

December 7, 2018

Alaska Department of Transportation & Public Facilities
2200 E. 42nd Avenue
Anchorage, Alaska 99508

Attn: Ms. Stephanie Kruse, P.E.

**RE: GROUNDWATER MONITORING, LOT 1A, BLOCK 100, PORT HEIDEN
AIRPORT, PORT HEIDEN, ALASKA; ADEC FILE NO. 2637.26.002**

This report presents the results of Shannon & Wilson's groundwater monitoring activities at Lot 1A, Block 100, Port Heiden Airport in Port Heiden, Alaska. A vicinity map showing the project site and surrounding area is included as Figure 1. The property is identified by the Alaska Department of Environmental Conservation (ADEC) as File No. 2637.26.002.

It is our understanding that approximately 43 groundwater monitoring wells were previously installed at the site. According to the November 2007 *Groundwater Monitoring Report, Samples collected August 2005, ADEC #97-25-00-227-01, Frosty Fuels/Reeve Aleutian, Port Heiden, Alaska* report prepared by ChemTrack, LLC, thirteen of these wells (Wells MW-2, MW-5 through MW-10, MW-13, MW-15, MW-20, MW-22, MW-35, and MW-39) were sampled during September and October 2007. The 13 wells are shown on Figure 2. ChemTrack classified the wells as boundary, sentry, and plume wells. As documented in the ADEC's February 14, 2008 *Conditional Closure Decision* letter, periodic sampling of the on-site groundwater monitoring wells is required.

The project was conducted under our Alaska Department of Transportation and Public Facilities (ADOT&PF) Statewide Hazardous Waste and Environmental Services Term Agreement. Authorization to proceed with the field activities was received from Mark Davis on August 24, 2018 with Notice to Proceed No. 2.

FIELD ACTIVITIES

The project consisted of a site reconnaissance, groundwater sampling, and investigation-derived waste (IDW) management. SGS North America, Inc. (SGS) of Anchorage, Alaska provided analytical testing of the groundwater samples. The project was conducted in general accordance with our September 27, 2018 *Work Plan for Groundwater Monitoring, Lot 1A, Block 100, Port Heiden Airport, Port Heiden, Alaska; ADEC File NO. 2637.26.002*, which was approved by Mr.

Joshua Barsis of the ADEC in the form of an email dated September 28, 2018. Field notes are provided in Attachment 1.

Site Reconnaissance

With the assistance of Mr. Erik Norberg of the ADOT&PF, our field representative attempted to locate the wells previously sampled by ChemTrack using a metal detector and swing tie measurements. With the exception of Monitoring Wells MW-7, MW-22, and MW-39, the previously sampled wells could not be located. Three additional wells (MW-4, MW-11, and MW-18) were also located. According to ChemTrack's November 2007 report, Wells MW-4, MW-11, and MW-18 are designated boundary, sentry, and plume wells, respectively.

Groundwater Sampling

Mr. Norberg requested that we collect groundwater samples from each of the located wells. Groundwater samples were collected from Monitoring Wells MW-4, MW-7, MW-18, MW-22, and MW-39. Based on the relatively shallow total depth of MW-11, it is assumed that the well is damaged and filled with sediment. Therefore, a groundwater sample was not collected from Well MW-11. The samples were collected using low-flow techniques to reduce the effects of stagnant well casing water on chemical concentrations and to obtain a groundwater sample that is representative of the surrounding water-bearing formation. The wells were purged and sampled with a submersible pump and disposable tubing. The submersible pump was placed within the top foot of the water column. A pump rate was adjusted with the goal of limiting the sustained water drawdown to a maximum of 0.3 foot (typical pump rate of 0.1 to 0.2 liter per minute).

During the purging process, field personnel monitored water quality parameters (pH, temperature, specific conductance, and turbidity) and purge volume. Purging was considered complete when the following stabilization criteria were met over three successive readings: pH within 0.1 unit, temperature within 3 percent (minimum 0.2 degree Celsius), specific conductance within 3 percent, and turbidity within 10 percent or three consecutive readings of less than 10 nephelometric turbidity units (NTU).

Analytical samples were collected in decreasing order of volatility by transferring water directly from the pump tubing into laboratory-supplied containers. The samples were placed into chilled coolers for transport to the laboratory using chain-of-custody procedures. Final water quality parameters are listed on Table 1.

LABORATORY ANALYSES

Six groundwater samples, including one duplicate, were collected and submitted to SGS for analysis. Each sample was analyzed for volatile organic compounds (VOCs) by Environmental Protection Agency (EPA) Method 8260C, diesel range organics (DRO) by Method Alaska (AK) 102, residual range organics (RRO) by AK 103, and polynuclear aromatic hydrocarbons (PAHs) by EPA Method 8270D selected ion monitoring (SIM). One trip blank sample accompanied the analytical sample containers from and to the laboratory and was tested for VOCs by EPA Method 8260C. Under the sample numbering scheme used for this project, a typical groundwater sample number is "FF18." The "FF" indicates the location of the sampling event (former Frosty Fuels facility). The "18" designation represents the monitoring well number (MW-18). The laboratory report is provided in Attachment 2.

DISCUSSION OF ANALYTICAL RESULTS

During the October 2018 groundwater sampling event, the groundwater sample (FF18) collected from Monitoring Well MW-18 contained concentrations of DRO (26.6 milligrams per liter [mg/L]), RRO (1.13 mg/L), benzene (0.0634 mg/L), ethylbenzene (0.148 mg/L), and xylenes (1.16 mg/L) exceeding the ADEC cleanup levels of 1.5 mg/L, 1.1 mg/L, 0.0046 mg/L, 0.015 mg/L, and 0.19 mg/L, respectively. Monitoring Well MW-18 also contained concentrations of three additional VOCs and two PAHs exceeding the applicable ADEC Table C cleanup levels. The duplicate sample set (FF22/FF229) collected from Monitoring Well MW-22 contained DRO (maximum of 7.17 mg/L), ethylbenzene (maximum of 0.113 mg/L), xylenes (maximum of 0.384 mg/L), two additional VOCs, and three PAHs exceeding ADEC cleanup levels. The groundwater samples collected from the remaining monitoring wells did not contain detectable concentrations of target analytes. The cleanup levels and analytical results for the October 2018 sampling event are provided in Tables 2.

QUALITY ASSURANCE SUMMARY

SGS follows on-going quality assurance/quality control (QC) procedures to evaluate conformance to applicable ADEC data quality objectives (DQO). Internal laboratory controls to assess data quality for this project include surrogates, method blanks, and laboratory control sample/laboratory control sample duplicates (LCS/LCSD) to determine precision, accuracy, and matrix bias. If a DQO was not met, the project laboratory provides a report specific note identifying the problem in the Case Narrative section of their Laboratory Analysis Reports (See Attachment 2).

One groundwater field duplicate set was collected during the October 2018 sampling event to assess precision of the sampling and analysis process using the calculated relative percent difference (RPD). The RPD between the field primary/duplicates for DRO, RRO, and nine PAHs were out outside the recommended DQO of 30 percent ranging from 31% to 41.6%. The sample results with failed RPDs are flagged “E” in Table 2 and are considered estimated.

According to the results of the October 2018 sampling event, the 2-Methylnaphthalene-d10 (PAHs surrogate) recovery for sample FF18 collected from Monitoring Well MW-18 is 176% and does not meet QC criteria due to matrix interference. The affected PAHs results are flagged “J+” in the report tables to indicate the potential high bias.

One laboratory-supplied trip blank accompanied the sample containers during transport to and from the project during each quarterly sampling event. There were no detections in the trip blank indicating that the samples were not cross contaminated by these compounds during the sample handling, storage, or testing process.

Shannon & Wilson reviewed the SGS deliverables and completed the ADEC’s Laboratory Data Review Checklist (LDRC) for each data package which are included in Attachment 2. Quality control discrepancies and the impact to data quality/usability are described in further detail in the LDRC. In our opinion, no non-conformances that would adversely impact data usability for the objectives of this project were noted. Based on this quality assurance summary, we find the project data to be complete and usable to support the intended data uses.

INVESTIGATION DERIVED WASTE

Investigation derived waste (IDW) from this project consisted of purge water, granulated activated carbon (GAC), and disposable sampling equipment. The purge water was processed using GAC prior to being discharged to the ground surface. The GAC was shipped to Anchorage and disposed by NRC Alaska, Inc. (NRC). The disposal receipt is included as Attachment 3. The disposable sampling equipment (nitrile gloves and pump tubing) was taken to the local landfill for disposal.

SUMMARY

The project work plan included plans to sample thirteen site wells (Wells MW-2, MW-5 through MW-10, MW-13, MW-15, MW-20, MW-22, MW-35, and MW-39). With the exception of Monitoring Wells MW-7, MW-22, and MW-39, the wells could not be located and are presumed destroyed. Three additional wells (MW-4, MW-11, and MW-18) were also located. Groundwater samples were collected from Monitoring Wells MW-4, MW-7, MW-18, MW-22,

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and MW-39. The groundwater samples collected from Monitoring Wells MW-18 (Sample FF18) and MW-22 (Sample Set FF22/FF229) contained concentrations of GRO, DRO, VOCs, and/or PAHs exceeding the applicable ADEC Table C cleanup levels. Concentrations of target analytes were not detected in the remaining wells sampled.

CLOSURE/LIMITATIONS

This report was prepared for the exclusive use of our clients and their representatives in the study of this site. The findings we have presented within this report are based on the limited sampling and analyses that we conducted. They should not be construed as a definite conclusion regarding the site's groundwater conditions. Therefore, the sampling and analyses performed can provide you with only our professional judgment as to the environmental characteristics of this site, and in no way guarantees that an agency or its staff will reach the same conclusions as Shannon & Wilson, Inc. The data presented in this report should be considered representative of the time of our site assessment. Changes in site conditions can occur over time, due to natural forces or human activity. In addition, changes in government codes, regulations, or laws may occur. Because of such changes beyond our control, our observations and interpretations may need to be revised.

Shannon & Wilson has prepared the documents in Attachment 4, "Important Information About Your Geotechnical/Environmental Report", to assist you and others in understanding the use and limitations of our reports. You are advised that various state and federal agencies (ADEC, EPA, etc.) may require the reporting of this information. Shannon & Wilson does not assume the responsibility for reporting these findings and therefore has not, and will not, disclose the results of this study, except with your permission or as required by law.

We appreciate the opportunity to be of service. Please call the undersigned at (907) 561-2120 with questions or comments concerning this report.

Sincerely,

SHANNON & WILSON, INC.


Schylar Healy
Environmental Scientist


Dan McMahon
Associate

Encl: Tables 1 and 2; Figures 1 and 2; and Attachments 1 through 4

**TABLE 1
MONITORING WELL SAMPLING LOG**

	Monitoring Well and Sample Number					
	MW-4 FF4	MW-7 FF7	MW-11 FF11	MW-18 FF18	MW-22 FF22	MW-39 FF39
Water Level Measurement Data						
Date Water Level Measured	10/19/2018	10/19/2018	10/19/2018	10/19/2018	10/19/2018	10/19/2018
Time Water Level Measured	15:55	17:59	17:45	18:16	18:05	18:24
Measured Depth to Water (ft below TOC)	11.64	12.39	2.20	12.97	11.82	13.85
Purging/Sampling Data						
Date Sampled	10/19/2018	10/19/2018	10/19/2018	10/19/2018	10/20/2018	10/20/2018
Time Sampled	17:11	19:26	NS	15:22	13:09	11:27
Measured Depth to Water (ft below MP)	11.64	12.39	2.20	12.97	11.82	13.85
Total Depth of Well (ft below MP)	19.58	17.61	6.61	16.61	15.81	16.81
Water Column in Well (ft)	7.94	5.22	4.41	3.64	3.99	2.96
Gallons per Foot	0.16	0.16	0.16	0.16	0.16	0.16
Water Column Volume (gallons)	1.27	0.84	0.71	0.58	0.64	0.47
Total Volume Pumped (gallons)	2.0	4.0	-	2.5	4.0	2.0
Sampling Method	Low-flow	Low-flow	NS	Low-flow	Low-flow	Low-flow
Diameter of Well Casing	2-inch	2-inch	2-inch	2-inch	2-inch	2-inch
Water Quality Data						
Temperature (°C)	6.92	5.88	-	6.53	6.41	5.86
Specific Conductance (µS/cm)	203	181	-	671	414	133
pH (Standard Units)	6.47	6.52	-	6.35	6.36	6.36
Turbidity (NTU)	6.72	6.83	-	25.98	0.74	5.57
Remarks			Well damaged		Duplicate Sample FF229	

Notes:

Water quality parameters were measured with a YSI Pro-Plus and a Hach 2100P Turbidimeter.

MP = measuring point

bgs = below ground surface

°C = degrees Celsius

ft = feet

µS/cm = microsiemens per centimeter

NTU = nephelometric turbidity unit

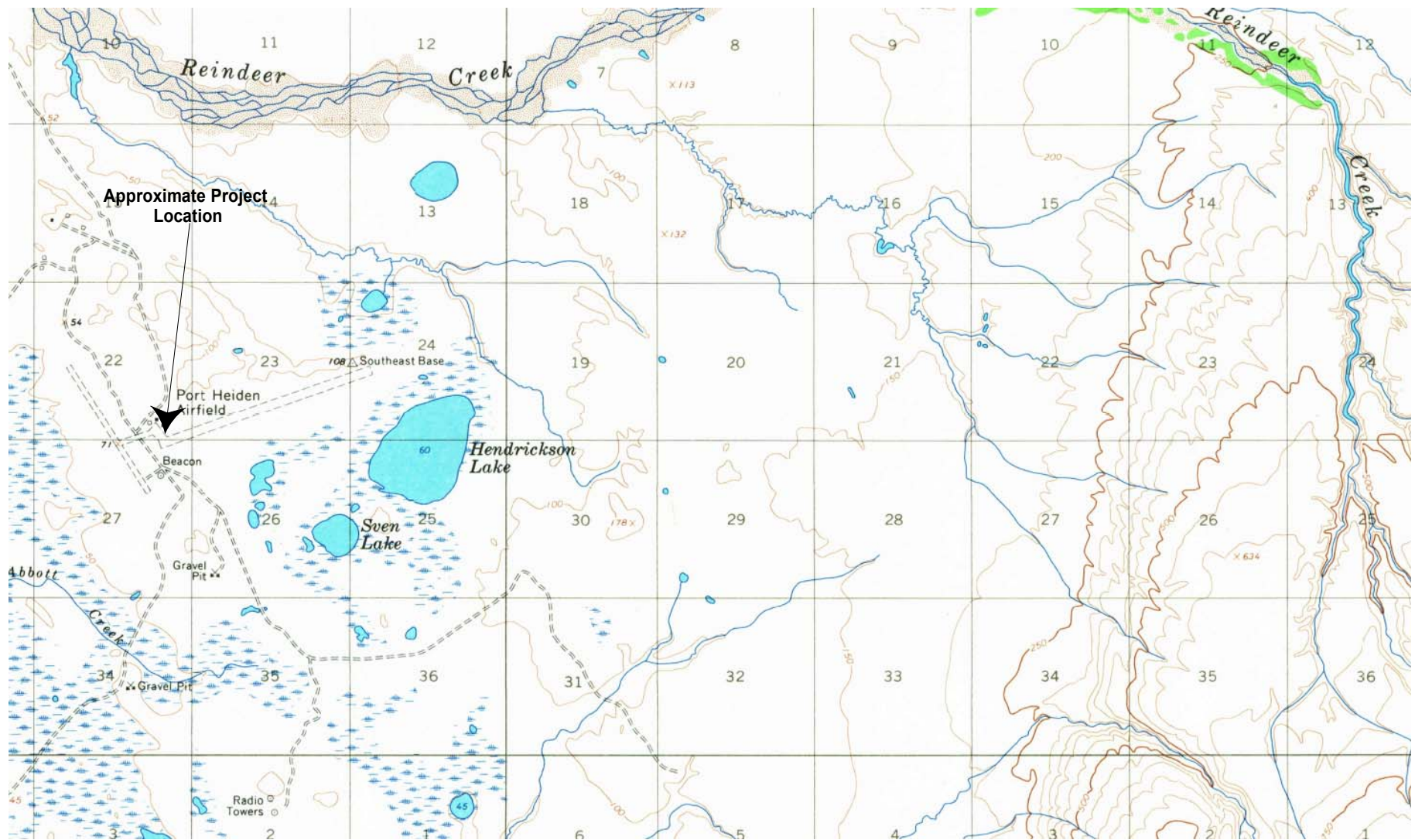
- = Not measured

NS = Not sampled

**TABLE 2
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS**

Parameter Tested	Method*	Cleanup Level **	Monitoring Well Number, Sample ID Number, and Water Depth in Feet Below Ground Surface (See Figure 2)						
			Groundwater Samples						Trip Blank
			MW-4	MW-7	MW-18	MW-22		MW-39	FF - Trip Blank
			FF4 11.64	FF7 12.39	FF18 12.97	FF22 11.82	FF229~ 11.82	FF39 11.27	
Diesel Range Organics (DRO) - mg/L	AK 102	1.5	<0.300	<0.288	26.6	7.17 E	4.78 E	<0.288	-
Residual Range Organics (RRO) - mg/L	AK 103	1.1	<0.250	<0.240	1.13	0.465 J, E	0.305 J, E	<0.240	-
Volatile Organic Compounds (VOCs)									
Benzene - mg/L	EPA 8260C	0.0046	<0.000200	<0.000200	0.0634	0.00306 E	0.00423 E	<0.000200	<0.000200
Toluene - mg/L	EPA 8260C	1.1	<0.000500	<0.000500	0.890	0.101	0.134	<0.000500	<0.000500
Ethylbenzene - mg/L	EPA 8260C	0.015	<0.000500	<0.000500	0.148	0.0812 E	0.113 E	<0.000500	<0.000500
Xylenes - mg/L	EPA 8260C	0.19	<0.00150	<0.00150	1.16	0.285	0.384	<0.00150	<0.00150
1,2,4-Trimethylbenzene - mg/L	EPA 8260C	0.056	<0.000500	<0.000500	0.176	0.120 E	0.164 E	<0.000500	<0.000500
1,3,5-Trimethylbenzene - mg/L	EPA 8260C	0.06	<0.000500	<0.000500	0.0718	0.0423 E	0.0597 E	<0.000500	<0.000500
1,2-Dibromoethane - mg/L	EPA 8260C	0.0017	<0.0000375	<0.0000375	0.000360	<0.0000375	0.000400	<0.0000375	<0.0000375
4-Isopropyltoluene - mg/L	EPA 8260C	-	<0.000500	<0.000500	0.0179	0.0194 E	0.0268 E	<0.000500	<0.000500
Isopropylbenzene (Cumene) - mg/L	EPA 8260C	0.45	<0.000500	<0.000500	0.00996	0.0132 E	0.0188 E	<0.000500	<0.000500
Naphthalene - mg/L	EPA 8260C	0.0017	<0.000500	<0.000500	0.0977	0.140 E	0.193 E	<0.000500	<0.000500
n-Propylbenzene - mg/L	EPA 8260C	0.66	<0.000500	<0.000500	0.0171	0.0219 E	0.0315 E	<0.000500	<0.000500
sec-Butylbenzene - mg/L	EPA 8260C	2	<0.000500	<0.000500	0.00309	0.00684 E	0.00948 E	<0.000500	<0.000500
tert-Butylbenzene - mg/L	EPA 8260C	0.69	<0.000500	<0.000500	0.00188	0.00124	0.00167	<0.000500	<0.000500
2-Hexanone - mg/L	EPA 8260C	0.038	<0.00500	<0.00500	0.00704 J	<0.00500	<0.00500	<0.00500	<0.00500
4-Methyl-2-pentanone (MIBK) - mg/L	EPA 8260C	6.3	<0.00500	<0.00500	0.0102	<0.00500	<0.00500	<0.00500	<0.00500
Chloromethane - mg/L	EPA 8260C	0.19	<0.000500	<0.000500	<0.000500	0.000320 J	<0.000500	<0.000500	<0.000500
Styrene - mg/L	EPA 8260C	1.2	<0.000500	<0.000500	<0.000500	<0.000500	0.000380 J	<0.000500	<0.000500
Other VOCs - mg/L	EPA 8260C	varies	ND	ND	ND	ND	ND	ND	ND
Polynuclear Aromatic Hydrocarbons (PAHs)									
1-Methylnaphthalene - mg/L	EPA 8270D SIM	0.011	<0.0000245	<0.0000240	0.0220 J+	0.0388	0.0395	<0.0000250	-
2-Methylnaphthalene - mg/L	EPA 8270D SIM	0.036	<0.0000245	<0.0000240	0.0270 J+	0.0493	0.0494	<0.0000250	-
Acenaphthene - mg/L	EPA 8270D SIM	0.53	<0.0000245	<0.0000240	0.00132 J+	0.000774	0.000800	<0.0000250	-
Fluorene - mg/L	EPA 8270D SIM	0.29	<0.0000245	<0.0000240	0.000356 J+	0.000353	0.000351	<0.0000250	-
Naphthalene - mg/L	EPA 8270D SIM	0.0017	<0.0000490	<0.0000481	0.0495 J+	0.111	0.113	<0.0000500	-
Phenanthrene - mg/L	EPA 8270D SIM	0.17	<0.0000245	<0.0000240	0.000589 J+	<0.0000240	<0.0000236	<0.0000250	-
Other PAHs - mg/L	EPA 8270D SIM	varies	ND	ND	ND	ND	ND	ND	-


- * = See Attachment 2 for compounds tested, methods, and laboratory reporting limits
- ** = Groundwater cleanup levels are listed in Table C, 18 AAC 75.345 (September 2018)
- mg/L = milligrams per liter
- <0.000200 = analyte not detected; laboratory limit of detection 0.000200 mg/L
- 0.0171** = Analyte detected
- 26.6** = Reported concentration exceeds the applicable ADEC cleanup level
- = Not applicable or sample not tested for this analyte
- ~ = Field duplicate of Sample MW-22
- J = Estimated concentration less than the limit of quantitation. See the SGS laboratory report for more details.
- J+ = Analytical result is potentially biased high due to surrogate recovery. See ADEC Laboratory Data Review Checklist (LDRC) in Attachment 2 for details.
- E = Result is an estimate due to a primary/field duplicate sample pair relative percent difference (RPD) failure. See ADEC LDRC in Attachment 2 for details.
- ND = Not detected
- SIM = selected ion monitoring

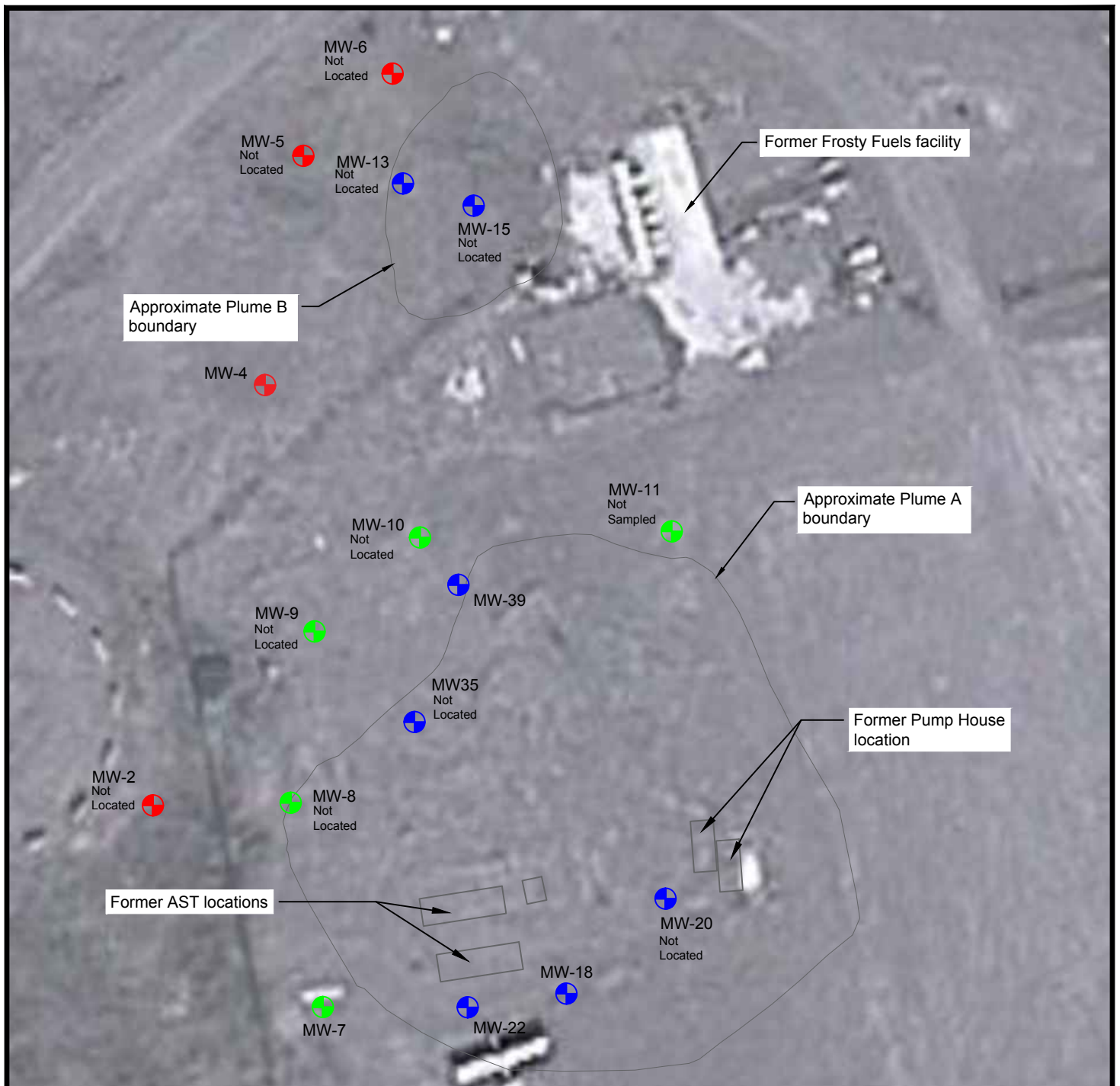


Elevation in Feet
 Contour Interval 50 Feet
 Taken from Chignik D-2
 U.S. Geological Survey Quadrangle

NOT TO SCALE



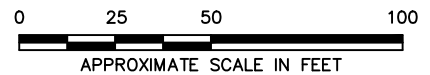
Lot 1A, Block 100, Port Heiden Airport Port Heiden, Alaska	
VICINITY MAP	
December 2018	101644-001
 SHANNON & WILSON, INC. Geotechnical & Environmental Consultants	FIG. 1



Aerial imagery provided by Google Earth Pro, reproduced by permission granted by Google Earth Mapping Service.
 Adapted from ChemTrack, LLC November 2007.

LEGEND

- Monitoring Well MW-13, designated a Plume Area Well and installed by Chem Track, LLC in 2003.
- Monitoring Well MW-10, designated a Sentry Well and installed by Chem Teck, LLC in 2003.
- Monitoring Well MW-2, designated a Boundary Well and installed by Chem Track, LLC in 2003.



LOT 1A, BLOCK 100, PORT HEIDEN AIRPORT PORT HEIDEN, ALASKA	
SITE PLAN	
DECEMBER 2018	101644-001
SHANNON & WILSON, INC. <small>Geotechnical & Environmental Consultants</small>	FIG. 2

ATTACHMENT 1

FIELD NOTES

FF4

LOW-FLOW WATER SAMPLING LOG

Shannon & Wilson, Inc.

Job No: 101644-001 Location: Frosty Fuels, Port Hella Weather: Windy, 40°F
 Well No.: FF4 (assumed)
 Date: 10/19/18 Time Started: 1611 Time Completed: _____
 Develop Date: July 2003 Develop End Time: _____ (24 hour break)

INITIAL GROUNDWATER LEVEL DATA

Time of Depth Measurement: 1555 Date of Depth Measurement: 10/19/18
 Measuring Point (MP): Top of PVC Casing / Top of Steel Protective Casing / Other: _____
 Diameter of Casing: 2" Well Screen Interval: 19.58 → 9.58
 Total Depth of Well Below MP: 19.58 Product Thickness, if noted: none
 Depth-to-Water (DTW) Below MP: 11.64
 Water Column in Well: 8.21 (Total Depth of Well Below MP - DTW Below MP)
 Gallons per foot: 1 well volume 1.31
 Gallons in Well: 3 well volumes 3.94 (Water Column in Well x Gallons per foot)

PURGING DATA

Date Purged: 10/19/18 Time Started: 1607 Time Completed: _____
 Three Well Volumes: _____ (Gallons in Well x 3)
 Gallons Purged: _____ Depth of Pump (generally 2 ft from bottom): 3ft from bottom
 Max. Drawdown (generally 0.3 ft): 11.93 Pump Rate: _____
 Well Purged Dry: Yes No (If yes, use Well Purged Dry Log)

Time:	Gallons:	Pump Rate (L/min):	DTW (ft BMP):	Drawdown (ft):	Temp: (°C)	Sp. Cond.: (uS/cm)	DO: (mg/L)	pH: (S.U.)	ORP: (mV)	Turb: (NTU)
1611	—	350	12.67	1.03	6.43	154	—	6.34	—	225
1619	~0.5	100	12.55	0.91	6.50	162	—	6.34	—	211
1624	~0.75	100	12.35	0.71	6.57	176	—	6.39	—	93.44
1629	—	100	12.29	0.65	6.58	184	—	6.41	—	67.35
1634	~1.00	100	12.29	0.65	6.56	191	—	6.43	—	41.49

SAMPLING DATA

Odor: sulfur Color: clear
 Sample Designation: FF4 Time / Date: 1711 - 10/19/18
 QC Sample Designation: — Time / Date: —
 QA Sample Designation: — Time / Date: —
 Evacuation Method: Submersible Pump / Other: _____
 Sampling Method: Submersible Pump / Other: _____
 Water Quality Instruments Used/Manufacturer/Model Number YSI 556
 Calibration Info (Time, Ranges, etc) _____
 Remarks: no bolts, very very soft bottom. No indicators on well
 Sampling Personnel: Matt Wark

WELL CASING VOLUMES (GAL/FT): 1" = 0.04 2" = 0.16 4" = 0.65
 ANNULAR SPACE VOLUME (GAL/FT): 4" casing and 2" well = 0.23

LOW-FLOW WATER SAMPLING LOG

Shannon & Wilson, Inc.

Continued from previous page

Job No: _____ Location: Area Port Heater Site: Frosty Fuels
 Well No.: FF4
 Date: 10/12/10

Time:	Gallons:	Pump Rate (L/min):	DTW (ft BMP):	Drawdown (ft):	Temp: (°C)	Sp. Cond (uS/cm)	DO (mg/L)	pH: (S.U.)	ORP: (mV)	Turb: (NTU)
1644		100	12.29	0.65	6.58	197	—	6.44	—	32.43
1649		100	12.28	0.64	6.63	200	—	6.45	—	32.10
1654	~1.5	100	12.28	0.64	6.67	203	—	6.48	—	24.31
1659		100	12.28	0.64	6.60	203	—	6.48	—	14.13
1704		100	12.28	0.64	6.72	203	—	6.47	—	14.99
1709	~2	100	12.28	0.64	6.92	203	—	6.47	—	6.72

sun came out

- Consider sample stable, also @ 1 hr after 1:14 per WP
 ★ Sample @ 1711 ★

	Interval (minutes)	Pump Rate (mL/min):	Drawdown (ft):	Temp: (°C)	Sp. Cond.: (uS/cm)	DO (mg/L)	pH: (S.U.)	ORP: (mV)	Turb: (NTU)
ADEC 1ay 2010)	3 to 5	100 to 150	<0.0328	±3% or ±0.2	±3%	±10%	±0.1	±10	±10%
EPA an. 2010)	5	50	<0.3	±3%	±3%	±10%	±0.1	±10	±10% or <5 NTU

EPA guidance requires all parameters to stabilize for 3 consecutive readings before sampling. If not stable within 2 hours, collect sample.
 ADEC guidance requires 3 parameters (4 if using temperature) to stabilize for 3 consecutive readings before sampling.

FF7

LOW-FLOW WATER SAMPLING LOG

Shannon & Wilson, Inc.

Job No: 101644-001 Location: Front Fields, Point Hellen Weather: Windy, 40°F
Well No.: FF7
Date: 10/19/18 Time Started: 1857 Time Completed: 1945
Develop Date: July 2003 Develop End Time: — (24 hour break)

INITIAL GROUNDWATER LEVEL DATA

measure
at the
sample

Time of Depth Measurement: 1759 Date of Depth Measurement: 10/19/18
Measuring Point (MP): Top of PVC Casing / Top of Steel Protective Casing / Other: —
Diameter of Casing: 2" Well Screen Interval: 10 ft from bottom, assumed
Total Depth of Well Below MP: 12.61 Product Thickness, if noted: none
Depth-to-Water (DTW) Below MP: 12.39
Water Column in Well: — (Total Depth of Well Below MP - DTW Below MP)
Gallons per foot: —
Gallons in Well: — (Water Column in Well x Gallons per foot)

PURGING DATA

Date Purged: — Time Started: 1857 Time Completed: 1945 ^{me} 1922
Three Well Volumes: — (Gallons in Well x 3)
Gallons Purged: 4 Depth of Pump (generally 2 ft from bottom): 14.5' BMP
Max. Drawdown (generally 0.3 ft): — Pump Rate: 500 ml/min
Well Purged Dry: Yes No (If yes, use Well Purged Dry Log)

Time:	Gallons:	Pump Rate (L/min):	DTW (ft BMP):	Drawdown (ft):	Temp: (°C)	Sp. Cond.: (uS/cm)	DO: (mg/L)	pH: (S.U.)	ORP: (mV)	Turb: (NTU)
1857		250	12.45	0.06	—	Fluor adjustments	—	—	—	—
1902		500	12.51	0.17	—	Fluor adjustments	—	—	—	—
1907	2	500	12.51	0.12	5.98	181	—	6.74	—	36.74
1912		500	12.52	0.13	5.90	181	—	6.56	—	6.98
1917	3	500	12.52	0.13	5.89	181	—	6.54	—	7.36
1922	4	500	12.52	0.13	5.98	181	—	6.52	—	6.83

* 1926 sample

SAMPLING DATA

Odor: none Color: clear
Sample Designation: FF7 Time / Date: 1926 10/19/18
QC Sample Designation: — Time / Date: —
QA Sample Designation: — Time / Date: —
Evacuation Method: Submersible Pump / Other: —
Sampling Method: Submersible Pump / Other: —
Water Quality Instruments Used/Manufacturer/Model Number YSI 556
Calibration Info (Time, Ranges, etc) see field notes
Remarks: likely need sediments removal
Sampling Personnel: Neil Webb

WELL CASING VOLUMES (GAL/FT): 1" = 0.04 2" = 0.16 4" = 0.65
ANNULAR SPACE VOLUME (GAL/FT): 4" casing and 2" well = 0.23

FF11

LOW-FLOW WATER SAMPLING LOG

Shannon & Wilson, Inc.

Job No: 101644-001 Location: Freshy Fuels, Port Heist Weather: windy, 40°F
Well No.: FF11 (assumed)
Date: 10/14/18 Time Started: 1745 Time Completed: 1750
Develop Date: July 2003 Develop End Time: _____ (24 hour break)

INITIAL GROUNDWATER LEVEL DATA

MW measured after sampling

Time of Depth Measurement: _____ Date of Depth Measurement: _____
Measuring Point (MP): Top of PVC Casing / Top of Steel Protective Casing / Other: _____
Diameter of Casing: 2 in 2" Well Screen Interval: _____
Total Depth of Well Below MP: 6.61 Product Thickness, if noted: _____
Depth-to-Water (DTW) Below MP: 2.20
Water Column in Well: _____ (Total Depth of Well Below MP - DTW Below MP)
Gallons per foot: _____
Gallons in Well: _____ (Water Column in Well x Gallons per foot)

PURGING DATA

Date Purged: _____ Time Started: _____ Time Completed: _____
Three Well Volumes: _____ (Gallons in Well x 3)
Gallons Purged: _____ Depth of Pump (generally 2 ft from bottom): _____
Max. Drawdown (generally 0.3 ft): _____ Pump Rate: _____
Well Purged Dry: Yes No (If yes, use Well Purged Dry Log)

Time:	Gallons:	Pump Rate (L/min):	DTW (ft BMP):	Drawdown (ft):	Temp: (°C)	Sp. Cond.: (uS/cm)	DO: (mg/L)	pH: (S.U.)	ORP: (mV)	Turb: (NTU)
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____

SAMPLING DATA

Odor: _____ Color: _____
Sample Designation: _____ Time / Date: _____
QC Sample Designation: _____ Time / Date: _____
QA Sample Designation: _____ Time / Date: _____

Evacuation Method: Submersible Pump / Other: _____
Sampling Method: Submersible Pump / Other: _____
Water Quality Instruments Used/Manufacturer/Model Number _____
Calibration Info (Time, Ranges, etc) _____

Remarks: Based on low total depth assume well was plugged/damaged and water is pooling on top. Inconsistent with known well details, shall be min 10' pit screen.

Sampling Personnel: B.H. Wals

WELL CASING VOLUMES (GAL/FT): 1" = 0.04 2" = 0.16 4" = 0.65
ANNULAR SPACE VOLUME (GAL/FT): 4" casing and 2" well = 0.23

FF18

LOW-FLOW WATER SAMPLING LOG

Shannon & Wilson, Inc.

Job No: 101644-001 Location: Frosty Fuels, Port Heide Weather: windy, rainy, 40°F
 Well No.: FF20 FF18 (icbdl)
 Date: 10/20/18 Time Started: 1457 Time Completed: 1519^m 1545
 Develop Date: 2003 Develop End Time: — (24 hour break)

INITIAL GROUNDWATER LEVEL DATA

Time of Depth Measurement: 1916 Date of Depth Measurement: 10/19/18
 Measuring Point (MP): Top of PVC Casing / Top of Steel Protective Casing / Other: _____
 Diameter of Casing: 2" Well Screen Interval: _____
 Total Depth of Well Below MP: 16.61 (soft) Product Thickness, if noted: none, but strong color
 Depth-to-Water (DTW) Below MP: 12.97
 Water Column in Well: 3.64 (Total Depth of Well Below MP - DTW Below MP)
 Gallons per foot: 0.16
 Gallons in Well: 0.582 (Water Column in Well x Gallons per foot)

PURGING DATA

Date Purged: 10/20/18 Time Started: 1457 Time Completed: 1519
 Three Well Volumes: 1.75 (Gallons in Well x 3)
 Gallons Purged: ~2.5 Depth of Pump (generally 2 ft from bottom): 14.5' BMP
 Max. Drawdown (generally 0.3 ft): _____ Pump Rate: 400
 Well Purged Dry: Yes No (If yes, use Well Purged Dry Log)

Time:	Gallons:	Pump Rate (L/min):	DTW (ft BMP):	Drawdown (ft):	Temp: (°C)	Sp. Cond.: (uS/cm)	DO: (mg/L)	pH: (S.U.)	ORP: (mV)	Turb: (NTU)
<u>1453</u>		<u>400</u>	<u>13.19</u>	<u>.22</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
<u>1507</u>	<u>1.5</u>	<u>400</u>	<u>13.19</u>	<u>.22</u>	<u>6.41</u>	<u>638</u>	<u>—</u>	<u>6.40</u>	<u>—</u>	<u>26.65</u>
<u>1512</u>		<u>400</u>	<u>13.19</u>	<u>.22</u>	<u>6.51</u>	<u>664</u>	<u>—</u>	<u>6.38</u>	<u>—</u>	<u>27.96</u>
<u>1516</u>	<u>2</u>	<u>400</u>	<u>13.19</u>	<u>.22</u>	<u>6.51</u>	<u>664</u>	<u>—</u>	<u>6.35</u>	<u>—</u>	<u>26.33</u>
<u>1519</u>	<u>~2.5</u>	<u>400</u>	<u>13.18</u>	<u>.21</u>	<u>6.53</u>	<u>671</u>	<u>—</u>	<u>6.35</u>	<u>—</u>	<u>25.98</u>

SAMPLING DATA

Odor: strong, petrole Color: clear
 Sample Designation: FF18 Time / Date: 1522 10/20/18
 QC Sample Designation: — Time / Date: —
 QA Sample Designation: — Time / Date: —
 Evacuation Method: Submersible Pump / Other: _____
 Sampling Method: Submersible Pump / Other: _____
 Water Quality Instruments Used/Manufacturer/Model Number YSI 556
 Calibration Info (Time, Ranges, etc) see field notes
 Remarks: likely need sediments removed
 Sampling Personnel: Matt Ward

WELL CASING VOLUMES (GAL/FT): 1" = 0.04 2" = 0.16 4" = 0.65
 ANNULAR SPACE VOLUME (GAL/FT): 4" casing and 2" well = 0.23

FF22

LOW-FLOW WATER SAMPLING LOG

Shannon & Wilson, Inc.

Job No: 101644-001 Location: Frosty Frets, Port Hills Weather: windy, 40°F
Well No.: FF22 (labeled)
Date: 10/20/18 Time Started: 1237 Time Completed: 1348
Develop Date: 2003 Develop End Time: — (24 hour break)

INITIAL GROUNDWATER LEVEL DATA

Time of Depth Measurement: 1905 Date of Depth Measurement: 10/19/18
Measuring Point (MP): Top of PVC Casing / Top of Steel Protective Casing / Other: —
Diameter of Casing: 2 Well Screen Interval: ~~15.81~~ 5.81 (50' from well bottom)
Total Depth of Well Below MP: 15.81 (soft) Product Thickness, if noted: none
Depth-to-Water (DTW) Below MP: 11.82
Water Column in Well: 3.94 (Total Depth of Well Below MP - DTW Below MP)
Gallons per foot: 0.16
Gallons in Well: 0.638 (Water Column in Well x Gallons per foot)

PURGING DATA

Date Purged: 10/20/18 Time Started: 1237 Time Completed: —
Three Well Volumes: 1.914 (Gallons in Well x 3)
Gallons Purged: — Depth of Pump (generally 2 ft from bottom): 13.8
Max. Drawdown (generally 0.3 ft): — Pump Rate: 400 ml/min
Well Purged Dry: Yes No (If yes, use Well Purged Dry Log)

Time:	Gallons:	Pump Rate (L/min):	DTW (ft BMP):	Drawdown (ft):	Temp: (°C)	Sp. Cond.: (uS/cm)	DO: (mg/L)	pH: (S.U.)	ORP: (mV)	Turb: (NTU)
1237	—	400	12.02	.20	—	—	—	—	—	—
1242	1	400	12.00	.18	—	—	—	—	—	—
1245	—	400	11.99	.17	6.23	375	—	6.33	—	0.52
1250	2	400	12.00	.18	6.25	389	—	6.32	—	1.36
1255	3	400	11.99	.17	6.33	422	—	6.34	—	1.29
1300	—	400	11.98	.16	6.38	413	—	6.35	—	0.93
1303	4	400	11.98	.16	6.41	414	—	6.36	—	0.74

SAMPLING DATA

Odor: petroleum, slight Color: clear w/ sheen
Sample Designation: FF22 Time / Date: 1309 10/20/18
QC Sample Designation: FF22.9 Time / Date: 1337 10/20/18
QA Sample Designation: — Time / Date: —

Evacuation Method: Submersible Pump / Other: —
Sampling Method: Submersible Pump / Other: —
Water Quality Instruments Used/Manufacturer/Model Number YSI 556
Calibration Info (Time, Ranges, etc) see field notes
Remarks: likely need sediment removed
Sampling Personnel: Scott Wan

WELL CASING VOLUMES (GAL/FT): 1" = 0.04 2" = 0.16 4" = 0.65
ANNULAR SPACE VOLUME (GAL/FT): 4" casing and 2" well = 0.23

FF39

LOW-FLOW WATER SAMPLING LOG

Shannon & Wilson, Inc.

Job No: 101644-001 Location: Fresh Fuels, Port Hedden Weather: windy, 40°F
 Well No.: FF39 (Ident)
 Date: 10/20/18 Time Started: 1100 Time Completed: 1150
 Develop Date: 2003 Develop End Time: — (24 hour break)

INITIAL GROUNDWATER LEVEL DATA

Time of Depth Measurement: 1324 Date of Depth Measurement: 10/19/18
 Measuring Point (MP): Top of PVC Casing / Top of Steel Protective Casing / Other:
 Diameter of Casing: 2" Well Screen Interval: 10 ft from bottom
 Total Depth of Well Below MP: 16.67 (scf) Product Thickness, if noted: none
 Depth-to-Water (DTW) Below MP: 13.81 13.81 13.85
 Water Column in Well: 2.85 2.88 2.85 (Total Depth of Well Below MP - DTW Below MP)
 Gallons per foot: 0.16
 Gallons in Well: 0.456 (Water Column in Well x Gallons per foot)

PURGING DATA

Date Purged: 10/20/18 Time Started: 1100 Time Completed: 1123
 Three Well Volumes: 1,368 (Gallons in Well x 3)
 Gallons Purged: 2 Depth of Pump (generally 2 ft from bottom): 15' BMP
 Max. Drawdown (generally 0.3 ft): 0.23 Pump Rate: 400
 Well Purged Dry: Yes No (If yes, use Well Purged Dry Log)

Time:	Gallons:	Pump Rate (L/min):	DTW (ft BMP):	Drawdown (ft):	Temp: (°C)	Sp. Cond.: (uS/cm)	DO: (mg/L)	pH: (S.U.)	ORP: (mV)	Turb: (NTU)
1100	—	400	13.91	0.06	—	—	—	—	—	—
1105	—	400	13.90	0.07	5.62	193	—	6.68	—	—
1110	—	500	13.14.08	0.23	5.70	140	—	6.53	—	13.69
1115	1	400	14.02	0.17	5.74	135	—	6.40	—	6.51
1120	1.5	400	14.02	0.17	5.93	134	—	6.37	—	5.38
1123	2	400	14.01	0.16	5.86	133	—	6.36	—	5.57

SAMPLING DATA

Odor: none Color: clear
 Sample Designation: FF39 Time / Date: 1127 10/20/18
 QC Sample Designation: — Time / Date: —
 QA Sample Designation: — Time / Date: —

Evacuation Method: Submersible Pump / Other: —
 Sampling Method: Submersible Pump / Other: —

Water Quality Instruments Used/Manufacturer/Model Number YSI 556

Calibration Info (Time, Ranges, etc) See notes

Remarks: spent 5 mins clearing out bottom of well post sampling, New total depth 16.81.

Sampling Personnel: Matt Woods

WELL CASING VOLUMES (GAL/FT): 1" = 0.04 2" = 0.16 4" = 0.65
 ANNULAR SPACE VOLUME (GAL/FT): 4" casing and 2" well = 0.23

ATTACHMENT 2

**RESULTS OF ANALYTICAL TESTING BY
SGS NORTH AMERICA INC. OF ANCHORAGE, ALASKA AND
ADEC LABORATORY DATA REVIEW CHECKLIST**

Laboratory Report of Analysis

To: Shannon & Wilson, Inc.
5430 Fairbanks St Ste 3
Anchorage, AK 99518
(907)561-2120

Report Number: **1186061**

Client Project: **Frosty Fuels**

Dear Dan McMahon,

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

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

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

Sincerely,
SGS North America Inc.

Jillian Vlahovich
Project Manager
Jillian.Vlahovich@sgs.com

Date

Case Narrative

SGS Client: **Shannon & Wilson, Inc.**

SGS Project: **1186061**

Project Name/Site: **Frosty Fuels**

Project Contact: **Dan McMahon**

Refer to sample receipt form for information on sample condition.

FF18 (1186061003) PS

8270D SIM - PAH surrogate recovery for 2-Methylnaphthalene-d10 does not meet QC criteria due to matrix interference.

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

Print Date: 11/01/2018 12:38:52PM

Laboratory Qualifiers

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

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

SGS maintains a formal Quality Assurance/Quality Control (QA/QC) program. A copy of our Quality Assurance Plan (QAP), which outlines this program, is available at your request. The laboratory certification numbers are AK00971 (DW Chemistry & Microbiology) & 17-021 (CS) for ADEC and 2944.01 for DOD ELAP/ISO17025 (RCRA methods: 1020B, 1311, 3010A, 3050B, 3520C, 3550C, 5030B, 5035A, 6020A, 7470A, 7471B, 8015C, 8021B, 8082A, 8260C, 8270D, 8270D-SIM, 9040C, 9045D, 9056A, 9060A, AK101 and AK102/103). Except as specifically noted, all statements and data in this report are in conformance to the provisions set forth by the SGS QAP and, when applicable, other regulatory authorities.

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

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

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

Sample Summary

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>Collected</u>	<u>Received</u>	<u>Matrix</u>
FF7	1186061001	10/19/2018	10/23/2018	Water (Surface, Eff., Ground)
FF4	1186061002	10/19/2018	10/23/2018	Water (Surface, Eff., Ground)
FF18	1186061003	10/20/2018	10/23/2018	Water (Surface, Eff., Ground)
FF22	1186061004	10/20/2018	10/23/2018	Water (Surface, Eff., Ground)
FF229	1186061005	10/20/2018	10/23/2018	Water (Surface, Eff., Ground)
FF39	1186061006	10/20/2018	10/23/2018	Water (Surface, Eff., Ground)
FF-Trip Blank	1186061007	10/19/2018	10/23/2018	Water (Surface, Eff., Ground)

<u>Method</u>	<u>Method Description</u>
8270D SIM LV (PAH)	8270 PAH SIM GC/MS Liq/Liq ext. LV
AK102	DRO/RRO Low Volume Water
AK103	DRO/RRO Low Volume Water
SW8260C	Volatile Organic Compounds (W) FULL

Print Date: 11/01/2018 12:38:55PM

Detectable Results Summary

Client Sample ID: **FF18**

Lab Sample ID: 1186061003

Polynuclear Aromatics GC/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
1-Methylnaphthalene	22.0	ug/L
2-Methylnaphthalene	27.0	ug/L
Acenaphthene	1.32	ug/L
Fluorene	0.356J	ug/L
Naphthalene	49.5	ug/L
Phenanthrene	0.589	ug/L

Semivolatile Organic Fuels

Diesel Range Organics	26.6	mg/L
Residual Range Organics	1.13	mg/L

Volatile GC/MS

1,2,4-Trimethylbenzene	176	ug/L
1,2-Dibromoethane	0.360	ug/L
1,3,5-Trimethylbenzene	71.8	ug/L
2-Hexanone	7.04J	ug/L
4-Isopropyltoluene	17.9	ug/L
4-Methyl-2-pentanone (MIBK)	10.2	ug/L
Benzene	63.4	ug/L
Ethylbenzene	148	ug/L
Isopropylbenzene (Cumene)	9.96	ug/L
Naphthalene	97.7	ug/L
n-Propylbenzene	17.1	ug/L
o-Xylene	451	ug/L
P & M -Xylene	705	ug/L
sec-Butylbenzene	3.09	ug/L
tert-Butylbenzene	1.88	ug/L
Toluene	890	ug/L
Xylenes (total)	1160	ug/L

Print Date: 11/01/2018 12:38:56PM

Detectable Results Summary

Client Sample ID: **FF22**

Lab Sample ID: 1186061004

Polynuclear Aromatics GC/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
1-Methylnaphthalene	38.8	ug/L
2-Methylnaphthalene	49.3	ug/L
Acenaphthene	0.774	ug/L
Fluorene	0.353	ug/L
Naphthalene	111	ug/L

Semivolatile Organic Fuels

Diesel Range Organics	7.17	mg/L
Residual Range Organics	0.465J	mg/L

Volatile GC/MS

1,2,4-Trimethylbenzene	120	ug/L
1,3,5-Trimethylbenzene	42.3	ug/L
4-Isopropyltoluene	19.4	ug/L
Benzene	3.06	ug/L
Chloromethane	0.320J	ug/L
Ethylbenzene	81.2	ug/L
Isopropylbenzene (Cumene)	13.2	ug/L
Naphthalene	140	ug/L
n-Propylbenzene	21.9	ug/L
o-Xylene	98.1	ug/L
P & M -Xylene	187	ug/L
sec-Butylbenzene	6.84	ug/L
tert-Butylbenzene	1.24	ug/L
Toluene	101	ug/L
Xylenes (total)	285	ug/L

Print Date: 11/01/2018 12:38:56PM

Detectable Results Summary

Client Sample ID: **FF229**
 Lab Sample ID: 1186061005

Polynuclear Aromatics GC/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
1-Methylnaphthalene	39.5	ug/L
2-Methylnaphthalene	49.4	ug/L
Acenaphthene	0.800	ug/L
Fluorene	0.351	ug/L
Naphthalene	113	ug/L

Semivolatile Organic Fuels

Diesel Range Organics	4.78	mg/L
Residual Range Organics	0.305J	mg/L

Volatile GC/MS

1,2,4-Trimethylbenzene	164	ug/L
1,2-Dibromoethane	0.400	ug/L
1,3,5-Trimethylbenzene	59.7	ug/L
4-Isopropyltoluene	26.8	ug/L
Benzene	4.23	ug/L
Ethylbenzene	113	ug/L
Isopropylbenzene (Cumene)	18.8	ug/L
Naphthalene	193	ug/L
n-Propylbenzene	31.5	ug/L
o-Xylene	133	ug/L
P & M -Xylene	252	ug/L
sec-Butylbenzene	9.48	ug/L
Styrene	0.380J	ug/L
tert-Butylbenzene	1.67	ug/L
Toluene	134	ug/L
Xylenes (total)	384	ug/L

Results of FF7

Client Sample ID: **FF7**
 Client Project ID: **Frosty Fuels**
 Lab Sample ID: 1186061001
 Lab Project ID: 1186061

Collection Date: 10/19/18 19:26
 Received Date: 10/23/18 11:03
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Polynuclear Aromatics GC/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
1-Methylnaphthalene	0.0240 U	0.0481	0.0144	ug/L	1		10/30/18 14:26
2-Methylnaphthalene	0.0240 U	0.0481	0.0144	ug/L	1		10/30/18 14:26
Acenaphthene	0.0240 U	0.0481	0.0144	ug/L	1		10/30/18 14:26
Acenaphthylene	0.0240 U	0.0481	0.0144	ug/L	1		10/30/18 14:26
Anthracene	0.0240 U	0.0481	0.0144	ug/L	1		10/30/18 14:26
Benzo(a)Anthracene	0.0240 U	0.0481	0.0144	ug/L	1		10/30/18 14:26
Benzo[a]pyrene	0.00960 U	0.0192	0.00596	ug/L	1		10/30/18 14:26
Benzo[b]Fluoranthene	0.0240 U	0.0481	0.0144	ug/L	1		10/30/18 14:26
Benzo[g,h,i]perylene	0.0240 U	0.0481	0.0144	ug/L	1		10/30/18 14:26
Benzo[k]fluoranthene	0.0240 U	0.0481	0.0144	ug/L	1		10/30/18 14:26
Chrysene	0.0240 U	0.0481	0.0144	ug/L	1		10/30/18 14:26
Dibenzo[a,h]anthracene	0.00960 U	0.0192	0.00596	ug/L	1		10/30/18 14:26
Fluoranthene	0.0240 U	0.0481	0.0144	ug/L	1		10/30/18 14:26
Fluorene	0.0240 U	0.0481	0.0144	ug/L	1		10/30/18 14:26
Indeno[1,2,3-c,d] pyrene	0.0240 U	0.0481	0.0144	ug/L	1		10/30/18 14:26
Naphthalene	0.0481 U	0.0962	0.0298	ug/L	1		10/30/18 14:26
Phenanthrene	0.0240 U	0.0481	0.0144	ug/L	1		10/30/18 14:26
Pyrene	0.0240 U	0.0481	0.0144	ug/L	1		10/30/18 14:26
Surrogates							
2-Methylnaphthalene-d10 (surr)	71.5	47-106		%	1		10/30/18 14:26
Fluoranthene-d10 (surr)	73.8	24-116		%	1		10/30/18 14:26

Batch Information

Analytical Batch: XMS11190
 Analytical Method: 8270D SIM LV (PAH)
 Analyst: BMZ
 Analytical Date/Time: 10/30/18 14:26
 Container ID: 1186061001-F

Prep Batch: XXX40790
 Prep Method: SW3520C
 Prep Date/Time: 10/24/18 09:10
 Prep Initial Wt./Vol.: 260 mL
 Prep Extract Vol: 1 mL



Results of FF7

Client Sample ID: FF7
Client Project ID: Frosty Fuels
Lab Sample ID: 1186061001
Lab Project ID: 1186061

Collection Date: 10/19/18 19:26
Received Date: 10/23/18 11:03
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Semivolatile Organic Fuels

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Row: Diesel Range Organics, 0.288 U, 0.577, 0.173, mg/L, 1, 10/31/18 11:06

Surrogates

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Row: 5a Androstane (surr), 85.8, 50-150, %, 1, 10/31/18 11:06

Batch Information

Analytical Batch: XFC14768
Analytical Method: AK102
Analyst: VDL
Analytical Date/Time: 10/31/18 11:06
Container ID: 1186061001-D

Prep Batch: XXX40821
Prep Method: SW3520C
Prep Date/Time: 10/30/18 08:20
Prep Initial Wt./Vol.: 260 mL
Prep Extract Vol: 1 mL

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Row: Residual Range Organics, 0.240 U, 0.481, 0.144, mg/L, 1, 10/31/18 11:06

Surrogates

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Row: n-Triacontane-d62 (surr), 103, 50-150, %, 1, 10/31/18 11:06

Batch Information

Analytical Batch: XFC14768
Analytical Method: AK103
Analyst: VDL
Analytical Date/Time: 10/31/18 11:06
Container ID: 1186061001-D

Prep Batch: XXX40821
Prep Method: SW3520C
Prep Date/Time: 10/30/18 08:20
Prep Initial Wt./Vol.: 260 mL
Prep Extract Vol: 1 mL



Results of FF7

Client Sample ID: **FF7**
 Client Project ID: **Frosty Fuels**
 Lab Sample ID: 1186061001
 Lab Project ID: 1186061

Collection Date: 10/19/18 19:26
 Received Date: 10/23/18 11:03
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Volatile GC/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
1,1,1,2-Tetrachloroethane	0.250 U	0.500	0.150	ug/L	1		10/24/18 19:02
1,1,1-Trichloroethane	0.500 U	1.00	0.310	ug/L	1		10/24/18 19:02
1,1,2,2-Tetrachloroethane	0.250 U	0.500	0.150	ug/L	1		10/24/18 19:02
1,1,2-Trichloroethane	0.200 U	0.400	0.120	ug/L	1		10/24/18 19:02
1,1-Dichloroethane	0.500 U	1.00	0.310	ug/L	1		10/24/18 19:02
1,1-Dichloroethene	0.500 U	1.00	0.310	ug/L	1		10/24/18 19:02
1,1-Dichloropropene	0.500 U	1.00	0.310	ug/L	1		10/24/18 19:02
1,2,3-Trichlorobenzene	0.500 U	1.00	0.310	ug/L	1		10/24/18 19:02
1,2,3-Trichloropropane	0.500 U	1.00	0.310	ug/L	1		10/24/18 19:02
1,2,4-Trichlorobenzene	0.500 U	1.00	0.310	ug/L	1		10/24/18 19:02
1,2,4-Trimethylbenzene	0.500 U	1.00	0.310	ug/L	1		10/24/18 19:02
1,2-Dibromo-3-chloropropane	5.00 U	10.0	3.10	ug/L	1		10/24/18 19:02
1,2-Dibromoethane	0.0375 U	0.0750	0.0180	ug/L	1		10/24/18 19:02
1,2-Dichlorobenzene	0.500 U	1.00	0.310	ug/L	1		10/24/18 19:02
1,2-Dichloroethane	0.250 U	0.500	0.150	ug/L	1		10/24/18 19:02
1,2-Dichloropropane	0.500 U	1.00	0.310	ug/L	1		10/24/18 19:02
1,3,5-Trimethylbenzene	0.500 U	1.00	0.310	ug/L	1		10/24/18 19:02
1,3-Dichlorobenzene	0.500 U	1.00	0.310	ug/L	1		10/24/18 19:02
1,3-Dichloropropane	0.250 U	0.500	0.150	ug/L	1		10/24/18 19:02
1,4-Dichlorobenzene	0.250 U	0.500	0.150	ug/L	1		10/24/18 19:02
2,2-Dichloropropane	0.500 U	1.00	0.310	ug/L	1		10/24/18 19:02
2-Butanone (MEK)	5.00 U	10.0	3.10	ug/L	1		10/24/18 19:02
2-Chlorotoluene	0.500 U	1.00	0.310	ug/L	1		10/24/18 19:02
2-Hexanone	5.00 U	10.0	3.10	ug/L	1		10/24/18 19:02
4-Chlorotoluene	0.500 U	1.00	0.310	ug/L	1		10/24/18 19:02
4-Isopropyltoluene	0.500 U	1.00	0.310	ug/L	1		10/24/18 19:02
4-Methyl-2-pentanone (MIBK)	5.00 U	10.0	3.10	ug/L	1		10/24/18 19:02
Benzene	0.200 U	0.400	0.120	ug/L	1		10/24/18 19:02
Bromobenzene	0.500 U	1.00	0.310	ug/L	1		10/24/18 19:02
Bromochloromethane	0.500 U	1.00	0.310	ug/L	1		10/24/18 19:02
Bromodichloromethane	0.250 U	0.500	0.150	ug/L	1		10/24/18 19:02
Bromoform	0.500 U	1.00	0.310	ug/L	1		10/24/18 19:02
Bromomethane	2.50 U	5.00	1.50	ug/L	1		10/24/18 19:02
Carbon disulfide	5.00 U	10.0	3.10	ug/L	1		10/24/18 19:02
Carbon tetrachloride	0.500 U	1.00	0.310	ug/L	1		10/24/18 19:02
Chlorobenzene	0.250 U	0.500	0.150	ug/L	1		10/24/18 19:02
Chloroethane	0.500 U	1.00	0.310	ug/L	1		10/24/18 19:02

Print Date: 11/01/2018 12:38:57PM

J flagging is activated



Results of FF7

Client Sample ID: **FF7**
 Client Project ID: **Frosty Fuels**
 Lab Sample ID: 1186061001
 Lab Project ID: 1186061

Collection Date: 10/19/18 19:26
 Received Date: 10/23/18 11:03
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Volatile GC/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Chloroform	0.500 U	1.00	0.310	ug/L	1		10/24/18 19:02
Chloromethane	0.500 U	1.00	0.310	ug/L	1		10/24/18 19:02
cis-1,2-Dichloroethene	0.500 U	1.00	0.310	ug/L	1		10/24/18 19:02
cis-1,3-Dichloropropene	0.250 U	0.500	0.150	ug/L	1		10/24/18 19:02
Dibromochloromethane	0.250 U	0.500	0.150	ug/L	1		10/24/18 19:02
Dibromomethane	0.500 U	1.00	0.310	ug/L	1		10/24/18 19:02
Dichlorodifluoromethane	0.500 U	1.00	0.310	ug/L	1		10/24/18 19:02
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		10/24/18 19:02
Freon-113	5.00 U	10.0	3.10	ug/L	1		10/24/18 19:02
Hexachlorobutadiene	0.500 U	1.00	0.310	ug/L	1		10/24/18 19:02
Isopropylbenzene (Cumene)	0.500 U	1.00	0.310	ug/L	1		10/24/18 19:02
Methylene chloride	2.50 U	5.00	1.00	ug/L	1		10/24/18 19:02
Methyl-t-butyl ether	5.00 U	10.0	3.10	ug/L	1		10/24/18 19:02
Naphthalene	0.500 U	1.00	0.310	ug/L	1		10/24/18 19:02
n-Butylbenzene	0.500 U	1.00	0.310	ug/L	1		10/24/18 19:02
n-Propylbenzene	0.500 U	1.00	0.310	ug/L	1		10/24/18 19:02
o-Xylene	0.500 U	1.00	0.310	ug/L	1		10/24/18 19:02
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		10/24/18 19:02
sec-Butylbenzene	0.500 U	1.00	0.310	ug/L	1		10/24/18 19:02
Styrene	0.500 U	1.00	0.310	ug/L	1		10/24/18 19:02
tert-Butylbenzene	0.500 U	1.00	0.310	ug/L	1		10/24/18 19:02
Tetrachloroethene	0.500 U	1.00	0.310	ug/L	1		10/24/18 19:02
Toluene	0.500 U	1.00	0.310	ug/L	1		10/24/18 19:02
trans-1,2-Dichloroethene	0.500 U	1.00	0.310	ug/L	1		10/24/18 19:02
trans-1,3-Dichloropropene	0.500 U	1.00	0.310	ug/L	1		10/24/18 19:02
Trichloroethene	0.500 U	1.00	0.310	ug/L	1		10/24/18 19:02
Trichlorofluoromethane	0.500 U	1.00	0.310	ug/L	1		10/24/18 19:02
Vinyl acetate	5.00 U	10.0	3.10	ug/L	1		10/24/18 19:02
Vinyl chloride	0.0750 U	0.150	0.0500	ug/L	1		10/24/18 19:02
Xylenes (total)	1.50 U	3.00	1.00	ug/L	1		10/24/18 19:02
Surrogates							
1,2-Dichloroethane-D4 (surr)	97.6	81-118		%	1		10/24/18 19:02
4-Bromofluorobenzene (surr)	102	85-114		%	1		10/24/18 19:02
Toluene-d8 (surr)	102	89-112		%	1		10/24/18 19:02

Results of FF7

Client Sample ID: **FF7**
Client Project ID: **Frosty Fuels**
Lab Sample ID: 1186061001
Lab Project ID: 1186061

Collection Date: 10/19/18 19:26
Received Date: 10/23/18 11:03
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Volatile GC/MS

Batch Information

Analytical Batch: VMS18492
Analytical Method: SW8260C
Analyst: FDR
Analytical Date/Time: 10/24/18 19:02
Container ID: 1186061001-A

Prep Batch: VXX33419
Prep Method: SW5030B
Prep Date/Time: 10/24/18 00:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL



Results of FF4

Client Sample ID: FF4
Client Project ID: Frosty Fuels
Lab Sample ID: 1186061002
Lab Project ID: 1186061

Collection Date: 10/19/18 17:11
Received Date: 10/23/18 11:03
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Polynuclear Aromatics GC/MS

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Lists various polynuclear aromatic hydrocarbons and their surrogate values.

Batch Information

Analytical Batch: XMS11190
Analytical Method: 8270D SIM LV (PAH)
Analyst: BMZ
Analytical Date/Time: 10/30/18 14:46
Container ID: 1186061002-F

Prep Batch: XXX40790
Prep Method: SW3520C
Prep Date/Time: 10/24/18 09:10
Prep Initial Wt./Vol.: 255 mL
Prep Extract Vol: 1 mL

Results of FF4

Client Sample ID: **FF4**
 Client Project ID: **Frosty Fuels**
 Lab Sample ID: 1186061002
 Lab Project ID: 1186061

Collection Date: 10/19/18 17:11
 Received Date: 10/23/18 11:03
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	0.300 U	0.600	0.180	mg/L	1		10/31/18 11:15

Surrogates

5a Androstane (surr)	89.6	50-150		%	1		10/31/18 11:15
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Batch Information

Analytical Batch: XFC14768
 Analytical Method: AK102
 Analyst: VDL
 Analytical Date/Time: 10/31/18 11:15
 Container ID: 1186061002-D

Prep Batch: XXX40821
 Prep Method: SW3520C
 Prep Date/Time: 10/30/18 08:20
 Prep Initial Wt./Vol.: 250 mL
 Prep Extract Vol: 1 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Residual Range Organics	0.250 U	0.500	0.150	mg/L	1		10/31/18 11:15

Surrogates

n-Triacontane-d62 (surr)	102	50-150		%	1		10/31/18 11:15
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Batch Information

Analytical Batch: XFC14768
 Analytical Method: AK103
 Analyst: VDL
 Analytical Date/Time: 10/31/18 11:15
 Container ID: 1186061002-D

Prep Batch: XXX40821
 Prep Method: SW3520C
 Prep Date/Time: 10/30/18 08:20
 Prep Initial Wt./Vol.: 250 mL
 Prep Extract Vol: 1 mL



Results of FF4

Client Sample ID: FF4
Client Project ID: Frosty Fuels
Lab Sample ID: 1186061002
Lab Project ID: 1186061

Collection Date: 10/19/18 17:11
Received Date: 10/23/18 11:03
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Volatile GC/MS

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Lists various chemical compounds and their detection results.



Results of FF4

Client Sample ID: **FF4**
 Client Project ID: **Frosty Fuels**
 Lab Sample ID: 1186061002
 Lab Project ID: 1186061

Collection Date: 10/19/18 17:11
 Received Date: 10/23/18 11:03
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Volatile GC/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Chloroform	0.500 U	1.00	0.310	ug/L	1		10/24/18 19:19
Chloromethane	0.500 U	1.00	0.310	ug/L	1		10/24/18 19:19
cis-1,2-Dichloroethene	0.500 U	1.00	0.310	ug/L	1		10/24/18 19:19
cis-1,3-Dichloropropene	0.250 U	0.500	0.150	ug/L	1		10/24/18 19:19
Dibromochloromethane	0.250 U	0.500	0.150	ug/L	1		10/24/18 19:19
Dibromomethane	0.500 U	1.00	0.310	ug/L	1		10/24/18 19:19
Dichlorodifluoromethane	0.500 U	1.00	0.310	ug/L	1		10/24/18 19:19
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		10/24/18 19:19
Freon-113	5.00 U	10.0	3.10	ug/L	1		10/24/18 19:19
Hexachlorobutadiene	0.500 U	1.00	0.310	ug/L	1		10/24/18 19:19
Isopropylbenzene (Cumene)	0.500 U	1.00	0.310	ug/L	1		10/24/18 19:19
Methylene chloride	2.50 U	5.00	1.00	ug/L	1		10/24/18 19:19
Methyl-t-butyl ether	5.00 U	10.0	3.10	ug/L	1		10/24/18 19:19
Naphthalene	0.500 U	1.00	0.310	ug/L	1		10/24/18 19:19
n-Butylbenzene	0.500 U	1.00	0.310	ug/L	1		10/24/18 19:19
n-Propylbenzene	0.500 U	1.00	0.310	ug/L	1		10/24/18 19:19
o-Xylene	0.500 U	1.00	0.310	ug/L	1		10/24/18 19:19
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		10/24/18 19:19
sec-Butylbenzene	0.500 U	1.00	0.310	ug/L	1		10/24/18 19:19
Styrene	0.500 U	1.00	0.310	ug/L	1		10/24/18 19:19
tert-Butylbenzene	0.500 U	1.00	0.310	ug/L	1		10/24/18 19:19
Tetrachloroethene	0.500 U	1.00	0.310	ug/L	1		10/24/18 19:19
Toluene	0.500 U	1.00	0.310	ug/L	1		10/24/18 19:19
trans-1,2-Dichloroethene	0.500 U	1.00	0.310	ug/L	1		10/24/18 19:19
trans-1,3-Dichloropropene	0.500 U	1.00	0.310	ug/L	1		10/24/18 19:19
Trichloroethene	0.500 U	1.00	0.310	ug/L	1		10/24/18 19:19
Trichlorofluoromethane	0.500 U	1.00	0.310	ug/L	1		10/24/18 19:19
Vinyl acetate	5.00 U	10.0	3.10	ug/L	1		10/24/18 19:19
Vinyl chloride	0.0750 U	0.150	0.0500	ug/L	1		10/24/18 19:19
Xylenes (total)	1.50 U	3.00	1.00	ug/L	1		10/24/18 19:19
Surrogates							
1,2-Dichloroethane-D4 (surr)	97.9	81-118		%	1		10/24/18 19:19
4-Bromofluorobenzene (surr)	101	85-114		%	1		10/24/18 19:19
Toluene-d8 (surr)	102	89-112		%	1		10/24/18 19:19

Results of FF4

Client Sample ID: **FF4**
Client Project ID: **Frosty Fuels**
Lab Sample ID: 1186061002
Lab Project ID: 1186061

Collection Date: 10/19/18 17:11
Received Date: 10/23/18 11:03
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Volatile GC/MS

Batch Information

Analytical Batch: VMS18492
Analytical Method: SW8260C
Analyst: FDR
Analytical Date/Time: 10/24/18 19:19
Container ID: 1186061002-A

Prep Batch: VXX33419
Prep Method: SW5030B
Prep Date/Time: 10/24/18 00:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL



Results of FF18

Client Sample ID: **FF18**
 Client Project ID: **Frosty Fuels**
 Lab Sample ID: 1186061003
 Lab Project ID: 1186061

Collection Date: 10/20/18 15:22
 Received Date: 10/23/18 11:03
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Polynuclear Aromatics GC/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
1-Methylnaphthalene	22.0	0.463	0.139	ug/L	10		10/31/18 12:04
2-Methylnaphthalene	27.0	0.463	0.139	ug/L	10		10/31/18 12:04
Acenaphthene	1.32	0.463	0.139	ug/L	10		10/31/18 12:04
Acenaphthylene	0.232 U	0.463	0.139	ug/L	10		10/31/18 12:04
Anthracene	0.232 U	0.463	0.139	ug/L	10		10/31/18 12:04
Benzo(a)Anthracene	0.0232 U	0.0463	0.0139	ug/L	1		10/30/18 15:07
Benzo[a]pyrene	0.00925 U	0.0185	0.00574	ug/L	1		10/30/18 15:07
Benzo[b]Fluoranthene	0.0232 U	0.0463	0.0139	ug/L	1		10/30/18 15:07
Benzo[g,h,i]perylene	0.0232 U	0.0463	0.0139	ug/L	1		10/30/18 15:07
Benzo[k]fluoranthene	0.0232 U	0.0463	0.0139	ug/L	1		10/30/18 15:07
Chrysene	0.0232 U	0.0463	0.0139	ug/L	1		10/30/18 15:07
Dibenzo[a,h]anthracene	0.00925 U	0.0185	0.00574	ug/L	1		10/30/18 15:07
Fluoranthene	0.0232 U	0.0463	0.0139	ug/L	1		10/30/18 15:07
Fluorene	0.356 J	0.463	0.139	ug/L	10		10/31/18 12:04
Indeno[1,2,3-c,d] pyrene	0.0232 U	0.0463	0.0139	ug/L	1		10/30/18 15:07
Naphthalene	49.5	0.926	0.287	ug/L	10		10/31/18 12:04
Phenanthrene	0.589	0.463	0.139	ug/L	10		10/31/18 12:04
Pyrene	0.0232 U	0.0463	0.0139	ug/L	1		10/30/18 15:07
Surrogates							
2-Methylnaphthalene-d10 (surr)	176	*	47-106	%	10		10/31/18 12:04
Fluoranthene-d10 (surr)	56.9		24-116	%	1		10/30/18 15:07

Batch Information

Analytical Batch: XMS11192
 Analytical Method: 8270D SIM LV (PAH)
 Analyst: BMZ
 Analytical Date/Time: 10/31/18 12:04
 Container ID: 1186061003-F

Prep Batch: XXX40790
 Prep Method: SW3520C
 Prep Date/Time: 10/24/18 09:10
 Prep Initial Wt./Vol.: 270 mL
 Prep Extract Vol: 1 mL

Analytical Batch: XMS11190
 Analytical Method: 8270D SIM LV (PAH)
 Analyst: BMZ
 Analytical Date/Time: 10/30/18 15:07
 Container ID: 1186061003-F

Prep Batch: XXX40790
 Prep Method: SW3520C
 Prep Date/Time: 10/24/18 09:10
 Prep Initial Wt./Vol.: 270 mL
 Prep Extract Vol: 1 mL

Results of FF18

Client Sample ID: **FF18**
 Client Project ID: **Frosty Fuels**
 Lab Sample ID: 1186061003
 Lab Project ID: 1186061

Collection Date: 10/20/18 15:22
 Received Date: 10/23/18 11:03
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	26.6	0.566	0.170	mg/L	1		10/31/18 11:25

Surrogates

5a Androstane (surr)	98.4	50-150		%	1		10/31/18 11:25
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Batch Information

Analytical Batch: XFC14768
 Analytical Method: AK102
 Analyst: VDL
 Analytical Date/Time: 10/31/18 11:25
 Container ID: 1186061003-D

Prep Batch: XXX40821
 Prep Method: SW3520C
 Prep Date/Time: 10/30/18 08:20
 Prep Initial Wt./Vol.: 265 mL
 Prep Extract Vol: 1 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Residual Range Organics	1.13	0.472	0.142	mg/L	1		10/31/18 11:25

Surrogates

n-Triacontane-d62 (surr)	106	50-150		%	1		10/31/18 11:25
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Batch Information

Analytical Batch: XFC14768
 Analytical Method: AK103
 Analyst: VDL
 Analytical Date/Time: 10/31/18 11:25
 Container ID: 1186061003-D

Prep Batch: XXX40821
 Prep Method: SW3520C
 Prep Date/Time: 10/30/18 08:20
 Prep Initial Wt./Vol.: 265 mL
 Prep Extract Vol: 1 mL



Results of FF18

Client Sample ID: FF18
Client Project ID: Frosty Fuels
Lab Sample ID: 1186061003
Lab Project ID: 1186061

Collection Date: 10/20/18 15:22
Received Date: 10/23/18 11:03
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Volatile GC/MS

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Lists various chemical compounds and their detection results.



Results of FF18

Client Sample ID: **FF18**
 Client Project ID: **Frosty Fuels**
 Lab Sample ID: 1186061003
 Lab Project ID: 1186061

Collection Date: 10/20/18 15:22
 Received Date: 10/23/18 11:03
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Volatile GC/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Chloroform	0.500 U	1.00	0.310	ug/L	1		10/24/18 19:37
Chloromethane	0.500 U	1.00	0.310	ug/L	1		10/24/18 19:37
cis-1,2-Dichloroethene	0.500 U	1.00	0.310	ug/L	1		10/24/18 19:37
cis-1,3-Dichloropropene	0.250 U	0.500	0.150	ug/L	1		10/24/18 19:37
Dibromochloromethane	0.250 U	0.500	0.150	ug/L	1		10/24/18 19:37
Dibromomethane	0.500 U	1.00	0.310	ug/L	1		10/24/18 19:37
Dichlorodifluoromethane	0.500 U	1.00	0.310	ug/L	1		10/24/18 19:37
Ethylbenzene	148	1.00	0.310	ug/L	1		10/24/18 19:37
Freon-113	5.00 U	10.0	3.10	ug/L	1		10/24/18 19:37
Hexachlorobutadiene	0.500 U	1.00	0.310	ug/L	1		10/24/18 19:37
Isopropylbenzene (Cumene)	9.96	1.00	0.310	ug/L	1		10/24/18 19:37
Methylene chloride	2.50 U	5.00	1.00	ug/L	1		10/24/18 19:37
Methyl-t-butyl ether	5.00 U	10.0	3.10	ug/L	1		10/24/18 19:37
Naphthalene	97.7	1.00	0.310	ug/L	1		10/24/18 19:37
n-Butylbenzene	0.500 U	1.00	0.310	ug/L	1		10/24/18 19:37
n-Propylbenzene	17.1	1.00	0.310	ug/L	1		10/24/18 19:37
o-Xylene	451	10.0	3.10	ug/L	10		10/25/18 15:20
P & M -Xylene	705	20.0	6.20	ug/L	10		10/25/18 15:20
sec-Butylbenzene	3.09	1.00	0.310	ug/L	1		10/24/18 19:37
Styrene	0.500 U	1.00	0.310	ug/L	1		10/24/18 19:37
tert-Butylbenzene	1.88	1.00	0.310	ug/L	1		10/24/18 19:37
Tetrachloroethene	0.500 U	1.00	0.310	ug/L	1		10/24/18 19:37
Toluene	890	10.0	3.10	ug/L	10		10/25/18 15:20
trans-1,2-Dichloroethene	0.500 U	1.00	0.310	ug/L	1		10/24/18 19:37
trans-1,3-Dichloropropene	0.500 U	1.00	0.310	ug/L	1		10/24/18 19:37
Trichloroethene	0.500 U	1.00	0.310	ug/L	1		10/24/18 19:37
Trichlorofluoromethane	0.500 U	1.00	0.310	ug/L	1		10/24/18 19:37
Vinyl acetate	5.00 U	10.0	3.10	ug/L	1		10/24/18 19:37
Vinyl chloride	0.0750 U	0.150	0.0500	ug/L	1		10/24/18 19:37
Xylenes (total)	1160	30.0	10.0	ug/L	10		10/25/18 15:20
Surrogates							
1,2-Dichloroethane-D4 (surr)	90.7	81-118		%	1		10/24/18 19:37
4-Bromofluorobenzene (surr)	108	85-114		%	1		10/24/18 19:37
Toluene-d8 (surr)	100	89-112		%	1		10/24/18 19:37

Results of FF18

Client Sample ID: **FF18**
Client Project ID: **Frosty Fuels**
Lab Sample ID: 1186061003
Lab Project ID: 1186061

Collection Date: 10/20/18 15:22
Received Date: 10/23/18 11:03
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Volatile GC/MS

Batch Information

Analytical Batch: VMS18499
Analytical Method: SW8260C
Analyst: FDR
Analytical Date/Time: 10/25/18 15:20
Container ID: 1186061003-A

Prep Batch: VXX33432
Prep Method: SW5030B
Prep Date/Time: 10/25/18 10:42
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Analytical Batch: VMS18492
Analytical Method: SW8260C
Analyst: FDR
Analytical Date/Time: 10/24/18 19:37
Container ID: 1186061003-A

Prep Batch: VXX33419
Prep Method: SW5030B
Prep Date/Time: 10/24/18 00:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL



Results of FF22

Client Sample ID: **FF22**
 Client Project ID: **Frosty Fuels**
 Lab Sample ID: 1186061004
 Lab Project ID: 1186061

Collection Date: 10/20/18 13:09
 Received Date: 10/23/18 11:03
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Polynuclear Aromatics GC/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
1-Methylnaphthalene	38.8	0.962	0.288	ug/L	20		10/31/18 12:24
2-Methylnaphthalene	49.3	0.962	0.288	ug/L	20		10/31/18 12:24
Acenaphthene	0.774	0.0481	0.0144	ug/L	1		10/30/18 15:48
Acenaphthylene	0.0240 U	0.0481	0.0144	ug/L	1		10/30/18 15:48
Anthracene	0.0240 U	0.0481	0.0144	ug/L	1		10/30/18 15:48
Benzo(a)Anthracene	0.0240 U	0.0481	0.0144	ug/L	1		10/30/18 15:48
Benzo[a]pyrene	0.00960 U	0.0192	0.00596	ug/L	1		10/30/18 15:48
Benzo[b]Fluoranthene	0.0240 U	0.0481	0.0144	ug/L	1		10/30/18 15:48
Benzo[g,h,i]perylene	0.0240 U	0.0481	0.0144	ug/L	1		10/30/18 15:48
Benzo[k]fluoranthene	0.0240 U	0.0481	0.0144	ug/L	1		10/30/18 15:48
Chrysene	0.0240 U	0.0481	0.0144	ug/L	1		10/30/18 15:48
Dibenzo[a,h]anthracene	0.00960 U	0.0192	0.00596	ug/L	1		10/30/18 15:48
Fluoranthene	0.0240 U	0.0481	0.0144	ug/L	1		10/30/18 15:48
Fluorene	0.353	0.0481	0.0144	ug/L	1		10/30/18 15:48
Indeno[1,2,3-c,d] pyrene	0.0240 U	0.0481	0.0144	ug/L	1		10/30/18 15:48
Naphthalene	111	1.92	0.596	ug/L	20		10/31/18 12:24
Phenanthrene	0.0240 U	0.0481	0.0144	ug/L	1		10/30/18 15:48
Pyrene	0.0240 U	0.0481	0.0144	ug/L	1		10/30/18 15:48
Surrogates							
2-Methylnaphthalene-d10 (surr)	85.4	47-106		%	1		10/30/18 15:48
Fluoranthene-d10 (surr)	76.5	24-116		%	1		10/30/18 15:48

Batch Information

Analytical Batch: XMS11192
 Analytical Method: 8270D SIM LV (PAH)
 Analyst: BMZ
 Analytical Date/Time: 10/31/18 12:24
 Container ID: 1186061004-F

Prep Batch: XXX40790
 Prep Method: SW3520C
 Prep Date/Time: 10/24/18 09:10
 Prep Initial Wt./Vol.: 260 mL
 Prep Extract Vol: 1 mL

Analytical Batch: XMS11190
 Analytical Method: 8270D SIM LV (PAH)
 Analyst: BMZ
 Analytical Date/Time: 10/30/18 15:48
 Container ID: 1186061004-F

Prep Batch: XXX40790
 Prep Method: SW3520C
 Prep Date/Time: 10/24/18 09:10
 Prep Initial Wt./Vol.: 260 mL
 Prep Extract Vol: 1 mL

Results of FF22

Client Sample ID: **FF22**
 Client Project ID: **Frosty Fuels**
 Lab Sample ID: 1186061004
 Lab Project ID: 1186061

Collection Date: 10/20/18 13:09
 Received Date: 10/23/18 11:03
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	7.17	0.566	0.170	mg/L	1		10/31/18 11:35

Surrogates

5a Androstane (surr)	90.1	50-150		%	1		10/31/18 11:35
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Batch Information

Analytical Batch: XFC14768
 Analytical Method: AK102
 Analyst: VDL
 Analytical Date/Time: 10/31/18 11:35
 Container ID: 1186061004-D

Prep Batch: XXX40821
 Prep Method: SW3520C
 Prep Date/Time: 10/30/18 08:20
 Prep Initial Wt./Vol.: 265 mL
 Prep Extract Vol: 1 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Residual Range Organics	0.465 J	0.472	0.142	mg/L	1		10/31/18 11:35

Surrogates

n-Triacontane-d62 (surr)	104	50-150		%	1		10/31/18 11:35
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Batch Information

Analytical Batch: XFC14768
 Analytical Method: AK103
 Analyst: VDL
 Analytical Date/Time: 10/31/18 11:35
 Container ID: 1186061004-D

Prep Batch: XXX40821
 Prep Method: SW3520C
 Prep Date/Time: 10/30/18 08:20
 Prep Initial Wt./Vol.: 265 mL
 Prep Extract Vol: 1 mL



Results of FF22

Client Sample ID: FF22
Client Project ID: Frosty Fuels
Lab Sample ID: 1186061004
Lab Project ID: 1186061

Collection Date: 10/20/18 13:09
Received Date: 10/23/18 11:03
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Volatile GC/MS

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Lists various chemical compounds and their detection results.



Results of FF22

Client Sample ID: FF22
Client Project ID: Frosty Fuels
Lab Sample ID: 1186061004
Lab Project ID: 1186061

Collection Date: 10/20/18 13:09
Received Date: 10/23/18 11:03
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Volatile GC/MS

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Lists various chemical compounds and their detection results.

Results of FF22

Client Sample ID: **FF22**
Client Project ID: **Frosty Fuels**
Lab Sample ID: 1186061004
Lab Project ID: 1186061

Collection Date: 10/20/18 13:09
Received Date: 10/23/18 11:03
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Volatile GC/MS

Batch Information

Analytical Batch: VMS18492
Analytical Method: SW8260C
Analyst: FDR
Analytical Date/Time: 10/24/18 19:54
Container ID: 1186061004-A

Prep Batch: VXX33419
Prep Method: SW5030B
Prep Date/Time: 10/24/18 00:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL



Results of FF229

Client Sample ID: FF229
Client Project ID: Frosty Fuels
Lab Sample ID: 1186061005
Lab Project ID: 1186061

Collection Date: 10/20/18 13:37
Received Date: 10/23/18 11:03
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Polynuclear Aromatics GC/MS

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Lists various polynuclear aromatic hydrocarbons and their surrogate compounds with associated quality and detection data.

Batch Information

Analytical Batch: XMS11192
Analytical Method: 8270D SIM LV (PAH)
Analyst: BMZ
Analytical Date/Time: 10/31/18 12:45
Container ID: 1186061005-F

Prep Batch: XXX40790
Prep Method: SW3520C
Prep Date/Time: 10/24/18 09:10
Prep Initial Wt./Vol.: 265 mL
Prep Extract Vol: 1 mL

Analytical Batch: XMS11190
Analytical Method: 8270D SIM LV (PAH)
Analyst: BMZ
Analytical Date/Time: 10/30/18 16:08
Container ID: 1186061005-F

Prep Batch: XXX40790
Prep Method: SW3520C
Prep Date/Time: 10/24/18 09:10
Prep Initial Wt./Vol.: 265 mL
Prep Extract Vol: 1 mL



Results of FF229

Client Sample ID: FF229
Client Project ID: Frosty Fuels
Lab Sample ID: 1186061005
Lab Project ID: 1186061

Collection Date: 10/20/18 13:37
Received Date: 10/23/18 11:03
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Semivolatile Organic Fuels

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows include Diesel Range Organics and Surrogates (5a Androstane).

Batch Information

Analytical Batch: XFC14768
Analytical Method: AK102
Analyst: VDL
Analytical Date/Time: 10/31/18 11:45
Container ID: 1186061005-D

Prep Batch: XXX40821
Prep Method: SW3520C
Prep Date/Time: 10/30/18 08:20
Prep Initial Wt./Vol.: 260 mL
Prep Extract Vol: 1 mL

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows include Residual Range Organics and Surrogates (n-Triacontane-d62).

Batch Information

Analytical Batch: XFC14768
Analytical Method: AK103
Analyst: VDL
Analytical Date/Time: 10/31/18 11:45
Container ID: 1186061005-D

Prep Batch: XXX40821
Prep Method: SW3520C
Prep Date/Time: 10/30/18 08:20
Prep Initial Wt./Vol.: 260 mL
Prep Extract Vol: 1 mL



Results of FF229

Client Sample ID: FF229
Client Project ID: Frosty Fuels
Lab Sample ID: 1186061005
Lab Project ID: 1186061

Collection Date: 10/20/18 13:37
Received Date: 10/23/18 11:03
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Volatile GC/MS

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Lists various chemical compounds and their detection results.



Results of FF229

Client Sample ID: FF229
Client Project ID: Frosty Fuels
Lab Sample ID: 1186061005
Lab Project ID: 1186061

Collection Date: 10/20/18 13:37
Received Date: 10/23/18 11:03
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Volatile GC/MS

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Lists various chemical compounds and their detection results.

Results of FF229

Client Sample ID: **FF229**
Client Project ID: **Frosty Fuels**
Lab Sample ID: 1186061005
Lab Project ID: 1186061

Collection Date: 10/20/18 13:37
Received Date: 10/23/18 11:03
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Volatile GC/MS

Batch Information

Analytical Batch: VMS18492
Analytical Method: SW8260C
Analyst: FDR
Analytical Date/Time: 10/24/18 20:11
Container ID: 1186061005-A

Prep Batch: VXX33419
Prep Method: SW5030B
Prep Date/Time: 10/24/18 00:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL



Results of **FF39**

Client Sample ID: **FF39**
Client Project ID: **Frosty Fuels**
Lab Sample ID: 1186061006
Lab Project ID: 1186061

Collection Date: 10/20/18 11:27
Received Date: 10/23/18 11:03
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Polynuclear Aromatics GC/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
1-Methylnaphthalene	0.0250 U	0.0500	0.0150	ug/L	1		10/30/18 16:28
2-Methylnaphthalene	0.0250 U	0.0500	0.0150	ug/L	1		10/30/18 16:28
Acenaphthene	0.0250 U	0.0500	0.0150	ug/L	1		10/30/18 16:28
Acenaphthylene	0.0250 U	0.0500	0.0150	ug/L	1		10/30/18 16:28
Anthracene	0.0250 U	0.0500	0.0150	ug/L	1		10/30/18 16:28
Benzo(a)Anthracene	0.0250 U	0.0500	0.0150	ug/L	1		10/30/18 16:28
Benzo[a]pyrene	0.0100 U	0.0200	0.00620	ug/L	1		10/30/18 16:28
Benzo[b]Fluoranthene	0.0250 U	0.0500	0.0150	ug/L	1		10/30/18 16:28
Benzo[g,h,i]perylene	0.0250 U	0.0500	0.0150	ug/L	1		10/30/18 16:28
Benzo[k]fluoranthene	0.0250 U	0.0500	0.0150	ug/L	1		10/30/18 16:28
Chrysene	0.0250 U	0.0500	0.0150	ug/L	1		10/30/18 16:28
Dibenzo[a,h]anthracene	0.0100 U	0.0200	0.00620	ug/L	1		10/30/18 16:28
Fluoranthene	0.0250 U	0.0500	0.0150	ug/L	1		10/30/18 16:28
Fluorene	0.0250 U	0.0500	0.0150	ug/L	1		10/30/18 16:28
Indeno[1,2,3-c,d] pyrene	0.0250 U	0.0500	0.0150	ug/L	1		10/30/18 16:28
Naphthalene	0.0500 U	0.100	0.0310	ug/L	1		10/30/18 16:28
Phenanthrene	0.0250 U	0.0500	0.0150	ug/L	1		10/30/18 16:28
Pyrene	0.0250 U	0.0500	0.0150	ug/L	1		10/30/18 16:28
Surrogates							
2-Methylnaphthalene-d10 (surr)	77.3	47-106		%	1		10/30/18 16:28
Fluoranthene-d10 (surr)	78.7	24-116		%	1		10/30/18 16:28

Batch Information

Analytical Batch: XMS11190
Analytical Method: 8270D SIM LV (PAH)
Analyst: BMZ
Analytical Date/Time: 10/30/18 16:28
Container ID: 1186061006-F

Prep Batch: XXX40790
Prep Method: SW3520C
Prep Date/Time: 10/24/18 09:10
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Results of FF39

Client Sample ID: **FF39**
 Client Project ID: **Frosty Fuels**
 Lab Sample ID: 1186061006
 Lab Project ID: 1186061

Collection Date: 10/20/18 11:27
 Received Date: 10/23/18 11:03
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	0.288 U	0.577	0.173	mg/L	1		10/31/18 11:55

Surrogates

5a Androstane (surr)	86.7	50-150		%	1		10/31/18 11:55
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Batch Information

Analytical Batch: XFC14768
 Analytical Method: AK102
 Analyst: VDL
 Analytical Date/Time: 10/31/18 11:55
 Container ID: 1186061006-D

Prep Batch: XXX40821
 Prep Method: SW3520C
 Prep Date/Time: 10/30/18 08:20
 Prep Initial Wt./Vol.: 260 mL
 Prep Extract Vol: 1 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Residual Range Organics	0.240 U	0.481	0.144	mg/L	1		10/31/18 11:55

Surrogates

n-Triacontane-d62 (surr)	99	50-150		%	1		10/31/18 11:55
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Batch Information

Analytical Batch: XFC14768
 Analytical Method: AK103
 Analyst: VDL
 Analytical Date/Time: 10/31/18 11:55
 Container ID: 1186061006-D

Prep Batch: XXX40821
 Prep Method: SW3520C
 Prep Date/Time: 10/30/18 08:20
 Prep Initial Wt./Vol.: 260 mL
 Prep Extract Vol: 1 mL



Results of FF39

Client Sample ID: **FF39**
 Client Project ID: **Frosty Fuels**
 Lab Sample ID: 1186061006
 Lab Project ID: 1186061

Collection Date: 10/20/18 11:27
 Received Date: 10/23/18 11:03
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Volatile GC/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
1,1,1,2-Tetrachloroethane	0.250 U	0.500	0.150	ug/L	1		10/24/18 20:28
1,1,1-Trichloroethane	0.500 U	1.00	0.310	ug/L	1		10/24/18 20:28
1,1,2,2-Tetrachloroethane	0.250 U	0.500	0.150	ug/L	1		10/24/18 20:28
1,1,2-Trichloroethane	0.200 U	0.400	0.120	ug/L	1		10/24/18 20:28
1,1-Dichloroethane	0.500 U	1.00	0.310	ug/L	1		10/24/18 20:28
1,1-Dichloroethene	0.500 U	1.00	0.310	ug/L	1		10/24/18 20:28
1,1-Dichloropropene	0.500 U	1.00	0.310	ug/L	1		10/24/18 20:28
1,2,3-Trichlorobenzene	0.500 U	1.00	0.310	ug/L	1		10/24/18 20:28
1,2,3-Trichloropropane	0.500 U	1.00	0.310	ug/L	1		10/24/18 20:28
1,2,4-Trichlorobenzene	0.500 U	1.00	0.310	ug/L	1		10/24/18 20:28
1,2,4-Trimethylbenzene	0.500 U	1.00	0.310	ug/L	1		10/25/18 15:03
1,2-Dibromo-3-chloropropane	5.00 U	10.0	3.10	ug/L	1		10/24/18 20:28
1,2-Dibromoethane	0.0375 U	0.0750	0.0180	ug/L	1		10/24/18 20:28
1,2-Dichlorobenzene	0.500 U	1.00	0.310	ug/L	1		10/24/18 20:28
1,2-Dichloroethane	0.250 U	0.500	0.150	ug/L	1		10/24/18 20:28
1,2-Dichloropropane	0.500 U	1.00	0.310	ug/L	1		10/24/18 20:28
1,3,5-Trimethylbenzene	0.500 U	1.00	0.310	ug/L	1		10/24/18 20:28
1,3-Dichlorobenzene	0.500 U	1.00	0.310	ug/L	1		10/24/18 20:28
1,3-Dichloropropane	0.250 U	0.500	0.150	ug/L	1		10/24/18 20:28
1,4-Dichlorobenzene	0.250 U	0.500	0.150	ug/L	1		10/24/18 20:28
2,2-Dichloropropane	0.500 U	1.00	0.310	ug/L	1		10/24/18 20:28
2-Butanone (MEK)	5.00 U	10.0	3.10	ug/L	1		10/24/18 20:28
2-Chlorotoluene	0.500 U	1.00	0.310	ug/L	1		10/24/18 20:28
2-Hexanone	5.00 U	10.0	3.10	ug/L	1		10/24/18 20:28
4-Chlorotoluene	0.500 U	1.00	0.310	ug/L	1		10/24/18 20:28
4-Isopropyltoluene	0.500 U	1.00	0.310	ug/L	1		10/24/18 20:28
4-Methyl-2-pentanone (MIBK)	5.00 U	10.0	3.10	ug/L	1		10/24/18 20:28
Benzene	0.200 U	0.400	0.120	ug/L	1		10/24/18 20:28
Bromobenzene	0.500 U	1.00	0.310	ug/L	1		10/24/18 20:28
Bromochloromethane	0.500 U	1.00	0.310	ug/L	1		10/24/18 20:28
Bromodichloromethane	0.250 U	0.500	0.150	ug/L	1		10/24/18 20:28
Bromoform	0.500 U	1.00	0.310	ug/L	1		10/24/18 20:28
Bromomethane	2.50 U	5.00	1.50	ug/L	1		10/24/18 20:28
Carbon disulfide	5.00 U	10.0	3.10	ug/L	1		10/24/18 20:28
Carbon tetrachloride	0.500 U	1.00	0.310	ug/L	1		10/24/18 20:28
Chlorobenzene	0.250 U	0.500	0.150	ug/L	1		10/24/18 20:28
Chloroethane	0.500 U	1.00	0.310	ug/L	1		10/24/18 20:28

Print Date: 11/01/2018 12:38:57PM

J flagging is activated



Results of FF39

Client Sample ID: **FF39**
 Client Project ID: **Frosty Fuels**
 Lab Sample ID: 1186061006
 Lab Project ID: 1186061

Collection Date: 10/20/18 11:27
 Received Date: 10/23/18 11:03
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Volatile GC/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Chloroform	0.500 U	1.00	0.310	ug/L	1		10/24/18 20:28
Chloromethane	0.500 U	1.00	0.310	ug/L	1		10/24/18 20:28
cis-1,2-Dichloroethene	0.500 U	1.00	0.310	ug/L	1		10/24/18 20:28
cis-1,3-Dichloropropene	0.250 U	0.500	0.150	ug/L	1		10/24/18 20:28
Dibromochloromethane	0.250 U	0.500	0.150	ug/L	1		10/24/18 20:28
Dibromomethane	0.500 U	1.00	0.310	ug/L	1		10/24/18 20:28
Dichlorodifluoromethane	0.500 U	1.00	0.310	ug/L	1		10/24/18 20:28
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		10/24/18 20:28
Freon-113	5.00 U	10.0	3.10	ug/L	1		10/24/18 20:28
Hexachlorobutadiene	0.500 U	1.00	0.310	ug/L	1		10/24/18 20:28
Isopropylbenzene (Cumene)	0.500 U	1.00	0.310	ug/L	1		10/24/18 20:28
Methylene chloride	2.50 U	5.00	1.00	ug/L	1		10/24/18 20:28
Methyl-t-butyl ether	5.00 U	10.0	3.10	ug/L	1		10/24/18 20:28
Naphthalene	0.500 U	1.00	0.310	ug/L	1		10/25/18 15:03
n-Butylbenzene	0.500 U	1.00	0.310	ug/L	1		10/24/18 20:28
n-Propylbenzene	0.500 U	1.00	0.310	ug/L	1		10/24/18 20:28
o-Xylene	0.500 U	1.00	0.310	ug/L	1		10/24/18 20:28
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		10/24/18 20:28
sec-Butylbenzene	0.500 U	1.00	0.310	ug/L	1		10/24/18 20:28
Styrene	0.500 U	1.00	0.310	ug/L	1		10/24/18 20:28
tert-Butylbenzene	0.500 U	1.00	0.310	ug/L	1		10/24/18 20:28
Tetrachloroethene	0.500 U	1.00	0.310	ug/L	1		10/24/18 20:28
Toluene	0.500 U	1.00	0.310	ug/L	1		10/24/18 20:28
trans-1,2-Dichloroethene	0.500 U	1.00	0.310	ug/L	1		10/24/18 20:28
trans-1,3-Dichloropropene	0.500 U	1.00	0.310	ug/L	1		10/24/18 20:28
Trichloroethene	0.500 U	1.00	0.310	ug/L	1		10/24/18 20:28
Trichlorofluoromethane	0.500 U	1.00	0.310	ug/L	1		10/24/18 20:28
Vinyl acetate	5.00 U	10.0	3.10	ug/L	1		10/24/18 20:28
Vinyl chloride	0.0750 U	0.150	0.0500	ug/L	1		10/24/18 20:28
Xylenes (total)	1.50 U	3.00	1.00	ug/L	1		10/24/18 20:28
Surrogates							
1,2-Dichloroethane-D4 (surr)	96.6	81-118		%	1		10/24/18 20:28
4-Bromofluorobenzene (surr)	103	85-114		%	1		10/24/18 20:28
Toluene-d8 (surr)	100	89-112		%	1		10/24/18 20:28

Results of FF39

Client Sample ID: **FF39**
Client Project ID: **Frosty Fuels**
Lab Sample ID: 1186061006
Lab Project ID: 1186061

Collection Date: 10/20/18 11:27
Received Date: 10/23/18 11:03
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Volatile GC/MS

Batch Information

Analytical Batch: VMS18499
Analytical Method: SW8260C
Analyst: FDR
Analytical Date/Time: 10/25/18 15:03
Container ID: 1186061006-A

Prep Batch: VXX33432
Prep Method: SW5030B
Prep Date/Time: 10/25/18 10:42
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Analytical Batch: VMS18492
Analytical Method: SW8260C
Analyst: FDR
Analytical Date/Time: 10/24/18 20:28
Container ID: 1186061006-A

Prep Batch: VXX33419
Prep Method: SW5030B
Prep Date/Time: 10/24/18 00:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL



Results of FF-Trip Blank

Client Sample ID: FF-Trip Blank
Client Project ID: Frosty Fuels
Lab Sample ID: 1186061007
Lab Project ID: 1186061

Collection Date: 10/19/18 17:11
Received Date: 10/23/18 11:03
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Volatile GC/MS

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Lists various chemical compounds and their detection results.



Results of FF-Trip Blank

Client Sample ID: **FF-Trip Blank**
 Client Project ID: **Frosty Fuels**
 Lab Sample ID: 1186061007
 Lab Project ID: 1186061

Collection Date: 10/19/18 17:11
 Received Date: 10/23/18 11:03
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Volatile GC/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Chloroform	0.500 U	1.00	0.310	ug/L	1		10/24/18 16:28
Chloromethane	0.500 U	1.00	0.310	ug/L	1		10/24/18 16:28
cis-1,2-Dichloroethene	0.500 U	1.00	0.310	ug/L	1		10/24/18 16:28
cis-1,3-Dichloropropene	0.250 U	0.500	0.150	ug/L	1		10/24/18 16:28
Dibromochloromethane	0.250 U	0.500	0.150	ug/L	1		10/24/18 16:28
Dibromomethane	0.500 U	1.00	0.310	ug/L	1		10/24/18 16:28
Dichlorodifluoromethane	0.500 U	1.00	0.310	ug/L	1		10/24/18 16:28
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		10/24/18 16:28
Freon-113	5.00 U	10.0	3.10	ug/L	1		10/24/18 16:28
Hexachlorobutadiene	0.500 U	1.00	0.310	ug/L	1		10/24/18 16:28
Isopropylbenzene (Cumene)	0.500 U	1.00	0.310	ug/L	1		10/24/18 16:28
Methylene chloride	2.50 U	5.00	1.00	ug/L	1		10/24/18 16:28
Methyl-t-butyl ether	5.00 U	10.0	3.10	ug/L	1		10/24/18 16:28
Naphthalene	0.500 U	1.00	0.310	ug/L	1		10/24/18 16:28
n-Butylbenzene	0.500 U	1.00	0.310	ug/L	1		10/24/18 16:28
n-Propylbenzene	0.500 U	1.00	0.310	ug/L	1		10/24/18 16:28
o-Xylene	0.500 U	1.00	0.310	ug/L	1		10/24/18 16:28
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		10/24/18 16:28
sec-Butylbenzene	0.500 U	1.00	0.310	ug/L	1		10/24/18 16:28
Styrene	0.500 U	1.00	0.310	ug/L	1		10/24/18 16:28
tert-Butylbenzene	0.500 U	1.00	0.310	ug/L	1		10/24/18 16:28
Tetrachloroethene	0.500 U	1.00	0.310	ug/L	1		10/24/18 16:28
Toluene	0.500 U	1.00	0.310	ug/L	1		10/24/18 16:28
trans-1,2-Dichloroethene	0.500 U	1.00	0.310	ug/L	1		10/24/18 16:28
trans-1,3-Dichloropropene	0.500 U	1.00	0.310	ug/L	1		10/24/18 16:28
Trichloroethene	0.500 U	1.00	0.310	ug/L	1		10/24/18 16:28
Trichlorofluoromethane	0.500 U	1.00	0.310	ug/L	1		10/24/18 16:28
Vinyl acetate	5.00 U	10.0	3.10	ug/L	1		10/24/18 16:28
Vinyl chloride	0.0750 U	0.150	0.0500	ug/L	1		10/24/18 16:28
Xylenes (total)	1.50 U	3.00	1.00	ug/L	1		10/24/18 16:28
Surrogates							
1,2-Dichloroethane-D4 (surr)	97.4	81-118		%	1		10/24/18 16:28
4-Bromofluorobenzene (surr)	102	85-114		%	1		10/24/18 16:28
Toluene-d8 (surr)	102	89-112		%	1		10/24/18 16:28

Results of FF-Trip Blank

Client Sample ID: **FF-Trip Blank**
Client Project ID: **Frosty Fuels**
Lab Sample ID: 1186061007
Lab Project ID: 1186061

Collection Date: 10/19/18 17:11
Received Date: 10/23/18 11:03
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Volatile GC/MS

Batch Information

Analytical Batch: VMS18492
Analytical Method: SW8260C
Analyst: FDR
Analytical Date/Time: 10/24/18 16:28
Container ID: 1186061007-A

Prep Batch: VXX33419
Prep Method: SW5030B
Prep Date/Time: 10/24/18 00:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Method Blank

Blank ID: MB for HBN 1788236 [VXX/33419]
 Blank Lab ID: 1484968

Matrix: Water (Surface, Eff., Ground)

QC for Samples:

1186061001, 1186061002, 1186061003, 1186061004, 1186061005, 1186061006, 1186061007

Results by SW8260C

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
1,1,1,2-Tetrachloroethane	0.250U	0.500	0.150	ug/L
1,1,1-Trichloroethane	0.500U	1.00	0.310	ug/L
1,1,2,2-Tetrachloroethane	0.250U	0.500	0.150	ug/L
1,1,2-Trichloroethane	0.200U	0.400	0.120	ug/L
1,1-Dichloroethane	0.500U	1.00	0.310	ug/L
1,1-Dichloroethene	0.500U	1.00	0.310	ug/L
1,1-Dichloropropene	0.500U	1.00	0.310	ug/L
1,2,3-Trichlorobenzene	0.500U	1.00	0.310	ug/L
1,2,3-Trichloropropane	0.500U	1.00	0.310	ug/L
1,2,4-Trichlorobenzene	0.500U	1.00	0.310	ug/L
1,2,4-Trimethylbenzene	0.500U	1.00	0.310	ug/L
1,2-Dibromo-3-chloropropane	5.00U	10.0	3.10	ug/L
1,2-Dibromoethane	0.0375U	0.0750	0.0180	ug/L
1,2-Dichlorobenzene	0.500U	1.00	0.310	ug/L
1,2-Dichloroethane	0.250U	0.500	0.150	ug/L
1,2-Dichloropropane	0.500U	1.00	0.310	ug/L
1,3,5-Trimethylbenzene	0.500U	1.00	0.310	ug/L
1,3-Dichlorobenzene	0.500U	1.00	0.310	ug/L
1,3-Dichloropropane	0.250U	0.500	0.150	ug/L
1,4-Dichlorobenzene	0.250U	0.500	0.150	ug/L
2,2-Dichloropropane	0.500U	1.00	0.310	ug/L
2-Butanone (MEK)	5.00U	10.0	3.10	ug/L
2-Chlorotoluene	0.500U	1.00	0.310	ug/L
2-Hexanone	5.00U	10.0	3.10	ug/L
4-Chlorotoluene	0.500U	1.00	0.310	ug/L
4-Isopropyltoluene	0.500U	1.00	0.310	ug/L
4-Methyl-2-pentanone (MIBK)	5.00U	10.0	3.10	ug/L
Benzene	0.200U	0.400	0.120	ug/L
Bromobenzene	0.500U	1.00	0.310	ug/L
Bromochloromethane	0.500U	1.00	0.310	ug/L
Bromodichloromethane	0.250U	0.500	0.150	ug/L
Bromoform	0.500U	1.00	0.310	ug/L
Bromomethane	2.50U	5.00	1.50	ug/L
Carbon disulfide	5.00U	10.0	3.10	ug/L
Carbon tetrachloride	0.500U	1.00	0.310	ug/L
Chlorobenzene	0.250U	0.500	0.150	ug/L
Chloroethane	0.500U	1.00	0.310	ug/L
Chloroform	0.500U	1.00	0.310	ug/L

Print Date: 11/01/2018 12:38:59PM

Method Blank

Blank ID: MB for HBN 1788236 [VXX/33419]
 Blank Lab ID: 1484968

Matrix: Water (Surface, Eff., Ground)

QC for Samples:

1186061001, 1186061002, 1186061003, 1186061004, 1186061005, 1186061006, 1186061007

Results by SW8260C

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Chloromethane	0.500U	1.00	0.310	ug/L
cis-1,2-Dichloroethene	0.500U	1.00	0.310	ug/L
cis-1,3-Dichloropropene	0.250U	0.500	0.150	ug/L
Dibromochloromethane	0.250U	0.500	0.150	ug/L
Dibromomethane	0.500U	1.00	0.310	ug/L
Dichlorodifluoromethane	0.500U	1.00	0.310	ug/L
Ethylbenzene	0.500U	1.00	0.310	ug/L
Freon-113	5.00U	10.0	3.10	ug/L
Hexachlorobutadiene	0.500U	1.00	0.310	ug/L
Isopropylbenzene (Cumene)	0.500U	1.00	0.310	ug/L
Methylene chloride	2.50U	5.00	1.00	ug/L
Methyl-t-butyl ether	5.00U	10.0	3.10	ug/L
Naphthalene	0.500U	1.00	0.310	ug/L
n-Butylbenzene	0.500U	1.00	0.310	ug/L
n-Propylbenzene	0.500U	1.00	0.310	ug/L
o-Xylene	0.500U	1.00	0.310	ug/L
P & M -Xylene	1.00U	2.00	0.620	ug/L
sec-Butylbenzene	0.500U	1.00	0.310	ug/L
Styrene	0.500U	1.00	0.310	ug/L
tert-Butylbenzene	0.500U	1.00	0.310	ug/L
Tetrachloroethene	0.500U	1.00	0.310	ug/L
Toluene	0.500U	1.00	0.310	ug/L
trans-1,2-Dichloroethene	0.500U	1.00	0.310	ug/L
trans-1,3-Dichloropropene	0.500U	1.00	0.310	ug/L
Trichloroethene	0.500U	1.00	0.310	ug/L
Trichlorofluoromethane	0.500U	1.00	0.310	ug/L
Vinyl acetate	5.00U	10.0	3.10	ug/L
Vinyl chloride	0.0750U	0.150	0.0500	ug/L
Xylenes (total)	1.50U	3.00	1.00	ug/L
Surrogates				
1,2-Dichloroethane-D4 (surr)	96.3	81-118		%
4-Bromofluorobenzene (surr)	104	85-114		%
Toluene-d8 (surr)	101	89-112		%

Print Date: 11/01/2018 12:38:59PM



Method Blank

Blank ID: MB for HBN 1788236 [VXX/33419]
Blank Lab ID: 1484968

Matrix: Water (Surface, Eff., Ground)

QC for Samples:

1186061001, 1186061002, 1186061003, 1186061004, 1186061005, 1186061006, 1186061007

Results by SW8260C

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
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Batch Information

Analytical Batch: VMS18492
Analytical Method: SW8260C
Instrument: VPA 780/5975 GC/MS
Analyst: FDR
Analytical Date/Time: 10/24/2018 2:06:00PM

Prep Batch: VXX33419
Prep Method: SW5030B
Prep Date/Time: 10/24/2018 12:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 11/01/2018 12:38:59PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1186061 [VXX33419]
 Blank Spike Lab ID: 1484969
 Date Analyzed: 10/24/2018 14:23

Spike Duplicate ID: LCSD for HBN 1186061 [VXX33419]
 Spike Duplicate Lab ID: 1484970
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1186061001, 1186061002, 1186061003, 1186061004, 1186061005, 1186061006, 1186061007

Results by SW8260C

Parameter	Blank Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
1,1,1,2-Tetrachloroethane	30	30.9	103	30	31.3	104	(78-124)	1.40	(< 20)
1,1,1-Trichloroethane	30	28.1	94	30	27.7	93	(74-131)	1.40	(< 20)
1,1,2,2-Tetrachloroethane	30	31.1	104	30	31.3	104	(71-121)	0.51	(< 20)
1,1,2-Trichloroethane	30	30.1	100	30	30.4	101	(80-119)	0.99	(< 20)
1,1-Dichloroethane	30	28.2	94	30	27.8	93	(77-125)	1.60	(< 20)
1,1-Dichloroethene	30	27.9	93	30	27.7	92	(71-131)	0.65	(< 20)
1,1-Dichloropropene	30	28.8	96	30	28.4	95	(79-125)	1.50	(< 20)
1,2,3-Trichlorobenzene	30	30.4	101	30	27.3	91	(69-129)	10.80	(< 20)
1,2,3-Trichloropropane	30	30.4	101	30	30.6	102	(73-122)	0.69	(< 20)
1,2,4-Trichlorobenzene	30	30.8	103	30	29.1	97	(69-130)	5.60	(< 20)
1,2,4-Trimethylbenzene	30	32.1	107	30	32.5	108	(79-124)	1.30	(< 20)
1,2-Dibromo-3-chloropropane	30	30.2	101	30	29.5	98	(62-128)	2.40	(< 20)
1,2-Dibromoethane	30	30.1	100	30	30.6	102	(77-121)	1.50	(< 20)
1,2-Dichlorobenzene	30	30.7	102	30	30.8	103	(80-119)	0.52	(< 20)
1,2-Dichloroethane	30	27.8	93	30	28.0	93	(73-128)	0.86	(< 20)
1,2-Dichloropropane	30	29.4	98	30	29.5	98	(78-122)	0.17	(< 20)
1,3,5-Trimethylbenzene	30	32.6	109	30	31.9	106	(75-124)	2.30	(< 20)
1,3-Dichlorobenzene	30	31.3	104	30	31.0	103	(80-119)	0.77	(< 20)
1,3-Dichloropropane	30	30.1	100	30	30.5	102	(80-119)	1.10	(< 20)
1,4-Dichlorobenzene	30	31.1	104	30	31.3	104	(79-118)	0.35	(< 20)
2,2-Dichloropropane	30	27.8	93	30	27.8	93	(60-139)	0.04	(< 20)
2-Butanone (MEK)	90	84.5	94	90	83.2	92	(56-143)	1.50	(< 20)
2-Chlorotoluene	30	31.6	105	30	31.9	106	(79-122)	0.69	(< 20)
2-Hexanone	90	94.2	105	90	91.8	102	(57-139)	2.60	(< 20)
4-Chlorotoluene	30	31.3	104	30	31.8	106	(78-122)	1.50	(< 20)
4-Isopropyltoluene	30	32.2	107	30	32.6	109	(77-127)	1.10	(< 20)
4-Methyl-2-pentanone (MIBK)	90	92.7	103	90	92.4	103	(67-130)	0.39	(< 20)
Benzene	30	29.4	98	30	28.9	96	(79-120)	1.60	(< 20)
Bromobenzene	30	31.0	103	30	31.0	103	(80-120)	0.00	(< 20)
Bromochloromethane	30	28.1	94	30	28.3	94	(78-123)	0.67	(< 20)
Bromodichloromethane	30	29.3	98	30	29.5	98	(79-125)	0.54	(< 20)
Bromoform	30	31.7	106	30	32.5	108	(66-130)	2.30	(< 20)
Bromomethane	30	30.3	101	30	30.2	101	(53-141)	0.30	(< 20)
Carbon disulfide	45	41.9	93	45	41.6	93	(64-133)	0.77	(< 20)

Print Date: 11/01/2018 12:39:01PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1186061 [VXX33419]
 Blank Spike Lab ID: 1484969
 Date Analyzed: 10/24/2018 14:23

Spike Duplicate ID: LCSD for HBN 1186061 [VXX33419]
 Spike Duplicate Lab ID: 1484970
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1186061001, 1186061002, 1186061003, 1186061004, 1186061005, 1186061006, 1186061007

Results by SW8260C

Parameter	Blank Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Carbon tetrachloride	30	29.5	98	30	29.3	98	(72-136)	0.58	(< 20)
Chlorobenzene	30	29.1	97	30	28.9	96	(82-118)	0.48	(< 20)
Chloroethane	30	30.2	101	30	29.8	99	(60-138)	1.50	(< 20)
Chloroform	30	27.1	90	30	26.9	90	(79-124)	0.74	(< 20)
Chloromethane	30	31.6	105	30	32.5	108	(50-139)	2.60	(< 20)
cis-1,2-Dichloroethene	30	28.2	94	30	28.4	95	(78-123)	0.46	(< 20)
cis-1,3-Dichloropropene	30	30.0	100	30	30.7	102	(75-124)	2.10	(< 20)
Dibromochloromethane	30	30.7	102	30	31.3	104	(74-126)	1.80	(< 20)
Dibromomethane	30	28.5	95	30	28.8	96	(79-123)	0.91	(< 20)
Dichlorodifluoromethane	30	28.9	96	30	28.6	95	(32-152)	0.97	(< 20)
Ethylbenzene	30	30.5	102	30	30.2	101	(79-121)	0.92	(< 20)
Freon-113	45	43.4	96	45	43.2	96	(70-136)	0.53	(< 20)
Hexachlorobutadiene	30	29.7	99	30	29.8	99	(66-134)	0.27	(< 20)
Isopropylbenzene (Cumene)	30	30.8	103	30	30.7	102	(72-131)	0.59	(< 20)
Methylene chloride	30	28.9	96	30	29.0	97	(74-124)	0.41	(< 20)
Methyl-t-butyl ether	45	42.5	95	45	43.2	96	(71-124)	1.50	(< 20)
Naphthalene	30	31.0	103	30	28.3	94	(61-128)	8.90	(< 20)
n-Butylbenzene	30	32.1	107	30	32.1	107	(75-128)	0.03	(< 20)
n-Propylbenzene	30	32.5	108	30	32.1	107	(76-126)	1.10	(< 20)
o-Xylene	30	30.4	101	30	30.4	101	(78-122)	0.00	(< 20)
P & M -Xylene	60	61.3	102	60	60.8	101	(80-121)	0.82	(< 20)
sec-Butylbenzene	30	32.2	107	30	32.1	107	(77-126)	0.25	(< 20)
Styrene	30	30.9	103	30	31.1	104	(78-123)	0.68	(< 20)
tert-Butylbenzene	30	31.9	106	30	32.0	107	(78-124)	0.16	(< 20)
Tetrachloroethene	30	30.3	101	30	29.6	99	(74-129)	2.30	(< 20)
Toluene	30	28.5	95	30	28.2	94	(80-121)	1.20	(< 20)
trans-1,2-Dichloroethene	30	27.9	93	30	27.6	92	(75-124)	1.20	(< 20)
trans-1,3-Dichloropropene	30	31.5	105	30	32.4	108	(73-127)	2.80	(< 20)
Trichloroethene	30	28.5	95	30	28.1	94	(79-123)	1.40	(< 20)
Trichlorofluoromethane	30	27.4	91	30	27.3	91	(65-141)	0.55	(< 20)
Vinyl acetate	30	29.5	98	30	30.1	100	(54-146)	2.10	(< 20)
Vinyl chloride	30	29.6	99	30	29.5	98	(58-137)	0.10	(< 20)
Xylenes (total)	90	91.7	102	90	91.2	101	(79-121)	0.55	(< 20)

Print Date: 11/01/2018 12:39:01PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1186061 [VXX33419]
 Blank Spike Lab ID: 1484969
 Date Analyzed: 10/24/2018 14:23

Spike Duplicate ID: LCSD for HBN 1186061 [VXX33419]
 Spike Duplicate Lab ID: 1484970
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1186061001, 1186061002, 1186061003, 1186061004, 1186061005, 1186061006, 1186061007

Results by SW8260C

Parameter	Blank Spike (%)			Spike Duplicate (%)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Surrogates									
1,2-Dichloroethane-D4 (surr)	30	92.9	93	30	92.9	93	(81-118)	0.00	
4-Bromofluorobenzene (surr)	30	103	103	30	104	104	(85-114)	0.26	
Toluene-d8 (surr)	30	102	102	30	101	101	(89-112)	1.00	

Batch Information

Analytical Batch: **VMS18492**
 Analytical Method: **SW8260C**
 Instrument: **VPA 780/5975 GC/MS**
 Analyst: **FDR**

Prep Batch: **VXX33419**
 Prep Method: **SW5030B**
 Prep Date/Time: **10/24/2018 00:00**
 Spike Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL
 Dupe Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL

Method Blank

Blank ID: MB for HBN 1788308 [VXX/33432]

Blank Lab ID: 1485249

QC for Samples:

1186061003, 1186061006

Matrix: Water (Surface, Eff., Ground)

Results by SW8260C

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
1,2,4-Trimethylbenzene	0.500U	1.00	0.310	ug/L
Naphthalene	0.500U	1.00	0.310	ug/L
o-Xylene	0.500U	1.00	0.310	ug/L
P & M -Xylene	1.00U	2.00	0.620	ug/L
Toluene	0.500U	1.00	0.310	ug/L
Xylenes (total)	1.50U	3.00	1.00	ug/L
Surrogates				
1,2-Dichloroethane-D4 (surr)	96.5	81-118		%
4-Bromofluorobenzene (surr)	102	85-114		%
Toluene-d8 (surr)	101	89-112		%

Batch Information

Analytical Batch: VMS18499

Analytical Method: SW8260C

Instrument: VPA 780/5975 GC/MS

Analyst: FDR

Analytical Date/Time: 10/25/2018 10:49:00AM

Prep Batch: VXX33432

Prep Method: SW5030B

Prep Date/Time: 10/25/2018 10:42:53AM

Prep Initial Wt./Vol.: 5 mL

Prep Extract Vol: 5 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1186061 [VXX33432]
 Blank Spike Lab ID: 1485250
 Date Analyzed: 10/25/2018 11:06

Spike Duplicate ID: LCSD for HBN 1186061 [VXX33432]
 Spike Duplicate Lab ID: 1485251
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1186061003, 1186061006

Results by SW8260C

Parameter	Blank Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
1,2,4-Trimethylbenzene	30	31.6	105	30	31.2	104	(79-124)	1.10	(< 20)
Naphthalene	30	31.8	106	30	29.9	100	(61-128)	6.10	(< 20)
o-Xylene	30	30.1	100	30	29.8	99	(78-122)	1.00	(< 20)
P & M -Xylene	60	60.4	101	60	59.9	100	(80-121)	0.95	(< 20)
Toluene	30	28.4	95	30	27.8	93	(80-121)	2.40	(< 20)
Xylenes (total)	90	90.5	101	90	89.6	100	(79-121)	0.97	(< 20)
Surrogates									
1,2-Dichloroethane-D4 (surr)	30	92	92	30	92.8	93	(81-118)	0.87	
4-Bromofluorobenzene (surr)	30	103	103	30	102	102	(85-114)	0.39	
Toluene-d8 (surr)	30	102	102	30	101	101	(89-112)	0.89	

Batch Information

Analytical Batch: VMS18499
 Analytical Method: SW8260C
 Instrument: VPA 780/5975 GC/MS
 Analyst: FDR

Prep Batch: VXX33432
 Prep Method: SW5030B
 Prep Date/Time: 10/25/2018 10:42
 Spike Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL
 Dupe Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL

Method Blank

Blank ID: MB for HBN 1788160 [XXX/40790]
 Blank Lab ID: 1484644

Matrix: Water (Surface, Eff., Ground)

QC for Samples:

1186061001, 1186061002, 1186061003, 1186061004, 1186061005, 1186061006

Results by 8270D SIM LV (PAH)

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
1-Methylnaphthalene	0.0250U	0.0500	0.0150	ug/L
2-Methylnaphthalene	0.0250U	0.0500	0.0150	ug/L
Acenaphthene	0.0250U	0.0500	0.0150	ug/L
Acenaphthylene	0.0250U	0.0500	0.0150	ug/L
Anthracene	0.0250U	0.0500	0.0150	ug/L
Benzo(a)Anthracene	0.0250U	0.0500	0.0150	ug/L
Benzo[a]pyrene	0.0100U	0.0200	0.00620	ug/L
Benzo[b]Fluoranthene	0.0250U	0.0500	0.0150	ug/L
Benzo[g,h,i]perylene	0.0250U	0.0500	0.0150	ug/L
Benzo[k]fluoranthene	0.0250U	0.0500	0.0150	ug/L
Chrysene	0.0250U	0.0500	0.0150	ug/L
Dibenzo[a,h]anthracene	0.0100U	0.0200	0.00620	ug/L
Fluoranthene	0.0250U	0.0500	0.0150	ug/L
Fluorene	0.0250U	0.0500	0.0150	ug/L
Indeno[1,2,3-c,d] pyrene	0.0250U	0.0500	0.0150	ug/L
Naphthalene	0.0500U	0.100	0.0310	ug/L
Phenanthrene	0.0250U	0.0500	0.0150	ug/L
Pyrene	0.0250U	0.0500	0.0150	ug/L
Surrogates				
2-Methylnaphthalene-d10 (surr)	72.6	47-106		%
Fluoranthene-d10 (surr)	74.1	24-116		%

Batch Information

Analytical Batch: XMS11190
 Analytical Method: 8270D SIM LV (PAH)
 Instrument: SVA Agilent 780/5975 GC/MS
 Analyst: BMZ
 Analytical Date/Time: 10/30/2018 12:03:00PM

Prep Batch: XXX40790
 Prep Method: SW3520C
 Prep Date/Time: 10/24/2018 9:10:18AM
 Prep Initial Wt./Vol.: 250 mL
 Prep Extract Vol: 1 mL

Print Date: 11/01/2018 12:39:06PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1186061 [XXX40790]
 Blank Spike Lab ID: 1484645
 Date Analyzed: 10/30/2018 12:23

Spike Duplicate ID: LCSD for HBN 1186061 [XXX40790]
 Spike Duplicate Lab ID: 1484646
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1186061001, 1186061002, 1186061003, 1186061004, 1186061005, 1186061006

Results by 8270D SIM LV (PAH)

Parameter	Blank Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
1-Methylnaphthalene	2	1.35	68	2	1.50	75	(41-115)	10.20	(< 20)
2-Methylnaphthalene	2	1.41	70	2	1.58	79	(39-114)	11.60	(< 20)
Acenaphthene	2	1.23	62	2	1.37	68	(48-114)	10.60	(< 20)
Acenaphthylene	2	1.34	67	2	1.49	75	(35-121)	11.10	(< 20)
Anthracene	2	1.37	69	2	1.53	77	(53-119)	10.70	(< 20)
Benzo(a)Anthracene	2	1.31	66	2	1.44	72	(59-120)	9.40	(< 20)
Benzo[a]pyrene	2	1.32	66	2	1.41	71	(53-120)	6.90	(< 20)
Benzo[b]Fluoranthene	2	1.33	66	2	1.49	75	(53-126)	11.80	(< 20)
Benzo[g,h,i]perylene	2	1.18	59	2	1.35	68	(44-128)	13.80	(< 20)
Benzo[k]fluoranthene	2	1.27	64	2	1.41	70	(54-125)	10.10	(< 20)
Chrysene	2	1.27	64	2	1.42	71	(57-120)	10.90	(< 20)
Dibenzo[a,h]anthracene	2	1.10	55	2	1.31	66	(44-131)	17.50	(< 20)
Fluoranthene	2	1.30	65	2	1.48	74	(58-120)	13.20	(< 20)
Fluorene	2	1.30	65	2	1.47	74	(50-118)	12.20	(< 20)
Indeno[1,2,3-c,d] pyrene	2	1.32	66	2	1.47	74	(48-130)	11.10	(< 20)
Naphthalene	2	1.37	69	2	1.56	78	(43-114)	12.80	(< 20)
Phenanthrene	2	1.29	65	2	1.45	72	(53-115)	11.40	(< 20)
Pyrene	2	1.32	66	2	1.52	76	(53-121)	13.80	(< 20)

Surrogates

2-Methylnaphthalene-d10 (surr)	2	67.9	68	2	75.2	75	(47-106)	10.20	
Fluoranthene-d10 (surr)	2	67.5	68	2	75.9	76	(24-116)	11.70	

Batch Information

Analytical Batch: XMS11190
 Analytical Method: 8270D SIM LV (PAH)
 Instrument: SVA Agilent 780/5975 GC/MS
 Analyst: BMZ

Prep Batch: XXX40790
 Prep Method: SW3520C
 Prep Date/Time: 10/24/2018 09:10
 Spike Init Wt./Vol.: 2 ug/L Extract Vol: 1 mL
 Dupe Init Wt./Vol.: 2 ug/L Extract Vol: 1 mL

Method Blank

Blank ID: MB for HBN 1788428 [XXX/40821]
 Blank Lab ID: 1485800

Matrix: Water (Surface, Eff., Ground)

QC for Samples:

1186061001, 1186061002, 1186061003, 1186061004, 1186061005, 1186061006

Results by AK102

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Diesel Range Organics	0.300U	0.600	0.180	mg/L
Surrogates				
5a Androstane (surr)	95.9	60-120		%

Batch Information

Analytical Batch: XFC14768
 Analytical Method: AK102
 Instrument: Agilent 7890B F
 Analyst: VDL
 Analytical Date/Time: 10/31/2018 9:57:00AM

Prep Batch: XXX40821
 Prep Method: SW3520C
 Prep Date/Time: 10/30/2018 8:20:13AM
 Prep Initial Wt./Vol.: 250 mL
 Prep Extract Vol: 1 mL

Print Date: 11/01/2018 12:39:08PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1186061 [XXX40821]
 Blank Spike Lab ID: 1485801
 Date Analyzed: 10/31/2018 10:07

Spike Duplicate ID: LCSD for HBN 1186061 [XXX40821]
 Spike Duplicate Lab ID: 1485802
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1186061001, 1186061002, 1186061003, 1186061004, 1186061005, 1186061006

Results by AK102

Parameter	Blank Spike (mg/L)			Spike Duplicate (mg/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Diesel Range Organics	20	20.1	101	20	19.8	99	(75-125)	1.40	(< 20)

Surrogates

5a Androstane (surr)	0.4	108	108	0.4	107	107	(60-120)	1.20	
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Batch Information

Analytical Batch: **XFC14768**
 Analytical Method: **AK102**
 Instrument: **Agilent 7890B F**
 Analyst: **VDL**

Prep Batch: **XXX40821**
 Prep Method: **SW3520C**
 Prep Date/Time: **10/30/2018 08:20**
 Spike Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL
 Dupe Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL

Method Blank

Blank ID: MB for HBN 1788428 [XXX/40821]
 Blank Lab ID: 1485800

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
 1186061001, 1186061002, 1186061003, 1186061004, 1186061005, 1186061006

Results by AK103

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Residual Range Organics	0.250U	0.500	0.150	mg/L
Surrogates				
n-Triacontane-d62 (surr)	108	60-120		%

Batch Information

Analytical Batch: XFC14768
 Analytical Method: AK103
 Instrument: Agilent 7890B F
 Analyst: VDL
 Analytical Date/Time: 10/31/2018 9:57:00AM

Prep Batch: XXX40821
 Prep Method: SW3520C
 Prep Date/Time: 10/30/2018 8:20:13AM
 Prep Initial Wt./Vol.: 250 mL
 Prep Extract Vol: 1 mL

Print Date: 11/01/2018 12:39:11PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1186061 [XXX40821]
 Blank Spike Lab ID: 1485801
 Date Analyzed: 10/31/2018 10:07

Spike Duplicate ID: LCSD for HBN 1186061 [XXX40821]
 Spike Duplicate Lab ID: 1485802
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1186061001, 1186061002, 1186061003, 1186061004, 1186061005, 1186061006

Results by AK103

Parameter	Blank Spike (mg/L)			Spike Duplicate (mg/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Residual Range Organics	20	21.7	108	20	20.9	104	(60-120)	3.60	(< 20)
Surrogates									
n-Triacontane-d62 (surr)	0.4	108	108	0.4	114	114	(60-120)	4.80	

Batch Information

Analytical Batch: **XFC14768**
 Analytical Method: **AK103**
 Instrument: **Agilent 7890B F**
 Analyst: **VDL**

Prep Batch: **XXX40821**
 Prep Method: **SW3520C**
 Prep Date/Time: **10/30/2018 08:20**
 Spike Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL
 Dupe Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL



CLIENT: ADOT & PF

CONTACT: Dan McMahon

PROJECT NAME: Frosty Fuels

REPORTS TO: Dan McMahon

INVOICE TO: Sherman & Wilson

PHONE NO.: —

PROJECT PWSID/ PERMIT#: —

E-MAIL: dan.mcmahon@shamwil.com

QUOTE #: —

P.O. #: 101644-001

Section 1

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

Section 2

RESERVED for lab use	SAMPLE IDENTIFICATION	DATE mm/dd/yy	TIME HH:MM	MATRIX/ MATRIX CODE
① A-G	FF7	10/14/18	1926	Water
② A-G	FF4 FF18	10/14/18	1711	—
③ A-G	FF18	10/20/18	1522	—
④ A-G	FF22	10/20/18	1309	—
⑤ A-G	FF2201	10/20/18	1337	—
⑥ A-G	FF39	10/20/18	1127	—
⑦ A-C	FF-Trip Blank	—	—	—

Section 3

Type
C = COMP
G = GRAB
M = Multi
Incr = Incremental
Soils

#	C	O	N	T	A	I	N	E	R	S
7	X	X	X	X	X	X	X	X	X	X
7	X	X	X	X	X	X	X	X	X	X
7	X	X	X	X	X	X	X	X	X	X
7	X	X	X	X	X	X	X	X	X	X
7	X	X	X	X	X	X	X	X	X	X
7	X	X	X	X	X	X	X	X	X	X
33	—	—	—	—	—	—	—	—	—	—

Section 4

Section 4 DOD Project? Yes (No) No

Cooler ID: Standard TAT

Requested Turnaround Time and/or Special Instructions: Level II

Section 5

Temp Blank °C: 1.3 D21 or Ambient []

Chain of Custody Seal: (Circle) HD BROKEN ABSENT

(See attached Sample Receipt Form)



e-Sample Receipt Form

SGS Workorder #:

1186061



1 1 8 6 0 6 1

Review Criteria	Condition (Yes, No, N/A)	Exceptions Noted below
Chain of Custody / Temperature Requirements		<input checked="" type="checkbox"/> Exemption permitted if sampler hand carries/delivers.
Were Custody Seals intact? Note # & location	<input type="checkbox"/> n/a	hand delivered
COC accompanied samples?	<input checked="" type="checkbox"/> yes	
<input type="checkbox"/> n/a **Exemption permitted if chilled & collected <8 hours ago, or for samples where chilling is not required		
Temperature blank compliant* (i.e., 0-6 °C after CF)?	<input checked="" type="checkbox"/> yes	Cooler ID: 1 @ 1.3 °C Therm. ID: D21
	<input type="checkbox"/>	Cooler ID: @ °C Therm. ID:
	<input type="checkbox"/>	Cooler ID: @ °C Therm. ID:
	<input type="checkbox"/>	Cooler ID: @ °C Therm. ID:
	<input type="checkbox"/>	Cooler ID: @ °C Therm. ID:
*If >6°C, were samples collected <8 hours ago?	<input type="checkbox"/> n/a	
If <0°C, were sample containers ice free?	<input type="checkbox"/> n/a	
If samples received <u>without</u> a temperature blank, the "cooler temperature" will be documented in lieu of the temperature blank & "COOLER TEMP" will be noted to the right. In cases where neither a temp blank nor cooler temp can be obtained, note "ambient" or "chilled".		
Note: Identify containers received at non-compliant temperature . Use form FS-0029 if more space is needed.		
Holding Time / Documentation / Sample Condition Requirements		Note: Refer to form F-083 "Sample Guide" for specific holding times.
Were samples received within holding time?	<input checked="" type="checkbox"/> yes	
Do samples match COC ** (i.e., sample IDs, dates/times collected)?	<input checked="" type="checkbox"/> yes	
**Note: If times differ <1hr, record details & login per COC.		
Were analyses requested unambiguous? (i.e., method is specified for analyses with >1 option for analysis)	<input checked="" type="checkbox"/> yes	
Were proper containers (type/mass/volume/preservative***) used?	<input checked="" type="checkbox"/> yes	<input type="checkbox"/> n/a ***Exemption permitted for metals (e.g.200.8/6020A).
Volatile / LL-Hg Requirements		
Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples?	<input checked="" type="checkbox"/> yes	
Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)?	<input checked="" type="checkbox"/> yes	
Were all soil VOAs field extracted with MeOH+BFB?	<input type="checkbox"/> n/a	
Note to Client: Any "No", answer above indicates non-compliance with standard procedures and may impact data quality.		
Additional notes (if applicable):		



Sample Containers and Preservatives

<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>	<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>
1186061001-A	HCL to pH < 2	OK			
1186061001-B	HCL to pH < 2	OK			
1186061001-C	HCL to pH < 2	OK			
1186061001-D	HCL to pH < 2	OK			
1186061001-E	HCL to pH < 2	OK			
1186061001-F	No Preservative Required	OK			
1186061001-G	No Preservative Required	OK			
1186061002-A	HCL to pH < 2	OK			
1186061002-B	HCL to pH < 2	OK			
1186061002-C	HCL to pH < 2	OK			
1186061002-D	HCL to pH < 2	OK			
1186061002-E	HCL to pH < 2	OK			
1186061002-F	No Preservative Required	OK			
1186061002-G	No Preservative Required	OK			
1186061003-A	HCL to pH < 2	OK			
1186061003-B	HCL to pH < 2	OK			
1186061003-C	HCL to pH < 2	OK			
1186061003-D	HCL to pH < 2	OK			
1186061003-E	HCL to pH < 2	OK			
1186061003-F	No Preservative Required	OK			
1186061003-G	No Preservative Required	OK			
1186061004-A	HCL to pH < 2	OK			
1186061004-B	HCL to pH < 2	OK			
1186061004-C	HCL to pH < 2	OK			
1186061004-D	HCL to pH < 2	OK			
1186061004-E	HCL to pH < 2	OK			
1186061004-F	No Preservative Required	OK			
1186061004-G	No Preservative Required	OK			
1186061005-A	HCL to pH < 2	OK			
1186061005-B	HCL to pH < 2	OK			
1186061005-C	HCL to pH < 2	OK			
1186061005-D	HCL to pH < 2	OK			
1186061005-E	HCL to pH < 2	OK			
1186061005-F	No Preservative Required	OK			
1186061005-G	No Preservative Required	OK			
1186061006-A	HCL to pH < 2	OK			
1186061006-B	HCL to pH < 2	OK			
1186061006-C	HCL to pH < 2	OK			
1186061006-D	HCL to pH < 2	OK			
1186061006-E	HCL to pH < 2	OK			
1186061006-F	No Preservative Required	OK			
1186061006-G	No Preservative Required	OK			
1186061007-A	HCL to pH < 2	OK			
1186061007-B	HCL to pH < 2	OK			
1186061007-C	HCL to pH < 2	OK			

Container Id

Preservative

Container
Condition

Container Id

Preservative

Container
Condition

Container Condition Glossary

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

OK - The container was received at an acceptable pH for the analysis requested.

BU - The container was received with headspace greater than 6mm.

DM - The container was received damaged.

FR - The container was received frozen and not usable for Bacteria or BOD analyses.

IC - The container provided for microbiology analysis was not a laboratory-supplied, pre-sterilized container and therefore was not suitable for analysis.

PA - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt and the container is now at the correct pH. See the Sample Receipt Form for details on the amount and lot # of the preservative added.

PH - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt, but was insufficient to bring the container to the correct pH for the analysis requested. See the Sample Receipt Form for details on the amount and lot # of the preservative added.

LABORATORY DATA REVIEW CHECKLIST

Completed by: Schylar Healy

Title: Environmental Scientist

Date: November 2018

CS Report Name: Groundwater Monitoring, Lot 1M Block100, Port Heiden, Alaska; ADEC
File NO. 2637.26.002

Laboratory Report Date: November 1, 2018

Consultant Firm: Shannon & Wilson, Inc.

Laboratory Name: SGS North America Inc.

Laboratory Report Number: 1186061

ADEC File Number: 2637.26.002

ADEC RecKey Number: NA

(NOTE: NA = not applicable; Text in *italics* added by Shannon & Wilson, Inc.)

1. Laboratory

a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses? **Yes** / No / NA (please explain)
Comments:

b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS-approved? **Yes** / No / **NA** (please explain)
Comments: *Samples were not transferred.*

2. Chain of Custody (COC)

a. COC information completed, signed, and dated (including released/received by)? **Yes** / No / NA (please explain)
Comments:

b. Correct analyses requested? **Yes** / No / NA (please explain)
Comments:

3. Laboratory Sample Receipt Documentation

a. Sample/cooler temperature documented and within range at receipt (0° to 6° C)? **Yes** / No / NA (please explain)
Comments: *The cooler temperature blank was documented at 1.3 degrees Celsius.*

- b. Sample preservation acceptable - acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)? **Yes** / No / NA (please explain)

Comments:

- c. Sample condition documented - broken, leaking (Methanol), zero headspace (VOC vials)? **Yes** / No / NA (please explain)

Comments: *No discrepancies noted.*

- d. If there were any discrepancies, were they documented? – For example, incorrect sample containers/preservation, sample temperature outside acceptance range, insufficient or missing samples, etc.? Yes / No / **NA** (please explain)

Comments:

- e. Data quality or usability affected? Please explain. **NA**

Comments:

4. Case Narrative

- a. Present and understandable? **Yes** / No / NA (please explain)

Comments:

- b. Discrepancies, errors or QC failures identified by the lab? **Yes** / No / NA (please explain)

Comments: *The laboratory noted the following:*

- *Sample FF14: 8270D SIM - Surrogate recovery for 2-methylnaphthalene-d10 (166%) does not meet QC criteria due to matrix interference.*

- c. Were corrective actions documented? Yes / **No** / NA (please explain)

Comments: *Corrective actions were not noted.*

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

Comments: *The case narrative does not comment on data quality/usability.*

5. Sample Results

- a. Correct analyses performed/reported as requested on COC? **Yes** / No / NA (please explain)

Comments:

- b. All applicable holding times met? **Yes** / No / NA (please explain)

Comments:

All soils reported on a dry weight basis? Yes / No / **NA** (please explain)

Comments: *No soil samples submitted as part of this project.*

- c. Are the reported LOQs less than the Cleanup Level or the minimum required detection level for the project? **Yes** / No / NA (please explain)
Comments: *The LOQs for several VOCs are greater than their respective ADEC Method Two cleanup levels.*
- d. Data quality or usability affected? **NA** Please explain.
Comments: *The data cannot be used to determine whether or not concentrations of these VOCs are present at concentrations greater than their respective ADEC cleanup levels.*

6. QC Samples

a. Method Blank

- i. One method blank reported per matrix, analysis, and 20 samples?
Yes / No / NA (please explain)
Comments:
- ii. All method blank results less than LOQ? **Yes** / No / NA (please explain)
Comments:
- iii. If above LOQ, what samples are affected? **NA**
Comments:
- iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?
Yes / No / **NA** (please explain)
Comments:
- v. Data quality or usability affected? Please explain. **NA**
Comments:

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

- i. Organics - One LCS/LCSD reported per matrix, analysis, and 20 samples?
(LCS/LCSD required per AK methods, LCS required per SW846) **Yes** / No / NA
(please explain)
Comments:
- ii. Metals/Inorganics - One LCS and one sample duplicate reported per matrix, analysis and 20 samples? **Yes** / No / **NA** (please explain)
Comments: *No metal/inorganic samples analyzed.*
- iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages) **Yes** / No / NA (please explain)
Comments:

- iv. Precision – All relative percent differences (RPDs) reported and less than method or laboratory limits? And project specified DQOs, if applicable. RPD reported from LCS/LCSD, MS/MSD, and or sample/sample duplicate. (AK Petroleum methods 20%, VOCs 20%; all other analyses see the laboratory QC pages) **Yes** / No / NA (please explain)

Comments:

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

Comments:

- vi. Do the affected samples(s) have data flags? If so, are the data flags clearly defined? **Yes** / No / **NA** (please explain)

Comments:

- vii. Data quality or usability affected? Please explain. **NA**

Comments:

c. Surrogates - Organics Only

- i. Are surrogate recoveries reported for organic analyses, field, QC and laboratory samples? **Yes** / No / NA (please explain)

Comments:

- ii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs if applicable. (AK Petroleum methods 50-150 %R; all other analyses see the laboratory report pages) **Yes** / **No** / NA (please explain)

Comments: *The 2-Methylnaphthalene-d10 (PAHs surrogate) recovery for sample FF18 collected from Monitoring Well MW-18 is 166% and does not meet QC criteria due to matrix interference.*

- iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined? **Yes** / No / NA (please explain)

Comments: *The affected samples were flagged “J+” on Table 2 and Figure 2.*

- iv. Data quality or usability affected? Please explain. **NA**

Comments: *The affected Sample FF18 PAH results are potentially biased high.*

d. Trip Blank - Volatile analyses only (GRO, BTEX, Volatile Chlorinated Solvents, etc.)

- i. One trip blank reported per matrix, analysis and cooler? (If not, enter explanation below.) **Yes** / No / NA (please explain)

Comments:

- ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment stating why must be entered below.) **Yes** / **No** / NA (please explain)

Comments: *Only one cooler was used to store and transport the samples.*

- iii. All results less than LOQ? **Yes** / No / NA (please explain)

Comments:

- iv. If above LOQ, what samples are affected? **NA**

Comments:

- v. Data quality or usability affected? Please explain. **NA**

Comments:

e. Field Duplicate

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

Yes / No NA (please explain)

Comments: *A field duplicate was submitted per 10 project samples for DRO, RRO, VOCs, and PAHs analysis.*

- ii. Submitted blind to the lab? **Yes** / No / NA (please explain)

Comments: *Sample FF229 is a field duplicate of FF22.*

- iii. Precision – All relative percent differences (RPDs) less than specified DQOs?

(Recommended: 30% for water, 50% for soil) **Yes** / **No** / NA (please explain)

Comments: *The RPDs for DRO, GRO, and nine VOCs are greater than 30% (31% to 41.6%).*

- iv. Data quality or usability affected? Please explain. **NA**

Comments: *In each case, both the primary and duplicate sample results are either greater or less than the ADEC cleanup levels. Therefore, it is our opinion that data quality is unaffected.*

f. Decontamination or Equipment Blank (if not applicable)

Yes / No / **NA** (please explain)

Comments: *The use of a decontamination or equipment blank was beyond the scope of this project.*

- i. All results less than LOQ? **Yes** / No / **NA** (please explain)

Comments:

- ii. If above LOQ, what samples are affected? **NA**

Comments:

- iii. Data quality or usability affected? Please explain. **NA**

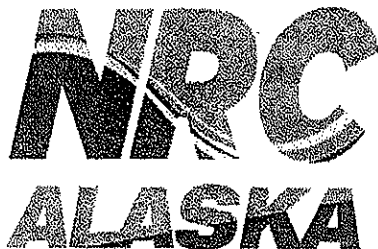
Comments:

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

- a. Defined and appropriate? **Yes** / No / NA (please explain)

Comments: *A key is provided on page 3 of the laboratory report.*

ATTACHMENT 3
DISPOSAL RECEIPT



CERTIFICATE OF DISPOSAL/RECYCLE

GENERATOR: SHANNON & WILSON, INC.
FROSTY FUELS GROUNDWATER MONITORING
PORT HEIDEN, AK 99549

DISPOSAL FACILITY: NRC ALASKA LLC
2020 VIKING DRIVE
ANCHORAGE, AK 99501

EPA ID NUMBER: VSQG
MANIFEST/DOCUMENT #: 131651
DATE OF DISPOSAL/RECYCLE: OCT-27-2018

<u>LINE</u>	<u>WASTE DESCRIPTION</u>	<u>CONTAINERS</u>	<u>TYPE</u>	<u>QUANTITY</u>	<u>UOM</u>
1	SPENT GRANULATED CARBON	1	DF	65	P

I certify, on behalf of the above listed treatment facility, that to the best of my knowledge, the above described waste was managed in compliance with all applicable laws, regulations, permits and licenses on the date listed above.

PREPARED BY: _____

SIGNATURE: Patricia J. Beasley

DATE: OCT 27 2018

ATTACHMENT 4

IMPORTANT INFORMATION ABOUT YOUR

GEOTECHNICAL/ENVIRONMENTAL REPORT



Date: December 2018
To: Alaska Department of Transportation and
Public Facilities

IMPORTANT INFORMATION ABOUT YOUR GEOTECHNICAL/ENVIRONMENTAL REPORT

CONSULTING SERVICES ARE PERFORMED FOR SPECIFIC PURPOSES AND FOR SPECIFIC CLIENTS.

Consultants prepare reports to meet the specific needs of specific individuals. A report prepared for a civil engineer may not be adequate for a construction contractor or even another civil engineer. Unless indicated otherwise, your consultant prepared your report expressly for you and expressly for the purposes you indicated. No one other than you should apply this report for its intended purpose without first conferring with the consultant. No party should apply this report for any purpose other than that originally contemplated without first conferring with the consultant.

THE CONSULTANT'S REPORT IS BASED ON PROJECT-SPECIFIC FACTORS.

A geotechnical/environmental report is based on a subsurface exploration plan designed to consider a unique set of project-specific factors. Depending on the project, these may include: the general nature of the structure and property involved; its size and configuration; its historical use and practice; the location of the structure on the site and its orientation; other improvements such as access roads, parking lots, and underground utilities; and the additional risk created by scope-of-service limitations imposed by the client. To help avoid costly problems, ask the consultant to evaluate how any factors that change subsequent to the date of the report may affect the recommendations. Unless your consultant indicates otherwise, your report should not be used: (1) when the nature of the proposed project is changed (for example, if an office building will be erected instead of a parking garage, or if a refrigerated warehouse will be built instead of an unrefrigerated one, or chemicals are discovered on or near the site); (2) when the size, elevation, or configuration of the proposed project is altered; (3) when the location or orientation of the proposed project is modified; (4) when there is a change of ownership; or (5) for application to an adjacent site. Consultants cannot accept responsibility for problems that may occur if they are not consulted after factors which were considered in the development of the report have changed.

SUBSURFACE CONDITIONS CAN CHANGE.

Subsurface conditions may be affected as a result of natural processes or human activity. Because a geotechnical/environmental report is based on conditions that existed at the time of subsurface exploration, construction decisions should not be based on a report whose adequacy may have been affected by time. Ask the consultant to advise if additional tests are desirable before construction starts; for example, groundwater conditions commonly vary seasonally.

Construction operations at or adjacent to the site and natural events such as floods, earthquakes, or groundwater fluctuations may also affect subsurface conditions and, thus, the continuing adequacy of a geotechnical/environmental report. The consultant should be kept apprised of any such events, and should be consulted to determine if additional tests are necessary.

MOST RECOMMENDATIONS ARE PROFESSIONAL JUDGMENTS.

Site exploration and testing identifies actual surface and subsurface conditions only at those points where samples are taken. The data were extrapolated by your consultant, who then applied judgment to render an opinion about overall subsurface conditions. The actual interface between materials may be far more gradual or abrupt than your report indicates. Actual conditions in areas not sampled may differ from those predicted in your report. While nothing can be done to prevent such situations, you and your consultant can work together to help reduce their impacts. Retaining your consultant to observe subsurface construction operations can be particularly beneficial in this respect.

A REPORT'S CONCLUSIONS ARE PRELIMINARY.

The conclusions contained in your consultant's report are preliminary because they must be based on the assumption that conditions revealed through selective exploratory sampling are indicative of actual conditions throughout a site. Actual subsurface conditions can be discerned only during earthwork; therefore, you should retain your consultant to observe actual conditions and to provide conclusions. Only the consultant who prepared the report is fully familiar with the background information needed to determine whether or not the report's recommendations based on those conclusions are valid and whether or not the contractor is abiding by applicable recommendations. The consultant who developed your report cannot assume responsibility or liability for the adequacy of the report's recommendations if another party is retained to observe construction.

THE CONSULTANT'S REPORT IS SUBJECT TO MISINTERPRETATION.

Costly problems can occur when other design professionals develop their plans based on misinterpretation of a geotechnical/environmental report. To help avoid these problems, the consultant should be retained to work with other project design professionals to explain relevant geotechnical, geological, hydrogeological, and environmental findings, and to review the adequacy of their plans and specifications relative to these issues.

BORING LOGS AND/OR MONITORING WELL DATA SHOULD NOT BE SEPARATED FROM THE REPORT.

Final boring logs developed by the consultant are based upon interpretation of field logs (assembled by site personnel), field test results, and laboratory and/or office evaluation of field samples and data. Only final boring logs and data are customarily included in geotechnical/environmental reports. These final logs should not, under any circumstances, be redrawn for inclusion in architectural or other design drawings, because drafters may commit errors or omissions in the transfer process.

To reduce the likelihood of boring log or monitoring well misinterpretation, contractors should be given ready access to the complete geotechnical engineering/environmental report prepared or authorized for their use. If access is provided only to the report prepared for you, you should advise contractors of the report's limitations, assuming that a contractor was not one of the specific persons for whom the report was prepared, and that developing construction cost estimates was not one of the specific purposes for which it was prepared. While a contractor may gain important knowledge from a report prepared for another party, the contractor should discuss the report with your consultant and perform the additional or alternative work believed necessary to obtain the data specifically appropriate for construction cost estimating purposes. Some clients hold the mistaken impression that simply disclaiming responsibility for the accuracy of subsurface information always insulates them from attendant liability. Providing the best available information to contractors helps prevent costly construction problems and the adversarial attitudes that aggravate them to a disproportionate scale.

READ RESPONSIBILITY CLAUSES CLOSELY.

Because geotechnical/environmental engineering is based extensively on judgment and opinion, it is far less exact than other design disciplines. This situation has resulted in wholly unwarranted claims being lodged against consultants. To help prevent this problem, consultants have developed a number of clauses for use in their contracts, reports, and other documents. These responsibility clauses are not exculpatory clauses designed to transfer the consultant's liabilities to other parties; rather, they are definitive clauses that identify where the consultant's responsibilities begin and end. Their use helps all parties involved recognize their individual responsibilities and take appropriate action. Some of these definitive clauses are likely to appear in your report, and you are encouraged to read them closely. Your consultant will be pleased to give full and frank answers to your questions.

The preceding paragraphs are based on information provided by the
ASFE/Association of Engineering Firms Practicing in the Geosciences, Silver Spring, Maryland