500.38.007

SELAWIK FORMER AVEC TANK FARM
SITE CHARACTERIZATION REPORT

Prepared for:

ALASKA VILLAGE ELECTRICAL COOPERATIVE, INC.
4831 Eagle Street
Anchorage, AK 99503

Prepared by:

TRAVIS/PETERSON ENVIRONMENTAL CONSULTING, INC.

3305 Arctic Blvd., Suite 102
Anchorage, Alaska 99503

329 2nd Street
Fairbanks, Alaska 99701

1159-20
May, 2015

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Acronyms and Abbreviations

ADEC	Alaska Department of Environmental Conservation
AVEC	Alaska Village Electrical Cooperative
AST	Above-ground Storage Tank
bgs	Below ground surface
BTEX	Benzene, Toluene, Ethylbenzene, Xylenes
COPC	Contaminants of Potential Concern
DRO	Diesel Range Organics
GRO	Gasoline Range Organics
Mg/L	Milligrams per Liter
PAH	Polycyclic Aromatic Hydrocarbons
PID	Photo-Ionization Detector
ppm	Parts per Million
QA/QC	Quality Assurance/Quality Control
RAFS	Rural Alaska Fuel Services
RRO	Residual Range Organics
SOP	Standard Operating Procedure
TCLP	Toxicity Characteristic Leaching Procedure
TPECI	Travis/Peterson Environmental Consulting, Inc.
µg/L	Micrograms per Liter
µg/mL	Micrograms per Milliliter
VOC	Volatile Organic Compound

1.0 INTRODUCTION

In 2010, the Alaska Department of Environmental Conservation (ADEC) contracted Shannon and Wilson to perform a Brownfields Assessment of several sites in Selawik, Alaska. The sites included a former Alaska Village Electrical Cooperative, Inc. (AVEC) tank farm and a barge landing site where several abandoned AVEC fuel tanks were stored.

The Brownfields Assessment found lead and hydrocarbon contamination around the former AVEC tank farm. The Assessment noted several potential public health and safety concerns at the site related to fuel spills and leaks, abandoned equipment, and derelict buildings. Soil samples collected from the site also indicate areas of significant hydrocarbon contamination with the potential for impact to the subsurface melt-water.

The Brownfields Assessment contained recommendations regarding cleanup prior to any future property use. Recommendations included the removal of the abandoned fuel storage tanks from the site, the draining of fluids from generator units located in an onsite building and their subsequent removal from the site, the demolition of the generator building, and the removal of all cribbing and support structures for the generator building and the tanks. The cleanup of miscellaneous debris on the site including metal and wood scraps was also mentioned.

In December, 2011, AVEC received a Potentially Responsible Party (PRP) letter from the ADEC regarding the former AVEC fuel tank farm in Selawik. In April, 2012, AVEC personnel and local laborers began site cleanup operations. The objective of the 2012 cleanup was to demolish all the structures on the former tank farm site and barge landing site and remove all debris. All non-hazardous solid waste from the demolition and cleanup was deposited in the Selawik landfill.

Five pad-mounted transformers that were noted in the Brownfields Assessment report were also drained and removed. The transformer oil was burned and the housing units were discarded in the landfill.

Around the year 2000, AVEC decommissioned several tanks and relocated them to the barge landing. These tanks were also mentioned in the 2011 Brownfields Assessment report under the Barge Landing section. During the cleanup process, AVEC cut and disassembled these tanks and then disposed them in the landfill. AVEC no longer has any tanks at the barge landing site.

Following the major demolition and cleanup process at the former tank farm, AVEC personnel and laborers cleaned up the remainder of the site. Any non-hazardous solid waste including lumber, metal scrap, and other materials related to the operation and maintenance of a power generating facility were disposed of in the Selawik landfill. Waste oils were burned on site.

As the original assessment of the site occurred during a time when the ground surface was partially frozen, a true characterization of the extent of hydrocarbon contamination was not possible. The assessment report recommended that a complete characterization of the site be made and contaminated soils excavated and treated in accordance with applicable standards.

In 2013, Travis/Peterson Environmental Consulting, Inc. (TPECI) characterized the former tank farm site and the barge landing site. TEPCI advanced soil test borings at both locations based on the areas of known surface contamination from the 2011 Brownfields Assessment as well as first-hand knowledge of facility locations from AVEC personnel.

Soil borings were made at the barge landing site around the temporary storage site of the AVEC tanks as well as below the marine header. No indications of hydrocarbon soil contamination were found during the investigation of the barge landing site. The TPECI Selawik Former AVEC Tank Farm and Barge Landing Site Characterization Report, December, 2013, detailed these findings.

An April, 2014 letter from Ms. Melinda Brunner of the ADEC to AVEC stated that the barge landing site was not a listed contaminated site and was only listed as having a status of "Informational" within the ADEC Contaminated Sites Database. The letter also states that based on the finding of the 2013 site characterization, the status of the site would not be changed from "Informational" and that under available information, AVEC is not presently liable for any contamination at the site.

The 2013 site characterization at the former tank farm site found areas of hydrocarbon soil contamination above ADEC cleanup levels. Many of the samples with elevated hydrocarbon levels were collected at soil boring locations associated with the identified 2011 Brownfields Assessment surface contamination locations. AVEC discussions with ADEC personnel following the 2013 site characterization found that while the previous years' activities did determine the vertical extents of the contamination and did identify the areas of maximum contaminant concentrations, it did not satisfactory identify the horizontal extents.

Based on these discussions, ADEC determined that additional site characterization was necessary, stepping outward from previous soil testing boring locations to effectively determine the horizontal extents of contamination at the former tank farm site.

2.0 OBJECTIVE

AVEC contracted TPECI to prepare a secondary site characterization work plan for the Selawik Tank Farm. ADEC approved it on June 20, 2014. The objective of the plan was to supplement the data collected in the previous work plan by expanding the soil testing locations. This information would lay the basis for a site remediation plan. The supplemental testing would assist TPECI personnel in delineating the soil contaminant plumes and estimating the volume of contaminated soil.

3.0 SITE DESCRIPTION AND BACKGROUND

The project site is located in the village of Selawik on the Selawik River in the Northwest Arctic Borough (Figure 1, Appendix A). AVEC demolished all structures on the former tank farm site in 2012. Additionally, all debris and other materials were removed from the site. Currently, the old tank farm site was cleared and ready for characterization (Figure 2, Appendix A).

The terrain surrounding the former tank farm site was relatively flat. Sparse vegetation including tundra grasses, willows, and alders were present at locations. Much of the surrounding ground surfaces consisted of gravels or other disturbed soil roadways or trails. General drainage the site is towards the Selawik River.

Continuous permafrost underlays Selawik, including the former AVEC power plant and tank farm site. The 2010 Brownsfield investigation report noted on multiple occasions the presence of continuous permafrost in Selawik and the impacts on previous construction and remediation projects in the area. The Brownsfield report also noted that the continuous permafrost and lack of groundwater supported the Arctic Zone category under Method Two of the ADEC cleanup standards.

4.0 CONTAMINANTS OF CONCERN

The primary contaminant of concern (COC) was number one diesel fuel. TPECI personnel collected soil samples for diesel range organics (DRO), residual range organics (RRO), gasoline range organics (GRO), and benzene, toluene, ethyl benzene, and xylenes (collectively referred to as BTEX). Ten percent of samples were also analyzed for Polycyclic Aromatic Hydrocarbons (PAH).

Lead contamination on site was previously noted as a concern. Laboratory samples were collected for toxicity characteristic leaching procedure (TCLP) analysis during the 2013 site characterization in the area of previously noted surface contamination. No indications of lead concentrations were found. Thus, no additional sampling for lead occurred in the 2014 site characterization efforts.

TPECI submitted samples to SGS Environmental Laboratories, Inc. in Anchorage, Alaska for analysis. The qualified sampler also performed field screening using a photo-ionization detector (PID) to screen for volatile organic compounds (VOC).

5.0 FIELD SCREENING

TPECI personnel field screened soils with the PID, in accordance with the ADEC *May 2010 Draft Field Sampling Guidance*, Section III Soil Sampling. TPECI used a PID threshold of 20 ppm as an indicator of hydrocarbon contamination in soils potentially exceeding ADEC cleanup levels. TPECI personnel took confirmation samples from the highest PID readings within the borehole area. The confirmation samples were collected in accordance with page 19 of the ADEC *May 2010 Draft Field Sampling Guidance*, Section III, Subsection C. Soil Laboratory Analytical Sample Collection, paragraph 5 In-Situ (sub-surface) Soils (see excerpt below).

> ***5. In-Situ (sub-surface) Soils***
> *The frequency and location of field screening and laboratory analytical samples must be proposed in the work plan submitted to ADEC for approval.*
>
> *Typically, two laboratory samples should be collected from each boring. Collect one sample from the interval that is most impacted based on field screening and observations. If applicable, collect a second laboratory sample from the saturated soils just above the water table where contaminants are most likely to migrate, unless sampling objectives dictate otherwise.*

The following describes the sampling protocols that TPECI field personnel followed to screen and collect soil samples. Field screening occurred first to delineate hydrocarbon contamination within test borings. A MiniRAE™ Systems 2000 PID was utilized for field screening.

The PID was calibrated according to the manufacturer specifications in the field using a fresh air charcoal blank and a 100-ppm isobutylene calibration span gas. Plastic bags were filled three quarters full of soil from the screening sample. The soil, sealed in a plastic bag, was allowed to warm up to between 50 and 70 degrees Fahrenheit. The tip of the calibrated PID was then placed inside the bag for thirty seconds or until the reading stabilizes. PID field screening samples exhibiting headspace screening results greater-than 20 ppm were considered potentially contaminated.

One sample was screened from each test boring. Because there were no excavation pits, no sidewall samples were collected. Permafrost was encountered between 2.0 and 3.0 feet below ground surface (bgs) depending on location. Meltwater was encountered at approximately 0.5 to 1.5 feet bgs. All samples were at the meltwater depth (in some cases this depth was also the depth to permafrost) as this was the area most likely to contain high contaminant concentrations.

6.0 SAMPLING

TPECI personnel conducted this site characterization in accordance with the ADEC *18 AAC 75 Oil and Other Hazardous Substances Pollution Control (revised Oct. 2008)* regulations and procedures described in the ADEC *Site Characterization Work Plan and Reporting Guidance for Investigation of Contaminated Sites (September 2009)*.

TPECI personnel conducted the site characterization August 11th, 2014. While on site, TPECI personnel were aided by AVEC staff. AVEC staff showed TPECI personnel the locations of the former AVEC tank farm structures, fuel storage areas, transformer storage areas and described site operating conditions. TPECI utilized a PID and an analytical sampling kit on site in addition to olfactory and visual clues to determine the extents of the contamination. Portable hand-power augers along with hand tools were used for soil borings.

TPECI excavated soil test borings in areas of probable known contamination and areas where visual indicators of contamination were present. These locations were stepped outward from both the five locations of detected surface contamination as noted in the 2011 Brownfields Assessment and the soil test boring locations sampled in 2013. Figure 3 depicts the locations of all soil borings excavated during 2014 field work. Several test borings were located upgradient and immediately adjacent to the AVEC property. The depths of the borings were based on the vertical extent of contamination and the depth to permafrost. On August 11th, 2014, the depth to permafrost ranged from 28 inches to 32 inches below ground surface. This was an increase in depth from the 18 to 24 inches observed in July of 2013.

The characterization process included the following:

- Worked with AVEC personnel identifying areas of known contamination;
- Identified locations of 2010 Brownfields Sampling;
- Identified locations of 2013 Site Characterization soil test borings;

- Worked outward from previous test borings with identified contamination (confirmed by PID screening) advanced borings using augers or hand tools until the horizontal extents of contamination were confirmed. (Soil borings were made at locations shown in Figure 3); and
- Screened and collected soil samples as prescribed in this plan (Sections 5.0 and 7.0),

Soil excavated from the test borings was temporarily stockpiled on visqueen. Following the screening and sampling of each test boring, the soil was backfilled.

6.1 Former Power Plant and Tank Farm Site

TPECI personnel advanced a total of 11 borings at the former power plant and tank farm site. The soil boring locations were selected based on the locations of the 2013 site characterization soil borings, the locations of the 2010 Brownsfield Study sample collection locations, knowledge of the AVEC staff familiar with the site, and visual and olfactory indicators of contamination on the site. Using the 2013 soil borings 2010 Brownsfield study locations as a starting point other known or readably visible contaminated soils were identified, additional borings were conducted moving outward from the contamination in an attempt to the determine the horizontal extent.

Visual and olfactory indicators of hydrocarbon contamination along with site topography of the presence of surface meltwater indicated that the most impacted areas of the site were in the immediate vicinity of the 2010 Brownsfield Study points. These areas were heavily sampled during the 2013 study. Therefore, TPECI personnel moved outward from these locations to characterize the site. The specific sampling locations were identified ahead of time in coordination with ADEC personnel. Due to field conditions, the locations of some borings were moved and their accurate positions are shown in Figure 3 of this document (See Section 9.0 Deviations from the Work Plan).

All soil borings at the Former Power Plant and Tank Farm Site were advanced to a depth of 2.0 to 3.0 feet below ground surface. All borings were drilled to refusal at permafrost depth. Meltwater depth was encountered in all borings at a depth of approximately 0.5 to 1.5 feet bgs. Soil was collected for screening from each of the 11 soil borings. Characterization samples for laboratory analysis were collected from each boring at melt-water depth, as was stated in in the work plan.

7.0 CHARACTERIZATION SAMPLING

Characterization samples were collected as described below from the locations flagged for field screening. Additionally, field duplicate samples were collected as described in in the work plan.

One laboratory sample was collected from each boring. One laboratory sample was collected from saturated soils just above the melt-water elevation (if encountered) where contaminants are most likely to migrate (ADEC *May 2010 Draft Field Sampling Guidance*, Section III, Subsection C. Soil Laboratory Analytical Sample Collection, paragraph 5 In-Situ (sub-surface) Soils). If melt-water was not encountered, the sample was collected at the permafrost interface.

All characterization soil samples were be analyzed for GRO compounds by method AK101, BTEX by method 8021, and DRO and RRO by method AK102. One sample for every 10 laboratory samples was also be analyzed for PAH by Method 8270 to comply with the ADEC requirement of 10%+ sampling of PAH for Diesel #2 contamination (i.e. the collection of two PAH samples occurred) (ADEC *May 2010 Draft Field Sampling Guidance* Appendix D*)*.

In addition to soil sampling at the former AVEC tank farm, surface water samples were collected for laboratory analysis from a small surface water (melt-water) depression at the site. Two surface water samples were collected at the site, one being a field duplicate sample. The two samples were analyzed for Total Aromatic Hydrocarbons (TAH) by EPA Method 602/624 and Total Aqueous Hydrocarbons (TAqH) by EPA Method 625M SIM. The surface water samples were collected as grab samples from the waterbody using an extendable dipping container.

Sample Field Preparation
Sampling was performed in accordance with the applicable regulations:

- All samples were collected using disposable or cleaned and decontaminated sampling equipment;
- TPECI Environmental Field Staff wore disposable gloves, safety goggles, steel toed boots, hard hat, reflective vest, and other appropriate Class D personal protective equipment. Gloves and sampling devices were changed between samples;
- Samples were collected as quickly as possible and placed in laboratory supplied containers;
- All samples were labeled; and
- All samples were preserved in accordance with laboratory specifications and cooled to a temperature of 4 +/- 2 degrees Celsius.

8.0 SAMPLING RESULTS

Several soil borings at the former power plant and tank farm site were found to have hydrocarbon odors. Strong wind conditions likely impacted the presence of olfactory indicators at the site. However, no hydrocarbon sheen was visible on the melt-water in any of the soil bore holes.

Soil borings at the former power plant and tank farm site that had a hydrocarbon odor included S17, S19, S20, and S24. No other borings contained any visual or olfactory indicators of hydrocarbon contamination. A general hydrocarbon odor was noted in the footprint of the former power plant building where water samples were collected from the surface meltwater pond.

TPECI found those locations identified in the 2010 Brownsfield investigation and again in 2013 to be among the areas with the highest PID field screening results. In attempts to delineate the horizontal extent of the contamination at the site, TPECI noted that contamination concentrations rapidly decreased from the former tank site. Contaminant concentrations at the edges of the property (sampled in 2014) were typical much lower than contaminant concentrations found beneath the former butler building and tank farm sites (sampled in 2013).

Table 1 shows the SGS laboratory analyticals for the samples collected from the borings at the former power plant and tank farm site. Complete analytical results, including PAH analysis results are shown in the SGS Laboratory Report in Appendix C. No PAH constituents were found to exceed ADEC cleanup levels. Additionally, due to permafrost, any future structures will be elevated. As such the vapor intrusion pathway is incomplete.

Table 1. Former Power Plant and Tank Farm Site Laboratory Results - Soil.

Sample ID	Date	Depth (ft)	Percent Solids	PID Reading PPM	RRO mg/Kg *13,700*	DRO mg/Kg *12,500*	GRO mg/Kg *1,400*	Benzene ug/Kg *200,000*	Toluene ug/Kg *11,000,000*	Ethylbenzene ug/Kg *13,700,000*	Xylenes ug/Kg *27,400,000*
S15	8/11/2014	3.0	47.5	3.2	**23,700**	3,670	10.9U	54.5U	109U	109U	327U
S16	8/11/2014	1.5	40.0	2.0	**20,100**	3,270	14.4U	72.2U	1,440	144U	433U
S17	8/11/2014	1.0	31.4	224.4	**20,300**	**20,900**	20.6U	103U	284	206U	617U
S18	8/11/2014	1.0	36.3	17.0	**26,100**	3,930	16.5U	82.5U	165U	165U	495U
S19	8/11/2014	0.5	73.0	173.5	2,810	1,780	15.3	23.6U	68.9	47.2U	371
S20	8/11/2014	0.5	56.7	319.5	8,820	1,680	8.65U	43.3U	499	86.5U	414
S21	8/11/2014	1.0	55.3	17.3	**17,900**	2,890	8.79U	43.9U	87.9U	87.9U	263.9U
S22	8/11/2014	0.5	23.8	122.6	9,240	1,450	28.7U	144U	1,570	287U	862U
S23	8/11/2014	1.0	42.5	41.8	9,300	1,400	12.8U	63.9U	1,270	128U	384U
S24	8/11/2014	1.0	71.0	334.5	319	210	4.40	19.0U	115	38.0U	199.3
S25	8/11/2014	0.5	37.6	30.8	-	-	14.2	71.1U	2,330	142U	427U
S26	8/11/2014	0.5	60.2	319.5	6,710	3,680	7.08U	35.4U	303	70.8U	328
S27	8/11/2014	0.5	58.9	334.5	1,620	422	6.94	29.9U	284	59.8U	282

Notes:
Bold indicates concentration exceed ADEC Arctic Zone Cleanup Level.
J The quantitation is an estimate.
U Indicates the analyte was analyzed for but not detected.

Contaminant concentrations at the former power plant and tank farm site exceeded ADEC cleanup levels for the Arctic Zone Method Two Inhalation Concentrations for DRO at S17 and RRO at S15 and S18. Additionally, Contaminant concentrations exceeded ADEC cleanup levels for the Arctic Zone Method Two Ingestion Concentrations for RRO S16, S17, and S21.

TPECI believes that the elevated RRO concentrations at several soil borings were likely due to the high organic content of the soils. The tundra soils were comprised of primarily peat material as is noted by the low percent solids shown in Table 1. High organic content may lead to biased RRO sample results. This is the most probably explanation for the elevated results as no heavy, viscous oils or other hydrocarbons would have been present at the far extents of the property where these samples were collected.

Samples S26 and S27 are field duplicate samples of S20 and S24, respectively.

Due to an omission on the Chain of Custody document, S25 was not analyzed for DRO/RRO. However, based on the PID reading, the GRO/BTEX analysis, and the location of the boring in relation to other borings on the property, it is unlikely that DRO concentrations at this location exceeded ADEC cleanup levels.

Two water samples were also collected from the melt-water pond at the property. The TAH and TAqH summation results are shown in Table 2. Complete analytical results, including TAH and TAqH analysis results are shown in the SGS Laboratory Report in Appendix C. The summations

for these analyses did not exceed the ADEC 18 AAC 70 Alaska Water Quality Standards (WQS) for TAH (10ug/L) or TAqH (15 ug/L).

Table 2. Former Power Plant and Tank Farm Site Laboratory Results - Water.

Sample ID	Date	Depth (ft)	TAH	TAqH
			ug/L	ug/L
			10.0	*15.0*
SW1	8/11/2014	Surface	2.66	0.1277
SW2	8/11/2014	Surface	2.62	0.1394

Notes:
Bold indicates concentration exceeds 18 AAC 70 AK WQS
J The quantitation is an estimate.
U Indicates the analyte was analyzed for but not detected.

9.0 DEVIATIONS FROM THE WORK PLAN

Section 5.0 "Sampling Plan" of the approved work plan stated that the locations of the soil borings for the proposed work were detailed on Figure 3 of that document. Field conditions and the presence of surface melt-water resulted in the need to move several of the proposed soil boring locations. TPECI contacted ADEC personnel from the field to inform them of the need to relocate some of the sampling sites.

The approved work plan also stated that no test boring were proposed outside of the AVEC property. However, due to the location of a boardwalk at the edge of the property, it was necessary to move several borings outside of the property, immediately on the other side of the boardwalk. It was neither safe, nor feasible to complete soil borings beneath the boardwalk within the property. As this boardwalk is heavily used to access village offices, the removal of the boardwalk, even temporarily, was not an option. The updated and accurate locations for all soil borings are shown in Figure 3 "Detailed Site Map" of this report.

Due to an omission on the Chain of Custody document, soil sample S25 was not analyzed for DR/RRO. This omission was due to an unintentional human transcription error. However, based on the PID reading, the GRO/BTEX analysis, and the location of the boring in relation to other borings on the property, it is unlikely that DRO concentrations at this location exceeded ADEC arctic zone cleanup levels.

10.0 SITE RECOMMENDATIONS AND CONCLUSIONS

TPECI site investigation and characterization found that hydrocarbon contamination was present at the former power plant and tank farm site. Contaminant concentrations in some locations exceeded Table B2 (Method Two) Inhalation Arctic Zone ADEC cleanup levels. The locations within the highest contaminant concentrations were located on the western edge of the property, or beyond the AVEC property line, upgradient of the property.

As no shallow groundwater is present on the site or in the Selawik area, the flow direction of surface meltwater is dependent solely upon topography. The Selawik River is located approximately 200 feet due east of the former power plant and tank farm site (Figure 2). Surface meltwater in the area drains downgradient towards the Selawik River. Based on the river flow directly, the surface meltwater flow direction at the property and in the surrounding area ranges

from east to east-north-east. As such, those areas to west, southwest, and potentially some areas to the northwest are located upgradient of the former power plant and tank farm site. This includes the Selawik school.

Several soil boring locations exhibited elevated RRO concentrations. TPECI believes that these elevated concentrations were likely due to the high organic content of the soils. The tundra soils at the site were comprised of primarily peat material as is noted by the low percent solids in Table 1. High organic content may lead to biased high RRO sample results. This is the most probably explanation of the elevated results as no heavy, viscous oils or other hydrocarbons have been present at the far extents of the property.

The presence of high organic content soils at the property has been well documented. Both the *Property Assessment and Cleanup Plan Selawik Area-Wide* by Shannon & Wilson (2011) and the *Selawik Former AVEC Tank Farm and Barge Landing Site Site Characterization Report* by TPECI (2013) identified the presence of high organic content soils. While neither report noted RRO sampling bias during the investigation, the potential for such a bias always exists with this soil type.

In addition to the contaminated soils located on the property, TPECI personnel noted during the investigation that significant quantities of debris and remnants of the former power plant and tank farm remain on the property. Demolition of the facilities on the property had occurred during the winter months. Much of the cribbing and sub-grade piping and structures remained frozen in the ground at the time. This debris remains on the property. The liner for the tank farm, though shredded and in many pieces, also remains partially buried on site. The debris being dumped on the property by local residents that was noted in 2013 appeared to have been largely removed. Significant debris cleanup will still be necessary prior to any excavation of contaminated soils.

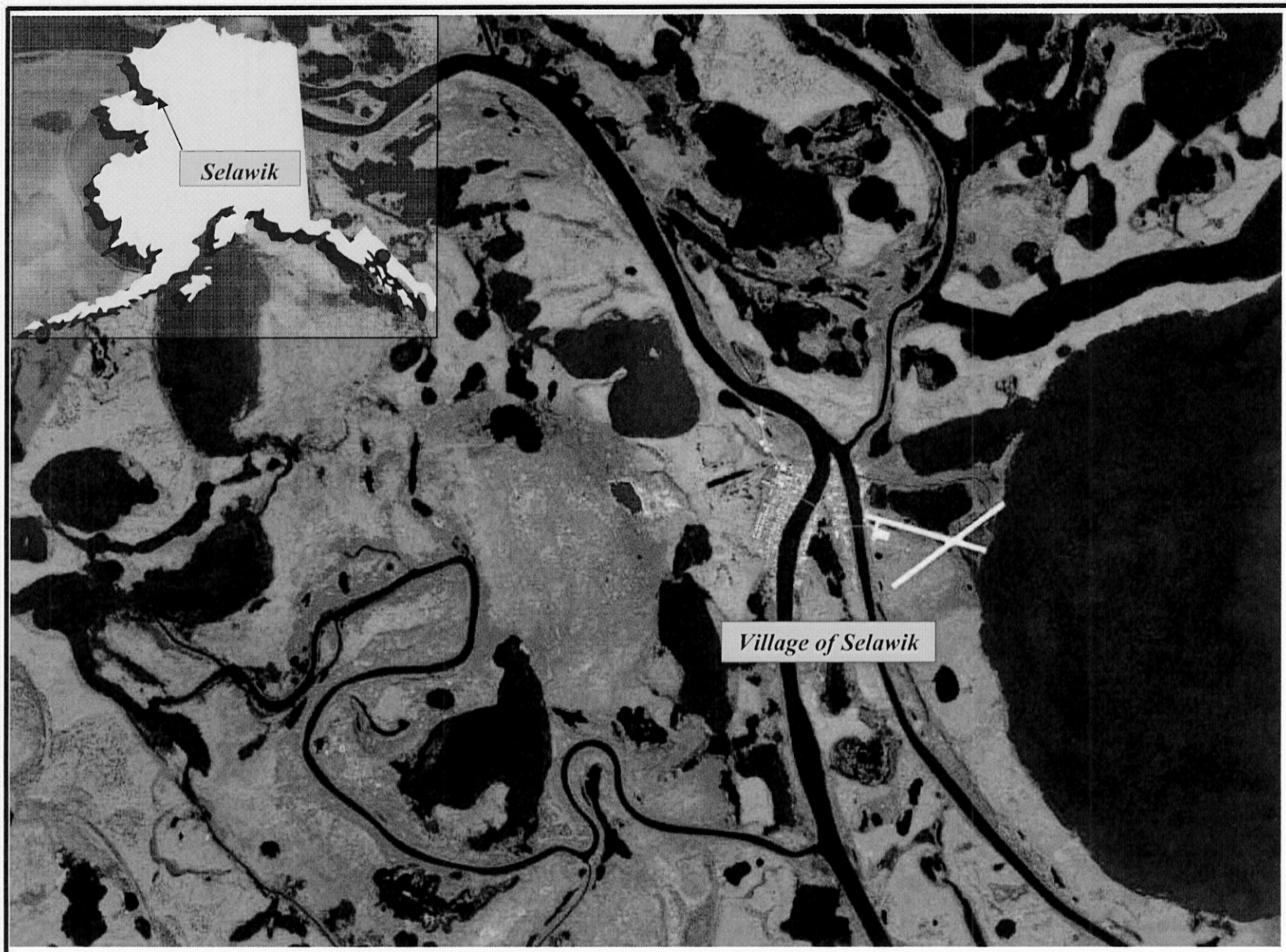
10.1 Conclusions

Based on the findings of this site characterization investigation, in conjunction with the 2013 TPECI site characterization investigation and the 2010 Brownsfield study of the property, TPECI has determined that the nature and extent of the contamination at the AVEC former power plant and tank farm site has been thoroughly characterized and defined. The findings of these investigations can be used to complete and institute a Corrective Action Plan to address the identified environmental concerns on the property.

Prior to any additional site cleanup at the former power plant and tank farm, a CAP will have to be prepared for the site and approved by the ADEC. The CAP will address methods for soil excavation, confirmation sampling, and the treatment of any excavated soils.

During the winter of 2014-2015, AVEC will prepare a CAP for the cleanup of the former power plant and tank farm site. This CAP will be submitted to ADEC for approval.

APPENDIX A:
Figures



Travis/Peterson Environmental Consulting, Inc. 3305 Arctic Boulevard, Suite 102 Anchorage, AK 99503 907-522-4337	**AVEC Selawik Site Characterization Plan** **Selawik, Alaska**	**General Location Map** **Figure #1**

Project No: 1159-20	**File: Jupiter\backup\Erik\1159-20\Figures**	**Date: 4/29/2014**	**Scale: None**

Travis/Peterson Environmental Consulting, Inc.
3305 Arctic Boulevard, Suite 102
Anchorage, AK 99503
907-522-4337

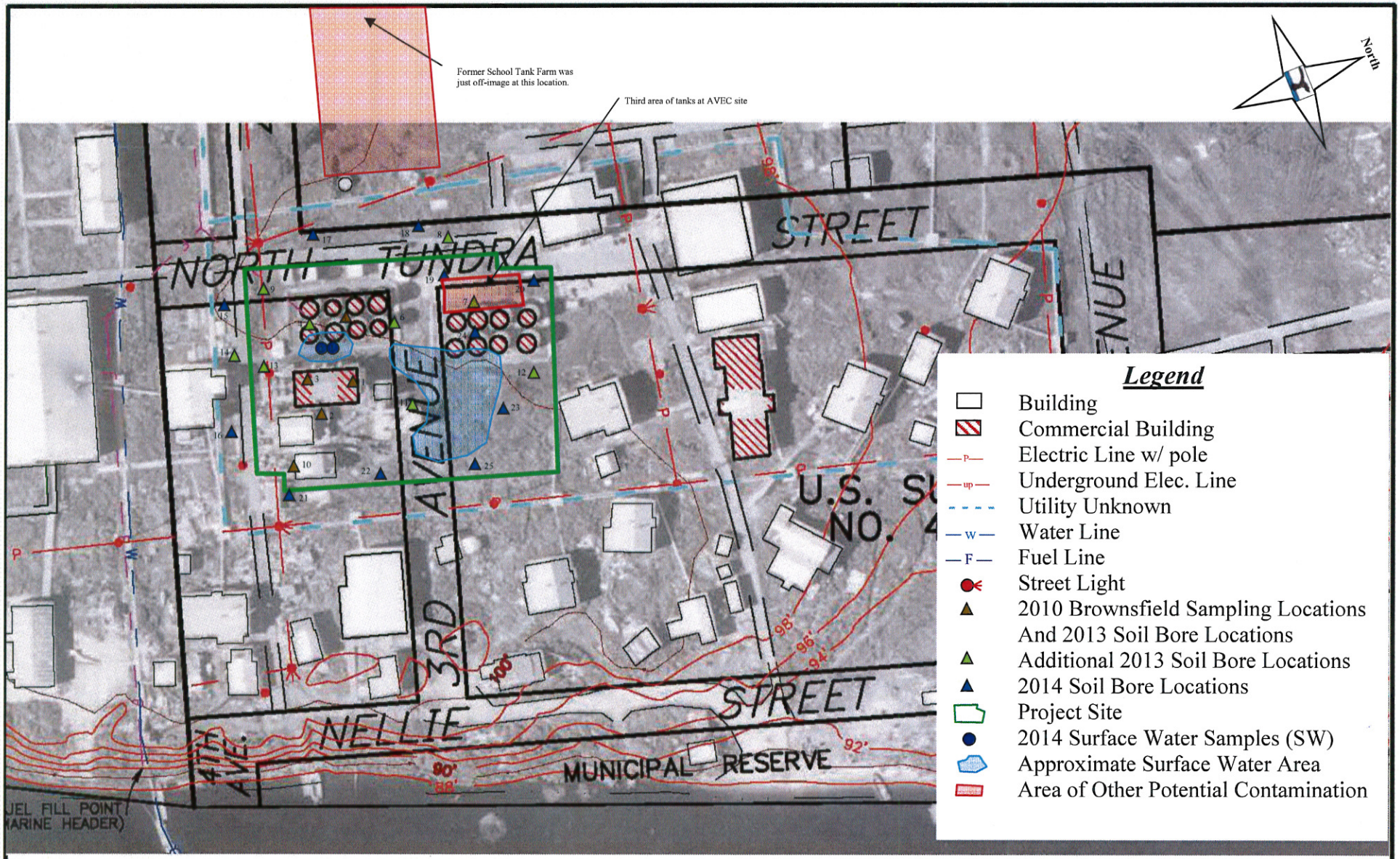
AVEC Selawik Site Characterization Plan

Selawik, Alaska

Site Map

Figure #2

Project No: 1159-20	**File: Jupiter\backup\Erik\1159-20\Figures**	**Date: 4/292014**	**Scale: None**



Travis/Peterson Environmental Consulting, Inc. 3305 Arctic Boulevard, Suite 102 Anchorage, AK 99503 907-522-4337	**Alaska Village Electric Corporation, Inc** **4831 Eagle Street** **Anchorage, AK 99503**	**Detailed Site Map** **Figure # 3**

Project No: 1159-20	**File: Jupiter\backup\Erik\projects/1159-20\Figures**	**Date: 8/12/14**	**Scale: None**

APPENDIX B:
Photo Log

Travis/Peterson
Environmental Consulting, Inc.

Selawik Old AVEC Power Plant and Tank Farm Charachterization: Photo Log – August, 2014

AVEC site looking northeast.	Typical soil boring vegetation.
	
Soil boring with high melt-water table.	Soil boring with high melt-water table.
	
AVEC site looking southwest.	Melt-water pond on site.
	

Soil boring to the southwest side of AVEC site.	AVEC site looking north.
	

AVEC site looking east.	Meltwater pond with remaining debris on site.
	

Soil borings on the northwest side of AVEC property.

APPENDIX C:
SGS Laboratory Report

SGS

Laboratory Report of Analysis

To: Travis/Peterson (TPECI)
3305 Arctic Blvd Suite 102
Anchorage, AK 99503
(907)522-4332

Report Number: **1143735**

Client Project: **1159-20 AVEC Selawik**

Dear Erik Mundahl,

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 five 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 Victoria 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.

Victoria Pennick Date
Project Manager
Victoria.Pennick@sgs.com

Print Date: 08/22/2014 2:32:27PM

Case Narrative

SGS Client: **Travis/Peterson (TPECI)**
SGS Project: **1143735**
Project Name/Site: **1159-20 AVEC Selawik**
Project Contact: **Erik Mundahl**

Refer to sample receipt form for information on sample condition.
Note: Benzene reporting limits exceed cleanup criteria due to high moisture content and/or low sample volume.

S15 (1143735001) PS

AK101 - BFB (surrogate) recovery does not meet QC criteria (biased low). Sample was analyzed twice and results confirmed.
AK102/103 - 5a-Androstane and n-triacontane (surrogates) recoveries are outside QC criteria due to sample dilution.
AK102/103 - Unknown hydrocarbon with several peaks is present.

S16 (1143735002) PS

AK102/103 - 5a-Androstane and n-triacontane (surrogates) recoveries are outside QC criteria due to sample dilution.
AK102/103 - Unknown hydrocarbon with several peaks is present.

S17 (1143735003) PS

AK101 - BFB (surrogate) recovery does not meet QC criteria (biased low). Sample was analyzed twice and results confirmed.
AK102/103 - 5a-Androstane and n-triacontane (surrogates) recoveries are outside QC criteria due to sample dilution.
AK103 - Unknown hydrocarbon with several peaks is present.
AK102 - The pattern is consistent with a weathered middle distillate.

S18 (1143735004) PS

AK101 - BFB (surrogate) recovery does not meet QC criteria (biased low). Sample was analyzed twice and results confirmed.
AK102/103 - 5a-Androstane and n-triacontane (surrogates) recoveries are outside QC criteria due to sample dilution.
AK102/103 - Unknown hydrocarbon with several peaks is present.

S19 (1143735005) PS

AK102/103 - 5a-Androstane and n-triacontane (surrogates) recoveries are outside QC criteria due to sample dilution.
AK102 - The pattern is consistent with a weathered middle distillate.
AK103 - Unknown hydrocarbon with several peaks is present.

S20 (1143735006) PS

8270D SIM - LOQs are elevated due to sample dilution. Sample analyzed at a dilution due to matrix interference with internal standards.
AK102/103 - 5a-Androstane and n-triacontane (surrogates) recoveries are outside QC criteria due to sample dilution.
AK102/103 - Unknown hydrocarbon with several peaks is present.

S21 (1143735007) PS

AK101 - BFB (surrogate) recovery does not meet QC criteria (biased low). Sample was analyzed twice and results confirmed.
AK102/103 - 5a-Androstane and n-triacontane (surrogates) recoveries are outside QC criteria due to sample dilution.
AK102/103 - Unknown hydrocarbon with several peaks is present.

S22 (1143735008) PS

AK101 - BFB (surrogate) recovery does not meet QC criteria (biased low). Sample was analyzed twice and results confirmed.
AK103 - n-Triacontane (surrogate) recovery is outside QC criteria due to sample dilution.
AK102/103 - Unknown hydrocarbon with several peaks is present.

S23 (1143735009) PS

AK102/103 - 5a-Androstane and n-triacontane (surrogates) recoveries are outside QC criteria due to sample dilution.
AK102/103 - Unknown hydrocarbon with several peaks is present.

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Case Narrative

SGS Client: **Travis/Peterson (TPECI)**
SGS Project: **1143735**
Project Name/Site: **1159-20 AVEC Selawik**
Project Contact: **Erik Mundahl**

S24 (1143735010) PS

8270D SIM - LOQs are elevated due to sample dilution. Sample analyzed at a dilution due to matrix interference with internal standards.
AK102 - The pattern is consistent with a weathered middle distillate.
AK103 - Unknown hydrocarbon with several peaks is present.

S25 (1143735011) PS

AK101 - BFB (surrogate) recovery does not meet QC criteria (biased low). Sample was analyzed twice and results confirmed.

S26 (1143735012) PS

8270D SIM - Surrogate (2-fluorobiphenyl) recovery is outside of QC criteria due to sample dilution.
8270D SIM - LOQs are elevated due to sample dilution. Sample analyzed at a dilution due to matrix interference with internal standards.
AK102/103 - 5a-Androstane and n-triacontane (surrogates) recoveries are outside QC criteria due to sample dilution.
AK102 - The pattern is consistent with a weathered middle distillate.
AK103 - Unknown hydrocarbon with several peaks is present.

S27 (1143735013) PS

8270D SIM - LOQs are elevated due to sample dilution. Sample analyzed at a dilution due to matrix interference with internal standards.
AK101 - BFB field surrogate does not meet QC criteria (biased high). This is likely due to non-homogeneity for the unpreserved aliquot which was used for Total Solids determination, causing an over-compensation to the results.
AK102 - The pattern is consistent with a weathered middle distillate.
AK103 - Unknown hydrocarbon with several peaks is present.

1143746001MSD (1227250) MSD

8270D SIM - MS/MSD RPD for benzo[k]fluoranthene and benzo[g,h,i]perylene does not meet QC criteria.
8270D SIM - MSD recovery for benzo[g,h,i]perylene is outside of QC criteria (biased low). Refer to LCS for accuracy.

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

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Report of Manual Integrations

Laboratory ID	Client Sample ID	Analytical Batch	Analyte	Reason
EPA 625M SIMS (PAH)				
1143735014	SW1	XMS8237	Pyrene	RP

Manual Integration Reason Code Descriptions

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

All DRO/RRO analysis are integrated per SOP.

Print Date: 08/22/2014 2:32:29PM

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. If you have any questions regarding this report, or if we can be of any other assistance, please contact your SGS Project Manager at 907-562-2343. All work is provided under SGS general terms and conditions (<http://www.sgs.com/terms_and_conditions.htm>), unless other written agreements have been accepted by both parties.

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: 1020A, 1311, 3010A, 3050B, 3520C, 3550C, 5030B, 5035B, 6020, 7470A, 7471B, 8021B, 8082A, 8260B, 8270D, 8270D-SIM, 9040B, 9045C, 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	Continuing Calibration Verification
CL	Control Limit
D	The analyte concentration is the result of a dilution.
DF	Dilution Factor
DL	Detection Limit (i.e., maximum method detection limit)
E	The analyte result is above the calibrated range.
F	Indicates value that is greater than or equal to the DL
GT	Greater Than
IB	Instrument Blank
ICV	Initial Calibration Verification
J	The quantitation is an estimation.
JL	The analyte was positively identified, but the quantitation is a low estimation.
LCS(D)	Laboratory Control Spike (Duplicate)
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
M	A matrix effect was present.
MB	Method Blank
MS(D)	Matrix Spike (Duplicate)
ND	Indicates the analyte is not detected.
Q	QC parameter out of acceptance range.
R	Rejected
RPD	Relative Percent Difference
U	Indicates the analyte was analyzed for but not detected.

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

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Sample Summary

Client Sample ID	Lab Sample ID	Collected	Received	Matrix
S15	1143735001	08/11/2014	08/12/2014	Soil/Solid (dry weight)
S16	1143735002	08/11/2014	08/12/2014	Soil/Solid (dry weight)
S17	1143735003	08/11/2014	08/12/2014	Soil/Solid (dry weight)
S18	1143735004	08/11/2014	08/12/2014	Soil/Solid (dry weight)
S19	1143735005	08/11/2014	08/12/2014	Soil/Solid (dry weight)
S20	1143735006	08/11/2014	08/12/2014	Soil/Solid (dry weight)
S21	1143735007	08/11/2014	08/12/2014	Soil/Solid (dry weight)
S22	1143735008	08/11/2014	08/12/2014	Soil/Solid (dry weight)
S23	1143735009	08/11/2014	08/12/2014	Soil/Solid (dry weight)
S24	1143735010	08/11/2014	08/12/2014	Soil/Solid (dry weight)
S25	1143735011	08/11/2014	08/12/2014	Soil/Solid (dry weight)
S26	1143735012	08/11/2014	08/12/2014	Soil/Solid (dry weight)
S27	1143735013	08/11/2014	08/12/2014	Soil/Solid (dry weight)
SW1	1143735014	08/11/2014	08/12/2014	Water (Surface, Eff., Ground)
SW2	1143735015	08/11/2014	08/12/2014	Water (Surface, Eff., Ground)
Trip Blank	1143735016	08/11/2014	08/12/2014	Water (Surface, Eff., Ground)
Trip Blank 2	1143735017	08/11/2014	08/12/2014	Soil/Solid (dry weight)

Method	Method Description
EPA 602/624	602 Aromatics by 624 (W)
EPA 625M SIMS (PAH)	625 Semi-Volatiles GC/MS Liq/Liq ext.
8270D SIMS (PAH)	8270 PAH SIM Semi-Volatiles GC/MS
AK101	AK101/8021 Combo. (S)
SW8021B	AK101/8021 Combo. (S)
AK102	Diesel/Residual Range Organics
AK103	Diesel/Residual Range Organics
SM21 2540G	Percent Solids SM2540G

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Detectable Results Summary

Client Sample ID: **S15**
Lab Sample ID: 1143735001

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	3670	mg/Kg
	Residual Range Organics	23700	mg/Kg

Client Sample ID: **S16**
Lab Sample ID: 1143735002

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	3270	mg/Kg
	Residual Range Organics	20100	mg/Kg
Volatile Fuels	Toluene	1440	ug/Kg

Client Sample ID: **S17**
Lab Sample ID: 1143735003

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	20900	mg/Kg
	Residual Range Organics	20300	mg/Kg
Volatile Fuels	Toluene	284	ug/Kg

Client Sample ID: **S18**
Lab Sample ID: 1143735004

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	3930	mg/Kg
	Residual Range Organics	26100	mg/Kg

Client Sample ID: **S19**
Lab Sample ID: 1143735005

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	1780	mg/Kg
	Residual Range Organics	2810	mg/Kg
Volatile Fuels	Gasoline Range Organics	15.3	mg/Kg
	o-Xylene	164	ug/Kg
	P & M -Xylene	207	ug/Kg
	Toluene	68.9	ug/Kg

Client Sample ID: **S20**
Lab Sample ID: 1143735006

	Parameter	Result	Units
Polynuclear Aromatics GC/MS	1-Methylnaphthalene	156	ug/Kg
	2-Methylnaphthalene	135	ug/Kg
	Naphthalene	96.7	ug/Kg
Semivolatile Organic Fuels	Diesel Range Organics	1680	mg/Kg
	Residual Range Organics	8820	mg/Kg
Volatile Fuels	o-Xylene	214	ug/Kg
	P & M -Xylene	200	ug/Kg
	Toluene	499	ug/Kg

Client Sample ID: **S21**
Lab Sample ID: 1143735007

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	2890	mg/Kg
	Residual Range Organics	17900	mg/Kg

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Detectable Results Summary

Client Sample ID: **S22**			
Lab Sample ID: 1143735008	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	1450	mg/Kg
	Residual Range Organics	9240	mg/Kg
Volatile Fuels	Toluene	1570	ug/Kg
Client Sample ID: **S23**			
Lab Sample ID: 1143735009	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	1400	mg/Kg
	Residual Range Organics	9300	mg/Kg
Volatile Fuels	Toluene	1270	ug/Kg
Client Sample ID: **S24**			
Lab Sample ID: 1143735010	Parameter	Result	Units
Polynuclear Aromatics GC/MS	1-Methylnaphthalene	94.3	ug/Kg
	2-Methylnaphthalene	114	ug/Kg
	Naphthalene	36.7	ug/Kg
Semivolatile Organic Fuels	Diesel Range Organics	210	mg/Kg
	Residual Range Organics	319	mg/Kg
Volatile Fuels	Gasoline Range Organics	4.40	mg/Kg
	o-Xylene	95.3	ug/Kg
	P & M -Xylene	104	ug/Kg
	Toluene	115	ug/Kg
Client Sample ID: **S25**			
Lab Sample ID: 1143735011	Parameter	Result	Units
Volatile Fuels	Toluene	2330	ug/Kg
Client Sample ID: **S26**			
Lab Sample ID: 1143735012	Parameter	Result	Units
Polynuclear Aromatics GC/MS	1-Methylnaphthalene	221	ug/Kg
	2-Methylnaphthalene	159	ug/Kg
Semivolatile Organic Fuels	Diesel Range Organics	3680	mg/Kg
	Residual Range Organics	6710	mg/Kg
Volatile Fuels	o-Xylene	185	ug/Kg
	P & M -Xylene	143	ug/Kg
	Toluene	303	ug/Kg
Client Sample ID: **S27**			
Lab Sample ID: 1143735013	Parameter	Result	Units
Polynuclear Aromatics GC/MS	1-Methylnaphthalene	151	ug/Kg
	2-Methylnaphthalene	199	ug/Kg
	Naphthalene	72.4	ug/Kg
Semivolatile Organic Fuels	Diesel Range Organics	422	mg/Kg
	Residual Range Organics	1620	mg/Kg
Volatile Fuels	Gasoline Range Organics	6.94	mg/Kg
	o-Xylene	116	ug/Kg
	P & M -Xylene	166	ug/Kg
	Toluene	284	ug/Kg

Detectable Results Summary

Client Sample ID: **SW1**
Lab Sample ID: 1143735014

	Parameter	Result	Units
Polynuclear Aromatics GC/MS	Fluoranthene	0.0558	ug/L
	Pyrene	0.0719	ug/L
Volatile GC/MS	Toluene	2.66	ug/L

Client Sample ID: **SW2**
Lab Sample ID: 1143735015

	Parameter	Result	Units
Polynuclear Aromatics GC/MS	Fluoranthene	0.0591	ug/L
	Pyrene	0.0803	ug/L
Volatile GC/MS	Toluene	2.62	ug/L

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Results of **S15**

Client Sample ID: **S15**
Client Project ID: **1159-20 AVEC Selawik**
Lab Sample ID: 1143735001
Lab Project ID: 1143735

Collection Date: 08/11/14 11:31
Received Date: 08/12/14 09:56
Matrix: Soil/Solid (dry weight)
Solids (%): 47.5
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	3670		1980	613	mg/Kg	10		08/19/14 19:24
Surrogates								
5a Androstane	0	*	50-150		%	10		08/19/14 19:24

Batch Information

Analytical Batch: XFC11515
Analytical Method: AK102
Analyst: AYC
Analytical Date/Time: 08/19/14 19:24
Container ID: 1143735001-A

Prep Batch: XXX31701
Prep Method: SW3550C
Prep Date/Time: 08/14/14 09:39
Prep Initial Wt./Vol.: 30.343 g
Prep Extract Vol: 4.75 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	23700		1980	613	mg/Kg	10		08/19/14 19:24
Surrogates								
n-Triacontane-d62	0	*	50-150		%	10		08/19/14 19:24

Batch Information

Analytical Batch: XFC11515
Analytical Method: AK103
Analyst: AYC
Analytical Date/Time: 08/19/14 19:24
Container ID: 1143735001-A

Prep Batch: XXX31701
Prep Method: SW3550C
Prep Date/Time: 08/14/14 09:39
Prep Initial Wt./Vol.: 30.343 g
Prep Extract Vol: 4.75 mL

Print Date: 08/22/2014 2:32:33PM

Results of **S15**

Client Sample ID: **S15**
Client Project ID: **1159-20 AVEC Selawik**
Lab Sample ID: 1143735001
Lab Project ID: 1143735

Collection Date: 08/11/14 11:31
Received Date: 08/12/14 09:56
Matrix: Soil/Solid (dry weight)
Solids (%): 47.5
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	10.9	U	10.9	3.27	mg/Kg	1		08/19/14 20:01
Surrogates								
4-Bromofluorobenzene	36.3	*	50-150		%	1		08/19/14 20:01

Batch Information

Analytical Batch: VFC12055
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 08/19/14 20:01
Container ID: 1143735001-B

Prep Batch: VXX26302
Prep Method: SW5035A
Prep Date/Time: 08/11/14 11:31
Prep Initial Wt./Vol.: 48.907 g
Prep Extract Vol: 50.6682 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	54.5	U	54.5	17.4	ug/Kg	1		08/19/14 20:01
Ethylbenzene	109	U	109	34.0	ug/Kg	1		08/19/14 20:01
o-Xylene	109	U	109	34.0	ug/Kg	1		08/19/14 20:01
P & M -Xylene	218	U	218	65.4	ug/Kg	1		08/19/14 20:01
Toluene	109	U	109	34.0	ug/Kg	1		08/19/14 20:01
Surrogates								
1,4-Difluorobenzene	103		72-119		%	1		08/19/14 20:01

Batch Information

Analytical Batch: VFC12055
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 08/19/14 20:01
Container ID: 1143735001-B

Prep Batch: VXX26302
Prep Method: SW5035A
Prep Date/Time: 08/11/14 11:31
Prep Initial Wt./Vol.: 48.907 g
Prep Extract Vol: 50.6682 mL

Print Date: 08/22/2014 2:32:33PM

Results of **S16**

Client Sample ID: **S16**
Client Project ID: **1159-20 AVEC Selawik**
Lab Sample ID: 1143735002
Lab Project ID: 1143735

Collection Date: 08/11/14 11:37
Received Date: 08/12/14 09:56
Matrix: Soil/Solid (dry weight)
Solids (%): 40.0
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	3270		1220	377	mg/Kg	10		08/19/14 19:34
Surrogates								
5a Androstane	0	*	50-150		%	10		08/19/14 19:34

Batch Information

Analytical Batch: XFC11515
Analytical Method: AK102
Analyst: AYC
Analytical Date/Time: 08/19/14 19:34
Container ID: 1143735002-A

Prep Batch: XXX31701
Prep Method: SW3550C
Prep Date/Time: 08/14/14 09:39
Prep Initial Wt./Vol.: 30.206 g
Prep Extract Vol: 2.45 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	20100		1220	377	mg/Kg	10		08/19/14 19:34
Surrogates								
n-Triacontane-d62	0	*	50-150		%	10		08/19/14 19:34

Batch Information

Analytical Batch: XFC11515
Analytical Method: AK103
Analyst: AYC
Analytical Date/Time: 08/19/14 19:34
Container ID: 1143735002-A

Prep Batch: XXX31701
Prep Method: SW3550C
Prep Date/Time: 08/14/14 09:39
Prep Initial Wt./Vol.: 30.206 g
Prep Extract Vol: 2.45 mL

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Results of **S16**

Client Sample ID: **S16**
Client Project ID: **1159-20 AVEC Selawik**
Lab Sample ID: 1143735002
Lab Project ID: 1143735

Collection Date: 08/11/14 11:37
Received Date: 08/12/14 09:56
Matrix: Soil/Solid (dry weight)
Solids (%): 40.0
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	14.4	U	14.4	4.33	mg/Kg	1		08/18/14 18:45
Surrogates								
4-Bromofluorobenzene	52.5		50-150		%	1		08/18/14 18:45

Batch Information

Analytical Batch: VFC12054
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 08/18/14 18:45
Container ID: 1143735002-B

Prep Batch: VXX26298
Prep Method: SW5035A
Prep Date/Time: 08/11/14 11:37
Prep Initial Wt./Vol.: 45.043 g
Prep Extract Vol: 52.0357 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	72.2	U	72.2	23.1	ug/Kg	1		08/18/14 18:45
Ethylbenzene	144	U	144	45.1	ug/Kg	1		08/18/14 18:45
o-Xylene	144	U	144	45.1	ug/Kg	1		08/18/14 18:45
P & M -Xylene	289	U	289	86.7	ug/Kg	1		08/18/14 18:45
Toluene	1440		144	45.1	ug/Kg	1		08/18/14 18:45
Surrogates								
1,4-Difluorobenzene	96		72-119		%	1		08/18/14 18:45

Batch Information

Analytical Batch: VFC12054
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 08/18/14 18:45
Container ID: 1143735002-B

Prep Batch: VXX26298
Prep Method: SW5035A
Prep Date/Time: 08/11/14 11:37
Prep Initial Wt./Vol.: 45.043 g
Prep Extract Vol: 52.0357 mL

Print Date: 08/22/2014 2:32:33PM

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Results of **S17**

Client Sample ID: **S17**
Client Project ID: **1159-20 AVEC Selawik**
Lab Sample ID: 1143735003
Lab Project ID: 1143735

Collection Date: 08/11/14 11:44
Received Date: 08/12/14 09:56
Matrix: Soil/Solid (dry weight)
Solids (%): 31.4
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	20900		1960	607	mg/Kg	10		08/19/14 19:44
Surrogates								
5a Androstane	0	*	50-150		%	10		08/19/14 19:44

Batch Information

Analytical Batch: XFC11515
Analytical Method: AK102
Analyst: AYC
Analytical Date/Time: 08/19/14 19:44
Container ID: 1143735003-A

Prep Batch: XXX31701
Prep Method: SW3550C
Prep Date/Time: 08/14/14 09:39
Prep Initial Wt./Vol.: 30.235 g
Prep Extract Vol: 3.1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	20300		1960	607	mg/Kg	10		08/19/14 19:44
Surrogates								
n-Triacontane-d62	0	*	50-150		%	10		08/19/14 19:44

Batch Information

Analytical Batch: XFC11515
Analytical Method: AK103
Analyst: AYC
Analytical Date/Time: 08/19/14 19:44
Container ID: 1143735003-A

Prep Batch: XXX31701
Prep Method: SW3550C
Prep Date/Time: 08/14/14 09:39
Prep Initial Wt./Vol.: 30.235 g
Prep Extract Vol: 3.1 mL

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Results of **S17**

Client Sample ID: **S17**
Client Project ID: **1159-20 AVEC Selawik**
Lab Sample ID: 1143735003
Lab Project ID: 1143735

Collection Date: 08/11/14 11:44
Received Date: 08/12/14 09:56
Matrix: Soil/Solid (dry weight)
Solids (%): 31.4
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	20.6	U	20.6	6.17	mg/Kg	1		08/18/14 19:03
Surrogates								
4-Bromofluorobenzene	37.5	*	50-150		%	1		08/18/14 19:03

Batch Information

Analytical Batch: VFC12054
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 08/18/14 19:03
Container ID: 1143735003-B

Prep Batch: VXX26298
Prep Method: SW5035A
Prep Date/Time: 08/11/14 11:44
Prep Initial Wt./Vol.: 41.143 g
Prep Extract Vol: 53.2089 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	103	U	103	32.9	ug/Kg	1		08/18/14 19:03
Ethylbenzene	206	U	206	64.2	ug/Kg	1		08/18/14 19:03
o-Xylene	206	U	206	64.2	ug/Kg	1		08/18/14 19:03
P & M -Xylene	411	U	411	123	ug/Kg	1		08/18/14 19:03
Toluene	284		206	64.2	ug/Kg	1		08/18/14 19:03
Surrogates								
1,4-Difluorobenzene	93.8		72-119		%	1		08/18/14 19:03

Batch Information

Analytical Batch: VFC12054
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 08/18/14 19:03
Container ID: 1143735003-B

Prep Batch: VXX26298
Prep Method: SW5035A
Prep Date/Time: 08/11/14 11:44
Prep Initial Wt./Vol.: 41.143 g
Prep Extract Vol: 53.2089 mL

Print Date: 08/22/2014 2:32:33PM

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Results of **S18**

Client Sample ID: **S18**
Client Project ID: **1159-20 AVEC Selawik**
Lab Sample ID: 1143735004
Lab Project ID: 1143735

Collection Date: 08/11/14 11:48
Received Date: 08/12/14 09:56
Matrix: Soil/Solid (dry weight)
Solids (%): 36.3
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	3930		1650	511	mg/Kg	10		08/19/14 19:53
Surrogates								
5a Androstane	0	*	50-150		%	10		08/19/14 19:53

Batch Information

Analytical Batch: XFC11515
Analytical Method: AK102
Analyst: AYC
Analytical Date/Time: 08/19/14 19:53
Container ID: 1143735004-A

Prep Batch: XXX31701
Prep Method: SW3550C
Prep Date/Time: 08/14/14 09:39
Prep Initial Wt./Vol.: 30.072 g
Prep Extract Vol: 3 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	26100		1650	511	mg/Kg	10		08/19/14 19:53
Surrogates								
n-Triacontane-d62	0	*	50-150		%	10		08/19/14 19:53

Batch Information

Analytical Batch: XFC11515
Analytical Method: AK103
Analyst: AYC
Analytical Date/Time: 08/19/14 19:53
Container ID: 1143735004-A

Prep Batch: XXX31701
Prep Method: SW3550C
Prep Date/Time: 08/14/14 09:39
Prep Initial Wt./Vol.: 30.072 g
Prep Extract Vol: 3 mL

Print Date: 08/22/2014 2:32:33PM

Results of **S18**

Client Sample ID: **S18**
Client Project ID: **1159-20 AVEC Selawik**
Lab Sample ID: 1143735004
Lab Project ID: 1143735

Collection Date: 08/11/14 11:48
Received Date: 08/12/14 09:56
Matrix: Soil/Solid (dry weight)
Solids (%): 36.3
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	16.5	U	16.5	4.95	mg/Kg	1		08/18/14 20:38
Surrogates								
4-Bromofluorobenzene	30.1	*	50-150		%	1		08/18/14 20:38

Batch Information

Analytical Batch: VFC12054
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 08/18/14 20:38
Container ID: 1143735004-B

Prep Batch: VXX26298
Prep Method: SW5035A
Prep Date/Time: 08/11/14 11:48
Prep Initial Wt./Vol.: 44.493 g
Prep Extract Vol: 53.3326 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	82.5	U	82.5	26.4	ug/Kg	1		08/18/14 20:38
Ethylbenzene	165	U	165	51.5	ug/Kg	1		08/18/14 20:38
o-Xylene	165	U	165	51.5	ug/Kg	1		08/18/14 20:38
P & M -Xylene	330	U	330	99.0	ug/Kg	1		08/18/14 20:38
Toluene	165	U	165	51.5	ug/Kg	1		08/18/14 20:38
Surrogates								
1,4-Difluorobenzene	93.6		72-119		%	1		08/18/14 20:38

Batch Information

Analytical Batch: VFC12054
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 08/18/14 20:38
Container ID: 1143735004-B

Prep Batch: VXX26298
Prep Method: SW5035A
Prep Date/Time: 08/11/14 11:48
Prep Initial Wt./Vol.: 44.493 g
Prep Extract Vol: 53.3326 mL

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Results of **S19**

Client Sample ID: **S19**
Client Project ID: **1159-20 AVEC Selawik**
Lab Sample ID: 1143735005
Lab Project ID: 1143735

Collection Date: 08/11/14 11:53
Received Date: 08/12/14 09:56
Matrix: Soil/Solid (dry weight)
Solids (%): 73.0
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	1780		273	84.7	mg/Kg	10		08/19/14 20:03
Surrogates								
5a Androstane	0	*	50-150		%	10		08/19/14 20:03

Batch Information

Analytical Batch: XFC11515
Analytical Method: AK102
Analyst: AYC
Analytical Date/Time: 08/19/14 20:03
Container ID: 1143735005-A

Prep Batch: XXX31701
Prep Method: SW3550C
Prep Date/Time: 08/14/14 09:39
Prep Initial Wt./Vol.: 30.092 g
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	2810		273	84.7	mg/Kg	10		08/19/14 20:03
Surrogates								
n-Triacontane-d62	0	*	50-150		%	10		08/19/14 20:03

Batch Information

Analytical Batch: XFC11515
Analytical Method: AK103
Analyst: AYC
Analytical Date/Time: 08/19/14 20:03
Container ID: 1143735005-A

Prep Batch: XXX31701
Prep Method: SW3550C
Prep Date/Time: 08/14/14 09:39
Prep Initial Wt./Vol.: 30.092 g
Prep Extract Vol: 1 mL

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Results of **S19**

Client Sample ID: **S19**
Client Project ID: **1159-20 AVEC Selawik**
Lab Sample ID: 1143735005
Lab Project ID: 1143735

Collection Date: 08/11/14 11:53
Received Date: 08/12/14 09:56
Matrix: Soil/Solid (dry weight)
Solids (%): 73.0
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	15.3		4.72	1.42	mg/Kg	1		08/18/14 20:56
Surrogates								
4-Bromofluorobenzene	123		50-150		%	1		08/18/14 20:56

Batch Information

Analytical Batch: VFC12054
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 08/18/14 20:56
Container ID: 1143735005-B

Prep Batch: VXX26298
Prep Method: SW5035A
Prep Date/Time: 08/11/14 11:53
Prep Initial Wt./Vol.: 59.629 g
Prep Extract Vol: 41.0908 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	23.6	U	23.6	7.55	ug/Kg	1		08/18/14 20:56
Ethylbenzene	47.2	U	47.2	14.7	ug/Kg	1		08/18/14 20:56
o-Xylene	164		47.2	14.7	ug/Kg	1		08/18/14 20:56
P & M -Xylene	207		94.4	28.3	ug/Kg	1		08/18/14 20:56
Toluene	68.9		47.2	14.7	ug/Kg	1		08/18/14 20:56
Surrogates								
1,4-Difluorobenzene	94.7		72-119		%	1		08/18/14 20:56

Batch Information

Analytical Batch: VFC12054
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 08/18/14 20:56
Container ID: 1143735005-B

Prep Batch: VXX26298
Prep Method: SW5035A
Prep Date/Time: 08/11/14 11:53
Prep Initial Wt./Vol.: 59.629 g
Prep Extract Vol: 41.0908 mL

Print Date: 08/22/2014 2:32:33PM

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Results of **S20**

Client Sample ID: **S20**
Client Project ID: **1159-20 AVEC Selawik**
Lab Sample ID: 1143735006
Lab Project ID: 1143735

Collection Date: 08/11/14 11:59
Received Date: 08/12/14 09:56
Matrix: Soil/Solid (dry weight)
Solids (%): 56.7
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	156		43.8	13.1	ug/Kg	5		08/15/14 20:31
2-Methylnaphthalene	135		43.8	13.1	ug/Kg	5		08/15/14 20:31
Acenaphthene	43.8	U	43.8	13.1	ug/Kg	5		08/15/14 20:31
Acenaphthylene	43.8	U	43.8	13.1	ug/Kg	5		08/15/14 20:31
Anthracene	43.8	U	43.8	13.1	ug/Kg	5		08/15/14 20:31
Benzo(a)Anthracene	43.8	U	43.8	13.1	ug/Kg	5		08/15/14 20:31
Benzo[a]pyrene	43.8	U	43.8	13.1	ug/Kg	5		08/15/14 20:31
Benzo[b]Fluoranthene	43.8	U	43.8	13.1	ug/Kg	5		08/15/14 20:31
Benzo[g,h,i]perylene	43.8	U	43.8	13.1	ug/Kg	5		08/15/14 20:31
Benzo[k]fluoranthene	43.8	U	43.8	13.1	ug/Kg	5		08/15/14 20:31
Chrysene	43.8	U	43.8	13.1	ug/Kg	5		08/15/14 20:31
Dibenzo[a,h]anthracene	43.8	U	43.8	13.1	ug/Kg	5		08/15/14 20:31
Fluoranthene	43.8	U	43.8	13.1	ug/Kg	5		08/15/14 20:31
Fluorene	43.8	U	43.8	13.1	ug/Kg	5		08/15/14 20:31
Indeno[1,2,3-c,d] pyrene	43.8	U	43.8	13.1	ug/Kg	5		08/15/14 20:31
Naphthalene	96.7		43.8	13.1	ug/Kg	5		08/15/14 20:31
Phenanthrene	43.8	U	43.8	13.1	ug/Kg	5		08/15/14 20:31
Pyrene	43.8	U	43.8	13.1	ug/Kg	5		08/15/14 20:31
Surrogates								
2-Fluorobiphenyl	104		45-105		%	5		08/15/14 20:31
Terphenyl-d14	67.4		30-125		%	5		08/15/14 20:31

Batch Information

Analytical Batch: XMS8229
Analytical Method: 8270D SIMS (PAH)
Analyst: RTS
Analytical Date/Time: 08/15/14 20:31
Container ID: 1143735006-A

Prep Batch: XXX31691
Prep Method: SW3550C
Prep Date/Time: 08/13/14 15:42
Prep Initial Wt./Vol.: 22.674 g
Prep Extract Vol: 1 mL

Print Date: 08/22/2014 2:32:33PM

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Results of **S20**

Client Sample ID: **S20**
Client Project ID: **1159-20 AVEC Selawik**
Lab Sample ID: 1143735006
Lab Project ID: 1143735

Collection Date: 08/11/14 11:59
Received Date: 08/12/14 09:56
Matrix: Soil/Solid (dry weight)
Solids (%): 56.7
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	1680		348	108	mg/Kg	10		08/19/14 20:23
Surrogates								
5a Androstane	0	*	50-150		%	10		08/19/14 20:23

Batch Information

Analytical Batch: XFC11515
Analytical Method: AK102
Analyst: AYC
Analytical Date/Time: 08/19/14 20:23
Container ID: 1143735006-A

Prep Batch: XXX31701
Prep Method: SW3550C
Prep Date/Time: 08/14/14 09:39
Prep Initial Wt./Vol.: 30.393 g
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	8820		348	108	mg/Kg	10		08/19/14 20:23
Surrogates								
n-Triacontane-d62	0	*	50-150		%	10		08/19/14 20:23

Batch Information

Analytical Batch: XFC11515
Analytical Method: AK103
Analyst: AYC
Analytical Date/Time: 08/19/14 20:23
Container ID: 1143735006-A

Prep Batch: XXX31701
Prep Method: SW3550C
Prep Date/Time: 08/14/14 09:39
Prep Initial Wt./Vol.: 30.393 g
Prep Extract Vol: 1 mL

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Results of **S20**

Client Sample ID: **S20**
Client Project ID: **1159-20 AVEC Selawik**
Lab Sample ID: 1143735006
Lab Project ID: 1143735

Collection Date: 08/11/14 11:59
Received Date: 08/12/14 09:56
Matrix: Soil/Solid (dry weight)
Solids (%): 56.7
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	8.65	U	8.65	2.60	mg/Kg	1		08/18/14 21:16
Surrogates								
4-Bromofluorobenzene	67.5		50-150		%	1		08/18/14 21:16

Batch Information

Analytical Batch: VFC12054
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 08/18/14 21:16
Container ID: 1143735006-B

Prep Batch: VXX26298
Prep Method: SW5035A
Prep Date/Time: 08/11/14 11:59
Prep Initial Wt./Vol.: 45.679 g
Prep Extract Vol: 44.7942 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	43.3	U	43.3	13.8	ug/Kg	1		08/18/14 21:16
Ethylbenzene	86.5	U	86.5	27.0	ug/Kg	1		08/18/14 21:16
o-Xylene	214		86.5	27.0	ug/Kg	1		08/18/14 21:16
P & M -Xylene	200		173	51.9	ug/Kg	1		08/18/14 21:16
Toluene	499		86.5	27.0	ug/Kg	1		08/18/14 21:16
Surrogates								
1,4-Difluorobenzene	94.5		72-119		%	1		08/18/14 21:16

Batch Information

Analytical Batch: VFC12054
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 08/18/14 21:16
Container ID: 1143735006-B

Prep Batch: VXX26298
Prep Method: SW5035A
Prep Date/Time: 08/11/14 11:59
Prep Initial Wt./Vol.: 45.679 g
Prep Extract Vol: 44.7942 mL

Print Date: 08/22/2014 2:32:33PM

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Results of **S21**

Client Sample ID: **S21**
Client Project ID: **1159-20 AVEC Selawik**
Lab Sample ID: 1143735007
Lab Project ID: 1143735

Collection Date: 08/11/14 12:03
Received Date: 08/12/14 09:56
Matrix: Soil/Solid (dry weight)
Solids (%): 55.3
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	2890		1050	325	mg/Kg	10		08/19/14 20:33
Surrogates								
5a Androstane	0	*	50-150		%	10		08/19/14 20:33

Batch Information

Analytical Batch: XFC11515
Analytical Method: AK102
Analyst: AYC
Analytical Date/Time: 08/19/14 20:33
Container ID: 1143735007-A

Prep Batch: XXX31701
Prep Method: SW3550C
Prep Date/Time: 08/14/14 09:39
Prep Initial Wt./Vol.: 30.019 g
Prep Extract Vol: 2.9 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	17900		1050	325	mg/Kg	10		08/19/14 20:33
Surrogates								
n-Triacontane-d62	0	*	50-150		%	10		08/19/14 20:33

Batch Information

Analytical Batch: XFC11515
Analytical Method: AK103
Analyst: AYC
Analytical Date/Time: 08/19/14 20:33
Container ID: 1143735007-A

Prep Batch: XXX31701
Prep Method: SW3550C
Prep Date/Time: 08/14/14 09:39
Prep Initial Wt./Vol.: 30.019 g
Prep Extract Vol: 2.9 mL

Print Date: 08/22/2014 2:32:33PM

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Results of **S21**

Client Sample ID: **S21**
Client Project ID: **1159-20 AVEC Selawik**
Lab Sample ID: 1143735007
Lab Project ID: 1143735

Collection Date: 08/11/14 12:03
Received Date: 08/12/14 09:56
Matrix: Soil/Solid (dry weight)
Solids (%): 55.3
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	8.79	U	8.79	2.64	mg/Kg	1		08/18/14 21:35
Surrogates								
4-Bromofluorobenzene	29.6	*	50-150		%	1		08/18/14 21:35

Batch Information

Analytical Batch: VFC12054
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 08/18/14 21:35
Container ID: 1143735007-B

Prep Batch: VXX26298
Prep Method: SW5035A
Prep Date/Time: 08/11/14 12:03
Prep Initial Wt./Vol.: 47.688 g
Prep Extract Vol: 46.3249 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	43.9	U	43.9	14.1	ug/Kg	1		08/18/14 21:35
Ethylbenzene	87.9	U	87.9	27.4	ug/Kg	1		08/18/14 21:35
o-Xylene	87.9	U	87.9	27.4	ug/Kg	1		08/18/14 21:35
P & M -Xylene	176	U	176	52.7	ug/Kg	1		08/18/14 21:35
Toluene	87.9	U	87.9	27.4	ug/Kg	1		08/18/14 21:35
Surrogates								
1,4-Difluorobenzene	94.5		72-119		%	1		08/18/14 21:35

Batch Information

Analytical Batch: VFC12054
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 08/18/14 21:35
Container ID: 1143735007-B

Prep Batch: VXX26298
Prep Method: SW5035A
Prep Date/Time: 08/11/14 12:03
Prep Initial Wt./Vol.: 47.688 g
Prep Extract Vol: 46.3249 mL

Print Date: 08/22/2014 2:32:33PM

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Results of **S22**

Client Sample ID: **S22**
Client Project ID: **1159-20 AVEC Selawik**
Lab Sample ID: 1143735008
Lab Project ID: 1143735

Collection Date: 08/11/14 12:07
Received Date: 08/12/14 09:56
Matrix: Soil/Solid (dry weight)
Solids (%): 23.8
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	1450		836	259	mg/Kg	10		08/19/14 20:43
Surrogates								
5a Androstane	126		50-150		%	10		08/19/14 20:43

Batch Information

Analytical Batch: XFC11515
Analytical Method: AK102
Analyst: AYC
Analytical Date/Time: 08/19/14 20:43
Container ID: 1143735008-A

Prep Batch: XXX31701
Prep Method: SW3550C
Prep Date/Time: 08/14/14 09:39
Prep Initial Wt./Vol.: 30.18 g
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	9240		836	259	mg/Kg	10		08/19/14 20:43
Surrogates								
n-Triacontane-d62	0	*	50-150		%	10		08/19/14 20:43

Batch Information

Analytical Batch: XFC11515
Analytical Method: AK103
Analyst: AYC
Analytical Date/Time: 08/19/14 20:43
Container ID: 1143735008-A

Prep Batch: XXX31701
Prep Method: SW3550C
Prep Date/Time: 08/14/14 09:39
Prep Initial Wt./Vol.: 30.18 g
Prep Extract Vol: 1 mL

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Results of **S22**

Client Sample ID: **S22**
Client Project ID: **1159-20 AVEC Selawik**
Lab Sample ID: 1143735008
Lab Project ID: 1143735

Collection Date: 08/11/14 12:07
Received Date: 08/12/14 09:56
Matrix: Soil/Solid (dry weight)
Solids (%): 23.8
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	28.7	U	28.7	8.62	mg/Kg	1		08/18/14 21:53
Surrogates								
4-Bromofluorobenzene	39.7	*	50-150		%	1		08/18/14 21:53

Batch Information

Analytical Batch: VFC12054
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 08/18/14 21:53
Container ID: 1143735008-B

Prep Batch: VXX26298
Prep Method: SW5035A
Prep Date/Time: 08/11/14 12:07
Prep Initial Wt./Vol.: 41.361 g
Prep Extract Vol: 56.5268 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	144	U	144	46.0	ug/Kg	1		08/18/14 21:53
Ethylbenzene	287	U	287	89.7	ug/Kg	1		08/18/14 21:53
o-Xylene	287	U	287	89.7	ug/Kg	1		08/18/14 21:53
P & M -Xylene	575	U	575	172	ug/Kg	1		08/18/14 21:53
Toluene	1570		287	89.7	ug/Kg	1		08/18/14 21:53
Surrogates								
1,4-Difluorobenzene	94.5		72-119		%	1		08/18/14 21:53

Batch Information

Analytical Batch: VFC12054
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 08/18/14 21:53
Container ID: 1143735008-B

Prep Batch: VXX26298
Prep Method: SW5035A
Prep Date/Time: 08/11/14 12:07
Prep Initial Wt./Vol.: 41.361 g
Prep Extract Vol: 56.5268 mL

Print Date: 08/22/2014 2:32:33PM

SGS

Results of **S23**

Client Sample ID: **S23**
Client Project ID: **1159-20 AVEC Selawik**
Lab Sample ID: 1143735009
Lab Project ID: 1143735

Collection Date: 08/11/14 12:12
Received Date: 08/12/14 09:56
Matrix: Soil/Solid (dry weight)
Solids (%): 42.5
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	1400		466	144	mg/Kg	10		08/19/14 20:53
Surrogates								
5a Androstane	0	*	50-150		%	10		08/19/14 20:53

Batch Information

Analytical Batch: XFC11515
Analytical Method: AK102
Analyst: AYC
Analytical Date/Time: 08/19/14 20:53
Container ID: 1143735009-A

Prep Batch: XXX31701
Prep Method: SW3550C
Prep Date/Time: 08/14/14 09:39
Prep Initial Wt./Vol.: 30.274 g
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	9300		466	144	mg/Kg	10		08/19/14 20:53
Surrogates								
n-Triacontane-d62	0	*	50-150		%	10		08/19/14 20:53

Batch Information

Analytical Batch: XFC11515
Analytical Method: AK103
Analyst: AYC
Analytical Date/Time: 08/19/14 20:53
Container ID: 1143735009-A

Prep Batch: XXX31701
Prep Method: SW3550C
Prep Date/Time: 08/14/14 09:39
Prep Initial Wt./Vol.: 30.274 g
Prep Extract Vol: 1 mL

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

Results of **S23**

Client Sample ID: **S23**
Client Project ID: **1159-20 AVEC Selawik**
Lab Sample ID: 1143735009
Lab Project ID: 1143735

Collection Date: 08/11/14 12:12
Received Date: 08/12/14 09:56
Matrix: Soil/Solid (dry weight)
Solids (%): 42.5
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	12.8	U	12.8	3.83	mg/Kg	1		08/18/14 22:12
Surrogates								
4-Bromofluorobenzene	53.5		50-150		%	1		08/18/14 22:12

Batch Information

Analytical Batch: VFC12054
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 08/18/14 22:12
Container ID: 1143735009-B

Prep Batch: VXX26298
Prep Method: SW5035A
Prep Date/Time: 08/11/14 12:12
Prep Initial Wt./Vol.: 48.761 g
Prep Extract Vol: 53.02 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	63.9	U	63.9	20.5	ug/Kg	1		08/18/14 22:12
Ethylbenzene	128	U	128	39.9	ug/Kg	1		08/18/14 22:12
o-Xylene	128	U	128	39.9	ug/Kg	1		08/18/14 22:12
P & M -Xylene	256	U	256	76.7	ug/Kg	1		08/18/14 22:12
Toluene	1270		128	39.9	ug/Kg	1		08/18/14 22:12
Surrogates								
1,4-Difluorobenzene	94.9		72-119		%	1		08/18/14 22:12

Batch Information

Analytical Batch: VFC12054
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 08/18/14 22:12
Container ID: 1143735009-B

Prep Batch: VXX26298
Prep Method: SW5035A
Prep Date/Time: 08/11/14 12:12
Prep Initial Wt./Vol.: 48.761 g
Prep Extract Vol: 53.02 mL

Print Date: 08/22/2014 2:32:33PM

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Results of **S24**

Client Sample ID: **S24**
Client Project ID: **1159-20 AVEC Selawik**
Lab Sample ID: 1143735010
Lab Project ID: 1143735

Collection Date: 08/11/14 12:19
Received Date: 08/12/14 09:56
Matrix: Soil/Solid (dry weight)
Solids (%): 71.0
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	94.3		34.5	10.3	ug/Kg	5		08/15/14 20:16
2-Methylnaphthalene	114		34.5	10.3	ug/Kg	5		08/15/14 20:16
Acenaphthene	34.5	U	34.5	10.3	ug/Kg	5		08/15/14 20:16
Acenaphthylene	34.5	U	34.5	10.3	ug/Kg	5		08/15/14 20:16
Anthracene	34.5	U	34.5	10.3	ug/Kg	5		08/15/14 20:16
Benzo(a)Anthracene	34.5	U	34.5	10.3	ug/Kg	5		08/15/14 20:16
Benzo[a]pyrene	34.5	U	34.5	10.3	ug/Kg	5		08/15/14 20:16
Benzo[b]Fluoranthene	34.5	U	34.5	10.3	ug/Kg	5		08/15/14 20:16
Benzo[g,h,i]perylene	34.5	U	34.5	10.3	ug/Kg	5		08/15/14 20:16
Benzo[k]fluoranthene	34.5	U	34.5	10.3	ug/Kg	5		08/15/14 20:16
Chrysene	34.5	U	34.5	10.3	ug/Kg	5		08/15/14 20:16
Dibenzo[a,h]anthracene	34.5	U	34.5	10.3	ug/Kg	5		08/15/14 20:16
Fluoranthene	34.5	U	34.5	10.3	ug/Kg	5		08/15/14 20:16
Fluorene	34.5	U	34.5	10.3	ug/Kg	5		08/15/14 20:16
Indeno[1,2,3-c,d] pyrene	34.5	U	34.5	10.3	ug/Kg	5		08/15/14 20:16
Naphthalene	36.7		34.5	10.3	ug/Kg	5		08/15/14 20:16
Phenanthrene	34.5	U	34.5	10.3	ug/Kg	5		08/15/14 20:16
Pyrene	34.5	U	34.5	10.3	ug/Kg	5		08/15/14 20:16
Surrogates								
2-Fluorobiphenyl	97.1		45-105		%	5		08/15/14 20:16
Terphenyl-d14	98.2		30-125		%	5		08/15/14 20:16

Batch Information

Analytical Batch: XMS8229
Analytical Method: 8270D SIMS (PAH)
Analyst: RTS
Analytical Date/Time: 08/15/14 20:16
Container ID: 1143735010-A

Prep Batch: XXX31691
Prep Method: SW3550C
Prep Date/Time: 08/13/14 15:42
Prep Initial Wt./Vol.: 22.983 g
Prep Extract Vol: 1 mL

Print Date: 08/22/2014 2:32:33PM

Results of **S24**

Client Sample ID: **S24**
Client Project ID: **1159-20 AVEC Selawik**
Lab Sample ID: 1143735010
Lab Project ID: 1143735

Collection Date: 08/11/14 12:19
Received Date: 08/12/14 09:56
Matrix: Soil/Solid (dry weight)
Solids (%): 71.0
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	210		28.0	8.69	mg/Kg	1		08/19/14 17:15
Surrogates								
5a Androstane	95.2		50-150		%	1		08/19/14 17:15

Batch Information

Analytical Batch: XFC11515
Analytical Method: AK102
Analyst: AYC
Analytical Date/Time: 08/19/14 17:15
Container ID: 1143735010-A

Prep Batch: XXX31701
Prep Method: SW3550C
Prep Date/Time: 08/14/14 09:39
Prep Initial Wt./Vol.: 30.132 g
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	319		28.0	8.69	mg/Kg	1		08/19/14 17:15
Surrogates								
n-Triacontane-d62	84.7		50-150		%	1		08/19/14 17:15

Batch Information

Analytical Batch: XFC11515
Analytical Method: AK103
Analyst: AYC
Analytical Date/Time: 08/19/14 17:15
Container ID: 1143735010-A

Prep Batch: XXX31701
Prep Method: SW3550C
Prep Date/Time: 08/14/14 09:39
Prep Initial Wt./Vol.: 30.132 g
Prep Extract Vol: 1 mL

Print Date: 08/22/2014 2:32:33PM

Results of **S24**

Client Sample ID: **S24**
Client Project ID: **1159-20 AVEC Selawik**
Lab Sample ID: 1143735010
Lab Project ID: 1143735

Collection Date: 08/11/14 12:19
Received Date: 08/12/14 09:56
Matrix: Soil/Solid (dry weight)
Solids (%): 71.0
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	4.40		3.80	1.14	mg/Kg	1		08/18/14 22:31
Surrogates								
4-Bromofluorobenzene	137		50-150		%	1		08/18/14 22:31

Batch Information

Analytical Batch: VFC12054
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 08/18/14 22:31
Container ID: 1143735010-B

Prep Batch: VXX26298
Prep Method: SW5035A
Prep Date/Time: 08/11/14 12:19
Prep Initial Wt./Vol.: 100.342 g
Prep Extract Vol: 54.0848 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	19.0	U	19.0	6.07	ug/Kg	1		08/18/14 22:31
Ethylbenzene	38.0	U	38.0	11.8	ug/Kg	1		08/18/14 22:31
o-Xylene	95.3		38.0	11.8	ug/Kg	1		08/18/14 22:31
P & M -Xylene	104		75.9	22.8	ug/Kg	1		08/18/14 22:31
Toluene	115		38.0	11.8	ug/Kg	1		08/18/14 22:31
Surrogates								
1,4-Difluorobenzene	92.6		72-119		%	1		08/18/14 22:31

Batch Information

Analytical Batch: VFC12054
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 08/18/14 22:31
Container ID: 1143735010-B

Prep Batch: VXX26298
Prep Method: SW5035A
Prep Date/Time: 08/11/14 12:19
Prep Initial Wt./Vol.: 100.342 g
Prep Extract Vol: 54.0848 mL

Print Date: 08/22/2014 2:32:33PM

Results of **S25**

Client Sample ID: **S25**
Client Project ID: **1159-20 AVEC Selawik**
Lab Sample ID: 1143735011
Lab Project ID: 1143735

Collection Date: 08/11/14 12:27
Received Date: 08/12/14 09:56
Matrix: Soil/Solid (dry weight)
Solids (%): 37.6
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	14.2	U	14.2	4.27	mg/Kg	1		08/18/14 22:50
Surrogates								
4-Bromofluorobenzene	30.1	*	50-150		%	1		08/18/14 22:50

Batch Information

Analytical Batch: VFC12054
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 08/18/14 22:50
Container ID: 1143735011-B

Prep Batch: VXX26298
Prep Method: SW5035A
Prep Date/Time: 08/11/14 12:27
Prep Initial Wt./Vol.: 56.087 g
Prep Extract Vol: 60.0034 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	71.1	U	71.1	22.8	ug/Kg	1		08/18/14 22:50
Ethylbenzene	142	U	142	44.4	ug/Kg	1		08/18/14 22:50
o-Xylene	142	U	142	44.4	ug/Kg	1		08/18/14 22:50
P & M -Xylene	285	U	285	85.4	ug/Kg	1		08/18/14 22:50
Toluene	2330		142	44.4	ug/Kg	1		08/18/14 22:50
Surrogates								
1,4-Difluorobenzene	93.7		72-119		%	1		08/18/14 22:50

Batch Information

Analytical Batch: VFC12054
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 08/18/14 22:50
Container ID: 1143735011-B

Prep Batch: VXX26298
Prep Method: SW5035A
Prep Date/Time: 08/11/14 12:27
Prep Initial Wt./Vol.: 56.087 g
Prep Extract Vol: 60.0034 mL

Print Date: 08/22/2014 2:32:33PM

Results of **S26**

Client Sample ID: **S26**
Client Project ID: **1159-20 AVEC Selawik**
Lab Sample ID: 1143735012
Lab Project ID: 1143735

Collection Date: 08/11/14 11:59
Received Date: 08/12/14 09:56
Matrix: Soil/Solid (dry weight)
Solids (%): 60.2
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	221		41.0	12.3	ug/Kg	5		08/15/14 21:01
2-Methylnaphthalene	159		41.0	12.3	ug/Kg	5		08/15/14 21:01
Acenaphthene	41.0	U	41.0	12.3	ug/Kg	5		08/15/14 21:01
Acenaphthylene	41.0	U	41.0	12.3	ug/Kg	5		08/15/14 21:01
Anthracene	41.0	U	41.0	12.3	ug/Kg	5		08/15/14 21:01
Benzo(a)Anthracene	41.0	U	41.0	12.3	ug/Kg	5		08/15/14 21:01
Benzo[a]pyrene	41.0	U	41.0	12.3	ug/Kg	5		08/15/14 21:01
Benzo[b]Fluoranthene	41.0	U	41.0	12.3	ug/Kg	5		08/15/14 21:01
Benzo[g,h,i]perylene	41.0	U	41.0	12.3	ug/Kg	5		08/15/14 21:01
Benzo[k]fluoranthene	41.0	U	41.0	12.3	ug/Kg	5		08/15/14 21:01
Chrysene	41.0	U	41.0	12.3	ug/Kg	5		08/15/14 21:01
Dibenzo[a,h]anthracene	41.0	U	41.0	12.3	ug/Kg	5		08/15/14 21:01
Fluoranthene	41.0	U	41.0	12.3	ug/Kg	5		08/15/14 21:01
Fluorene	41.0	U	41.0	12.3	ug/Kg	5		08/15/14 21:01
Indeno[1,2,3-c,d] pyrene	41.0	U	41.0	12.3	ug/Kg	5		08/15/14 21:01
Naphthalene	41.0	U	41.0	12.3	ug/Kg	5		08/15/14 21:01
Phenanthrene	41.0	U	41.0	12.3	ug/Kg	5		08/15/14 21:01
Pyrene	41.0	U	41.0	12.3	ug/Kg	5		08/15/14 21:01
Surrogates								
2-Fluorobiphenyl	159	*	45-105		%	5		08/15/14 21:01
Terphenyl-d14	101		30-125		%	5		08/15/14 21:01

Batch Information

Analytical Batch: XMS8229
Analytical Method: 8270D SIMS (PAH)
Analyst: RTS
Analytical Date/Time: 08/15/14 21:01
Container ID: 1143735012-A

Prep Batch: XXX31691
Prep Method: SW3550C
Prep Date/Time: 08/13/14 15:42
Prep Initial Wt./Vol.: 22.805 g
Prep Extract Vol: 1 mL

Print Date: 08/22/2014 2:32:33PM

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Results of **S26**

Client Sample ID: **S26**
Client Project ID: **1159-20 AVEC Selawik**
Lab Sample ID: 1143735012
Lab Project ID: 1143735

Collection Date: 08/11/14 11:59
Received Date: 08/12/14 09:56
Matrix: Soil/Solid (dry weight)
Solids (%): 60.2
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	3680		332	103	mg/Kg	10		08/19/14 21:03
Surrogates								
5a Androstane	0	*	50-150		%	10		08/19/14 21:03

Batch Information

Analytical Batch: XFC11515
Analytical Method: AK102
Analyst: AYC
Analytical Date/Time: 08/19/14 21:03
Container ID: 1143735012-A

Prep Batch: XXX31701
Prep Method: SW3550C
Prep Date/Time: 08/14/14 09:39
Prep Initial Wt./Vol.: 30.028 g
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	6710		332	103	mg/Kg	10		08/19/14 21:03
Surrogates								
n-Triacontane-d62	0	*	50-150		%	10		08/19/14 21:03

Batch Information

Analytical Batch: XFC11515
Analytical Method: AK103
Analyst: AYC
Analytical Date/Time: 08/19/14 21:03
Container ID: 1143735012-A

Prep Batch: XXX31701
Prep Method: SW3550C
Prep Date/Time: 08/14/14 09:39
Prep Initial Wt./Vol.: 30.028 g
Prep Extract Vol: 1 mL

Print Date: 08/22/2014 2:32:33PM

Results of **S26**

Client Sample ID: **S26**
Client Project ID: **1159-20 AVEC Selawik**
Lab Sample ID: 1143735012
Lab Project ID: 1143735

Collection Date: 08/11/14 11:59
Received Date: 08/12/14 09:56
Matrix: Soil/Solid (dry weight)
Solids (%): 60.2
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	7.08	U	7.08	2.12	mg/Kg	1		08/18/14 23:09
Surrogates								
4-Bromofluorobenzene	56.5		50-150		%	1		08/18/14 23:09

Batch Information

Analytical Batch: VFC12054
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 08/18/14 23:09
Container ID: 1143735012-B

Prep Batch: VXX26298
Prep Method: SW5035A
Prep Date/Time: 08/11/14 11:59
Prep Initial Wt./Vol.: 55.09 g
Prep Extract Vol: 46.94 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	35.4	U	35.4	11.3	ug/Kg	1		08/18/14 23:09
Ethylbenzene	70.8	U	70.8	22.1	ug/Kg	1		08/18/14 23:09
o-Xylene	185		70.8	22.1	ug/Kg	1		08/18/14 23:09
P & M -Xylene	143		142	42.5	ug/Kg	1		08/18/14 23:09
Toluene	303		70.8	22.1	ug/Kg	1		08/18/14 23:09
Surrogates								
1,4-Difluorobenzene	93.1		72-119		%	1		08/18/14 23:09

Batch Information

Analytical Batch: VFC12054
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 08/18/14 23:09
Container ID: 1143735012-B

Prep Batch: VXX26298
Prep Method: SW5035A
Prep Date/Time: 08/11/14 11:59
Prep Initial Wt./Vol.: 55.09 g
Prep Extract Vol: 46.94 mL

Print Date: 08/22/2014 2:32:33PM

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Results of **S27**

Client Sample ID: **S27**
Client Project ID: **1159-20 AVEC Selawik**
Lab Sample ID: 1143735013
Lab Project ID: 1143735

Collection Date: 08/11/14 12:19
Received Date: 08/12/14 09:56
Matrix: Soil/Solid (dry weight)
Solids (%): 58.9
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	151		41.9	12.6	ug/Kg	5		08/15/14 20:46
2-Methylnaphthalene	199		41.9	12.6	ug/Kg	5		08/15/14 20:46
Acenaphthene	41.9	U	41.9	12.6	ug/Kg	5		08/15/14 20:46
Acenaphthylene	41.9	U	41.9	12.6	ug/Kg	5		08/15/14 20:46
Anthracene	41.9	U	41.9	12.6	ug/Kg	5		08/15/14 20:46
Benzo(a)Anthracene	41.9	U	41.9	12.6	ug/Kg	5		08/15/14 20:46
Benzo[a]pyrene	41.9	U	41.9	12.6	ug/Kg	5		08/15/14 20:46
Benzo[b]Fluoranthene	41.9	U	41.9	12.6	ug/Kg	5		08/15/14 20:46
Benzo[g,h,i]perylene	41.9	U	41.9	12.6	ug/Kg	5		08/15/14 20:46
Benzo[k]fluoranthene	41.9	U	41.9	12.6	ug/Kg	5		08/15/14 20:46
Chrysene	41.9	U	41.9	12.6	ug/Kg	5		08/15/14 20:46
Dibenzo[a,h]anthracene	41.9	U	41.9	12.6	ug/Kg	5		08/15/14 20:46
Fluoranthene	41.9	U	41.9	12.6	ug/Kg	5		08/15/14 20:46
Fluorene	41.9	U	41.9	12.6	ug/Kg	5		08/15/14 20:46
Indeno[1,2,3-c,d] pyrene	41.9	U	41.9	12.6	ug/Kg	5		08/15/14 20:46
Naphthalene	72.4		41.9	12.6	ug/Kg	5		08/15/14 20:46
Phenanthrene	41.9	U	41.9	12.6	ug/Kg	5		08/15/14 20:46
Pyrene	41.9	U	41.9	12.6	ug/Kg	5		08/15/14 20:46
Surrogates								
2-Fluorobiphenyl	97.3		45-105		%	5		08/15/14 20:46
Terphenyl-d14	104		30-125		%	5		08/15/14 20:46

Batch Information

Analytical Batch: XMS8229
Analytical Method: 8270D SIMS (PAH)
Analyst: RTS
Analytical Date/Time: 08/15/14 20:46
Container ID: 1143735013-A

Prep Batch: XXX31691
Prep Method: SW3550C
Prep Date/Time: 08/13/14 15:42
Prep Initial Wt./Vol.: 22.786 g
Prep Extract Vol: 1 mL

Print Date: 08/22/2014 2:32:33PM

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Results of **S27**

Client Sample ID: **S27**
Client Project ID: **1159-20 AVEC Selawik**
Lab Sample ID: 1143735013
Lab Project ID: 1143735

Collection Date: 08/11/14 12:19
Received Date: 08/12/14 09:56
Matrix: Soil/Solid (dry weight)
Solids (%): 58.9
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	422		335	104	mg/Kg	10		08/19/14 21:13
Surrogates								
5a Androstane	102		50-150		%	10		08/19/14 21:13

Batch Information

Analytical Batch: XFC11515
Analytical Method: AK102
Analyst: AYC
Analytical Date/Time: 08/19/14 21:13
Container ID: 1143735013-A

Prep Batch: XXX31701
Prep Method: SW3550C
Prep Date/Time: 08/14/14 09:39
Prep Initial Wt./Vol.: 30.402 g
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	1620		335	104	mg/Kg	10		08/19/14 21:13
Surrogates								
n-Triacontane-d62	126		50-150		%	10		08/19/14 21:13

Batch Information

Analytical Batch: XFC11515
Analytical Method: AK103
Analyst: AYC
Analytical Date/Time: 08/19/14 21:13
Container ID: 1143735013-A

Prep Batch: XXX31701
Prep Method: SW3550C
Prep Date/Time: 08/14/14 09:39
Prep Initial Wt./Vol.: 30.402 g
Prep Extract Vol: 1 mL

Print Date: 08/22/2014 2:32:33PM

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Results of **S27**

Client Sample ID: **S27**
Client Project ID: **1159-20 AVEC Selawik**
Lab Sample ID: 1143735013
Lab Project ID: 1143735

Collection Date: 08/11/14 12:19
Received Date: 08/12/14 09:56
Matrix: Soil/Solid (dry weight)
Solids (%): 58.9
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	6.94		5.98	1.79	mg/Kg	1		08/18/14 23:28
Surrogates								
4-Bromofluorobenzene	166	*	50-150		%	1		08/18/14 23:28

Batch Information

Analytical Batch: VFC12054
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 08/18/14 23:28
Container ID: 1143735013-B

Prep Batch: VXX26298
Prep Method: SW5035A
Prep Date/Time: 08/11/14 12:19
Prep Initial Wt./Vol.: 85.326 g
Prep Extract Vol: 60.0953 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	29.9	U	29.9	9.57	ug/Kg	1		08/18/14 23:28
Ethylbenzene	59.8	U	59.8	18.7	ug/Kg	1		08/18/14 23:28
o-Xylene	116		59.8	18.7	ug/Kg	1		08/18/14 23:28
P & M -Xylene	166		120	35.9	ug/Kg	1		08/18/14 23:28
Toluene	284		59.8	18.7	ug/Kg	1		08/18/14 23:28
Surrogates								
1,4-Difluorobenzene	94.8		72-119		%	1		08/18/14 23:28

Batch Information

Analytical Batch: VFC12054
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 08/18/14 23:28
Container ID: 1143735013-B

Prep Batch: VXX26298
Prep Method: SW5035A
Prep Date/Time: 08/11/14 12:19
Prep Initial Wt./Vol.: 85.326 g
Prep Extract Vol: 60.0953 mL

SGS

Results of **SW1**

Client Sample ID: **SW1**
Client Project ID: **1159-20 AVEC Selawik**
Lab Sample ID: 1143735014
Lab Project ID: 1143735

Collection Date: 08/11/14 12:43
Received Date: 08/12/14 09:56
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Acenaphthene	0.0513	U	0.0513	0.0154	ug/L	1		08/19/14 21:09
Acenaphthylene	0.0513	U	0.0513	0.0154	ug/L	1		08/19/14 21:09
Anthracene	0.0513	U	0.0513	0.0154	ug/L	1		08/19/14 21:09
Benzo(a)Anthracene	0.0513	U	0.0513	0.0154	ug/L	1		08/19/14 21:09
Benzo[a]pyrene	0.0513	U	0.0513	0.0154	ug/L	1		08/19/14 21:09
Benzo[b]Fluoranthene	0.0513	U	0.0513	0.0154	ug/L	1		08/19/14 21:09
Benzo[g,h,i]perylene	0.0513	U	0.0513	0.0154	ug/L	1		08/19/14 21:09
Benzo[k]fluoranthene	0.0513	U	0.0513	0.0154	ug/L	1		08/19/14 21:09
Chrysene	0.0513	U	0.0513	0.0154	ug/L	1		08/19/14 21:09
Dibenzo[a,h]anthracene	0.0513	U	0.0513	0.0154	ug/L	1		08/19/14 21:09
Fluoranthene	0.0558		0.0513	0.0154	ug/L	1		08/19/14 21:09
Fluorene	0.0513	U	0.0513	0.0154	ug/L	1		08/19/14 21:09
Indeno[1,2,3-c,d] pyrene	0.0513	U	0.0513	0.0154	ug/L	1		08/19/14 21:09
Naphthalene	0.103	U	0.103	0.0318	ug/L	1		08/19/14 21:09
Phenanthrene	0.0513	U	0.0513	0.0154	ug/L	1		08/19/14 21:09
Pyrene	0.0719		0.0513	0.0154	ug/L	1		08/19/14 21:09
Surrogates								
2-Fluorobiphenyl	67.7		50-110		%	1		08/19/14 21:09
Terphenyl-d14	93		50-135		%	1		08/19/14 21:09

Batch Information

Analytical Batch: XMS8237
Analytical Method: EPA 625M SIMS (PAH)
Analyst: RTS
Analytical Date/Time: 08/19/14 21:09
Container ID: 1143735014-E

Prep Batch: XXX31736
Prep Method: SW3520C
Prep Date/Time: 08/18/14 10:05
Prep Initial Wt./Vol.: 975 mL
Prep Extract Vol: 1 mL

Print Date: 08/22/2014 2:32:33PM

Results of **SW1**

Client Sample ID: **SW1**
Client Project ID: **1159-20 AVEC Selawik**
Lab Sample ID: 1143735014
Lab Project ID: 1143735

Collection Date: 08/11/14 12:43
Received Date: 08/12/14 09:56
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,4-Dichlorobenzene	0.500	U	0.500	0.150	ug/L	1		08/13/14 17:19
Chlorobenzene	0.500	U	0.500	0.150	ug/L	1		08/13/14 17:19
o-Xylene	1.00	U	1.00	0.310	ug/L	1		08/13/14 17:19
P & M -Xylene	2.00	U	2.00	0.620	ug/L	1		08/13/14 17:19
Toluene	2.66		1.00	0.310	ug/L	1		08/13/14 17:19
1,3-Dichlorobenzene	1.00	U	1.00	0.310	ug/L	1		08/13/14 17:19
Benzene	0.400	U	0.400	0.120	ug/L	1		08/13/14 17:19
Ethylbenzene	1.00	U	1.00	0.310	ug/L	1		08/13/14 17:19
1,2-Dichlorobenzene	1.00	U	1.00	0.310	ug/L	1		08/13/14 17:19
Surrogates								
1,2-Dichloroethane-D4	109		70-120		%	1		08/13/14 17:19
4-Bromofluorobenzene	99.6		75-120		%	1		08/13/14 17:19
Toluene-d8	102		85-120		%	1		08/13/14 17:19

Batch Information

Analytical Batch: VMS14362
Analytical Method: EPA 602/624
Analyst: NRB
Analytical Date/Time: 08/13/14 17:19
Container ID: 1143735014-A

Prep Batch: VXX26267
Prep Method: SW5030B
Prep Date/Time: 08/13/14 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 08/22/2014 2:32:33PM

SGS

Results of **SW2**

Client Sample ID: **SW2**
Client Project ID: **1159-20 AVEC Selawik**
Lab Sample ID: 1143735015
Lab Project ID: 1143735

Collection Date: 08/11/14 12:49
Received Date: 08/12/14 09:56
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Acenaphthene	0.0500	U	0.0500	0.0150	ug/L	1		08/19/14 21:24
Acenaphthylene	0.0500	U	0.0500	0.0150	ug/L	1		08/19/14 21:24
Anthracene	0.0500	U	0.0500	0.0150	ug/L	1		08/19/14 21:24
Benzo(a)Anthracene	0.0500	U	0.0500	0.0150	ug/L	1		08/19/14 21:24
Benzo[a]pyrene	0.0500	U	0.0500	0.0150	ug/L	1		08/19/14 21:24
Benzo[b]Fluoranthene	0.0500	U	0.0500	0.0150	ug/L	1		08/19/14 21:24
Benzo[g,h,i]perylene	0.0500	U	0.0500	0.0150	ug/L	1		08/19/14 21:24
Benzo[k]fluoranthene	0.0500	U	0.0500	0.0150	ug/L	1		08/19/14 21:24
Chrysene	0.0500	U	0.0500	0.0150	ug/L	1		08/19/14 21:24
Dibenzo[a,h]anthracene	0.0500	U	0.0500	0.0150	ug/L	1		08/19/14 21:24
Fluoranthene	0.0591		0.0500	0.0150	ug/L	1		08/19/14 21:24
Fluorene	0.0500	U	0.0500	0.0150	ug/L	1		08/19/14 21:24
Indeno[1,2,3-c,d] pyrene	0.0500	U	0.0500	0.0150	ug/L	1		08/19/14 21:24
Naphthalene	0.100	U	0.100	0.0310	ug/L	1		08/19/14 21:24
Phenanthrene	0.0500	U	0.0500	0.0150	ug/L	1		08/19/14 21:24
Pyrene	0.0803		0.0500	0.0150	ug/L	1		08/19/14 21:24
Surrogates								
2-Fluorobiphenyl	63		50-110		%	1		08/19/14 21:24
Terphenyl-d14	94.8		50-135		%	1		08/19/14 21:24

Batch Information

Analytical Batch: XMS8237
Analytical Method: EPA 625M SIMS (PAH)
Analyst: RTS
Analytical Date/Time: 08/19/14 21:24
Container ID: 1143735015-E

Prep Batch: XXX31736
Prep Method: SW3520C
Prep Date/Time: 08/18/14 10:05
Prep Initial Wt./Vol.: 1000 mL
Prep Extract Vol: 1 mL

Print Date: 08/22/2014 2:32:33PM

SGS

Results of **SW2**

Client Sample ID: **SW2**
Client Project ID: **1159-20 AVEC Selawik**
Lab Sample ID: 1143735015
Lab Project ID: 1143735

Collection Date: 08/11/14 12:49
Received Date: 08/12/14 09:56
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2-Dichlorobenzene	1.00	U	1.00	0.310	ug/L	1		08/13/14 17:36
1,3-Dichlorobenzene	1.00	U	1.00	0.310	ug/L	1		08/13/14 17:36
1,4-Dichlorobenzene	0.500	U	0.500	0.150	ug/L	1		08/13/14 17:36
Benzene	0.400	U	0.400	0.120	ug/L	1		08/13/14 17:36
Chlorobenzene	0.500	U	0.500	0.150	ug/L	1		08/13/14 17:36
Ethylbenzene	1.00	U	1.00	0.310	ug/L	1		08/13/14 17:36
o-Xylene	1.00	U	1.00	0.310	ug/L	1		08/13/14 17:36
P & M -Xylene	2.00	U	2.00	0.620	ug/L	1		08/13/14 17:36
Toluene	2.62		1.00	0.310	ug/L	1		08/13/14 17:36
Surrogates								
1,2-Dichloroethane-D4	117		70-120		%	1		08/13/14 17:36
4-Bromofluorobenzene	110		75-120		%	1		08/13/14 17:36
Toluene-d8	99.3		85-120		%	1		08/13/14 17:36

Batch Information

Analytical Batch: VMS14362
Analytical Method: EPA 602/624
Analyst: NRB
Analytical Date/Time: 08/13/14 17:36
Container ID: 1143735015-A

Prep Batch: VXX26267
Prep Method: SW5030B
Prep Date/Time: 08/13/14 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 08/22/2014 2:32:33PM

SGS

Results of **Trip Blank**

Client Sample ID: **Trip Blank**
Client Project ID: **1159-20 AVEC Selawik**
Lab Sample ID: 1143735016
Lab Project ID: 1143735

Collection Date: 08/11/14 12:43
Received Date: 08/12/14 09:56
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2-Dichlorobenzene	1.00	U	1.00	0.310	ug/L	1		08/13/14 16:46
1,3-Dichlorobenzene	1.00	U	1.00	0.310	ug/L	1		08/13/14 16:46
1,4-Dichlorobenzene	0.500	U	0.500	0.150	ug/L	1		08/13/14 16:46
Benzene	0.400	U	0.400	0.120	ug/L	1		08/13/14 16:46
Chlorobenzene	0.500	U	0.500	0.150	ug/L	1		08/13/14 16:46
Ethylbenzene	1.00	U	1.00	0.310	ug/L	1		08/13/14 16:46
o-Xylene	1.00	U	1.00	0.310	ug/L	1		08/13/14 16:46
P & M -Xylene	2.00	U	2.00	0.620	ug/L	1		08/13/14 16:46
Toluene	1.00	U	1.00	0.310	ug/L	1		08/13/14 16:46
Surrogates								
1,2-Dichloroethane-D4	106		70-120		%	1		08/13/14 16:46
4-Bromofluorobenzene	101		75-120		%	1		08/13/14 16:46
Toluene-d8	100		85-120		%	1		08/13/14 16:46

Batch Information

Analytical Batch: VMS14362
Analytical Method: EPA 602/624
Analyst: NRB
Analytical Date/Time: 08/13/14 16:46
Container ID: 1143735016-A

Prep Batch: VXX26267
Prep Method: SW5030B
Prep Date/Time: 08/13/14 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 08/22/2014 2:32:33PM

Results of **Trip Blank 2**

Client Sample ID: **Trip Blank 2**
Client Project ID: **1159-20 AVEC Selawik**
Lab Sample ID: 1143735017
Lab Project ID: 1143735

Collection Date: 08/11/14 11:31
Received Date: 08/12/14 09:56
Matrix: Soil/Solid (dry weight)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	2.51	U	2.51	0.752	mg/Kg	1		08/18/14 19:41
Surrogates								
4-Bromofluorobenzene	97		50-150		%	1		08/18/14 19:41

Batch Information

Analytical Batch: VFC12054
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 08/18/14 19:41
Container ID: 1143735017-A

Prep Batch: VXX26298
Prep Method: SW5035A
Prep Date/Time: 08/11/14 11:31
Prep Initial Wt./Vol.: 49.882 g
Prep Extract Vol: 25 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	12.5	U	12.5	4.01	ug/Kg	1		08/18/14 19:41
Ethylbenzene	25.1	U	25.1	7.82	ug/Kg	1		08/18/14 19:41
o-Xylene	25.1	U	25.1	7.82	ug/Kg	1		08/18/14 19:41
P & M -Xylene	50.1	U	50.1	15.0	ug/Kg	1		08/18/14 19:41
Toluene	25.1	U	25.1	7.82	ug/Kg	1		08/18/14 19:41
Surrogates								
1,4-Difluorobenzene	93.6		72-119		%	1		08/18/14 19:41

Batch Information

Analytical Batch: VFC12054
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 08/18/14 19:41
Container ID: 1143735017-A

Prep Batch: VXX26298
Prep Method: SW5035A
Prep Date/Time: 08/11/14 11:31
Prep Initial Wt./Vol.: 49.882 g
Prep Extract Vol: 25 mL

Print Date: 08/22/2014 2:32:33PM

Method Blank

Blank ID: MB for HBN 1625550 [SPT/9422]
Blank Lab ID: 1226694

Matrix: Soil/Solid (dry weight)

QC for Samples:
1143735001, 1143735002, 1143735003, 1143735004, 1143735005, 1143735006, 1143735007, 1143735008, 1143735009, 1143735010, 1143735011, 1143735012, 1143735013

Results by **SM21 2540G**

Parameter	Results	LOQ/CL	DL	Units
Total Solids	100			%

Batch Information

Analytical Batch: SPT9422
Analytical Method: SM21 2540G
Instrument:
Analyst: MJN
Analytical Date/Time: 8/13/2014 7:50:00PM

Print Date: 08/22/2014 2:32:38PM

Duplicate Sample Summary

Original Sample ID: 1143734076
Duplicate Sample ID: 1226695

Analysis Date: 08/13/2014 19:50
Matrix: Soil/Solid (dry weight)

QC for Samples:

1143735001, 1143735002, 1143735003, 1143735004, 1143735005, 1143735006, 1143735007, 1143735008, 1143735009, 1143735010, 1143735011, 1143735012, 1143735013

Results by **SM21 2540G**

NAME	Original ()	Duplicate ()	RPD (%)	RPD CL
Total Solids	95.9	95.8	0.12	15.00

Batch Information

Analytical Batch: SPT9422
Analytical Method: SM21 2540G
Instrument:
Analyst: MJN

Print Date: 08/22/2014 2:32:39PM

Duplicate Sample Summary

Original Sample ID: 1143746015
Duplicate Sample ID: 1226696

Analysis Date: 08/13/2014 19:50
Matrix: Soil/Solid (dry weight)

QC for Samples:

1143735001, 1143735002, 1143735003, 1143735004, 1143735005, 1143735006, 1143735007, 1143735008, 1143735009, 1143735010, 1143735011, 1143735012, 1143735013

Results by **SM21 2540G**

NAME	Original ()	Duplicate ()	RPD (%)	RPD CL
Total Solids	87.1	87.1	0.04	15.00

Batch Information

Analytical Batch: SPT9422
Analytical Method: SM21 2540G
Instrument:
Analyst: MJN

Print Date: 08/22/2014 2:32:39PM

Method Blank

Blank ID: MB for HBN 1625582 [VXX/26267]
Blank Lab ID: 1226844

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1143735014, 1143735015, 1143735016

Results by **EPA 602/624**

Parameter	Results	LOQ/CL	DL	Units
1,2-Dichlorobenzene	0.500U	1.00	0.310	ug/L
1,3-Dichlorobenzene	0.500U	1.00	0.310	ug/L
1,4-Dichlorobenzene	0.250U	0.500	0.150	ug/L
Benzene	0.200U	0.400	0.120	ug/L
Chlorobenzene	0.250U	0.500	0.150	ug/L
Ethylbenzene	0.500U	1.00	0.310	ug/L
o-Xylene	0.500U	1.00	0.310	ug/L
P & M -Xylene	1.00U	2.00	0.620	ug/L
Toluene	0.500U	1.00	0.310	ug/L
Surrogates				
1,2-Dichloroethane-D4	108	70-120		%
4-Bromofluorobenzene	105	75-120		%
Toluene-d8	95.2	85-120		%

Batch Information

Analytical Batch: VMS14362
Analytical Method: EPA 602/624
Instrument: VPA 780/5975 GC/MS
Analyst: NRB
Analytical Date/Time: 8/13/2014 1:47:00PM

Prep Batch: VXX26267
Prep Method: SW5030B
Prep Date/Time: 8/13/2014 6:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Anti-Foam Blank

Blank ID: AFB for HBN 1625582 [VXX/26267
Blank Lab ID: 1226847

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1143735014, 1143735015, 1143735016

Results by **EPA 602/624**

Parameter	Results	LOQ/CL	DL	Units
1,2-Dichlorobenzene	0.500U	1.00	0.310	ug/L
1,3-Dichlorobenzene	0.500U	1.00	0.310	ug/L
1,4-Dichlorobenzene	0.250U	0.500	0.150	ug/L
Benzene	0.200U	0.400	0.120	ug/L
Chlorobenzene	0.250U	0.500	0.150	ug/L
Ethylbenzene	0.500U	1.00	0.310	ug/L
o-Xylene	0.500U	1.00	0.310	ug/L
P & M -Xylene	1.00U	2.00	0.620	ug/L
Toluene	0.500U	1.00	0.310	ug/L

Batch Information

Analytical Batch: VMS14362
Analytical Method: EPA 602/624
Instrument: VPA 780/5975 GC/MS
Analyst: NRB
Analytical Date/Time: 8/13/2014 8:54:00PM

Prep Batch: VXX26267
Prep Method: SW5030B
Prep Date/Time: 8/13/2014 6:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1143735 [VXX26267]
Blank Spike Lab ID: 1226845
Date Analyzed: 08/13/2014 15:07

Spike Duplicate ID: LCSD for HBN 1143735 [VXX26267]
Spike Duplicate Lab ID: 1226846
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1143735014, 1143735015, 1143735016

Results by **EPA 602/624**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
1,2-Dichlorobenzene	30	27.6	92	30	28.4	95	(70-120)	2.80	(< 20)
1,3-Dichlorobenzene	30	28.2	94	30	28.7	96	(75-125)	1.80	(< 20)
1,4-Dichlorobenzene	30	29.0	97	30	29.1	97	(75-125)	0.31	(< 20)
Benzene	30	29.1	97	30	29.6	99	(80-120)	1.50	(< 20)
Chlorobenzene	30	29.5	98	30	29.8	99	(80-120)	0.98	(< 20)
Ethylbenzene	30	31.6	105	30	32.0	107	(75-125)	1.10	(< 20)
o-Xylene	30	29.4	98	30	31.5	105	(80-120)	7.10	(< 20)
P & M -Xylene	60	59.6	99	60	61.1	102	(75-130)	2.60	(< 20)
Toluene	30	29.6	99	30	30.3	101	(75-120)	2.20	(< 20)
Surrogates									
1,2-Dichloroethane-D4	30		97	30		93	(70-120)	4.90	
4-Bromofluorobenzene	30		98	30		97	(75-120)	1.30	
Toluene-d8	30		103	30		104	(85-120)	0.93	

Batch Information

Analytical Batch: **VMS14362**
Analytical Method: **EPA 602/624**
Instrument: **VPA 780/5975 GC/MS**
Analyst: **NRB**

Prep Batch: **VXX26267**
Prep Method: **SW5030B**
Prep Date/Time: **08/13/2014 06:00**
Spike Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL
Dup Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1625835 [VXX/26298]
Blank Lab ID: 1227950

Matrix: Soil/Solid (dry weight)

QC for Samples:
1143735002, 1143735003, 1143735004, 1143735005, 1143735006, 1143735007, 1143735008, 1143735009, 1143735010, 1143735011, 1143735012, 1143735013, 1143735017

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	0.840J	2.50	0.750	mg/Kg
Surrogates				
4-Bromofluorobenzene	106	50-150		%

Batch Information

Analytical Batch: VFC12054
Analytical Method: AK101
Instrument: Agilent 7890 PID/FID
Analyst: ST
Analytical Date/Time: 8/18/2014 2:00:00PM

Prep Batch: VXX26298
Prep Method: SW5035A
Prep Date/Time: 8/18/2014 8:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1143735 [VXX26298]
Blank Spike Lab ID: 1227953
Date Analyzed: 08/18/2014 14:57

Spike Duplicate ID: LCSD for HBN 1143735 [VXX26298]
Spike Duplicate Lab ID: 1227954
Matrix: Soil/Solid (dry weight)

QC for Samples: 1143735002, 1143735003, 1143735004, 1143735005, 1143735006, 1143735007, 1143735008, 1143735009, 1143735010, 1143735011, 1143735012, 1143735013, 1143735017

Results by **AK101**

	Blank Spike (mg/Kg)			Spike Duplicate (mg/Kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	10.0	9.50	95	10.0	9.41	94	(60-120)	0.97	(< 20)
Surrogates									
4-Bromofluorobenzene	1.25		105	1.25		108	(50-150)	3.40	

Batch Information

Analytical Batch: **VFC12054**
Analytical Method: **AK101**
Instrument: **Agilent 7890 PID/FID**
Analyst: **ST**

Prep Batch: **VXX26298**
Prep Method: **SW5035A**
Prep Date/Time: **08/18/2014 08:00**
Spike Init Wt./Vol.: 10.0 mg/Kg Extract Vol: 25 mL
Dup Init Wt./Vol.: 10.0 mg/Kg Extract Vol: 25 mL

Print Date: 08/22/2014 2:32:46PM

Method Blank

Blank ID: MB for HBN 1625835 [VXX/26298]
Blank Lab ID: 1227950

Matrix: Soil/Solid (dry weight)

QC for Samples:
1143735002, 1143735003, 1143735004, 1143735005, 1143735006, 1143735007, 1143735008, 1143735009, 1143735010, 1143735011, 1143735012, 1143735013, 1143735017

Results by **SW8021B**

Parameter	Results	LOQ/CL	DL	Units
Benzene	6.25U	12.5	4.00	ug/Kg
Ethylbenzene	12.5U	25.0	7.80	ug/Kg
o-Xylene	12.5U	25.0	7.80	ug/Kg
P & M -Xylene	25.0U	50.0	15.0	ug/Kg
Toluene	12.5U	25.0	7.80	ug/Kg
Surrogates				
1,4-Difluorobenzene	94.7	72-119		%

Batch Information

Analytical Batch: VFC12054
Analytical Method: SW8021B
Instrument: Agilent 7890 PID/FID
Analyst: ST
Analytical Date/Time: 8/18/2014 2:00:00PM

Prep Batch: VXX26298
Prep Method: SW5035A
Prep Date/Time: 8/18/2014 8:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1143735 [VXX26298]
Blank Spike Lab ID: 1227951
Date Analyzed: 08/18/2014 14:19

Spike Duplicate ID: LCSD for HBN 1143735 [VXX26298]
Spike Duplicate Lab ID: 1227952
Matrix: Soil/Solid (dry weight)

QC for Samples: 1143735002, 1143735003, 1143735004, 1143735005, 1143735006, 1143735007, 1143735008, 1143735009, 1143735010, 1143735011, 1143735012, 1143735013, 1143735017

Results by **SW8021B**

	Blank Spike (ug/Kg)			Spike Duplicate (ug/Kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	1250	1350	108	1250	1410	113	(75-125)	4.40	(< 20)
Ethylbenzene	1250	1280	103	1250	1340	107	(75-125)	4.30	(< 20)
o-Xylene	1250	1240	100	1250	1290	103	(75-125)	3.80	(< 20)
P & M -Xylene	2500	2510	101	2500	2620	105	(80-125)	4.20	(< 20)
Toluene	1250	1290	103	1250	1350	108	(70-125)	4.50	(< 20)
Surrogates									
1,4-Difluorobenzene	1250		100	1250		102	(72-119)	1.50	

Batch Information

Analytical Batch: **VFC12054**
Analytical Method: **SW8021B**
Instrument: **Agilent 7890 PID/FID**
Analyst: **ST**

Prep Batch: **VXX26298**
Prep Method: **SW5035A**
Prep Date/Time: **08/18/2014 08:00**
Spike Init Wt./Vol.: 1250 ug/Kg Extract Vol: 25 mL
Dup Init Wt./Vol.: 1250 ug/Kg Extract Vol: 25 mL

Print Date: 08/22/2014 2:32:49PM

Matrix Spike Summary

Original Sample ID: 1143826001
MS Sample ID: 1227955 MS
MSD Sample ID: 1227956 MSD

Analysis Date: 08/18/2014 15:35
Analysis Date: 08/18/2014 15:54
Analysis Date: 08/18/2014 16:13
Matrix: Soil/Solid (dry weight)

QC for Samples: 1143735002, 1143735003, 1143735004, 1143735005, 1143735006, 1143735007, 1143735008, 1143735009, 1143735010, 1143735011, 1143735012, 1143735013, 1143735017

Results by **SW8021B**

		Matrix Spike (ug/Kg)			Spike Duplicate (ug/Kg)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	3.49U	587	650	111	587	632	108	75-125	3.10	(< 20)
Ethylbenzene	7.00U	587	620	106	587	599	102	75-125	3.50	(< 20)
o-Xylene	7.00U	587	595	101	587	573	98	75-125	3.70	(< 20)
P & M -Xylene	13.4J	1169	1211	103	1169	1169	100	80-125	3.50	(< 20)
Toluene	7.00U	587	624	106	587	603	103	70-125	3.30	(< 20)
Surrogates										
1,4-Difluorobenzene		587	588	100	587	577	98	72-119	1.80	

Batch Information

Analytical Batch: VFC12054
Analytical Method: SW8021B
Instrument: Agilent 7890 PID/FID
Analyst: ST
Analytical Date/Time: 8/18/2014 3:54:00PM

Prep Batch: VXX26298
Prep Method: AK101 Extraction (S)
Prep Date/Time: 8/18/2014 8:00:00AM
Prep Initial Wt./Vol.: 111.15g
Prep Extract Vol: 25.00mL

Print Date: 08/22/2014 2:32:50PM

Method Blank

Blank ID: MB for HBN 1625894 [VXX/26302]
Blank Lab ID: 1228189

Matrix: Soil/Solid (dry weight)

QC for Samples:
1143735001

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	1.25U	2.50	0.750	mg/Kg
Surrogates				
4-Bromofluorobenzene	101	50-150		%

Batch Information

Analytical Batch: VFC12055
Analytical Method: AK101
Instrument: Agilent 7890 PID/FID
Analyst: ST
Analytical Date/Time: 8/19/2014 12:14:00PM

Prep Batch: VXX26302
Prep Method: SW5035A
Prep Date/Time: 8/19/2014 8:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1143735 [VXX26302]
Blank Spike Lab ID: 1228192
Date Analyzed: 08/19/2014 13:11

Spike Duplicate ID: LCSD for HBN 1143735 [VXX26302]
Spike Duplicate Lab ID: 1228193
Matrix: Soil/Solid (dry weight)

QC for Samples: 1143735001

Results by **AK101**

	Blank Spike (mg/Kg)			Spike Duplicate (mg/Kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	10.0	9.19	92	10.0	9.06	91	(60-120)	1.50	(< 20)
Surrogates									
4-Bromofluorobenzene	1.25		104	1.25		103	(50-150)	1.50	

Batch Information

Analytical Batch: **VFC12055**
Analytical Method: **AK101**
Instrument: **Agilent 7890 PID/FID**
Analyst: **ST**

Prep Batch: **VXX26302**
Prep Method: **SW5035A**
Prep Date/Time: **08/19/2014 08:00**
Spike Init Wt./Vol.: 10.0 mg/Kg Extract Vol: 25 mL
Dup Init Wt./Vol.: 10.0 mg/Kg Extract Vol: 25 mL

Print Date: 08/22/2014 2:32:52PM

Method Blank

Blank ID: MB for HBN 1625894 [VXX/26302]
Blank Lab ID: 1228189

Matrix: Soil/Solid (dry weight)

QC for Samples:
1143735001

Results by **SW8021B**

Parameter	Results	LOQ/CL	DL	Units
Benzene	6.25U	12.5	4.00	ug/Kg
Ethylbenzene	12.5U	25.0	7.80	ug/Kg
o-Xylene	12.5U	25.0	7.80	ug/Kg
P & M -Xylene	25.0U	50.0	15.0	ug/Kg
Toluene	12.5U	25.0	7.80	ug/Kg
Surrogates				
1,4-Difluorobenzene	95.4	72-119		%

Batch Information

Analytical Batch: VFC12055
Analytical Method: SW8021B
Instrument: Agilent 7890 PID/FID
Analyst: ST
Analytical Date/Time: 8/19/2014 12:14:00PM

Prep Batch: VXX26302
Prep Method: SW5035A
Prep Date/Time: 8/19/2014 8:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

Print Date: 08/22/2014 2:32:53PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1143735 [VXX26302]
Blank Spike Lab ID: 1228190
Date Analyzed: 08/19/2014 12:33

Spike Duplicate ID: LCSD for HBN 1143735 [VXX26302]
Spike Duplicate Lab ID: 1228191
Matrix: Soil/Solid (dry weight)

QC for Samples: 1143735001

Results by **SW8021B**

	Blank Spike (ug/Kg)			Spike Duplicate (ug/Kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	1250	1340	107	1250	1350	108	(75-125)	0.17	(< 20)
Ethylbenzene	1250	1260	101	1250	1270	101	(75-125)	0.85	(< 20)
o-Xylene	1250	1220	97	1250	1230	98	(75-125)	0.76	(< 20)
P & M -Xylene	2500	2450	98	2500	2470	99	(80-125)	0.79	(< 20)
Toluene	1250	1280	102	1250	1280	103	(70-125)	0.41	(< 20)
Surrogates									
1,4-Difluorobenzene	1250		99	1250		98	(72-119)	0.63	

Batch Information

Analytical Batch: **VFC12055**
Analytical Method: **SW8021B**
Instrument: **Agilent 7890 PID/FID**
Analyst: **ST**

Prep Batch: **VXX26302**
Prep Method: **SW5035A**
Prep Date/Time: **08/19/2014 08:00**
Spike Init Wt./Vol.: 1250 ug/Kg Extract Vol: 25 mL
Dup Init Wt./Vol.: 1250 ug/Kg Extract Vol: 25 mL

Print Date: 08/22/2014 2:32:54PM

Matrix Spike Summary

Original Sample ID: 1143821003
MS Sample ID: 1228194 MS
MSD Sample ID: 1228195 MSD

QC for Samples: 1143735001

Analysis Date: 08/19/2014 13:49
Analysis Date: 08/19/2014 14:07
Analysis Date: 08/19/2014 14:26
Matrix: Soil/Solid (dry weight)

Results by **SW8021B**

		Matrix Spike (ug/Kg)			Spike Duplicate (ug/Kg)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	8.44J	752	784	103	752	794	104	75-125	1.20	(< 20)
Ethylbenzene	15.8J	752	736	96	752	748	97	75-125	1.60	(< 20)
o-Xylene	47.1	752	730	91	752	739	92	75-125	1.30	(< 20)
P & M -Xylene	73.0	1504	1462	93	1504	1483	94	80-125	1.40	(< 20)
Toluene	26.4	752	767	99	752	777	100	70-125	1.30	(< 20)
Surrogates										
1,4-Difluorobenzene		752	733	98	752	722	96	72-119	1.50	

Batch Information

Analytical Batch: VFC12055
Analytical Method: SW8021B
Instrument: Agilent 7890 PID/FID
Analyst: ST
Analytical Date/Time: 8/19/2014 2:07:00PM

Prep Batch: VXX26302
Prep Method: AK101 Extraction (S)
Prep Date/Time: 8/19/2014 8:00:00AM
Prep Initial Wt./Vol.: 87.46g
Prep Extract Vol: 25.00mL

Print Date: 08/22/2014 2:32:55PM

Method Blank

Blank ID: MB for HBN 1625520 [XXX/31691]
Blank Lab ID: 1226562

Matrix: Soil/Solid (dry weight)

QC for Samples:
1143735006, 1143735010, 1143735012, 1143735013

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

Parameter	Results	LOQ/CL	DL	Units
1-Methylnaphthalene	2.50U	5.00	1.50	ug/Kg
2-Methylnaphthalene	2.50U	5.00	1.50	ug/Kg
Acenaphthene	2.50U	5.00	1.50	ug/Kg
Acenaphthylene	2.50U	5.00	1.50	ug/Kg
Anthracene	2.50U	5.00	1.50	ug/Kg
Benzo(a)Anthracene	2.50U	5.00	1.50	ug/Kg
Benzo[a]pyrene	2.50U	5.00	1.50	ug/Kg
Benzo[b]Fluoranthene	2.50U	5.00	1.50	ug/Kg
Benzo[g,h,i]perylene	2.50U	5.00	1.50	ug/Kg
Benzo[k]fluoranthene	2.50U	5.00	1.50	ug/Kg
Chrysene	2.50U	5.00	1.50	ug/Kg
Dibenzo[a,h]anthracene	2.50U	5.00	1.50	ug/Kg
Fluoranthene	2.50U	5.00	1.50	ug/Kg
Fluorene	2.50U	5.00	1.50	ug/Kg
Indeno[1,2,3-c,d] pyrene	2.50U	5.00	1.50	ug/Kg
Naphthalene	2.50U	5.00	1.50	ug/Kg
Phenanthrene	2.50U	5.00	1.50	ug/Kg
Pyrene	2.50U	5.00	1.50	ug/Kg
Surrogates				
2-Fluorobiphenyl	80.7	45-105		%
Terphenyl-d14	98.4	30-125		%

Batch Information

Analytical Batch: XMS8227
Analytical Method: 8270D SIMS (PAH)
Instrument: HP 6890/5973 MS SVQA
Analyst: RTS
Analytical Date/Time: 8/14/2014 4:36:00PM

Prep Batch: XXX31691
Prep Method: SW3550C
Prep Date/Time: 8/13/2014 3:42:44PM
Prep Initial Wt./Vol.: 22.5 g
Prep Extract Vol: 1 mL

Print Date: 08/22/2014 2:32:56PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1143735 [XXX31691]
Blank Spike Lab ID: 1226563
Date Analyzed: 08/14/2014 16:51

Matrix: Soil/Solid (dry weight)

QC for Samples: 1143735006, 1143735010, 1143735012, 1143735013

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

	Blank Spike (ug/Kg)			
Parameter	Spike	Result	Rec (%)	CL
1-Methylnaphthalene	22.2	13.5	61	(44-107)
2-Methylnaphthalene	22.2	12.0	54	(45-105)
Acenaphthene	22.2	14.2	64	(45-110)
Acenaphthylene	22.2	14.7	66	(45-105)
Anthracene	22.2	18.1	82	(55-105)
Benzo(a)Anthracene	22.2	20.9	94	(50-110)
Benzo[a]pyrene	22.2	19.7	88	(50-110)
Benzo[b]Fluoranthene	22.2	20.3	92	(45-115)
Benzo[g,h,i]perylene	22.2	20.6	93	(40-125)
Benzo[k]fluoranthene	22.2	23.7	107	(45-125)
Chrysene	22.2	21.4	96	(55-110)
Dibenzo[a,h]anthracene	22.2	20.3	91	(40-125)
Fluoranthene	22.2	20.7	93	(55-115)
Fluorene	22.2	16.4	74	(50-110)
Indeno[1,2,3-c,d] pyrene	22.2	20.8	94	(40-120)
Naphthalene	22.2	12.6	57	(40-105)
Phenanthrene	22.2	17.3	78	(50-110)
Pyrene	22.2	20.3	91	(45-125)
Surrogates				
2-Fluorobiphenyl	22.2		76	(45-105)
Terphenyl-d14	22.2		103	(30-125)

Batch Information

Analytical Batch: **XMS8227**
Analytical Method: **8270D SIMS (PAH)**
Instrument: **HP 6890/5973 MS SVQA**
Analyst: **RTS**

Prep Batch: **XXX31691**
Prep Method: **SW3550C**
Prep Date/Time: **08/13/2014 15:42**
Spike Init Wt./Vol.: 22.2 ug/Kg Extract Vol: 1 mL
Dup Init Wt./Vol.: Extract Vol:

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Matrix Spike Summary

Original Sample ID: 1143746001
MS Sample ID: 1227249 MS
MSD Sample ID: 1227250 MSD

Analysis Date: 08/14/2014 20:22
Analysis Date: 08/14/2014 20:37
Analysis Date: 08/14/2014 20:52
Matrix: Soil/Solid (dry weight)

QC for Samples: 1143735006, 1143735010, 1143735012, 1143735013

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

		Matrix Spike (ug/Kg)			Spike Duplicate (ug/Kg)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
1-Methylnaphthalene	4.24U	38.1	25.7	68	37.7	24.4	64	44-107	5.80	(< 30)
2-Methylnaphthalene	4.24U	38.1	23.8	63	37.7	23.3	62	45-105	2.40	(< 30)
Acenaphthene	4.24U	38.1	27.6	73	37.7	24.4	64	45-110	12.70	(< 30)
Acenaphthylene	4.24U	38.1	26.8	70	37.7	25.6	68	45-105	4.60	(< 30)
Anthracene	4.24U	38.1	29.0	76	37.7	24.4	65	55-105	17.20	(< 30)
Benzo(a)Anthracene	4.24U	38.1	31.6	83	37.7	24.5	65	50-110	24.80	(< 30)
Benzo[a]pyrene	4.24U	38.1	23.8	63	37.7	19.0	50	50-110	22.90	(< 30)
Benzo[b]Fluoranthene	4.24U	38.1	26.6	70	37.7	23.2	62	45-115	13.40	(< 30)
Benzo[g,h,i]perylene	4.24U	38.1	20.4	54	37.7	14.4	38 *	40-125	34.40	* (< 30)
Benzo[k]fluoranthene	4.24U	38.1	27.8	73	37.7	19.4	52	45-125	35.50	* (< 30)
Chrysene	4.24U	38.1	29.8	79	37.7	24.2	64	55-110	21.00	(< 30)
Dibenzo[a,h]anthracene	4.24U	38.1	19.7	52	37.7	15.6	41	40-125	23.00	(< 30)
Fluoranthene	4.24U	38.1	32.6	86	37.7	26.2	70	55-115	21.20	(< 30)
Fluorene	4.24U	38.1	30.0	79	37.7	26.4	70	50-110	12.70	(< 30)
Indeno[1,2,3-c,d] pyrene	4.24U	38.1	19.4	51	37.7	15.7	42	40-120	20.80	(< 30)
Naphthalene	4.24U	38.1	21.3	56	37.7	22.1	59	40-105	3.90	(< 30)
Phenanthrene	4.24U	38.1	31.0	82	37.7	25.9	68	50-110	18.20	(< 30)
Pyrene	4.24U	38.1	31.9	84	37.7	25.0	66	45-125	24.40	(< 30)
Surrogates										
2-Fluorobiphenyl		38.1	31.4	83	37.7	32.8	87	45-105	4.30	
Terphenyl-d14		38.1	40.5	106	37.7	42.0	111	30-125	3.70	

Batch Information

Analytical Batch: XMS8227
Analytical Method: 8270D SIMS (PAH)
Instrument: HP 6890/5973 MS SVQA
Analyst: RTS
Analytical Date/Time: 8/14/2014 8:37:00PM

Prep Batch: XXX31691
Prep Method: Sonication Extraction Soil 8270 PAH SIM
Prep Date/Time: 8/13/2014 3:42:44PM
Prep Initial Wt./Vol.: 22.54g
Prep Extract Vol: 1.00mL

Print Date: 08/22/2014 2:32:57PM

Method Blank

Blank ID: MB for HBN 1625557 [XXX/31701]
Blank Lab ID: 1226731

Matrix: Soil/Solid (dry weight)

QC for Samples:
1143735001, 1143735002, 1143735003, 1143735004, 1143735005, 1143735006, 1143735007, 1143735008, 1143735009, 1143735010, 1143735012, 1143735013

Results by **AK102**

Parameter	Results	LOQ/CL	DL	Units
Diesel Range Organics	10.0U	20.0	6.20	mg/Kg
Surrogates				
5a Androstane	89.3	60-120		%

Batch Information

Analytical Batch: XFC11515
Analytical Method: AK102
Instrument: HP 6890 Series II FID SV D R
Analyst: AYC
Analytical Date/Time: 8/19/2014 4:45:00PM

Prep Batch: XXX31701
Prep Method: SW3550C
Prep Date/Time: 8/14/2014 9:39:44AM
Prep Initial Wt./Vol.: 30 g
Prep Extract Vol: 1 mL

Print Date: 08/22/2014 2:32:58PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1143735 [XXX31701]
Blank Spike Lab ID: 1226732
Date Analyzed: 08/19/2014 16:55

Spike Duplicate ID: LCSD for HBN 1143735 [XXX31701]
Spike Duplicate Lab ID: 1226733
Matrix: Soil/Solid (dry weight)

QC for Samples: 1143735001, 1143735002, 1143735003, 1143735004, 1143735005, 1143735006, 1143735007, 1143735008, 1143735009, 1143735010, 1143735012, 1143735013

Results by **AK102**

	Blank Spike (mg/Kg)			Spike Duplicate (mg/Kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Diesel Range Organics	167	158	95	167	163	98	(75-125)	3.30	(< 20)
Surrogates									
5a Androstane	3.33		109	3.33		107	(60-120)	1.70	

Batch Information

Analytical Batch: **XFC11515**
Analytical Method: **AK102**
Instrument: **HP 6890 Series II FID SV D R**
Analyst: **AYC**

Prep Batch: **XXX31701**
Prep Method: **SW3550C**
Prep Date/Time: **08/14/2014 09:39**
Spike Init Wt./Vol.: 167 mg/Kg Extract Vol: 1 mL
Dup Init Wt./Vol.: 167 mg/Kg Extract Vol: 1 mL

Print Date: 08/22/2014 2:32:59PM

Method Blank

Blank ID: MB for HBN 1625557 [XXX/31701]
Blank Lab ID: 1226731

Matrix: Soil/Solid (dry weight)

QC for Samples:
1143735001, 1143735002, 1143735003, 1143735004, 1143735005, 1143735006, 1143735007, 1143735008, 1143735009, 1143735010, 1143735012, 1143735013

Results by **AK103**

Parameter	Results	LOQ/CL	DL	Units
Residual Range Organics	10.0U	20.0	6.20	mg/Kg
Surrogates				
n-Triacontane-d62	94.2	60-120		%

Batch Information

Analytical Batch: XFC11515
Analytical Method: AK103
Instrument: HP 6890 Series II FID SV D R
Analyst: AYC
Analytical Date/Time: 8/19/2014 4:45:00PM

Prep Batch: XXX31701
Prep Method: SW3550C
Prep Date/Time: 8/14/2014 9:39:44AM
Prep Initial Wt./Vol.: 30 g
Prep Extract Vol: 1 mL

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

Blank Spike Summary

Blank Spike ID: LCS for HBN 1143735 [XXX31701]
Blank Spike Lab ID: 1226732
Date Analyzed: 08/19/2014 16:55

Spike Duplicate ID: LCSD for HBN 1143735 [XXX31701]
Spike Duplicate Lab ID: 1226733
Matrix: Soil/Solid (dry weight)

QC for Samples: 1143735001, 1143735002, 1143735003, 1143735004, 1143735005, 1143735006, 1143735007, 1143735008, 1143735009, 1143735010, 1143735012, 1143735013

Results by **AK103**

	Blank Spike (mg/Kg)			Spike Duplicate (mg/Kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Residual Range Organics	167	155	93	167	159	95	(60-120)	2.60	(< 20)
Surrogates									
n-Triacontane-d62	3.33		102	3.33		103	(60-120)	1.20	

Batch Information

Analytical Batch: **XFC11515**
Analytical Method: **AK103**
Instrument: **HP 6890 Series II FID SV D R**
Analyst: **AYC**

Prep Batch: **XXX31701**
Prep Method: **SW3550C**
Prep Date/Time: **08/14/2014 09:39**
Spike Init Wt./Vol.: 167 mg/Kg Extract Vol: 1 mL
Dup Init Wt./Vol.: 167 mg/Kg Extract Vol: 1 mL

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

Method Blank

Blank ID: MB for HBN 1625734 [XXX/31736]
Blank Lab ID: 1227549

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1143735014, 1143735015

Results by **EPA 625M SIMS (PAH)**

Parameter	Results	LOQ/CL	DL	Units
Acenaphthene	0.0250U	0.0500	0.0150	ug/L
Acenaphthylene	0.0250U	0.0500	0.0150	ug/L
Anthracene	0.0250U	0.0500	0.0150	ug/L
Benzo(a)Anthracene	0.0250U	0.0500	0.0150	ug/L
Benzo[a]pyrene	0.0250U	0.0500	0.0150	ug/L
Benzo[b]Fluoranthene	0.0250U	0.0500	0.0150	ug/L
Benzo[g,h,i]perylene	0.0250U	0.0500	0.0150	ug/L
Benzo[k]fluoranthene	0.0250U	0.0500	0.0150	ug/L
Chrysene	0.0250U	0.0500	0.0150	ug/L
Dibenzo[a,h]anthracene	0.0250U	0.0500	0.0150	ug/L
Fluoranthene	0.0250U	0.0500	0.0150	ug/L
Fluorene	0.0250U	0.0500	0.0150	ug/L
Indeno[1,2,3-c,d] pyrene	0.0250U	0.0500	0.0150	ug/L
Naphthalene	0.0500U	0.100	0.0310	ug/L
Phenanthrene	0.0250U	0.0500	0.0150	ug/L
Pyrene	0.0250U	0.0500	0.0150	ug/L
Surrogates				
2-Fluorobiphenyl	72.8	50-110		%
Terphenyl-d14	102	50-135		%

Batch Information

Analytical Batch: XMS8232
Analytical Method: EPA 625M SIMS (PAH)
Instrument: HP 6890/5973 MS SVQA
Analyst: RTS
Analytical Date/Time: 8/18/2014 6:52:00PM

Prep Batch: XXX31736
Prep Method: SW3520C
Prep Date/Time: 8/18/2014 10:05:44AM
Prep Initial Wt./Vol.: 1000 mL
Prep Extract Vol: 1 mL

Print Date: 08/22/2014 2:33:03PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1143735 [XXX31736]
Blank Spike Lab ID: 1227550
Date Analyzed: 08/18/2014 19:07

Spike Duplicate ID: LCSD for HBN 1143735 [XXX31736]
Spike Duplicate Lab ID: 1227551
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1143735014, 1143735015

Results by **EPA 625M SIMS (PAH)**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Acenaphthene	0.5	0.344	69	0.5	0.339	68	(45-110)	1.50	(< 30)
Acenaphthylene	0.5	0.350	70	0.5	0.335	67	(50-105)	4.40	(< 30)
Anthracene	0.5	0.376	75	0.5	0.370	74	(55-110)	1.80	(< 30)
Benzo(a)Anthracene	0.5	0.436	87	0.5	0.427	85	(55-110)	2.20	(< 30)
Benzo[a]pyrene	0.5	0.398	80	0.5	0.378	76	(55-110)	5.30	(< 30)
Benzo[b]Fluoranthene	0.5	0.423	85	0.5	0.409	82	(45-120)	3.40	(< 30)
Benzo[g,h,i]perylene	0.5	0.393	79	0.5	0.379	76	(40-125)	3.50	(< 30)
Benzo[k]fluoranthene	0.5	0.454	91	0.5	0.459	92	(45-125)	1.10	(< 30)
Chrysene	0.5	0.467	93	0.5	0.451	90	(55-110)	3.50	(< 30)
Dibenzo[a,h]anthracene	0.5	0.407	81	0.5	0.385	77	(40-125)	5.60	(< 30)
Fluoranthene	0.5	0.407	81	0.5	0.411	82	(55-115)	1.10	(< 30)
Fluorene	0.5	0.359	72	0.5	0.353	71	(50-110)	1.70	(< 30)
Indeno[1,2,3-c,d] pyrene	0.5	0.401	80	0.5	0.385	77	(45-125)	4.20	(< 30)
Naphthalene	0.5	0.325	65	0.5	0.328	66	(40-100)	1.00	(< 30)
Phenanthrene	0.5	0.366	73	0.5	0.371	74	(50-115)	1.40	(< 30)
Pyrene	0.5	0.399	80	0.5	0.395	79	(50-130)	1.00	(< 30)
Surrogates									
2-Fluorobiphenyl	0.5		78	0.5		74	(50-110)	5.60	
Terphenyl-d14	0.5		103	0.5		102	(50-135)	1.20	

Batch Information

Analytical Batch: **XMS8232**
Analytical Method: **EPA 625M SIMS (PAH)**
Instrument: **HP 6890/5973 MS SVQA**
Analyst: **RTS**

Prep Batch: **XXX31736**
Prep Method: **SW3520C**
Prep Date/Time: **08/18/2014 10:05**
Spike Init Wt./Vol.: 0.5 ug/L Extract Vol: 1 mL
Dup Init Wt./Vol.: 0.5 ug/L Extract Vol: 1 mL

Print Date: 08/22/2014 2:33:05PM

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SGS North America Inc.
CHAIN OF CUSTODY RECORD

1143735

Locations Nationwide

Alaska	Maryland
New Jersey	New York
North Carolina	Indiana
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Instructions: Sections 1 - 5 must be filled out. Omissions may delay the onset of analysis.

Page 1 of 2

Section 1

CLIENT: Travis Peterson

CONTACT: Erik Mundahl PHONE NO: 907-522-4337

PROJECT NAME: Selawik AVEC ~~Stebbins~~ VLP 8/12/14 PROJECT/ PWSID/ PERMIT#: 1159-20

REPORTS TO: Travis Peterson E-MAIL: EMundahl@tpeii.com

INVOICE TO: Travis Peterson QUOTE #: #10752 P.O. #: 1159-20

Section 2

RESERVED for lab use	SAMPLE IDENTIFICATION	DATE mm/dd/yy	TIME HH:MM	MATRIX/ MATRIX CODE	# CONTAINERS	Type C = COMP G = GRAB MI = Multi Incremental Soils	Preservative: MeOH+BFB	None			HCL	NONE					REMARKS/ LOC ID
							GRO/BTEX (AK101/8021B)	DRO/RRO (AK102/AK103)	PAH (8270D SIM)		TAH (602 by 624)	TAqH (625-SIM)					
(1) AB	S15	8/11/14	11:31	Soil	2	G	X	X									
(2) AB	S16		11:37				X	X									
(3) AB	S17		11:44				X	X									
(4) AB	S18		11:48				X	X									
(5) AB	S19		11:53				X	X									
(6) AB	S20		11:59				X	X	X								
(7) AB	S21		12:03				X	X									
(8) AB	S22		12:07				X	X									
(9) AB	S23		12:12				X	X									
(10) AB	S24		12:19				X	X	X								

Section 5

	Date	Time	
Relinquished By: (1)	8/12/14	9:53	Received By:
Relinquished By: (2)			Received By:
Relinquished By: (3)			Received By:
Relinquished By: (4)	8/12/14	09:56	Received For Laboratory By:

Section 4

DOD Project? Yes No

Cooler ID:

Data Deliverable Requirements:

Requested Turnaround Time and/or Special Instructions:

Temp Blank °C: 5.3°/#200 3.5°/#200 or Ambient [ ]

(See attached Sample Receipt Form)

Chain of Custody Seal: (Circle) INTACT BROKEN ABSENT

(See attached Sample Receipt Form)

[ ] 200 W. Potter Drive Anchorage, AK 99518 Tel: (907) 562-2343 Fax: (907) 561-5301

[ ] 5500 Business Drive Wilmington, NC 28405 Tel: (910) 350-1903 Fax: (910) 350-1557

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

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SGS North America Inc.
CHAIN OF CUSTODY RECORD

1143735

Locations Nationwide
Alaska Maryland
New Jersey New York
North Carolina Indiana
West Virginia Kentucky
www.us.sgs.com

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

Section 1

CLIENT: Travis Peterson

CONTACT: Erik Mundahl PHONE NO: 907-522-4337

PROJECT NAME: Selawik AVEC ~~Stebbins~~ VLP 8/12/14 PROJECT/PWSID/PERMIT#: 1159-20

REPORTS TO: Travis Peterson E-MAIL: EMundahl@tpeci.com

INVOICE TO: Travis Peterson QUOTE #: #10752 P.O. #: 1159-20

Section 2

RESERVED for lab use	SAMPLE IDENTIFICATION	DATE mm/dd/yy	TIME HH:MM	MATRIX/ MATRIX CODE	# CONTAINERS	Type C = COMP G = GRAB MI = Multi Incremental Soils	Preservative: MeOH+BFB	None			HCL	NONE					REMARKS/ LOC ID
							GRO/BTEX (AK101/8021B)	DRO/RRO (AK102/AK103)	PAH (8270D SIM)		TAH (602 by 624)	TAqH (625-SIM)					
(11) AB	S25	8/11/14	12:27	Soil	2	G	X										
(12) AB	S26		12:59		2		X	X	X								
(13) AB	S27		12:19		2		X	X	X								
(14) AB	Sw1		12:43	water	5						X	X					
(15) A-E	Sw2		12:49		5						X	X					
(16) ~~A-D~~																	
(17) A-C A																	

Section 5

	Date	Time	
Relinquished By: (1)	8/12/14	9:53am	Received By:
Relinquished By: (2)	Date	Time	Received By:
Relinquished By: (3)	Date	Time	Received By:
Relinquished By: (4)	8/12/14	09:54	Received For Laboratory By:

Section 4

DOD Project? Yes No

Data Deliverable Requirements:

Cooler ID:

Requested Turnaround Time and/or Special Instructions:

Temp Blank °C: 5.3°/#200 3.5°/#200 or Ambient [ ]

(See attached Sample Receipt Form)

Chain of Custody Seal: (Circle) INTACT BROKEN ABSENT

(See attached Sample Receipt Form)

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

SGS

1143735

SAMPLE RECEIPT FORM

Review Criteria:	Condition:	Comments/Action Taken:
Were **custody seals** intact? Note # & location, if applicable. COC accompanied samples?	Yes No (N/A) (Yes) No	☐ *Exemption permitted if sampler hand carries/delivers.*
Temperature blank compliant* (i.e., 0-6°C after CF)? *If >6°C, were samples collected <8 hours ago?* *If <0°C, were all sample containers ice free?* Cooler ID: 1 @ 5.3 w/ Therm.ID: 200 Cooler ID: 2 @ 3.5 w/ Therm.ID: 200 Cooler ID: _____ @ _____ w/ Therm.ID: _____ Cooler ID: _____ @ _____ w/ Therm.ID: _____ Cooler ID: _____ @ _____ w/ Therm.ID: _____ If samples are received without 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."	(Yes) No Yes No (N/A) Yes No (N/A)	☐ *Exemption permitted if chilled & collected <8 hrs ago.* *Note: Identify containers received at non-compliant temperature. Use form FS-0029 if more space is needed.*
Delivery method (specify all that apply): (Client (hand carried)) USPS Lynden AK Air Alert Courier UPS FedEx RAVN C&D Delivery Carlile Pen Air Warp Speed Other: _____ → *For WO# with airbills, was the WO# & airbill info recorded in the Front Counter eLog?*	Tracking/AB # or see attached or (N/A) Yes No (N/A)	
→ For samples received with payment, note amount ($) and whether cash / check / CC (**circle one**) was received. → For samples **received in FBKS**, ANCH staff will verify all criteria are reviewed. SRF initiated in FBKS by:		
Were samples received within hold time? Do samples **match COC*** (i.e., sample IDs, dates/times collected)? Were analyses requested unambiguous?	(Yes) No N/A (Yes) No N/A (Yes) No N/A	*Note: Refer to form F-083 "Sample Guide" for hold times.* *Note: If times differ <1hr, record details and login per COC.*
Were samples in **good condition** (no leaks/cracks/breakage)? Packing material used (specify all that apply): (Bubble Wrap) Separate plastic bags Vermiculite Other:	(Yes) No	
Were **proper containers** (type/mass/volume/preservative*) used? Were **Trip Blanks** (i.e., VOAs, LL-Hg) in cooler with samples? Were all VOA vials **free of headspace** (i.e., bubbles ≤6 mm)? Were all soil VOAs **field extracted** with MeOH+BFB?	(Yes) No N/A (Yes) No N/A Yes (No) N/A (Yes) No N/A	☐ *Exemption permitted for metals (e.g., 200.8/6020A).* (14)(15) B&C have Bubbles >6mm. (effervescence?) ULP 8/12/14 use "A" for analysis
For preserved waters (other than VOA vials, LL-Mercury or microbiological analyses), was **pH verified and compliant**? If pH was adjusted, were bottles flagged (i.e., stickers)?	Yes No (N/A) Yes No (N/A)	
For **special handling** (e.g., "MI" soils, foreign soils, lab filter for dissolved…, lab extract for volatiles, Ref Lab, limited volume), were bottles/paperwork flagged (e.g., sticker)?	Yes No (N/A)	
For **RUSH/SHORT Hold Time**, were COC/Bottles flagged accordingly? Was Rush/Short HT email sent, if applicable?	Yes No (N/A)	
For **SITE-SPECIFIC QC, e.g. BMS/BMSD/BDUP**, were containers / paperwork flagged accordingly?	Yes No (N/A)	8
For any question answered "No," has the PM been notified and the problem resolved (or paperwork put in their bin)?	(Yes) No N/A	SRF Completed by: TCP PM notified: TORI N/A
Was **PEER REVIEW** of ***sample numbering/labeling completed?***	Yes No (N/A)	Peer Reviewed by: N/A
Additional notes (if applicable):		

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

Sample Containers and Preservatives

Container Id	Preservative	Container Condition	Container Id	Preservative	Container Condition
1143735001-A	No Preservative Required	OK			
1143735001-B	Methanol field pres. 4 C	OK			
1143735002-A	No Preservative Required	OK			
1143735002-B	Methanol field pres. 4 C	OK			
1143735003-A	No Preservative Required	OK			
1143735003-B	Methanol field pres. 4 C	OK			
1143735004-A	No Preservative Required	OK			
1143735004-B	Methanol field pres. 4 C	OK			
1143735005-A	No Preservative Required	OK			
1143735005-B	Methanol field pres. 4 C	OK			
1143735006-A	No Preservative Required	OK			
1143735006-B	Methanol field pres. 4 C	OK			
1143735007-A	No Preservative Required	OK			
1143735007-B	Methanol field pres. 4 C	OK			
1143735008-A	No Preservative Required	OK			
1143735008-B	Methanol field pres. 4 C	OK			
1143735009-A	No Preservative Required	OK			
1143735009-B	Methanol field pres. 4 C	OK			
1143735010-A	No Preservative Required	OK			
1143735010-B	Methanol field pres. 4 C	OK			
1143735011-A	No Preservative Required	OK			
1143735011-B	Methanol field pres. 4 C	OK			
1143735012-A	No Preservative Required	OK			
1143735012-B	Methanol field pres. 4 C	OK			
1143735013-A	No Preservative Required	OK			
1143735013-B	Methanol field pres. 4 C	OK			
1143735014-A	HCL to pH < 2	OK			
1143735014-B	HCL to pH < 2	BU			
1143735014-C	HCL to pH < 2	BU			
1143735014-D	No Preservative Required	OK			
1143735014-E	No Preservative Required	OK			
1143735015-A	HCL to pH < 2	OK			
1143735015-B	HCL to pH < 2	BU			
1143735015-C	HCL to pH < 2	BU			
1143735015-D	No Preservative Required	OK			
1143735015-E	No Preservative Required	OK			
1143735016-A	HCL to pH < 2	OK			
1143735016-B	HCL to pH < 2	OK			
1143735016-C	HCL to pH < 2	OK			
1143735017-A	Methanol field pres. 4 C	OK			

Container Id	Preservative	Container Condition	Container Id	Preservative	Container Condition

Container Condition Glossary

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

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.

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

SGS

Returned Bottles Inventory

Name of individual returning bottles: Erik

Date Received: 8/12/14

Client Name: Travis Peterson

Received by: TLD

Project Name: AVEC Stebbins

SGS PM: Tori

HDPE/Nalgene:	1-L					
	500-ml					
	250-ml or 8-oz					
	125-ml or 4-oz					
	60-ml or 2-oz					
	other					
amber glass:	1-L	2				
	500-ml					
	250-ml or 8-oz					
	125-ml or 4-oz with or without septa	8				
	40-ml VOA vial	3				
	other					
Subtotal:		13				

Note: Returned bottles (regardless of size/pres.) are billed back at $4/bottle ***unless otherwise quoted***.

Amount to Invoice Client $: 52.00

WO#: 1143735

Laboratory Data Review Checklist

Completed by:	Lisa Krebs-Barsis		
Title:	Staff Scientist	Date:	11/6/2014
CS Report Name:	1159-20 AVEC Selawik	Report Date:	8/22/2014
Consultant Firm:	Travis/Peterson Environmental Consulting, Inc.		
Laboratory Name:	SGS Laboratories	Laboratory Report Number:	1143735
ADEC File Number:	500.38.007 500.57.001	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:

Sample was S25 was not analyzed for DRO and RRO, due to a sampler mistake in filling out COC.

3. Laboratory Sample Receipt Documentation

a. Sample/cooler temperature documented and within range at receipt (4° ± 2° C)?

(●) Yes ( ) No ( ) NA (Please explain) Comments:

There were 2 coolers, both were in the acceptable range at 5.3 degrees C and 3.5 degree C.

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

(●) Yes ( ) No ( ) NA (Please explain) Comments:

Volatile soil samples field preserved with methanol and volatile water samples field preserved with HCL.

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

(●) Yes ( ) No ( ) NA (Please explain) Comments:

VOC vials for samples SW1 and SW2 had bubbles.

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

( ) Yes ( ) No (●) NA (Please explain) Comments:

No discrepancies.

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

Comments:

See attached.

4. Case Narrative

a. Present and understandable?

(●) Yes ( ) No ( ) NA (Please explain) Comments:

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

(●) Yes ( ) No ( ) NA (Please explain) Comments:

QC failures identified and described within the Case Narrative.

c. Were all corrective actions documented?

(●) Yes ( ) No ( ) NA (Please explain) Comments:

Corrective actions regarding the QC failures were documented in the Case Narrative.

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

Comments:

The case narrative does not judge data quality or usability, simply states QC issues.

5. Samples Results

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

(●) Yes (●) No ( ) NA (Please explain) Comments:

Analyses performed as requested on the COC.

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:

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:

See narrative.

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

Comments:

Data is affected because though some LOQ were elevated, they were still well below cleanup levels.

6. QC Samples

a. Method Blank

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

(●) Yes ( ) No ( ) NA (Please explain) Comments:

ii. All method blank results less than PQL?

(●) Yes ( ) No ( ) NA (Please explain) Comments:

All method blank results were below the LOQ. SGS uses LOQ rather than PQL.

iii. If above PQL, what samples are affected? Comments:

NA

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

○ Yes ○ No ◉ NA (Please explain) Comments:

No affected samples.

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

No affected samples.

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

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

◉ Yes ○ No ○ NA (Please explain) Comments:

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

○ Yes ○ No ◉ NA (Please explain) Comments:

No metals or inorganics sampled.

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

◉ Yes ○ No ○ NA (Please explain) Comments:

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

◉ Yes ○ No ○ NA (Please explain) Comments:

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

Comments:

NA

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

○ Yes ○ No ◉ NA (Please explain) Comments:

No affected samples.

vii. Data quality or usability affected? (Please explain) Comments:

No affected samples.

c. Surrogates - Organics Only

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

◉ Yes ○ No ○ NA (Please explain) Comments:

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

○ Yes ◉ No ○ NA (Please explain) Comments:

See narrative.

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:

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

Comments:

See narrative.

d. 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:

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:

The cooler with the trip blanks were not indicated on the COC.

iii. All results less than PQL?

◉ Yes ○ No ○ NA (Please explain.) Comments:

SGS uses LOQ instead of PQL. All analytes are less than the LOQ. No analytes were detected.

iv. If above PQL, what samples are affected?

Comments:

NA

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

Comments:

See narrative.

e. Field Duplicate

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

◉ Yes ○ No ○ NA (Please explain) Comments:

ii. Submitted blind to lab?

◉ Yes ○ No ○ NA (Please explain.) Comments:

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:

Percent differences for Sample S24 and field duplicate S27 were not within 50% differences.

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

○ Yes ◉ No ○ NA (Please explain) Comments:

See narrative.

f. Decontamination or Equipment Blank (if applicable)

○ Yes ○ No ◉ NA (Please explain) Comments:

Not applicable

i. All results less than PQL?

◉ Yes ○ No ○ NA (Please explain) Comments:

NA

ii. If above PQL, what samples are affected?

Comments:

NA

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

Comments:

NA

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

a. Defined and appropriate?

◉ Yes ○ No ○ NA (Please explain) Comments:

See narrative.

Reset Form

LABORATORY DATA REVIEW CHECKLIST SUPPLEMENT

AVEC SELAWIK

3. e.

It is not likely that the bubbles in the VOC vials for samples SW1 and SW2 made a difference. According to Groundwater Monitoring and Remediation Volume 21, Issue 1 "The Effect of Air Bubbles and Headspace on the Aqueous Concentrations of Volatile Organic Compounds in Sampling Vials," (Nadim, et al) bubbles do not affect the outcome unless they are greater than 10 percent of the sampling volume. The bubbles in SW1 and SW2 did not comprise more than 10% of the sample volumes.

The omission of a request to analyze S25 for DRO and RRO does not affect the usability of the other samples. Other analyses for S25 are similar to those analyses for the other samples.

5. d.

SGS laboratory uses the limit of quantitation (LOQ) instead of PQL. For the 8270D SIMS analyses, the LOQ for samples S20, S24, S26, and S27 are elevated due to dilution but are still below cleanup levels.

6. c. ii.

All sample results with failed surrogate recoveries were flagged. The samples affected by surrogate failures were: S15, S16, S17, S18, S19, S20, S21, S22, S23, S25, S26, and S27. All samples, except S24, SW1, and SW2 had surrogate recovery QC failures.

8270D SIMS

For sample S26, the 2-fluorobiphenyl surrogate in the 8270 SIM analyses was biased high.

AK101

For samples S15, S17, S18, S21, S22, S25, and S27, the surrogate recovery for BFB in the AK101 analyses was biased low. Samples were analyzed twice to confirm bias.

AK102/AK103

For samples S15, S16, S17, S18, S19, S20, S21, S23, and S26, the surrogate recovery of 5a-androstane and n-triacontane in the AK102 analyses was 0% because of sample dilution.

Sample S22 surrogate recovery of n-triacontane was 0% because of sample dilution.

6. c. iv.

Data usability should not be affected by these quality issues.

For sample S26 the surrogate recovery for the PAH analyses was biased high. This should not affect the usability of the data because sample results may also be biased high or have poor precision. All of the results were well below cleanup levels or completely undetecting rendering poor precision or high bias insignificant for the fate of the material.

For samples S15, S17, S18, S21, S22, and S25, surrogate recovery for the GRO analysis was biased low. For sample S27 it was biased high. Surrogate recovery for BFB should range between 50 and 150. The low

biased recoveries ranged from 29.6 to 39.7 while the high biased recovery (S27) was 166. The biases that might have a small effect on sample results are not enough to make a significant difference in the outcome since the cleanup levels are one or two orders of magnitude above the LOQ.

Samples S15, S16, S17, S18, S19, S20, S21, S23, and S26 had DRO surrogate recoveries as 0% due to sample dilution. The concentrations of DRO in the samples were high (but almost all below cleanup levels) and the samples had to be diluted due to matrix interference. This should not affect the data usability because levels of DRO contamination, except in S17, were one order of magnitude below cleanup levels. Though sample dilution can result in poor surrogate recovery, it often has the effect of resulting in higher concentrations due to the need to multiply sample results by the dilution factor. It is unlikely that the sample results are lower than they should be.

Samples S15, S16, S17, S18, S19, S20, S21, S22, S23, and S26 had RRO surrogate recoveries as 0% due to sample dilution. These samples had the highest analytical results for RRO and the samples had to be diluted. Dilution often results in higher concentrations due to the need to multiply sample results by the dilution factor. It is unlikely that these results are lower than they should be.

6. d. v.

Data quality and usability are not affected. Though the cooler with the trip blanks was not identified on the COC, none of the target analytes were detected in the Trip Blanks. Trip blanks are used to determine if there has been field or lab cross contamination. Undetected analytes indicate that no cross contamination occurred.

6. e. iii.

Sample S20 and duplicate S26 exceeded 50% RPD for the following analytes:

- DRO (74.6%)
- Naphthalene, one was undetected and one was not.

Sample S24 and duplicate S27 exceeded 50% RPD for the following analytes:

- DRO (67.1%)
- RRO (134.2%)
- Toluene (84.7%)
- 2-Methylnaphthalene (54.3%)
- Naphthalene (65.4%)

6. e. iv.

The elevated RPD for Toluene for S24 and S27 is likely due to lack of homogeneity between the sample and its duplicate. It is not proper to homogenize soil for the sample and duplicate collection for volatile analyses.

The elevated RPD for the remaining samples and duplicates (non-volatiles) is likely a result of not homogenizing the soil enough before collecting the sample and duplicate.

Though data quality is affected, it does not affect data usability. For samples where the there was one where an analyte was detected and another where the analyte was not detected, TPECI personnel assume that the sample location was impacted.

7.

Matrix Spike and Matrix Spike Duplicate

The Matrix Spike (MS) and Matrix Spike Duplicate (MSD) effecting all of the samples (except sample S15 and Trip Blank) had QC issues. The RPD for benzo[k]fluoranthene and benzo[g,h,i]perylene was 34.4 and 35.5 instead of less than 30. The MSD percent recovery for benzo[g,h,i]perylene was biased low, at 38 instead of the accepted range of 40-125.

The RPD and percent recovery are very close to their acceptable ranges. It will not affect data quality or usability.

Other Qualifiers

A number of samples (S17, S19, S24, S26, and S27) had a qualifier in the case narrative identifying that the contaminant present in the sample was consistent with a "weathered middle distillate." This was a former tank farm and that is consistent with the site history.

Another qualifier identified that some samples analyzed under AK103 contained an "unknown hydrocarbon with several peaks."

Almost all of the samples with detectable AK103 results were given the "unknown hydrocarbon with several peaks present" qualifier. This means that the unknown hydrocarbon was in the heavier (RRO) range but could not be identified as lube oil or any other specific hydrocarbon.

This is additional information provided by the laboratory and does not affect data quality or usability.

APPENDIX D:
Professional Qualifications

Erik D. Mundahl, P.E.

Environmental Engineer

Erik has over 6 years of experience in Environmental projects in Alaska. He currently is an Environmental Engineer at Travis/Peterson Environmental Consulting, Inc., conducting a wide variety of work throughout Alaska.

Erik's education and experience with State agencies, Federal laws and statutes, and working with local communities enables him to effectively manage projects in all habitats throughout Alaska. Erik has a strong background in fisheries biology including habitat restoration, stream channel design, and fluvial geomorphology that would be an asset to the project. Erik has also worked on other relevant projects across Alaska.

Work Experience

Environmental Engineer, Travis/Peterson Environmental Consulting, Inc.

Responsibilities: Environmental Engineering, P.E. at an environmental engineering consulting firm. Provided a wide range of environmental and engineering services for private and governmental agencies. Performed environmental impact analysis for new and expanded airports, mines, and power plants. Impact analysis involved, storm water planning, public involvement, and social-economic analysis. Designed corrective action plans to respond to hazardous waste spills and assess the area of contamination. Performed Phase I and Phase II environmental site assessments for properties throughout Alaska. Designed soil and groundwater remediation systems. Developed aquatic ecology monitoring plans for large mine facilities and developed and conducted wildlife monitoring programs.

Environmental Engineer Intern, Restoration Science and Engineering

Responsibilities: Conducted Watershed hydraulic analysis for numerous river and stream systems throughout south central Alaska. Performed Phase I and II Environmental Assessments. Worked throughout Alaska in contaminated site cleanup and groundwater contaminate monitoring.

Environmental Engineer Intern, Oasis Environmental

Responsibilities: Engineer Intern at an environmental firm in Livingston, Montana specializing in stream habitat restoration, wetland mitigation, and aquatic biological surveys. Performed wetland mitigation and construction from design to implementation. Conducted stream hydraulic analysis and design for restoration returning many agriculturally affected stream channels to natural habitats with appropriate fisheries habitats. Performed fish and invertebrate population

Education

Michigan Technological University

B.S. Environmental Engineering

Certifications

State of Alaska Registered Professional Engineer EV14420

State of Alaska Sanitary Survey Inspector

Hazardous Waste Operations and Emergency Response Certification

Alaska Certified Erosion and Sediment Control Lead

Wilderness First Responder

surveys including in depth studies on the endangered West Slope Cutthroat Trout.

Field Research Assistant, Winona State University

Responsibilities: Biology field technician for University research in Southeastern Minnesota streams. Extensive experience in fish collection and identification using a variety of methods including backpack electrofishing. Conducted aquatic invertebrate surveys including collection, sorting, and identification. Worked in stream habitat assessments identifying and measuring primary v variables (depth, velocity, substrate assessment, embeddedness, fish cover, riparian buffer assessments, soil compaction, pebbles counts, cross section construction, longitudinal stream profiles). Conducted research for and co-authored several published journal articles on habitat use and feeding and dietary assessments by Slimy Sculpin (*Cottus cognatus*) in southeastern Minnesota. Worked on long-term monitoring of fish communities and stream habitats in Minnesota. Worked on long-term monitoring of aquatic invertebrates throughout Minnesota. Conducted a study on the deterioration of stream fish habitats due to sediment deposition. Studied the effects of livestock grazing management on stream fish communities and stream habitats.

APPENDIX E:
Field Notes

Location _____ Date _____

Project / Client _____

Location Selawik, AK Date 8/11/14

Project / Client AVEC Selawik

Weather: Sunny, 65°F, Stong, sustained wind

Personnel on site: E. Mundahl, TPECI, Juri (George) Prudic, AVEC, unnamed plant operator from village.

Soil Samplings

Boring ID	Boring Depth	Sample Depth	PIDppm	Time
S15	36"	36"	3.2	11:31
S16	26"	18"	2.0	11:37
S17	25"	12"	224.4	11:44
S18	30"	12"	17.0	11:48
S19	31"	6"	173.5	11:53
• S20	28"	6"	319.5	11:59
S21	24"	12"	17.3	12:03
S22	33"	6"	122.6	12:07
S23	27"	12"	4.8	12:12
• S24	30"	6"	334.5	12:19
S25	28"	6"	30.8	12:27

- Sample boring locations shown on hand drawn additions to Fig. 3 from work plan field copy.
- S20 and S24 were blind field duplicates as S26, S27 respectively.

Location Selawik, AK Date 8/11/14

Project / Client AVEC Selawik

Cont.

Water Sampling

Sample ID	Time
SW1	12:43
SW2	12:49

- Water Sampling location hand drawn on fild copy of work plan

Notes

- Worked with George Prudic of AVEC in use of hand auger for soil borings.
- Plant operator also assisted in soil borings. I didn't catch his name
- TPECI provided location direction based on work plan and Figure 3.
- Slight diesel odor on site, tough to tell due to wind
- Melt water present on surface to greater extent than in 2013
- Soil borings found permafrost depth from 24" - 32" bgs.
- Most borings encountered meltwater approximately 6" - 12" bgs
- Soil samples at meltwater interface

Location Selawik, AK Date 8/11/14

Project / Client AVEC Selawik

Cont.

Notes

- No sheen visible on ~~soil~~ meltwater withing soil borings
- Some soil samples exhibited slight diesel odor
- Water samples were collected from primary surface water pond (under former boiler building) near borings #4 and #5 on Figure #3
- Light hydrocarbon sheen present on surface water at this location
- Slight diesel odor coming of surface water at this location when disturbed.
- Surface water on rest of site doesnt have same sheen or odor
- lots of the refuse and debris that had been dumped on site by residents had been removed since 2013.
- Buried liner pieces, cribbing, etc. still on site.
- Borings 15, 16, 17, 18 not on AVEC property. On opposite sides of boardwalk from former AVEC plant site
- Believe property line beneath boardwalk

Location Selawik, AK Date 8/11/14

Project / Client AVEC Selawik

Cont.

Notes

- No space to work under boardwalk, too close to ground surface
- Talked to George w/ AVEC about removing section to test under, he refused said too busy and too much traffic - true, lots of children gone by while working
- Also noted several borings on property due to presence of lots more surface water than 2013
- Contacted Grant @ ADEC about having to move some samples locations - mentioned lots more water. Grant said thats OK
- Also asked if any other testing or work he wanted beyond work plan, he said "no"
- PID readings @ boring SB7 indicated diesel (hydrocarbon) contamination upgradient of old AVEC site. Due to higher elevation, elected to not follow contamination further onto other property and further upgradient. Potentially this contamination not associated with AVEC, based on gradient

Location Date

Project / Client