Barrow Shop # 2 Ultra-Low Sulfur Diesel Release
Final Site Assessment Report
Barrow, Alaska

May 21, 2015

SHANNON & WILSON, INC.

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

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NORTH SLOPE BOROUGH
BARROW, ALASKA

May 21, 2015

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ACRONYMS AND ABBREVIATIONS

ºC	degrees celsius
ADEC	Alaska Department of Environmental Conservation
bgs	below the ground surface
BTEX	benzene, toluene, ethylbenzene, and xylenes
COC	chain of custody
cy	cubic yard
DRO	diesel range organics
E1	excavation area 1; spill extent at Shop #2, per North Slope Borough
E2	excavation area 2; original temporary snow stockpile area at Shop #2
EPA	United States Environmental Protection Agency
GRO	gasoline range organics
LOD	limit of detection
LOQ	limit of quantitation
MTG	migration-to-groundwater
NSB	North Slope Borough
PAH	polynuclear aromatic hydrocarbon
PID	photoionization detector
ppm	parts per million
QA	quality assurance
QC	quality control
RCRA	Resource Conservation and Recovery Act
RRO	residual range organics
SGS	SGS North America, Inc.
ULSD	ultra-low sulfur diesel

BARROW SHOP #2 ULTRA-LOW SULFUR DIESEL RELEASE
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NORTH SLOPE BOROUGH
BARROW, ALASKA

1.0 INTRODUCTION

This report summarizes field observations from two site visits to the North Slope Borough (NSB) Barrow Shop #2 (the Site), in Barrow, Alaska (Figure 1). We completed two trips to the Site in order to characterize and excavate contaminated soil and snowmelt resulting from an approximately 110-gallon ultra-low sulfur diesel (ULSD) fuel spill that occurred on March 28, 2015 (ADEC Spill File No. 1539908701). The remedial work to investigate the spill was performed under NSB Task Order No. 6, Project No. 6103.FUEL, Contract No. 2011-116. This trip report describes activities conducted April 14 through April 19, 2015, and snowmelt sampling that occurred on April 27, 2015.

The NSB submitted a spill report to the Alaska Department of Environmental Conservation (ADEC) on March 31, 2015. According to the spill report, approximately 110 gallons of ULSD were released at the Site when a fuel tanker was overfilled during a tank-to-tank transfer at 11:00 a.m. on March 28, 2015. The location of the release is 71.30324 degrees North latitude and 156.75780 degrees West longitude (Datum WGS84). The Site is within 400 feet of the Chukchi Sea, which is located to the north of the spill site. The spill area comprises approximately six square yards on the snow/ice pad on the northwest side of the Shop #2 building (Figure 2). According to NSB personnel, the spill was confined to the snow/ice pad, between the Barrow Shop #2 building and Stevenson Street (Figure 1; Appendix A, Photo 1). NSB responders used absorbent materials to clean up pooled product under the fuel tanker and excavated snow and ice in contact with the ULSD. According to the ADEC spill report, an estimated 25 gallons of fuel was recovered using absorbents. Additional recovered product includes contaminated snow and ice contained in six 85-gallon overpack drums, one 95-gallon overpack drum, and one 10 cubic yard (cy) double-lined dumpster.

1.1 Scope of Services

Our scope of services included preparing the 2015 *Site Characterization Work Plan* (Work Plan), implementing the work plan, and preparing this trip report. Our Work Plan was approved by ADEC on April 14, 2015. Initial remedial activities included:

- field-screening soil samples to characterize the extent of contamination and to delineate excavation boundaries (Appendix B);
- providing guidance and observation of contaminated-soil removal during excavation;
- collecting soil samples for laboratory analysis;
- providing guidance and observation of contaminated-snow removal and transport to an off-site storage unit;
- collecting snowmelt water and sediment samples for laboratory analysis before and after treatment through a granular activated carbon (GAC) treatment system; and,
- preparing detailed daily summary reports (Appendix C).

The NSB provided equipment and personnel to excavate soil, handle excavated soil, and remove contaminated snow from the Site. This report includes a summary of field activities, analytical laboratory results (Appendix D), conclusions, and recommendations relevant to future remediation efforts.

2.0 FIELD ACTIVITIES

This section summarizes field activities performed during two trips to Barrow, in an effort to characterize the contamination at the Barrow Shop #2 spill site.

2.1 Site Characterization and Initial Remediation

Shannon & Wilson field geologists Katie Nolan and Jenny Davis mobilized to Barrow to observe the site conditions on April 14, 2015. We arrived at the Site to meet with Mr. Lokeni Lokeni Jr., NSB Fuels Department Spill Coordinator, to identify the release area and temporary snow stockpile locations. We observed seven overpack drums (one 95-gallon and six 85-gallon) and two 10-cy dumpsters containing contaminated snow at the fuel release area (Appendix A, Photo 2). We also observed an additional approximately three inches of fresh snow covering the fuel release area (Appendix A, Photo 3).

We obtained approval from Mr. Paul Lhotke, ADEC Program Specialist, for the transport of the contaminated-snow containers to the NSB Barrow Shop #3 facility, located less than one mile from the Site. We accompanied the NSB staff as they transported the containers of contaminated snow to Shop #3, where they were placed on a liner inside the shop (Appendix A, Photo 4).

Field staff reconvened at the Site on the morning of April 15, 2015. NSB responders removed and placed the fresh snow into three 85-gallon overpack drums, two 95-gallon overpack drums, and one 10-cy dumpster. Approximately 12-cy of fresh snow was removed from the site and

transported to Shop #3. We proceeded by marking the boundary of the ULSD release and initial temporary snow stockpile locations (labeled E1 and E2, respectively, in Figure 2), per Mr. Lokeni's description. The spill boundary was expanded to the northwest due to the presence of surface staining and petroleum odor. Following the *ADEC Draft Field Sampling Guidance* (2010) and based on the total estimated fuel-release and snow stockpile areas, we marked and field-screened fourteen surface samples in the fuel-release area (i.e., E1) and six surface samples in the initial temporary snow stockpile area (i.e., E2; Appendix A, Photos 5 and 6). We conducted the field-screening using a photoionization detector (PID).

The ground was frozen and difficult to dig; surface samples were collected at approximately four inches below ground surface (bgs). PID readings from samples from the top four inches of E1 ranged between 2.8 to 356 ppm (Appendix B). Following the initial field-screening results, we worked with the NSB responders and began excavation of the contaminated media.

Based on field-screening results from the top four inches of E1, and in coordination with NSB, we extended the fuel-release area to the north and west of the release location, but reduced it to the east and south. The new E1 footprint required that we collect ten additional field-screening samples, which were planned for the next day.

We collected field-screening characterization samples from the base of the E2 area in order to characterize soils underneath the original snow stockpile. Results were below 20 parts per million (ppm), and considered "clean." Therefore, we collected two analytical confirmation samples (E2-S5 and E2-S6) from the E2 area (Figure 2).

Field staff arrived back at the Site on the morning of April 16, 2015 to observe an accumulation of approximately one inch of additional new snow. NSB responders stockpiled and placed the snow into a 95-gallon overpack drum, which was half-filled. We accompanied NSB staff to Shop #3 where they transported the drum of fresh snow. A total of three 10-cy dumpsters, four 95-gallon drums (one half-filled), and nine 85-gallon drums containing potentially contaminated snow were present in Shop #3.

Upon returning to the Site, ten additional field-screening samples were collected from the top four inches of E1. Frozen soil conditions required that the excavation area be trenched with a trencher in order to break up the soil, prior to using an excavator to remove the soil (Appendix A, Photo 7). Barrow Utilities and Electric Co-Op, Incorporated (BUECI) trenched soil in E1 to approximately six to eight inches bgs, separating the trenches by approximately one foot (Appendix A, Photo 8). We observed staining to a depth of up to two inches bgs throughout most of the E1 area. Deeper staining (i.e., greater than one to two inches) was observed in the

northwest corner of E1. An excavator arrived on site and was unsuccessful at breaking through the soil trenches.

Field efforts continued on the morning of April 17, 2015. Crews used a loader and small backhoe to break up and excavate the soil in E1 (Appendix A, Photo 9). The limited mobility of the loader required the excavation be deeper (i.e., one to two feet bgs) than the originally anticipated eight inches bgs. We observed digging of the center of the excavation area to approximately two feet bgs. Excavated soils were stockpiled in the northeast corner of E1 (Appendix A, Photo 10). We observed staining throughout the vertical profile in the west corner of the excavation area (Appendix A, Photo 11). We also noted a strong hydrocarbon odor in the west corner of E1.

We collected field-screening samples at six inches below the surface of the soil stockpile at five locations (Appendix A, Photo 13; Figure 2). PID readings ranged from 817 to 2,026 ppm (Appendix B). We collected two analytical soil samples (*SP-1* and *SP-2*) from six inches below the stockpile surface at the field-screening sample locations yielding the highest PID readings.

2.2 Excavations Deeper than 4 Inches

Field-screening sample collection from the soil stockpile and base and sidewalls of the excavation continued through April 18 and April 19, 2015. We collected a total of fourteen field-screening samples, ranging in depth from 0.7 feet to 2.5 feet bgs, from the base of E1. We also collected eleven field-screening samples, ranging in depth from 0.6 feet to 1.1 feet bgs from the E1 sidewalls. PID readings from samples collected at the base of E1 ranged between 46.7 ppm and 3,096 ppm at depths of 1.5 feet and 1.3 feet bgs, respectively. PID readings from the sidewall samples ranged between 24 ppm and 4,671 ppm, at depths of 0.8 feet and 1.1 feet bgs, respectively. We collected five analytical soil samples (i.e., four samples and a duplicate; samples *E1-S3 (2.2')*, *E1-S10 (2.0')*, *E1-S110 (2.0')*, *E1-S12 (1.4')* and *E1-S18 (1.3')*) from the base E1 in the approximate locations of field-screening samples resulting in the highest PID readings, and seven (six samples and a duplicate; samples *E1-SE-1*, *E1-SW-2*, *E1-SW-200*, *E1-SW-5*, *E1-SW-7*, *E1-SW-9*, and *E1-SW-11*) from the sidewalls of E1 (Appendix A, Photo 12; Figure 2). NSB responders bagged the contaminated-soil into 29 5-cy supersacks (Appendix A, Photo 14), which were not filled to full capacity.

We estimate the total volume of excavated contaminated soil at 87 cy (Section 2.4, Table 1). Each of the supersacks was labeled and placed on a liner outside of Shop #2. NSB staff barricaded the soil storage area. No snowmelt samples were collected during the April 14 through April 18 site visit due to incomplete melting of the snow stored in Shop #3.

Shannon & Wilson field staff departed Barrow on April 18, and delivered samples to the SGS North America (SGS) laboratory, in Anchorage on April 20, 2015. Samples were analyzed for gasoline range organics (GRO; Alaska Method AK101), diesel range organics (DRO; Alaska Method AK102), residual range organics (RRO; Alaska Method 103), benzene, toluene, ethylbenzene, and xylenes (BTEX; EPA Method SW8021B), and Resource Conservation Recovery Act (RCRA; EPA Method SW6020A) metals. Four of the sixteen samples (i.e., *E1-S18 (1.3')*, *E1-SW-2*, *E1-SW-200*, and *E2-S5*) were also analyzed for polynuclear aromatic hydrocarbons (PAHs; EPA Method 8070D SIMS).

2.3 Pre- and Post-Treatment Snowmelt and Sediment Sampling

Shannon & Wilson field geologist Erica Blake mobilized to Barrow, on April 26, 2015, to collect contaminated-snowmelt samples from containers housed in Shop #3. Erica met with Mr. Lokeni at the Shop #3 on the morning of April 27, 2015. Mr. Lokeni and other NSB responders constructed their granular activated carbon (GAC) water-filter system (Photos 15 and 16) and continued consolidating the meltwater from the drums and dumpsters. Erica observed one round 1,600-gallon holding tank containing approximately 1,500 gallons of consolidated pre-treatment water from the Shop #3 sump (Appendix A, Photo 17; Section 2.4, Table 1), and one 10-cy dumpster into which the remaining snowmelt water was being consolidated. Erica estimated the total volume of consolidated snowmelt in the dumpster at approximately 900 gallons (Table 1). In total, the volume of snowmelt water stored in pre-treatment containers, including both sump water and snowmelt, was 2,400 gallons.

Erica collected one grab sample for laboratory analysis from the dumpster with contaminated snowmelt. In addition, she collected one snowmelt water grab sample and a duplicate for laboratory analysis from the 1,600-gallon holding tank. Mr. Lokeni assisted Erica with water sample collection.

NSB staff pumped the consolidated sump water from the 1,600-gallon tank through the GAC system and into a clean 2,000-gallon holding tank. Erica collected one post-treatment analytical water sample and a duplicate for laboratory analysis from the 2,000-gallon holding tank. In order to create additional holding capacity for water from the dumpster, NSB staff scrubbed the 1,600-gallon holding tank once all of the pre-treatment water had run through the GAC system. Water from the dumpster was then filtered through the GAC system and into the 1,600-gallon tank. Erica collected a second post-treatment analytical water sample from the clean 1,600-gallon tank (Appendix A, Photos 19 and 20).

The two empty dumpsters that formerly contained snowmelt also contained sediment that had settled out of suspension (Appendix A, Photos 20 and 21). NSB responders consolidated the sediment from the bottom of the bins into three 85-gallon overpack drums (Appendix A, Photo

23). A total of approximately 1.1 cy of soil were consolidated from snow storage containers (Section 2.4, Table 1). The NSB crew members used a shovel to scoop contaminated sediment out of the drum for sampling. Erica then used a clean metal spoon to collect samples of sediment from the shovel.

The analytical samples were packaged and shipped to Fairbanks on April 28, 2015. Field personnel departed Barrow for Fairbanks on April 28, 2015, delivering samples to the SGS laboratory in Fairbanks at approximately 3:00 p.m. Water and sediment samples were analyzed for GRO, DRO, BTEX, and PAHs by the methods noted previously.

We drafted a request to discharge the post-treatment snow meltwater upon receiving and compiling analytical results from SGS. The request was submitted to ADEC on May 4, 2015. ADEC provided approval to discharge the treated water on May 8, 2015.

2.4 Summary of Contaminated Material

Below is a summary of the total volumes for the recovered contaminated materials.

TABLE 1
VOLUMES OF RECOVERED CONTAMINATED MATERIALS

Material	Volume*
Excavated soil	87 cy
Consolidated sediment from snowmelt water	1.1 cy
Snowmelt water (from Shop # 3 containers and sump)	2,400 gal

*Volumes are approximated based on the capacity of containers used to store the material.

3.0 ANALYTICAL RESULTS

We compared analytical results of soil samples collected from the Shop #2 spill site and sediment samples collected from the contaminated-snowmelt bins housed in Shop #3, to the migration-to-groundwater cleanup levels (MTG) in 18 AAC 75.341(c), Table B1. Analytical results that were greater than the MTG cleanup level for a given contaminant were considered to exceed the ADEC cleanup levels. Sample results for the analytes assessed in soil and sediment are found in Tables 2 and 3 of this report.

We compared analytical results of water samples collected from contaminated snowmelt to 18 AAC 75.345 Table C to determine if the results exceeded the ADEC cleanup levels. Cleanup

levels for groundwater are listed in Table 4 of this report, along with analytical snowmelt-water sample results.

3.1 Results

A summary of the analytical results of excavated soil, sediment from snowmelt, and snowmelt water from the Shop #2 spill site are presented in Tables 2, 3 and 4, respectively. The complete analytical laboratory reports are attached to this report, along with the ADEC checklists (Appendix D). Our review of the data reveals that some of the analytical samples experienced method and laboratory data quality failures (i.e. surrogate recovery, matrix spike/matrix spike duplicate, methanol leakage, etc.). None of the data quality failures caused the data to be considered unusable. The analytical results that were affected by the method and laboratory data-quality failures are flagged in Tables 2, 3, and 4.

3.1.1 Excavated Soil

Arsenic was detected above the laboratory's limit of quantitation (LOQ) and above the ADEC cleanup level in all excavated soil samples from the Shop #2 spill site (Table 2).

DRO was detected above the laboratory's LOQ and above the ADEC cleanup level in all excavated-soil samples except for samples *E1-SW-5*, *E2-S5*, and *E2-S6*. DRO concentrations in samples *E1-SW-5*, *E2-S5*, and *E2-S6*, were above the laboratory's LOQ, but below the ADEC cleanup level.

GRO was detected above the laboratory's LOQ and above the ADEC cleanup level in samples *E1-SW-1*, *E1-SW-2*, and *E1-SW-200*. GRO was detected above the LOQ but below the ADEC cleanup level in all remaining samples, except for samples *E1-SW-5*, *E2-S5*, and *E2-S6*, in which GRO was not detected.

Two PAH analytes (1-methylnapthalene and 2-methylnapthelene) were detected above the LOQ and above the ADEC MTG in samples *E1-S18 (1.3')*, *E1-SW-2*, and *E1-SW-200*. No PAH analytes were detected above the ADEC cleanup level in sample *E2-S5*.

3.1.2 Sediment from Snowmelt

DRO, GRO, benzene and o-xylene were detected above the LOQ and above ADEC cleanup levels in all sediment samples collected from the contaminated-snow storage containers stored in Shop #3 (Table 3). Ethylbenzene was detected above the LOQ and above the ADEC cleanup level in one of three samples, and above the LOQ but below the ADEC cleanup level in the remaining two samples. Other analytes (i.e., 1-methylnapthalene, 2-methylnapthalene,

acenapthalene, naphthalene, p-&m-xylenes, and toluene) were detected above the LOQ but below the ADEC cleanup level.

3.1.3 Contaminated Snowmelt

DRO was detected above the laboratory's LOQ in all pre-treatment water samples, and above the ADEC cleanup level in two of three pre-treatment samples (i.e., the sample collected from the dumpster and the duplicate sample collected from the 1,600-gallon holding tank; Table 4). DRO concentrations in post-treatment samples were above the ADEC cleanup level in two of three samples, including the post-treatment samples collected from the holding tanks. The DRO result from the duplicate post-treatment sample from the 2,000-gallon holding tank was not above the ADEC cleanup level.

Benzene was detected above the laboratory's LOQ and above ADEC cleanup levels in all three pre-treatment water samples. Post-treatment sample benzene concentrations were reduced to below ADEC cleanup levels in all three samples.

Concentrations of all other analytes in pre- and post-treatment water samples were below the ADEC cleanup levels.

3.2 Chromatogram Analysis

We reviewed the laboratory-provided DRO (AK102) and RRO (AK103) chromatograms for analytical soil results presented in SGS work order (WO) 1151534 to determine if we could differentiate between historic contamination and the current release. We compared chromatograms from sidewall samples *E1-SW-7*, *E1-SW-9*, and *E1-SW-11*, thought to be indicative of a newer release, located at shallow depths (0.6 feet, 0.8 feet, and 0.6 feet bgs, respectively) to chromatograms from samples collected at deeper depths (1.0 feet to 2.2 feet).

Results from our review were inconclusive. Data from deeper depths showed little weathering (volatilization, degradation, etc.) of material. Chromatograms for deep samples display a signature within the volatile, GRO range and several fully resolved peaks in the DRO and/or RRO range, which are typically indicative of a fresher sample. Chromatograms from surface samples indicate some weathering (likely volatilization) has occurred, as suggested by unresolved peaks in the DRO and RRO ranges and the relatively small proportion of resolvable compounds to the unresolved complex mixture of analytes.

It is possible weathering of petroleum material at depth may be slowed in Barrow due to the surface soil freezing and prolonged cold ground temperatures. It is likely frozen surface soil has inhibited the rate of weathering of older spills at depth.

TABLE 2
ANALYTICAL RESULTS FOR EXCAVATED AND STOCKPILED SOIL SAMPLES

Analytical Method	Units	Analytes	ADEC Soil-Cleanup Level^	Sample Number	E1-S3 (2.2')	E1-S10 (2.0')	E1-S110 (2.0')	E1-S12 (1.4')	E1-S18 (1.3')	E1-SW-1	E1-SW-2	E1-SW-200	E1-SW-5	E1-SW-7	E1-SW-9	E1-SW-11	E2-S5	E2-S6	SP-1	SP-2
				Sample Location	E1-S3	E1-S10	E1-S10	E1-S12	E1-S18	E1-SW-1	E1-SW-2	E1-SW-2	E1-SW-5	E1-SW-7	E1-SW-9	E1-SW-11	E2-S5	E2-S6	SP-1	SP-2
				Sample Depth (ft bgs)	2.2	2.0	2.0	1.4	1.3	1.0	1.1	1.1	0.9	0.8	0.8	0.6	0.3	0.3	0.5	0.5
8270D SIMS (PAH)	mg/kg	1-Methyl-naphthalene	6.2		--	--	--	--	**11.5JH***	--	**21.7JH***	**21.9**	--	--	--	--	0.00475J	--	--	--
	mg/kg	2-Methyl-naphthalene	6.1		--	--	--	--	**15.4JH***	--	**35.3JH***	**29.0**	--	--	--	--	0.00600	--	--	--
	mg/kg	Ace-naphthene	180		--	--	--	--	0.0679JH*	--	0.0942JH*	0.483J*	--	--	--	--	0.00253J	--	--	--
	mg/kg	Acenaphthylene	180		--	--	--	--	0.00255JH*	--	0.00256JH*	<0.256	--	--	--	--	0.00338J	--	--	--
	mg/kg	Anthracene	3,000		--	--	--	--	0.00291JH*	--	0.00610JH*	<0.256	--	--	--	--	<0.00257	--	--	--
	mg/kg	Benzo(a)-anthracene	3.6		--	--	--	--	<0.00255	--	<0.00256	<0.00256	--	--	--	--	0.00184J	--	--	--
	mg/kg	Benzo(a)pyrene	2.1		--	--	--	--	<0.00255	--	0.00204J	0.00224J	--	--	--	--	<0.00257	--	--	--
	mg/kg	Benzo(b)-fluoranthene	12.0		--	--	--	--	<0.00255	--	<0.00256	0.00214J	--	--	--	--	0.00453J	--	--	--
	mg/kg	Benzo(g,h,i)-perylene	38,700		--	--	--	--	<0.00255	--	<0.00256	<0.00256	--	--	--	--	0.00201J	--	--	--
	mg/kg	Benzo(k)-fluoranthene	120		--	--	--	--	<0.00255	--	<0.00256	<0.00256	--	--	--	--	<0.00257	--	--	--
	mg/kg	Chrysene	360		--	--	--	--	<0.00255	--	<0.00256	<0.00256	--	--	--	--	0.00414J	--	--	--
	mg/kg	Dibenzo(a,h)-anthracene	4.0		--	--	--	--	<0.00255	--	<0.00256	<0.00256	--	--	--	--	<0.00257	--	--	--
	mg/kg	Fluoranthene	1,400		--	--	--	--	0.00185J	--	0.00304J	0.00271J	--	--	--	--	0.00402J	--	--	--
	mg/kg	Fluorene	220		--	--	--	--	0.0954JH*	--	0.691JH*	0.736	--	--	--	--	<0.00257	--	--	--
	mg/kg	Indeno-(1,2,3cd)-pyrene	41		--	--	--	--	<0.00255	--	<0.00256	<0.00256	--	--	--	--	<0.00257	--	--	--
	mg/kg	Naphthalene	20		--	--	--	--	6.39JH*	--	13.7JH*	14.4	--	--	--	--	0.00415J	--	--	--
	mg/kg	Phenanthrene	3,000		--	--	--	--	0.0271JH*	--	0.0619JH*	0.311J*	--	--	--	--	0.00402J	--	--	--
	mg/kg	Pyrene	1,000		--	--	--	--	0.00358J	--	0.00586	0.00565	--	--	--	--	0.00863	--	--	--

TABLE 2
ANALYTICAL RESULTS FOR EXCAVATED
AND STOCKPILED SOIL SAMPLES, CONTINUED

Analytical Method	Units	Analytes	ADEC Soil-Cleanup Level^	Sample Number	E1-S3 (2.2')	E1-S10 (2.0')	E1-S110 (2.0')	E1-S12 (1.4')	E1-S18 (1.3')	E1-SW-1	E1-SW-2	E1-SW-200	E1-SW-5	E1-SW-7	E1-SW-9	E1-SW-11	E2-S5	E2-S6	SP-1	SP-2
				Sample Location	**E1-S3**	**E1-S10**	**E1-S10**	**E1-S12**	**E1-S18**	**E1-SW-1**	**E1-SW-2**	**E1-SW-2**	**E1-SW-5**	**E1-SW-7**	**E1-SW-9**	**E1-SW-11**	**E2-S5**	**E2-S6**	**SP-1**	**SP-2**
				Sample Depth (ft bgs)	**2.2**	**2.0**	**2.0**	**1.4**	**1.3**	**1.0**	**1.1**	**1.1**	**0.9**	**0.8**	**0.8**	**0.6**	**0.3**	**0.3**	**0.5**	**0.5**
AK101	mg/kg	Gasoline Range Organics	300		195JL*	128J*	54.1J*	12.1J*	129JL*	**513JL***	**471JL***	**518JL***	<1.63B*	38.1J*	10.1J*	43.8J*	<2.10B*	<1.41B*	36.2J*	51.9J*
AK102	mg/kg	Diesel Range Organics	250		**4,540**	**2,250**	**2,250**	**1,330**	**1,870**	**9,420**	**5,510**	**6,730**	203	**1,020**	**513**	**1,140**	208	62.8	**2,220**	**2,670**
AK103	mg/kg	Residual Range Organics	11,000		590	711J*	3,72J*	2,960	326	1,260	765	841	536	970	5270	<102	937	378	2690	3240
SM21 2540G	mg/kg	Total Solids	-		94.9	95.4	95.3	96.9	97.1	96.6	97.2	96.8	96.1	96.8	96.5	97.2	95.7	94.4	93.2	93.1
SW6020A	mg/kg	Arsenic	3.9		**8.68**	**7.81**	**9.11**	**7.79**	**6.10**	**10.2**	**7.25**	**6.77**	**11.9**	**9.71**	**14.1**	**16.9**	**8.32**	**6.63**	**7.38**	**5.90**
	mg/kg	Barium	1,100		118	119J*	209J*	125	86.1	115	71.4	62.4	217	107	206	56.8	206	150	106	162
	mg/kg	Cadmium	5		<0.0965	<0.100	<0.103	0.0762J	<0.0990	0.0995J	<0.0950	<0.0980	0.0642J	<0.0945	0.170J	<0.0950	<0.0980	<0.0970	0.115J	0.0809J
	mg/kg	Chromium	25		4.75	6.15	4.55	3.21	3.06	4.63	3.14	3.39	4.88	4.55	4.96	3.10	4.09	2.68	4.60	2.91
	mg/kg	Lead	-		5.60	3.92	3.13	6.97	2.77	10.5	3.02	3.70	5.39	4.13	11.9	3.48	3.40	2.08	8.75	5.57
	mg/kg	Mercury	1.4		0.0116J	<0.0200	<0.0206	0.0115J	0.0124J	0.0167J	<0.0190	<0.0196	0.0150J	<0.0190	0.0189J	<0.0190	0.0191J	0.0121J	0.0180J	0.0138J
	mg/kg	Selenium	3.4		<0.967B*	<1.00B*	<0.515	<0.949B*	<0.496	<0.998B*	<0.475	<0.490	<0.479	<0.947B*	<1.02B*	<0.951B*	<0.489	<0.484	<0.510	<1.02B*
	mg/kg	Silver	11.2		<0.0965	<0.100	<0.103	<0.0950	<0.0990	<0.100	<0.0950	<0.0980	<0.0960	<0.0945	<0.102	<0.0950	<0.0980	<0.0970	<0.102	<0.102
SW8021B	mg/kg	Benzene	0.025		0.0197	0.00670J	0.00742	0.00652J	0.00510J	**0.0290**	0.0117	<0.183	0.00230J	<0.00377	0.00458J	<0.00367	<0.00525	0.00282J	0.00482J	0.00720J
	mg/kg	Ethylbenzene	6.9		1.37	0.608	0.455	0.0408	0.576	6.42	2.79	3.42	0.00662J	0.0581	0.0317	0.0118J	0.0124J	<0.00705	0.270	0.311
	mg/kg	o-Xylene	-		2.87	2.90	2.21	0.0940JH*	0.441	20.8	20.2	13.6	0.0148	0.485	0.135	1.63	0.0265	0.00564J	1.32	1.76
	mg/kg	P & M -Xylene	-		2.37	2.55	1.67	0.175	0.873	26.2	26.8	22.7	0.0289	0.218	0.166	0.117	0.0496	<0.0141	1.16	1.26
	mg/kg	Xylenes (total)	63		5.24	5.45	3.88	0.269	1.314	47	47	36.3	0.0437	0.703	0.301	1.747	0.0761	0.00564	2.48	3.02
	mg/kg	Toluene	6.5		0.0630JH*	<0.0297B*	<0.0264B*	<0.0167B*	<0.0224B*	0.142	0.161	<0.365	0.0102J	<0.0151B*	<0.0153B*	<0.0190B*	<0.0210B*	<0.0141B*	0.0737JH*	0.0924JH*

Notes for Table 2:

^	ADEC Soil-Cleanup Levels from 18 AAC 75.341 Tables B1 and B2, Method Two - Migration to Groundwater for the "Under 40 Inch Zone"
ADEC	Alaska Department of Environmental Conservation
mg/kg	milligrams per kilogram
ft	feet
bgs	below ground surface
E	excavated
SP	stockpiled
SW	side-wall
PAH	polynuclear aromatic hydrocarbons

Notes for Table 2 (continued):

<	analyte not detected; limit of detection (LOD) listed. Flag applied by laboratory.
-	cleanup level not applicable
--	not analyzed in the sample
bold	Result exceeds ADEC Cleanup Level
J	Estimated concentration, detected above the detection limit (DL) and below the limit of quantitation (LOQ). Flag applied by laboratory.
J*	Result is considered estimated (no direction of bias) due to quality control failures. See checklist for details. Flag applied by Shannon & Wilson, Inc.
JL*	Result is considered estimated (biased low) due to sample handling anomalies. Flag applied by Shannon & Wilson, Inc.
JH*	Result is considered estimated (biased high) due to quality control failures. See checklist for additional details. Flag applied by Shannon & Wilson, Inc.
B*	Result is considered not detected at the LOQ or reported concentration (higher value reported) due to contamination identified in a method blank. Flag applied by Shannon & Wilson, Inc.

TABLE 3
ANALYTICAL RESULTS FOR
CONTAMINATED SEDIMENT FROM SNOWMELT CONTAINERS

				Sample Names		
Analytical Method	**Units**	**Analyte**	**ADEC Cleanup Levels^**	**Drum1-Soil**	**Drum2-Soil**	**Drum20-Soil (DUP)**
8270D SIMS (PAH)	mg/kg	1-Methyl-naphthalene	6.2	2.36	2.45	3.22
	mg/kg	2-Methyl-naphthalene	6.1	2.76	3.16	3.98
	mg/kg	Acenaphthene	180	0.634	0.806	0.711
	mg/kg	Acenaphthylene	180	<0.0280	<0.300	<0.0372
	mg/kg	Anthracene	3000	<0.0280	<0.300	<0.0372
	mg/kg	Benzo(a)anthracene	3.6	<0.0280	<0.0300	<0.0372
	mg/kg	Benzo(a)pyrene	2.1	<0.0280	<0.0300	<0.0372
	mg/kg	Benzo(b)fluoranthene	12	<0.0280	<0.0300	<0.0372
	mg/kg	Benzo(g,h,i)perylene	38700	<0.0280	<0.0300	<0.0372
	mg/kg	Benzo(k)fluoranthene	120	<0.0280	<0.0300	<0.0372
	mg/kg	Chrysene	360	<0.0280	<0.0300	<0.0372
	mg/kg	Dibenzo(a,h)anthracene	4	<0.0280	<0.0300	<0.0372
	mg/kg	Fluoranthene	1400	<0.0280	<0.0300	<0.0372
	mg/kg	Fluorene	220	0.0627	<0.300	0.0682J
	mg/kg	Indeno(1,2,3-cd)pyrene	41	<0.0280	<0.0300	<0.0372
	mg/kg	Naphthalene	20	4.08	4.59	5.82
	mg/kg	Phenanthrene	3000	<0.0280	<0.300	<0.0372
	mg/kg	Pyrene	1000	<0.0280	<0.0300	<0.0372
AK101	mg/kg	Gasoline Range Organics	**300**	**396JH***	**599JH***	**416JH***
AK102	mg/kg	Diesel Range Organics	**250**	**16000**	**15300**	**19200**
SM21 2540G	mg/kg	Total Solids	-	88.3	82.3	83.0
SW8021B	mg/kg	Benzene	**0.025**	**0.100J**	**0.226**	**0.186**
	mg/kg	Ethylbenzene	6.9	5.25	**7.13**	5.85
	mg/kg	o-Xylene	**6.5**	**12.4**	**16.4**	**13.2**
	mg/kg	P & M -Xylene	63	18.9	24.6	20.4
	mg/kg	Toluene	63	4.07	6.81	5.66

Notes for Table 3:

^	ADEC Soil-Cleanup Levels from 18 AAC 75.341 Tables B1 and B2 Method Two - Migration to Groundwater for the "Under 40 Inch Zone"
ADEC	Alaska Department of Environmental Conservation
mg/Kg	milligrams per kilograms
PAH	polynuclear aromatic hydrocarbons
DUP	duplicate
<	analyte not detected; limit of detection (LOD) listed. Flag applied by laboratory.
-	cleanup level not applicable
bold	Result exceeds ADEC Migration to Groundwater Cleanup Level
J	Estimated concentration, detected above the detection limit (DL) and below the limit of quantitation (LOQ). Flag applied by laboratory.
JH*	Result is considered estimated (biased high) due to quality control failures. See checklist for additional details. Flag applied by Shannon & Wilson, Inc.

TABLE 4
ANALYTICAL RESULTS FOR CONTAMINATED SNOWMELT:
PRE- & POST-TREATMENT

				PRE-TREATMENT			POST-TREATMENT		
				Holding Tank #1	Holding Tank #10	Holding Tank #2	Post-trmt Tank #1	Post-trmt Tank #10	Post-trmt Tank #2
					Duplicate of Holding Tank #1			Duplicate of Post Trmt Tank #1	
Analytical Method	**Units**	**Analyte**	**ADEC Cleanup Levels^**						
8270D SIMS (PAH)	mg/L	1-Methylnaph-thalene	0.15	0.00239JL*	0.00217JL*	0.0124	0.000100	0.0000959	0.000407
	mg/L	2-Methylnaph-thalene	0.15	0.00503JL*	0.00251JL*	0.0117	0.0000972	0.0000955	0.000301
	mg/L	Acenaph-thene	2.2	<0.0000274	<0.0000266	0.00298	<0.0000262	<0.0000257	0.000163
	mg/L	Acenaph-thylene	2.2	<0.0000274	<0.0000266	<0.000129	0.0000226J*	0.0000344J*	<0.0000261
	mg/L	Anthracene	11	<0.0000274	<0.0000266	<0.000129	<0.0000262	0.0000198J	<0.0000261
	mg/L	Benzo(a)-anthracene	0.0012	<0.0000274	<0.0000266	<0.000129	0.0000512J*	0.0000863J*	<0.0000261
	mg/L	Benzo(a)-pyrene	0.0012	<0.0000274	<0.0000266	<0.000129	0.0000261J*	0.0000476J*	<0.0000261
	mg/L	Benzo(b)-fluoranthene	0.0012	<0.0000274	<0.0000266	0.000211J	0.000141J*	0.000256J*	<0.0000261
	mg/L	Benzo(g,h,i)-perylene	1.1	<0.0000274	<0.0000266	<0.000129	0.0000383J*	0.0000636J*	<0.0000261
	mg/L	Benzo(k)-fluoranthene	1.5	<0.0000274	<0.0000266	<0.000129	<0.0000262	<0.0000257	<0.0000261
	mg/L	Chrysene	0.12	<0.0000274	<0.0000266	<0.000129	0.0000940J*	0.000157J*	<0.0000261
	mg/L	Dibenzo(a,h)-anthracene	0.00012	<0.0000274	<0.0000266	0.000367	<0.0000262	<0.0000257	<0.0000261
	mg/L	Fluoranthene	1.5	<0.0000274	<0.0000266	<0.000129	0.000208J*	0.000382J*	<0.0000261
	mg/L	Fluorene	1.5	0.0000921JL*	0.0000831JL*	0.000393	0.0000204J*	0.0000343J*	<0.0000261
	mg/L	Indeno-(1,2,3-cd)-pyrene	0.0012	<0.0000274	<0.0000266	0.000309	0.0000430J*	0.0000730J*	<0.0000261
	mg/L	Naphthalene	0.73	0.00251JL*	0.00228JL*	0.0398	0.000119	0.000144	0.000656
	mg/L	Phenanthrene	11	0.0000467JL*	0.0000401JL*	0.0000854J	0.000305J*	0.000566J*	<0.0000261
	mg/L	Pyrene	1.1	<0.0000274	<0.0000266	0.000148J	0.000111J*	0.000205J*	<0.0000261
AK101	mg/L	Gasoline Range Organics	2.2	0.651	0.681	37.5	0.0611J	0.0552J	0.285

TABLE 4
ANALYTICAL RESULTS FOR CONTAMINATED-SNOWMELT:
PRE- & POST-TREATMENT, CONTINUED

				PRE-TREATMENT			POST-TREATMENT		
				Holding Tank #1	Holding Tank #10	Holding Tank #2	Post-trmt Tank #1	Post-trmt Tank #10	Post-trmt Tank #2
					Duplicate of Holding Tank #1			Duplicate of Post Trmt Tank #1	
Analytical Method	**Units**	**Analyte**	**ADEC Cleanup Levels^**						
AK102	mg/L	**Diesel Range Organics**	**1.5**	1.18J*	**7.99J***	**742**	**5.47J***	0.964J*	**7.15**
SW8021B	mg/L	**Benzene**	**0.005**	**0.00923**	**0.00899**	**0.0257**	<0.000250	<0.000250	0.000260J
	mg/L	Ethylbenzene	0.7	0.0203	0.0201	0.290	<0.000500	<0.000500	0.00117
	mg/L	o-Xylene	10	0.0529	0.0517	0.551	0.000660J	0.000580J	0.00129
	mg/L	P & M - Xylene	10	0.0757	0.0738	0.975	<0.00121B*	<0.00115B*	<0.00324B*
	mg/L	Toluene	1	0.0735	0.0730	0.302	<1.00B*	<1.00B*	0.000680J

Notes for Table 4:

^	ADEC Water-Cleanup Levels from 18 AAC 75.345, Table C
ADEC	Alaska Department of Environmental Conservation
mg/L	milligrams per liter
trmt	treatment
PAH	polynuclear aromatic hydrocarbon
<	analyte not detected; limit of detection (LOD) listed. Flag applied by laboratory.
bold	Result exceeds ADEC Groundwater Cleanup Level
J*	Result is considered estimated (no direction of bias) due to an RPD failure. Flag applied by Shannon & Wilson, Inc.
JL*	Result is considered estimated (biased low) due to a surrogate recovery failure. Flag applied by Shannon & Wilson, Inc.
B*	Result is considered not detected due to sample contamination identified in the trip blank; the result is listed as less than the limit of quantitation (LOQ) or the concentration originally reported in the sample (higher concentration reported). Flag applied by Shannon & Wilson, Inc.

4.0 QUALITY ASSURANCE/QUALITY CONTROL

We reviewed the analytical results provided by SGS for laboratory QC samples and also conducted our own QA assessment for this project. We reviewed chain of custody (COC) records and laboratory sample-receipt forms to check that we followed proper custody procedures, met sample holding times, and kept samples properly chilled (between 0 degrees Celsius [ºC] and 6 ºC) during shipping. Our QA-review procedures allow us to document accuracy and precision of the analytical data and check that the analyses were sufficiently sensitive to detect analytes at levels below regulatory standards.

For this report, we reviewed the soil and groundwater data report for SGS work orders 1151534, 1157839, and 1157840. The SGS laboratory reports contain the case narratives, sample-receipt forms, analytical results and copies of the COCs. Details regarding the results of our QA analyses are presented in the ADEC data-review checklists, included in Appendix D, along with copies of the SGS laboratory reports.

5.0 DISCUSSION & RECOMMENDATIONS

5.1 Discussion

On behalf of the NSB, and based on analytical results obtained from the April 27 contaminated-snowmelt sampling event, we requested ADEC approval for the NSB to discharge snowmelt water to the Barrow treatment lagoon. On May 8, 2015, we received approval from ADEC's representative Paul Lhotka to discharge the water to a formerly used wastewater lagoon. Sediment from the snowmelt remains in storage at Shop #3 in three 85-gallon drums. Results indicate that the sediment contains DRO, GRO, benzene, o-xylene, and ethylbenzene at concentrations above the ADEC cleanup levels (Table 3).

Based on laboratory results, the contaminated-soils excavated from the Shop #2 spill site contain arsenic, DRO, GRO, PAH analytes (1- and 2-methylnapthalene), and benzene at concentrations above the ADEC cleanup level (Table 2). The results of analytical sample analyses also indicate that contamination likely exists at the limits of the excavated-area (E1). In addition, while DRO, GRO, PAH analytes or benzene were not found in soil samples from the E2 area, arsenic was discovered at concentrations above the ADEC cleanup level (Table 2).

Field staff and NSB responders worked with frozen soils during the initial excavation effort at the Site. The frozen condition of the soils made excavation efforts challenging and inefficient. Soils from both the E1 and E2 areas should be further excavated in order to remove contaminated soil from the Site. We recommend performing the excavation as soon as the soil

conditions improve (i.e., once temperatures rise enough to thaw soils). In addition, a plan for treatment and/or disposal is needed for both the sediment from snowmelt and the excavated soil.

5.2 Recommendations

Based on our field observations and analytical sample results, observed contamination in the excavation area is consistent with the ADEC Spill Report (Appendix E) for a ULSD release. The observed vertical extent of contamination in the area is apparently deeper than initially excavated. In addition, the lateral extent of contamination is still unknown. Given the apparent remaining contamination, we provide these recommendations:

- Further delineate the vertical and lateral extents of the ULSD release and the former stockpile (E2).
- Further excavate contaminated soils within the E1 and E2 areas.
- Identify treatment and disposal options for the NSB.

6.0 LIMITATIONS

This report was prepared for the use of the NSB, ADEC, and their representatives for evaluating remaining contamination at the Barrow Shop #2 in Barrow, Alaska. This work presents our professional judgment as to the conditions in the area. Conclusions and recommendations presented here are based on sampling and analyses we preformed, along with a limited review of records and other data available to the public. They should not be construed as definite conclusions about soil or groundwater conditions in the area, and it is possible our tests may not represent the highest levels of contamination in the area. We have not performed an independent evaluation of the accuracy or completeness of third-party information, and shall not be responsible for errors or omissions contained in such information.

The results included in this report should be considered representative of the time and locations at which the sampling occurred. It was not the intent of our investigation to detect the presence of contaminants other than those for which laboratory analyses were performed. No conclusions can be drawn on the presence or absence of other contaminants. The observed levels of contamination may be dependent upon seasonal changes and the passage of time. Due to such changes, or others beyond our control, our observations and recommendations applicable to this site may need to be revised. If substantial time has elapsed between submission of this report and the start of activities or action based upon it, we recommend this report be reviewed to determine the applicability of the conclusions and recommendations considering the lapsed time or changed conditions.

This report was prepared for the exclusive use of the NSB and ADEC. All documents prepared by Shannon & Wilson are instruments of service with respect to the project for the sole use of the NSB and ADEC. Only the NSB or ADEC shall have the right to rely upon such documents. Such documents are not intended or represented to be suitable for reuse by NSB, ADEC, or others after the passage of time, on extensions of the project, or on any other project. Any such reuse without written verification or adaptation by Shannon & Wilson, as appropriate for the specific purpose intended, shall be at the user's sole risk.

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Shannon & Wilson, Inc. has prepared the attachment, *"Important Information About Your Environmental Site Assessment/Evaluation Report"* in Appendix F to assist you and others in understanding the uses and limitations of our reports.

7.0 REFERENCES

Alaska Department of Environmental Conservation (ADEC), 2003, 18 AAC 75: Oil and other hazardous substances pollution control: Juneau, Alaska, available http://dec.alaska.gov/commish/regulations/.

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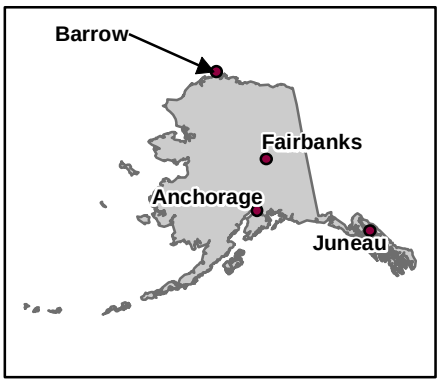
Feet



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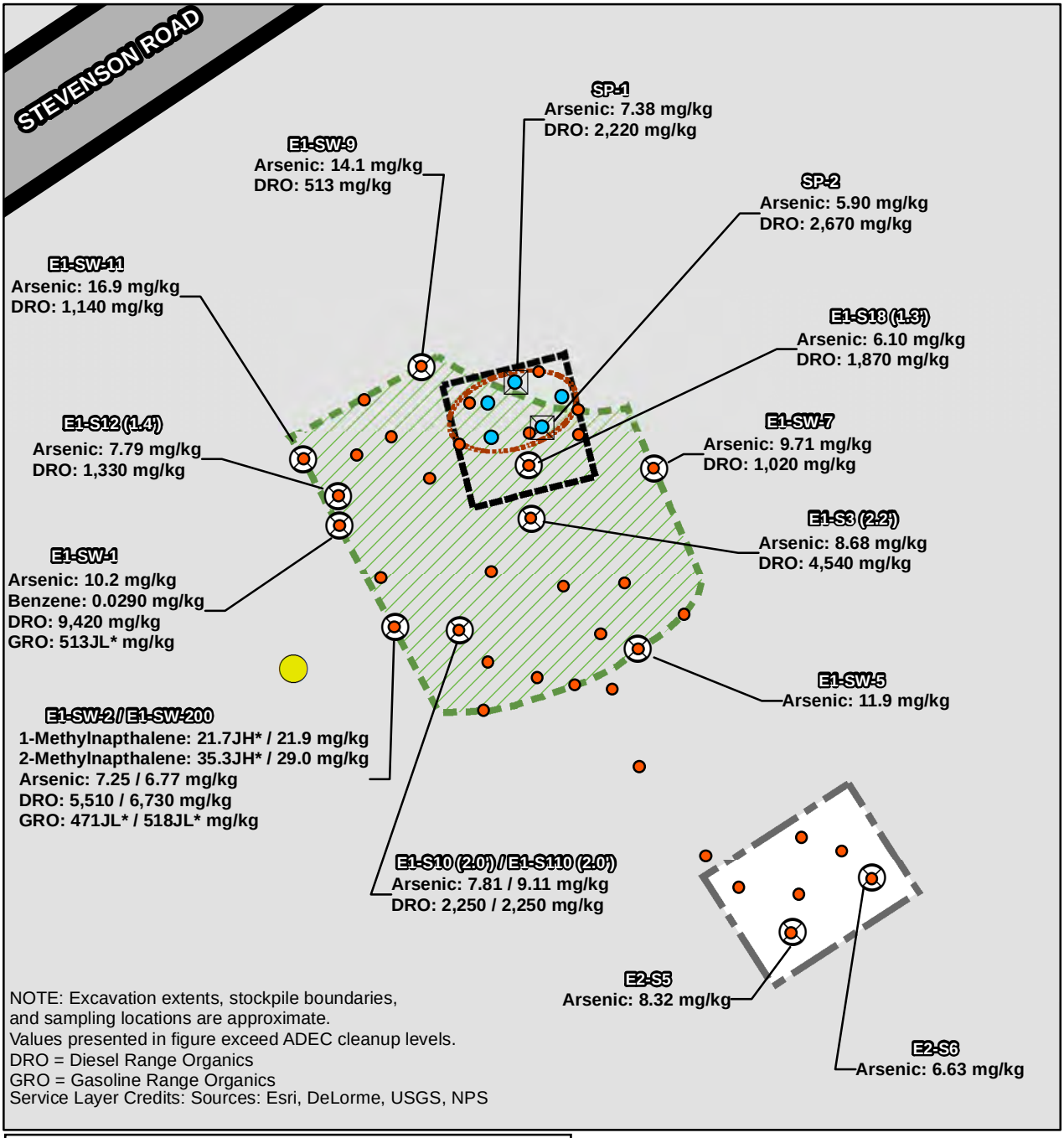
2015 Barrow Shop #2 ULSD Release
Trip Report
Barrow, Alaska

PROJECT SITE & CONTAMINATED-SNOW STORAGE LOCATION MAP

May 2015 31-1-11765-003

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

Figure 1



LEGEND

- Field-screening sample locations - excavation
- Field-screening sample locations - soil stockpile
- Analytical soil sample locations - excavation
- Analytical soil sample locations - soil stockpile
- Temporary Soil Stockpile
- E1 (Boundary of excavated soils)
- E2 (Initial temporary snow stockpile outline)
- Most recent temporary snow stockpile outline
- Light post

0 25

Feet

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2015 Barrow Shop #2 ULSD Release
Trip Report
Barrow, Alaska

SHOP #2 SAMPLE LOCATION & EXCAVATION MAP

May 2015

31-1-11765-003

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

Figure 2

APPENDIX A

SITE PHOTOGRAPHS

Photo 1: Location of ULSD fuel release on snow/ice pad between Shop #2 building and Stevenson Street; facing south towards Shop #2. (April 14, 2015)

Photo 2: Seven overpack drums and one dumpster containing contaminated snow were observed at the fuel release area. (April 14, 2015)

Photo 3: Location of ULSD fuel release, release area covered in three inches of fresh snow. Facing west towards Stevenson Street. (April 14, 2015)

Photo 4: Containers holding contaminated snow were placed on a liner inside Shop #3, located less than one mile from the ULSD fuel release site. (April 14, 2015)

Photo 5: We field-screened surface soils at 14 locations in the fuel release (E1) area and six locations in the snow stockpile area (E2); locations marked with orange whiskers. (April 15, 2015)

Photo 6: Ten additional field-screening samples were collected from E1 on April 16; facing southeast towards Shop #2 building. (April 16, 2015)

Photo 7: The ULSD fuel release area (E1) was trenched with a trencher in order to break up frozen soil prior to excavation. (April 16, 2015)

Photo 8: Barrow Utilities trenched soil in the fuel release area (E1) to approximately six to eight inches bgs, separating the trenches by approximately one foot; facing north towards Stevenson Street. (April 16, 2015)

Photo 9: NSB crews used a loader and small backhoe to break up and excavate contaminated soil in the fuel release area (E1); facing west-southwest towards Stevenson Street. (April 17, 2015)

Photo 10: Excavated soils were stockpiled in the northeast corner of the fuel release area (E1). We collected five field-screening samples from the soil stockpile; facing south. (April 17, 2015)

Photo 11: Staining was observed in the west corner of the fuel release area (E1); facing east. (April 17, 2015)

Photo 12: We collected analytical soil samples from the base and sidewalls of the excavated area; facing northwest towards Stevenson Street. (April 18, 2015)

Photo 13: Field-screening samples were collected at 6-inches below ground surface at five locations in the soil stockpile, flagged by whiskers; looking north. (April 17, 2015)

Photo 14: Excavated soils were bagged and placed on a liner at the northeast end of the Shop #2 site; facing southeast. (April 18, 2015)

Photo 15: 55-gallon granular activated carbon (GAC) drum (on the left) and micron filter (on the right), in front of the 2,000-gallon holding tank. (April 27, 2015)

Photo 16: The GAC filtration system setup. Water in the 2,000-gal holding tank is filtered water from the round holding tank (Pictured on the left behind the GAC setup). (April 27, 2015)

Photo 17: Pre-treated sump water in the round 1,600-gallon holding tank. (April 27, 2015).

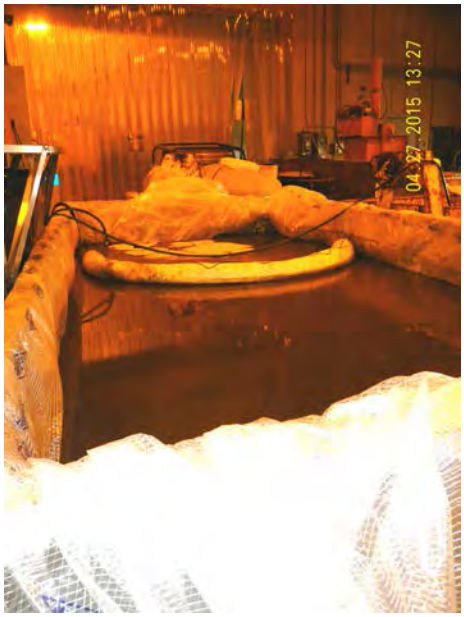

Photo 18: Pre-treated snowmelt water consolidated into one dumpster. (April 27, 2015).

Photo 19: Post-treatment water from the pre-treatment round holding tank. (April 27, 2015).

Photo 20: Post-treatment water from the pre-treatment dumpster. (April 27, 2015).

Photo 21: Contaminated sediment from snowmelt. (April 27, 2015)

Photo 22: Contaminated sediment from snowmelt in a second dumpster. (April 27, 2015)

Photo 23: Drums containing sediment from snowmelt; sediment was consolidated from the two dumpsters. (April 27, 2015)

APPENDIX B

FIELD-SCREENING LOG

Job Number: 31-1-11765-002

SOIL SAMPLE COLLECTION LOG

SHANNON & WILSON, INC.

	Sample Number	Date	Time	Sample Location (See Figure 1 and Table 2)	Depth (Ft.) → inches bgs / feet	Sample Classification	PID Type - ppm
	E1-S1	4/15/15	1025	N end, center of Ex.1 (fuel-release)	4"	10 silt, 30 sand 60 gravel, brown	356 HC
	E1-S2		1048	N end, center of Ex.1	4"	" " " "	195 HC
	E1-S3		1055	N end, center of Ex.1	4"	" " " "	148 HC
	E1-S4		1108	center of Ex.1	3"	10 silt, 20 sand, 70 gravel, brown	356 HC
	E1-S5		1100	E side, of Ex.1	4"	10 silt, 30 sand, 60 gravel "	243 HC
	E1-S6		1130	SW corner of Ex.1	4"	" " " "	57.6 HC
	E1-S7		1137	SW corner of Ex.1	4"	" " " "	3.4
	E1-S8		1143	SW corner of Ex.1	4"	" " " "	3.9
	E1-S9		1345	SW corner of Ex.1	4"	" " " "	334 HC
	E1-S10		1350	W side of Ex.1	3"	10 silt, 20 sand, 70 gravel, brown	20.2
	E1-S11		1354	W side of Ex.1	4"	10 silt, 30 sand 60 gravel "	39.2 HC
	E1-S12		1400	NW corner of Ex.1	4"	5 silt, 15 sand, 80 gravel "	168 HC
	E1-S13		1405	center of Ex.1	4"	" " " "	237 HC
	E1-S14		1412	S end, center of Ex.1	4"	" " " "	2.8
	E2-S1		1429	NE corner of Ex.2 (former temp snow SP)	4"	10 silt 10 sand 80 gravel, brown	0.9 KVN
	E2-S2		1435	center of Ex.2	4"	" " " "	~~3.7~~ 2.7
	E2-S3		1442	NW corner of Ex.2	4"	" " " "	2.8
	E2-S4		1449	N end, center of Ex.2	4"	" " " "	0.9
*	E2-S5		1458	SW corner of Ex.2	4"	5 silt 10 sand 85 gravel "	3.2
*	E2-S6		1603	SE corner of Ex.2	4"	" " " "	3.2
	E1-S15	4/16/15	1000	NW corner of Ex.1	4"	10 silt 30 sand 60 gravel brown	8.5
	E1-S16		1008	N end, center of Ex.1	4"	" " " "	8.2
	E1-S17		1014	NE corner of Ex.1	3"	5 silt 25 sand 70 gravel "	47.2
	E1-S18		1020	"	3"	" " " "	408 HC
	E1-S19		1026	"	3"	10 silt 30 sand 60 gravel "	299 HC
	E1-S20		1035	"	3"	" " " "	8.0
	E1-S21		1043	"	3"	" " " "	5.6
	E1-S22		1134	"	4"	" " " "	10.2
*	SP-1	4/17/15	1509	S end, center of SP	6" b.s.	5 silt 25 sand 70 gravel d. brown	1503 HC
	SP-5		1510	SE corner of SP		" " " "	1236 HC
*	SP-2		1512	N end center of SP		" " " "	1894 HC
	SP-3		1513	NW corner of SP		" " " "	880 HC
	SP-4		1515	SW corner of SP		" " " "	817 HC
*	E1-SW-1	4/17/15	1628	NW corner sidewall	1'	10 silt 30 sand, 60 gravel, d. brown	2026 HC
	E1-S1 (2.5')		1637		2.5'	" 40 sand 50 gravel, brown	816 HC
	E1-S2 (2.2')		1648		2.2'	" " " "	685 HC
*	E1-S3 (2.2')		1657		2.2'	" 30 sand 60 gravel "	1960 HC
	E1-S4 (2.5')		1706		2.5'	" " " "	1376 HC
	E1-S5 (0.67')		1717		0.67'	" " " "	82.7 HC
	E1-S6 (1.5')		1727		1.5'	" " " "	46.7 HC
dup *	E1-S10 (2.0')		1749		2.0'	" " " "	2503 HC
	E1-S9 (1.5')		1738		1.5'	" " " "	569 HC
	E1-S11 (1.6)		1822		1.6'	" " " "	1654 HC
	*	Sample Analyzed By Laboratory					

Note: PID filter may have been saturated after E1-SW-1

b.s. below SP surface S.P. stockpile

Job Number: 31-1-11765

SOIL SAMPLE COLLECTION LOG

SHANNON & WILSON, INC.

Sample Number	Date	Time	Sample Location (See Figure 1 and Table 2)	Depth (Ft.) bgs	Sample Classification	PID Type - ppm
* E1-S12 (1.4')	4/17/15	1826		1.4	10 silt 30 sand 60 gravel brown	956 HC
E1-S13 (1.8')	4/17/15	1837		1.8	10 silt 30 sand 60 gravel brown	197 HC
* E1-SW-2	4/18/15	0900		1.1	10 silt 30 sand 60 gravel, d. brown	4671 HC
E1-SW-3	↓	0904		0.7	10 silt 30 sand 60 gravel brown	2411 HC
E1-SW-4		0937		0.8	10 silt 30 sand 60 gravel brown	118 HC
* E1-SW-5		0938		0.9	5 silt 15 sand 80 gravel brown	634 HC
E1-SW-6		1010		0.6	10 silt 10 sand 80 gravel brown	76.9
* E1-SW-11		1012		0.6	10 silt 30 sand 60 gravel brown	1482 HC
* E1-SW-7		1836		0.8	10 silt 40 sand 50 gravel brown	1648 HC
E1-SW-8		1845		0.7	10 silt 30 sand 60 gravel brown	427 HC
* E1-SW-9		1856		0.8	5 silt 15 sand 80 gravel brown	37.4
E1-SW-10		1904		0.8	5 silt 15 sand 80 gravel brown	24.1
E1-S17 (1.2')		1822		1.2	10 silt 30 sand 60 gravel, d. brown	2319 HC
* E1-S18 (1.3')		1824		1.3	" " " "	3096 HC
E1-S19 (0.8')	↓	1827		0.8	" " " "	1396 HC

* Sample Analyzed By Laboratory

APPENDIX C

FIELD-ACTIBITY REPORTS

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

PROJECT NO.:	31-1-11765-002
REPORT DATE:	4/14/15
REPORT NO.:	1 of 6
SW FIELD REP.:	Kathryn Nolan & Jennifer Davis
PERMIT NO.:	

DAILY FIELD ACTIVITY REPORT

PROJECT NAME/LOCATION	NSB Barrow Shop #2 ULSD Release

REPORT SUBMITTED TO:		CONTRACTOR NAME AND CONTACT:		WEATHER & TEMP.	Partly cloudy, -2ºF
Client	North Slope Borough	General			
CC		Subcontractors for Geotechnical Construction		TIMES OF SITE VISITS:	
				from 1420	to 1700
				from	to

CONSTRUCTION OBSERVATIONS

NO.	TOPIC AND LOCATION	DESCRIPTION OF FIELD ACTIVITY, OBSERVATIONS AND RECOMMENDATIONS TO OWNER	FURTHER ACTION RECOMMENDED TO OWNER
1	Initial Site Visit	Katie and Jenny arrived on site at 1420 to meet with Lokeni Lokeni Jr. Lokeni identified the release area and temporary snow stockpile locations. The spill area was estimated to be a 20-foot by 8-foot area per Lokeni.	
	Transport of snow to Shop #3	Approval was obtained from Paul Lohtke (ADEC) for storage of potentially contaminated snow at NSB Barrow Shop #3. Lokeni and other NSB staff transported nine containers of contaminated snow (estimated at 25 cubic yards (c.y.)) to Shop #3, located approximately 0.5 miles from Shop #2. Katie and Jenny accompanied the NSB staff to Shop #3 to document activities. The containers included the following: • 2, 10-c.y. roll-off bins • 1, 95-gallon overpack drum • 6, 85-gallon drums All containers of snow were placed inside Shop #3 on a liner. The granular activated carbon (GAC) system for treatment of the contaminated snow is not set to arrive and be in operation for another 1.5- 2 weeks, per Lokeni.	Continue to monitor the melt of snow in bins and drums. Consolidate snow from drums and bins into as few containers as possible.
	Departure from site	Katie and Jenny and NSB staff departed from Shop #2 site at 1700.	

REVIEW BY (PM initial/date)
VEW 05/20/15

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

DAILY FIELD ACTIVITY REPORT

PROJECT NO.:	31-1-11765-002
REPORT DATE:	4/15/15
REPORT NO.:	2 of 6
SW FIELD REP.:	Kathryn Nolan & Jennifer Davis
PERMIT NO.:	

PROJECT NAME/LOCATION	NSB Barrow Shop #2 ULSD Release

REPORT SUBMITTED TO:		CONTRACTOR NAME AND CONTACT:		WEATHER & TEMP.	Sunny; -3ºF with wind chill, light snow at 1430
Client	North Slope Borough	General			
CC		Subcontractors for Geotechnical Construction		TIMES OF SITE VISITS:	
				from 0840	to 1200
				from 1300	to 1720

CONSTRUCTION OBSERVATIONS

NO.	TOPIC AND LOCATION	DESCRIPTION OF FIELD ACTIVITY, OBSERVATIONS AND RECOMMENDATIONS TO OWNER	FURTHER ACTION RECOMMENDED TO OWNER
	Full work day #1, Barrow Shop #2	Katie and Jenny arrived onsite to meet Lokeni and NSB staff at 0840.. Approximately 2-3 inches of snow accumulated on the site prior to 4/14/15. Snow was immediately scooped off of the worksite using a loader and stockpiled in the NE corner of the approximate spill area. The approximate boundary of the spill and initial snow stockpile areas were marked with nails and whiskers according to Lokeni's directions. The overall site was broken into two excavation areas: the spill area (E1) and the initial snow stockpile area (E2). E1, based on Lokeni's description, comprised and area of approximately 19.5 feet by 13.5 feet. E2 comprised a 10-foot by 13.5-foot area. A telephone call was made to Val Webb, SWI Project Manager, to discuss expansion of the excavation footprint based on surface staining. During the telephone conversation, it was agreed that while we should expand the investigation area to include areas of surface stains, this could potentially incorporate historical releases from vehicles and other equipment. The fuel release area was expanded W and NW due to observed surface staining, and NE due to the fresh snow stockpile location. Adhering to the ADEC guidance, the total required number of field-screening samples in E1 was fourteen, while the total required number of field-screenings in E2 was six. Field-screening sample locations were marked using whiskers and nails.	Containerize snow and transport to Shop #3.

REVIEW BY (PM initial/date)

VEW 05/20/15

CONSTRUCTION OBSERVATIONS (continued)

NO.	TOPIC AND LOCATION	DESCRIPTION OF FIELD ACTIVITY, OBSERVATIONS AND RECOMMENDATIONS TO OWNER	FURTHER ACTION RECOMMENDED TO OWNER
1	Full work day #1, Barrow Shop #2	The ground surface was frozen, making it very difficult to dig down to six inches to collect field-screening samples. We were able to dig down to four inches with the help of NSB staff members, who used an ice-pick. The loosened soil at four inches below ground surface (bgs) was collected for field-screening at each of the fourteen sampling points in E1 and each of the six sampling points in E2. Dark staining was observed down to one inch at the first sample at excavation 1 (E1-S1). Breathing zone PID readings read 1 ppm. The fresh snowpile that was stockpiled in the morning was transferred to a 10 c.y. roll-off bin, three 85-gallon, and two 95-gallon drums (~12 c.y. of snow). SWI accompanied NSB staff to Shop #3 to where the newly containerized snow was transferred. The snow in the containers transported to Shop #3 on Tuesday were beginning to melt. Air monitoring produced readings <5 ppm except when PID was held directly over drums and roll-offs. Readings >200 ppm were observed directly above drums and roll-offs. SWI and NSB staff returned to Shop #2 site. Field-screening from E2 were all <20 ppm. Confirmation samples, E2-S1 and E2-S2, were collected at 1707 and 1709, respectively. .	

REVIEW BY (PM initial/date)

VEW 05/20/15

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

PROJECT NO.:	31-1-11765-002
REPORT DATE:	4/16/15
REPORT NO.:	3 of 6
SW FIELD REP.:	Kathryn Nolan & Jennifer Davis
PERMIT NO.:	

DAILY FIELD ACTIVITY REPORT

PROJECT NAME/LOCATION	NSB Barrow Shop #2 ULSD Release

REPORT SUBMITTED TO:		CONTRACTOR NAME AND CONTACT:		WEATHER & TEMP.	Cloudy; -2ºF with light wind
Client	North Slope Borough	General			
CC		Subcontractors for Geotechnical Construction		TIMES OF SITE VISITS:	
				from 0830	to 1700
				from	to

CONSTRUCTION OBSERVATIONS

NO.	TOPIC AND LOCATION	DESCRIPTION OF FIELD ACTIVITY, OBSERVATIONS AND RECOMMENDATIONS TO OWNER	FURTHER ACTION RECOMMENDED TO OWNER
	Full work day #2, Barrow Shop #2	We began the day (4/16/15) by meeting Lokeni at the Shop #2 site at 0830. Lokeni confirmed the utility locates and excavation equipment would not be available until late morning/afternoon; therefore we decided to first check the containerized snow at Shop #3 to document the thawing process. The lids on the drums and liners on the bins were removed and we observed some progress with the melting, but still not sufficient for sampling (and not likely to completely melt in the next few days due to the large volume of material in the bins). Approximately 1 inch of fresh snow had accumulated on the project area overnight so we used push brooms to gather the snow into the footprint of the newest snow stockpile area (NE corner of the spill area (E1). This small stockpile was containerized into one 95-gallon drum (3/4 full). We collected six field screening samples from the E3 area. PID readings from samples collected in the footprint of the newest temporary snow stockpile area ranged from 5.6 to 408 ppm, with three readings greater than 20 ppm. The three "hot" field screening samples were collected from locations closest to the spill area; therefore we decided to combine the newest temporary snow stockpile area into the spill area (E1) area to better delineate the spill area. We did not collect an analytical sample from the newest temporary snow stockpile area, but will adjust the confirmation sampling accordingly to incorporate the additional area. A phone call was made to Val Webb and Jon Lindstrom to discuss the use of various equipment to excavate contaminated soil. We discussed the use of the rock saw to first trench the excavation area. A decision was reached that we would use the rock saw, as this was one of the only options that we thought would be successful. At 13:50, Barrow Utilities and Electric Co-op Incorporated (BUECI) arrived on site to conduct utility locates. BUECI personnel confirmed there were no buried utilities in our project area. Due to the frozen soil conditions, shallow trenching using a rock saw was proposed prior to bringing in an excavator. From 14:00-16:00, a BUECI operator used a BUECI-owned rock saw to cut shallow trenches about 6-8 inches deep across the delineated spill area to break up the frozen soil (see photos attached). Small rows of frozen soil (less than 1 foot wide) were left in between the shallow trenches which we believed the excavator could handle during the soil removal.	

REVIEW BY (PM initial/date)
VEW 05/20/15

CONSTRUCTION OBSERVATIONS (continued)

NO.	TOPIC AND LOCATION	DESCRIPTION OF FIELD ACTIVITY, OBSERVATIONS AND RECOMMENDATIONS TO OWNER	FURTHER ACTION RECOMMENDED TO OWNER
1	Full work day #1, Barrow Shop #2	At 16:15, an NSB-owned excavator was brought on site, but this excavator was not powerful enough to break through the frozen soil. According to NSB, they were trying to get their larger excavator ready, but were having mechanical issues so it was not going to be available right away. They thought they might be able to have it ready to go tomorrow morning. Jenny and I measured the extent of the proposed excavation area to be approximately 700 sq ft, and about 17 cy of excavated soils. At that point, we could not proceed without the excavator so we covered the entire spill area with liners and called it a day. - We will meet at 0830 at Shop #2. - We will excavate the delineated spill area down to at least six inches. Field screening samples will be collected at the base to confirm headspace readings less than 20 ppm. We will have NSB stockpile the excavated soils temporarily on a liner to facilitate our sample collection. If all field screening comes back clean, I will proceed with the analytical confirmation sampling and excavated soil sampling. After sample collection is complete, I will have the NSB crew transfer the soils into supersacks/drums.	

REVIEW BY (PM initial/date)

VEW 05/20/15

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

DAILY FIELD ACTIVITY REPORT

PROJECT NO.:	31-1-11765-002
REPORT DATE:	4/17/15
REPORT NO.:	4 of 6
SW FIELD REP.:	Kathryn Nolan & Jennifer Davis
PERMIT NO.:	

PROJECT NAME/LOCATION	NSB Barrow Shop #2 ULSD Release

REPORT SUBMITTED TO:		CONTRACTOR NAME AND CONTACT:		WEATHER & TEMP.	Cloudy; -4ºF with wind chill
Client	North Slope Borough	General			
CC		Subcontractors for Geotechnical Construction		TIMES OF SITE VISITS:	
				from 0845	to 1948
				from	to

CONSTRUCTION OBSERVATIONS

NO.	TOPIC AND LOCATION	DESCRIPTION OF FIELD ACTIVITY, OBSERVATIONS AND RECOMMENDATIONS TO OWNER	FURTHER ACTION RECOMMENDED TO OWNER
	Full work day #3, Barrow Shop #2	We arived onsite at 8:45AM and met with Lokeni. We transported the 95-gallon drum containing snow from the accumulation that occurred on the night of 4/15/15 to Shop #3. While at shop #3, we immediately noted that one of the roll-offs was leaking, resulting in accumulation of approximately 5-10 gallons of oily water on top of the liner. The NSB staff retrieved a pump and immediately pumped the water from the liner into one of the other roll-offs that was not leaking. We briefly discussed monitoring of the water leakage/accumulation and consolidating the water from the drums and other roll-offs into one bin. A phone call was made to Val Webb to discuss the use of various equipment to excavate contaminated soil. Because our options were limited, due to the large excavator being in repair, a decision was made that we would use whatever means were possible to remove the contaminated soil. We therefore relied on a loader to do the work. We returned to the Shop #2 site at 10:45AM. The small excavator was onsite by 11:00AM, and a loader arrived onsite shortly thereafter. Together, the loader and small excavator worked to both break up and excavate the contaminated soil. The loader broke the soil into large chunks and stockpiled it in the northeast corner of the excavation. Once the bulk of the excavated soil was stockpiled, NSB staff worked to shovel the remaining loose soil at the bottom of the excavation into supersacks. We estimated the volume of the soil stockpile at approximately 25 cubic yards. We therefore collected five field-screening samples from the stockpile, and collected two analytical samples from the field-screening sampling points having the highest PID readings. After our samples were collected, the NSB staff began moving the soil stockpile material from the stockpile to supersacks, which were placed on a liner at the Shop #2 site. The NSB staff was able to fill one supersack with excavated soil. The stockpile was covered for the night and NSB staff will continue placing the soil in to supersacks tomorrow (4/18/15).	

REVIEW BY (PM initial/date)
VEW 05/20/15

CONSTRUCTION OBSERVATIONS (continued)

NO.	TOPIC AND LOCATION	DESCRIPTION OF FIELD ACTIVITY, OBSERVATIONS AND RECOMMENDATIONS TO OWNER	FURTHER ACTION RECOMMENDED TO OWNER
1	Full work day #1, Barrow Shop #2	We calculated the total area of the excavation to be approximately 654 s.f. We therefore collected 14 field-screening samples. Field-screening samples returned results that were well above the field-screening samples we observed at four inches below the ground surface. We observed a diesel smell and soil staining, especially in the northwest corner of the excavation area. It was apparent to us that we had excavated into contaminated soils that existed prior to the most recent spill. We collected three of the four required analytical samples from the base of the excavation, along with one duplicate sample. The samples were collected at field screening points at which the highest PID readings were observed. We plan to collect the fourth analytical sample from the northeast corner of the excavation area, after the soil stockpile is removed from the northeast corner. We elected to take a sample in this area, because it is the location of the highest PID reading observed in the field screening conducted at 4" below ground surface. The soil was excavated to a depth deeper than desired due to conditions of the soil (i.e. frozen, very hard, and difficult to move), which required use of a loader to break up the soil. The loader was the only piece of equipment available for use at the site that had potential to break up the soil. The small excavator had been tried twice without much success while the large excavator is currently being repaired. The bulkiness of the loader limited its maneuverability and the finesse with which the excavation could be performed. The contaminated area was excavated to a depth ranging between one foot and 2.5 feet, instead of our intended 6-inch excavation depth, as a result. We are therefore required to collect 11 field-screen samples and five analytical samples, as well as a duplicate sample, from the excavation sidewalls. We collected one field-screening and one analytical sample from the stained area in the northwest corner of the excavation in order to characterize what we believe to be soil contamination that existed prior to the March 2015 spill. We will proceed on 4/18/15 by collecting an additional 10 field-screening samples and four analytical samples from the sidewalls of the excavation. In addition to the work described above, we also collected swing-ties to the corners of our excavation area and to sampling points. We plan to meet with Lokeni onsite at Shop #2 at 8:30AM tomorrow (4/18/15). Lokeni warned of the possibility that laborers may not be available to work due to the community activities related to the whaling season. Jenny is to depart at 11:48AM from Barrow. Katie intends to stay until Sunday afternoon.	

REVIEW BY (PM initial/date)

VEW 05/20/15

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

DAILY FIELD ACTIVITY REPORT

PROJECT NO.:	31-1-11765-002
REPORT DATE:	4/18/15
REPORT NO.:	5 of 6
SW FIELD REP.:	Kathryn Nolan & Jennifer Davis
PERMIT NO.:	

PROJECT NAME/LOCATION	NSB Barrow Shop #2 ULSD Release

REPORT SUBMITTED TO:		CONTRACTOR NAME AND CONTACT:		WEATHER & TEMP.	Cloudy; -1ºF with wind chill
Client	North Slope Borough	General		TIMES OF SITE VISITS:	
CC		Subcontractors for Geotechnical Construction		from 0840	to 2130
				from	to

CONSTRUCTION OBSERVATIONS

NO.	TOPIC AND LOCATION	DESCRIPTION OF FIELD ACTIVITY, OBSERVATIONS AND RECOMMENDATIONS TO OWNER	FURTHER ACTION RECOMMENDED TO OWNER
	Full work day #4, Barrow Shop #2	SWI staff were onsite by 0845 and we started off collecting several field screening samples while the NSB crew was prepping the loader & backhoe. NSB containerized the excavated soils into 5 cy supersacks (bags filled at half capacity due to large chunks of frozen soil). Jenny was off site around 1030 to catch her flight out. During lunch, I accompanied Lokeni to the Shop #3 to check the snowmelt. Approximately 20-25 gallons of water (with a heavy sheen) was observed pooled on the liner. After lunch, the NSB crew continued to containerize the excavated soils. During a break, Lokeni and I went back to the Shop #3 with a new pump to transfer the water on the liner into the non-leaking bin. The NSB crew was able to containerize the soil stockpile into a total of 28 (5-cy) supersacks (1 filled at full capacity and 27 filled at about half capacity) and one small (3-cy) supersack filled with about 1 cy of soil. All of the supersacks were placed on a liner in the NE corner of the yard. The NSB crew finished at Shop #2 around 1800. The bucket on the loader was used to scrape some of the loose material around the ground surface adjacent to the excavation into the excavation to limit possible offsite transfer by the tires of the heavy equipment that drive throughout the yard. Katie remained on site with Lokeni to finish the sample collection. In total, 14 base and 11 sidewall field screening samples were collected from the excavation. All of the field screening samples were greater than 20 ppm. The base samples ranged from 46.7 to 3,096 ppm, and the sidewall samples ranged from 24.1 to 4,671 ppm. The highest PID results were from the West side of the excavation (near the light post) in an area with obvious staining and a strong hydrocarbon odor. Six analytical samples plus a duplicate were collected on 4/18/15 from the base and sidewalls of the excavation. Swing-tie measurements were obtained for each sample location and the approximate extent of the excavation.	

REVIEW BY (PM initial/date)
VEW 05/20/15

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

PROJECT NO.:	31-1-11765-002
REPORT DATE:	4/19/15
REPORT NO.:	6 of 6
SW FIELD REP.:	Kathryn Nolan & Jennifer Davis
PERMIT NO.:	

DAILY FIELD ACTIVITY REPORT

PROJECT NAME/LOCATION	NSB Barrow Shop #2 ULSD Release

REPORT SUBMITTED TO:		CONTRACTOR NAME AND CONTACT:		WEATHER & TEMP.	Partly cloudy; -11ºF with wind chill
Client	North Slope Borough	General		TIMES OF SITE VISITS:	
CC		Subcontractors for Geotechnical Construction		from 0800	to 1625
				from	to

CONSTRUCTION OBSERVATIONS

NO.	TOPIC AND LOCATION	DESCRIPTION OF FIELD ACTIVITY, OBSERVATIONS AND RECOMMENDATIONS TO OWNER	FURTHER ACTION RECOMMENDED TO OWNER
	Full work day #5, Barrow Shop #2	This morning, Katie prepared the samples for shipping and packed the remaining gear coolers. She stopped by Alaska Airlines Cargo at around 1330 – the sample cooler was confirmed on the evening flight to Anchorage using Goldstreak and the PID & field gear cooler were confirmed on tomorrow's morning flight to Fairbanks using Priority. Katie left the water sample jars, extra cal gas, and bailers with Lokeni for our next trip. She and Lokeni met at Shop #3 around 1400 to observe the progress with the snowmelt. Lokeni was able to drain three drums into the non-leaking bin. The remaining nine drums were not completely melted so we labeled these drums with our "hazardous waste" labels. Lokeni said he would try to skim the fuel off the surface of the drums, but could wait to consolidate until SWI is back on site if advised. Lokeni and Katie also labeled the 3 bins and 1 additional drum that would be used for saturated absorbent pads. A significant amount of water was observed pooling on the floor of the shop under the garbage truck. There are two floor drains in the shop and according to Lokeni, the two drains are connected to a holding tank, maybe 150 to 300-gallons in capacity. It was difficult to tell if this water was from the leaking bins or from snow/icemelt directly off the truck. Some water was observed under the liners; therefore, the water in the holding tank may need to be sampled as well and should probably be addressed during the next trip up (Lokeni says they pump out the tank usually on an as-needed basis for off-site treatment and disposal). He would be willing to filter this water through the GAC system if needed. Lastly, Lokeni and Katie stopped at Shop #2 to label the supersacks. We used spray paint to number each bag. Lokeni says he will make some laminated signs indicating contaminated soil and will post them around the area tomorrow. Lokeni and Katie discussed possibly moving the supersacks to inside the secured (fenced) area at Shop #3. Lokeni elected not to place a liner in the excavation before Katie's departure due to the forecasted high winds.	

REVIEW BY (PM initial/date)
VEW 05/20/15

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

DAILY FIELD ACTIVITY REPORT

PROJECT NO.:	31-1-11765-002
REPORT DATE:	4/26/2015
REPORT NO.:	1 of 3
SW FIELD REP.:	Erica Blake
PERMIT NO.:	

PROJECT NAME/LOCATION	NSB Barrow Shop #2 ULSD Release

REPORT SUBMITTED TO:		CONTRACTOR NAME AND CONTACT:		WEATHER & TEMP.	Cloudy; 31°F on arrival. 5-10 mph winds
Client	North Slope Borough	General			
CC		Subcontractors for Geotechnical Construction		TIMES OF SITE VISITS:	
				from N/A	to N/A
				from	to

CONSTRUCTION OBSERVATIONS

NO.	TOPIC AND LOCATION	DESCRIPTION OF FIELD ACTIVITY, OBSERVATIONS AND RECOMMENDATIONS TO OWNER	FURTHER ACTION RECOMMENDED TO OWNER
	Arrival in Barrow	Erica met with Lokeni Lokeni Jr. at the airport, and he assisted her in picking up the equipment and picking up the rental car. Lokeni took the field equipment and extra sample jars left from the previous trip, to the site (Shop #3). Erica picked up the two extra coolers of ice packs and soil jars from the Alaska Airlines Goldstreak, she confirmed they would be open at 08:30 am Tuesday morning. Ice packs were left in the rental car to remain frozen for samples to be collected on Monday, April 27. No site visit. Coordinated with Lokeni a time to meet on the morning of Monday, April 27 to begin the fieldwork.	

REVIEW BY (PM initial/date)

VEW 05/20/15

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

DAILY FIELD ACTIVITY REPORT

PROJECT NO.:	31-1-11765-002
REPORT DATE:	4/27/2015
REPORT NO.:	2 of 3
SW FIELD REP.:	Erica Blake
PERMIT NO.:	

PROJECT NAME/LOCATION	NSB Barrow Shop #2 ULSD Release

REPORT SUBMITTED TO:		CONTRACTOR NAME AND CONTACT:		WEATHER & TEMP.	16°F in morning, 33°F/34°F by mid-afternoon. 5-10 mph winds
Client	North Slope Borough	General			
CC		Subcontractors for Geotechnical Construction		TIMES OF SITE VISITS:	
				from 0945	to 2030
				from	to

CONSTRUCTION OBSERVATIONS

NO.	TOPIC AND LOCATION	DESCRIPTION OF FIELD ACTIVITY, OBSERVATIONS AND RECOMMENDATIONS TO OWNER	FURTHER ACTION RECOMMENDED TO OWNER
	Barrow Shop #2 and Shop #3	The initial start up of the filtration system worked, however, the 64 gpm pump forced too much pressure through and a new system set up had to be figured out. The excess pressure forced too much sediment particles through, which clogged up the micron filter, which stopped the flow going into the post-treatment holding tank. Lokeni and crew were troubleshooting system set-ups from 1140-1310. The 64 gpm pump had to pump the sump water from the round 1,600-gallon holding tank through the micron filter first, before going through the GAC drum and flowing directly into the post-treatment holding tank. Once the filtration was working with a steady flow rate, Erica prepared jars for the second pre-treatment sampling, which was to be collected from the rectangular bin. The second set of pre-treatment samples was collected at 1330 by scooping water from the surface water of the bin using an empty jar. The majority of the afternoon was spent working with the filtration system. At 1430, Lokeni and crew re-adjusted the filtration so that the sump water would pump through the micron filter, to the GAC drum, then through the second micron filter before entering the clean water holding tank. At 1545, Lokeni and crew consolidated all sediment from the two empty snow storage bins into two 85-gallon drums by shoveling it out of the liners. The two drums used to store the consolidated sediment were labeled. Erica prepared the remaining water sample jars and soil sampling jars for sample collection. A clarification call to Val was made at 1630, who confirmed Erica only needs to collect representative grab samples. There is no need to wait for a complete filtration of both tanks, only collect samples to obtain results from SGS later. A disposal plan will come once sample results come back.	

REVIEW BY (PM initial/date)
VEW 05/20/15

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

DAILY FIELD ACTIVITY REPORT

PROJECT NO.:	31-1-11765-002
REPORT DATE:	4/27/2015
REPORT NO.:	2 of 3
SW FIELD REP.:	Erica Blake
PERMIT NO.:	

PROJECT NAME/LOCATION	NSB Barrow Shop #2 ULSD Release

CONSTRUCTION OBSERVATIONS (continued)

NO.	TOPIC AND LOCATION	DESCRIPTION OF FIELD ACTIVITY, OBSERVATIONS AND RECOMMENDATIONS TO OWNER	FURTHER ACTION RECOMMENDED TO OWNER
	Barrow Shop #2 and Shop #3	After a break, the post-treatment water samples and sediment samples were collected. One of Lokeni's crew members scooped, with a shovel, the potentially contaminated soil from the drums. Erica used a spoon to scoop wet sediment from the shovel into sample jars. By 1940 all necessary samples were collected, but not all of the water had been emptied from the bin through the filtration system. In addition to the 1.2 drums filled with sediment, Lokeni estimated approximately 1.5 85-gallon drums of potentially contaminated sediment remained at the bottom of the bin where the water was still filtering. Erica continued to clean up equipment and package the samples with appropriate ice packs while Lokeni and crew monitored the on-going filtering of the meltwater in the bin. Coolers were readied for shipment for Tuesday morning. They were placed in Shop #3 for the night. Lokeni and Erica agreed to meet at the Alaska Airlines Goldstreak at 0830. Lokeni and crew would bring the sample coolers. Erica departed site at 2030, Lokeni and crew shut off the filtering system and cleaned up the area.	Continue filtering all the water once. Wait for sample results before proceeding with any disposal methods.

REVIEW BY (PM initial/date)
VEW 05/20/15

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

DAILY FIELD ACTIVITY REPORT

PROJECT NO.:	31-1-11765-002
REPORT DATE:	4/28/2015
REPORT NO.:	3 of 3
SW FIELD REP.:	Erica Blake
PERMIT NO.:	

PROJECT NAME/LOCATION	NSB Barrow Shop #2 ULSD Release

REPORT SUBMITTED TO:		CONTRACTOR NAME AND CONTACT:		WEATHER & TEMP.	20°F on departure; 5-10 mph winds
Client	North Slope Borough	General			
CC		Subcontractors for Geotechnical Construction		TIMES OF SITE VISITS:	
				from N/A	to N/A
				from	to

CONSTRUCTION OBSERVATIONS

NO.	TOPIC AND LOCATION	DESCRIPTION OF FIELD ACTIVITY, OBSERVATIONS AND RECOMMENDATIONS TO OWNER	FURTHER ACTION RECOMMENDED TO OWNER
	Departing Barrow	Erica met with Lokeni and crew at Alaska Airlines Goldstreak. Once samples were guaranteed to be on the plane to Fairbanks, Erica departed the Alaska Airlines airport. Erica followed Lokeni back to Shop #3 and picked up rest of the equipment. Headed back to airport where she dropped off at the baggage claim all equipment. Once that was taken care of, Erica returned the rental car and Lokeni dropped Erica off at the airport. No site work performed today. Samples taken to SGS North America Inc. laboratory in Fairbanks around 1500.	

REVIEW BY (PM initial/date)
VEW 05/20/15

ADEC LABORATORY DATA REVIEW CHECKLIST FOR WATER AND ANALYTICAL RESULTS

Laboratory Data Review Checklist

Completed by: Erica Blake

Title: Geologist Date: May 14, 2015

CS Report Name: NSB Barrow Shop#2 - Pre-treated Soils Report Date: May 13, 2015

Consultant Firm: Shannon & Wilson, Inc.

Laboratory Name: SGS North America, Inc. Laboratory Report Number: 1157840_rev1

ADEC File Number: ADEC RecKey Number:

1. Laboratory
   a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses?
      ☒Yes ☐ No ☐NA (Please explain.) Comments:

   b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS approved?
      ☐Yes ☐ No ☒NA (Please explain.) Comments:

      Analyses were performed by SGS North America, Inc. in Anchorage, Alaska.

2. Chain of Custody (COC)
   a. COC information completed, signed, and dated (including released/received by)?
      ☒Yes ☐ No ☐NA (Please explain.) Comments:

   b. Correct analyses requested?
      ☒Yes ☐ No ☒NA (Please explain.) Comments:

3. Laboratory Sample Receipt Documentation
   a. Sample/cooler temperature documented and within range at receipt (4° ± 2° C)?
      ☒Yes ☐ No ☐NA (Please explain.) Comments:

      Temperature blanks and/or the cooler were measured within the acceptable temperature range of 0 °C to 6 °C upon receipt at the SGS Fairbanks receiving office and Anchorage laboratory. This range has been approved by ADEC.

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

c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?
☒Yes ☐ No ☐NA (Please explain.) Comments:

Samples were received in good condition.

d. If there were any discrepancies, were they documented? For example, incorrect sample containers/preservation, sample temperature outside of acceptable range, insufficient or missing samples, etc.?
☐Yes ☐ No ☒NA (Please explain.) Comments:

No discrepancies were reported by the laboratory.

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

The data quality and usability were not affected; see above.

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:

Project samples Drum1-Soil and Drum2-Soil could not be re-analyzed at a lower dilution due to non-target analytes with peaks greater than six times the internal standard for the analysis by AK101/8021B. Project samples Drum1-Soil, Drum2-Soil, and Drum20-Soil had surrogate recovery failures for BFB that do not meet QC criteria (biased high) due to matrix interference for the analysis by AK101. Project samples Drum1-Soil, Drum2-Soil, and Drum20-Soil had elevated LOQs due to sample dilution. The samples were analysed at dilutions due to matrix interferences with the internal standard for the analysis by 8270D SIM. Project samples Drum1-Soil, Drum2-Soil, and Drum20-Soil had surrogate recoveries that did not meet QC criteria for terphenyl-d14 due to sample dilution for the analysis by 8270D SIM. Project samples Drum1-Soil and Drum20-Soil had surrogate recoveries that did not meet QC criteria for 2-fluorobiphenyl due to sample dilution for the analysis by 8270D SIM. The laboratory duplicate (1261881) sample did not meet QC criteria due to non-homogeneity for the analysis of precent total solids. MS (1262182) and MSD (1262183) had elevated LOQs due to sample dilution, sample analyzed at a dilution due to matrix interference with internal standards. Surrogate (2-fluorobiphenyl and terphenyl-d14) recovery is outside QC criteria due to sample dilution. The MS and MSD recovery for several compounds is outside QC criteria due to matrix interference and dilution. Refer to LCS for accuracy.

c. Were all corrective actions documented?
☐Yes ☐ No ☒NA (Please explain.) Comments:

No corrective actions required.

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

The laboratory does not specify any effect on the data quality or usability due to the QC failures; refer to sections 5.b., 6.a., 6.b., and 6.c. for further assessment.

5. Samples Results
a. Correct analyses performed/reported as requested on COC?
☒Yes ☐ No ☐NA (Please explain.) Comments:

b. All applicable holding times met?
☒Yes ☐ No ☐NA (Please explain.) Comments:

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:

The project samples are being analyzed to characterize the soils and prepare a waste profile for disposal of the material. Cleanup levels are not applicable for this project.

e. Data quality or usability affected?
Comments:

The data quality and usability are not considered to be affected; see above.

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:

However, gasoline range organics (GRO) were detected in the method blank at an estimated concentration of 0.766J mg/kg.

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

The associated project samples had detections that were greater than ten times the method blank detection and are not considered to be affected by the QC failure.

iv. Do the affected sample(s) have data flags and if so, are the data flags clearly defined?
☐Yes ☐ No ☒NA (Please explain.) Comments:

The associated project samples had detections that were greater than ten times the method blank detection and are not considered to be affected by the QC failure.

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

The data quality and usability were not affected; see above.

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:

LCS and MS/MSD samples were reported for PAH analysis.
LCS/LCSD samples were reported for GRO and DRO analyses.
LCS/LCSD and MS/MSD sampes were reported for BTEX analysis.

ii. Metals/Inorganics – one LCS and one sample duplicate reported per matrix, analysis and 20 samples?
☐Yes ☐ No ☒NA (Please explain.) Comments:

Only organic analysis were requested with this work order.

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:

Several MS and/or MSD analytes were outside QC limits for 8270 analysis.

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

The laboratory duplicate (1261881) RPD for percent total solid did not meet QC criteria.

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

The parent sample associated with the MS/MSD failures and laboratory duplicate RPD failure for percent total solids were not a part of the project sample set. The project samples are not considered to be affected by the QC failures.

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?
☐Yes ☐ No ☒NA (Please explain.) Comments:

The project samples are not considered to be affected by the QC failure; see above.

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

The data quality and usability are not considered to be affected; see above.

c. Surrogates – Organics Only

i. Are surrogate recoveries reported for organic analyses – field, QC and laboratory samples?
☒Yes ☐ No ☐NA (Please explain.) Comments:

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

The surrogate recoveries for 2-fluorobiphenyl and/or terphenyl-d14 (8270 surrogates) were outside QC criteria due to sample dilution for project samples Drum1-Soil, Drum2-Soil, and Drum20-Soil.

Additionally, the GRO surrogate, BFB was recovered outside acceptable limits for samples Drum1-Soil, Drum2-Soil, and Drum20-Soil due to matrix interference.

iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined?
☐Yes ☒ No ☐NA (Please explain.) Comments:

Project samples are not considered to be affected by surrogate recovery failures that are associated with sample dilutions. The 8270 results are not considered to be affected by the surrogate failures.

GRO results associated with above-limits surrogate failures are considered biased high, flagged with a 'JH'.

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

Yes; see above.

d. Trip blank – Volatile analyses only (GRO, BTEX, Volatile Chlorinated Solvents, etc.): <u>Water and Soil</u>

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 COC did not clearly identify that the trip blank and VOA samples were transported in the same cooler. However, only one cooler was submitted to the laboratory and we can assume the trip blank was transported with the samples at all times.

iii. All results less than PQL?
☒Yes ☐ No ☐NA (Please explain.) Comments:

Project analytes were not detected in the trip blank.

iv. If above PQL, what samples are affected?

Comments:

The project samples were not considered to be affected because the project analytes were not detected in the trip blank.

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

Comments:

The data quality and usability is not considered to be affected; see above.

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:

The field duplicate pair Drum2-Soil / Drum20-Soil was submitted with this work order.

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

RPD (%) = 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:

RPD's are within acceptance criteria, where applicable.

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

Comments:

The data quality and usability were not affected; see above.

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

☐Yes ☐ No ☒NA (Please explain.) Comments:

Equipment blanks were not submitted with this work order due to the nature of the project.

i. All results less than PQL?

☐Yes ☐ No ☒NA (Please explain.) Comments:

Equipment blanks were not required for the project.

ii. If above PQL, what samples are affected?

Comments:

N/A; equipment blanks were not required for the project.

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

Comments:

The data quality and usability were not affected; see above.

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

a. Defined and appropriate?

☐Yes ☐ No ☒NA (Please explain.) Comments:

There were no other data flags/qualifiers.

Laboratory Report of Analysis

To: Shannon & Wilson-Fairbanks
5430 Fairbanks Street, Suite 3
Anchorage, AK 99518
907-479-0600

Report Number: **1157839**

Client Project: **31-1-11765-002 NSB Shop #2**

Dear Valerie Webb,

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

If there are any questions about the report or services performed during this project, please call Jennifer 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.

_____

Jennifer Dawkins Date
Project Manager

SGS North America Inc. 200 West Potter Drive, Anchorage, AK 99518
t 907.562.2343 f 907.561.5301 www.us.sgs.com

Case Narrative

SGS Client: **Shannon & Wilson-Fairbanks**
SGS Project: **1157839**
Project Name/Site: **31-1-11765-002 NSB Shop #2**
Project Contact: **Valerie Webb**

Refer to sample receipt form for information on sample condition.

Holding Tank #1 (1157839001) PS

8270D SIM - Surrogate (2-fluorobiphenyl) recovery is outside of QC criteria (38%) due to matrix interference.

Holding Tank #10 (1157839002) PS

8270D SIM - Surrogate (2-fluorobiphenyl) recovery is outside of QC criteria (44%) due to matrix interference.

Holding Tank #2 (1157839003) PS

8270D SIM - LOQs are elevated due to sample dilution. Sample analyzed at a dilution due to matrix interference with internal standards.
8270D SIM - Surrogate (2-fluorobiphenyl) recovery is outside of QC criteria (273%) due to sample dilution.

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

SGS North America Inc.
200 West Potter Drive, Anchorage, AK 99518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

Report of Manual Integrations

Laboratory ID	Client Sample ID	Analytical Batch	Analyte	Reason
8270D SIMS (PAH)				
1157839003	Holding Tank #2	XMS8633	1-Methylnaphthalene	RP
1157839003	Holding Tank #2	XMS8633	Acenaphthene	SP
1157839003	Holding Tank #2	XMS8633	Benzo[b]Fluoranthene	SP
1157839006	Post-trmt Tank #2	XMS8635	Acenaphthene	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: 05/01/2015 4:39:05PM

Laboratory Qualifiers

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

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

SGS maintains a formal Quality Assurance/Quality Control (QA/QC) program. A copy of our Quality Assurance Plan (QAP), which outlines this program, is available at your request. The laboratory certification numbers are AK00971 (DW Chemistry & Microbiology) & UST-005 (CS) for ADEC and 2944.01 for DOD ELAP/ISO17025 (RCRA methods: 1020B, 1311, 3010A, 3050B, 3520C, 3550C, 5030B, 5035A, 6020A, 7470A, 7471B, 8021B, 8082A, 8260B, 8270D, 8270D-SIM, 9040C, 9045D, 9056A, 9060A, AK101 and AK102/103). Except as specifically noted, all statements and data in this report are in conformance to the provisions set forth by the SGS QAP and, when applicable, other regulatory authorities.

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

*	The analyte has exceeded allowable regulatory or control limits.
!	Surrogate out of control limits.
B	Indicates the analyte is found in a blank associated with the sample.
CCV	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.

SGS North America Inc. 200 West Potter Drive, Anchorage, AK 99518
t 907.562.2343 f 907.561.5301 www.us.sgs.com

Sample Summary

Client Sample ID	Lab Sample ID	Collected	Received	Matrix
Holding Tank #1	1157839001	04/27/2015	04/29/2015	Water (Surface, Eff., Ground)
Holding Tank #10	1157839002	04/27/2015	04/29/2015	Water (Surface, Eff., Ground)
Holding Tank #2	1157839003	04/27/2015	04/29/2015	Water (Surface, Eff., Ground)
Post-trmt Tank #1	1157839004	04/27/2015	04/29/2015	Water (Surface, Eff., Ground)
Post-trmt Tank #10	1157839005	04/27/2015	04/29/2015	Water (Surface, Eff., Ground)
Post-trmt Tank #2	1157839006	04/27/2015	04/29/2015	Water (Surface, Eff., Ground)
Trip Blank	1157839007	04/27/2015	04/29/2015	Water (Surface, Eff., Ground)

Method	Method Description
8270D SIMS (PAH)	8270 PAH SIM Semi-Vol GC/MS Liq/Liq ext.
AK101	AK101/8021 Combo.
SW8021B	AK101/8021 Combo.
AK102	DRO Low Volume (W)

SGS North America Inc.
200 West Potter Drive, Anchorage, AK 99518
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Detectable Results Summary

Client Sample ID: **Holding Tank #1**
Lab Sample ID: 1157839001

	Parameter	Result	Units
Polynuclear Aromatics GC/MS	1-Methylnaphthalene	2.39	ug/L
	2-Methylnaphthalene	5.03	ug/L
	Fluorene	0.0921	ug/L
	Naphthalene	2.51	ug/L
	Phenanthrene	0.0467J	ug/L
Semivolatile Organic Fuels	Diesel Range Organics	1.18	mg/L
Volatile Fuels	Benzene	9.23	ug/L
	Ethylbenzene	20.3	ug/L
	Gasoline Range Organics	0.651	mg/L
	o-Xylene	52.9	ug/L
	P & M -Xylene	75.7	ug/L
	Toluene	73.5	ug/L

Client Sample ID: **Holding Tank #10**
Lab Sample ID: 1157839002

	Parameter	Result	Units
Polynuclear Aromatics GC/MS	1-Methylnaphthalene	2.17	ug/L
	2-Methylnaphthalene	2.51	ug/L
	Fluorene	0.0831	ug/L
	Naphthalene	2.28	ug/L
	Phenanthrene	0.0401J	ug/L
Semivolatile Organic Fuels	Diesel Range Organics	7.99	mg/L
Volatile Fuels	Benzene	8.99	ug/L
	Ethylbenzene	20.1	ug/L
	Gasoline Range Organics	0.681	mg/L
	o-Xylene	51.7	ug/L
	P & M -Xylene	73.8	ug/L
	Toluene	73.0	ug/L

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Detectable Results Summary

Client Sample ID: **Holding Tank #2**
Lab Sample ID: 1157839003

	Parameter	Result	Units
Polynuclear Aromatics GC/MS	1-Methylnaphthalene	12.4	ug/L
	2-Methylnaphthalene	11.7	ug/L
	Acenaphthene	2.98	ug/L
	Benzo[b]Fluoranthene	0.211J	ug/L
	Dibenzo[a,h]anthracene	0.367	ug/L
	Fluorene	0.393	ug/L
	Indeno[1,2,3-c,d] pyrene	0.309	ug/L
	Naphthalene	39.8	ug/L
	Phenanthrene	0.0854J	ug/L
	Pyrene	0.148J	ug/L
Semivolatile Organic Fuels	Diesel Range Organics	742	mg/L
Volatile Fuels	Benzene	25.7	ug/L
	Ethylbenzene	290	ug/L
	Gasoline Range Organics	37.5	mg/L
	o-Xylene	551	ug/L
	P & M -Xylene	975	ug/L
	Toluene	302	ug/L

Client Sample ID: **Post-trmt Tank #1**
Lab Sample ID: 1157839004

	Parameter	Result	Units
Polynuclear Aromatics GC/MS	1-Methylnaphthalene	0.100	ug/L
	2-Methylnaphthalene	0.0972	ug/L
	Acenaphthylene	0.0226J	ug/L
	Benzo(a)Anthracene	0.0512J	ug/L
	Benzo[a]pyrene	0.0261J	ug/L
	Benzo[b]Fluoranthene	0.141	ug/L
	Benzo[g,h,i]perylene	0.0383J	ug/L
	Chrysene	0.0940	ug/L
	Fluoranthene	0.208	ug/L
	Fluorene	0.0204J	ug/L
	Indeno[1,2,3-c,d] pyrene	0.0430J	ug/L
	Naphthalene	0.119	ug/L
	Phenanthrene	0.305	ug/L
	Pyrene	0.111	ug/L
Semivolatile Organic Fuels	Diesel Range Organics	5.47	mg/L
Volatile Fuels	Gasoline Range Organics	0.0611J	mg/L
	o-Xylene	0.660J	ug/L
	P & M -Xylene	1.21J	ug/L
	Toluene	0.480J	ug/L

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Detectable Results Summary

Client Sample ID: **Post-trmt Tank #10**
Lab Sample ID: 1157839005

	Parameter	Result	Units
Polynuclear Aromatics GC/MS	1-Methylnaphthalene	0.0959	ug/L
	2-Methylnaphthalene	0.0955	ug/L
	Acenaphthylene	0.0344J	ug/L
	Anthracene	0.0198J	ug/L
	Benzo(a)Anthracene	0.0863	ug/L
	Benzo[a]pyrene	0.0476J	ug/L
	Benzo[b]Fluoranthene	0.256	ug/L
	Benzo[g,h,i]perylene	0.0636	ug/L
	Chrysene	0.157	ug/L
	Fluoranthene	0.382	ug/L
	Fluorene	0.0343J	ug/L
	Indeno[1,2,3-c,d] pyrene	0.0730	ug/L
	Naphthalene	0.144	ug/L
	Phenanthrene	0.566	ug/L
	Pyrene	0.205	ug/L
Semivolatile Organic Fuels	Diesel Range Organics	0.964	mg/L
Volatile Fuels	Gasoline Range Organics	0.0552J	mg/L
	o-Xylene	0.580J	ug/L
	P & M -Xylene	1.15J	ug/L
	Toluene	0.480J	ug/L

Client Sample ID: **Post-trmt Tank #2**
Lab Sample ID: 1157839006

	Parameter	Result	Units
Polynuclear Aromatics GC/MS	1-Methylnaphthalene	0.407	ug/L
	2-Methylnaphthalene	0.301	ug/L
	Acenaphthene	0.163	ug/L
	Naphthalene	0.656	ug/L
Semivolatile Organic Fuels	Diesel Range Organics	7.15	mg/L
Volatile Fuels	Benzene	0.260J	ug/L
	Ethylbenzene	1.17	ug/L
	Gasoline Range Organics	0.285	mg/L
	o-Xylene	1.29	ug/L
	P & M -Xylene	3.24	ug/L
	Toluene	0.680J	ug/L

Client Sample ID: **Trip Blank**
Lab Sample ID: 1157839007

	Parameter	Result	Units
Volatile Fuels	P & M -Xylene	1.05J	ug/L
	Toluene	0.490J	ug/L

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Results of **Holding Tank #1**

Client Sample ID: **Holding Tank #1**
Client Project ID: **31-1-11765-002 NSB Shop #2**
Lab Sample ID: 1157839001
Lab Project ID: 1157839

Collection Date: 04/27/15 11:30
Received Date: 04/29/15 08:50
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	2.39		0.0549	0.0165	ug/L	1		04/30/15 18:18
2-Methylnaphthalene	5.03		0.275	0.0824	ug/L	5		05/01/15 00:06
Acenaphthene	0.0274	U	0.0549	0.0165	ug/L	1		04/30/15 18:18
Acenaphthylene	0.0274	U	0.0549	0.0165	ug/L	1		04/30/15 18:18
Anthracene	0.0274	U	0.0549	0.0165	ug/L	1		04/30/15 18:18
Benzo(a)Anthracene	0.0274	U	0.0549	0.0165	ug/L	1		04/30/15 18:18
Benzo[a]pyrene	0.0274	U	0.0549	0.0165	ug/L	1		04/30/15 18:18
Benzo[b]Fluoranthene	0.0274	U	0.0549	0.0165	ug/L	1		04/30/15 18:18
Benzo[g,h,i]perylene	0.0274	U	0.0549	0.0165	ug/L	1		04/30/15 18:18
Benzo[k]fluoranthene	0.0274	U	0.0549	0.0165	ug/L	1		04/30/15 18:18
Chrysene	0.0274	U	0.0549	0.0165	ug/L	1		04/30/15 18:18
Dibenzo[a,h]anthracene	0.0274	U	0.0549	0.0165	ug/L	1		04/30/15 18:18
Fluoranthene	0.0274	U	0.0549	0.0165	ug/L	1		04/30/15 18:18
Fluorene	0.0921		0.0549	0.0165	ug/L	1		04/30/15 18:18
Indeno[1,2,3-c,d] pyrene	0.0274	U	0.0549	0.0165	ug/L	1		04/30/15 18:18
Naphthalene	2.51		0.110	0.0341	ug/L	1		04/30/15 18:18
Phenanthrene	0.0467	J	0.0549	0.0165	ug/L	1		04/30/15 18:18
Pyrene	0.0274	U	0.0549	0.0165	ug/L	1		04/30/15 18:18
Surrogates								
2-Fluorobiphenyl	37.9	*	50-110		%	1		04/30/15 18:18
Terphenyl-d14	73		50-135		%	1		04/30/15 18:18

Batch Information

Analytical Batch: XMS8633
Analytical Method: 8270D SIMS (PAH)
Analyst: SP
Analytical Date/Time: 04/30/15 18:18
Container ID: 1157839001-F

Prep Batch: XXX32962
Prep Method: SW3520C
Prep Date/Time: 04/30/15 10:50
Prep Initial Wt./Vol.: 910 mL
Prep Extract Vol: 1 mL

Analytical Batch: XMS8634
Analytical Method: 8270D SIMS (PAH)
Analyst: SP
Analytical Date/Time: 05/01/15 00:06
Container ID: 1157839001-F

Prep Batch: XXX32962
Prep Method: SW3520C
Prep Date/Time: 04/30/15 10:50
Prep Initial Wt./Vol.: 910 mL
Prep Extract Vol: 1 mL

Print Date: 05/01/2015 4:39:09PM

J flagging is activated

Results of **Holding Tank #1**

Client Sample ID: **Holding Tank #1**
Client Project ID: **31-1-11765-002 NSB Shop #2**
Lab Sample ID: 1157839001
Lab Project ID: 1157839

Collection Date: 04/27/15 11:30
Received Date: 04/29/15 08:50
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	1.18		0.628	0.188	mg/L	1		04/30/15 18:10
Surrogates								
5a Androstane	81.3		50-150		%	1		04/30/15 18:10

Batch Information

Analytical Batch: XFC11807
Analytical Method: AK102
Analyst: NLL
Analytical Date/Time: 04/30/15 18:10
Container ID: 1157839001-D

Prep Batch: XXX32963
Prep Method: SW3520C
Prep Date/Time: 04/30/15 10:50
Prep Initial Wt./Vol.: 239 mL
Prep Extract Vol: 1 mL

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Results of **Holding Tank #1**

Client Sample ID: **Holding Tank #1**
Client Project ID: **31-1-11765-002 NSB Shop #2**
Lab Sample ID: 1157839001
Lab Project ID: 1157839

Collection Date: 04/27/15 11:30
Received Date: 04/29/15 08:50
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.651		0.100	0.0310	mg/L	1		04/30/15 12:23
Surrogates								
4-Bromofluorobenzene	102		50-150		%	1		04/30/15 12:23

Batch Information

Analytical Batch: VFC12361
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 04/30/15 12:23
Container ID: 1157839001-A

Prep Batch: VXX27146
Prep Method: SW5030B
Prep Date/Time: 04/30/15 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	9.23		0.500	0.150	ug/L	1		04/30/15 12:23
Ethylbenzene	20.3		1.00	0.310	ug/L	1		04/30/15 12:23
o-Xylene	52.9		1.00	0.310	ug/L	1		04/30/15 12:23
P & M -Xylene	75.7		2.00	0.620	ug/L	1		04/30/15 12:23
Toluene	73.5		1.00	0.310	ug/L	1		04/30/15 12:23
Surrogates								
1,4-Difluorobenzene	92.2		77-115		%	1		04/30/15 12:23

Batch Information

Analytical Batch: VFC12361
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 04/30/15 12:23
Container ID: 1157839001-A

Prep Batch: VXX27146
Prep Method: SW5030B
Prep Date/Time: 04/30/15 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **Holding Tank #10**

Client Sample ID: **Holding Tank #10**
Client Project ID: **31-1-11765-002 NSB Shop #2**
Lab Sample ID: 1157839002
Lab Project ID: 1157839

Collection Date: 04/27/15 11:25
Received Date: 04/29/15 08:50
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	2.17		0.0532	0.0160	ug/L	1		04/30/15 18:35
2-Methylnaphthalene	2.51		0.0532	0.0160	ug/L	1		04/30/15 18:35
Acenaphthene	0.0266	U	0.0532	0.0160	ug/L	1		04/30/15 18:35
Acenaphthylene	0.0266	U	0.0532	0.0160	ug/L	1		04/30/15 18:35
Anthracene	0.0266	U	0.0532	0.0160	ug/L	1		04/30/15 18:35
Benzo(a)Anthracene	0.0266	U	0.0532	0.0160	ug/L	1		04/30/15 18:35
Benzo[a]pyrene	0.0266	U	0.0532	0.0160	ug/L	1		04/30/15 18:35
Benzo[b]Fluoranthene	0.0266	U	0.0532	0.0160	ug/L	1		04/30/15 18:35
Benzo[g,h,i]perylene	0.0266	U	0.0532	0.0160	ug/L	1		04/30/15 18:35
Benzo[k]fluoranthene	0.0266	U	0.0532	0.0160	ug/L	1		04/30/15 18:35
Chrysene	0.0266	U	0.0532	0.0160	ug/L	1		04/30/15 18:35
Dibenzo[a,h]anthracene	0.0266	U	0.0532	0.0160	ug/L	1		04/30/15 18:35
Fluoranthene	0.0266	U	0.0532	0.0160	ug/L	1		04/30/15 18:35
Fluorene	0.0831		0.0532	0.0160	ug/L	1		04/30/15 18:35
Indeno[1,2,3-c,d] pyrene	0.0266	U	0.0532	0.0160	ug/L	1		04/30/15 18:35
Naphthalene	2.28		0.106	0.0330	ug/L	1		04/30/15 18:35
Phenanthrene	0.0401	J	0.0532	0.0160	ug/L	1		04/30/15 18:35
Pyrene	0.0266	U	0.0532	0.0160	ug/L	1		04/30/15 18:35
Surrogates								
2-Fluorobiphenyl	43.8	*	50-110		%	1		04/30/15 18:35
Terphenyl-d14	84		50-135		%	1		04/30/15 18:35

Batch Information

Analytical Batch: XMS8633
Analytical Method: 8270D SIMS (PAH)
Analyst: SP
Analytical Date/Time: 04/30/15 18:35
Container ID: 1157839002-F

Prep Batch: XXX32962
Prep Method: SW3520C
Prep Date/Time: 04/30/15 10:50
Prep Initial Wt./Vol.: 940 mL
Prep Extract Vol: 1 mL

Results of **Holding Tank #10**

Client Sample ID: **Holding Tank #10**
Client Project ID: **31-1-11765-002 NSB Shop #2**
Lab Sample ID: 1157839002
Lab Project ID: 1157839

Collection Date: 04/27/15 11:25
Received Date: 04/29/15 08:50
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	7.99		0.593	0.178	mg/L	1		04/30/15 18:31
Surrogates								
5a Androstane	76.8		50-150		%	1		04/30/15 18:31

Batch Information

Analytical Batch: XFC11807
Analytical Method: AK102
Analyst: NLL
Analytical Date/Time: 04/30/15 18:31
Container ID: 1157839002-D

Prep Batch: XXX32963
Prep Method: SW3520C
Prep Date/Time: 04/30/15 10:50
Prep Initial Wt./Vol.: 253 mL
Prep Extract Vol: 1 mL

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Results of **Holding Tank #10**

Client Sample ID: **Holding Tank #10**
Client Project ID: **31-1-11765-002 NSB Shop #2**
Lab Sample ID: 1157839002
Lab Project ID: 1157839

Collection Date: 04/27/15 11:25
Received Date: 04/29/15 08:50
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.681		0.100	0.0310	mg/L	1		04/30/15 12:42
Surrogates								
4-Bromofluorobenzene	107		50-150		%	1		04/30/15 12:42

Batch Information

Analytical Batch: VFC12361
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 04/30/15 12:42
Container ID: 1157839002-A

Prep Batch: VXX27146
Prep Method: SW5030B
Prep Date/Time: 04/30/15 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	8.99		0.500	0.150	ug/L	1		04/30/15 12:42
Ethylbenzene	20.1		1.00	0.310	ug/L	1		04/30/15 12:42
o-Xylene	51.7		1.00	0.310	ug/L	1		04/30/15 12:42
P & M -Xylene	73.8		2.00	0.620	ug/L	1		04/30/15 12:42
Toluene	73.0		1.00	0.310	ug/L	1		04/30/15 12:42
Surrogates								
1,4-Difluorobenzene	89.3		77-115		%	1		04/30/15 12:42

Batch Information

Analytical Batch: VFC12361
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 04/30/15 12:42
Container ID: 1157839002-A

Prep Batch: VXX27146
Prep Method: SW5030B
Prep Date/Time: 04/30/15 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **Holding Tank #2**

Client Sample ID: **Holding Tank #2**
Client Project ID: **31-1-11765-002 NSB Shop #2**
Lab Sample ID: 1157839003
Lab Project ID: 1157839

Collection Date: 04/27/15 13:30
Received Date: 04/29/15 08:50
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	12.4		0.258	0.0773	ug/L	5		04/30/15 20:14
2-Methylnaphthalene	11.7		0.258	0.0773	ug/L	5		04/30/15 20:14
Acenaphthene	2.98		0.258	0.0773	ug/L	5		04/30/15 20:14
Acenaphthylene	0.129	U	0.258	0.0773	ug/L	5		04/30/15 20:14
Anthracene	0.129	U	0.258	0.0773	ug/L	5		04/30/15 20:14
Benzo(a)Anthracene	0.129	U	0.258	0.0773	ug/L	5		04/30/15 20:14
Benzo[a]pyrene	0.129	U	0.258	0.0773	ug/L	5		04/30/15 20:14
Benzo[b]Fluoranthene	0.211	J	0.258	0.0773	ug/L	5		04/30/15 20:14
Benzo[g,h,i]perylene	0.129	U	0.258	0.0773	ug/L	5		04/30/15 20:14
Benzo[k]fluoranthene	0.129	U	0.258	0.0773	ug/L	5		04/30/15 20:14
Chrysene	0.129	U	0.258	0.0773	ug/L	5		04/30/15 20:14
Dibenzo[a,h]anthracene	0.367		0.258	0.0773	ug/L	5		04/30/15 20:14
Fluoranthene	0.129	U	0.258	0.0773	ug/L	5		04/30/15 20:14
Fluorene	0.393		0.258	0.0773	ug/L	5		04/30/15 20:14
Indeno[1,2,3-c,d] pyrene	0.309		0.258	0.0773	ug/L	5		04/30/15 20:14
Naphthalene	39.8		5.15	1.60	ug/L	50		04/30/15 18:51
Phenanthrene	0.0854	J	0.258	0.0773	ug/L	5		04/30/15 20:14
Pyrene	0.148	J	0.258	0.0773	ug/L	5		04/30/15 20:14
Surrogates								
2-Fluorobiphenyl	273	*	50-110		%	5		04/30/15 20:14
Terphenyl-d14	81.5		50-135		%	5		04/30/15 20:14

Batch Information

Analytical Batch: XMS8633
Analytical Method: 8270D SIMS (PAH)
Analyst: SP
Analytical Date/Time: 04/30/15 20:14
Container ID: 1157839003-F

Prep Batch: XXX32962
Prep Method: SW3520C
Prep Date/Time: 04/30/15 10:50
Prep Initial Wt./Vol.: 970 mL
Prep Extract Vol: 1 mL

Print Date: 05/01/2015 4:39:09PM

J flagging is activated

Results of **Holding Tank #2**

Client Sample ID: **Holding Tank #2**
Client Project ID: **31-1-11765-002 NSB Shop #2**
Lab Sample ID: 1157839003
Lab Project ID: 1157839

Collection Date: 04/27/15 13:30
Received Date: 04/29/15 08:50
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	742		6.00	1.80	mg/L	10		04/30/15 22:35
Surrogates								
5a Androstane	85		50-150		%	10		04/30/15 22:35

Batch Information

Analytical Batch: XFC11807
Analytical Method: AK102
Analyst: NLL
Analytical Date/Time: 04/30/15 22:35
Container ID: 1157839003-D

Prep Batch: XXX32963
Prep Method: SW3520C
Prep Date/Time: 04/30/15 10:50
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Print Date: 05/01/2015 4:39:09PM

J flagging is activated

Results of **Holding Tank #2**

Client Sample ID: **Holding Tank #2**
Client Project ID: **31-1-11765-002 NSB Shop #2**
Lab Sample ID: 1157839003
Lab Project ID: 1157839

Collection Date: 04/27/15 13:30
Received Date: 04/29/15 08:50
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	37.5		10.0	3.10	mg/L	100		04/30/15 17:16
Surrogates								
4-Bromofluorobenzene	117		50-150		%	100		04/30/15 17:16

Batch Information

Analytical Batch: VFC12361
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 04/30/15 17:16
Container ID: 1157839003-A

Prep Batch: VXX27146
Prep Method: SW5030B
Prep Date/Time: 04/30/15 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	25.7		5.00	1.50	ug/L	10		04/30/15 15:18
Ethylbenzene	290		10.0	3.10	ug/L	10		04/30/15 15:18
o-Xylene	551		10.0	3.10	ug/L	10		04/30/15 15:18
P & M -Xylene	975		20.0	6.20	ug/L	10		04/30/15 15:18
Toluene	302		10.0	3.10	ug/L	10		04/30/15 15:18
Surrogates								
1,4-Difluorobenzene	93.3		77-115		%	10		04/30/15 15:18

Batch Information

Analytical Batch: VFC12361
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 04/30/15 15:18
Container ID: 1157839003-A

Prep Batch: VXX27146
Prep Method: SW5030B
Prep Date/Time: 04/30/15 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **Post-trmt Tank #1**

Client Sample ID: **Post-trmt Tank #1**
Client Project ID: **31-1-11765-002 NSB Shop #2**
Lab Sample ID: 1157839004
Lab Project ID: 1157839

Collection Date: 04/27/15 18:10
Received Date: 04/29/15 08:50
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	0.100		0.0524	0.0157	ug/L	1		04/30/15 19:08
2-Methylnaphthalene	0.0972		0.0524	0.0157	ug/L	1		04/30/15 19:08
Acenaphthene	0.0262	U	0.0524	0.0157	ug/L	1		04/30/15 19:08
Acenaphthylene	0.0226	J	0.0524	0.0157	ug/L	1		04/30/15 19:08
Anthracene	0.0262	U	0.0524	0.0157	ug/L	1		04/30/15 19:08
Benzo(a)Anthracene	0.0512	J	0.0524	0.0157	ug/L	1		04/30/15 19:08
Benzo[a]pyrene	0.0261	J	0.0524	0.0157	ug/L	1		04/30/15 19:08
Benzo[b]Fluoranthene	0.141		0.0524	0.0157	ug/L	1		04/30/15 19:08
Benzo[g,h,i]perylene	0.0383	J	0.0524	0.0157	ug/L	1		04/30/15 19:08
Benzo[k]fluoranthene	0.0262	U	0.0524	0.0157	ug/L	1		04/30/15 19:08
Chrysene	0.0940		0.0524	0.0157	ug/L	1		04/30/15 19:08
Dibenzo[a,h]anthracene	0.0262	U	0.0524	0.0157	ug/L	1		04/30/15 19:08
Fluoranthene	0.208		0.0524	0.0157	ug/L	1		04/30/15 19:08
Fluorene	0.0204	J	0.0524	0.0157	ug/L	1		04/30/15 19:08
Indeno[1,2,3-c,d] pyrene	0.0430	J	0.0524	0.0157	ug/L	1		04/30/15 19:08
Naphthalene	0.119		0.105	0.0325	ug/L	1		04/30/15 19:08
Phenanthrene	0.305		0.0524	0.0157	ug/L	1		04/30/15 19:08
Pyrene	0.111		0.0524	0.0157	ug/L	1		04/30/15 19:08
Surrogates								
2-Fluorobiphenyl	55.5		50-110		%	1		04/30/15 19:08
Terphenyl-d14	78		50-135		%	1		04/30/15 19:08

Batch Information

Analytical Batch: XMS8633
Analytical Method: 8270D SIMS (PAH)
Analyst: SP
Analytical Date/Time: 04/30/15 19:08
Container ID: 1157839004-F

Prep Batch: XXX32962
Prep Method: SW3520C
Prep Date/Time: 04/30/15 10:50
Prep Initial Wt./Vol.: 955 mL
Prep Extract Vol: 1 mL

Results of **Post-trmt Tank #1**

Client Sample ID: **Post-trmt Tank #1**
Client Project ID: **31-1-11765-002 NSB Shop #2**
Lab Sample ID: 1157839004
Lab Project ID: 1157839

Collection Date: 04/27/15 18:10
Received Date: 04/29/15 08:50
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	5.47		0.600	0.180	mg/L	1		04/30/15 19:12
Surrogates								
5a Androstane	74.3		50-150		%	1		04/30/15 19:12

Batch Information

Analytical Batch: XFC11807
Analytical Method: AK102
Analyst: NLL
Analytical Date/Time: 04/30/15 19:12
Container ID: 1157839004-D

Prep Batch: XXX32963
Prep Method: SW3520C
Prep Date/Time: 04/30/15 10:50
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Results of **Post-trmt Tank #1**

Client Sample ID: **Post-trmt Tank #1**
Client Project ID: **31-1-11765-002 NSB Shop #2**
Lab Sample ID: 1157839004
Lab Project ID: 1157839

Collection Date: 04/27/15 18:10
Received Date: 04/29/15 08:50
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.0611	J	0.100	0.0310	mg/L	1		04/30/15 14:39
Surrogates								
4-Bromofluorobenzene	88.6		50-150		%	1		04/30/15 14:39

Batch Information

Analytical Batch: VFC12361
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 04/30/15 14:39
Container ID: 1157839004-B

Prep Batch: VXX27146
Prep Method: SW5030B
Prep Date/Time: 04/30/15 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.250	U	0.500	0.150	ug/L	1		04/30/15 14:39
Ethylbenzene	0.500	U	1.00	0.310	ug/L	1		04/30/15 14:39
o-Xylene	0.660	J	1.00	0.310	ug/L	1		04/30/15 14:39
P & M -Xylene	1.21	J	2.00	0.620	ug/L	1		04/30/15 14:39
Toluene	0.480	J	1.00	0.310	ug/L	1		04/30/15 14:39
Surrogates								
1,4-Difluorobenzene	94.9		77-115		%	1		04/30/15 14:39

Batch Information

Analytical Batch: VFC12361
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 04/30/15 14:39
Container ID: 1157839004-B

Prep Batch: VXX27146
Prep Method: SW5030B
Prep Date/Time: 04/30/15 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 05/01/2015 4:39:09PM

J flagging is activated

Results of **Post-trmt Tank #10**

Client Sample ID: **Post-trmt Tank #10**
Client Project ID: **31-1-11765-002 NSB Shop #2**
Lab Sample ID: 1157839005
Lab Project ID: 1157839

Collection Date: 04/27/15 18:05
Received Date: 04/29/15 08:50
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	0.0959		0.0515	0.0155	ug/L	1		04/30/15 19:24
2-Methylnaphthalene	0.0955		0.0515	0.0155	ug/L	1		04/30/15 19:24
Acenaphthene	0.0257	U	0.0515	0.0155	ug/L	1		04/30/15 19:24
Acenaphthylene	0.0344	J	0.0515	0.0155	ug/L	1		04/30/15 19:24
Anthracene	0.0198	J	0.0515	0.0155	ug/L	1		04/30/15 19:24
Benzo(a)Anthracene	0.0863		0.0515	0.0155	ug/L	1		04/30/15 19:24
Benzo[a]pyrene	0.0476	J	0.0515	0.0155	ug/L	1		04/30/15 19:24
Benzo[b]Fluoranthene	0.256		0.0515	0.0155	ug/L	1		04/30/15 19:24
Benzo[g,h,i]perylene	0.0636		0.0515	0.0155	ug/L	1		04/30/15 19:24
Benzo[k]fluoranthene	0.0257	U	0.0515	0.0155	ug/L	1		04/30/15 19:24
Chrysene	0.157		0.0515	0.0155	ug/L	1		04/30/15 19:24
Dibenzo[a,h]anthracene	0.0257	U	0.0515	0.0155	ug/L	1		04/30/15 19:24
Fluoranthene	0.382		0.0515	0.0155	ug/L	1		04/30/15 19:24
Fluorene	0.0343	J	0.0515	0.0155	ug/L	1		04/30/15 19:24
Indeno[1,2,3-c,d] pyrene	0.0730		0.0515	0.0155	ug/L	1		04/30/15 19:24
Naphthalene	0.144		0.103	0.0320	ug/L	1		04/30/15 19:24
Phenanthrene	0.566		0.0515	0.0155	ug/L	1		04/30/15 19:24
Pyrene	0.205		0.0515	0.0155	ug/L	1		04/30/15 19:24
Surrogates								
2-Fluorobiphenyl	55.7		50-110		%	1		04/30/15 19:24
Terphenyl-d14	80.5		50-135		%	1		04/30/15 19:24

Batch Information

Analytical Batch: XMS8633
Analytical Method: 8270D SIMS (PAH)
Analyst: SP
Analytical Date/Time: 04/30/15 19:24
Container ID: 1157839005-F

Prep Batch: XXX32962
Prep Method: SW3520C
Prep Date/Time: 04/30/15 10:50
Prep Initial Wt./Vol.: 970 mL
Prep Extract Vol: 1 mL

Print Date: 05/01/2015 4:39:09PM

J flagging is activated

Results of **Post-trmt Tank #10**

Client Sample ID: **Post-trmt Tank #10**
Client Project ID: **31-1-11765-002 NSB Shop #2**
Lab Sample ID: 1157839005
Lab Project ID: 1157839

Collection Date: 04/27/15 18:05
Received Date: 04/29/15 08:50
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	0.964		0.600	0.180	mg/L	1		04/30/15 19:32
Surrogates								
5a Androstane	84		50-150		%	1		04/30/15 19:32

Batch Information

Analytical Batch: XFC11807
Analytical Method: AK102
Analyst: NLL
Analytical Date/Time: 04/30/15 19:32
Container ID: 1157839005-D

Prep Batch: XXX32963
Prep Method: SW3520C
Prep Date/Time: 04/30/15 10:50
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Results of **Post-trmt Tank #10**

Client Sample ID: **Post-trmt Tank #10**
Client Project ID: **31-1-11765-002 NSB Shop #2**
Lab Sample ID: 1157839005
Lab Project ID: 1157839

Collection Date: 04/27/15 18:05
Received Date: 04/29/15 08:50
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.0552	J	0.100	0.0310	mg/L	1		04/30/15 14:59
Surrogates								
4-Bromofluorobenzene	89.1		50-150		%	1		04/30/15 14:59

Batch Information

Analytical Batch: VFC12361
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 04/30/15 14:59
Container ID: 1157839005-B

Prep Batch: VXX27146
Prep Method: SW5030B
Prep Date/Time: 04/30/15 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.250	U	0.500	0.150	ug/L	1		04/30/15 14:59
Ethylbenzene	0.500	U	1.00	0.310	ug/L	1		04/30/15 14:59
o-Xylene	0.580	J	1.00	0.310	ug/L	1		04/30/15 14:59
P & M -Xylene	1.15	J	2.00	0.620	ug/L	1		04/30/15 14:59
Toluene	0.480	J	1.00	0.310	ug/L	1		04/30/15 14:59
Surrogates								
1,4-Difluorobenzene	93.4		77-115		%	1		04/30/15 14:59

Batch Information

Analytical Batch: VFC12361
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 04/30/15 14:59
Container ID: 1157839005-B

Prep Batch: VXX27146
Prep Method: SW5030B
Prep Date/Time: 04/30/15 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **Post-trmt Tank #2**

Client Sample ID: **Post-trmt Tank #2**
Client Project ID: **31-1-11765-002 NSB Shop #2**
Lab Sample ID: 1157839006
Lab Project ID: 1157839

Collection Date: 04/27/15 19:40
Received Date: 04/29/15 08:50
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	0.407		0.0521	0.0156	ug/L	1		05/01/15 14:32
2-Methylnaphthalene	0.301		0.0521	0.0156	ug/L	1		05/01/15 14:32
Acenaphthene	0.163		0.0521	0.0156	ug/L	1		05/01/15 14:32
Acenaphthylene	0.0261	U	0.0521	0.0156	ug/L	1		05/01/15 14:32
Anthracene	0.0261	U	0.0521	0.0156	ug/L	1		05/01/15 14:32
Benzo(a)Anthracene	0.0261	U	0.0521	0.0156	ug/L	1		04/30/15 19:41
Benzo[a]pyrene	0.0261	U	0.0521	0.0156	ug/L	1		04/30/15 19:41
Benzo[b]Fluoranthene	0.0261	U	0.0521	0.0156	ug/L	1		04/30/15 19:41
Benzo[g,h,i]perylene	0.0261	U	0.0521	0.0156	ug/L	1		04/30/15 19:41
Benzo[k]fluoranthene	0.0261	U	0.0521	0.0156	ug/L	1		04/30/15 19:41
Chrysene	0.0261	U	0.0521	0.0156	ug/L	1		04/30/15 19:41
Dibenzo[a,h]anthracene	0.0261	U	0.0521	0.0156	ug/L	1		04/30/15 19:41
Fluoranthene	0.0261	U	0.0521	0.0156	ug/L	1		04/30/15 19:41
Fluorene	0.0261	U	0.0521	0.0156	ug/L	1		05/01/15 14:32
Indeno[1,2,3-c,d] pyrene	0.0261	U	0.0521	0.0156	ug/L	1		04/30/15 19:41
Naphthalene	0.656		0.104	0.0323	ug/L	1		05/01/15 14:32
Phenanthrene	0.0261	U	0.0521	0.0156	ug/L	1		05/01/15 14:32
Pyrene	0.0261	U	0.0521	0.0156	ug/L	1		04/30/15 19:41
Surrogates								
2-Fluorobiphenyl	70.1		50-110		%	1		05/01/15 14:32
Terphenyl-d14	84		50-135		%	1		04/30/15 19:41

Batch Information

Analytical Batch: XMS8633
Analytical Method: 8270D SIMS (PAH)
Analyst: SP
Analytical Date/Time: 04/30/15 19:41
Container ID: 1157839006-F

Prep Batch: XXX32962
Prep Method: SW3520C
Prep Date/Time: 04/30/15 10:50
Prep Initial Wt./Vol.: 960 mL
Prep Extract Vol: 1 mL

Analytical Batch: XMS8635
Analytical Method: 8270D SIMS (PAH)
Analyst: SP
Analytical Date/Time: 05/01/15 14:32
Container ID: 1157839006-F

Prep Batch: XXX32962
Prep Method: SW3520C
Prep Date/Time: 04/30/15 10:50
Prep Initial Wt./Vol.: 960 mL
Prep Extract Vol: 1 mL

Print Date: 05/01/2015 4:39:09PM

J flagging is activated

Results of **Post-trmt Tank #2**

Client Sample ID: **Post-trmt Tank #2**
Client Project ID: **31-1-11765-002 NSB Shop #2**
Lab Sample ID: 1157839006
Lab Project ID: 1157839

Collection Date: 04/27/15 19:40
Received Date: 04/29/15 08:50
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	7.15		0.600	0.180	mg/L	1		04/30/15 19:52
Surrogates								
5a Androstane	87.1		50-150		%	1		04/30/15 19:52

Batch Information

Analytical Batch: XFC11807
Analytical Method: AK102
Analyst: NLL
Analytical Date/Time: 04/30/15 19:52
Container ID: 1157839006-D

Prep Batch: XXX32963
Prep Method: SW3520C
Prep Date/Time: 04/30/15 10:50
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Results of **Post-trmt Tank #2**

Client Sample ID: **Post-trmt Tank #2**
Client Project ID: **31-1-11765-002 NSB Shop #2**
Lab Sample ID: 1157839006
Lab Project ID: 1157839

Collection Date: 04/27/15 19:40
Received Date: 04/29/15 08:50
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.285		0.100	0.0310	mg/L	1		04/30/15 14:00
Surrogates								
4-Bromofluorobenzene	117		50-150		%	1		04/30/15 14:00

Batch Information

Analytical Batch: VFC12361
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 04/30/15 14:00
Container ID: 1157839006-A

Prep Batch: VXX27146
Prep Method: SW5030B
Prep Date/Time: 04/30/15 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.260	J	0.500	0.150	ug/L	1		04/30/15 14:00
Ethylbenzene	1.17		1.00	0.310	ug/L	1		04/30/15 14:00
o-Xylene	1.29		1.00	0.310	ug/L	1		04/30/15 14:00
P & M -Xylene	3.24		2.00	0.620	ug/L	1		04/30/15 14:00
Toluene	0.680	J	1.00	0.310	ug/L	1		04/30/15 14:00
Surrogates								
1,4-Difluorobenzene	92.9		77-115		%	1		04/30/15 14:00

Batch Information

Analytical Batch: VFC12361
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 04/30/15 14:00
Container ID: 1157839006-A

Prep Batch: VXX27146
Prep Method: SW5030B
Prep Date/Time: 04/30/15 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **Trip Blank**

Client Sample ID: **Trip Blank**
Client Project ID: **31-1-11765-002 NSB Shop #2**
Lab Sample ID: 1157839007
Lab Project ID: 1157839

Collection Date: 04/27/15 11:30
Received Date: 04/29/15 08:50
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.0500	U	0.100	0.0310	mg/L	1		04/30/15 11:24
Surrogates								
4-Bromofluorobenzene	90.6		50-150		%	1		04/30/15 11:24

Batch Information

Analytical Batch: VFC12361
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 04/30/15 11:24
Container ID: 1157839007-A

Prep Batch: VXX27146
Prep Method: SW5030B
Prep Date/Time: 04/30/15 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.250	U	0.500	0.150	ug/L	1		04/30/15 11:24
Ethylbenzene	0.500	U	1.00	0.310	ug/L	1		04/30/15 11:24
o-Xylene	0.500	U	1.00	0.310	ug/L	1		04/30/15 11:24
P & M -Xylene	1.05	J	2.00	0.620	ug/L	1		04/30/15 11:24
Toluene	0.490	J	1.00	0.310	ug/L	1		04/30/15 11:24
Surrogates								
1,4-Difluorobenzene	93		77-115		%	1		04/30/15 11:24

Batch Information

Analytical Batch: VFC12361
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 04/30/15 11:24
Container ID: 1157839007-A

Prep Batch: VXX27146
Prep Method: SW5030B
Prep Date/Time: 04/30/15 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Method Blank

Blank ID: MB for HBN 1707808 [VXX/27146]
Blank Lab ID: 1262038

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1157839001, 1157839002, 1157839003, 1157839004, 1157839005, 1157839006, 1157839007

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	0.0500U	0.100	0.0310	mg/L
Surrogates				
4-Bromofluorobenzene	92.2	50-150		%

Batch Information

Analytical Batch: VFC12361
Analytical Method: AK101
Instrument: Agilent 7890 PID/FID
Analyst: ST
Analytical Date/Time: 4/30/2015 10:06:00AM

Prep Batch: VXX27146
Prep Method: SW5030B
Prep Date/Time: 4/30/2015 8:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1157839 [VXX27146]
Blank Spike Lab ID: 1262041
Date Analyzed: 04/30/2015 11:05

Spike Duplicate ID: LCSD for HBN 1157839 [VXX27146]
Spike Duplicate Lab ID: 1262042
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1157839001, 1157839002, 1157839003, 1157839004, 1157839005, 1157839006, 1157839007

Results by **AK101**

	Blank Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	1.00	0.949	95	1.00	0.962	96	(60-120)	1.30	(< 20)
Surrogates									
4-Bromofluorobenzene	0.0500	97.6	98	0.0500	96.3	96	(50-150)	1.40	

Batch Information

Analytical Batch: **VFC12361**
Analytical Method: **AK101**
Instrument: **Agilent 7890 PID/FID**
Analyst: **ST**

Prep Batch: **VXX27146**
Prep Method: **SW5030B**
Prep Date/Time: **04/30/2015 08:00**
Spike Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1707808 [VXX/27146]
Blank Lab ID: 1262038

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1157839001, 1157839002, 1157839003, 1157839004, 1157839005, 1157839006, 1157839007

Results by **SW8021B**

Parameter	Results	LOQ/CL	DL	Units
Benzene	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				
1,4-Difluorobenzene	95.5	77-115		%

Batch Information

Analytical Batch: VFC12361
Analytical Method: SW8021B
Instrument: Agilent 7890 PID/FID
Analyst: ST
Analytical Date/Time: 4/30/2015 10:06:00AM

Prep Batch: VXX27146
Prep Method: SW5030B
Prep Date/Time: 4/30/2015 8:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 05/01/2015 4:39:14PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1157839 [VXX27146]
Blank Spike Lab ID: 1262039
Date Analyzed: 04/30/2015 10:45

Spike Duplicate ID: LCSD for HBN 1157839 [VXX27146]
Spike Duplicate Lab ID: 1262040
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1157839001, 1157839002, 1157839003, 1157839004, 1157839005, 1157839006, 1157839007

Results by **SW8021B**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	100	95.2	95	100	97.7	98	(80-120)	2.50	(< 20)
Ethylbenzene	100	104	104	100	109	109	(75-125)	4.10	(< 20)
o-Xylene	100	104	104	100	107	107	(80-120)	2.10	(< 20)
P & M -Xylene	200	209	104	200	215	107	(75-130)	2.90	(< 20)
Toluene	100	102	102	100	106	106	(75-120)	3.70	(< 20)
Surrogates									
1,4-Difluorobenzene	50	102	102	50	99.2	99	(77-115)	2.80	

Batch Information

Analytical Batch: **VFC12361**
Analytical Method: **SW8021B**
Instrument: **Agilent 7890 PID/FID**
Analyst: **ST**

Prep Batch: **VXX27146**
Prep Method: **SW5030B**
Prep Date/Time: **04/30/2015 08:00**
Spike Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1707726 [XXX/32962]
Blank Lab ID: 1261903

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1157839001, 1157839002, 1157839003, 1157839004, 1157839005, 1157839006

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

Parameter	Results	LOQ/CL	DL	Units
1-Methylnaphthalene	0.0250U	0.0500	0.0150	ug/L
2-Methylnaphthalene	0.0250U	0.0500	0.0150	ug/L
Acenaphthene	0.0250U	0.0500	0.0150	ug/L
Acenaphthylene	0.0250U	0.0500	0.0150	ug/L
Anthracene	0.0250U	0.0500	0.0150	ug/L
Benzo(a)Anthracene	0.0250U	0.0500	0.0150	ug/L
Benzo[a]pyrene	0.0250U	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	62.4	50-110		%
Terphenyl-d14	94.7	50-135		%

Batch Information

Analytical Batch: XMS8633
Analytical Method: 8270D SIMS (PAH)
Instrument: HP 6890/5973 MS SVQA
Analyst: SP
Analytical Date/Time: 4/30/2015 5:29:00PM

Prep Batch: XXX32962
Prep Method: SW3520C
Prep Date/Time: 4/30/2015 10:50:26AM
Prep Initial Wt./Vol.: 1000 mL
Prep Extract Vol: 1 mL

Print Date: 05/01/2015 4:39:19PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1157839 [XXX32962]
Blank Spike Lab ID: 1261904
Date Analyzed: 04/30/2015 17:45

Spike Duplicate ID: LCSD for HBN 1157839 [XXX32962]
Spike Duplicate Lab ID: 1261905
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1157839001, 1157839002, 1157839003, 1157839004, 1157839005, 1157839006

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

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
1-Methylnaphthalene	0.5	0.317	63	0.5	0.330	66	(47-107)	4.10	(< 30)
2-Methylnaphthalene	0.5	0.284	57	0.5	0.298	60	(45-105)	4.80	(< 30)
Acenaphthene	0.5	0.310	62	0.5	0.313	63	(45-110)	0.73	(< 30)
Acenaphthylene	0.5	0.326	65	0.5	0.324	65	(50-105)	0.59	(< 30)
Anthracene	0.5	0.284	57	0.5	0.291	58	(55-110)	2.30	(< 30)
Benzo(a)Anthracene	0.5	0.351	70	0.5	0.341	68	(55-110)	3.10	(< 30)
Benzo[a]pyrene	0.5	0.356	71	0.5	0.326	65	(55-110)	8.70	(< 30)
Benzo[b]Fluoranthene	0.5	0.359	72	0.5	0.345	69	(45-120)	3.90	(< 30)
Benzo[g,h,i]perylene	0.5	0.362	73	0.5	0.356	71	(40-125)	1.70	(< 30)
Benzo[k]fluoranthene	0.5	0.352	71	0.5	0.364	73	(45-125)	3.20	(< 30)
Chrysene	0.5	0.359	72	0.5	0.370	74	(55-110)	2.90	(< 30)
Dibenzo[a,h]anthracene	0.5	0.393	79	0.5	0.389	78	(40-125)	0.97	(< 30)
Fluoranthene	0.5	0.323	65	0.5	0.323	65	(55-115)	0.01	(< 30)
Fluorene	0.5	0.307	61	0.5	0.307	61	(50-110)	0.03	(< 30)
Indeno[1,2,3-c,d] pyrene	0.5	0.379	76	0.5	0.367	74	(45-125)	3.10	(< 30)
Naphthalene	0.5	0.302	61	0.5	0.311	62	(40-100)	2.90	(< 30)
Phenanthrene	0.5	0.292	59	0.5	0.287	57	(50-115)	1.90	(< 30)
Pyrene	0.5	0.314	63	0.5	0.311	62	(50-130)	0.77	(< 30)
Surrogates									
2-Fluorobiphenyl	0.5	59.5	60	0.5	59.7	60	(50-110)	0.22	
Terphenyl-d14	0.5	86.1	86	0.5	83.4	83	(50-135)	3.10	

Batch Information

Analytical Batch: **XMS8633**
Analytical Method: **8270D SIMS (PAH)**
Instrument: **HP 6890/5973 MS SVQA**
Analyst: **SP**

Prep Batch: **XXX32962**
Prep Method: **SW3520C**
Prep Date/Time: **04/30/2015 10:50**
Spike Init Wt./Vol.: 0.5 ug/L Extract Vol: 1 mL
Dupe Init Wt./Vol.: 0.5 ug/L Extract Vol: 1 mL

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Method Blank

Blank ID: MB for HBN 1707727 [XXX/32963]
Blank Lab ID: 1261906

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1157839001, 1157839002, 1157839003, 1157839004, 1157839005, 1157839006

Results by **AK102**

Parameter	Results	LOQ/CL	DL	Units
Diesel Range Organics	0.300U	0.600	0.180	mg/L
Surrogates				
5a Androstane	76	60-120		%

Batch Information

Analytical Batch: XFC11807
Analytical Method: AK102
Instrument: HP 7890A FID SV E F
Analyst: NLL
Analytical Date/Time: 4/30/2015 5:09:00PM

Prep Batch: XXX32963
Prep Method: SW3520C
Prep Date/Time: 4/30/2015 10:50:35AM
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1157839 [XXX32963]
Blank Spike Lab ID: 1261907
Date Analyzed: 04/30/2015 17:29

Spike Duplicate ID: LCSD for HBN 1157839 [XXX32963]
Spike Duplicate Lab ID: 1261908
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1157839001, 1157839002, 1157839003, 1157839004, 1157839005, 1157839006

Results by **AK102**

	Blank Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Diesel Range Organics	20	21.0	105	20	22.3	111	(75-125)	6.10	(< 20)
Surrogates									
5a Androstane	0.4	77.8	78	0.4	83	83	(60-120)	6.50	

Batch Information

Analytical Batch: **XFC11807**
Analytical Method: **AK102**
Instrument: **HP 7890A FID SV E F**
Analyst: **NLL**

Prep Batch: **XXX32963**
Prep Method: **SW3520C**
Prep Date/Time: **04/30/2015 10:50**
Spike Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL
Dupe Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL

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1157839

SHANNON & WILSON, INC. — CHAIN OF CUSTODY RECORD

Geotechnical and Environmental Consultants

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Laboratory SGS
Attn: Jen Dawkins

Analysis Parameters/Sample Container Description
(include preservative if used)

Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	BTEX 8021	GRO	DRO	PAH 8270			Total Number of Containers	Remarks/Matrix
Holding Tank #1	(1) A-G	11:30	4/27/15		X	X	X	X	X			7	Snowmelt water
Holding Tank #1	(2) A-G	11:25			X	X	X	X	X			7	Hydrocarbons
Holding Tank #2	(3) A-G	13:30			X	X	X	X	X			7	present
Post-trmt Tank 1	(4) A-G	18:10			X	X	X	X	X			7	
Post-trmt Tank 1	(5) A-G	18:05			X	X	X	X	X			7	
Post-trmt Tank 2	(6) A-G	19:40			X	X	X	X	X			7	
Trip Blank	(7) A-C				X	X	X						+ water supplied by SGS (ELS)

RUSH

Project Information		Sample Receipt	
Project Number:	31-1-11765-002	Total Number of Containers	36
Project Name:	NSB Shop #2	COC Seals/Intact? Y/N/NA	—
Contact:	VEW	Received Good Cond./Cold	—
Ongoing Project? Yes ☐ No ☑		Delivery Method:	Hand
Sampler:	ELS	(attach shipping bill, if any)	

Instructions	
Requested Turnaround Time:	3-Day Rush
Special Instructions:	Bill to S&W

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: Time: 15:05	Signature: Time: 1600	Signature: Time:
Printed Name: Erica Blake Date: 4-28-15	Printed Name: Jen Dawkins Date: 4-28-15	Printed Name: Date:
Company: Shannon & Wilson, Inc.	Company: SGS	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature: Time: 1506	Signature: Time:	Signature: Time: 8:50
Printed Name: Jen Dawkins Date: 4-28-15	Printed Name: Date:	Printed Name: Cory Dunning Date: 4/29/15
Company: SGS	Company:	Company: SGS

Distribution: White - w/shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/shipment - for consignee files
Pink - Shannon & Wilson - Job File

F-19-91/UR

TB1 = 2.3°C TB2 = 0.2°C

Anch: 1: 2.3 #205
2: 3.3 #246

No. 33177

SGS

RUSH

1157839

FAIRBANKS SAMPLE RECEIPT FORM

Note: This form is to be completed by Fairbanks Receiving Staff for all samples

Review Criteria:	Condition:	Comments/Actions Taken
Were **custody seals** intact? Note # & location, if applicable. COC accompanied samples?	Yes No (N/A) (Yes) No N/A	□*Exemption permitted if sampler hand carries/delivers.*
Temperature blank compliant* (i.e., 0-6°C) *If >6°C, were samples collected <8 hours ago?* *If <0°C, were all sample containers ice free?* Cooler ID: 1 @ 2.3 w/Therm. ID: 241 Cooler ID: 2 @ 0.2 w/Therm. ID: DE-1 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 and "**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 <8hrs ago* ***Note: Identify containers received at non-compliant temperature. Use form FS-0029 if more space is needed.***
Delivery Method: (Client (hand carried)) Other:____	Tracking/AB# : Or see attached (Or N/A)	
→For samples received with payment, note amount ($) and whether cash / check / CC (**circle one**) was received.		
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 N/A	***Note: some samples are sent to Anchorage without inspection by SGS Fairbanks personnel.***
Were **Trip Blanks** (i.e., VOAs, LL-Hg) in cooler with samples?	(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 (Yes) No N/A	Rush due: 5-1-15

Additional notes (if applicable):

* One DRO jar for "Holding Tank #1" had a cracked lid. (taped & marked)
* Client expects samples to have hydrocarbons present.

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

SGS

Returned Bottles Inventory

Name of individual returning bottles: Erika Blake

Date Received: 04/29/15

Client Name: Shannon & Wilson

Received by: CRD

Project Name: NSB Shop #2

SGS PM: FBKS

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					
	500-ml					
	250-ml or 8-oz					
	125-ml or 4-oz with or without septa					
	40-ml VOA vial	12				
	other					
Subtotal:		12				

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

Amount to Invoice Client $: 48.00

WO#: 1157839

1157839

SAMPLE RECEIPT FORM

Review Criteria:	Yes	N/A	No	Comments/Action Taken:
Were **custody seals** intact? Note # & location, if applicable. COC accompanied samples?	☑ ☑	☐ ☐	☐ ☐	***Exemption permitted if sampler hand carries/delivers.*** 1F, 1B
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] _____ @ 2.3 w/ Therm.ID: 205 Cooler ID: [2] _____ @ 3.3 w/ Therm.ID: 240 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."	☑ ☐ ☐	☐ ☑ ☑	☐ ☐ ☐	***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?*	☐	☑	☐	
	Yes	N/A	No	
Were samples received within hold time? Do samples **match COC*** (i.e., sample IDs, dates/times collected)? Were analyses requested unambiguous?	☑ ☑ ☑	☐ ☐ ☐	☐ ☐ ☐	***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:	☐	☐	☑	lid replaced for "Holding Tank #1" DRO container
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?	☑ ☑ ☑ ☐	☐ ☐ ☐ ☑	☐ ☐ ☐ ☐	☐ ***Exemption permitted for metals (e.g., 200.8/6020A).***
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)?	☑ ☐	☐ ☑	☐ ☐	
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)?	☐	☑	☐	
For **RUSH/SHORT Hold Time**, were COC/Bottles flagged accordingly? Was Rush/Short HT email sent, if applicable?	☑	☐	☐	Rush Due: 05/01/2015
For **SITE-SPECIFIC QC, e.g. BMS/BMSD/BDUP**, were containers / paperwork flagged accordingly?	☐	☑	☐	
For any question answered "No," has the PM been notified and the problem resolved (or paperwork put in their bin)?	☐	☑	☐	SRF Completed by: CRD PM notified:
Was **PEER REVIEW** of ***sample numbering/labeling completed?***	☐	☑	☐	Peer Reviewed by:
Additional notes (if applicable):				

Note to Client: *Any "no" answer 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
1157839001-A	No Preservative Required	OK	1157839007-A	No Preservative Required	OK
1157839001-B	No Preservative Required	OK	1157839007-B	No Preservative Required	OK
1157839001-C	No Preservative Required	OK	1157839007-C	No Preservative Required	OK
1157839001-D	No Preservative Required	OK			
1157839001-E	No Preservative Required	OK			
1157839001-F	No Preservative Required	OK			
1157839001-G	No Preservative Required	OK			
1157839002-A	No Preservative Required	OK			
1157839002-B	No Preservative Required	OK			
1157839002-C	No Preservative Required	OK			
1157839002-D	No Preservative Required	OK			
1157839002-E	No Preservative Required	OK			
1157839002-F	No Preservative Required	OK			
1157839002-G	No Preservative Required	OK			
1157839003-A	No Preservative Required	OK			
1157839003-B	No Preservative Required	OK			
1157839003-C	No Preservative Required	OK			
1157839003-D	No Preservative Required	OK			
1157839003-E	No Preservative Required	OK			
1157839003-F	No Preservative Required	OK			
1157839003-G	No Preservative Required	OK			
1157839004-A	No Preservative Required	OK			
1157839004-B	No Preservative Required	OK			
1157839004-C	No Preservative Required	OK			
1157839004-D	No Preservative Required	OK			
1157839004-E	No Preservative Required	OK			
1157839004-F	No Preservative Required	OK			
1157839004-G	No Preservative Required	OK			
1157839005-A	No Preservative Required	OK			
1157839005-B	No Preservative Required	OK			
1157839005-C	No Preservative Required	OK			
1157839005-D	No Preservative Required	OK			
1157839005-E	No Preservative Required	OK			
1157839005-F	No Preservative Required	OK			
1157839005-G	No Preservative Required	OK			
1157839006-A	No Preservative Required	OK			
1157839006-B	No Preservative Required	OK			
1157839006-C	No Preservative Required	OK			
1157839006-D	No Preservative Required	OK			
1157839006-E	No Preservative Required	OK			
1157839006-F	No Preservative Required	OK			
1157839006-G	No Preservative Required	OK			

Container Id	Preservative	Container Condition	Container Id	Preservative	Container Condition

Container Condition Glossary

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

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

Laboratory Data Review Checklist

Completed by: Erica Blake

Title: Geologist Date: May 04, 2015

CS Report Name: NSB Barrow Shop #2 ULSD Release Report Date: May 1, 2015

Consultant Firm: Shannon & Wilson, Inc.

Laboratory Name: SGS North America, Inc. Laboratory Report Number: 1157839

ADEC File Number: ADEC RecKey Number:

1. Laboratory
   a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses?
      ☒Yes ☐ No ☐NA (Please explain.) Comments:

   b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS approved?
      ☐Yes ☐ No ☒NA (Please explain.) Comments:

      Analyses were performed by SGS North America, Inc. in Anchorage, Alaska.

2. Chain of Custody (COC)
   a. COC information completed, signed, and dated (including released/received by)?
      ☒Yes ☐ No ☐NA (Please explain.) Comments:

   b. Correct analyses requested?
      ☒Yes ☐ No ☐NA (Please explain.) Comments:

3. Laboratory Sample Receipt Documentation
   a. Sample/cooler temperature documented and within range at receipt (4° ± 2° C)?
      ☒Yes ☐ No ☐NA (Please explain.) Comments:

      The temperature blank was measured within the acceptable range of 0° C - 6° C upon arrival at SGS-Fairbanks and SGS-Anchorage. This temperature range has been approved by ADEC.

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

c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?
☒Yes ☐ No ☐NA (Please explain.) Comments:

One jar for diesel range organics (DRO), had a cracked lid which was marked and taped closed. Sample results are considered not affected, the broken lid on the DRO jar was replaced and sample was analyzed.

d. If there were any discrepancies, were they documented? For example, incorrect sample containers/preservation, sample temperature outside of acceptable range, insufficient or missing samples, etc.?
☒Yes ☐ No ☐NA (Please explain.) Comments:

Please see 3.c. above.

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

Data quality/usability was not affected; please see 3.c. above.

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:

Project sample Holding Tank #1 analyzed for polynuclear aromatic hydrocarbons (PAH) had a surrogate-recovery failure. The surrogate 2-fluorobiphenyl was outside QC criteria (38%) due to matrix interference.

Project sample Holding Tank #10 analyzed for PAH had a surrogate-recovery failure. The surrogate 2-fluorobiphenyl was outside QC criteria (44%) due to matrix interference.

Project sample Holding Tank #2 analyzed for PAH had elevated LOQs due to sample dilution. Samples were diluted due to matrix interference with internal standards. There was a high surrogate (2-fluorobiphenyl) recovery outside QC criteria (273%) due to sample dilution.

c. Were all corrective actions documented?
☐Yes ☐ No ☒NA (Please explain.) Comments:

Corrective actions were not required.

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

Comments:

Please see section 6.c.ii. for the effect on data quality and usability.

5. Samples Results

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

☒Yes ☐ No ☐NA (Please explain.) Comments:

b. All applicable holding times met?

☒Yes ☐ No ☐NA (Please explain.) Comments:

c. All soils reported on a dry weight basis?

☐Yes ☐ No ☒NA (Please explain.) Comments:

Soil samples were not submitted with this work order.

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:

Reporting values were below ADEC-established groundwater-cleanup levels.

e. Data quality or usability affected?

Comments:

The data quality and usability were not affected; see above.

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:

iii. If above PQL, what samples are affected?

N/A; project analytes were not detected in the method blanks.

Comments:

iv. Do the affected sample(s) have data flags and if so, are the data flags clearly defined?
☐Yes ☐ No ☒NA (Please explain.) Comments:

Project analytes were not detected in the method blanks.

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

The data quality and usability were not affected; see above.

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:

An LCS sample was analyzed for gasoline range organics, diesel range organics, BTEX and PAH.

ii. Metals/Inorganics – one LCS and one sample duplicate reported per matrix, analysis and 20 samples?
☐Yes ☐ No ☒NA (Please explain.) Comments:

Only organic analyses were requested.

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/MSD, 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:

There were no percent recovery or LCS/LCSD RPD failures reported for this work order.

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?
☐Yes ☐ No ☒NA (Please explain.) Comments:

There were no percent recovery or LCS/LCSD RPD failures reported for this work order.

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

No; see above.

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:

Project samples Holding Tank #1 and Holding Tank #10 analyzed for PAH were outside QC criteria due to a matrix interference. Percent recovery was below the acceptable range for both samples; associated sample results are considered affected, with a low analytical bias. Project sample Holding Tank #2 analyzed for PAH was outside QC criteria due to a matrix interference with internal standards. Because the sample was diluted, the LOQs were elevated. Sample results with surrogate failures due to dilution are not considered affected.

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:

These analytes in samples "Holding Tank #1" and "Holding Tank #10" are considered biased low, and will be flagged 'JL': 1-methylnaphthalene, 2-methylnaphthalene, fluorene, naphthalene and phenanthrene.

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

Yes, please see above.

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:

iii. All results less than PQL?

☐Yes ☒ No ☐NA (Please explain.) Comments:

No, there were detections of p- &m-xylenes (1.05 J ug/L) and toluene (0.490 J ug/L) in the trip blank.

iv. If above PQL, what samples are affected?

Comments:

Post-trmt Tank #1, Post-trmt Tank #10 and Post-trmt Tank #2 were between the detected p- &m-xylenes concentration (1.05J ug/L) and 5x the detected concentration (5.25J ug/L). p- & m-Xylenes sample results will be flagged 'UB' as not detected at the reported sample result.

Post-trmt Tank #2 was between the detected toluene concentration (0.490J ug/L) and 5x the detected concentration (2.45J ug/L). The toluene result will be flagged 'UB' as not detected at the reported sample result.

Post-trmt Tank #1 and Post-trmt Tank #10 p- & m-xylenes and toluene results were below the LOQ/CL but above the detection limit. The p- & m-xylenes and toluene sample results are J-flagged, and will be flagged 'UB' as not detected at the LOQ.

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

Comments:

Yes, please see above.

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:

Field duplicate pairs 'Holding Tank #1' / 'Holding Tank #10' and 'Post-trmt Tank #1' / 'Post-trmt Tank #10' were submitted with this work order.

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

RPD (%) = 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 RPD's for Holding Tank #1 / Holding Tank #10 were within acceptance criteria, except diesel range organics which was above the acceptance criteria of 30%.
Percent RPD's for Post-trmt Tank #1 / Post-trmt Tank #10 were within acceptance criteria, except the following analytes: acenaphthylene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, chrysene, fluoranthene, fluorene, indeno(1,2,3-c,d)pyrene, phenanthrene, pyrene, and diesel range organics, which were above the acceptance criterion of 30%.

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

Comments:

Yes, sample analytes with RPD failures outside acceptance criteria will be flagged 'J' for imprecision.

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

Samples were collected using equipment that was not re-usable. An equipment blank was not required for this project.

☐Yes ☐ No ☒NA (Please explain.) Comments:

i. All results less than PQL?

☐Yes ☐ No ☒NA (Please explain.) Comments:

N/A; see above.

ii. If above PQL, what samples are affected?

Comments:

N/A; see above.

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

Comments:

N/A; see above.

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)
   a. Defined and appropriate?
      ☐Yes ☐ No ☒NA (Please explain.) Comments:

There were no other data flags/qualifiers.

Laboratory Report of Analysis

To: Shannon & Wilson-Fairbanks
5430 Fairbanks Street, Suite 3
Anchorage, AK 99518
907-479-0600

Report Number: **1157840**

Client Project: **31-1-11765-002 NSB Shop #2**

Dear Valerie Webb,

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

If there are any questions about the report or services performed during this project, please call Jennifer 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.

_____

Jennifer Dawkins Date
Project Manager

Print Date: 05/13/2015 9:21:22AM

Case Narrative

Customer: SHANFBK **Shannon & Wilson-Fairbanks**

Project: 1157840 **31-1-11765-002 NSB Shop #2**

Refer to the sample receipt form for information on sample condition. Case narrative has been edited to reflect correct QA/QC dependencies.

1157840001 PS **Drum1-Soil**

AK101/8021B - Sample cannot be re-analyzed at lower dilution due to non-target analytes with a peak height greater than 6 times the internal standard.

AK101 - BFB (surrogate) recovery does not meet QC criteria (1780 %) due to matrix interference.

8270D SIM - LOQs are elevated due to sample dilution. Sample analyzed at a dilution due to matrix interference with internal standards.

8270D SIM - Surrogate (2-fluorobiphenyl and terphenyl-d14) recovery is outside of QC criteria) due to sample dilution.

1157840002 PS **Drum2-Soil**

AK101/8021B - Sample cannot be re-analyzed at lower dilution due to non-target analytes with a peak height greater than 6 times the internal standard.

AK101 - BFB (surrogate) recovery does not meet QC criteria (2760%) due to matrix interference.

8270D SIM - LOQs are elevated due to sample dilution. Sample analyzed at a dilution due to matrix interference with internal standards.

8270D SIM - Surrogate (terphenyl-d14) recovery is outside of QC criteria) due to sample dilution.

1157840003 PS **Drum20-Soil**

AK101 - BFB (surrogate) recovery does not meet QC criteria (1890%) due to matrix interference.

8270D SIM - LOQs are elevated due to sample dilution. Sample analyzed at a dilution due to matrix interference with internal standards.

8270D SIM - Surrogate (2-fluorobiphenyl and terphenyl-d14) recovery is outside of QC criteria) due to sample dilution.

1261881 DUP **1157837001DUP**

1261881 dup did not meet QC criteria due to non-homogeneity

1262182 MS **1157834009MS**

8270D SIM - LOQs are elevated due to sample dilution. Sample analyzed at a dilution due to matrix interference with internal standards.

8270D SIM - Surrogate (2-fluorobiphenyl, terphenyl-d14) recovery is outside of QC criteria due to sample dilution.

8270D SIM - MS recovery for several compounds is outside of QC criteria due to matrix interference and dilution. Refer to LCS for accuracy.

1262183 MSD **1157834009MSD**

8270D SIM - Surrogate (2-fluorobiphenyl, terphenyl-d14) 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.

8270D SIM - MSD recovery for several compounds is outside of QC criteria due to matrix interference and dilution. 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 the associated field samples.

Report of Manual Integrations

Laboratory ID	Client Sample ID	Analytical Batch	Analyte	Reason
8270D SIMS (PAH)				
1151658005	LABREFQC	XMS8643	Chrysene	BLC
1157834009	LABREFQC	XMS8645	Fluorene	SP
1262182	1157834009MS	XMS8645	Acenaphthene	SP
1262182	1157834009MS	XMS8645	Fluorene	SP
1262183	1157834009MSD	XMS8645	Acenaphthene	SP
1262183	1157834009MSD	XMS8645	Fluorene	SP

Manual Integration Reason Code Descriptions

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

All DRO/RRO analysis are integrated per SOP.

Print Date: 05/13/2015 9:21:24AM

Laboratory Qualifiers

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

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

SGS maintains a formal Quality Assurance/Quality Control (QA/QC) program. A copy of our Quality Assurance Plan (QAP), which outlines this program, is available at your request. The laboratory certification numbers are AK00971 (DW Chemistry & Microbiology) & UST-005 (CS) for ADEC and 2944.01 for DOD ELAP/ISO17025 (RCRA methods: 1020B, 1311, 3010A, 3050B, 3520C, 3550C, 5030B, 5035A, 6020A, 7470A, 7471B, 8021B, 8082A, 8260B, 8270D, 8270D-SIM, 9040C, 9045D, 9056A, 9060A, AK101 and AK102/103). Except as specifically noted, all statements and data in this report are in conformance to the provisions set forth by the SGS QAP and, when applicable, other regulatory authorities.

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

*	The analyte has exceeded allowable regulatory or control limits.
!	Surrogate out of control limits.
B	Indicates the analyte is found in a blank associated with the sample.
CCV	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.

SGS North America Inc. 200 West Potter Drive, Anchorage, AK 99518
t 907.562.2343 f 907.561.5301 www.us.sgs.com

Sample Summary

Client Sample ID	Lab Sample ID	Collected	Received	Matrix
Drum1-Soil	1157840001	04/27/2015	04/29/2015	Soil/Solid (dry weight)
Drum2-Soil	1157840002	04/27/2015	04/29/2015	Soil/Solid (dry weight)
Drum20-Soil	1157840003	04/27/2015	04/29/2015	Soil/Solid (dry weight)
Trip Blank	1157840004	04/27/2015	04/29/2015	Soil/Solid (dry weight)

Method	Method Description
8270D SIMS (PAH)	8270 PAH SIM Semi-Volatiles GC/MS
AK101	AK101/8021 Combo. (S)
SW8021B	AK101/8021 Combo. (S)
AK102	Diesel Range Organics (S)
SM21 2540G	Percent Solids SM2540G

Detectable Results Summary

Client Sample ID: **Drum1-Soil**
Lab Sample ID: 1157840001

	Parameter	Result	Units
Polynuclear Aromatics GC/MS	1-Methylnaphthalene	2.36	mg/Kg
	2-Methylnaphthalene	2.76	mg/Kg
	Acenaphthene	0.634	mg/Kg
	Fluorene	0.0627	mg/Kg
	Naphthalene	4.08	mg/Kg
Semivolatile Organic Fuels	Diesel Range Organics	16000	mg/Kg
Volatile Fuels	Benzene	0.100J	mg/Kg
	Ethylbenzene	5.25	mg/Kg
	Gasoline Range Organics	396	mg/Kg
	o-Xylene	12.4	mg/Kg
	P & M -Xylene	18.9	mg/Kg
	Toluene	4.07	mg/Kg

Client Sample ID: **Drum2-Soil**
Lab Sample ID: 1157840002

	Parameter	Result	Units
Polynuclear Aromatics GC/MS	1-Methylnaphthalene	2.45	mg/Kg
	2-Methylnaphthalene	3.16	mg/Kg
	Acenaphthene	0.806	mg/Kg
	Naphthalene	4.59	mg/Kg
Semivolatile Organic Fuels	Diesel Range Organics	15300	mg/Kg
Volatile Fuels	Benzene	0.226	mg/Kg
	Ethylbenzene	7.13	mg/Kg
	Gasoline Range Organics	599	mg/Kg
	o-Xylene	16.4	mg/Kg
	P & M -Xylene	24.6	mg/Kg
	Toluene	6.81	mg/Kg

Client Sample ID: **Drum20-Soil**
Lab Sample ID: 1157840003

	Parameter	Result	Units
Polynuclear Aromatics GC/MS	1-Methylnaphthalene	3.22	mg/Kg
	2-Methylnaphthalene	3.98	mg/Kg
	Acenaphthene	0.711	mg/Kg
	Fluorene	0.0682J	mg/Kg
	Naphthalene	5.82	mg/Kg
Semivolatile Organic Fuels	Diesel Range Organics	19200	mg/Kg
Volatile Fuels	Benzene	0.186	mg/Kg
	Ethylbenzene	5.85	mg/Kg
	Gasoline Range Organics	416	mg/Kg
	o-Xylene	13.2	mg/Kg
	P & M -Xylene	20.4	mg/Kg
	Toluene	5.66	mg/Kg

Results of **Drum1-Soil**

Client Sample ID: **Drum1-Soil**
Client Project ID: **31-1-11765-002 NSB Shop #2**
Lab Sample ID: 1157840001
Lab Project ID: 1157840

Collection Date: 04/27/15 19:00
Received Date: 04/29/15 08:50
Matrix: Soil/Solid (dry weight)
Solids (%):88.3
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	2.36		0.561	0.168	mg/Kg	100		05/05/15 09:48
2-Methylnaphthalene	2.76		0.561	0.168	mg/Kg	100		05/05/15 09:48
Acenaphthene	0.634		0.0561	0.0168	mg/Kg	10		05/04/15 22:55
Acenaphthylene	0.0280	U	0.0561	0.0168	mg/Kg	10		05/04/15 22:55
Anthracene	0.0280	U	0.0561	0.0168	mg/Kg	10		05/04/15 22:55
Benzo(a)Anthracene	0.0280	U	0.0561	0.0168	mg/Kg	10		05/04/15 22:55
Benzo[a]pyrene	0.0280	U	0.0561	0.0168	mg/Kg	10		05/04/15 22:55
Benzo[b]Fluoranthene	0.0280	U	0.0561	0.0168	mg/Kg	10		05/04/15 22:55
Benzo[g,h,i]perylene	0.0280	U	0.0561	0.0168	mg/Kg	10		05/04/15 22:55
Benzo[k]fluoranthene	0.0280	U	0.0561	0.0168	mg/Kg	10		05/04/15 22:55
Chrysene	0.0280	U	0.0561	0.0168	mg/Kg	10		05/04/15 22:55
Dibenzo[a,h]anthracene	0.0280	U	0.0561	0.0168	mg/Kg	10		05/04/15 22:55
Fluoranthene	0.0280	U	0.0561	0.0168	mg/Kg	10		05/04/15 22:55
Fluorene	0.0627		0.0561	0.0168	mg/Kg	10		05/04/15 22:55
Indeno[1,2,3-c,d] pyrene	0.0280	U	0.0561	0.0168	mg/Kg	10		05/04/15 22:55
Naphthalene	4.08		0.561	0.168	mg/Kg	100		05/05/15 09:48
Phenanthrene	0.0280	U	0.0561	0.0168	mg/Kg	10		05/04/15 22:55
Pyrene	0.0280	U	0.0561	0.0168	mg/Kg	10		05/04/15 22:55
Surrogates								
2-Fluorobiphenyl	1210	*	45-105		%	100		05/05/15 09:48
2-Fluorobiphenyl	1080	*	45-105		%	10		05/04/15 22:55
Terphenyl-d14	0	*	30-125		%	100		05/05/15 09:48
Terphenyl-d14	87.7		30-125		%	10		05/04/15 22:55

Batch Information

Analytical Batch: XMS8643
Analytical Method: 8270D SIMS (PAH)
Analyst: SP
Analytical Date/Time: 05/04/15 22:55
Container ID: 1157840001-A

Prep Batch: XXX32978
Prep Method: SW3550C
Prep Date/Time: 05/02/15 12:34
Prep Initial Wt./Vol.: 22.715 g
Prep Extract Vol: 1 mL

Analytical Batch: XMS8644
Analytical Method: 8270D SIMS (PAH)
Analyst: SP
Analytical Date/Time: 05/05/15 09:48
Container ID: 1157840001-A

Prep Batch: XXX32978
Prep Method: SW3550C
Prep Date/Time: 05/02/15 12:34
Prep Initial Wt./Vol.: 22.715 g
Prep Extract Vol: 1 mL

Print Date: 05/13/2015 9:21:29AM

J flagging is activated

Results of **Drum1-Soil**

Client Sample ID: **Drum1-Soil**
Client Project ID: **31-1-11765-002 NSB Shop #2**
Lab Sample ID: 1157840001
Lab Project ID: 1157840

Collection Date: 04/27/15 19:00
Received Date: 04/29/15 08:50
Matrix: Soil/Solid (dry weight)
Solids (%):88.3
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	16000		446	138	mg/Kg	20		05/01/15 11:13
Surrogates								
5a Androstane	84.5		50-150		%	20		05/01/15 11:13

Batch Information

Analytical Batch: XFC11808
Analytical Method: AK102
Analyst: NLL
Analytical Date/Time: 05/01/15 11:13
Container ID: 1157840001-A

Prep Batch: XXX32960
Prep Method: SW3550C
Prep Date/Time: 04/30/15 09:02
Prep Initial Wt./Vol.: 30.46 g
Prep Extract Vol: 1 mL

Results of **Drum1-Soil**

Client Sample ID: **Drum1-Soil**
Client Project ID: **31-1-11765-002 NSB Shop #2**
Lab Sample ID: 1157840001
Lab Project ID: 1157840

Collection Date: 04/27/15 19:00
Received Date: 04/29/15 08:50
Matrix: Soil/Solid (dry weight)
Solids (%):88.3
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	396		25.8	7.75	mg/Kg	10		04/29/15 20:35
Surrogates								
4-Bromofluorobenzene	1780	*	50-150		%	10		04/29/15 20:35

Batch Information

Analytical Batch: VFC12360
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 04/29/15 20:35
Container ID: 1157840001-B

Prep Batch: VXX27144
Prep Method: SW5035A
Prep Date/Time: 04/27/15 19:00
Prep Initial Wt./Vol.: 73.829 g
Prep Extract Vol: 33.6668 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.100	J	0.129	0.0413	mg/Kg	10		04/29/15 20:35
Ethylbenzene	5.25		0.258	0.0806	mg/Kg	10		04/29/15 20:35
o-Xylene	12.4		0.258	0.0806	mg/Kg	10		04/29/15 20:35
P & M -Xylene	18.9		0.517	0.155	mg/Kg	10		04/29/15 20:35
Toluene	4.07		0.258	0.0806	mg/Kg	10		04/29/15 20:35
Surrogates								
1,4-Difluorobenzene	103		72-119		%	10		04/29/15 20:35

Batch Information

Analytical Batch: VFC12360
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 04/29/15 20:35
Container ID: 1157840001-B

Prep Batch: VXX27144
Prep Method: SW5035A
Prep Date/Time: 04/27/15 19:00
Prep Initial Wt./Vol.: 73.829 g
Prep Extract Vol: 33.6668 mL

Print Date: 05/13/2015 9:21:29AM

J flagging is activated

Results of **Drum2-Soil**

Client Sample ID: **Drum2-Soil**
Client Project ID: **31-1-11765-002 NSB Shop #2**
Lab Sample ID: 1157840002
Lab Project ID: 1157840

Collection Date: 04/27/15 18:55
Received Date: 04/29/15 08:50
Matrix: Soil/Solid (dry weight)
Solids (%):82.3
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	2.45		0.600	0.180	mg/Kg	100		05/05/15 10:05
2-Methylnaphthalene	3.16		0.600	0.180	mg/Kg	100		05/05/15 10:05
Acenaphthene	0.806		0.600	0.180	mg/Kg	100		05/05/15 10:05
Acenaphthylene	0.300	U	0.600	0.180	mg/Kg	100		05/05/15 10:05
Anthracene	0.300	U	0.600	0.180	mg/Kg	100		05/05/15 10:05
Benzo(a)Anthracene	0.0300	U	0.0600	0.0180	mg/Kg	10		05/04/15 23:12
Benzo[a]pyrene	0.0300	U	0.0600	0.0180	mg/Kg	10		05/04/15 23:12
Benzo[b]Fluoranthene	0.0300	U	0.0600	0.0180	mg/Kg	10		05/04/15 23:12
Benzo[g,h,i]perylene	0.0300	U	0.0600	0.0180	mg/Kg	10		05/04/15 23:12
Benzo[k]fluoranthene	0.0300	U	0.0600	0.0180	mg/Kg	10		05/04/15 23:12
Chrysene	0.0300	U	0.0600	0.0180	mg/Kg	10		05/04/15 23:12
Dibenzo[a,h]anthracene	0.0300	U	0.0600	0.0180	mg/Kg	10		05/04/15 23:12
Fluoranthene	0.0300	U	0.0600	0.0180	mg/Kg	10		05/04/15 23:12
Fluorene	0.300	U	0.600	0.180	mg/Kg	100		05/05/15 10:05
Indeno[1,2,3-c,d] pyrene	0.0300	U	0.0600	0.0180	mg/Kg	10		05/04/15 23:12
Naphthalene	4.59		0.600	0.180	mg/Kg	100		05/05/15 10:05
Phenanthrene	0.300	U	0.600	0.180	mg/Kg	100		05/05/15 10:05
Pyrene	0.0300	U	0.0600	0.0180	mg/Kg	10		05/04/15 23:12
Surrogates								
2-Fluorobiphenyl	1150	*	45-105		%	100		05/05/15 10:05
Terphenyl-d14	0	*	30-125		%	100		05/05/15 10:05
Terphenyl-d14	87.1		30-125		%	10		05/04/15 23:12

Batch Information

Analytical Batch: XMS8643
Analytical Method: 8270D SIMS (PAH)
Analyst: SP
Analytical Date/Time: 05/04/15 23:12
Container ID: 1157840002-A

Prep Batch: XXX32978
Prep Method: SW3550C
Prep Date/Time: 05/02/15 12:34
Prep Initial Wt./Vol.: 22.776 g
Prep Extract Vol: 1 mL

Analytical Batch: XMS8644
Analytical Method: 8270D SIMS (PAH)
Analyst: SP
Analytical Date/Time: 05/05/15 10:05
Container ID: 1157840002-A

Prep Batch: XXX32978
Prep Method: SW3550C
Prep Date/Time: 05/02/15 12:34
Prep Initial Wt./Vol.: 22.776 g
Prep Extract Vol: 1 mL

Results of **Drum2-Soil**

Client Sample ID: **Drum2-Soil**
Client Project ID: **31-1-11765-002 NSB Shop #2**
Lab Sample ID: 1157840002
Lab Project ID: 1157840

Collection Date: 04/27/15 18:55
Received Date: 04/29/15 08:50
Matrix: Soil/Solid (dry weight)
Solids (%):82.3
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	15300		483	150	mg/Kg	20		05/01/15 11:23
Surrogates								
5a Androstane	70.9		50-150		%	20		05/01/15 11:23

Batch Information

Analytical Batch: XFC11808
Analytical Method: AK102
Analyst: NLL
Analytical Date/Time: 05/01/15 11:23
Container ID: 1157840002-A

Prep Batch: XXX32960
Prep Method: SW3550C
Prep Date/Time: 04/30/15 09:02
Prep Initial Wt./Vol.: 30.167 g
Prep Extract Vol: 1 mL

Results of **Drum2-Soil**

Client Sample ID: **Drum2-Soil**
Client Project ID: **31-1-11765-002 NSB Shop #2**
Lab Sample ID: 1157840002
Lab Project ID: 1157840

Collection Date: 04/27/15 18:55
Received Date: 04/29/15 08:50
Matrix: Soil/Solid (dry weight)
Solids (%):82.3
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	599		28.6	8.57	mg/Kg	10		04/29/15 20:54
Surrogates								
4-Bromofluorobenzene	2760	*	50-150		%	10		04/29/15 20:54

Batch Information

Analytical Batch: VFC12360
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 04/29/15 20:54
Container ID: 1157840002-B

Prep Batch: VXX27144
Prep Method: SW5035A
Prep Date/Time: 04/27/15 18:55
Prep Initial Wt./Vol.: 85.264 g
Prep Extract Vol: 40.0905 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.226		0.143	0.0457	mg/Kg	10		04/29/15 20:54
Ethylbenzene	7.13		0.286	0.0891	mg/Kg	10		04/29/15 20:54
o-Xylene	16.4		0.286	0.0891	mg/Kg	10		04/29/15 20:54
P & M -Xylene	24.6		0.571	0.171	mg/Kg	10		04/29/15 20:54
Toluene	6.81		0.286	0.0891	mg/Kg	10		04/29/15 20:54
Surrogates								
1,4-Difluorobenzene	104		72-119		%	10		04/29/15 20:54

Batch Information

Analytical Batch: VFC12360
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 04/29/15 20:54
Container ID: 1157840002-B

Prep Batch: VXX27144
Prep Method: SW5035A
Prep Date/Time: 04/27/15 18:55
Prep Initial Wt./Vol.: 85.264 g
Prep Extract Vol: 40.0905 mL

Results of **Drum20-Soil**

Client Sample ID: **Drum20-Soil**
Client Project ID: **31-1-11765-002 NSB Shop #2**
Lab Sample ID: 1157840003
Lab Project ID: 1157840

Collection Date: 04/27/15 18:45
Received Date: 04/29/15 08:50
Matrix: Soil/Solid (dry weight)
Solids (%):83.0
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	3.22		0.744	0.223	mg/Kg	100		05/05/15 10:21
2-Methylnaphthalene	3.98		0.744	0.223	mg/Kg	100		05/05/15 10:21
Acenaphthene	0.711		0.0744	0.0223	mg/Kg	10		05/04/15 23:28
Acenaphthylene	0.0372	U	0.0744	0.0223	mg/Kg	10		05/04/15 23:28
Anthracene	0.0372	U	0.0744	0.0223	mg/Kg	10		05/04/15 23:28
Benzo(a)Anthracene	0.0372	U	0.0744	0.0223	mg/Kg	10		05/04/15 23:28
Benzo[a]pyrene	0.0372	U	0.0744	0.0223	mg/Kg	10		05/04/15 23:28
Benzo[b]Fluoranthene	0.0372	U	0.0744	0.0223	mg/Kg	10		05/04/15 23:28
Benzo[g,h,i]perylene	0.0372	U	0.0744	0.0223	mg/Kg	10		05/04/15 23:28
Benzo[k]fluoranthene	0.0372	U	0.0744	0.0223	mg/Kg	10		05/04/15 23:28
Chrysene	0.0372	U	0.0744	0.0223	mg/Kg	10		05/04/15 23:28
Dibenzo[a,h]anthracene	0.0372	U	0.0744	0.0223	mg/Kg	10		05/04/15 23:28
Fluoranthene	0.0372	U	0.0744	0.0223	mg/Kg	10		05/04/15 23:28
Fluorene	0.0682	J	0.0744	0.0223	mg/Kg	10		05/04/15 23:28
Indeno[1,2,3-c,d] pyrene	0.0372	U	0.0744	0.0223	mg/Kg	10		05/04/15 23:28
Naphthalene	5.82		0.744	0.223	mg/Kg	100		05/05/15 10:21
Phenanthrene	0.0372	U	0.0744	0.0223	mg/Kg	10		05/04/15 23:28
Pyrene	0.0372	U	0.0744	0.0223	mg/Kg	10		05/04/15 23:28
Surrogates								
2-Fluorobiphenyl	1380	*	45-105		%	100		05/05/15 10:21
2-Fluorobiphenyl	1150	*	45-105		%	10		05/04/15 23:28
Terphenyl-d14	0	*	30-125		%	100		05/05/15 10:21
Terphenyl-d14	98.7		30-125		%	10		05/04/15 23:28

Batch Information

Analytical Batch: XMS8643
Analytical Method: 8270D SIMS (PAH)
Analyst: SP
Analytical Date/Time: 05/04/15 23:28
Container ID: 1157840003-A

Prep Batch: XXX32978
Prep Method: SW3550C
Prep Date/Time: 05/02/15 12:34
Prep Initial Wt./Vol.: 22.745 g
Prep Extract Vol: 1.25 mL

Analytical Batch: XMS8644
Analytical Method: 8270D SIMS (PAH)
Analyst: SP
Analytical Date/Time: 05/05/15 10:21
Container ID: 1157840003-A

Prep Batch: XXX32978
Prep Method: SW3550C
Prep Date/Time: 05/02/15 12:34
Prep Initial Wt./Vol.: 22.745 g
Prep Extract Vol: 1.25 mL

Print Date: 05/13/2015 9:21:29AM

J flagging is activated

Results of **Drum20-Soil**

Client Sample ID: **Drum20-Soil**
Client Project ID: **31-1-11765-002 NSB Shop #2**
Lab Sample ID: 1157840003
Lab Project ID: 1157840

Collection Date: 04/27/15 18:45
Received Date: 04/29/15 08:50
Matrix: Soil/Solid (dry weight)
Solids (%):83.0
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	19200		480	149	mg/Kg	20		05/01/15 10:53
Surrogates								
5a Androstane	81.6		50-150		%	20		05/01/15 10:53

Batch Information

Analytical Batch: XFC11808
Analytical Method: AK102
Analyst: NLL
Analytical Date/Time: 05/01/15 10:53
Container ID: 1157840003-A

Prep Batch: XXX32960
Prep Method: SW3550C
Prep Date/Time: 04/30/15 09:02
Prep Initial Wt./Vol.: 30.074 g
Prep Extract Vol: 1 mL

Results of **Drum20-Soil**

Client Sample ID: **Drum20-Soil**
Client Project ID: **31-1-11765-002 NSB Shop #2**
Lab Sample ID: 1157840003
Lab Project ID: 1157840

Collection Date: 04/27/15 18:45
Received Date: 04/29/15 08:50
Matrix: Soil/Solid (dry weight)
Solids (%):83.0
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	416		28.4	8.51	mg/Kg	10		04/29/15 21:14
Surrogates								
4-Bromofluorobenzene	1890	*	50-150		%	10		04/29/15 21:14

Batch Information

Analytical Batch: VFC12360
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 04/29/15 21:14
Container ID: 1157840003-B

Prep Batch: VXX27144
Prep Method: SW5035A
Prep Date/Time: 04/27/15 18:45
Prep Initial Wt./Vol.: 82.85 g
Prep Extract Vol: 39.0471 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.186		0.142	0.0454	mg/Kg	10		04/29/15 21:14
Ethylbenzene	5.85		0.284	0.0885	mg/Kg	10		04/29/15 21:14
o-Xylene	13.2		0.284	0.0885	mg/Kg	10		04/29/15 21:14
P & M -Xylene	20.4		0.568	0.170	mg/Kg	10		04/29/15 21:14
Toluene	5.66		0.284	0.0885	mg/Kg	10		04/29/15 21:14
Surrogates								
1,4-Difluorobenzene	101		72-119		%	10		04/29/15 21:14

Batch Information

Analytical Batch: VFC12360
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 04/29/15 21:14
Container ID: 1157840003-B

Prep Batch: VXX27144
Prep Method: SW5035A
Prep Date/Time: 04/27/15 18:45
Prep Initial Wt./Vol.: 82.85 g
Prep Extract Vol: 39.0471 mL

Results of **Trip Blank**

Client Sample ID: **Trip Blank**
Client Project ID: **31-1-11765-002 NSB Shop #2**
Lab Sample ID: 1157840004
Lab Project ID: 1157840

Collection Date: 04/27/15 19:00
Received Date: 04/29/15 08:50
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	1.28	U	2.56	0.769	mg/Kg	1		04/29/15 16:24
Surrogates								
4-Bromofluorobenzene	96.5		50-150		%	1		04/29/15 16:24

Batch Information

Analytical Batch: VFC12360
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 04/29/15 16:24
Container ID: 1157840004-A

Prep Batch: VXX27144
Prep Method: SW5035A
Prep Date/Time: 04/27/15 19:00
Prep Initial Wt./Vol.: 48.758 g
Prep Extract Vol: 25 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.00640	U	0.0128	0.00410	mg/Kg	1		04/29/15 16:24
Ethylbenzene	0.0128	U	0.0256	0.00800	mg/Kg	1		04/29/15 16:24
o-Xylene	0.0128	U	0.0256	0.00800	mg/Kg	1		04/29/15 16:24
P & M -Xylene	0.0256	U	0.0513	0.0154	mg/Kg	1		04/29/15 16:24
Toluene	0.0128	U	0.0256	0.00800	mg/Kg	1		04/29/15 16:24
Surrogates								
1,4-Difluorobenzene	97.7		72-119		%	1		04/29/15 16:24

Batch Information

Analytical Batch: VFC12360
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 04/29/15 16:24
Container ID: 1157840004-A

Prep Batch: VXX27144
Prep Method: SW5035A
Prep Date/Time: 04/27/15 19:00
Prep Initial Wt./Vol.: 48.758 g
Prep Extract Vol: 25 mL

Print Date: 05/13/2015 9:21:29AM

J flagging is activated

Method Blank

Blank ID: MB for HBN 1707718 [SPT/9577]
Blank Lab ID: 1261878

Matrix: Soil/Solid (dry weight)

QC for Samples:
1157840001, 1157840002, 1157840003

Results by **SM21 2540G**

Parameter	Results	LOQ/CL	DL	Units
Total Solids	100			%

Batch Information

Analytical Batch: SPT9577
Analytical Method: SM21 2540G
Instrument:
Analyst: A.K
Analytical Date/Time: 4/29/2015 7:05:00PM

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Duplicate Sample Summary

Original Sample ID: 1151686001
Duplicate Sample ID: 1261880
QC for Samples:

Analysis Date: 04/29/2015 19:05
Matrix: Soil/Solid (dry weight)

Results by **SM21 2540G**

NAME	Original	Duplicate	Units	RPD (%)	RPD CL
Total Solids	83.7	85.2	%	1.70	(< 15)

Batch Information

Analytical Batch: SPT9577
Analytical Method: SM21 2540G
Instrument:
Analyst: A.K

Print Date: 05/13/2015 9:21:31AM

Duplicate Sample Summary

Original Sample ID: 1157837001
Duplicate Sample ID: 1261881
QC for Samples:
1157840001, 1157840002, 1157840003

Analysis Date: 04/29/2015 19:05
Matrix: Soil/Solid (dry weight)

Results by **SM21 2540G**

NAME	Original	Duplicate	Units	RPD (%)	RPD CL
Total Solids	8.02	4.59	%	54.30*	(< 15)

Batch Information

Analytical Batch: SPT9577
Analytical Method: SM21 2540G
Instrument:
Analyst: A.K

Print Date: 05/13/2015 9:21:31AM

Method Blank

Blank ID: MB for HBN 1707755 [VXX/27144]
Blank Lab ID: 1262005

Matrix: Soil/Solid (dry weight)

QC for Samples:
1157840001, 1157840002, 1157840003, 1157840004

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	0.766J	2.50	0.750	mg/Kg
Surrogates				
4-Bromofluorobenzene	92.3	50-150		%

Batch Information

Analytical Batch: VFC12360
Analytical Method: AK101
Instrument: Agilent 7890A PID/FID
Analyst: ST
Analytical Date/Time: 4/29/2015 1:30:00PM

Prep Batch: VXX27144
Prep Method: SW5035A
Prep Date/Time: 4/29/2015 8:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

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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 1157840 [VXX27144]
Blank Spike Lab ID: 1262006
Date Analyzed: 04/29/2015 13:50

Spike Duplicate ID: LCSD for HBN 1157840 [VXX27144]
Spike Duplicate Lab ID: 1262007
Matrix: Soil/Solid (dry weight)

QC for Samples: 1157840001, 1157840002, 1157840003, 1157840004

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	9.48	95	10.0	9.21	92	(60-120)	2.90	(< 20)
Surrogates									
4-Bromofluorobenzene	1.25	98.7	99	1.25	98.2	98	(50-150)	0.51	

Batch Information

Analytical Batch: **VFC12360**
Analytical Method: **AK101**
Instrument: **Agilent 7890A PID/FID**
Analyst: **ST**

Prep Batch: **VXX27144**
Prep Method: **SW5035A**
Prep Date/Time: **04/29/2015 08:00**
Spike Init Wt./Vol.: 10.0 mg/Kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: 10.0 mg/Kg Extract Vol: 25 mL

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Method Blank

Blank ID: MB for HBN 1707755 [VXX/27144]
Blank Lab ID: 1262005

Matrix: Soil/Solid (dry weight)

QC for Samples:
1157840001, 1157840002, 1157840003, 1157840004

Results by **SW8021B**

Parameter	Results	LOQ/CL	DL	Units
Benzene	0.00625U	0.0125	0.00400	mg/Kg
Ethylbenzene	0.0125U	0.0250	0.00780	mg/Kg
o-Xylene	0.0125U	0.0250	0.00780	mg/Kg
P & M -Xylene	0.0250U	0.0500	0.0150	mg/Kg
Toluene	0.0125U	0.0250	0.00780	mg/Kg
Surrogates				
1,4-Difluorobenzene	101	72-119		%

Batch Information

Analytical Batch: VFC12360
Analytical Method: SW8021B
Instrument: Agilent 7890A PID/FID
Analyst: ST
Analytical Date/Time: 4/29/2015 1:30:00PM

Prep Batch: VXX27144
Prep Method: SW5035A
Prep Date/Time: 4/29/2015 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 1157840 [VXX27144]
Blank Spike Lab ID: 1262008
Date Analyzed: 04/29/2015 14:34

Spike Duplicate ID: LCSD for HBN 1157840 [VXX27144]
Spike Duplicate Lab ID: 1262009
Matrix: Soil/Solid (dry weight)

QC for Samples: 1157840001, 1157840002, 1157840003, 1157840004

Results by **SW8021B**

	Blank Spike (mg/Kg)			Spike Duplicate (mg/Kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	1.25	1.39	111	1.25	1.40	112	(75-125)	0.43	(< 20)
Ethylbenzene	1.25	1.41	113	1.25	1.41	113	(75-125)	0.21	(< 20)
o-Xylene	1.25	1.39	111	1.25	1.39	111	(75-125)	0.47	(< 20)
P & M -Xylene	2.50	2.79	112	2.50	2.79	112	(80-125)	0.05	(< 20)
Toluene	1.25	1.36	109	1.25	1.37	110	(70-125)	1.00	(< 20)
Surrogates									
1,4-Difluorobenzene	1.25	102	102	1.25	102	102	(72-119)	0.69	

Batch Information

Analytical Batch: **VFC12360**
Analytical Method: **SW8021B**
Instrument: **Agilent 7890A PID/FID**
Analyst: **ST**

Prep Batch: **VXX27144**
Prep Method: **SW5035A**
Prep Date/Time: **04/29/2015 08:00**
Spike Init Wt./Vol.: 1.25 mg/Kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: 1.25 mg/Kg Extract Vol: 25 mL

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

Matrix Spike Summary

Original Sample ID: 1157837001
MS Sample ID: 1262010 MS
MSD Sample ID: 1262011 MSD

Analysis Date: 04/29/2015 17:55
Analysis Date: 04/29/2015 18:15
Analysis Date: 04/29/2015 18:37
Matrix: Soil/Solid (dry weight)

QC for Samples: 1157840001, 1157840002, 1157840003, 1157840004

Results by **SW8021B**

		Matrix Spike (mg/Kg)			Spike Duplicate (mg/Kg)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	0.270U	9.61	9.64	100	9.61	9.89	103	75-125	2.60	(< 20)
Ethylbenzene	0.540U	9.61	10.3	107	9.61	10.7	111	75-125	3.30	(< 20)
o-Xylene	0.540U	9.61	10.3	107	9.61	10.8	112	75-125	4.10	(< 20)
P & M -Xylene	1.08U	19.3	20.5	107	19.3	21.3	111	80-125	3.60	(< 20)
Toluene	0.540U	9.61	9.93	103	9.61	10.2	106	70-125	2.30	(< 20)
Surrogates										
1,4-Difluorobenzene		9.61	9.94	104	9.61	9.99	104	72-119	0.44	

Batch Information

Analytical Batch: VFC12360
Analytical Method: SW8021B
Instrument: Agilent 7890A PID/FID
Analyst: ST
Analytical Date/Time: 4/29/2015 6:15:00PM

Prep Batch: VXX27144
Prep Method: AK101 Extraction (S)
Prep Date/Time: 4/29/2015 8:00:00AM
Prep Initial Wt./Vol.: 81.33g
Prep Extract Vol: 25.00mL

Print Date: 05/13/2015 9:21:42AM

Method Blank

Blank ID: MB for HBN 1707709 [XXX/32960]
Blank Lab ID: 1261843

Matrix: Soil/Solid (dry weight)

QC for Samples:
1157840001, 1157840002, 1157840003

Results by **AK102**

Parameter	Results	LOQ/CL	DL	Units
Diesel Range Organics	10.0U	20.0	6.20	mg/Kg
Surrogates				
5a Androstane	59.7*	60-120		%

Batch Information

Analytical Batch: XFC11808
Analytical Method: AK102
Instrument: HP 6890 Series II FID SV D R
Analyst: NLL
Analytical Date/Time: 4/30/2015 6:23:00PM

Prep Batch: XXX32960
Prep Method: SW3550C
Prep Date/Time: 4/30/2015 9:02:50AM
Prep Initial Wt./Vol.: 30 g
Prep Extract Vol: 1 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1157840 [XXX32960]
Blank Spike Lab ID: 1261844
Date Analyzed: 04/30/2015 18:32

Spike Duplicate ID: LCSD for HBN 1157840 [XXX32960]
Spike Duplicate Lab ID: 1261845
Matrix: Soil/Solid (dry weight)

QC for Samples: 1157840001, 1157840002, 1157840003

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	144	87	167	145	87	(75-125)	0.43	(< 20)
Surrogates									
5a Androstane	3.33	75.1	75	3.33	79.1	79	(60-120)	5.20	

Batch Information

Analytical Batch: **XFC11808**
Analytical Method: **AK102**
Instrument: **HP 6890 Series II FID SV D R**
Analyst: **NLL**

Prep Batch: **XXX32960**
Prep Method: **SW3550C**
Prep Date/Time: **04/30/2015 09:02**
Spike Init Wt./Vol.: 167 mg/Kg Extract Vol: 1 mL
Dupe Init Wt./Vol.: 167 mg/Kg Extract Vol: 1 mL

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Method Blank

Blank ID: MB for HBN 1707909 [XXX/32978]
Blank Lab ID: 1262180

Matrix: Soil/Solid (dry weight)

QC for Samples:
1157840001, 1157840002, 1157840003

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

Parameter	Results	LOQ/CL	DL	Units
1-Methylnaphthalene	0.00250U	0.00500	0.00150	mg/Kg
2-Methylnaphthalene	0.00250U	0.00500	0.00150	mg/Kg
Acenaphthene	0.00250U	0.00500	0.00150	mg/Kg
Acenaphthylene	0.00250U	0.00500	0.00150	mg/Kg
Anthracene	0.00250U	0.00500	0.00150	mg/Kg
Benzo(a)Anthracene	0.00250U	0.00500	0.00150	mg/Kg
Benzo[a]pyrene	0.00250U	0.00500	0.00150	mg/Kg
Benzo[b]Fluoranthene	0.00250U	0.00500	0.00150	mg/Kg
Benzo[g,h,i]perylene	0.00250U	0.00500	0.00150	mg/Kg
Benzo[k]fluoranthene	0.00250U	0.00500	0.00150	mg/Kg
Chrysene	0.00250U	0.00500	0.00150	mg/Kg
Dibenzo[a,h]anthracene	0.00250U	0.00500	0.00150	mg/Kg
Fluoranthene	0.00250U	0.00500	0.00150	mg/Kg
Fluorene	0.00250U	0.00500	0.00150	mg/Kg
Indeno[1,2,3-c,d] pyrene	0.00250U	0.00500	0.00150	mg/Kg
Naphthalene	0.00250U	0.00500	0.00150	mg/Kg
Phenanthrene	0.00250U	0.00500	0.00150	mg/Kg
Pyrene	0.00250U	0.00500	0.00150	mg/Kg
Surrogates				
2-Fluorobiphenyl	64.6	45-105		%
Terphenyl-d14	92.4	30-125		%

Batch Information

Analytical Batch: XMS8643
Analytical Method: 8270D SIMS (PAH)
Instrument: HP 6890/5973 MS SVQA
Analyst: SP
Analytical Date/Time: 5/4/2015 7:04:00PM

Prep Batch: XXX32978
Prep Method: SW3550C
Prep Date/Time: 5/2/2015 12:34:25PM
Prep Initial Wt./Vol.: 22.5 g
Prep Extract Vol: 1 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1157840 [XXX32978]
Blank Spike Lab ID: 1262181
Date Analyzed: 05/04/2015 19:20

Matrix: Soil/Solid (dry weight)

QC for Samples: 1157840001, 1157840002, 1157840003

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

Blank Spike (mg/Kg)

Parameter	Spike	Result	Rec (%)	CL
1-Methylnaphthalene	0.0222	0.0146	66	(44-107)
2-Methylnaphthalene	0.0222	0.0142	64	(45-105)
Acenaphthene	0.0222	0.0153	69	(45-110)
Acenaphthylene	0.0222	0.0152	68	(45-105)
Anthracene	0.0222	0.0162	73	(55-105)
Benzo(a)Anthracene	0.0222	0.0183	82	(50-110)
Benzo[a]pyrene	0.0222	0.0155	70	(50-110)
Benzo[b]Fluoranthene	0.0222	0.0196	88	(45-115)
Benzo[g,h,i]perylene	0.0222	0.0195	88	(40-125)
Benzo[k]fluoranthene	0.0222	0.0200	90	(45-125)
Chrysene	0.0222	0.0193	87	(55-110)
Dibenzo[a,h]anthracene	0.0222	0.0200	90	(40-125)
Fluoranthene	0.0222	0.0192	86	(55-115)
Fluorene	0.0222	0.0168	76	(50-110)
Indeno[1,2,3-c,d] pyrene	0.0222	0.0201	90	(40-120)
Naphthalene	0.0222	0.0140	63	(40-105)
Phenanthrene	0.0222	0.0173	78	(50-110)
Pyrene	0.0222	0.0181	81	(45-125)
Surrogates				
2-Fluorobiphenyl	0.0222	67.5	68	(45-105)
Terphenyl-d14	0.0222	88.4	88	(30-125)

Batch Information

Analytical Batch: **XMS8643**
Analytical Method: **8270D SIMS (PAH)**
Instrument: **HP 6890/5973 MS SVQA**
Analyst: **SP**

Prep Batch: **XXX32978**
Prep Method: **SW3550C**
Prep Date/Time: **05/02/2015 12:34**
Spike Init Wt./Vol.: 0.0222 mg/Kg Extract Vol: 1 mL
Dupe Init Wt./Vol.: Extract Vol:

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Matrix Spike Summary

Original Sample ID: 1157834009
MS Sample ID: 1262182 MS
MSD Sample ID: 1262183 MSD

Analysis Date: 05/05/2015 22:59
Analysis Date: 05/05/2015 23:15
Analysis Date: 05/05/2015 23:32
Matrix: Soil/Solid (dry weight)

QC for Samples: 1157840001, 1157840002, 1157840003

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

		Matrix Spike (mg/Kg)				Spike Duplicate (mg/Kg)					
Parameter	Sample	Spike	Result	Rec (%)		Spike	Result	Rec (%)		CL	RPD (%)	RPD CL
Acenaphthene	1.14	0.0237	1.23	363	*	0.0239	1.22	313	*	45-110	0.94	(< 30)
Acenaphthylene	0.267U	0.0237	0.274J	1150	*	0.0239	0.294J	1230	*	45-105	7.20	(< 30)
Anthracene	0.267U	0.0237	0.267U	0	*	0.0239	0.00J	0	*	55-105	0.00	(< 30)
Benzo(a)Anthracene	0.267U	0.0237	0.267U	0	*	0.0239	0.00J	0	*	50-110	0.00	(< 30)
Benzo[a]pyrene	0.267U	0.0237	0.267U	0	*	0.0239	0.00J	0	*	50-110	0.00	(< 30)
Benzo[b]Fluoranthene	0.267U	0.0237	0.267U	0	*	0.0239	0.00J	0	*	45-115	0.00	(< 30)
Benzo[g,h,i]perylene	0.267U	0.0237	0.267U	0	*	0.0239	0.00J	0	*	40-125	0.00	(< 30)
Benzo[k]fluoranthene	0.267U	0.0237	0.267U	0	*	0.0239	0.00J	0	*	45-125	0.00	(< 30)
Chrysene	0.267U	0.0237	0.267U	0	*	0.0239	0.00J	0	*	55-110	0.00	(< 30)
Dibenzo[a,h]anthracene	0.267U	0.0237	0.267U	0	*	0.0239	0.00J	0	*	40-125	0.00	(< 30)
Fluoranthene	0.267U	0.0237	0.267U	0	*	0.0239	0.00J	0	*	55-115	0.00	(< 30)
Fluorene	1.42	0.0237	1.47	195	*	0.0239	1.50	325	*	50-110	2.10	(< 30)
Indeno[1,2,3-c,d] pyrene	0.267U	0.0237	0.267U	0	*	0.0239	0.00J	0	*	40-120	0.00	(< 30)
Phenanthrene	0.722	0.0237	0.748	108		0.0239	0.713	-36	*	50-110	4.70	(< 30)
Pyrene	0.267U	0.0237	0.267U	0	*	0.0239	0.00J	0	*	45-125	0.00	(< 30)
1-Methylnaphthalene	35.0	0.0237	34.7	-1090	*	0.0239	33.9	-4660	*	44-107	2.50	(< 30)
2-Methylnaphthalene	50.4	0.0237	51.4	4210	*	0.0239	48.6	-7460	*	45-105	5.60	(< 30)
Naphthalene	25.3	0.0237	25.2	-318	*	0.0239	24.8	-2400	*	40-105	2.00	(< 30)
Surrogates												
2-Fluorobiphenyl		0.0237	0.290	1220	*	0.0239	0.311	1300	*	45-105	7.10	
Terphenyl-d14		0.0237	0.00	0	*	0.0239	0.00	0	*	30-125	0.00	

Batch Information

Analytical Batch: XMS8645
Analytical Method: 8270D SIMS (PAH)
Instrument: HP 6890/5973 MS SVQA
Analyst: SP
Analytical Date/Time: 5/5/2015 11:15:00PM

Prep Batch: XXX32978
Prep Method: Sonication Extraction Soil 8270 PAH SIM
Prep Date/Time: 5/2/2015 12:34:25PM
Prep Initial Wt./Vol.: 22.68g
Prep Extract Vol: 1.00mL

Print Date: 05/13/2015 9:21:54AM

1157840

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

CHAIN-OF-C ...D

Page 1 of 1

Laboratory SGS
Attn: Jen Dawkins

400 N. 34th Street, Suite 100
Seattle, WA 98103
(206) 632-8020

2355 Hill Road
Fairbanks, AK 99709
(907) 479-0600

2255 S.W. Canyon Road
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2043 Westport Center Drive
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5430 Fairbanks Street, Suite 3
Anchorage, AK 99518
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1321 Bannock Street, Suite 200
Denver, CO 80204
(303) 825-3800

2705 Saint Andrews Loop, Suite A
Pasco, WA 99301-3378
(509) 946-6309

Analysis Parameters/Sample Container Description
(include preservative if used)

Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	GRO	BTEX 8021	DRO	PAH 8270			Total Number of Containers	Remarks/Matrix
Drum 1-Soil	(1) A-B	19:00	4/27/15		X	X	X	X	X			2	wet sediment
Drum 2-Soil	(2) A-B	18:55	↓		X	X	X	X	X			2	↓
Drum 20-Soil	(3) A-B	18:45	↓		X	X	X	X	X			2	↓
Trip Blank	(4) A												Soil prepared by SGS
						RUSH							

Project Information		Sample Receipt	
Project Number: 31-1-11765-00		Total Number of Containers	6
Project Name: NSB Shop #2		COC Seals/Intact? Y/N/NA	—
Contact: VEW		Received Good Cond./Cold	—
Ongoing Project? Yes ☐ No ☑		Delivery Method: Hand	
Sampler: ELB		(attach shipping bill, if any)	

Instructions
Requested Turnaround Time: 3-Day Rush
Special Instructions: Bill to S&W

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: Erica Blake Time: 1505	Signature: Time: 1600	Signature: Time:
Printed Name: Erica Blake Date: 4-28-15	Printed Name: Ben Dawkins Date: 4-28-15	Printed Name: Date:
Company: Shannon & Wilson, Inc.	Company: SGS	Company:
Received By: 1.	**Received By: 2.**	**Received By: 3.**
Signature: Time: 1506	Signature: Time:	Signature: Time: 8:50
Printed Name: Ben Dawkins Date: 4-28-15	Printed Name: Date:	Printed Name: Cory Dunning Date: 4/29/15
Company: SGS	Company:	Company: SGS

Distribution: White - w/shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/shipment - for consignee files
Pink - Shannon & Wilson - Job File

F-19-91/UR

TB = 4.9c

Anch: 1.6 #205

No. 33180

SGS

RUSH

1157840

FAIRBANKS SAMPLE RECEIPT FORM

Note: This form is to be completed by Fairbanks Receiving Staff for all samples

Review Criteria:	Condition:	Comments/Actions Taken
Were **custody seals** intact? Note # & location, if applicable. COC accompanied samples?	Yes No (N/A) (Yes) No N/A	□*Exemption permitted if sampler hand carries/delivers.*
Temperature blank compliant* (i.e., 0-6°C) *If >6°C, were samples collected <8 hours ago?* *If <0°C, were all sample containers ice free?* Cooler ID: 1 @ 4.9 w/Therm. ID: 241 Cooler ID:____ @____ w/Therm. ID:____ 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 and "**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 <8hrs ago* ***Note: Identify containers received at non-compliant temperature. Use form FS-0029 if more space is needed.***
Delivery Method: (Client (hand carried) Other:____	Tracking/AB# : Or see attached (Or N/A)	
→For samples received with payment, note amount ($) and whether cash / check / CC (**circle one**) was received.		
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 N/A	***Note: some samples are sent to Anchorage without inspection by SGS Fairbanks personnel.***
Were **Trip Blanks** (i.e., VOAs, LL-Hg) in cooler with samples?	(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 (Yes) No N/A	Rush due: 5-1-15
Additional notes (if applicable):		

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

SGS

Returned Bottles Inventory

Name of individual returning bottles: Erica Blake

Date Received: 4/29/15

Client Name: Shannon + Wilson

Received by: CRD

Project Name: NS-B Shop #2

SGS PM: ERKS

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					
	500-ml					
	250-ml or 8-oz					
	125-ml or 4-oz with or without septa	14				
	40-ml VOA vial					
	other					
Subtotal:		14				

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

Amount to Invoice Client $: 56.00

WO#: 1157840

1157840

SAMPLE RECEIPT FORM

Review Criteria:	Yes	N/A	No	Comments/Action Taken:
Were **custody seals** intact? Note # & location, if applicable. COC accompanied samples?	☑ ☑	☐ ☐	☐ ☐	***Exemption permitted if sampler hand carries/delivers.*** 1F, 1B
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] _____ @ 1.6 _____ w/ Therm.ID: 205 Cooler ID: _____ @ _____ w/ Therm.ID: _____ 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."	☑ ☐ ☐	☐ ☑ ☑	☐ ☐ ☐	***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?*		☑	☐	
	Yes	N/A	No	
Were samples received within hold time? Do samples **match COC*** (i.e., sample IDs, dates/times collected)? Were analyses requested unambiguous?	☑ ☑ ☑	☐ ☐ ☐	☐ ☐ ☐	***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:	☑	☐	☐	
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?	☑ ☑ ☐ ☑	☐ ☐ ☑ ☐	☐ ☐ ☐ ☐	☐ ***Exemption permitted for metals (e.g., 200.8/6020A).***
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)?	☐ ☐	☑ ☑	☐ ☐	
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)?	☐	☑	☐	
For **RUSH/SHORT Hold Time**, were COC/Bottles flagged accordingly? Was Rush/Short HT email sent, if applicable?	☑	☐	☐	Rush Due: 05/01/2015
For **SITE-SPECIFIC QC, e.g. BMS/BMSD/BDUP**, were containers / paperwork flagged accordingly?	☐	☑	☐	
For any question answered "No," has the PM been notified and the problem resolved (or paperwork put in their bin)?	☐	☑	☐	SRF Completed by: CRD PM notified:
Was **PEER REVIEW** of ***sample numbering/labeling completed?***	☐	☑	☐	Peer Reviewed by:
Additional notes (if applicable):				

Note to Client: *Any "no" answer 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
1157840001-A	No Preservative Required	OK			
1157840001-B	Methanol field pres. 4 C	OK			
1157840002-A	No Preservative Required	OK			
1157840002-B	Methanol field pres. 4 C	OK			
1157840003-A	No Preservative Required	OK			
1157840003-B	Methanol field pres. 4 C	OK			
1157840004-A	Methanol field pres. 4 C	OK			

Container Condition Glossary

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

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

APPENDIX E

ADEC SPILL REPORT

ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION

OIL & HAZARDOUS SUBSTANCES SPILL NOTIFICATION FORM

ADEC USE ONLY

ADEC SPILL #:	ADEC FILE #:	ADEC LC:
15399908701		

PERSON REPORTING:	PHONE NUMBER:	REPORTED HOW? (ADEC USE ONLY)
Lokeni Lokeni	908-855-0500	☐ Phone ☐ Fax ☐ PERS ☐ E-mail
DATE/TIME OF SPILL:	**DATE/TIME DISCOVERED:**	**DATE/TIME REPORTED TO ADEC:**
03.28.2015 @ 11:00 A.M.	03.28.15 @11:00 A.M.	3.31.2015

INCIDENT LOCATION/ADDRESS:	DATUM: ☐ NAD27 ☐ NAD83 ☐ WGS84 ☐ Other _____	PRODUCT SPILLED:
North Slope Borough Public Works, Shop 2 pad. Barrow, AK. 99723	LAT. LONG.	ULSD

QUANTITY SPILLED:	QUANTITY CONTAINED:	QUANTITY RECOVERED:	QUANTITY DISPOSED:
approx. 100 ☑ gallons ☐ pounds	0 ☑ gallons ☐ pounds	25 ☑ gallons ☐ pounds	0 ☑ gallons ☐ pounds

	POTENTIAL RESPONSIBLE PARTY:	OTHER PRP, IF ANY:	VESSEL NAME:
Name/Business:	North Slope Borough, Public Works.		
Mailing Address:	P.O. Box 350		VESSEL NUMBER:
	Barrow AK. 99723		
Contact Name:	Lokeni Lokeni		> 400 GROSS TON VESSEL: ☐ Yes ☐ No
Contact Number:	907-855-0500		

SOURCE OF SPILL:
Ultra Low Sulfur Diesel

CAUSE OF SPILL: ☐ Under Investigation

diesel overfill fuel tanker during transfer tank to tank.

CAUSE CLASSIFICATION:
☐ Accident
☐ Human Factors
☐ Structural/Mechanical
☐ Other

CLEANUP ACTIONS:
absorbent materials deployed to collect product pooled under the fuel tanker. Contaminated snow/ice excavated and put in 7 85gal. overpacks and a 10yd. double lined dumpster and brought in the shop for filtration and disposal.

DISPOSAL METHODS AND LOCATION:
Contaminated snow/ice will be treated in shop. Contaminated absorbents will be burn in Smart Ash Burner.

AFFECTED AREA SIZE:	SURFACE TYPE: *(gravel, asphalt, name of river etc.)*	RESOURCES AFFECTED/THREATENED: *(Water sources, wildlife, wells, etc.)*
6 yrd.	snow/ice pad	None

COMMENTS:
During fuel transfer operation by Shop2 oilers, they had used a 1,500 gal tanker to transfer fuel from their 6k tanker to service frost fighters in town. Operators did not follow SOP on fuel transfer, Product overfill tanker and pooled under the fuel truck. Operators shuts the transfer pump and notified he's supervisor. I was notified Monday March 30, 2015 at 11:45 A.M. about the spill, I arrived at the site at 12:00pm Mar 30, 2015 and start investigating the spill site. I activated our spill response crew and start the clean up phase at 1:45p.m. March 30, 2015. At 9:00p.m. March 30, 2015 we excavated approximate 10 yards of contaminated snow/ice from the pad. Contaminated materials will be brought in Shop 2 garage to melt, skimmed out fuel product and run contaminated water through filtration unit. Contaminated absorbent will burn in a smart ash burner.

ADEC USE ONLY

SPILL NAME:	NAME OF DEC STAFF RESPONDING:	C-PLAN MGR NOTIFIED? ☐ Yes ☐ No

DEC RESPONSE: ☐ Phone follow-up ☐ Field visit ☐ Took Report	CASELOAD CODE: ☐ First and Final ☐ Open/No LC ☐ LC Assigned	CLEANUP CLOSURE ACTION: ☐ NFA ☐ Monitoring ☐ Transferred to CS or STP

COMMENTS:

Status of Case: ☐ Open ☐ Closed DATE CASE CLOSED:

REPORT PREPARED BY:	DATE:

Revised 6/16/2014

#302 2015 NART

(CHARLIE SAKEAGAK PUBLIC WORKS DIRECTOR)

APPENDIX F

IMPORTANT INFORMATION ABOUT YOUR ENVIRONMENTAL SITE ASSESSMENT/EVALUATION REPORT

IMPORTANT INFORMATION ABOUT YOUR ENVIRONMENTAL SITE ASSESSMENT/EVALUATION REPORT

ENVIRONMENTAL SITE ASSESSMENTS/EVALUATIONS ARE PERFORMED FOR SPECIFIC PURPOSES AND FOR SPECIFIC CLIENTS.

This report was prepared to meet the needs you specified with respect to your specific site and your risk management preferences. Unless indicated otherwise, we prepared your report expressly for you and for the purposes you indicated. No one other than you should use this report for any purpose without first conferring with us. No one is authorized to use this report for any purpose other than that originally contemplated without our prior written consent.

The findings and conclusions documented in this site assessment/evaluation have been prepared for specific application to this project and have been developed in a manner consistent with that level of care and skill normally exercised by members of the environmental science profession currently practicing under similar conditions in this area. The conclusions presented are based on interpretation of information currently available to us and are made within the operational scope, budget, and schedule constraints of this project. No warranty, express or implied, is made.

OUR REPORT IS BASED ON PROJECT-SPECIFIC FACTORS.

Our environmental site assessment is based on several factors and may include (but not be limited to): reviewing public documents to chronicle site ownership for the past 30, 40, or more years; investigating the site's regulatory history to learn about permits granted or citations issued; determining prior uses of the site and those adjacent to it; reviewing available topographic and real estate maps, historical aerial photos, geologic information, and hydrologic data; reviewing readily available published information about surface and subsurface conditions; reviewing federal and state lists of known and potentially contaminated sites; evaluating the potential for naturally occurring hazards; and interviewing public officials, owners/operators, and/or adjacent owners with respect to local concerns and environmental conditions.

Except as noted within the text of the report, no sampling or quantitative laboratory testing was performed by us as part of this site assessment. Where such analyses were conducted by an outside laboratory, Shannon & Wilson relied upon the data provided and did not conduct an independent evaluation regarding the reliability of the data.

CONDITIONS CAN CHANGE.

Site conditions, both surface and subsurface, may be affected as a result of natural processes or human influence. An environmental site assessment/evaluation is based on conditions that existed at the time of the evaluation. Because so many aspects of a historical review rely on third party information, most consultants will refuse to certify (warrant) that a site is free of contaminants, as it is impossible to know with absolute certainty if such a condition exists. Contaminants may be present in areas that were not surveyed or sampled, or may migrate to areas that showed no signs of contamination at the time they were studied.

Unless your consultant indicates otherwise, your report should not be construed to represent geotechnical subsurface conditions at or adjacent to the site and does not provide sufficient information for construction-related activities. Your report also should not be used following floods, earthquakes, or other acts of nature; if the size or configuration of the site is altered; if the location of the site is modified; or if there is a change of ownership and/or use of the property.

INCIDENTAL DAMAGE MAY OCCUR DURING SAMPLING ACTIVITIES.

Incidental damage to a facility may occur during sampling activities. Asbestos and lead-based paint sampling often require destructive sampling of pipe insulation, floor tile, walls, doors, ceiling tile, roofing, and other building materials. Shannon & Wilson does not provide for paint repair. Limited repair of asbestos sample locations are provided. However, Shannon & Wilson neither warranties repairs made by our field personnel, nor are we held liable for injuries or damages as a result of those repairs. If you desire a specific

form of repair, such as those provided by a licensed roofing contractor, you need to request the specific repair at the time of the proposal. The owner is responsible for repair methods that are not specified in the proposal.

READ RESPONSIBILITY CLAUSES CAREFULLY.

Environmental site assessments/evaluations are less exact than other design disciplines because they are based extensively on judgment and opinion, and there may not have been any (or very limited) investigation of actual subsurface conditions. Wholly unwarranted claims have been lodged against consultants. To limit this exposure, consultants have developed a number of clauses for use in their contracts, reports, and other documents. These responsibility clauses are not exculpatory clauses designed to transfer the consultant's liabilities to other parties; rather, they are definitive clauses that identify where responsibilities begin and end. Their use helps all parties involved recognize their individual responsibilities and take appropriate action. Some of these definitive clauses may appear in this report, and you are encouraged to read them closely. Your consultant will be pleased to give full and frank answers to your questions.

Consultants cannot accept responsibility for problems that may develop if they are not consulted after factors considered in their reports have changed, or conditions at the site have changed. Therefore, it is incumbent upon you to notify your consultant of any factors that may have changed prior to submission of the final assessment/evaluation.

An assessment/evaluation of a site helps reduce your risk, but does not eliminate it. Even the most rigorous professional assessment may fail to identify all existing conditions.

ONE OF THE OBLIGATIONS OF YOUR CONSULTANT IS TO PROTECT THE SAFETY, HEALTH, PROPERTY, AND WELFARE OF THE PUBLIC.

If our environmental site assessment/evaluation discloses the existence of conditions that may endanger the safety, health, property, or welfare of the public, we may be obligated under rules of professional conduct, statutory law, or common law to notify you and others of these conditions.

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