

DRAFT

02 FEBRUARY 2017

FORT LEWIS AGREED ORDER GROUNDWATER MONITORING REPORT – 2016

BUILDING 4131 FORMER UST SITE (AOC 8-2)

BUILDING A0111 FORMER UST SITE (AOC 8-4)

BUILDING A1033 FORMER UST SITE (AOC 9-2)

GRAY ARMY FUEL FACILITY (AOC 10-8)

Joint Base Lewis-McChord

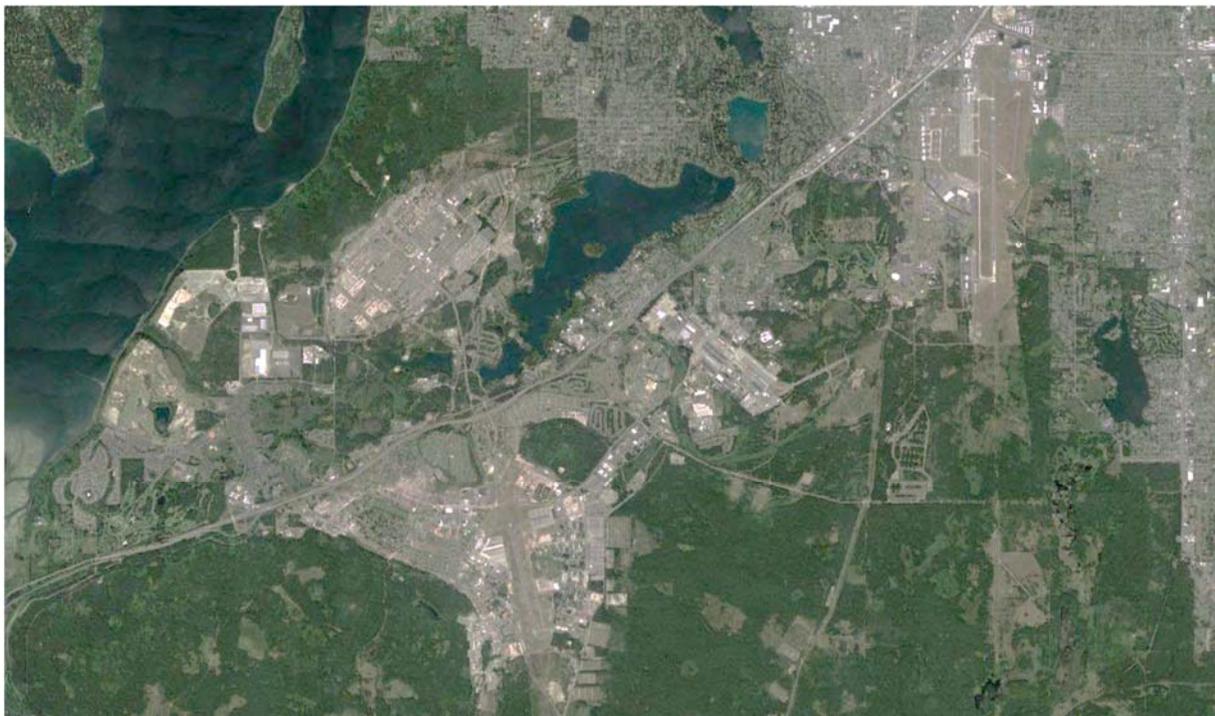
Pierce County, Washington

Joint Base Lewis-McChord Public Works – Environmental Division

IMLM-PWE

MS 17 Box 339500

Joint Base Lewis-McChord, Washington 98433





REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
HEADQUARTERS, JOINT BASE LEWIS-MCCHORD
1010 LIGGETT AVENUE, BOX 339500, MAIL STOP 14A
JOINT BASE LEWIS-MCCHORD, WA 98433-9500

February 2, 2017

Public Works

Mr. Charles Hoffman
Washington Department of Ecology
Attention: Hazardous Waste and Toxics Reduction Program
PO Box 47600
Olympia, Washington 98504-7600

Dear Mr. Hoffman:

Enclosed for your review is one paper copy of the Draft Fort Lewis Agreed Order Groundwater Monitoring Report – 2016. This document contains groundwater level measurements and TPH-D data collected during sampling events conducted in 2016 at Fort Lewis Agreed Order Sites: AOC 8-2, AOC 8-4, and AOC 10-8. This document also contains groundwater level measurements and TPH-G and BTEX data from groundwater samples collected from AOC 9-2 in 2016. These groundwater events were conducted in general accordance with the Fort Lewis Agreed Order Groundwater Sampling and Analysis Plan, dated February 2014.

TPH-D detected in samples collected from existing monitoring wells at AOC 8-2, AOC 8-4, and AOC 10-8 have been decreasing or have been staying constant over time. TPH-D was not detected in any samples from wells where it has never been detected before suggesting the TPH-D plumes at these sites are not expanding or impacting new areas onsite. TPH-D concentrations at AOC 8-4 have been below Model Toxics Control Act cleanup criteria for two years (four sampling events) and the Army is requesting to discontinue sampling at this site.

TPH-G and BTEX detected in samples collected from wells at AOC 9-2 have also been staying constant over time and were not detected in any samples from wells where they have never been detected previously.

If you have any questions or need clarification, please contact me at (253) 477-3742.

Sincerely,

GHEBRESLLASSIE.ME
SERET.C.1015675159

Digitally signed by
GHEBRESLLASSIE.MESERET.C.1015675159
DN: c=US, o=U.S. Government, ou=DoD, ou=PKI,
ou=USA, cn=GHEBRESLLASSIE.MESERET.C.1015675159
Date: 2017.02.02 15:04:50 -08'00'

Meseret Ghebreslassie
Installation Restoration Program Manager
Public Works Department

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FORT LEWIS AGREED ORDER
GROUNDWATER MONITORING REPORT – 2016

BUILDING 4131 FORMER UST SITE (AOC 8-2)
BUILDING A0111 FORMER UST SITE (AOC 8-4)
BUILDING A1033 FORMER UST SITE (AOC 9-2)
GRAY ARMY FUEL FACILITY (AOC 10-8)

CONTRACT NO. W912DW-11-D-1031, TASK ORDER 0001

FEBRUARY 2, 2017

JOINT BASE LEWIS-MCCHORD
PIERCE COUNTY, WASHINGTON

SEALASKA ENVIRONMENTAL SERVICES, LLC
POULSBO, WASHINGTON

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1	ACRONYMS AND ABBREVIATIONS	
2	AOC	Area of Concern
3	AS	air sparge
4	bgs	below ground surface
5	BTEX	Benzene, Toluene, Ethylbenzene and total Xylenes
6	Ecology	Washington State Department of Ecology
7	ERS	Environmental Remediation Services
8	FLAO	Fort Lewis Agreed Order
9	GAAF	Gray Army Airfield
10	IDW	Investigation-derived waste
11	IRP	Installation Restoration Program
12	JBLM	Joint Base Lewis-McChord
13	µg/L	micrograms per liter
14	MTCA	Model Toxics Control Act
15	MW	monitoring well
16	SAP	Sampling and Analysis Plan
17	Sealaska	Sealaska Environmental Services, LLC
18	SVE	soil vapor extraction
19	TPH-D	diesel-range total petroleum hydrocarbons
20	TPH-G	gasoline-range total petroleum hydrocarbons
21	TPH-HO	heavy oil-range total petroleum hydrocarbons
22	UST	underground storage tank
23	VOC	volatile organic compound
24		

DATA QUALIFIER DEFINITIONS

1		
2	B	The analyte was detected in an associated laboratory blank.
3	D	The reported result is from a dilution.
4	H	The chromatographic fingerprint of the sample resembles a petroleum product,
5		but the elution pattern indicates the presence of a greater amount of heavier
6		molecular weight constituents than the calibration standard.
7	J	The reported result is an estimated concentration.
8	L	The chromatographic fingerprint of the sample resembles a petroleum product,
9		but the elution pattern indicates the presence of a greater amount of lighter
10		molecular weight constituents than the calibration standard.
11	U	Analyte was not detected. Reported value is the quantitation limit.
12	UJ	Analyte was not detected. Reported value is the quantitation limit, which is
13		estimated.
14	X	The reported result may have a slight high bias due to the presence of non-
15		target components.
16	Y	The chromatographic fingerprint of the sample resembles a petroleum product
17		eluting in approximately the correct carbon range, but the elution pattern does
18		not match the calibration standard.
19	Z	The chromatographic fingerprint does not resemble a petroleum product.
20		

1

1 INTRODUCTION

2 This Groundwater Monitoring Report was prepared for Joint Base Lewis-McChord Public
3 Works, Joint Base Lewis-McChord (JBLM), Washington (Figure 1-1) by Sealaska
4 Environmental Services, LLC (Sealaska). All work was completed in accordance with the
5 2014 Sampling and Analysis Plan (SAP) for the four Fort Lewis Agreed Order (FLAO) sites
6 (Versar 2014). This report documents groundwater monitoring events conducted in April
7 and August 2016 at four FLAO sites (Figure 1-2) being addressed in accordance with
8 Washington State Department of Ecology (Ecology) Model Toxics Control Act (MTCA).
9 The four FLAO sites are:

- 10 • Building 4131 Former Underground Storage Tank (UST) Site (Area of
11 Concern [AOC] 8-2);
- 12 • Building A0111 Former UST Site (AOC 8-4);
- 13 • Building A1033 Former UST Site (AOC 9-2); and
- 14 • Gray Army Airfield (GAAF) Fuel Facility (AOC 10-8).

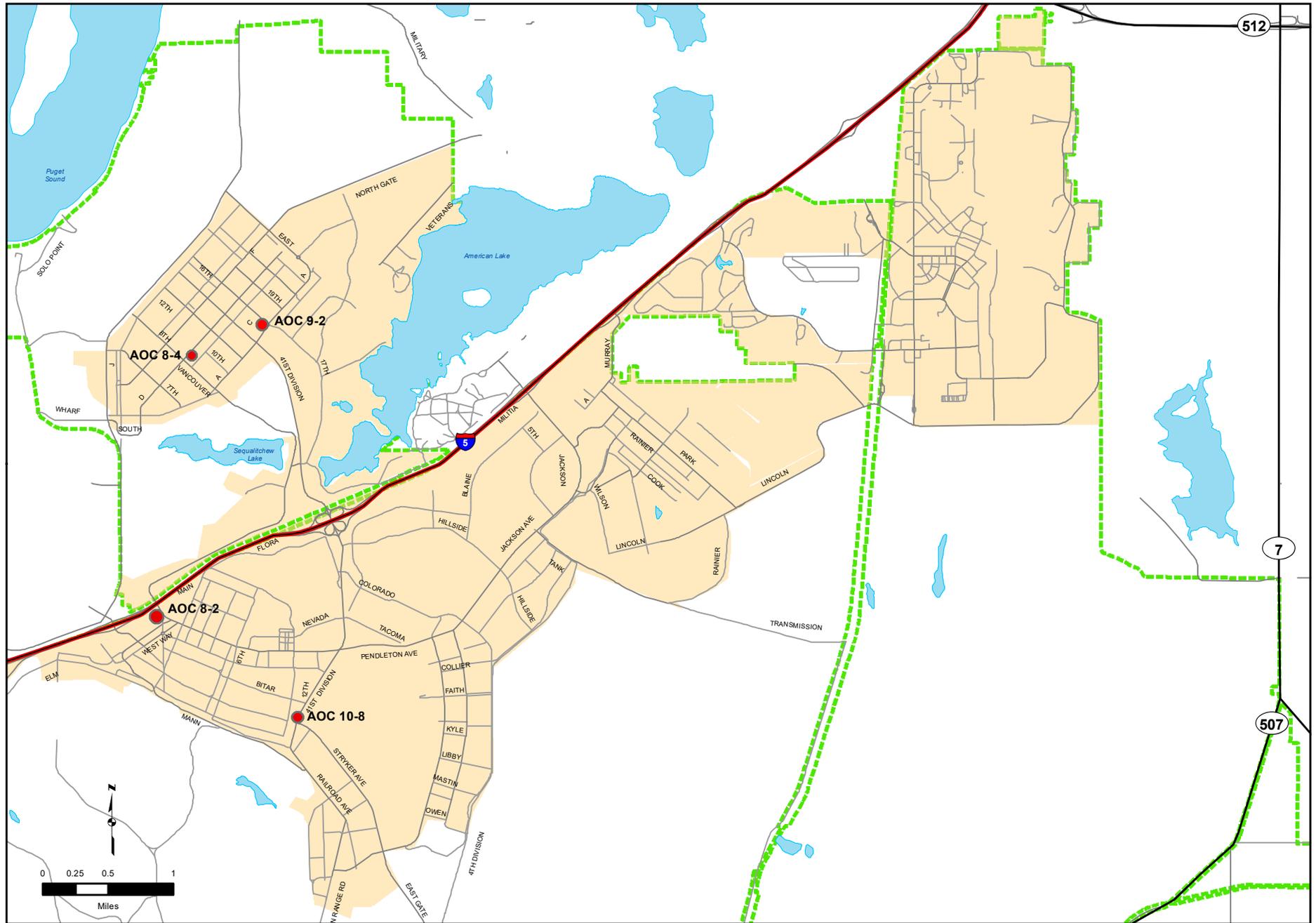
15 Field forms and logbooks for both sampling events covered in this report are included in
16 Appendix A. Laboratory analytical reports and data quality review for both sampling events
17 are included in Appendix B.

18 1.1 SITE LOCATIONS AND USE

19 1.1.1 Building 4131 Former UST Site (AOC 8-2)

20 The site is located on Lewis Main near the Pendleton underpass of Interstate 5 at the
21 intersection of Pendleton Avenue and Lewis Drive. A 500-gallon heating oil tank and
22 associated soil contamination were removed from the former building location in 1996.
23 Currently, the site is a vacant lot. The land use of the site is designated for Open Space in the
24 JBLM Master Plan.

25



<p>Legend</p> <p> Cantonment Area JBLM Boundary</p>	<p>Map Data: Coordinate System: UTM, Zone 10 Horizontal Datum: WGS 84</p>	<p>USACE</p>	<p>SEALASKA</p>	<p>Figure 1-2 Projects Location Map</p>
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1 **1.1.2 Building A0111 Former UST Site (AOC 8-4)**

2 The site is located on Lewis North near the intersection of 9th Street and D Street. A
3 300-gallon heating oil tank and associated soil contamination were removed from the former
4 building location in 1996. A chemical battalion administration building was constructed on
5 the site in 2010 and 2011. Most of the construction of the building and landscaping was
6 completed in August 2011. The land use of the site is designated for Administration in the
7 JBLM Master Plan.

8 **1.1.3 Building A1033 Former UST Site (AOC 9-2)**

9 The site is located on Lewis North near the intersection of 17th Street and A Street. Four
10 4,000-gallon gasoline USTs and associated soil contamination were removed from the
11 former building location between 1990 and 1994. A credit union and Domino's Pizza are
12 currently on the site. A combination air sparge (AS)/soil vapor extraction (SVE) system was
13 constructed in 2009 under the building to intercept petroleum vapors in the vadose zone and
14 prevent them from migrating into the building (Versar 2009a). The SVE system has been
15 operating since February 2010. After a pilot test was conducted on the full AS/SVE system,
16 the AS system was started up in 2013. The land use of the site is designated for Community
17 Services in the JBLM Master Plan.

18 **1.1.4 GAAF Fuel Facility (AOC 10-8)**

19 The GAAF Fuel Facility is located on the northwest side of GAAF adjacent to Building 3034
20 on Lewis Main. Four 25,000-gallon jet fuel USTs and associated soil contamination were
21 removed from the site in 1998. The site is currently a fenced and gated paved parking lot. The
22 land use of the site is designated as Aviation in the JBLM Master Plan.

23 **1.2 INVESTIGATION CHRONOLOGY**

24 **1.2.1 Building 4131 Former UST Site (AOC 8-2)**

25 Detailed background information is included in the FLAO Remedial Investigation Report
26 (Bussey 2008). In summary, six monitoring wells have been installed to date (designated as
27 4131-MW01 through 4131-MW06). Groundwater monitoring events have been conducted
28 from 2005 to present.

29 **1.2.2 Building A0111 Former UST Site (AOC 8-4)**

30 Detailed background information is included in the FLAO Remedial Investigation Report
31 (Bussey 2008). In summary, eight monitoring wells have been installed to date (designated

1 as A0111-MW01 through A0111-MW08) and groundwater monitoring events have been
2 conducted from 2005 to present.

3 Monitoring wells A0111-MW01 through A0111-MW03 were decommissioned by Krazan
4 and Associates in February 2010 because they were within the footprint of a new, chemical
5 battalion administration building. Three new monitoring wells, designated as A0111-MW06
6 through A0111-MW08 were constructed and developed in February 2010 to replace the
7 three decommissioned wells. Monitoring wells A0111-MW06 through A0111-MW08 were
8 initially sampled on 1 March 2010 after development by Krazan Associates. These wells
9 were initially sampled quarterly with exceptions due to monument or casing damage and
10 construction or soil debris placement prohibiting access to all of the wells.

11 The three monitoring wells' sampling schedule was changed to semiannual beginning with
12 the March 2012 sampling event. As of August 2016, 16 sampling events have been
13 completed. This does not include an event conducted in February 2011 when monitoring
14 wells A0111-MW06 and A0111-MW07 could not be located and A0111-MW08's
15 monument and casing were broken. Beginning with the June 2012 sampling event, all
16 monitoring wells part of AOC 8-4's current sampling network have been repaired and there
17 have been no access issues.

18 **1.2.3 Building A1033 Former UST Site (AOC 9-2)**

19 Detailed background information is included in the FLAO Remedial Investigation Report
20 (Bussey 2008). In summary, eight monitoring wells have been installed to date (designated
21 as 95-A17-1, 95-A17-2, 95-A17-3a, 95-A17-4, 96-A17-5, 96-A17-6, 07-A17-7, and
22 10-A17-08). Groundwater monitoring events have been conducted from 1995 to present. A
23 combination AS/SVE system was constructed in 2009 to intercept volatile organic
24 compound (VOC) vapors in soil under the new credit union and Domino's Pizza building
25 (Versar 2009a). The SVE portion of the system was turned on in February 2010, prior to
26 occupation of the building. The AS system was turned on later and both are currently
27 operational. Field events and data regarding the AS/SVE system are detailed in reports
28 specific to that system.

29 **1.2.4 GAAF Fuel Facility (AOC 10-8)**

30 Detailed background information is included in the FLAO Remedial Investigation Report
31 (Bussey 2008). In summary, five monitoring wells were installed from 2005 through 2009. The
32 wells were designated as AOC 10-8-MW01 through AOC 10-8-MW04 and AOC 10-8-B05.
33 Initially, the monitoring wells were designated as JP-MW-1 through JP-MW-4 and then

1 changed to AOC 10-8-MW01 through AOC 10-8-MW04. Beginning with the August 2010
2 Monitoring Report (Versar 2009b), these monitoring wells have been referred to as JP-MW-1
3 through JP-MW-4 per the original numbering. Groundwater monitoring events were conducted
4 from 1993 to 1995 and from 2004 to present. In 2007, the site was paved over and is currently a
5 parking lot. During construction activities JP-MW-4 was paved over and is no longer
6 accessible and AOC 10-8-B05 was damaged. The AOC 10-8-B05 casing was cracked and bent,
7 and personnel are unable to collect samples from the well using a pump. Due to these issues,
8 since 2008, samples have been collected from AOC 10-8-B05 using a disposable bailer.

9 **1.3 HYDROGEOLOGY**

10 The aquifer of interest for all four sites is the upper Vashon Aquifer. The unconfined upper
11 Vashon Aquifer consists of glacial outwash deposits generally underlain by lower
12 permeability Vashon Till deposits. Depth to groundwater is typically 20 to 30 feet below
13 ground surface (bgs) at AOC 8-2, 15 to 20 feet bgs at AOC 8-4, 20 to 30 feet bgs at
14 AOC 9-2, and 35 to 45 feet bgs at AOC 10-8. The regional direction of groundwater flow in
15 the Vashon Aquifer across the Fort Lewis Cantonment Area is generally to the west, with
16 eventual discharge at Puget Sound. Local flow direction at each site is generally:

- 17 • To the southwest at AOC 8-2;
- 18 • To the northwest at AOC 8-4;
- 19 • To the west at AOC 9-2; and
- 20 • To the northwest at AOC 10-8.

21 The closest potential downgradient receptor to each site is:

- 22 • JBLM production well 17 and the City of DuPont's Bell Hill Wells are located
23 approximately 1/4 mile southwest and 2/3 mile northwest of AOC 8-2, respectively.
24 However, these wells are screened in deeper aquifers than the upper Vashon Aquifer;
- 25 • There are no potential receptors currently located downgradient of either AOC 8-4 or
26 AOC 9-2; and
- 27 • JBLM production well 17 is located approximately 1.5 miles west of AOC 10-8 and is
28 screened at a depth of approximately 460 to 480 feet bgs (below the upper Vashon Aquifer).

2 FIELD ACTIVITIES

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Sealaska personnel conducted the spring 2016 sampling event from April 18 to 21 and the fall event from August 18 to 31. Copies of the completed field forms and logbooks for both sampling events are included in Appendix A.

During each monitoring event, an electronic water level indicator was used to measure depth to water in all monitoring wells scheduled for static water level measurements to the nearest 0.01-foot from the top of the well's casing. Well construction details are presented in Table 2-1.

All monitoring wells at AOC 8-2, AOC 8-4, AOC 9-2, and AOC 10-8 except AOC 10-8-B05 (AOC 10-8) were purged using standard low-flow purging procedures prior to sampling. Because of obstructions in AOC 10-8-B05, a disposable bailer was used to purge three well volumes from this well prior to sampling during the April and August sampling events.

At AOC 8-2, all monitoring wells were purged and sampled using dedicated stainless steel bladder pumps. A variable frequency drive controller limited the purging flow rate to less than 1 liter per minute.

At AOC 8-4, all sampled wells were purged and sampled using a peristaltic pump and disposable sample tubing. Monitoring well A0111-MW06 is located within a landscaped area behind the chemical battalion administration building. The other monitoring wells were located in front of the building within a lawn.

At AOC 9-2, monitoring wells 95-A17-3a, 95-A17-4, and 07-A17-7 were purged and sampled using dedicated stainless steel bladder pumps. Monitoring well 95-A17-2 was purged and sampled using a peristaltic pump and disposable sample tubing. Monitoring well 10-A17-8 was purged and sampled using a submersible pump with dedicated tubing.

At AOC 10-8, AOC 10-8-B05 was purged and sampled using a disposable bailer (as noted above). JP-MW02 was purged and sampled using a submersible pump with dedicated tubing.

To verify stabilization during purging, relative water levels were taken and water quality parameters including pH, specific conductivity, temperature, and turbidity were measured with a calibrated Horiba U-52 meter. The Horiba was calibrated at the beginning of each day prior to any sampling activities. In addition, dissolved oxygen and oxidation-reduction

1 potential were monitored to support stabilization and provide natural attenuation data.
2 Groundwater samples were collected immediately after field measurements had stabilized
3 without turning off the pumping system.

4 During each event, two duplicate samples were collected from monitoring wells. During the
5 April and August events, duplicates were collected from wells 4131-MW03 (AOC 8-2) and
6 10-A17-8 (AOC 9-2).

7 Groundwater samples collected from monitoring wells at AOC 8-2, AOC 8-4, and AOC 10-
8 8 were analyzed for diesel-range total petroleum hydrocarbons (TPH-D) and heavy oil-range
9 total petroleum hydrocarbons (TPH-HO), respectively, using Ecology Method NWTPH-Dx.

10 Groundwater samples collected from monitoring wells at AOC 9-2 were analyzed for
11 gasoline-range TPH (TPH-G) using Ecology Method NWTPH-Gx. Samples were also
12 analyzed for benzene, toluene, ethylbenzene, and total xylenes (BTEX) using United States
13 Environmental Protection Agency Method 8260C.

14 Samples collected during the April and August events were sent via courier to ALS
15 Environmental of Kelso, Washington. Copies of laboratory analytical reports are included in
16 Appendix B.

17 **2.1 INVESTIGATION-DERIVED WASTE**

18 Investigation-derived waste (IDW) was disposed of as follows:

- 19 • Purge water and decontamination water from all sites were containerized and held
20 for analyses. Analyses results determined where the purge and decontamination
21 water was discharged. If results were less than MTCA Method A cleanup level, then
22 the water was discharged at the Landfill 2 Pump and Treat System. If results were
23 higher than MTCA cleanup levels, the water was discharged to the new Industrial
24 Wastewater Treatment Plant.
 - 25 ○ During the April sampling, 14 gallons of purge water was collected. Samples
26 were submitted to ALS for analysis and all results were less than cleanup criteria
27 so the water was discharged to the IDW tank at the Landfill 2 Pump and Treat
28 System in June for disposal.
 - 29 ○ During the August sampling event, approximately 10 gallons of purge water was
30 collected. A sample of the IDW was submitted to ALS for analysis and all results
31 except TPH-D were below cleanup criteria. Since the TPH-D results were above
32 cleanup criteria, the IDW water will be discharged at the new Industrial

1 Wastewater Treatment Plant per Installation Restoration Program (IRP)
2 personnel. The IDW is currently being stored at the Landfill 2 Pump and Treat
3 System area.

- 4 • Personal protective equipment and garbage was disposed of as solid waste in a
5 Sealaska dumpster.

6 **2.2 DEVIATIONS FROM THE SAMPLING AND ANALYSIS PLAN**

7 Groundwater monitoring events were completed in general accordance with the February
8 2014 SAP for the four FLAO sites (Versar 2014). Deviations from the 2014 SAP for 2016
9 were:

- 10 • The 2014 SAP specifies that the wet season sampling should occur in February or
11 March. An updated plan that has not yet been approved by Ecology specifies that the
12 wet season sampling will occur in March or April each year. The 2016 wet season
13 sampling was conducted in April to coordinate with other site sampling events.
- 14 • AOC 8-2 – No deviations from the plan were noted.
- 15 • AOC 8-4 – No deviations from the plan were noted.
- 16 • AOC 9-2 – During construction of the Credit Union, the monument for 95-A17-2
17 was destroyed and replaced. The dedicated bladder pump was broken and personnel
18 have been unable to retrieve the broken pump. During the April 2016 and August
19 2016 sampling events, samples were collected from 95-A17-2 using a peristaltic
20 pump and dedicated disposable sample tubing.
- 21 • AOC 10-8 – No deviations from the plan were noted.

Table 2-1. Well Construction Details

Location ID	Northing WGS84	Easting WGS84	TOC Elevation (ft AMSL)	Well Depth (ft bgs)	Screen Top (ft bgs)	Screen Bottom (ft bgs)	Completion Date
Building 4131 AOC-8-2							
4131-MW01	5215634.5	529115.8	266.57	37.5	27.5	37.5	21-Feb-05
4131-MW02	5215643.6	529095.4	265.39	33	23	33	23-Feb-05
4131-MW03	5215656.6	529118.6	267.42	34	24	34	22-Feb-05
4131-MW04	5215614.5	529085.2	264.98	34	23	33	22-Dec-05
4131-MW05	5215644.6	529058.4	264.49	34	23	33	20-Dec-05
4131-MW06	5215676.9	529079.3	266.45	35	23	33	20-Dec-05
Building A0111 AOC-8-4							
A0111-MW04	5218894.39	529498.24	230.88	28.5	17	27	19-Dec-05
A0111-MW05	5218864.97	529469.978	230.84	29	17	27	19-Dec-05
A0111-MW06	5218832.28	529534.8	227.69	29	19	29	5-Mar-10
A0111-MW07	5218911.85	529523.91	230.88	30	20	30	5-Mar-10
A0111-MW08	5218871.71	529489.3	231.24	30	20	30	5-Mar-10
Building A1033 AOC 9-2							
95-A17-1	5219211.8	530441.04	236.9	42.5	27.1	42.1	18-Aug-95
95-A17-2	5219199.78	530377.39	235.9	42.2	27.0	42.0	17-Aug-95
95-A17-3a	5219229.15	530377.99	235.9	44.5	29.3	44.3	17-Aug-95
95-A17-4	5219240.22	530396.92	236.8	42.5	26.6	42.0	18-Aug-95
96-A17-5	5219268.15	530331.27	233.9	45.0	29.8	44.8	22-Jan-96
96-A17-6	5219288.6	530365.07	235.1	45.0	29.8	44.8	22-Jan-96
07-A17-7	5219226	530335	233.2	37	22	37	21-Jun-07
10-A17-8	5219219.2	530397.6	235.8	39	29	39	8-Oct-10
Building 3034 - GAAF Fuel Facility AOC 10-8							
AOC 10-8-B05	5214424.454	530833.657	281.39	47.5	37.5	47.5	1-May-05
JP-MW-01	5214386.4	530828.5	281.56	51.7	39.6	49.6	27-May-93
JP-MW-02	5214452.6	530794.3	279.33	50.0	39.2	49.2	27-May-93
JP-MW-03	5214456.9	530848.1	280.7	50.3	39.6	49.6	25-May-93
JP-MW-04	5214433	530832.67	281.12	51.3	40.8	50.8	27-May-93

Notes:
 TOC – Top of casing
 ft AMSL – Feet above mean sea level
 ft bgs – Feet below ground surface

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3 RESULTS AND DISCUSSION

2 3.1 BUILDING 4131 FORMER UST SITE (AOC 8-2)

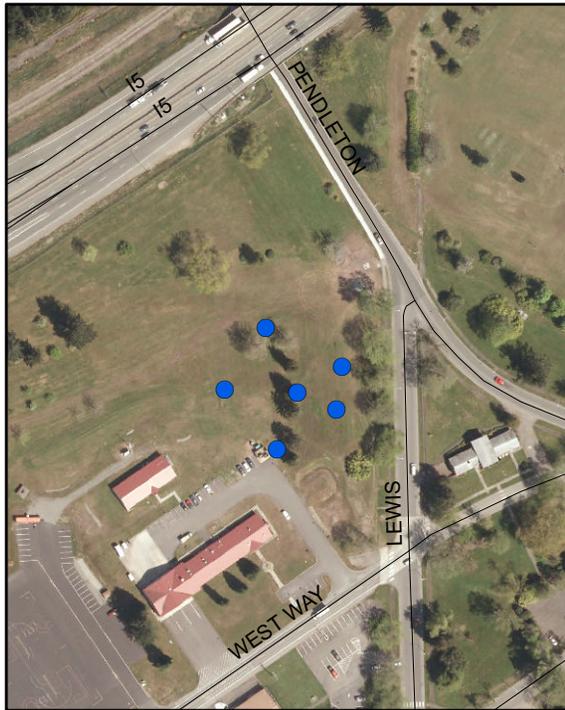
3 Groundwater level and TPH-D concentration iso-contour lines are presented on Figure 3-1
4 (April) and Figure 3-2 (August). Due to perceived inaccuracies in casing elevation data at
5 wells 4131-MW01 and 4131-MW02, all site wells were resurveyed in March 2016 by AES
6 Consultants, Inc. using a Leica 1200 GPS unit. The new elevation data collected was used in
7 the generation of the groundwater contours. The well survey report is included as Appendix C.

8 Table 3-1 presents depth to water measurements, TPH-D concentrations, and groundwater
9 parameter field measurements for AOC 8-2. TPH-D concentrations are compared to
10 Ecology's MTCA Method A cleanup level of 500 micrograms per liter ($\mu\text{g/L}$). Appendix B
11 contains copies of laboratory analytical reports for both groundwater sampling events.

12 Historically, 4131-MW03 has been considered at or near the source area since it typically
13 has the highest concentrations of TPH-D. Concentrations of TPH-D decrease to values well
14 below MTCA cleanup levels in downgradient wells 4131-MW04 (south of 4131-MW03)
15 and 4131-MW05 (southwest of 4131-MW03). These results are generally consistent with
16 previous events. TPH-D concentrations detected in samples collected from monitoring wells
17 4131-MW02 in August and 4131-MW03 during both events in 2016 were above 500 $\mu\text{g/L}$.
18 A duplicate sample was collected during both the April and September sampling events
19 from well 4131-MW03. Sample results are inconsistent with the primary samples from the
20 April sampling (2,400 $\mu\text{g/L}$ in the primary sample and 630 $\mu\text{g/L}$ in the duplicate). The
21 duplicate sample collected in September was consistent with the primary sample (3,100
22 $\mu\text{g/L}$ in the primary sample and 3,200 $\mu\text{g/L}$ in the duplicate). More discussion on this issue
23 can be found in Section 3.6.

24 Figure 3-3 presents TPH-D concentrations in samples collected from monitoring wells
25 4131-MW02 and 4131-MW03 over time. During the April sampling event, TPH-D was
26 detected at 480 $\mu\text{g/L}$ (4131-MW02) and 2,400 $\mu\text{g/L}$ from 4131-MW03 (Table 3-1). During
27 the August sampling event, TPH-D was detected at 1,700 $\mu\text{g/L}$ (4131-MW02) and
28 3,100 $\mu\text{g/L}$ (4131-MW03).

29 TPH-D has continued to exceed MTCA Method A cleanup levels in two site wells. Because
30 of this, it is recommended that prescribed monitoring continue in 2017.



Notes:

Depth to water measurements collected April 19, 2016.

Groundwater samples collected April 20, 2016.

TPH-D Cleanup level = 500 µg/L

Legend

- Monitoring Well
- ~ TPH-D Concentration (µg/L)
- ~ Groundwater Elevation (famsl)

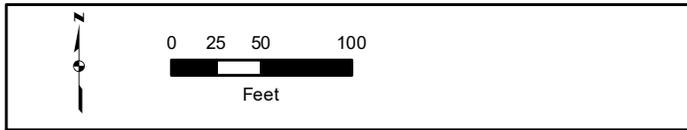
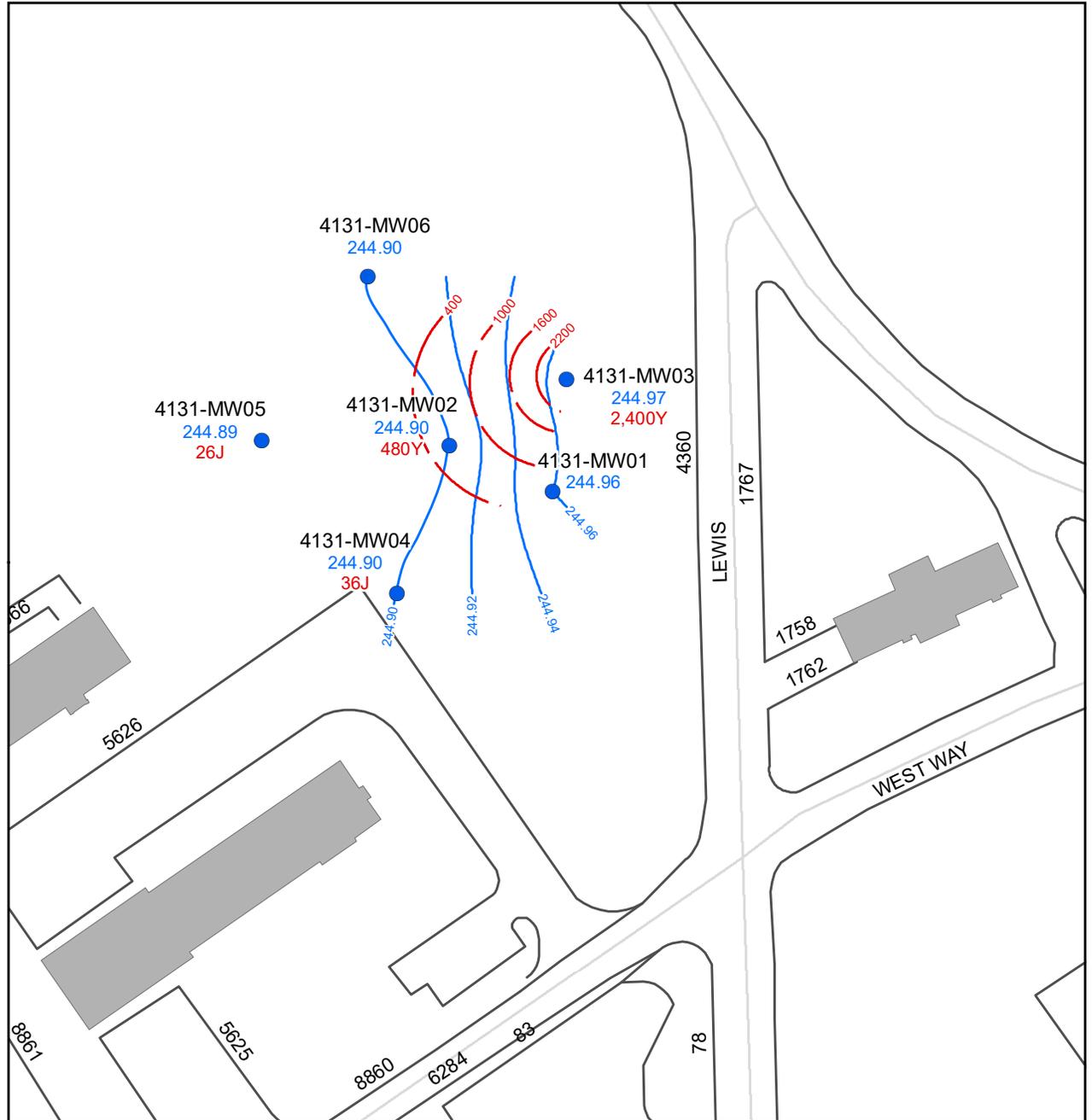
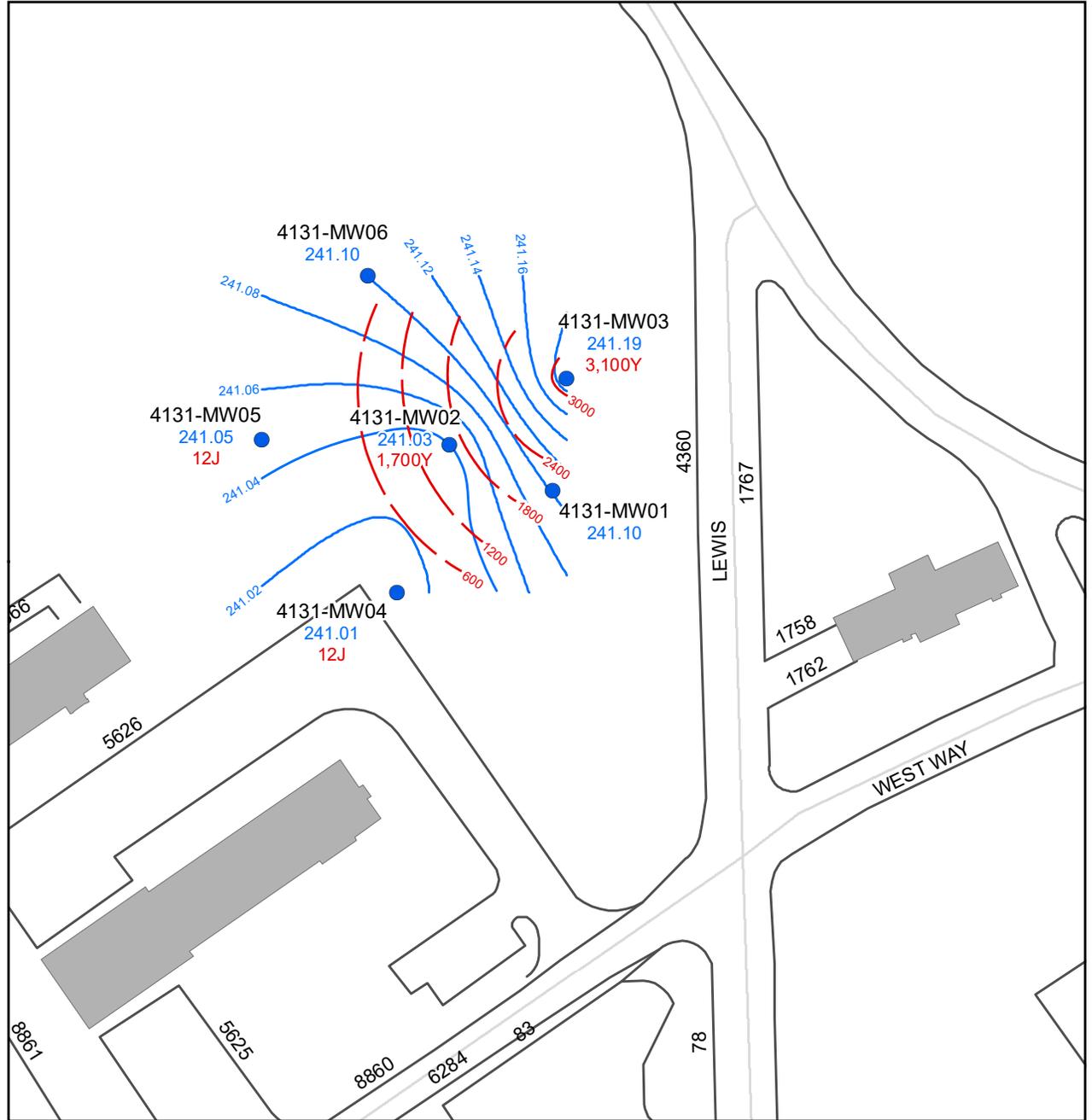
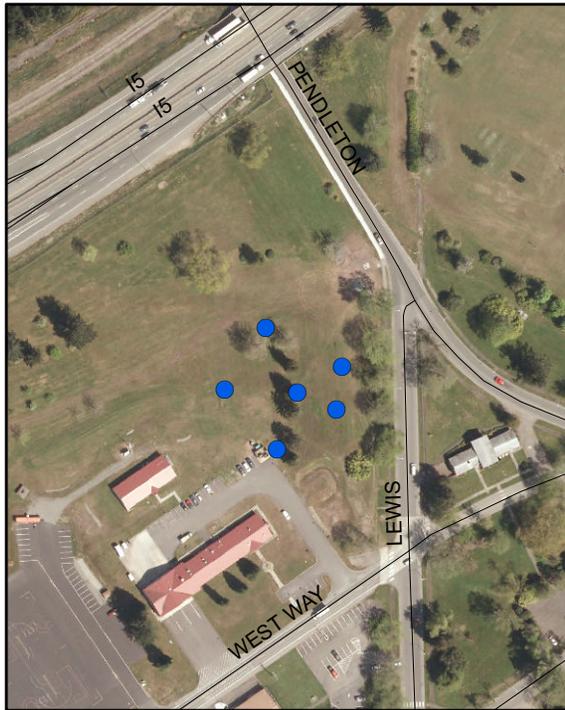


Figure 3-1
AOC 8-2 Groundwater Elevation and
TPH-D Concentration Contours April 2016



Notes:

Depth to water measurements collected August 18, 2016.

Groundwater samples collected August 31, 2016.

TPH-D Cleanup level = 500 µg/L

Legend

- Monitoring Well
- - - TPH-D Concentration (µg/L)
- ~ ~ ~ Groundwater Elevation (fmsl)

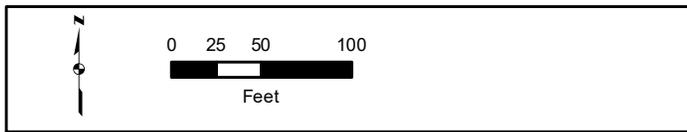
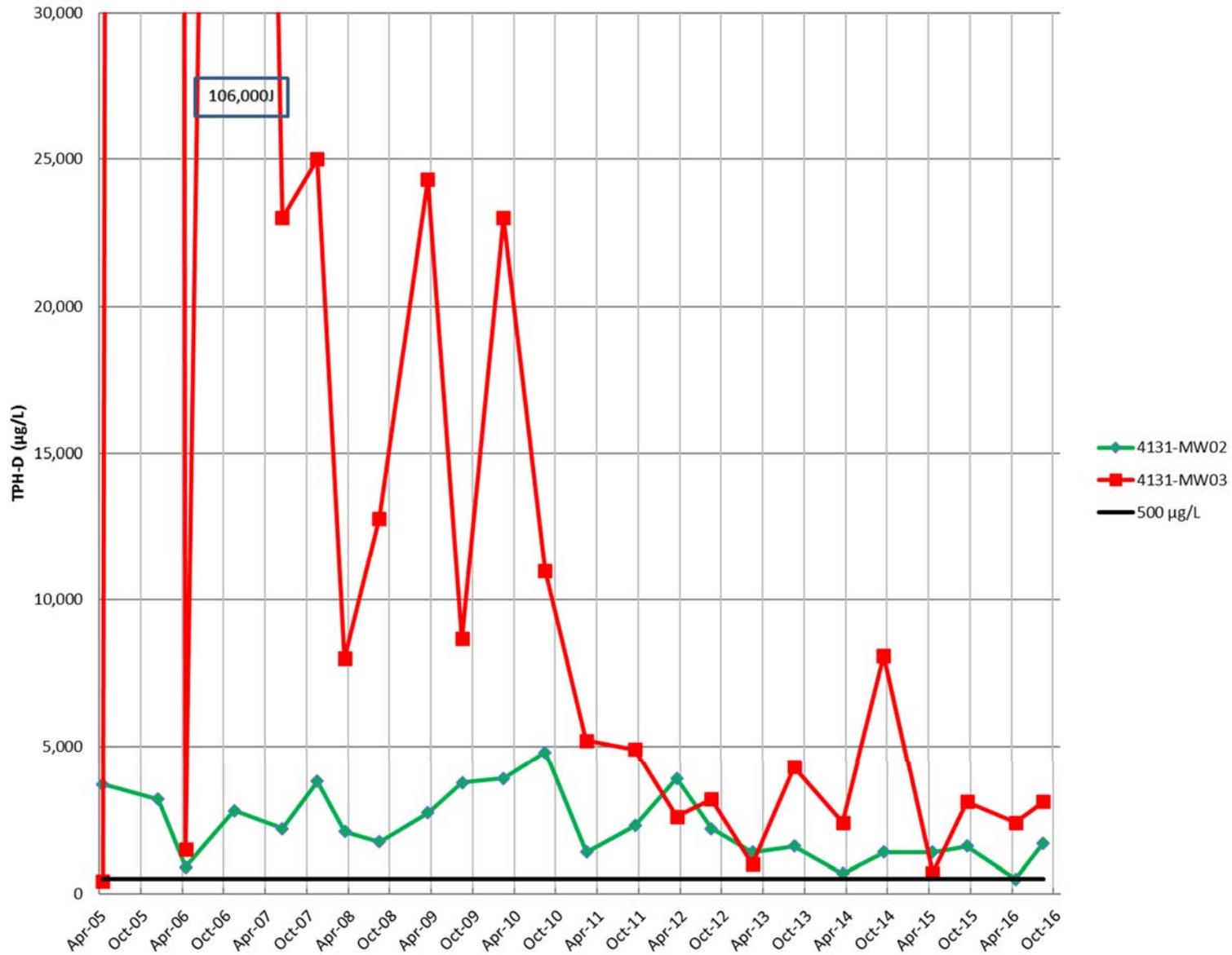


Figure 3-2
AOC 8-2 Groundwater Elevation and
TPH-D Concentration Contours August 2016

Figure 3-3. TPH-D Concentration Trends in 4131-MW02 and -MW03 (AOC 8-2)



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1 **Table 3-1.** AOC 8-2 Depth to Water Measurements, TPH-D Concentrations, and
 2 Groundwater Parameter Field Measurements

Well ID TOC Elevation	Date	DTW (ft btoc)	GWELEV (ft AMSL)	TPH-D (µg/L)	pH	Cond. (µS/cm)	DO (ppm)	ORP (mv)	Temp °C	
4131-MW01 266.57	11-Apr-05	28.14	238.43	250U	-	-	-	-	-	
	29-Dec-05	28.22	238.35	250U	-	-	-	-	-	
	4-Apr-06	24.09	242.48	250U	-	-	-	-	-	
	3-Nov-06	28.69	237.88	-	-	-	-	-	-	
	18-Jun-07	24.88	241.69	-	-	-	-	-	-	
	16-Nov-07	27.86	238.71	-	-	-	-	-	-	
	26-Mar-08	25.23	241.34	-	-	-	-	-	-	
	25-Aug-08	28.00	238.57	-	-	-	-	-	-	
	2-Mar-09	26.82	239.75	-	-	-	-	-	-	
	25-Aug-09	28.15	238.42	-	-	-	-	-	-	
	22-Feb-10	26.2	240.37	-	-	-	-	-	-	
	23-Aug-10	27.18	239.39	-	-	-	-	-	-	
	22-Feb-11	24.7	241.87	-	-	-	-	-	-	
	8-Sep-11	26.14	240.43	-	-	-	-	-	-	
	6-Mar-12	25.44	241.13	-	-	-	-	-	-	
	15-Aug-12	26	240.57	-	-	-	-	-	-	
	20-Feb-13	25.19	241.38	-	-	-	-	-	-	
	12-Aug-13	26.75	239.82	-	-	-	-	-	-	
13-Mar-14	23.95	242.62	-	-	-	-	-	-		
22-Sep-14	26.19	240.38	-	-	-	-	-	-		
27-Apr-15	24.59	241.98	-	-	-	-	-	-		
3-Sep-15	27.26	239.31	-	-	-	-	-	-		
19-Apr-16	21.61	244.96	-	-	-	-	-	-		
18-Aug-16	25.47	241.10	-	-	-	-	-	-		
4131-MW02 265.39	11-Apr-05	26.95	238.44	3,700	-	-	-	-	-	
	29-Dec-05	27.04	238.35	3,200	-	-	-	-	-	
	4-Apr-06	22.99	242.40	890	-	-	-	-	-	
	3-Nov-06	27.55	237.84	2,800	6.37	0.37	-	-	13.00	
	18-Jun-07	23.74	241.65	2,200	5.94	0.15	-	-	12.40	
	16-Nov-07	26.69	238.70	3,800J	7.50	0.32	0.66	-	12.80	
	26-Mar-08	24.05	241.34	2,100	7.19	0.17	2.75	11	161.00	
	25-Aug-08	26.85	238.54	1,750	7.02	0.31	1.02	29	12.78	
	2-Mar-09	25.67	239.72	2,730	6.37	0.23	0.55	-	12.68	
	25-Aug-09	26.96	238.43	3,760	6.24	0.31	0.56	41	12.70	
	Duplicate	25-Aug-09	26.96	238.43	3,430	6.24	0.31	0.56	41	12.70
		22-Feb-10	25.00	240.39	3,900	6.59	0.27	0.44	35	12.50
	Duplicate	22-Feb-10	25.00	240.39	3,200	6.59	0.27	0.44	35	12.50
		23-Aug-10	26.00	239.39	120U*	5.59	0.11	7.49	308	13.10
		22-Feb-11	23.62	241.77	1,400	6.14	0.17	1.17	-	11.90
		8-Sep-11	25.00	240.39	2,300	5.19	0.19	-	209	12.20
	Duplicate	8-Sep-11	25.00	240.39	2,200	5.19	0.19	-	209	12.20
		6-Mar-12	24.26	241.13	3,900	7.05	-	0.32	16	12.30
	15-Aug-12	24.98	240.41	2,200	7.74	-	0.43	11	12.80	
	20-Feb-13	24.10	241.29	1,400	7.62	-	5.07	23	13.20	
	12-Aug-13	25.60	239.79	1,600	6.52	0.21	0.38	25	11.90	
	13-Mar-14	22.95	242.44	680	5.90	0.11	4.06	28	12.00	

3

1 **Table 3-1.** AOC 8-2 Depth to Water Measurements, TPH-D Concentrations, and
 2 Groundwater Parameter Field Measurements (continued)

Well ID TOC Elevation	Date	DTW (ft btoc)	GWELEV (ft AMSL)	TPH-D (µg/L)	pH	Cond. (µS/cm)	DO (ppm)	ORP (mv)	Temp °C	
4131-MW02 Cont.	22-Sep-14	24.98	240.41	1,400	6.30	0.16	1.40	26	12.80	
	27-Apr-15	23.41	241.98	1,400	6.26	0.18	6.10	72	12.93	
	3-Sep-15	26.11	239.28	1,600	5.77	0.24	0.00	80	14.00	
	Duplicate	3-Sep-15	26.11	239.28	1,900	5.77	0.24	0.00	80	14.00
		20-Apr-16	20.49	244.90	480Y	6.37	0.132	3.31	115	14.50
		18-Aug-16	24.36	241.03	1,700Y	6.45	0.393	0.83	-22	13.17
4131-MW03 267.42	11-Apr-05	28.22	239.20	430	-	-	-	-	-	
	29-Dec-05	25.00	242.42	850,000	-	-	-	-	-	
	4-Apr-06	24.73	242.69	1,500	-	-	-	-	-	
	3-Nov-06	29.48	237.94	106,000J	5.83	0.35	-	-	13.00	
	18-Jun-07	25.10	242.32	23,000	6.16	0.28	-	-	12.60	
	16-Nov-07	28.07	239.35	25,000J	-	-	-	-	-	
	26-Mar-08	24.61	242.81	8,000	-	-	-	-	-	
	25-Aug-08	27.62	239.80	12,800	6.92	0.27	1.15	61	13.43	
	2-Mar-09	25.45	241.97	24,300	6.27	0.19	0.56	-	12.80	
	25-Aug-09	26.22	241.20	8,660	6.10	0.19	0.72	217	12.90	
	22-Feb-10	24.55	242.87	23,000	6.18	0.18	2.32	114	12.50	
	23-Aug-10	25.68	241.74	4,800*	5.98	0.28	0.46	141	12.60	
	22-Feb-11	24.50	242.92	5,200	6.04	0.18	1.64	-	11.90	
	8-Sep-11	25.55	241.87	4,900	4.96	0.15	1.64	-105	12.90	
	6-Mar-12	24.65	242.77	2,600	7.05	-	2.59	47	11.20	
	Duplicate	6-Mar-12	24.65	242.77	5,600	7.05	-	2.59	47	11.20
		15-Aug-12	25.64	241.78	3,200	7.28	-	2.04	30	12.40
		20-Feb-13	24.94	242.48	1,000	7.16	-	2.39	35	12.40
		12-Aug-13	27.20	240.22	4,300	6.19	0.13	0.39	45	12.50
		13-Mar-14	24.25	243.17	2,400	6.08	0.16	3.63	44	12.20
		22-Sep-14	26.76	240.66	8,100			Pumped Dry		
		27-Apr-15	24.80	242.62	690	6.04	0.17	8.01	-9	12.90
	Duplicate	27-Apr-15	24.80	242.62	990	6.04	0.17	8.01	-9	12.90
	3-Sep-15	27.98	239.44	3,100	6.30	0.24	0.00	-25	13.23	
	20-Apr-16	22.45	244.97	2,400Y	6.27	0.134	1.88	-58	15.23	
Duplicate	20-Apr-16	22.45	244.97	630Y	6.27	0.134	1.88	-58	15.23	
	18-Aug-16	26.23	241.19	3,100Y	6.13	0.288	0.47	-44	13.4	
Duplicate	18-Aug-16	26.23	241.19	3,200Y	6.13	0.288	0.47	-44	13.4	
4131-MW04 264.98	29-Dec-05	26.64	238.34	1,200	-	-	-	-	-	
	4-Apr-06	22.59	242.39	250U	-	-	-	-	-	
	3-Nov-06	27.17	237.81	100U	6.25	0.10	-	-	13.20	
	18-Jun-07	23.34	241.64	100U	6.20	0.08	-	-	12.60	
	16-Nov-07	26.31	238.67	100UJ	7.09	0.08	6.78	-	13.40	
	21-Mar-08	23.70	241.28	100U	7.24	0.09	7.39	280	11.90	
	25-Aug-08	26.48	238.50	100U	6.06	0.09	7.81	307	12.18	
	2-Mar-09	25.31	239.67	100U	5.61	0.07	8.11	-	12.70	
	25-Aug-09	26.60	238.38	100U	5.30	0.08	7.67	200	11.90	
	22-Feb-10	24.67	240.31	120U	6.70	0.07	8.43	210	12.80	
	25-Aug-09	26.60	238.38	100U	5.30	0.08	7.67	200	11.90	
	23-Aug-10	25.65	239.33	120U	5.73	0.09	7.12	365	12.60	
	22-Feb-11	23.23	241.75	120U	6.11	0.06	7.77	-	12.30	
8-Sep-11	24.45	240.53	130	4.38	0.08	-	146	12.60		

1 **Table 3-1.** AOC 8-2 Depth to Water Measurements, TPH-D Concentrations, and
 2 Groundwater Parameter Field Measurements (continued)

Well ID TOC Elevation	Date	DTW (ft btoc)	GWELEV (ft AMSL)	TPH-D (µg/L)	pH	Cond. (µS/cm)	DO (ppm)	ORP (mv)	Temp °C
4131-MW04 Cont.	6-Mar-12	23.90	241.08	120U	7.04	-	7.51	25	12.70
	15-Aug-12	25.60	239.38	120U	7.48	-	6.74	21	12.40
	20-Feb-13	23.90	241.08	100U	7.69	-	6.78	13	12.30
	12-Aug-13	25.30	239.68	100U	6.16	0.07	8.58	42	12.30
	13-Mar-14	22.60	242.38	100U	6.36	0.07	9.67	28	12.80
	22-Sep-14	24.60	240.38	15J	6.20	0.08	9.00	240	13.30
	27-Apr-15	23.06	241.92	22J	6.17	0.09	10.60	189	12.97
	3-Sep-15	25.75	239.23	19J	5.54	0.11	8.30	195	14.14
	21-Apr-16	20.08	244.90	36J	6.41	0.128	5.83	211	14.53
	18-Aug-16	23.97	241.01	12J	6.07	0.255	5.09	225	13.73
4131-MW05 264.49	29-Dec-05	26.10	238.39	250U	-	-	-	-	-
	4-Apr-06	22.04	242.45	250U	-	-	-	-	-
	3-Nov-06	26.62	237.87	100U	6.38	0.12	-	-	13.50
	18-Jun-07	22.81	241.68	100U	6.45	0.10	-	-	13.30
	16-Nov-07	25.78	238.71	100UJ	7.53	0.11	9.36	-	13.50
	21-Mar-08	23.16	241.33	100U	7.32	0.10	7.99	153	12.60
	25-Aug-08	25.93	238.56	100U	7.60	0.11	8.64	201	13.00
	2-Mar-09	24.75	239.74	100U	6.15	0.09	7.95	-	13.20
	25-Aug-09	26.07	238.42	100U	6.49	0.11	8.22	142	13.30
	22-Feb-10	24.15	240.34	120U	6.63	0.09	7.67	215	13.20
	23-Aug-10	25.14	239.35	11,000*	5.49	0.16	1.74	-33	13.00
	22-Feb-11	22.65	241.84	120U	6.29	0.10	7.41	-	13.10
	8-Sep-11	24.09	240.40	120U	4.91	0.10	-	346	13.00
	6-Mar-12	26.36	238.13	120U	7.04	-	7.45	17	13.10
	15-Aug-12	24.50	239.99	120U	7.81	-	5.83	8	13.10
Duplicate	15-Aug-12	24.50	239.99	120U	7.81	-	5.83	8	13.10
	20-Feb-13	23.19	241.30	100U	7.84	-	6.70	7	12.90
	12-Aug-13	24.72	239.77	100U	6.44	0.08	9.01	31	12.60
	13-Mar-14	22.50	241.99	100U	6.51	0.12	9.30	21	13.00
	22-Sep-14	24.08	240.41	15J	6.40	0.10	9.50	255	13.50
	27-Apr-15	22.54	241.95	16J	6.40	0.14	10.29	208	13.32
	3-Sep-15	25.21	239.28	28J	6.00	0.15	8.89	150	14.60
	21-Apr-16	19.60	244.89	26J	5.8	0.139	6.04	233	14.49
	18-Aug-16	23.44	241.05	12J	6.33	0.293	5.27	227	13.72
	4131-MW06 266.45	29-Dec-05	24.97	241.48	250U	-	-	-	-
4-Apr-06		23.98	242.47	250U	-	-	-	-	-
3-Nov-06		28.50	237.95	-	-	-	-	-	-
18-Jun-07		24.75	241.70	-	-	-	-	-	-
16-Nov-07		27.64	238.81	-	-	-	-	-	-
21-Mar-08		25.06	241.39	-	-	-	-	-	-
25-Aug-08		27.62	238.83	-	-	-	-	-	-
2-Mar-09		25.51	240.94	-	-	-	-	-	-
25-Aug-09		27.58	238.87	-	-	-	-	-	-
22-Feb-10		25.20	241.25	-	-	-	-	-	-
23-Aug-10		25.70	240.75	-	-	-	-	-	-
22-Feb-11		24.50	241.95	-	-	-	-	-	-
8-Sep-11		25.56	240.89	-	-	-	-	-	-
6-Mar-12	25.17	241.28	-	-	-	-	-	-	

1 **Table 3-1.** AOC 8-2 Depth to Water Measurements, TPH-D Concentrations, and
 2 Groundwater Parameter Field Measurements (continued)

Well ID	DTW	GWELEV	TPH-D	Cond.	DO	ORP	Temp		
TOC Elevation	Date	(ft btoc)	(ft AMSL)	(µg/L)	pH	(µS/cm)	(ppm)	(mv)	°C
4131-MW06	15-Aug-12	26.62	239.83	-	-	-	-	-	-
Cont.	20-Feb-13	25.05	241.40	-	-	-	-	-	-
	12-Aug-13	25.62	240.83	-	-	-	-	-	-
	13-Mar-14	24.00	242.45	-	-	-	-	-	-
	22-Sep-14	25.64	240.81	-	-	-	-	-	-
	27-Apr-15	24.47	241.98	-	-	-	-	-	-
	3-Sep-15	26.51	239.94	-	-	-	-	-	-
	19-Apr-16	21.55	244.90	-	-	-	-	-	-
	18-Aug-16	25.35	241.10	-	-	-	-	-	-
MTCA Method A Cleanup Level			500						

Notes:

- TOC = Top of casing
- DTW (ft btoc) = Depth to water (feet below top of casing). Static DTW collected prior to purging beginning in 2015
- GWELEV (ft AMSL) = Groundwater elevation (feet above mean sea level)
- TPH-D (µg/L) = Diesel range total petroleum hydrocarbons (micrograms per liter)
- Cond. (µS/cm) = Conductivity (microsiemens per centimeter)
- DO (ppm) = Dissolved oxygen (parts per million)
- ORP (mv) = Oxygen / reduction potential (millivolts)
- Temp. (°C) = Temperature (degrees celsius)
- BOLD** = Analyte detected at or above laboratory practical quantification limit
- BOLD** = TPH-D detected at or above MTCA Method A cleanup level of 500 µg/L
- J = Value estimated
- U = Analyte not detected above practical quantification limit reported
- = No data, not applicable
- * = It is suspected that three samples were mislabeled. The sample collected from well 4131-MW02 was labelled as 4131-MW03. The sample collected from well 4131-MW03 was labelled as 4131-MW05, and the sample collected from well 4131-MW05 was labelled as 4131-MW02.

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 4

1 **3.2 BUILDING A0111 FORMER UST SITE (AOC 8-4)**

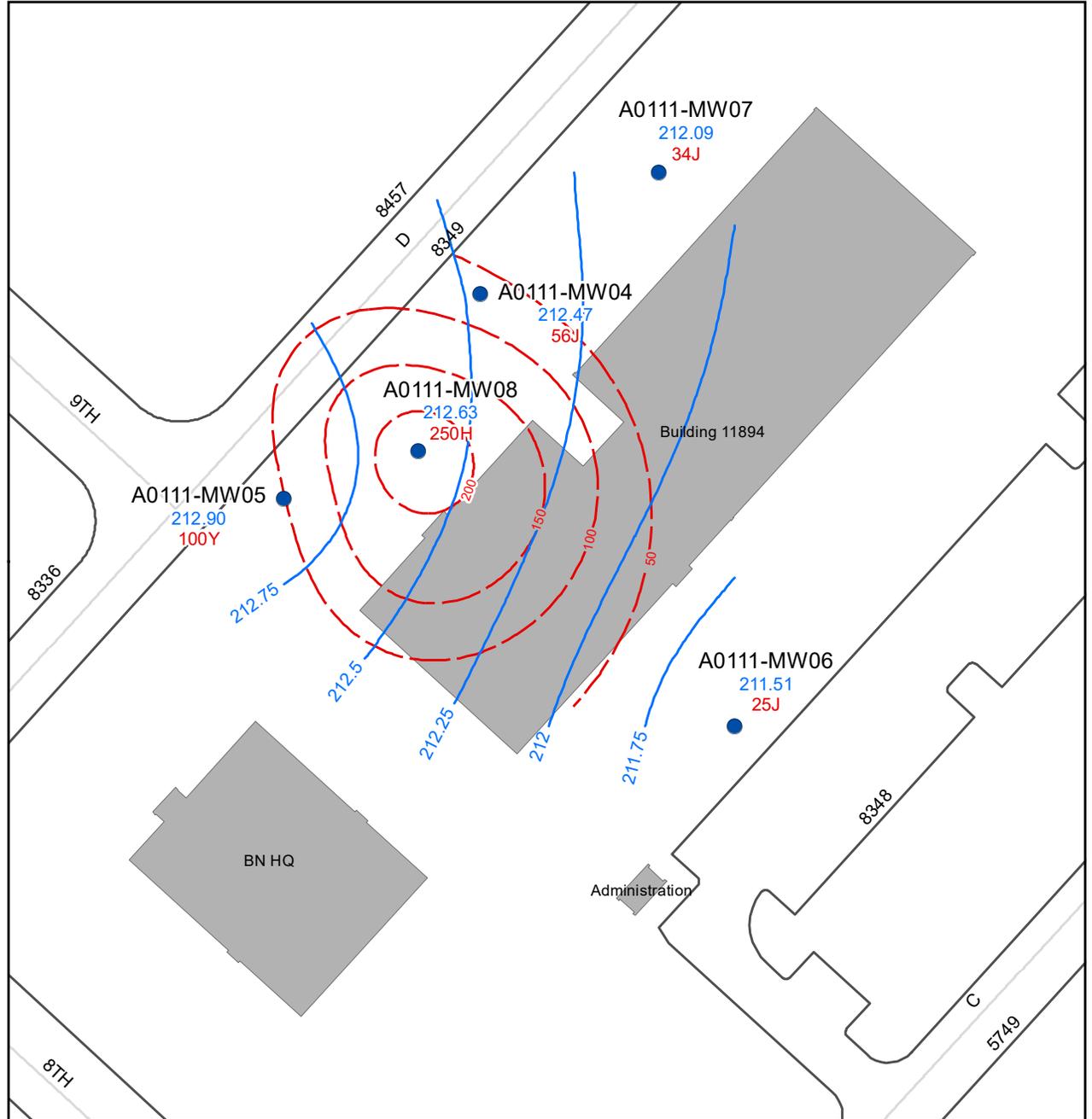
2 Groundwater level and TPH-D concentration iso-contour lines for the April and August
3 sampling events are presented on Figures 3-4 and 3-5, respectively. Table 3-2 presents depth
4 to water measurements, TPH-D concentrations, and groundwater parameter field
5 measurements. Appendix B contains copies of laboratory analytical reports for both
6 groundwater sampling events.

7 Historically, A0111-MW02 had been considered at or near the source since it consistently
8 had the highest detected concentrations of TPH-D in any onsite monitoring wells ranging
9 from 791 µg/L to 7,600 µg/L. However, A0111-MW02 was one of the three wells
10 decommissioned in 2010 during construction activities of the chemical battalion
11 administration building.

12 TPH-D was detected at 56 µg/L (A0111-MW04), 100 µg/L (A0111-MW05), 25 µg/L
13 (A0111-MW06), 34 µg/L (A0111-MW07) and 250 µg/L (A0111-MW08) during the April
14 sampling event. TPH-D was detected at 310 µg/L (A0111-MW04), 23 µg/L (A0111-
15 MW06), 31 µg/L (A0111-MW07) and 400 µg/L (A0111-MW08) during the August
16 sampling event. Well A0111-MW05 was not sampled in August per the SAP. Figure 3-6
17 presents TPH-D concentration trends in monitoring wells at AOC 8-4 over time.

18 TPH-D concentrations have not exceeded MTCA Method A cleanup levels at this site over
19 the past four semiannual sampling events (2 years). Because of this, it is recommended that
20 monitoring at this site be discontinued. If approved, the FLAO sites Groundwater
21 Monitoring Plan will be updated to eliminate the site from monitoring and a request for site
22 closure will be presented to Ecology.

23



Notes:

Depth to water measurements collected April 21, 2016.

Groundwater samples collected April 21, 2016.

TPH-D Cleanup level = 500 µg/L

Legend

- Monitoring Well
- ~ Groundwater Elevation (fmsl)
- - - TPH-D Concentration (µg/L)

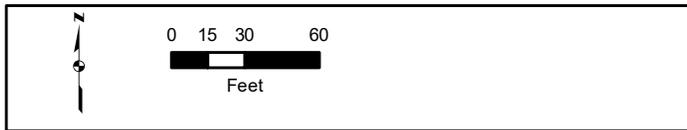
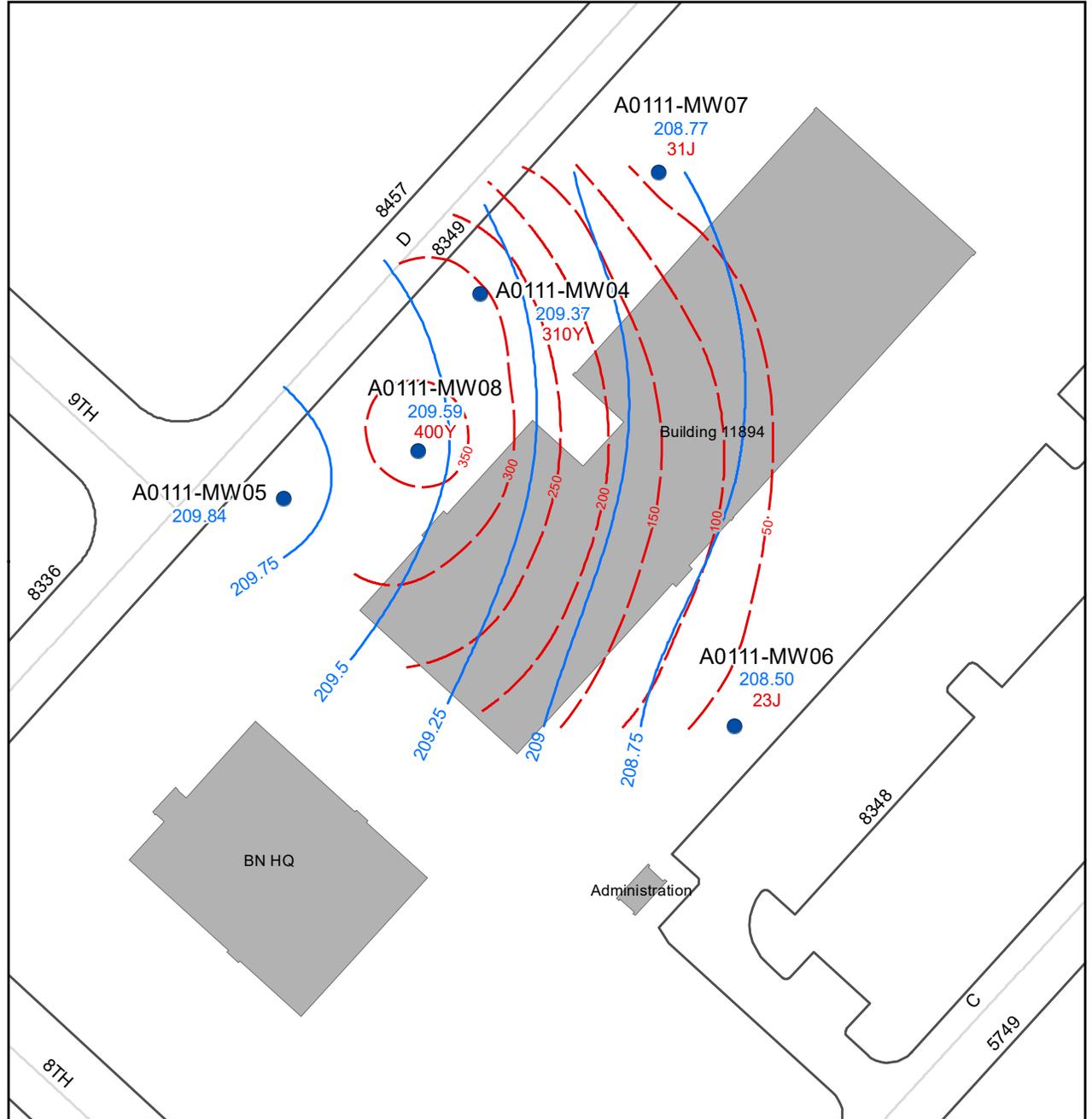


Figure 3-4
AOC 8-4 Groundwater Elevation and TPH-D Concentration Contours April 2016



Notes:

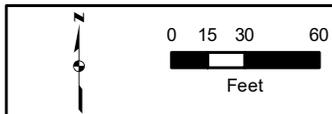
Depth to water measurements collected August 18, 2016.

Groundwater samples collected August 30, 2016.

TPH-D Cleanup level = 500 µg/L

Legend

- Monitoring Well
- ~ Groundwater Elevation (fmsl)
- - - TPH-D Concentration (µg/L)

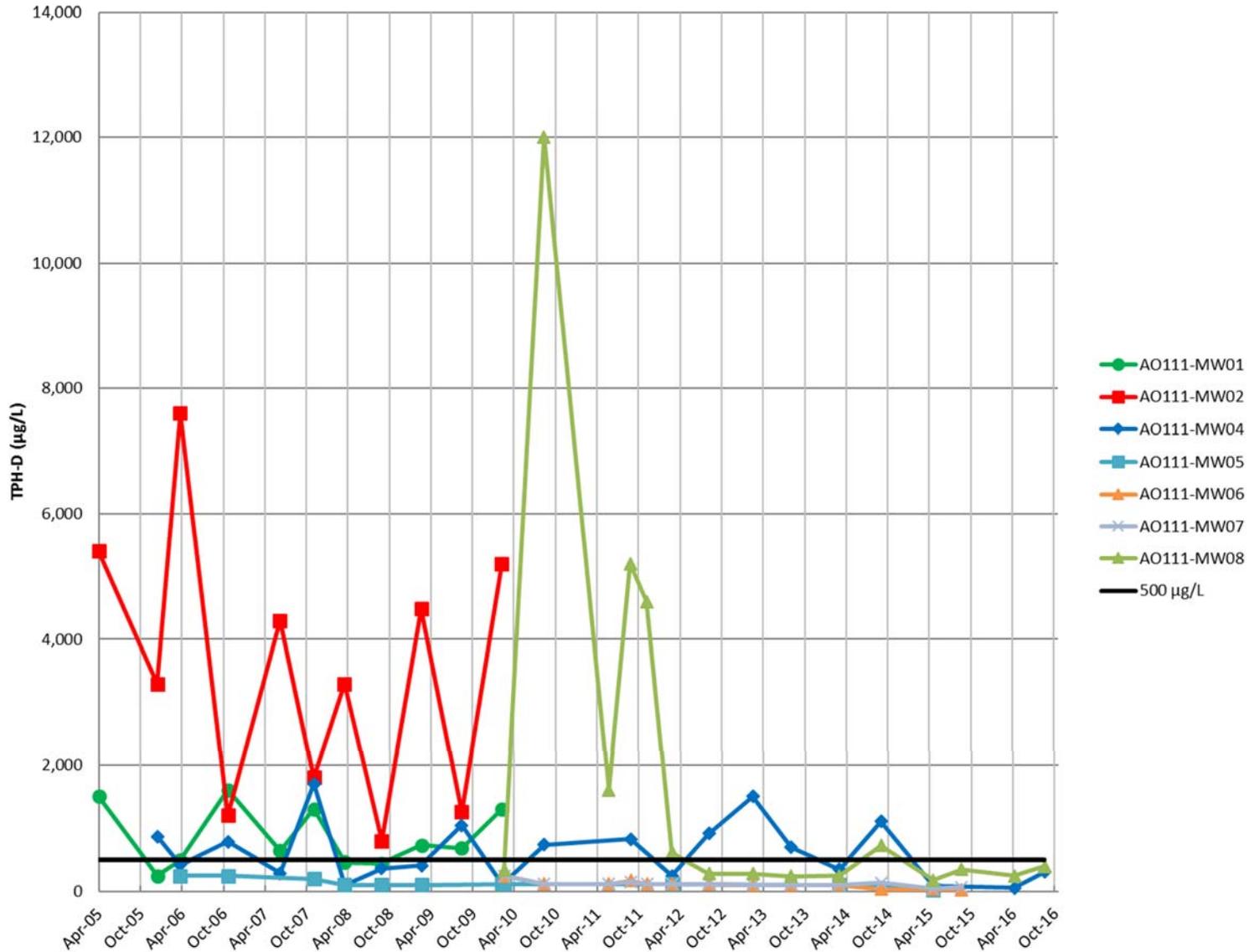


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Figure 3-5
AOC 8-4 Groundwater Elevation and
TPH-D Concentration Contours August 2016

Figure 3-6. TPH-D Concentration Trends in AO111-MW01, -MW02, -MW-04, -MW-08 (AOC 8-4)



3-12

1 **Table 3-2.** AOC 8-4 Depth to Water Measurements, TPH-D Concentrations, and
 2 Groundwater Parameter Field Measurements

Well ID TOC Elevation	Date	DTW (ft bgs)	GWELEV (ft AMSL)	TPH-D (µg/L)	pH	Cond. (µS/cm)	DO (ppm)	ORP (mv)	Temp °C
A0111-MW01 101.64 (Decommissioned)	14-Apr-05	19.95	81.69	1,500	-	-	-	-	-
	27-Dec-05	19.56	82.08	250U	-	-	-	-	-
	7-Apr-06	18.79	82.85	490	-	-	-	-	-
	2-Nov-06	22.52	79.12	1,600	6.01	0.20	-	-	13.10
	19-Jun-07	19.45	82.19	640	5.41	0.11	-	-	12.90
	16-Nov-07	20.99	80.65	1,300J	6.90	0.17	0.41	-	13.20
	28-Mar-08	19.03	82.61	460	6.55	0.13	1.80	207	11.30
	8-Sep-08	21.57	80.07	437	6.60	0.18	0.47	79	12.65
	2-Mar-09	19.97	81.67	723	5.85	0.14	0.26	91	12.40
	26-Aug-09	21.70	79.94	678	5.73	0.18	0.40	118	12.80
19-Feb-10	- ^{1/}	-	1,300	-	-	-	-	-	
A0111-MW02 102.02 (Decommissioned)	14-Apr-05	20.23	81.79	5,400	-	-	-	-	-
	27-Dec-05	20.21	81.81	3,300	-	-	-	-	-
	7-Apr-06	19.18	82.84	7,600	-	-	-	-	-
	2-Nov-06	22.73	79.29	1,200	6.93	0.21	-	-	12.70
	19-Jun-07	19.83	82.19	4,300	5.43	0.12	-	-	12.30
	16-Nov-07	21.34	80.68	1,800J	6.86	0.21	-	-	13.00
	28-Mar-08	19.45	82.57	3,300	6.31	0.12	0.62	158	11.60
	8-Sep-08	21.72	80.3	791	6.80	0.17	0.51	-7	12.35
	2-Mar-09	20.29	81.73	4,480	5.49	0.10	0.45	60	12.60
	26-Aug-09	21.80	80.22	1,250	5.63	0.19	0.23	15	12.70
17-Feb-10	19.03	82.99	5,200	4.30	0.11	0.75	165	12.00	
A0111-MW03 100 (Decommissioned)	14-Apr-05	18.17	81.83	250U	-	-	-	-	-
	27-Dec-05	18.05	81.95	250U	-	-	-	-	-
	7-Apr-06	17.08	82.92	250U	-	-	-	-	-
	2-Nov-06	20.80	79.2	-	-	-	-	-	-
	19-Jun-07	17.78	82.22	-	-	-	-	-	-
	16-Nov-07	19.25	80.75	-	-	-	-	-	-
	28-Mar-08	17.39	82.61	-	-	-	-	-	-
	8-Sep-08	19.61	80.39	-	-	-	-	-	-
	2-Mar-09	18.25	81.75	-	-	-	-	-	-
	26-Aug-09	19.84	80.16	-	-	-	-	-	-
17-Feb-10	16.97	83.03	-	-	-	-	-	-	
A0111-MW04 230.88	27-Dec-05	20.18	81.93	860	-	-	-	-	-
	7-Apr-06	19.34	82.77	420	-	-	-	-	-
	2-Nov-06	23.21	78.9	780	6.10	0.19	-	-	13.00
	19-Jun-07	20.00	82.11	290	5.54	0.10	-	-	12.10
	16-Nov-07	21.70	80.41	1,700J	6.88	0.16	-	-	13.20
	28-Mar-08	19.61	82.5	100U	6.40	0.09	6.91	257	11.70
8-Sep-08	22.20	79.91	366	6.03	0.16	1.02	160	13.38	

1 **Table 3-2.** AOC 8-4 Depth to Water Measurements, TPH-D Concentrations, and
 2 Groundwater Parameter Field Measurements (continued)

Well ID TOC Elevation	Date	DTW (ft bgs)	GWELEV (ft AMSL)	TPH-D (µg/L)	pH	Cond. (µS/cm)	DO (ppm)	ORP (mv)	Temp °C
A0111-MW04 230.88 (continued)	2-Mar-09	20.52	81.59	414	6.00	0.12	1.87	191	12.40
	26-Aug-09	22.28	205.10	1,040	5.38	0.49	0.45	89	12.80
	17-Feb-10	19.21	208.17	120U	4.51	0.09	6.59	239	12.20
	24-Aug-10	21.42	205.96	730	Well pumped dry				
	23-Feb-11	18.87	208.51	No sample collected					
	2-Jun-11	19.20	208.27	-	-	-	-	-	-
	8-Sep-11	21.58	205.89	820	5.66	0.25	1.92	198	15.30
	6-Mar-12	19.59	207.88	250	-	-	-	-	-
	16-Aug-12	21.69	205.78	910	7.09	-	3.44	37	14.10
	25-Feb-13	20.04	207.43	1,500	7.00	-	5.57	42	11.60
	13-Aug-13	22.00	208.88	690	Water very turbid, field parameters not measured				
	13-Mar-14	18.00	212.88	350	5.73	0.17	8.26	59.00	12.10
	11-Sep-14	21.95	208.93	1,100	Sample collected by bailer - No parameters				
	28-Apr-15	19.72	211.16	91J	5.83	0.19	7.55	224	12.87
	31-Aug-15	22.26	208.62	Well dry, no sample collected					
	21-Apr-16	18.41	212.47	56J	5.70	0.122	7.24	232	15.25
	18-Aug-16	21.51	209.37	310Y	5.84	0.148	0.78	113	15.29
	A0111-MW05 230.84	27-Dec-05	20.24	81.83	250U	-	-	-	-
7-Apr-06		19.32	82.75	250U	-	-	-	-	-
2-Nov-06		22.88	79.19	-	-	-	-	-	-
19-Jun-07		19.97	82.1	100U	5.68	0.10	-	-	11.60
16-Nov-07		21.52	80.55	-	-	-	-	-	-
28-Mar-08		19.65	82.42	100U	6.59	0.11	6.65	254	11.40
8-Sep-08		21.93	80.14	100U	6.42	0.11	7.34	200	12.33
2-Mar-09		20.47	81.6	100U	6.00	0.12	6.74	359	12.80
26-Aug-09		21.93	205.41	-	-	-	-	-	-
17-Feb-10		19.24	208.10	120U	-	-	-	-	-
27-Aug-10		21.27	206.07	120U	5.0	0.12	6.7	302	13
23-Feb-11		18.93	208.41	No sample collected					
2-Jun-11		18.72	208.23	-	-	-	-	-	-
6-Mar-12		19.18	207.77	120U	-	-	-	-	-
16-Aug-12		21.00	205.95	-	-	-	-	-	-
25-Feb-13		19.62	207.72	-	-	-	-	-	-
13-Aug-13		22.75	208.09	-	-	-	-	-	-
13-Mar-14		17.55	213.29	100U	6.01	0.16	9.43	44.00	11.60
11-Sep-14	21.24	209.60	-	-	-	-	-	-	
28-Apr-15	19.28	211.56	29J	5.96	0.15	9.17	241	13.27	
31-Aug-15	21.51	209.33	-	-	-	-	-	-	

3

1 **Table 3-2.** AOC 8-4 Depth to Water Measurements, TPH-D Concentrations, and
 2 Groundwater Parameter Field Measurements (continued)

Well ID TOC Elevation	Date	DTW (ft bgs)	GWELEV (ft AMSL)	TPH-D (µg/L)	pH	Cond. (µS/cm)	DO (ppm)	ORP (mv)	Temp °C	
A0111-MW05	21-Apr-16	17.94	212.90	100Y	5.57	0.123	6.47	245	14.77	
	(continued) 18-Aug-16	21.00	209.84	-	-	-	-	-	-	
A0111-MW06 227.69	1-Mar-10 ^{2/}	20.50	203.69	250U	-	-	-	-	-	
	25-Jun-10	16.65	207.54	120U	4.86	0.14	5.22	53 ^{3/}	12.0	
	24-Aug-10	18.00	206.19	120U	5.48	0.15	5.22	356	12.9	
	23-Feb-11			Could not locate well						
	2-Jun-11	16.92	208.29	120U	Water very turbid, field parameters not measured					
	8-Sep-11	19.15	206.06	170	5.87	0.18	2.02	356	12.90	
	18-Nov-11	-	-	120U	-	-	-	-	-	
	6-Mar-12	17.29	207.92	120U	-	-	-	-	-	
	16-Aug-12	19.12	206.09	120U	7.36	-	4.18	28.00	13.60	
	25-Feb-13	17.83	207.38	100	7.00	-	5.45	42.00	11.10	
	13-Aug-13	19.60	208.09	100U	-	-	-	-	-	
	13-Mar-14	15.70	211.99	100U	5.93	0.23	7.05	49.00	11.50	
	11-Sep-14	19.53	208.16	34J	Sample collected by bailer - No parameters					
	23-Apr-15	17.47	210.22	32J	5.96	0.14	7.78	216	12.55	
	31-Aug-15	19.62	208.07	25J	5.88	0.253	3.8	190	14.09	
	21-Apr-16	16.18	211.51	25J	5.30	0.138	5.02	248	14.01	
	18-Aug-16	19.19	208.50	23J	6.16	0.189	3.27	212	14.42	
A0111-MW07 230.88	1-Mar-10 ^{2/}	19.30	207.45	250U	-	-	-	-	-	
	25-Jun-10	19.97	206.78	120U	5.30	0.15	4.16	355	12.8	
	24-Aug-10	21.42	205.33	120U	Very turbid water, never cleared up					
	23-Feb-11			Could not locate well						
	2-Jun-11	19.68	208.20	120U	Water very turbid, field parameters not measured					
	8-Sep-11	22.10	205.78	150	5.15	0.19	1.56	340	13.8	
	18-Nov-11	22.40	205.48	120U	-	-	-	-	-	
	6-Mar-12	20.25	207.63	120	Water very turbid, field parameters not measured					
	16-Aug-12	22.10	205.78	120U	Water very turbid, field parameters not measured					
	25-Feb-13	20.69	207.19	100U	7.27	-	4.41	30.00	11.50	
	13-Aug-13	21.45	209.43	100U	Water very turbid, field parameters not measured					
	13-Mar-14	18.50	212.38	100U	6.09	0.22	7.19	42.00	10.80	
	11-Sep-14	22.59	208.29	140J	Sample collected by bailer - No parameters					
	27-Apr-15	20.25	210.63	42J	5.98	0.23	8.44	218	14	
	31-Aug-15	22.88	208.00	68J	6.10	0.27	1.64	186	13.91	
	21-Apr-16	18.79	212.09	34J	5.94	0.199	4.21	219	15.12	
	18-Aug-16	22.11	208.77	31J	6.10	0.184	1.41	199	14.73	
A0111-MW08 231.24	1-Mar-10 ^{2/}	18.10	209.60	340	-	-	-	-	-	
	25-Jun-10			Well monument broken, casing bent						

1 **Table 3-2.** AOC 8-4 Depth to Water Measurements, TPH-D Concentrations, and
 2 Groundwater Parameter Field Measurements (continued)

Well ID TOC Elevation	Date	DTW (ft bgs)	GWELEV (ft AMSL)	TPH-D (µg/L)	pH	Cond. (µS/cm)	DO (ppm)	ORP (mv)	Temp °C
A0111-MW08	24-Aug-10	21.60	206.10	12,000	-	-	-	-	-
(continued)	23-Feb-11	Well monument and casing broken							
	2-Jun-11	19.36	208.34	1,600	Water very turbid, field parameters not measured				
	8-Sep-11	22.65	205.05	5,200	5.19	0.15	1.58	245.00	14.00
	18-Nov-11	21.85	205.85	4,600	-	-	-	-	-
	6-Mar-12	19.86	207.84	610	-	-	-	-	-
	16-Aug-12	21.96	205.74	280	-	-	-	-	-
	25-Feb-13	20.25	207.45	280	7.05	-	3.06	40.00	12.50
	13-Aug-13	22.12	209.12	240	Well pumped dry				
	13-Mar-14	18.20	213.04	250	6.07	0.19	6.94	41.00	12.40
	11-Sep-14	22.00	209.24	720	Sample collected by bailer - No parameters				
Duplicate	11-Sep-14	22.00	209.24	590	Sample collected by bailer - No parameters				
	28-Apr-15	19.94	211.30	180	5.84	0.19	6.60	231	13.53
	1-Sep-15	22.19	209.05	350	5.84	0.18	0.10	194	15.91
	21-Apr-16	18.61	212.63	250H	5.91	0.120	2.09	212	15.62
	18-Aug-16	21.65	209.59	400Y	5.69	0.133	7.50	223	15.15
MTCA Method A Cleanup Level				500					

Notes:

- ^{1/} Monument was destroyed and casing was bent before DTW was measured. No accurate measurement could be made. Sample was collected using a disposable bailer.
^{2/} Groundwater samples collected by Krazan and Associates after well development.
^{3/} Cap was on ORP sensor, value is most likely wrong. Monitoring wells A0111-MW04 through A0111-MW08 elevations were re-surveyed on 26 July 2011. New TOC elevations were used to measure groundwater elevations on 02 June 11.

TOC – Top of casing

DTW (ft bgs) – Depth to water (feet below ground surface)

GWELEV (ft AMSL) – Groundwater elevation (feet above mean sea level)

TPH-D (µg/L) – Diesel-range total petroleum hydrocarbons (micrograms per liter)

Cond. (µS/cm) – Conductivity (microsiemens per centimeter)

DO (ppm) – Dissolved oxygen (parts per million)

ORP (mv) – Oxygen / reduction potential (millivolts)

Temp. (°C) – Temperature (degrees Celsius)

BOLD – Analyte detected at or above laboratory practical quantification limit

BOLD – Analyte detected at or above MTCA Method A cleanup level of 500 µg/L

J – The reported result is an estimated concentration.

U – Analyte not detected above practical quantification limit reported

H – The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.

Y – The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.

-- No data, not applicable

3
 4
 5
 6

1 **3.3 BUILDING A1033 FORMER UST SITE (AOC 9-2)**

2 Groundwater level and TPH-G concentration iso-contour lines for the April and August
3 sampling events are presented on Figures 3-7 and 3-8, respectively. Table 3-3 presents depth
4 to water and groundwater parameter measurements. Table 3-4 presents TPH-G and BTEX
5 concentrations relative to Ecology's MTCA Method A cleanup levels. Appendix B contains
6 copies of laboratory analytical reports for both groundwater sampling events.

7 Historically, 95-A17-3a has been considered at or near the source area since it had the
8 highest detected concentrations of TPH-G ranging from 1,400 µg/L (September 2014) to
9 35,000 µg/L (March 2008). In October 2010, monitoring well 10-A17-8 was completed
10 within the boundary of the historical UST excavation. TPH-G was detected in samples
11 collected from 10-A17-8 ranging from 3,500 µg/L (September 2014) to 74,000 µg/L
12 (November 2011).

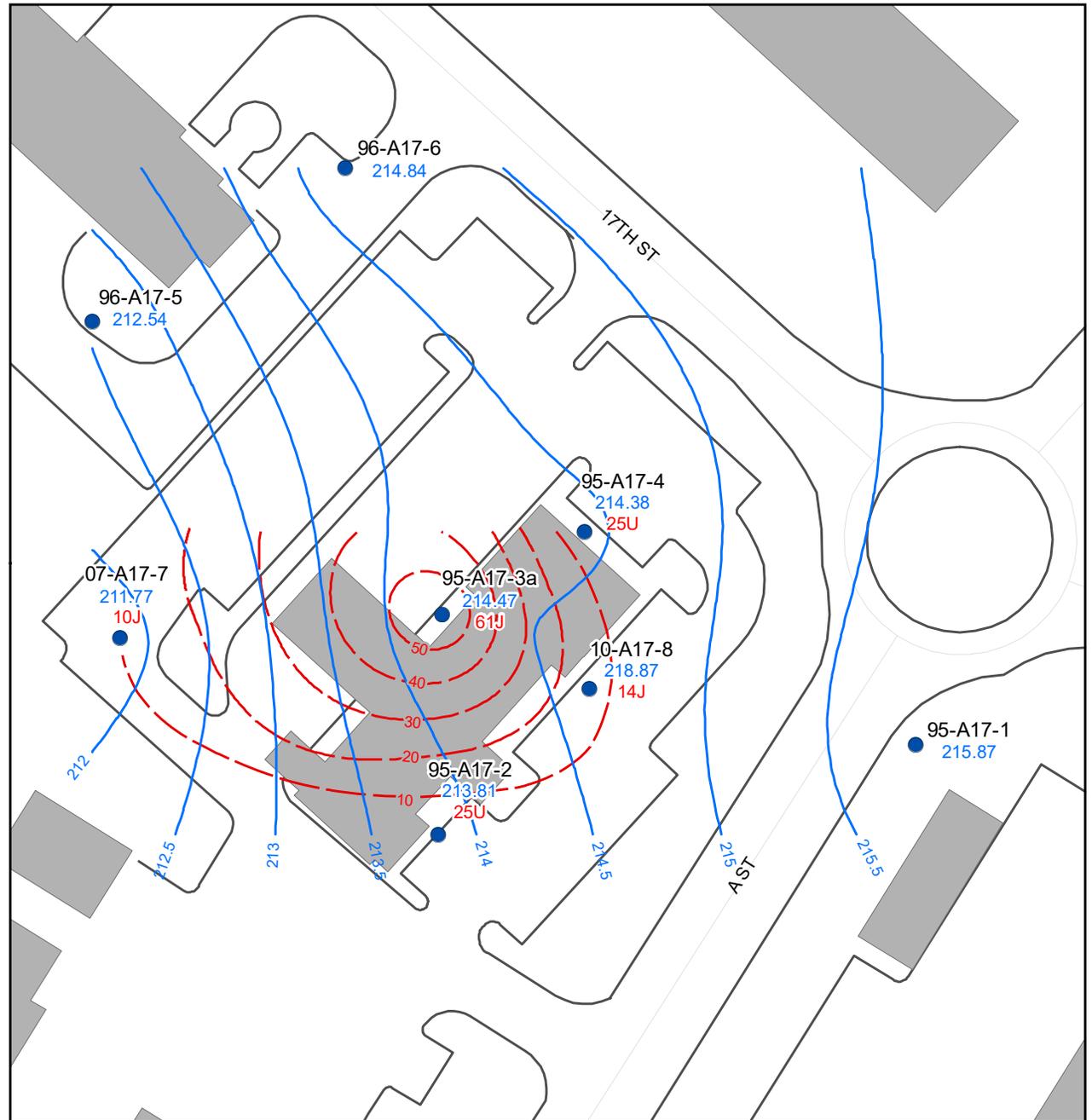
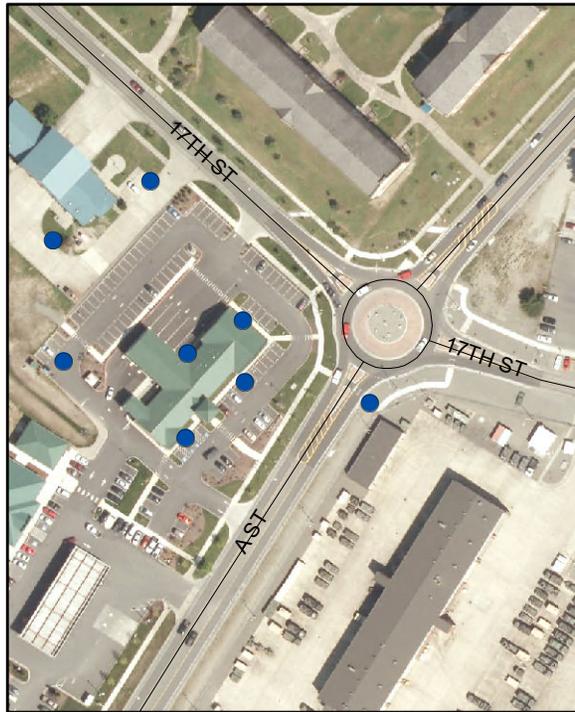
13 Samples collected from 95-A17-3a during April and August 2016 had TPH-G detected in
14 them at an estimated 61 µg/L and 610 µg/L, respectively. TPH-G was detected at an
15 estimated 14 µg/L (April) and an estimated 230 µg/L (August) in samples collected from
16 10-A17-8. A duplicate sample was collected during both the April and September sampling
17 events from well 10-A17-8. Sample results are consistent with the primary samples
18 (estimated at 15 µg/L in April and estimated at 230 µg/L in August).

19 Benzene concentrations detected in samples collected from 95-A17-3a during 2016 were
20 non-detect (April) and 1.9 µg/L (August). Samples collected from 10-A17-8 had benzene
21 detected in them at an estimated concentration of 0.14 µg/L (April) and 3 µg/L (August). A
22 duplicate sample was collected during the April and August/September sampling events
23 from well 10-A17-8. Sample results are consistent with the primary sample (estimated at
24 0.14 µg/L in April and 3.1 µg/L in August).

25 Both benzene and TPH-G were either not detected or detected below their respective
26 cleanup levels in samples collected from all the other monitoring wells during 2016.
27 Figure 3-9 presents TPH-G and benzene concentrations in monitoring wells at AOC 9-2
28 over time. TPH-G and benzene have continued to exceed MTCA Method A cleanup levels
29 in two site wells. Because of this, it is recommended that prescribed monitoring continue in
30 2017. TPH-G and benzene concentrations at this site in 2016 were orders of magnitude
31 lower than had been observed historically. An analysis of the data collection and operation
32 of the AS/SVE system indicates that one possible cause of the lower than usual
33 concentrations could be the fact that prior to September 2015, the air sparge blower was not
34 functional for several months and may not have been operating efficiently before then. The

1 blower motor was replaced in September 2015. As a note, the samples collected in early
2 September 2015 (prior to the motor replacement) were the highest TPH-G results in over
3 2 years and BTEX components also showed a dramatic increase. An additional
4 consideration of the unusually low contaminant concentrations is the possibility of the 2016
5 samples being collected during or close to active air sparging. The AS system currently
6 operates in 30 minute intervals four times per day (0:00, 6:00, 12:00 and 18:00). The April
7 samples were collected across the 12:00 AS interval and while the AS system was shut off
8 prior to the August samples being collected, it had run at 6:00 that day prior to the sampling.
9 Sample results were higher in August than in April.

10 A third possible cause of the low concentrations is that with the new air sparge blower motor
11 installed and the system presumably running efficiently, we could be seeing mass removal
12 of contaminants at the site while the September 2015 results could indicate contaminant
13 rebound while the AS system was down. Regardless of the reasons behind the low
14 contaminant concentrations, to maintain consistent conditions for future sampling events, it
15 is proposed that future samples at AOC 9-2 be collected after the AS system has been shut
16 down for at least 48 hours.



Notes:

Depth to water measurements collected April 18, 2016.

Groundwater samples collected April 18 and 19, 2016.

AS/SVE System was running during sampling

TPH-G Cleanup level = 800 µg/L

Legend

- Monitoring Well
- ~ Groundwater Elevation (famsl)
- - - TPH-G Concentration (µg/L)

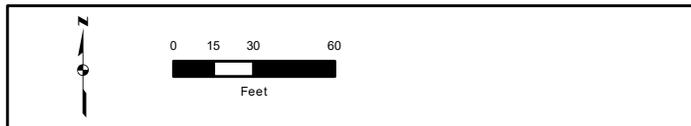
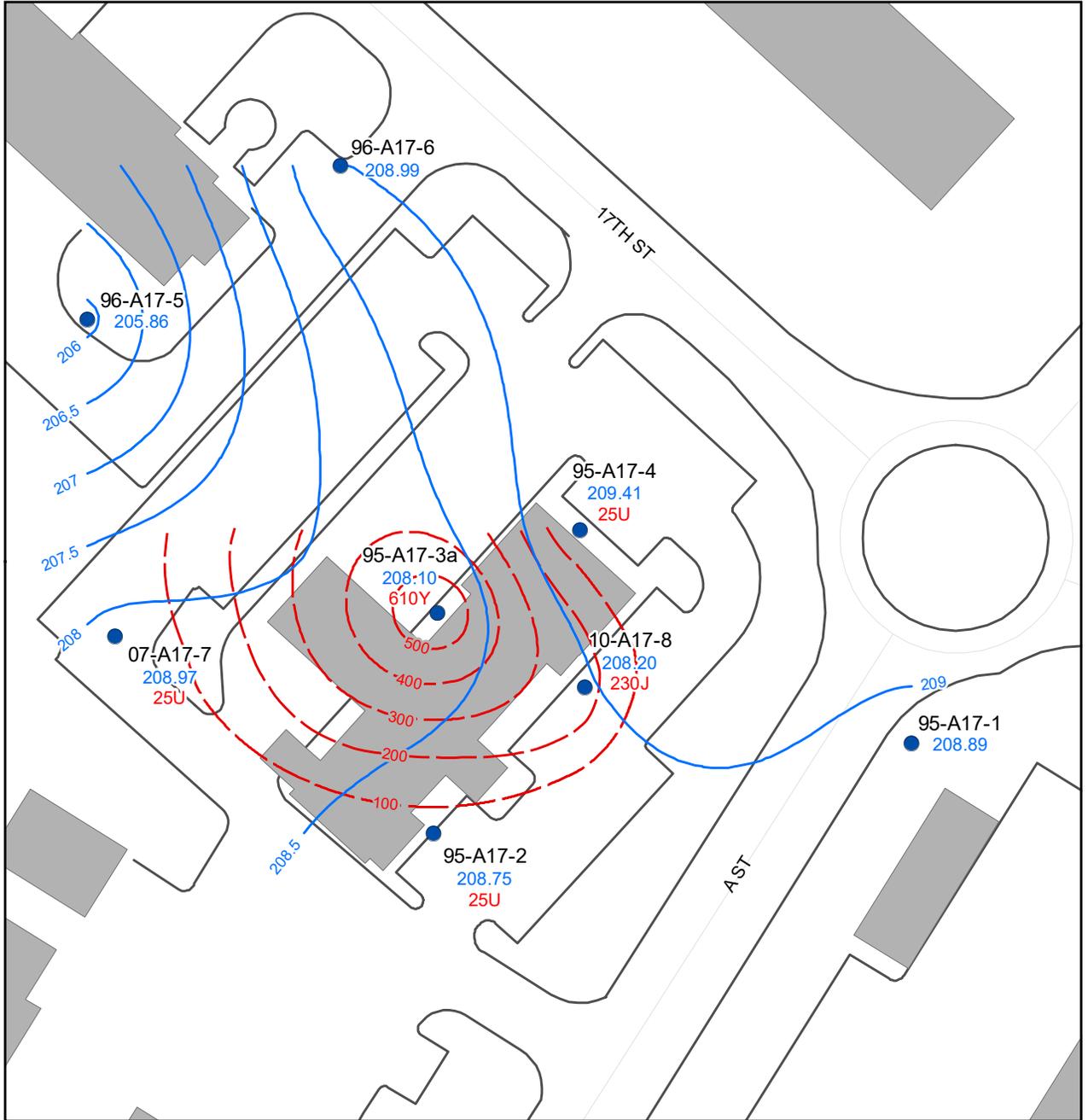


Figure 3-7
AOC 9-2 Groundwater Elevation and TPH-G Concentration Contours April 2016



Notes:

Depth to water measurements collected August 18, 2016.

Groundwater samples collected August 29, 2016.

TPH-G Cleanup level = 800 µg/L

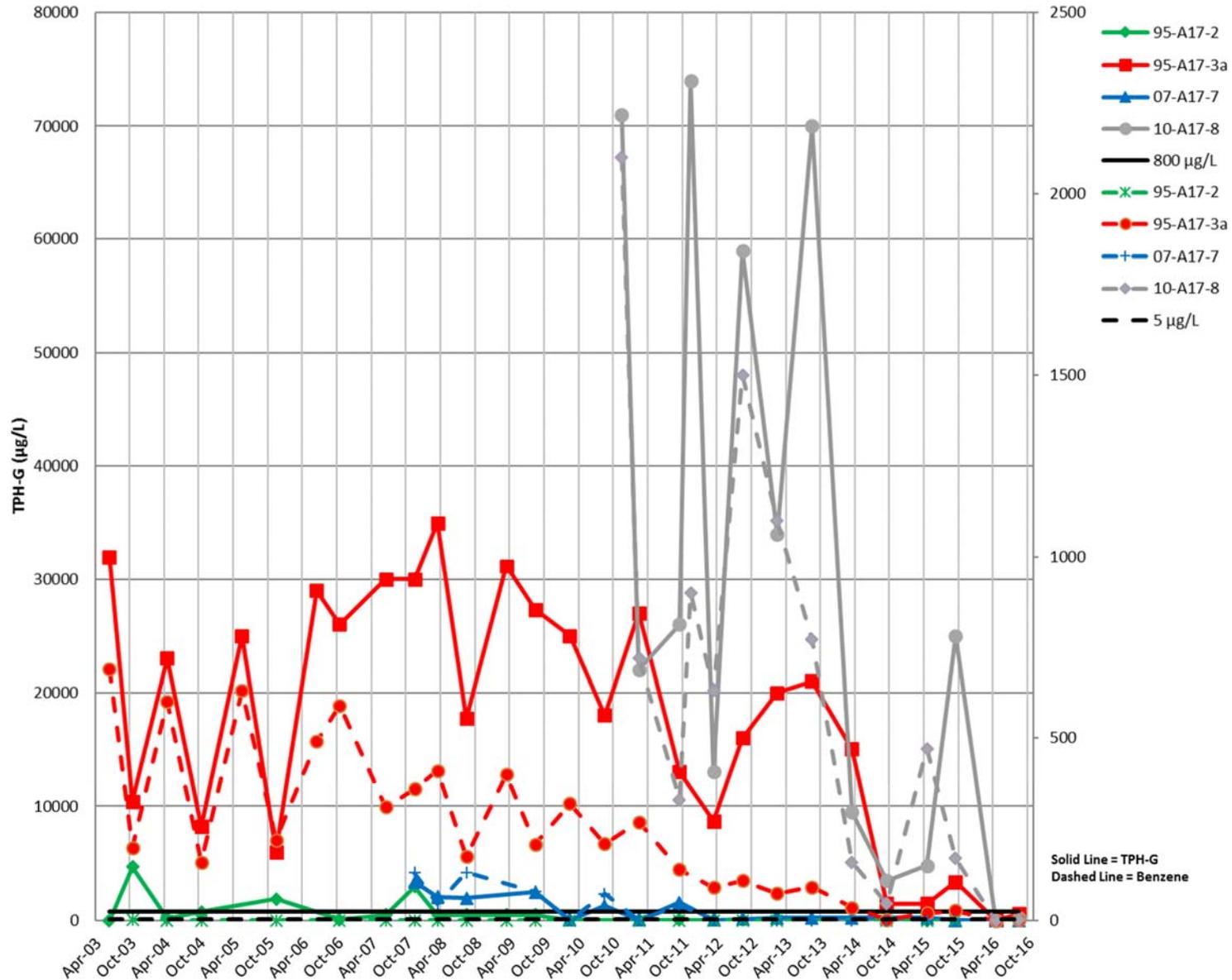
Legend

- Monitoring Well
- ~ Groundwater Elevation (fmsl)
- - - TPH-G Concentration (µg/L)



Figure 3-8
AOC 9-2 Groundwater Elevation and TPH-G Concentration Contours August 2016

Figure 3-9. TPH-G and Benzene Concentration Trends (AOC 9-2)



3-21

1 **Table 3-3.** AOC 9-2 Depth to Water and Groundwater Parameter Measurements

Well ID TOC Elevation	Date	DTW (ft bgs)	GWELEV (ft AMSL)	pH	Cond. (μ S/cm)	DO (ppm)	ORP (mv)	Temp °C	
95-A17-1 236.9	1-Aug-95	30.49	204.77	-	-	-	-	-	
	1-Feb-96	24.21	211.05	-	-	-	-	-	
	1-Sep-96	28.2	207.06	-	-	-	-	-	
	1-Mar-97	22.8	212.46	-	-	-	-	-	
	1-Aug-97	26.4	208.86	-	-	-	-	-	
	1-Mar-98	24.06	211.2	-	-	-	-	-	
	1-Sep-98	29.2	206.06	-	-	-	-	-	
	1-Mar-99	21.1	214.16	-	-	-	-	-	
	1-Aug-99	27.01	208.25	-	-	-	-	-	
	1-Mar-00	23.93	211.33	-	-	-	-	-	
	1-Sep-00	28.99	206.27	-	-	-	-	-	
	1-Mar-01	29.51	205.75	-	-	-	-	-	
	1-Aug-02	29.6	205.66	-	-	-	-	-	
	28-Oct-03	30.11	205.15	-	-	-	-	-	
	20-Oct-04	30.94	204.32	-	-	-	-	-	
	9-Nov-05	30.51	204.75	-	-	-	-	-	
	14-Jun-07	26.33	208.93	-	-	-	-	-	
	21-Mar-08	26.33	208.93	-	-	-	-	-	
	8-Aug-08	29.78	205.48	-	-	-	-	-	
	9-Mar-09	27.57	207.69	-	-	-	-	-	
	25-Aug-09	29.87	207.03	-	-	-	-	-	
	22-Feb-10	26.1	210.8	-	-	-	-	-	
	24-Aug-10	28.6	208.3	-	-	-	-	-	
	24-Feb-11	25.1	211.8	-	-	-	-	-	
	9-Sep-11				Could not locate				
	14-Mar-12	25.5	211.4	-	-	-	-	-	
	16-Aug-12	27.9	209	-	-	-	-	-	
	21-Feb-13	24.28	212.62	-	-	-	-	-	
	13-Aug-13	28.8	208.1	-	-	-	-	-	
	10-Mar-14	23.6	213.3	-	-	-	-	-	
22-Sep-14	28.67	208.23	-	-	-	-	-		
21-Apr-15	25.37	211.53	-	-	-	-	-		
1-Sep-15	29.43	207.47	-	-	-	-	-		
18-Apr-16	21.03	215.87	-	-	-	-	-		
18-Aug-16	28.01	208.89	-	-	-	-	-		
95-A17-2 235.9	1-Aug-95	30.2	204.59	-	-	-	-	-	
	1-Feb-96	24.24	210.55	-	-	-	-	-	
	1-Sep-96	27.71	207.08	-	-	-	-	-	
	1-Mar-97	22.34	212.45	-	-	-	-	-	
	1-Aug-97	26.08	208.71	-	-	-	-	-	
	1-Mar-98	23.82	210.97	-	-	-	-	-	
	1-Sep-98	28.7	206.09	-	-	-	-	-	
	1-Mar-99	20.6	214.19	-	-	-	-	-	
	1-Aug-99	26.55	208.24	-	-	-	-	-	
	1-Mar-00	23.49	211.30	-	-	-	-	-	
	1-Sep-00	28.51	206.28	-	-	-	-	-	
	1-Mar-01	29.09	205.70	-	-	-	-	-	
1-Aug-02	28.92	205.87	-	-	-	-	-		

1 **Table 3-3. AOC 9-2 Depth to Water and Groundwater Parameter Measurements (continued)**

Well ID TOC Elevation	Date	DTW (ft bgs)	GWELEV (ft AMSL)	pH	Cond. (µS/cm)	DO (ppm)	ORP (mv)	Temp °C	
95-A17-2 235.9 (continued)	28-Oct-03	29.65	205.14	-	-	-	-	-	
	28-Apr-04	27.97	206.82	-	-	-	-	-	
	20-Oct-04	30.47	204.32	-	-	-	-	-	
	9-Nov-05	30	204.79	-	-	-	-	-	
	31-Oct-06	30.38	204.41	6.89	0.155	-	-	13.30	
	14-Jun-07	26.03	208.76	6.90	0.153	-	-	13.30	
	21-Mar-08	26.02	208.77	7.32	0.139	-	-	12.43	
	8-Aug-08	29.37	205.42	7.19	0.114	1.45	195.33	12.57	
	9-Mar-09	27.21	207.58	7.24	0.124	0.62	148.75	13.33	
	25-Aug-09	29.49	206.41	6.66	0.106	0.76	252.00	13.10	
	22-Feb-10	25.5	210.40	- ^{1/}	-	-	-	-	
	24-Aug-10	27.82	208.08	- ^{1/}	-	-	-	-	
	24-Feb-11	24.4	211.50	5.48 ^{1/}	0.126	3.06	-	12.80	
	9-Sep-11	27.25	208.65	6.27	0.111	3.60	230.00	16.00	
	14-Mar-12	24.73	211.17	-	-	5.96	26.00	11.20	
	16-Aug-12	27.03	208.87	-	-	-	-	-	
	21-Feb-13	25.37	210.53	7.45	-	5.07	23.00	13.20	
	13-Aug-13	28.4	207.50	6.60	0.176	0.47	24.00	13.60	
	10-Mar-14	Low water level, unable to collect sample							
	22-Sep-14	27.7	208.20	6.50	0.147	5.90	173.00	17.20	
23-Apr-15	24.56	211.34	6.26	0.191	8.30	206	14.71		
1-Sep-15	28.38	207.52	6.49	0.196	9.40	125	16.83		
18-Apr-16	22.09	213.81	6.44	0.173	5.83	170	18.73		
18-Aug-16	27.15	208.75	6.82	0.161	7.03	168	17.34		
95-A17-3a 235.9	1-Aug-95	30.41	204.81	-	-	-	-	-	
	1-Feb-96	24.65	210.57	-	-	-	-	-	
	1-Sep-96	28.06	207.16	-	-	-	-	-	
	1-Mar-97	22.31	212.91	-	-	-	-	-	
	1-Aug-97	26.1	209.12	-	-	-	-	-	
	1-Mar-98	23.51	211.71	-	-	-	-	-	
	1-Sep-98	28.7	206.52	-	-	-	-	-	
	1-Mar-99	20	215.22	-	-	-	-	-	
	1-Aug-99	26.44	208.78	-	-	-	-	-	
	1-Mar-00	23.16	212.06	-	-	-	-	-	
	1-Sep-00	28.54	206.68	-	-	-	-	-	
	1-Mar-01	29.51	205.71	-	-	-	-	-	
	1-Aug-02	29.14	206.08	-	-	-	-	-	
	30-Jun-03	28.94	206.28	-	-	-	-	-	
	28-Oct-03	29.85	205.37	-	-	-	-	-	
	28-Apr-04	28.06	207.16	-	-	-	-	-	
	20-Oct-04	30.88	204.34	-	-	-	-	-	
	24-May-05	28.75	206.47	-	-	-	-	-	
	9-Nov-05	30.32	204.90	-	-	-	-	-	
	14-Jun-06	26.99	208.23	-	-	-	-	-	
31-Oct-06	30.86	204.36	6.49	0.253	-	-	12.60		
14-Jun-07	26.09	209.13	6.51	0.252	-	-	12.60		
21-Nov-07	29.21	206.01	6.05	0.205	-	-	13.00		
21-Mar-08	26	209.22	7.35	0.237	0.70	-	12.37		

1 **Table 3-3. AOC 9-2 Depth to Water and Groundwater Parameter Measurements (continued)**

Well ID TOC Elevation	Date	DTW (ft bgs)	GWELEV (ft AMSL)	pH	Cond. (µS/cm)	DO (ppm)	ORP (mv)	Temp °C
95-A17-3a 235.9 (continued)	8-Aug-08	29.42	205.80	7.16	0.214	0.97	-25.75	12.28
	9-Mar-09	27.07	208.15	7.04	0.227	0.71	-177.00	12.88
	25-Aug-09	29.46	206.44	6.03	0.199	0.77	233.00	13.10
	22-Feb-10	25.6	210.30	6.52	0.205	0.47	-196.00	12.80
	23-Aug-10	29.1	206.80	4.80	0.200	1.17	-125.00	13.10
	24-Feb-11	24.55	211.35	5.86	0.191	0.73	-	13.00
	9-Sep-11	27.62	208.28	6.07	0.177	4.87	-98.00	14.40
	14-Mar-12	24.85	211.05	-	-	-	-	-
	16-Aug-12	27.47	208.43	-	-	-	-	-
	21-Feb-13	25.66	210.24	-	-	-	-	-
	13-Aug-13	27.85	208.05	-	-	-	-	-
	14-Mar-14	22.9	213.00	6.36	0.223	7.70	26.00	13.60
	23-Sep-14	28.07	207.83	6.30	0.147	2.90	42.00	14.70
	22-Apr-15	24.96	210.94	6.5	0.329	5.20	0	14.5
	2-Sep-15	28.96	206.94	6.57	0.403	0.0	-56	15.50
	18-Apr-16	21.43	214.47	6.32	0.212	3.38	-79	16.6
	18-Aug-16	27.8	208.10	6.55	0.230	0.99	63	16.7
95-A17-4 236.8	1-Aug-95	29.91	205.24	-	-	-	-	-
	1-Feb-96	23.65	211.50	-	-	-	-	-
	1-Sep-96	27.56	207.59	-	-	-	-	-
	1-Mar-97	21.75	213.40	-	-	-	-	-
	1-Aug-97	25.85	209.30	-	-	-	-	-
	1-Mar-98	23.35	211.80	-	-	-	-	-
	1-Sep-98	28.7	206.45	-	-	-	-	-
	1-Mar-99	19.7	215.45	-	-	-	-	-
	1-Aug-99	26.33	208.82	-	-	-	-	-
	1-Mar-00	22.93	212.22	-	-	-	-	-
	1-Sep-00	28.1	207.05	-	-	-	-	-
	1-Mar-01	29.05	206.10	-	-	-	-	-
	1-Aug-02	29.04	206.11	-	-	-	-	-
	28-Oct-03	29.51	205.64	-	-	-	-	-
	20-Oct-04	30.5	204.65	-	-	-	-	-
	9-Nov-05	29.8	205.35	-	-	-	-	-
	14-Jun-07	25.72	209.43	-	-	-	-	-
	21-Mar-08	25.77	209.38	6.15	0.13	-	-	14.37
	8-Aug-08	29.31	205.84	7.15	0.14	6.81	130.00	12.00
	9-Mar-09	26.91	208.24	7.12	0.14	7.03	228.25	13.83
	25-Aug-09	29.32	207.48	-	-	-	-	-
	21-Feb-10	25.38	211.42	5.95	0.14	4.97	285.00	13.30
	24-Aug-10	27.95	208.85	-	-	-	-	-
	24-Feb-11	24.37	212.43	6.01	0.14	6.91	-	13.30
	9-Sep-11	27.45	209.35	6.09	0.13	5.90	353.00	14.30
	14-Mar-12	24.89	211.91	-	-	6.36	26.00	11.20
	16-Aug-12	27.29	209.51	-	-	-	-	-
21-Feb-13	25.49	211.31	6.69	-	6.47	-146.00	13.50	
13-Aug-13	27.85	208.95	-	-	-	-	-	

2

1 **Table 3-3. AOC 9-2 Depth to Water and Groundwater Parameter Measurements (continued)**

Well ID TOC Elevation	Date	DTW (ft bgs)	GWELEV (ft AMSL)	pH	Cond. (µS/cm)	DO (ppm)	ORP (mv)	Temp °C
95-A17-4 236.8 (continued)	14-Mar-14	22.5	214.30	6.26	0.18	8.55	32.00	13.50
	23-Sep-14	27.99	208.81	-	-	-	-	-
	22-Apr-15	24.76	212.04	6.31	0.18	9.4	206	14.4
	1-Sep-15	28.82	207.98	-	-	-	-	-
	18-Apr-16	22.42	214.38	6.46	0.16	5.39	191	18.11
	18-Aug-16	27.39	209.41	-	-	-	-	-
96-A17-5 233.9	1-Feb-96	22.44	211.14	-	-	-	-	-
	1-Sep-96	26.2	207.38	-	-	-	-	-
	1-Mar-97	20.75	212.83	-	-	-	-	-
	1-Aug-97	24.6	208.98	-	-	-	-	-
	1-Mar-98	22.25	211.33	-	-	-	-	-
	1-Sep-98	27.3	206.28	-	-	-	-	-
	1-Mar-99	18.9	214.68	-	-	-	-	-
	1-Aug-99	25.05	208.53	-	-	-	-	-
	1-Mar-00	21.92	211.66	-	-	-	-	-
	1-Sep-00	27.07	206.51	-	-	-	-	-
	1-Mar-01	27.76	205.82	-	-	-	-	-
	1-Aug-02	27.68	205.90	-	-	-	-	-
	28-Oct-03	28.3	205.28	-	-	-	-	-
	9-Nov-05	28.47	205.11	-	-	-	-	-
	14-Jun-07	24.47	209.11	-	-	-	-	-
	21-Mar-08	24.48	209.10	-	-	-	-	-
	8-Aug-08	27.93	205.65	-	-	-	-	-
	9-Mar-09	25.71	207.87	-	-	-	-	-
	25-Aug-09	28.03	205.87	-	-	-	-	-
	21-Feb-10	24.29	209.61	-	-	-	-	-
	24-Aug-10	26.66	207.24	-	-	-	-	-
	24-Feb-11	23.26	210.64	-	-	-	-	-
	9-Sep-11	26.15	207.75	-	-	-	-	-
	14-Mar-12	25.7	208.20	-	-	-	-	-
	16-Aug-12	26.01	207.89	-	-	-	-	-
	21-Feb-13	24.28	209.62	-	-	-	-	-
	13-Aug-13	26.93	206.97	-	-	-	-	-
10-Mar-14	21.85	212.05	-	-	-	-	-	
23-Sep-14	26.66	207.24	-	-	-	-	-	
21-Apr-15	23.57	210.33	-	-	-	-	-	
1-Sep-15	27.51	206.39	-	-	-	-	-	
18-Apr-16	21.36	212.54	-	-	-	-	-	
18-Aug-16	28.04	205.86	-	-	-	-	-	
96-A17-6 235.1	1-Feb-96	22.95	209.66	-	-	-	-	-
	1-Mar-01	28.18	204.43	-	-	-	-	-
	28-Oct-03	27.25	205.36	-	-	-	-	-
	9-Nov-05	27.41	205.20	-	-	-	-	-
	14-Jun-07	23.41	209.20	-	-	-	-	-
	21-Mar-08	23.43	209.18	-	-	-	-	-
	8-Aug-08	26.91	205.70	-	-	-	-	-
	9-Mar-09	24.62	207.99	-	-	-	-	-
25-Aug-09	26.98	208.12	-	-	-	-	-	

1 **Table 3-3. AOC 9-2 Depth to Water and Groundwater Parameter Measurements (continued)**

Well ID TOC Elevation	Date	DTW (ft bgs)	GWELEV (ft AMSL)	pH	Cond. (μ S/cm)	DO (ppm)	ORP (mv)	Temp °C	
96-A17-6 235.1 (continued)	21-Feb-10	23.2	211.90	-	-	-	-	-	
	24-Aug-10	25.5	209.60	-	-	-	-	-	
	25-Feb-11	22.14	212.96	-	-	-	-	-	
	9-Sep-11	25.11	209.99	-	-	-	-	-	
	14-Mar-12	22.56	212.54	-	-	-	-	-	
	16-Aug-12	24.93	210.17	-	-	-	-	-	
	21-Feb-13	23.2	211.90	-	-	-	-	-	
	13-Aug-13	25.85	209.25	-	-	-	-	-	
	10-Mar-14	20.6	214.50	-	-	-	-	-	
	23-Sep-14	26.59	208.51	-	-	-	-	-	
	21-Apr-15	22.48	212.62	-	-	-	-	-	
	1-Sep-15	28.5	206.60	-	-	-	-	-	
	18-Apr-16	20.26	214.84	-	-	-	-	-	
	18-Aug-16	26.11	208.99	-	-	-	-	-	
	07-A17-7 233.2	16-Nov-07	27.85	206.20	7.27	0.170	-	-	12.80
		26-Mar-08	24.88	209.17	7.18	0.138	0.79	38.33	12.67
		26-Aug-08	28.33	205.72	7.25	0.161	0.35	-158.25	12.85
3-Mar-09		26.09	207.96	-	-	-	-	-	
25-Aug-09		28.46	204.74	6.70	0.132	0.23	172	13.20	
21-Feb-10		24.30	208.90	5.82	0.067	0.24	131	11.9	
24-Aug-10		26.71	206.49	5.64	0.132	0.37	76	14.1	
24-Feb-11		23.20	210.00	5.24	0.038	5.66	-	10.6	
9-Sep-11		26.20	207.00	6.05	0.125	1.82	243	16.5	
14-Mar-12		23.63	209.57	-	-	6.8	26	9.5	
16-Aug-12		26.02	207.18	7.34	-	1.06	28	18.6	
21-Feb-13		24.28	208.92	7.48	-	2.49	22	9.9	
13-Aug-13		27.00	206.20	5.97	0.099	0.59	57	13.3	
14-Mar-14		21.45	211.75	5.97	0.059	6.3	46	11.6	
23-Sep-14		26.74	206.46	6.2	0.101	2	2	14	
22-Apr-15		23.60	209.60	6.17	0.130	4.9	28	12.8	
2-Sep-15		27.46	205.74	6.55	0.180	0.0	49	14.85	
18-Apr-16	21.43	211.77	6.8	0.149	0.47	-84	13.36		
18-Aug-16	25.00	208.20	5.75	0.123	0.67	16	13.8		
10-A17-8 235.8	29-Nov-10	26.87	208.93	-	-	-	-	-	
	25-Feb-11	24.30	211.50	-	-	-	-	-	
	9-Sep-11	26.68	209.12	5.82	0.208	1.99	230	16	
	18-Nov-11	29.00	206.80	-	-	-	-	-	
	14-Mar-12	24.81	210.99	-	-	-	-	-	
	16-Aug-12	27.18	208.62	-	-	-	-	-	
	21-Feb-13	25.53	210.27	-	-	-	-	-	
	13-Aug-13	28.02	207.78	6.6	0.176	0.48	24	13.6	
	10-Mar-14	22.85	212.95	6.01	-	2	47	14.7	
	22-Sep-14	27.13	208.67	6.4	0.159	4.4	-21	18.9	
	Duplicate	22-Sep-14	27.13	208.67	6.4	0.159	4.4	-21	18.9
		22-Apr-15	24.72	211.08	6.43	0.297	4.53	-11	17.3
	Duplicate	22-Apr-15	24.72	211.08	6.43	0.297	4.53	-11	17.3
	1-Sep-15	28.39	207.41	6.31	0.371	3.40	-35	19.54	
Duplicate	1-Sep-15	28.39	207.41	6.31	0.371	3.40	-35	19.54	

1 **Table 3-3. AOC 9-2 Depth to Water and Groundwater Parameter Measurements (continued)**

Well ID TOC Elevation	Date	DTW (ft bgs)	GWELEV (ft AMSL)	pH	Cond. (μ S/cm)	DO (ppm)	ORP (mv)	Temp °C
10-A17-8 (continued)	18-Apr-16	16.93	218.87	7.18	0.153	8.53	156	19.21
Duplicate	18-Apr-16	16.93	218.87	7.18	0.153	8.53	156	19.21
	18-Aug-16	26.83	208.97	7.56	0.194	6.07	146	19.92
Duplicate	18-Aug-16	26.83	208.97	7.56	0.194	6.07	146	19.92

Notes:

^{1/}– Pump is broken and caught in well. Well casing is possibly bent. Sample collected using a disposable bailer.
 New TOC elevations surveyed on 11 June 2010 were used beginning with August 2009 data.

TOC – Top of casing

DTW (ft bgs) – Depth to water (feet below ground surface)

GWELEV (ft AMSL) – Groundwater elevation (feet above mean sea level)

Cond. (μ S/cm) – Conductivity (microsiemens per centimeter)

DO (ppm) – Dissolved oxygen (parts per million)

ORP (mv) – Oxygen / reduction potential (millivolts)

Temp. (°C) – Temperature (degrees Celsius)

-- No data, not applicable

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1 **Table 3-4. AOC 9-2 TPH-G and BTEX Concentrations**

Well ID	Date	TPH-G (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	
95-A17-1	28-Oct-03	100U	0.5U	0.5U	0.5U	1U	
	20-Oct-04	100U	1U	1U	1U	3U	
	9-Nov-05	100U	1U	1U	1U	3U	
95-A17-2	28-Oct-03	4,700	1.6	2.9	102	184	
	28-Apr-04	200U	1	1U	1	3U	
	20-Oct-04	760	1	1U	18	2	
	9-Nov-05	1,900	1U	2	54	67	
	31-Oct-06	100U	1U	1U	1U	3U	
	14-Jun-07	500U	1U	1U	1U	3U	
	7-Nov-07	3,000	1U	1	12	12	
	8-Mar-08	500U	1U	1U	1U	3U	
	26-Aug-08	500U	1U	1U	1U	3U	
	9-Mar-09	500U	1U	1U	1U	3U	
	25-Aug-09	500U	1U	1U	1U	3U	
	26-Mar-10	50U	1U	1U	1U	3U	
	24-Aug-10	No sample collected					
	24-Feb-11	50U	1U	1U	1U	3U	
	9-Sep-11	50U	1U	1U	1U	3U	
	14-Mar-12	50U	1U	1U	1U	2U	
	16-Aug-12	50U	1U	1U	1U	2U	
	21-Feb-13	250U	0.20U	0.20U	0.20U	0.40U	
	13-Aug-13	No sample collected					
	10-Mar-14	No sample collected					
22-Sep-14	250U	0.5U	0.080J	0.5U	0.5U		
23-Apr-15	25U	0.1U	0.1U	0.1U	0.2U		
1-Sep-15	48J	0.1U	0.08J	0.07J	0.37J		
19-Apr-16	25U	0.1U	0.1U	0.1U	0.2U		
29-Aug-16	25U	0.1U	0.1U	0.1U	0.2U		
95-A17-3a	30-Jun-03	32,000	690	1,200	1,100	4,800	
	28-Oct-03	10,400	200	270	270	1,200	
	28-Apr-04	23,000	600	800	780	3,500	
	20-Oct-04	8,200	160	100	310	740	
	24-May-05	25,000	630	650	810	3,400	
	9-Nov-05	6,000	220	170	280	940	
	14-Jun-06	29,000	490	500	840	4,000	
	31-Oct-06	26,000	590	380	840	3,000	
	14-Jun-07	30,000	310	360	610	2,700	
	7-Nov-07	30,000	360	270	730	2,700	
	8-Mar-08	35,000	410	400	870	3,600	
	26-Aug-08	17,700	175	162	517	1,819	
	9-Mar-09	31,200	399	335	772	2,762	
	25-Aug-09	27,300	209	245	629	2,370	
22-Feb-10	25,000	320	390	990	3,650		

2

1 **Table 3-4.** AOC 9-2 TPH-G and BTEX Concentrations (continued)

Well ID	Date	TPH-G (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
95-A17-3a (continued)	24-Aug-10 ^{1/}	1,300	73	12	42	24
	24-Feb-11	27,000	270	350		3,970
	9-Sep-11	13,000	140	110	480	1,620
	14-Mar-12	8,700	91	170	350	330
	16-Aug-12	16,000	110	240	610	2,440
	21-Feb-13	20,000	75	190	480	1,880
	13-Aug-13 ^{2/}	21,000	92	460	460	2,100
	14-Mar-14	15,000	36	100	230	1,210
	23-Sep-14	1,400	3.7	15	16	216
	22-Apr-15	1,500	21	25	33	166
	2-Sep-15	3,400	28	34	120	242
	19-Apr-16	61J	0.1U	0.1U	0.1U	0.2U
	29-Aug-16	610Y	1.9	6.9	13	66
95-A17-4	28-Oct-03	100U	0.5U	0.5U	0.5U	1U
	20-Oct-04	100U	1U	1U	1U	3U
	9-Nov-05	100U	1U	1U	1U	3U
	14-Jun-07	500U	1U	1U	1U	3U
	8-Mar-08	500U	1U	1U	1U	3U
	26-Aug-08	300	1U	1U	1U	3U
	9-Mar-09	500U	1U	1U	1U	3U
	21-Feb-10	50U	1U	1U	1U	3U
	9-Sep-11	50U	1U	1U	1U	3U
	14-Mar-12	50U	1U	1U	1U	2U
	21-Feb-13	250U	0.20U	0.20U	0.20U	0.40U
	14-Mar-14	250U	0.20U	0.20U	0.20U	0.40U
	22-Apr-15	25U	0.1U	0.1U	0.1U	0.2U
19-Apr-16	25U	0.34J	0.48J	0.22J	6.5	
96-A17-5	28-Oct-03	100U	0.5U	0.5U	0.5U	1U
	9-Nov-05	100U	1U	1U	1U	3U
Duplicate	7-Nov-07	3,400	130	6.8	130	31
	8-Mar-08	2,100	47	3.8	120	8.3
	26-Aug-08	1,990	132	5.7	199	4.6
	25-Aug-09	2,500U	79.1	5U	94.1	15U
	25-Aug-09	2,500U	79.5	5U	95	15U
07-A17-7	21-Feb-10	50U	2.5	1U	1U	3U
	24-Aug-10 ^{1/}	18,000	210	220	690	2,500
	24-Feb-11	50U	1U	1U	1U	3U
	9-Sep-11	1,600	44	15	79	46
	14-Mar-12	50U	1U	1U	1U	2U
	16-Aug-12	150	4.7	3.9	1U	3U
	21-Feb-13	250U	0.20U	1.6	0.20U	0.40U
	13-Aug-13	250U	0.6	0.85	0.2U	0.4U

2

1 **Table 3-4.** AOC 9-2 TPH-G and BTEX Concentrations (continued)

Well ID	Date	TPH-G (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
Duplicate	13-Aug-13	250U	0.57	0.63	0.25	0.4U
	14-Mar-14	250U	0.20U	0.25	0.20U	0.4U
07-A17-7	23-Sep-14	250U	0.5U	0.5U	0.5U	0.5U
(continued)	22-Apr-15	25U	0.1U	0.1U	0.1U	0.2U
	2-Sep-15	19J	0.1U	0.1U	0.05J	0.2U
	19-Apr-16	10J	0.08J	0.08J	0.1U	0.2U
	29-Aug-16	25U	0.1U	0.1U	0.1U	0.34J
	29-Nov-10	71,000	2,100	8,400	1,900	9,600
	25-Feb-11	22,000	720	1,000	490	2,220
Duplicate	25-Feb-11	21,000	730	1,100	490	2,210
	9-Sep-11	26,000	330	300	740	4,200
	18-Nov-11	74,000	900	6,200	2,200	11,500
	14-Mar-12	19,000	710	1,300	490	2,000
	22-May-12	13,000	630	830	350	2,050
10-A17-8	16-Aug-12	59,000	1,500	3,400	1,600	8,800
	21-Feb-13	34,000	1,100	2,000	640	3,700
	13-Aug-13	70,000	770	3,600	1,700	8,900
	10-Mar-14	9,500	160	330	160	1,030
	22-Sep-14	3,500	46	90	61	410
Duplicate	22-Sep-14	3,700	50	110	65	440
	22-Apr-15	4,800	470	260	100	810
Duplicate	22-Apr-15	5,000	380	210	89	670
	1-Sep-15	25,000	170	800	740	3,750
Duplicate	1-Sep-15	24,000	180	870	770	3,920
	18-Apr-16	14J	0.14J	0.57	0.07J	1.61
Duplicate	18-Apr-16	15J	0.14J	0.52	0.08J	1.48
	29-Aug-16	230J	3	3.8	5.2	26
Duplicate	29-Aug-16	230J	3.1	3.9	5.4	27
MTCA Cleanup Level		800	5	1,000	700	1,000

Notes:

^{1/} It is suspected that these samples' labels were switched.

^{2/} Sample was labeled as 95-A17-2 by mistake.

TPH-G – Gasoline-range total petroleum hydrocarbons

µg/L – Micrograms per liter

BOLD – Analyte detected above practical quantification limit

BOLD – Analyte detected above MTCA Method A cleanup level

U – Analyte not detected above practical quantification limit reported

J – The reported result is an estimated concentration.

Y – The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.

- - No data, not applicable

2

3

1 **3.4 GAAF FUEL FACILITY (AOC 10-8)**

2 Groundwater level iso-contour lines and TPH-D concentrations detected in monitoring wells
3 at AOC 10-8-B05 for the April and August 2016 sampling events are presented on
4 Figures 3-10 and 3-11, respectively. Table 3-5 presents depth to water measurements,
5 TPH-D concentrations, and groundwater parameter field measurements for AOC 10-8.
6 TPH-D concentrations are compared to Ecology's MTCA Method A cleanup level of
7 500 µg/L. Appendix B contains copies of laboratory analytical reports for both groundwater
8 sampling events.

9 Historically, AOC 10-8-B05 has been considered at or near the source area since it has the
10 highest detected concentrations of TPH-D. Concentrations of TPH-D decrease to non-
11 detectable amounts in downgradient well AOC 10-8-MW02 to the northwest. Before the
12 well was paved over in 2007, TPH-D was non-detect in downgradient well AOC 10-8-
13 MW04 located approximately 30 feet northwest of AOC 10-8-B05.

14 Results from the 2016 groundwater sampling events are generally consistent with results
15 from previous events. TPH-D remains in AOC 10-8-B05 at concentrations above the MTCA
16 Method A groundwater cleanup level. The concentration fell below the MTCA Method A
17 cleanup levels for the first time in March 2014 (440 µg/L), but rose again in September 2014
18 and remained above the cleanup method during the 2016 sampling events (590 µg/L in both
19 April and 1,100 µg/L in August 2016). Figure 3-12 presents TPH-D concentrations in AOC
20 10-8-B05 over time.

21 TPH-D has continued to exceed MTCA Method A cleanup levels in one site well. Because
22 of this, it is recommended that prescribed monitoring continue in 2017.

23 **3.5 DESCRIPTIVE STATISTICS**

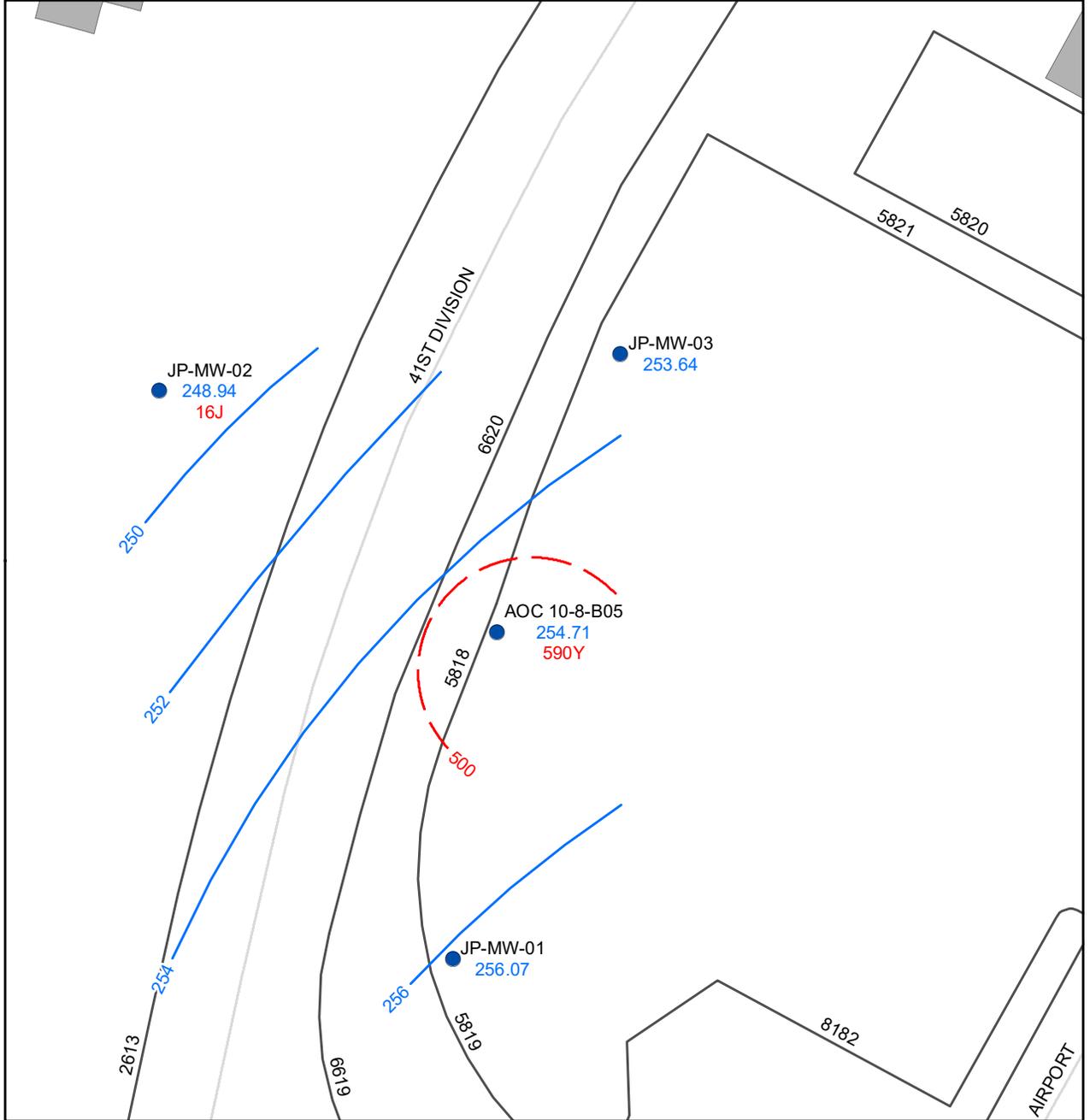
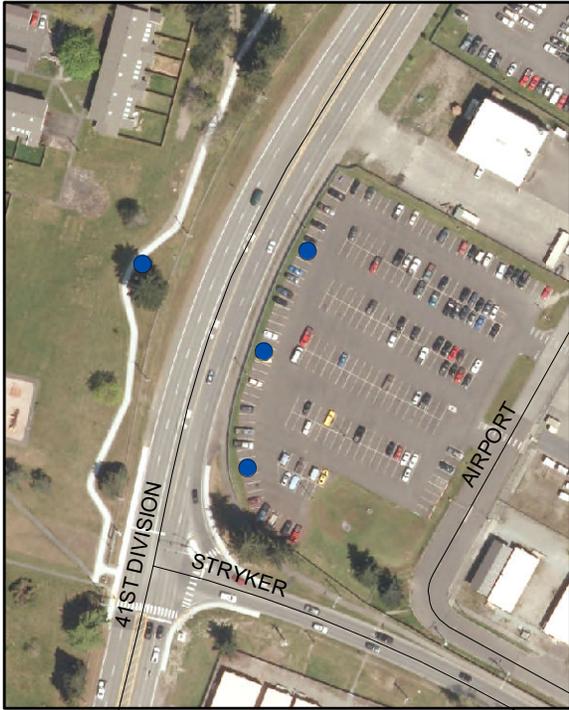
24 Summary statistics for each site were calculated using Microsoft Excel's Descriptive
25 Statistics tool. Results are presented in Table 3-6. No constituents were detected at their
26 highest concentrations in samples collected during 2016 at any of the four sites.

27 **3.6 DATA QUALITY REVIEW AND VERIFICATION**

28 The data quality review and verification documentation is included in Appendix B. Data
29 quality objectives for both 2016 groundwater events were met. The data is deemed
30 acceptable for use and comparison with other site data.

31 At site AOC 8-2, the duplicate sample collected from well 4131-MW03 during the April
32 sampling, was not consistent with the primary sample collected – 2,400 µg/L (primary)

1 versus 630 $\mu\text{g/L}$ (duplicate). Well 4131-MW03 has consistently shown the presence of a red
2 particulate during purging. The well is purged until the water flows relatively clear and 3
3 volumes have been removed. It is likely that the red particulate matter is what causes the
4 discrepancy between the primary and duplicate samples. This issue has been observed
5 during other spring sampling events when a duplicate has been collected from this well.



Notes:

Depth to water measurements collected April 18, 2016.

Groundwater samples collected April 18 and 19, 2016.

TPH-D Cleanup level = 500 µg/L

Legend

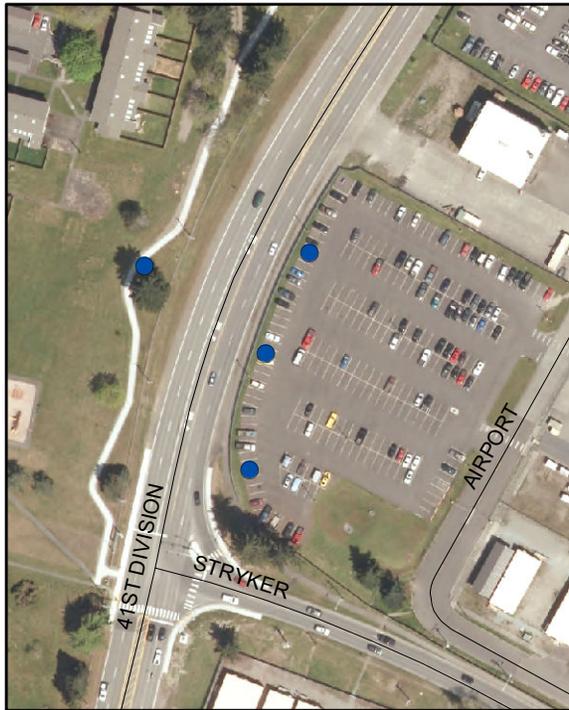
- Monitoring Well
- - - TPH-D Concentration (µg/L)
- ~ Groundwater Elevation (fmsl)



USACE



Figure 3-10
AOC 10-8 Groundwater Elevation and
TPH-D Concentration Contours April 2016



Notes:

Depth to water measurements collected August 18, 2016.

Groundwater samples collected August 29 and 30, 2016.

TPH-D Cleanup level = 500 µg/L

Legend

- Monitoring Well
- - - TPH-G Concentration (µg/L)
- ~ ~ ~ Groundwater Elevation (famsl)

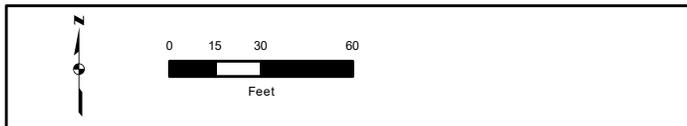
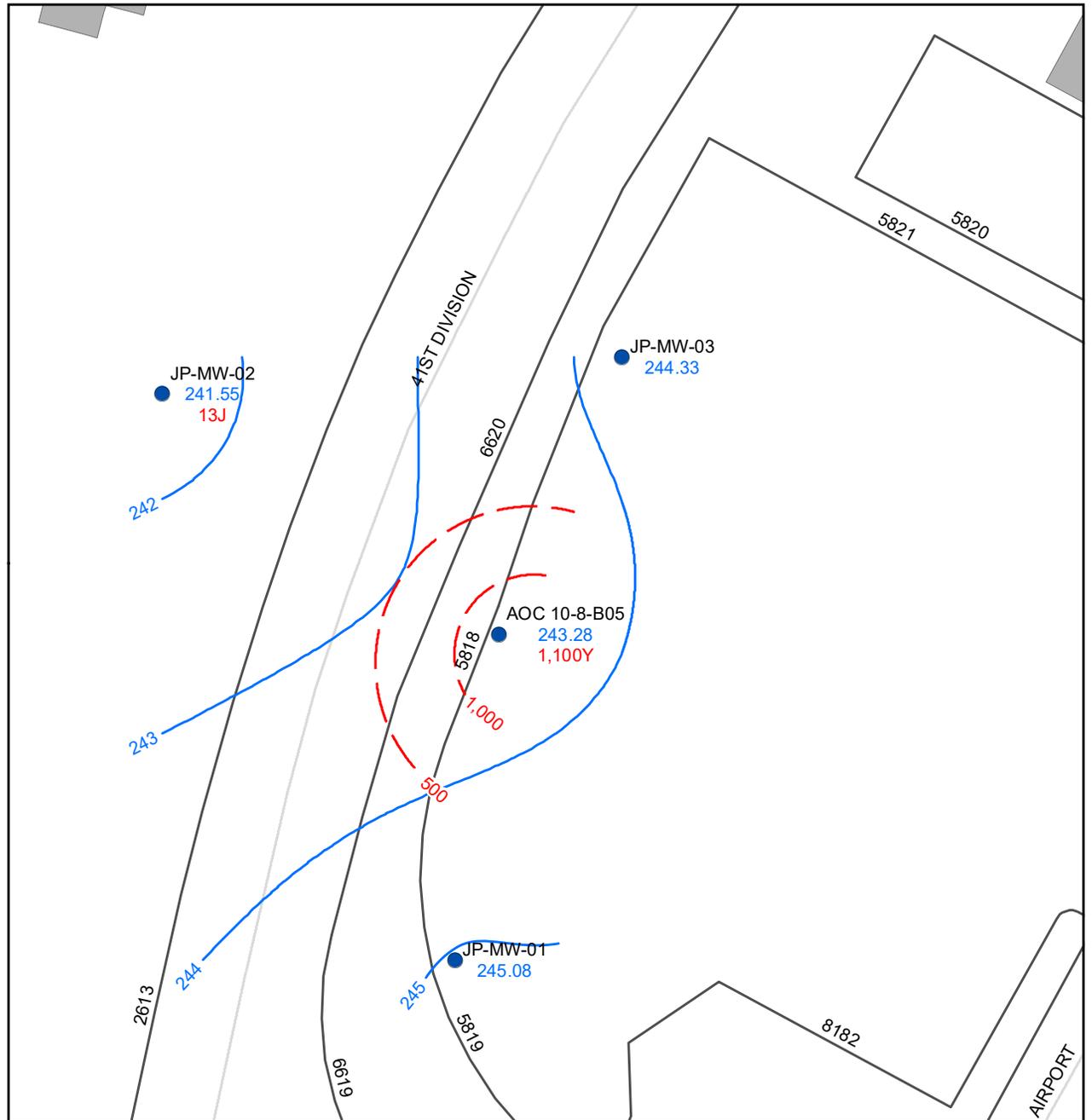
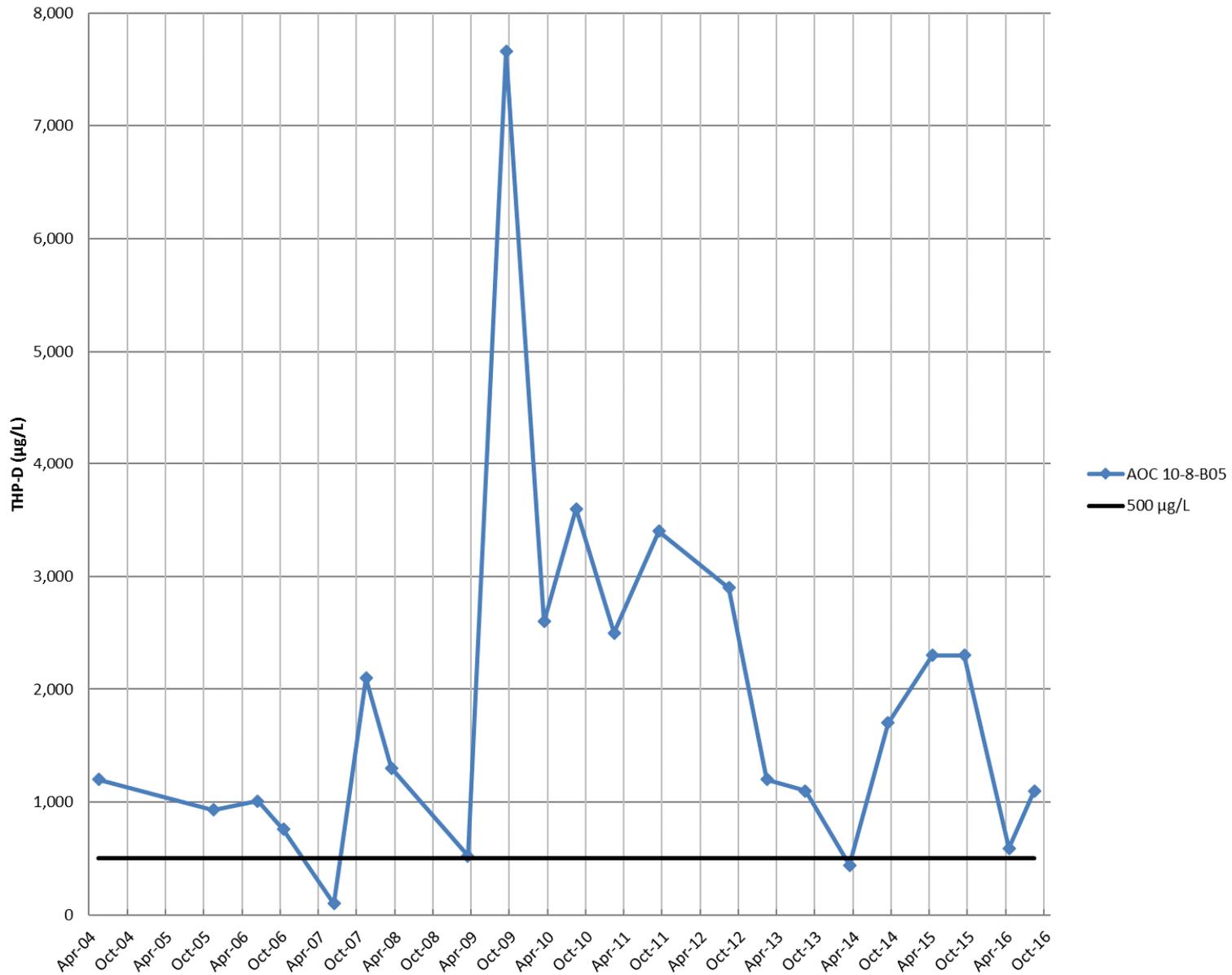


Figure 3-11
AOC 10-8 Groundwater Elevation and
TPH-D Concentration Contours August 2016

Figure 3-12. TPH-D Concentration Trends in AOC 10-8-B05 (AOC 10-8)



3-35

Table 3-5. AOC 10-8 Depth to Water Measurements, TPH-D Concentrations, and Groundwater Parameter Field Measurements

Well ID	DTW	GWELEV	TPH-D	Cond.	DO	ORP	Temp			
TOC Elevation	Date	(ft bgs)	(ft AMSL)	(µg/L)	pH	(µS/cm)	(ppm)	(mv)	°C	
JP-MW01 281.56	1-Jun-93	42.1	239.46	250U	-	-	-	-	-	
	1-Dec-93	45.94	235.62	250U	-	-	-	-	-	
	1-Mar-94	43.84	237.72	250U	-	-	-	-	-	
	1-Jun-94	44.68	236.88	250U	-	-	-	-	-	
	1-Oct-94	47.1	234.46	250U	-	-	-	-	-	
	1-Jan-95	42.92	238.64	250U	-	-	-	-	-	
	1-Apr-95	37.01	244.55	250U	-	-	-	-	-	
	1-May-04	40.12	241.44	250U	-	-	-	-	-	
	14-Nov-05	44.96	236.6	100U	-	-	-	-	-	
	13-Jun-06	36.29	245.27	100U	-	-	-	-	-	
	12-Jun-07	33.22	248.34	-	-	-	-	-	-	
	21-Mar-08	35.98	245.58	-	-	-	-	-	-	
	27-Aug-08				Could not locate					
	14-Sep-09				Could not locate					
	9-Mar-10	38.25	243.31	-	-	-	-	-	-	
	23-Aug-10	41.52	240.04	-	-	-	-	-	-	
	22-Feb-11	34.40	247.16	-	-	-	-	-	-	
	9-Sep-11	38.95	242.61	-	-	-	-	-	-	
	25-Mar-12	35.62	245.94	-	-	-	-	-	-	
	15-Aug-12	39.00	242.56	-	-	-	-	-	-	
	20-Feb-13	36.46	245.10							
	12-Aug-13				No access, vehicle over well					
	10-Mar-14	33.80	247.76	-	-	-	-	-	-	
24-Sep-14	40.48	241.08	-	-	-	-	-	-		
20-Apr-15	34.94	246.62	-	-	-	-	-	-		
31-Aug-15	43.22	238.34	-	-	-	-	-	-		
18-Apr-16	25.49	256.07	-	-	-	-	-	-		
18-Aug-16	36.48	245.08	-	-	-	-	-	-		
JP-MW02 279.33	1-Jun-93	40.40	238.93	250U	-	-	-	-	-	
	1-Dec-93	43.74	235.59	250U	-	-	-	-	-	
	1-Mar-94	41.46	237.87	250U	-	-	-	-	-	
	1-Jun-94	42.65	236.68	250U	-	-	-	-	-	
	1-Oct-94	44.82	234.51	250U	-	-	-	-	-	
	1-Jan-95	41.06	238.27	250U	-	-	-	-	-	
	1-Apr-95	37.49	241.84	250U	-	-	-	-	-	
	1-May-04	39.52	239.81	250U	-	-	-	-	-	
	14-Nov-05	42.80	236.53	100U	-	-	-	-	-	
	13-Jun-06	37.77	241.56	100U	-	-	-	-	-	
	12-Jun-07	36.46	242.87	100U	6.56	0.13	-	-	15.0	
	21-Mar-08	37.57	241.76	100U	7.38	0.13	6.49	112.0	12.6	
	27-Aug-08	41.62	237.71	-	-	-	-	-	-	
	3-Mar-09	39.79	239.54	100U	6.46	0.13	5.09	243.0	13.8	
14-Sep-09	41.97	237.36	-	-	-	-	-	-		

Table 3-5. AOC 10-8 Depth to Water Measurements, TPH-D Concentrations, and Groundwater Parameter Field Measurements (continued)

Well ID TOC Elevation	Date	DTW (ft bgs)	GWELEV (ft AMSL)	TPH-D (µg/L)	pH	Cond. (µS/cm)	DO (ppm)	ORP (mv)	Temp °C
JP-MW02 279.33 (continued)	9-Mar-10	38.52	240.81	120U	6.73	0.13	4.79	95.0	13.4
	27-Aug-10	40.45	238.88	120U	5.73	0.14	4.07	203.0	14.2
	22-Feb-11	36.72	242.61	120U	6.32	0.14	4.70	-	12.3
	9-Sep-11	38.88	240.45	-	-	-	-	-	-
	25-Mar-12	37.33	242.00	-	-	-	-	-	-
	15-Aug-12	38.83	240.50	120U	-	-	-	-	-
	20-Feb-13	37.67	241.66	100U	8.75	-	4.84	31.00	13.10
	20-Feb-13	37.67	241.66	100U	8.75	-	4.84	31.00	13.10
	13-Mar-14	35.10	244.23	100U	6.72	0.14	6.71	10.00	13.80
	Duplicate	13-Mar-14	35.10	244.23	100U	6.72	0.14	6.71	10.00
JP-MW03 280.7	24-Sep-14	39.29	240.04	38J	6.40	0.12	7.90	125.00	16.10
	23-Apr-15	36.48	242.85	18J	6.60	0.14	8.89	91	15.50
	1-Sep-15	40.61	238.72	24J	6.36	0.16	5.80	104	16.70
	18-Apr-16	30.39	248.94	16J	6.72	0.12	6.84	126	16.91
	18-Aug-16	37.78	241.55	13J	6.99	0.12	5.62	142.00	19.01
	1-Dec-93	44.37	235.92	250U	-	-	-	-	-
	1-Mar-94	42.03	238.26	250U	-	-	-	-	-
	1-Jun-94	43.24	237.05	250U	-	-	-	-	-
	1-Oct-94	45.57	234.72	250U	-	-	-	-	-
	1-Jan-95	41.46	238.83	250U	-	-	-	-	-
	1-Apr-95	36.71	243.58	250U	-	-	-	-	-
	1-May-04	39.30	240.99	250U	-	-	-	-	-
	14-Nov-05	43.35	236.94	100U	-	-	-	-	-
	13-Jun-06	36.39	243.90	100U	-	-	-	-	-
	12-Jun-07	33.82	246.47	-	-	-	-	-	-
	21-Mar-08	36.01	244.28	-	-	-	-	-	-
	27-Aug-08	41.95	238.34	-	-	-	-	-	-
	3-Mar-09	40.95	239.34	-	-	-	-	-	-
14-Sep-09	42.48	237.81	-	-	-	-	-	-	
9-Mar-10	37.81	242.48	-	-	-	-	-	-	
23-Aug-10	40.39	239.90	-	-	-	-	-	-	
22-Feb-11	36.14	244.15	-	-	-	-	-	-	
9-Sep-11	39.50	240.79	-	-	-	-	-	-	
25-Mar-12	35.98	244.31	-	-	-	-	-	-	
15-Aug-12	38.42	241.87	-	-	-	-	-	-	
20-Feb-13	36.45	243.84	-	-	-	-	-	-	
10-Mar-14	33.85	246.85	-	-	-	-	-	-	
23-Sep-14	39.65	241.05	-	-	-	-	-	-	
20-Apr-15	35.70	245.00	-	-	-	-	-	-	
31-Aug-15	42.17	238.53	-	-	-	-	-	-	
18-Apr-16	27.06	253.64	-	-	-	-	-	-	
18-Aug-16	36.37	244.33	-	-	-	-	-	-	

Table 3-5. AOC 10-8 Depth to Water Measurements, TPH-D Concentrations, and Groundwater Parameter Field Measurements (continued)

Well ID TOC Elevation	Date	DTW (ft bgs)	GWELEV (ft AMSL)	TPH-D (µg/L)	pH	Cond. (µS/cm)	DO (ppm)	ORP (mv)	Temp °C	
JP-MW04 281.12	1-Jun-93	41.60	239.52	250U	-	-	-	-	-	
	1-Dec-93	45.24	235.88	250U	-	-	-	-	-	
	1-Mar-94	43.21	237.91	250U	-	-	-	-	-	
	1-Jun-94	44.00	237.12	250U	-	-	-	-	-	
	1-Oct-94	46.45	234.67	250U	-	-	-	-	-	
	1-Jan-95	42.38	238.74	250U	-	-	-	-	-	
	1-Apr-95	37.34	243.78	250U	-	-	-	-	-	
	1-May-04	40.02	241.10	250U	-	-	-	-	-	
	14-Nov-05	44.30	236.82	100U	-	-	-	-	-	
	13-Jun-06	36.84	244.28	100U	-	-	-	-	-	
31-Oct-06	Well lost or destroyed									
AOC 10-8-B05 281.39	1-May-04	39.87	241.52	1,200	-	-	-	-	-	
	14-Nov-05	44.62	236.77	930	-	-	-	-	-	
	13-Jun-06	36.75	244.64	1,010	-	-	-	-	-	
	31-Oct-06	43.91	237.48	760	-	-	-	-	-	
	12-Jun-07	33.4	247.99	100UJ	-	-	-	-	-	
	16-Nov-07	41.82	239.57	2,100J	-	-	-	-	-	
	21-Mar-08	35.65	245.74	1,300J	-	-	-	-	-	
	27-Aug-08	No access, vehicle over well								
	3-Mar-09	39.65	241.74	521	7.17	0.331	4.02	207	12.4	
	14-Sep-09	43	238.39	7,660	-	-	-	-	-	
	9-Mar-10	38.8	242.59	2,600	6.61	0.75	1.66	-11	13.2	
	23-Aug-10	42.78	238.61	3,600	6.08	0.69	1.84	216	15.8	
	Duplicate	23-Aug-10	42.78	238.61	3,900	6.08	0.69	1.84	216	15.8
	22-Feb-11	36.25	245.14	2,500	6.22	0.76	1.16	-	13.7	
9-Sep-11	39	242.39	3,400	6.16	0.74	1.64	200	16.6		
25-Mar-12	37.22	244.17	-	-	-	-	-	-		
15-Aug-12	40.26	241.13	2,900	-	-	-	-	-		
20-Feb-13	38.13	243.26	1,200	8.24	-	3.46	11	13.1		
12-Aug-13	42	239.39	1,100	6.75	0.50	1.14	13	18.0		
Duplicate	12-Aug-13	42	239.39	1,100	6.75	0.50	1.14	13	18.0	
13-Mar-14	34.7	246.69	440	6.79	0.52	1.47	7	13.6		
25-Sep-14	40.65	240.74	1,700	Sample collected by bailer - No parameters						
23-Apr-15	35.54	245.85	2,300	Sample collected by bailer - No parameters						
1-Sep-15	42.91	238.48	2,300	Sample collected by bailer - No parameters						
18-Apr-16	26.68	254.71	590Y	Sample collected by bailer - No parameters						
18-Aug-16	38.11	243.28	1,100Y	Sample collected by bailer - No parameters						
MTCA Method A Cleanup Level				500						

Table 3-5. AOC 10-8 Depth to Water Measurements, TPH-D Concentrations, and Groundwater Parameter Field Measurements (continued)

Notes:

TOC – Top of casing

DTW (ft bgs) – Depth to water (feet below ground surface)

GWELEV (ft AMSL) – Groundwater elevation (feet above mean sea level)

TPH-D (µg/L) – Diesel-range total petroleum hydrocarbons (micrograms per liter)

Cond. (µS/cm) – Conductivity (microsiemens per centimeter)

DO (ppm) – Dissolved oxygen (parts per million)

ORP (mv) – Oxygen / reduction potential (millivolts)

Temp. (°C) – Temperature (degrees Celsius)

BOLD – Analyte detected at or above laboratory practical quantification limit

BOLD – Analyte detected at or above MTCA Method A cleanup level of 500 µg/L

J – The reported result is an estimated concentration.

U – Analyte not detected above practical quantification limit reported

Y – The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.

- - No data, not applicable

Table 3-6. Descriptive Statistics

Well ID	Constituent	Number of Samples	Number of Non-Detects	Sample Mean	Standard Deviation	Minimum Conc. (µg/L)	Maximum Conc. (µg/L)	Date of Maximum Conc.
AOC 8-2								
4131-MW02	TPH-D	24	1	2320.42	1176.10	480	4,800	23-Aug-10
4131-MW03		24	0	47278.33	172321.03	430	850,000	29-Dec-05
4131-MW04		21	16	-	-	15J	1,200	29-Dec-05
4131-MW05		21	17	-	-	-	-	-
AOC 8-4								
A0111-MW04	TPH-D	21	2	614.14	461.05	56	1,700	16-Nov-07
A0111-MW05		11	10	-	-	-	-	-
A0111-MW06		12	8	-	-	25J	170	8-Sep-11
A0111-MW07		12	8	-	-	42J	150	8-Sep-11
A0111-MW08		13	0	2050.00	3434.69	180	12,000	22-Aug-10
AOC 9-2								
95-A17-2	TPH-G	22	15	-	-	25U	4,700	28-Oct-03
	Benzene	20	17	-	-	0.2U	1.6	28-Oct-03
95-A17-3a	TPH-G	28	0	17909.68	10959.64	61J	35,000	8-Mar-08
	Benzene	28	0	244.35	207.88	0.1U	690	30-Jun-03
95-A17-4	TPH-G	14	13	-	-	50U	300	26-Aug-08
	Benzene	14	14	-	-	-	-	-
07-A17-7	TPH-G	18	10	805.22	1060.04	10J	3,400	7-Nov-07
	Benzene	16	8	28.72	45.53	0.08J	132	26-Aug-08
10-A17-8	TPH-G	15	0	28736.27	26870.05	14J	74,000	18-Nov-11
	Benzene	13	0	640.61	593.00	0.14	2,100	29-Nov-10
AOC 10-8								
JP-MW02	TPH-D	23	20	-	-	-	-	-
AOC 10-8-B05		22	1	1877.77	1621.27	100UJ	7,660	14-Sep-09

Notes:

TPH-D – Diesel-range total petroleum hydrocarbons (AOC 8-2, AOC 8-4, and AOC 10-8)

TPH-G – Gasoline-range total petroleum hydrocarbons (AOC 9-2)

Conc. (µg/L) – Concentration in micrograms per liter

U – Analyte not detected above practical quantification limit reported

J – Result reported is an estimated concentration

- - Not applicable

1

4 REFERENCES

- 2 Bussey, Troy. 2008. Fort Lewis Agreed Order Final Remedial Investigation Report.
3 February 2008.
- 4 Versar. 2009a. Design Report, Air Sparge and Soil Vapor Extraction System, Fort Lewis
5 Area of Concern 9-2, North Fort Credit Union. 2009.
- 6 Versar. 2009b. Fort Lewis Agreed Order Groundwater Monitoring Report for August 2010
7 and Quarterly Sampling Conducted in 2011. June 2012.
- 8 Versar. 2014. Fort Lewis Agreed Order Groundwater Sampling and Analysis Plan;
9 Building 4131 Former UST Site (AOC 8-2), Building A0111 Former UST Site
10 (AOC 8-4), Building A1033 Former UST Site (AOC 9-2), Gary Army Fuel Facility
11 (AOC 10-8); Joint Base Lewis McChord, Washington 98433. February 2014.
- 12

1

APPENDIX A

2

COMPLETED FIELD FORMS AND LOGBOOKS



Sealaska Environmental Services

Marine Science Center, P.O. Box 869
18743 Front Street, NE, Suite 201
Poulsbo, WA 98370

FLAO Spring 2016 Sampling Matrix Form

Well ID	Pump	DTW	Previous		Previous		Date	Time	PID	Sample ID	Date	Time	Holding Time:	TPH-O	TPH-G	8260C	Purge
			DTW	DTB	DTW	DTB								1 L Amber w/HCl	40 mL VOA w/HCl	40 mL VOA w/HCl	Volume (L)
AOC 8-2																	
4131-MW01	NA	21.61	24.59	37.14	37.00	04/19/16	14.21	-	-	-	-	-	-	-	-	-	-
4131-MW02	AP	20.49	23.41	-	27.11	04/19/16	14.27	-	AOC1604204131MW02	04/20/16	1255	-	2	-	-	-	13.6
4131-MW03	AP	22.45	24.80	-	29.75	04/19/16	14.37	-	AOC1604204131MW03	04/20/16	1410	-	2	-	-	-	14.1
4131-MW03	AP	-	-	-	-	-	-	-	AOC1604204131MW13	04/20/16	1420	-	2	-	-	-	-
4131-MW04	AP	20.09	23.06	-	27.50	04/19/16	14.17	-	AOC1604204131MW04	04/20/16	1100	-	6	-	-	-	14.0
4131-MW05	AP	19.60	22.54	-	26.84	04/19/16	14.32	-	AOC1604204131MW05	04/20/16	0955	-	2	-	-	-	8.0
4131-MW06	NA	21.55	24.47	33.85	32.41	04/19/16	14.42	-	-	-	-	-	-	-	-	-	-
AOC 8-4																	
A0111-MW04	PP	18.41	19.72	22.73	22.70	04/21/16	0917	-	AOC160421A0111MW04	04/21/16	1255	-	2	-	-	-	7.6
A0111-MW05	PP	17.94	19.28	27.20	27.21	04/21/16	0909	-	AOC160421A0111MW05	04/21/16	1110	-	2	-	-	-	13.2
A0111-MW06	PP	16.18	17.47	25.55	25.50	04/21/16	0904	-	AOC160421A0111MW06	04/21/16	1010	-	2	-	-	-	12.6
A0111-MW07	PP	18.79	20.25	28.95	28.72	04/21/16	0920	-	AOC160421A0111MW07	04/21/16	1340	-	2	-	-	-	9.0
A0111-MW08	PP	16.61	19.94	22.92	22.91	04/21/16	0914	-	AOC160421A0111MW08	04/21/16	1155	-	2	-	-	-	7.2
AOC 9-2																	
95-A17-1	NA	21.03	25.37	41.25	41.55	04/19/16	1345	0.0	-	-	-	-	-	-	-	-	-
95-A17-2	PP	22.09	24.56	37.49	37.49	04/19/16	1351	0.0	AOC16041995A172	04/19/16	1155	-	-	3	3	3	7.5
95-A17-3A	AP	21.43	24.96	-	32.22 (top of pump)	04/19/16	1323	0.0	AOC16041995A173A	04/19/16	1345	-	-	3	3	3	5.4
95-A17-4	AP	22.42	24.76	-	30.12 (top of pump)	04/19/16	1338	0.0	AOC16041995A174	04/19/16	1255	-	-	9	9	9	10.0
96-A17-5	NA	21.36	23.57	45.31	45.29	04/19/16	1326	0.0	-	-	-	-	-	-	-	-	-
96-A17-6	NA	20.26	22.48	42.75	42.81	04/19/16	1331	0.0	-	-	-	-	-	-	-	-	-
07-A17-7	AP	21.43	23.60	-	28.29 (top of pump)	04/19/16	1329	0.0	AOC16041907A177	04/19/16	1055	-	-	3	3	3	17.6
10-A17-8	E2	16.93	24.72	-	37.70	04/19/16	1404	0.0	AOC16041910A178	04/19/16	1450	-	-	3	3	3	6.25
10-A17-8	E2	-	-	-	-	-	-	-	AOC16041910A188	04/19/16	1500	-	-	3	3	3	-
TRIP BLANK	G	NA	NA	NA	NA	NA	NA	NA	AOC160419TB	04/19/16	1420	-	-	2	2	2	NA
AOC 10-8																	
AOC 10-8-B05	BL	26.68	35.54	46.20	46.24	04/19/16	1027	-	AOC160419AOC108B05	04/19/16	1105	-	2	-	-	-	35.32
JP-MW01	NA	25.49	34.94	51.10	51.02	04/19/16	1012	-	-	-	-	-	-	-	-	-	-
JP-MW02	E2	30.39	36.48	49.80	49.80	04/19/16	0943	-	AOC160419JPMW02	04/19/16	1230	-	2	-	-	-	8.28
JP-MW03	NA	27.06	35.70	51.09	52.32	04/19/16	1020	-	-	-	-	-	-	-	-	-	-
Total														28	26	26	-

NEEZ" CAP

A-1

Laboratory: ALS
DTW = Depth to water

PO#: PO-01281 AU
DTB = Depth to bottom

Turnaround Time (TAT): Standard
Duplicate MSMD

Bill To: (Shipper) **SEALASKA ENV**
 Address **18743 FRONT ST NE**
 City **POULSBORO** Zip **98370**
 Ship To: (Consignee) **ALS KELSO**
 Address **1317 S 13TH STREET**
 City **KELSO** Zip **98626** Phone **360 3777222**

C.O.D. T Expedite Hot Shot Time **681996**
 \$. @ \$. Hr. DELIVERY CHARGE
 Tariff Class EXPEDITE CHARGE
 @ \$. Hr. DELAY CHARGE
 # PIECES DRIVER C.O.D. FEE
5 79
 WEIGHT TOTAL
240



1410 Martin Luther King Jr. Way, Tacoma, WA 98405
 www.mcdelivery.com
 253-272-1800 1-800-553-3252

SPECIAL INSTRUCTIONS

TO ARRIVE @ ALS by 1pm

KIM! PLEASE CHARGE A. LEWIS C/C

USE THIS SPACE WHEN SHIPPING HAZARDOUS MATERIALS

Shipping Name		Classification	
UN or NA Number	P.G. # Pkg.	Net Quantity Per Pkg.	Emergency Contact Number
			1-800-

Shipping Name Classification

UN or NA Number	P.G. # Pkg.	Net Quantity Per Pkg.	Emergency Contact Number
			1-800-

I HEREBY DECLARE THAT ALL HAZARDOUS MATERIALS CONTAINED IN THIS SHIPMENT ARE PROPERLY CLASSIFIED, DESCRIBED, PACKAGED, MARKED AND LABELED AND ARE IN ALL RESPECTS IN PROPER CONDITION FOR TRANSPORT ACCORDING TO THE APPLICABLE REGULATIONS OF THE DEPARTMENT OF TRANSPORTATION 49 CFR.

Shipper's Signature **[Signature]** Shipment Date **04/22/16**
 Shipper agrees to the terms and conditions set forth on the back of this bill of lading.

RECEIVED IN GOOD ORDER UNLESS OTHERWISE NOTED

X Consignee Signature

PREPAID BILL OF LADING

A-2



Sealaska Environmental Services

Marine Science Center, P.O. Box 869
18743 Front Street, NE, Suite 201
Poulsbo, WA 98370

Well Inspection, Purging, and Field Measurement Form

Contract Number: _____ Task Order: 01 Installation: JBLM Site Name: FLAO: AOC 8-2

Well Data

Well ID: 4131-MW02 Measuring Point (MP): Top of Casing, Rim Monument, Other: _____
 Total Well Depth (ft below MP): NC Pooled Water in Well Head: Y: N: Well Casing Volume (liters/ft): 0.6
 Depth to Water (ft below MP): 20.49 Inner Casing Straight and Clear: Y: N: _____ Well Volume (liters): NA
 Length of Water Column in well (ft): NA Well Head Locked: Y: N: _____ 3 x Well Volume (liters): NA
 Diameter of well casing (inches): 2 Exterior Seal Good Y: N: _____ Volume Purged (liters): 136
 Purge Method: Peristaltic/Submersible/Bladder/Other: _____ Remarks: _____

Water Sample Data

Sample ID: AOC16 0420 4131MW02 Type: ENV. Date: 4-20-16 Time: 1255 # Containers: 2
 QC Sample ID: NA Type: NA Date: NA Time: NA # Containers: NA
 Sampling Personnel: SP, WK Sampling Method: Low flow grab
 Remarks (color, odor, etc.): colorless/odorless

Time	Purge Vol. (liters)	Depth to Water (ft btoc)	pH	Spec. Cond. (ms/cm)	Turbidity (NTU)	DO (mg/L)	Temp. (°C)	ORP (mv)	Notes
Stabilization Requirements		(± 0.5)	(± 2.0)	(± 10%)	(± 10% or <20)	(± 10%)	(± 10%)	(± 10)	
04/19/16	0	20.49	Initial Depth to Water (Pre-pumping)						
1207	556W	PURGE	Flow = 340ml/min						
1208	correct	flow cal							
1212	1.7		6.38	0.308	52	5.45	15.75	6	
1217	3.4		6.45	0.296	38	1.03	15.52	14	
1222	5.1		6.53	0.283	28	0.78	15.55	26	
1227	6.8		6.55	0.212	17	1.93	15.61	53	
1232	8.5		6.45	0.162	12	2.63	15.17	90	
1237	10.2		6.39	0.140	5	3.07	14.54	107	
1242	11.9		6.39	0.135	4	3.20	14.52	110	
1247	13.6		6.37	0.132	4	3.31	14.50	115	
1255	collect	SAMPLE							

Well Volume Calculation

Well volume (liters) = [Well casing volume (liters/ft)] x [Length of water column (ft)]

Well casing diameter (in) → Well casing volume (liters/ft)

1.25" → 0.3 1.5" → 0.4 2" → 0.6 2.5" → 1 3" → 1.4 3.5" → 2 4" → 2.5 6" → 5.5



Sealaska Environmental Services

Marine Science Center, P.O. Box 869
18743 Front Street, NE, Suite 201
Poulsbo, WA 98370

Well Inspection, Purging, and Field Measurement Form

Contract Number: _____ Task Order: 01 Installation: JBLM Site Name: FLAO: AOC 8-2

Well Data

Well ID: 4131-MW03 Measuring Point (MP): Top of Casing, Rim Monument, Other: _____
 Total Well Depth (ft below MP): NC Pooled Water in Well Head: Y: ___ N: Well Casing Volume (liters/ft): 0.6
 Depth to Water (ft below MP): 22.48 Inner Casing Straight and Clear: Y: N: ___ Well Volume (liters): NA
 Length of Water Column in well (ft): NA Well Head Locked: Y: N: ___ 3 x Well Volume (liters): NA
 Diameter of well casing (inches): 2 Exterior Seal Good Y: N: ___ Volume Purged (liters): 14.1
 Purge Method: Peristaltic/Submersible/Bladder/Other: _____ Remarks: _____

Water Sample Data

Sample ID: AOC1604204131MW03 Type: ENV. Date: 04/20/14 Time: 1410 # Containers: 2
 QC Sample ID: AOC1604204131MW13 Type: DUP. Date: 04/20/14 Time: 1420 # Containers: 2
 Sampling Personnel: S. PATTERSON, W. KATGE Sampling Method: Low flow grab
 Remarks (color, odor, etc.): PARTICULATE SEEN THROUGHOUT PURGE

Time	Purge Vol. (liters)	Depth to Water (ft btoc)	pH	Spec. Cond. (ms/cm)	Turbidity (NTU)	DO (mg/L)	Temp. (°C)	ORP (mv)	Notes
Stabilization Requirements		(± 0.5)	(± 2.0)	(± 10%)	(± 10% or <20)	(± 10%)	(± 10%)	(± 10)	
1321	0	22.48	Initial Depth to Water (Pre-pumping)						
1323	START TO PURGE			SET FLOW RATE: 320 ml/min					
	RED/ORANGE/BROWN PARTICULATE			ALLOWED TO RISE					
1338	CONNECT TO FLOW CELL								
1342	6.1	22.63	6.33	0.173	42.7	1.65	15.51	-96	
1347	7.7	22.65	6.36	0.159	30.7	1.59	15.25	-88	
1352	9.3	22.66	6.38	0.146	19	1.68	14.97	-74	
1357	10.9	22.67	6.33	0.141	18	1.74	15.15	-66	
1402	12.5	22.68	6.26	0.139	16	1.79	15.03	-60	
1407	14.1	22.69	6.27	0.134	15	1.83	15.23	-58	
1410	COLLECT SAMPLE								
1420	COLLECT DUP SAMPLE								

Well Volume Calculation

Well volume (liters) = [Well casing volume (liters/ft)] x [Length of water column (ft)]

Well casing diameter (in) → Well casing volume (liters/ft)

1.25" → 0.3 1.5" → 0.4 2" → 0.6 2.5" → 1 3" → 1.4 3.5" → 2 4" → 2.5 6" → 5.5



Sealaska Environmental Services

Marine Science Center, P.O. Box 869
18743 Front Street, NE, Suite 201
Poulsbo, WA 98370

Well Inspection, Purging, and Field Measurement Form

Contract Number: _____ Task Order: 01 Installation: JBLM Site Name: FLAO: AOC 8-2

Well Data

Well ID: 4131-MW04 Measuring Point (MP): Top of Casing, Rim Monument, Other: _____
 Total Well Depth (ft below MP): NC Pooled Water in Well Head: Y: ___ N: Well Casing Volume (liters/ft): NA
 Depth to Water (ft below MP): 20.13 Inner Casing Straight and Clear: Y: N: ___ Well Volume (liters): NA
 Length of Water Column in well (ft): NA Well Head Locked: Y: N: ___ 3 x Well Volume (liters): NA
 Diameter of well casing (inches): 2 Exterior Seal Good Y: N: ___ Volume Purged (liters): 14.0
 Purge Method: Peristaltic/Submersible/Bladder/Other: _____ Remarks: _____

Water Sample Data

Sample ID: AOC160420 4131MW04 Type: MS/MSD Date: 04/20/16 Time: 1100 # Containers: 6
 QC Sample ID: NA Type: NA Date: NA Time: NA # Containers: NA
 Sampling Personnel: SP, LK Sampling Method: Low flow grab
 Remarks (color, odor, etc.): COLORLESS/CLEAR

Time	Purge Vol. (liters)	Depth to Water (ft btoc)	pH	Spec. Cond. (ms/cm)	Turbidity (NTU)	DO (mg/L)	Temp. (°C)	ORP (mv)	Notes
Stabilization Requirements		(± 0.5)	(± 2.0)	(± 10%)	(± 10% or <20)	(± 10%)	(± 10%)	(± 10)	
1017	0	20.13	Initial Depth to Water (Pre-pumping)						
1020	B54N PURGE FLOW = 400 ml/min								
1022	CONNECT FLOW CELL								
1025	2.0		6.06	0.118	48	6.24	15.23	220	
1030	4.0		6.01	0.122	32	5.84	14.72	225	
1035	6.0		6.09	0.126	17	5.88	14.54	222	
1040	8.0		6.13	0.127	16	5.84	14.56	221	
1045	10.0	20.14	6.30	0.127	9.6	5.83	14.56	216	
1050	12.0	20.14	6.38	0.128	7.3	5.83	14.55	211	
1055	14.0	20.14	6.41	0.128	6.0	5.83	14.53	211	
1100	COLLECT SAMPLE								

Well Volume Calculation

Well volume (liters) = [Well casing volume (liters/ft)] x [Length of water column (ft)]

Well casing diameter (in) → Well casing volume (liters/ft)

1.25" → 0.3 1.5" → 0.4 2" → 0.6 2.5" → 1 3" → 1.4 3.5" → 2 4" → 2.5 6" → 5.5



Sealaska Environmental Services
 Marine Science Center, P.O. Box 869
 18743 Front Street, NE, Suite 201
 Poulsbo, WA 98370

**Well Inspection,
 Purging, and Field
 Measurement Form**

Contract Number: _____ Task Order: 01 Installation: JBLM Site Name: FLAO: AOC 8-2

Well Data

Well ID: 4131-MW05 Measuring Point (MP): Top of Casing, Rim Monument, Other: _____
 Total Well Depth (ft below MP): NA Pooled Water in Well Head: Y: N: X Well Casing Volume (liters/ft): NA
 Depth to Water (ft below MP): 19.60 Inner Casing Straight and Clear: Y: X N: Well Volume (liters): NA
 Length of Water Column in well (ft): NA Well Head Locked: Y: X N: 3 x Well Volume (liters): NA
 Diameter of well casing (inches): 2" Exterior Seal Good Y: X N: Volume Purged (liters): 8.0
 Purge Method: Peristaltic/Submersible/Bladder/Other: _____ Remarks: _____

Water Sample Data

Sample ID: AOC1604204131MW05 Type: ENV. Date: 4-20-16 Time: 0955 # Containers: 2
 QC Sample ID: NA Type: NA Date: NA Time: NA # Containers: NA
 Sampling Personnel: SP, WK Sampling Method: Low flow grab
 Remarks (color, odor, etc.): COLORLESS/ODORLESS

Time	Purge Vol. (liters)	Depth to Water (ft btoc)	pH	Spec. Cond. (ms/cm)	Turbidity (NTU)	DO (mg/L)	Temp. (°C)	ORP (mv)	Notes
Stabilization Requirements		(± 0.5)	(± 2.0)	(± 10%)	(± 10% or <20)	(± 10%)	(± 10%)	(± 10)	
Initial Depth to Water (Pre-pumping)									
0930	0								
0930	BEGW	PURGE	FLOW = 400 L/min						
0932	CONDU	FLOW CELL							
0935	2.0		5.76	0.148	0	6.90	14.86	232	
0940	4.0		5.80	0.139	0	6.21	14.54	225	
0945	6.0		5.80	0.139	0	6.00	14.52	230	
0950	8.0		5.80	0.139	0	6.04	14.49	233	
0955	COLLECT SAMPLE								

Well Volume Calculation

Well volume (liters) = [Well casing volume (liters/ft)] x [Length of water column (ft)]

Well casing diameter (in) → Well casing volume (liters/ft)

- 1.25" → 0.3
- 1.5" → 0.4
- 2" → 0.6
- 2.5" → 1
- 3" → 1.4
- 3.5" → 2
- 4" → 2.5
- 6" → 5.5

Meter Model: Horiba U52

Page 1 of 1

Revision: Nov. 2014



Sealaska Environmental Services

Marine Science Center, P.O. Box 869
18743 Front Street, NE, Suite 201
Poulsbo, WA 98370

Well Inspection, Purging, and Field Measurement Form

Contract Number: _____ Task Order: 01 Installation: JBLM Site Name: FLAO: AOC 8-4

Well Data

Well ID: AO111-MW04 Measuring Point (MP): Top of Casing, Rim Monument, Other: _____
 Total Well Depth (ft below MP): 22.73 Pooled Water in Well Head: Y: N: X Well Casing Volume (liters/ft): 0.6
 Depth to Water (ft below MP): 18.41 Inner Casing Straight and Clear: Y: X N: Well Volume (liters): 3.72
 Length of Water Column in well (ft): 4.32 Well Head Locked: Y: X N: 3 x Well Volume (liters): 11.16
 Diameter of well casing (inches): 2" Exterior Seal Good Y: X N: Volume Purged (liters): 7.6
 Purge Method: Peristaltic/Submersible/Bladder/Other: _____ Remarks: _____

Water Sample Data

Sample ID: AOC160421 A0111MW04 Type: ENV. Date: 04/21/16 Time: 1255 # Containers: 2
 QC Sample ID: NA Type: NA Date: NA Time: NA # Containers: 2
 Sampling Personnel: S. PATTERSON, W. LAAGE Sampling Method: Low flow grab
 Remarks (color, odor, etc.): _____

Time	Purge Vol. (liters)	Depth to Water (ft btoc)	pH	Spec. Cond. (ms/cm)	Turbidity (NTU)	DO (mg/L)	Temp. (°C)	ORP (mv)	Notes
Stabilization Requirements		(± 0.5)	(± 2.0)	(± 10%)	(± 10% or <20)	(± 10%)	(± 10%)	(± 10)	
0917	0	18.41	Initial Depth to Water (Pre-pumping)						
1232	BEGUN	PURGE	RWS 380 m/mv						
1233	CONNECT FLOW CELL								
1237	1.9	18.41	5.56	0.122	2	6.71	15.56	229	
1243	3.8	18.41	5.78	0.122	0	7.13	15.27	223	
1247	5.7	18.41	5.77	0.122	0	6.99	15.26	227	
1253	7.6	18.41	5.70	0.122	0	7.24	15.25	232	
1257	9.5	18.41							
1255	COLLECT SAMPLE								

Well Volume Calculation

Well volume (liters) = [Well casing volume (liters/ft)] x [Length of water column (ft)]

Well casing diameter (in) → Well casing volume (liters/ft)

1.25" → 0.3 1.5" → 0.4 2" → 0.6 2.5" → 1 3" → 1.4 3.5" → 2 4" → 2.5 6" → 5.5

Meter Model: Horiba U52

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Sealaska Environmental Services

Marine Science Center, P.O. Box 869
18743 Front Street, NE, Suite 201
Poulsbo, WA 98370

Well Inspection, Purging, and Field Measurement Form

Contract Number: _____ Task Order: 01 Installation: JBLM Site Name: FLAO: AOC 8-4

Well Data

Well ID: AO111-MW05 Measuring Point (MP): Top of Casing, Rim Monument, Other: _____
 Total Well Depth (ft below MP): 2720 Pooled Water in Well Head: Y: ___ N: Well Casing Volume (liters/ft): 0.6
 Depth to Water (ft below MP): 17.94 Inner Casing Straight and Clear: Y: N: ___ Well Volume (liters): 5.556
 Length of Water Column in well (ft): 9.26 Well Head Locked: Y: N: ___ 3 x Well Volume (liters): 14.668
 Diameter of well casing (inches): 2 in Exterior Seal Good Y: N: ___ Volume Purged (liters): 13.2
 Purge Method: Peristaltic/Submersible/Bladder/Other: _____ Remarks: _____

Water Sample Data

Sample ID: AOC16 0421 A0111MW05 Type: ENV. Date: 04/21/16 Time: 1110 # Containers: 2
 QC Sample ID: NA Type: NA Date: NA Time: NA # Containers: 2
 Sampling Personnel: S. PATTERSON, W. KAAGE Sampling Method: Low flow grab
 Remarks (color, odor, etc.): COLORLESS/ODORLESS

Time	Purge Vol. (liters)	Depth to Water (ft btoc)	pH	Spec. Cond. (ms/cm)	Turbidity (NTU)	DO (mg/L)	Temp. (°C)	ORP (mv)	Notes
		(± 0.5)	(± 2.0)	(± 10%)	(± 10% or <20)	(± 10%)	(± 10%)	(± 10)	
0909	0	17.94							Initial Depth to Water (Pre-pumping)
1038	STARTED PURGE								SET FLOW RATE: 440 ml/min
1040	CONNECT FLOW CELL								
1043	2.2	17.98	5.66	0.123	23	6.82	15.06	223	
1048	4.4	17.96	5.72	0.123	32	6.88	14.84	225	
1053	6.6	17.96	5.66	0.123	22	6.68	14.84	232	
1058	8.8	17.96	5.60	0.123	17	6.56	14.81	239	
1103	11.0	17.96	5.56	0.123	16	6.48	14.71	244	
1108	13.2	17.96	5.57	0.123	12	6.47	14.77	245	
1110	COLLECT SAMPLE								

Well Volume Calculation

Well volume (liters) = [Well casing volume (liters/ft)] x [Length of water column (ft)]

Well casing diameter (in) → Well casing volume (liters/ft)

1.25" → 0.3 1.5" → 0.4 2" → 0.6 2.5" → 1 3" → 1.4 3.5" → 2 4" → 2.5 6" → 5.5



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Poulsbo, WA 98370

Well Inspection, Purging, and Field Measurement Form

Contract Number: _____ Task Order: 01 Installation: JBLM Site Name: FLAO: AOC 8-4

Well Data

Well ID: AO111-MW06 Measuring Point (MP): Top of Casing, Rim Monument, Other: _____
 Total Well Depth (ft below MP): 25.55 Pooled Water in Well Head: Y: ___ N: Well Casing Volume (liters/ft): 0.4
 Depth to Water (ft below MP): 16.18 Inner Casing Straight and Clear: Y: N: ___ Well Volume (liters): 5.622
 Length of Water Column in well (ft): 9.37 Well Head Locked: Y: N: ___ 3 x Well Volume (liters): 16.866
 Diameter of well casing (inches): 2 Exterior Seal Good Y: N: ___ Volume Purged (liters): 12.16
 Purge Method: Peristaltic/Submersible/Bladder/Other: _____ Remarks: _____

Water Sample Data

Sample ID: AOC160471 A0111MW06 Type: ENV. Date: 04/21/14 Time: 1010 # Containers: 2
 QC Sample ID: NA Type: NA Date: NA Time: NA # Containers: 2
 Sampling Personnel: S. PRATERSON, W. KRAGE Sampling Method: Low flow grab
 Remarks (color, odor, etc.): CLEAR / ODORLESS

Time	Purge Vol. (liters)	Depth to Water (ft btoc)	pH	Spec. Cond. (ms/cm)	Turbidity (NTU)	DO (mg/L)	Temp. (°C)	ORP (mv)	Notes
Stabilization Requirements		(± 0.5)	(± 2.0)	(± 10%)	(± 10% or <20)	(± 10%)	(± 10%)	(± 10)	
	0	Initial Depth to Water (Pre-pumping)							
0934	START PURGE			SET FLOW RATE	420 ml/min				
0936	CONNECT TO FLOW CELL								
0939	2.1	16.25	5.47	0.139	27.4	5.63	13.86	205	
0944	4.2	16.25	5.40	0.136	17.5	5.13	13.71	219	
0949	6.3	16.25	5.39	0.137	15.6	4.90	13.76	231	
0954	8.4	16.25	5.33	0.137	17.5	4.82	13.82	240	
0959	10.5	16.26	5.30	0.137	12.2	4.73	13.88	245	
1004	12.6	16.26	5.30	0.138	11.4	5.02	14.01	248	
1010	COLLECT SAMPLE								

Well Volume Calculation

Well volume (liters) = [Well casing volume (liters/ft)] x [Length of water column (ft)]

Well casing diameter (in) → Well casing volume (liters/ft)

1.25" → 0.3 1.5" → 0.4 2" → 0.6 2.5" → 1 3" → 1.4 3.5" → 2 4" → 2.5 6" → 5.5



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Poulsbo, WA 98370

Well Inspection, Purging, and Field Measurement Form

Contract Number: _____ Task Order: 01 Installation: JBLM Site Name: FLAO: AOC 8-4

Well Data

Well ID: AO111-MW07 Measuring Point (MP): Top of Casing, Rim Monument, Other: _____
 Total Well Depth (ft below MP): 28.95 Pooled Water in Well Head: Y: N: _____ Well Casing Volume (liters/ft): 0.6
 Depth to Water (ft below MP): 18.79 Inner Casing Straight and Clear: Y: N: _____ Well Volume (liters): 6.096
 Length of Water Column in well (ft): 10.16 Well Head Locked: Y: N: _____ 3 x Well Volume (liters): 18.288
 Diameter of well casing (inches): 2' Exterior Seal Good Y: N: _____ Volume Purged (liters): 9.0
 Purge Method: Peristaltic/Submersible/Bladder/Other: _____ Remarks: _____

Water Sample Data

Sample ID: AOC16 0421 A0111MW07 Type: ENV. Date: 04/21/16 Time: 1340 # Containers: 2
 QC Sample ID: NA Type: NA Date: NA Time: NA # Containers: 2
 Sampling Personnel: SP, WK Sampling Method: Low flow grab
 Remarks (color, odor, etc.): COLORLESS/ODORLESS

Time	Purge Vol. (liters)	Depth to Water (ft btoc)	pH	Spec. Cond. (ms/cm)	Turbidity (NTU)	DO (mg/L)	Temp. (°C)	ORP (mv)	Notes
Stabilization Requirements		(± 0.5)	(± 2.0)	(± 10%)	(± 10% or <20)	(± 10%)	(± 10%)	(± 10)	
0920	0	15.79							Initial Depth to Water (Pre-pumping)
1313									BEGIN PURGE FLOW = 360 L/MIN
1315									CONNECT FLOW CELL
1318	1.8	18.81	6.08	0.203	70	8.92	15.42	210	
1323	3.6	18.81	6.09	0.202	74	4.50	14.94	212	
1328	5.4	18.81	6.05	0.200	38	4.32	14.97	214	
1333	7.2	18.81	6.02	0.200	37	4.18	15.02	217	
1338	9.0	18.81	5.94	0.199	37	4.21	15.12	219	
1340									COLLECT SAMPLE

Well Volume Calculation

Well volume (liters) = [Well casing volume (liters/ft)] x [Length of water column (ft)]

Well casing diameter (in) → Well casing volume (liters/ft)

1.25" → 0.3 1.5" → 0.4 2" → 0.6 2.5" → 1 3" → 1.4 3.5" → 2 4" → 2.5 6" → 5.5

Meter Model: Horiba U52

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Well Inspection, Purging, and Field Measurement Form

Contract Number: _____ Task Order: 01 Installation: JBLM Site Name: FLAO: AOC 8-4

Well Data

Well ID: AO111-MW08 Measuring Point (MP): Top of Casing Rim Monument, Other: _____
 Total Well Depth (ft below MP): 27.92 Pooled Water in Well Head: Y: N: _____ Well Casing Volume (liters/ft): 0.6
 Depth to Water (ft below MP): 18.61 Inner Casing Straight and Clear: Y: N: _____ Well Volume (liters): 2.586
 Length of Water Column in well (ft): 4.31 Well Head Locked: Y: N: _____ 3 x Well Volume (liters): 7.758
 Diameter of well casing (inches): 2" Exterior Seal Good Y: N: _____ Volume Purged (liters): 7.7
 Purge Method: Peristaltic Submersible/Bladder/Other: _____ Remarks: _____

Water Sample Data

Sample ID: AOC160421A0111MW08 Type: ENV. Date: 4-21-17 Time: 1155 # Containers: 2
 QC Sample ID: NA Type: NA Date: NA Time: NA # Containers: 2
 Sampling Personnel: Sp, WK Sampling Method: Low flow grab
 Remarks (color, odor, etc.): COLORLESS / ODORLESS

Time	Purge Vol. (liters)	Depth to Water (ft btoc)	pH	Spec. Cond. (ms/cm)	Turbidity (NTU)	DO (mg/L)	Temp. (°C)	ORP (mv)	Notes
Stabilization Requirements		(± 0.5)	(± 2.0)	(± 10%)	(± 10% or <20)	(± 10%)	(± 10%)	(± 10)	
1127	0	18.58	Initial Depth to Water (Pre-pumping)						
1128	BEGIN	PURGE	FLOW = 360 mL/min						
1129	CON	ECT FLOW CFW	15.67 217.44-17						
1133	1.8	18.58	5.91	0.121	0	2.47	15.67	217	
1138	3.6	18.58	5.91	0.120	0	2.19	15.66	212	
1143	5.4	18.58	5.91	0.120	0	2.08	15.59	212	
1148	7.2	18.58	5.91	0.120	0	2.09	15.62	212	
1155	COLLECT	SAMPLE							

Well Volume Calculation

Well volume (liters) = [Well casing volume (liters/ft)] x [Length of water column (ft)]

Well casing diameter (in) → Well casing volume (liters/ft)

1.25" → 0.3 1.5" → 0.4 2" → 0.6 2.5" → 1 3" → 1.4 3.5" → 2 4" → 2.5 6" → 5.5

Meter Model: Horiba U52

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Sealaska Environmental Services
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 Poulsbo, WA 98370

**Well Inspection,
 Purging, and Field
 Measurement Form**

Contract Number: _____ Task Order: 01 Installation: JBLM Site Name: FLAO: AOC 9-2

Well Data

Well ID: 95-A17-2 Measuring Point (MP): Top of Casing, Rim Monument, Other: _____
 Total Well Depth (ft below MP): 37.49 Pooled Water in Well Head: Y: N: Well Casing Volume (liters/ft): 0.6
 Depth to Water (ft below MP): 22.09 Inner Casing Straight and Clear: Y: N: Well Volume (liters): 9.24
 Length of Water Column in well (ft): 15.40 Well Head Locked: Y: N: 3 x Well Volume (liters): 27.72
 Diameter of well casing (inches): 2 Exterior Seal Good Y: N: Volume Purged (liters): 7.5
 Purge Method: Peristaltic/Submersible/Bladder/Other: _____ Remarks: _____

Water Sample Data

Sample ID: AOC160419 95A172 Type: ENV. Date: 04/19/14 Time: 1155 # Containers: 6
 QC Sample ID: NA Type: NA Date: NA Time: NA # Containers: NA
 Sampling Personnel: S. PATTERSON, W. KAAGE Sampling Method: Low flow grab
 Remarks (color, odor, etc.): COLORLESS ODORLESS

Time	Purge Vol. (liters)	Depth to Water (ft btoc)	pH	Spec. Cond. (ms/cm)	Turbidity (NTU)	DO (mg/L)	Temp. (°C)	ORP (mv)	Notes
Stabilization Requirements		(± 0.5)	(± 2.0)	(± 10%)	(± 10% or <20)	(± 10%)	(± 10%)	(± 10)	
1124	0	22.47	Initial Depth to Water (Pre-pumping)						
1125	-	BEGIN PURGE	FLOW > 300-L						
1130	-	CONNECT FLOW CELL							
1135	3.0	22.55	6.32	0.175	6	9.43	19.04	161	
1140	4.5	22.57	6.45	0.174	6	6.02	18.81	162	
1145	6.0	22.57	6.44	0.179	6	2.85	18.79	167	
1150	7.5	22.56	6.44	0.173	6	5.83	18.73	170	
1155	COLLECT	SAMPLE							

Well Volume Calculation

Well volume (liters) = [Well casing volume (liters/ft)] x [Length of water column (ft)]

Well casing diameter (in) → Well casing volume (liters/ft)

1.25" → 0.3 1.5" → 0.4 2" → 0.6 2.5" → 1 3" → 1.4 3.5" → 2 4" → 2.5 6" → 5.5

Meter Model: Horiba U52

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Poulsbo, WA 98370

Well Inspection, Purging, and Field Measurement Form

Contract Number: _____ Task Order: 01 Installation: JBLM Site Name: FLAO: AOC 9-2

Well Data

Well ID: 95-A17-3A Measuring Point (MP): Top of Casing, Rim Monument, Other: _____
 Total Well Depth (ft below MP): NC Pooled Water in Well Head: Y: N: Well Casing Volume (liters/ft): NA
 Depth to Water (ft below MP): 21.43 Inner Casing Straight and Clear: Y: N: _____ Well Volume (liters): NA
 Length of Water Column in well (ft): 21.43 Well Head Locked: Y: N: _____ 3 x Well Volume (liters): NA
 Diameter of well casing (inches): 2" Exterior Seal Good Y: N: _____ Volume Purged (liters): 5.4
 Purge Method: Peristaltic/Submersible/Bladder/Other: _____ Remarks: _____

Water Sample Data

Sample ID: AOC16041995A173A Type: ENV. Date: 4-19-16 Time: 1345 # Containers: 6
 QC Sample ID: NA Type: NA Date: NA Time: NA # Containers: NA
 Sampling Personnel: SP, WK Sampling Method: Low flow grab
 Remarks (color, odor, etc.): COLORLESS/CODORLESS

Time	Purge Vol. (liters)	Depth to Water (ft btoc)	pH	Spec. Cond. (ms/cm)	Turbidity (NTU)	DO (mg/L)	Temp. (°C)	ORP (mv)	Notes
Stabilization Requirements		(± 0.5)	(± 2.0)	(± 10%)	(± 10% or <20)	(± 10%)	(± 10%)	(± 10)	
	0	Initial Depth to Water (Pre-pumping)							
<u>1323</u>		<u>BEGIN PURGE</u>			<u>FLOW = 270 ml/min</u>				
<u>1324</u>		<u>CONVERT FLOW CELL</u>							
<u>1329</u>	<u>1.35</u>		<u>6.08</u>	<u>0.221</u>	<u>0</u>	<u>4.22</u>	<u>16.97</u>	<u>-81</u>	
<u>1333</u>	<u>2.7</u>		<u>6.23</u>	<u>0.219</u>	<u>0</u>	<u>3.58</u>	<u>16.69</u>	<u>-84</u>	
<u>1338</u>	<u>4.05</u>		<u>6.25</u>	<u>0.217</u>	<u>0</u>	<u>3.31</u>	<u>16.66</u>	<u>-78</u>	
<u>1343</u>	<u>5.4</u>		<u>6.32</u>	<u>0.212</u>	<u>0</u>	<u>3.38</u>	<u>16.60</u>	<u>-79</u>	
<u>1345</u>	<u>COLLECT SAMPLE</u>								

Well Volume Calculation

Well volume (liters) = [Well casing volume (liters/ft)] x [Length of water column (ft)]

Well casing diameter (in) → Well casing volume (liters/ft)

1.25" → 0.3 1.5" → 0.4 2" → 0.6 2.5" → 1 3" → 1.4 3.5" → 2 4" → 2.5 6" → 5.5



SEALASKA ENVIRONMENTAL

Sealaska Environmental Services

Marine Science Center, P.O. Box 869
18743 Front Street, NE, Suite 201
Poulsbo, WA 98370

Well Inspection, Purging, and Field Measurement Form

Contract Number: _____ Task Order: 01 Installation: JBLM Site Name: FLAO: AOC 9-2

Well Data

Well ID: 95-A17-4 Measuring Point (MP): Top of Casing, Rim Monument, Other: _____
Total Well Depth (ft below MP): NA Pooled Water in Well Head: Y: NA N: X Well Casing Volume (liters/ft): NA
Depth to Water (ft below MP): 22.42 Inner Casing Straight and Clear: Y: X N: _____ Well Volume (liters): NA
Length of Water Column in well (ft): NA Well Head Locked: Y: X N: _____ 3 x Well Volume (liters): NA
Diameter of well casing (inches): 2" Exterior Seal Good Y: X N: _____ Volume Purged (liters): 10.0
Purge Method: Peristaltic/Submersible/Bladder/Other: _____ Remarks: _____

Water Sample Data

Sample ID: AOC16 041995A174 Type: MS/MSD Date: 4-19-16 Time: 1255 # Containers: 18
QC Sample ID: NA Type: NA Date: NA Time: NA # Containers: NA
Sampling Personnel: SP, WK Sampling Method: Low flow grab
Remarks (color, odor, etc.): SOME PARTICULATES / ODORLESS, GRAY COLOR.

Time	Purge Vol. (liters)	Depth to Water (ft btoc)	pH	Spec. Cond. (ms/cm)	Turbidity (NTU)	DO (mg/L)	Temp. (°C)	ORP (mv)	Notes
Stabilization Requirements		(± 0.5)	(± 2.0)	(± 10%)	(± 10% or <20)	(± 10%)	(± 10%)	(± 10)	
04/19/16	0	22.42	Initial Depth to Water (Pre-pumping)						
1228		BEGIN PURGE	FLOW = 400 mL/min						
1230		CONNECT FLOW LINE							
1233	2.0		6.34	0.164	269	6.10	18.01	184	
1238	4.0		6.42	0.163	174	5.74	17.26	186	
1243	6.0		6.45	0.163	124	5.52	17.51	188	
1248	8.0		6.47	0.162	119	5.48	17.99	190	
1253	10.0		6.46	0.162	115	5.39	18.11	191	
1255		COLLECT SAMPLE							

Well Volume Calculation

Well volume (liters) = [Well casing volume (liters/ft)] x [Length of water column (ft)]

Well casing diameter (in) → Well casing volume (liters/ft)

1.25" → 0.3 1.5" → 0.4 2" → 0.6 2.5" → 1 3" → 1.4 3.5" → 2 4" → 2.5 6" → 5.5

Meter Model: Horiba U52

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Sealaska Environmental Services

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Poulsbo, WA 98370

Well Inspection, Purging, and Field Measurement Form

Contract Number: _____ Task Order: 01 Installation: JBLM Site Name: FLAO: AOC 9-2

Well Data

Well ID: 07-A17-7 Measuring Point (MP): Top of Casing, Rim Monument, Other: _____
 Total Well Depth (ft below MP): NA Pooled Water in Well Head: Y: ___ N: X Well Casing Volume (liters/ft): JA
 Depth to Water (ft below MP): 21.43 Inner Casing Straight and Clear: Y: X N: ___ Well Volume (liters): NA
 Length of Water Column in well (ft): NA Well Head Locked: Y: X N: ___ 3 x Well Volume (liters): NA
 Diameter of well casing (inches): 2 Exterior Seal Good Y: X N: ___ Volume Purged (liters): 17L
 Purge Method: Peristaltic/Submersible/Bladder/Other: _____ Remarks: _____

Water Sample Data

Sample ID: AOC16041907A177 Type: ENV. Date: 04/19/16 Time: 1055 # Containers: 6
 QC Sample ID: NA Type: NA Date: NA Time: NA # Containers: NA
 Sampling Personnel: S. PATTERSON, W. VAAGE Sampling Method: Low flow grab
 Remarks (color, odor, etc.): LOTS OF TURBID 11.0 AT BEGINNING. DARK PARTICULATES

Time	Purge Vol. (liters)	Depth to Water (ft btoc)	pH	Spec. Cond. (ms/cm)	Turbidity (NTU)	DO (mg/L)	Temp. (°C)	ORP (mv)	Notes
Stabilization Requirements		(± 0.5)	(± 2.0)	(± 10%)	(± 10% or <20)	(± 10%)	(± 10%)	(± 10)	
<u>04/19/16</u>	<u>0</u>	<u>21.43</u>	Initial Depth to Water (Pre-pumping)						
<u>1011</u>	<u>BEGUN PURGE</u>	<u>PURGE</u>	<u>440</u>	<u>ml/min</u>					
<u>1014</u>	<u>CONNECT FLOW</u>	<u>CEW</u>							
<u>1016</u>	<u>2.2</u>		<u>6.13</u>	<u>0.183</u>	<u>758</u>	<u>2.88</u>	<u>14.05</u>	<u>22</u>	
<u>1021</u>	<u>4.4</u>		<u>6.16</u>	<u>0.162</u>	<u>800</u>	<u>0.81</u>	<u>13.57</u>	<u>-46</u>	
<u>1026</u>	<u>6.6</u>		<u>6.07</u>	<u>0.160</u>	<u>677</u>	<u>0.58</u>	<u>13.39</u>	<u>-43</u>	
<u>1031</u>	<u>8.8</u>		<u>6.07</u>	<u>0.156</u>	<u>381</u>	<u>0.52</u>	<u>13.32</u>	<u>-42</u>	
<u>1036</u>	<u>11.0</u>		<u>6.11</u>	<u>0.154</u>	<u>378</u>	<u>0.51</u>	<u>13.29</u>	<u>-44</u>	
<u>1041</u>	<u>13.2</u>		<u>6.78</u>	<u>0.151</u>	<u>294</u>	<u>0.47</u>	<u>13.35</u>	<u>-80</u>	
<u>1046</u>	<u>15.4</u>		<u>6.80</u>	<u>0.150</u>	<u>282</u>	<u>0.48</u>	<u>13.34</u>	<u>-83</u>	
<u>1051</u>	<u>17.6</u>		<u>6.80</u>	<u>0.144</u>	<u>278</u>	<u>0.47</u>	<u>13.36</u>	<u>-84</u>	
<u>1055</u>	<u>COLLECT SAMPLE</u>								

Well Volume Calculation

Well volume (liters) = [Well casing volume (liters/ft)] x [Length of water column (ft)]

Well casing diameter (in) → Well casing volume (liters/ft)

1.25" → 0.3 1.5" → 0.4 2" → 0.6 2.5" → 1 3" → 1.4 3.5" → 2 4" → 2.5 6" → 5.5



Sealaska Environmental Services

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Poulsbo, WA 98370

Well Inspection, Purging, and Field Measurement Form

Contract Number: _____ Task Order: 01 Installation: JBLM Site Name: FLAO: AOC 9-2

Well Data

Well ID: 10-A17-8 Measuring Point (MP): Top of Casing, Rim Monument, Other: _____
 Total Well Depth (ft below MP): 27.70 Pooled Water in Well Head: Y: N: Well Casing Volume (liters/ft): 0.6
 Depth to Water (ft below MP): 10.93 Inner Casing Straight and Clear: Y: N: Well Volume (liters): 12.462
 Length of Water Column in well (ft): 20.77 Well Head Locked: Y: N: 3 x Well Volume (liters): 37.386
 Diameter of well casing (inches): 2" Exterior Seal Good Y: N: Volume Purged (liters): 6.25
 Purge Method: Peristaltic, Submersible, Bladder/Other: _____ Remarks: Pressurized

Water Sample Data

Sample ID: AOC16 0414 10A178 Type: ENV. Date: 04/18/16 Time: 1450 # Containers: 6
 QC Sample ID: AOC16 0418 10A188 Type: DUP. Date: 04/18/16 Time: 1500 # Containers: 6
 Sampling Personnel: S. PATTERSON, W. LAAGE Sampling Method: Low flow grab
 Remarks (color, odor, etc.): BUBBLING IN WELL, STIRRING UP LOTS OF PARTICULATES
(DO EXPECTED TO BE HIGH)

Time	Purge Vol. (liters)	Depth to Water (ft btoc)	pH	Spec. Cond. (ms/cm)	Turbidity (NTU)	DO (mg/L)	Temp. (°C)	ORP (mv)	Notes
		(± 0.5)	(± 2.0)	(± 10%)	(± 10% or <20)	(± 10%)	(± 10%)	(± 10)	
1404	0	10.93							Initial Depth to Water (Pre-pumping)
1405	STARTED PUMPING								
	ISSUES W/SUB PUMP. SWITCH TO PERISTALTIC								
1419	BEGIN PUMPING 250 mL/min								
1424	CONNECT HORIBA								
1429	2.50		7.15	0.145	163	9.20	20.08	152	
1434	3.75		7.18	0.148	166	8.67	19.52	154	
1439	5.0		7.18	0.150	165	8.95	19.37	156	
1444	6.25		7.18	0.153	156	8.53	19.21	156	
1450	COLLECT SAMPLE								
1500	COLLECT DUP SAMPLE								

Well Volume Calculation

Well volume (liters) = [Well casing volume (liters/ft)] x [Length of water column (ft)]

Well casing diameter (in) → Well casing volume (liters/ft)

1.25" → 0.3 1.5" → 0.4 2" → 0.6 2.5" → 1 3" → 1.4 3.5" → 2 4" → 2.5 6" → 5.5



Sealaska Environmental Services

Marine Science Center, P.O. Box 869
18743 Front Street, NE, Suite 201
Poulsbo, WA 98370

Well Inspection, Purging, and Field Measurement Form

Contract Number: _____ Task Order: 01 Installation: JBLM Site Name: FLAO: AOC 10-8

Well Data

Well ID: AOC 10-8-B05 Measuring Point (MP): Top of Casing Rim Monument, Other: _____
 Total Well Depth (ft below MP): 46.20 Pooled Water in Well Head: Y: ___ N: Well Casing Volume (liters/ft): 0.6
 Depth to Water (ft below MP): 26.68 Inner Casing Straight and Clear: Y: N: ___ Well Volume (liters): 11.712
 Length of Water Column in well (ft): 19.52 Well Head Locked: Y: N: ___ 3 x Well Volume (liters): 35.136
 Diameter of well casing (inches): 2.0 Exterior Seal Good Y: N: ___ Volume Purged (liters): 35.32
 Purge Method: Peristaltic/Submersible/Bladder/Other: Bailer Remarks: _____

Water Sample Data

Sample ID: AOC160418 AOC108B05 Type: ENV. Date: 04/18/16 Time: 1105 # Containers: 2
 QC Sample ID: NA Type: NA Date: NA Time: NA # Containers: 2

Sampling Personnel: S. PATTERSON, W. KARGE Sampling Method: Grab

Remarks (color, odor, etc.): _____

Vol. in Bailer (liters)	Purge Vol. (liters)	Vol. in Bailer (liters)	Purge Vol. (liters)	Vol. in Bailer (liters)	Purge Vol. (liters)	Vol. in Bailer (liters)	Purge Vol. (liters)	Vol. in Bailer (liters)	Purge Vol. (liters)
950	0.950	960	14.32	960	27.68				
950	1.900	940	15.26	960	28.64				
950	2.85	960	16.22	960	29.16				
950	3.8	960	17.18	960	30.56				
950	4.75	970	18.15	950	31.51				
940	5.69	980	19.13	950	32.46				
950	6.64	950	20.08	960	33.42				
960	7.6	950	21.03	940	34.36				
960	8.56	950	21.98	960	35.32				
960	9.52	950	22.93						
950	10.47	950	23.88						
970	11.44	950	24.83						
940	12.38	940	25.77						
950	13.34	950	26.72						

Well Volume Calculation

Well volume (liters) = [Well casing volume (liters/ft)] x [Length of water column (ft)]

Well casing diameter (in) → Well casing volume (liters/ft)

1.25" → 0.3 1.5" → 0.4 2" → 0.6 2.5" → 1 3" → 1.4 3.5" → 2 4" → 2.5 6" → 5.5

Meter Model: Horiba U52

Page 1 of 1

Revision: June 2014



Sealaska Environmental Services

Marine Science Center, P.O. Box 869
18743 Front Street, NE, Suite 201
Poulsbo, WA 98370

Well Inspection, Purging, and Field Measurement Form

Contract Number: _____ Task Order: 01 Installation: JBLM Site Name: FLAO: AOC 10-8

Well Data

Well ID: JP-MW02 Measuring Point (MP): Top of Casing, Rim Monument, Other: _____
 Total Well Depth (ft below MP): 49.80 Pooled Water in Well Head: Y: _____ N: Well Casing Volume (liters/ft): 48.53 ^{4" dia} 2.5
 Depth to Water (ft below MP): 30.39 Inner Casing Straight and Clear: Y: N: _____ Well Volume (liters): 48.53
 Length of Water Column in well (ft): 19.41 Well Head Locked: Y: N: _____ 3 x Well Volume (liters): 145.58
 Diameter of well casing (inches): 4" Exterior Seal Good Y: N: _____ Volume Purged (liters): 8.28
 Purge Method: Peristaltic Submersible Bladder/Other: _____ Remarks: _____

Water Sample Data

Sample ID: AOC16-0118 JPMW02 Type: ENV. Date: 4-18-16 Time: 1230 # Containers: 2
 QC Sample ID: NA Type: NA Date: NA Time: NA # Containers: NA
 Sampling Personnel: SP, WK Sampling Method: Low flow grab
 Remarks (color, odor, etc.): COLORLESS/ODORLESS

Time	Purge Vol. (liters)	Depth to Water (ft btoc)	pH	Spec. Cond. (ms/cm)	Turbidity (NTU)	DO (mg/L)	Temp. (°C)	ORP (mv)	Notes
Stabilization Requirements		(± 0.5)	(± 2.0)	(± 10%)	(± 10% or <20)	(± 10%)	(± 10%)	(± 10)	
1200 <u>1200</u>	<u>0</u>	<u>30.39</u>	Initial Depth to Water (Pre-pumping)						
<u>1200</u>	<u>13.64</u>	<u>PURGE</u>	<u>FLOW = 360 ml/min</u>						
<u>1208</u>	<u>2.88</u>	<u>30.41</u>	<u>6.68</u>	<u>0.124</u>	<u>0</u>	<u>7.09</u>	<u>16.27</u>	<u>138</u>	
<u>1213</u>	<u>4.68</u>		<u>6.76</u>	<u>0.121</u>	<u>0</u>	<u>6.94</u>	<u>16.66</u>	<u>126</u>	
<u>1218</u>	<u>6.48</u>		<u>6.83</u>	<u>0.121</u>	<u>0</u>	<u>6.84</u>	<u>16.90</u>	<u>126</u>	
<u>1223</u>	<u>8.28</u>		<u>6.72</u>	<u>0.120</u>	<u>0</u>	<u>6.84</u>	<u>16.91</u>	<u>126</u>	
1228	10.08								
<u>1230</u>	<u>COLLECT SAMPLE</u>								

Well Volume Calculation

Well volume (liters) = [Well casing volume (liters/ft)] x [Length of water column (ft)]

Well casing diameter (in) → Well casing volume (liters/ft)

1.25" → 0.3 1.5" → 0.4 2" → 0.6 2.5" → 1 3" → 1.4 3.5" → 2 4" → 2.5 6" → 5.5

Meter Model: Horiba U52

Page 1 of 1

Revision: Nov. 2014

Sealaska Environmental Service Daily Briefing Sign-in Sheet

Date: 04/18/14	Project Name/Location: JBLM FLAD
Task Order: DIA	SSHO Conducting Briefing: V. SUNRISE PATTERSON
Activity Hazard Analysis (AHAs) reviewed weekly and updated as needed? NA	
Awareness (e.g., special AHA concerns, pollution prevention, recent incidents, controls, etc.)	
VEHICLE OPERATIONS, PROPER LIFTING, HAND TOOL SAFETY, GRAB & PINCH POINTS, ERGONOMICS, PROPER PPE, HYDRATION, THERMAL STRESS, BIOLOGICAL HAZARDS, COMMUNICATION, HOSPITAL ROUTE, CUTS, SCRAPES, BURNS, PUNCTURES	
Other issues (Change in plans, attendee comments, subcontractor checklist used)	
Weather: Mix of clouds & sun, Hi- 84°F, LIGHT WINDS	

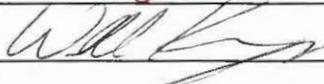
ATTENDEES:

Print Name	Company	Signature
Will Kraage	SFS	

Sealaska Environmental Service Daily Briefing Sign-in Sheet

Date: 04/19/16	Project Name/Location: JB LM FLAO
Task Order: 01A	SSHO Conducting Briefing: V. SUNRISE PATTERSON
Activity Hazard Analysis (AHAs) reviewed weekly and updated as needed? NA	
Awareness (e.g., special AHA concerns, pollution prevention, recent incidents, controls, etc.)	
VEHICLE OPERATIONS, PROPER LIFTING, HAND TOOL SAFETY, PINCH & GRAB POINTS, ERGONOMICS, PROPER PPE, HYDRATION, THERMAL STRESS, BIOLOGICAL HAZARDS, COMMUNICATION, HOSPITAL ROUTE, CUTS, SCRAPES BURNS, PUNCTURES, PRESERVATIVE AWARENESS	
Other issues (Change in plans, attendee comments, subcontractor checklist used)	
Weather: SUNNY, H. - 84°F, LO - 51°F, LIGHT WINDS	

ATTENDEES:

Print Name	Company	Signature
Will Kange	SES	

Sealaska Environmental Service Daily Briefing Sign-in Sheet

Date: 04/20/16	Project Name/Location: JBLM FLAO
Task Order: 01A	SSHO Conducting Briefing: V. SUNRISE PATTERSON
Activity Hazard Analysis (AHAs) reviewed weekly and updated as needed? NA	
Awareness (e.g., special AHA concerns, pollution prevention, recent incidents, controls, etc.)	
VEHICLE OPERATIONS, PROPER LIFTING, HAND TOOL SAFETY, PINCH & GRAB POINTS, ERGONOMICS, PROPER APE, HYDRATIONS, THERMAL STRESS, BIOLOGICAL HAZARDS, COMMUNICATION, HOSPITAL ROUTE, CUTS, SCRAPES, BURNS, PUNCTURES, PRESERVATIVE AWARENESS, PEDESTRIANS	
Other issues (Change in plans, attendee comments, subcontractor checklist used)	
Weather: SUNSHINE, HI-82°F, LO-47°, WIND 5-10 MPH	

ATTENDEES:

Print Name	Company	Signature
Will Kashe	SES	



Sealaska Environmental Service Daily Briefing Sign-in Sheet

Date: 21 04/29/16	Project Name/Location: JB LM FLAO
Task Order: ØIA	SSHO Conducting Briefing: V. SUNRISE PATTERSON
Activity Hazard Analysis (AHAs) reviewed weekly and updated as needed? NA	
Awareness (e.g., special AHA concerns, pollution prevention, recent incidents, controls, etc.)	
VEHICLE OPERATIONS, PROPER LIFTING, HAND TOOL SAFETY, PINCH & GRAB POINTS, ERGONOMICS, PROPER PPE, HYDRATION, THERMAL STRESS, BIOLOGICAL HAZARDS, COMMUNICATION, HOSPITAL ROUTE, CUTS, SCRAPES, BURNS, PUNCTURES, PRESERVATIVE AWARENESS, PEDESTRIANS, TRAFFIC REVISIONS	
Other issues (Change in plans, attendee comments, subcontractor checklist used)	
Weather: Mix of clouds & sun, Hi-74°F, Lo-51°F, Wind 5-10mph	

ATTENDEES:

Print Name	Company	Signature
Will Kraege	SES	



Sealaska Environmental Services

Marine Science Center, P.O. Box 869
18743 Front Street, NE, Suite 201
Poulsbo, WA 98370

FLAO Spring 2016 Sampling Matrix Form

QC check 8/31/16

Well ID	Pump	DTW	Previous DTW	Previous DTB	Date	Time	PID	Sample ID	Date	Time	Holding Time:	TPH-O NWTPH-Dx 1 L Amber w/HCl 1M	TPH-G NWTPH-Gx 40 mL VOA w/HCl 140	8260C 40 mL VOA w/HCl 140	Purge Volume (L)	
AOC 8-2																
4131-MW01	NA	25.47	24.59	37.00	08/31/16	1320	-	-	-	-	-	-	-	-	-	
4131-MW02	AP	24.36	23.41	27.11	08/31/16	1318	-	AOC1608314131MW02-1	08/31/16	1035	-	-	-	8.34	11	
4131-MW03	AP	20.23	24.80	29.75	08/31/16	1323	-	AOC1608314131MW03-1	08/31/16	1205	-	-	-	12.58	11 ✓	
4131-MW03	AP	-	-	-	-	-	-	AOC1608314131MW13-1	08/31/16	1215	-	-	-	-	11 ✓	
4131-MW04	AP	23.97	23.06	27.50	08/31/16	1313	-	AOC1608314131MW04-1	08/31/16	0845	-	-	-	5.16	11 ✓	
4131-MW05	AP	23.44	22.54	26.84	08/31/16	1316	-	AOC1608314131MW05-1	08/31/16	0940	-	-	-	6.4	11	
4131-MW06	NA	25.35	24.47	32.41	08/31/16	1320	-	-	-	-	-	-	-	-	-	
AOC 8-4																
A0111-MW04	PP	21.51	19.72	22.70	08/31/16	1142	-	AOC160830A0111MW04-1	08/30/16	1035	-	-	-	9.25	11	
A0111-MW05	PP	21.00	19.28	27.21	08/31/16	1139	-	-	-	-	-	-	-	-	-	
A0111-MW06	PP	19.19	17.47	25.50	08/31/16	1148	-	AOC160830A0111MW06-1	08/30/16	1240	-	-	-	4.94	11	
A0111-MW07	PP	22.11	20.25	28.72	08/31/16	1144	-	AOC160830A0111MW07-1	08/30/16	1120	-	-	-	4.68	11	
A0111-MW08	PP	21.65	19.94	22.91	08/31/16	1141	-	AOC160830A0111MW08-1	08/30/16	0925	-	-	-	3.8	11	
AOC 9-2																
95-A17-1	NA	28.01	25.37	41.55	08/29/16	1120	OppD	-	-	-	-	-	-	-	-	
95-A17-2	PP	27.15	24.56	37.49	08/29/16	1114	OppD	AOC16082995A172-1	08/29/16	1220	-	3	3	5.5	11 ✓	
95-A17-3A	AP	27.40	24.96	32.22 (top of pump)	08/29/16	1126	OppD	AOC16082995A173A-1	08/29/16	1105	-	3	3	6.8	11 ✓	
95-A17-4	AP	27.31	24.76	30.12 (top of pump)	08/29/16	1109	OppD	-	-	-	-	-	-	-	-	
96-A17-5	NA	28.04	23.57	45.29	08/29/16	1104	OppD	-	-	-	-	-	-	-	-	
96-A17-6	NA	26.11	22.48	42.81	08/29/16	1102	OppD	-	-	-	-	-	-	-	-	
07-A17-7	AP	25.00	23.60	28.29 (top of pump)	08/29/16	1100	OppD	AOC16082907A177-1	08/29/16	0950	-	9	9	13.5	11 ✓ 11 ✓ 11 ✓	
10-A17-8	E2	26.83	24.72	37.70	08/29/16	1112	OppD	AOC16082910A178-1	08/29/16	1330	-	3	3	3.2	11 ✓	
10-A17-8	E2	-	-	-	-	-	-	AOC16082910A188-1	08/29/16	1340	-	3	3	-	11 ✓	
TRIP BLANK	G	NA	NA	NA	NA	NA	NA	AOC160829TB-1	08/29/16	0930	-	2	2	NA	11 11	
AOC 10-8																
AOC 10-8-B05	BL	35.11	35.54	46.24	08/31/16	1405	-	AOC160830AOC108B05-1	08/30/16	1410	-	2	-	-	12.7	11
JP-MW01	NA	30.48	34.94	51.02	08/31/16	1400	-	-	-	-	-	-	-	-	-	
JP-MW02	E2	57.78	36.48	49.80	08/31/16	1344	-	AOC160830JPMW02-1	08/31/16	1530	-	2	-	-	4	11
JP-MW03	NA	30.37	35.70	52.32	08/31/16	1355	-	-	-	-	-	-	-	-	-	
Total												26	23	23	-	
10 N	PP	-	-	-	-	-	-	AOC16083110N-1	08/31/16	1330	-	2	3	-	11 11 11	

A-23

Laboratory: ALS
DTW = Depth to water

PO#: Turnaround Time (TAT):
DTB = Depth to bottom Duplicate MINISD

Standard

Bill To: (Shipper) SEA/ALASKA		C.O.D.		T	Expedite	Hot Shot	Time	623053	
Address		\$.		@ \$	Hr.		DELIVERY CHARGE		
City		Zip		Tariff		Class		EXPEDITE CHARGE	
Ship To: (Consignee) ALS Environmental		Thank you for your shipment. You are a valued customer and we sincerely appreciate this opportunity to serve you.		@ \$	Hr.		DELAY CHARGE		
Address 1317 SO. 13TH AVE				# PIECES	DRIVER		C.O.D. FEE		
City Ke/so		Zip 98626		4 79					
Phone				WEIGHT				TOTAL	
				200					
USE THIS SPACE WHEN SHIPPING HAZARDOUS MATERIALS									
Shipping Name					Classification				
UN or NA Number	P.G.	# Pkg.	Net Quantity Per Pkg.	Emergency Contact Number					
				1-800-					
Shipping Name					Classification				
UN or NA Number	P.G.	# Pkg.	Net Quantity Per Pkg.	Emergency Contact Number					
				1-800-					
I HEREBY DECLARE THAT ALL HAZARDOUS MATERIALS CONTAINED IN THIS SHIPMENT ARE PROPERLY CLASSIFIED, DESCRIBED, PACKAGED, MARKED AND LABELED AND ARE IN ALL RESPECTS IN PROPER CONDITION FOR TRANSPORT ACCORDING TO THE APPLICABLE REGULATIONS OF THE DEPARTMENT OF TRANSPORTATION 49 CFR.									
Shipper's Signature <i>[Signature]</i>						Shipment Date 9/1/16			
RECEIVED IN GOOD ORDER UNLESS OTHERWISE NOTED		<input checked="" type="checkbox"/> Consignee Signature		Shipper agrees to the terms and conditions set forth on the back of this bill of lading.					



1410 Martin Luther King Jr. Way, Tacoma, WA 98405
www.mcdelivery.com
253-272-1800 1-800-553-3252

SPECIAL INSTRUCTIONS

ADD CHARGE CODE TO INVOICE
10044.OIB.O20

PREPAID BILL OF LADING



Sealaska Environmental Services

Marine Science Center, P.O. Box 869
18743 Front Street, NE, Suite 201
Poulsbo, WA 98370

Well Inspection, Purging, and Field Measurement Form

Contract Number: _____ Task Order: 01B Installation: JBLM Site Name: FLAO: AOC 8-2

Well Data

Well ID: 4131-MW02 Measuring Point (MP): Top of Casing Rim Monument, Other: _____
 Total Well Depth (ft below MP): 27.11 Pooled Water in Well Head: Y: ___ N: Well Casing Volume (liters/ft): 0.6
 (TOP OF PUMP?)
 Depth to Water (ft below MP): 24.68 Inner Casing Straight and Clear: Y: N: ___ Well Volume (liters): 1.454
 Length of Water Column in well (ft): 2.43 Well Head Locked: Y: N: ___ 3 x Well Volume (liters): 4.374
 Diameter of well casing (inches): 2 Exterior Seal Good Y: N: ___ Volume Purged (liters): 8.36
 Purge Method: Peristaltic/Submersible/Bladder/Other: _____ Remarks: _____

Water Sample Data

Sample ID: AOC160831 4131MW02-1 Type: ENV. Date: 08/31/16 Time: 1035 # Containers: 2
 QC Sample ID: NA Type: NA Date: NA Time: NA # Containers: NA
 Sampling Personnel: S. PATTERSON, M. GRADON Sampling Method: Low flow grab
 Remarks (color, odor, etc.): Clear

Time	Purge Vol. (liters)	Depth to Water (ft btoc)	pH	Spec. Cond. (ms/cm)	Turbidity (NTU)	DO (mg/L)	Temp. (°C)	ORP (mv)	Notes
		(± 0.5)	(± 0.2)	(± 10%)	(± 10% or <20)	(± 10%)	(± 10%)	(± 10)	
1005	0	24.68							Initial Depth to Water (Pre-pumping)
1007									Pump begin, Flow rate @ 380 mL/min
1009									Horiba hooked up.
1017	3.8	25.15	6.39	0.352	7.4	1.07	13.17	-5	
1020	4.94	25.22	6.40	0.355	15.1	0.92	13.18	-6	
1023	6.08	25.24	6.42	0.365	13.5	0.91	13.19	-17	
1026	7.22	25.26	6.44	0.380	13.6	0.89	13.19	-24	
1029	8.36	25.29	6.45	0.393	12.9	0.83	13.17	-22	

Well Volume Calculation

Well volume (liters) = [Well casing volume (liters/ft)] x [Length of water column (ft)]

Well casing diameter (in) → Well casing volume (liters/ft)

1.25" → 0.3 1.5" → 0.4 2" → 0.6 2.5" → 1 3" → 1.4 3.5" → 2 4" → 2.5 6" → 5.5



Sealaska Environmental Services

Marine Science Center, P.O. Box 869
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Poulsbo, WA 98370

Well Inspection, Purging, and Field Measurement Form

Contract Number: _____ Task Order: 013 Installation: JBLM Site Name: FLAO: AOC 8-2

Well Data

Well ID: 4131-MW03 Measuring Point (MP): Top of Casing, Rim Monument, Other: _____
 Total Well Depth (ft below MP): 29.75 Pooled Water in Well Head: Y: N: _____ Well Casing Volume (liters/ft): 0.4
 Depth to Water (ft below MP): 26.53 Inner Casing Straight and Clear: Y: N: _____ Well Volume (liters): 1.932
 Length of Water Column in well (ft): 3.22 Well Head Locked: Y: N: _____ 3 x Well Volume (liters): 5.794
 Diameter of well casing (inches): 2 Exterior Seal Good Y: N: _____ Volume Purged (liters): 12.58
 Purge Method: Peristaltic/Submersible/Bladder/Other: _____ Remarks: _____

Water Sample Data

Sample ID: AOC160831 4131MW03-1 Type: ENV. Date: 08/31/16 Time: 1205 # Containers: 2
 QC Sample ID: AOC160831 4131MW13-1 Type: DUP. Date: 08/31/16 Time: 1215 # Containers: 2
 Sampling Personnel: S. PATTERSON, M. GRADON Sampling Method: Low flow grab
 Remarks (color, odor, etc.): BROWN/ORANGE CLOUDY

Time	Purge Vol. (liters)	Depth to Water (ft btoc)	pH	Spec. Cond. (ms/cm)	Turbidity (NTU)	DO (mg/L)	Temp. (°C)	ORP (mv)	Notes
Stabilization Requirements		(± 0.5)	(± 0.2)	(± 10%)	(± 10% or <20)	(± 10%)	(± 10%)	(± 10)	
1118	0	26.53	Initial Depth to Water (Pre-pumping)						
1123	STARTED PUMP		SET FLOW RATE: 340 mL/min						
1124	CONNECT TO FLOW CELL								
1127	1.36	27.10	6.33	0.339	713	1.67	13.84	-28	
1130	2.38	27.20	6.24	0.312	294	1.06	13.64	-26	
1133	3.40	27.40	6.19	0.298	778	0.84	13.62	-22	
1136	4.42	27.42	6.14	0.293	474	0.66	13.60	-21	
1139	5.44	27.46	6.17	0.293	136	0.56	13.56	-21	
1142	6.46	27.52	6.15	0.287	41.3	0.68	13.56	-26	
1145	7.48	27.56	6.14	0.287	26.6	0.66	13.51	-34	
1148	8.50	27.45	6.13	0.284	26.4	0.59	13.50	-38	
1151	9.52	27.66	6.12	0.288	26.3	0.52	13.46	-42	
1154	10.54	27.69	6.13	0.288	18.4	0.49	13.43	-44	
1157	11.56	27.72	6.13	0.289	15.9	0.48	13.41	-45	
1200	12.54	27.70	6.13	0.288	12.0	0.47	13.40	-44	

Well Volume Calculation

Well volume (liters) = [Well casing volume (liters/ft)] x [Length of water column (ft)]

Well casing diameter (in) → Well casing volume (liters/ft)

1.25" → 0.3 1.5" → 0.4 2" → 0.6 2.5" → 1 3" → 1.4 3.5" → 2 4" → 2.5 6" → 5.5



Sealaska Environmental Services

Marine Science Center, P.O. Box 869
18743 Front Street, NE, Suite 201
Poulsbo, WA 98370

Well Inspection, Purging, and Field Measurement Form

Contract Number: _____ Task Order: 01B Installation: JBLM Site Name: FLAO: AOC 8-4

Well Data

Well ID: AO111-MW04 Measuring Point (MP): Top of Casing, Rim Monument, Other: _____
 Total Well Depth (ft below MP): 22.70 Pooled Water in Well Head: Y: ___ N: X Well Casing Volume (liters/ft): 0.6
 Depth to Water (ft below MP): 21.80 Inner Casing Straight and Clear: Y: X N: ___ Well Volume (liters): 0.66
 Length of Water Column in well (ft): 1.10 Well Head Locked: Y: X N: ___ 3 x Well Volume (liters): 1.98
 Diameter of well casing (inches): 2 Exterior Seal Good Y: X N: ___ Volume Purged (liters): 9.25
 Purge Method: Peristaltic Submersible/Bladder/Other: _____ Remarks: _____

Water Sample Data

Sample ID: AOC160830AO111MW04-1 Type: ENV. Date: 8/30/16 Time: 10:35 # Containers: 2
 QC Sample ID: NA Type: NA Date: NA Time: NA # Containers: NA
 Sampling Personnel: S. Patterson, M. Graddon Sampling Method: Low flow grab
 Remarks (color, odor, etc.): Clear

Time	Purge Vol. (liters)	Depth to Water (ft btoc)	pH	Spec. Cond. (ms/cm)	Turbidity (NTU)	DO (mg/L)	Temp. (°C)	ORP (mv)	Notes
Stabilization Requirements		(± 0.5)	(± 0.2)	(± 10%)	(± 10% or <20)	(± 10%)	(± 10%)	(± 10)	
	0								Initial Depth to Water (Pre-pumping)
0953	Start pump								flow rate = 250 u/min
0955	Hook up Horiba								
1003	2.5	21.90	5.86	0.144	0.0	1.15	15.30	185	
1006	3.25	21.90	5.86	0.144	0.0	1.23	15.27	172	
1009	4	21.90	5.86	0.145	0.0	1.05	15.29	157	
1012	4.75	21.90	5.86	0.146	0.0	0.95	15.27	145	
1015	5.5	21.90	5.85	0.146	0.0	0.96	15.30	137	
1018	6.25	21.90	5.84	0.146	0.0	0.87	15.28	131	
1021	7	21.90	5.84	0.146	0.0	0.80	15.28	127	
1024	7.75	21.90	5.84	0.146	0.0	0.80	15.27	122	
1027	8.5	21.90	5.84	0.146	0.0	0.82	15.27	116	
1030	9.25	21.90	5.84	0.148	0.0	0.78	15.29	113	

Well Volume Calculation

Well volume (liters) = [Well casing volume (liters/ft)] x [Length of water column (ft)]

Well casing diameter (in) → Well casing volume (liters/ft)

1.25" → 0.3 1.5" → 0.4 2" → 0.6 2.5" → 1 3" → 1.4 3.5" → 2 4" → 2.5 6" → 5.5



Sealaska Environmental Services

Marine Science Center, P.O. Box 869
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Poulsbo, WA 98370

Well Inspection, Purging, and Field Measurement Form

Contract Number: _____ Task Order: 01B Installation: JBLM Site Name: FLAO: AOC 8-4

Well Data

Well ID: AO111-MW07 Measuring Point (MP): Top of Casing Rim Monument, Other: _____

Total Well Depth (ft below MP): 28.72 Pooled Water in Well Head: Y: N: Well Casing Volume (liters/ft): 0.6

Depth to Water (ft below MP): 22.37 Inner Casing Straight and Clear: Y: N: Well Volume (liters): 3.81

Length of Water Column in well (ft): 6.35 Well Head Locked: Y: N: 3 x Well Volume (liters): 11.43

Diameter of well casing (inches): 2 Exterior Seal Good Y: N: Volume Purged (liters): 4.68

Purge Method: Peristaltic Submersible/Bladder/Other: _____ Remarks: _____

Water Sample Data

Sample ID: AOC16083DA0111MW07-1 Type: ENV. Date: 08/20/16 Time: 1120 # Containers: 2

QC Sample ID: NA Type: NA Date: NA Time: NA # Containers: NA

Sampling Personnel: SPATTERSON, M. GRADSON Sampling Method: Low flow grab

Remarks (color, odor, etc.): Clear

Time	Purge Vol. (liters)	Depth to Water (ft btoc)	pH	Spec. Cond. (ms/cm)	Turbidity (NTU)	DO (mg/L)	Temp. (°C)	ORP (mv)	Notes
Stabilization Requirements		(± 0.5)	(± 0.2)	(± 10%)	(± 10% or <20)	(± 10%)	(± 10%)	(± 10)	
1055	0	22.37							Initial Depth to Water (Pre-pumping)
1100	STARTED PUMP								SET FLOW RATE: 260 mL/min
1102	CONNECT TO								FLOW CELL
1106	1.56	22.37	6.10	0.163	0.0	1.17	14.58	157	
1109	2.34	22.37	6.11	0.170	0.0	1.18	14.50	174	
1112	3.12	22.37	6.10	0.177	0.0	1.20	14.51	178	
1112 HTS (Mg)	3.12	22.37	6.10	0.184	0.0	1.29	14.59	191	
1115	3.90	22.37	6.10	0.184	0.0	1.34	14.67	194	
1118	4.68	22.37	6.10	0.184	0.0	1.41	14.73	199	

Well Volume Calculation

Well volume (liters) = [Well casing volume (liters/ft)] x [Length of water column (ft)]

Well casing diameter (in) → Well casing volume (liters/ft)

1.25" → 0.3 1.5" → 0.4 2" → 0.6 2.5" → 1 3" → 1.4 3.5" → 2 4" → 2.5 6" → 5.5



Sealaska Environmental Services

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Poulsbo, WA 98370

Well Inspection, Purging, and Field Measurement Form

Contract Number: _____ Task Order: 01B Installation: JBLM Site Name: FLAO: AOC 8-4

Well Data

Well ID: AO111-MW08 Measuring Point (MP): Top of Casing, Rim Monument, Other: _____
 Total Well Depth (ft below MP): 2291 Pooled Water in Well Head: Y: N: X Well Casing Volume (liters/ft): 0.6
 Depth to Water (ft below MP): 21.88 Inner Casing Straight and Clear: Y: X N: Well Volume (liters): 0.618
 Length of Water Column in well (ft): 1.03 Well Head Locked: Y: X N: 3 x Well Volume (liters): 1.85
 Diameter of well casing (inches): 2 Exterior Seal Good Y: X N: Volume Purged (liters): 3.8
 Purge Method: Peristaltic Submersible/Bladder/Other: _____ Remarks: _____

Water Sample Data

Sample ID: AOC160830A0111MW08-1 Type: ENV. Date: 08/30/16 Time: 0925 # Containers: 2
 QC Sample ID: NA Type: NA Date: NA Time: NA # Containers: NA
 Sampling Personnel: S. PATTERSON, M. GRADSON Sampling Method: Low flow grab
 Remarks (color, odor, etc.): Clear, bubbles in line

Time	Purge Vol. (liters)	Depth to Water (ft btoc)	pH	Spec. Cond. (ms/cm)	Turbidity (NTU)	DO (mg/L)	Temp. (°C)	ORP (mv)	Notes
	0	(± 0.5)	(± 0.2)	(± 10%)	(± 10% or <20)	(± 10%)	(± 10%)	(± 10)	
Initial Depth to Water (Pre-pumping)									
0901									
0940									
0903									
0911	2	21.88	5.77	0.155	0.0	8.15	15.26	223	
0914	1.6	21.90	5.74	0.143	0.0	7.93	15.22	223	
0917	3.2	21.90	5.72	0.137	0.0	7.74	15.16	223	
0920	3.8	21.90	5.69	0.133	0.0	7.50	15.15	223	

Well Volume Calculation

Well volume (liters) = [Well casing volume (liters/ft)] x [Length of water column (ft)]

Well casing diameter (in) → Well casing volume (liters/ft)

1.25" → 0.3 1.5" → 0.4 2" → 0.6 2.5" → 1 3" → 1.4 3.5" → 2 4" → 2.5 6" → 5.5

Meter Model: Horiba U52

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Sealaska Environmental Services

Marine Science Center, P.O. Box 869
18743 Front Street, NE, Suite 201
Poulsbo, WA 98370

Well Inspection, Purging, and Field Measurement Form

Contract Number: _____ Task Order: 01B Installation: JBLM Site Name: FLAO: AOC 9-2

Well Data

Well ID: 95-A17-3A Measuring Point (MP): Top of Casing, Rim Monument, Other: _____
 Total Well Depth (ft below MP): TOP OF PUMP Pooled Water in Well Head: Y: N: Well Casing Volume (liters/ft): 0.6
 Depth to Water (ft below MP): 28.08 Inner Casing Straight and Clear: Y: N: Well Volume (liters): NA
 Length of Water Column in well (ft): NA Well Head Locked: Y: N: 5/16 PERDS 3 x Well Volume (liters): NA
 Diameter of well casing (inches): 2 in Exterior Seal Good Y: N: Volume Purged (liters): 6.8
 Purge Method: Peristaltic/Submersible/Bladder Other: _____ Remarks: _____

Water Sample Data

Sample ID: AOC16 0429 95A173A-1 Type: ENV. Date: 08/29/16 Time: 1105 # Containers: 6
 QC Sample ID: NA Type: NA Date: NA Time: NA # Containers: NA
 Sampling Personnel: S. Patterson, M. Graddon Sampling Method: Low flow grab
 Remarks (color, odor, etc.): Clear, hydrocarbon odor

Time	Purge Vol. (liters)	Depth to Water (ft btoc)	pH	Spec. Cond. (ms/cm)	Turbidity (NTU)	DO (mg/L)	Temp. (°C)	ORP (mv)	Notes
Stabilization Requirements		(± 0.5)	(± 0.2)	(± 10%)	(± 10% or <20)	(± 10%)	(± 10%)	(± 10)	
1019	0	28.08							Initial Depth to Water (Pre-pumping)
1025	Pump start				Flow rate 200 ul/min				
1031	Hor bar	hooked up							
1035	2	28.10	6.68	0.224	2.6	1.23	17.11	6	
1038	2.6	28.10	6.69	0.225	2.5	1.18	17.08	11	
1041	2.9	28.10	6.69	0.226	1.2	1.11	16.92	20	
1044	3.8	28.10	6.67	0.227	0.2	1.07	16.88	30	
1047	4.4	28.10	6.65	0.228	0.0	1.03	16.84	39	
1050	5.0	28.10	6.63	0.229	0.0	1.01	16.79	46	
1053	5.6	28.10	6.59	0.229	0.0	1.00	16.77	53	
1056	6.2	28.10	6.56	0.230	0.0	0.99	16.74	59	
1059	6.8	28.10	6.55	0.230	0.0	0.99	16.70	63	

Well Volume Calculation

Well volume (liters) = [Well casing volume (liters/ft)] x [Length of water column (ft)]

Well casing diameter (in) → Well casing volume (liters/ft)

1.25" → 0.3 1.5" → 0.4 2" → 0.6 2.5" → 1 3" → 1.4 3.5" → 2 4" → 2.5 6" → 5.5

Meter Model: Horiba U52

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Sealaska Environmental Services

Marine Science Center, P.O. Box 869
18743 Front Street, NE, Suite 201
Poulsbo, WA 98370

Well Inspection, Purging, and Field Measurement Form

Contract Number: _____ Task Order: 01B Installation: JBLM Site Name: FLAO: AOC 9-2

Well Data

Well ID: 07-A17-7 Measuring Point (MP): Top of Casing, Rim Monument, Other: _____
 Total Well Depth (ft below MP): Top of Pump Pooled Water in Well Head: Y: N: Well Casing Volume (liters/ft): 0.6
 Depth to Water (ft below MP): 26.40 Inner Casing Straight and Clear: Y: N: Well Volume (liters): NA
 Length of Water Column in well (ft): NA Well Head Locked: Y: N: 3 x Well Volume (liters): NA
 Diameter of well casing (inches): 2 Exterior Seal Good Y: N: Volume Purged (liters): 13.5
 Purge Method: Peristaltic/Submersible Bladder Other: _____ Remarks: PTD - 0 ppb

Water Sample Data

Sample ID: AOC16 0829 07A177-1 Type: ENV/MMSD Date: 08/29/16 Time: 0950 # Containers: 18
 QC Sample ID: NA Type: NA Date: NA Time: NA # Containers: NA
 Sampling Personnel: S. PATTERSON, M. GARDNER Sampling Method: Low flow grab
 Remarks (color, odor, etc.): Clear, no odor

Time	Purge Vol. (liters)	Depth to Water (ft btoc)	pH	Spec. Cond. (ms/cm)	Turbidity (NTU)	DO (mg/L)	Temp. (°C)	ORP (mv)	Notes
Stabilization Requirements		(± 0.5)	(± 0.2)	(± 10%)	(± 10% or <20)	(± 10%)	(± 10%)	(± 10)	
0910	0	26.40							Initial Depth to Water (Pre-pumping)
0915	STARTED PUMP			SET FLOW RATE: 420 ml/min					
0922	CONNECT TO FLOW CELL								
0924	5.8	26.45	5.70	0.139	25.2	1.98	14.70	32	
0927	7.0	26.45	5.69	0.127	20.3	0.96	14.41	15	
0930	8.3	26.44	5.65	0.125	15.9	0.76	14.17	16	
0933	9.5	26.45	5.64	0.124	12.3	1.00	13.97	19	
0936	8.7	26.45	5.63	0.124	8.9	0.91	13.99	19	
0939	9.9	26.45	5.65	0.124	7.1	0.82	13.94	20	
0942	11.1	26.45	5.70	0.124	5.2	0.71	13.92	18	
0945	12.3	26.45	5.75	0.124	3.9	0.69	13.88	16	
0948	13.5	26.45	5.75	0.123	2.3	0.67	13.80	16	

Well Volume Calculation

Well volume (liters) = [Well casing volume (liters/ft)] x [Length of water column (ft)]

Well casing diameter (in) → Well casing volume (liters/ft)

1.25" → 0.3 1.5" → 0.4 2" → 0.6 2.5" → 1 3" → 1.4 3.5" → 2 4" → 2.5 6" → 5.5



Sealaska Environmental Services

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18743 Front Street, NE, Suite 201
Poulsbo, WA 98370

Well Inspection, Purging, and Field Measurement Form

Contract Number: _____ Task Order: 013 Installation: JBLM Site Name: FLAO: AOC 10-8

Well Data

Well ID: AOC 10-8-B05 Measuring Point (MP): Top of Casing Rim Monument, Other: _____

Total Well Depth (ft below MP): 46.24 Pooled Water in Well Head: Y: ___ N: Well Casing Volume (liters/ft): 0.6

Depth to Water (ft below MP): 39.22 Inner Casing Straight and Clear: Y: N: ___ Well Volume (liters): 4.212

Length of Water Column in well (ft): 7.02 Well Head Locked: Y: N: ___ 3 x Well Volume (liters): 12.636

Diameter of well casing (inches): 2 Exterior Seal Good Y: N: ___ Volume Purged (liters): 12.7

Purge Method: Peristaltic/Submersible/Bladder/Other: Bailer Remarks: _____

Water Sample Data

Sample ID: AOC160530AOC108B05-1 Type: ENV. Date: 8/30/14 Time: 1410 # Containers: 2

QC Sample ID: NA Type: NA Date: NA Time: NA # Containers: NA

Sampling Personnel: S. Patterson, M. Gradelon Sampling Method: Grab

Remarks (color, odor, etc.): cloudy

Vol. in Bailer (liters)	Purge Vol. (liters)	Vol. in Bailer (liters)	Purge Vol. (liters)	Vol. in Bailer (liters)	Purge Vol. (liters)	Vol. in Bailer (liters)	Purge Vol. (liters)	Vol. in Bailer (liters)	Purge Vol. (liters)
1	1	0.5	11.3						
0.75	1.75	0.8	12.1						
0.25	2	0.6	12.7						
1	3								
0.8	3.8								
0.7	4.5								
0.9	5.4								
0.9	6.3								
0.7	7.0								
0.75	7.75								
0.5	8.25								
0.75	9.10								
0.9	10.0								
0.8	10.8								

Well Volume Calculation

Well volume (liters) = [Well casing volume (liters/ft)] x [Length of water column (ft)]

Well casing diameter (in) → Well casing volume (liters/ft)

1.25" → 0.3 1.5" → 0.4 2" → 0.6 2.5" → 1 3" → 1.4 3.5" → 2 4" → 2.5 6" → 5.5

Meter Model: Horiba U52

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Revision: June 2014

TO Ø1A JBLM LGC ⁰⁹ W. MAR 18/16
 0700 S PATTERSON ON SITE FRED MEYER
 PURCHASE ICE FOR SAMPLE SHIPMENT
 PACK SAMPLES FOR SHIPMENT
 SHIP TWO COOLERS VIA MC DELIVERY
 TO AKKELSO.
 0800 S. PATTERSON OFF SITE

~~W. MAR 18/16~~
 03/09/16

TO Ø1A JBLM FLAO 18 APR 16
 0755 S PATTERSON ON SITE
 MOB TRUCK FOR SAMPLING
 0810 W. KARGE ON SITE
 CONDUCT TAILGATE SAFETY
 BRIEFING SSHO - S. PATTERSON
 TOPICS INCLUDE:
 • HYDRATION
 • THERMAL STRESS
 • PROPER LIFTING
 • VEHICLE OPERATIONS
 • PROPER PPE - MODIFIED LEVEL D
 - SAFETY GLASSES, BOOTS & GLOVES
 WX: MIX OF CLOUDS & SUN HI - 84°F, LIGHT WIND
 ON SITE LFZ SHED
 MOB FOR SAMPLING
 ON SITE AOC 10-8

COLLECT DTB

WELL ID	DTB	DTB	TIME
AOC 10-8-BOS	26.68	46.20	1027
JP-MN01	25.49	51.10	1012
JP-MN02	30.39	49.50	0943
JP-MN03	27.06	51.09	1020

SET UP TO SAMPLE AOC 10-8-BOS

USED BAILER TO PURGE 35.32 L ~~From~~

WELL 3x CASING VOLUME = 35.136 L

1105 COLLECT SAMPLE AOC10-8-BOS

W. MAR 18/16
 04/18/16

TO DIA JBLM FLAD 16 APR 18

2-1L AMBER w/HCl DRO NUTPH-Dx
1145 SET UP TO SAMPLE JP-MN102 VIA
SUBMERSIBLE PUMP

1200 STARTED PURGE SET FLOW RATE: 360ml/min
1208 COLLECT PARAMETERS - LISTED ON PURGE FORM
COLORLESS/ODORLESS

1223 PARAMETERS STABILIZE: PURGE VOL. - 8.25L,
PH - 6.72, COND. - 0.120ms/cm, TURB. - 0 NTU,
DO - 6.84 mg/L, TEMP. - 16.91°C, ORP - 126mV

1230 COLLECT SAMPLE AOC160418 JP MN102
2-1L AMBER w/HCl DRO NUTPH-Dx
ON SITE AOC 9-2

COLLECT DTN'S PID CHECK - 97.6 ppm

WELL ID	DTN	DTB	TIME	PID	NOTES
95-A17-1	21.03	41.25	1345	0.0	
95-A17-2	22.09	37.49	1357	0.0	
95-A17-3A	21.43	-	1323	0.0	
95-A17-4	22.42	-	1338	0.0	
96-A17-5	21.36	45.31	1326	0.0	
96-A17-6	20.26	42.75	1331	0.0	
07-A17-7	21.43	-	1329	0.0	
10-A17-8	16.93	-	1404	0.0	

LATE ENTRY

1240 CLEANED SUBMERSIBLE PUMP

1. USE SCRUB BRUSH ON PUMP
04/18/18

TO DIA JBLM FLAD 16 APR 18

2. ALLOWED PUMP TO CYCLE IN LIQUINOX
SOLUTION FOR A MINIMUM OF 5
MINUTES

3. TRANSFERRED PUMP TO RINSE WATER
AND ALLOWED PUMP TO CYCLE FOR
A MINIMUM OF 5 MINUTES

END OF LATE ENTRY

SET UP TO SAMPLE 10-A17-8 VIA
SUBMERSIBLE PUMP

PUMP UNABLE TO PULL WATER
WATER COULD BE HEARD BUBBLE PRIOR
TO INSTALLING PUMP, AIR IN WELL
LIKELY DISRUPTING PUMP FUNCTIONS

SET UP TO SAMPLE VIA PERISTALTIC
PUMP. PREPARE TRIP BLANK AOC160418 TB

1419 BEGIN PURGING SET FLOW RATE: 250ml/min

1424 CONNECT TO FLOW CELL SOME AIR SEEN IN TUBING

1429 COLLECT PARAMETERS - LISTED ON PURGE FORM
PARTICULATE SEEN IN WATER

1444 PARAMETERS STABILIZE: PURGE VOL. - 6.25L,
PH - 7.18, COND. - 0.153ms/cm, TURB. - 156 NTU,
DO - 8.53 mg/L, TEMP. - 19.21°C, ORP - 156mV

1450 COLLECT SAMPLE AOC160418 10A17-8
3-40ml vol w/HCl BTEX 82600
3-40ml vol w/HCl GRO NUTPH-GX
04/18/18

TO DIA JBUM FLAD 10 APR 16

1500 COLLECT DUP SAMPLE ACC 16041810A18X

3-40mL vca w/HCl BTEX 8260C

3-40mL vca w/HCl GLO NNTPH-GX

CLEANED SUBMERSIBLE PUMP AS

DESCRIBED ON PAGES 112-113.

185 DN SITE LF2 SHED

DEMOP

PLACE SAMPLE IN FRIG FOR STORAGE (3°C)

DISPOSE OF APPROX 20 GAL OF PURGE

AND DECON WATER INTO DRUM

HORIBA CALIBRATION

TIME	°C	PH	ORP	MS/CM	NTU	DO	SALT
1159	17.77	4.00	290	4.49	0.0	10.20	0.24
1545	26.54	4.00	301	4.48	0.0	10.07	0.24

1625 S. PATTERSON B W. KAAGE OFF SITE

TO DIA JBUM FLAD 10 APR 16

0745 S. PATTERSON ON SITE

PREP FOR SAMPLING

0815 W. KAAGE ON SITE

CONDUCT TAILGATE SAFETY BRIEFING

SSH0-S. PATTERSON

TOPICS INCLUDE:

• ANCH & GRAB POINTS

• ERGONOMICS

• THERMAL STRESS

• HYDRATION

• PROPER PPE - MODIFIED LEVEL D

- SAFETY GLASS, BOOTS, VEST & GLOVES

WX: SUNNY, HI - 84°F, LO - 51°F, LIGHT WIND

0835 DN SITE LF2 SHED

0835 MOB FOR SAMPLING

0841 CALIBRATE HORIBA U-52:

TEMP - 17.97°C, PH - 3.99, ORP - 300mV,

COND. - 4.48 mS/cm, TURB - 0.0 NTU,

DO - 9.17 mg/L, SAL - 0.24%

0925 DN SITE ADC 9-2

SET UP TO SAMPLE 07-A17-7 VIA

BLADDER PUMP

MADE REPAIRS TO CONTROLLER

1011 START PURGE: FLOW RATE - 440 mL/min

1014 CONVERT TO FLOW CELL ~~W/AD~~ 07/12/16

TO DIA JBLM FLAD 16 APR 19
1016 COLLECT PARAMETERS - LISTED ON PURGE
FORM

DARK / TURBID WATER AT BEGINNING

1051 PARAMETERS STABILIZE: PURGE VOL - 17.6L,

pH - 6.80, COND. - 680 μ S/cm, TURB. - 278 NTUs,

DO - 0.47 mg/L, TEMP. - 13.36°C, ORP - -84 mV

1055 COLLECT SAMPLE ACC16041907A17

3-40ml voc w/HCl BTEX 82600

3-40ml voc w/HCl GRO NWTPH-GX

1115 ON SITE 95-A17-2 SET UP TO SAMPLE

VIA PERISTALTIC PUMP

1124 DTW - 22.47 ft DTC

1125 BEGIN PURGE SET FLOW RATE: 300 ml/min

1130 CONNECT TO FLOW CELL

1135 COLLECT PARAMETERS: LISTED ON PURGE FORM

COLORLESS/ODORLESS

1150 PARAMETERS STABILIZE: PURGE VOL. - 7.5L,

DTW - 22.56 ft DTC, pH - 6.44, COND - 0.173 μ S/cm,

TURB. - 6 NTUs, DO - 5.83 mg/L,

TEMP. - 14.73°C, ORP - 170 mV

1155 COLLECT SAMPLE ACC16041995A172

3-40ml voc w/HCl BTEX 82600

3-40ml voc w/HCl GRO NWTPH-GX

1220 ON SITE 95-A17-4 SET UP TO SAMPLE

VIA BLADDER PUMP

~~VIA~~ 04/19/16

TO DIA JBLM FLAD 16 APR 19

1228 BEGIN PURGE SET FLOW RATE: 400 ml/min

1230 CONNECT TO FLOW CELL

1233 COLLECT PARAMETERS - LISTED ON PURGE FORM

GRAY COLOR w/PARTICULATE/ODORLESS

1253 PARAMETERS STABILIZE: PURGE VOL - 10.0L,

pH - 6.46, COND. - 0.162 μ S/cm, TURB. - 115 NTUs,

DO - 5.39 mg/L, TEMP. - 18.11°C, ORP - 191 mV

1255 COLLECT SAMPLE ACC16041995A174 MS/MSD

9-40ml voc w/HCl BTEX 82600

9-40ml voc w/HCl GRO NWTPH-GX

CHECK IN WITH BANK FOR ACCESS TO

95-A17-3A

SET UP TO SAMPLE VIA BLADDER PUMP

1323 STARTED PURGE SET FLOW RATE: 270 ml/min

1324 CONNECT TO FLOW CELL

1328 COLLECT PARAMETERS - LISTED ON PURGE FORM

COLORLESS/ODORLESS

1343 PARAMETERS STABILIZE: PURGE VOL. - 5.4L,

pH - 6.32, COND. - 0.212 μ S/cm, TURB. - 0 NTUs,

DO - 3.38 mg/L, TEMP. - 14.60°C, ORP - -79 mV

1345 COLLECT SAMPLE ACC16041995A173A

3-40ml voc w/HCl BTEX 82600

3-40ml voc w/HCl GRO NWTPH-GX

ON SITE LF2 SHED

DEMOP ~~VIA~~ 04/19/16

TO DIA JBLM FLAO 16 APR 19

PLACE SAMPLES IN FRIG (30C) FOR STORAGE

1514 CALIBRATE HORIBA: TEMP. - 22.540C,
 PH - 3.99, ORP - 281mv, COND. - 4.48ms/cm,
 TURB. - 0.0 NTU, DO - 10.56mg/L, SAL - 0.24%
 DISPOSED OF APPROX 9 GAL OF
 PURGE WATER INTO DESIGNATED DRUM.
 1530 S. PATTERSON, W. KAAGE OFF SITE

~~WATER~~ 04/20/16

TO DIA JBLM FLAO 16 APR 20

0800 S. PATTERSON, W. KAAGE ON SITE

CONDUCT TAILGATE SAFETY BRIEFING,
 SSHO - V. SUNRISE PATTERSON

TOPICS INCLUDE

- HYDRATION
- THERMAL STRESS
- CUTS, SCRAPES, BURNS, PUNCTURES
- PINCH & GRAB POINT
- PROPER PPE - MODIFIED LEVEL 1
- SAFETY GLASSES, VEST, BOOTS & GLOVES

WX: SUNSHINE HI - 82°F, LO - 47°, WIND 5-10 mph

ON SITE LF2 SHED

MOB FOR SAMPLING

FUEL GENERATOR

0855 CALIBRATE HORIBA: TEMP. - 17.38°C, pH - 3.78,

ORP - 271mv, 4.48ms/cm, TURB. - 0.0 NTU,

DO - 7.95mg/L, SAL - 0.24%

0925 ON SITE 4131 - MNOS SET UP TO
 SAMPLE VIA BLADDER PUMP

0930 START PURGE SET FLOW RATE: 400ml/min

0932 CONNECT TO FLOW CELL

0935 COLLECT PARAMETERS - LISTED ON PURGE FORM

~~0950~~ COLORLESS/ODORLESS

0950 PARAMETERS STABILIZE: PURGE VOL. 8.0L,

PH - 5.80, COND. - 0.139ms/cm, TURB. - 0.0 NTU,

04/20/16

120

TO Ø1A JBUM FLAO 16 APR 20
 DO - 6.04 mg/L, TEMP - 14.49°C, ORP - 233 mV
 0955 COLLECT SAMPLE AOC1604204131MN05
 2-1 L AMBER w/HCl DRO: NWT PH-Dx
 1010 ON SITE 4131-MN04 SET UP TO SAMPLE
 VIA BLADDER PUMP
 1017 DTW - 20.13 ft bToc
 1020 START PURGE, SET FLOW RATE: 400 mL/min
 1022 CONNECT TO FLOW CELL
 1025 COLLECT PARAMETERS - LISTED ON PURGE FORM
 COLORLESS / ODORLESS
 1055 PARAMETERS STABILIZE: PURGE VOL - 14.0 L,
 DTW - 20.14 ft bToc, pH - 6.41, COND. - 0.128 ms/cm,
 TURB. - 6.0 NTUS, DO - 5.83 mg/L, TEMP. - 14.53°C,
 ORP - 211 mV
 1100 COLLECT SAMPLE AOC1604204131MN04
 6-1 L AMBER w/HCl DRO: NWT PH-Dx (MSMSD)
 1200 SET UP TO SAMPLE 4131-MN02 VIA
 BLADDER PUMP
 1207 STARTED PURGE, SET FLOW RATE: 340 mL/min
 1208 CONNECT TO FLOW CELL
 1212 COLLECT PARAMETERS - LISTED ON PURGE FORM
 1247 PARAMETERS STABILIZE! PURGE VOL - 13.6 L,
 pH 6.37, COND. - 0.132 ms/cm, TURB. - 4 NTUS,
 DO - 3.31 mg/L, TEMP. - 14.50°C, ORP - 115 mV
 1255 COLLECT SAMPLE AOC1604204131MN02

[Signature]

04/20/16

121

TO Ø1A JBUM FLAO 16 APR 20
 2-1 L AMBER w/HCl DRO: NWT PH-Dx
 1315 SET UP TO SAMPLE 4131-MN03 VIA
 BLADDER PUMP
 1321 DTW - 22.48 ft bToc
 1323 STARTED PURGE SET FLOW RATE: 320 mL/min
 TURBID WATER ALLOWED TO PURGE
 1338 CONNECT TO FLOW CELL
 1342 COLLECT PARAMETERS - LISTED ON PURGE FORM
 1407 PARAMETERS STABILIZE: PURGE VOL - 14.1 L,
 DTW - 22.69 ft bToc, pH - 6.27, COND. - 0.134 ms/cm,
 TURB. - 15 NTUS, DO - 1.88 mg/L, TEMP. - 15.23°C,
 ORP - -58 mV
 1420 COLLECT SAMPLE, AOC1604204131MN03
 2-1 L AMBER w/HCl DRO: NWT PH-Dx
 1420 COLLECT DUP SAMPLE AOC1604204131MN03
 2-1 L AMBER w/HCl DRO: NWT PH-Dx
 ON SITE LFZ SHED DEMOB
 PLACE SAMPLES IN FRIG (2°C) FOR STORAGE
 1517 CALIBRATE HORIBA: TEMP - 25.01°C,
 pH - 4.01, ORP - 284 mV, COND. - 4.50 ms/cm,
 TURB. - 0.0 NTUS, DO - 9.76 mg/L, SAL. - 0.24%
 DISPOSED OF APPROX. 14 GALLONS OF PURGE
 WATER INTO DESIGNATED DRUM.
 1550 S. PATTERSON, N. LARGE OFFSITE

[Signature]

04/20/16

TO DIA JBLM FLAO 16 APR 21

0800 S. PATTERSON, W. KARGE ON SITE
CONDUCT TAILGATE SAFETY BRIEFING,
SSTD - V. S. PATTERSON

TOPICS INCLUDE:

- PROPER LIFTING
 - ERGONOMICS
 - COMMUNICATION
 - PRESERVATIVE AWARENESS
 - PROPER PPE - MODIFIED LEVEL D
 - SAFETY GLASSES, GLOVES, BOOTS - SAFETY TOE
- Wx! Mix of clouds & sun, Hi-74°F, Lo-51°F,
WIND 5-10 MPH

ON SITE LFZ SHED: MOB FOR SAMPLING

0823 CALIBRATE HORIBA: TEMP - 18.19°C, pH - 4.00,
ORP - 279mv, COND - 4.49 ms/cm, TURB - 0.0 NTUS
DO - 8.87 mg/L, SAL - 0.24%

ON SITE AOC 8-4

COLLECT DTW/DTB

WELL ID	TIME	DTW (FT BTM)	DTB (FT BTM)	NOTES
ADIII-MN04	0917	18.41	22.73	
ADIII-MN05	0909	17.94	27.20	NEEDS 2" CAP
ADIII-MN06	0904	16.18	25.55	
ADIII-MN07	0920	18.79	28.95	
ADIII-MN08	0914	18.61	22.92	

0925 SET UP TO SAMPLE ADIII-MN06 VIA

~~HAHA~~

09/21/16

TO DIA JBLM FLAO

16 APR 21

PERISTALTIC PUMP

0934 START PURGE SET FLOW RATE: 420ml/min

0936 CONNECT TO FLOW CELL

0939 COLLECT PARAMETERS - LISTED ON PURGE FORM
CLEAR/ODORLESS

1004 PARAMETERS STABILIZE: PURGE VOL. - 12.6 L,
DTW - 16.26 FT BTM, pH - 5.30, COND - 0.138 ms/cm,
TURB - 11.4 NTUS, DO - 5.02 mg/L, TEMP - 14.01°C,
ORP - 248mv

1010 COLLECT SAMPLE ADIII-MN06

2-1L AMBER W/HCI DRO: NUNTPH-DX

SET UP TO SAMPLE ADIII-MN05 VIA
PERISTALTIC PUMP

1038 START PURGE SET FLOW RATE: 440ml/min

1040 CONNECT TO FLOW CELL

1043 COLLECT PARAMETERS - LISTED ON PURGE FORM

1108 PARAMETERS STABILIZE: PURGE VOL. - 13.2 L, pH - 5.57,
DTW - 17.96 FT BTM, COND - 0.123 ms/cm, ORP - 245mv,
TURB - 12 NTUS, DO - 6.47 mg/L, TEMP - 14.77°C,
CLEAR, ODORLESS

1110 COLLECT SAMPLE ADIII-MN05

2-1L AMBER W/HCI DRO: NUNTPH-DX

SET UP TO SAMPLE ADIII-MN05 VIA PERISTALTIC

1127 DTW - 18.58 FT BTM

1128 START PURGE SET FLOW RATE: 360ml/min

~~HAHA~~

09/21/16

TO DIA JBLM FLAD 16 APR 21

1129 CONNECT TO FLOW CELL

1133 COLLECT PARAMETERS - LISTE ON PURGE FORM

1148 PARAMETERS STABILIZE: PURGE VOL - 7.2 L,
DTN - 18.58 μ btoc, PH - 5.91, COND. - 0.120 ms/cm,
TURB - 0.0 NTUS, DO - 2.09 mg/L, TEMP - 15.62 °C,
ORP - 212 mV, COLORLESS, ODORLESS

1155 COLLECT SAMPLE AOC160421A0111MN07

2-1 L AMBER W/HC1 DRO: NNTPH-DX

SET UP TO SAMPLE A0111-MN07 VIA
PERISTALTIC PUMP

1232 START PURGE SET FLOW RATE: 380 ml/min

1233 CONNECT TO FLOW CELL

1237 COLLECT PARAMETERS - LISTED ON PURGE FORM

1253 PARAMETERS STABILIZE: PURGE VOL - 7.6 L,
DTN - 18.41 mg/L, PH - 5.70, COND. - 0.122 ms/cm,
TURB. - 0.0 NTUS, DO - 7.24 mg/L, TEMP - 15.25 °C,
ORP - 232 mV,

1255 COLLECT SAMPLE AOC160421A0111MN07

2-1 L AMBER W/HC1 DRO: NNTPH-DX

ON SITE A0111-MN07 SET UP TO
SAMPLE VIA PERISTALTIC PUMP

1313 START PURGE SET FLOW RATE: 360 ml/min

1315 CONNECT TO FLOW CELL

1318 COLLECT PARAMETERS - LISTED ON PURGE FORM

1336 PARAMETERS STABILIZE: PURGE VOL - 9.0 L,
DTN - 18.41 mg/L, PH - 5.70, COND. - 0.122 ms/cm,
TURB. - 0.0 NTUS, DO - 7.24 mg/L, TEMP - 15.25 °C,
ORP - 232 mV,

~~VJH~~

04/21/21

TO DIA JBLM FLAD 16 APR 21

DTN - 18.81 μ btoc, PH - 5.94, COND. - 0.199 ms/cm,

TURB - 37 NTUS, DO - 4.21 mg/L, TEMP - 15.12 °C,

ORP - 219 mV, COLORLESS, ODORLESS

1340 COLLECT SAMPLE AOC160421A0111MN07

2-1 L AMBER W/HC1 DRO: NNTPH-DX

CHECK ACCESS TO LF4 WELLS DUE TO
ROAD CONSTRUCTION

ON SITE LF2 SHED: DEMLAB

1513 CALIBRATE HORIBA: TEMP - 21.70 °C, PH - 399,

ORP - 287 mV, DO - 9.00 mg/L, COND - 4.49 ms/cm,

TURB. - 0.0 NTUS, SAL - 0.24%

PACU SAMPLE FOR SHIPMENT/OVERNIGHT STORAGE

DISPOSED OF APPROX 14 GALS OF PURGE
WATER INTO DESIGNATED DRUM.

1600 S. PATTERSON, W. RANGE OFF SITE

~~VJH~~ 04/21/21

TO DIA JBLM FLAD 16 APR 22

0700 S. PATTERSON ON SITE FRED MEYER
PORT OLYMPIA, WA

PURCHASE ICE FOR SAMPLE SHIPMENT
PACK COOLERS FOR SAMPLE SHIPMENT
QC COCS

DROPPED ONE BOTTLE FROM

SAMPLE ACU10418AC0408B05

NOTIFIED LAB/DITTED COC

CONTINUE PACKING SAMPLES FOR
SHIPMENT

0805 SHIP 5 COOLERS TO ALS, KELSO
VIA MC DELIVERY

0820 S. PATTERSON OFF SITE

~~VWA~~ 04/22/16

TO DIA JBLM ^{04/25/16} FLAD AIA 16 APR 25

0700 S. PATTERSON, R. BOYD, T. MALAMALAL
ON SITE

CONDUCT TAILGATE SAFETY BRIEFING,
SHD - S. PATTERSON

TOPICS INCLUDE:

- SLIPS, TRIPS, FALLS
- CUTS, SCRAPES, BURNS, PUNCTURES,
- BIOLOGICAL HAZARDS
- HYDRATION
- PROPER PPE - MODIFIED LEVEL D
- SAFETY GLASSES, BOOTS, & GLOVES

WX: CLOUDY, CHANCE OF RAIN, HI-60°F, LO-37°F,

WIND: LIGHT

ON SITE LF2 SHED: MOB FOR SAMPLING

0734 CALIBRATE HORIBA: TEMP - 12.83°C, PH - 3.98

ORP - 291mV, COND. - 4.51 ns/cm, TURB. - 0.4 NTU

DO - 9.29 mg/L, SAL - 0.24%

0800 ON SITE SEALABLE TRAILER

W. KARGE ON SITE

REVIEW H&S/DISCUSS PLAN FOR DAY

0845 ON SITE FISH HATCHERY PREPARE SAMPLE
FOR FISH HATCHERY & AIA-SPO1

0855 S.P. R.B. COLLECT SAMPLE AIA160425FH05

6-L AMBER w/p NITROARENATICS/NITROAMINES

~~VWA~~ 04/25/16

EPA SW 846-8330

TO OIB JBLM LGC SAMPLING 17 AUG 16

DEMOS

1620 S. PATTERSON, M. TILLOTSON OFF SITE



08/17/16

TO OIB JBLM LGC SAMPLING 18 AUG 16

0700 S. PATTERSON, M. TILLOTSON ON SITE

CONDUCT TAILGATE SAFETY BRIEFING

SSHO - S. PATTERSON

TOPICS INCLUDE:

- SLIPS, TRIPS, FALLS
- CUTS, SCRAPES, BURNS, PUNCTURES
- PINCH AND GRAB POINTS
- BIOLOGICAL HAZARDS
- PROPER PPE - MODIFIED LEVEL D

- SAFETY GLASSES, GLOVES, BOOTS, VEST

WX: H: 89°F, L: 56°F, SUNSHINE, WIND 10-15 MPH

MOB FOR DTN COLLECTION

WELL ID	DTN (FT BTOC)
LC-64A	11.35
LC-108	14.90
LC-57	17.67
MT-6	12.71
MT-5	12.98
LC-24	19.04
LC-26	5.92
LC-26D	8.95
LC-177	13.91
LC-182	5.24
LC-180	6.45
LC-79D	85.32

08/18/16

Rite in the Rain

TO OIB JBLM LGC/FLAO/LFS 18AUG16

WELL ID DTN (FTBTOC)

LC-39 20.91

LC-61B 26.47

COLLECT DTNs - FLAO

WELL ID DTN (FTBTOC) TIME

95-A17-1 28.01 1120

95-A17-2 27.15 1114

95-A17-3A 27.80 1126

95-A17-4 27.89 1109

96-A17-5 28.04 1104

96-A17-6 26.11 1102

07-A17-7 25.00 1106

10-A17-8 26.83 1112

A0111-MW04 21.51 1142

A0111-MW05 21.00 1139

A0111-MW06 19.19 1148

A0111-MW07 22.11 1144

A0111-MW08 21.65 1141

COLLECT DTNs - LFS

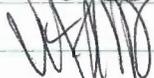
WELL ID DTN (FTBTOC) TIME

13-1-VD 21.61 1201

AEP-2 17.43 1214

AEP-1 18.41 1249

COLLECT DTNs - FLAO

 08/18/16

TO OIB JBLM FLAO/LFS 18AUG16

WELL ID DTN (FTBTOC) TIME

4131-MW01 25.47 1320

4131-MW02 24.36 1318

4131-MW03 26.23 1323

4131-MW04 23.97 1313

4131-MW05 23.44 1316

4131-MW06 25.35 1328

AOC 10-8-B05 38.11 1405

JP-MW01 36.48 1400

JP-MW02 37.78 1344

JP-MW03 36.37 1355

COLLECT DTN - LFS

WELL ID DTN (FTBTOC) TIME

88LS-AM-VD 19.72 1524

93-1-VD 16.49 1507

93-2-VD 16.75 1510

93-3-VD 21.10 1513

CS-3 23.66 1516

D-2 19.46 1505

D3 14.78 1531

DEMOS

1620 S. PATTERSON, M. TIMOTSON OFF SITE

 08/18/16

TO OIB JBLM LFS 28 AUG 16

1105 COLLECT PARAMETERS - LISTED ON PURGE FORM

1125 PARAMETERS STABILIZE: PURGE VOL. - 10L,
DTW - 16.71 FT BTOC, PH - 5.91, COND. - ~~5.11~~ 8.15 / 1.6
COND. - 0.111 ms/cm, TURB. - 0.0 NTUS, DO - 3.49 mg/L,
TEMP. - 17.26°C, ORP - 217 mV

1130 COLLECT SAMPLE LFS160825922VD-1

3 - 40 mL voa w/HCl VOLs 8260C

3 - 40 mL voa w/HCl VINYL CHLORIDE 8260C SIM

1 - 250 mL POLY w/HNO₃ TOTAL METALS 6010B

1 - 500 mL POLY w/H₂SO₄ NH₃ 4500G / TOC 9000

1 - 1L POLY NO₃ 300.0 / TSS 2540D / TDS 2540C

1 - 250 mL POLY w/HNO₃ (FF) DISS. METALS 6010B

1 - 1L POLY (FF) SO₄ & Cl 3000 / HCO₃ & PAUL 2320B

ON SITE LFZ SHED

DEMOMB / CLEAN UP SHED

PLACE SAMPLES IN OVERNIGHT STORAGE

FRIG TEMP. 3°C

1345 CALIBRATE HORIBA US2: TEMP. - 23.54°C,

PH - 4.01, ORP - 289 mV, COND. - 4.47 ms/cm,

TURB. - 0.0 NTUS, DO - 10.55 mg/L, SAL. - 0.24‰

1330 COLLECT IDW SAMPLE LFS160825151DW-1

1 - 250 mL POLY w/HCl TOTAL METALS 6010B

1 - 250 mL POLY w/HCl (FF) DISS. METALS 6010B

PURGE WATER QUANTITY 37 GALLONS

1430 S. PATTERSON & M. TILLOTSON OFF SITE

~~VIA~~

08/25/16

TO OIB JBLM FLAC 29 AUG 16

0700 S. PATTERSON & M. GRADSON ON SITE

CONDUCT TAILGATE SAFETY BRIEFING

SSH0 - S. PATTERSON

TOPICS INCLUDE:

- PROPER LIFTING

- PINCH & GRAB POINTS

- PRESERVATIVE HAZARDS

- VEHICLE OPERATIONS

- PROPER PPE - MODIFIED LEVEL D

- SAFETY GLASSES, VEST, BOOTS & GLOVES

WX: PARTLY CLOUDY HI - 79°F, LO - 53°F, WIND 5-10 MPH

MOB TRUCK FOR SAMPLING

DISCUSS PLAN FOR THE DAY

0755 CALIBRATE HORIBA US2: TEMP. - 17.08°C,

PH - 3.96, ORP - 314 mV, COND. - 4.49 ms/cm,

TURB. - 0.0 NTUS, DO - 9.31 mg/L, SAL. - 0.24‰

ON SITE AOC 9-2 MEET T. MALAMALAL

TO GET PID

TROUBLE SHOOT EQUIPMENT

ON SITE 07A17-7 SET UP TO SAMPLE VIA

BLADDER PUMP

0910 DTW - 26.40 FT BTOC

0915 STARTED PUMP SET FLOW RATE: 420 mL/min

0922 CONNECT TO FLOW CELL

0924 COLLECT PARAMETERS - LISTED ON PURGE FORM

~~VIA~~

08/29/16 *Rite in the Rain*

TO 01B JBLM FLAO 29 AUG 16

0948 PARAMETERS STABILIZE: PURGE VOL. - 13.5L,
DTW - 26.45 FT BTDC, PH - 5.75, COND. - 0.123 ms/cm,
TURB. - 2.3 NTUS, DO - 0.67 mg/L, TEMP. - 13.80°C,
ORP - 166mV, CLEAR, NO ODOR

0950 COLLECT SAMPLE AOC16082907A17-1 MS/MSD
9-40ml voc w/HCl GRO NWT PH-GX
9-40ml voc w/HCl VOCs 8260C

0930 PREPARE TRIP BLANK AOC1608291B-1
2-40ml voc w/HCl GRO NWT PH-GX
2-40ml voc w/HCl VOCs 8260C

ON SITE 95-A17-3A SET UP TO SAMPLE
VIA BLADDER PUMP (BOLTS STRIPPED)

1019 DTW - 28.05 FT BTDC
1028 STARTED PUMP SET FLOW RATE: 200 ml/min
1031 CONNECT TO FLOW CELL
1035 COLLECT PARAMETERS - LISTED ON PURGE FORM
1059 PARAMETERS STABILIZE: PURGE VOL. - 6.8L,

DTW - 28.10 FT BTDC, PH - 6.55, COND. - 0.230 ms/cm,
TURB. - 0.0 NTUS, DO - 0.99 mg/L, TEMP. - 14.70°C,
ORP - 63mV, CLEAR, HYDROCARBON ODOR

1105 COLLECT ~~PARAMETERS~~ ^{PERISTALTIC} SAMPLE AOC16082995A173A-1
3-40ml voc w/HCl GRO NWT PH-GX
3-40ml voc w/HCl VOCs 8260C

ON SITE 95-A17-2 SET UP TO SAMPLE
VIA PERISTALTIC PUMP *[Signature]* 08/29/16

TO 01B JBLM FLAO 29 AUG 16

1140 DTW - 27.49 FT BTDC
1142 STARTED PUMP SET FLOW RATE: 300 ml/min
1146 CONNECT TO FLOW CELL

1150 AIR IN LINE REPLACE TUBING
1205 STARTED PUMP SET FLOW RATE: 280 ml/min

1210 COLLECT PARAMETERS - LISTED ON PURGE FORM
USED WATER LEVEL METER AS WEIGHT FOR
TUBING

1216 PARAMETERS STABILIZE: PURGE VOL. - 5.5L, PH - 6.82,
COND. - 0.166 ms/cm, TURB. - 0.0, DO - 7.03 mg/L,
TEMP. - 17.34°C, ORP - 168mV, CLEAR

1220 COLLECT SAMPLE AOC16082995A172-1
3-40ml voc w/HCl GRO NWT PH-GX
3-40ml voc w/HCl VOCs 8260C
ON SITE 10-A17-8 SET UP TO SAMPLE VIA
PERISTALTIC PUMP
DTW - 27.38 FT BTDC

1308 STARTED PUMP SET FLOW RATE: 200 ml/min
1309 CONNECT TO FLOW CELL

1318 COLLECT PARAMETERS - LISTED ON PURGE FORM
1324 PARAMETERS STABILIZED: PURGE VOL. - 3.2L
DTW - 27.59 FT BTDC, PH - 7.56, COND. - 0.194 ms/cm,
TURB. - 4.7 NTUS, DO - 6.07 mg/L, TEMP. - 19.92°C,
ORP - 146mV, SLIGHTLY TURBID WATER

1330 COLLECT SAMPLE AOC16082910A175-1
[Signature] 08/29/16 *Rite in the Rain*

TO OIB JBLM FLAO 29 AUG 16

3-40 mL vial w/ HCl GRO NNTPH-GX

3-40 mL vial w/ HCl VCS 82600

^{08/29/16} COLLECT SAMPLE AD016082910A188-1

3-40 mL vial w/ HCl GRO NNTPH-GX

3-40 mL vial w/ HCl VCS 82600

ON SITE ADC 10-8 JP-MNDZ SET UP TO

SAMPLE VIA SUBMERSIBLE PUMP VIA SUBMERSIBLE
PUMP DTN-38.30FTBTOC

1510 START PUMP SET FLOW RATE 250 mL/min

1513 CONNECT TO FLOW CELL

1520 COLLECT PARAMETERS - LISTED ON PURGE FORM

1526 PARAMETERS STABILIZE: PURGE VOL. - 4L,

DTN - 38.30FTBTOC, PH - 6.99, COND. - 0.121 ms/cm,

TURB. - 0.0 NTU, DO - 5.62 mg/L, TEMP. - 19.01°C,

ORP - 142 mV, CLEAR

1530 COLLECT SAMPLE AD016082910A188-1

2-1 L AMBER w/ HCl TPH-0 NNTPH-DX

ON SITE LF2 SHED; DEMOB

PLACE SAMPLES INTO OVERNIGHT STORAGE

FRIG TEMP 3°C

1625 CALIBRATE HORIBA U52: TEMP. - 22.35°C,

PH - 4.00, ORP - 281 mV, COND. - 4.26 ms/cm,

TURB. - 0.0 NTU, DO - 11.59 mg/L, SAL - 0.24%

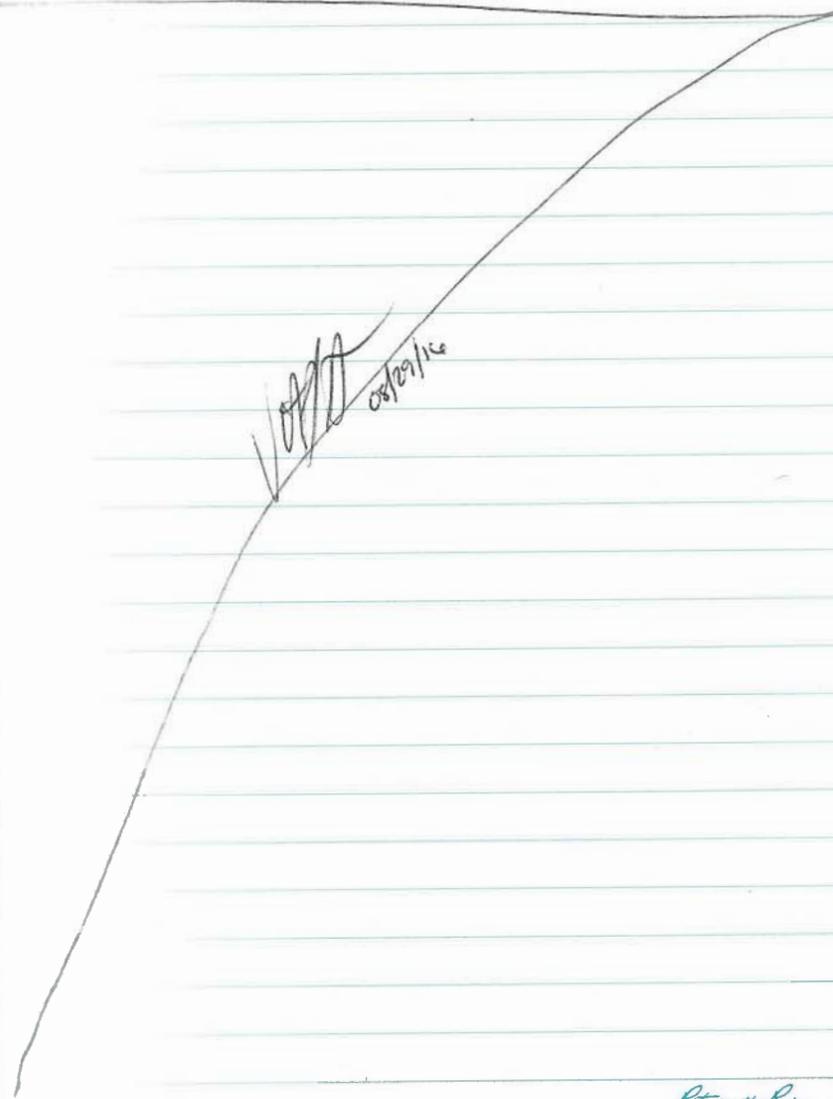
TRANSFER PURGE WATER TO 55 GALLON

~~WASH~~ DRUM (APPROX 10 GALLONS) LABELED
08/29/16

TO OIB JBLM FLAO 29 AUG 16

DRUM WITH DUCT TAPE.

1100 S. PATTERSON & M. GRADSON OFF SITE



TO OIB: JBLM FLAD 30AUG16

0700 ON SITE: S. PATTERSON, M. GRADSON

CONDUCT TAILGATE SAFETY BRIEFING
SSH10-S. PATTERSON

TOPICS INCLUDE:

- SLIPS, TRIPS, FALLS
- BIOLOGICAL HAZARDS
- PRESERVATIVE SAFETY
- THERMAL STRESS
- PROPER PPE - MODIFIED LEVEL D

- SAFETY GLASSES, VEST, BOOTS & GLOVES

Wx: CLOUDY AM SUNSHINE SS-74°F N, WIND 5-10 MPH

MOP TRUCK FOR SAMPLING

0735 CALIBRATE HORIBA US2: TEMP. - 19.73°C,

PH - 4.00, ORP - 263mv, COND. - 4.63ms/cm,

TURB. - 0.1 NTUS, DO - 9.30 mg/L, SAL - 0.24‰

ON SITE AD11-MN08 SET UP TO SAMPLE

VIA PERISTALTIC PUMP

DTW - 21.58 FT BTCL

0901 STARTED PUMP SET FLOW RATE 200mL/min

0903 CONNECT TO FLOW CELL

0911 COLLECT PARAMETERS - LISTED ON PURGE FORM

0920 PARAMETERS STABILIZE: PURGE VOL - 3.8L,

DTW - 21.90 FT BTCL, PH - 5.69, COND. - 0.133ms/cm,

TURB. - 0.0 NTUS, DO - 7.50 mg/L, TEMP. - 15.15°C,

ORP - 223mv, CLEAR, BUBBLES IN LINE

UHP

08/30/16

TO OIB: JBLM FLAD 30AUG16

0925 COLLECT SAMPLE A0C160830A0111MN08-1

2-1 L AMBER W/HU TPH-D NNTPH-Dx

ON SITE AD11-MN04 SET UP TO SAMPLE

VIA PERISTALTIC PUMP

DTW - 21.80 FT BTCL

0953 STARTED PUMP SET FLOW RATE: 250mL/min

0955 CONNECT TO FLOW CELL

1003 COLLECT PARAMETERS - LISTED ON PURGE FORM

1030 PARAMETERS STABILIZE: PURGE VOL - 9.25L,

DTW - 21.90 FT BTCL, PH - 5.84, COND. - 0.148ms/cm,

TURB. - 0.0 NTUS, DO - 0.78 mg/L, TEMP. - 15.29°C,

ORP - 113mv

1035 COLLECT SAMPLE A0C160830A0111MN04-1

2-1 L AMBER W/HU TPH-D NNTPH-Dx

ON SITE AD11-MN07 SET UP TO SAMPLE

VIA PERISTALTIC PUMP

1055 DTW - 22.37 FT BTCL

1100 STARTED PUMP SET FLOW RATE: 260mL/min

1102 CONNECT TO FLOW CELL

1106 COLLECT PARAMETERS - LISTED ON PURGE FORM

1118 PARAMETERS STABILIZE: PURGE VOL - 4.68L,

DTW - 22.37 FT BTCL, PH - 6.10, COND. - 0.184ms/cm,

TURB. - 0.0 NTUS, DO - 1.41 mg/L, TEMP. - 14.73°C,

ORP - 199mv, CLEAR

1120 COLLECT SAMPLE A0C160830A0111MN07-1

UHP

08/30/16 *Rite in the Rain*

42

TO OIB JBLM FLAD 30 AUG 16

2-1 L AMBER w/HCl TPH-D NWT PH-Dx

ON SITE AOC11-MWOL SET UP TO SAMPLE
VIA PERISTALTIC PUMP

1217 DTW - 19.43 FT BTCL

1218 STARTED PUMP SET FLOW RATE: 260 ml/min

1220 CONNECT TO FLOW CELL ^{0.23% DO} ~~SHED~~

1230 COLLECT PARAMETERS - LISTED ON PURGE FORM

1236 PARAMETERS STABILIZE: PURGE VOL. - 4.94 L,
DTW - 19.48 FT BTCL, PH - 6.16, COND. - 0.189 ms/cm,
TURB. - 0.0 NTU, DO - 3.27 mg/L, TEMP. - 14.42°C,
ORP - 212 mv, CLEAR1240 COLLECT SAMPLE AOC110830AOC110830-1

2-1 L AMBER w/HCl TPH-D NWT PH-Dx

ON SITE AOC 10-8 AOC 10-8-BOS SET
UP TO SAMPLE VIA BAILER

DTW - 39.22 FT BTCL DTB - 46.24 FT BTCL

WCL - 7.02 FT L/F - 0.6

WV - 4.212 3x WV - 12.636

BAILED WELL PURGE VOL. - 12.7 L

1410 COLLECT SAMPLE AOC160830AOC10830-1

2-1 L AMBER w/HCl TPH-D NWT PH-Dx

ON SITE LF2 SHED: DEMOB

PLACE SAMPLES IN OVERNIGHT STORAGE (4°C)

1450 CALIBRATE HORIBA U52: TEMP. - 20.53°C

~~PH - 4.04, ORP - 275 mv, COND. - 4.40 ms/cm, TURB. - 0.0 NTU,~~
08/30/16

43

TO OIB JBLM FLAD 30 AUG 16

DO - 10.24 mg/L, SAL - 0.23%

TRANSFER APPROX 10 GALLONS OF PURGE WATER
TO LABELED 55 GAL DRUM

1530 S. PATTERSON & M. GRADON OFF SITE



Rite in the Rain

A-54

TO OIB JBLM FLAD 31ANG116

0700 S. PATTERSON & M. GRADSON ON SITE

CONDUCT TAILGATE SAFETY BRIEFING

SSHO - S. PATTERSON

TOPICS INCLUDE:

- PINCH & GRAB POINTS

- BIOLOGICAL HAZARDS

- BUDDY SYSTEM

- EMERGENCY COMMUNICATION

- PROPER PPE - MODIFIED LEVEL D

- SAFETY GLASS, BOOTS, VEST & GLOVES

Wx: CLOUDY N/OCC. RAIN 54-68°F, WIND S-NW@H

MOB TRAIL FOR SAMPLING

0740 CALIBRATE HORIBA US2: TEMP - 17.90°C,

pH - 4.00, ORP - 264 mv, COND - 4.50 ms/cm,

TURB - 0.2 NTU, DO - 9.51 mg/L, SAL - 0.24‰

ON SITE 4131-MW04 SET UP TO SAMPLE

VIA BLADDER PUMP

DTN - 24.33 FT BTDC (~~TOP OF~~ ~~WATER~~)

0825 START PUMP SET FLOW RATE: 350 mL/min

0827 CONNECT TO FLOW CELL

0835 COLLECT PARAMETERS - LISTED ON PURGE FORM

0841 PARAMETERS STABILIZE: PURGE VOL - 5.6 L,

DTN - 24.33 FT BTDC, pH - 6.07, COND - 0.255 ms/cm,

TURB - 0.0 NTU, DO - 5.09 mg/L, TEMP - 13.73°C,

ORP - 225 mv, CLEAR

08/31/16

TO OIB JBLM FLAD 31ANG116

0845 COLLECT SAMPLE ACC11608314131MW04-1

6-1 L AMBER w/HCl TPH-D NNTPH-D_p MS/MSD

ON SITE 4131-MW05 SET UP TO SAMPLE

VIA BLADDER PUMP

0920 DTN - 23.80 FT BTDC

STARTED PUMP SET FLOW RATE: 400 mL/min

0924 CONNECT TO FLOW CELL

0930 COLLECT PARAMETERS - LISTED ON PURGE FORM

0936 PARAMETERS STABILIZE: PURGE VOL - 6.4 L,

DTN - 23.80 FT BTDC, pH - 6.33, COND - 0.293 ms/cm,

TURB - 0.0 NTU, DO - 5.27 mg/L, TEMP - 13.72°C,

ORP - 227 mv

0940 COLLECT SAMPLE ACC11608314131MW05-1

2-1 L AMBER w/HCl TPH-D NNTPH-D_p

ON SITE 4131-MW02 SET UP TO SAMPLE

VIA BLADDER PUMP

1005 DTN - 24.68 FT BTDC

1007 STARTED PUMP SET FLOW RATE: 380 mL/min

1009 CONNECT TO FLOW CELL

1017 COLLECT PARAMETERS - LISTED ON PURGE FORM

1029 PARAMETERS STABILIZE: PURGE VOL - 8.36 L,

DTN - 25.29 FT BTDC, pH - 6.45, COND - 0.393 ms/cm,

TURB - 12.9 NTU, DO - 0.83 mg/L, TEMP - 13.17°C,

ORP - 22 mv, CLEAR

1035 COLLECT SAMPLE ACC11608314131MW02-1

08/31/16 *Rite in the Rain*

TO OIB JBLM FLAO 31AUG16

2-1L AMBER w/HCl TPH-D NUTPH-Dx

ON SITE 4131-MW03 SET UP TO
SAMPLE VIA BLADDER PUMP

1118 DTW-26.53 FT BTCC

1123 STARTED PUMP SET FLOW RATE: 340 ml/min

1124 CONNECT TO FLOW CELL

1127 ~~1127~~ COLLECT PARAMETERS - LISTED ON ~~FORM~~ ~~FORM~~

1200 PARAMETERS STABILIZE: PURGE VOL-12.5% L,
DTW-27.70 FT BTCC, PH-6.13, COND.-0.288 ms/cm,
TURB.-12.0, DO-0.47 mg/L, TEMP.-13.40°C,
ORP--44 mV, BROWN/ORANGE CLOUDY

1205 COLLECT SAMPLE AOC1608314131MW03-1
2-1L AMBER w/HCl TPH-D NUTPH-Dx

1215 COLLECT SAMPLE AOC1608314131MW13-1
2-1L AMBER w/HCl TPH-D NUTPH-Dx
ON SITE LF2 SHED: DEMOB

TRANSFER APPROX 10 GALLONS OF
PURGE WATER TO LABELED 55 GALLON
DRUM

CALL SI ELKIND TO CONFIRM IDW
SAMPLE

SET UP TO SAMPLE FLAO IDW VIA
PERISTALTIC PUMP

1330 COLLECT SAMPLE AOC160831IDW-1

~~1330~~ 2-40 ML voa w/HCl GRD NUTPH-Dx
08/30/16

TO OIB JBLM FLAO 31AUG16

2-1L AMBER w/HCl TPH-D NUTPH-Dx

1415 CALIBRATE HORIBA US2: TEMP.-19.430°C,
PH-4.00, ORP-274 mV, COND.-4.49 ms/cm,
TURB.-0.0 NTUs, DO-10.06 mg/L, SAL.-0.24‰

PACK SAMPLES FOR SHIPMENT

1530 S. PATTERSON, M. GRADON OFF SITE

~~1330~~
08/30/16

TO OIB JBLM FLAD/LFS OISEPT16
 0700 S PATTERSON ON SITE PORT ORCHARD
 FRED MEYER
 PURCHASE ICE
 PACK SAMPLES FOR SHIPMENT
 SHIP 4 COOLERS OF SAMPLES
 VIA MC DELIVERY TO ALS KELSO
 0815 S PATTERSON OFF SITE

~~0815 S PATTERSON~~
 0815 S PATTERSON

A-57

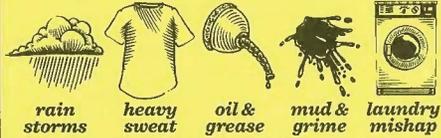
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GENUINE BRAND
TACOMA, WA

Rite in the Rain®
ALL-WEATHER WRITING PAPER

Yes, Rite in the Rain
is a wood-based & recyclable
paper, but unlike plain paper...
it won't turn to mush
when exposed to:



- USE WET OR DRY**
most pens stop writing when wet
- ALL PENCILS
 - RITE IN THE RAIN PENS
 - WAX MARKERS
 - CRAYONS
 - OIL PASTELS / PAINT

- WHEN DRY ONLY**
what you write won't wash off
- PERMANENT MARKERS
 - STANDARD BALLPOINTS

- WON'T WORK**
water based inks bead off sheet
- GEL PENS
 - MOST HIGHLIGHTERS
 - FOUNTAIN PENS
 - WATER COLORS
 - ACRYLIC PAINT

ALL-WEATHER TOUGH!



The Rite in the Rain story began nearly a century ago in the forests of the Great Northwest. Entrepreneur, Jerry Darling, recognized the logging industry's need for a durable material that could be written on and survive in poor weather conditions. Jerry developed a special coating that created a unique moisture shield on the hand-dipped sheets of paper that he and his wife, Mary, processed at their home. From humble beginnings our first all-weather paper was born! Over the many years we've perfected and patented our environmentally responsible coating process. Still located in Tacoma, our continued mission is to provide innovative products for professionals and enthusiasts who brave the outdoors.



RiteintheRain.com ©JL DARLING LLC 2614 PACIFIC HWY EAST, TACOMA, WA 98424 USA
 MADE USA RITE GREEN Archival paper

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APPENDIX B
LABORATORY ANALYTICAL REPORTS
AND
DATA QUALITY REVIEW
(PROVIDED ON DISC)



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ALS Group USA, Corp
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www.alsglobal.com

May 11, 2016

Analytical Report for Service Request No: K1604131

Scott Elkind
Sealaska Environmental Services, LLC
18743 Front Street NE
P.O. Box 869
Poulsbo, WA 98370

RE: JBLM FLAO AOC 8-4 / TO 01A

Dear Scott,

Enclosed are the results of the sample(s) submitted to our laboratory April 22, 2016
For your reference, these analyses have been assigned our service request number **K1604131**.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3376. You may also contact me via email at gregory.salata@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Gregory Salata, Ph.D.
Senior Project
Manager



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Chain of Custody

Diesel and Residual Range Organics

Raw Data

 Diesel and Residual Range Organics

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

- * The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- E The result is an estimate amount because the value exceeded the instrument calibration range.
- J The result is an estimated value.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.2 definition : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.
- H The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

- # The control limit criteria is not applicable. See case narrative.
- J The result is an estimated value.
- E The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
- M The duplicate injection precision was not met.
- N The Matrix Spike sample recovery is not within control limits. See case narrative.
- S The reported value was determined by the Method of Standard Additions (MSA).
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.2 definition : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- W The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
 - i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- + The correlation coefficient for the MSA is less than 0.995.
- Q See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

- * The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- A A tentatively identified compound, a suspected aldol-condensation product.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- C The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
- D The reported result is from a dilution.
- E The result is an estimated value.
- J The result is an estimated value.
- N The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
- P The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.2 definition : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

- F The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
- L The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
- H The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
- O The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
- Y The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
- Z The chromatographic fingerprint does not resemble a petroleum product.

**ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses**

Agency	Web Site	Number
Alaska DEC UST	http://dec.alaska.gov/applications/eh/ehllabreports/USTLabs.aspx	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L14-51
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	Not available	-
ISO 17025	http://www.pjllabs.com/	L16-57
Louisiana DEQ	http://www.deq.louisiana.gov/portal/DIVISIONS/PublicParticipationandPermitSupport/LouisianaLaboratoryAccreditationProgram.aspx	03016
Maine DHS	Not available	WA01276
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Montana DPHHS	http://www.dphhs.mt.gov/publichealth/	CERT0047
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/oqa/	WA005
North Carolina DWQ	http://www.dwqlab.org/	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/envserv/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wisconsin DNR	http://dnr.wi.gov/	998386840
Wyoming (EPA Region 8)	http://www.epa.gov/region8/water/dwhome/wyomingdi.html	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.

Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/analyte is offered by that state.



Case Narrative

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

ALS ENVIRONMENTAL

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 8-4/ TO 01A
Sample Matrix: Water

Service Request No.: K1604131
Date Received: 04/22/16

Case Narrative

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier IV validation deliverables including summary forms and all of the associated raw data for each of the analyses. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt

Ten water samples were received for analysis at ALS Environmental on 04/22/16. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

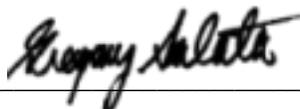
Diesel Range Organics by Method NWTPH-Dx

Relative Percent Difference Exceptions:

The Relative Percent Difference (RPD) criterion for the replicate analysis of Diesel and Residual Range Organics in sample AOC1604204131MW04 was not applicable because the analyte concentration was not significantly greater than the Method Reporting Limit (MRL). Analytical values derived from measurements close to the detection limit are not subject to the same accuracy and precision criteria as results derived from measurements higher on the calibration range for the method.

No other anomalies associated with the analysis of these samples were observed.

Approved by _____





Chain of Custody

ALS Environmental—Kelso Laboratory
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Phone (360)577-7222 Fax (360)636-1068
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ALS Environmental

1317 13th Ave S, Kelso, WA 98626
 PH: (360) 577-7222

Chain-of-Custody

101604131

WORKORDER #	
PAGE	1 of 1

SAMPLER	V. Sunrise Patterson
PROJECT NAME	JBLM FLAO AOC 8-4
SITE ID	
PROJECT No.	TO 01A
EDD FORMAT	
PURCHASE ORDER	PO-01281 AU
COMPANY NAME	Sealaska Environmental Services, LLC
BILL TO COMPANY	Sealaska Environmental Services, LLC
SEND REPORT TO	Aaron Vernik
INVOICE ATTN TO	
ADDRESS	18743 Front Street NE, STE 201
ADDRESS	
CITY / STATE / ZIP	Poulsbo, WA
CITY / STATE / ZIP	
PHONE	(425) 326-0280
PHONE	
FAX	
FAX	
E-MAIL	aaron.vernik@sealaska.com
E-MAIL	

DATE	4/21/2016
TURNAROUND	21 Day
DISPOSAL	By Lab

Lab ID	Field ID	Matrix	Sample Date	Sample Time	# Bottles	Pres.	MS/MSD	DRO
	AOC160421AO111MW04	W	4/21/2016	12:55	2	1	NO	2
	AOC160421AO111MW05	W	4/21/2016	11:10	2	1	NO	2
	AOC160421AO111MW06	W	4/21/2016	10:10	2	1	NO	2
	AOC160421AO111MW07	W	4/21/2016	13:40	2	1	NO	2
	AOC160421AO111MW08	W	4/21/2016	11:55	2	1	NO	2

*Time Zone (Circle): PST Matrix: O = oil S = soil NS = non-soil solid W = water L = liquid E = extract F = filter

For metals or anions, please detail analytes below.

Comments:	QC PACKAGE (check below)
AS PER CONTRACT	<input type="checkbox"/> LEVEL II (Standard QC)
	<input type="checkbox"/> LEVEL III (Std QC + forms)
	<input type="checkbox"/> LEVEL IV (Std QC + forms + raw data)
Preservative Key:	1-HCl 2-HNO3 3-H2SO4 4-NaOH 5-NaHSO4 7-Other 8-4 degrees C 9-5035

	SIGNATURE	PRINTED NAME	DATE	TIME
RELINQUISHED BY	<i>[Signature]</i>	V. Sunrise Patterson	4/22/2016	800
RECEIVED BY		MC Delivery		
RELINQUISHED BY		MC Delivery		
RECEIVED BY				
RELINQUISHED BY				
RECEIVED BY	<i>a. juell</i>	Juell / AIS	4/22/16	1130



PC GS

Cooler Receipt and Preservation Form

Client Sealaska Service Request K16 04/31
 Received: 4/22/16 Opened: 4/22/16 By: A.J Unloaded: 4/22/16 By: A.J

1. Samples were received via? Mail Fed Ex UPS DHL PDX Courier Hand Delivered
2. Samples were received in: (circle) Cooler Box Envelope Other NA
3. Were custody seals on coolers? NA Y N If yes, how many and where? 1F, 1B
 If present, were custody seals intact? Y N If present, were they signed and dated? Y N

Raw Cooler Temp	Corrected Cooler Temp	Raw Temp Blank	Corrected Temp Blank	Corr. Factor	Thermometer ID	Copier/COC ID	Tracking Number	NA	Filed
-0.7	-0.8	1.9	1.8	-0.1	362				
-0.1	-0.2	1.4	1.3	-0.1	327				
-0.5	-0.6	1.2	1.1	-0.1	365				
0.3	0.3	2.6	2.6	0.0	308				

4. Packing material: Inserts Baggies Bubble Wrap Gel Packs Wet Ice Dry Ice Sleeves
5. Were custody papers properly filled out (ink, signed, etc.)? NA Y N
6. Did all bottles arrive in good condition (unbroken)? *Indicate in the table below.* NA Y N
7. Were all sample labels complete (i.e analysis, preservation, etc.)? NA Y N
8. Did all sample labels and tags agree with custody papers? *Indicate major discrepancies in the table on page 2.* NA Y N
9. Were appropriate bottles/containers and volumes received for the tests indicated? NA Y N
10. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* NA Y N
11. Were VOA vials received without headspace? *Indicate in the table below.* NA Y N
12. Was C12/Res negative? NA Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count	Out of	Head-	Broke	pH	Reagent	Volume	Reagent Lot	Initials	Time
	Bottle Type	Temp	space				added	Number		

Notes, Discrepancies, & Resolutions:



Diesel and Residual Range Organics

ALS Environmental—Kelso Laboratory
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Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 8-4/TO 01A

Service Request: K1604131

**Cover Page - Organic Analysis Data Package
 Diesel and Residual Range Organics**

Sample Name	Lab Code	Date Collected	Date Received
AOC1604204131MW02	K1604131-001	04/20/2016	04/22/2016
AOC1604204131MW03	K1604131-002	04/20/2016	04/22/2016
AOC1604204131MW04	K1604131-003	04/20/2016	04/22/2016
AOC1604204131MW05	K1604131-004	04/20/2016	04/22/2016
AOC1604204131MW13	K1604131-005	04/20/2016	04/22/2016
AOC160421AO111MW04	K1604131-006	04/21/2016	04/22/2016
AOC160421AO111MW05	K1604131-007	04/21/2016	04/22/2016
AOC160421AO111MW06	K1604131-008	04/21/2016	04/22/2016
AOC160421AO111MW07	K1604131-009	04/21/2016	04/22/2016
AOC160421AO111MW08	K1604131-010	04/21/2016	04/22/2016
AOC1604204131MW04	KWG1603391-1	04/20/2016	04/22/2016
AOC1604204131MW04MS	KWG1603391-2	04/20/2016	04/22/2016
AOC1604204131MW04DMS	KWG1603391-3	04/20/2016	04/22/2016

Analytical Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 8-4/TO 01A
Sample Matrix: Water

Service Request: K1604131
Date Collected: 04/20/2016
Date Received: 04/22/2016

Diesel and Residual Range Organics

Sample Name: AOC1604204131MW02
Lab Code: K1604131-001
Extraction Method: METHOD
Analysis Method: NWTTPH-Dx

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	480	Y	95	20	11	1	05/02/16	05/04/16	KWG1603391	
Residual Range Organics (RRO)	230	L	95	50	19	1	05/02/16	05/04/16	KWG1603391	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	94	50-150	05/04/16	Acceptable
n-Triacontane	82	50-150	05/04/16	Acceptable

Comments: _____

Analytical Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 8-4/TO 01A
Sample Matrix: Water

Service Request: K1604131
Date Collected: 04/20/2016
Date Received: 04/22/2016

Diesel and Residual Range Organics

Sample Name: AOC1604204131MW03
Lab Code: K1604131-002
Extraction Method: METHOD
Analysis Method: NWTTPH-Dx

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	2400	Y	97	20	11	1	05/02/16	05/04/16	KWG1603391	
Residual Range Organics (RRO)	620	L	97	50	19	1	05/02/16	05/04/16	KWG1603391	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	97	50-150	05/04/16	Acceptable
n-Triacontane	93	50-150	05/04/16	Acceptable

Comments: _____

Analytical Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 8-4/TO 01A
Sample Matrix: Water

Service Request: K1604131
Date Collected: 04/20/2016
Date Received: 04/22/2016

Diesel and Residual Range Organics

Sample Name: AOC1604204131MW04
Lab Code: K1604131-003
Extraction Method: METHOD
Analysis Method: NWTPH-Dx

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	36	J	95	20	11	1	05/02/16	05/04/16	KWG1603391	
Residual Range Organics (RRO)	74	J	95	50	19	1	05/02/16	05/04/16	KWG1603391	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	90	50-150	05/04/16	Acceptable
n-Triacontane	75	50-150	05/04/16	Acceptable

Comments: _____

Analytical Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 8-4/TO 01A
Sample Matrix: Water

Service Request: K1604131
Date Collected: 04/20/2016
Date Received: 04/22/2016

Diesel and Residual Range Organics

Sample Name: AOC1604204131MW05
Lab Code: K1604131-004
Extraction Method: METHOD
Analysis Method: NWTPH-Dx

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	26	J	95	20	11	1	05/02/16	05/04/16	KWG1603391	
Residual Range Organics (RRO)	48	J	95	50	19	1	05/02/16	05/04/16	KWG1603391	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	97	50-150	05/04/16	Acceptable
n-Triacontane	83	50-150	05/04/16	Acceptable

Comments: _____

Analytical Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 8-4/TO 01A
Sample Matrix: Water

Service Request: K1604131
Date Collected: 04/20/2016
Date Received: 04/22/2016

Diesel and Residual Range Organics

Sample Name: AOC1604204131MW13
Lab Code: K1604131-005
Extraction Method: METHOD
Analysis Method: NWTPH-Dx

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	630	Y	97	20	11	1	05/02/16	05/04/16	KWG1603391	
Residual Range Organics (RRO)	330	L	97	50	19	1	05/02/16	05/04/16	KWG1603391	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	94	50-150	05/04/16	Acceptable
n-Triacontane	87	50-150	05/04/16	Acceptable

Comments: _____

Analytical Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 8-4/TO 01A
Sample Matrix: Water

Service Request: K1604131
Date Collected: 04/21/2016
Date Received: 04/22/2016

Diesel and Residual Range Organics

Sample Name: AOC160421AO111MW04
Lab Code: K1604131-006
Extraction Method: METHOD
Analysis Method: NWTPH-Dx

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	56	J	95	20	11	1	05/02/16	05/04/16	KWG1603391	
Residual Range Organics (RRO)	85	J	95	50	19	1	05/02/16	05/04/16	KWG1603391	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	97	50-150	05/04/16	Acceptable
n-Triacontane	83	50-150	05/04/16	Acceptable

Comments: _____

Analytical Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 8-4/TO 01A
Sample Matrix: Water

Service Request: K1604131
Date Collected: 04/21/2016
Date Received: 04/22/2016

Diesel and Residual Range Organics

Sample Name: AOC160421AO111MW05
Lab Code: K1604131-007
Extraction Method: METHOD
Analysis Method: NWTPH-Dx

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	100	Y	97	20	11	1	05/02/16	05/04/16	KWG1603391	
Residual Range Organics (RRO)	110	L	97	50	19	1	05/02/16	05/04/16	KWG1603391	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	92	50-150	05/04/16	Acceptable
n-Triacontane	79	50-150	05/04/16	Acceptable

Comments: _____

Analytical Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 8-4/TO 01A
Sample Matrix: Water

Service Request: K1604131
Date Collected: 04/21/2016
Date Received: 04/22/2016

Diesel and Residual Range Organics

Sample Name: AOC160421AO111MW06
Lab Code: K1604131-008
Extraction Method: METHOD
Analysis Method: NWTPH-Dx

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	25	J	97	20	11	1	05/02/16	05/06/16	KWG1603391	
Residual Range Organics (RRO)	120	Z	97	50	19	1	05/02/16	05/06/16	KWG1603391	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	85	50-150	05/06/16	Acceptable
n-Triacontane	83	50-150	05/06/16	Acceptable

Comments: _____

Analytical Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 8-4/TO 01A
Sample Matrix: Water

Service Request: K1604131
Date Collected: 04/21/2016
Date Received: 04/22/2016

Diesel and Residual Range Organics

Sample Name: AOC160421AO111MW07
Lab Code: K1604131-009
Extraction Method: METHOD
Analysis Method: NWTPH-Dx

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	34	J	95	20	11	1	05/02/16	05/06/16	KWG1603391	
Residual Range Organics (RRO)	110	Z	95	50	19	1	05/02/16	05/06/16	KWG1603391	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	91	50-150	05/06/16	Acceptable
n-Triacontane	86	50-150	05/06/16	Acceptable

Comments: _____

Analytical Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 8-4/TO 01A
Sample Matrix: Water

Service Request: K1604131
Date Collected: 04/21/2016
Date Received: 04/22/2016

Diesel and Residual Range Organics

Sample Name: AOC160421AO111MW08
Lab Code: K1604131-010
Extraction Method: METHOD
Analysis Method: NWTPH-Dx

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	250	H	95	20	11	1	05/02/16	05/06/16	KWG1603391	
Residual Range Organics (RRO)	260	O	95	50	19	1	05/02/16	05/06/16	KWG1603391	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	91	50-150	05/06/16	Acceptable
n-Triacontane	89	50-150	05/06/16	Acceptable

Comments: _____

Analytical Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 8-4/TO 01A
Sample Matrix: Water

Service Request: K1604131
Date Collected: NA
Date Received: NA

Diesel and Residual Range Organics

Sample Name: Method Blank
Lab Code: KWG1603391-5
Extraction Method: METHOD
Analysis Method: NWTTPH-Dx

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	14	J	95	20	11	1	05/02/16	05/04/16	KWG1603391	
Residual Range Organics (RRO)	31	J	95	50	19	1	05/02/16	05/04/16	KWG1603391	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	96	50-150	05/04/16	Acceptable
n-Triacontane	79	50-150	05/04/16	Acceptable

Comments: _____

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 8-4/TO 01A
Sample Matrix: Water

Service Request: K1604131

**Surrogate Recovery Summary
 Diesel and Residual Range Organics**

Extraction Method: METHOD
Analysis Method: NWTPH-Dx

Units: Percent
Level: Low

<u>Sample Name</u>	<u>Lab Code</u>	<u>Sur1</u>	<u>Sur2</u>
AOC1604204131MW02	K1604131-001	94	82
AOC1604204131MW03	K1604131-002	97	93
AOC1604204131MW04	K1604131-003	90	75
AOC1604204131MW05	K1604131-004	97	83
AOC1604204131MW13	K1604131-005	94	87
AOC160421AO111MW04	K1604131-006	97	83
AOC160421AO111MW05	K1604131-007	92	79
AOC160421AO111MW06	K1604131-008	85	83
AOC160421AO111MW07	K1604131-009	91	86
AOC160421AO111MW08	K1604131-010	91	89
AOC1604204131MW04DUP	KWG1603391-1	90	78
Method Blank	KWG1603391-5	96	79
AOC1604204131MW04MS	KWG1603391-2	96	87
AOC1604204131MW04DMS	KWG1603391-3	96	88
Lab Control Sample	KWG1603391-4	93	82

Surrogate Recovery Control Limits (%)

Sur1 = o-Terphenyl 50-150
 Sur2 = n-Triacontane 50-150

Results flagged with an asterisk (*) indicate values outside control criteria.
 Results flagged with a pound (#) indicate the control criteria is not applicable.

QA/QC Report

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 8-4/TO 01A
Sample Matrix: Water

Service Request: K1604131
Date Extracted: 05/02/2016
Date Analyzed: 05/04/2016

**Matrix Spike/Duplicate Matrix Spike Summary
 Diesel and Residual Range Organics**

Sample Name: AOC1604204131MW04
Lab Code: K1604131-003
Extraction Method: METHOD
Analysis Method: NWTPH-Dx

Units: ug/L
Basis: NA
Level: Low
Extraction Lot: KWG1603391

Analyte Name	Sample Result	AOC1604204131MW04MS KWG1603391-2 Matrix Spike			AOC1604204131MW04DMS KWG1603391-3 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Spike Amount	%Rec	Result	Spike Amount	%Rec			
Diesel Range Organics (DRO)	36	1390	1510	89	1430	1510	93	46-140	3	30
Residual Range Organics (RRO)	74	720	755	86	732	755	87	45-159	2	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

QA/QC Report

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 8-4/TO 01A
Sample Matrix: Water

Service Request: K1604131
Date Extracted: 05/02/2016
Date Analyzed: 05/04/2016

Duplicate Sample Summary
Diesel and Residual Range Organics

Sample Name: AOC1604204131MW04
Lab Code: K1604131-003
Extraction Method: METHOD
Analysis Method: NWTPH-Dx

Units: ug/L
Basis: NA
Level: Low
Extraction Lot: KWG1603391

Analyte Name	LOQ	MDL	Sample Result	AOC1604204131MW04DUP KWG1603391-1 Duplicate Sample		Relative Percent Difference	RPD Limit
				Result	Average		
Diesel Range Organics (DRO)	95	11	36	26	31	35 #	30
Residual Range Organics (RRO)	95	19	74	50	62	40 #	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

QA/QC Report

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 8-4/TO 01A
Sample Matrix: Water

Service Request: K1604131
Date Extracted: 05/02/2016
Date Analyzed: 05/04/2016

Lab Control Spike Summary
Diesel and Residual Range Organics

Extraction Method: METHOD
Analysis Method: NWTPH-Dx

Units: ug/L
Basis: NA
Level: Low
Extraction Lot: KWG1603391

Lab Control Sample
 KWG1603391-4
 Lab Control Spike

Analyte Name	Result	Spike Amount	%Rec	%Rec Limits
Diesel Range Organics (DRO)	1380	1600	87	46-140
Residual Range Organics (RRO)	703	800	88	45-159

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

QA/QC Report

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 8-4/TO 01A
Sample Matrix: Water

Service Request: K1604131
Date Extracted: 05/02/2016
Date Analyzed: 05/04/2016
Time Analyzed: 16:03

Method Blank Summary
Diesel and Residual Range Organics

Sample Name: Method Blank **Instrument ID:** GC21
Lab Code: KWG1603391-5 **File ID:** J:\GC21\DATA\050416B\0504F047.D
Extraction Method: METHOD **Level:** Low
Analysis Method: NWTPH-Dx **Extraction Lot:** KWG1603391

This Method Blank applies to the following analyses:

Sample Name	Lab Code	File ID	Date Analyzed	Time Analyzed
Lab Control Sample	KWG1603391-4	J:\GC21\DATA\050416B\0504F045.D	05/04/16	15:41
AOC1604204131MW02	K1604131-001	J:\GC21\DATA\050416B\0504F049.D	05/04/16	16:25
AOC1604204131MW04	K1604131-003	J:\GC21\DATA\050416B\0504F051.D	05/04/16	16:47
AOC1604204131MW04MS	KWG1603391-2	J:\GC21\DATA\050416B\0504F053.D	05/04/16	17:09
AOC1604204131MW04DMS	KWG1603391-3	J:\GC21\DATA\050416B\0504F055.D	05/04/16	17:31
AOC1604204131MW04DUP	KWG1603391-1	J:\GC21\DATA\050416B\0504F057.D	05/04/16	17:54
AOC1604204131MW05	K1604131-004	J:\GC21\DATA\050416B\0504F059.D	05/04/16	18:16
AOC160421AO111MW04	K1604131-006	J:\GC21\DATA\050416B\0504F061.D	05/04/16	18:39
AOC160421AO111MW05	K1604131-007	J:\GC21\DATA\050416B\0504F063.D	05/04/16	19:01
AOC1604204131MW13	K1604131-005	J:\GC21\DATA\050416B\0504F065.D	05/04/16	19:24
AOC1604204131MW03	K1604131-002	J:\GC21\DATA\050416B\0504F067.D	05/04/16	19:46
AOC160421AO111MW06	K1604131-008	J:\GC21\DATA\050616F\0506F072.D	05/06/16	21:11
AOC160421AO111MW07	K1604131-009	J:\GC21\DATA\050616F\0506F074.D	05/06/16	21:33
AOC160421AO111MW08	K1604131-010	J:\GC21\DATA\050616F\0506F076.D	05/06/16	21:55

QA/QC Report

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 8-4/TO 01A
Sample Matrix: Water

Service Request: K1604131
Date Extracted: 05/02/2016
Date Analyzed: 05/04/2016
Time Analyzed: 15:41

Lab Control Sample Summary
Diesel and Residual Range Organics

Sample Name: Lab Control Sample
Lab Code: KWG1603391-4
Extraction Method: METHOD
Analysis Method: NWTPH-Dx

Instrument ID: GC21
File ID: J:\GC21\DATA\050416B\0504F045.D
Level: Low
Extraction Lot: KWG1603391

This Lab Control Sample applies to the following analyses:

Sample Name	Lab Code	File ID	Date Analyzed	Time Analyzed
Method Blank	KWG1603391-5	J:\GC21\DATA\050416B\0504F047.D	05/04/16	16:03
AOC1604204131MW02	K1604131-001	J:\GC21\DATA\050416B\0504F049.D	05/04/16	16:25
AOC1604204131MW04	K1604131-003	J:\GC21\DATA\050416B\0504F051.D	05/04/16	16:47
AOC1604204131MW04MS	KWG1603391-2	J:\GC21\DATA\050416B\0504F053.D	05/04/16	17:09
AOC1604204131MW04DMS	KWG1603391-3	J:\GC21\DATA\050416B\0504F055.D	05/04/16	17:31
AOC1604204131MW04DUP	KWG1603391-1	J:\GC21\DATA\050416B\0504F057.D	05/04/16	17:54
AOC1604204131MW05	K1604131-004	J:\GC21\DATA\050416B\0504F059.D	05/04/16	18:16
AOC160421AO111MW04	K1604131-006	J:\GC21\DATA\050416B\0504F061.D	05/04/16	18:39
AOC160421AO111MW05	K1604131-007	J:\GC21\DATA\050416B\0504F063.D	05/04/16	19:01
AOC1604204131MW13	K1604131-005	J:\GC21\DATA\050416B\0504F065.D	05/04/16	19:24
AOC1604204131MW03	K1604131-002	J:\GC21\DATA\050416B\0504F067.D	05/04/16	19:46
AOC160421AO111MW06	K1604131-008	J:\GC21\DATA\050616F\0506F072.D	05/06/16	21:11
AOC160421AO111MW07	K1604131-009	J:\GC21\DATA\050616F\0506F074.D	05/06/16	21:33
AOC160421AO111MW08	K1604131-010	J:\GC21\DATA\050616F\0506F076.D	05/06/16	21:55

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 8-4/TO 01A

Service Request: K1604131
Calibration Date: 01/19/2016

**Initial Calibration Summary
 Diesel and Residual Range Organics**

Calibration ID: CAL14546
Instrument ID: GC21

Column: ZB-1

Level ID	File ID	Level ID	File ID
A	J:\GC21\DATA\011916B\0119F017.D	K	J:\GC21\DATA\011916B\0119F043.D
B	J:\GC21\DATA\011916B\0119F019.D	L	J:\GC21\DATA\011916B\0119F051.D
C	J:\GC21\DATA\011916B\0119F021.D	M	J:\GC21\DATA\011916B\0119F053.D
D	J:\GC21\DATA\011916B\0119F023.D	N	J:\GC21\DATA\011916B\0119F055.D
E	J:\GC21\DATA\011916B\0119F025.D	O	J:\GC21\DATA\011916B\0119F057.D
F	J:\GC21\DATA\011916B\0119F027.D	P	J:\GC21\DATA\011916B\0119F059.D
G	J:\GC21\DATA\011916B\0119F035.D	Q	J:\GC21\DATA\012016B\0120F013.D
H	J:\GC21\DATA\011916B\0119F037.D	R	J:\GC21\DATA\012016B\0120F015.D
I	J:\GC21\DATA\011916B\0119F039.D		
J	J:\GC21\DATA\011916B\0119F041.D		

Analyte Name	Level			Level			Level			Level			Level		
	ID	Amt	RF	ID	Amt	RF	ID	Amt	RF	ID	Amt	RF	ID	Amt	RF
Diesel Range Organics (DRO)	A	200	1140	B	500	1170	C	2000	1150	D	5000	1090	E	20000	963
	F	50000	971												
				Q	20	1230	R	50	1190						
Residual Range Organics (RRO)				G	50	705	H	200	607	I	500	614	J	2000	593
	K	5000	590												
o-Terphenyl	A	10	1540	B	25	1540	C	100	1560	D	250	1420			
				Q	1.0	1640	R	2.5	1570						
n-Triacontane	A	10	1320	B	25	1310	C	100	1360	D	250	1230			
				Q	1.0	1380	R	2.5	1350						

Results flagged with an asterisk (*) indicate values outside control criteria.

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 8-4/TO 01A

Service Request: K1604131
Calibration Date: 01/19/2016

Initial Calibration Summary
Diesel and Residual Range Organics

Calibration ID: CAL14546
Instrument ID: GC21

Column: ZB-1

Analyte Name	Compound Type	Calibration Evaluation				
		Fit Type	Eval.	Eval. Result	Q	Control Criteria
Diesel Range Organics (DRO)	MS	AverageRF	% RSD	8.9		≤ 20
Residual Range Organics (RRO)	MS	AverageRF	% RSD	7.7		≤ 20
o-Terphenyl	SURR	AverageRF	% RSD	4.7		≤ 20
n-Triacontane	SURR	AverageRF	% RSD	4.0		≤ 20

Results flagged with an asterisk (*) indicate values outside control criteria.

QA/QC Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 8-4/TO 01A

Service Request: K1604131
Calibration Date: 01/19/2016
Date Analyzed: 01/19/2016 - 01/22/2016

Second Source Calibration Verification
Diesel and Residual Range Organics

Calibration Type: External Standard
Analysis Method: NWTPH-Dx

Calibration ID: CAL14546
Units: ppm

File ID: J:\GC21\DATA\011916B\0119F047.D
 J:\GC21\DATA\011916B\0119F063.D
 J:\GC21\DATA\012216B\0122F015.D

Column ID: ZB-1

Analyte Name	Expected	Result	Average RF	SSV RF	%D	%Drift	Criteria	Curve Fit
Diesel Range Organics (DRO)	1000	1000	1110	1120	1	NA	± 15 %	AverageRF
Residual Range Organics (RRO)	1000	910	622	565	-9	NA	± 15 %	AverageRF

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 8-4/TO 01A

Service Request: K1604131
Calibration Date: 01/20/2016

**Initial Calibration Summary
 Diesel and Residual Range Organics**

Calibration ID: CAL14548
Instrument ID: GC21

Column: ZB-1

Level ID	File ID	Level ID	File ID
A	J:\GC21\DATA\012016F\0120F016.D	K	J:\GC21\DATA\012016F\0120F040.D
B	J:\GC21\DATA\012016F\0120F018.D	L	J:\GC21\DATA\012016F\0120F042.D
C	J:\GC21\DATA\012016F\0120F020.D	M	J:\GC21\DATA\012016F\0120F044.D
D	J:\GC21\DATA\012016F\0120F022.D	N	J:\GC21\DATA\012016F\0120F052.D
E	J:\GC21\DATA\012016F\0120F024.D	O	J:\GC21\DATA\012016F\0120F054.D
F	J:\GC21\DATA\012016F\0120F030.D	P	J:\GC21\DATA\012016F\0120F056.D
G	J:\GC21\DATA\012016F\0120F032.D	Q	J:\GC21\DATA\012016F\0120F058.D
H	J:\GC21\DATA\012016F\0120F034.D	R	J:\GC21\DATA\012016F\0120F060.D
I	J:\GC21\DATA\012016F\0120F036.D		
J	J:\GC21\DATA\012016F\0120F038.D		

Analyte Name	Level ID	Amt	RF	Level ID	Amt	RF	Level ID	Amt	RF	Level ID	Amt	RF	Level ID	Amt	RF
Diesel Range Organics (DRO)	F	20	1230	G	50	1150	H	200	1080	I	500	1070	J	2000	1110
	K	5000	1270	L	20000	1180	M	50000	1270						
Residual Range Organics (RRO)	A	50	679	B	200	619	C	500	607	D	2000	569	E	5000	601
o-Terphenyl	F	1.0	1540	G	2.5	1470	H	10	1450	I	25	1390	J	100	1470
	K	250	1600												
n-Triacontane	F	1.0	1300	G	2.5	1240	H	10	1260	I	25	1210	J	100	1230
	K	250	1370												

Results flagged with an asterisk (*) indicate values outside control criteria.

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 8-4/TO 01A

Service Request: K1604131
Calibration Date: 01/20/2016

**Initial Calibration Summary
 Diesel and Residual Range Organics**

Calibration ID: CAL14548
Instrument ID: GC21

Column: ZB-1

Analyte Name	Compound Type	Calibration Evaluation				
		Fit Type	Eval.	Eval. Result	Q	Control Criteria
Diesel Range Organics (DRO)	MS	AverageRF	% RSD	6.9		≤ 20
Residual Range Organics (RRO)	MS	AverageRF	% RSD	6.6		≤ 20
o-Terphenyl	SURR	AverageRF	% RSD	5.0		≤ 20
n-Triacontane	SURR	AverageRF	% RSD	4.7		≤ 20

Results flagged with an asterisk (*) indicate values outside control criteria.

QA/QC Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 8-4/TO 01A

Service Request: K1604131
Calibration Date: 01/20/2016
Date Analyzed: 01/20/2016

Second Source Calibration Verification
Diesel and Residual Range Organics

Calibration Type: External Standard
Analysis Method: NWTPH-Dx

Calibration ID: CAL14548
Units: ppm

File ID: J:\GC21\DATA\012016F\0120F028.D
 J:\GC21\DATA\012016F\0120F048.D
 J:\GC21\DATA\012016F\0120F064.D

Column ID: ZB-1

Analyte Name	Expected	Result	Average RF	SSV RF	%D	%Drift	Criteria	Curve Fit
Diesel Range Organics (DRO)	1000	1100	1170	1230	5	NA	± 15 %	AverageRF
Residual Range Organics (RRO)	1000	850	615	526	-15	NA	± 15 %	AverageRF

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

ALS Group USA, Corp. dba ALS Environmental

QA/QC Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 8-4/TO 01A

Service Request: K1604131
Date Analyzed: 05/04/2016

**Continuing Calibration Verification Summary
 Diesel and Residual Range Organics**

Calibration Type: External Standard
Analysis Method: NWTPH-Dx

Calibration Date: 01/19/2016
Calibration ID: CAL14546
Analysis Lot: KWG1603572
Units: ppm
Column ID: ZB-1

File ID: J:\GC21\DATA\050416B\0504F033.D
 J:\GC21\DATA\050416B\0504F035.D

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Diesel Range Organics (DRO)	1000	1100	1110	1190	7	NA	± 15	AverageRF
Residual Range Organics (RRO)	1000	1000	622	635	2	NA	± 15	AverageRF
o-Terphenyl	50	56	1540	1720	12	NA	± 15	AverageRF
n-Triacontane	50	47	1330	1240	-6	NA	± 15	AverageRF

Results flagged with an asterisk (*) indicate values outside control criteria.

ALS Group USA, Corp. dba ALS Environmental

QA/QC Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 8-4/TO 01A

Service Request: K1604131
Date Analyzed: 05/04/2016

**Continuing Calibration Verification Summary
 Diesel and Residual Range Organics**

Calibration Type: External Standard
Analysis Method: NWTPH-Dx

Calibration Date: 01/19/2016
Calibration ID: CAL14546
Analysis Lot: KWG1603572
Units: ppm
Column ID: ZB-1

File ID: J:\GC21\DATA\050416B\0504F069.D
 J:\GC21\DATA\050416B\0504F071.D

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Diesel Range Organics (DRO)	1000	1100	1110	1230	10	NA	± 15	AverageRF
Residual Range Organics (RRO)	1000	920	622	573	-8	NA	± 15	AverageRF
o-Terphenyl	50	57	1540	1760	14	NA	± 15	AverageRF
n-Triacontane	50	56	1330	1470	11	NA	± 15	AverageRF

Results flagged with an asterisk (*) indicate values outside control criteria.

ALS Group USA, Corp. dba ALS Environmental

QA/QC Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 8-4/TO 01A

Service Request: K1604131
Date Analyzed: 05/06/2016

**Continuing Calibration Verification Summary
 Diesel and Residual Range Organics**

Calibration Type: External Standard
Analysis Method: NWTPH-Dx

Calibration Date: 01/20/2016
Calibration ID: CAL14548
Analysis Lot: KWG1603624
Units: ppm
Column ID: ZB-1

File ID: J:\GC21\DATA\050616F\0506F066.D
 J:\GC21\DATA\050616F\0506F068.D

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Diesel Range Organics (DRO)	1000	1000	1170	1210	4	NA	± 15	AverageRF
Residual Range Organics (RRO)	1000	1000	615	624	1	NA	± 15	AverageRF
o-Terphenyl	50	57	1490	1700	14	NA	± 15	AverageRF
n-Triacontane	50	55	1270	1390	10	NA	± 15	AverageRF

Results flagged with an asterisk (*) indicate values outside control criteria.

ALS Group USA, Corp. dba ALS Environmental

QA/QC Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 8-4/TO 01A

Service Request: K1604131
Date Analyzed: 05/07/2016

**Continuing Calibration Verification Summary
 Diesel and Residual Range Organics**

Calibration Type: External Standard
Analysis Method: NWTPH-Dx

Calibration Date: 01/20/2016
Calibration ID: CAL14548
Analysis Lot: KWG1603624
Units: ppm
Column ID: ZB-1

File ID: J:\GC21\DATA\050616F\0506F090.D
 J:\GC21\DATA\050616F\0506F092.D

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Diesel Range Organics (DRO)	1000	1000	1170	1170	0	NA	± 15	AverageRF
Residual Range Organics (RRO)	1000	990	615	609	-1	NA	± 15	AverageRF
o-Terphenyl	50	56	1490	1680	13	NA	± 15	AverageRF
n-Triacontane	50	56	1270	1410	11	NA	± 15	AverageRF

Results flagged with an asterisk (*) indicate values outside control criteria.

ALS Group USA, Corp. dba ALS Environmental

QA/QC Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 8-4/TO 01A

Service Request: K1604131

Analysis Run Log
Diesel and Residual Range Organics

Analysis Method: NWTPH-Dx

Analysis Lot: KWG1603572
Instrument ID: GC21
Column: ZB-1

File ID	Sample Name	Lab Code	Date Analysis Started	Start Time	Q	Date Analysis Finished	Finish Time
0504F033.D	Continuing Calibration Verification	KWG1603572-1	5/4/2016	13:28		5/4/2016	13:44
0504F035.D	Continuing Calibration Verification	KWG1603572-1	5/4/2016	13:50		5/4/2016	14:06
0504F037.D	Instrument Blank	KWG1603572-3	5/4/2016	14:12		5/4/2016	14:28
0504F045.D	Lab Control Sample	KWG1603391-4	5/4/2016	15:41		5/4/2016	15:57
0504F047.D	Method Blank	KWG1603391-5	5/4/2016	16:03		5/4/2016	16:19
0504F049.D	AOC1604204131MW02	K1604131-001	5/4/2016	16:25		5/4/2016	16:41
0504F051.D	AOC1604204131MW04	K1604131-003	5/4/2016	16:47		5/4/2016	17:03
0504F053.D	AOC1604204131MW04MS	KWG1603391-2	5/4/2016	17:09		5/4/2016	17:25
0504F055.D	AOC1604204131MW04DMS	KWG1603391-3	5/4/2016	17:31		5/4/2016	17:47
0504F057.D	AOC1604204131MW04DUP	KWG1603391-1	5/4/2016	17:54		5/4/2016	18:10
0504F059.D	AOC1604204131MW05	K1604131-004	5/4/2016	18:16		5/4/2016	18:32
0504F061.D	AOC160421AO111MW04	K1604131-006	5/4/2016	18:39		5/4/2016	18:55
0504F063.D	AOC160421AO111MW05	K1604131-007	5/4/2016	19:01		5/4/2016	19:17
0504F065.D	AOC1604204131MW13	K1604131-005	5/4/2016	19:24		5/4/2016	19:40
0504F067.D	AOC1604204131MW03	K1604131-002	5/4/2016	19:46		5/4/2016	20:02
0504F069.D	Continuing Calibration Verification	KWG1603572-2	5/4/2016	20:08		5/4/2016	20:24
0504F071.D	Continuing Calibration Verification	KWG1603572-2	5/4/2016	20:30		5/4/2016	20:46
0504F073.D	Instrument Blank	KWG1603572-4	5/4/2016	20:52		5/4/2016	21:08

Results flagged with an asterisk (*) indicate the holding time was exceeded for the analysis

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 8-4/TO 01A

Service Request: K1604131

Analysis Run Log
Diesel and Residual Range Organics

Analysis Method: NWTPH-Dx

Analysis Lot: KWG1603624
Instrument ID: GC21
Column: ZB-1

File ID	Sample Name	Lab Code	Date Analysis Started	Start Time	Q	Date Analysis Finished	Finish Time
0506F010.D	Continuing Calibration Verification	KWG1603624-1	5/6/2016	09:47		5/6/2016	10:03
0506F012.D	Continuing Calibration Verification	KWG1603624-1	5/6/2016	10:09		5/6/2016	10:25
0506F014.D	Instrument Blank	KWG1603624-5	5/6/2016	10:32		5/6/2016	10:48
0506F020.D	ZZZZZZ	ZZZZZZ	5/6/2016	11:38		5/6/2016	11:54
0506F022.D	ZZZZZZ	ZZZZZZ	5/6/2016	12:00		5/6/2016	12:16
0506F024.D	ZZZZZZ	ZZZZZZ	5/6/2016	12:23		5/6/2016	12:39
0506F026.D	ZZZZZZ	ZZZZZZ	5/6/2016	12:45		5/6/2016	13:01
0506F028.D	ZZZZZZ	ZZZZZZ	5/6/2016	13:07		5/6/2016	13:23
0506F030.D	ZZZZZZ	ZZZZZZ	5/6/2016	13:29		5/6/2016	13:45
0506F032.D	ZZZZZZ	ZZZZZZ	5/6/2016	13:51		5/6/2016	14:07
0506F034.D	ZZZZZZ	ZZZZZZ	5/6/2016	14:13		5/6/2016	14:29
0506F036.D	ZZZZZZ	ZZZZZZ	5/6/2016	14:35		5/6/2016	14:51
0506F038.D	ZZZZZZ	ZZZZZZ	5/6/2016	14:57		5/6/2016	15:13
0506F040.D	ZZZZZZ	ZZZZZZ	5/6/2016	15:19		5/6/2016	15:35
0506F042.D	Continuing Calibration Verification	KWG1603624-2	5/6/2016	15:41		5/6/2016	15:57
0506F044.D	Continuing Calibration Verification	KWG1603624-2	5/6/2016	16:03		5/6/2016	16:19
0506F046.D	Instrument Blank	KWG1603624-6	5/6/2016	16:24		5/6/2016	16:40
0506F048.D	ZZZZZZ	ZZZZZZ	5/6/2016	16:46		5/6/2016	17:02
0506F050.D	ZZZZZZ	ZZZZZZ	5/6/2016	17:08		5/6/2016	17:24
0506F052.D	ZZZZZZ	ZZZZZZ	5/6/2016	17:30		5/6/2016	17:46
0506F054.D	ZZZZZZ	ZZZZZZ	5/6/2016	17:52		5/6/2016	18:08
0506F056.D	ZZZZZZ	ZZZZZZ	5/6/2016	18:15		5/6/2016	18:31
0506F058.D	ZZZZZZ	ZZZZZZ	5/6/2016	18:36		5/6/2016	18:52
0506F060.D	ZZZZZZ	ZZZZZZ	5/6/2016	18:58		5/6/2016	19:14
0506F062.D	ZZZZZZ	ZZZZZZ	5/6/2016	19:20		5/6/2016	19:36
0506F064.D	ZZZZZZ	ZZZZZZ	5/6/2016	19:42		5/6/2016	19:58
0506F066.D	Continuing Calibration Verification	KWG1603624-3	5/6/2016	20:05		5/6/2016	20:21
0506F068.D	Continuing Calibration Verification	KWG1603624-3	5/6/2016	20:27		5/6/2016	20:43
0506F070.D	Instrument Blank	KWG1603624-7	5/6/2016	20:49		5/6/2016	21:05
0506F072.D	AOC160421AO111MW06	K1604131-008	5/6/2016	21:11		5/6/2016	21:27
0506F074.D	AOC160421AO111MW07	K1604131-009	5/6/2016	21:33		5/6/2016	21:49
0506F076.D	AOC160421AO111MW08	K1604131-010	5/6/2016	21:55		5/6/2016	22:11
0506F078.D	ZZZZZZ	ZZZZZZ	5/6/2016	22:17		5/6/2016	22:33
0506F080.D	ZZZZZZ	ZZZZZZ	5/6/2016	22:39		5/6/2016	22:55

Results flagged with an asterisk (*) indicate the holding time was exceeded for the analysis

QA/QC Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 8-4/TO 01A

Service Request: K1604131

Analysis Run Log
Diesel and Residual Range Organics

Analysis Method: NWTPH-Dx

Analysis Lot: KWG1603624
Instrument ID: GC21
Column: ZB-1

File ID	Sample Name	Lab Code	Date Analysis Started	Start Time	Q	Date Analysis Finished	Finish Time
0506F082.D	ZZZZZZ	ZZZZZZ	5/6/2016	23:01		5/6/2016	23:17
0506F084.D	ZZZZZZ	ZZZZZZ	5/6/2016	23:23		5/6/2016	23:39
0506F086.D	ZZZZZZ	ZZZZZZ	5/6/2016	23:46		5/7/2016	00:02
0506F088.D	ZZZZZZ	ZZZZZZ	5/7/2016	00:08		5/7/2016	00:24
0506F090.D	Continuing Calibration Verification	KWG1603624-4	5/7/2016	00:30		5/7/2016	00:46
0506F092.D	Continuing Calibration Verification	KWG1603624-4	5/7/2016	00:52		5/7/2016	01:08
0506F094.D	Instrument Blank	KWG1603624-8	5/7/2016	01:14		5/7/2016	01:30

Results flagged with an asterisk (*) indicate the holding time was exceeded for the analysis

QA/QC Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 8-4/TO 01A
Sample Matrix: Water

Service Request: K1604131
Date Extracted: 05/02/2016

Extraction Prep Log
Diesel and Residual Range Organics

Extraction Method: METHOD
Analysis Method: NWTPH-Dx

Extraction Lot: KWG1603391
Level: Low

Sample Name	Lab Code	Date Collected	Date Received	Sample Amount	Final Volume	% Solids	Note
AOC1604204131MW02	K1604131-001	04/20/16	04/22/16	1060ml	2ml	NA	
AOC1604204131MW03	K1604131-002	04/20/16	04/22/16	1040ml	2ml	NA	
AOC1604204131MW04	K1604131-003	04/20/16	04/22/16	1060ml	2ml	NA	
AOC1604204131MW05	K1604131-004	04/20/16	04/22/16	1060ml	2ml	NA	
AOC1604204131MW13	K1604131-005	04/20/16	04/22/16	1040ml	2ml	NA	
AOC160421AO111MW04	K1604131-006	04/21/16	04/22/16	1060ml	2ml	NA	
AOC160421AO111MW05	K1604131-007	04/21/16	04/22/16	1040ml	2ml	NA	
AOC160421AO111MW06	K1604131-008	04/21/16	04/22/16	1040ml	2ml	NA	
AOC160421AO111MW07	K1604131-009	04/21/16	04/22/16	1060ml	2ml	NA	
AOC160421AO111MW08	K1604131-010	04/21/16	04/22/16	1060ml	2ml	NA	
AOC1604204131MW04DUP	KWG1603391-1	04/20/16	04/22/16	1060ml	2ml	NA	
Method Blank	KWG1603391-5	NA	NA	1060ml	2ml	NA	
AOC1604204131MW04MS	KWG1603391-2	04/20/16	04/22/16	1060ml	2ml	NA	
AOC1604204131MW04DMS	KWG1603391-3	04/20/16	04/22/16	1060ml	2ml	NA	
Lab Control Sample	KWG1603391-4	NA	NA	1000ml	2ml	NA	

Results flagged with an asterisk (*) indicate the holding time was exceeded for the analysis



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May 24, 2016

Analytical Report for Service Request No: K1604135

Scott Elkind
Sealaska Environmental Services, LLC
18743 Front Street NE
P.O. Box 869
Poulsbo, WA 98370

RE: JBLM FLAO AOC 9-2/10-8 / TO 01A

Dear Scott,

Enclosed are the results of the sample(s) submitted to our laboratory April 22, 2016
For your reference, these analyses have been assigned our service request number **K1604135**.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3376. You may also contact me via email at gregory.salata@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

for G.S.

Gregory Salata, Ph.D.
Senior Project
Manager



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Gasoline Range Organics

Volatile Organic Compounds

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 Diesel and Residual Range Organics

 Gasoline Range Organics

 Volatile Organic Compounds

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

- * The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- E The result is an estimate amount because the value exceeded the instrument calibration range.
- J The result is an estimated value.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.2 definition : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.
- H The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

- # The control limit criteria is not applicable. See case narrative.
- J The result is an estimated value.
- E The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
- M The duplicate injection precision was not met.
- N The Matrix Spike sample recovery is not within control limits. See case narrative.
- S The reported value was determined by the Method of Standard Additions (MSA).
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.2 definition : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- W The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
 - i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- + The correlation coefficient for the MSA is less than 0.995.
- Q See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

- * The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- A A tentatively identified compound, a suspected aldol-condensation product.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- C The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
- D The reported result is from a dilution.
- E The result is an estimated value.
- J The result is an estimated value.
- N The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
- P The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.2 definition : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
 - i The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

- F The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
- L The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
- H The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
- O The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
- Y The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
- Z The chromatographic fingerprint does not resemble a petroleum product.

**ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses**

Agency	Web Site	Number
Alaska DEC UST	http://dec.alaska.gov/applications/eh/ehllabreports/USTLabs.aspx	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L14-51
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	Not available	-
ISO 17025	http://www.pjllabs.com/	L16-57
Louisiana DEQ	http://www.deq.louisiana.gov/portal/DIVISIONS/PublicParticipationandPermitSupport/LouisianaLaboratoryAccreditationProgram.aspx	03016
Maine DHS	Not available	WA01276
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Montana DPHHS	http://www.dphhs.mt.gov/publichealth/	CERT0047
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/oqa/	WA005
North Carolina DWQ	http://www.dwqlab.org/	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/envserv/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wisconsin DNR	http://dnr.wi.gov/	998386840
Wyoming (EPA Region 8)	http://www.epa.gov/region8/water/dwhome/wyomingdi.html	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.

Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/analyte is offered by that state.



Case Narrative

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

ALS ENVIRONMENTAL

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/ TO 01A
Sample Matrix: Water

Service Request No.: K1604135
Date Received: 04/22/16

Case Narrative

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier IV validation deliverables including summary forms and all of the associated raw data for each of the analyses. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt

Nine water samples were received for analysis at ALS Environmental on 04/22/16. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

Diesel Range Organics by Method NWTPH-Dx

No anomalies associated with the analysis of these samples were observed.

Gasoline Range Organics by Method NWTPH-Gx

Sample Notes and Discussion:

Manual integration of one or more chromatographic peaks in was required to correct the integration performed by the automated data processing program. The manual integration was performed in accordance with ALS policy, which is consistent with the National Environmental Laboratory Accreditation Program (NELAP), Department of Defense (DOD), and other certifying agencies. The analytes that required manual integrations are identified on each sample report contained in this data package.

No other anomalies associated with the analysis of these samples were observed.

Volatile Organic Compounds by EPA Method 8260

Matrix Spike Recovery Exceptions:

The matrix spike recovery of o-Xylene for sample AOC-16041995A174 was outside control criteria. Positive detections in the parent sample are flagged, as per the DOD QAPP. No further corrective action was appropriate.

Sample Notes and Discussion:

Manual integration of one or more chromatographic peaks was required to correct the integration performed by the automated data processing program. The manual integration was performed in accordance with ALS policy, which is consistent with the National Environmental Laboratory Accreditation Program (NELAP), Department of Defense (DOD), and other certifying agencies. The analytes that required manual integrations are identified on each sample report contained in this data package.

No other anomalies associated with the analysis of these samples were observed.

Approved by _____





Chain of Custody

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com



ALS Environmental

1317 13th Ave S, Kelso, WA 98626
 PH: (360) 577-7222

Chain-of-Custody

1C1604135

WORKORDER #	
PAGE	1 of 1
DISPOSAL	By Lab

PROJECT NAME	JBLM FLAQ AOC 9-2/10-8	SAMPLER	V. Sunrise Patterson	DATE	4/18/2016
PROJECT No.	TQ 01A	SITE ID		TURNAROUND	21 Day
COMPANY NAME	Sealaska Environmental Services, LLC	EDD FORMAT			
SEND REPORT TO	Aaron Vernik	PURCHASE ORDER	PO-01281 AU		
ADDRESS	18743 Front Street NE, STE 201	BILL TO COMPANY	Sealaska Environmental Services, LLC		
CITY / STATE / ZIP	Poulsbo, WA	INVOICE ATTN TO			
PHONE	(425) 326-0280	ADDRESS			
FAX		CITY / STATE / ZIP			
E-MAIL	aaron.vernik@sealaska.com	PHONE			
		FAX			
		E-MAIL			

Lab ID	Field ID	Matrix	Sample Date	Sample Time	# Bottles	Pres.	MS/MSD	GRO	BTEX	Other
	AOC16041995A172	W	4/19/2016	11:55	6	1	NO	3	3	Ø
	AOC16041995A173A	W	4/19/2016	13:45	6	1	NO	3	3	Ø
	AOC16041995A174	W	4/19/2016	12:55	18	1	YES	9	9	Ø
	AOC16041907A177	W	4/19/2016	10:55	6	1	NO	3	3	Ø
	AOC16041807A178	W	4/18/2016	14:50	6	1	NO	3	3	Ø
	AOC16041807A188	W	4/18/2016	15:00	6	1	NO	3	3	Ø
	AOC160418TB	W	4/18/2016	14:20	4	1	NO	2	2	Ø
	AOC160418JPMNOZ	W	04/18/16	12:30	2	1	NO	Ø	Ø	2
	AOC160418AOC108BOS	W	04/18/16	11:05	1	1	NO	Ø	Ø	1*

*Time Zone (Circle): PST Matrix: O = oil S = soil NS = non-soil solid W = water L = liquid E = extract F = filter

For metals or anions, please detail analytes below.

Comments: AS PER CONTRACT	QC PACKAGE (check below)
	<input type="checkbox"/> LEVEL II (Standard QC)
	<input type="checkbox"/> LEVEL III (Std QC + forms)
	<input type="checkbox"/> LEVEL IV (Std QC + forms + raw data)
Preservative Key: 1-HCl 2-HNO3 3-H2SO4 4-NaOH 5-NaHSO4 7-Other 8-4 degrees C 9-5035	

*1 BOTTLE BROKEN WHILE PACKING

	SIGNATURE	PRINTED NAME	DATE	TIME
RELINQUISHED BY		V. Sunrise Patterson	4/22/2016	800
RECEIVED BY		MC Delivery		
RELINQUISHED BY		MC Delivery		
RECEIVED BY				
RELINQUISHED BY				
RECEIVED BY	<i>A. Guel</i>	Juell / ALS	4/22/16	1130



PC GS

Cooler Receipt and Preservation Form

Client Sealaska Service Request K16 04134
 Received: 4/22/16 Opened: 4/22/16 By: A.J. Unloaded: 4/22/16 By: A.J.

1. Samples were received via? Mail Fed Ex UPS DHL PDX Courier Hand Delivered
 2. Samples were received in: (circle) Cooler Box Envelope Other NA
 3. Were custody seals on coolers? NA N If yes, how many and where? 1F, 1B
 If present, were custody seals intact? N If present, were they signed and dated? N

Raw Cooler Temp	Corrected Cooler Temp	Raw Temp Blank	Corrected Temp Blank	Corr. Factor	Thermometer ID	Cooler/COC ID NA	Tracking Number NA	Filed
-0.7	-0.8	1.9	1.8	-0.1	362			
-0.1	-0.2	1.4	1.3	-0.1	327			
-0.5	-0.6	1.2	1.1	-0.1	365			
0.3	0.3	2.6	2.6	0.0	308			

4. Packing material: Inserts Gaggies Bubble Wrap Gel Packs Wet Ice Dry Ice Sleeves
 5. Were custody papers properly filled out (ink, signed, etc.)? NA N
 6. Did all bottles arrive in good condition (unbroken)? *Indicate in the table below.* NA Y
 7. Were all sample labels complete (i.e analysis, preservation, etc.)? NA N
 8. Did all sample labels and tags agree with custody papers? *Indicate major discrepancies in the table on page 2.* NA N
 9. Were appropriate bottles/containers and volumes received for the tests indicated? NA N
 10. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* NA Y N
 11. Were VOA vials received without headspace? *Indicate in the table below.* NA N
 12. Was C12/Res negative? NA Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	Out of Temp	Head- space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time
<u>AOC16041907A177</u>	<u>1 of 2</u>			<input checked="" type="checkbox"/>						

Notes, Discrepancies, & Resolutions: _____



Diesel and Residual Range Organics

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A

Service Request: K1604135

**Cover Page - Organic Analysis Data Package
Diesel and Residual Range Organics**

Sample Name	Lab Code	Date Collected	Date Received
ADC160418JPMW02	K1604135-008	04/18/2016	04/22/2016
ADC160418AOC108B05	K1604135-009	04/18/2016	04/22/2016

Analytical Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A
Sample Matrix: Water

Service Request: K1604135
Date Collected: 04/18/2016
Date Received: 04/22/2016

Diesel and Residual Range Organics

Sample Name: ADC160418JPMW02 **Units:** ug/L
Lab Code: K1604135-008 **Basis:** NA
Extraction Method: METHOD **Level:** Low
Analysis Method: NWTPH-Dx

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	16	J	95	20	11	1	05/02/16	05/06/16	KWG1603391	
Residual Range Organics (RRO)	70	J	95	50	19	1	05/02/16	05/06/16	KWG1603391	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	94	50-150	05/06/16	Acceptable
n-Triacontane	90	50-150	05/06/16	Acceptable

Comments: _____

Analytical Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A
Sample Matrix: Water

Service Request: K1604135
Date Collected: 04/18/2016
Date Received: 04/22/2016

Diesel and Residual Range Organics

Sample Name: ADC160418AOC108B05 **Units:** ug/L
Lab Code: K1604135-009 **Basis:** NA
Extraction Method: METHOD **Level:** Low
Analysis Method: NWTPH-Dx

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	590	Y	97	20	11	1	05/02/16	05/06/16	KWG1603391	
Residual Range Organics (RRO)	190	L	97	50	19	1	05/02/16	05/06/16	KWG1603391	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	98	50-150	05/06/16	Acceptable
n-Triacontane	97	50-150	05/06/16	Acceptable

Comments: _____

Analytical Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A
Sample Matrix: Water

Service Request: K1604135
Date Collected: NA
Date Received: NA

Diesel and Residual Range Organics

Sample Name: Method Blank **Units:** ug/L
Lab Code: KWG1603391-5 **Basis:** NA
Extraction Method: METHOD **Level:** Low
Analysis Method: NWTPH-Dx

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	14	J	95	20	11	1	05/02/16	05/04/16	KWG1603391	
Residual Range Organics (RRO)	31	J	95	50	19	1	05/02/16	05/04/16	KWG1603391	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	96	50-150	05/04/16	Acceptable
n-Triacontane	79	50-150	05/04/16	Acceptable

Comments: _____

Analytical Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A
Sample Matrix: Water

Service Request: K1604135
Date Collected: NA
Date Received: NA

Diesel and Residual Range Organics

Sample Name: Method Blank **Units:** ug/L
Lab Code: KWG1603581-3 **Basis:** NA
Extraction Method: METHOD **Level:** Low
Analysis Method: NWTPH-Dx

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	ND	U	100	20	11	1	05/05/16	05/09/16	KWG1603581	
Residual Range Organics (RRO)	27	J	100	50	19	1	05/05/16	05/09/16	KWG1603581	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	85	50-150	05/09/16	Acceptable
n-Triacontane	82	50-150	05/09/16	Acceptable

Comments: _____

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A
Sample Matrix: Water

Service Request: K1604135

**Surrogate Recovery Summary
 Diesel and Residual Range Organics**

Extraction Method: METHOD
Analysis Method: NWTPH-Dx

Units: Percent
Level: Low

<u>Sample Name</u>	<u>Lab Code</u>	<u>Sur1</u>	<u>Sur2</u>
Batch QC	K1604125-001	96 D	111 D
ADC160418JPMW02	K1604135-008	94	90
ADC160418AOC108B05	K1604135-009	98	97
Batch QCDUP	KWG1603581-1	84 D	100 D
Method Blank	KWG1603391-5	96	79
Method Blank	KWG1603581-3	85	82
Lab Control Sample	KWG1603391-4	93	82
Lab Control Sample	KWG1603581-2	93	86

Surrogate Recovery Control Limits (%)

Sur1 = o-Terphenyl	50-150
Sur2 = n-Triacontane	50-150

Results flagged with an asterisk (*) indicate values outside control criteria.
 Results flagged with a pound (#) indicate the control criteria is not applicable.

QA/QC Report

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A
Sample Matrix: Water

Service Request: K1604135
Date Extracted: 05/05/2016
Date Analyzed: 05/09/2016

**Duplicate Sample Summary
 Diesel and Residual Range Organics**

Sample Name: Batch QC
Lab Code: K1604125-001
Extraction Method: METHOD
Analysis Method: NWTPH-Dx

Units: ug/L
Basis: NA
Level: Low
Extraction Lot: KWG1603581

Analyte Name	LOQ	MDL	Sample Result	Batch QCDUP KWG1603581-1 Duplicate Sample		Relative Percent Difference	RPD Limit
				Result	Average		
Diesel Range Organics (DRO)	520	57	2000	1800	1900	12	30
Residual Range Organics (RRO)	520	97	11000	11000	11000	5	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

QA/QC Report

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A
Sample Matrix: Water

Service Request: K1604135
Date Extracted: 05/02/2016
Date Analyzed: 05/04/2016

Lab Control Spike Summary
Diesel and Residual Range Organics

Extraction Method: METHOD
Analysis Method: NWTPH-Dx

Units: ug/L
Basis: NA
Level: Low
Extraction Lot: KWG1603391

Lab Control Sample
 KWG1603391-4
Lab Control Spike

Analyte Name	Result	Spike Amount	%Rec	%Rec Limits
Diesel Range Organics (DRO)	1380	1600	87	46-140
Residual Range Organics (RRO)	703	800	88	45-159

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

QA/QC Report

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A
Sample Matrix: Water

Service Request: K1604135
Date Extracted: 05/05/2016
Date Analyzed: 05/09/2016

Lab Control Spike Summary
Diesel and Residual Range Organics

Extraction Method: METHOD
Analysis Method: NWTPH-Dx

Units: ug/L
Basis: NA
Level: Low
Extraction Lot: KWG1603581

Lab Control Sample
 KWG1603581-2
Lab Control Spike

Analyte Name	Result	Spike Amount	%Rec	%Rec Limits
Diesel Range Organics (DRO)	1310	1600	82	46-140
Residual Range Organics (RRO)	661	800	83	45-159

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

QA/QC Report

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A
Sample Matrix: Water

Service Request: K1604135
Date Extracted: 05/02/2016
Date Analyzed: 05/04/2016
Time Analyzed: 16:03

Method Blank Summary
Diesel and Residual Range Organics

Sample Name: Method Blank
Lab Code: KWG1603391-5
Extraction Method: METHOD
Analysis Method: NWTPH-Dx

Instrument ID: GC21
File ID: J:\GC21\DATA\050416B\0504F047.D
Level: Low
Extraction Lot: KWG1603391

This Method Blank applies to the following analyses:

Sample Name	Lab Code	File ID	Date Analyzed	Time Analyzed
Lab Control Sample	KWG1603391-4	J:\GC21\DATA\050416B\0504F045.D	05/04/16	15:41
ADC160418JPMW02	K1604135-008	J:\GC21\DATA\050616F\0506F078.D	05/06/16	22:17
ADC160418AOC108B05	K1604135-009	J:\GC21\DATA\050616F\0506F080.D	05/06/16	22:39
Batch QC	K1604125-001	J:\GC21\DATA\050616F\0506F088.D	05/07/16	00:08

QA/QC Report

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A
Sample Matrix: Water

Service Request: K1604135
Date Extracted: 05/05/2016
Date Analyzed: 05/09/2016
Time Analyzed: 16:15

Method Blank Summary
Diesel and Residual Range Organics

Sample Name: Method Blank
Lab Code: KWG1603581-3
Extraction Method: METHOD
Analysis Method: NWTPH-Dx

Instrument ID: GC21
File ID: J:\GC21\DATA\050916F\0509F038.D
Level: Low
Extraction Lot: KWG1603581

This Method Blank applies to the following analyses:

Sample Name	Lab Code	File ID	Date Analyzed	Time Analyzed
Lab Control Sample	KWG1603581-2	J:\GC21\DATA\050916F\0509F036.D	05/09/16	15:53
Batch QCDUP	KWG1603581-1	J:\GC21\DATA\050916F\0509F040.D	05/09/16	16:36

QA/QC Report

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A
Sample Matrix: Water

Service Request: K1604135
Date Extracted: 05/02/2016
Date Analyzed: 05/04/2016
Time Analyzed: 15:41

Lab Control Sample Summary
Diesel and Residual Range Organics

Sample Name: Lab Control Sample
Lab Code: KWG1603391-4
Extraction Method: METHOD
Analysis Method: NWTPH-Dx

Instrument ID: GC21
File ID: J:\GC21\DATA\050416B\0504F045.D
Level: Low
Extraction Lot: KWG1603391

This Lab Control Sample applies to the following analyses:

Sample Name	Lab Code	File ID	Date Analyzed	Time Analyzed
Method Blank	KWG1603391-5	J:\GC21\DATA\050416B\0504F047.D	05/04/16	16:03
ADC160418JPMW02	K1604135-008	J:\GC21\DATA\050616F\0506F078.D	05/06/16	22:17
ADC160418AOC108B05	K1604135-009	J:\GC21\DATA\050616F\0506F080.D	05/06/16	22:39
Batch QC	K1604125-001	J:\GC21\DATA\050616F\0506F088.D	05/07/16	00:08

QA/QC Report

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A
Sample Matrix: Water

Service Request: K1604135
Date Extracted: 05/05/2016
Date Analyzed: 05/09/2016
Time Analyzed: 15:53

Lab Control Sample Summary
Diesel and Residual Range Organics

Sample Name: Lab Control Sample
Lab Code: KWG1603581-2
Extraction Method: METHOD
Analysis Method: NWTPH-Dx

Instrument ID: GC21
File ID: J:\GC21\DATA\050916F\0509F036.D
Level: Low
Extraction Lot: KWG1603581

This Lab Control Sample applies to the following analyses:

Sample Name	Lab Code	File ID	Date Analyzed	Time Analyzed
Method Blank	KWG1603581-3	J:\GC21\DATA\050916F\0509F038.D	05/09/16	16:15
Batch QCDUP	KWG1603581-1	J:\GC21\DATA\050916F\0509F040.D	05/09/16	16:36

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A

Service Request: K1604135
Calibration Date: 01/19/2016

Initial Calibration Summary
Diesel and Residual Range Organics

Calibration ID: CAL14546
Instrument ID: GC21

Column: ZB-1

Level ID	File ID	Level ID	File ID
A	J:\GC21\DATA\011916B\0119F017.D	K	J:\GC21\DATA\011916B\0119F043.D
B	J:\GC21\DATA\011916B\0119F019.D	L	J:\GC21\DATA\011916B\0119F051.D
C	J:\GC21\DATA\011916B\0119F021.D	M	J:\GC21\DATA\011916B\0119F053.D
D	J:\GC21\DATA\011916B\0119F023.D	N	J:\GC21\DATA\011916B\0119F055.D
E	J:\GC21\DATA\011916B\0119F025.D	O	J:\GC21\DATA\011916B\0119F057.D
F	J:\GC21\DATA\011916B\0119F027.D	P	J:\GC21\DATA\011916B\0119F059.D
G	J:\GC21\DATA\011916B\0119F035.D	Q	J:\GC21\DATA\012016B\0120F013.D
H	J:\GC21\DATA\011916B\0119F037.D	R	J:\GC21\DATA\012016B\0120F015.D
I	J:\GC21\DATA\011916B\0119F039.D		
J	J:\GC21\DATA\011916B\0119F041.D		

Analyte Name	Level			Level			Level			Level			Level		
	ID	Amt	RF	ID	Amt	RF	ID	Amt	RF	ID	Amt	RF	ID	Amt	RF
Diesel Range Organics (DRO)	A	200	1140	B	500	1170	C	2000	1150	D	5000	1090	E	20000	963
	F	50000	971												
				Q	20	1230	R	50	1190						
Residual Range Organics (RRO)				G	50	705	H	200	607	I	500	614	J	2000	593
	K	5000	590												
o-Terphenyl	A	10	1540	B	25	1540	C	100	1560	D	250	1420			
				Q	1.0	1640	R	2.5	1570						
n-Triacontane	A	10	1320	B	25	1310	C	100	1360	D	250	1230			
				Q	1.0	1380	R	2.5	1350						

Results flagged with an asterisk (*) indicate values outside control criteria.

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A

Service Request: K1604135
Calibration Date: 01/19/2016

Initial Calibration Summary
Diesel and Residual Range Organics

Calibration ID: CAL14546
Instrument ID: GC21

Column: ZB-1

Analyte Name	Compound Type	Calibration Evaluation				Control Criteria
		Fit Type	Eval.	Eval. Result	Q	
Diesel Range Organics (DRO)	MS	AverageRF	% RSD	8.9		≤ 20
Residual Range Organics (RRO)	MS	AverageRF	% RSD	7.7		≤ 20
o-Terphenyl	SURR	AverageRF	% RSD	4.7		≤ 20
n-Triacontane	SURR	AverageRF	% RSD	4.0		≤ 20

Results flagged with an asterisk (*) indicate values outside control criteria.

QA/QC Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A

Service Request: K1604135
Calibration Date: 01/19/2016
Date Analyzed: 01/19/2016 -
 01/22/2016

Second Source Calibration Verification
Diesel and Residual Range Organics

Calibration Type: External Standard
Analysis Method: NWTPH-Dx

Calibration ID: CAL14546
Units: ppm

File ID: J:\GC21\DATA\011916B\0119F047.D
 J:\GC21\DATA\011916B\0119F063.D
 J:\GC21\DATA\012216B\0122F015.D

Column ID: ZB-1

Analyte Name	Expected	Result	Average RF	SSV RF	%D	%Drift	Criteria	Curve Fit
Diesel Range Organics (DRO)	1000	1000	1110	1120	1	NA	± 15 %	AverageRF
Residual Range Organics (RRO)	1000	910	622	565	-9	NA	± 15 %	AverageRF

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A

Service Request: K1604135
Calibration Date: 01/20/2016

**Initial Calibration Summary
 Diesel and Residual Range Organics**

Calibration ID: CAL14548
Instrument ID: GC21

Column: ZB-1

Level ID	File ID	Level ID	File ID
A	J:\GC21\DATA\012016F\0120F016.D	K	J:\GC21\DATA\012016F\0120F040.D
B	J:\GC21\DATA\012016F\0120F018.D	L	J:\GC21\DATA\012016F\0120F042.D
C	J:\GC21\DATA\012016F\0120F020.D	M	J:\GC21\DATA\012016F\0120F044.D
D	J:\GC21\DATA\012016F\0120F022.D	N	J:\GC21\DATA\012016F\0120F052.D
E	J:\GC21\DATA\012016F\0120F024.D	O	J:\GC21\DATA\012016F\0120F054.D
F	J:\GC21\DATA\012016F\0120F030.D	P	J:\GC21\DATA\012016F\0120F056.D
G	J:\GC21\DATA\012016F\0120F032.D	Q	J:\GC21\DATA\012016F\0120F058.D
H	J:\GC21\DATA\012016F\0120F034.D	R	J:\GC21\DATA\012016F\0120F060.D
I	J:\GC21\DATA\012016F\0120F036.D		
J	J:\GC21\DATA\012016F\0120F038.D		

Analyte Name	Level			Level			Level			Level			Level		
	ID	Amt	RF	ID	Amt	RF	ID	Amt	RF	ID	Amt	RF	ID	Amt	RF
Diesel Range Organics (DRO)	F	20	1230	G	50	1150	H	200	1080	I	500	1070	J	2000	1110
	K	5000	1270	L	20000	1180	M	50000	1270						
Residual Range Organics (RRO)	A	50	679	B	200	619	C	500	607	D	2000	569	E	5000	601
o-Terphenyl	F	1.0	1540	G	2.5	1470	H	10	1450	I	25	1390	J	100	1470
	K	250	1600												
n-Triacontane	F	1.0	1300	G	2.5	1240	H	10	1260	I	25	1210	J	100	1230
	K	250	1370												

Results flagged with an asterisk (*) indicate values outside control criteria.

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A

Service Request: K1604135
Calibration Date: 01/20/2016

**Initial Calibration Summary
 Diesel and Residual Range Organics**

Calibration ID: CAL14548
Instrument ID: GC21

Column: ZB-1

Analyte Name	Compound Type	Calibration Evaluation				Control Criteria
		Fit Type	Eval.	Eval. Result	Q	
Diesel Range Organics (DRO)	MS	AverageRF	% RSD	6.9		≤ 20
Residual Range Organics (RRO)	MS	AverageRF	% RSD	6.6		≤ 20
o-Terphenyl	SURR	AverageRF	% RSD	5.0		≤ 20
n-Triacontane	SURR	AverageRF	% RSD	4.7		≤ 20

Results flagged with an asterisk (*) indicate values outside control criteria.

QA/QC Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A

Service Request: K1604135
Calibration Date: 01/20/2016
Date Analyzed: 01/20/2016

**Second Source Calibration Verification
 Diesel and Residual Range Organics**

Calibration Type: External Standard
Analysis Method: NWTPH-Dx

Calibration ID: CAL14548
Units: ppm

File ID: J:\GC21\DATA\012016F\0120F028.D
 J:\GC21\DATA\012016F\0120F048.D
 J:\GC21\DATA\012016F\0120F064.D

Column ID: ZB-1

Analyte Name	Expected	Result	Average RF	SSV RF	%D	%Drift	Criteria	Curve Fit
Diesel Range Organics (DRO)	1000	1100	1170	1230	5	NA	± 15 %	AverageRF
Residual Range Organics (RRO)	1000	850	615	526	-15	NA	± 15 %	AverageRF

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

QA/QC Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A

Service Request: K1604135
Date Analyzed: 05/04/2016

**Continuing Calibration Verification Summary
 Diesel and Residual Range Organics**

Calibration Type: External Standard
Analysis Method: NWTPH-Dx

Calibration Date: 01/19/2016
Calibration ID: CAL14546
Analysis Lot: KWG1603572
Units: ppm
Column ID: ZB-1

File ID: J:\GC21\DATA\050416B\0504F033.D
 J:\GC21\DATA\050416B\0504F035.D

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Diesel Range Organics (DRO)	1000	1100	1110	1190	7	NA	± 15	AverageRF
Residual Range Organics (RRO)	1000	1000	622	635	2	NA	± 15	AverageRF
o-Terphenyl	50	56	1540	1720	12	NA	± 15	AverageRF
n-Triacontane	50	47	1330	1240	-6	NA	± 15	AverageRF

Results flagged with an asterisk (*) indicate values outside control criteria.

QA/QC Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A

Service Request: K1604135
Date Analyzed: 05/04/2016

Continuing Calibration Verification Summary
Diesel and Residual Range Organics

Calibration Type: External Standard
Analysis Method: NWTPH-Dx

Calibration Date: 01/19/2016
Calibration ID: CAL14546
Analysis Lot: KWG1603572
Units: ppm
Column ID: ZB-1

File ID: J:\GC21\DATA\050416B\0504F069.D
 J:\GC21\DATA\050416B\0504F071.D

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Diesel Range Organics (DRO)	1000	1100	1110	1230	10	NA	± 15	AverageRF
Residual Range Organics (RRO)	1000	920	622	573	-8	NA	± 15	AverageRF
o-Terphenyl	50	57	1540	1760	14	NA	± 15	AverageRF
n-Triacontane	50	56	1330	1470	11	NA	± 15	AverageRF

Results flagged with an asterisk (*) indicate values outside control criteria.

QA/QC Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A

Service Request: K1604135
Date Analyzed: 05/06/2016

Continuing Calibration Verification Summary
Diesel and Residual Range Organics

Calibration Type: External Standard
Analysis Method: NWTPH-Dx

Calibration Date: 01/20/2016
Calibration ID: CAL14548
Analysis Lot: KWG1603624
Units: ppm
Column ID: ZB-1

File ID: J:\GC21\DATA\050616F\0506F066.D
 J:\GC21\DATA\050616F\0506F068.D

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Diesel Range Organics (DRO)	1000	1000	1170	1210	4	NA	± 15	AverageRF
Residual Range Organics (RRO)	1000	1000	615	624	1	NA	± 15	AverageRF
o-Terphenyl	50	57	1490	1700	14	NA	± 15	AverageRF
n-Triacontane	50	55	1270	1390	10	NA	± 15	AverageRF

Results flagged with an asterisk (*) indicate values outside control criteria.

QA/QC Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A

Service Request: K1604135
Date Analyzed: 05/07/2016

Continuing Calibration Verification Summary
Diesel and Residual Range Organics

Calibration Type: External Standard
Analysis Method: NWTPH-Dx

Calibration Date: 01/20/2016
Calibration ID: CAL14548
Analysis Lot: KWG1603624
Units: ppm
Column ID: ZB-1

File ID: J:\GC21\DATA\050616F\0506F090.D
 J:\GC21\DATA\050616F\0506F092.D

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Diesel Range Organics (DRO)	1000	1000	1170	1170	0	NA	± 15	AverageRF
Residual Range Organics (RRO)	1000	990	615	609	-1	NA	± 15	AverageRF
o-Terphenyl	50	56	1490	1680	13	NA	± 15	AverageRF
n-Triacontane	50	56	1270	1410	11	NA	± 15	AverageRF

Results flagged with an asterisk (*) indicate values outside control criteria.

QA/QC Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A

Service Request: K1604135
Date Analyzed: 05/09/2016

Continuing Calibration Verification Summary
Diesel and Residual Range Organics

Calibration Type: External Standard
Analysis Method: NWTPH-Dx

Calibration Date: 01/20/2016
Calibration ID: CAL14548
Analysis Lot: KWG1603661
Units: ppm
Column ID: ZB-1

File ID: J:\GC21\DATA\050916F\0509F026.D
 J:\GC21\DATA\050916F\0509F028.D

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Diesel Range Organics (DRO)	1000	980	1170	1140	-2	NA	± 15	AverageRF
Residual Range Organics (RRO)	1000	930	615	573	-7	NA	± 15	AverageRF
o-Terphenyl	50	55	1490	1620	9	NA	± 15	AverageRF
n-Triacontane	50	53	1270	1340	5	NA	± 15	AverageRF

Results flagged with an asterisk (*) indicate values outside control criteria.

QA/QC Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A

Service Request: K1604135
Date Analyzed: 05/09/2016

**Continuing Calibration Verification Summary
 Diesel and Residual Range Organics**

Calibration Type: External Standard
Analysis Method: NWTPH-Dx

Calibration Date: 01/20/2016
Calibration ID: CAL14548
Analysis Lot: KWG1603661
Units: ppm
Column ID: ZB-1

File ID: J:\GC21\DATA\050916F\0509F042.D
 J:\GC21\DATA\050916F\0509F044.D

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Diesel Range Organics (DRO)	1000	960	1170	1120	-4	NA	± 15	AverageRF
Residual Range Organics (RRO)	1000	940	615	581	-6	NA	± 15	AverageRF
o-Terphenyl	50	54	1490	1600	8	NA	± 15	AverageRF
n-Triacontane	50	53	1270	1340	6	NA	± 15	AverageRF

Results flagged with an asterisk (*) indicate values outside control criteria.

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A

Service Request: K1604135

**Analysis Run Log
 Diesel and Residual Range Organics**

Analysis Method: NWTPH-Dx

Analysis Lot: KWG1603572
Instrument ID: GC21
Column: ZB-1

File ID	Sample Name	Lab Code	Date Analysis Started	Start Time	Q	Date Analysis Finished	Finish Time
0504F033.D	Continuing Calibration Verification	KWG1603572-1	5/4/2016	13:28		5/4/2016	13:44
0504F035.D	Continuing Calibration Verification	KWG1603572-1	5/4/2016	13:50		5/4/2016	14:06
0504F037.D	Instrument Blank	KWG1603572-3	5/4/2016	14:12		5/4/2016	14:28
0504F045.D	Lab Control Sample	KWG1603391-4	5/4/2016	15:41		5/4/2016	15:57
0504F047.D	Method Blank	KWG1603391-5	5/4/2016	16:03		5/4/2016	16:19
0504F049.D	ZZZZZZ	ZZZZZZ	5/4/2016	16:25		5/4/2016	16:41
0504F051.D	ZZZZZZ	ZZZZZZ	5/4/2016	16:47		5/4/2016	17:03
0504F053.D	ZZZZZZ	ZZZZZZ	5/4/2016	17:09		5/4/2016	17:25
0504F055.D	ZZZZZZ	ZZZZZZ	5/4/2016	17:31		5/4/2016	17:47
0504F057.D	ZZZZZZ	ZZZZZZ	5/4/2016	17:54		5/4/2016	18:10
0504F059.D	ZZZZZZ	ZZZZZZ	5/4/2016	18:16		5/4/2016	18:32
0504F061.D	ZZZZZZ	ZZZZZZ	5/4/2016	18:39		5/4/2016	18:55
0504F063.D	ZZZZZZ	ZZZZZZ	5/4/2016	19:01		5/4/2016	19:17
0504F065.D	ZZZZZZ	ZZZZZZ	5/4/2016	19:24		5/4/2016	19:40
0504F067.D	ZZZZZZ	ZZZZZZ	5/4/2016	19:46		5/4/2016	20:02
0504F069.D	Continuing Calibration Verification	KWG1603572-2	5/4/2016	20:08		5/4/2016	20:24
0504F071.D	Continuing Calibration Verification	KWG1603572-2	5/4/2016	20:30		5/4/2016	20:46
0504F073.D	Instrument Blank	KWG1603572-4	5/4/2016	20:52		5/4/2016	21:08

Results flagged with an asterisk (*) indicate the holding time was exceeded for the analysis

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A

Service Request: K1604135

**Analysis Run Log
 Diesel and Residual Range Organics**

Analysis Method: NWTPH-Dx

Analysis Lot: KWG1603624
Instrument ID: GC21
Column: ZB-1

File ID	Sample Name	Lab Code	Date Analysis Started	Start Time	Q	Date Analysis Finished	Finish Time
0506F010.D	Continuing Calibration Verification	KWG1603624-1	5/6/2016	09:47		5/6/2016	10:03
0506F012.D	Continuing Calibration Verification	KWG1603624-1	5/6/2016	10:09		5/6/2016	10:25
0506F014.D	Instrument Blank	KWG1603624-5	5/6/2016	10:32		5/6/2016	10:48
0506F020.D	ZZZZZZ	ZZZZZZ	5/6/2016	11:38		5/6/2016	11:54
0506F022.D	ZZZZZZ	ZZZZZZ	5/6/2016	12:00		5/6/2016	12:16
0506F024.D	ZZZZZZ	ZZZZZZ	5/6/2016	12:23		5/6/2016	12:39
0506F026.D	ZZZZZZ	ZZZZZZ	5/6/2016	12:45		5/6/2016	13:01
0506F028.D	ZZZZZZ	ZZZZZZ	5/6/2016	13:07		5/6/2016	13:23
0506F030.D	ZZZZZZ	ZZZZZZ	5/6/2016	13:29		5/6/2016	13:45
0506F032.D	ZZZZZZ	ZZZZZZ	5/6/2016	13:51		5/6/2016	14:07
0506F034.D	ZZZZZZ	ZZZZZZ	5/6/2016	14:13		5/6/2016	14:29
0506F036.D	ZZZZZZ	ZZZZZZ	5/6/2016	14:35		5/6/2016	14:51
0506F038.D	ZZZZZZ	ZZZZZZ	5/6/2016	14:57		5/6/2016	15:13
0506F040.D	ZZZZZZ	ZZZZZZ	5/6/2016	15:19		5/6/2016	15:35
0506F042.D	Continuing Calibration Verification	KWG1603624-2	5/6/2016	15:41		5/6/2016	15:57
0506F044.D	Continuing Calibration Verification	KWG1603624-2	5/6/2016	16:03		5/6/2016	16:19
0506F046.D	Instrument Blank	KWG1603624-6	5/6/2016	16:24		5/6/2016	16:40
0506F048.D	ZZZZZZ	ZZZZZZ	5/6/2016	16:46		5/6/2016	17:02
0506F050.D	ZZZZZZ	ZZZZZZ	5/6/2016	17:08		5/6/2016	17:24
0506F052.D	ZZZZZZ	ZZZZZZ	5/6/2016	17:30		5/6/2016	17:46
0506F054.D	ZZZZZZ	ZZZZZZ	5/6/2016	17:52		5/6/2016	18:08
0506F056.D	ZZZZZZ	ZZZZZZ	5/6/2016	18:15		5/6/2016	18:31
0506F058.D	ZZZZZZ	ZZZZZZ	5/6/2016	18:36		5/6/2016	18:52
0506F060.D	ZZZZZZ	ZZZZZZ	5/6/2016	18:58		5/6/2016	19:14
0506F062.D	ZZZZZZ	ZZZZZZ	5/6/2016	19:20		5/6/2016	19:36
0506F064.D	ZZZZZZ	ZZZZZZ	5/6/2016	19:42		5/6/2016	19:58
0506F066.D	Continuing Calibration Verification	KWG1603624-3	5/6/2016	20:05		5/6/2016	20:21
0506F068.D	Continuing Calibration Verification	KWG1603624-3	5/6/2016	20:27		5/6/2016	20:43
0506F070.D	Instrument Blank	KWG1603624-7	5/6/2016	20:49		5/6/2016	21:05
0506F072.D	ZZZZZZ	ZZZZZZ	5/6/2016	21:11		5/6/2016	21:27
0506F074.D	ZZZZZZ	ZZZZZZ	5/6/2016	21:33		5/6/2016	21:49
0506F076.D	ZZZZZZ	ZZZZZZ	5/6/2016	21:55		5/6/2016	22:11
0506F078.D	ADC160418JPMW02	K1604135-008	5/6/2016	22:17		5/6/2016	22:33
0506F080.D	ADC160418AOC108B05	K1604135-009	5/6/2016	22:39		5/6/2016	22:55

Results flagged with an asterisk (*) indicate the holding time was exceeded for the analysis

QA/QC Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A

Service Request: K1604135

**Analysis Run Log
 Diesel and Residual Range Organics**

Analysis Method: NWTPH-Dx

Analysis Lot: KWG1603624
Instrument ID: GC21
Column: ZB-1

File ID	Sample Name	Lab Code	Date Analysis Started	Start Time	Q	Date Analysis Finished	Finish Time
0506F082.D	ZZZZZZ	ZZZZZZ	5/6/2016	23:01		5/6/2016	23:17
0506F084.D	ZZZZZZ	ZZZZZZ	5/6/2016	23:23		5/6/2016	23:39
0506F086.D	ZZZZZZ	ZZZZZZ	5/6/2016	23:46		5/7/2016	00:02
0506F088.D	Batch QC	K1604125-001	5/7/2016	00:08		5/7/2016	00:24
0506F090.D	Continuing Calibration Verification	KWG1603624-4	5/7/2016	00:30		5/7/2016	00:46
0506F092.D	Continuing Calibration Verification	KWG1603624-4	5/7/2016	00:52		5/7/2016	01:08
0506F094.D	Instrument Blank	KWG1603624-8	5/7/2016	01:14		5/7/2016	01:30

Results flagged with an asterisk (*) indicate the holding time was exceeded for the analysis

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A

Service Request: K1604135

**Analysis Run Log
 Diesel and Residual Range Organics**

Analysis Method: NWTPH-Dx

Analysis Lot: KWG1603661
Instrument ID: GC21
Column: ZB-1

File ID	Sample Name	Lab Code	Date Analysis Started	Start Time	Q	Date Analysis Finished	Finish Time
0509F026.D	Continuing Calibration Verification	KWG1603661-1	5/9/2016	14:03		5/9/2016	14:19
0509F028.D	Continuing Calibration Verification	KWG1603661-1	5/9/2016	14:25		5/9/2016	14:41
0509F030.D	Instrument Blank	KWG1603661-4	5/9/2016	14:47		5/9/2016	15:03
0509F036.D	Lab Control Sample	KWG1603581-2	5/9/2016	15:53		5/9/2016	16:09
0509F038.D	Method Blank	KWG1603581-3	5/9/2016	16:15		5/9/2016	16:31
0509F040.D	Batch QCDUP	KWG1603581-1	5/9/2016	16:36		5/9/2016	16:52
0509F042.D	Continuing Calibration Verification	KWG1603661-2	5/9/2016	16:58		5/9/2016	17:14
0509F044.D	Continuing Calibration Verification	KWG1603661-2	5/9/2016	17:20		5/9/2016	17:36
0509F046.D	Instrument Blank	KWG1603661-5	5/9/2016	17:42		5/9/2016	17:58
0509F048.D	ZZZZZZ	ZZZZZZ	5/9/2016	18:04		5/9/2016	18:20
0509F050.D	ZZZZZZ	ZZZZZZ	5/9/2016	18:26		5/9/2016	18:42
0509F052.D	ZZZZZZ	ZZZZZZ	5/9/2016	18:48		5/9/2016	19:04
0509F054.D	ZZZZZZ	ZZZZZZ	5/9/2016	19:10		5/9/2016	19:26
0509F056.D	ZZZZZZ	ZZZZZZ	5/9/2016	19:32		5/9/2016	19:48
0509F058.D	ZZZZZZ	ZZZZZZ	5/9/2016	19:54		5/9/2016	20:10
0509F060.D	ZZZZZZ	ZZZZZZ	5/9/2016	20:16		5/9/2016	20:32
0509F062.D	ZZZZZZ	ZZZZZZ	5/9/2016	20:38		5/9/2016	20:54
0509F064.D	ZZZZZZ	ZZZZZZ	5/9/2016	21:00		5/9/2016	21:16
0509F066.D	ZZZZZZ	ZZZZZZ	5/9/2016	21:22		5/9/2016	21:38
0509F068.D	ZZZZZZ	ZZZZZZ	5/9/2016	21:44		5/9/2016	22:00
0509F070.D	ZZZZZZ	ZZZZZZ	5/9/2016	22:06		5/9/2016	22:22
0509F072.D	Continuing Calibration Verification	KWG1603661-3	5/9/2016	22:28		5/9/2016	22:44
0509F074.D	Continuing Calibration Verification	KWG1603661-3	5/9/2016	22:51		5/9/2016	23:07
0509F076.D	Instrument Blank	KWG1603661-6	5/9/2016	23:13		5/9/2016	23:29

Results flagged with an asterisk (*) indicate the holding time was exceeded for the analysis

QA/QC Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A
Sample Matrix: Water

Service Request: K1604135
Date Extracted: 05/02/2016

Extraction Prep Log
Diesel and Residual Range Organics

Extraction Method: METHOD
Analysis Method: NWTPH-Dx

Extraction Lot: KWG1603391
Level: Low

Sample Name	Lab Code	Date Collected	Date Received	Sample Amount	Final Volume	% Solids	Note
ADC160418JPMW02	K1604135-008	04/18/16	04/22/16	1060ml	2ml	NA	
ADC160418AOC108B05	K1604135-009	04/18/16	04/22/16	1040ml	2ml	NA	
Method Blank	KWG1603391-5	NA	NA	1060ml	2ml	NA	
Batch QC	K1604125-001	NA	NA	900ml	2ml	NA	
Lab Control Sample	KWG1603391-4	NA	NA	1000ml	2ml	NA	

Results flagged with an asterisk (*) indicate the holding time was exceeded for the analysis

QA/QC Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A
Sample Matrix: Water

Service Request: K1604135
Date Extracted: 05/05/2016

Extraction Prep Log
Diesel and Residual Range Organics

Extraction Method: METHOD
Analysis Method: NWTPH-Dx

Extraction Lot: KWG1603581
Level: Low

Sample Name	Lab Code	Date Collected	Date Received	Sample Amount	Final Volume	% Solids	Note
Batch QCDUP	KWG1603581-1	NA	NA	980ml	2ml	NA	
Method Blank	KWG1603581-3	NA	NA	1000ml	2ml	NA	
Lab Control Sample	KWG1603581-2	NA	NA	1000ml	2ml	NA	

Results flagged with an asterisk (*) indicate the holding time was exceeded for the analysis



Gasoline Range Organics

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A

Service Request: K1604135

**Cover Page - Organic Analysis Data Package
 Gasoline Range Organics**

Sample Name	Lab Code	Date Collected	Date Received
AOC-16041995A172	K1604135-001	04/19/2016	04/22/2016
AOC-16041995A173A	K1604135-002	04/19/2016	04/22/2016
AOC-16041995A174	K1604135-003	04/19/2016	04/22/2016
AOC-16041907A177	K1604135-004	04/19/2016	04/22/2016
AOC-16041807A178	K1604135-005	04/18/2016	04/22/2016
AOC-16041807A188	K1604135-006	04/18/2016	04/22/2016
AOC-160418TB	K1604135-007	04/18/2016	04/22/2016
AOC-16041995A174MS	KWG1603414-1	04/19/2016	04/22/2016
AOC-16041995A174DMS	KWG1603414-2	04/19/2016	04/22/2016
AOC-16041995A174	KWG1603414-5	04/19/2016	04/22/2016

Analytical Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A
Sample Matrix: Water

Service Request: K1604135
Date Collected: 04/19/2016
Date Received: 04/22/2016

Gasoline Range Organics

Sample Name: AOC-16041995A172
Lab Code: K1604135-001
Extraction Method: EPA 5030B
Analysis Method: NWTPH-Gx

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics-NWTPH	ND	U	250	25	9.6	1	04/27/16	04/27/16	KWG1603414	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Difluorobenzene	102	50-150	04/27/16	Acceptable

Comments: _____

Analytical Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A
Sample Matrix: Water

Service Request: K1604135
Date Collected: 04/19/2016
Date Received: 04/22/2016

Gasoline Range Organics

Sample Name: AOC-16041995A173A
Lab Code: K1604135-002
Extraction Method: EPA 5030B
Analysis Method: NWTPH-Gx

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics-NWTPH	61	J	250	25	9.6	1	04/27/16	04/27/16	KWG1603414	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Difluorobenzene	100	50-150	04/27/16	Acceptable

Comments: _____

Analytical Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A
Sample Matrix: Water

Service Request: K1604135
Date Collected: 04/19/2016
Date Received: 04/22/2016

Gasoline Range Organics

Sample Name: AOC-16041995A174
Lab Code: K1604135-003
Extraction Method: EPA 5030B
Analysis Method: NWTPH-Gx

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics-NWTPH	ND	U	250	25	9.6	1	04/27/16	04/27/16	KWG1603414	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Difluorobenzene	100	50-150	04/27/16	Acceptable

Comments: _____

Analytical Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A
Sample Matrix: Water

Service Request: K1604135
Date Collected: 04/19/2016
Date Received: 04/22/2016

Gasoline Range Organics

Sample Name: AOC-16041907A177
Lab Code: K1604135-004
Extraction Method: EPA 5030B
Analysis Method: NWTPH-Gx

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics-NWTPH	10	J	250	25	9.6	1	04/27/16	04/27/16	KWG1603414	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Difluorobenzene	101	50-150	04/27/16	Acceptable

Comments: _____

Analytical Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A
Sample Matrix: Water

Service Request: K1604135
Date Collected: 04/18/2016
Date Received: 04/22/2016

Gasoline Range Organics

Sample Name: AOC-16041807A178
Lab Code: K1604135-005
Extraction Method: EPA 5030B
Analysis Method: NWTPH-Gx

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics-NWTPH	14	J	250	25	9.6	1	04/27/16	04/27/16	KWG1603414	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Difluorobenzene	100	50-150	04/27/16	Acceptable

Comments: _____

Analytical Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A
Sample Matrix: Water

Service Request: K1604135
Date Collected: 04/18/2016
Date Received: 04/22/2016

Gasoline Range Organics

Sample Name: AOC-16041807A188
Lab Code: K1604135-006
Extraction Method: EPA 5030B
Analysis Method: NWTPH-Gx

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics-NWTPH	15	J	250	25	9.6	1	04/27/16	04/27/16	KWG1603414	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Difluorobenzene	101	50-150	04/27/16	Acceptable

Comments: _____

Analytical Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A
Sample Matrix: Water

Service Request: K1604135
Date Collected: 04/18/2016
Date Received: 04/22/2016

Gasoline Range Organics

Sample Name: AOC-160418TB
Lab Code: K1604135-007
Extraction Method: EPA 5030B
Analysis Method: NWTPH-Gx

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics-NWTPH	ND	U	250	25	9.6	1	04/27/16	04/27/16	KWG1603414	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Difluorobenzene	101	50-150	04/27/16	Acceptable

Comments: _____

Analytical Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A
Sample Matrix: Water

Service Request: K1604135
Date Collected: NA
Date Received: NA

Gasoline Range Organics

Sample Name: Method Blank
Lab Code: KWG1603414-4
Extraction Method: EPA 5030B
Analysis Method: NWTPH-Gx

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics-NWTPH	ND	U	250	25	9.6	1	04/27/16	04/27/16	KWG1603414	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Difluorobenzene	101	50-150	04/27/16	Acceptable

Comments: _____

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A
Sample Matrix: Water

Service Request: K1604135

**Surrogate Recovery Summary
 Gasoline Range Organics**

Extraction Method: EPA 5030B
Analysis Method: NWTPH-Gx

Units: Percent
Level: Low

<u>Sample Name</u>	<u>Lab Code</u>	<u>Sur1</u>
AOC-16041995A172	K1604135-001	102
AOC-16041995A173A	K1604135-002	100
AOC-16041995A174	K1604135-003	100
AOC-16041907A177	K1604135-004	101
AOC-16041807A178	K1604135-005	100
AOC-16041807A188	K1604135-006	101
AOC-160418TB	K1604135-007	101
AOC-16041995A174DUP	KWG1603414-5	101
Method Blank	KWG1603414-4	101
AOC-16041995A174MS	KWG1603414-1	101
AOC-16041995A174DMS	KWG1603414-2	102
Lab Control Sample	KWG1603414-3	101

Surrogate Recovery Control Limits (%)

Sur1 = 1,4-Difluorobenzene 50-150

Results flagged with an asterisk (*) indicate values outside control criteria.
 Results flagged with a pound (#) indicate the control criteria is not applicable.

QA/QC Report

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A
Sample Matrix: Water

Service Request: K1604135
Date Extracted: 04/27/2016
Date Analyzed: 04/27/2016

Matrix Spike/Duplicate Matrix Spike Summary
Gasoline Range Organics

Sample Name: AOC-16041995A174
Lab Code: K1604135-003
Extraction Method: EPA 5030B
Analysis Method: NWTPH-Gx

Units: ug/L
Basis: NA
Level: Low
Extraction Lot: KWG1603414

Analyte Name	Sample Result	AOC-16041995A174MS KWG1603414-1 Matrix Spike			AOC-16041995A174DMS KWG1603414-2 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Spike Amount	%Rec	Result	Spike Amount	%Rec			
Gasoline Range Organics-NWTPH	ND	451	500	90	488	500	98	80-119	8	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

QA/QC Report

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A
Sample Matrix: Water

Service Request: K1604135
Date Extracted: 04/27/2016
Date Analyzed: 04/27/2016

Duplicate Sample Summary
Gasoline Range Organics

Sample Name: AOC-16041995A174
Lab Code: K1604135-003
Extraction Method: EPA 5030B
Analysis Method: NWTPH-Gx

Units: ug/L
Basis: NA
Level: Low
Extraction Lot: KWG1603414

Analyte Name	LOQ	MDL	Sample Result	AOC-16041995A174DUP KWG1603414-5 Duplicate Sample		Relative Percent Difference	RPD Limit
				Result	Average		
Gasoline Range Organics-NWTPH	250	9.6	ND	ND	ND	-	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

QA/QC Report

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A
Sample Matrix: Water

Service Request: K1604135
Date Extracted: 04/27/2016
Date Analyzed: 04/27/2016

Lab Control Spike Summary
Gasoline Range Organics

Extraction Method: EPA 5030B
Analysis Method: NWTPH-Gx

Units: ug/L
Basis: NA
Level: Low
Extraction Lot: KWG1603414

Lab Control Sample
 KWG1603414-3
Lab Control Spike

Analyte Name	Result	Spike Amount	%Rec	%Rec Limits
Gasoline Range Organics-NWTPH	487	500	97	80-119

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

QA/QC Report

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A
Sample Matrix: Water

Service Request: K1604135
Date Extracted: 04/27/2016
Date Analyzed: 04/27/2016
Time Analyzed: 21:03

Method Blank Summary
Gasoline Range Organics

Sample Name: Method Blank
Lab Code: KWG1603414-4
Extraction Method: EPA 5030B
Analysis Method: NWTPH-Gx

Instrument ID: GC39
File ID: J:\GC39\DATA\042616\0426F085.D
Level: Low
Extraction Lot: KWG1603414

This Method Blank applies to the following analyses:

Sample Name	Lab Code	File ID	Date Analyzed	Time Analyzed
AOC-16041995A172	K1604135-001	J:\GC39\DATA\042616\0426F074.D	04/27/16	16:38
AOC-16041995A173A	K1604135-002	J:\GC39\DATA\042616\0426F075.D	04/27/16	17:02
AOC-16041995A174	K1604135-003	J:\GC39\DATA\042616\0426F076.D	04/27/16	17:26
AOC-16041995A174DUP	KWG1603414-5	J:\GC39\DATA\042616\0426F077.D	04/27/16	17:50
AOC-16041995A174MS	KWG1603414-1	J:\GC39\DATA\042616\0426F078.D	04/27/16	18:14
AOC-16041995A174DMS	KWG1603414-2	J:\GC39\DATA\042616\0426F079.D	04/27/16	18:38
AOC-16041907A177	K1604135-004	J:\GC39\DATA\042616\0426F080.D	04/27/16	19:02
AOC-16041807A178	K1604135-005	J:\GC39\DATA\042616\0426F081.D	04/27/16	19:27
AOC-16041807A188	K1604135-006	J:\GC39\DATA\042616\0426F082.D	04/27/16	19:51
AOC-160418TB	K1604135-007	J:\GC39\DATA\042616\0426F083.D	04/27/16	20:15
Lab Control Sample	KWG1603414-3	J:\GC39\DATA\042616\0426F084.D	04/27/16	20:39

QA/QC Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A

Service Request: K1604135
Calibration Date: 08/06/2015

Initial Calibration Summary
Gasoline Range Organics

Calibration ID: CAL14201
Instrument ID: GC39

Column: DB-624

Level ID	File ID	Level ID	File ID
A	J:\GC39\Data\080615\0806F009.D	E	J:\GC39\Data\080615\0806F013.D
B	J:\GC39\Data\080615\0806F010.D	F	J:\GC39\Data\080615\0806F014.D
C	J:\GC39\Data\080615\0806F011.D	G	J:\GC39\Data\080615\0806F015.D
D	J:\GC39\Data\080615\0806F012.D		

Analyte Name	Level ID			Level ID			Level ID			Level ID					
	ID	Amt	RF	ID	Amt	RF	ID	Amt	RF	ID	Amt	RF			
Gasoline Range Organics-NWTPH	A	50	74200	B	100	63800	C	200	67900	D	500	66800	E	1000	66900
	F	5000	71800	G	10000	73400									
1,4-Difluorobenzene	A	20	1.23E+5	B	25	1.25E+5	C	50	1.20E+5	D	100	1.16E+5	E	150	1.18E+5

Results flagged with an asterisk (*) indicate values outside control criteria.

QA/QC Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A

Service Request: K1604135
Calibration Date: 08/06/2015

Initial Calibration Summary
Gasoline Range Organics

Calibration ID: CAL14201
Instrument ID: GC39

Column: DB-624

Analyte Name	Compound Type	Calibration Evaluation				Control Criteria
		Fit Type	Eval.	Eval. Result	Q	
Gasoline Range Organics-NWTPH	MS	AverageRF	% RSD	5.6		≤ 20
1,4-Difluorobenzene	SURR	AverageRF	% RSD	3.0		≤ 20

Results flagged with an asterisk (*) indicate values outside control criteria.

QA/QC Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A

Service Request: K1604135
Calibration Date: 08/06/2015
Date Analyzed: 08/06/2015

**Second Source Calibration Verification
 Gasoline Range Organics**

Calibration Type: External Standard
Analysis Method: NWTPH-Gx

Calibration ID: CAL14201
Units: ug/L

File ID: J:\GC39\Data\080615\0806F018.D

Column ID: DB-624

Analyte Name	Expected	Result	Average RF	SSV RF	%D	%Drift	Criteria	Curve Fit
Gasoline Range Organics-NWTPH	500	430	69300	60200	-13	NA	± 15 %	AverageRF

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

QA/QC Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A

Service Request: K1604135
Date Analyzed: 04/27/2016

Continuing Calibration Verification Summary
Gasoline Range Organics

Calibration Type: External Standard
Analysis Method: NWTPH-Gx

Calibration Date: 08/06/2015
Calibration ID: CAL14201
Analysis Lot: KWG1603358
Units: ug/L
Column ID: DB-624

File ID: J:\GC39\DATA\042616\0426F071.D

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Gasoline Range Organics-NWTPH	500	490	69300	67700	-2	NA	± 20	AverageRF
1,4-Difluorobenzene	100	100	120000	123000	2	NA	± 20	AverageRF

Results flagged with an asterisk (*) indicate values outside control criteria.

QA/QC Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A

Service Request: K1604135
Date Analyzed: 04/27/2016

Continuing Calibration Verification Summary
Gasoline Range Organics

Calibration Type: External Standard
Analysis Method: NWTPH-Gx

Calibration Date: 08/06/2015
Calibration ID: CAL14201
Analysis Lot: KWG1603358
Units: ug/L
Column ID: DB-624

File ID: J:\GC39\DATA\042616\0426F087.D

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Gasoline Range Organics-NWTPH	500	480	69300	66300	-4	NA	± 20	AverageRF
1,4-Difluorobenzene	100	100	120000	124000	3	NA	± 20	AverageRF

Results flagged with an asterisk (*) indicate values outside control criteria.

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A

Service Request: K1604135

Analysis Run Log
Gasoline Range Organics

Analysis Method: NWTPH-Gx

Analysis Lot: KWG1603358
Instrument ID: GC39
Column: DB-624

File ID	Sample Name	Lab Code	Date Analysis Started	Start Time	Q	Date Analysis Finished	Finish Time
0426F006.D	Continuing Calibration Verification	KWG1603358-1	4/26/2016	11:56		4/26/2016	12:11
0426F007.D	Instrument Blank	KWG1603358-8	4/26/2016	12:38		4/26/2016	12:53
0426F015.D	ZZZZZZ	ZZZZZZ	4/26/2016	16:17		4/26/2016	16:32
0426F016.D	ZZZZZZ	ZZZZZZ	4/26/2016	16:41		4/26/2016	16:56
0426F018.D	ZZZZZZ	ZZZZZZ	4/26/2016	18:03		4/26/2016	18:18
0426F022.D	ZZZZZZ	ZZZZZZ	4/26/2016	19:40		4/26/2016	19:55
0426F025.D	ZZZZZZ	ZZZZZZ	4/26/2016	20:53		4/26/2016	21:08
0426F026.D	ZZZZZZ	ZZZZZZ	4/26/2016	21:17		4/26/2016	21:32
0426F027.D	ZZZZZZ	ZZZZZZ	4/26/2016	21:41		4/26/2016	21:56
0426F028.D	ZZZZZZ	ZZZZZZ	4/26/2016	22:05		4/26/2016	22:20
0426F029.D	Continuing Calibration Verification	KWG1603358-2	4/26/2016	22:29		4/26/2016	22:44
0426F030.D	Instrument Blank	KWG1603358-9	4/26/2016	22:53		4/26/2016	23:08
0426F031.D	ZZZZZZ	ZZZZZZ	4/26/2016	23:17		4/26/2016	23:32
0426F032.D	ZZZZZZ	ZZZZZZ	4/26/2016	23:41		4/26/2016	23:56
0426F035.D	ZZZZZZ	ZZZZZZ	4/27/2016	00:54		4/27/2016	01:09
0426F038.D	ZZZZZZ	ZZZZZZ	4/27/2016	02:06		4/27/2016	02:21
0426F041.D	ZZZZZZ	ZZZZZZ	4/27/2016	03:19		4/27/2016	03:34
0426F042.D	ZZZZZZ	ZZZZZZ	4/27/2016	03:43		4/27/2016	03:58
0426F043.D	ZZZZZZ	ZZZZZZ	4/27/2016	04:07		4/27/2016	04:22
0426F044.D	ZZZZZZ	ZZZZZZ	4/27/2016	04:31		4/27/2016	04:46
0426F045.D	ZZZZZZ	ZZZZZZ	4/27/2016	04:56		4/27/2016	05:11
0426F046.D	ZZZZZZ	ZZZZZZ	4/27/2016	05:20		4/27/2016	05:35
0426F047.D	ZZZZZZ	ZZZZZZ	4/27/2016	05:44		4/27/2016	05:59
0426F048.D	ZZZZZZ	ZZZZZZ	4/27/2016	06:08		4/27/2016	06:23
0426F049.D	ZZZZZZ	ZZZZZZ	4/27/2016	06:32		4/27/2016	06:47
0426F050.D	Continuing Calibration Verification	KWG1603358-3	4/27/2016	06:56		4/27/2016	07:11
0426F051.D	Instrument Blank	KWG1603358-10	4/27/2016	07:20		4/27/2016	07:35
0426F052.D	ZZZZZZ	ZZZZZZ	4/27/2016	07:44		4/27/2016	07:59
0426F053.D	ZZZZZZ	ZZZZZZ	4/27/2016	08:09		4/27/2016	08:24
0426F054.D	ZZZZZZ	ZZZZZZ	4/27/2016	08:33		4/27/2016	08:48
0426F055.D	ZZZZZZ	ZZZZZZ	4/27/2016	08:57		4/27/2016	09:12
0426F056.D	ZZZZZZ	ZZZZZZ	4/27/2016	09:21		4/27/2016	09:36
0426F057.D	ZZZZZZ	ZZZZZZ	4/27/2016	09:45		4/27/2016	10:00
0426F058.D	ZZZZZZ	ZZZZZZ	4/27/2016	10:10		4/27/2016	10:25
0426F059.D	ZZZZZZ	ZZZZZZ	4/27/2016	10:34		4/27/2016	10:49

Results flagged with an asterisk (*) indicate the holding time was exceeded for the analysis

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A

Service Request: K1604135

Analysis Run Log
Gasoline Range Organics

Analysis Method: NWTPH-Gx

Analysis Lot: KWG1603358
Instrument ID: GC39
Column: DB-624

File ID	Sample Name	Lab Code	Date Analysis Started	Start Time	Q	Date Analysis Finished	Finish Time
0426F060.D	ZZZZZZ	ZZZZZZ	4/27/2016	10:58		4/27/2016	11:13
0426F061.D	ZZZZZZ	ZZZZZZ	4/27/2016	11:22		4/27/2016	11:37
0426F062.D	Continuing Calibration Verification	KWG1603358-4	4/27/2016	11:47		4/27/2016	12:02
0426F063.D	Instrument Blank	KWG1603358-11	4/27/2016	12:11		4/27/2016	12:26
0426F064.D	ZZZZZZ	ZZZZZZ	4/27/2016	12:35		4/27/2016	12:50
0426F066.D	ZZZZZZ	ZZZZZZ	4/27/2016	13:24		4/27/2016	13:39
0426F067.D	ZZZZZZ	ZZZZZZ	4/27/2016	13:48		4/27/2016	14:03
0426F068.D	ZZZZZZ	ZZZZZZ	4/27/2016	14:12		4/27/2016	14:27
0426F070.D	ZZZZZZ	ZZZZZZ	4/27/2016	15:01		4/27/2016	15:16
0426F071.D	Continuing Calibration Verification	KWG1603358-5	4/27/2016	15:25		4/27/2016	15:40
0426F073.D	Instrument Blank	KWG1603358-12	4/27/2016	16:13		4/27/2016	16:28
0426F074.D	AOC-16041995A172	K1604135-001	4/27/2016	16:38		4/27/2016	16:53
0426F075.D	AOC-16041995A173A	K1604135-002	4/27/2016	17:02		4/27/2016	17:17
0426F076.D	AOC-16041995A174	K1604135-003	4/27/2016	17:26		4/27/2016	17:41
0426F077.D	AOC-16041995A174DUP	KWG1603414-5	4/27/2016	17:50		4/27/2016	18:05
0426F078.D	AOC-16041995A174MS	KWG1603414-1	4/27/2016	18:14		4/27/2016	18:29
0426F079.D	AOC-16041995A174DMS	KWG1603414-2	4/27/2016	18:38		4/27/2016	18:53
0426F080.D	AOC-16041907A177	K1604135-004	4/27/2016	19:02		4/27/2016	19:17
0426F081.D	AOC-16041807A178	K1604135-005	4/27/2016	19:27		4/27/2016	19:42
0426F082.D	AOC-16041807A188	K1604135-006	4/27/2016	19:51		4/27/2016	20:06
0426F083.D	AOC-160418TB	K1604135-007	4/27/2016	20:15		4/27/2016	20:30
0426F084.D	Lab Control Sample	KWG1603414-3	4/27/2016	20:39		4/27/2016	20:54
0426F085.D	Method Blank	KWG1603414-4	4/27/2016	21:03		4/27/2016	21:18
0426F087.D	Continuing Calibration Verification	KWG1603358-6	4/27/2016	21:52		4/27/2016	22:07
0426F088.D	Instrument Blank	KWG1603358-13	4/27/2016	22:16		4/27/2016	22:31
0426F089.D	ZZZZZZ	ZZZZZZ	4/27/2016	22:40		4/27/2016	22:55
0426F090.D	ZZZZZZ	ZZZZZZ	4/27/2016	23:04		4/27/2016	23:19
0426F103.D	ZZZZZZ	ZZZZZZ	4/28/2016	04:19		4/28/2016	04:34
0426F106.D	ZZZZZZ	ZZZZZZ	4/28/2016	05:31		4/28/2016	05:46
0426F107.D	ZZZZZZ	ZZZZZZ	4/28/2016	05:55		4/28/2016	06:10
0426F108.D	ZZZZZZ	ZZZZZZ	4/28/2016	06:19		4/28/2016	06:34
0426F109.D	Continuing Calibration Verification	KWG1603358-7	4/28/2016	06:43		4/28/2016	06:58
0426F110.D	Instrument Blank	KWG1603358-14	4/28/2016	07:07		4/28/2016	07:22

Results flagged with an asterisk (*) indicate the holding time was exceeded for the analysis

QA/QC Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A
Sample Matrix: Water

Service Request: K1604135
Date Extracted: 04/27/2016

Extraction Prep Log
Gasoline Range Organics

Extraction Method: EPA 5030B
Analysis Method: NWTPH-Gx

Extraction Lot: KWG1603414
Level: Low

Sample Name	Lab Code	Date Collected	Date Received	Sample Amount	Final Volume	% Solids	Note
AOC-16041995A172	K1604135-001	04/19/16	04/22/16	10ml	10ml	NA	
AOC-16041995A173A	K1604135-002	04/19/16	04/22/16	10ml	10ml	NA	
AOC-16041995A174	K1604135-003	04/19/16	04/22/16	10ml	10ml	NA	
AOC-16041907A177	K1604135-004	04/19/16	04/22/16	10ml	10ml	NA	
AOC-16041807A178	K1604135-005	04/18/16	04/22/16	10ml	10ml	NA	
AOC-16041807A188	K1604135-006	04/18/16	04/22/16	10ml	10ml	NA	
AOC-160418TB	K1604135-007	04/18/16	04/22/16	10ml	10ml	NA	
AOC-16041995A174DUP	KWG1603414-5	04/19/16	04/22/16	10ml	10ml	NA	
Method Blank	KWG1603414-4	NA	NA	10ml	10ml	NA	
AOC-16041995A174MS	KWG1603414-1	04/19/16	04/22/16	10ml	10ml	NA	
AOC-16041995A174DMS	KWG1603414-2	04/19/16	04/22/16	10ml	10ml	NA	
Lab Control Sample	KWG1603414-3	NA	NA	10ml	10ml	NA	

Results flagged with an asterisk (*) indicate the holding time was exceeded for the analysis



Volatile Organic Compounds

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A

Service Request: K1604135

**Cover Page - Organic Analysis Data Package
 Volatile Organic Compounds**

Sample Name	Lab Code	Date Collected	Date Received
AOC-16041995A172	K1604135-001	04/19/2016	04/22/2016
AOC-16041995A173A	K1604135-002	04/19/2016	04/22/2016
AOC-16041995A174	K1604135-003	04/19/2016	04/22/2016
AOC-16041907A177	K1604135-004	04/19/2016	04/22/2016
AOC-16041807A178	K1604135-005	04/18/2016	04/22/2016
AOC-16041807A188	K1604135-006	04/18/2016	04/22/2016
AOC-160418TB	K1604135-007	04/18/2016	04/22/2016
AOC-16041995A174MS	KWG1603398-1	04/19/2016	04/22/2016
AOC-16041995A174DMS	KWG1603398-2	04/19/2016	04/22/2016

Analytical Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A
Sample Matrix: Water

Service Request: K1604135
Date Collected: 04/19/2016
Date Received: 04/22/2016

Volatile Organic Compounds

Sample Name: AOC-16041995A172
Lab Code: K1604135-001
Extraction Method: EPA 5030B
Analysis Method: 8260C

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	ND	U	0.50	0.10	0.062	1	05/02/16	05/02/16	KWG1603398	
Toluene	ND	U	0.50	0.10	0.054	1	05/02/16	05/02/16	KWG1603398	
Ethylbenzene	ND	U	0.50	0.10	0.050	1	05/02/16	05/02/16	KWG1603398	
m,p-Xylenes	ND	U	0.50	0.20	0.11	1	05/02/16	05/02/16	KWG1603398	
o-Xylene	ND	U	0.50	0.20	0.074	1	05/02/16	05/02/16	KWG1603398	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,2-Dichloroethane-d4	88	70-120	05/02/16	Acceptable
Dibromofluoromethane	91	85-115	05/02/16	Acceptable
Toluene-d8	99	85-120	05/02/16	Acceptable
4-Bromofluorobenzene	85	75-120	05/02/16	Acceptable

Comments: _____

Analytical Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A
Sample Matrix: Water

Service Request: K1604135
Date Collected: 04/19/2016
Date Received: 04/22/2016

Volatile Organic Compounds

Sample Name: AOC-16041995A173A
Lab Code: K1604135-002
Extraction Method: EPA 5030B
Analysis Method: 8260C

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	ND	U	0.50	0.10	0.062	1	05/02/16	05/02/16	KWG1603398	
Toluene	ND	U	0.50	0.10	0.054	1	05/02/16	05/02/16	KWG1603398	
Ethylbenzene	ND	U	0.50	0.10	0.050	1	05/02/16	05/02/16	KWG1603398	
m,p-Xylenes	ND	U	0.50	0.20	0.11	1	05/02/16	05/02/16	KWG1603398	
o-Xylene	ND	U	0.50	0.20	0.074	1	05/02/16	05/02/16	KWG1603398	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,2-Dichloroethane-d4	89	70-120	05/02/16	Acceptable
Dibromofluoromethane	93	85-115	05/02/16	Acceptable
Toluene-d8	100	85-120	05/02/16	Acceptable
4-Bromofluorobenzene	86	75-120	05/02/16	Acceptable

Comments: _____

Analytical Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A
Sample Matrix: Water

Service Request: K1604135
Date Collected: 04/19/2016
Date Received: 04/22/2016

Volatile Organic Compounds

Sample Name: AOC-16041995A174
Lab Code: K1604135-003
Extraction Method: EPA 5030B
Analysis Method: 8260C

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	0.34	J	0.50	0.10	0.062	1	05/02/16	05/02/16	KWG1603398	
Toluene	0.48	J	0.50	0.10	0.054	1	05/02/16	05/02/16	KWG1603398	
Ethylbenzene	0.22	J	0.50	0.10	0.050	1	05/02/16	05/02/16	KWG1603398	
m,p-Xylenes	3.8		0.50	0.20	0.11	1	05/02/16	05/02/16	KWG1603398	
o-Xylene	2.7	J	0.50	0.20	0.074	1	05/02/16	05/02/16	KWG1603398	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,2-Dichloroethane-d4	88	70-120	05/02/16	Acceptable
Dibromofluoromethane	92	85-115	05/02/16	Acceptable
Toluene-d8	99	85-120	05/02/16	Acceptable
4-Bromofluorobenzene	86	75-120	05/02/16	Acceptable

Comments: _____

Analytical Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A
Sample Matrix: Water

Service Request: K1604135
Date Collected: 04/19/2016
Date Received: 04/22/2016

Volatile Organic Compounds

Sample Name: AOC-16041907A177
Lab Code: K1604135-004
Extraction Method: EPA 5030B
Analysis Method: 8260C

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	0.080	J	0.50	0.10	0.062	1	05/02/16	05/02/16	KWG1603398	
Toluene	0.080	J	0.50	0.10	0.054	1	05/02/16	05/02/16	KWG1603398	
Ethylbenzene	ND	U	0.50	0.10	0.050	1	05/02/16	05/02/16	KWG1603398	
m,p-Xylenes	ND	U	0.50	0.20	0.11	1	05/02/16	05/02/16	KWG1603398	
o-Xylene	ND	U	0.50	0.20	0.074	1	05/02/16	05/02/16	KWG1603398	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,2-Dichloroethane-d4	88	70-120	05/02/16	Acceptable
Dibromofluoromethane	92	85-115	05/02/16	Acceptable
Toluene-d8	99	85-120	05/02/16	Acceptable
4-Bromofluorobenzene	85	75-120	05/02/16	Acceptable

Comments: _____

Analytical Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A
Sample Matrix: Water

Service Request: K1604135
Date Collected: 04/18/2016
Date Received: 04/22/2016

Volatile Organic Compounds

Sample Name: AOC-16041807A178
Lab Code: K1604135-005
Extraction Method: EPA 5030B
Analysis Method: 8260C

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	0.14	J	0.50	0.10	0.062	1	04/28/16	04/28/16	KWG1603323	
Toluene	0.57		0.50	0.10	0.054	1	04/28/16	04/28/16	KWG1603323	
Ethylbenzene	0.070	J	0.50	0.10	0.050	1	04/28/16	04/28/16	KWG1603323	
m,p-Xylenes	0.72		0.50	0.20	0.11	1	04/28/16	04/28/16	KWG1603323	
o-Xylene	0.89		0.50	0.20	0.074	1	04/28/16	04/28/16	KWG1603323	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,2-Dichloroethane-d4	88	70-120	04/28/16	Acceptable
Dibromofluoromethane	93	85-115	04/28/16	Acceptable
Toluene-d8	100	85-120	04/28/16	Acceptable
4-Bromofluorobenzene	87	75-120	04/28/16	Acceptable

Comments: _____

Analytical Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A
Sample Matrix: Water

Service Request: K1604135
Date Collected: 04/18/2016
Date Received: 04/22/2016

Volatile Organic Compounds

Sample Name: AOC-16041807A188
Lab Code: K1604135-006
Extraction Method: EPA 5030B
Analysis Method: 8260C

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	0.14	J	0.50	0.10	0.062	1	04/28/16	04/28/16	KWG1603323	
Toluene	0.52		0.50	0.10	0.054	1	04/28/16	04/28/16	KWG1603323	
Ethylbenzene	0.080	J	0.50	0.10	0.050	1	04/28/16	04/28/16	KWG1603323	
m,p-Xylenes	0.65		0.50	0.20	0.11	1	04/28/16	04/28/16	KWG1603323	
o-Xylene	0.83		0.50	0.20	0.074	1	04/28/16	04/28/16	KWG1603323	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,2-Dichloroethane-d4	88	70-120	04/28/16	Acceptable
Dibromofluoromethane	92	85-115	04/28/16	Acceptable
Toluene-d8	100	85-120	04/28/16	Acceptable
4-Bromofluorobenzene	86	75-120	04/28/16	Acceptable

Comments: _____

Analytical Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A
Sample Matrix: Water

Service Request: K1604135
Date Collected: 04/18/2016
Date Received: 04/22/2016

Volatile Organic Compounds

Sample Name: AOC-160418TB
Lab Code: K1604135-007
Extraction Method: EPA 5030B
Analysis Method: 8260C

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	ND	U	0.50	0.10	0.062	1	04/28/16	04/28/16	KWG1603323	
Toluene	ND	U	0.50	0.10	0.054	1	04/28/16	04/28/16	KWG1603323	
Ethylbenzene	ND	U	0.50	0.10	0.050	1	04/28/16	04/28/16	KWG1603323	
m,p-Xylenes	ND	U	0.50	0.20	0.11	1	04/28/16	04/28/16	KWG1603323	
o-Xylene	ND	U	0.50	0.20	0.074	1	04/28/16	04/28/16	KWG1603323	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,2-Dichloroethane-d4	88	70-120	04/28/16	Acceptable
Dibromofluoromethane	94	85-115	04/28/16	Acceptable
Toluene-d8	98	85-120	04/28/16	Acceptable
4-Bromofluorobenzene	84	75-120	04/28/16	Acceptable

Comments: _____

Analytical Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A
Sample Matrix: Water

Service Request: K1604135
Date Collected: NA
Date Received: NA

Volatile Organic Compounds

Sample Name: Method Blank
Lab Code: KWG1603323-3
Extraction Method: EPA 5030B
Analysis Method: 8260C

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	ND	U	0.50	0.10	0.062	1	04/28/16	04/28/16	KWG1603323	
Toluene	ND	U	0.50	0.10	0.054	1	04/28/16	04/28/16	KWG1603323	
Ethylbenzene	ND	U	0.50	0.10	0.050	1	04/28/16	04/28/16	KWG1603323	
m,p-Xylenes	ND	U	0.50	0.20	0.11	1	04/28/16	04/28/16	KWG1603323	
o-Xylene	ND	U	0.50	0.20	0.074	1	04/28/16	04/28/16	KWG1603323	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,2-Dichloroethane-d4	86	70-120	04/28/16	Acceptable
Dibromofluoromethane	92	85-115	04/28/16	Acceptable
Toluene-d8	100	85-120	04/28/16	Acceptable
4-Bromofluorobenzene	83	75-120	04/28/16	Acceptable

Comments: _____

Analytical Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A
Sample Matrix: Water

Service Request: K1604135
Date Collected: NA
Date Received: NA

Volatile Organic Compounds

Sample Name: Method Blank
Lab Code: KWG1603398-5
Extraction Method: EPA 5030B
Analysis Method: 8260C

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	ND	U	0.50	0.10	0.062	1	05/02/16	05/02/16	KWG1603398	
Toluene	ND	U	0.50	0.10	0.054	1	05/02/16	05/02/16	KWG1603398	
Ethylbenzene	ND	U	0.50	0.10	0.050	1	05/02/16	05/02/16	KWG1603398	
m,p-Xylenes	ND	U	0.50	0.20	0.11	1	05/02/16	05/02/16	KWG1603398	
o-Xylene	ND	U	0.50	0.20	0.074	1	05/02/16	05/02/16	KWG1603398	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,2-Dichloroethane-d4	89	70-120	05/02/16	Acceptable
Dibromofluoromethane	93	85-115	05/02/16	Acceptable
Toluene-d8	100	85-120	05/02/16	Acceptable
4-Bromofluorobenzene	87	75-120	05/02/16	Acceptable

Comments: _____

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A
Sample Matrix: Water

Service Request: K1604135

**Surrogate Recovery Summary
 Volatile Organic Compounds**

Extraction Method: EPA 5030B
Analysis Method: 8260C

Units: Percent
Level: Low

<u>Sample Name</u>	<u>Lab Code</u>	<u>Sur1</u>	<u>Sur2</u>	<u>Sur3</u>	<u>Sur4</u>
AOC-16041995A172	K1604135-001	88	91	99	85
AOC-16041995A173A	K1604135-002	89	93	100	86
AOC-16041995A174	K1604135-003	88	92	99	86
AOC-16041907A177	K1604135-004	88	92	99	85
AOC-16041807A178	K1604135-005	88	93	100	87
AOC-16041807A188	K1604135-006	88	92	100	86
AOC-160418TB	K1604135-007	88	94	98	84
Method Blank	KWG1603323-3	86	92	100	83
Method Blank	KWG1603398-5	89	93	100	87
AOC-16041995A174MS	KWG1603398-1	92	95	104	91
AOC-16041995A174DMS	KWG1603398-2	88	95	104	90
Lab Control Sample	KWG1603323-1	89	97	105	90
Duplicate Lab Control Sample	KWG1603323-2	90	97	104	88
Lab Control Sample	KWG1603398-3	90	96	103	90
Duplicate Lab Control Sample	KWG1603398-4	90	96	104	90

Surrogate Recovery Control Limits (%)

Sur1 = 1,2-Dichloroethane-d4	70-120
Sur2 = Dibromofluoromethane	85-115
Sur3 = Toluene-d8	85-120
Sur4 = 4-Bromofluorobenzene	75-120

Results flagged with an asterisk (*) indicate values outside control criteria.
 Results flagged with a pound (#) indicate the control criteria is not applicable.

QA/QC Report

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A

Service Request: K1604135
Date Analyzed: 04/28/2016
Time Analyzed: 08:59

Internal Standard Area and RT Summary
Volatile Organic Compounds

File ID: J:\MS13\DATA\042816\0428F003.D
Instrument ID: MS13
Analysis Method: 8260C

Lab Code: KWG1603288-2
Analysis Lot: KWG1603288

	Fluorobenzene		Chlorobenzene-d5		1,4-Dichlorobenzene-d4	
	<u>Area</u>	<u>RT</u>	<u>Area</u>	<u>RT</u>	<u>Area</u>	<u>RT</u>
Results ==>	683,375	5.73	240,870	9.69	211,675	12.26
Upper Limit ==>	1,366,750	5.90	481,740	9.86	423,350	12.43
Lower Limit ==>	341,688	5.56	120,435	9.52	105,838	12.09
ICAL Result ==>	617,654	5.73	205,668	9.69	180,405	12.26

Associated Analyses

Lab Control Sample	KWG1603323-1	610,971	5.73	215,981	9.69	193,826	12.26
Duplicate Lab Control Sample	KWG1603323-2	687,380	5.72	243,083	9.69	222,416	12.26
Method Blank	KWG1603323-3	679,678	5.73	238,471	9.69	206,001	12.27
AOC-160418TB	K1604135-007	685,164	5.73	244,765	9.69	207,426	12.26
AOC-16041807A178	K1604135-005	671,921	5.73	236,207	9.69	205,054	12.26
AOC-16041807A188	K1604135-006	665,808	5.73	230,666	9.69	199,015	12.26

Results flagged with an asterisk (*) indicate values outside control criteria.

QA/QC Report

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A

Service Request: K1604135
Date Analyzed: 05/02/2016
Time Analyzed: 09:43

Internal Standard Area and RT Summary
Volatile Organic Compounds

File ID: J:\MS13\DATA\050216\0502F004.D
Instrument ID: MS13
Analysis Method: 8260C

Lab Code: KWG1603395-2
Analysis Lot: KWG1603395

	Fluorobenzene		Chlorobenzene-d5		1,4-Dichlorobenzene-d4	
	<u>Area</u>	<u>RT</u>	<u>Area</u>	<u>RT</u>	<u>Area</u>	<u>RT</u>
Results ==>	689,420	5.73	240,215	9.69	215,083	12.26
Upper Limit ==>	1,378,840	5.90	480,430	9.86	430,166	12.43
Lower Limit ==>	344,710	5.56	120,108	9.52	107,542	12.09
ICAL Result ==>	617,654	5.73	205,668	9.69	180,405	12.26

Associated Analyses

Lab Control Sample	KWG1603398-3	647,209	5.73	230,883	9.69	211,602	12.27
Duplicate Lab Control Sample	KWG1603398-4	679,808	5.72	241,090	9.69	221,697	12.27
AOC-16041995A174MS	KWG1603398-1	629,716	5.72	223,051	9.69	203,324	12.26
AOC-16041995A174DMS	KWG1603398-2	697,249	5.73	243,247	9.69	218,396	12.27
Method Blank	KWG1603398-5	702,127	5.73	249,721	9.69	225,738	12.26
AOC-16041995A172	K1604135-001	666,003	5.73	230,199	9.69	206,194	12.26
AOC-16041995A173A	K1604135-002	648,289	5.72	229,426	9.69	203,156	12.27
AOC-16041995A174	K1604135-003	679,443	5.73	240,411	9.69	213,442	12.26
AOC-16041907A177	K1604135-004	683,354	5.73	238,962	9.69	210,913	12.27

Results flagged with an asterisk (*) indicate values outside control criteria.

QA/QC Report

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A
Sample Matrix: Water

Service Request: K1604135
Date Extracted: 05/02/2016
Date Analyzed: 05/02/2016

Matrix Spike/Duplicate Matrix Spike Summary
Volatile Organic Compounds

Sample Name: AOC-16041995A174
Lab Code: K1604135-003
Extraction Method: EPA 5030B
Analysis Method: 8260C

Units: ug/L
Basis: NA
Level: Low
Extraction Lot: KWG1603398

Analyte Name	Sample Result	AOC-16041995A174MS KWG1603398-1 Matrix Spike			AOC-16041995A174DMS KWG1603398-2 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Spike Amount	%Rec	Result	Spike Amount	%Rec			
Benzene	0.34	11.2	10.0	108	9.97	10.0	96	80-120	11	30
Toluene	0.48	10.9	10.0	104	9.88	10.0	94	75-120	10	30
Ethylbenzene	0.22	10.9	10.0	107	9.91	10.0	97	75-125	9	30
m,p-Xylenes	3.8	21.7	20.0	90	19.8	20.0	80	75-130	9	30
o-Xylene	2.7	10.6	10.0	79 *	9.69	10.0	70 *	80-120	9	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

QA/QC Report

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A
Sample Matrix: Water

Service Request: K1604135
Date Extracted: 04/28/2016
Date Analyzed: 04/28/2016

Lab Control Spike/Duplicate Lab Control Spike Summary
Volatile Organic Compounds

Extraction Method: EPA 5030B
Analysis Method: 8260C

Units: ug/L
Basis: NA
Level: Low
Extraction Lot: KWG1603323

Analyte Name	Lab Control Sample KWG1603323-1 Lab Control Spike			Duplicate Lab Control Sample KWG1603323-2 Duplicate Lab Control Spike			%Rec Limits	RPD	RPD Limit
	Result	Spike Amount	%Rec	Result	Spike Amount	%Rec			
Benzene	10.5	10.0	105	9.11	10.0	91	80-120	14	30
Toluene	10.1	10.0	101	8.95	10.0	90	75-120	12	30
Ethylbenzene	10.0	10.0	100	8.88	10.0	89	75-125	12	30
m,p-Xylenes	20.3	20.0	102	17.7	20.0	89	75-130	14	30
o-Xylene	10.1	10.0	101	8.86	10.0	89	80-120	13	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

QA/QC Report

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A
Sample Matrix: Water

Service Request: K1604135
Date Extracted: 05/02/2016
Date Analyzed: 05/02/2016

Lab Control Spike/Duplicate Lab Control Spike Summary
Volatile Organic Compounds

Extraction Method: EPA 5030B
Analysis Method: 8260C

Units: ug/L
Basis: NA
Level: Low
Extraction Lot: KWG1603398

Analyte Name	Lab Control Sample KWG1603398-3 Lab Control Spike			Duplicate Lab Control Sample KWG1603398-4 Duplicate Lab Control Spike			%Rec Limits	RPD	RPD Limit
	Result	Spike Amount	%Rec	Result	Spike Amount	%Rec			
Benzene	9.83	10.0	98	9.20	10.0	92	80-120	7	30
Toluene	9.45	10.0	95	8.93	10.0	89	75-120	6	30
Ethylbenzene	9.38	10.0	94	8.92	10.0	89	75-125	5	30
m,p-Xylenes	18.7	20.0	93	18.2	20.0	91	75-130	3	30
o-Xylene	9.30	10.0	93	9.09	10.0	91	80-120	2	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

QA/QC Report

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A
Sample Matrix: Water

Service Request: K1604135
Date Extracted: 04/28/2016
Date Analyzed: 04/28/2016
Time Analyzed: 12:24

Method Blank Summary
Volatile Organic Compounds

Sample Name: Method Blank
Lab Code: KWG1603323-3
Extraction Method: EPA 5030B
Analysis Method: 8260C

Instrument ID: MS13
File ID: J:\MS13\DATA\042816\0428F011.D
Level: Low
Extraction Lot: KWG1603323

This Method Blank applies to the following analyses:

Sample Name	Lab Code	File ID	Date Analyzed	Time Analyzed
Lab Control Sample	KWG1603323-1	J:\MS13\DATA\042816\0428F005.D	04/28/16	09:50
Duplicate Lab Control Sample	KWG1603323-2	J:\MS13\DATA\042816\0428F006.D	04/28/16	10:15
AOC-160418TB	K1604135-007	J:\MS13\DATA\042816\0428F015.D	04/28/16	14:07
AOC-16041807A178	K1604135-005	J:\MS13\DATA\042816\0428F018.D	04/28/16	15:24
AOC-16041807A188	K1604135-006	J:\MS13\DATA\042816\0428F019.D	04/28/16	15:50

QA/QC Report

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A
Sample Matrix: Water

Service Request: K1604135
Date Extracted: 05/02/2016
Date Analyzed: 05/02/2016
Time Analyzed: 12:27

Method Blank Summary
Volatile Organic Compounds

Sample Name: Method Blank **Instrument ID:** MS13
Lab Code: KWG1603398-5 **File ID:** J:\MS13\DATA\050216\0502F010.D
Extraction Method: EPA 5030B **Level:** Low
Analysis Method: 8260C **Extraction Lot:** KWG1603398

This Method Blank applies to the following analyses:

Sample Name	Lab Code	File ID	Date Analyzed	Time Analyzed
Lab Control Sample	KWG1603398-3	J:\MS13\DATA\050216\0502F005.D	05/02/16	10:19
Duplicate Lab Control Sample	KWG1603398-4	J:\MS13\DATA\050216\0502F006.D	05/02/16	10:44
AOC-16041995A174MS	KWG1603398-1	J:\MS13\DATA\050216\0502F007.D	05/02/16	11:10
AOC-16041995A174DMS	KWG1603398-2	J:\MS13\DATA\050216\0502F008.D	05/02/16	11:36
AOC-16041995A172	K1604135-001	J:\MS13\DATA\050216\0502F013.D	05/02/16	13:45
AOC-16041995A173A	K1604135-002	J:\MS13\DATA\050216\0502F014.D	05/02/16	14:10
AOC-16041995A174	K1604135-003	J:\MS13\DATA\050216\0502F015.D	05/02/16	14:36
AOC-16041907A177	K1604135-004	J:\MS13\DATA\050216\0502F018.D	05/02/16	15:53

QA/QC Report

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A
Sample Matrix: Water

Service Request: K1604135
Date Extracted: 04/28/2016
Date Analyzed: 04/28/2016
Time Analyzed: 09:50

Lab Control Sample Summary
Volatile Organic Compounds

Sample Name: Lab Control Sample
Lab Code: KWG1603323-1
Extraction Method: EPA 5030B
Analysis Method: 8260C

Instrument ID: MS13
File ID: J:\MS13\DATA\042816\0428F005.D
Level: Low
Extraction Lot: KWG1603323

This Lab Control Sample applies to the following analyses:

Sample Name	Lab Code	File ID	Date Analyzed	Time Analyzed
Method Blank	KWG1603323-3	J:\MS13\DATA\042816\0428F011.D	04/28/16	12:24
AOC-160418TB	K1604135-007	J:\MS13\DATA\042816\0428F015.D	04/28/16	14:07
AOC-16041807A178	K1604135-005	J:\MS13\DATA\042816\0428F018.D	04/28/16	15:24
AOC-16041807A188	K1604135-006	J:\MS13\DATA\042816\0428F019.D	04/28/16	15:50

QA/QC Report

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A
Sample Matrix: Water

Service Request: K1604135
Date Extracted: 05/02/2016
Date Analyzed: 05/02/2016
Time Analyzed: 10:19

Lab Control Sample Summary
Volatile Organic Compounds

Sample Name: Lab Control Sample
Lab Code: KWG1603398-3
Extraction Method: EPA 5030B
Analysis Method: 8260C

Instrument ID: MS13
File ID: J:\MS13\DATA\050216\0502F005.D
Level: Low
Extraction Lot: KWG1603398

This Lab Control Sample applies to the following analyses:

Sample Name	Lab Code	File ID	Date Analyzed	Time Analyzed
AOC-16041995A174MS	KWG1603398-1	J:\MS13\DATA\050216\0502F007.D	05/02/16	11:10
AOC-16041995A174DMS	KWG1603398-2	J:\MS13\DATA\050216\0502F008.D	05/02/16	11:36
Method Blank	KWG1603398-5	J:\MS13\DATA\050216\0502F010.D	05/02/16	12:27
AOC-16041995A172	K1604135-001	J:\MS13\DATA\050216\0502F013.D	05/02/16	13:45
AOC-16041995A173A	K1604135-002	J:\MS13\DATA\050216\0502F014.D	05/02/16	14:10
AOC-16041995A174	K1604135-003	J:\MS13\DATA\050216\0502F015.D	05/02/16	14:36
AOC-16041907A177	K1604135-004	J:\MS13\DATA\050216\0502F018.D	05/02/16	15:53

QA/QC Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A

Service Request: K1604135
Date Analyzed: 04/28/2016
Time Analyzed: 08:31

Tune Summary
Volatile Organic Compounds

File ID: J:\MS13\DATA\042816\0428F002.D
Instrument ID: MS13
Column:

Analysis Method: 8260C
Analysis Lot: KWG1603288

Target Mass	Relative to Mass	Lower Limit%	Upper Limit%	Relative Abundance %	Raw Abundance	Result Pass/Fail
50	95	15	40	16.7	2878	PASS
75	95	30	60	46.6	8024	PASS
95	95	100	100	100.0	17224	PASS
96	95	5	9	6.4	1103	PASS
173	174	0	2	0.2	24	PASS
174	95	50	120	91.6	15780	PASS
175	174	5	9	6.7	1058	PASS
176	174	95	101	95.6	15082	PASS
177	176	5	9	6.8	1027	PASS

Sample Name	Lab Code	File ID	Date Analyzed	Time Analyzed	Q
Continuing Calibration Verification	KWG1603288-2	J:\MS13\DATA\042816\0428F003.D	04/28/2016	08:59	
Lab Control Sample	KWG1603323-1	J:\MS13\DATA\042816\0428F005.D	04/28/2016	09:50	
Duplicate Lab Control Sample	KWG1603323-2	J:\MS13\DATA\042816\0428F006.D	04/28/2016	10:15	
Method Blank	KWG1603323-3	J:\MS13\DATA\042816\0428F011.D	04/28/2016	12:24	
AOC-160418TB	K1604135-007	J:\MS13\DATA\042816\0428F015.D	04/28/2016	14:07	
AOC-16041807A178	K1604135-005	J:\MS13\DATA\042816\0428F018.D	04/28/2016	15:24	
AOC-16041807A188	K1604135-006	J:\MS13\DATA\042816\0428F019.D	04/28/2016	15:50	

Results flagged with an asterisk (*) indicate the analysis performed outside specified tune window

QA/QC Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A

Service Request: K1604135
Date Analyzed: 05/02/2016
Time Analyzed: 09:06

Tune Summary
Volatile Organic Compounds

File ID: J:\MS13\DATA\050216\0502F003.D
Instrument ID: MS13
Column:

Analysis Method: 8260C
Analysis Lot: KWG1603395

Target Mass	Relative to Mass	Lower Limit%	Upper Limit%	Relative Abundance %	Raw Abundance	Result Pass/Fail
50	95	15	40	17.2	3748	PASS
75	95	30	60	46.4	10119	PASS
95	95	100	100	100.0	21801	PASS
96	95	5	9	6.2	1343	PASS
173	174	0	2	0.1	18	PASS
174	95	50	120	90.7	19774	PASS
175	174	5	9	5.3	1057	PASS
176	174	95	101	96.5	19074	PASS
177	176	5	9	6.7	1278	PASS

Sample Name	Lab Code	File ID	Date Analyzed	Time Analyzed	Q
Continuing Calibration Verification	KWG1603395-2	J:\MS13\DATA\050216\0502F004.D	05/02/2016	09:43	
Lab Control Sample	KWG1603398-3	J:\MS13\DATA\050216\0502F005.D	05/02/2016	10:19	
Duplicate Lab Control Sample	KWG1603398-4	J:\MS13\DATA\050216\0502F006.D	05/02/2016	10:44	
AOC-16041995A174MS	KWG1603398-1	J:\MS13\DATA\050216\0502F007.D	05/02/2016	11:10	
AOC-16041995A174DMS	KWG1603398-2	J:\MS13\DATA\050216\0502F008.D	05/02/2016	11:36	
Method Blank	KWG1603398-5	J:\MS13\DATA\050216\0502F010.D	05/02/2016	12:27	
AOC-16041995A172	K1604135-001	J:\MS13\DATA\050216\0502F013.D	05/02/2016	13:45	
AOC-16041995A173A	K1604135-002	J:\MS13\DATA\050216\0502F014.D	05/02/2016	14:10	
AOC-16041995A174	K1604135-003	J:\MS13\DATA\050216\0502F015.D	05/02/2016	14:36	
AOC-16041907A177	K1604135-004	J:\MS13\DATA\050216\0502F018.D	05/02/2016	15:53	

Results flagged with an asterisk (*) indicate the analysis performed outside specified tune window

Client: Sealaska Environmental Services, LLC
 Project: JBLM FLAO AOC 9-2/10-8/TO 01A

Service Request: K1604135
 Calibration Date: 04/19/2016

Initial Calibration Summary
 Volatile Organic Compounds

Calibration ID: CAL14694
 Instrument ID: MS13

Column: MS

Level ID	File ID	Level ID	File ID
A	J:\MS13\DATA\041916\0419F006.D	G	J:\MS13\DATA\041916\0419F012.D
B	J:\MS13\DATA\041916\0419F007.D	H	J:\MS13\DATA\041916\0419F013.D
C	J:\MS13\DATA\041916\0419F008.D	I	J:\MS13\DATA\041916\0419F014.D
D	J:\MS13\DATA\041916\0419F009.D	J	J:\MS13\DATA\041916\0419F015.D
E	J:\MS13\DATA\041916\0419F010.D	K	J:\MS13\DATA\041916\0419F016.D
F	J:\MS13\DATA\041916\0419F011.D		

Analyte Name	Level ID			Level ID			Level ID			Level ID					
	ID	Amt	RRF	ID	Amt	RRF	ID	Amt	RRF	ID	Amt	RRF			
1,2-Dichloroethane-d4	F	8.0	0.199	G	10	0.209	H	12	0.209	I	14	0.200	J	16	0.200
	K	20	0.196												
Benzene	A	0.10	1.18	B	0.20	1.08	C	0.50	0.886	D	1.0	0.949	E	2.0	0.909
	F	5.0	1.12	G	10	1.05	H	20	0.962	I	40	1.04	J	60	0.994
	K	80	1.02												
Toluene	A	0.10	0.854	B	0.20	0.714	C	0.50	0.629	D	1.0	0.610	E	2.0	0.574
	F	5.0	0.708	G	10	0.669	H	20	0.624	I	40	0.671	J	60	0.639
	K	80	0.656												
Ethylbenzene	A	0.10	1.32	B	0.20	1.28	C	0.50	0.988	D	1.0	1.04	E	2.0	0.986
	F	5.0	1.22	G	10	1.18	H	20	1.05	I	40	1.15	J	60	1.08
	K	80	1.13												
m,p-Xylenes	A	0.20	1.61	B	0.40	1.36	C	1.0	1.23	D	2.0	1.28	E	4.0	1.21
	F	10	1.52	G	20	1.45	H	40	1.32	I	80	1.44	J	120	1.35
	K	160	1.40												
o-Xylene	A	0.10	1.59	B	0.20	1.47	C	0.50	1.22	D	1.0	1.23	E	2.0	1.15
	F	5.0	1.41	G	10	1.39	H	20	1.25	I	40	1.34	J	60	1.27
	K	80	1.31												
Dibromofluoromethane	F	8.0	0.202	G	10	0.218	H	12	0.219	I	14	0.208	J	16	0.212
	K	20	0.203												
Toluene-d8	F	8.0	0.931	G	10	1.01	H	12	1.01	I	14	0.958	J	16	0.973
	K	20	0.933												
4-Bromofluorobenzene	F	8.0	0.910	G	10	1.01	H	12	0.974	I	14	0.943	J	16	0.944
	K	20	0.926												

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

QA/QC Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A

Service Request: K1604135
Calibration Date: 04/19/2016

**Initial Calibration Summary
 Volatile Organic Compounds**

Calibration ID: CAL14694
Instrument ID: MS13

Column: MS

Analyte Name	Compound Type	Calibration Evaluation					RRF Evaluation		
		Fit Type	Eval.	Eval. Result	Q	Control Criteria	Average RRF	Q	Minimum RRF
1,2-Dichloroethane-d4	SURR	AverageRF	% RSD	4.8		≤ 20	0.199		0.01
Benzene	MS	AverageRF	% RSD	8.7		≤ 20	1.02		0.500
Toluene	MS	AverageRF	% RSD	11.1		≤ 20	0.668		0.400
Ethylbenzene	MS	AverageRF	% RSD	9.9		≤ 20	1.13		0.100
m,p-Xylenes	MS	AverageRF	% RSD	8.8		≤ 20	1.38		0.100
o-Xylene	MS	AverageRF	% RSD	9.5		≤ 20	1.33		0.300
Dibromofluoromethane	SURR	AverageRF	% RSD	6.0		≤ 20	0.206		0.01
Toluene-d8	SURR	AverageRF	% RSD	6.1		≤ 20	0.950		0.01
4-Bromofluorobenzene	SURR	AverageRF	% RSD	6.1		≤ 20	0.934		0.01

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

QA/QC Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A

Service Request: K1604135
Calibration Date: 04/19/2016
Date Analyzed: 04/19/2016

Second Source Calibration Verification
Volatile Organic Compounds

Calibration Type: Internal Standard
Analysis Method: 8260C

Calibration ID: CAL14694
Units: PPB

File ID: J:\MS13\DATA\041916\0419F019.D
 J:\MS13\DATA\041916\0419F020.D
 J:\MS13\DATA\041916\0419F021.D

Analyte Name	Expected	Result	Average RF	SSV RF	%D	%Drift	Criteria	Curve Fit
Benzene	10	10	1.02	1.02	0	NA	± 30 %	AverageRF
Toluene	10	9.7	0.668	0.649	-3	NA	± 30 %	AverageRF
Ethylbenzene	10	9.8	1.13	1.11	-2	NA	± 30 %	AverageRF
m,p-Xylenes	20	20	1.38	1.38	0	NA	± 30 %	AverageRF
o-Xylene	10	10	1.33	1.34	0	NA	± 30 %	AverageRF

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

QA/QC Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A

Service Request: K1604135
Date Analyzed: 04/28/2016

Continuing Calibration Verification Summary
Volatile Organic Compounds

Calibration Type: Internal Standard
Analysis Method: 8260C

Calibration Date: 04/19/2016
Calibration ID: CAL14694
Analysis Lot: KWG1603288
Units: PPB

File ID: J:\MS13\DATA\042816\0428F003.D

Analyte Name	Expected	Result	Min RF	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
1,2-Dichloroethane-d4	10	8.7	0.01	0.199	0.173	-13	NA	± 20	AverageRF
Benzene	10	9.5	0.500	1.02	0.962	-5	NA	± 20	AverageRF
Toluene	10	9.4	0.400	0.668	0.630	-6	NA	± 20	AverageRF
Ethylbenzene	10	9.2	0.100	1.13	1.04	-8	NA	± 20	AverageRF
m,p-Xylenes	20	19	0.100	1.38	1.29	-7	NA	± 20	AverageRF
o-Xylene	10	9.2	0.300	1.33	1.22	-8	NA	± 20	AverageRF
Dibromofluoromethane	10	9.6	0.01	0.206	0.198	-4	NA	± 20	AverageRF
Toluene-d8	10	10	0.01	0.950	0.976	3	NA	± 20	AverageRF
4-Bromofluorobenzene	10	8.7	0.01	0.934	0.812	-13	NA	± 20	AverageRF

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

QA/QC Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A

Service Request: K1604135
Date Analyzed: 05/02/2016

Continuing Calibration Verification Summary
Volatile Organic Compounds

Calibration Type: Internal Standard
Analysis Method: 8260C

Calibration Date: 04/19/2016
Calibration ID: CAL14694
Analysis Lot: KWG1603395
Units: PPB

File ID: J:\MS13\DATA\050216\0502F004.D

Analyte Name	Expected	Result	Min RF	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
1,2-Dichloroethane-d4	10	8.7	0.01	0.199	0.173	-13	NA	± 20	AverageRF
Benzene	10	9.3	0.500	1.02	0.942	-7	NA	± 20	AverageRF
Toluene	10	8.9	0.400	0.668	0.595	-11	NA	± 20	AverageRF
Ethylbenzene	10	8.9	0.100	1.13	1.00	-11	NA	± 20	AverageRF
m,p-Xylenes	20	18	0.100	1.38	1.24	-10	NA	± 20	AverageRF
o-Xylene	10	8.8	0.300	1.33	1.17	-12	NA	± 20	AverageRF
Dibromofluoromethane	10	9.7	0.01	0.206	0.199	-3	NA	± 20	AverageRF
Toluene-d8	10	10	0.01	0.950	0.959	1	NA	± 20	AverageRF
4-Bromofluorobenzene	10	9.0	0.01	0.934	0.840	-10	NA	± 20	AverageRF

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A

Service Request: K1604135

Analysis Run Log
Volatile Organic Compounds

Analysis Method: 8260C

Analysis Lot: KWG1603288
Instrument ID: MS13

File ID	Sample Name	Lab Code	Date Analysis Started	Start Time	Q	Date Analysis Finished	Finish Time
0428F002.D	GC/MS Tuning - Bromofluorobenzene	KWG1603288-1	4/28/2016	08:31		4/28/2016	08:47
0428F003.D	Continuing Calibration Verification	KWG1603288-2	4/28/2016	08:59		4/28/2016	09:15
0428F005.D	Lab Control Sample	KWG1603323-1	4/28/2016	09:50		4/28/2016	10:06
0428F006.D	Duplicate Lab Control Sample	KWG1603323-2	4/28/2016	10:15		4/28/2016	10:31
0428F011.D	Method Blank	KWG1603323-3	4/28/2016	12:24		4/28/2016	12:40
0428F014.D	ZZZZZZ	ZZZZZZ	4/28/2016	13:41		4/28/2016	13:57
0428F015.D	AOC-160418TB	K1604135-007	4/28/2016	14:07		4/28/2016	14:23
0428F016.D	ZZZZZZ	ZZZZZZ	4/28/2016	14:32		4/28/2016	14:48
0428F017.D	ZZZZZZ	ZZZZZZ	4/28/2016	14:58		4/28/2016	15:14
0428F018.D	AOC-16041807A178	K1604135-005	4/28/2016	15:24		4/28/2016	15:40
0428F019.D	AOC-16041807A188	K1604135-006	4/28/2016	15:50		4/28/2016	16:06
0428F020.D	ZZZZZZ	ZZZZZZ	4/28/2016	16:15		4/28/2016	16:31
0428F021.D	ZZZZZZ	ZZZZZZ	4/28/2016	16:41		4/28/2016	16:57
0428F022.D	ZZZZZZ	ZZZZZZ	4/28/2016	17:07		4/28/2016	17:23
0428F023.D	ZZZZZZ	ZZZZZZ	4/28/2016	17:33		4/28/2016	17:49
0428F024.D	ZZZZZZ	ZZZZZZ	4/28/2016	17:59		4/28/2016	18:15
0428F025.D	ZZZZZZ	ZZZZZZ	4/28/2016	18:24		4/28/2016	18:40
0428F026.D	ZZZZZZ	ZZZZZZ	4/28/2016	18:50		4/28/2016	19:06
0428F027.D	ZZZZZZ	ZZZZZZ	4/28/2016	19:16		4/28/2016	19:32
0428F028.D	ZZZZZZ	ZZZZZZ	4/28/2016	19:42		4/28/2016	19:58

Results flagged with an asterisk (*) indicate the holding time was exceeded for the analysis

QA/QC Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A

Service Request: K1604135

Analysis Run Log
Volatile Organic Compounds

Analysis Method: 8260C

Analysis Lot: KWG1603395
Instrument ID: MS13

File ID	Sample Name	Lab Code	Date Analysis Started	Start Time	Q	Date Analysis Finished	Finish Time
0502F003.D	GC/MS Tuning - Bromofluorobenzene	KWG1603395-1	5/2/2016	09:06		5/2/2016	09:22
0502F004.D	Continuing Calibration Verification	KWG1603395-2	5/2/2016	09:43		5/2/2016	09:59
0502F005.D	Lab Control Sample	KWG1603398-3	5/2/2016	10:19		5/2/2016	10:35
0502F006.D	Duplicate Lab Control Sample	KWG1603398-4	5/2/2016	10:44		5/2/2016	11:00
0502F007.D	AOC-16041995A174MS	KWG1603398-1	5/2/2016	11:10		5/2/2016	11:26
0502F008.D	AOC-16041995A174DMS	KWG1603398-2	5/2/2016	11:36		5/2/2016	11:52
0502F010.D	Method Blank	KWG1603398-5	5/2/2016	12:27		5/2/2016	12:43
0502F011.D	ZZZZZZ	ZZZZZZ	5/2/2016	12:53		5/2/2016	13:09
0502F012.D	ZZZZZZ	ZZZZZZ	5/2/2016	13:19		5/2/2016	13:35
0502F013.D	AOC-16041995A172	K1604135-001	5/2/2016	13:45		5/2/2016	14:01
0502F014.D	AOC-16041995A173A	K1604135-002	5/2/2016	14:10		5/2/2016	14:26
0502F015.D	AOC-16041995A174	K1604135-003	5/2/2016	14:36		5/2/2016	14:52
0502F018.D	AOC-16041907A177	K1604135-004	5/2/2016	15:53		5/2/2016	16:09
0502F019.D	ZZZZZZ	ZZZZZZ	5/2/2016	16:19		5/2/2016	16:35

Results flagged with an asterisk (*) indicate the holding time was exceeded for the analysis

QA/QC Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A
Sample Matrix: Water

Service Request: K1604135
Date Extracted: 04/28/2016

Extraction Prep Log
Volatile Organic Compounds

Extraction Method: EPA 5030B
Analysis Method: 8260C

Extraction Lot: KWG1603323
Level: Low

Sample Name	Lab Code	Date Collected	Date Received	Sample Amount	Final Volume	% Solids	Note
AOC-16041807A178	K1604135-005	04/18/16	04/22/16	10ml	10ml	NA	
AOC-16041807A188	K1604135-006	04/18/16	04/22/16	10ml	10ml	NA	
AOC-160418TB	K1604135-007	04/18/16	04/22/16	10ml	10ml	NA	
Method Blank	KWG1603323-3	NA	NA	10ml	10ml	NA	
Lab Control Sample	KWG1603323-1	NA	NA	10ml	10ml	NA	
Duplicate Lab Control Sample	KWG1603323-2	NA	NA	10ml	10ml	NA	

Results flagged with an asterisk (*) indicate the holding time was exceeded for the analysis

QA/QC Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO AOC 9-2/10-8/TO 01A
Sample Matrix: Water

Service Request: K1604135
Date Extracted: 05/02/2016

Extraction Prep Log
Volatile Organic Compounds

Extraction Method: EPA 5030B
Analysis Method: 8260C

Extraction Lot: KWG1603398
Level: Low

Sample Name	Lab Code	Date Collected	Date Received	Sample Amount	Final Volume	% Solids	Note
AOC-16041995A172	K1604135-001	04/19/16	04/22/16	10ml	10ml	NA	
AOC-16041995A173A	K1604135-002	04/19/16	04/22/16	10ml	10ml	NA	
AOC-16041995A174	K1604135-003	04/19/16	04/22/16	10ml	10ml	NA	
AOC-16041907A177	K1604135-004	04/19/16	04/22/16	10ml	10ml	NA	
Method Blank	KWG1603398-5	NA	NA	10ml	10ml	NA	
AOC-16041995A174MS	KWG1603398-1	04/19/16	04/22/16	10ml	10ml	NA	
AOC-16041995A174DMS	KWG1603398-2	04/19/16	04/22/16	10ml	10ml	NA	
Lab Control Sample	KWG1603398-3	NA	NA	10ml	10ml	NA	
Duplicate Lab Control Sample	KWG1603398-4	NA	NA	10ml	10ml	NA	

Results flagged with an asterisk (*) indicate the holding time was exceeded for the analysis



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June 02, 2016

Analytical Report for Service Request No: K1604464

Scott Elkind
Sealaska Environmental Services, LLC
18743 Front Street NE
P.O. Box 869
Poulsbo, WA 98370

RE: JBLM FLAO / TO 01A

Dear Scott,

Enclosed are the results of the sample(s) submitted to our laboratory April 29, 2016
For your reference, these analyses have been assigned our service request number **K1604464**.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3376. You may also contact me via email at gregory.salata@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Gregory Salata, Ph.D.
Senior Project
Manager



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Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

- * The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- E The result is an estimate amount because the value exceeded the instrument calibration range.
- J The result is an estimated value.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.2 definition : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.
- H The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

- # The control limit criteria is not applicable. See case narrative.
- J The result is an estimated value.
- E The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
- M The duplicate injection precision was not met.
- N The Matrix Spike sample recovery is not within control limits. See case narrative.
- S The reported value was determined by the Method of Standard Additions (MSA).
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.2 definition : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- W The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
 - i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- + The correlation coefficient for the MSA is less than 0.995.
- Q See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

- * The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- A A tentatively identified compound, a suspected aldol-condensation product.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- C The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
- D The reported result is from a dilution.
- E The result is an estimated value.
- J The result is an estimated value.
- N The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
- P The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.2 definition : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
 - i The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

- F The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
- L The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
- H The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
- O The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
- Y The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
- Z The chromatographic fingerprint does not resemble a petroleum product.

**ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses**

Agency	Web Site	Number
Alaska DEC UST	http://dec.alaska.gov/applications/eh/ehllabreports/USTLabs.aspx	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L14-51
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	Not available	-
ISO 17025	http://www.pjllabs.com/	L16-57
Louisiana DEQ	http://www.deq.louisiana.gov/portal/DIVISIONS/PublicParticipationandPermitSupport/LouisianaLaboratoryAccreditationProgram.aspx	03016
Maine DHS	Not available	WA01276
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Montana DPHHS	http://www.dphhs.mt.gov/publichealth/	CERT0047
Nevada DEP	http://ndep.nv.gov/bsdwlabservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/oqa/	WA005
North Carolina DWQ	http://www.dwqlab.org/	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/envserv/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wisconsin DNR	http://dnr.wi.gov/	998386840
Wyoming (EPA Region 8)	http://www.epa.gov/region8/water/dwhome/wyomingdi.html	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.

Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/analyte is offered by that state.



Case Narrative

ALS Environmental—Kelso Laboratory
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ALS ENVIRONMENTAL

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/ TO 01A
Sample Matrix: Water

Service Request No.: K1604464
Date Received: 04/29/16

Case Narrative

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier IV validation deliverables including summary forms and all of the associated raw data for each of the analyses. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt

Four water samples were received for analysis at ALS Environmental on 04/29/16. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

Diesel Range Organics by Method NWTPH-Dx

Sample Notes and Discussion:

Manual integration of one or more chromatographic peaks was required to correct the integration performed by the automated data processing program. The manual integration was performed in accordance with ALS policy, which is consistent with the National Environmental Laboratory Accreditation Program (NELAP), Department of Defense (DOD), and other certifying agencies. The analytes that required manual integrations are identified on each sample report contained in this data package.

No other anomalies associated with the analysis of these samples were observed.

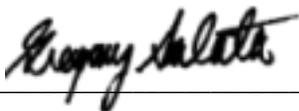
Gasoline Range Organics by Method NWTPH-Gx

Sample Notes and Discussion:

Manual integration of one or more chromatographic peaks in was required to correct the integration performed by the automated data processing program. The manual integration was performed in accordance with ALS policy, which is consistent with the National Environmental Laboratory Accreditation Program (NELAP), Department of Defense (DOD), and other certifying agencies. The analytes that required manual integrations are identified on each sample report contained in this data package.

No other anomalies associated with the analysis of these samples were observed.

Approved by _____



Volatile Organic Compounds by EPA Method 8260

Calibration Verification Exceptions:

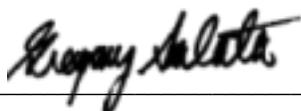
The following analytes were flagged as outside the control criterion for Continuing Calibration Verification (CCV) J:\MS13\0509F004.D: Dichlorodifluoromethane, Chloromethane, Vinyl Chloride, Carbon Disulfide, 2,2-Dichloropropane, and Carbon Tetrachloride. In accordance with the EPA Method, 80% or more of the CCV analytes must pass within 20% of the true value. The ALS SOP allows for 40% difference for the remaining analytes. The CCV met these criteria. The quality of the sample data was not significantly affected. No further corrective action was required.

Sample Notes and Discussion:

Manual integration of one or more chromatographic peaks was required to correct the integration performed by the automated data processing program. The manual integration was performed in accordance with ALS policy, which is consistent with the National Environmental Laboratory Accreditation Program (NELAP), Department of Defense (DOD), and other certifying agencies. The analytes that required manual integrations are identified on each sample report contained in this data package.

No other anomalies associated with the analysis of these samples were observed.

Approved by _____





Chain of Custody

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PC Greg

Cooler Receipt and Preservation Form

Client Sealaska Service Request K16 04464
 Received: 4-29-16 Opened: 4-29-16 By: bw Unloaded: 4/29/16 By: KB
MC Delivery

1. Samples were received via? Mail Fed Ex UPS DHL PDX Courier Hand Delivered
2. Samples were received in: (circle) Cooler Box Envelope Other NA
3. Were custody seals on coolers? NA Y N If yes, how many and where? 1 Front / 1 Back
 If present, were custody seals intact? Y N If present, were they signed and dated? Y N

Raw Cooler Temp	Corrected Cooler Temp	Raw Temp Blank	Corrected Temp Blank	Corr. Factor	Thermometer ID	Cooler/COC ID	Tracking Number	NA	Filed
-1.3	-1.6	2.5	2.3	-0.2	342	MC Delivery	681393		
-1.4	-1.6	3.4	3.2	-0.2	355				
-1.4	-1.5	1.2	1.1	-0.1	349				
-0.2	-0.4	1.6	1.4	-0.2	325				
-0.7	-0.7	1.4	1.4	0	367				

4. Packing material: Inserts Baggies Bubble Wrap Gel Packs Wet Ice Dry Ice Sleeves
5. Were custody papers properly filled out (ink, signed, etc.)? NA Y N
6. Did all bottles arrive in good condition (unbroken)? *Indicate in the table below.* NA Y N
7. Were all sample labels complete (i.e analysis, preservation, etc.)? NA Y N
8. Did all sample labels and tags agree with custody papers? *Indicate major discrepancies in the table on page 2.* NA Y N
9. Were appropriate bottles/containers and volumes received for the tests indicated? NA Y N
10. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* NA Y N
11. Were VOA vials received without headspace? *Indicate in the table below.* NA Y N
12. Was C12/Res negative? NA Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count	Bottle Type	Out of Temp	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, & Resolutions: _____



Diesel and Residual Range Organics

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01A

Service Request: K1604464

**Cover Page - Organic Analysis Data Package
Diesel and Residual Range Organics**

Sample Name	Lab Code	Date Collected	Date Received
AOC160426IDW	K1604464-002	04/26/2016	04/29/2016

Analytical Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01A
Sample Matrix: Water

Service Request: K1604464
Date Collected: 04/26/2016
Date Received: 04/29/2016

Diesel and Residual Range Organics

Sample Name: AOC160426IDW **Units:** ug/L
Lab Code: K1604464-002 **Basis:** NA
Extraction Method: METHOD **Level:** Low
Analysis Method: NWTPH-Dx

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	180	Y	95	20	11	1	05/04/16	05/06/16	KWG1603514	
Residual Range Organics (RRO)	150	L	95	50	19	1	05/04/16	05/06/16	KWG1603514	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	71	50-150	05/06/16	Acceptable
n-Triacontane	72	50-150	05/06/16	Acceptable

Comments: _____

Analytical Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01A
Sample Matrix: Water

Service Request: K1604464
Date Collected: NA
Date Received: NA

Diesel and Residual Range Organics

Sample Name: Method Blank **Units:** ug/L
Lab Code: KWG1603514-3 **Basis:** NA
Extraction Method: METHOD **Level:** Low
Analysis Method: NWTPH-Dx

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	ND	U	95	20	11	1	05/04/16	05/06/16	KWG1603514	
Residual Range Organics (RRO)	ND	U	95	50	19	1	05/04/16	05/06/16	KWG1603514	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	84	50-150	05/06/16	Acceptable
n-Triacontane	85	50-150	05/06/16	Acceptable

Comments: _____

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01A
Sample Matrix: Water

Service Request: K1604464

**Surrogate Recovery Summary
 Diesel and Residual Range Organics**

Extraction Method: METHOD
Analysis Method: NWTPH-Dx

Units: Percent
Level: Low

<u>Sample Name</u>	<u>Lab Code</u>	<u>Sur1</u>	<u>Sur2</u>
AOC160426IDW	K1604464-002	71	72
Batch QC	K1604482-001	90	93
Batch QCDUP	KWG1603514-1	91	96
Method Blank	KWG1603514-3	84	85
Lab Control Sample	KWG1603514-2	94	88

Surrogate Recovery Control Limits (%)

Sur1 = o-Terphenyl	50-150
Sur2 = n-Triacontane	50-150

Results flagged with an asterisk (*) indicate values outside control criteria.
 Results flagged with a pound (#) indicate the control criteria is not applicable.

QA/QC Report

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01A
Sample Matrix: Water

Service Request: K1604464
Date Extracted: 05/04/2016
Date Analyzed: 05/06/2016

**Duplicate Sample Summary
 Diesel and Residual Range Organics**

Sample Name: Batch QC
Lab Code: K1604482-001
Extraction Method: METHOD
Analysis Method: NWTPH-Dx

Units: ug/L
Basis: NA
Level: Low
Extraction Lot: KWG1603514

Analyte Name	LOQ	MDL	Sample Result	Batch QCDUP KWG1603514-1 Duplicate Sample		Relative Percent Difference	RPD Limit
				Result	Average		
Diesel Range Organics (DRO)	100	11	1400	1400	1400	1	30
Residual Range Organics (RRO)	100	19	3700	3700	3700	2	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

QA/QC Report

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01A
Sample Matrix: Water

Service Request: K1604464
Date Extracted: 05/04/2016
Date Analyzed: 05/06/2016

Lab Control Spike Summary
Diesel and Residual Range Organics

Extraction Method: METHOD
Analysis Method: NWTPH-Dx

Units: ug/L
Basis: NA
Level: Low
Extraction Lot: KWG1603514

Lab Control Sample
 KWG1603514-2
Lab Control Spike

Analyte Name	Result	Spike Amount	%Rec	%Rec Limits
Diesel Range Organics (DRO)	1350	1600	84	46-140
Residual Range Organics (RRO)	655	800	82	45-159

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

QA/QC Report

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01A
Sample Matrix: Water

Service Request: K1604464
Date Extracted: 05/04/2016
Date Analyzed: 05/06/2016
Time Analyzed: 17:08

Method Blank Summary
Diesel and Residual Range Organics

Sample Name: Method Blank
Lab Code: KWG1603514-3
Extraction Method: METHOD
Analysis Method: NWTPH-Dx

Instrument ID: GC21
File ID: J:\GC21\DATA\050616F\0506F050.D
Level: Low
Extraction Lot: KWG1603514

This Method Blank applies to the following analyses:

Sample Name	Lab Code	File ID	Date Analyzed	Time Analyzed
Lab Control Sample	KWG1603514-2	J:\GC21\DATA\050616F\0506F048.D	05/06/16	16:46
AOC160426IDW	K1604464-002	J:\GC21\DATA\050616F\0506F054.D	05/06/16	17:52
Batch QC	K1604482-001	J:\GC21\DATA\050616F\0506F060.D	05/06/16	18:58
Batch QCDUP	KWG1603514-1	J:\GC21\DATA\050616F\0506F062.D	05/06/16	19:20

QA/QC Report

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01A
Sample Matrix: Water

Service Request: K1604464
Date Extracted: 05/04/2016
Date Analyzed: 05/06/2016
Time Analyzed: 16:46

Lab Control Sample Summary
Diesel and Residual Range Organics

Sample Name: Lab Control Sample
Lab Code: KWG1603514-2
Extraction Method: METHOD
Analysis Method: NWTPH-Dx

Instrument ID: GC21
File ID: J:\GC21\DATA\050616F\0506F048.D
Level: Low
Extraction Lot: KWG1603514

This Lab Control Sample applies to the following analyses:

Sample Name	Lab Code	File ID	Date Analyzed	Time Analyzed
Method Blank	KWG1603514-3	J:\GC21\DATA\050616F\0506F050.D	05/06/16	17:08
AOC160426IDW	K1604464-002	J:\GC21\DATA\050616F\0506F054.D	05/06/16	17:52
Batch QC	K1604482-001	J:\GC21\DATA\050616F\0506F060.D	05/06/16	18:58
Batch QCDUP	KWG1603514-1	J:\GC21\DATA\050616F\0506F062.D	05/06/16	19:20

Client: Sealaska Environmental Services, LLC
 Project: JBLM FLAO/TO 01A

Service Request: K1604464
 Calibration Date: 01/20/2016

**Initial Calibration Summary
 Diesel and Residual Range Organics**

Calibration ID: CAL14548
 Instrument ID: GC21

Column: ZB-1

Level ID	File ID	Level ID	File ID
A	J:\GC21\DATA\012016F\0120F016.D	K	J:\GC21\DATA\012016F\0120F040.D
B	J:\GC21\DATA\012016F\0120F018.D	L	J:\GC21\DATA\012016F\0120F042.D
C	J:\GC21\DATA\012016F\0120F020.D	M	J:\GC21\DATA\012016F\0120F044.D
D	J:\GC21\DATA\012016F\0120F022.D	N	J:\GC21\DATA\012016F\0120F052.D
E	J:\GC21\DATA\012016F\0120F024.D	O	J:\GC21\DATA\012016F\0120F054.D
F	J:\GC21\DATA\012016F\0120F030.D	P	J:\GC21\DATA\012016F\0120F056.D
G	J:\GC21\DATA\012016F\0120F032.D	Q	J:\GC21\DATA\012016F\0120F058.D
H	J:\GC21\DATA\012016F\0120F034.D	R	J:\GC21\DATA\012016F\0120F060.D
I	J:\GC21\DATA\012016F\0120F036.D		
J	J:\GC21\DATA\012016F\0120F038.D		

Analyte Name	Level ID	Amt	RF	Level ID	Amt	RF	Level ID	Amt	RF	Level ID	Amt	RF	Level ID	Amt	RF
Diesel Range Organics (DRO)	F	20	1230	G	50	1150	H	200	1080	I	500	1070	J	2000	1110
	K	5000	1270	L	20000	1180	M	50000	1270						
Residual Range Organics (RRO)	A	50	679	B	200	619	C	500	607	D	2000	569	E	5000	601
o-Terphenyl	F	1.0	1540	G	2.5	1470	H	10	1450	I	25	1390	J	100	1470
	K	250	1600												
n-Triacontane	F	1.0	1300	G	2.5	1240	H	10	1260	I	25	1210	J	100	1230
	K	250	1370												

Results flagged with an asterisk (*) indicate values outside control criteria.

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01A

Service Request: K1604464
Calibration Date: 01/20/2016

Initial Calibration Summary
Diesel and Residual Range Organics

Calibration ID: CAL14548
Instrument ID: GC21

Column: ZB-1

Analyte Name	Compound Type	Calibration Evaluation				Control Criteria
		Fit Type	Eval.	Eval. Result	Q	
Diesel Range Organics (DRO)	MS	AverageRF	% RSD	6.9		≤ 20
Residual Range Organics (RRO)	MS	AverageRF	% RSD	6.6		≤ 20
o-Terphenyl	SURR	AverageRF	% RSD	5.0		≤ 20
n-Triacontane	SURR	AverageRF	% RSD	4.7		≤ 20

Results flagged with an asterisk (*) indicate values outside control criteria.

QA/QC Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01A

Service Request: K1604464
Calibration Date: 01/20/2016
Date Analyzed: 01/20/2016

**Second Source Calibration Verification
 Diesel and Residual Range Organics**

Calibration Type: External Standard
Analysis Method: NWTPH-Dx

Calibration ID: CAL14548
Units: ppm

File ID: J:\GC21\DATA\012016F\0120F028.D
 J:\GC21\DATA\012016F\0120F048.D
 J:\GC21\DATA\012016F\0120F064.D

Column ID: ZB-1

Analyte Name	Expected	Result	Average RF	SSV RF	%D	%Drift	Criteria	Curve Fit
Diesel Range Organics (DRO)	1000	1100	1170	1230	5	NA	± 15 %	AverageRF
Residual Range Organics (RRO)	1000	850	615	526	-15	NA	± 15 %	AverageRF

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

QA/QC Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01A

Service Request: K1604464
Date Analyzed: 05/06/2016

**Continuing Calibration Verification Summary
 Diesel and Residual Range Organics**

Calibration Type: External Standard
Analysis Method: NWTPH-Dx

Calibration Date: 01/20/2016
Calibration ID: CAL14548
Analysis Lot: KWG1603624
Units: ppm
Column ID: ZB-1

File ID: J:\GC21\DATA\050616F\0506F042.D
 J:\GC21\DATA\050616F\0506F044.D

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Diesel Range Organics (DRO)	1000	850	1170	990	-15	NA	± 15	AverageRF
Residual Range Organics (RRO)	1000	920	615	568	-8	NA	± 15	AverageRF
o-Terphenyl	50	48	1490	1420	-5	NA	± 15	AverageRF
n-Triacontane	50	46	1270	1180	-7	NA	± 15	AverageRF

Results flagged with an asterisk (*) indicate values outside control criteria.

QA/QC Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01A

Service Request: K1604464
Date Analyzed: 05/06/2016

**Continuing Calibration Verification Summary
 Diesel and Residual Range Organics**

Calibration Type: External Standard
Analysis Method: NWTPH-Dx

Calibration Date: 01/20/2016
Calibration ID: CAL14548
Analysis Lot: KWG1603624
Units: ppm
Column ID: ZB-1

File ID: J:\GC21\DATA\050616F\0506F066.D
 J:\GC21\DATA\050616F\0506F068.D

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Diesel Range Organics (DRO)	1000	1000	1170	1210	4	NA	± 15	AverageRF
Residual Range Organics (RRO)	1000	1000	615	624	1	NA	± 15	AverageRF
o-Terphenyl	50	57	1490	1700	14	NA	± 15	AverageRF
n-Triacontane	50	55	1270	1390	10	NA	± 15	AverageRF

Results flagged with an asterisk (*) indicate values outside control criteria.

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01A

Service Request: K1604464

Analysis Run Log
Diesel and Residual Range Organics

Analysis Method: NWTPH-Dx

Analysis Lot: KWG1603624
Instrument ID: GC21
Column: ZB-1

File ID	Sample Name	Lab Code	Date Analysis Started	Start Time	Q	Date Analysis Finished	Finish Time
0506F010.D	Continuing Calibration Verification	KWG1603624-1	5/6/2016	09:47		5/6/2016	10:03
0506F012.D	Continuing Calibration Verification	KWG1603624-1	5/6/2016	10:09		5/6/2016	10:25
0506F014.D	Instrument Blank	KWG1603624-5	5/6/2016	10:32		5/6/2016	10:48
0506F020.D	ZZZZZZ	ZZZZZZ	5/6/2016	11:38		5/6/2016	11:54
0506F022.D	ZZZZZZ	ZZZZZZ	5/6/2016	12:00		5/6/2016	12:16
0506F024.D	ZZZZZZ	ZZZZZZ	5/6/2016	12:23		5/6/2016	12:39
0506F026.D	ZZZZZZ	ZZZZZZ	5/6/2016	12:45		5/6/2016	13:01
0506F028.D	ZZZZZZ	ZZZZZZ	5/6/2016	13:07		5/6/2016	13:23
0506F030.D	ZZZZZZ	ZZZZZZ	5/6/2016	13:29		5/6/2016	13:45
0506F032.D	ZZZZZZ	ZZZZZZ	5/6/2016	13:51		5/6/2016	14:07
0506F034.D	ZZZZZZ	ZZZZZZ	5/6/2016	14:13		5/6/2016	14:29
0506F036.D	ZZZZZZ	ZZZZZZ	5/6/2016	14:35		5/6/2016	14:51
0506F038.D	ZZZZZZ	ZZZZZZ	5/6/2016	14:57		5/6/2016	15:13
0506F040.D	ZZZZZZ	ZZZZZZ	5/6/2016	15:19		5/6/2016	15:35
0506F042.D	Continuing Calibration Verification	KWG1603624-2	5/6/2016	15:41		5/6/2016	15:57
0506F044.D	Continuing Calibration Verification	KWG1603624-2	5/6/2016	16:03		5/6/2016	16:19
0506F046.D	Instrument Blank	KWG1603624-6	5/6/2016	16:24		5/6/2016	16:40
0506F048.D	Lab Control Sample	KWG1603514-2	5/6/2016	16:46		5/6/2016	17:02
0506F050.D	Method Blank	KWG1603514-3	5/6/2016	17:08		5/6/2016	17:24
0506F052.D	ZZZZZZ	ZZZZZZ	5/6/2016	17:30		5/6/2016	17:46
0506F054.D	AOC160426IDW	K1604464-002	5/6/2016	17:52		5/6/2016	18:08
0506F056.D	ZZZZZZ	ZZZZZZ	5/6/2016	18:15		5/6/2016	18:31
0506F058.D	ZZZZZZ	ZZZZZZ	5/6/2016	18:36		5/6/2016	18:52
0506F060.D	Batch QC	K1604482-001	5/6/2016	18:58		5/6/2016	19:14
0506F062.D	Batch QCDUP	KWG1603514-1	5/6/2016	19:20		5/6/2016	19:36
0506F064.D	ZZZZZZ	ZZZZZZ	5/6/2016	19:42		5/6/2016	19:58
0506F066.D	Continuing Calibration Verification	KWG1603624-3	5/6/2016	20:05		5/6/2016	20:21
0506F068.D	Continuing Calibration Verification	KWG1603624-3	5/6/2016	20:27		5/6/2016	20:43
0506F070.D	Instrument Blank	KWG1603624-7	5/6/2016	20:49		5/6/2016	21:05
0506F072.D	ZZZZZZ	ZZZZZZ	5/6/2016	21:11		5/6/2016	21:27
0506F074.D	ZZZZZZ	ZZZZZZ	5/6/2016	21:33		5/6/2016	21:49
0506F076.D	ZZZZZZ	ZZZZZZ	5/6/2016	21:55		5/6/2016	22:11
0506F078.D	ZZZZZZ	ZZZZZZ	5/6/2016	22:17		5/6/2016	22:33
0506F080.D	ZZZZZZ	ZZZZZZ	5/6/2016	22:39		5/6/2016	22:55

Results flagged with an asterisk (*) indicate the holding time was exceeded for the analysis

QA/QC Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01A

Service Request: K1604464

**Analysis Run Log
 Diesel and Residual Range Organics**

Analysis Method: NWTPH-Dx

Analysis Lot: KWG1603624
Instrument ID: GC21
Column: ZB-1

File ID	Sample Name	Lab Code	Date Analysis Started	Start Time	Q	Date Analysis Finished	Finish Time
0506F082.D	ZZZZZZ	ZZZZZZ	5/6/2016	23:01		5/6/2016	23:17
0506F084.D	ZZZZZZ	ZZZZZZ	5/6/2016	23:23		5/6/2016	23:39
0506F086.D	ZZZZZZ	ZZZZZZ	5/6/2016	23:46		5/7/2016	00:02
0506F088.D	ZZZZZZ	ZZZZZZ	5/7/2016	00:08		5/7/2016	00:24
0506F090.D	Continuing Calibration Verification	KWG1603624-4	5/7/2016	00:30		5/7/2016	00:46
0506F092.D	Continuing Calibration Verification	KWG1603624-4	5/7/2016	00:52		5/7/2016	01:08
0506F094.D	Instrument Blank	KWG1603624-8	5/7/2016	01:14		5/7/2016	01:30

Results flagged with an asterisk (*) indicate the holding time was exceeded for the analysis

QA/QC Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01A
Sample Matrix: Water

Service Request: K1604464
Date Extracted: 05/04/2016

Extraction Prep Log
Diesel and Residual Range Organics

Extraction Method: METHOD
Analysis Method: NWTPH-Dx

Extraction Lot: KWG1603514
Level: Low

Sample Name	Lab Code	Date Collected	Date Received	Sample Amount	Final Volume	% Solids	Note
AOC160426IDW	K1604464-002	04/26/16	04/29/16	1060ml	2ml	NA	
Batch QCDUP	KWG1603514-1	NA	NA	1000ml	2ml	NA	
Method Blank	KWG1603514-3	NA	NA	1060ml	2ml	NA	
Batch QC	K1604482-001	NA	NA	1020ml	2ml	NA	
Lab Control Sample	KWG1603514-2	NA	NA	1000ml	2ml	NA	

Results flagged with an asterisk (*) indicate the holding time was exceeded for the analysis



Gasoline Range Organics

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01A

Service Request: K1604464

**Cover Page - Organic Analysis Data Package
Gasoline Range Organics**

Sample Name	Lab Code	Date Collected	Date Received
AOC160426TB	K1604464-001	04/26/2016	04/29/2016
AOC160426IDW	K1604464-002	04/26/2016	04/29/2016
AOC160426IDW	KWG1603526-5	04/26/2016	04/29/2016

Analytical Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01A
Sample Matrix: Water

Service Request: K1604464
Date Collected: 04/26/2016
Date Received: 04/29/2016

Gasoline Range Organics

Sample Name: AOC160426TB
Lab Code: K1604464-001
Extraction Method: EPA 5030B
Analysis Method: NWTPH-Gx

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics-NWTPH	ND	U	250	25	9.6	1	05/03/16	05/03/16	KWG1603526	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Difluorobenzene	88	50-150	05/03/16	Acceptable

Comments: _____

Analytical Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01A
Sample Matrix: Water

Service Request: K1604464
Date Collected: 04/26/2016
Date Received: 04/29/2016

Gasoline Range Organics

Sample Name: AOC160426IDW
Lab Code: K1604464-002
Extraction Method: EPA 5030B
Analysis Method: NWTPH-Gx

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics-NWTPH	ND	U	250	25	9.6	1	05/03/16	05/03/16	KWG1603526	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Difluorobenzene	88	50-150	05/03/16	Acceptable

Comments: _____

Analytical Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01A
Sample Matrix: Water

Service Request: K1604464
Date Collected: NA
Date Received: NA

Gasoline Range Organics

Sample Name: Method Blank
Lab Code: KWG1603526-4
Extraction Method: EPA 5030B
Analysis Method: NWTPH-Gx

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics-NWTPH	ND	U	250	25	9.6	1	05/03/16	05/03/16	KWG1603526	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Difluorobenzene	88	50-150	05/03/16	Acceptable

Comments: _____

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01A
Sample Matrix: Water

Service Request: K1604464

**Surrogate Recovery Summary
 Gasoline Range Organics**

Extraction Method: EPA 5030B
Analysis Method: NWTPH-Gx

Units: Percent
Level: Low

<u>Sample Name</u>	<u>Lab Code</u>	<u>Sur1</u>
AOC160426TB	K1604464-001	88
AOC160426IDW	K1604464-002	88
AOC160426IDWDUP	KWG1603526-5	88
Method Blank	KWG1603526-4	88
Lab Control Sample	KWG1603526-3	90

Surrogate Recovery Control Limits (%)

Sur1 = 1,4-Difluorobenzene 50-150

Results flagged with an asterisk (*) indicate values outside control criteria.
 Results flagged with a pound (#) indicate the control criteria is not applicable.

QA/QC Report

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01A
Sample Matrix: Water

Service Request: K1604464
Date Extracted: 05/03/2016
Date Analyzed: 05/03/2016

Duplicate Sample Summary
Gasoline Range Organics

Sample Name: AOC160426IDW
Lab Code: K1604464-002
Extraction Method: EPA 5030B
Analysis Method: NWTPH-Gx

Units: ug/L
Basis: NA
Level: Low
Extraction Lot: KWG1603526

Analyte Name	LOQ	MDL	Sample Result	AOC160426IDWDUP KWG1603526-5 Duplicate Sample		Relative Percent Difference	RPD Limit
				Result	Average		
Gasoline Range Organics-NWTPH	250	9.6	ND	ND	ND	-	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

QA/QC Report

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01A
Sample Matrix: Water

Service Request: K1604464
Date Extracted: 05/03/2016
Date Analyzed: 05/03/2016

Lab Control Spike Summary
Gasoline Range Organics

Extraction Method: EPA 5030B
Analysis Method: NWTPH-Gx

Units: ug/L
Basis: NA
Level: Low
Extraction Lot: KWG1603526

Lab Control Sample
 KWG1603526-3
Lab Control Spike

Analyte Name	Result	Spike Amount	%Rec	%Rec Limits
Gasoline Range Organics-NWTPH	482	500	96	80-119

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

QA/QC Report

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01A
Sample Matrix: Water

Service Request: K1604464
Date Extracted: 05/03/2016
Date Analyzed: 05/03/2016
Time Analyzed: 17:11

Method Blank Summary
Gasoline Range Organics

Sample Name: Method Blank
Lab Code: KWG1603526-4
Extraction Method: EPA 5030B
Analysis Method: NWTPH-Gx

Instrument ID: GC39
File ID: J:\GC39\DATA\050316\0503F021.D
Level: Low
Extraction Lot: KWG1603526

This Method Blank applies to the following analyses:

Sample Name	Lab Code	File ID	Date Analyzed	Time Analyzed
AOC160426TB	K1604464-001	J:\GC39\DATA\050316\0503F005.D	05/03/16	10:43
AOC160426IDW	K1604464-002	J:\GC39\DATA\050316\0503F006.D	05/03/16	11:07
AOC160426IDWDUP	KWG1603526-5	J:\GC39\DATA\050316\0503F007.D	05/03/16	11:32
Lab Control Sample	KWG1603526-3	J:\GC39\DATA\050316\0503F020.D	05/03/16	16:47

QA/QC Report

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01A
Sample Matrix: Water

Service Request: K1604464
Date Extracted: 05/03/2016
Date Analyzed: 05/03/2016
Time Analyzed: 16:47

Lab Control Sample Summary
Gasoline Range Organics

Sample Name: Lab Control Sample **Instrument ID:** GC39
Lab Code: KWG1603526-3 **File ID:** J:\GC39\DATA\050316\0503F020.D
Extraction Method: EPA 5030B **Level:** Low
Analysis Method: NWTPH-Gx **Extraction Lot:** KWG1603526

This Lab Control Sample applies to the following analyses:

Sample Name	Lab Code	File ID	Date Analyzed	Time Analyzed
AOC160426TB	K1604464-001	J:\GC39\DATA\050316\0503F005.D	05/03/16	10:43
AOC160426IDW	K1604464-002	J:\GC39\DATA\050316\0503F006.D	05/03/16	11:07
AOC160426IDWDUP	KWG1603526-5	J:\GC39\DATA\050316\0503F007.D	05/03/16	11:32
Method Blank	KWG1603526-4	J:\GC39\DATA\050316\0503F021.D	05/03/16	17:11

QA/QC Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01A

Service Request: K1604464
Calibration Date: 08/06/2015

Initial Calibration Summary
Gasoline Range Organics

Calibration ID: CAL14201
Instrument ID: GC39

Column: DB-624

Level ID	File ID	Level ID	File ID
A	J:\GC39\Data\080615\0806F009.D	E	J:\GC39\Data\080615\0806F013.D
B	J:\GC39\Data\080615\0806F010.D	F	J:\GC39\Data\080615\0806F014.D
C	J:\GC39\Data\080615\0806F011.D	G	J:\GC39\Data\080615\0806F015.D
D	J:\GC39\Data\080615\0806F012.D		

Analyte Name	Level ID			Level ID			Level ID			Level ID					
	ID	Amt	RF	ID	Amt	RF	ID	Amt	RF	ID	Amt	RF			
Gasoline Range Organics-NWTPH	A	50	74200	B	100	63800	C	200	67900	D	500	66800	E	1000	66900
	F	5000	71800	G	10000	73400									
1,4-Difluorobenzene	A	20	1.23E+5	B	25	1.25E+5	C	50	1.20E+5	D	100	1.16E+5	E	150	1.18E+5

Results flagged with an asterisk (*) indicate values outside control criteria.

QA/QC Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01A

Service Request: K1604464
Calibration Date: 08/06/2015

Initial Calibration Summary
Gasoline Range Organics

Calibration ID: CAL14201
Instrument ID: GC39

Column: DB-624

Analyte Name	Compound Type	Calibration Evaluation				Control Criteria
		Fit Type	Eval.	Eval. Result	Q	
Gasoline Range Organics-NWTPH	MS	AverageRF	% RSD	5.6		≤ 20
1,4-Difluorobenzene	SURR	AverageRF	% RSD	3.0		≤ 20

Results flagged with an asterisk (*) indicate values outside control criteria.

QA/QC Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01A

Service Request: K1604464
Calibration Date: 08/06/2015
Date Analyzed: 08/06/2015

Second Source Calibration Verification
Gasoline Range Organics

Calibration Type: External Standard
Analysis Method: NWTPH-Gx

Calibration ID: CAL14201
Units: ug/L

File ID: J:\GC39\Data\080615\0806F018.D

Column ID: DB-624

Analyte Name	Expected	Result	Average RF	SSV RF	%D	%Drift	Criteria	Curve Fit
Gasoline Range Organics-NWTPH	500	430	69300	60200	-13	NA	± 15 %	AverageRF

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

QA/QC Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01A

Service Request: K1604464
Date Analyzed: 05/03/2016

Continuing Calibration Verification Summary
Gasoline Range Organics

Calibration Type: External Standard
Analysis Method: NWTPH-Gx

Calibration Date: 08/06/2015
Calibration ID: CAL14201
Analysis Lot: KWG1603524
Units: ug/L
Column ID: DB-624

File ID: J:\GC39\DATA\050316\0503F003.D

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Gasoline Range Organics-NWTPH	500	480	69300	66500	-4	NA	± 20	AverageRF
1,4-Difluorobenzene	100	90	120000	108000	-10	NA	± 20	AverageRF

Results flagged with an asterisk (*) indicate values outside control criteria.

QA/QC Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01A

Service Request: K1604464
Date Analyzed: 05/03/2016

Continuing Calibration Verification Summary
Gasoline Range Organics

Calibration Type: External Standard
Analysis Method: NWTPH-Gx

Calibration Date: 08/06/2015
Calibration ID: CAL14201
Analysis Lot: KWG1603524
Units: ug/L
Column ID: DB-624

File ID: J:\GC39\DATA\050316\0503F022.D

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Gasoline Range Organics-NWTPH	500	460	69300	64400	-7	NA	± 20	AverageRF
1,4-Difluorobenzene	100	90	120000	108000	-10	NA	± 20	AverageRF

Results flagged with an asterisk (*) indicate values outside control criteria.

QA/QC Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01A

Service Request: K1604464

Analysis Run Log
Gasoline Range Organics

Analysis Method: NWTPH-Gx

Analysis Lot: KWG1603524
Instrument ID: GC39
Column: DB-624

File ID	Sample Name	Lab Code	Date Analysis Started	Start Time	Q	Date Analysis Finished	Finish Time
0503F003.D	Continuing Calibration Verification	KWG1603524-1	5/3/2016	09:44		5/3/2016	09:59
0503F004.D	Instrument Blank	KWG1603524-4	5/3/2016	10:19		5/3/2016	10:34
0503F005.D	AOC160426TB	K1604464-001	5/3/2016	10:43		5/3/2016	10:58
0503F006.D	AOC160426IDW	K1604464-002	5/3/2016	11:07		5/3/2016	11:22
0503F007.D	AOC160426IDWDUP	KWG1603526-5	5/3/2016	11:32		5/3/2016	11:47
0503F009.D	ZZZZZZ	ZZZZZZ	5/3/2016	12:20		5/3/2016	12:35
0503F010.D	ZZZZZZ	ZZZZZZ	5/3/2016	12:45		5/3/2016	13:00
0503F011.D	ZZZZZZ	ZZZZZZ	5/3/2016	13:09		5/3/2016	13:24
0503F013.D	ZZZZZZ	ZZZZZZ	5/3/2016	13:57		5/3/2016	14:12
0503F016.D	ZZZZZZ	ZZZZZZ	5/3/2016	15:10		5/3/2016	15:25
0503F019.D	ZZZZZZ	ZZZZZZ	5/3/2016	16:22		5/3/2016	16:37
0503F020.D	Lab Control Sample	KWG1603526-3	5/3/2016	16:47		5/3/2016	17:02
0503F021.D	Method Blank	KWG1603526-4	5/3/2016	17:11		5/3/2016	17:26
0503F022.D	Continuing Calibration Verification	KWG1603524-2	5/3/2016	17:35		5/3/2016	17:50
0503F023.D	Instrument Blank	KWG1603524-5	5/3/2016	17:59		5/3/2016	18:14
0503F024.D	ZZZZZZ	ZZZZZZ	5/3/2016	18:23		5/3/2016	18:38
0503F027.D	ZZZZZZ	ZZZZZZ	5/3/2016	19:36		5/3/2016	19:51
0503F030.D	ZZZZZZ	ZZZZZZ	5/3/2016	20:49		5/3/2016	21:04
0503F033.D	ZZZZZZ	ZZZZZZ	5/3/2016	22:01		5/3/2016	22:16
0503F034.D	ZZZZZZ	ZZZZZZ	5/3/2016	22:26		5/3/2016	22:41
0503F035.D	Continuing Calibration Verification	KWG1603524-3	5/3/2016	22:50		5/3/2016	23:05
0503F036.D	Instrument Blank	KWG1603524-6	5/3/2016	23:14		5/3/2016	23:29

Results flagged with an asterisk (*) indicate the holding time was exceeded for the analysis

QA/QC Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01A
Sample Matrix: Water

Service Request: K1604464
Date Extracted: 05/03/2016

Extraction Prep Log
Gasoline Range Organics

Extraction Method: EPA 5030B
Analysis Method: NWTPH-Gx

Extraction Lot: KWG1603526
Level: Low

Sample Name	Lab Code	Date Collected	Date Received	Sample Amount	Final Volume	% Solids	Note
AOC160426TB	K1604464-001	04/26/16	04/29/16	10ml	10ml	NA	
AOC160426IDW	K1604464-002	04/26/16	04/29/16	10ml	10ml	NA	
AOC160426IDWDUP	KWG1603526-5	04/26/16	04/29/16	10ml	10ml	NA	
Method Blank	KWG1603526-4	NA	NA	10ml	10ml	NA	
Lab Control Sample	KWG1603526-3	NA	NA	10ml	10ml	NA	

Results flagged with an asterisk (*) indicate the holding time was exceeded for the analysis



Volatile Organic Compounds

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01A

Service Request: K1604464

**Cover Page - Organic Analysis Data Package
Volatile Organic Compounds**

Sample Name	Lab Code	Date Collected	Date Received
LGC160427MAMC1R	K1604464-003	04/27/2016	04/29/2016
LGC160427MAMC6R	K1604464-004	04/27/2016	04/29/2016

Analytical Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01A
Sample Matrix: Water

Service Request: K1604464
Date Collected: 04/27/2016
Date Received: 04/29/2016

Volatile Organic Compounds

Sample Name: LGC160427MAMC1R
Lab Code: K1604464-003
Extraction Method: EPA 5030B
Analysis Method: 8260C

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Vinyl Chloride	ND	U	0.50	0.10	0.075	1	05/09/16	05/09/16	KWG1603657	*
cis-1,2-Dichloroethene	ND	U	0.50	0.20	0.067	1	05/09/16	05/09/16	KWG1603657	
1,1,1-Trichloroethane (TCA)	ND	U	0.50	0.20	0.075	1	05/09/16	05/09/16	KWG1603657	
Trichloroethene (TCE)	1.4		0.50	0.10	0.10	1	05/09/16	05/09/16	KWG1603657	
Tetrachloroethene (PCE)	ND	U	0.50	0.20	0.099	1	05/09/16	05/09/16	KWG1603657	

* See Case Narrative

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	95	85-115	05/09/16	Acceptable
1,2-Dichloroethane-d4	98	70-120	05/09/16	Acceptable
Toluene-d8	106	85-120	05/09/16	Acceptable
4-Bromofluorobenzene	92	75-120	05/09/16	Acceptable

Comments: _____

Analytical Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01A
Sample Matrix: Water

Service Request: K1604464
Date Collected: 04/27/2016
Date Received: 04/29/2016

Volatile Organic Compounds

Sample Name: LGC160427MAMC6R
Lab Code: K1604464-004
Extraction Method: EPA 5030B
Analysis Method: 8260C

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Vinyl Chloride	ND	U	0.50	0.10	0.075	1	05/09/16	05/09/16	KWG1603657	*
cis-1,2-Dichloroethene	ND	U	0.50	0.20	0.067	1	05/09/16	05/09/16	KWG1603657	
1,1,1-Trichloroethane (TCA)	ND	U	0.50	0.20	0.075	1	05/09/16	05/09/16	KWG1603657	
Trichloroethene (TCE)	0.89		0.50	0.10	0.10	1	05/09/16	05/09/16	KWG1603657	
Tetrachloroethene (PCE)	ND	U	0.50	0.20	0.099	1	05/09/16	05/09/16	KWG1603657	

* See Case Narrative

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	94	85-115	05/09/16	Acceptable
1,2-Dichloroethane-d4	95	70-120	05/09/16	Acceptable
Toluene-d8	104	85-120	05/09/16	Acceptable
4-Bromofluorobenzene	91	75-120	05/09/16	Acceptable

Comments: _____

Analytical Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01A
Sample Matrix: Water

Service Request: K1604464
Date Collected: NA
Date Received: NA

Volatile Organic Compounds

Sample Name: Method Blank
Lab Code: KWG1603657-4
Extraction Method: EPA 5030B
Analysis Method: 8260C

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Vinyl Chloride	ND	U	0.50	0.10	0.075	1	05/09/16	05/09/16	KWG1603657	*
cis-1,2-Dichloroethene	ND	U	0.50	0.20	0.067	1	05/09/16	05/09/16	KWG1603657	
1,1,1-Trichloroethane (TCA)	ND	U	0.50	0.20	0.075	1	05/09/16	05/09/16	KWG1603657	
Trichloroethene (TCE)	ND	U	0.50	0.10	0.10	1	05/09/16	05/09/16	KWG1603657	
Tetrachloroethene (PCE)	ND	U	0.50	0.20	0.099	1	05/09/16	05/09/16	KWG1603657	

* See Case Narrative

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	92	85-115	05/09/16	Acceptable
1,2-Dichloroethane-d4	93	70-120	05/09/16	Acceptable
Toluene-d8	104	85-120	05/09/16	Acceptable
4-Bromofluorobenzene	91	75-120	05/09/16	Acceptable

Comments: _____

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01A
Sample Matrix: Water

Service Request: K1604464

**Surrogate Recovery Summary
 Volatile Organic Compounds**

Extraction Method: EPA 5030B
Analysis Method: 8260C

Units: Percent
Level: Low

<u>Sample Name</u>	<u>Lab Code</u>	<u>Sur1</u>	<u>Sur2</u>	<u>Sur3</u>	<u>Sur4</u>
Batch QC	K1604463-005	92	96	105	93
LGC160427MAMC1R	K1604464-003	95	98	106	92
LGC160427MAMC6R	K1604464-004	94	95	104	91
Method Blank	KWG1603657-4	92	93	104	91
Batch QCMS	KWG1603657-1	105	91	115	103
Batch QCDMS	KWG1603657-2	104	94	113	102
Lab Control Sample	KWG1603657-3	104	91	115	103

Surrogate Recovery Control Limits (%)

Sur1 = Dibromofluoromethane	85-115
Sur2 = 1,2-Dichloroethane-d4	70-120
Sur3 = Toluene-d8	85-120
Sur4 = 4-Bromofluorobenzene	75-120

Results flagged with an asterisk (*) indicate values outside control criteria.
 Results flagged with a pound (#) indicate the control criteria is not applicable.

QA/QC Report

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01A

Service Request: K1604464
Date Analyzed: 05/09/2016
Time Analyzed: 14:54

Internal Standard Area and RT Summary
Volatile Organic Compounds

File ID: J:\MS18\DATA\050916\0509F004.D
Instrument ID: GC-MS 18
Analysis Method: 8260C

Lab Code: KWG1603656-2
Analysis Lot: KWG1603656

	Fluorobenzene		Chlorobenzene-d5		1,4-Dichlorobenzene-d4	
	<u>Area</u>	<u>RT</u>	<u>Area</u>	<u>RT</u>	<u>Area</u>	<u>RT</u>
Results ==>	646,449	5.55	244,609	9.02	236,433	11.44
Upper Limit ==>	1,292,898	5.72	489,218	9.19	472,866	11.61
Lower Limit ==>	323,225	5.38	122,305	8.85	118,217	11.27
ICAL Result ==>	674,911	5.55	264,357	9.02	240,805	11.43

Associated Analyses

Lab Control Sample	KWG1603657-3	623,109	5.55	240,078	9.02	233,582	11.44
Batch QCMS	KWG1603657-1	623,721	5.55	242,526	9.02	235,154	11.44
Batch QCDMS	KWG1603657-2	634,227	5.55	250,037	9.02	241,620	11.44
Method Blank	KWG1603657-4	603,054	5.55	229,237	9.02	215,032	11.44
Batch QC	K1604463-005	585,281	5.55	222,711	9.02	208,096	11.44
LGC160427MAMC1R	K1604464-003	570,540	5.55	219,639	9.02	211,360	11.44
LGC160427MAMC6R	K1604464-004	594,236	5.55	231,350	9.02	215,977	11.44

Results flagged with an asterisk (*) indicate values outside control criteria.

QA/QC Report

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01A
Sample Matrix: Water

Service Request: K1604464
Date Extracted: 05/09/2016
Date Analyzed: 05/09/2016

Matrix Spike/Duplicate Matrix Spike Summary
Volatile Organic Compounds

Sample Name: Batch QC
Lab Code: K1604463-005
Extraction Method: EPA 5030B
Analysis Method: 8260C

Units: ug/L
Basis: NA
Level: Low
Extraction Lot: KWG1603657

Analyte Name	Sample Result	Batch QCMS KWG1603657-1 Matrix Spike			Batch QCDMS KWG1603657-2 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Spike Amount	%Rec	Result	Spike Amount	%Rec			
Vinyl Chloride	ND	9.88	10.0	99	9.74	10.0	97	50-145	1	30
cis-1,2-Dichloroethene	ND	11.4	10.0	114	11.5	10.0	115	70-125	1	30
1,1,1-Trichloroethane (TCA)	ND	11.1	10.0	111	10.9	10.0	109	65-130	2	30
Trichloroethene (TCE)	2.2	13.7	10.0	115	13.5	10.0	113	70-125	1	30
Tetrachloroethene (PCE)	0.20	13.3	10.0	131	12.8	10.0	126	45-150	4	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01A
Sample Matrix: Water

Service Request: K1604464
Date Extracted: 05/09/2016
Date Analyzed: 05/09/2016

Lab Control Spike Summary
Volatile Organic Compounds

Extraction Method: EPA 5030B
Analysis Method: 8260C

Units: ug/L
Basis: NA
Level: Low
Extraction Lot: KWG1603657

Lab Control Sample
 KWG1603657-3
Lab Control Spike

Analyte Name	Result	Spike Amount	%Rec	%Rec Limits
Vinyl Chloride	8.62	10.0	86	50-145
cis-1,2-Dichloroethene	10.9	10.0	109	70-125
1,1,1-Trichloroethane (TCA)	9.69	10.0	97	65-130
Trichloroethene (TCE)	10.4	10.0	104	70-125
Tetrachloroethene (PCE)	11.8	10.0	118	45-150

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

QA/QC Report

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01A
Sample Matrix: Water

Service Request: K1604464
Date Extracted: 05/09/2016
Date Analyzed: 05/09/2016
Time Analyzed: 16:49

Method Blank Summary
Volatile Organic Compounds

Sample Name: Method Blank
Lab Code: KWG1603657-4
Extraction Method: EPA 5030B
Analysis Method: 8260C

Instrument ID: GC-MS 18
File ID: J:\MS18\DATA\050916\0509F009.D
Level: Low
Extraction Lot: KWG1603657

This Method Blank applies to the following analyses:

Sample Name	Lab Code	File ID	Date Analyzed	Time Analyzed
Lab Control Sample	KWG1603657-3	J:\MS18\DATA\050916\0509F005.D	05/09/16	15:22
Batch QCMS	KWG1603657-1	J:\MS18\DATA\050916\0509F006.D	05/09/16	15:44
Batch QCDMS	KWG1603657-2	J:\MS18\DATA\050916\0509F007.D	05/09/16	16:06
Batch QC	K1604463-005	J:\MS18\DATA\050916\0509F010.D	05/09/16	17:10
LGC160427MAMC1R	K1604464-003	J:\MS18\DATA\050916\0509F016.D	05/09/16	19:19
LGC160427MAMC6R	K1604464-004	J:\MS18\DATA\050916\0509F017.D	05/09/16	19:41

QA/QC Report

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01A
Sample Matrix: Water

Service Request: K1604464
Date Extracted: 05/09/2016
Date Analyzed: 05/09/2016
Time Analyzed: 15:22

Lab Control Sample Summary
Volatile Organic Compounds

Sample Name: Lab Control Sample
Lab Code: KWG1603657-3
Extraction Method: EPA 5030B
Analysis Method: 8260C

Instrument ID: GC-MS 18
File ID: J:\MS18\DATA\050916\0509F005.D
Level: Low
Extraction Lot: KWG1603657

This Lab Control Sample applies to the following analyses:

Sample Name	Lab Code	File ID	Date Analyzed	Time Analyzed
Batch QCMS	KWG1603657-1	J:\MS18\DATA\050916\0509F006.D	05/09/16	15:44
Batch QCDMS	KWG1603657-2	J:\MS18\DATA\050916\0509F007.D	05/09/16	16:06
Method Blank	KWG1603657-4	J:\MS18\DATA\050916\0509F009.D	05/09/16	16:49
Batch QC	K1604463-005	J:\MS18\DATA\050916\0509F010.D	05/09/16	17:10
LGC160427MAMC1R	K1604464-003	J:\MS18\DATA\050916\0509F016.D	05/09/16	19:19
LGC160427MAMC6R	K1604464-004	J:\MS18\DATA\050916\0509F017.D	05/09/16	19:41

QA/QC Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01A

Service Request: K1604464
Date Analyzed: 05/09/2016
Time Analyzed: 14:28

Tune Summary
Volatile Organic Compounds

File ID: J:\MS18\DATA\050916\0509F003.D
Instrument ID: GC-MS 18
Column:

Analysis Method: 8260C
Analysis Lot: KWG1603656

Target Mass	Relative to Mass	Lower Limit%	Upper Limit%	Relative Abundance %	Raw Abundance	Result Pass/Fail
50	95	15	40	16.1	11395	PASS
75	95	30	60	43.9	31144	PASS
95	95	100	100	100.0	70960	PASS
96	95	5	9	7.6	5424	PASS
173	174	0	2	0.7	381	PASS
174	95	50	120	82.0	58192	PASS
175	174	5	9	7.0	4071	PASS
176	174	95	101	96.8	56336	PASS
177	176	5	9	6.4	3613	PASS

Sample Name	Lab Code	File ID	Date Analyzed	Time Analyzed	Q
Continuing Calibration Verification	KWG1603656-2	J:\MS18\DATA\050916\0509F004.D	05/09/2016	14:54	
Lab Control Sample	KWG1603657-3	J:\MS18\DATA\050916\0509F005.D	05/09/2016	15:22	
Batch QCMS	KWG1603657-1	J:\MS18\DATA\050916\0509F006.D	05/09/2016	15:44	
Batch QCDMS	KWG1603657-2	J:\MS18\DATA\050916\0509F007.D	05/09/2016	16:06	
Method Blank	KWG1603657-4	J:\MS18\DATA\050916\0509F009.D	05/09/2016	16:49	
Batch QC	K1604463-005	J:\MS18\DATA\050916\0509F010.D	05/09/2016	17:10	
LGC160427MAMC1R	K1604464-003	J:\MS18\DATA\050916\0509F016.D	05/09/2016	19:19	
LGC160427MAMC6R	K1604464-004	J:\MS18\DATA\050916\0509F017.D	05/09/2016	19:41	

Results flagged with an asterisk (*) indicate the analysis performed outside specified tune window

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01A

Service Request: K1604464
Calibration Date: 04/13/2016

Initial Calibration Summary
Volatile Organic Compounds

Calibration ID: CAL14682
Instrument ID: GC-MS 18

Column: MS

Level ID	File ID	Level ID	File ID
A	J:\MS18\DATA\041316\0413F012.D	G	J:\MS18\DATA\041316\0413F018.D
B	J:\MS18\DATA\041316\0413F013.D	H	J:\MS18\DATA\041316\0413F019.D
C	J:\MS18\DATA\041316\0413F014.D	I	J:\MS18\DATA\041316\0413F020.D
D	J:\MS18\DATA\041316\0413F015.D	J	J:\MS18\DATA\041316\0413F021.D
E	J:\MS18\DATA\041316\0413F016.D	K	J:\MS18\DATA\041316\0413F022.D
F	J:\MS18\DATA\041316\0413F017.D		

Analyte Name	Level ID			Level ID			Level ID			Level ID			Level ID		
	ID	Amt	RRF	ID	Amt	RRF	ID	Amt	RRF	ID	Amt	RRF	ID	Amt	RRF
Vinyl Chloride	A	0.10	0.295	B	0.20	0.278	C	0.50	0.275	D	1.0	0.298	E	2.0	0.296
	F	5.0	0.318	G	10	0.306	H	20	0.317	I	40	0.327	J	60	0.308
	K	80	0.320												
cis-1,2-Dichloroethene				B	0.20	0.244	C	0.50	0.269	D	1.0	0.282	E	2.0	0.269
	F	5.0	0.273	G	10	0.276	H	20	0.283	I	40	0.293	J	60	0.284
	K	80	0.289												
1,1,1-Trichloroethane (TCA)							C	0.50	0.243	D	1.0	0.277	E	2.0	0.263
	F	5.0	0.309	G	10	0.306	H	20	0.331	I	40	0.352	J	60	0.340
	K	80	0.357												
Trichloroethene (TCE)				B	0.20	0.229	C	0.50	0.227	D	1.0	0.236	E	2.0	0.224
	F	5.0	0.234	G	10	0.233	H	20	0.244	I	40	0.255	J	60	0.246
	K	80	0.255												
Tetrachloroethene (PCE)				B	0.20	0.424	C	0.50	0.458	D	1.0	0.458	E	2.0	0.445
	F	5.0	0.471	G	10	0.464	H	20	0.481	I	40	0.506	J	60	0.485
	K	80	0.510												
Dibromofluoromethane										D	4.0	0.174	E	6.0	0.188
	F	8.0	0.185	G	10	0.196	H	12	0.206	I	14	0.209	J	16	0.210
	K	20	0.216												
1,2-Dichloroethane-d4										D	4.0	0.230	E	6.0	0.232
	F	8.0	0.228	G	10	0.228	H	12	0.229	I	14	0.229	J	16	0.226
	K	20	0.229												
Toluene-d8										D	4.0	0.833	E	6.0	0.903
	F	8.0	0.851	G	10	0.872	H	12	0.927	I	14	0.918	J	16	0.929
	K	20	0.929												
4-Bromofluorobenzene										D	4.0	0.792	E	6.0	0.876
	F	8.0	0.838	G	10	0.870	H	12	0.891	I	14	0.892	J	16	0.894
	K	20	0.908												

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01A

Service Request: K1604464
Calibration Date: 04/13/2016

**Initial Calibration Summary
 Volatile Organic Compounds**

Calibration ID: CAL14682
Instrument ID: GC-MS 18

Column: MS

Analyte Name	Compound Type	Calibration Evaluation					RRF Evaluation		
		Fit Type	Eval.	Eval. Result	Q	Control Criteria	Average RRF	Q	Minimum RRF
Vinyl Chloride	MS	AverageRF	% RSD	5.6		≤20	0.303		0.100
cis-1,2-Dichloroethene	MS	AverageRF	% RSD	5.0		≤20	0.276		0.100
1,1,1-Trichloroethane (TCA)	MS	AverageRF	% RSD	13.2		≤20	0.309		.100
Trichloroethene (TCE)	MS	AverageRF	% RSD	4.7		≤20	0.238		0.200
Tetrachloroethene (PCE)	MS	AverageRF	% RSD	5.6		≤20	0.470		0.200
Dibromofluoromethane	SURR	AverageRF	% RSD	7.4		≤20	0.198		0.01
1,2-Dichloroethane-d4	SURR	AverageRF	% RSD	0.7		≤20	0.229		0.01
Toluene-d8	SURR	AverageRF	% RSD	4.3		≤20	0.895		0.01
4-Bromofluorobenzene	SURR	AverageRF	% RSD	4.4		≤20	0.870		0.01

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

QA/QC Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01A

Service Request: K1604464
Calibration Date: 04/13/2016
Date Analyzed: 04/13/2016

Second Source Calibration Verification
Volatile Organic Compounds

Calibration Type: Internal Standard
Analysis Method: 8260C

Calibration ID: CAL14682
Units: PPB

File ID: J:\MS18\DATA\041316\0413F025.D
 J:\MS18\DATA\041316\0413F027.D

Analyte Name	Expected	Result	Average RF	SSV RF	%D	%Drift	Criteria	Curve Fit
Vinyl Chloride	10	9.0	0.303	0.273	-10	NA	± 30 %	AverageRF
cis-1,2-Dichloroethene	10	10	0.276	0.276	0	NA	± 30 %	AverageRF
1,1,1-Trichloroethane (TCA)	10	9.8	0.309	0.302	-2	NA	± 30 %	AverageRF
Trichloroethene (TCE)	10	9.7	0.238	0.230	-3	NA	± 30 %	AverageRF
Tetrachloroethene (PCE)	10	9.9	0.470	0.466	-1	NA	± 30 %	AverageRF

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

QA/QC Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01A

Service Request: K1604464
Date Analyzed: 05/09/2016

Continuing Calibration Verification Summary
Volatile Organic Compounds

Calibration Type: Internal Standard
Analysis Method: 8260C

Calibration Date: 04/13/2016
Calibration ID: CAL14682
Analysis Lot: KWG1603656
Units: PPB

File ID: J:\MS18\DATA\050916\0509F004.D

Analyte Name	Expected	Result	Min RF	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Vinyl Chloride	10	7.9	0.100	0.303	0.240	-21 *	NA	± 20	AverageRF
cis-1,2-Dichloroethene	10	11	0.100	0.276	0.298	8	NA	± 20	AverageRF
1,1,1-Trichloroethane (TCA)	10	8.8	.100	0.309	0.272	-12	NA	± 20	AverageRF
Trichloroethene (TCE)	10	9.5	0.200	0.238	0.225	-5	NA	± 20	AverageRF
Tetrachloroethene (PCE)	10	10	0.200	0.470	0.480	2	NA	± 20	AverageRF
Dibromofluoromethane	10	10	0.01	0.198	0.201	2	NA	± 20	AverageRF
1,2-Dichloroethane-d4	10	8.7	0.01	0.229	0.199	-13	NA	± 20	AverageRF
Toluene-d8	10	11	0.01	0.895	0.977	9	NA	± 20	AverageRF
4-Bromofluorobenzene	10	10	0.01	0.870	0.876	1	NA	± 20	AverageRF

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01A

Service Request: K1604464

Analysis Run Log
Volatile Organic Compounds

Analysis Method: 8260C

Analysis Lot: KWG1603656
Instrument ID: GC-MS 18

File ID	Sample Name	Lab Code	Date Analysis Started	Start Time	Q	Date Analysis Finished	Finish Time
0509F003.D	GC/MS Tuning - Bromofluorobenzene	KWG1603656-1	5/9/2016	14:28		5/9/2016	14:44
0509F004.D	Continuing Calibration Verification	KWG1603656-2	5/9/2016	14:54		5/9/2016	15:10
0509F005.D	Lab Control Sample	KWG1603657-3	5/9/2016	15:22		5/9/2016	15:38
0509F006.D	Batch QCMS	KWG1603657-1	5/9/2016	15:44		5/9/2016	16:00
0509F007.D	Batch QCDMS	KWG1603657-2	5/9/2016	16:06		5/9/2016	16:22
0509F009.D	Method Blank	KWG1603657-4	5/9/2016	16:49		5/9/2016	17:05
0509F010.D	Batch QC	K1604463-005	5/9/2016	17:10		5/9/2016	17:26
0509F011.D	ZZZZZZ	ZZZZZZ	5/9/2016	17:32		5/9/2016	17:48
0509F012.D	ZZZZZZ	ZZZZZZ	5/9/2016	17:53		5/9/2016	18:09
0509F013.D	ZZZZZZ	ZZZZZZ	5/9/2016	18:15		5/9/2016	18:31
0509F014.D	ZZZZZZ	ZZZZZZ	5/9/2016	18:36		5/9/2016	18:52
0509F015.D	ZZZZZZ	ZZZZZZ	5/9/2016	18:58		5/9/2016	19:14
0509F016.D	LGC160427MAMC1R	K1604464-003	5/9/2016	19:19		5/9/2016	19:35
0509F017.D	LGC160427MAMC6R	K1604464-004	5/9/2016	19:41		5/9/2016	19:57
0509F018.D	ZZZZZZ	ZZZZZZ	5/9/2016	20:02		5/9/2016	20:18
0509F019.D	ZZZZZZ	ZZZZZZ	5/9/2016	20:24		5/9/2016	20:40
0509F020.D	ZZZZZZ	ZZZZZZ	5/9/2016	20:45		5/9/2016	21:01
0509F021.D	ZZZZZZ	ZZZZZZ	5/9/2016	21:07		5/9/2016	21:23
0509F022.D	ZZZZZZ	ZZZZZZ	5/9/2016	21:28		5/9/2016	21:44
0509F023.D	ZZZZZZ	ZZZZZZ	5/9/2016	21:50		5/9/2016	22:06
0509F024.D	ZZZZZZ	ZZZZZZ	5/9/2016	22:11		5/9/2016	22:27
0509F025.D	ZZZZZZ	ZZZZZZ	5/9/2016	22:33		5/9/2016	22:49
0509F026.D	ZZZZZZ	ZZZZZZ	5/9/2016	22:54		5/9/2016	23:10
0509F027.D	ZZZZZZ	ZZZZZZ	5/9/2016	23:16		5/9/2016	23:32
0509F028.D	ZZZZZZ	ZZZZZZ	5/9/2016	23:37		5/9/2016	23:53
0509F029.D	ZZZZZZ	ZZZZZZ	5/9/2016	23:59		5/10/2016	00:15

Results flagged with an asterisk (*) indicate the holding time was exceeded for the analysis

QA/QC Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01A
Sample Matrix: Water

Service Request: K1604464
Date Extracted: 05/09/2016

Extraction Prep Log
Volatile Organic Compounds

Extraction Method: EPA 5030B
Analysis Method: 8260C

Extraction Lot: KWG1603657
Level: Low

Sample Name	Lab Code	Date Collected	Date Received	Sample Amount	Final Volume	% Solids	Note
LGC160427MAMC1R	K1604464-003	04/27/16	04/29/16	10ml	10ml	NA	
LGC160427MAMC6R	K1604464-004	04/27/16	04/29/16	10ml	10ml	NA	
Method Blank	KWG1603657-4	NA	NA	10ml	10ml	NA	
Batch QC	K1604463-005	NA	NA	10ml	10ml	NA	
Batch QCMS	KWG1603657-1	NA	NA	10ml	10ml	NA	
Batch QCDMS	KWG1603657-2	NA	NA	10ml	10ml	NA	
Lab Control Sample	KWG1603657-3	NA	NA	10ml	10ml	NA	

Results flagged with an asterisk (*) indicate the holding time was exceeded for the analysis



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October 05, 2016

Analytical Report for Service Request No: K1610210

Scott Elkind
Sealaska Environmental Services, LLC
18743 Front Street NE
P.O. Box 869
Poulsbo, WA 98370

RE: JBLM FLAO / TO 01B

Dear Scott,

Enclosed are the results of the sample(s) submitted to our laboratory September 01, 2016
For your reference, these analyses have been assigned our service request number **K1610210**.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3376. You may also contact me via email at gregory.salata@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Gregory Salata, Ph.D.
Senior Project
Manager



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Acronyms

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Diesel and Residual Range Organics

Gasoline Range Organics

Volatile Organic Compounds

Raw Data

 Diesel and Residual Range Organics

 Gasoline Range Organics

 Volatile Organic Compounds

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

- * The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- E The result is an estimate amount because the value exceeded the instrument calibration range.
- J The result is an estimated value.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.2 definition : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.
- H The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

- # The control limit criteria is not applicable. See case narrative.
- J The result is an estimated value.
- E The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
- M The duplicate injection precision was not met.
- N The Matrix Spike sample recovery is not within control limits. See case narrative.
- S The reported value was determined by the Method of Standard Additions (MSA).
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.2 definition : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- W The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
 - i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- + The correlation coefficient for the MSA is less than 0.995.
- Q See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

- * The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- A A tentatively identified compound, a suspected aldol-condensation product.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- C The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
- D The reported result is from a dilution.
- E The result is an estimated value.
- J The result is an estimated value.
- N The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
- P The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.2 definition : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

- F The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
- L The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
- H The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
- O The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
- Y The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
- Z The chromatographic fingerprint does not resemble a petroleum product.

**ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses**

Agency	Web Site	Number
Alaska DEC UST	http://dec.alaska.gov/applications/eh/ehllabreports/USTLabs.aspx	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L14-51
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	Not available	-
ISO 17025	http://www.pjllabs.com/	L16-57
Louisiana DEQ	http://www.deq.louisiana.gov/portal/DIVISIONS/PublicParticipationandPermitSupport/LouisianaLaboratoryAccreditationProgram.aspx	03016
Maine DHS	Not available	WA01276
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Montana DPHHS	http://www.dphhs.mt.gov/publichealth/	CERT0047
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/oqa/	WA005
North Carolina DWQ	http://www.dwqlab.org/	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/envserv/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wyoming (EPA Region 8)	http://www.epa.gov/region8/water/dwhome/wyomingdi.html	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.

Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/analyte is offered by that state.



Case Narrative

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

ALS ENVIRONMENTAL

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/ TO 01B
Sample Matrix: Water

Service Request No.: K1610210
Date Received: 09/01/16

Case Narrative

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier IV validation deliverables including summary forms and all of the associated raw data for each of the analyses. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt

Eighteen water samples were received for analysis at ALS Environmental on 09/01/16. The samples were received in good condition and consistent with the accompanying chain of custody form, except where noted on the cooler receipt and preservation form included in this report. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

Diesel Range Organics by Method NWTPH-Dx

Sample Notes and Discussion:

Manual integration of one or more chromatographic peaks was required to correct the integration performed by the automated data processing program. The manual integration was performed in accordance with ALS policy, which is consistent with the National Environmental Laboratory Accreditation Program (NELAP), Department of Defense (DOD), and other certifying agencies. The analytes that required manual integrations are identified on each sample report contained in this data package.

Relative Percent Difference Exceptions:

The Relative Percent Difference (RPD) criterion for the replicate analysis of all analytes in sample AOC1608314131MW04-1 was not applicable because the analyte concentration was not significantly greater than the Method Reporting Limit (MRL). Analytical values derived from measurements close to the detection limit are not subject to the same accuracy and precision criteria as results derived from measurements higher on the calibration range for the method.

No other anomalies associated with the analysis of these samples were observed.

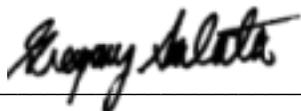
Gasoline Range Organics by Method NWTPH-Gx

Sample Notes and Discussion:

Manual integration of one or more chromatographic peaks was required to correct the integration performed by the automated data processing program. The manual integration was performed in accordance with ALS policy, which is consistent with the National Environmental Laboratory Accreditation Program (NELAP), Department of Defense (DOD), and other certifying agencies. The analytes that required manual integrations are identified on each sample report contained in this data package.

No other anomalies associated with the analysis of these samples were observed.

Approved by _____



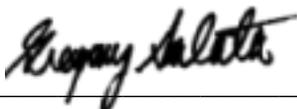
Volatile Organic Compounds by EPA Method 8260

Sample Notes and Discussion:

Manual integration of one or more chromatographic peaks was required to correct the integration performed by the automated data processing program. The manual integrations were performed in accordance with ALS policy, which is consistent with the National Environmental Laboratory Accreditation Program (NELAP), Department of Defense (DOD), and other certifying agencies. The analytes that required manual integrations are identified on each sample report contained in this data package.

No other anomalies associated with the analysis of these samples were observed.

Approved by _____





Chain of Custody

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com



PC Greig

Cooler Receipt and Preservation Form

Client Sealaska Service Request K16 10210
Received: 9-1-16 Opened: 9-1-16 By: EG Unloaded: 9-1-16 By: EG

- 1. Samples were received via? **USPS** Fed Ex **UPS** **DHL** **PDX** Courier **Hand Delivered**
- 2. Samples were received in: (circle) Cooler **Box** **Envelope** **Other** NA
- 3. Were custody seals on coolers? NA Y **N** If yes, how many and where? 1-front 1-back
If present, were custody seals intact? Y **N** If present, were they signed and dated? Y **N**

Raw Cooler Temp	Corrected Cooler Temp	Raw Temp Blank	Corrected Temp Blank	Corr. Factor	Thermometer ID	Cooler/COC ID NA	Tracking Number NA	Filed
1.0	1.0	Frozen		0	352		623053	
-0.6	-0.8	Frozen		-0.2	361			
-0.3	-0.3	Frozen		0	348			
0.7	0.6	1.9	1.8	-0.1	323			

- 4. Packing material: Inserts Baggies Bubble Wrap **Gel Packs** Wet Ice **Dry Ice** **Sleeves**
- 5. Were custody papers properly filled out (ink, signed, etc.)? NA Y **N**
- 6. Were samples received in good condition (temperature, unbroken)? *Indicate in the table below.* NA Y **N**
If applicable, tissue samples were received: **Frozen** **Partially Thawed** **Thawed**
- 7. Were all sample labels complete (i.e analysis, preservation, etc.)? NA Y **N**
- 8. Did all sample labels and tags agree with custody papers? *Indicate major discrepancies in the table on page 2.* NA **Y** N
- 9. Were appropriate bottles/containers and volumes received for the tests indicated? NA Y **N**
- 10. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* NA **Y** **N**
- 11. Were VOA vials received without headspace? *Indicate in the table below.* NA Y **N**
- 12. Was C12/Res negative? NA **Y** **N**

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count	Bottle Type	Out of Temp	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, & Resolutions: Sample: AOC1608314131MW04-1 Received 6 containers
Sample AOC1608314131 MW05-1 only received 2 containers



Diesel and Residual Range Organics

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01B

Service Request: K1610210

**Cover Page - Organic Analysis Data Package
 Diesel and Residual Range Organics**

Sample Name	Lab Code	Date Collected	Date Received
AOC1608314131MW02-1	K1610210-001	08/31/2016	09/01/2016
AOC1608314131MW03-1	K1610210-002	08/31/2016	09/01/2016
AOC1608314131MW04-1	K1610210-003	08/31/2016	09/01/2016
AOC1608314131MW05-1	K1610210-004	08/31/2016	09/01/2016
AOC1608314131MW13-1	K1610210-005	08/31/2016	09/01/2016
AOC160830A0111MW04-1	K1610210-006	08/30/2016	09/01/2016
AOC160830A0111MW06-1	K1610210-007	08/30/2016	09/01/2016
AOC160830A0111MW07-1	K1610210-008	08/30/2016	09/01/2016
AOC160830A0111MW08-1	K1610210-009	08/30/2016	09/01/2016
AOC160830AOC108B05-1	K1610210-010	08/30/2016	09/01/2016
AOC160829JPMW02-1	K1610210-011	08/29/2016	09/01/2016
AOC160831IDW-1	K1610210-017	08/31/2016	09/01/2016
AOC1608314131MW04-1	KWG1608058-1	08/31/2016	09/01/2016
AOC1608314131MW04-1MS	KWG1608058-2	08/31/2016	09/01/2016
AOC1608314131MW04-1DMS	KWG1608058-3	08/31/2016	09/01/2016
AOC1608314131MW03-1	KWG1608626-4	08/31/2016	09/01/2016

Analytical Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01B
Sample Matrix: Water

Service Request: K1610210
Date Collected: 08/31/2016
Date Received: 09/01/2016

Diesel and Residual Range Organics

Sample Name: AOC1608314131MW02-1
Lab Code: K1610210-001
Extraction Method: METHOD
Analysis Method: NWTTPH-Dx

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	1700	Y	97	20	11	1	09/12/16	09/30/16	KWG1608058	
Residual Range Organics (RRO)	550	L	97	50	19	1	09/12/16	09/30/16	KWG1608058	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	87	50-150	09/30/16	Acceptable
n-Triacontane	90	50-150	09/30/16	Acceptable

Comments: _____

Analytical Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01B
Sample Matrix: Water

Service Request: K1610210
Date Collected: 08/31/2016
Date Received: 09/01/2016

Diesel and Residual Range Organics

Sample Name: AOC1608314131MW03-1
Lab Code: K1610210-002
Extraction Method: METHOD
Analysis Method: NWTPH-Dx

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	3100	Y	97	20	11	1	09/12/16	09/30/16	KWG1608058	
Residual Range Organics (RRO)	600	L	97	50	19	1	09/12/16	09/30/16	KWG1608058	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	82	50-150	09/30/16	Acceptable
n-Triacontane	85	50-150	09/30/16	Acceptable

Comments: _____

Analytical Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01B
Sample Matrix: Water

Service Request: K1610210
Date Collected: 08/31/2016
Date Received: 09/01/2016

Diesel and Residual Range Organics

Sample Name: AOC1608314131MW04-1
Lab Code: K1610210-003
Extraction Method: METHOD
Analysis Method: NWTTPH-Dx

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	12	J	110	21	12	1	09/12/16	09/29/16	KWG1608058	
Residual Range Organics (RRO)	38	J	110	53	20	1	09/12/16	09/29/16	KWG1608058	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	83	50-150	09/29/16	Acceptable
n-Triacontane	87	50-150	09/29/16	Acceptable

Comments: _____

Analytical Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01B
Sample Matrix: Water

Service Request: K1610210
Date Collected: 08/31/2016
Date Received: 09/01/2016

Diesel and Residual Range Organics

Sample Name: AOC1608314131MW05-1
Lab Code: K1610210-004
Extraction Method: METHOD
Analysis Method: NWTPH-Dx

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	12	J	110	21	12	1	09/12/16	09/30/16	KWG1608058	
Residual Range Organics (RRO)	27	J	110	53	20	1	09/12/16	09/30/16	KWG1608058	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	83	50-150	09/30/16	Acceptable
n-Triacontane	86	50-150	09/30/16	Acceptable

Comments: _____

Analytical Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01B
Sample Matrix: Water

Service Request: K1610210
Date Collected: 08/31/2016
Date Received: 09/01/2016

Diesel and Residual Range Organics

Sample Name: AOC1608314131MW13-1
Lab Code: K1610210-005
Extraction Method: METHOD
Analysis Method: NWTPH-Dx

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	3200	Y	110	21	12	1	09/12/16	09/30/16	KWG1608058	
Residual Range Organics (RRO)	520	L	110	52	20	1	09/12/16	09/30/16	KWG1608058	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	84	50-150	09/30/16	Acceptable
n-Triacontane	87	50-150	09/30/16	Acceptable

Comments: _____

Analytical Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01B
Sample Matrix: Water

Service Request: K1610210
Date Collected: 08/30/2016
Date Received: 09/01/2016

Diesel and Residual Range Organics

Sample Name: AOC160830A0111MW04-1
Lab Code: K1610210-006
Extraction Method: METHOD
Analysis Method: NWTPH-Dx

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	310	Y	97	20	11	1	09/12/16	09/30/16	KWG1608058	
Residual Range Organics (RRO)	160	L	97	50	19	1	09/12/16	09/30/16	KWG1608058	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	76	50-150	09/30/16	Acceptable
n-Triacontane	83	50-150	09/30/16	Acceptable

Comments: _____

Analytical Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01B
Sample Matrix: Water

Service Request: K1610210
Date Collected: 08/30/2016
Date Received: 09/01/2016

Diesel and Residual Range Organics

Sample Name: AOC160830A0111MW06-1
Lab Code: K1610210-007
Extraction Method: METHOD
Analysis Method: NWTPH-Dx

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	23	J	110	21	12	1	09/12/16	09/30/16	KWG1608058	
Residual Range Organics (RRO)	59	J	110	53	20	1	09/12/16	09/30/16	KWG1608058	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	77	50-150	09/30/16	Acceptable
n-Triacontane	81	50-150	09/30/16	Acceptable

Comments: _____

Analytical Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01B
Sample Matrix: Water

Service Request: K1610210
Date Collected: 08/30/2016
Date Received: 09/01/2016

Diesel and Residual Range Organics

Sample Name: AOC160830A0111MW07-1
Lab Code: K1610210-008
Extraction Method: METHOD
Analysis Method: NWTPH-Dx

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	31	J	97	20	11	1	09/12/16	09/30/16	KWG1608058	
Residual Range Organics (RRO)	47	J	97	50	19	1	09/12/16	09/30/16	KWG1608058	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	81	50-150	09/30/16	Acceptable
n-Triacontane	83	50-150	09/30/16	Acceptable

Comments: _____

Analytical Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01B
Sample Matrix: Water

Service Request: K1610210
Date Collected: 08/30/2016
Date Received: 09/01/2016

Diesel and Residual Range Organics

Sample Name: AOC160830A0111MW08-1
Lab Code: K1610210-009
Extraction Method: METHOD
Analysis Method: NWTPH-Dx

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	400	Y	97	20	11	1	09/12/16	09/30/16	KWG1608058	
Residual Range Organics (RRO)	100	L	97	50	19	1	09/12/16	09/30/16	KWG1608058	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	84	50-150	09/30/16	Acceptable
n-Triacontane	87	50-150	09/30/16	Acceptable

Comments: _____

Analytical Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01B
Sample Matrix: Water

Service Request: K1610210
Date Collected: 08/30/2016
Date Received: 09/01/2016

Diesel and Residual Range Organics

Sample Name: AOC160830AOC108B05-1
Lab Code: K1610210-010
Extraction Method: METHOD
Analysis Method: NWTPH-Dx

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	1100	Y	97	20	11	1	09/12/16	09/30/16	KWG1608058	
Residual Range Organics (RRO)	150	L	97	50	19	1	09/12/16	09/30/16	KWG1608058	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	57	50-150	09/30/16	Acceptable
n-Triacontane	63	50-150	09/30/16	Acceptable

Comments: _____

Analytical Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01B
Sample Matrix: Water

Service Request: K1610210
Date Collected: 08/29/2016
Date Received: 09/01/2016

Diesel and Residual Range Organics

Sample Name: AOC160829JPMW02-1
Lab Code: K1610210-011
Extraction Method: METHOD
Analysis Method: NWTPH-Dx

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	13	J	97	20	11	1	09/12/16	09/30/16	KWG1608058	
Residual Range Organics (RRO)	32	J	97	50	19	1	09/12/16	09/30/16	KWG1608058	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	79	50-150	09/30/16	Acceptable
n-Triacontane	80	50-150	09/30/16	Acceptable

Comments: _____

Analytical Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01B
Sample Matrix: Water

Service Request: K1610210
Date Collected: 08/31/2016
Date Received: 09/01/2016

Diesel and Residual Range Organics

Sample Name: AOC160831IDW-1
Lab Code: K1610210-017
Extraction Method: METHOD
Analysis Method: NWTTPH-Dx

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	770	Y	97	20	11	1	09/12/16	09/30/16	KWG1608058	
Residual Range Organics (RRO)	250	L	97	50	19	1	09/12/16	09/30/16	KWG1608058	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	81	50-150	09/30/16	Acceptable
n-Triacontane	88	50-150	09/30/16	Acceptable

Comments: _____

Analytical Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01B
Sample Matrix: Water

Service Request: K1610210
Date Collected: NA
Date Received: NA

Diesel and Residual Range Organics

Sample Name: Method Blank
Lab Code: KWG1608058-5
Extraction Method: METHOD
Analysis Method: NWTTPH-Dx

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	ND	U	97	20	11	1	09/12/16	09/29/16	KWG1608058	
Residual Range Organics (RRO)	22	J	97	50	19	1	09/12/16	09/29/16	KWG1608058	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	77	50-150	09/29/16	Acceptable
n-Triacontane	80	50-150	09/29/16	Acceptable

Comments: _____

Analytical Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01B
Sample Matrix: Water

Service Request: K1610210
Date Collected: NA
Date Received: NA

Diesel and Residual Range Organics

Sample Name: Method Blank
Lab Code: KWG1608626-3
Extraction Method: METHOD
Analysis Method: NWTTPH-Dx

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	11	J	99	20	11	1	09/27/16	09/30/16	KWG1608626	
Residual Range Organics (RRO)	22	J	99	50	19	1	09/27/16	09/30/16	KWG1608626	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	93	50-150	09/30/16	Acceptable
n-Triacontane	94	50-150	09/30/16	Acceptable

Comments: _____

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01B
Sample Matrix: Water

Service Request: K1610210

**Surrogate Recovery Summary
 Diesel and Residual Range Organics**

Extraction Method: METHOD
Analysis Method: NWTPH-Dx

Units: Percent
Level: Low

<u>Sample Name</u>	<u>Lab Code</u>	<u>Sur1</u>	<u>Sur2</u>
AOC1608314131MW02-1	K1610210-001	87	90
AOC1608314131MW03-1	K1610210-002	82	85
AOC1608314131MW04-1	K1610210-003	83	87
AOC1608314131MW05-1	K1610210-004	83	86
AOC1608314131MW13-1	K1610210-005	84	87
AOC160830A0111MW04-1	K1610210-006	76	83
AOC160830A0111MW06-1	K1610210-007	77	81
AOC160830A0111MW07-1	K1610210-008	81	83
AOC160830A0111MW08-1	K1610210-009	84	87
AOC160830AOC108B05-1	K1610210-010	57	63
AOC160829JPMW02-1	K1610210-011	79	80
AOC160831IDW-1	K1610210-017	81	88
AOC1608314131MW04-1DUP	KWG1608058-1	85	87
AOC1608314131MW03-1DUP	KWG1608626-4	97	98
Method Blank	KWG1608058-5	77	80
Method Blank	KWG1608626-3	93	94
AOC1608314131MW04-1MS	KWG1608058-2	79	79
AOC1608314131MW04-1DMS	KWG1608058-3	89	88
Lab Control Sample	KWG1608058-4	97	97
Lab Control Sample	KWG1608626-1	87	88
Duplicate Lab Control Sample	KWG1608626-2	70	70

Surrogate Recovery Control Limits (%)

Sur1 = o-Terphenyl	50-150
Sur2 = n-Triacontane	50-150

Results flagged with an asterisk (*) indicate values outside control criteria.
 Results flagged with a pound (#) indicate the control criteria is not applicable.

QA/QC Report

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01B
Sample Matrix: Water

Service Request: K1610210
Date Extracted: 09/12/2016
Date Analyzed: 09/30/2016

Matrix Spike/Duplicate Matrix Spike Summary
Diesel and Residual Range Organics

Sample Name: AOC1608314131MW04-1
Lab Code: K1610210-003
Extraction Method: METHOD
Analysis Method: NWTPH-Dx

Units: ug/L
Basis: NA
Level: Low
Extraction Lot: KWG1608058

Analyte Name	Sample Result	AOC1608314131MW04-1MS KWG1608058-2 Matrix Spike			AOC1608314131MW04-1DMS KWG1608058-3 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Spike Amount	%Rec	Result	Spike Amount	%Rec			
Diesel Range Organics (DRO)	12	1390	1670	83	1440	1540	93	46-140	3	30
Residual Range Organics (RRO)	38	750	833	85	736	769	91	45-159	2	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

QA/QC Report

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01B
Sample Matrix: Water

Service Request: K1610210
Date Extracted: 09/12/2016
Date Analyzed: 09/29/2016

Duplicate Sample Summary
Diesel and Residual Range Organics

Sample Name: AOC1608314131MW04-1
Lab Code: K1610210-003
Extraction Method: METHOD
Analysis Method: NWTPH-Dx

Units: ug/L
Basis: NA
Level: Low
Extraction Lot: KWG1608058

Analyte Name	LOQ	MDL	Sample Result	AOC1608314131MW04-1DUP KWG1608058-1 Duplicate Sample		Relative Percent Difference	RPD Limit
				Result	Average		
Diesel Range Organics (DRO)	110	12	12	ND	NC	NC #	30
Residual Range Organics (RRO)	110	20	38	26	32	37 #	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

QA/QC Report

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01B
Sample Matrix: Water

Service Request: K1610210
Date Extracted: 09/27/2016
Date Analyzed: 09/30/2016

Duplicate Sample Summary
Diesel and Residual Range Organics

Sample Name: AOC1608314131MW03-1
Lab Code: K1610210-002
Extraction Method: METHOD
Analysis Method: NWTPH-Dx

Units: ug/L
Basis: NA
Level: Low
Extraction Lot: KWG1608626

Analyte Name	LOQ	MDL	Sample Result	AOC1608314131MW03-1DUP KWG1608626-4 Duplicate Sample		Relative Percent Difference	RPD Limit
				Result	Average		
Diesel Range Organics (DRO)	99	11	3100	3200	3200	4	30
Residual Range Organics (RRO)	99	19	600	630	610	4	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01B
Sample Matrix: Water

Service Request: K1610210
Date Extracted: 09/12/2016
Date Analyzed: 09/29/2016

Lab Control Spike Summary
Diesel and Residual Range Organics

Extraction Method: METHOD
Analysis Method: NWTPH-Dx

Units: ug/L
Basis: NA
Level: Low
Extraction Lot: KWG1608058

Lab Control Sample
 KWG1608058-4
Lab Control Spike

Analyte Name	Result	Spike Amount	%Rec	%Rec Limits
Diesel Range Organics (DRO)	1410	1600	88	46-140
Residual Range Organics (RRO)	765	800	96	45-159

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01B
Sample Matrix: Water

Service Request: K1610210
Date Extracted: 09/27/2016
Date Analyzed: 09/30/2016

**Lab Control Spike/Duplicate Lab Control Spike Summary
 Diesel and Residual Range Organics**

Extraction Method: METHOD
Analysis Method: NWTPH-Dx

Units: ug/L
Basis: NA
Level: Low
Extraction Lot: KWG1608626

Analyte Name	Lab Control Sample KWG1608626-1 Lab Control Spike			Duplicate Lab Control Sample KWG1608626-2 Duplicate Lab Control Spike			%Rec Limits	RPD	RPD Limit
	Result	Spike Amount	%Rec	Result	Spike Amount	%Rec			
Diesel Range Organics (DRO)	1410	1600	88	1290	1600	80	46-140	9	30
Residual Range Organics (RRO)	684	800	86	627	800	78	45-159	9	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

QA/QC Report

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01B
Sample Matrix: Water

Service Request: K1610210
Date Extracted: 09/12/2016
Date Analyzed: 09/29/2016
Time Analyzed: 14:43

Method Blank Summary
Diesel and Residual Range Organics

Sample Name: Method Blank **Instrument ID:** GC35
Lab Code: KWG1608058-5 **File ID:** J:\GC35\DATA\092916F\0929F042.D
Extraction Method: METHOD **Level:** Low
Analysis Method: NWTPH-Dx **Extraction Lot:** KWG1608058

This Method Blank applies to the following analyses:

Sample Name	Lab Code	File ID	Date Analyzed	Time Analyzed
AOC1608314131MW04-1	K1610210-003	J:\GC35\DATA\092916F\0929F036.D	09/29/16	13:37
AOC1608314131MW04-1DUP	KWG1608058-1	J:\GC35\DATA\092916F\0929F038.D	09/29/16	13:59
Lab Control Sample	KWG1608058-4	J:\GC35\DATA\092916F\0929F040.D	09/29/16	14:21
AOC160830A0111MW07-1	K1610210-008	J:\GC35\DATA\093016F\0930F026.D	09/30/16	14:54
AOC160830A0111MW08-1	K1610210-009	J:\GC35\DATA\093016F\0930F028.D	09/30/16	15:16
AOC160829JPMW02-1	K1610210-011	J:\GC35\DATA\093016F\0930F030.D	09/30/16	15:38
AOC1608314131MW04-1MS	KWG1608058-2	J:\GC35\DATA\093016F\0930F032.D	09/30/16	16:00
AOC1608314131MW04-1DMS	KWG1608058-3	J:\GC35\DATA\093016F\0930F034.D	09/30/16	16:22
AOC1608314131MW05-1	K1610210-004	J:\GC35\DATA\093016F\0930F036.D	09/30/16	16:44
AOC160830A0111MW04-1	K1610210-006	J:\GC35\DATA\093016F\0930F038.D	09/30/16	17:06
AOC160830A0111MW06-1	K1610210-007	J:\GC35\DATA\093016F\0930F040.D	09/30/16	17:29
AOC160830AOC108B05-1	K1610210-010	J:\GC35\DATA\093016F\0930F042.D	09/30/16	17:50
AOC1608314131MW02-1	K1610210-001	J:\GC35\DATA\093016F\0930F044.D	09/30/16	18:12
AOC1608314131MW13-1	K1610210-005	J:\GC35\DATA\093016F\0930F058.D	09/30/16	20:47
AOC1608314131MW03-1	K1610210-002	J:\GC35\DATA\093016F\0930F064.D	09/30/16	21:53
AOC160831IDW-1	K1610210-017	J:\GC35\DATA\093016F\0930F068.D	09/30/16	22:37

QA/QC Report

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01B
Sample Matrix: Water

Service Request: K1610210
Date Extracted: 09/27/2016
Date Analyzed: 09/30/2016
Time Analyzed: 19:18

Method Blank Summary
Diesel and Residual Range Organics

Sample Name: Method Blank
Lab Code: KWG1608626-3
Extraction Method: METHOD
Analysis Method: NWTPH-Dx

Instrument ID: GC35
File ID: J:\GC35\DATA\093016F\0930F050.D
Level: Low
Extraction Lot: KWG1608626

This Method Blank applies to the following analyses:

Sample Name	Lab Code	File ID	Date Analyzed	Time Analyzed
Lab Control Sample	KWG1608626-1	J:\GC35\DATA\093016F\0930F046.D	09/30/16	18:34
Duplicate Lab Control Sample	KWG1608626-2	J:\GC35\DATA\093016F\0930F048.D	09/30/16	18:56
AOC1608314131MW03-1DUP	KWG1608626-4	J:\GC35\DATA\093016F\0930F066.D	09/30/16	22:15

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01B

Service Request: K1610210
Calibration Date: 09/21/2016

**Initial Calibration Summary
 Diesel and Residual Range Organics**

Calibration ID: CAL14927
Instrument ID: GC35

Column: ZB-1

Level ID	File ID	Level ID	File ID
A	J:\GC35\DATA\092116F\0921F014.D	H	J:\GC35\DATA\092116F\0921F038.D
B	J:\GC35\DATA\092116F\0921F016.D	I	J:\GC35\DATA\092116F\0921F040.D
C	J:\GC35\DATA\092116F\0921F018.D	J	J:\GC35\DATA\092116F\0921F042.D
D	J:\GC35\DATA\092116F\0921F020.D	K	J:\GC35\DATA\092116F\0921F044.D
E	J:\GC35\DATA\092116F\0921F022.D	L	J:\GC35\DATA\092216F\0922F022.D
F	J:\GC35\DATA\092116F\0921F024.D	M	J:\GC35\DATA\092216F\0922F024.D
G	J:\GC35\DATA\092116F\0921F036.D		

Analyte Name	Level ID	Amt	RF	Level ID	Amt	RF	Level ID	Amt	RF	Level ID	Amt	RF	Level ID	Amt	RF
Diesel Range Organics (DRO)	A	20	832	B	50	902	C	200	918	D	500	1020	E	2000	870
	F	5000	1040												
				L	20000	1000	M	50000	1040						
Residual Range Organics (RRO)				G	50	556	H	200	538	I	500	528	J	2000	512
				K	5000	504									
o-Terphenyl	A	1.0	1390	B	2.5	1420	C	10	1410	D	25	1450	E	100	1260
	F	250	1430												
n-Triacontane	A	1.0	1110	B	2.5	1130	C	10	1140	D	25	1190	E	100	1030
	F	250	1180												

Results flagged with an asterisk (*) indicate values outside control criteria.

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01B

Service Request: K1610210
Calibration Date: 09/21/2016

Initial Calibration Summary
Diesel and Residual Range Organics

Calibration ID: CAL14927
Instrument ID: GC35

Column: ZB-1

Analyte Name	Compound Type	Calibration Evaluation				
		Fit Type	Eval.	Eval. Result	Q	Control Criteria
Diesel Range Organics (DRO)	MS	AverageRF	% RSD	8.6		≤ 20
Residual Range Organics (RRO)	MS	AverageRF	% RSD	3.9		≤ 20
o-Terphenyl	SURR	AverageRF	% RSD	4.9		≤ 20
n-Triacontane	SURR	AverageRF	% RSD	4.9		≤ 20

Results flagged with an asterisk (*) indicate values outside control criteria.

QA/QC Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01B

Service Request: K1610210
Calibration Date: 09/21/2016
Date Analyzed: 09/22/2016

Second Source Calibration Verification
Diesel and Residual Range Organics

Calibration Type: External Standard
Analysis Method: NWTPH-Dx

Calibration ID: CAL14927
Units: ppm

File ID: J:\GC35\DATA\092216F\0922F028.D
 J:\GC35\DATA\092216F\0922F030.D

Column ID: ZB-1

Analyte Name	Expected	Result	Average RF	SSV RF	%D	%Drift	Criteria	Curve Fit
Diesel Range Organics (DRO)	1000	1100	953	1030	9	NA	± 15 %	AverageRF
Residual Range Organics (RRO)	1000	880	528	466	-12	NA	± 15 %	AverageRF

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

QA/QC Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01B

Service Request: K1610210
Date Analyzed: 09/29/2016

**Continuing Calibration Verification Summary
 Diesel and Residual Range Organics**

Calibration Type: External Standard
Analysis Method: NWTPH-Dx

Calibration Date: 09/21/2016
Calibration ID: CAL14927
Analysis Lot: KWG1608796
Units: ppm
Column ID: ZB-1

File ID: J:\GC35\DATA\092916F\0929F020.D
 J:\GC35\DATA\092916F\0929F022.D

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Diesel Range Organics (DRO)	1000	1000	953	966	1	NA	± 15	AverageRF
Residual Range Organics (RRO)	1000	890	528	472	-11	NA	± 15	AverageRF
o-Terphenyl	50	46	1390	1290	-7	NA	± 15	AverageRF
n-Triacontane	50	46	1130	1050	-7	NA	± 15	AverageRF

Results flagged with an asterisk (*) indicate values outside control criteria.

ALS Group USA, Corp. dba ALS Environmental

QA/QC Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01B

Service Request: K1610210
Date Analyzed: 09/29/2016

**Continuing Calibration Verification Summary
 Diesel and Residual Range Organics**

Calibration Type: External Standard
Analysis Method: NWTPH-Dx

Calibration Date: 09/21/2016
Calibration ID: CAL14927
Analysis Lot: KWG1608796
Units: ppm
Column ID: ZB-1

File ID: J:\GC35\DATA\092916F\0929F048.D
 J:\GC35\DATA\092916F\0929F050.D

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Diesel Range Organics (DRO)	1000	1000	953	982	3	NA	± 15	AverageRF
Residual Range Organics (RRO)	1000	930	528	488	-7	NA	± 15	AverageRF
o-Terphenyl	50	47	1390	1310	-6	NA	± 15	AverageRF
n-Triacontane	50	47	1130	1060	-6	NA	± 15	AverageRF

Results flagged with an asterisk (*) indicate values outside control criteria.

QA/QC Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01B

Service Request: K1610210
Date Analyzed: 09/30/2016

**Continuing Calibration Verification Summary
 Diesel and Residual Range Organics**

Calibration Type: External Standard
Analysis Method: NWTPH-Dx

Calibration Date: 09/21/2016
Calibration ID: CAL14927
Analysis Lot: KWG1608850
Units: ppm
Column ID: ZB-1

File ID: J:\GC35\DATA\093016F\0930F020.D
 J:\GC35\DATA\093016F\0930F022.D

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Diesel Range Organics (DRO)	1000	1100	953	1090	15	NA	± 15	AverageRF
Residual Range Organics (RRO)	1000	1000	528	533	1	NA	± 15	AverageRF
o-Terphenyl	50	52	1390	1460	5	NA	± 15	AverageRF
n-Triacontane	50	52	1130	1180	5	NA	± 15	AverageRF

Results flagged with an asterisk (*) indicate values outside control criteria.

QA/QC Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01B

Service Request: K1610210
Date Analyzed: 09/30/2016

**Continuing Calibration Verification Summary
 Diesel and Residual Range Organics**

Calibration Type: External Standard
Analysis Method: NWTPH-Dx

Calibration Date: 09/21/2016
Calibration ID: CAL14927
Analysis Lot: KWG1608850
Units: ppm
Column ID: ZB-1

File ID: J:\GC35\DATA\093016F\0930F052.D
 J:\GC35\DATA\093016F\0930F054.D

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Diesel Range Organics (DRO)	1000	1100	953	1050	10	NA	± 15	AverageRF
Residual Range Organics (RRO)	1000	1000	528	526	0	NA	± 15	AverageRF
o-Terphenyl	50	50	1390	1390	0	NA	± 15	AverageRF
n-Triacontane	50	50	1130	1120	-1	NA	± 15	AverageRF

Results flagged with an asterisk (*) indicate values outside control criteria.

ALS Group USA, Corp. dba ALS Environmental

QA/QC Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01B

Service Request: K1610210
Date Analyzed: 10/01/2016

**Continuing Calibration Verification Summary
 Diesel and Residual Range Organics**

Calibration Type: External Standard
Analysis Method: NWTPH-Dx

Calibration Date: 09/21/2016
Calibration ID: CAL14927
Analysis Lot: KWG1608850
Units: ppm
Column ID: ZB-1

File ID: J:\GC35\DATA\093016F\0930F078.D
 J:\GC35\DATA\093016F\0930F080.D

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Diesel Range Organics (DRO)	1000	1000	953	967	2	NA	± 15	AverageRF
Residual Range Organics (RRO)	1000	1100	528	557	6	NA	± 15	AverageRF
o-Terphenyl	50	46	1390	1290	-8	NA	± 15	AverageRF
n-Triacontane	50	47	1130	1060	-6	NA	± 15	AverageRF

Results flagged with an asterisk (*) indicate values outside control criteria.

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01B

Service Request: K1610210

Analysis Run Log
Diesel and Residual Range Organics

Analysis Method: NWTPH-Dx

Analysis Lot: KWG1608796
Instrument ID: GC35
Column: ZB-1

File ID	Sample Name	Lab Code	Date Analysis Started	Start Time	Q	Date Analysis Finished	Finish Time
0929F020.D	Continuing Calibration Verification	KWG1608796-1	9/29/2016	10:40		9/29/2016	10:56
0929F022.D	Continuing Calibration Verification	KWG1608796-1	9/29/2016	11:02		9/29/2016	11:18
0929F024.D	Instrument Blank	KWG1608796-6	9/29/2016	11:24		9/29/2016	11:40
0929F026.D	ZZZZZZ	ZZZZZZ	9/29/2016	11:47		9/29/2016	12:03
0929F028.D	ZZZZZZ	ZZZZZZ	9/29/2016	12:09		9/29/2016	12:25
0929F030.D	ZZZZZZ	ZZZZZZ	9/29/2016	12:31		9/29/2016	12:47
0929F032.D	ZZZZZZ	ZZZZZZ	9/29/2016	12:53		9/29/2016	13:09
0929F034.D	ZZZZZZ	ZZZZZZ	9/29/2016	13:15		9/29/2016	13:31
0929F036.D	AOC1608314131MW04-1	K1610210-003	9/29/2016	13:37		9/29/2016	13:53
0929F038.D	AOC1608314131MW04-1DUP	KWG1608058-1	9/29/2016	13:59		9/29/2016	14:15
0929F040.D	Lab Control Sample	KWG1608058-4	9/29/2016	14:21		9/29/2016	14:37
0929F042.D	Method Blank	KWG1608058-5	9/29/2016	14:43		9/29/2016	14:59
0929F044.D	ZZZZZZ	ZZZZZZ	9/29/2016	15:05		9/29/2016	15:21
0929F046.D	ZZZZZZ	ZZZZZZ	9/29/2016	15:27		9/29/2016	15:43
0929F048.D	Continuing Calibration Verification	KWG1608796-2	9/29/2016	15:49		9/29/2016	16:05
0929F050.D	Continuing Calibration Verification	KWG1608796-2	9/29/2016	16:12		9/29/2016	16:28
0929F052.D	Instrument Blank	KWG1608796-7	9/29/2016	16:34		9/29/2016	16:50
0929F054.D	ZZZZZZ	ZZZZZZ	9/29/2016	16:56		9/29/2016	17:12
0929F056.D	ZZZZZZ	ZZZZZZ	9/29/2016	17:18		9/29/2016	17:34
0929F058.D	ZZZZZZ	ZZZZZZ	9/29/2016	17:40		9/29/2016	17:56
0929F060.D	ZZZZZZ	ZZZZZZ	9/29/2016	18:02		9/29/2016	18:18
0929F062.D	ZZZZZZ	ZZZZZZ	9/29/2016	18:24		9/29/2016	18:40
0929F064.D	ZZZZZZ	ZZZZZZ	9/29/2016	18:46		9/29/2016	19:02
0929F066.D	ZZZZZZ	ZZZZZZ	9/29/2016	19:08		9/29/2016	19:24
0929F068.D	ZZZZZZ	ZZZZZZ	9/29/2016	19:30		9/29/2016	19:46
0929F070.D	ZZZZZZ	ZZZZZZ	9/29/2016	19:52		9/29/2016	20:08
0929F072.D	ZZZZZZ	ZZZZZZ	9/29/2016	20:14		9/29/2016	20:30
0929F074.D	ZZZZZZ	ZZZZZZ	9/29/2016	20:36		9/29/2016	20:52
0929F076.D	Continuing Calibration Verification	KWG1608796-3	9/29/2016	20:59		9/29/2016	21:15
0929F078.D	Continuing Calibration Verification	KWG1608796-3	9/29/2016	21:21		9/29/2016	21:37
0929F080.D	Instrument Blank	KWG1608796-8	9/29/2016	21:43		9/29/2016	21:59
0929F082.D	ZZZZZZ	ZZZZZZ	9/29/2016	22:05		9/29/2016	22:21
0929F084.D	ZZZZZZ	ZZZZZZ	9/29/2016	22:27		9/29/2016	22:43
0929F086.D	ZZZZZZ	ZZZZZZ	9/29/2016	22:49		9/29/2016	23:05

Results flagged with an asterisk (*) indicate the holding time was exceeded for the analysis

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01B

Service Request: K1610210

Analysis Run Log
Diesel and Residual Range Organics

Analysis Method: NWTPH-Dx

Analysis Lot: KWG1608796
Instrument ID: GC35
Column: ZB-1

File ID	Sample Name	Lab Code	Date Analysis Started	Start Time	Q	Date Analysis Finished	Finish Time
0929F088.D	ZZZZZZ	ZZZZZZ	9/29/2016	23:11		9/29/2016	23:27
0929F090.D	ZZZZZZ	ZZZZZZ	9/29/2016	23:33		9/29/2016	23:49
0929F092.D	ZZZZZZ	ZZZZZZ	9/29/2016	23:55		9/30/2016	00:11
0929F094.D	ZZZZZZ	ZZZZZZ	9/30/2016	00:16		9/30/2016	00:32
0929F096.D	ZZZZZZ	ZZZZZZ	9/30/2016	00:38		9/30/2016	00:54
0929F098.D	ZZZZZZ	ZZZZZZ	9/30/2016	01:00		9/30/2016	01:16
0929F100.D	ZZZZZZ	ZZZZZZ	9/30/2016	01:22		9/30/2016	01:38
0929F102.D	ZZZZZZ	ZZZZZZ	9/30/2016	01:44		9/30/2016	02:00
0929F104.D	ZZZZZZ	ZZZZZZ	9/30/2016	02:06		9/30/2016	02:22
0929F106.D	ZZZZZZ	ZZZZZZ	9/30/2016	02:28		9/30/2016	02:44
0929F108.D	Continuing Calibration Verification	KWG1608796-4	9/30/2016	02:50		9/30/2016	03:06
0929F110.D	Continuing Calibration Verification	KWG1608796-4	9/30/2016	03:12		9/30/2016	03:28
0929F112.D	Instrument Blank	KWG1608796-9	9/30/2016	03:34		9/30/2016	03:50
0929F114.D	ZZZZZZ	ZZZZZZ	9/30/2016	03:56		9/30/2016	04:12
0929F116.D	ZZZZZZ	ZZZZZZ	9/30/2016	04:18		9/30/2016	04:34
0929F118.D	ZZZZZZ	ZZZZZZ	9/30/2016	04:40		9/30/2016	04:56
0929F120.D	ZZZZZZ	ZZZZZZ	9/30/2016	05:02		9/30/2016	05:18
0929F122.D	Continuing Calibration Verification	KWG1608796-5	9/30/2016	05:24		9/30/2016	05:40
0929F124.D	Continuing Calibration Verification	KWG1608796-5	9/30/2016	05:46		9/30/2016	06:02
0929F126.D	Instrument Blank	KWG1608796-10	9/30/2016	06:08		9/30/2016	06:24

Results flagged with an asterisk (*) indicate the holding time was exceeded for the analysis

ALS Group USA, Corp. dba ALS Environmental

QA/QC Results

Client: Sealaska Environmental Services, LLC
 Project: JBLM FLAO/TO 01B

Service Request: K1610210

Analysis Run Log
 Diesel and Residual Range Organics

Analysis Method: NWTPH-Dx

Analysis Lot: KWG1608850
 Instrument ID: GC35
 Column: ZB-1

File ID	Sample Name	Lab Code	Date Analysis Started	Start Time	Q	Date Analysis Finished	Finish Time
0930F020.D	Continuing Calibration Verification	KWG1608850-1	9/30/2016	13:48		9/30/2016	14:04
0930F022.D	Continuing Calibration Verification	KWG1608850-1	9/30/2016	14:10		9/30/2016	14:26
0930F024.D	Instrument Blank	KWG1608850-4	9/30/2016	14:32		9/30/2016	14:48
0930F026.D	AOC160830A0111MW07-1	K1610210-008	9/30/2016	14:54		9/30/2016	15:10
0930F028.D	AOC160830A0111MW08-1	K1610210-009	9/30/2016	15:16		9/30/2016	15:32
0930F030.D	AOC160829JPMW02-1	K1610210-011	9/30/2016	15:38		9/30/2016	15:54
0930F032.D	AOC1608314131MW04-1MS	KWG1608058-2	9/30/2016	16:00		9/30/2016	16:16
0930F034.D	AOC1608314131MW04-1DMS	KWG1608058-3	9/30/2016	16:22		9/30/2016	16:38
0930F036.D	AOC1608314131MW05-1	K1610210-004	9/30/2016	16:44		9/30/2016	17:00
0930F038.D	AOC160830A0111MW04-1	K1610210-006	9/30/2016	17:06		9/30/2016	17:22
0930F040.D	AOC160830A0111MW06-1	K1610210-007	9/30/2016	17:29		9/30/2016	17:45
0930F042.D	AOC160830AOC108B05-1	K1610210-010	9/30/2016	17:50		9/30/2016	18:06
0930F044.D	AOC1608314131MW02-1	K1610210-001	9/30/2016	18:12		9/30/2016	18:28
0930F046.D	Lab Control Sample	KWG1608626-1	9/30/2016	18:34		9/30/2016	18:50
0930F048.D	Duplicate Lab Control Sample	KWG1608626-2	9/30/2016	18:56		9/30/2016	19:12
0930F050.D	Method Blank	KWG1608626-3	9/30/2016	19:18		9/30/2016	19:34
0930F052.D	Continuing Calibration Verification	KWG1608850-2	9/30/2016	19:41		9/30/2016	19:57
0930F054.D	Continuing Calibration Verification	KWG1608850-2	9/30/2016	20:03		9/30/2016	20:19
0930F056.D	Instrument Blank	KWG1608850-5	9/30/2016	20:25		9/30/2016	20:41
0930F058.D	AOC1608314131MW13-1	K1610210-005	9/30/2016	20:47		9/30/2016	21:03
0930F060.D	ZZZZZ	ZZZZZ	9/30/2016	21:09		9/30/2016	21:25
0930F062.D	ZZZZZ	ZZZZZ	9/30/2016	21:31		9/30/2016	21:47
0930F064.D	AOC1608314131MW03-1	K1610210-002	9/30/2016	21:53		9/30/2016	22:09
0930F066.D	AOC1608314131MW03-1DUP	KWG1608626-4	9/30/2016	22:15		9/30/2016	22:31
0930F068.D	AOC1608311DW-1	K1610210-017	9/30/2016	22:37		9/30/2016	22:53
0930F070.D	ZZZZZ	ZZZZZ	9/30/2016	22:59		9/30/2016	23:15
0930F072.D	ZZZZZ	ZZZZZ	9/30/2016	23:21		9/30/2016	23:37
0930F074.D	ZZZZZ	ZZZZZ	9/30/2016	23:43		9/30/2016	23:59
0930F076.D	ZZZZZ	ZZZZZ	10/1/2016	00:05		10/1/2016	00:21
0930F078.D	Continuing Calibration Verification	KWG1608850-3	10/1/2016	00:27		10/1/2016	00:43
0930F080.D	Continuing Calibration Verification	KWG1608850-3	10/1/2016	00:49		10/1/2016	01:05
0930F084.D	Instrument Blank	KWG1608850-6	10/1/2016	01:33		10/1/2016	01:49

Results flagged with an asterisk (*) indicate the holding time was exceeded for the analysis

QA/QC Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01B
Sample Matrix: Water

Service Request: K1610210
Date Extracted: 09/12/2016

Extraction Prep Log
Diesel and Residual Range Organics

Extraction Method: METHOD
Analysis Method: NWTPH-Dx

Extraction Lot: KWG1608058
Level: Low

Sample Name	Lab Code	Date Collected	Date Received	Sample Amount	Final Volume	% Solids	Note
AOC1608314131MW02-1	K1610210-001	08/31/16	09/01/16	1040ml	2ml	NA	
AOC1608314131MW03-1	K1610210-002	08/31/16	09/01/16	1040ml	2ml	NA	
AOC1608314131MW04-1	K1610210-003	08/31/16	09/01/16	960ml	2ml	NA	
AOC1608314131MW05-1	K1610210-004	08/31/16	09/01/16	960ml	2ml	NA	
AOC1608314131MW13-1	K1610210-005	08/31/16	09/01/16	980ml	2ml	NA	
AOC160830A0111MW04-1	K1610210-006	08/30/16	09/01/16	1040ml	2ml	NA	
AOC160830A0111MW06-1	K1610210-007	08/30/16	09/01/16	960ml	2ml	NA	
AOC160830A0111MW07-1	K1610210-008	08/30/16	09/01/16	1040ml	2ml	NA	
AOC160830A0111MW08-1	K1610210-009	08/30/16	09/01/16	1040ml	2ml	NA	
AOC160830AOC108B05-1	K1610210-010	08/30/16	09/01/16	1040ml	2ml	NA	
AOC160829JPMW02-1	K1610210-011	08/29/16	09/01/16	1040ml	2ml	NA	
AOC160831IDW-1	K1610210-017	08/31/16	09/01/16	1040ml	2ml	NA	
AOC1608314131MW04-1DUP	KWG1608058-1	08/31/16	09/01/16	960ml	2ml	NA	
Method Blank	KWG1608058-5	NA	NA	1040ml	2ml	NA	
AOC1608314131MW04-1MS	KWG1608058-2	08/31/16	09/01/16	960ml	2ml	NA	
AOC1608314131MW04-1DMS	KWG1608058-3	08/31/16	09/01/16	1040ml	2ml	NA	
Lab Control Sample	KWG1608058-4	NA	NA	1000ml	2ml	NA	

Results flagged with an asterisk (*) indicate the holding time was exceeded for the analysis

QA/QC Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01B
Sample Matrix: Water

Service Request: K1610210
Date Extracted: 09/27/2016

Extraction Prep Log
Diesel and Residual Range Organics

Extraction Method: METHOD
Analysis Method: NWTPH-Dx

Extraction Lot: KWG1608626
Level: Low

Sample Name	Lab Code	Date Collected	Date Received	Sample Amount	Final Volume	% Solids	Note
AOC1608314131MW03-1DUP	KWG1608626-4	08/31/16	09/01/16	1020ml	2ml	NA	
Method Blank	KWG1608626-3	NA	NA	1020ml	2ml	NA	
Lab Control Sample	KWG1608626-1	NA	NA	1000ml	2ml	NA	
Duplicate Lab Control Sample	KWG1608626-2	NA	NA	1000ml	2ml	NA	

Results flagged with an asterisk (*) indicate the holding time was exceeded for the analysis



Gasoline Range Organics

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01B

Service Request: K1610210

**Cover Page - Organic Analysis Data Package
 Gasoline Range Organics**

Sample Name	Lab Code	Date Collected	Date Received
AOC16082995A172-1	K1610210-012	08/29/2016	09/01/2016
AOC16082995A173A-1	K1610210-013	08/29/2016	09/01/2016
AOC16082907A177-1	K1610210-014	08/29/2016	09/01/2016
AOC16082910A178-1	K1610210-015	08/29/2016	09/01/2016
AOC16082910A188-1	K1610210-016	08/29/2016	09/01/2016
AOC160831IDW-1	K1610210-017	08/31/2016	09/01/2016
AOC160829TB-1	K1610210-018	08/29/2016	09/01/2016
AOC16082907A177-1MS	KWG1608610-1	08/29/2016	09/01/2016
AOC16082907A177-1DMS	KWG1608610-2	08/29/2016	09/01/2016
AOC16082907A177-1	KWG1608610-5	08/29/2016	09/01/2016

Analytical Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01B
Sample Matrix: Water

Service Request: K1610210
Date Collected: 08/29/2016
Date Received: 09/01/2016

Gasoline Range Organics

Sample Name: AOC16082995A172-1
Lab Code: K1610210-012
Extraction Method: EPA 5030B
Analysis Method: NWTPH-Gx

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics-NWTPH	ND	U	250	25	12	1	09/09/16	09/09/16	KWG1608610	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Difluorobenzene	86	50-150	09/09/16	Acceptable

Comments: _____

Analytical Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01B
Sample Matrix: Water

Service Request: K1610210
Date Collected: 08/29/2016
Date Received: 09/01/2016

Gasoline Range Organics

Sample Name: AOC16082995A173A-1
Lab Code: K1610210-013
Extraction Method: EPA 5030B
Analysis Method: NWTPH-Gx

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics-NWTPH	610	Y	250	25	12	1	09/09/16	09/09/16	KWG1608610	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Difluorobenzene	89	50-150	09/09/16	Acceptable

Comments: _____

Analytical Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01B
Sample Matrix: Water

Service Request: K1610210
Date Collected: 08/29/2016
Date Received: 09/01/2016

Gasoline Range Organics

Sample Name: AOC16082907A177-1 **Units:** ug/L
Lab Code: K1610210-014 **Basis:** NA
Extraction Method: EPA 5030B **Level:** Low
Analysis Method: NWTPH-Gx

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics-NWTPH	ND	U	250	25	12	1	09/08/16	09/08/16	KWG1608610	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Difluorobenzene	93	50-150	09/08/16	Acceptable

Comments: _____

Analytical Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01B
Sample Matrix: Water

Service Request: K1610210
Date Collected: 08/29/2016
Date Received: 09/01/2016

Gasoline Range Organics

Sample Name: AOC16082910A178-1
Lab Code: K1610210-015
Extraction Method: EPA 5030B
Analysis Method: NWTPH-Gx

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics-NWTPH	230	J	250	25	12	1	09/09/16	09/09/16	KWG1608610	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Difluorobenzene	87	50-150	09/09/16	Acceptable

Comments: _____

Analytical Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01B
Sample Matrix: Water

Service Request: K1610210
Date Collected: 08/29/2016
Date Received: 09/01/2016

Gasoline Range Organics

Sample Name: AOC16082910A188-1
Lab Code: K1610210-016
Extraction Method: EPA 5030B
Analysis Method: NWTPH-Gx

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics-NWTPH	230	J	250	25	12	1	09/09/16	09/09/16	KWG1608610	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Difluorobenzene	88	50-150	09/09/16	Acceptable

Comments: _____

Analytical Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01B
Sample Matrix: Water

Service Request: K1610210
Date Collected: 08/31/2016
Date Received: 09/01/2016

Gasoline Range Organics

Sample Name: AOC160831IDW-1
Lab Code: K1610210-017
Extraction Method: EPA 5030B
Analysis Method: NWTPH-Gx

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics-NWTPH	18	J	250	25	12	1	09/09/16	09/09/16	KWG1608610	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Difluorobenzene	84	50-150	09/09/16	Acceptable

Comments: _____

Analytical Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01B
Sample Matrix: Water

Service Request: K1610210
Date Collected: 08/29/2016
Date Received: 09/01/2016

Gasoline Range Organics

Sample Name: AOC160829TB-1 **Units:** ug/L
Lab Code: K1610210-018 **Basis:** NA
Extraction Method: EPA 5030B **Level:** Low
Analysis Method: NWTPH-Gx

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics-NWTPH	ND	U	250	25	12	1	09/09/16	09/09/16	KWG1608610	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Difluorobenzene	84	50-150	09/09/16	Acceptable

Comments: _____

Analytical Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01B
Sample Matrix: Water

Service Request: K1610210
Date Collected: NA
Date Received: NA

Gasoline Range Organics

Sample Name: Method Blank
Lab Code: KWG1608610-4
Extraction Method: EPA 5030B
Analysis Method: NWTPH-Gx

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics-NWTPH	ND	U	250	25	12	1	09/08/16	09/08/16	KWG1608610	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Difluorobenzene	84	50-150	09/08/16	Acceptable

Comments: _____

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01B
Sample Matrix: Water

Service Request: K1610210

**Surrogate Recovery Summary
 Gasoline Range Organics**

Extraction Method: EPA 5030B
Analysis Method: NWTPH-Gx

Units: Percent
Level: Low

<u>Sample Name</u>	<u>Lab Code</u>	<u>Sur1</u>
AOC16082995A172-1	K1610210-012	86
AOC16082995A173A-1	K1610210-013	89
AOC16082907A177-1	K1610210-014	93
AOC16082910A178-1	K1610210-015	87
AOC16082910A188-1	K1610210-016	88
AOC160831IDW-1	K1610210-017	84
AOC160829TB-1	K1610210-018	84
AOC16082907A177-1DUP	KWG1608610-5	90
Method Blank	KWG1608610-4	84
AOC16082907A177-1MS	KWG1608610-1	81
AOC16082907A177-1DMS	KWG1608610-2	73
Lab Control Sample	KWG1608610-3	85

Surrogate Recovery Control Limits (%)

Sur1 = 1,4-Difluorobenzene 50-150

Results flagged with an asterisk (*) indicate values outside control criteria.
 Results flagged with a pound (#) indicate the control criteria is not applicable.

QA/QC Report

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01B
Sample Matrix: Water

Service Request: K1610210
Date Extracted: 09/08/2016
Date Analyzed: 09/08/2016

Matrix Spike/Duplicate Matrix Spike Summary
Gasoline Range Organics

Sample Name: AOC16082907A177-1
Lab Code: K1610210-014
Extraction Method: EPA 5030B
Analysis Method: NWTPH-Gx

Units: ug/L
Basis: NA
Level: Low
Extraction Lot: KWG1608610

Analyte Name	Sample Result	AOC16082907A177-1MS KWG1608610-1 Matrix Spike			AOC16082907A177-1DMS KWG1608610-2 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Spike Amount	%Rec	Result	Spike Amount	%Rec			
Gasoline Range Organics-NWTPH	ND	444	500	89	403	500	81	80-119	10	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

QA/QC Report

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01B
Sample Matrix: Water

Service Request: K1610210
Date Extracted: 09/08/2016
Date Analyzed: 09/08/2016

Duplicate Sample Summary
Gasoline Range Organics

Sample Name: AOC16082907A177-1
Lab Code: K1610210-014
Extraction Method: EPA 5030B
Analysis Method: NWTPH-Gx

Units: ug/L
Basis: NA
Level: Low
Extraction Lot: KWG1608610

Analyte Name	LOQ	MDL	Sample Result	AOC16082907A177-1DUP KWG1608610-5 Duplicate Sample		Relative Percent Difference	RPD Limit
				Result	Average		
Gasoline Range Organics-NWTPH	250	12	ND	ND	ND	-	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

QA/QC Report

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01B
Sample Matrix: Water

Service Request: K1610210
Date Extracted: 09/08/2016
Date Analyzed: 09/08/2016

Lab Control Spike Summary
Gasoline Range Organics

Extraction Method: EPA 5030B
Analysis Method: NWTPH-Gx

Units: ug/L
Basis: NA
Level: Low
Extraction Lot: KWG1608610

Lab Control Sample
 KWG1608610-3
Lab Control Spike

Analyte Name	Result	Spike Amount	%Rec	%Rec Limits
Gasoline Range Organics-NWTPH	465	500	93	80-119

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

QA/QC Report

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01B
Sample Matrix: Water

Service Request: K1610210
Date Extracted: 09/08/2016
Date Analyzed: 09/08/2016
Time Analyzed: 18:48

Method Blank Summary
Gasoline Range Organics

Sample Name: Method Blank **Instrument ID:** GC60
Lab Code: KWG1608610-4 **File ID:** I:\GC60\DATA\090816\0908F019.D
Extraction Method: EPA 5030B **Level:** Low
Analysis Method: NWTPH-Gx **Extraction Lot:** KWG1608610

This Method Blank applies to the following analyses:

Sample Name	Lab Code	File ID	Date Analyzed	Time Analyzed
AOC16082907A177-1	K1610210-014	I:\GC60\DATA\090816\0908F014.D	09/08/16	16:41
AOC16082907A177-1DUP	KWG1608610-5	I:\GC60\DATA\090816\0908F015.D	09/08/16	17:06
AOC16082907A177-1MS	KWG1608610-1	I:\GC60\DATA\090816\0908F016.D	09/08/16	17:32
AOC16082907A177-1DMS	KWG1608610-2	I:\GC60\DATA\090816\0908F017.D	09/08/16	17:57
Lab Control Sample	KWG1608610-3	I:\GC60\DATA\090816\0908F018.D	09/08/16	18:23
AOC16082910A178-1	K1610210-015	I:\GC60\DATA\090816\0909F007.D	09/09/16	11:29
AOC16082910A188-1	K1610210-016	I:\GC60\DATA\090816\0909F008.D	09/09/16	11:54
AOC16082995A173A-1	K1610210-013	I:\GC60\DATA\090816\0909F009.D	09/09/16	12:19
AOC16082995A172-1	K1610210-012	I:\GC60\DATA\090816\0909F011.D	09/09/16	13:11
AOC160831IDW-1	K1610210-017	I:\GC60\DATA\090816\0909F012.D	09/09/16	13:36
AOC160829TB-1	K1610210-018	I:\GC60\DATA\090816\0909F013.D	09/09/16	14:01

QA/QC Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01B

Service Request: K1610210
Calibration Date: 08/01/2016

Initial Calibration Summary
Gasoline Range Organics

Calibration ID: CAL14851
Instrument ID: GC60

Column: DB-624

Level ID	File ID	Level ID	File ID
A	J:\GC60\Data\080116\0801F005.D	E	J:\GC60\Data\080116\0801F009.D
B	J:\GC60\Data\080116\0801F006.D	F	J:\GC60\Data\080116\0801F010.D
C	J:\GC60\Data\080116\0801F007.D	G	J:\GC60\Data\080116\0801F011.D
D	J:\GC60\Data\080116\0801F008.D		

Analyte Name	Level			Level			Level			Level			Level		
	ID	Amt	RF	ID	Amt	RF	ID	Amt	RF	ID	Amt	RF	ID	Amt	RF
Gasoline Range Organics-NWTPH	A	50	86200	B	100	78800	C	200	74800	D	500	70700	E	1000	69300
	F	5000	72100	G	10000	71200									
1,4-Difluorobenzene	A	20	1.36E+5	B	25	1.31E+5	C	50	1.31E+5	D	100	1.37E+5	E	150	1.37E+5

Results flagged with an asterisk (*) indicate values outside control criteria.

QA/QC Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01B

Service Request: K1610210
Calibration Date: 08/01/2016

Initial Calibration Summary
Gasoline Range Organics

Calibration ID: CAL14851
Instrument ID: GC60

Column: DB-624

Analyte Name	Compound Type	Calibration Evaluation				Control Criteria
		Fit Type	Eval.	Eval. Result	Q	
Gasoline Range Organics-NWTPH	MS	AverageRF	% RSD	8.0		≤ 20
1,4-Difluorobenzene	SURR	AverageRF	% RSD	2.6		≤ 20

Results flagged with an asterisk (*) indicate values outside control criteria.

QA/QC Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01B

Service Request: K1610210
Calibration Date: 08/01/2016
Date Analyzed: 08/01/2016

Second Source Calibration Verification
Gasoline Range Organics

Calibration Type: External Standard
Analysis Method: NWTPH-Gx

Calibration ID: CAL14851
Units: ug/L

File ID: J:\GC60\Data\080116\0801F014.D

Column ID: DB-624

Analyte Name	Expected	Result	Average RF	SSV RF	%D	%Drift	Criteria	Curve Fit
Gasoline Range Organics-NWTPH	500	550	74700	82800	11	NA	± 15 %	AverageRF

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

QA/QC Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01B

Service Request: K1610210
Date Analyzed: 09/08/2016

Continuing Calibration Verification Summary
Gasoline Range Organics

Calibration Type: External Standard
Analysis Method: NWTPH-Gx

Calibration Date: 08/01/2016
Calibration ID: CAL14851
Analysis Lot: KWG1608604
Units: ug/L
Column ID: DB-624

File ID: J:\GC60\DATA\090816\0907F046.D

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Gasoline Range Organics-NWTPH	500	440	74700	65300	-13	NA	± 20	AverageRF
1,4-Difluorobenzene	100	84	134000	113000	-16	NA	± 20	AverageRF

Results flagged with an asterisk (*) indicate values outside control criteria.

QA/QC Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01B

Service Request: K1610210
Date Analyzed: 09/08/2016

Continuing Calibration Verification Summary
Gasoline Range Organics

Calibration Type: External Standard
Analysis Method: NWTPH-Gx

Calibration Date: 08/01/2016
Calibration ID: CAL14851
Analysis Lot: KWG1608604
Units: ug/L
Column ID: DB-624

File ID: J:\GC60\DATA\090816\0908F020.D

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Gasoline Range Organics-NWTPH	500	470	74700	70400	-6	NA	± 20	AverageRF
1,4-Difluorobenzene	100	81	134000	110000	-19	NA	± 20	AverageRF

Results flagged with an asterisk (*) indicate values outside control criteria.

QA/QC Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01B

Service Request: K1610210
Date Analyzed: 09/09/2016

Continuing Calibration Verification Summary
Gasoline Range Organics

Calibration Type: External Standard
Analysis Method: NWTPH-Gx

Calibration Date: 08/01/2016
Calibration ID: CAL14851
Analysis Lot: KWG1608604
Units: ug/L
Column ID: DB-624

File ID: J:\GC60\DATA\090816\0909F002.D

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Gasoline Range Organics-NWTPH	500	470	74700	70500	-6	NA	± 20	AverageRF
1,4-Difluorobenzene	100	98	134000	132000	-2	NA	± 20	AverageRF

Results flagged with an asterisk (*) indicate values outside control criteria.

QA/QC Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01B

Service Request: K1610210
Date Analyzed: 09/09/2016

Continuing Calibration Verification Summary
Gasoline Range Organics

Calibration Type: External Standard
Analysis Method: NWTPH-Gx

Calibration Date: 08/01/2016
Calibration ID: CAL14851
Analysis Lot: KWG1608604
Units: ug/L
Column ID: DB-624

File ID: J:\GC60\DATA\090816\0909F014.D

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Gasoline Range Organics-NWTPH	500	460	74700	68200	-9	NA	± 20	AverageRF
1,4-Difluorobenzene	100	99	134000	133000	-1	NA	± 20	AverageRF

Results flagged with an asterisk (*) indicate values outside control criteria.

Client: Sealaska Environmental Services, LLC
 Project: JBLM FLAO/TO 01B

Service Request: K1610210

Analysis Run Log
 Gasoline Range Organics

Analysis Method: NWTPH-Gx

Analysis Lot: KWG1608604
 Instrument ID: GC60
 Column: DB-624

File ID	Sample Name	Lab Code	Date Analysis Started	Start Time	Q	Date Analysis Finished	Finish Time
0907F046.D	Continuing Calibration Verification	KWG1608604-1	9/8/2016	08:56		9/8/2016	09:11
0907F048.D	Instrument Blank	KWG1608604-6	9/8/2016	09:47		9/8/2016	10:02
0908F001.D	ZZZZZZ	ZZZZZZ	9/8/2016	11:11		9/8/2016	11:26
0908F003.D	ZZZZZZ	ZZZZZZ	9/8/2016	12:01		9/8/2016	12:16
0908F005.D	ZZZZZZ	ZZZZZZ	9/8/2016	12:52		9/8/2016	13:07
0908F006.D	ZZZZZZ	ZZZZZZ	9/8/2016	13:18		9/8/2016	13:33
0908F008.D	ZZZZZZ	ZZZZZZ	9/8/2016	14:09		9/8/2016	14:24
0908F009.D	ZZZZZZ	ZZZZZZ	9/8/2016	14:34		9/8/2016	14:49
0908F010.D	ZZZZZZ	ZZZZZZ	9/8/2016	14:59		9/8/2016	15:14
0908F011.D	ZZZZZZ	ZZZZZZ	9/8/2016	15:25		9/8/2016	15:40
0908F012.D	ZZZZZZ	ZZZZZZ	9/8/2016	15:50		9/8/2016	16:05
0908F014.D	AOC16082907A177-1	K1610210-014	9/8/2016	16:41		9/8/2016	16:56
0908F015.D	AOC16082907A177-1DUP	KWG1608610-5	9/8/2016	17:06		9/8/2016	17:21
0908F016.D	AOC16082907A177-1MS	KWG1608610-1	9/8/2016	17:32		9/8/2016	17:47
0908F017.D	AOC16082907A177-1DMS	KWG1608610-2	9/8/2016	17:57		9/8/2016	18:12
0908F018.D	Lab Control Sample	KWG1608610-3	9/8/2016	18:23		9/8/2016	18:38
0908F019.D	Method Blank	KWG1608610-4	9/8/2016	18:48		9/8/2016	19:03
0908F020.D	Continuing Calibration Verification	KWG1608604-2	9/8/2016	19:13		9/8/2016	19:28
0908F021.D	Instrument Blank	KWG1608604-7	9/8/2016	19:39		9/8/2016	19:54
0908F032.D	ZZZZZZ	ZZZZZZ	9/9/2016	00:19		9/9/2016	00:34
0908F033.D	ZZZZZZ	ZZZZZZ	9/9/2016	00:45		9/9/2016	01:00
0908F034.D	Continuing Calibration Verification	KWG1608604-3	9/9/2016	01:10		9/9/2016	01:25
0908F035.D	Instrument Blank	KWG1608604-8	9/9/2016	01:36		9/9/2016	01:51
0908F036.D	ZZZZZZ	ZZZZZZ	9/9/2016	02:01		9/9/2016	02:16
0908F037.D	ZZZZZZ	ZZZZZZ	9/9/2016	02:27		9/9/2016	02:42
0908F038.D	ZZZZZZ	ZZZZZZ	9/9/2016	02:52		9/9/2016	03:07
0908F040.D	ZZZZZZ	ZZZZZZ	9/9/2016	03:43		9/9/2016	03:58
0908F041.D	ZZZZZZ	ZZZZZZ	9/9/2016	04:09		9/9/2016	04:24
0908F042.D	ZZZZZZ	ZZZZZZ	9/9/2016	04:34		9/9/2016	04:49
0909F002.D	Continuing Calibration Verification	KWG1608604-4	9/9/2016	09:22		9/9/2016	09:37
0909F004.D	Instrument Blank	KWG1608604-9	9/9/2016	10:12		9/9/2016	10:27
0909F005.D	ZZZZZZ	ZZZZZZ	9/9/2016	10:38		9/9/2016	10:53
0909F006.D	ZZZZZZ	ZZZZZZ	9/9/2016	11:03		9/9/2016	11:18
0909F007.D	AOC16082910A178-1	K1610210-015	9/9/2016	11:29		9/9/2016	11:44

Results flagged with an asterisk (*) indicate the holding time was exceeded for the analysis

QA/QC Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01B

Service Request: K1610210

**Analysis Run Log
 Gasoline Range Organics**

Analysis Method: NWTPH-Gx

Analysis Lot: KWG1608604
Instrument ID: GC60
Column: DB-624

File ID	Sample Name	Lab Code	Date Analysis Started	Start Time	Q	Date Analysis Finished	Finish Time
0909F008.D	AOC16082910A188-1	K1610210-016	9/9/2016	11:54		9/9/2016	12:09
0909F009.D	AOC16082995A173A-1	K1610210-013	9/9/2016	12:19		9/9/2016	12:34
0909F011.D	AOC16082995A172-1	K1610210-012	9/9/2016	13:11		9/9/2016	13:26
0909F012.D	AOC160831IDW-1	K1610210-017	9/9/2016	13:36		9/9/2016	13:51
0909F013.D	AOC160829TB-1	K1610210-018	9/9/2016	14:01		9/9/2016	14:16
0909F014.D	Continuing Calibration Verification	KWG1608604-5	9/9/2016	14:27		9/9/2016	14:42
0909F015.D	Instrument Blank	KWG1608604-10	9/9/2016	14:52		9/9/2016	15:07

Results flagged with an asterisk (*) indicate the holding time was exceeded for the analysis

QA/QC Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01B
Sample Matrix: Water

Service Request: K1610210
Date Extracted: 09/09/2016

**Extraction Prep Log
 Gasoline Range Organics**

Extraction Method: EPA 5030B
Analysis Method: NWTPH-Gx

Extraction Lot: KWG1608610
Level: Low

Sample Name	Lab Code	Date Collected	Date Received	Sample Amount	Final Volume	% Solids	Note
AOC16082995A172-1	K1610210-012	08/29/16	09/01/16	10ml	10ml	NA	
AOC16082995A173A-1	K1610210-013	08/29/16	09/01/16	10ml	10ml	NA	
AOC16082907A177-1	K1610210-014	08/29/16	09/01/16	10ml	10ml	NA	
AOC16082910A178-1	K1610210-015	08/29/16	09/01/16	10ml	10ml	NA	
AOC16082910A188-1	K1610210-016	08/29/16	09/01/16	10ml	10ml	NA	
AOC160831IDW-1	K1610210-017	08/31/16	09/01/16	10ml	10ml	NA	
AOC160829TB-1	K1610210-018	08/29/16	09/01/16	10ml	10ml	NA	
AOC16082907A177-1DUP	KWG1608610-5	08/29/16	09/01/16	10ml	10ml	NA	
Method Blank	KWG1608610-4	NA	NA	10ml	10ml	NA	
AOC16082907A177-1MS	KWG1608610-1	08/29/16	09/01/16	10ml	10ml	NA	
AOC16082907A177-1DMS	KWG1608610-2	08/29/16	09/01/16	10ml	10ml	NA	
Lab Control Sample	KWG1608610-3	NA	NA	10ml	10ml	NA	

Results flagged with an asterisk (*) indicate the holding time was exceeded for the analysis



Volatile Organic Compounds

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01B

Service Request: K1610210

**Cover Page - Organic Analysis Data Package
 Volatile Organic Compounds**

Sample Name	Lab Code	Date Collected	Date Received
AOC16082995A172-1	K1610210-012	08/29/2016	09/01/2016
AOC16082995A173A-1	K1610210-013	08/29/2016	09/01/2016
AOC16082907A177-1	K1610210-014	08/29/2016	09/01/2016
AOC16082910A178-1	K1610210-015	08/29/2016	09/01/2016
AOC16082910A188-1	K1610210-016	08/29/2016	09/01/2016
AOC160829TB-1	K1610210-018	08/29/2016	09/01/2016
AOC16082907A177-1MS	KWG1607888-1	08/29/2016	09/01/2016
AOC16082907A177-1DMS	KWG1607888-2	08/29/2016	09/01/2016

Analytical Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01B
Sample Matrix: Water

Service Request: K1610210
Date Collected: 08/29/2016
Date Received: 09/01/2016

Volatile Organic Compounds

Sample Name: AOC16082995A172-1
Lab Code: K1610210-012
Extraction Method: EPA 5030B
Analysis Method: 8260C

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	ND	U	0.50	0.10	0.062	1	09/06/16	09/06/16	KWG1607888	
Toluene	ND	U	0.50	0.10	0.054	1	09/06/16	09/06/16	KWG1607888	
Ethylbenzene	ND	U	0.50	0.10	0.050	1	09/06/16	09/06/16	KWG1607888	
m,p-Xylenes	ND	U	0.50	0.20	0.11	1	09/06/16	09/06/16	KWG1607888	
o-Xylene	ND	U	0.50	0.20	0.074	1	09/06/16	09/06/16	KWG1607888	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,2-Dichloroethane-d4	101	70-120	09/06/16	Acceptable
Dibromofluoromethane	99	85-115	09/06/16	Acceptable
Toluene-d8	103	85-120	09/06/16	Acceptable
4-Bromofluorobenzene	94	75-120	09/06/16	Acceptable

Comments: _____

Analytical Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01B
Sample Matrix: Water

Service Request: K1610210
Date Collected: 08/29/2016
Date Received: 09/01/2016

Volatile Organic Compounds

Sample Name: AOC16082995A173A-1
Lab Code: K1610210-013
Extraction Method: EPA 5030B
Analysis Method: 8260C

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	1.9		0.50	0.10	0.062	1	09/06/16	09/06/16	KWG1607888	
Toluene	6.9		0.50	0.10	0.054	1	09/06/16	09/06/16	KWG1607888	
Ethylbenzene	13		0.50	0.10	0.050	1	09/06/16	09/06/16	KWG1607888	
m,p-Xylenes	43		0.50	0.20	0.11	1	09/06/16	09/06/16	KWG1607888	
o-Xylene	23		0.50	0.20	0.074	1	09/06/16	09/06/16	KWG1607888	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,2-Dichloroethane-d4	104	70-120	09/06/16	Acceptable
Dibromofluoromethane	98	85-115	09/06/16	Acceptable
Toluene-d8	103	85-120	09/06/16	Acceptable
4-Bromofluorobenzene	89	75-120	09/06/16	Acceptable

Comments: _____

Analytical Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01B
Sample Matrix: Water

Service Request: K1610210
Date Collected: 08/29/2016
Date Received: 09/01/2016

Volatile Organic Compounds

Sample Name: AOC16082907A177-1
Lab Code: K1610210-014
Extraction Method: EPA 5030B
Analysis Method: 8260C

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	ND	U	0.50	0.10	0.062	1	09/06/16	09/06/16	KWG1607888	
Toluene	ND	U	0.50	0.10	0.054	1	09/06/16	09/06/16	KWG1607888	
Ethylbenzene	ND	U	0.50	0.10	0.050	1	09/06/16	09/06/16	KWG1607888	
m,p-Xylenes	0.14	J	0.50	0.20	0.11	1	09/06/16	09/06/16	KWG1607888	
o-Xylene	ND	U	0.50	0.20	0.074	1	09/06/16	09/06/16	KWG1607888	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,2-Dichloroethane-d4	103	70-120	09/06/16	Acceptable
Dibromofluoromethane	98	85-115	09/06/16	Acceptable
Toluene-d8	104	85-120	09/06/16	Acceptable
4-Bromofluorobenzene	93	75-120	09/06/16	Acceptable

Comments: _____

Analytical Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01B
Sample Matrix: Water

Service Request: K1610210
Date Collected: 08/29/2016
Date Received: 09/01/2016

Volatile Organic Compounds

Sample Name: AOC16082910A178-1
Lab Code: K1610210-015
Extraction Method: EPA 5030B
Analysis Method: 8260C

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	3.0		0.50	0.10	0.062	1	09/06/16	09/06/16	KWG1607888	
Toluene	3.8		0.50	0.10	0.054	1	09/06/16	09/06/16	KWG1607888	
Ethylbenzene	5.2		0.50	0.10	0.050	1	09/06/16	09/06/16	KWG1607888	
m,p-Xylenes	16		0.50	0.20	0.11	1	09/06/16	09/06/16	KWG1607888	
o-Xylene	10		0.50	0.20	0.074	1	09/06/16	09/06/16	KWG1607888	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,2-Dichloroethane-d4	100	70-120	09/06/16	Acceptable
Dibromofluoromethane	97	85-115	09/06/16	Acceptable
Toluene-d8	103	85-120	09/06/16	Acceptable
4-Bromofluorobenzene	98	75-120	09/06/16	Acceptable

Comments: _____

Analytical Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01B
Sample Matrix: Water

Service Request: K1610210
Date Collected: 08/29/2016
Date Received: 09/01/2016

Volatile Organic Compounds

Sample Name: AOC16082910A188-1
Lab Code: K1610210-016
Extraction Method: EPA 5030B
Analysis Method: 8260C

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	3.1		0.50	0.10	0.062	1	09/06/16	09/06/16	KWG1607888	
Toluene	3.9		0.50	0.10	0.054	1	09/06/16	09/06/16	KWG1607888	
Ethylbenzene	5.4		0.50	0.10	0.050	1	09/06/16	09/06/16	KWG1607888	
m,p-Xylenes	17		0.50	0.20	0.11	1	09/06/16	09/06/16	KWG1607888	
o-Xylene	10		0.50	0.20	0.074	1	09/06/16	09/06/16	KWG1607888	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,2-Dichloroethane-d4	104	70-120	09/06/16	Acceptable
Dibromofluoromethane	99	85-115	09/06/16	Acceptable
Toluene-d8	103	85-120	09/06/16	Acceptable
4-Bromofluorobenzene	98	75-120	09/06/16	Acceptable

Comments: _____

Analytical Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01B
Sample Matrix: Water

Service Request: K1610210
Date Collected: 08/29/2016
Date Received: 09/01/2016

Volatile Organic Compounds

Sample Name: AOC160829TB-1
Lab Code: K1610210-018
Extraction Method: EPA 5030B
Analysis Method: 8260C

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	ND	U	0.50	0.10	0.062	1	09/07/16	09/07/16	KWG1607888	
Toluene	ND	U	0.50	0.10	0.054	1	09/07/16	09/07/16	KWG1607888	
Ethylbenzene	ND	U	0.50	0.10	0.050	1	09/07/16	09/07/16	KWG1607888	
m,p-Xylenes	ND	U	0.50	0.20	0.11	1	09/07/16	09/07/16	KWG1607888	
o-Xylene	ND	U	0.50	0.20	0.074	1	09/07/16	09/07/16	KWG1607888	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,2-Dichloroethane-d4	103	70-120	09/07/16	Acceptable
Dibromofluoromethane	98	85-115	09/07/16	Acceptable
Toluene-d8	103	85-120	09/07/16	Acceptable
4-Bromofluorobenzene	93	75-120	09/07/16	Acceptable

Comments: _____

Analytical Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01B
Sample Matrix: Water

Service Request: K1610210
Date Collected: NA
Date Received: NA

Volatile Organic Compounds

Sample Name: Method Blank
Lab Code: KWG1607888-4
Extraction Method: EPA 5030B
Analysis Method: 8260C

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	ND	U	0.50	0.10	0.062	1	09/06/16	09/06/16	KWG1607888	
Toluene	ND	U	0.50	0.10	0.054	1	09/06/16	09/06/16	KWG1607888	
Ethylbenzene	ND	U	0.50	0.10	0.050	1	09/06/16	09/06/16	KWG1607888	
m,p-Xylenes	ND	U	0.50	0.20	0.11	1	09/06/16	09/06/16	KWG1607888	
o-Xylene	ND	U	0.50	0.20	0.074	1	09/06/16	09/06/16	KWG1607888	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,2-Dichloroethane-d4	102	70-120	09/06/16	Acceptable
Dibromofluoromethane	99	85-115	09/06/16	Acceptable
Toluene-d8	102	85-120	09/06/16	Acceptable
4-Bromofluorobenzene	92	75-120	09/06/16	Acceptable

Comments: _____

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01B
Sample Matrix: Water

Service Request: K1610210

**Surrogate Recovery Summary
 Volatile Organic Compounds**

Extraction Method: EPA 5030B
Analysis Method: 8260C

Units: Percent
Level: Low

<u>Sample Name</u>	<u>Lab Code</u>	<u>Sur1</u>	<u>Sur2</u>	<u>Sur3</u>	<u>Sur4</u>
AOC16082995A172-1	K1610210-012	101	99	103	94
AOC16082995A173A-1	K1610210-013	104	98	103	89
AOC16082907A177-1	K1610210-014	103	98	104	93
AOC16082910A178-1	K1610210-015	100	97	103	98
AOC16082910A188-1	K1610210-016	104	99	103	98
AOC160829TB-1	K1610210-018	103	98	103	93
Method Blank	KWG1607888-4	102	99	102	92
AOC16082907A177-1MS	KWG1607888-1	97	103	106	101
AOC16082907A177-1DMS	KWG1607888-2	98	104	105	97
Lab Control Sample	KWG1607888-3	96	105	107	98

Surrogate Recovery Control Limits (%)

Sur1 = 1,2-Dichloroethane-d4	70-120
Sur2 = Dibromofluoromethane	85-115
Sur3 = Toluene-d8	85-120
Sur4 = 4-Bromofluorobenzene	75-120

Results flagged with an asterisk (*) indicate values outside control criteria.
 Results flagged with a pound (#) indicate the control criteria is not applicable.

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01B

Service Request: K1610210
Date Analyzed: 09/06/2016
Time Analyzed: 15:53

Internal Standard Area and RT Summary
Volatile Organic Compounds

File ID: J:\MS18\DATA\090616\0906F005.D
Instrument ID: GC-MS 18
Analysis Method: 8260C

Lab Code: KWG1607887-2
Analysis Lot: KWG1607887

	Fluorobenzene		Chlorobenzene-d5		1,4-Dichlorobenzene-d4	
	<u>Area</u>	<u>RT</u>	<u>Area</u>	<u>RT</u>	<u>Area</u>	<u>RT</u>
Results ==>	516,906	5.55	198,393	9.02	177,821	11.44
Upper Limit ==>	1,033,812	5.72	396,786	9.19	355,642	11.61
Lower Limit ==>	258,453	5.38	99,197	8.85	88,911	11.27
ICAL Result ==>	674,911	5.55	264,357	9.02	240,805	11.43

Associated Analyses

Lab Control Sample	KWG1607888-3	518,470	5.54	201,730	9.02	180,886	11.44
AOC16082907A177-1MS	KWG1607888-1	514,663	5.55	194,779	9.02	177,999	11.45
AOC16082907A177-1DMS	KWG1607888-2	523,239	5.55	200,800	9.02	183,636	11.45
Method Blank	KWG1607888-4	495,983	5.55	188,452	9.02	169,957	11.45
AOC16082995A172-1	K1610210-012	483,900	5.55	185,240	9.02	168,899	11.45
AOC16082995A173A-1	K1610210-013	614,088	5.55	206,751	9.02	175,434	11.45
AOC16082907A177-1	K1610210-014	485,483	5.55	186,694	9.02	168,882	11.45
AOC16082910A178-1	K1610210-015	487,900	5.55	185,761	9.02	172,882	11.45
AOC16082910A188-1	K1610210-016	496,976	5.55	188,596	9.02	172,959	11.45
AOC160829TB-1	K1610210-018	497,390	5.55	189,303	9.02	171,923	11.45

Results flagged with an asterisk (*) indicate values outside control criteria.

QA/QC Report

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01B
Sample Matrix: Water

Service Request: K1610210
Date Extracted: 09/06/2016
Date Analyzed: 09/06/2016

Matrix Spike/Duplicate Matrix Spike Summary
Volatile Organic Compounds

Sample Name: AOC16082907A177-1
Lab Code: K1610210-014
Extraction Method: EPA 5030B
Analysis Method: 8260C

Units: ug/L
Basis: NA
Level: Low
Extraction Lot: KWG1607888

Analyte Name	Sample Result	AOC16082907A177-1MS KWG1607888-1 Matrix Spike			AOC16082907A177-1DMS KWG1607888-2 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Spike Amount	%Rec	Result	Spike Amount	%Rec			
Benzene	ND	9.17	10.0	92	8.99	10.0	90	80-120	2	30
Toluene	ND	8.85	10.0	89	8.87	10.0	89	75-120	0	30
Ethylbenzene	ND	9.61	10.0	96	9.43	10.0	94	75-125	2	30
m,p-Xylenes	0.14	19.3	20.0	96	18.6	20.0	93	75-130	4	30
o-Xylene	ND	9.89	10.0	99	9.54	10.0	95	80-120	4	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01B
Sample Matrix: Water

Service Request: K1610210
Date Extracted: 09/06/2016
Date Analyzed: 09/06/2016

Lab Control Spike Summary
Volatile Organic Compounds

Extraction Method: EPA 5030B
Analysis Method: 8260C

Units: ug/L
Basis: NA
Level: Low
Extraction Lot: KWG1607888

Lab Control Sample
 KWG1607888-3
Lab Control Spike

Analyte Name	Result	Spike Amount	%Rec	%Rec Limits
Benzene	8.75	10.0	88	80-120
Toluene	8.40	10.0	84	75-120
Ethylbenzene	8.90	10.0	89	75-125
m,p-Xylenes	17.8	20.0	89	75-130
o-Xylene	9.07	10.0	91	80-120

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

QA/QC Report

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01B
Sample Matrix: Water

Service Request: K1610210
Date Extracted: 09/06/2016
Date Analyzed: 09/06/2016
Time Analyzed: 20:39

Method Blank Summary
Volatile Organic Compounds

Sample Name: Method Blank
Lab Code: KWG1607888-4
Extraction Method: EPA 5030B
Analysis Method: 8260C

Instrument ID: GC-MS 18
File ID: J:\MS18\DATA\090616\0906F017.D
Level: Low
Extraction Lot: KWG1607888

This Method Blank applies to the following analyses:

Sample Name	Lab Code	File ID	Date Analyzed	Time Analyzed
Lab Control Sample	KWG1607888-3	J:\MS18\DATA\090616\0906F006.D	09/06/16	16:27
AOC16082907A177-1MS	KWG1607888-1	J:\MS18\DATA\090616\0906F012.D	09/06/16	18:49
AOC16082907A177-1DMS	KWG1607888-2	J:\MS18\DATA\090616\0906F013.D	09/06/16	19:10
AOC16082995A172-1	K1610210-012	J:\MS18\DATA\090616\0906F022.D	09/06/16	22:28
AOC16082995A173A-1	K1610210-013	J:\MS18\DATA\090616\0906F023.D	09/06/16	22:50
AOC16082907A177-1	K1610210-014	J:\MS18\DATA\090616\0906F024.D	09/06/16	23:11
AOC16082910A178-1	K1610210-015	J:\MS18\DATA\090616\0906F025.D	09/06/16	23:33
AOC16082910A188-1	K1610210-016	J:\MS18\DATA\090616\0906F026.D	09/06/16	23:56
AOC160829TB-1	K1610210-018	J:\MS18\DATA\090616\0906F027.D	09/07/16	00:19

QA/QC Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01B

Service Request: K1610210
Date Analyzed: 09/06/2016
Time Analyzed: 15:27

Tune Summary
Volatile Organic Compounds

File ID: J:\MS18\DATA\090616\0906F004.D
Instrument ID: GC-MS 18
Column:

Analysis Method: 8260C
Analysis Lot: KWG1607887

Target Mass	Relative to Mass	Lower Limit%	Upper Limit%	Relative Abundance %	Raw Abundance	Result Pass/Fail
50	95	15	40	17.5	9079	PASS
75	95	30	60	48.7	25253	PASS
95	95	100	100	100.0	51898	PASS
96	95	5	9	7.0	3615	PASS
173	174	0	2	0.8	342	PASS
174	95	50	120	84.2	43693	PASS
175	174	5	9	6.8	2988	PASS
176	174	95	101	96.1	41986	PASS
177	176	5	9	7.2	3031	PASS

Sample Name	Lab Code	File ID	Date Analyzed	Time Analyzed	Q
Continuing Calibration Verification	KWG1607887-2	J:\MS18\DATA\090616\0906F005.D	09/06/2016	15:53	
Lab Control Sample	KWG1607888-3	J:\MS18\DATA\090616\0906F006.D	09/06/2016	16:27	
AOC16082907A177-1MS	KWG1607888-1	J:\MS18\DATA\090616\0906F012.D	09/06/2016	18:49	
AOC16082907A177-1DMS	KWG1607888-2	J:\MS18\DATA\090616\0906F013.D	09/06/2016	19:10	
Method Blank	KWG1607888-4	J:\MS18\DATA\090616\0906F017.D	09/06/2016	20:39	
AOC16082995A172-1	K1610210-012	J:\MS18\DATA\090616\0906F022.D	09/06/2016	22:28	
AOC16082995A173A-1	K1610210-013	J:\MS18\DATA\090616\0906F023.D	09/06/2016	22:50	
AOC16082907A177-1	K1610210-014	J:\MS18\DATA\090616\0906F024.D	09/06/2016	23:11	
AOC16082910A178-1	K1610210-015	J:\MS18\DATA\090616\0906F025.D	09/06/2016	23:33	
AOC16082910A188-1	K1610210-016	J:\MS18\DATA\090616\0906F026.D	09/06/2016	23:56	
AOC160829TB-1	K1610210-018	J:\MS18\DATA\090616\0906F027.D	09/07/2016	00:19	

Results flagged with an asterisk (*) indicate the analysis performed outside specified tune window

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01B

Service Request: K1610210
Calibration Date: 04/13/2016

Initial Calibration Summary
Volatile Organic Compounds

Calibration ID: CAL14682
Instrument ID: GC-MS 18

Column: MS

Level ID	File ID	Level ID	File ID
A	J:\MS18\DATA\041316\0413F012.D	G	J:\MS18\DATA\041316\0413F018.D
B	J:\MS18\DATA\041316\0413F013.D	H	J:\MS18\DATA\041316\0413F019.D
C	J:\MS18\DATA\041316\0413F014.D	I	J:\MS18\DATA\041316\0413F020.D
D	J:\MS18\DATA\041316\0413F015.D	J	J:\MS18\DATA\041316\0413F021.D
E	J:\MS18\DATA\041316\0413F016.D	K	J:\MS18\DATA\041316\0413F022.D
F	J:\MS18\DATA\041316\0413F017.D		

Analyte Name	Level ID			Level ID			Level ID			Level ID			Level ID		
	ID	Amt	RRF	ID	Amt	RRF	ID	Amt	RRF	ID	Amt	RRF	ID	Amt	RRF
1,2-Dichloroethane-d4	F	8.0	0.228	G	10	0.228	H	12	0.229	D	4.0	0.230	E	6.0	0.232
	K	20	0.229							I	14	0.229	J	16	0.226
Benzene	A	0.10	1.28	B	0.20	1.06	C	0.50	1.08	D	1.0	1.08	E	2.0	1.05
	F	5.0	1.07	G	10	1.06	H	20	1.08	I	40	1.11	J	60	1.06
	K	80	1.09												
Toluene	A	0.10	0.773	B	0.20	0.668	C	0.50	0.693	D	1.0	0.698	E	2.0	0.676
	F	5.0	0.685	G	10	0.679	H	20	0.703	I	40	0.721	J	60	0.689
	K	80	0.711												
Ethylbenzene	A	0.10	1.00	B	0.20	0.845	C	0.50	0.944	D	1.0	0.987	E	2.0	0.954
	F	5.0	1.01	G	10	1.00	H	20	1.04	I	40	1.08	J	60	1.04
	K	80	1.07												
m,p-Xylenes	A	0.20	1.15	B	0.40	1.13	C	1.0	1.15	D	2.0	1.20	E	4.0	1.18
	F	10	1.27	G	20	1.24	H	40	1.28	I	80	1.33	J	120	1.29
	K	160	1.32												
o-Xylene	A	0.10	1.04	B	0.20	1.06	C	0.50	1.08	D	1.0	1.15	E	2.0	1.14
	F	5.0	1.22	G	10	1.22	H	20	1.26	I	40	1.30	J	60	1.27
	K	80	1.30												
Dibromofluoromethane	F	8.0	0.185	G	10	0.196	H	12	0.206	D	4.0	0.174	E	6.0	0.188
	K	20	0.216							I	14	0.209	J	16	0.210
Toluene-d8	F	8.0	0.851	G	10	0.872	H	12	0.927	D	4.0	0.833	E	6.0	0.903
	K	20	0.929							I	14	0.918	J	16	0.929
4-Bromofluorobenzene	F	8.0	0.838	G	10	0.870	H	12	0.891	D	4.0	0.792	E	6.0	0.876
	K	20	0.908							I	14	0.892	J	16	0.894

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01B

Service Request: K1610210
Calibration Date: 04/13/2016

**Initial Calibration Summary
 Volatile Organic Compounds**

Calibration ID: CAL14682
Instrument ID: GC-MS 18

Column: MS

Analyte Name	Compound Type	Calibration Evaluation					RRF Evaluation		
		Fit Type	Eval.	Eval. Result	Q	Control Criteria	Average RRF	Q	Minimum RRF
1,2-Dichloroethane-d4	SURR	AverageRF	% RSD	0.7		≤20	0.229		0.01
Benzene	MS	AverageRF	% RSD	5.8		≤20	1.09		0.500
Toluene	MS	AverageRF	% RSD	4.1		≤20	0.700		0.400
Ethylbenzene	MS	AverageRF	% RSD	6.7		≤20	0.998		0.100
m,p-Xylenes	MS	AverageRF	% RSD	6.0		≤20	1.23		0.100
o-Xylene	MS	AverageRF	% RSD	8.1		≤20	1.19		0.300
Dibromofluoromethane	SURR	AverageRF	% RSD	7.4		≤20	0.198		0.01
Toluene-d8	SURR	AverageRF	% RSD	4.3		≤20	0.895		0.01
4-Bromofluorobenzene	SURR	AverageRF	% RSD	4.4		≤20	0.870		0.01

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

QA/QC Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01B

Service Request: K1610210
Calibration Date: 04/13/2016
Date Analyzed: 04/13/2016

Second Source Calibration Verification
Volatile Organic Compounds

Calibration Type: Internal Standard
Analysis Method: 8260C

Calibration ID: CAL14682
Units: PPB

File ID: J:\MS18\DATA\041316\0413F025.D
 J:\MS18\DATA\041316\0413F027.D

Analyte Name	Expected	Result	Average RF	SSV RF	%D	%Drift	Criteria	Curve Fit
Benzene	10	9.5	1.09	1.04	-5	NA	± 30 %	AverageRF
Toluene	10	9.6	0.700	0.673	-4	NA	± 30 %	AverageRF
Ethylbenzene	10	10	0.998	1.00	0	NA	± 30 %	AverageRF
m,p-Xylenes	20	20	1.23	1.23	0	NA	± 30 %	AverageRF
o-Xylene	10	10	1.19	1.23	4	NA	± 30 %	AverageRF

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

QA/QC Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01B

Service Request: K1610210
Date Analyzed: 09/06/2016

Continuing Calibration Verification Summary
Volatile Organic Compounds

Calibration Type: Internal Standard
Analysis Method: 8260C

Calibration Date: 04/13/2016
Calibration ID: CAL14682
Analysis Lot: KWG1607887
Units: PPB

File ID: J:\MS18\DATA\090616\0906F005.D

Analyte Name	Expected	Result	Min RF	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
1,2-Dichloroethane-d4	10	9.6	0.01	0.229	0.219	-5	NA	± 20	AverageRF
Benzene	10	9.0	0.500	1.09	0.983	-10	NA	± 20	AverageRF
Toluene	10	8.7	0.400	0.700	0.611	-13	NA	± 20	AverageRF
Ethylbenzene	10	9.1	0.100	0.998	0.907	-9	NA	± 20	AverageRF
m,p-Xylenes	20	18	0.100	1.23	1.13	-8	NA	± 20	AverageRF
o-Xylene	10	9.3	0.300	1.19	1.10	-7	NA	± 20	AverageRF
Dibromofluoromethane	10	10	0.01	0.198	0.204	3	NA	± 20	AverageRF
Toluene-d8	10	11	0.01	0.895	0.953	6	NA	± 20	AverageRF
4-Bromofluorobenzene	10	9.9	0.01	0.870	0.860	-1	NA	± 20	AverageRF

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound

‡ CCC Compound

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01B

Service Request: K1610210

Analysis Run Log
Volatile Organic Compounds

Analysis Method: 8260C

Analysis Lot: KWG1607887
Instrument ID: GC-MS 18

File ID	Sample Name	Lab Code	Date Analysis Started	Start Time	Q	Date Analysis Finished	Finish Time
0906F004.D	GC/MS Tuning - Bromofluorobenzene	KWG1607887-1	9/6/2016	15:27		9/6/2016	15:43
0906F005.D	Continuing Calibration Verification	KWG1607887-2	9/6/2016	15:53		9/6/2016	16:09
0906F006.D	Lab Control Sample	KWG1607888-3	9/6/2016	16:27		9/6/2016	16:43
0906F007.D	ZZZZZZ	ZZZZZZ	9/6/2016	16:59		9/6/2016	17:15
0906F008.D	ZZZZZZ	ZZZZZZ	9/6/2016	17:21		9/6/2016	17:37
0906F009.D	ZZZZZZ	ZZZZZZ	9/6/2016	17:44		9/6/2016	18:00
0906F010.D	ZZZZZZ	ZZZZZZ	9/6/2016	18:06		9/6/2016	18:22
0906F011.D	ZZZZZZ	ZZZZZZ	9/6/2016	18:27		9/6/2016	18:43
0906F012.D	AOC16082907A177-1MS	KWG1607888-1	9/6/2016	18:49		9/6/2016	19:05
0906F013.D	AOC16082907A177-1DMS	KWG1607888-2	9/6/2016	19:10		9/6/2016	19:26
0906F015.D	ZZZZZZ	ZZZZZZ	9/6/2016	19:55		9/6/2016	20:11
0906F016.D	ZZZZZZ	ZZZZZZ	9/6/2016	20:17		9/6/2016	20:33
0906F017.D	Method Blank	KWG1607888-4	9/6/2016	20:39		9/6/2016	20:55
0906F018.D	ZZZZZZ	ZZZZZZ	9/6/2016	21:00		9/6/2016	21:16
0906F019.D	ZZZZZZ	ZZZZZZ	9/6/2016	21:22		9/6/2016	21:38
0906F020.D	ZZZZZZ	ZZZZZZ	9/6/2016	21:44		9/6/2016	22:00
0906F021.D	ZZZZZZ	ZZZZZZ	9/6/2016	22:07		9/6/2016	22:23
0906F022.D	AOC16082995A172-1	K1610210-012	9/6/2016	22:28		9/6/2016	22:44
0906F023.D	AOC16082995A173A-1	K1610210-013	9/6/2016	22:50		9/6/2016	23:06
0906F024.D	AOC16082907A177-1	K1610210-014	9/6/2016	23:11		9/6/2016	23:27
0906F025.D	AOC16082910A178-1	K1610210-015	9/6/2016	23:33		9/6/2016	23:49
0906F026.D	AOC16082910A188-1	K1610210-016	9/6/2016	23:56		9/7/2016	00:12
0906F027.D	AOC160829TB-1	K1610210-018	9/7/2016	00:19		9/7/2016	00:35
0906F028.D	ZZZZZZ	ZZZZZZ	9/7/2016	00:40		9/7/2016	00:56
0906F029.D	ZZZZZZ	ZZZZZZ	9/7/2016	01:01		9/7/2016	01:17
0906F030.D	Continuing Calibration Verification	KWG1607887-3	9/7/2016	01:23		9/7/2016	01:39

Results flagged with an asterisk (*) indicate the holding time was exceeded for the analysis

QA/QC Results

Client: Sealaska Environmental Services, LLC
Project: JBLM FLAO/TO 01B
Sample Matrix: Water

Service Request: K1610210
Date Extracted: 09/06/2016

Extraction Prep Log
Volatile Organic Compounds

Extraction Method: EPA 5030B
Analysis Method: 8260C

Extraction Lot: KWG1607888
Level: Low

Sample Name	Lab Code	Date Collected	Date Received	Sample Amount	Final Volume	% Solids	Note
AOC16082995A172-1	K1610210-012	08/29/16	09/01/16	10ml	10ml	NA	
AOC16082995A173A-1	K1610210-013	08/29/16	09/01/16	10ml	10ml	NA	
AOC16082907A177-1	K1610210-014	08/29/16	09/01/16	10ml	10ml	NA	
AOC16082910A178-1	K1610210-015	08/29/16	09/01/16	10ml	10ml	NA	
AOC16082910A188-1	K1610210-016	08/29/16	09/01/16	10ml	10ml	NA	
AOC160829TB-1	K1610210-018	08/29/16	09/01/16	10ml	10ml	NA	
Method Blank	KWG1607888-4	NA	NA	10ml	10ml	NA	
AOC16082907A177-1MS	KWG1607888-1	08/29/16	09/01/16	10ml	10ml	NA	
AOC16082907A177-1DMS	KWG1607888-2	08/29/16	09/01/16	10ml	10ml	NA	
Lab Control Sample	KWG1607888-3	NA	NA	10ml	10ml	NA	

Results flagged with an asterisk (*) indicate the holding time was exceeded for the analysis

1

APPENDIX C

2

AOC 8-2 WELL SURVEY REPORT



AES
CONSULTANTS, INC.

PROFESSIONAL LAND SURVEYORS

P.O. BOX 930 • 3472 N.W. LOWELL "OLD TOWNE" • SILVERDALE, WA 98383 • 360-692-6400 • FAX 360-692-8927

Well ID	Center of Wells						Top of Well Casing Elev. (meters)		Adjacent Ground Elev. (meters)	
	UTM WGS 84 ZONE 10 (meters)		NAD 83 State Plane South Zone (meters)		NAD 27 (meters)					
	Northing	Easting	Northing	Easting	Northing	Easting	NAVD 88	MSL (NGVD 1929)	NAVD 88	MSL (NGVD 1929)
1168-MW01	5221778.925	538408.163	203659.570	348832.342	203676.067	458523.011	85.618	84.569	85.74	84.69
1168-MW02	5221766.229	538399.325	203647.156	348823.103	203663.654	458513.772	85.582	84.533	85.70	84.65
1168-MW03	5221758.503	538425.860	203638.589	348849.389	203655.086	458540.057	85.737	84.688	85.80	84.75
1168-MW04	5221765.262	538414.302	203645.714	348838.047	203662.211	458528.715	85.652	84.603	85.71	84.66
1168-CW-11	5221702.498	538429.080	203582.490	348850.830	203598.988	458541.499	85.615	84.566	85.77	84.72
6031-MW01	5215943.325	531704.710	198037.757	341944.671	198054.266	451635.440	88.551	87.502	87.69	86.64
6031-MW02	5215901.292	531677.217	197996.604	341915.848	198013.113	451606.618	88.240	87.191	87.39	86.34
6034-MW01	5215894.301	531786.013	197986.161	342024.405	198002.669	451715.174	89.099	88.050	88.55	87.50
4131-MW01	5215634.275	529115.968	197810.932	339346.535	197827.430	449037.332	81.251	80.202	81.33	80.28
4131-MW02	5215641.092	529097.414	197818.336	339328.200	197834.835	449018.997	80.891	79.842	81.01	79.96
4131-MW03	5215656.554	529118.645	197833.122	339349.919	197849.620	449040.716	81.510	80.461	81.62	80.57
4131-MW04	5215614.004	529087.219	197791.576	339317.147	197808.075	449007.945	80.766	79.717	80.88	79.83
4131-MW05	5215644.700	529058.489	197823.179	339289.396	197839.677	448980.193	80.617	79.568	80.71	79.66
4131-MW06	5215676.530	529080.688	197854.300	339312.602	197870.797	449003.399	81.214	80.165	81.30	80.25
Well T-15	5218721.072	533106.864	200770.544	343434.786	200787.044	453125.514	80.680	79.631	80.83	79.78

Horizontal positions based upon a combination of ground traverse and GPS readings using a Leica 1200 unit and Washington State Reference Network with cross checks to existing JBLM monuments. March 2016.

Vertical elevations based upon closed level loops from existing JBLM monuments. March 2016

Horizontal position is the center of the well casing.

Vertical elevation is the north rim of the well casing, except for the 6 wells at site #4131. These 6 wells have jagged edged casing pipes with an existing definite marked measuring point.



3-13-2016

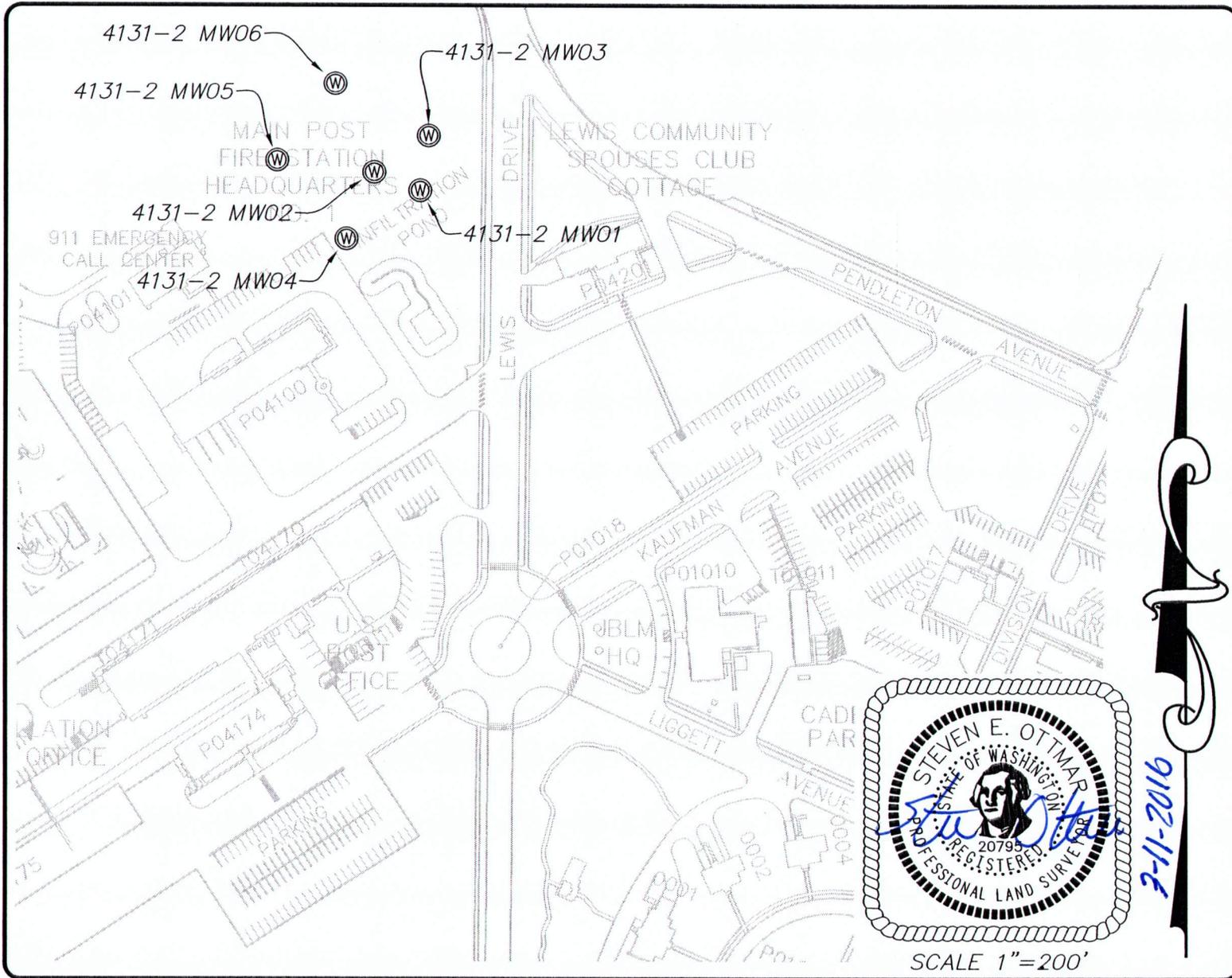


EXHIBIT MAP SITE 4131 FOR SEALASKA	DWN BY: B.J.M.	CHK. BY: S.E.O.
	DATE: 3/08/16	JOB No. 6300
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