

September 27, 2017

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## **RESTORATION**

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Subject: Bethel Youth Facility UST #1 Site Characterization – August 2017 Groundwater Monitoring Event, ADEC File No. 2407.26.016

Ms. Rodman:

Restoration Science & Engineering, LLC (RSE) is providing the following letter report for groundwater sampling of four (4) groundwater monitoring wells located at the Bethel Youth Facility (BYF) in Bethel, Alaska at 950 State Highway. This site is listed under file 2407.26.016 in the Alaska Department of Environmental Conservation (ADEC) contaminated sites database.

#### **SITE OVERVIEW**

In June 2015, a 2,000-gallon arctic diesel UST used for the BYF heating system was decommissioned and hydrocarbon-impacted soil was encountered. Diesel contaminated soil was identified on the northern end of the UST near the fill pipe and extending around the UST excavation limits. The UST excavation was extended and 50 cubic yards of diesel-impacted soil was removed for offsite treatment. Laboratory soil sample results showed that diesel range organics (DRO), gasoline range organics (GRO), benzene, toluene, ethylbenzene, and 2-methylnaphthalene soil impacts exceeded ADEC Method 2 Soil Migration to Groundwater and remain at the UST excavation limit sidewall and bottom. Since the time of this investigation, RSE understands the parking area elevation was raised through placement of additional fill.

In January of 2016, RSE performed site characterization activities which included the installation of nine (9) soil borings at the BYF. Four (4) of the nine (9) soil borings were completed as groundwater monitoring wells.

The majority of the soil sample laboratory data indicated low (below ADEC cleanup levels) or non-detect concentrations of hydrocarbons or SVOCs in soil. Samples collected from borings installed in the immediate vicinity (Borings B-4, B-5, and B-9) of the former UST location exhibited elevated levels of DRO, GRO, BTEX constituents, and the SVOC 2-Methylnaphthalene above ADEC Method 2 Migration to Groundwater Soil Cleanup Levels (MTG). PID and laboratory data suggests that elevated concentrations exist in these three borings from between

approximately 9 and 16 feet below ground surface (bgs). None of the samples collected from soil borings installed outside of the immediate vicinity of the former UST location exhibited results above ADEC cleanup levels. All groundwater and drinking water sample results were below Table C ADEC groundwater cleanup concentrations.

In August of 2016, RSE performed groundwater sampling activities at the four groundwater monitoring wells remaining on site. Groundwater samples were analyzed for diesel range organics (DRO); gasoline range organics (GRO); and benzene, toluene, ethylbenzene and total xylenes (BTEX); with semi-volatile organic compounds (SVOCs) additionally analyzed from monitoring well 4 (MW4). Results for the August 2016 show that contaminant concentrations in groundwater at the site are stable and below ADEC Table C cleanup levels.

In September of 2016, the ADEC requested RSE complete a second sampling event in August of 2017. RSE completed the requested field sampling event on August 29, 2017.

## OBJECTIVES

This field sampling event objective was to further characterize the groundwater onsite to determine if any hydrocarbon impacts are present within the groundwater.

## GROUNDWATER SAMPLING METHODS

Based upon the results of previous investigations, RSE has identified the following contaminants of potential concern (COPCs):

*Table 1. Contaminants of Potential Concern*

COPC	Matrix	COPC Abbreviation	ADEC- Approved Lab Method	ADEC Table C Groundwater Cleanup
Gasoline Range Organics	Water	GRO	AK 101	2.2 mg/L
Diesel Range Organics	Water	DRO	AK 102	1.5 mg/L
Polyaromatic Hydrocarbons	Water	PAH	EPA 8270D	Varies*
Benzene	Water	Collectively referred to as BTEX	EPA 8260	4.6 ug/L
Toluene	Water			1100 ug/L
Ethylbenzene	Water			15 ug/L
Total Xylenes	Water			190 ug/L
Volatile Organic Compounds	Water	VOCs	EPA 8260	Varies*

Note: \*Groundwater Cleanup Standards are found in 18 AAC 75, Table C

Groundwater monitoring wells MW-1 (B1), MW-3 (B3), MW-4 (B4) and MW-8 (B8) were sampled and water analyzed for the contaminants listed in Table 1. Refer to Attachment A for monitoring wells' locations.

RSE examined the condition of each well and document evidence of compromise, if any. All wells were found intact and good condition. RSE measured the depth to the bottom of each well, and the depth to groundwater. Following this observation, RSE purged three (3) well volumes from each well using peristaltic pump. The following water quality parameters were monitored using an YSI 556:

- pH
- Temperature
- Salinity
- Conductivity
- Specific Conductance
- Redox

Monitoring well purging and sampling were completed using low flow sampling methods. Water samples were collected from the 1-inch diameter wells using a peristaltic pump set to a low flow rate during purging and sampling.

One (1) sample was collected from each well and one blind duplicate (BX, blind duplicate of B4) was collected. The water samples were collected using new, dedicated tubing. The water level indicator and any other equipment that is not disposable or dedicated was decontaminated with distilled water and Alconox wash. As water samples are collected, care was taken to minimize volatile loss by excessive turbulence or air mixing. Water samples were placed directly into method specific containers and stored in a clean sample cooler chilled. Coolers will be transported under chain-of-custody to ADEC-approved laboratory, SGS North America located in Anchorage, Alaska. Table 3, below, shows the containers, preservation, and holding times for the groundwater samples:

*Table 2. Containers, Preservation, and Holding Times for Groundwater Samples*

<b>COPC</b>	<b>Matrix</b>	<b>Lab Method</b>	<b>Sample Container</b>	<b>Preservation</b>	<b>Holding Time</b>
DRO	Water	AK 102	2 x 250 mL amber glass Teflon-lined cap	HCl 0 – 6° C	7 days to extract, <40 days to analysis
GRO	Water	AK 103	3x40 mL Volatile organic analysis (VOA) vials, minimize headspace	HCl 0 – 6° C	14 days
VOCs	Water	EPA 8260	3x40 mL Volatile organic analysis (VOA) vials, minimize headspace	HCl 0 – 6° C	14 days
PAHs	Water	EPA 8270D	2x1 L amber glass jars Teflon-lined cap	HCl 0 – 6° C	7 days to extract, <40 days to analysis

## **FIELD EVENTS**

On August 28, 2017, RSE Qualified Environmental Professional (QEP), Emily Mahanna, collected groundwater samples from monitoring wells MW-1 (sample B1), MW-3 (sample B3), MW-4 (sample B4), and MW-8 (sample B8). Upon approval to the Bethel Youth Facility (BYF), RSE personnel meet with maintenance personnel to locate the wells. Monitoring wells MW-1, MW-2 and MW-3 were buried within the BYF parking are and were located using a Mag-Locator. All wells were found in good condition.

During the summer of 2017, a road was developed adjacent to the BYF parking area to provide access to a construction camp.. Monitoring well MW-1 is located within the road way, and is buried. RSE personnel hand dug and used swing ties to locate MW-1, which was found in good condition.

All monitoring wells were sampled for the analytes listed Table 1. A blind duplicate (sample BX) was taken from MW-4. Samples were collected using a peristaltic pump. A submersible pump was unable to be used because all monitoring wells are one-inch in diameter. Low flow sampling methods were employed to reduce volatile loss. ADEC project manager, Amy Rodman, was informed of the pump restrictions on August 28, 2017 while RSE personnel was in the field, and approval was given to use the peristaltic pump.

Refer to Attachment C for select site photographs.

## **RESULTS**

Groundwater samples yielded DRO concentrations ranging from 0.200 mg/L to 0.378 mg/L below the ADEC Groundwater Cleanup Level (ADEC GCL) of 1.5 mg/L DRO.

Samples MW-1, MW-3 and MW-4 yielded dichlorodifluoromethane (Freon 12) concentrations ranging from 9.98 ug/L to 38.4 ug/L, and sample MW-8 resulted in 159 ug/L dichlorodifluoromethane below the ADEC GCL of 200 ug/L dichlorodifluoromethane. Samples MW-8 and MW-4 yielded 0.520 ug/L trichlorofluoromethane (Freon 11) and 0.380 ug/L trichlorofluoromethane, respectively. The ADEC GCL for trichlorofluoromethane is 5,200 ug/L.

Sample MW-4 resulted in 0.0271 ug/L 1-methylnaphthalene, 0.0161 ug/L 2-methylnaphthalene, and 0.0513 ug/L naphthalene. The ADEC GCL for 1-methylnaphthalene, 2-methylnaphthalene, and naphthalene are as follows: 11 ug/L, 36 ug/L, and 1.7 ug/L. Sample MW-4 resulted in 0.610 ug/L 1,2,4-trimethylbenzene below the ADEC GCL of 15 ug/L.

Groundwater elevation measurements indicate the groundwater gradient consistently flows in the east-southeast direction.

Please refer to Attachment B for complete tabulated analytical results, and Attachment F for the SGS lab report.

#### **INVESTIGATIVE DERIVED WASTE**

Consumables such as tubing and gloves were placed into a trash receptacle for disposal. Non-consumables such water level indicator was decontaminated using Alconox and hot water between sampling at each well. Tubing for water samples was dedicated to each well and disposed of following use.

Purge water from the monitoring was containerized and stored onsite adjacent to a light pole, and previously collected purge water and awaits proper disposal pending laboratory results.

#### **QUALITY ASSURANCE AND QUALITY CONTROL**

RSE collected each sample in general accordance with applicable ADEC regulation and guidance documents. A single blind duplicate (BX, duplicate of B4) was submitted for four laboratory samples achieving a frequency of 25%. RSE submitted one trip blank with the cooler containing volatile samples. RSE has completed the ADEC Laboratory Review checklist (Attachment E).

Two relative percent differences (RPDs) for 1,2,4-trimethylbenzene (102%) and 2-methylnaphthalene (37%) exceeded the target of 20%. All results for 1,2,4-trimethylbenzene and 2-methylnaphthalene were below the limit of quantification and were estimates. The higher of the two results will be used for comparison purposes where results from MW-4 and MW-X differ. The data quality and usability is unaffected. All data was determined to be usable for comparison with the ADEC Table C cleanup levels.

## **CONCLUSION and RECOMMENDATIONS**

Results for the August 2016 and August 2017 displayed results show that contaminant concentrations in groundwater at the site are stable and below ADEC Table C cleanup levels. Additionally, the RSE March 2016 Site Characterization Report contained a completed Human Health Conceptual Site Model (Attachment D) indicating that all current and future receptors for soil, groundwater and air are insignificant. Based upon the stable groundwater monitoring results which are below ADEC Groundwater Cleanup Levels and the minimal risk to human health and the environment, Restoration Science and Engineering, LLC recommends all current monitoring wells be removed, and the Bethel Youth Facility be issued a determination of cleanup complete with no further action required.

Please contact Emily Mahanna at ext. 110, if you have any questions or comments. It is our pleasure to work with the ADEC on this project.

This report was prepared by an ADEC-qualified environmental professional in accordance with 18 AAC 75/78.



Emily Mahanna, EIT

**RESTORATION SCIENCE & ENGINEERING**

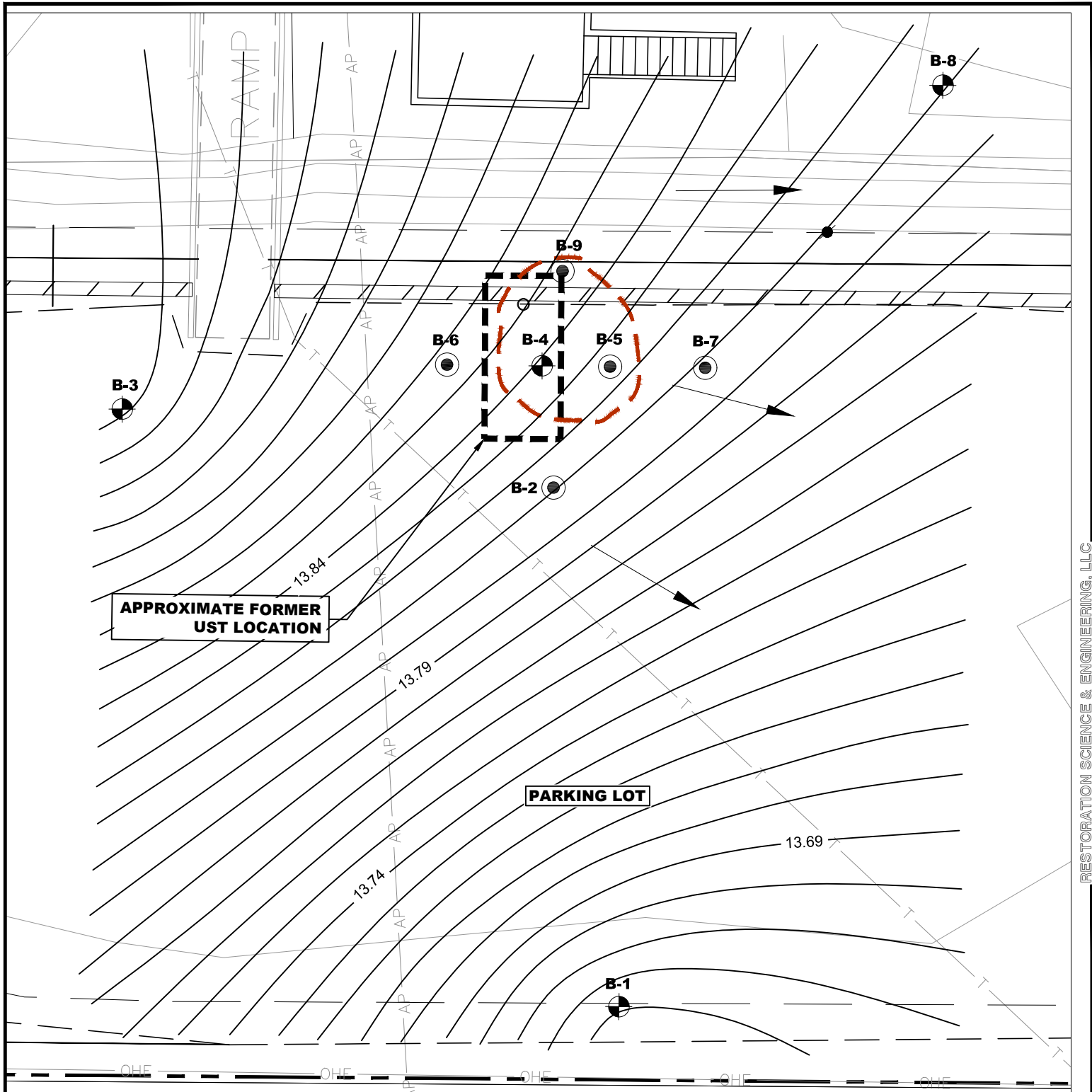
cc: David Nyman, Restoration Science & Engineering, LLC  
Mark Moon, State of Alaska Health & Social Services, DSS-Facilities Management  
Darrel Garrison, State of Alaska Health & Social Services, DJJ-BYF Support Staff

### Attachments:

- Attachment A- Figures
- Attachment B- Laboratory Results
- Attachment C- Photographs
- Attachment D- 2016 Human Health Site Conceptual Model
- Attachment E- ADEC Laboratory Data Review Checklist
- Attachment F- SGS Laboratory Report





# **ATTACHMENT A**

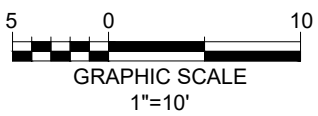
## **Figures**




RESTORATION SCIENCE & ENGINEERING, LLC

**LEGEND**

-  SOIL BORING & MONITORING WELL LOCATION
-  SOIL BORING LOCATION
-  GROUNDWATER FLOW DIRECTION
- 13.88 APPROX GROUNDWATER ELEVATION JANUARY 2016
-  ESTIMATED LIMITS OF DRO IMPACTED SOIL ABOVE ADEC METHOD 2 CLEANUP LEVELS



<b>ALASKA DEPARTMENT OF HEALTH AND SOCIAL SERVICES</b> <b>BETHEL YOUTH FACILITY</b> <b>AUGUST 2017 GROUNDWATER MONITORING REPORT</b>	
<b>GROUNDWATER GRADIENT MAP</b> <b>AUGUST 2016</b>	
<b>BETHEL, ALASKA</b>	
JOB NO: 15-1459 DATE: 9.13.2016	DRAWN: MSB CHECKED: DN
 <b>RESTORATION</b> Science & Engineering, LLC 911 West 8th Avenue, Suite 100 Anchorage, Alaska 99501 PH.(907) 278-1023 FAX (907) 277-5718	
<b>FIGURE 5</b>	



# **ATTACHMENT B**

## Laboratory Results

**Table 1**  
**Groundwater Quality Field Parameters**  
**Bethel Youth Facility**  
**August 2017 Groundwater Sampling**

GROUNDWATER QUALITY FIELD PARAMETERS													
LOCATION	DATE	DEPTH TO WATER (BGS) (feet)	DEPTH TO BOTTOM (BGS) (feet)	Water Column Depth in Well (feet)	VOLUME PURGED (gal)	TIME (hh:mm)	TOTAL WATER REMOVED (gal)	TEMPERATURE (°C)	pH (pH Units)	CONDUCTIVITY (mS/cm3)	SPECIFIC CONDUCTANCE (mS/cm)	SALINITY (ppt)	REDOX (mV)
<i>MW-RSE-3</i>													
MW- 1 (B1)	8/29/2017	17.00	22.25	5.25	2.5	13:54	1.0	2.7	5.49	0.24	0.138	0.11	96.9
						14:05	1.75	2.9	5.51	0.238	0.137	0.11	91.0
						14:10	2.5	2.97	5.51	0.238	0.138	0.11	90.7
MW-3 (B3)	8/29/2017	17.98	22.86	4.88	3	12:44	1.0	2.19	5.47	0.215	0.121	0.10	117.2
						12:51	2.0	2.41	5.4	0.214	0.122	0.10	125.5
						12:56	3.0	2.60	5.39	0.215	0.124	0.10	128.5
MW-8 (B8)	8/29/2017	13.86	19.63	5.77	2.5	10:38	1.0	2.62	4.89	0.472	0.269	0.23	53.5
						10:43	1.8	2.55	5.12	0.438	0.25	0.21	40.4
						10:49	2.5	2.49	5.18	0.414	0.236	0.20	37.3
MW-4 (B4)	8/29/2017	18.27	23.80	5.53	3	11:33	1.0	1.93	5.39	0.407	0.228	0.19	99.2
						11:42	2.0	2.08	5.38	0.418	0.235	0.20	106.5
						11:48	3.0	2.19	5.39	0.422	0.239	0.20	108.2

**NOTES:**

- 1) Water quality measurements performed using a YSI Model 556 Water Quality Me
- 2) Purging of well was done with a submersible pump.
- 3) mS/cm = microsiemens per centimeter; ppt = parts per thousand; mV = millivolts.
- 4) Purging and sampling conducted using a peristaltic pump.

**Table 2**  
**Hydrocarbons In Groundwater**  
**Bethel Youth Facility**  
**August 2017 Groundwater Sampling**

HYDROCARBONS IN GROUNDWATER								
SAMPLE ID	DATE	DIESEL RANGE ORGANICS (mg/L)	GASOLINE RANGE ORGANICS (mg/L)	BENZENE (ug/L)	TOLUENE (ug/L)	ETHYL-BENZENE (ug/L)	XYLENES (ug/L)	SGS PROJECT NO.
MW-1 (B1)	8/29/2017	<b>0.228 J</b>	0.0500 U	0.200 U	0.500 U	0.500 U	1.50 U	1176160
MW-3 (B3)	8/29/2017	<b>0.207 J</b>	0.0500 U	0.200 U	0.500 U	0.500 U	1.50 U	
MW-8 (B8)	8/29/2017	<b>0.200 J</b>	0.0500 U	0.200 U	0.500 U	0.500 U	1.50 U	
MW-4 (B4)	8/29/2017	<b>0.378 J</b>	0.0500 U	0.200 U	0.500 U	0.500 U	1.50 U	
MW-X (BX)	8/29/2017	<b>0.433 J</b>	0.0500 U	0.200 U	0.500 U	0.500 U	<b>1.36 J</b>	
<b>ADEC GROUNDWATER CLEANUP LEVELS TABLE C (18 AAC 75)</b>		<b>1.5</b>	<b>2.2</b>	<b>4.6</b>	<b>1100</b>	<b>15</b>	<b>190</b>	

NOTES:

- 1) Diesel Range Organics (DRO) samples analyzed by AK Method 102;
- Gasoline Range Organics (GRO) samples analyzed by AK Method 101; BTEX samples analyzed by EPA SW8260C
- 2) "mg/L" means "milligrams per liter"; "ug/L" means "micrograms per liter".
- 3) **Bold** font indicates the analyte was detected above the Laboratory Limit of Detection (LOD).
- 4) *Italicized* font with a U-flag indicates the analyte was not detected at the LOD; the value presented is the LOD
- 5) J flag indicates the result is an estimated value
- 6) Sample MW-X is a duplicate of sample MW-4

**Table 3**  
**Volatile Organic Compounds in Groundwater**  
**Bethel Youth Facility**  
**August 2017 Groundwater Sampling**

VOLATILE ORGANIC COMPOUND CONCENTRATIONS IN GROUNDWATER						
SAMPLE ID	MW-1 (B1)	MW-3 (B3)	MW-8 (B8)	MW-4 (B4)	MW-X (BX)	ADEC Table C
Date	8/29/2017	8/29/2017	8/29/2017	8/29/2017	8/29/2017	Groundwater
SGS Work Order	1176160	1176160	1176160	1176160	1176160	Cleanup Levels
Units	ug/L	ug/L	ug/L	ug/L	ug/L	(ug/L)
1,1,1,2-Tetrachloroethane	0.250 U	0.250 U	0.250 U	0.250 U	0.250 U	5.7
1,1,1-Trichloroethane	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	8,000
1,1,2,2-Tetrachloroethane	0.250 U	0.250 U	0.250 U	0.250 U	0.250 U	0.76
1,1,2-Trichloroethane	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.41
1,1-Dichloroethane	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	28
1,1-Dichloroethene	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	280
1,1-Dichloropropene	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	--
1,2,3-Trichlorobenzene	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	7.0
1,2,3-Trichloropropane	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.0075
1,2,4-Trichlorobenzene	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	4.0
1,2,4-Trimethylbenzene	0.500 U	0.500 U	0.500 U	<b>0.610 J</b>	<b>1.23</b>	15
1,2-Dibromo-3-chloropropane	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	--
1,2-Dibromoethane	0.0375 U	0.0375 U	0.0375 U	0.0375 U	0.0375 U	0.075
1,2-Dichlorobenzene	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	300
1,2-Dichloroethane	0.250 U	0.250 U	0.250 U	0.250 U	0.250 U	1.7
1,2-Dichloropropane	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	4.4
1,3,5-Trimethylbenzene	0.500 U	0.500 U	0.500 U	0.500 U	<b>0.370 J</b>	120
1,3-Dichlorobenzene	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	300
1,3-Dichloropropane	0.250 U	0.250 U	0.250 U	0.250 U	0.250 U	4.7
1,4-Dichlorobenzene	0.250 U	0.250 U	0.250 U	0.250 U	0.250 U	4.8
2,2-Dichloropropane	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	--
2-Butanone (MEK)	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5,600
2-Chlorotoluene	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	--
2-Hexanone	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	38
4-Chlorotoluene	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	--
4-Isopropyltoluene	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	--
4-Methyl-2-pentanone (MIBK)	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	6,300
Benzene	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	4.6
Bromobenzene	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	62
Bromochloromethane	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	--
Bromodichloromethane	0.250 U	0.250 U	0.250 U	0.250 U	0.250 U	1.3
Bromoform	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	33
Bromomethane	2.50 U	2.50 U	2.50 U	2.50 U	2.50 U	7.5
Carbon disulfide	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	810
Carbon tetrachloride	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	4.6
Chlorobenzene	0.250 U	0.250 U	0.250 U	0.250 U	0.250 U	78
Chloroethane	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	--
Chloroform	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	2.2
Chloromethane	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	190
cis-1,2-Dichloroethene	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	36
cis-1,3-Dichloropropene	0.250 U	0.250 U	0.250 U	0.250 U	0.250 U	--
Dibromochloromethane	0.250 U	0.250 U	0.250 U	0.250 U	0.250 U	8.7
Dibromomethane	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	8.3
Dichlorodifluoromethane	<b>9.52</b>	<b>8.98</b>	<b>159</b>	<b>36.5</b>	<b>38.4</b>	200
Ethylbenzene	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	15
Freon-113	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	--
Hexachlorobutadiene	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	1.4
Isopropylbenzene (Cumene)	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	450
Methylene chloride	2.50 U	2.50 U	2.50 U	2.50 U	2.50 U	110
Methyl-t-butyl ether	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	140
Naphthalene	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	1.7
n-Butylbenzene	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	1,000
n-Propylbenzene	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	--
o-Xylene	0.500 U	0.500 U	0.500 U	0.500 U	0.520 J	See Total Xylenes
P & M -Xylene	1.00 U	1.00 U	1.00 U	1.00 U	0.840 J	See Total Xylenes
sec-Butylbenzene	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	2,000
Styrene	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	1,200
tert-Butylbenzene	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	690
Tetrachloroethene	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	41
Toluene	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	1,100
trans-1,2-Dichloroethene	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	360
trans-1,3-Dichloropropene	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	4.7
Trichloroethene	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	2.8
Trichlorofluoromethane	0.500 U	0.500 U	<b>0.520 J</b>	<b>0.380 J</b>	<b>0.430 J</b>	5,200
Vinyl acetate	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	410
Vinyl chloride	0.0750 U	0.0750 U	0.0750 U	0.0750 U	0.0750 U	0.19
Xylenes (total)	1.50 U	1.50 U	1.50 U	1.50 U	<b>1.36 J</b>	190

NOTES:

- 1) Volatile organic compounds (VOC) analyses by Method EPA SW8260C
- 2) "ug/L" means "micrograms per liter"
- 3) **Bold** font indicates the analyte was detected above the laboratory Limit of Quantitation (LOQ)
- 4) *Italicized* font with a U-qualifier indicates the analyte was not detected above the limit of detection (LOD); the value presented is the LOD
- 5) J flag indicates the result is an estimated value above the Detection Limit (DL) but less than the LOQ
- 6) Sample MW-X is a duplicate of sample MW-4

**Table 4**  
**Polynuclear Aromatic Hydrocarbons in Groundwater**  
**Bethel Youth Facility**  
**August 2017 Groundwater Sampling**

POLYNUCLEAR AROMATIC HYDROCARBONS IN GROUNDWATER						
SAMPLE ID	MW-B1	MW-B3	MW-B8	MW-B4	MW-BX	ADEC TABLE C GROUNDWATER CLEANUP LEVELS
DATE	8/29/2017	8/29/2017	8/29/2017	8/29/2017	8/29/2017	
UNITS	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
1-Methylnaphthalene	<i>0.00630 U</i>	<i>0.00630 U</i>	<i>0.00625 U</i>	<b>0.0271</b>	<b>0.0250</b>	11
2-Methylnaphthalene	<i>0.00630 U</i>	<i>0.00630 U</i>	<i>0.00625 U</i>	<b>0.0161</b>	<b>0.0101 J</b>	36
Acenaphthene	<i>0.00630 U</i>	<i>0.00630 U</i>	<i>0.00625 U</i>	<i>0.00630 U</i>	<i>0.00625 U</i>	530
Acenaphthylene	<i>0.00630 U</i>	<i>0.00630 U</i>	<i>0.00625 U</i>	<i>0.00630 U</i>	<i>0.00625 U</i>	260
Anthracene	<i>0.00630 U</i>	<i>0.00630 U</i>	<i>0.00625 U</i>	<i>0.00630 U</i>	<i>0.00625 U</i>	43
Benzo(a)Anthracene	<i>0.00630 U</i>	<i>0.00630 U</i>	<i>0.00625 U</i>	<i>0.00630 U</i>	<i>0.00625 U</i>	0.12
Benzo[a]pyrene	<i>0.00252 U</i>	<i>0.00252 U</i>	<i>0.00250 U</i>	<i>0.00251 U</i>	<i>0.00250 U</i>	0.34
Benzo[b]Fluoranthene	<i>0.00630 U</i>	<i>0.00630 U</i>	<i>0.00625 U</i>	<i>0.00630 U</i>	<i>0.00625 U</i>	0.34
Benzo[g,h,i]perylene	<i>0.00630 U</i>	<i>0.00630 U</i>	<i>0.00625 U</i>	<i>0.00630 U</i>	<i>0.00625 U</i>	0.26
Benzo[k]fluoranthene	<i>0.00630 U</i>	<i>0.00630 U</i>	<i>0.00625 U</i>	<i>0.00630 U</i>	<i>0.00625 U</i>	0.8
Chrysene	<i>0.00630 U</i>	<i>0.00630 U</i>	<i>0.00625 U</i>	<i>0.00630 U</i>	<i>0.00625 U</i>	2
Dibenzo[a,h]anthracene	<i>0.00252 U</i>	<i>0.00252 U</i>	<i>0.00250 U</i>	<i>0.00251 U</i>	<i>0.00250 U</i>	0.034
Fluoranthene	<i>0.00630 U</i>	<i>0.00630 U</i>	<i>0.00625 U</i>	<i>0.00630 U</i>	<i>0.00625 U</i>	260
Fluorene	<i>0.00630 U</i>	<i>0.00630 U</i>	<i>0.00625 U</i>	<i>0.00630 U</i>	<i>0.00625 U</i>	4.3
Indeno[1,2,3-c,d] pyrene	<i>0.00630 U</i>	<i>0.00630 U</i>	<i>0.00625 U</i>	<i>0.00630 U</i>	<i>0.00625 U</i>	0.19
Naphthalene	<i>0.0127 U</i>	<i>0.0127 U</i>	<i>0.0125 U</i>	<b>0.0513</b>	<b>0.0537</b>	1.7
Phenanthrene	<i>0.0253 U</i>	<i>0.0253 U</i>	<i>0.0250 U</i>	<i>0.0251 U</i>	<i>0.0250 U</i>	170
Pyrene	<i>0.0253 U</i>	<i>0.0253 U</i>	<i>0.0250 U</i>	<i>0.0251 U</i>	<i>0.0250 U</i>	120

NOTES:

- 1) PAH analyses by Method EPA 8270D
- 2) "ug/L" means "micrograms per liter"
- 3) **Bold** font indicates the analyte was detected above the laboratory Limit of Quantitation (LOQ)
- 4) *Italicized* font with a U-qualifier indicates the analyte was not detected above the limit of detection (LOD); the value presented is the LOD
- 5) J flag indicates the result is an estimated value above the Detection Limit (DL) but less than the LOQ
- 6) Sample MW-X is a duplicate of sample MW-4

# **ATTACHMENT C**

## **Photographs**



Monitoring Well 8



Sampling MW-8



Monitoring Well 4



Sampling MW-4



Sampling Monitoring Well 3



Monitoring Well 1



Monitoring Well 1 found in good condition



Purge water placed adjacent to light pole by previous purge water.



# **ATTACHMENT D**

## **2016 Human Health Site Conceptual Model**

# Appendix A - Human Health Conceptual Site Model Scoping Form and Standardized Graphic

**Site Name:**

**File Number:**

**Completed by:**

### Introduction

The form should be used to reach agreement with the Alaska Department of Environmental Conservation (DEC) about which exposure pathways should be further investigated during site characterization. From this information, summary text about the CSM and a graphic depicting exposure pathways should be submitted with the site characterization work plan and updated as needed in later reports.

*General Instructions: Follow the italicized instructions in each section below.*

### 1. General Information:

**Sources** (*check potential sources at the site*)

- USTs
- ASTs
- Dispensers/fuel loading racks
- Drums
- Vehicles
- Landfills
- Transformers
- Other:

**Release Mechanisms** (*check potential release mechanisms at the site*)

- Spills
- Leaks
- Direct discharge
- Burning
- Other:

**Impacted Media** (*check potentially-impacted media at the site*)

- Surface soil (0-2 feet bgs\*)
- Subsurface soil (>2 feet bgs)
- Air
- Sediment
- Groundwater
- Surface water
- Biota
- Other:

**Receptors** (*check receptors that could be affected by contamination at the site*)

- Residents (adult or child)
- Commercial or industrial worker
- Construction worker
- Subsistence harvester (i.e. gathers wild foods)
- Subsistence consumer (i.e. eats wild foods)
- Site visitor
- Trespasser
- Recreational user
- Farmer
- Other:

\* bgs - below ground surface

**2. Exposure Pathways:** *(The answers to the following questions will identify complete exposure pathways at the site. Check each box where the answer to the question is "yes".)*

a) Direct Contact -


1. Incidental Soil Ingestion

Are contaminants present or potentially present in surface soil between 0 and 15 feet below the ground surface? (Contamination at deeper depths may require evaluation on a site-specific basis.)

*If the box is checked, label this pathway complete:*

Complete

Comments:

Site data indicates impacts remain at depths below nine feet bgs, including contaminant concentrations above ADEC Method 2 Cleanup Levels. Risk of direct contact is considered unlikely due to depth of impacted soil unless excavation is conducted. Impacted soil is overlain by nine feet of clean silty sandy fill. 

2. Dermal Absorption of Contaminants from Soil

Are contaminants present or potentially present in surface soil between 0 and 15 feet below the ground surface? (Contamination at deeper depths may require evaluation on a site specific basis.)

Can the soil contaminants permeate the skin (see Appendix B in the guidance document)?

*If both boxes are checked, label this pathway complete:*

Complete

Comments:

Site data indicates impacts remain at depths below nine feet bgs, including contaminant concentrations above ADEC Method 2 Cleanup Levels. Risk of direct contact is considered unlikely due to depth of impacted soil unless excavation is conducted. Impacted soil is overlain by nine feet of clean silty sandy fill.

b) Ingestion -

1. Ingestion of Groundwater

Have contaminants been detected or are they expected to be detected in the groundwater, or are contaminants expected to migrate to groundwater in the future?

Could the potentially affected groundwater be used as a current or future drinking water source? Please note, only leave the box unchecked if DEC has determined the groundwater is not a currently or reasonably expected future source of drinking water according to 18 AAC 75.350.

*If both boxes are checked, label this pathway complete:*

Complete

Comments:

Contaminants were detected in one of the four installed monitoring wells (MW4), although levels were less than 1/10th of Table C cleanup levels. Measurements indicate groundwater flow direction is easterly. YKCC drinking water well (completed to 131 feet bgs) is located 180 feet south of impact area. Most Bethel wells are completed through 300-400 foot thick permafrost layer.

## 2. Ingestion of Surface Water

Have contaminants been detected or are they expected to be detected in surface water, or are contaminants expected to migrate to surface water in the future?

Could potentially affected surface water bodies be used, currently or in the future, as a drinking water source? Consider both public water systems and private use (i.e., during residential, recreational or subsistence activities).

*If both boxes are checked, label this pathway complete:*

Incomplete

Comments:

Surface water not observed at the site. A small pond is visible in aerial photos ~950 WNW of site, and Kuskokwim River is approximately 1,900 feet ESE. Exposure pathway incomplete.

## 3. Ingestion of Wild and Farmed Foods

Is the site in an area that is used or reasonably could be used for hunting, fishing, or harvesting of wild or farmed foods?

Do the site contaminants have the potential to bioaccumulate (see Appendix C in the guidance document)?

Are site contaminants located where they would have the potential to be taken up into biota? (i.e. soil within the root zone for plants or burrowing depth for animals, in groundwater that could be connected to surface water, etc.)

*If all of the boxes are checked, label this pathway complete:*

Incomplete

Comments:

Exposure pathway incomplete.

### c) Inhalation-

#### 1. Inhalation of Outdoor Air

Are contaminants present or potentially present in surface soil between 0 and 15 feet below the ground surface? (Contamination at deeper depths may require evaluation on a site specific basis.)

Are the contaminants in soil volatile (see Appendix D in the guidance document)?

*If both boxes are checked, label this pathway complete:*

Complete

Comments:

Detected impacts are overlain by approximately 9 feet of clean soil. Risk is considered insignificant.

## 2. Inhalation of Indoor Air

Are occupied buildings on the site or reasonably expected to be occupied or placed on the site in an area that could be affected by contaminant vapors? (within 30 horizontal or vertical feet of petroleum contaminated soil or groundwater; within 100 feet of non-petroleum contaminated soil or groundwater; or subject to "preferential pathways," which promote easy airflow like utility conduits or rock fractures)



Are volatile compounds present in soil or groundwater (see Appendix D in the guidance document)?



*If both boxes are checked, label this pathway complete:*

Complete

### Comments:

Detected impacts are overlain by approximately 9 feet of clean soil. Building is elevated on pilings with free air flow beneath the building. Risk is considered insignificant.

**3. Additional Exposure Pathways:** *(Although there are no definitive questions provided in this section, these exposure pathways should also be considered at each site. Use the guidelines provided below to determine if further evaluation of each pathway is warranted.)*

**Dermal Exposure to Contaminants in Groundwater and Surface Water**

Dermal exposure to contaminants in groundwater and surface water may be a complete pathway if:

- Climate permits recreational use of waters for swimming.
- Climate permits exposure to groundwater during activities, such as construction.
- Groundwater or surface water is used for household purposes, such as bathing or cleaning.

Generally, DEC groundwater cleanup levels in 18 AAC 75, Table C, are assumed to be protective of this pathway.

*Check the box if further evaluation of this pathway is needed:*

Comments:

**Inhalation of Volatile Compounds in Tap Water**

Inhalation of volatile compounds in tap water may be a complete pathway if:

- The contaminated water is used for indoor household purposes such as showering, laundering, and dish washing.
- The contaminants of concern are volatile (common volatile contaminants are listed in Appendix D in the guidance document.)

Generally, DEC groundwater cleanup levels in 18 AAC 75, Table C, are assumed to be protective of this pathway.

*Check the box if further evaluation of this pathway is needed:*

Comments:

## Inhalation of Fugitive Dust

Inhalation of fugitive dust may be a complete pathway if:

- Nonvolatile compounds are found in the top 2 centimeters of soil. The top 2 centimeters of soil are likely to be dispersed in the wind as dust particles.
- Dust particles are less than 10 micrometers (Particulate Matter - PM<sub>10</sub>). Particles of this size are called respirable particles and can reach the pulmonary parts of the lungs when inhaled.
- Chromium is present in soil that can be dispersed as dust particles of any size.

Generally, DEC direct contact soil cleanup levels in Table B1 of 18 AAC 75 are protective of this pathway because it is assumed most dust particles are incidentally ingested instead of inhaled to the lower lungs. The inhalation pathway only needs to be evaluated when very small dust particles are present (e.g., along a dirt roadway or where dusts are a nuisance). This is not true in the case of chromium. Site specific cleanup levels will need to be calculated in the event that inhalation of dust containing chromium is a complete pathway at a site.

*Check the box if further evaluation of this pathway is needed:*

Comments:

## Direct Contact with Sediment

This pathway involves people's hands being exposed to sediment, such as during some recreational, subsistence, or industrial activity. People then incidentally ingest sediment from normal hand-to-mouth activities. In addition, dermal absorption of contaminants may be of concern if the the contaminants are able to permeate the skin (see Appendix B in the guidance document). This type of exposure should be investigated if:

- Climate permits recreational activities around sediment.
- The community has identified subsistence or recreational activities that would result in exposure to the sediment, such as clam digging.

Generally, DEC direct contact soil cleanup levels in 18 AAC 75, Table B1, are assumed to be protective of direct contact with sediment.

*Check the box if further evaluation of this pathway is needed:*

Comments:

**4. Other Comments** (*Provide other comments as necessary to support the information provided in this form.*)



# HUMAN HEALTH CONCEPTUAL SITE MODEL GRAPHIC FORM

Site: Bethel Youth Facility  
ADEC File No. 2407.26.016

Completed By: Emily Mahanna, RSE  
 Date Completed: September 21, 2017

**Instructions:** Follow the numbered directions below. Do not consider contaminant concentrations or engineering/land use controls when describing pathways.

**(1)** Check the media that could be directly affected by the release.

**(2)** For each medium identified in (1), follow the top arrow and check possible transport mechanisms. Check additional media under (1) if the media acts as a secondary source.

Media	Transport Mechanisms
<input type="checkbox"/> Surface Soil (0-2 ft bgs)	<input type="checkbox"/> Direct release to surface soil <i>check soil</i> <input type="checkbox"/> Migration to subsurface <i>check soil</i> <input type="checkbox"/> Migration to groundwater <i>check groundwater</i> <input type="checkbox"/> Volatilization <i>check air</i> <input type="checkbox"/> Runoff or erosion <i>check surface water</i> <input type="checkbox"/> Uptake by plants or animals <i>check biota</i> <input type="checkbox"/> Other (list): _____
<input checked="" type="checkbox"/> Subsurface Soil (2-15 ft bgs)	<input checked="" type="checkbox"/> Direct release to subsurface soil <i>check soil</i> <input checked="" type="checkbox"/> Migration to groundwater <i>check groundwater</i> <input checked="" type="checkbox"/> Volatilization <i>check air</i> <input type="checkbox"/> Uptake by plants or animals <i>check biota</i> <input type="checkbox"/> Other (list): _____
<input checked="" type="checkbox"/> Ground-water	<input checked="" type="checkbox"/> Direct release to groundwater <i>check groundwater</i> <input type="checkbox"/> Volatilization <i>check air</i> <input type="checkbox"/> Flow to surface water body <i>check surface water</i> <input type="checkbox"/> Flow to sediment <i>check sediment</i> <input type="checkbox"/> Uptake by plants or animals <i>check biota</i> <input type="checkbox"/> Other (list): _____
<input type="checkbox"/> Surface Water	<input type="checkbox"/> Direct release to surface water <i>check surface water</i> <input type="checkbox"/> Volatilization <i>check air</i> <input type="checkbox"/> Sedimentation <i>check sediment</i> <input type="checkbox"/> Uptake by plants or animals <i>check biota</i> <input type="checkbox"/> Other (list): _____
<input type="checkbox"/> Sediment	<input type="checkbox"/> Direct release to sediment <i>check sediment</i> <input type="checkbox"/> Resuspension, runoff, or erosion <i>check surface water</i> <input type="checkbox"/> Uptake by plants or animals <i>check biota</i> <input type="checkbox"/> Other (list): _____

**(3)** Check all exposure media identified in (2).

**(4)** Check all pathways that could be complete. The pathways identified in this column **must** agree with Sections 2 and 3 of the Human Health CSM Scoping Form.

**(5)** Identify the receptors potentially affected by each exposure pathway: Enter "C" for current receptors, "F" for future receptors, "C/F" for both current and future receptors, or "I" for insignificant exposure.

### Current & Future Receptors

Exposure Media	Exposure Pathway/Route	Residents (adults or children)	Commercial or Industrial workers	Site visitors, trespassers, or recreational users	Construction workers	Farmers or subsistence harvesters	Subsistence consumers	Other
<input checked="" type="checkbox"/> soil	<input checked="" type="checkbox"/> Incidental Soil Ingestion <input checked="" type="checkbox"/> Dermal Absorption of Contaminants from Soil <input type="checkbox"/> Inhalation of Fugitive Dust							
<input checked="" type="checkbox"/> groundwater	<input checked="" type="checkbox"/> Ingestion of Groundwater <input type="checkbox"/> Dermal Absorption of Contaminants in Groundwater <input type="checkbox"/> Inhalation of Volatile Compounds in Tap Water							
<input checked="" type="checkbox"/> air	<input checked="" type="checkbox"/> Inhalation of Outdoor Air <input checked="" type="checkbox"/> Inhalation of Indoor Air <input type="checkbox"/> Inhalation of Fugitive Dust							
<input type="checkbox"/> surface water	<input type="checkbox"/> Ingestion of Surface Water <input type="checkbox"/> Dermal Absorption of Contaminants in Surface Water <input type="checkbox"/> Inhalation of Volatile Compounds in Tap Water							
<input type="checkbox"/> sediment	<input type="checkbox"/> Direct Contact with Sediment							
<input type="checkbox"/> biota	<input type="checkbox"/> Ingestion of Wild or Farmed Foods							

# **ATTACHMENT E**

## **ADEC Laboratory Checklist**

## Laboratory Data Review Checklist

Completed by:

Title:  Date:

CS Report Name:  Report Date:

Consultant Firm:

Laboratory Name:  Laboratory Report Number:

ADEC File Number:  ADEC RecKey Number:

### 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:

### 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 ( $4^{\circ} \pm 2^{\circ}$  C)?  
 Yes  No  NA (Please explain.)      Comments:

- b. Sample preservation acceptable – acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?  
 Yes  No  NA (Please explain.)      Comments:

Version 2.7

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

Yes  No  NA (Please explain.)                      Comments:

All samples were received in good condition.

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

Yes  No  NA (Please explain.)                      Comments:

Sample temperature was 7.6C upon delivery, and RSE requested analysis to proceed.

e. Data quality or usability affected? (Please explain.)

Comments:

Data quality and usability was not affected due to the slightly elevated temperatures because all results were well below applicable ADEC standards.

#### 4. Case Narrative

a. Present and understandable?

Yes  No  NA (Please explain.)                      Comments:

The case narrative is present and understandable on page 2 of the lab report.

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

Yes  No  NA (Please explain.)                      Comments:

The case narrative did not note any QC failures.

c. Were all corrective actions documented?

Yes  No  NA (Please explain.)                      Comments:

No corrective actions were required.

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

Comments:

There is no effect on data quality and usability.

#### 5. Samples Results

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

Yes  No  NA (Please explain.)                      Comments:

The correct analyses were performed and reported as requested on the COC.

All holding times were met.

b. All applicable holding times met?

Yes  No  NA (Please explain.)

Comments:

c. All soils reported on a dry weight basis?

Yes  No  NA (Please explain.)

Comments:

All samples were water.

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

Yes  No  NA (Please explain.)

Comments:

SGS refers to the PQL as the LOQ and reports data below the PQL but above the detection limit (DL) as estimated results with a "J". Constituents that were analyzed for but not detected are reported as a value equal to 2 times the DL and flagged with a "U". All PQLs were below the cleanup level.

e. Data quality or usability affected?

Comments:

There is no effect on data quality or usability.

## 6. QC Samples

a. Method Blank

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

Yes  No  NA (Please explain.)

Comments:

There is one method blank for each requested analyses and matrix per 20 samples submitted.

ii. All method blank results less than PQL?

Yes  No  NA (Please explain.)

Comments:

All method blank results are less than the LOQ (PQL).

iii. If above PQL, what samples are affected?

Comments:

No method blank samples were reported above the LOQ (PQL).

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

Yes  No  NA (Please explain.)

Comments:

No method blank samples were reported above the LOQ (PQL).

v. Data quality or usability affected? (Please explain.)

Data quality or usability was not affected.

c. 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:

One LCS and LCSDs were performed per analysis (less than 20 samples submitted).

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

Yes  No  NA (Please explain.)                      Comments:

No metal or inorganic analysis were completed.

- 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:

All percent recoveries were within method and laboratory limits.

- iv. Precision – All relative percent differences (RPD) 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%; all other analyses see the laboratory QC pages)

Yes  No  NA (Please explain.)                      Comments:

All RPDs reported were less than method and laboratory limits.

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

Comments:

N/A, All RPDs were reported within laboratory limits.

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

Yes  No  NA (Please explain.)                      Comments:

Data flags are clearly defined and described in the case narrative. In the exceedances described above, data is flagged with an asterisks (\*).

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

Comments:

No corrective actions were required.

d. Surrogates – Organics Only

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

Surrogate recoveries are reported for all organic analyses.

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:

All %R were reported and within limits.

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

Yes  No  NA (Please explain.)                      Comments:

No samples had failed surrogate recoveries.

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

Comments:

Data quality or usability not affected

e. Trip blank – Volatile analyses only (GRO, BTEX, Volatile Chlorinated Solvents, etc.): Water and Soil

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

Yes  No  NA (Please explain.)                      Comments:

One trip blank included per sample cooler containing volatile samples (2).

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

Yes  No  NA (Please explain.)                      Comments:

Trip blank is clearly indicated on the COC.

iii. All results less than PQL?

Yes  No  NA (Please explain.)                      Comments:

All results are non-detect at the LOQ (PQL).

iv. If above PQL, what samples are affected?

Comments:

No affected samples.

v. Data quality or usability affected? (Please explain.)

Comments:

Data quality and usability not affected.

f. Field Duplicate

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

Yes  No  NA (Please explain.)      Comments:

Bx is a duplicate of B4.

ii. Submitted blind to lab?

Yes  No  NA (Please explain.)      Comments:

Duplicate samples were submitted blind to the lab.

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

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

Where  $R_1$  = Sample Concentration

$R_2$  = Field Duplicate Concentration

Yes  No  NA (Please explain.)      Comments:

Two relative percent differences (RPDs) for 1,2,4-trimethylbenzene (102%) and 2-methylnaphthalene (37%) exceeded the target of 20%.

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

Comments:

Data quality or usability is not affected. Where values differ, the higher value will be used for comparison purposes.

g. Decontamination or Equipment Blank (If not used explain why).

Yes  No  NA (Please explain.)      Comments:

All equipment used in sampling was dedicated toward the specific sample. No decontamination procedures were employed.

i. All results less than PQL?

Yes  No  NA (Please explain.)      Comments:

There are no decontamination or equipment blanks.

ii. If above PQL, what samples are affected?

Comments:

There are no decontamination equipment blanks.



iii. Data quality or usability affected? (Please explain.)

Comments:

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

a. Defined and appropriate?

Yes  No  NA (Please explain.)

Comments:

Data flags and qualifiers are defined appropriately. Page 4 of the lab report describes the qualifiers used.

# **ATTACHMENT F**

## **SGS Laboratory Report**



## Laboratory Report of Analysis

To: Restoration Science & Eng  
911 West 8th Ave Suite 100  
Anchorage, AK 99501  
(907)278-1023

Report Number: **1176160**

Client Project: **Bethel Youth Facility 15-1459**

Dear Emily Mahanna,

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 Chuck 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.

---

Chuck Homestead  
Project Manager  
Charles.Homestead@sgs.com

Date

Print Date: 09/11/2017 10:35:52AM

## Case Narrative

SGS Client: **Restoration Science & Eng**  
SGS Project: **1176160**  
Project Name/Site: **Bethel Youth Facility 15-1459**  
Project Contact: **Emily Mahanna**  
NPDES/APDES#: **15-1459**

Refer to sample receipt form for information on sample condition.

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

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## 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.

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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) & UST-005 (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>
B1	1176160001	08/29/2017	08/30/2017	Water (Surface, Eff., Ground)
B3	1176160002	08/29/2017	08/30/2017	Water (Surface, Eff., Ground)
B8	1176160003	08/29/2017	08/30/2017	Water (Surface, Eff., Ground)
B4	1176160004	08/29/2017	08/30/2017	Water (Surface, Eff., Ground)
BX	1176160005	08/29/2017	08/30/2017	Water (Surface, Eff., Ground)
Trip Blank	1176160006	08/29/2017	08/30/2017	Water (Surface, Eff., Ground)

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

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### Detectable Results Summary

Client Sample ID: **B1**  
 Lab Sample ID: 1176160001  
**Semivolatile Organic Fuels**  
**Volatile GC/MS**

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	0.228J	mg/L
Dichlorodifluoromethane	9.52	ug/L

Client Sample ID: **B3**  
 Lab Sample ID: 1176160002  
**Semivolatile Organic Fuels**  
**Volatile GC/MS**

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	0.207J	mg/L
Dichlorodifluoromethane	8.98	ug/L

Client Sample ID: **B8**  
 Lab Sample ID: 1176160003  
**Semivolatile Organic Fuels**  
**Volatile GC/MS**

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	0.200J	mg/L
Dichlorodifluoromethane	159	ug/L
Trichlorofluoromethane	0.520J	ug/L

Client Sample ID: **B4**  
 Lab Sample ID: 1176160004  
**Polynuclear Aromatics GC/MS**

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
1-Methylnaphthalene	0.0271	ug/L
2-Methylnaphthalene	0.0161	ug/L
Naphthalene	0.0513	ug/L
Diesel Range Organics	0.378J	mg/L
1,2,4-Trimethylbenzene	0.610J	ug/L
Dichlorodifluoromethane	36.5	ug/L
Trichlorofluoromethane	0.380J	ug/L

**Semivolatile Organic Fuels**  
**Volatile GC/MS**

Client Sample ID: **BX**  
 Lab Sample ID: 1176160005  
**Polynuclear Aromatics GC/MS**

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
1-Methylnaphthalene	0.0250	ug/L
2-Methylnaphthalene	0.0101J	ug/L
Naphthalene	0.0537	ug/L
Diesel Range Organics	0.433J	mg/L
1,2,4-Trimethylbenzene	1.23	ug/L
1,3,5-Trimethylbenzene	0.370J	ug/L
Dichlorodifluoromethane	38.4	ug/L
o-Xylene	0.520J	ug/L
P & M -Xylene	0.840J	ug/L
Trichlorofluoromethane	0.430J	ug/L
Xylenes (total)	1.36J	ug/L

**Semivolatile Organic Fuels**  
**Volatile GC/MS**



Results of B1

Client Sample ID: B1
Client Project ID: Bethel Youth Facility 15-1459
Lab Sample ID: 1176160001
Lab Project ID: 1176160

Collection Date: 08/29/17 14:15
Received Date: 08/30/17 10:45
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 standards.

Batch Information

Analytical Batch: XMS10383
Analytical Method: 8270D SIM (PAH)
Analyst: DSD
Analytical Date/Time: 09/07/17 17:58
Container ID: 1176160001-I

Prep Batch: XXX38329
Prep Method: SW3520C
Prep Date/Time: 09/03/17 09:01
Prep Initial Wt./Vol.: 990 mL
Prep Extract Vol: 1 mL





**Results of B1**

Client Sample ID: **B1**  
Client Project ID: **Bethel Youth Facility 15-1459**  
Lab Sample ID: 1176160001  
Lab Project ID: 1176160

Collection Date: 08/29/17 14:15  
Received Date: 08/30/17 10:45  
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	0.228 J	0.566	0.170	mg/L	1		09/01/17 20:21
<b>Surrogates</b>							
5a Androstane (surr)	81.1	50-150		%	1		09/01/17 20:21

**Batch Information**

Analytical Batch: XFC13751  
Analytical Method: AK102  
Analyst: JMG  
Analytical Date/Time: 09/01/17 20:21  
Container ID: 1176160001-G

Prep Batch: XXX38305  
Prep Method: SW3520C  
Prep Date/Time: 08/31/17 09:11  
Prep Initial Wt./Vol.: 265 mL  
Prep Extract Vol: 1 mL



**Results of B1**

Client Sample ID: **B1**  
Client Project ID: **Bethel Youth Facility 15-1459**  
Lab Sample ID: 1176160001  
Lab Project ID: 1176160

Collection Date: 08/29/17 14:15  
Received Date: 08/30/17 10:45  
Matrix: Water (Surface, Eff., Ground)  
Solids (%):  
Location:

**Results by Volatile 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>
Gasoline Range Organics	0.0500 U	0.100	0.0310	mg/L	1		08/31/17 15:08
<b>Surrogates</b>							
4-Bromofluorobenzene (surr)	90.6	50-150		%	1		08/31/17 15:08

**Batch Information**

Analytical Batch: VFC13848  
Analytical Method: AK101  
Analyst: ST  
Analytical Date/Time: 08/31/17 15:08  
Container ID: 1176160001-A

Prep Batch: VXX31190  
Prep Method: SW5030B  
Prep Date/Time: 08/31/17 08:00  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL



Results of B1

Client Sample ID: B1
Client Project ID: Bethel Youth Facility 15-1459
Lab Sample ID: 1176160001
Lab Project ID: 1176160

Collection Date: 08/29/17 14:15
Received Date: 08/30/17 10:45
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 B1**

Client Sample ID: **B1**  
 Client Project ID: **Bethel Youth Facility 15-1459**  
 Lab Sample ID: 1176160001  
 Lab Project ID: 1176160

Collection Date: 08/29/17 14:15  
 Received Date: 08/30/17 10:45  
 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		09/07/17 21:45
Chloromethane	0.500 U	1.00	0.310	ug/L	1		09/07/17 21:45
cis-1,2-Dichloroethene	0.500 U	1.00	0.310	ug/L	1		09/07/17 21:45
cis-1,3-Dichloropropene	0.250 U	0.500	0.150	ug/L	1		09/07/17 21:45
Dibromochloromethane	0.250 U	0.500	0.150	ug/L	1		09/07/17 21:45
Dibromomethane	0.500 U	1.00	0.310	ug/L	1		09/07/17 21:45
Dichlorodifluoromethane	9.52	1.00	0.310	ug/L	1		09/07/17 21:45
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		09/07/17 21:45
Freon-113	5.00 U	10.0	3.10	ug/L	1		09/07/17 21:45
Hexachlorobutadiene	0.500 U	1.00	0.310	ug/L	1		09/07/17 21:45
Isopropylbenzene (Cumene)	0.500 U	1.00	0.310	ug/L	1		09/07/17 21:45
Methylene chloride	2.50 U	5.00	1.00	ug/L	1		09/07/17 21:45
Methyl-t-butyl ether	5.00 U	10.0	3.10	ug/L	1		09/07/17 21:45
Naphthalene	0.500 U	1.00	0.310	ug/L	1		09/07/17 21:45
n-Butylbenzene	0.500 U	1.00	0.310	ug/L	1		09/07/17 21:45
n-Propylbenzene	0.500 U	1.00	0.310	ug/L	1		09/07/17 21:45
o-Xylene	0.500 U	1.00	0.310	ug/L	1		09/07/17 21:45
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		09/07/17 21:45
sec-Butylbenzene	0.500 U	1.00	0.310	ug/L	1		09/07/17 21:45
Styrene	0.500 U	1.00	0.310	ug/L	1		09/07/17 21:45
tert-Butylbenzene	0.500 U	1.00	0.310	ug/L	1		09/07/17 21:45
Tetrachloroethene	0.500 U	1.00	0.310	ug/L	1		09/07/17 21:45
Toluene	0.500 U	1.00	0.310	ug/L	1		09/07/17 21:45
trans-1,2-Dichloroethene	0.500 U	1.00	0.310	ug/L	1		09/07/17 21:45
trans-1,3-Dichloropropene	0.500 U	1.00	0.310	ug/L	1		09/07/17 21:45
Trichloroethene	0.500 U	1.00	0.310	ug/L	1		09/07/17 21:45
Trichlorofluoromethane	0.500 U	1.00	0.310	ug/L	1		09/07/17 21:45
Vinyl acetate	5.00 U	10.0	3.10	ug/L	1		09/07/17 21:45
Vinyl chloride	0.0750 U	0.150	0.0500	ug/L	1		09/07/17 21:45
Xylenes (total)	1.50 U	3.00	1.00	ug/L	1		09/07/17 21:45
<b>Surrogates</b>							
4-Bromofluorobenzene (surr)	110	85-114		%	1		09/07/17 21:45
Toluene-d8 (surr)	93.5	89-112		%	1		09/07/17 21:45



**Results of B1**

Client Sample ID: **B1**  
Client Project ID: **Bethel Youth Facility 15-1459**  
Lab Sample ID: 1176160001  
Lab Project ID: 1176160

Collection Date: 08/29/17 14:15  
Received Date: 08/30/17 10:45  
Matrix: Water (Surface, Eff., Ground)  
Solids (%):  
Location:

**Results by Volatile GC/MS**

**Batch Information**

Analytical Batch: VMS17149  
Analytical Method: SW8260C  
Analyst: FDR  
Analytical Date/Time: 09/07/17 21:45  
Container ID: 1176160001-D

Prep Batch: VXX31241  
Prep Method: SW5030B  
Prep Date/Time: 09/07/17 00:00  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL



Results of B3

Client Sample ID: B3
Client Project ID: Bethel Youth Facility 15-1459
Lab Sample ID: 1176160002
Lab Project ID: 1176160

Collection Date: 08/29/17 13:00
Received Date: 08/30/17 10:45
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: XMS10383
Analytical Method: 8270D SIM (PAH)
Analyst: DSD
Analytical Date/Time: 09/07/17 18:18
Container ID: 1176160002-I

Prep Batch: XXX38329
Prep Method: SW3520C
Prep Date/Time: 09/03/17 09:01
Prep Initial Wt./Vol.: 990 mL
Prep Extract Vol: 1 mL



**Results of B3**

Client Sample ID: **B3**  
Client Project ID: **Bethel Youth Facility 15-1459**  
Lab Sample ID: 1176160002  
Lab Project ID: 1176160

Collection Date: 08/29/17 13:00  
Received Date: 08/30/17 10:45  
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	0.207 J	0.556	0.167	mg/L	1		09/01/17 20:31
<b>Surrogates</b>							
5a Androstane (surr)	82.8	50-150		%	1		09/01/17 20:31

**Batch Information**

Analytical Batch: XFC13751  
Analytical Method: AK102  
Analyst: JMG  
Analytical Date/Time: 09/01/17 20:31  
Container ID: 1176160002-G

Prep Batch: XXX38305  
Prep Method: SW3520C  
Prep Date/Time: 08/31/17 09:11  
Prep Initial Wt./Vol.: 270 mL  
Prep Extract Vol: 1 mL



**Results of B3**

Client Sample ID: **B3**  
Client Project ID: **Bethel Youth Facility 15-1459**  
Lab Sample ID: 1176160002  
Lab Project ID: 1176160

Collection Date: 08/29/17 13:00  
Received Date: 08/30/17 10:45  
Matrix: Water (Surface, Eff., Ground)  
Solids (%):  
Location:

**Results by Volatile 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>
Gasoline Range Organics	0.0500 U	0.100	0.0310	mg/L	1		08/31/17 15:28
<b>Surrogates</b>							
4-Bromofluorobenzene (surr)	93.5	50-150		%	1		08/31/17 15:28

**Batch Information**

Analytical Batch: VFC13848  
Analytical Method: AK101  
Analyst: ST  
Analytical Date/Time: 08/31/17 15:28  
Container ID: 1176160002-A

Prep Batch: VXX31190  
Prep Method: SW5030B  
Prep Date/Time: 08/31/17 08:00  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL





Results of B3

Client Sample ID: B3
Client Project ID: Bethel Youth Facility 15-1459
Lab Sample ID: 1176160002
Lab Project ID: 1176160

Collection Date: 08/29/17 13:00
Received Date: 08/30/17 10:45
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 B3

Client Sample ID: B3
Client Project ID: Bethel Youth Facility 15-1459
Lab Sample ID: 1176160002
Lab Project ID: 1176160

Collection Date: 08/29/17 13:00
Received Date: 08/30/17 10:45
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 B3**

Client Sample ID: **B3**  
Client Project ID: **Bethel Youth Facility 15-1459**  
Lab Sample ID: 1176160002  
Lab Project ID: 1176160

Collection Date: 08/29/17 13:00  
Received Date: 08/30/17 10:45  
Matrix: Water (Surface, Eff., Ground)  
Solids (%):  
Location:

**Results by Volatile GC/MS**

**Batch Information**

Analytical Batch: VMS17149  
Analytical Method: SW8260C  
Analyst: FDR  
Analytical Date/Time: 09/07/17 22:02  
Container ID: 1176160002-D

Prep Batch: VXX31241  
Prep Method: SW5030B  
Prep Date/Time: 09/07/17 00:00  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL



**Results of B8**

Client Sample ID: **B8**  
Client Project ID: **Bethel Youth Facility 15-1459**  
Lab Sample ID: 1176160003  
Lab Project ID: 1176160

Collection Date: 08/29/17 11:15  
Received Date: 08/30/17 10:45  
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	0.00625 U	0.0125	0.00370	ug/L	1		09/07/17 18:39
2-Methylnaphthalene	0.00625 U	0.0125	0.00370	ug/L	1		09/07/17 18:39
Acenaphthene	0.00625 U	0.0125	0.00370	ug/L	1		09/07/17 18:39
Acenaphthylene	0.00625 U	0.0125	0.00370	ug/L	1		09/07/17 18:39
Anthracene	0.00625 U	0.0125	0.00370	ug/L	1		09/07/17 18:39
Benzo(a)Anthracene	0.00625 U	0.0125	0.00370	ug/L	1		09/07/17 18:39
Benzo[a]pyrene	0.00250 U	0.00500	0.00150	ug/L	1		09/07/17 18:39
Benzo[b]Fluoranthene	0.00625 U	0.0125	0.00370	ug/L	1		09/07/17 18:39
Benzo[g,h,i]perylene	0.00625 U	0.0125	0.00370	ug/L	1		09/07/17 18:39
Benzo[k]fluoranthene	0.00625 U	0.0125	0.00370	ug/L	1		09/07/17 18:39
Chrysene	0.00625 U	0.0125	0.00370	ug/L	1		09/07/17 18:39
Dibenzo[a,h]anthracene	0.00250 U	0.00500	0.00150	ug/L	1		09/07/17 18:39
Fluoranthene	0.00625 U	0.0125	0.00370	ug/L	1		09/07/17 18:39
Fluorene	0.00625 U	0.0125	0.00370	ug/L	1		09/07/17 18:39
Indeno[1,2,3-c,d] pyrene	0.00625 U	0.0125	0.00370	ug/L	1		09/07/17 18:39
Naphthalene	0.0125 U	0.0250	0.00780	ug/L	1		09/07/17 18:39
Phenanthrene	0.0250 U	0.0500	0.00370	ug/L	1		09/07/17 18:39
Pyrene	0.0250 U	0.0500	0.00370	ug/L	1		09/07/17 18:39
<b>Surrogates</b>							
2-Methylnaphthalene-d10 (surr)	73.3	47-106		%	1		09/07/17 18:39
Fluoranthene-d10 (surr)	72.8	24-116		%	1		09/07/17 18:39

**Batch Information**

Analytical Batch: XMS10383  
Analytical Method: 8270D SIM (PAH)  
Analyst: DSD  
Analytical Date/Time: 09/07/17 18:39  
Container ID: 1176160003-I

Prep Batch: XXX38329  
Prep Method: SW3520C  
Prep Date/Time: 09/03/17 09:01  
Prep Initial Wt./Vol.: 1000 mL  
Prep Extract Vol: 1 mL



**Results of B8**

Client Sample ID: **B8**  
Client Project ID: **Bethel Youth Facility 15-1459**  
Lab Sample ID: 1176160003  
Lab Project ID: 1176160

Collection Date: 08/29/17 11:15  
Received Date: 08/30/17 10:45  
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	0.200 J	0.566	0.170	mg/L	1		09/01/17 20:42
<b>Surrogates</b>							
5a Androstane (surr)	80.3	50-150		%	1		09/01/17 20:42

**Batch Information**

Analytical Batch: XFC13751  
Analytical Method: AK102  
Analyst: JMG  
Analytical Date/Time: 09/01/17 20:42  
Container ID: 1176160003-G

Prep Batch: XXX38305  
Prep Method: SW3520C  
Prep Date/Time: 08/31/17 09:11  
Prep Initial Wt./Vol.: 265 mL  
Prep Extract Vol: 1 mL



**Results of B8**

Client Sample ID: **B8**  
Client Project ID: **Bethel Youth Facility 15-1459**  
Lab Sample ID: 1176160003  
Lab Project ID: 1176160

Collection Date: 08/29/17 11:15  
Received Date: 08/30/17 10:45  
Matrix: Water (Surface, Eff., Ground)  
Solids (%):  
Location:

**Results by Volatile 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>
Gasoline Range Organics	0.0500 U	0.100	0.0310	mg/L	1		08/31/17 15:47
<b>Surrogates</b>							
4-Bromofluorobenzene (surr)	90.6	50-150		%	1		08/31/17 15:47

**Batch Information**

Analytical Batch: VFC13848  
Analytical Method: AK101  
Analyst: ST  
Analytical Date/Time: 08/31/17 15:47  
Container ID: 1176160003-A

Prep Batch: VXX31190  
Prep Method: SW5030B  
Prep Date/Time: 08/31/17 08:00  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL



Results of B8

Client Sample ID: B8
Client Project ID: Bethel Youth Facility 15-1459
Lab Sample ID: 1176160003
Lab Project ID: 1176160

Collection Date: 08/29/17 11:15
Received Date: 08/30/17 10:45
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 B8

Client Sample ID: **B8**  
 Client Project ID: **Bethel Youth Facility 15-1459**  
 Lab Sample ID: 1176160003  
 Lab Project ID: 1176160

Collection Date: 08/29/17 11:15  
 Received Date: 08/30/17 10:45  
 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		09/07/17 22:20
Chloromethane	0.500 U	1.00	0.310	ug/L	1		09/07/17 22:20
cis-1,2-Dichloroethene	0.500 U	1.00	0.310	ug/L	1		09/07/17 22:20
cis-1,3-Dichloropropene	0.250 U	0.500	0.150	ug/L	1		09/07/17 22:20
Dibromochloromethane	0.250 U	0.500	0.150	ug/L	1		09/07/17 22:20
Dibromomethane	0.500 U	1.00	0.310	ug/L	1		09/07/17 22:20
Dichlorodifluoromethane	159	10.0	3.10	ug/L	10		09/08/17 18:53
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		09/07/17 22:20
Freon-113	5.00 U	10.0	3.10	ug/L	1		09/07/17 22:20
Hexachlorobutadiene	0.500 U	1.00	0.310	ug/L	1		09/07/17 22:20
Isopropylbenzene (Cumene)	0.500 U	1.00	0.310	ug/L	1		09/07/17 22:20
Methylene chloride	2.50 U	5.00	1.00	ug/L	1		09/07/17 22:20
Methyl-t-butyl ether	5.00 U	10.0	3.10	ug/L	1		09/07/17 22:20
Naphthalene	0.500 U	1.00	0.310	ug/L	1		09/07/17 22:20
n-Butylbenzene	0.500 U	1.00	0.310	ug/L	1		09/07/17 22:20
n-Propylbenzene	0.500 U	1.00	0.310	ug/L	1		09/07/17 22:20
o-Xylene	0.500 U	1.00	0.310	ug/L	1		09/07/17 22:20
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		09/07/17 22:20
sec-Butylbenzene	0.500 U	1.00	0.310	ug/L	1		09/07/17 22:20
Styrene	0.500 U	1.00	0.310	ug/L	1		09/07/17 22:20
tert-Butylbenzene	0.500 U	1.00	0.310	ug/L	1		09/07/17 22:20
Tetrachloroethene	0.500 U	1.00	0.310	ug/L	1		09/07/17 22:20
Toluene	0.500 U	1.00	0.310	ug/L	1		09/07/17 22:20
trans-1,2-Dichloroethene	0.500 U	1.00	0.310	ug/L	1		09/07/17 22:20
trans-1,3-Dichloropropene	0.500 U	1.00	0.310	ug/L	1		09/07/17 22:20
Trichloroethene	0.500 U	1.00	0.310	ug/L	1		09/07/17 22:20
Trichlorofluoromethane	0.520 J	1.00	0.310	ug/L	1		09/07/17 22:20
Vinyl acetate	5.00 U	10.0	3.10	ug/L	1		09/07/17 22:20
Vinyl chloride	0.0750 U	0.150	0.0500	ug/L	1		09/07/17 22:20
Xylenes (total)	1.50 U	3.00	1.00	ug/L	1		09/07/17 22:20
<b>Surrogates</b>							
1,2-Dichloroethane-D4 (surr)	107	81-118		%	1		09/07/17 22:20
4-Bromofluorobenzene (surr)	108	85-114		%	1		09/07/17 22:20
Toluene-d8 (surr)	95.2	89-112		%	1		09/07/17 22:20





**Results of B8**

Client Sample ID: **B8**  
Client Project ID: **Bethel Youth Facility 15-1459**  
Lab Sample ID: 1176160003  
Lab Project ID: 1176160

Collection Date: 08/29/17 11:15  
Received Date: 08/30/17 10:45  
Matrix: Water (Surface, Eff., Ground)  
Solids (%):  
Location:

**Results by Volatile GC/MS**

**Batch Information**

Analytical Batch: VMS17154  
Analytical Method: SW8260C  
Analyst: FDR  
Analytical Date/Time: 09/08/17 18:53  
Container ID: 1176160003-D

Prep Batch: VXX31248  
Prep Method: SW5030B  
Prep Date/Time: 09/08/17 00:00  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL

Analytical Batch: VMS17149  
Analytical Method: SW8260C  
Analyst: FDR  
Analytical Date/Time: 09/07/17 22:20  
Container ID: 1176160003-D

Prep Batch: VXX31241  
Prep Method: SW5030B  
Prep Date/Time: 09/07/17 00:00  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL



Results of B4

Client Sample ID: B4
Client Project ID: Bethel Youth Facility 15-1459
Lab Sample ID: 1176160004
Lab Project ID: 1176160

Collection Date: 08/29/17 11:55
Received Date: 08/30/17 10:45
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: XMS10383
Analytical Method: 8270D SIM (PAH)
Analyst: DSD
Analytical Date/Time: 09/07/17 18:59
Container ID: 1176160004-I

Prep Batch: XXX38329
Prep Method: SW3520C
Prep Date/Time: 09/03/17 09:01
Prep Initial Wt./Vol.: 995 mL
Prep Extract Vol: 1 mL

## Results of B4

Client Sample ID: **B4**  
 Client Project ID: **Bethel Youth Facility 15-1459**  
 Lab Sample ID: 1176160004  
 Lab Project ID: 1176160

Collection Date: 08/29/17 11:55  
 Received Date: 08/30/17 10:45  
 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	0.378 J	0.556	0.167	mg/L	1		09/01/17 20:52
<b>Surrogates</b>							
5a Androstane (surr)	84.6	50-150		%	1		09/01/17 20:52

## Batch Information

Analytical Batch: XFC13751  
 Analytical Method: AK102  
 Analyst: JMG  
 Analytical Date/Time: 09/01/17 20:52  
 Container ID: 1176160004-G

Prep Batch: XXX38305  
 Prep Method: SW3520C  
 Prep Date/Time: 08/31/17 09:11  
 Prep Initial Wt./Vol.: 270 mL  
 Prep Extract Vol: 1 mL



**Results of B4**

Client Sample ID: **B4**  
Client Project ID: **Bethel Youth Facility 15-1459**  
Lab Sample ID: 1176160004  
Lab Project ID: 1176160

Collection Date: 08/29/17 11:55  
Received Date: 08/30/17 10:45  
Matrix: Water (Surface, Eff., Ground)  
Solids (%):  
Location:

**Results by Volatile 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>
Gasoline Range Organics	0.0500 U	0.100	0.0310	mg/L	1		08/31/17 16:06
<b>Surrogates</b>							
4-Bromofluorobenzene (surr)	89.7	50-150		%	1		08/31/17 16:06

**Batch Information**

Analytical Batch: VFC13848  
Analytical Method: AK101  
Analyst: ST  
Analytical Date/Time: 08/31/17 16:06  
Container ID: 1176160004-A

Prep Batch: VXX31190  
Prep Method: SW5030B  
Prep Date/Time: 08/31/17 08:00  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL



Results of B4

Client Sample ID: B4
Client Project ID: Bethel Youth Facility 15-1459
Lab Sample ID: 1176160004
Lab Project ID: 1176160

Collection Date: 08/29/17 11:55
Received Date: 08/30/17 10:45
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 B4

Client Sample ID: **B4**  
 Client Project ID: **Bethel Youth Facility 15-1459**  
 Lab Sample ID: 1176160004  
 Lab Project ID: 1176160

Collection Date: 08/29/17 11:55  
 Received Date: 08/30/17 10:45  
 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		09/07/17 22:38
Chloromethane	0.500 U	1.00	0.310	ug/L	1		09/07/17 22:38
cis-1,2-Dichloroethene	0.500 U	1.00	0.310	ug/L	1		09/07/17 22:38
cis-1,3-Dichloropropene	0.250 U	0.500	0.150	ug/L	1		09/07/17 22:38
Dibromochloromethane	0.250 U	0.500	0.150	ug/L	1		09/07/17 22:38
Dibromomethane	0.500 U	1.00	0.310	ug/L	1		09/07/17 22:38
Dichlorodifluoromethane	36.5	1.00	0.310	ug/L	1		09/07/17 22:38
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		09/07/17 22:38
Freon-113	5.00 U	10.0	3.10	ug/L	1		09/07/17 22:38
Hexachlorobutadiene	0.500 U	1.00	0.310	ug/L	1		09/07/17 22:38
Isopropylbenzene (Cumene)	0.500 U	1.00	0.310	ug/L	1		09/07/17 22:38
Methylene chloride	2.50 U	5.00	1.00	ug/L	1		09/07/17 22:38
Methyl-t-butyl ether	5.00 U	10.0	3.10	ug/L	1		09/07/17 22:38
Naphthalene	0.500 U	1.00	0.310	ug/L	1		09/07/17 22:38
n-Butylbenzene	0.500 U	1.00	0.310	ug/L	1		09/07/17 22:38
n-Propylbenzene	0.500 U	1.00	0.310	ug/L	1		09/07/17 22:38
o-Xylene	0.500 U	1.00	0.310	ug/L	1		09/07/17 22:38
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		09/07/17 22:38
sec-Butylbenzene	0.500 U	1.00	0.310	ug/L	1		09/07/17 22:38
Styrene	0.500 U	1.00	0.310	ug/L	1		09/07/17 22:38
tert-Butylbenzene	0.500 U	1.00	0.310	ug/L	1		09/07/17 22:38
Tetrachloroethene	0.500 U	1.00	0.310	ug/L	1		09/07/17 22:38
Toluene	0.500 U	1.00	0.310	ug/L	1		09/07/17 22:38
trans-1,2-Dichloroethene	0.500 U	1.00	0.310	ug/L	1		09/07/17 22:38
trans-1,3-Dichloropropene	0.500 U	1.00	0.310	ug/L	1		09/07/17 22:38
Trichloroethene	0.500 U	1.00	0.310	ug/L	1		09/07/17 22:38
Trichlorofluoromethane	0.380 J	1.00	0.310	ug/L	1		09/07/17 22:38
Vinyl acetate	5.00 U	10.0	3.10	ug/L	1		09/07/17 22:38
Vinyl chloride	0.0750 U	0.150	0.0500	ug/L	1		09/07/17 22:38
Xylenes (total)	1.50 U	3.00	1.00	ug/L	1		09/07/17 22:38
<b>Surrogates</b>							
1,2-Dichloroethane-D4 (surr)	110	81-118		%	1		09/07/17 22:38
4-Bromofluorobenzene (surr)	105	85-114		%	1		09/07/17 22:38
Toluene-d8 (surr)	94.1	89-112		%	1		09/07/17 22:38

## Results of B4

Client Sample ID: **B4**  
Client Project ID: **Bethel Youth Facility 15-1459**  
Lab Sample ID: 1176160004  
Lab Project ID: 1176160

Collection Date: 08/29/17 11:55  
Received Date: 08/30/17 10:45  
Matrix: Water (Surface, Eff., Ground)  
Solids (%):  
Location:

## Results by Volatile GC/MS

### Batch Information

Analytical Batch: VMS17149  
Analytical Method: SW8260C  
Analyst: FDR  
Analytical Date/Time: 09/07/17 22:38  
Container ID: 1176160004-D

Prep Batch: VXX31241  
Prep Method: SW5030B  
Prep Date/Time: 09/07/17 00:00  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL



**Results of BX**

Client Sample ID: **BX**  
Client Project ID: **Bethel Youth Facility 15-1459**  
Lab Sample ID: 1176160005  
Lab Project ID: 1176160

Collection Date: 08/29/17 12:15  
Received Date: 08/30/17 10:45  
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	0.0125	0.00370	ug/L	1		09/07/17 19:20
2-Methylnaphthalene	0.0101 J	0.0125	0.00370	ug/L	1		09/07/17 19:20
Acenaphthene	0.00625 U	0.0125	0.00370	ug/L	1		09/07/17 19:20
Acenaphthylene	0.00625 U	0.0125	0.00370	ug/L	1		09/07/17 19:20
Anthracene	0.00625 U	0.0125	0.00370	ug/L	1		09/07/17 19:20
Benzo(a)Anthracene	0.00625 U	0.0125	0.00370	ug/L	1		09/07/17 19:20
Benzo[a]pyrene	0.00250 U	0.00500	0.00150	ug/L	1		09/07/17 19:20
Benzo[b]Fluoranthene	0.00625 U	0.0125	0.00370	ug/L	1		09/07/17 19:20
Benzo[g,h,i]perylene	0.00625 U	0.0125	0.00370	ug/L	1		09/07/17 19:20
Benzo[k]fluoranthene	0.00625 U	0.0125	0.00370	ug/L	1		09/07/17 19:20
Chrysene	0.00625 U	0.0125	0.00370	ug/L	1		09/07/17 19:20
Dibenzo[a,h]anthracene	0.00250 U	0.00500	0.00150	ug/L	1		09/07/17 19:20
Fluoranthene	0.00625 U	0.0125	0.00370	ug/L	1		09/07/17 19:20
Fluorene	0.00625 U	0.0125	0.00370	ug/L	1		09/07/17 19:20
Indeno[1,2,3-c,d] pyrene	0.00625 U	0.0125	0.00370	ug/L	1		09/07/17 19:20
Naphthalene	0.0537	0.0250	0.00780	ug/L	1		09/07/17 19:20
Phenanthrene	0.0250 U	0.0500	0.00370	ug/L	1		09/07/17 19:20
Pyrene	0.0250 U	0.0500	0.00370	ug/L	1		09/07/17 19:20
<b>Surrogates</b>							
2-Methylnaphthalene-d10 (surr)	76.7	47-106		%	1		09/07/17 19:20
Fluoranthene-d10 (surr)	84.1	24-116		%	1		09/07/17 19:20

**Batch Information**

Analytical Batch: XMS10383  
Analytical Method: 8270D SIM (PAH)  
Analyst: DSD  
Analytical Date/Time: 09/07/17 19:20  
Container ID: 1176160005-I

Prep Batch: XXX38329  
Prep Method: SW3520C  
Prep Date/Time: 09/03/17 09:01  
Prep Initial Wt./Vol.: 1000 mL  
Prep Extract Vol: 1 mL





**Results of BX**

Client Sample ID: **BX**  
Client Project ID: **Bethel Youth Facility 15-1459**  
Lab Sample ID: 1176160005  
Lab Project ID: 1176160

Collection Date: 08/29/17 12:15  
Received Date: 08/30/17 10:45  
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	0.433 J	0.556	0.167	mg/L	1		09/01/17 21:03
<b>Surrogates</b>							
5a Androstane (surr)	80.6	50-150		%	1		09/01/17 21:03

**Batch Information**

Analytical Batch: XFC13751  
Analytical Method: AK102  
Analyst: JMG  
Analytical Date/Time: 09/01/17 21:03  
Container ID: 1176160005-G

Prep Batch: XXX38305  
Prep Method: SW3520C  
Prep Date/Time: 08/31/17 09:11  
Prep Initial Wt./Vol.: 270 mL  
Prep Extract Vol: 1 mL



**Results of BX**

Client Sample ID: **BX**  
Client Project ID: **Bethel Youth Facility 15-1459**  
Lab Sample ID: 1176160005  
Lab Project ID: 1176160

Collection Date: 08/29/17 12:15  
Received Date: 08/30/17 10:45  
Matrix: Water (Surface, Eff., Ground)  
Solids (%):  
Location:

**Results by Volatile 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>
Gasoline Range Organics	0.0500 U	0.100	0.0310	mg/L	1		08/31/17 16:25
<b>Surrogates</b>							
4-Bromofluorobenzene (surr)	89	50-150		%	1		08/31/17 16:25

**Batch Information**

Analytical Batch: VFC13848  
Analytical Method: AK101  
Analyst: ST  
Analytical Date/Time: 08/31/17 16:25  
Container ID: 1176160005-A

Prep Batch: VXX31190  
Prep Method: SW5030B  
Prep Date/Time: 08/31/17 08:00  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL



Results of BX

Client Sample ID: BX
Client Project ID: Bethel Youth Facility 15-1459
Lab Sample ID: 1176160005
Lab Project ID: 1176160

Collection Date: 08/29/17 12:15
Received Date: 08/30/17 10:45
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 BX

Client Sample ID: **BX**  
 Client Project ID: **Bethel Youth Facility 15-1459**  
 Lab Sample ID: 1176160005  
 Lab Project ID: 1176160

Collection Date: 08/29/17 12:15  
 Received Date: 08/30/17 10:45  
 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		09/07/17 22:55
Chloromethane	0.500 U	1.00	0.310	ug/L	1		09/07/17 22:55
cis-1,2-Dichloroethene	0.500 U	1.00	0.310	ug/L	1		09/07/17 22:55
cis-1,3-Dichloropropene	0.250 U	0.500	0.150	ug/L	1		09/07/17 22:55
Dibromochloromethane	0.250 U	0.500	0.150	ug/L	1		09/07/17 22:55
Dibromomethane	0.500 U	1.00	0.310	ug/L	1		09/07/17 22:55
Dichlorodifluoromethane	38.4	1.00	0.310	ug/L	1		09/07/17 22:55
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		09/07/17 22:55
Freon-113	5.00 U	10.0	3.10	ug/L	1		09/07/17 22:55
Hexachlorobutadiene	0.500 U	1.00	0.310	ug/L	1		09/07/17 22:55
Isopropylbenzene (Cumene)	0.500 U	1.00	0.310	ug/L	1		09/07/17 22:55
Methylene chloride	2.50 U	5.00	1.00	ug/L	1		09/07/17 22:55
Methyl-t-butyl ether	5.00 U	10.0	3.10	ug/L	1		09/07/17 22:55
Naphthalene	0.500 U	1.00	0.310	ug/L	1		09/07/17 22:55
n-Butylbenzene	0.500 U	1.00	0.310	ug/L	1		09/07/17 22:55
n-Propylbenzene	0.500 U	1.00	0.310	ug/L	1		09/07/17 22:55
o-Xylene	0.520 J	1.00	0.310	ug/L	1		09/07/17 22:55
P & M -Xylene	0.840 J	2.00	0.620	ug/L	1		09/07/17 22:55
sec-Butylbenzene	0.500 U	1.00	0.310	ug/L	1		09/07/17 22:55
Styrene	0.500 U	1.00	0.310	ug/L	1		09/07/17 22:55
tert-Butylbenzene	0.500 U	1.00	0.310	ug/L	1		09/07/17 22:55
Tetrachloroethene	0.500 U	1.00	0.310	ug/L	1		09/07/17 22:55
Toluene	0.500 U	1.00	0.310	ug/L	1		09/07/17 22:55
trans-1,2-Dichloroethene	0.500 U	1.00	0.310	ug/L	1		09/07/17 22:55
trans-1,3-Dichloropropene	0.500 U	1.00	0.310	ug/L	1		09/07/17 22:55
Trichloroethene	0.500 U	1.00	0.310	ug/L	1		09/07/17 22:55
Trichlorofluoromethane	0.430 J	1.00	0.310	ug/L	1		09/07/17 22:55
Vinyl acetate	5.00 U	10.0	3.10	ug/L	1		09/07/17 22:55
Vinyl chloride	0.0750 U	0.150	0.0500	ug/L	1		09/07/17 22:55
Xylenes (total)	1.36 J	3.00	1.00	ug/L	1		09/07/17 22:55
<b>Surrogates</b>							
1,2-Dichloroethane-D4 (surr)	112	81-118		%	1		09/07/17 22:55
4-Bromofluorobenzene (surr)	105	85-114		%	1		09/07/17 22:55
Toluene-d8 (surr)	95.4	89-112		%	1		09/07/17 22:55

## Results of **BX**

Client Sample ID: **BX**  
Client Project ID: **Bethel Youth Facility 15-1459**  
Lab Sample ID: 1176160005  
Lab Project ID: 1176160

Collection Date: 08/29/17 12:15  
Received Date: 08/30/17 10:45  
Matrix: Water (Surface, Eff., Ground)  
Solids (%):  
Location:

## Results by **Volatile GC/MS**

### Batch Information

Analytical Batch: VMS17149  
Analytical Method: SW8260C  
Analyst: FDR  
Analytical Date/Time: 09/07/17 22:55  
Container ID: 1176160005-D

Prep Batch: VXX31241  
Prep Method: SW5030B  
Prep Date/Time: 09/07/17 00:00  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL



### Results of Trip Blank

Client Sample ID: **Trip Blank**  
Client Project ID: **Bethel Youth Facility 15-1459**  
Lab Sample ID: 1176160006  
Lab Project ID: 1176160

Collection Date: 08/29/17 11:15  
Received Date: 08/30/17 10:45  
Matrix: Water (Surface, Eff., Ground)  
Solids (%):  
Location:

### Results by Volatile 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>
Gasoline Range Organics	0.0500 U	0.100	0.0310	mg/L	1		08/31/17 12:35
<b>Surrogates</b>							
4-Bromofluorobenzene (surr)	93.6	50-150		%	1		08/31/17 12:35

### Batch Information

Analytical Batch: VFC13848  
Analytical Method: AK101  
Analyst: ST  
Analytical Date/Time: 08/31/17 12:35  
Container ID: 1176160006-A

Prep Batch: VXX31190  
Prep Method: SW5030B  
Prep Date/Time: 08/31/17 08:00  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL



### Results of Trip Blank

Client Sample ID: **Trip Blank**  
 Client Project ID: **Bethel Youth Facility 15-1459**  
 Lab Sample ID: 1176160006  
 Lab Project ID: 1176160

Collection Date: 08/29/17 11:15  
 Received Date: 08/30/17 10:45  
 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		09/07/17 19:25
1,1,1-Trichloroethane	0.500 U	1.00	0.310	ug/L	1		09/07/17 19:25
1,1,2,2-Tetrachloroethane	0.250 U	0.500	0.150	ug/L	1		09/07/17 19:25
1,1,2-Trichloroethane	0.200 U	0.400	0.120	ug/L	1		09/07/17 19:25
1,1-Dichloroethane	0.500 U	1.00	0.310	ug/L	1		09/07/17 19:25
1,1-Dichloroethene	0.500 U	1.00	0.310	ug/L	1		09/07/17 19:25
1,1-Dichloropropene	0.500 U	1.00	0.310	ug/L	1		09/07/17 19:25
1,2,3-Trichlorobenzene	0.500 U	1.00	0.310	ug/L	1		09/07/17 19:25
1,2,3-Trichloropropane	0.500 U	1.00	0.310	ug/L	1		09/07/17 19:25
1,2,4-Trichlorobenzene	0.500 U	1.00	0.310	ug/L	1		09/07/17 19:25
1,2,4-Trimethylbenzene	0.500 U	1.00	0.310	ug/L	1		09/07/17 19:25
1,2-Dibromo-3-chloropropane	5.00 U	10.0	3.10	ug/L	1		09/07/17 19:25
1,2-Dibromoethane	0.0375 U	0.0750	0.0180	ug/L	1		09/07/17 19:25
1,2-Dichlorobenzene	0.500 U	1.00	0.310	ug/L	1		09/07/17 19:25
1,2-Dichloroethane	0.250 U	0.500	0.150	ug/L	1		09/07/17 19:25
1,2-Dichloropropane	0.500 U	1.00	0.310	ug/L	1		09/07/17 19:25
1,3,5-Trimethylbenzene	0.500 U	1.00	0.310	ug/L	1		09/07/17 19:25
1,3-Dichlorobenzene	0.500 U	1.00	0.310	ug/L	1		09/07/17 19:25
1,3-Dichloropropane	0.250 U	0.500	0.150	ug/L	1		09/07/17 19:25
1,4-Dichlorobenzene	0.250 U	0.500	0.150	ug/L	1		09/07/17 19:25
2,2-Dichloropropane	0.500 U	1.00	0.310	ug/L	1		09/07/17 19:25
2-Butanone (MEK)	5.00 U	10.0	3.10	ug/L	1		09/07/17 19:25
2-Chlorotoluene	0.500 U	1.00	0.310	ug/L	1		09/07/17 19:25
2-Hexanone	5.00 U	10.0	3.10	ug/L	1		09/07/17 19:25
4-Chlorotoluene	0.500 U	1.00	0.310	ug/L	1		09/07/17 19:25
4-Isopropyltoluene	0.500 U	1.00	0.310	ug/L	1		09/07/17 19:25
4-Methyl-2-pentanone (MIBK)	5.00 U	10.0	3.10	ug/L	1		09/07/17 19:25
Benzene	0.200 U	0.400	0.120	ug/L	1		09/07/17 19:25
Bromobenzene	0.500 U	1.00	0.310	ug/L	1		09/07/17 19:25
Bromochloromethane	0.500 U	1.00	0.310	ug/L	1		09/07/17 19:25
Bromodichloromethane	0.250 U	0.500	0.150	ug/L	1		09/07/17 19:25
Bromoform	0.500 U	1.00	0.310	ug/L	1		09/07/17 19:25
Bromomethane	2.50 U	5.00	1.50	ug/L	1		09/07/17 19:25
Carbon disulfide	5.00 U	10.0	3.10	ug/L	1		09/07/17 19:25
Carbon tetrachloride	0.500 U	1.00	0.310	ug/L	1		09/07/17 19:25
Chlorobenzene	0.250 U	0.500	0.150	ug/L	1		09/07/17 19:25
Chloroethane	0.500 U	1.00	0.310	ug/L	1		09/07/17 19:25



Results of Trip Blank

Client Sample ID: Trip Blank
Client Project ID: Bethel Youth Facility 15-1459
Lab Sample ID: 1176160006
Lab Project ID: 1176160

Collection Date: 08/29/17 11:15
Received Date: 08/30/17 10:45
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 parameters like Chloroform, Benzene, and Toluene with their respective results and limits.





**Results of Trip Blank**

Client Sample ID: **Trip Blank**  
Client Project ID: **Bethel Youth Facility 15-1459**  
Lab Sample ID: 1176160006  
Lab Project ID: 1176160

Collection Date: 08/29/17 11:15  
Received Date: 08/30/17 10:45  
Matrix: Water (Surface, Eff., Ground)  
Solids (%):  
Location:

**Results by Volatile GC/MS**

**Batch Information**

Analytical Batch: VMS17149  
Analytical Method: SW8260C  
Analyst: FDR  
Analytical Date/Time: 09/07/17 19:25  
Container ID: 1176160006-D

Prep Batch: VXX31241  
Prep Method: SW5030B  
Prep Date/Time: 09/07/17 00:00  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL



### Method Blank

Blank ID: MB for HBN 1767321 [VXX/31190]  
Blank Lab ID: 1409698

Matrix: Water (Surface, Eff., Ground)

QC for Samples:  
1176160001, 1176160002, 1176160003, 1176160004, 1176160005, 1176160006

### Results by AK101

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Gasoline Range Organics	0.0500U	0.100	0.0310	mg/L
<b>Surrogates</b>				
4-Bromofluorobenzene (surr)	87.9	50-150		%

### Batch Information

Analytical Batch: VFC13848  
Analytical Method: AK101  
Instrument: Agilent 7890 PID/FID  
Analyst: ST  
Analytical Date/Time: 8/31/2017 11:18:00AM

Prep Batch: VXX31190  
Prep Method: SW5030B  
Prep Date/Time: 8/31/2017 8:00:00AM  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL

Print Date: 09/11/2017 10:36:01AM



### Blank Spike Summary

Blank Spike ID: LCS for HBN 1176160 [VXX31190]  
Blank Spike Lab ID: 1409699  
Date Analyzed: 08/31/2017 12:16

Spike Duplicate ID: LCSD for HBN 1176160 [VXX31190]  
Spike Duplicate Lab ID: 1409700  
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1176160001, 1176160002, 1176160003, 1176160004, 1176160005, 1176160006

### Results by AK101

Parameter	Blank Spike (mg/L)			Spike Duplicate (mg/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Gasoline Range Organics	1.00	1.06	106	1.00	1.08	108	( 60-120 )	1.80	(< 20 )

### Surrogates

4-Bromofluorobenzene (surr)	0.0500	102	102	0.0500	96.2	96	( 50-150 )	6.30	
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### Batch Information

Analytical Batch: VFC13848  
Analytical Method: AK101  
Instrument: Agilent 7890 PID/FID  
Analyst: ST

Prep Batch: VXX31190  
Prep Method: SW5030B  
Prep Date/Time: 08/31/2017 08:00  
Spike Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL  
Dupe Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL

Print Date: 09/11/2017 10:36:03AM



### Method Blank

Blank ID: MB for HBN 1767893 [VXX/31241]

Matrix: Water (Surface, Eff., Ground)

Blank Lab ID: 1411449

QC for Samples:

1176160001, 1176160002, 1176160003, 1176160004, 1176160005, 1176160006

### 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: 09/11/2017 10:36:04AM



### Method Blank

Blank ID: MB for HBN 1767893 [VXX/31241]

Matrix: Water (Surface, Eff., Ground)

Blank Lab ID: 1411449

QC for Samples:

1176160001, 1176160002, 1176160003, 1176160004, 1176160005, 1176160006

### 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
<b>Surrogates</b>				
1,2-Dichloroethane-D4 (surr)	108	81-118		%
4-Bromofluorobenzene (surr)	108	85-114		%
Toluene-d8 (surr)	94	89-112		%

Print Date: 09/11/2017 10:36:04AM



### Method Blank

Blank ID: MB for HBN 1767893 [VXX/31241]  
Blank Lab ID: 1411449

Matrix: Water (Surface, Eff., Ground)

QC for Samples:

1176160001, 1176160002, 1176160003, 1176160004, 1176160005, 1176160006

### 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: VMS17149  
Analytical Method: SW8260C  
Instrument: VSA Agilent GC/MS 7890B/5977A  
Analyst: FDR  
Analytical Date/Time: 9/7/2017 1:41:00PM

Prep Batch: VXX31241  
Prep Method: SW5030B  
Prep Date/Time: 9/7/2017 12:00:00AM  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL

Print Date: 09/11/2017 10:36:04AM



### Blank Spike Summary

Blank Spike ID: LCS for HBN 1176160 [VXX31241]  
 Blank Spike Lab ID: 1411450  
 Date Analyzed: 09/07/2017 13:58

Spike Duplicate ID: LCSD for HBN 1176160 [VXX31241]  
 Spike Duplicate Lab ID: 1411451  
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1176160001, 1176160002, 1176160003, 1176160004, 1176160005, 1176160006

### 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	32.8	109	30	33.2	111	( 78-124 )	1.20	(< 20 )
1,1,1-Trichloroethane	30	30.7	102	30	30.4	101	( 74-131 )	0.98	(< 20 )
1,1,2,2-Tetrachloroethane	30	32.5	108	30	32.3	108	( 71-121 )	0.68	(< 20 )
1,1,2-Trichloroethane	30	31.8	106	30	31.4	105	( 80-119 )	1.10	(< 20 )
1,1-Dichloroethane	30	29.1	97	30	29.1	97	( 77-125 )	0.10	(< 20 )
1,1-Dichloroethene	30	27.6	92	30	27.3	91	( 71-131 )	0.95	(< 20 )
1,1-Dichloropropene	30	33.0	110	30	32.4	108	( 79-125 )	2.00	(< 20 )
1,2,3-Trichlorobenzene	30	32.1	107	30	31.9	106	( 69-129 )	0.66	(< 20 )
1,2,3-Trichloropropane	30	34.1	114	30	33.4	111	( 73-122 )	2.20	(< 20 )
1,2,4-Trichlorobenzene	30	31.7	106	30	32.0	107	( 69-130 )	0.88	(< 20 )
1,2,4-Trimethylbenzene	30	31.6	105	30	31.5	105	( 79-124 )	0.35	(< 20 )
1,2-Dibromo-3-chloropropane	30	33.1	110	30	31.6	105	( 62-128 )	4.60	(< 20 )
1,2-Dibromoethane	30	34.7	116	30	34.9	116	( 77-121 )	0.52	(< 20 )
1,2-Dichlorobenzene	30	30.7	102	30	31.0	103	( 80-119 )	0.81	(< 20 )
1,2-Dichloroethane	30	29.0	97	30	29.2	97	( 73-128 )	0.86	(< 20 )
1,2-Dichloropropane	30	31.9	106	30	31.9	106	( 78-122 )	0.00	(< 20 )
1,3,5-Trimethylbenzene	30	30.9	103	30	30.9	103	( 75-124 )	0.19	(< 20 )
1,3-Dichlorobenzene	30	30.0	100	30	30.1	100	( 80-119 )	0.37	(< 20 )
1,3-Dichloropropane	30	33.0	110	30	32.9	110	( 80-119 )	0.33	(< 20 )
1,4-Dichlorobenzene	30	30.4	101	30	30.1	100	( 79-118 )	0.76	(< 20 )
2,2-Dichloropropane	30	29.4	98	30	29.2	97	( 60-139 )	0.72	(< 20 )
2-Butanone (MEK)	90	95.1	106	90	88.0	98	( 56-143 )	7.70	(< 20 )
2-Chlorotoluene	30	30.8	103	30	31.0	103	( 79-122 )	0.68	(< 20 )
2-Hexanone	90	91.1	101	90	87.5	97	( 57-139 )	4.00	(< 20 )
4-Chlorotoluene	30	30.5	102	30	30.3	101	( 78-122 )	0.72	(< 20 )
4-Isopropyltoluene	30	32.6	109	30	32.1	107	( 77-127 )	1.60	(< 20 )
4-Methyl-2-pentanone (MIBK)	90	88.4	98	90	86.6	96	( 67-130 )	2.00	(< 20 )
Benzene	30	31.9	106	30	32.1	107	( 79-120 )	0.41	(< 20 )
Bromobenzene	30	30.6	102	30	31.0	103	( 80-120 )	1.30	(< 20 )
Bromochloromethane	30	31.5	105	30	31.7	106	( 78-123 )	0.60	(< 20 )
Bromodichloromethane	30	30.3	101	30	30.9	103	( 79-125 )	2.00	(< 20 )
Bromoform	30	29.9	100	30	30.4	101	( 66-130 )	1.50	(< 20 )
Bromomethane	30	31.6	105	30	30.8	103	( 53-141 )	2.60	(< 20 )
Carbon disulfide	45	36.5	81	45	36.9	82	( 64-133 )	1.10	(< 20 )

Print Date: 09/11/2017 10:36:06AM



### Blank Spike Summary

Blank Spike ID: LCS for HBN 1176160 [VXX31241]  
 Blank Spike Lab ID: 1411450  
 Date Analyzed: 09/07/2017 13:58

Spike Duplicate ID: LCSD for HBN 1176160 [VXX31241]  
 Spike Duplicate Lab ID: 1411451  
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1176160001, 1176160002, 1176160003, 1176160004, 1176160005, 1176160006

### 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	30.3	101	30	30.6	102	( 72-136 )	1.10	(< 20 )
Chlorobenzene	30	30.6	102	30	30.6	102	( 82-118 )	0.16	(< 20 )
Chloroethane	30	29.2	98	30	29.0	97	( 60-138 )	0.93	(< 20 )
Chloroform	30	29.6	99	30	29.5	98	( 79-124 )	0.51	(< 20 )
Chloromethane	30	26.2	87	30	25.9	86	( 50-139 )	1.20	(< 20 )
cis-1,2-Dichloroethene	30	29.9	100	30	30.0	100	( 78-123 )	0.23	(< 20 )
cis-1,3-Dichloropropene	30	30.0	100	30	30.6	102	( 75-124 )	1.90	(< 20 )
Dibromochloromethane	30	31.3	104	30	32.0	107	( 74-126 )	2.30	(< 20 )
Dibromomethane	30	30.0	100	30	30.3	101	( 79-123 )	1.10	(< 20 )
Dichlorodifluoromethane	30	24.3	81	30	23.8	79	( 32-152 )	2.40	(< 20 )
Ethylbenzene	30	31.9	106	30	32.1	107	( 79-121 )	0.53	(< 20 )
Freon-113	45	39.3	87	45	38.7	86	( 70-136 )	1.60	(< 20 )
Hexachlorobutadiene	30	30.8	103	30	30.8	103	( 66-134 )	0.03	(< 20 )
Isopropylbenzene (Cumene)	30	30.8	103	30	30.8	103	( 72-131 )	0.19	(< 20 )
Methylene chloride	30	29.9	100	30	30.1	100	( 74-124 )	0.70	(< 20 )
Methyl-t-butyl ether	45	43.4	96	45	43.9	98	( 71-124 )	1.30	(< 20 )
Naphthalene	30	33.6	112	30	32.4	108	( 61-128 )	3.60	(< 20 )
n-Butylbenzene	30	31.9	106	30	31.6	105	( 75-128 )	0.85	(< 20 )
n-Propylbenzene	30	30.9	103	30	30.6	102	( 76-126 )	0.91	(< 20 )
o-Xylene	30	31.7	106	30	31.6	105	( 78-122 )	0.19	(< 20 )
P & M -Xylene	60	61.5	103	60	61.0	102	( 80-121 )	0.80	(< 20 )
sec-Butylbenzene	30	31.1	104	30	30.9	103	( 77-126 )	0.55	(< 20 )
Styrene	30	24.0	80	30	24.1	80	( 78-123 )	0.62	(< 20 )
tert-Butylbenzene	30	31.4	105	30	31.0	103	( 78-124 )	1.30	(< 20 )
Tetrachloroethene	30	32.8	109	30	32.5	108	( 74-129 )	1.00	(< 20 )
Toluene	30	31.4	105	30	30.7	102	( 80-121 )	2.30	(< 20 )
trans-1,2-Dichloroethene	30	29.3	98	30	29.1	97	( 75-124 )	0.55	(< 20 )
trans-1,3-Dichloropropene	30	30.7	102	30	31.2	104	( 73-127 )	1.90	(< 20 )
Trichloroethene	30	31.7	106	30	31.5	105	( 79-123 )	0.76	(< 20 )
Trichlorofluoromethane	30	27.7	92	30	26.2	87	( 65-141 )	5.60	(< 20 )
Vinyl acetate	30	26.6	89	30	26.6	89	( 54-146 )	0.23	(< 20 )
Vinyl chloride	30	26.9	90	30	26.5	88	( 58-137 )	1.50	(< 20 )
Xylenes (total)	90	93.2	104	90	92.6	103	( 79-121 )	0.59	(< 20 )

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## Blank Spike Summary

Blank Spike ID: LCS for HBN 1176160 [VXX31241]  
 Blank Spike Lab ID: 1411450  
 Date Analyzed: 09/07/2017 13:58

Spike Duplicate ID: LCSD for HBN 1176160 [VXX31241]  
 Spike Duplicate Lab ID: 1411451  
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1176160001, 1176160002, 1176160003, 1176160004, 1176160005, 1176160006

## Results by SW8260C

Parameter	Spike	Blank Spike (%)		Spike	Spike Duplicate (%)		CL	RPD (%)	RPD CL
		Result	Rec (%)		Result	Rec (%)			
<b>Surrogates</b>									
1,2-Dichloroethane-D4 (surr)	30	94.7	95	30	94.7	95	( 81-118 )	0.00	
4-Bromofluorobenzene (surr)	30	95.8	96	30	95.9	96	( 85-114 )	0.10	
Toluene-d8 (surr)	30	102	102	30	100	100	( 89-112 )	1.10	

## Batch Information

Analytical Batch: **VMS17149**  
 Analytical Method: **SW8260C**  
 Instrument: **VSA Agilent GC/MS 7890B/5977A**  
 Analyst: **FDR**

Prep Batch: **VXX31241**  
 Prep Method: **SW5030B**  
 Prep Date/Time: **09/07/2017 00:00**  
 Spike Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL  
 Dupe Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL



### Matrix Spike Summary

Original Sample ID: 1176149006  
 MS Sample ID: 1411452 MS  
 MSD Sample ID: 1411453 MSD

Analysis Date: 09/07/2017 20:52  
 Analysis Date: 09/07/2017 23:13  
 Analysis Date: 09/07/2017 23:30  
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1176160001, 1176160002, 1176160003, 1176160004, 1176160005, 1176160006

### Results by SW8260C

Parameter	Sample	Matrix Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
1,1,1,2-Tetrachloroethane	0.250U	30.0	34.8	116	30.0	33.6	112	78-124	3.50	(< 20 )
1,1,1-Trichloroethane	0.500U	30.0	32.5	108	30.0	32.3	108	74-131	0.68	(< 20 )
1,1,2,2-Tetrachloroethane	0.250U	30.0	31	103	30.0	31.0	103	71-121	0.06	(< 20 )
1,1,2-Trichloroethane	0.200U	30.0	32.5	108	30.0	31.8	106	80-119	2.20	(< 20 )
1,1-Dichloroethane	0.500U	30.0	30.9	103	30.0	30.6	102	77-125	0.78	(< 20 )
1,1-Dichloroethene	0.500U	30.0	29.2	97	30.0	28.5	95	71-131	2.30	(< 20 )
1,1-Dichloropropene	0.500U	30.0	34.9	116	30.0	34.4	115	79-125	1.40	(< 20 )
1,2,3-Trichlorobenzene	0.500U	30.0	30.1	100	30.0	29.9	100	69-129	0.63	(< 20 )
1,2,3-Trichloropropane	0.500U	30.0	32.2	107	30.0	31.6	105	73-122	1.70	(< 20 )
1,2,4-Trichlorobenzene	0.500U	30.0	30.1	100	30.0	30.2	101	69-130	0.23	(< 20 )
1,2,4-Trimethylbenzene	0.500U	30.0	31.8	106	30.0	31.3	104	79-124	1.60	(< 20 )
1,2-Dibromo-3-chloropropane	5.00U	30.0	32.3	108	30.0	32.4	108	62-128	0.43	(< 20 )
1,2-Dibromoethane	0.0375U	30.0	35.3	118	30.0	34.7	116	77-121	1.50	(< 20 )
1,2-Dichlorobenzene	0.500U	30.0	31.5	105	30.0	31.2	104	80-119	0.92	(< 20 )
1,2-Dichloroethane	0.250U	30.0	30.1	100	30.0	29.7	99	73-128	1.30	(< 20 )
1,2-Dichloropropane	0.500U	30.0	33.1	110	30.0	32.7	109	78-122	1.30	(< 20 )
1,3,5-Trimethylbenzene	0.500U	30.0	32.3	108	30.0	32.1	107	75-124	0.71	(< 20 )
1,3-Dichlorobenzene	0.500U	30.0	30.7	102	30.0	30.3	101	80-119	1.40	(< 20 )
1,3-Dichloropropane	0.250U	30.0	34.1	114	30.0	33.3	111	80-119	2.40	(< 20 )
1,4-Dichlorobenzene	0.250U	30.0	30.8	103	30.0	30.6	102	79-118	0.65	(< 20 )
2,2-Dichloropropane	0.500U	30.0	29.4	98	30.0	29.6	99	60-139	0.47	(< 20 )
2-Butanone (MEK)	5.00U	90.0	86.5	96	90.0	85.9	95	56-143	0.65	(< 20 )
2-Chlorotoluene	0.500U	30.0	32.6	109	30.0	32.1	107	79-122	1.60	(< 20 )
2-Hexanone	5.00U	90.0	85	95	90.0	83.8	93	57-139	1.50	(< 20 )
4-Chlorotoluene	0.500U	30.0	32.2	107	30.0	31.7	106	78-122	1.60	(< 20 )
4-Isopropyltoluene	0.500U	30.0	32.2	107	30.0	31.7	106	77-127	1.40	(< 20 )
4-Methyl-2-pentanone (MIBK)	5.00U	90.0	83.7	93	90.0	82.5	92	67-130	1.40	(< 20 )
Bromobenzene	0.500U	30.0	31.3	104	30.0	31.8	106	80-120	1.40	(< 20 )
Bromochloromethane	0.500U	30.0	32.7	109	30.0	32.4	108	78-123	1.00	(< 20 )
Bromodichloromethane	0.250U	30.0	32.8	109	30.0	32.3	108	79-125	1.50	(< 20 )
Bromoform	0.500U	30.0	32	107	30.0	31.4	105	66-130	1.90	(< 20 )
Bromomethane	2.50U	30.0	27.2	91	30.0	25.6	85	53-141	6.00	(< 20 )
Carbon disulfide	5.00U	45.0	40.7	91	45.0	39.9	89	64-133	2.10	(< 20 )
Carbon tetrachloride	0.500U	30.0	33.8	113	30.0	33.7	112	72-136	0.36	(< 20 )
Chlorobenzene	0.250U	30.0	31.8	106	30.0	31.0	103	82-118	2.70	(< 20 )
Chloroethane	0.500U	30.0	29.4	98	30.0	28.8	96	60-138	2.30	(< 20 )
Chloroform	0.500U	30.0	31.2	104	30.0	30.6	102	79-124	1.90	(< 20 )

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### Matrix Spike Summary

Original Sample ID: 1176149006  
 MS Sample ID: 1411452 MS  
 MSD Sample ID: 1411453 MSD

Analysis Date: 09/07/2017 20:52  
 Analysis Date: 09/07/2017 23:13  
 Analysis Date: 09/07/2017 23:30  
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1176160001, 1176160002, 1176160003, 1176160004, 1176160005, 1176160006

### Results by SW8260C

Parameter	Sample	Matrix Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Chloromethane	0.500U	30.0	27.9	93	30.0	27.6	92	50-139	1.30	(< 20 )
cis-1,2-Dichloroethene	0.500U	30.0	31.4	105	30.0	31.1	104	78-123	0.99	(< 20 )
cis-1,3-Dichloropropene	0.250U	30.0	31.5	105	30.0	31.4	105	75-124	0.41	(< 20 )
Dibromochloromethane	0.250U	30.0	34.2	114	30.0	33.2	111	74-126	3.00	(< 20 )
Dibromomethane	0.500U	30.0	30.8	103	30.0	30.6	102	79-123	0.85	(< 20 )
Dichlorodifluoromethane	0.500U	30.0	24.8	83	30.0	24.5	82	32-152	1.10	(< 20 )
Ethylbenzene	0.500U	30.0	33.8	113	30.0	33.3	111	79-121	1.50	(< 20 )
Freon-113	5.00U	45.0	41.3	92	45.0	40.4	90	70-136	2.20	(< 20 )
Hexachlorobutadiene	0.500U	30.0	29.6	99	30.0	29.1	97	66-134	1.70	(< 20 )
Isopropylbenzene (Cumene)	0.500U	30.0	33.6	112	30.0	32.5	108	72-131	3.30	(< 20 )
Methylene chloride	2.50U	30.0	31.9	106	30.0	31.5	105	74-124	1.50	(< 20 )
Methyl-t-butyl ether	5.00U	45.0	43.9	97	45.0	43.0	95	71-124	2.10	(< 20 )
Naphthalene	0.500U	30.0	30.9	103	30.0	31.0	103	61-128	0.55	(< 20 )
n-Butylbenzene	0.500U	30.0	30.4	101	30.0	30.2	101	75-128	0.69	(< 20 )
n-Propylbenzene	0.500U	30.0	32.3	108	30.0	32.1	107	76-126	0.50	(< 20 )
o-Xylene	0.500U	30.0	34.2	114	30.0	33.2	111	78-122	2.90	(< 20 )
P & M -Xylene	1.00U	60.0	68	113	60.0	66.2	110	80-121	2.50	(< 20 )
sec-Butylbenzene	0.500U	30.0	30.7	102	30.0	31.0	103	77-126	1.10	(< 20 )
Styrene	0.500U	30.0	33.9	113	30.0	32.8	109	78-123	3.10	(< 20 )
tert-Butylbenzene	0.500U	30.0	32.4	108	30.0	31.8	106	78-124	1.70	(< 20 )
Tetrachloroethene	0.500U	30.0	34.7	116	30.0	33.6	112	74-129	3.20	(< 20 )
Toluene	0.500U	30.0	32.9	110	30.0	31.7	106	80-121	3.70	(< 20 )
trans-1,2-Dichloroethene	0.500U	30.0	30.7	102	30.0	30.2	101	75-124	1.90	(< 20 )
trans-1,3-Dichloropropene	0.500U	30.0	32.1	107	30.0	31.8	106	73-127	0.69	(< 20 )
Trichloroethene	0.500U	30.0	33.4	111	30.0	32.8	109	79-123	1.80	(< 20 )
Trichlorofluoromethane	15.8	30.0	40.4	82	30.0	39.4	79	65-141	2.50	(< 20 )
Vinyl acetate	5.00U	30.0	27	90	30.0	27.4	91	54-146	1.30	(< 20 )
Vinyl chloride	0.0750U	30.0	29	97	30.0	28.4	95	58-137	2.10	(< 20 )
Xylenes (total)	1.50U	90.0	102	113	90.0	99.4	110	79-121	2.70	(< 20 )
<b>Surrogates</b>										
1,2-Dichloroethane-D4 (surr)		30.0	28.9	96	30.0	28.6	95	81-118	0.84	
4-Bromofluorobenzene (surr)		30.0	29	97	30.0	29.7	99	85-114	2.50	
Toluene-d8 (surr)		30.0	30.3	101	30.0	29.8	100	89-112	1.70	

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### Matrix Spike Summary

Original Sample ID: 1176149006  
MS Sample ID: 1411452 MS  
MSD Sample ID: 1411453 MSD

Analysis Date:  
Analysis Date: 09/07/2017 23:13  
Analysis Date: 09/07/2017 23:30  
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1176160001, 1176160002, 1176160003, 1176160004, 1176160005, 1176160006

### Results by SW8260C

Parameter	Sample	Matrix Spike (%)			Spike Duplicate (%)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			

### Batch Information

Analytical Batch: VMS17149  
Analytical Method: SW8260C  
Instrument: VSA Agilent GC/MS 7890B/5977A  
Analyst: FDR  
Analytical Date/Time: 9/7/2017 11:13:00PM

Prep Batch: VXX31241  
Prep Method: Volatiles Extraction 8240/8260 FULL  
Prep Date/Time: 9/7/2017 12:00:00AM  
Prep Initial Wt./Vol.: 5.00mL  
Prep Extract Vol: 5.00mL

Print Date: 09/11/2017 10:36:07AM



### Method Blank

Blank ID: MB for HBN 1767931 [VXX/31248]

Blank Lab ID: 1411585

QC for Samples:

1176160003

Matrix: Water (Surface, Eff., Ground)

### Results by SW8260C

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Dichlorodifluoromethane	0.500U	1.00	0.310	ug/L
<b>Surrogates</b>				
1,2-Dichloroethane-D4 (surr)	104	81-118		%
4-Bromofluorobenzene (surr)	103	85-114		%
Toluene-d8 (surr)	98.9	89-112		%

### Batch Information

Analytical Batch: VMS17154  
Analytical Method: SW8260C  
Instrument: VPA 780/5975 GC/MS  
Analyst: FDR  
Analytical Date/Time: 9/8/2017 11:20:00AM

Prep Batch: VXX31248  
Prep Method: SW5030B  
Prep Date/Time: 9/8/2017 12:00:00AM  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL

Print Date: 09/11/2017 10:36:08AM



### Blank Spike Summary

Blank Spike ID: LCS for HBN 1176160 [VXX31248]  
Blank Spike Lab ID: 1411586  
Date Analyzed: 09/08/2017 11:58

Spike Duplicate ID: LCSD for HBN 1176160 [VXX31248]  
Spike Duplicate Lab ID: 1411587  
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1176160003

### Results by SW8260C

Parameter	Blank Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Dichlorodifluoromethane	30	28.7	96	30	29.5	98	( 32-152 )	2.60	(< 20 )
<b>Surrogates</b>									
1,2-Dichloroethane-D4 (surr)	30	101	101	30	100	100	( 81-118 )	1.00	
4-Bromofluorobenzene (surr)	30	100	100	30	101	101	( 85-114 )	0.27	
Toluene-d8 (surr)	30	100	100	30	100	100	( 89-112 )	0.07	

### Batch Information

Analytical Batch: VMS17154  
Analytical Method: SW8260C  
Instrument: VPA 780/5975 GC/MS  
Analyst: FDR

Prep Batch: VXX31248  
Prep Method: SW5030B  
Prep Date/Time: 09/08/2017 00:00  
Spike Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL  
Dupe Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL

Print Date: 09/11/2017 10:36:09AM



### Matrix Spike Summary

Original Sample ID: 1411592  
MS Sample ID: 1411588 MS  
MSD Sample ID: 1411589 MSD

Analysis Date: 09/08/2017 17:25  
Analysis Date: 09/08/2017 19:28  
Analysis Date: 09/08/2017 19:46  
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1176160003

### Results by SW8260C

Parameter	Sample	Matrix Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Dichlorodifluoromethane	0.500U	30.0	33.6	112	30.0	31.8	106	32-152	5.40	(< 20 )
<b>Surrogates</b>										
1,2-Dichloroethane-D4 (surr)		30.0	30.5	102	30.0	30.4	101	81-118	0.46	
4-Bromofluorobenzene (surr)		30.0	30.1	100	30.0	30.5	102	85-114	1.10	
Toluene-d8 (surr)		30.0	30.2	101	30.0	29.7	99	89-112	1.50	

### Batch Information

Analytical Batch: VMS17154  
Analytical Method: SW8260C  
Instrument: VPA 780/5975 GC/MS  
Analyst: FDR  
Analytical Date/Time: 9/8/2017 7:28:00PM

Prep Batch: VXX31248  
Prep Method: Volatiles Extraction 8240/8260 FULL  
Prep Date/Time: 9/8/2017 12:00:00AM  
Prep Initial Wt./Vol.: 5.00mL  
Prep Extract Vol: 5.00mL

Print Date: 09/11/2017 10:36:10AM



### Method Blank

Blank ID: MB for HBN 1767235 [XXX/38305]  
Blank Lab ID: 1409339

Matrix: Water (Surface, Eff., Ground)

QC for Samples:  
1176160001, 1176160002, 1176160003, 1176160004, 1176160005

### 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
<b>Surrogates</b>				
5a Androstane (surr)	87.7	60-120		%

### Batch Information

Analytical Batch: XFC13751  
Analytical Method: AK102  
Instrument: Agilent 7890B F  
Analyst: JMG  
Analytical Date/Time: 9/1/2017 5:45:00PM

Prep Batch: XXX38305  
Prep Method: SW3520C  
Prep Date/Time: 8/31/2017 9:11:08AM  
Prep Initial Wt./Vol.: 250 mL  
Prep Extract Vol: 1 mL

Print Date: 09/11/2017 10:36:11AM





### Blank Spike Summary

Blank Spike ID: LCS for HBN 1176160 [XXX38305]  
Blank Spike Lab ID: 1409340  
Date Analyzed: 09/01/2017 17:56

Spike Duplicate ID: LCSD for HBN 1176160 [XXX38305]  
Spike Duplicate Lab ID: 1409341  
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1176160001, 1176160002, 1176160003, 1176160004, 1176160005

### 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	19.2	96	20	19.6	98	( 75-125 )	1.90	(< 20 )
<b>Surrogates</b>									
5a Androstane (surr)	0.4	101	101	0.4	103	103	( 60-120 )	1.10	

### Batch Information

Analytical Batch: **XFC13751**  
Analytical Method: **AK102**  
Instrument: **Agilent 7890B F**  
Analyst: **JMG**

Prep Batch: **XXX38305**  
Prep Method: **SW3520C**  
Prep Date/Time: **08/31/2017 09:11**  
Spike Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL  
Dupe Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL

Print Date: 09/11/2017 10:36:13AM



### Method Blank

Blank ID: MB for HBN 1767471 [XXX/38329]  
Blank Lab ID: 1410014

Matrix: Water (Surface, Eff., Ground)

QC for Samples:  
1176160001, 1176160002, 1176160003, 1176160004, 1176160005

### Results by 8270D SIM (PAH)

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
1-Methylnaphthalene	0.00625U	0.0125	0.00370	ug/L
2-Methylnaphthalene	0.00625U	0.0125	0.00370	ug/L
Acenaphthene	0.00625U	0.0125	0.00370	ug/L
Acenaphthylene	0.00625U	0.0125	0.00370	ug/L
Anthracene	0.00625U	0.0125	0.00370	ug/L
Benzo(a)Anthracene	0.00625U	0.0125	0.00370	ug/L
Benzo[a]pyrene	0.00250U	0.00500	0.00150	ug/L
Benzo[b]Fluoranthene	0.00625U	0.0125	0.00370	ug/L
Benzo[g,h,i]perylene	0.00625U	0.0125	0.00370	ug/L
Benzo[k]fluoranthene	0.00625U	0.0125	0.00370	ug/L
Chrysene	0.00625U	0.0125	0.00370	ug/L
Dibenzo[a,h]anthracene	0.00250U	0.00500	0.00150	ug/L
Fluoranthene	0.00625U	0.0125	0.00370	ug/L
Fluorene	0.00625U	0.0125	0.00370	ug/L
Indeno[1,2,3-c,d] pyrene	0.00625U	0.0125	0.00370	ug/L
Naphthalene	0.0125U	0.0250	0.00780	ug/L
Phenanthrene	0.0250U	0.0500	0.00370	ug/L
Pyrene	0.0250U	0.0500	0.00370	ug/L
<b>Surrogates</b>				
2-Methylnaphthalene-d10 (surr)	84.1	47-106		%
Fluoranthene-d10 (surr)	81.4	24-116		%

### Batch Information

Analytical Batch: XMS10383  
Analytical Method: 8270D SIM (PAH)  
Instrument: SVA Agilent 780/5975 GC/MS  
Analyst: DSD  
Analytical Date/Time: 9/7/2017 4:56:00PM

Prep Batch: XXX38329  
Prep Method: SW3520C  
Prep Date/Time: 9/3/2017 9:01:19AM  
Prep Initial Wt./Vol.: 1000 mL  
Prep Extract Vol: 1 mL

Print Date: 09/11/2017 10:36:15AM



### Blank Spike Summary

Blank Spike ID: LCS for HBN 1176160 [XXX38329]  
 Blank Spike Lab ID: 1410015  
 Date Analyzed: 09/07/2017 17:17

Spike Duplicate ID: LCSD for HBN 1176160  
 [XXX38329]  
 Spike Duplicate Lab ID: 1410016  
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1176160001, 1176160002, 1176160003, 1176160004, 1176160005

### Results by 8270D SIM (PAH)

Parameter	Blank Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
1-Methylnaphthalene	0.5	0.412	82	0.5	0.389	78	( 41-115 )	5.50	(< 20 )
2-Methylnaphthalene	0.5	0.380	76	0.5	0.356	71	( 39-114 )	6.60	(< 20 )
Acenaphthene	0.5	0.495	99	0.5	0.471	94	( 48-114 )	5.00	(< 20 )
Acenaphthylene	0.5	0.406	81	0.5	0.378	76	( 35-121 )	7.00	(< 20 )
Anthracene	0.5	0.418	84	0.5	0.400	80	( 53-119 )	4.40	(< 20 )
Benzo(a)Anthracene	0.5	0.405	81	0.5	0.387	77	( 59-120 )	4.50	(< 20 )
Benzo[a]pyrene	0.5	0.406	81	0.5	0.379	76	( 53-120 )	6.80	(< 20 )
Benzo[b]Fluoranthene	0.5	0.402	80	0.5	0.392	79	( 53-126 )	2.40	(< 20 )
Benzo[g,h,i]perylene	0.5	0.397	80	0.5	0.376	75	( 44-128 )	5.40	(< 20 )
Benzo[k]fluoranthene	0.5	0.399	80	0.5	0.385	77	( 54-125 )	3.60	(< 20 )
Chrysene	0.5	0.424	85	0.5	0.407	82	( 57-120 )	3.90	(< 20 )
Dibenzo[a,h]anthracene	0.5	0.403	81	0.5	0.365	73	( 44-131 )	9.60	(< 20 )
Fluoranthene	0.5	0.398	80	0.5	0.376	75	( 58-120 )	5.90	(< 20 )
Fluorene	0.5	0.413	83	0.5	0.391	78	( 50-118 )	5.50	(< 20 )
Indeno[1,2,3-c,d] pyrene	0.5	0.400	80	0.5	0.376	75	( 48-130 )	6.10	(< 20 )
Naphthalene	0.5	0.390	78	0.5	0.370	74	( 43-114 )	5.20	(< 20 )
Phenanthrene	0.5	0.408	82	0.5	0.393	79	( 53-115 )	3.90	(< 20 )
Pyrene	0.5	0.417	83	0.5	0.393	79	( 53-121 )	5.70	(< 20 )
<b>Surrogates</b>									
2-Methylnaphthalene-d10 (surr)	0.5	88.4	88	0.5	83.4	83	( 47-106 )	5.80	
Fluoranthene-d10 (surr)	0.5	85.9	86	0.5	80.6	81	( 24-116 )	6.30	

### Batch Information

Analytical Batch: XMS10383  
 Analytical Method: 8270D SIM (PAH)  
 Instrument: SVA Agilent 780/5975 GC/MS  
 Analyst: DSD

Prep Batch: XXX38329  
 Prep Method: SW3520C  
 Prep Date/Time: 09/03/2017 09:01  
 Spike Init Wt./Vol.: 0.5 ug/L Extract Vol: 1 mL  
 Dupe Init Wt./Vol.: 0.5 ug/L Extract Vol: 1 mL

Print Date: 09/11/2017 10:36:17AM

## Wells, Nicholas (Anchorage)

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**From:** Homestead, Charles (Anchorage)  
**Sent:** Thursday, August 31, 2017 10:30 AM  
**To:** Env.Alaska.RcvgLogin  
**Subject:** 1176160\_CO

As per request below please delete the GRO/BTEX combo and schedule GRO only. Thanks, CGH

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**From:** Emily Mahanna [<mailto:emahanna@restorsci.com>]  
**Sent:** Thursday, August 31, 2017 10:15 AM  
**To:** Homestead, Charles (Anchorage)  
**Cc:** David Nyman  
**Subject:** Bethel Youth Facility

Hey Chuck,

Please remove the 8021 BTEX from the Bethel Youth Facility order.

Thanks!

Emily Mahanna  
Environmental Engineer, EIT  
Restoration Science & Engineering, LLC  
[emahanna@restorsci.com](mailto:emahanna@restorsci.com)  
907-278-1023 x110



## Wells, Nicholas (Anchorage)

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**From:** Homestead, Charles (Anchorage)  
**Sent:** Thursday, August 31, 2017 1:29 PM  
**To:** Env.Alaska.RcvgLogin  
**Subject:** 1176160\_CO2

Please see below, CGH

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**From:** Emily Mahanna [<mailto:emahanna@restorsci.com>]  
**Sent:** Thursday, August 31, 2017 12:51 PM  
**To:** Homestead, Charles (Anchorage)  
**Cc:** David Nyman  
**Subject:** RE: Bethel Youth Facility

After further discussion with David, please also switch the SVOCs to PAH SIMMS for the Bethel Youth Facility order.

Thanks,

Emily Mahanna  
Environmental Engineer, EIT  
Restoration Science & Engineering, LLC  
[emahanna@restorsci.com](mailto:emahanna@restorsci.com)  
907-278-1023 x110

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**From:** Emily Mahanna  
**Sent:** Thursday, August 31, 2017 10:15 AM  
**To:** 'Homestead, Charles (Anchorage)' <[Charles.Homestead@sgs.com](mailto:Charles.Homestead@sgs.com)>  
**Cc:** David Nyman <[dnyman@restorsci.com](mailto:dnyman@restorsci.com)>  
**Subject:** Bethel Youth Facility

Hey Chuck,

Please remove the 8021 BTEX from the Bethel Youth Facility order.

Thanks!

Emily Mahanna  
Environmental Engineer, EIT  
Restoration Science & Engineering, LLC  
[emahanna@restorsci.com](mailto:emahanna@restorsci.com)  
907-278-1023 x110







SGS North America Inc.  
CHAIN OF CUSTODY RECORD

1176160



**CLIENT:** Restoration Science & Eng.  
**CONTACT:** Emily Mahanna PHONE #: 278-1023 x 110  
**PROJECT NAME:** Bethel Youth Facility 1459 <sup>Project/ PWSID/ PERMIT#:</sup> 15-1459  
**REPORTS TO:** Emily Mahanna E-MAIL: emahanna @ restorsci.com  
**INVOICE TO:** Restoration Science & Eng. QUOTE #: P.O. #:

**Section 1**

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

**Section 3** Preservative

#	CONTAINERS	Pres: Type:	HCL				DRO (AK102) LV	SVOCs (8270D)	REMARKS/ LOC ID
			HCL	HCL	HCL	None			
10	10	Gr	X	X	X	X	X		
10	10	Gr	X	X	X	X	X		
10	10	Gr	X	X	X	X	X		
10	10	Gr	X	X	X	X	X		
10	10	Gr	X	X	X	X	X		

**Section 2**

RESERVED for lab use	SAMPLE IDENTIFICATION	DATE mm/dd/yy	TIME HH:MM	MATRIX/MATRIX CODE
DA-J	B1	8/29/17	14:15	H <sub>2</sub> O
DA-J	B3	8/29/17	13:00	H <sub>2</sub> O
DA-J	B8	8/29/17	11:15	H <sub>2</sub> O
DA-J	B4	8/29/17	11:55	H <sub>2</sub> O
DA-J	BX	8/29/17	12:15	H <sub>2</sub> O
DA-F	Trip Blank			

**Section 4** DOD Project? Yes No

**Section 5**

Relinquished By: (1) [Signature] Date: 8/30/17 Time: 10:45 Received By: [Signature]  
 Relinquished By: (2) [Signature] Date: 8/30/17 Time: 10:45 Received By: [Signature]  
 Relinquished By: (3) [Signature] Date: 8/30/17 Time: 10:45 Received By: [Signature]  
 Relinquished By: (4) [Signature] Date: 8/30/17 Time: 10:45 Received By: [Signature]

Temp Blank °C 5.1 #D40  
 Ambient [ ] #D30  
 (See attached Sample Receipt Form)

Chain of Custody Seal: (Circle)  
 HANDLED - INTACT BROKEN ABSENT

proceed per client request

Requested Turnaround Time and/or Special Instructions:

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

[ ] 200 W. Potter Drive Anchorage, AK 99518 Tel: (907) 562-2343 Fax: (907) 561-5301  
 [ ] 5500 Business Drive Wilmington, NC 28405 Tel: (910) 350-1903 Fax: (910) 350-1557



e-Sample Receipt Form

SGS Workorder #:

1176160



1 1 7 6 1 6 0

Review Criteria	Condition (Yes, No, N/A)	Exceptions Noted below
<b>Chain of Custody / Temperature Requirements</b>		<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 @ 5.1 °C Therm. ID: D40
	<input checked="" type="checkbox"/> No	Cooler ID: 2 @ 7.6 °C Therm. ID: D20
	<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".		Proceed per client.
Note: Identify containers received at non-compliant temperature . Use form FS-0029 if more space is needed.		
<b>Holding Time / Documentation / Sample Condition Requirements</b>		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 <b>match COC**</b> (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).
<b>Volatile / LL-Hg Requirements</b>		
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	
<b>Note to Client:</b> 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>
1176160001-A	HCL to pH < 2	OK	1176160005-C	HCL to pH < 2	OK
1176160001-B	HCL to pH < 2	OK	1176160005-D	HCL to pH < 2	OK
1176160001-C	HCL to pH < 2	OK	1176160005-E	HCL to pH < 2	OK
1176160001-D	HCL to pH < 2	OK	1176160005-F	HCL to pH < 2	OK
1176160001-E	HCL to pH < 2	OK	1176160005-G	HCL to pH < 2	OK
1176160001-F	HCL to pH < 2	OK	1176160005-H	HCL to pH < 2	OK
1176160001-G	HCL to pH < 2	OK	1176160005-I	No Preservative Required	OK
1176160001-H	HCL to pH < 2	OK	1176160005-J	No Preservative Required	OK
1176160001-I	No Preservative Required	OK	1176160006-A	HCL to pH < 2	OK
1176160001-J	No Preservative Required	OK	1176160006-B	HCL to pH < 2	OK
1176160002-A	HCL to pH < 2	OK	1176160006-C	HCL to pH < 2	OK
1176160002-B	HCL to pH < 2	OK	1176160006-D	HCL to pH < 2	OK
1176160002-C	HCL to pH < 2	OK	1176160006-E	HCL to pH < 2	OK
1176160002-D	HCL to pH < 2	OK	1176160006-F	HCL to pH < 2	OK
1176160002-E	HCL to pH < 2	OK			
1176160002-F	HCL to pH < 2	OK			
1176160002-G	HCL to pH < 2	OK			
1176160002-H	HCL to pH < 2	OK			
1176160002-I	No Preservative Required	OK			
1176160002-J	No Preservative Required	OK			
1176160003-A	HCL to pH < 2	OK			
1176160003-B	HCL to pH < 2	OK			
1176160003-C	HCL to pH < 2	OK			
1176160003-D	HCL to pH < 2	OK			
1176160003-E	HCL to pH < 2	OK			
1176160003-F	HCL to pH < 2	OK			
1176160003-G	HCL to pH < 2	OK			
1176160003-H	HCL to pH < 2	OK			
1176160003-I	No Preservative Required	OK			
1176160003-J	No Preservative Required	OK			
1176160004-A	HCL to pH < 2	OK			
1176160004-B	HCL to pH < 2	OK			
1176160004-C	HCL to pH < 2	OK			
1176160004-D	HCL to pH < 2	OK			
1176160004-E	HCL to pH < 2	OK			
1176160004-F	HCL to pH < 2	OK			
1176160004-G	HCL to pH < 2	OK			
1176160004-H	HCL to pH < 2	OK			
1176160004-I	No Preservative Required	OK			
1176160004-J	No Preservative Required	OK			
1176160005-A	HCL to pH < 2	OK			
1176160005-B	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 than an inappropriate container was submitted.

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

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

DM- The container was received damaged.

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

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.