

November 15, 2021

Mrs. Rebekah Reams (rebekah.reams@alaska.gov)
Contaminated Sites Program
Alaska Department of Environmental Conservation
610 University Avenue
Fairbanks, AK 99709

Soil Investigation Report, Heating Oil Tank Release, University Park Condos, 656 Fairbanks St, Fairbanks AK

This report describes site characterization activities for the University Park Condominiums (U-Park Condos) site at 656 Fairbanks St in Fairbanks, Alaska. The site is managed by the Alaska Department of Environmental Conservation (ADEC) Contaminated Sites Program (CSP) under file number 100.38.162, hazard ID 3806. The property is managed by the University Park Condo Association, who contracted Arctic Data Services, LLC (ADS) to perform a soil investigation and related field work as described in the work plan approved by ADEC on August 18, 2021. This report presents our observations, findings, and conclusions based on our preliminary August 24, 2021 site visit, and August 31, 2021 site visit and associated sampling event.

Site Description

U-Park Condos is located at 656 Fairbanks St off Geist Rd across from the University of Alaska-Fairbanks campus in Fairbanks, Alaska. The property consists of three multi-unit condo buildings, a central laundry building, and an administrative office. The condos and laundry are heated with oil-fired boilers; the boiler room is in the rear of the building located west of Fairbanks St. The property is located on a single parcel owned by Mr. James B. Chumbley. The condos are served by College Utilities for water and wastewater; to our knowledge there are no on-site wells for irrigation or other purposes.

Immediately north of the property is the former College Inn, which burned down in September, 2019, and has yet to be demolished and cleaned up. Further to the north is a Holiday gas station, which is the University Car Care Center - Williams #5026 contaminated site (hazard ID 23798). To the northeast is the Geist Road post office, which is also a contaminated site (hazard ID 27192). These sites are roughly 500 to 750 feet away from the subject property, and are likely cross-gradient in terms of groundwater flow (see below). To the east is a residential development, and to the west is largely undeveloped land. There is one residence, associated with the Light of the World Lutheran Church at 4155 Geist Road, that is approximately 200 ft to the northwest (presumed downgradient), across a seasonal slough channel (see Figure 1 for site location and vicinity).

Soil borings encountered the presence of groundwater, with water level at time of sampling between 10 to 13 ft bgs. Direction of flow is unknown; groundwater in the Fairbanks area generally flows northwest, but local

hydrogeology may vary. The site is located roughly 150 ft from Deadman Slough, and roughly 2000 ft from the Chena River.

Project Background

On April 17, 2001, an unknown volume of heating oil (estimated at 500 to 1,000 gallons per the ADEC CSP database summary) was released from a day-tank vent to the exterior of the boiler room. An unknown portion of the released heating oil also may have been released inside the boiler room, which would have flowed into the floor drains that lead to the municipal sewer system. A small amount of heating oil (estimated at less than five gallons by ADEC Preparedness, Prevention, and Response (PPR) staff per the ADEC CSP database summary) entered the nearby seasonal channel of Deadman's Slough. According to the ADEC CSP and PPR databases, a cleanup was performed following the release, which included excavation and off-site thermal remediation of an estimated 100 cubic yards (cy) of contaminated soil. However, there is no report in the ADEC file documenting this cleanup, and the consultant who oversaw the cleanup has since deceased.

A preliminary site visit with ADEC personnel and the property owner was conducted on August 24, 2021 to evaluate the feasibility of field work goals and objectives. Field work commenced on August 31, 2021 and was completed that same day. Refer to the work plan for additional background information.

Project Objectives and Scope of Work

The primary objective of the soil investigation was to determine if contamination remains in sub-surface soil at the site, following the 2001 cleanup that was not documented in ADEC files. A location adjacent to the boiler room at the point of release was targeted for sub-surface soil sampling, as this location would have been difficult to excavate without undermining the boiler room foundation (See Attachment A for site photograph log). A second location was selected for sub-surface sampling at the location where historic photos showed potential pooling of heating oil immediately following the release (See Attachment D for historic site photographs). As noted below, after hitting refusal at this location, a boring closer to the slough was field-screened and sampled. Additionally, surface-soil field screening was proposed along the seasonal slough channel edge to determine if surface impacts remained close to seasonal surface water.

Contaminants of Concern

Contaminants of concern at the site include diesel range organics (DRO), gasoline range organics (GRO), petroleum-related volatile organic compounds (VOCs), and polycyclic aromatic hydrocarbons (PAHs). Applicable cleanup levels include the ADEC 18 AAC 75.341 Tables B1 and B2 human health soil cleanup levels (HH SCLs) for the under-40-inch zone and migration-to-groundwater SCLs (MTG SCLs). Analytical results from soil samples collected during field work are listed in Table 1, for comparison with applicable individual SCLs (most stringent).

Field Activities and Observations

A site reconnaissance visit was performed on August 24, 2021 with ADEC staff and property owners to confirm proposed soil boring locations. Field activities and observations from the August 31, 2021 site visit and associated sampling event are documented in the attached field notes (Attachment B). The following presents field activities and observations from the soil investigation, which was completed on August 31, 2021. All soil borings were advanced using a Geoprobe® LB soil-sampler driven with a Skidril G20D powered driver; this tooling allows for collection of a 1-inch by 2-foot soil core from a discrete sample depth. In accordance with the work plan, three depths (3 to 5 feet bgs, 8 to 10 feet bgs, and 13 to 15 feet bgs) were targeted for sampling at each boring location, unless groundwater was encountered shallower.

Field work commenced by advancing a soil boring at the source release point. The initial 3 feet bgs was grey gravel fill, followed by sandy gravel from 3 to 5 feet bgs, sand from 8 to 9 feet bgs, sandy gravel from 9 to 10 feet, and saturated grey fine sand with hydrocarbon odor from 13 to 15 feet bgs. Heated headspace (HHS) field screening with a photoionization device (PID) yielded results of 50.8 parts per million (ppm) from 3 to 5 feet bgs, 275.8 ppm from 8 to 10 feet bgs, and 460.6 ppm from 13 to 15 feet bgs. The target sample depth was 11 to 13 feet bgs, estimated to be directly above the water table. Water was not detected using water-finding paste at 11 feet bgs; the tape measure could not be advanced further than 11 feet due to the borehole caving in. An adjacent boring was overdriven to 14 feet bgs to ensure adequate sample collection volume; one soil sample and a field duplicate were collected for analysis of GRO, DRO, petroleum-related VOCs, and PAHs from this adjacent boring.

After decontaminating sampling tools, a soil boring was advanced downgradient of the source location. Refusal was encountered at 1 foot bgs at two locations in the low spot of roadbed, where historic photos showed pooled fuel (See Attachment D for historic site photographs). The borehole was moved to a location closer to the seasonal channel as shown on the attached site plan (Figure 2), where the ground surface was roughly 1 to 2 feet lower in elevation compared to the source location. The initial 3 feet bgs was grey gravel fill, followed by a black silty organic layer from 3 to 4.5 feet bgs, fine grey silt from 4.5 to 5 feet bgs, and saturated g sandy silt with trace organics from 8 to 10 feet bgs. A soil sample was collected from 8 to 10 feet bgs for analysis of GRO, DRO, petroleum-related VOCs, and PAHs. The soil from 8 to 10 feet bgs was saturated with water but no hydrocarbon odor was observed. HHS PID field screening yielded results of 2.3 ppm from 3 to 5 feet bgs, and 1.2 ppm from 8 to 10 feet bgs.

An additional soil boring was advanced ten feet directly west of the release point with a target depth of 10 feet bgs to help delineate soil contamination away from the building. Driving speed significantly slowed down at a depth of 7.5 feet bgs, and the sample probe barrel opened early due to a loose plug, causing a range of 2 to 7 feet bgs to be collected in the 2-foot sample core; this core contained entirely grey-brown sandy gravel. An additional core was driven from 7.5 to 10 feet bgs, encountering grey-brown sandy gravel from 7.5 to 8 feet bgs, a moist grey sand from 8 to 9.5 feet bgs, and grey sandy gravel from 9.5 to 10 feet bgs. HHS results gathered with a PID

yielded results of 4.0 ppm from 2 to 7.5 feet bgs, and 256 ppm from 7.5 to 10 feet bgs, with the top of the smear zone encountered at roughly eight feet bgs.

Shallow surface test holes were dug from 1.5 to 2 feet bgs along a transect parallel and adjacent to the downgradient seasonal slough channel, to determine if shallow surface contamination remained along the slough and to identify potential ongoing ecological impacts. Soil type was brown silt at all locations, and HHS PID field-screening results ranged from 1.1 to 2.6 ppm, with no observable hydrocarbon odor. See attached field notes (Attachment B) for results and site plan (Figure 2) showing field screening locations.

After field work was completed, swing-tie measurements of sample locations were taken using corners of the boiler room as the permanent fixtures for measurements. See attached field notes (Attachment B) for a site diagram showing swing-tie measurements.

Soil Sample Analysis

All collected soil samples were analyzed for GRO by AK Method AK101, DRO by Alaska Method AK102, petroleum-related VOCs by EPA Method 8260D, and PAHs by EPA Method 8270D-SIM. Samples were submitted to SGS North America, Inc. in Anchorage, Alaska (SGSA) for laboratory analysis.

Soil Sample Results

Analytical soil sample results are presented in Table 1 (attached) and are compared to the most stringent ADEC SCLs. For detailed analytical results and data validation findings, refer to the SGSA Laboratory Report 1215638 and completed ADEC laboratory data review checklist (Attachment C).

The results of the soil sample and field duplicate sample collected from the source location confirmed the remaining presence of contamination in soil from 11 to 14 feet bgs. DRO, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, ethylbenzene, naphthalene, total xylenes, 1-methylnaphthalene, and 2-methylnaphthalene were detected above MTG SCLs (highlighted on Table 1). The soil sample collected from the boring downgradient of the source location was non-detect for all analytes except GRO, which was flagged as estimated, biased high, and a potential false-positive detection due to laboratory-based contamination.

Quality Assurance / Quality Control

Data quality was generally acceptable with only two GRO results qualified with a high bias due to surrogate recovery failures or method blank detections (see Summary of Qualified Results Table in Attachment C for details); both qualified results were below PALs despite the high bias and are still considered usable for the purposes of this project. Overall precision, accuracy, representativeness, comparability, completeness, and sensitivity of the data were adequate for purposes of this project.

Conclusions

Given the location of the release, PID screening results, field observations, and analytical soil-sample results, contamination remains present in soil at the groundwater interface despite former limited removal actions. Soil contamination may extend under the building where removal was not feasible due to risk of undermining the building foundation. Groundwater impacts at this time are unknown and require further characterization. A conceptual site model is included in Attachment E, that visually presents the potential current and future exposure pathways described below.

While some contamination at the site remained in place following historical removal actions, results from the soil samples collected from the source location confirmed that remaining contamination is below human health SCLs, though there were several exceedances of MTG SCLs. The soil sample collected from the downgradient soil boring contained no analytes above MTG SCLs. The depth, limited volume, and relatively low concentrations of remaining soil contamination, combined with the placement of additional clean fill across the site, suggests that there is minimal risk of exposure to contaminated soil via direct contact pathways. While a thorough soil delineation has not been performed, our findings suggest the cleanup was largely complete, however a limited volume of soil contamination was left in place at and/or beneath the boiler room, and residual impacts to groundwater are likely.

The building, while close to the release location, is located in the likely upgradient direction of the source release point and risk of exposure via vapor intrusion is minimal, due to the separation between the source area and inhabited building spaces. The only interior space that is within 30 feet of the source area, and thus potentially impacted, is the boiler room.

The greatest concern related to the contamination remaining in place is potential migration of contaminants in groundwater. Groundwater contamination is likely, based on visual/olfactory observations, PID readings, and analytical sample results from near the groundwater interface. The potential presence of groundwater contamination should be confirmed, and if present, characterized.

Recommendations

The following actions are recommended to characterize potential groundwater impacts at the site, and to investigate potential exposure to contaminated groundwater if encountered:

- install and sample a temporary well at the source release point to confirm if groundwater contamination exists;
- install and sample three temporary wells along the property boundary at the edge of the seasonal slough channel, to determine if groundwater contamination is migrating off the property; and
- survey groundwater elevations to calculate groundwater gradient and flow direction.

Temporary wells would be installed using a Geoprobe drill rig to advance 2-inch by 10-foot pre-packed well screens spanning the groundwater interface. Wells would be developed and sampled for DRO, GRO, VOCs, and PAHs (see Figure 3 for proposed groundwater sampling locations). The wells would be left without surface completion pending analytical results. Select wells determined useful for long-term monitoring (likely the source area well and one downgradient well) would be completed with stick-up monuments. Remaining wells would be decommissioned.

The above approach should be adequate to characterize groundwater impacts, though additional characterization would be needed if groundwater contamination is found to be migrating off the property. Based on site conditions and results, we do not recommend any further delineation of soil contamination or investigation of the vapor intrusion pathway. Soil has been adequately characterized and the risk of exposure via vapor intrusion is insignificant, due to the distance between contaminated soil and building living spaces.

Sincerely,

Arctic Data Services, LLC



Scott Joyce

Environmental Scientist

Reviewed by

Rodney Guritz

Principal Chemist

Attachments:

Table 1 – Soil Sample Results

Figure 1 – Site Location and Vicinity

Figure 2 – Site Plan

Figure 3 – Site Plan with Proposed Groundwater Sampling Locations

Attachment A – Site Photograph Log

Attachment B - Scanned Field Notes

Attachment C - Laboratory Report – SGS 1215638 and ADEC Laboratory Data Review Checklist

Attachment D – Historic Site Photographs

Attachment E – Conceptual Site Model Scoping and Graphic Forms

TABLE 1
SOIL SAMPLE RESULTS

University Park Condominiums Soil Results Table				Client Sample ID	21-UPC-SB01	21-UPC-SB02	21-UPC-SB03	Trip Blank
				SDG	1215638	1215638	1215638	1215638
				Lab Sample ID	1215638001	1215638002	1215638003	1215638004
				Matrix	Soil	Soil	Soil	Soil
				QC Type	Field_Sample	Field_Duplicate of 1215638001	Field_Sample	Trip_Blank
Collected Date	08/31/2021 10:54:00	08/31/2021 10:58:00	08/31/2021 12:08:00	08/31/2021 09:00:00				
Method	Analyte	CAS	Units	PAL	Result			
8260D	1,2,4-Trimethylbenzene	95-63-6	µg/kg	610	19200	20100	86.0 U	50.5 U
	1,2-Dibromoethane	106-93-4	µg/kg	0.24	22.0 U	20.7 U	1.29 U	0.760 U
	1,2-Dichloroethane	107-06-2	µg/kg	5.5	29.4 U	27.6 U	1.72 U	1.01 U
	1,3,5-Trimethylbenzene	108-67-8	µg/kg	660	8800	9510	15.5 J	12.7 U
	Benzene	71-43-2	µg/kg	22	184 U	173 U	10.8 U	6.30 U
	Ethylbenzene	100-41-4	µg/kg	130	1080	1140	21.5 U	12.7 U
	Isopropylbenzene	98-82-8	µg/kg	5600	998	1030	21.5 U	12.7 U
	Methyl-tert-butyl ether (MTBE)	1634-04-4	µg/kg	400	1470 U	1380 U	86.0 U	50.5 U
	Naphthalene	91-20-3	µg/kg	38	14000	16200	21.5 U	12.7 U
	Toluene	108-88-3	µg/kg	6700	367 U	345 U	21.5 U	12.7 U
	Xylene, Isomers m & p	179601-23-1	µg/kg	NA	7840	8370	43.0 U	25.3 U
	Xylenes	1330-20-7	µg/kg	1500	11500	12300	64.5 U	37.9 U
	n-Butylbenzene	104-51-8	µg/kg	20000	367 U	345 U	21.5 U	12.7 U
	o-Xylene	95-47-6	µg/kg	NA	3660	3940	21.5 U	12.7 U
	sec-Butylbenzene	135-98-8	µg/kg	28000	1250	1280	21.5 U	12.7 U
tert-Butylbenzene	98-06-6	µg/kg	NA	367 U	345 U	21.5 U	12.7 U	
8270DSIM	1-Methylnaphthalene	90-12-0	µg/kg	410	12400	15100	17.6 U	NA
	2-Methylnaphthalene	91-57-6	µg/kg	1300	14700	18000	17.6 U	NA
	Acenaphthene	83-32-9	µg/kg	37000	625 U	775 U	17.6 U	NA
	Acenaphthylene	208-96-8	µg/kg	18000	625 U	775 U	17.6 U	NA
	Anthracene	120-12-7	µg/kg	390000	457 J	574 J	17.6 U	NA
	Benzo(a)anthracene	56-55-3	µg/kg	700	625 U	775 U	17.6 U	NA
	Benzo(a)pyrene	50-32-8	µg/kg	1500	625 U	775 U	17.6 U	NA
	Benzo(b)fluoranthene	205-99-2	µg/kg	15000	625 U	775 U	17.6 U	NA
	Benzo(g,h,i)perylene	191-24-2	µg/kg	2300000	625 U	775 U	17.6 U	NA
	Benzo(k)fluoranthene	207-08-9	µg/kg	150000	625 U	775 U	17.6 U	NA
	Chrysene	218-01-9	µg/kg	600000	625 U	775 U	17.6 U	NA
	Dibenzo(a,h)anthracene	53-70-3	µg/kg	1500	625 U	775 U	17.6 U	NA
	Fluoranthene	206-44-0	µg/kg	590000	625 U	775 U	17.6 U	NA
	Fluorene	86-73-7	µg/kg	36000	1900	2320	17.6 U	NA
	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	15000	625 U	775 U	17.6 U	NA
	Naphthalene	91-20-3	µg/kg	38	6180	7660	14.1 U	NA
	Phenanthrene	85-01-8	µg/kg	39000	3440	4220	17.6 U	NA
Pyrene	129-00-0	µg/kg	87000	625 U	775 U	17.6 U	NA	
A2540G	Total Solids	PCT_Solids	Percent	NA	78.3	79.9	70.4	NA
AK101	Gasoline Range Organics (C6-C10)	GRO-C6-C10	mg/kg	300	202	155 J+	1.94 B	1.28 NA
AK102	Diesel Range Organics (C10-C25)	DRO-C10-C25	mg/kg	250	7990	7580	14.0 U	NA

Notes

grey highlight	The analyte was non-detect
red highlight	The analyte was detected at a concentration exceeding the MTG SCL. No results exceeded HH SCLs.
bold	The analyte was detected.
CAS	Chemical Abstract Service registry number
CALC	Indicates the result was calculated by the validator following ADEC guidelines.
LOD	limit of detection
PAL	project action limit; most stringent of: 18 Alaska Administrative Code 75.341 Method Two Tables B1 and B2 Migration to Groundwater Soil Cleanup Levels 18 Alaska Administrative Code 75.341 Method Two Tables B1 and B2 Human Health Soil Cleanup Levels
QC	quality control
NA	not applicable / not analyzed
µg/L	micrograms per liter
mg/L	milligrams per liter

Data Qualifiers

U	non-detect
J+	The quantitation is considered estimated, biased high, due to a QC anomaly.
J-	The result is considered estimated, biased low, due to a QC anomaly.
J	The result is considered estimated, with an unknown direction of bias, either due to a QC anomaly (validator-applied) or detection below the LOQ (laboratory-applied).
UJ	There is uncertainty in the presence or absence of the analyte, due to a QC anomaly.
B	The result is considered estimated, biased high, and a potential false-positive detection due to laboratory-based sample contamination.

FIGURES
SITE LOCATION AND VICINITY, SITE PLAN



Figure 1 - Site Location and Vicinity
656 Fairbanks St, Fairbanks, Alaska



- Approximate Property Boundaries
- ▲ Contaminated Site

Project Number: 10213	Figure Number: 1
Date: 11/15/2021	
Drafted By: S. Joyce	



21-UPC-SB03

21-UPC-SB01,
21-UPC-SB02

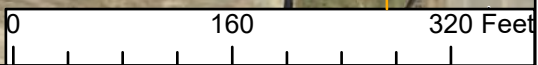


Figure 2 - Site Plan
656 Fairbanks St, Fairbanks, Alaska



- Shallow Field Screening (1.5-2 ft bgs) - PID result below 20 ppm
- Analytical Soil Sample
- Approximate Property Boundary

Project Number: 10213	Figure Number: 2
Date: 11/15/2021	
Drafted By: S. Joyce	

APPENDIX A
SITE PHOTOGRAPH LOG

July 16, 2021 Site Visit with property owners

Photo 1. Interior of boiler room facing south



August 24, 2021 Site Visit with ADEC

Photo 2. Release location marked near boiler room, downgradient borehole was moved to where ADEC, ADS, and University Park Condo Association personnel are gathered due to refusal in roadbed



August 31, 2021 ADS Field Work

Photo 3. Release location marked near boiler room, with Geoprobe LB sampler rod driven with Skidril G20D powered driver



Photo 4. Downgradient borehole location, with Geoprobe LB sampler rod being driven with Skidril G20D powered driver by ADS principal chemist Rodney Guritz



APPENDIX B
SCANNED FIELD NOTES

2 GSG FAIRBANKS ST 08/31/21 RG/SS

09:00 - S. SOYCE & R. GURTZ ON SITE
PURPOSE: PERFORM ANALYTICAL SAMPLING
VIA SOIL BORING AND FIELD SCREEN
ALONG TRANSECT AT SEASONAL CHANNEL

WEATHER: MOSTLY CLOUDY
TEMP: 52° - 64° WIND: 2-3 MPH
PID CALIBRATED TO 100.0 PPM w/
100.0 PPM ISOBUTYLENE GAS AFTER
ZEROING IN FRESH AIR BUMPED TO 100.7 PPM

09:15 - BEGAN SOIL BORING AT
SOURCE RELEASE POINT

SB-01

Depth	Soil type	RECOVERY	PID (PPM)
3-5 ft	SANDY GRAVEL	50%	50.8
8-10 ft	2-4 ft SAND 9-10 ft SANDY GRAVEL	60%	275.8
13-15 ft	GRAY FINE SAND SATURATED, STAGNANT HYDROCARBON SOIL	10%	460.6

Using water finding paste on inner
rod, checked for water to 11 ft.
No water at 11 ft.
Target sample depth 11-13 ft,
should be directly above water
table.

10:30 - DRIVING ADJACENT BORING
Drove to 11, opened barrel, over-
drive to 14 ft. for recovery

8/31/21 RG/SS

TIME	SAMPLE ID	NOTES
10:54	21-UPC-SB01	GR0, GR0, PH, VOC <small>SATURATED GRAY SAND</small>
10:58	21-UPC-SB02	DUP, OF 01

98% recovery in core sample,
adequate volume for all jars

10:00 Decontaminated tooling with
Alconox spray, paper towels,
VI water spray, paper towels

11:20 - BEGAN SOIL BORING AT DOWN
FLOW GRADIENT LOCATION

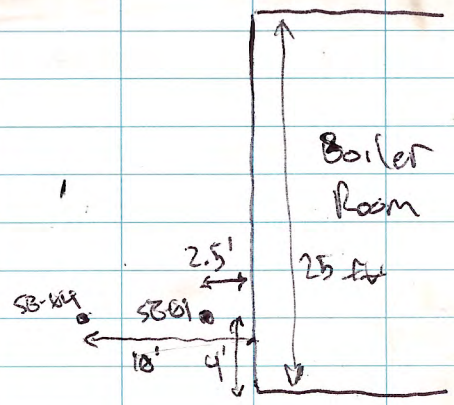
DEPTH (ft)	SOIL TYPE	RECOVERY	PID (PPM)

Refusal at 1 ft. bys in
two locations at low spot
in middle of roadway.
Moving to downgradient
location adjacent the slough
channel.

DEPTH (ft)	SOIL TYPE	RECOVERY	PID (ppm)
3-5	3-4.5 ft CLAY SILTY ORGANIC LAYER 4.5-5 ft FINE GRAY SILT	70%	2.3
8-10	SATURATED GRAY SANDY SILT, TRACE ORGANICS	80%	1.2

TIME	SAMPLE ID	NOTES
12:08	21-VPC- SP03 SB03 SB-RB75	8-10 FT GRD, ORG, VOL, PAH 1-2 FT LOWER IN SURFACE ELEVATION THAN SOURCE LOCATION SATURATED SOIL NO HYDROCARBON ODOR

12:20 Lunch break



1300 Attempting to drive an extra boring SB-04 10 ft, W of release point. Target depth 8-10 ft.

Opened sample barrel at 7.5 ft, driving slowed significantly. Plug was loose, sample barrel opened early, unknown depth sample in core. (2-7ft.)

Depth	Soil	PID (ppm)
2-? to 7.5 ft.	grey-brn. sandy gravel	4.0
7.5-10 ft.	7.5-8 " "	} 256
	moist 8-9.5 grey sand	
	↓ 9.5-10 grey sandy gravel	

Appears to be top of smear zone at ~8 ft.

1400 Collecting shallow soil samples for field screening along dry slough channel bank.

8/31/21 RG/SS

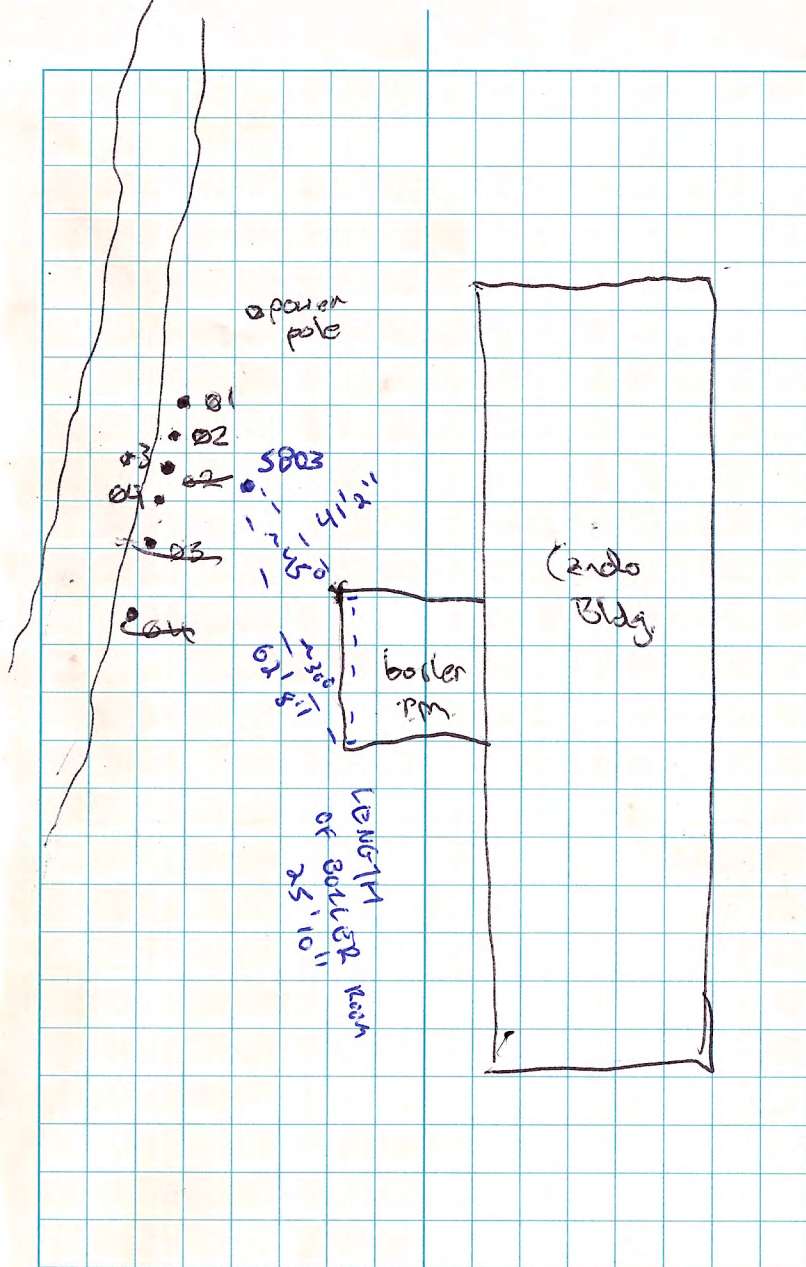
Location	Depth	PbD (ppm)
02	1.5-2 Ft.	2.6
03	1.5-2 Ft	1.7
04	1.5-2 Ft.	2.0
01	1.5-2 Ft	1.1

BROWN SILT AT ALL LOCATIONS

14:30 - S. SOYCE & R. GURTZ OFF-SITE

16:15 - S. SOYCE RETURNED TO SITE
TO TAKE SWING TIE MEASUREMENT
FOR SECOND BORING LOCATION

16:30 - S. SOYCE OFF SITE



APPENDIX C
LABORATORY REPORT - SGS 1215638 AND ADEC
LABORATORY DATA REVIEW CHECKLIST

Laboratory Report of Analysis

To: Arctic Data Services LLC
250 Cushman Street, Suite 3D
Fairbanks, AK 99701
(907)457-3147

Report Number: **1215638**

Client Project: **University Park Spill Investig**

Dear Rodney Guritz,

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.



Justin Nelson
2021.09.23
16:47:18 -08'00'

Jennifer Dawkins
Project Manager
Jennifer.Dawkins@sgs.com

Date

Case Narrative

SGS Client: **Arctic Data Services LLC**
SGS Project: **1215638**
Project Name/Site: **University Park Spill Investig**
Project Contact: **Rodney Guritz**

Refer to sample receipt form for information on sample condition.

21-UPC-SB01 (1215638001) PS

AK101 - Surrogate recovery for 4-bromofluorobenzene does not meet QC criteria due to sample dilution.
8270D SIM - PAH surrogate recoveries for fluoranthene-d10 and 2-methylnaphthalene-d10 do not meet QC criteria due to sample dilution.

21-UPC-SB02 (1215638002) PS

AK101 - Surrogate recovery for 4-bromofluorobenzene does not meet QC criteria due to sample dilution.
8270D SIM - PAH surrogate recoveries for fluoranthene-d10 and 2-methylnaphthalene-d10 do not meet QC criteria 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.

Print Date: 09/23/2021 8:39:52AM

Report of Manual Integrations

<u>Laboratory ID</u>	<u>Client Sample ID</u>	<u>Analytical Batch</u>	<u>Analyte</u>	<u>Reason</u>
8270D SIM (PAH)				
1215638001	21-UPC-SB01	XMS12883	Fluorene	BLC
1215638002	21-UPC-SB02	XMS12883	Fluorene	BLC

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.

Laboratory Qualifiers

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

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

SGS maintains a formal Quality Assurance/Quality Control (QA/QC) program. A copy of our Quality Assurance Plan (QAP), which outlines this program, is available at your request. The laboratory certification numbers are AK00971 (DW Chemistry & Microbiology) & 17-021 (CS) for ADEC and 2944.01 for DOD ELAP/ISO17025 (RCRA methods: 1020B, 1311, 3010A, 3050B, 3520C, 3550C, 5030B, 5035A, 6020B, 7470A, 7471B, 8015C, 8021B, 8082A, 8260D, 8270D, 8270D-SIM, 9040C, 9045D, 9056A, 9060A, AK101 and AK102/103). SGS is only certified for the analytes listed on our Drinking Water Certification (DW methods: 200.8, 2130B, 2320B, 2510B, 300.0, 4500-CN-C,E, 4500-H-B, 4500-NO3-F, 4500-P-E and 524.2) and only those analytes will be reported to the State of Alaska for compliance. Except as specifically noted, all statements and data in this report are in conformance to the provisions set forth by the SGS QAP and, when applicable, other regulatory authorities.

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

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

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

Sample Summary

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>Collected</u>	<u>Received</u>	<u>Matrix</u>
21-UPC-SB01	1215638001	08/31/2021	09/01/2021	Soil/Solid (dry weight)
21-UPC-SB02	1215638002	08/31/2021	09/01/2021	Soil/Solid (dry weight)
21-UPC-SB03	1215638003	08/31/2021	09/01/2021	Soil/Solid (dry weight)
Trip Blank	1215638004	08/31/2021	09/01/2021	Soil/Solid (dry weight)

<u>Method</u>	<u>Method Description</u>
8270D SIM (PAH)	8270 PAH SIM Semi-Volatiles GC/MS
AK102	Diesel Range Organics (S)
AK101	Gasoline Range Organics (S)
SM21 2540G	Percent Solids SM2540G
SW8260D	VOC 8260 (S) Field Extracted

Print Date: 09/23/2021 8:39:57AM

Detectable Results Summary

Client Sample ID: **21-UPC-SB01**

Lab Sample ID: 1215638001

Polynuclear Aromatics GC/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
1-Methylnaphthalene	12400	ug/kg
2-Methylnaphthalene	14700	ug/kg
Anthracene	457J	ug/kg
Fluorene	1900	ug/kg
Naphthalene	6180	ug/kg
Phenanthrene	3440	ug/kg
Semivolatile Organic Fuels		
Diesel Range Organics	7990	mg/kg
Volatile Fuels		
Gasoline Range Organics	202	mg/kg
Volatile GC/MS- Petroleum VOC Group		
1,2,4-Trimethylbenzene	19200	ug/kg
1,3,5-Trimethylbenzene	8800	ug/kg
Ethylbenzene	1080	ug/kg
Isopropylbenzene (Cumene)	998	ug/kg
Naphthalene	14000	ug/kg
o-Xylene	3660	ug/kg
P & M -Xylene	7840	ug/kg
sec-Butylbenzene	1250	ug/kg
Xylenes (total)	11500	ug/kg

Client Sample ID: **21-UPC-SB02**

Lab Sample ID: 1215638002

Polynuclear Aromatics GC/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
1-Methylnaphthalene	15100	ug/kg
2-Methylnaphthalene	18000	ug/kg
Anthracene	574J	ug/kg
Fluorene	2320	ug/kg
Naphthalene	7660	ug/kg
Phenanthrene	4220	ug/kg
Semivolatile Organic Fuels		
Diesel Range Organics	7580	mg/kg
Volatile Fuels		
Gasoline Range Organics	155	mg/kg
Volatile GC/MS- Petroleum VOC Group		
1,2,4-Trimethylbenzene	20100	ug/kg
1,3,5-Trimethylbenzene	9510	ug/kg
Ethylbenzene	1140	ug/kg
Isopropylbenzene (Cumene)	1030	ug/kg
Naphthalene	16200	ug/kg
o-Xylene	3940	ug/kg
P & M -Xylene	8370	ug/kg
sec-Butylbenzene	1280	ug/kg
Xylenes (total)	12300	ug/kg

Client Sample ID: **21-UPC-SB03**

Lab Sample ID: 1215638003

Volatile Fuels

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Gasoline Range Organics	1.94J	mg/kg
Volatile GC/MS- Petroleum VOC Group		
1,3,5-Trimethylbenzene	15.5J	ug/kg

Client Sample ID: **Trip Blank**

Lab Sample ID: 1215638004

Volatile Fuels

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Gasoline Range Organics	1.28J	mg/kg

Print Date: 09/23/2021 8:39:58AM



Results of 21-UPC-SB01

Client Sample ID: 21-UPC-SB01
Client Project ID: University Park Spill Investig
Lab Sample ID: 1215638001
Lab Project ID: 1215638

Collection Date: 08/31/21 10:54
Received Date: 09/01/21 08:56
Matrix: Soil/Solid (dry weight)
Solids (%):78.3
Location:

Results by Polynuclear Aromatics GC/MS

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

Batch Information

Analytical Batch: XMS12883
Analytical Method: 8270D SIM (PAH)
Analyst: LAW
Analytical Date/Time: 09/13/21 23:11
Container ID: 1215638001-A

Prep Batch: XXX45520
Prep Method: SW3550C
Prep Date/Time: 09/07/21 12:12
Prep Initial Wt./Vol.: 22.983 g
Prep Extract Vol: 5 mL



Results of 21-UPC-SB01

Client Sample ID: 21-UPC-SB01
Client Project ID: University Park Spill Investig
Lab Sample ID: 1215638001
Lab Project ID: 1215638

Collection Date: 08/31/21 10:54
Received Date: 09/01/21 08:56
Matrix: Soil/Solid (dry weight)
Solids (%):78.3
Location:

Results by Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	7990	253	114	mg/kg	10		09/09/21 03:05
Surrogates							
5a Androstane (surr)	84.8	50-150		%	10		09/09/21 03:05

Batch Information

Analytical Batch: XFC16077
Analytical Method: AK102
Analyst: IVM
Analytical Date/Time: 09/09/21 03:05
Container ID: 1215638001-A

Prep Batch: XXX45511
Prep Method: SW3550C
Prep Date/Time: 09/05/21 09:53
Prep Initial Wt./Vol.: 30.242 g
Prep Extract Vol: 5 mL



Results of 21-UPC-SB01

Client Sample ID: **21-UPC-SB01**
Client Project ID: **University Park Spill Investig**
Lab Sample ID: 1215638001
Lab Project ID: 1215638

Collection Date: 08/31/21 10:54
Received Date: 09/01/21 08:56
Matrix: Soil/Solid (dry weight)
Solids (%):78.3
Location:

Results by Volatile Fuels

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	202		36.7	11.0	mg/kg	10		09/13/21 14:22
Surrogates								
4-Bromofluorobenzene (surr)	1070	*	50-150		%	10		09/13/21 14:22

Batch Information

Analytical Batch: VFC15818
Analytical Method: AK101
Analyst: IJV
Analytical Date/Time: 09/13/21 14:22
Container ID: 1215638001-B

Prep Batch: VXX37836
Prep Method: SW5035A
Prep Date/Time: 08/31/21 10:54
Prep Initial Wt./Vol.: 70.047 g
Prep Extract Vol: 40.2216 mL



Results of 21-UPC-SB01

Client Sample ID: **21-UPC-SB01**
Client Project ID: **University Park Spill Investig**
Lab Sample ID: 1215638001
Lab Project ID: 1215638

Collection Date: 08/31/21 10:54
Received Date: 09/01/21 08:56
Matrix: Soil/Solid (dry weight)
Solids (%):78.3
Location:

Results by Volatile GC/MS- Petroleum VOC Group

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
1,2,4-Trimethylbenzene	19200	2930	880	ug/kg	20		09/10/21 22:01
1,2-Dibromoethane	22.0 U	44.0	22.0	ug/kg	20		09/10/21 22:01
1,2-Dichloroethane	29.4 U	58.7	20.5	ug/kg	20		09/10/21 22:01
1,3,5-Trimethylbenzene	8800	734	229	ug/kg	20		09/10/21 22:01
Benzene	184 U	367	114	ug/kg	20		09/10/21 22:01
Ethylbenzene	1080	734	229	ug/kg	20		09/10/21 22:01
Isopropylbenzene (Cumene)	998	734	229	ug/kg	20		09/10/21 22:01
Methyl-t-butyl ether	1465 U	2930	910	ug/kg	20		09/10/21 22:01
Naphthalene	14000	734	229	ug/kg	20		09/10/21 22:01
n-Butylbenzene	367 U	734	229	ug/kg	20		09/10/21 22:01
o-Xylene	3660	734	229	ug/kg	20		09/10/21 22:01
P & M -Xylene	7840	1470	440	ug/kg	20		09/10/21 22:01
sec-Butylbenzene	1250	734	229	ug/kg	20		09/10/21 22:01
tert-Butylbenzene	367 U	734	229	ug/kg	20		09/10/21 22:01
Toluene	367 U	734	229	ug/kg	20		09/10/21 22:01
Xylenes (total)	11500	2200	669	ug/kg	20		09/10/21 22:01
Surrogates							
1,2-Dichloroethane-D4 (surr)	104	71-136		%	20		09/10/21 22:01
4-Bromofluorobenzene (surr)	114	55-151		%	20		09/10/21 22:01
Toluene-d8 (surr)	99.2	85-116		%	20		09/10/21 22:01

Batch Information

Analytical Batch: VMS21168
Analytical Method: SW8260D
Analyst: S.S
Analytical Date/Time: 09/10/21 22:01
Container ID: 1215638001-B

Prep Batch: VXX37827
Prep Method: SW5035A
Prep Date/Time: 08/31/21 10:54
Prep Initial Wt./Vol.: 70.047 g
Prep Extract Vol: 40.2216 mL



Results of 21-UPC-SB02

Client Sample ID: 21-UPC-SB02
Client Project ID: University Park Spill Investig
Lab Sample ID: 1215638002
Lab Project ID: 1215638

Collection Date: 08/31/21 10:58
Received Date: 09/01/21 08:56
Matrix: Soil/Solid (dry weight)
Solids (%):79.9
Location:

Results by Polynuclear Aromatics GC/MS

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

Batch Information

Analytical Batch: XMS12883
Analytical Method: 8270D SIM (PAH)
Analyst: LAW
Analytical Date/Time: 09/13/21 23:32
Container ID: 1215638002-A

Prep Batch: XXX45520
Prep Method: SW3550C
Prep Date/Time: 09/07/21 12:12
Prep Initial Wt./Vol.: 22.765 g
Prep Extract Vol: 5 mL



Results of 21-UPC-SB02

Client Sample ID: **21-UPC-SB02**
Client Project ID: **University Park Spill Investig**
Lab Sample ID: 1215638002
Lab Project ID: 1215638

Collection Date: 08/31/21 10:58
Received Date: 09/01/21 08:56
Matrix: Soil/Solid (dry weight)
Solids (%):79.9
Location:

Results by Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	7580	250	112	mg/kg	10		09/09/21 03:14
Surrogates							
5a Androstane (surr)	86.7	50-150		%	10		09/09/21 03:14

Batch Information

Analytical Batch: XFC16077
Analytical Method: AK102
Analyst: IVM
Analytical Date/Time: 09/09/21 03:14
Container ID: 1215638002-A

Prep Batch: XXX45511
Prep Method: SW3550C
Prep Date/Time: 09/05/21 09:53
Prep Initial Wt./Vol.: 30.079 g
Prep Extract Vol: 5 mL



Results of 21-UPC-SB02

Client Sample ID: 21-UPC-SB02
Client Project ID: University Park Spill Investig
Lab Sample ID: 1215638002
Lab Project ID: 1215638

Collection Date: 08/31/21 10:58
Received Date: 09/01/21 08:56
Matrix: Soil/Solid (dry weight)
Solids (%):79.9
Location:

Results by Volatile Fuels

Table with 8 columns: Parameter, Result, Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows include Gasoline Range Organics and 4-Bromofluorobenzene (surr).

Batch Information

Analytical Batch: VFC15818
Analytical Method: AK101
Analyst: IJV
Analytical Date/Time: 09/13/21 14:40
Container ID: 1215638002-B

Prep Batch: VXX37836
Prep Method: SW5035A
Prep Date/Time: 08/31/21 10:58
Prep Initial Wt./Vol.: 71.469 g
Prep Extract Vol: 39.3667 mL



Results of 21-UPC-SB02

Client Sample ID: **21-UPC-SB02**
Client Project ID: **University Park Spill Investig**
Lab Sample ID: 1215638002
Lab Project ID: 1215638

Collection Date: 08/31/21 10:58
Received Date: 09/01/21 08:56
Matrix: Soil/Solid (dry weight)
Solids (%):79.9
Location:

Results by Volatile GC/MS- Petroleum VOC Group

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
1,2,4-Trimethylbenzene	20100	2760	827	ug/kg	20		09/10/21 22:16
1,2-Dibromoethane	20.7 U	41.4	20.7	ug/kg	20		09/10/21 22:16
1,2-Dichloroethane	27.6 U	55.2	19.3	ug/kg	20		09/10/21 22:16
1,3,5-Trimethylbenzene	9510	689	215	ug/kg	20		09/10/21 22:16
Benzene	173 U	345	108	ug/kg	20		09/10/21 22:16
Ethylbenzene	1140	689	215	ug/kg	20		09/10/21 22:16
Isopropylbenzene (Cumene)	1030	689	215	ug/kg	20		09/10/21 22:16
Methyl-t-butyl ether	1380 U	2760	855	ug/kg	20		09/10/21 22:16
Naphthalene	16200	689	215	ug/kg	20		09/10/21 22:16
n-Butylbenzene	345 U	689	215	ug/kg	20		09/10/21 22:16
o-Xylene	3940	689	215	ug/kg	20		09/10/21 22:16
P & M -Xylene	8370	1380	414	ug/kg	20		09/10/21 22:16
sec-Butylbenzene	1280	689	215	ug/kg	20		09/10/21 22:16
tert-Butylbenzene	345 U	689	215	ug/kg	20		09/10/21 22:16
Toluene	345 U	689	215	ug/kg	20		09/10/21 22:16
Xylenes (total)	12300	2070	629	ug/kg	20		09/10/21 22:16
Surrogates							
1,2-Dichloroethane-D4 (surr)	103	71-136		%	20		09/10/21 22:16
4-Bromofluorobenzene (surr)	110	55-151		%	20		09/10/21 22:16
Toluene-d8 (surr)	99.6	85-116		%	20		09/10/21 22:16

Batch Information

Analytical Batch: VMS21168
Analytical Method: SW8260D
Analyst: S.S
Analytical Date/Time: 09/10/21 22:16
Container ID: 1215638002-B

Prep Batch: VXX37827
Prep Method: SW5035A
Prep Date/Time: 08/31/21 10:58
Prep Initial Wt./Vol.: 71.469 g
Prep Extract Vol: 39.3667 mL



Results of 21-UPC-SB03

Client Sample ID: 21-UPC-SB03
Client Project ID: University Park Spill Investig
Lab Sample ID: 1215638003
Lab Project ID: 1215638

Collection Date: 08/31/21 12:08
Received Date: 09/01/21 08:56
Matrix: Soil/Solid (dry weight)
Solids (%):70.4
Location:

Results by Polynuclear Aromatics GC/MS

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

Batch Information

Analytical Batch: XMS12890
Analytical Method: 8270D SIM (PAH)
Analyst: LAW
Analytical Date/Time: 09/13/21 21:58
Container ID: 1215638003-A

Prep Batch: XXX45520
Prep Method: SW3550C
Prep Date/Time: 09/07/21 12:12
Prep Initial Wt./Vol.: 22.657 g
Prep Extract Vol: 5 mL



Results of 21-UPC-SB03

Client Sample ID: **21-UPC-SB03**
Client Project ID: **University Park Spill Investig**
Lab Sample ID: 1215638003
Lab Project ID: 1215638

Collection Date: 08/31/21 12:08
Received Date: 09/01/21 08:56
Matrix: Soil/Solid (dry weight)
Solids (%):70.4
Location:

Results by Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	14.0 U	28.0	12.6	mg/kg	1		09/07/21 22:12
Surrogates							
5a Androstane (surr)	73.5	50-150		%	1		09/07/21 22:12

Batch Information

Analytical Batch: XFC16076
Analytical Method: AK102
Analyst: IVM
Analytical Date/Time: 09/07/21 22:12
Container ID: 1215638003-A

Prep Batch: XXX45511
Prep Method: SW3550C
Prep Date/Time: 09/05/21 09:53
Prep Initial Wt./Vol.: 30.489 g
Prep Extract Vol: 5 mL



Results of 21-UPC-SB03

Client Sample ID: **21-UPC-SB03**
Client Project ID: **University Park Spill Investig**
Lab Sample ID: 1215638003
Lab Project ID: 1215638

Collection Date: 08/31/21 12:08
Received Date: 09/01/21 08:56
Matrix: Soil/Solid (dry weight)
Solids (%):70.4
Location:

Results by Volatile Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	1.94 J	4.30	1.29	mg/kg	1		09/13/21 17:05
Surrogates							
4-Bromofluorobenzene (surr)	95	50-150		%	1		09/13/21 17:05

Batch Information

Analytical Batch: VFC15818
Analytical Method: AK101
Analyst: IJV
Analytical Date/Time: 09/13/21 17:05
Container ID: 1215638003-B

Prep Batch: VXX37836
Prep Method: SW5035A
Prep Date/Time: 08/31/21 12:08
Prep Initial Wt./Vol.: 80.901 g
Prep Extract Vol: 48.9814 mL



Results of 21-UPC-SB03

Client Sample ID: 21-UPC-SB03
Client Project ID: University Park Spill Investig
Lab Sample ID: 1215638003
Lab Project ID: 1215638

Collection Date: 08/31/21 12:08
Received Date: 09/01/21 08:56
Matrix: Soil/Solid (dry weight)
Solids (%):70.4
Location:

Results by Volatile GC/MS- Petroleum VOC Group

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows include various petroleum VOCs like 1,2,4-Trimethylbenzene, Benzene, Toluene, and Surrogates.

Batch Information

Analytical Batch: VMS21168
Analytical Method: SW8260D
Analyst: S.S
Analytical Date/Time: 09/10/21 17:06
Container ID: 1215638003-B

Prep Batch: VXX37827
Prep Method: SW5035A
Prep Date/Time: 08/31/21 12:08
Prep Initial Wt./Vol.: 80.901 g
Prep Extract Vol: 48.9814 mL



Results of Trip Blank

Client Sample ID: **Trip Blank**
Client Project ID: **University Park Spill Investig**
Lab Sample ID: 1215638004
Lab Project ID: 1215638

Collection Date: 08/31/21 09:00
Received Date: 09/01/21 08:56
Matrix: Soil/Solid (dry weight)
Solids (%):
Location:

Results by Volatile Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	1.28 J	2.53	0.758	mg/kg	1		09/13/21 13:11
Surrogates							
4-Bromofluorobenzene (surr)	83.5	50-150		%	1		09/13/21 13:11

Batch Information

Analytical Batch: VFC15818
Analytical Method: AK101
Analyst: IJV
Analytical Date/Time: 09/13/21 13:11
Container ID: 1215638004-A

Prep Batch: VXX37836
Prep Method: SW5035A
Prep Date/Time: 08/31/21 09:00
Prep Initial Wt./Vol.: 49.474 g
Prep Extract Vol: 25 mL



Results of Trip Blank

Client Sample ID: **Trip Blank**
 Client Project ID: **University Park Spill Investig**
 Lab Sample ID: 1215638004
 Lab Project ID: 1215638

Collection Date: 08/31/21 09:00
 Received Date: 09/01/21 08:56
 Matrix: Soil/Solid (dry weight)
 Solids (%):
 Location:

Results by Volatile GC/MS- Petroleum VOC Group

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
1,2,4-Trimethylbenzene	50.5 U	101	30.3	ug/kg	1		09/10/21 15:49
1,2-Dibromoethane	0.760 U	1.52	0.758	ug/kg	1		09/10/21 15:49
1,2-Dichloroethane	1.01 U	2.02	0.707	ug/kg	1		09/10/21 15:49
1,3,5-Trimethylbenzene	12.7 U	25.3	7.88	ug/kg	1		09/10/21 15:49
Benzene	6.30 U	12.6	3.94	ug/kg	1		09/10/21 15:49
Ethylbenzene	12.7 U	25.3	7.88	ug/kg	1		09/10/21 15:49
Isopropylbenzene (Cumene)	12.7 U	25.3	7.88	ug/kg	1		09/10/21 15:49
Methyl-t-butyl ether	50.5 U	101	31.3	ug/kg	1		09/10/21 15:49
Naphthalene	12.7 U	25.3	7.88	ug/kg	1		09/10/21 15:49
n-Butylbenzene	12.7 U	25.3	7.88	ug/kg	1		09/10/21 15:49
o-Xylene	12.7 U	25.3	7.88	ug/kg	1		09/10/21 15:49
P & M -Xylene	25.3 U	50.5	15.2	ug/kg	1		09/10/21 15:49
sec-Butylbenzene	12.7 U	25.3	7.88	ug/kg	1		09/10/21 15:49
tert-Butylbenzene	12.7 U	25.3	7.88	ug/kg	1		09/10/21 15:49
Toluene	12.7 U	25.3	7.88	ug/kg	1		09/10/21 15:49
Xylenes (total)	37.9 U	75.8	23.0	ug/kg	1		09/10/21 15:49
Surrogates							
1,2-Dichloroethane-D4 (surr)	104	71-136		%	1		09/10/21 15:49
4-Bromofluorobenzene (surr)	92.2	55-151		%	1		09/10/21 15:49
Toluene-d8 (surr)	99.6	85-116		%	1		09/10/21 15:49

Batch Information

Analytical Batch: VMS21168
 Analytical Method: SW8260D
 Analyst: S.S
 Analytical Date/Time: 09/10/21 15:49
 Container ID: 1215638004-A

Prep Batch: VXX37827
 Prep Method: SW5035A
 Prep Date/Time: 08/31/21 09:00
 Prep Initial Wt./Vol.: 49.474 g
 Prep Extract Vol: 25 mL



Method Blank

Blank ID: MB for HBN 1825193 [SPT/11368]
Blank Lab ID: 1634842

Matrix: Soil/Solid (dry weight)

QC for Samples:
1215638001, 1215638002, 1215638003

Results by SM21 2540G

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Total Solids	100			%

Batch Information

Analytical Batch: SPT11368
Analytical Method: SM21 2540G
Instrument:
Analyst: CRF
Analytical Date/Time: 9/7/2021 12:20:00PM

Print Date: 09/23/2021 8:40:02AM

Duplicate Sample Summary

Original Sample ID: 1215638002

Duplicate Sample ID: 1634843

QC for Samples:

1215638001, 1215638002, 1215638003

Analysis Date: 09/07/2021 12:20

Matrix: Soil/Solid (dry weight)

Results by SM21 2540G

<u>NAME</u>	<u>Original</u>	<u>Duplicate</u>	<u>Units</u>	<u>RPD (%)</u>	<u>RPD CL</u>
Total Solids	79.9	80.2	%	0.42	(< 15)

Batch Information

Analytical Batch: SPT11368

Analytical Method: SM21 2540G

Instrument:

Analyst: CRF

Print Date: 09/23/2021 8:40:03AM

Duplicate Sample Summary

Original Sample ID: 1215658013

Duplicate Sample ID: 1634844

QC for Samples:

1215638003

Analysis Date: 09/07/2021 12:20

Matrix: Soil/Solid (dry weight)

Results by SM21 2540G

<u>NAME</u>	<u>Original</u>	<u>Duplicate</u>	<u>Units</u>	<u>RPD (%)</u>	<u>RPD CL</u>
Total Solids	95.6	95.6	%	0.03	(< 15)

Batch Information

Analytical Batch: SPT11368

Analytical Method: SM21 2540G

Instrument:

Analyst: CRF

Print Date: 09/23/2021 8:40:03AM

Method Blank

Blank ID: MB for HBN 1825452 [VXX/37827]

Blank Lab ID: 1636024

QC for Samples:

1215638001, 1215638002, 1215638003, 1215638004

Matrix: Soil/Solid (dry weight)

Results by SW8260D

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
1,2,4-Trimethylbenzene	50.0U	100	30.0	ug/kg
1,2-Dibromoethane	0.750U	1.50	0.750	ug/kg
1,2-Dichloroethane	1.00U	2.00	0.700	ug/kg
1,3,5-Trimethylbenzene	12.5U	25.0	7.80	ug/kg
Benzene	6.25U	12.5	3.90	ug/kg
Ethylbenzene	12.5U	25.0	7.80	ug/kg
Isopropylbenzene (Cumene)	12.5U	25.0	7.80	ug/kg
Methyl-t-butyl ether	50.0U	100	31.0	ug/kg
Naphthalene	12.5U	25.0	7.80	ug/kg
n-Butylbenzene	12.5U	25.0	7.80	ug/kg
o-Xylene	12.5U	25.0	7.80	ug/kg
P & M -Xylene	25.0U	50.0	15.0	ug/kg
sec-Butylbenzene	12.5U	25.0	7.80	ug/kg
tert-Butylbenzene	12.5U	25.0	7.80	ug/kg
Toluene	12.5U	25.0	7.80	ug/kg
Xylenes (total)	37.5U	75.0	22.8	ug/kg
Surrogates				
1,2-Dichloroethane-D4 (surr)	104	71-136		%
4-Bromofluorobenzene (surr)	89.7	55-151		%
Toluene-d8 (surr)	98.9	85-116		%

Batch Information

Analytical Batch: VMS21168

Analytical Method: SW8260D

Instrument: VRA Agilent GC/MS 7890B/5977A

Analyst: S.S

Analytical Date/Time: 9/10/2021 11:25:00AM

Prep Batch: VXX37827

Prep Method: SW5035A

Prep Date/Time: 9/10/2021 6:00:00AM

Prep Initial Wt./Vol.: 50 g

Prep Extract Vol: 25 mL



Blank Spike Summary

Blank Spike ID: LCS for HBN 1215638 [VXX37827]

Blank Spike Lab ID: 1636025

Date Analyzed: 09/10/2021 12:46

Matrix: Soil/Solid (dry weight)

QC for Samples: 1215638001, 1215638002, 1215638003, 1215638004

Results by SW8260D

Blank Spike (ug/kg)

Parameter	Spike	Result	Rec (%)	CL
1,2,4-Trimethylbenzene	750	822	110	(75-123)
1,2-Dibromoethane	750	803	107	(78-122)
1,2-Dichloroethane	750	762	102	(73-128)
1,3,5-Trimethylbenzene	750	840	112	(73-124)
Benzene	750	789	105	(77-121)
Ethylbenzene	750	746	99	(76-122)
Isopropylbenzene (Cumene)	750	814	109	(68-134)
Methyl-t-butyl ether	1130	1150	102	(73-125)
Naphthalene	750	741	99	(62-129)
n-Butylbenzene	750	948	126	(70-128)
o-Xylene	750	766	102	(77-123)
P & M -Xylene	1500	1480	99	(77-124)
sec-Butylbenzene	750	898	120	(73-126)
tert-Butylbenzene	750	871	116	(73-125)
Toluene	750	754	100	(77-121)
Xylenes (total)	2250	2250	100	(78-124)

Surrogates

1,2-Dichloroethane-D4 (surr)	750		101	(71-136)
4-Bromofluorobenzene (surr)	750		90	(55-151)
Toluene-d8 (surr)	750		99	(85-116)

Batch Information

Analytical Batch: **VMS21168**
 Analytical Method: **SW8260D**
 Instrument: **VRA Agilent GC/MS 7890B/5977A**
 Analyst: **S.S**

Prep Batch: **VXX37827**
 Prep Method: **SW5035A**
 Prep Date/Time: **09/10/2021 06:00**
 Spike Init Wt./Vol.: 750 ug/kg Extract Vol: 25 mL
 Dupe Init Wt./Vol.: Extract Vol:

Print Date: 09/23/2021 8:40:10AM



Matrix Spike Summary

Original Sample ID: 1636026
 MS Sample ID: 1636027 MS
 MSD Sample ID: 1636028 MSD

Analysis Date: 09/10/2021 16:36
 Analysis Date: 09/10/2021 13:46
 Analysis Date: 09/10/2021 14:01
 Matrix: Solid/Soil (Wet Weight)

QC for Samples: 1215638001, 1215638002, 1215638003, 1215638004

Results by SW8260D

Parameter	Sample	Matrix Spike (ug/kg)			Spike Duplicate (ug/kg)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
1,2,4-Trimethylbenzene	52.5U	786	862	110	786	888	113	75-123	3.00	(< 20)
1,2-Dibromoethane	0.785U	786	859	109	786	848	108	78-122	1.30	(< 20)
1,2-Dichloroethane	1.05U	786	795	101	786	787	100	73-128	0.99	(< 20)
1,3,5-Trimethylbenzene	13.1U	786	897	114	786	903	115	73-124	0.73	(< 20)
Benzene	6.55U	786	813	103	786	804	102	77-121	1.10	(< 20)
Ethylbenzene	13.1U	786	800	102	786	785	100	76-122	1.80	(< 20)
Isopropylbenzene (Cumene)	13.1U	786	875	111	786	857	109	68-134	2.00	(< 20)
Methyl-t-butyl ether	52.5U	1180	1180	100	1180	1180	100	73-125	0.00	(< 20)
Naphthalene	13.1U	786	794	101	786	858	109	62-129	7.80	(< 20)
n-Butylbenzene	13.1U	786	996	127	786	990	126	70-128	0.55	(< 20)
o-Xylene	13.1U	786	806	103	786	794	101	77-123	1.60	(< 20)
P & M -Xylene	26.2U	1570	1600	101	1570	1570	100	77-124	1.50	(< 20)
sec-Butylbenzene	13.1U	786	949	121	786	961	122	73-126	1.20	(< 20)
tert-Butylbenzene	13.1U	786	917	117	786	909	116	73-125	0.89	(< 20)
Toluene	13.1U	786	807	103	786	796	101	77-121	1.40	(< 20)
Xylenes (total)	39.3U	2360	2400	102	2360	2370	100	78-124	1.60	(< 20)
Surrogates										
1,2-Dichloroethane-D4 (surr)		786	794	101	786	786	100	71-136	1.10	
4-Bromofluorobenzene (surr)		1310	1130	86	1310	1130	86	55-151	0.09	
Toluene-d8 (surr)		786	790	100	786	787	100	85-116	0.30	

Batch Information

Analytical Batch: VMS21168
 Analytical Method: SW8260D
 Instrument: VRA Agilent GC/MS 7890B/5977A
 Analyst: S.S
 Analytical Date/Time: 9/10/2021 1:46:00PM

Prep Batch: VXX37827
 Prep Method: Vol. Extraction SW8260 Field Extracted L
 Prep Date/Time: 9/10/2021 6:00:00AM
 Prep Initial Wt./Vol.: 47.68g
 Prep Extract Vol: 25.00mL

Print Date: 09/23/2021 8:40:11AM



Method Blank

Blank ID: MB for HBN 1825519 [VXX/37836]
Blank Lab ID: 1636311

Matrix: Soil/Solid (dry weight)

QC for Samples:
1215638001, 1215638002, 1215638003, 1215638004

Results by AK101

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Gasoline Range Organics	1.24J	2.50	0.750	mg/kg
Surrogates				
4-Bromofluorobenzene (surr)	94.1	50-150		%

Batch Information

Analytical Batch: VFC15818
Analytical Method: AK101
Instrument: Agilent 7890A PID/FID
Analyst: IJV
Analytical Date/Time: 9/13/2021 12:11:00PM

Prep Batch: VXX37836
Prep Method: SW5035A
Prep Date/Time: 9/13/2021 6:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

Print Date: 09/23/2021 8:40:13AM



Blank Spike Summary

Blank Spike ID: LCS for HBN 1215638 [VXX37836]
 Blank Spike Lab ID: 1636312
 Date Analyzed: 09/13/2021 11:35

Spike Duplicate ID: LCSD for HBN 1215638 [VXX37836]
 Spike Duplicate Lab ID: 1636313
 Matrix: Soil/Solid (dry weight)

QC for Samples: 1215638001, 1215638002, 1215638003, 1215638004

Results by AK101

Parameter	Blank Spike (mg/kg)			Spike Duplicate (mg/kg)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Gasoline Range Organics	12.5	13.7	109	12.5	13.2	106	(60-120)	3.30	(< 20)

Surrogates

4-Bromofluorobenzene (surr)	1.25		94	1.25		100	(50-150)	5.60	
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Batch Information

Analytical Batch: **VFC15818**
 Analytical Method: **AK101**
 Instrument: **Agilent 7890A PID/FID**
 Analyst: **IJV**

Prep Batch: **VXX37836**
 Prep Method: **SW5035A**
 Prep Date/Time: **09/13/2021 06:00**
 Spike Init Wt./Vol.: 12.5 mg/Kg Extract Vol: 25 mL
 Dupe Init Wt./Vol.: 12.5 mg/Kg Extract Vol: 25 mL

Print Date: 09/23/2021 8:40:15AM

Method Blank

Blank ID: MB for HBN 1825121 [XXX/45511]
Blank Lab ID: 1634550

Matrix: Soil/Solid (dry weight)

QC for Samples:
1215638001, 1215638002, 1215638003

Results by AK102

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Diesel Range Organics	10.0U	20.0	9.00	mg/kg
Surrogates				
5a Androstane (surr)	104	60-120		%

Batch Information

Analytical Batch: XFC16076
Analytical Method: AK102
Instrument: Agilent 7890B R
Analyst: IVM
Analytical Date/Time: 9/7/2021 9:22:00PM

Prep Batch: XXX45511
Prep Method: SW3550C
Prep Date/Time: 9/5/2021 9:53:05AM
Prep Initial Wt./Vol.: 30 g
Prep Extract Vol: 5 mL

Print Date: 09/23/2021 8:40:17AM



Blank Spike Summary

Blank Spike ID: LCS for HBN 1215638 [XXX45511]
 Blank Spike Lab ID: 1634551
 Date Analyzed: 09/07/2021 21:32

Spike Duplicate ID: LCSD for HBN 1215638 [XXX45511]
 Spike Duplicate Lab ID: 1634552
 Matrix: Soil/Solid (dry weight)

QC for Samples: 1215638001, 1215638002, 1215638003

Results by AK102

Parameter	Blank Spike (mg/kg)			Spike Duplicate (mg/kg)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Diesel Range Organics	667	724	109	667	713	107	(75-125)	1.60	(< 20)
Surrogates									
5a Androstane (surr)	16.7		105	16.7		106	(60-120)	1.20	

Batch Information

Analytical Batch: **XFC16076**
 Analytical Method: **AK102**
 Instrument: **Agilent 7890B R**
 Analyst: **IVM**

Prep Batch: **XXX45511**
 Prep Method: **SW3550C**
 Prep Date/Time: **09/05/2021 09:53**
 Spike Init Wt./Vol.: 667 mg/kg Extract Vol: 5 mL
 Dupe Init Wt./Vol.: 667 mg/kg Extract Vol: 5 mL

Print Date: 09/23/2021 8:40:20AM

Method Blank

Blank ID: MB for HBN 1825158 [XXX/45520]
 Blank Lab ID: 1634707

Matrix: Soil/Solid (dry weight)

QC for Samples:
 1215638001, 1215638002, 1215638003

Results by 8270D SIM (PAH)

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
1-Methylnaphthalene	12.5U	25.0	6.25	ug/kg
2-Methylnaphthalene	12.5U	25.0	6.25	ug/kg
Acenaphthene	12.5U	25.0	6.25	ug/kg
Acenaphthylene	12.5U	25.0	6.25	ug/kg
Anthracene	12.5U	25.0	6.25	ug/kg
Benzo(a)Anthracene	12.5U	25.0	6.25	ug/kg
Benzo[a]pyrene	12.5U	25.0	6.25	ug/kg
Benzo[b]Fluoranthene	12.5U	25.0	6.25	ug/kg
Benzo[g,h,i]perylene	12.5U	25.0	6.25	ug/kg
Benzo[k]fluoranthene	12.5U	25.0	6.25	ug/kg
Chrysene	12.5U	25.0	6.25	ug/kg
Dibenzo[a,h]anthracene	12.5U	25.0	6.25	ug/kg
Fluoranthene	12.5U	25.0	6.25	ug/kg
Fluorene	12.5U	25.0	6.25	ug/kg
Indeno[1,2,3-c,d] pyrene	12.5U	25.0	6.25	ug/kg
Naphthalene	10.0U	20.0	5.00	ug/kg
Phenanthrene	12.5U	25.0	6.25	ug/kg
Pyrene	12.5U	25.0	6.25	ug/kg
Surrogates				
2-Methylnaphthalene-d10 (surr)	72.5	58-103		%
Fluoranthene-d10 (surr)	77.1	54-113		%

Batch Information

Analytical Batch: XMS12880
 Analytical Method: 8270D SIM (PAH)
 Instrument: Agilent GC 7890B/5977A SWA
 Analyst: LAW
 Analytical Date/Time: 9/11/2021 6:59:00AM

Prep Batch: XXX45520
 Prep Method: SW3550C
 Prep Date/Time: 9/7/2021 12:12:24PM
 Prep Initial Wt./Vol.: 22.5 g
 Prep Extract Vol: 5 mL



Blank Spike Summary

Blank Spike ID: LCS for HBN 1215638 [XXX45520]

Blank Spike Lab ID: 1634708

Date Analyzed: 09/11/2021 07:19

Matrix: Soil/Solid (dry weight)

QC for Samples: 1215638001, 1215638002, 1215638003

Results by 8270D SIM (PAH)

Blank Spike (ug/kg)

Parameter	Spike	Result	Rec (%)	CL
1-Methylnaphthalene	111	89.8	81	(43-111)
2-Methylnaphthalene	111	90.1	81	(39-114)
Acenaphthene	111	85.7	77	(44-111)
Acenaphthylene	111	84.5	76	(39-116)
Anthracene	111	86.4	78	(50-114)
Benzo(a)Anthracene	111	89.8	81	(54-122)
Benzo[a]pyrene	111	76.8	69	(50-125)
Benzo[b]Fluoranthene	111	88.0	79	(53-128)
Benzo[g,h,i]perylene	111	71.4	64	(49-127)
Benzo[k]fluoranthene	111	85.5	77	(56-123)
Chrysene	111	86.6	78	(57-118)
Dibenzo[a,h]anthracene	111	68.4	62	(50-129)
Fluoranthene	111	88.7	80	(55-119)
Fluorene	111	86.3	78	(47-114)
Indeno[1,2,3-c,d] pyrene	111	69.7	63	(49-130)
Naphthalene	111	88.8	80	(38-111)
Phenanthrene	111	92.7	84	(49-113)
Pyrene	111	88.8	80	(55-117)

Surrogates

2-Methylnaphthalene-d10 (surr)	111		76	(58-103)
Fluoranthene-d10 (surr)	111		78	(54-113)

Batch Information

Analytical Batch: XMS12880

Analytical Method: 8270D SIM (PAH)

Instrument: Agilent GC 7890B/5977A SWA

Analyst: LAW

Prep Batch: XXX45520

Prep Method: SW3550C

Prep Date/Time: 09/07/2021 12:12

Spike Init Wt./Vol.: 111 ug/kg Extract Vol: 5 mL

Dupe Init Wt./Vol.: Extract Vol:

Print Date: 09/23/2021 8:40:24AM



Matrix Spike Summary

Original Sample ID: 1215658001
 MS Sample ID: 1634709 MS
 MSD Sample ID: 1634710 MSD

Analysis Date: 09/11/2021 7:40
 Analysis Date: 09/11/2021 8:00
 Analysis Date: 09/11/2021 8:21
 Matrix: Soil/Solid (dry weight)

QC for Samples: 1215638001, 1215638002, 1215638003

Results by 8270D SIM (PAH)

Parameter	Sample	Matrix Spike (ug/kg)			Spike Duplicate (ug/kg)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
1-Methylnaphthalene	13.1U	118	90.9	77	117	84.0	72	43-111	7.90	(< 20)
2-Methylnaphthalene	13.1U	118	90.7	77	117	83.5	71	39-114	8.30	(< 20)
Acenaphthene	13.1U	118	84.2	72	117	78.3	67	44-111	7.30	(< 20)
Acenaphthylene	13.1U	118	84.5	72	117	78.2	67	39-116	7.80	(< 20)
Anthracene	13.1U	118	85.1	73	117	78.3	67	50-114	8.40	(< 20)
Benzo(a)Anthracene	13.1U	118	90.5	77	117	83.6	71	54-122	7.90	(< 20)
Benzo(a)pyrene	13.1U	118	81.5	69	117	75.7	65	50-125	7.30	(< 20)
Benzo(b)Fluoranthene	13.1U	118	90.5	77	117	82.6	71	53-128	9.10	(< 20)
Benzo(g,h,i)perylene	13.1U	118	82.2	70	117	76.5	65	49-127	7.30	(< 20)
Benzo(k)fluoranthene	13.1U	118	87.9	75	117	81.1	69	56-123	8.10	(< 20)
Chrysene	13.1U	118	86.5	74	117	79.9	68	57-118	8.00	(< 20)
Dibenzo(a,h)anthracene	13.1U	118	78.5	67	117	73.2	63	50-129	7.00	(< 20)
Fluoranthene	13.1U	118	85.9	73	117	78.7	67	55-119	8.80	(< 20)
Fluorene	13.1U	118	85.5	73	117	78.9	68	47-114	8.00	(< 20)
Indeno[1,2,3-c,d] pyrene	13.1U	118	79.6	68	117	73.3	63	49-130	8.10	(< 20)
Naphthalene	10.4U	118	90.6	77	117	83.4	71	38-111	8.30	(< 20)
Phenanthrene	13.1U	118	90.1	77	117	83.4	71	49-113	7.90	(< 20)
Pyrene	13.1U	118	86.7	74	117	80.4	69	55-117	7.60	(< 20)
Surrogates										
2-Methylnaphthalene-d10 (surr)		118	83.2	71	117	76.2	65	58-103	8.70	
Fluoranthene-d10 (surr)		118	82.8	71	117	75.4	65	54-113	9.40	

Batch Information

Analytical Batch: XMS12880
 Analytical Method: 8270D SIM (PAH)
 Instrument: Agilent GC 7890B/5977A SWA
 Analyst: LAW
 Analytical Date/Time: 9/11/2021 8:00:00AM

Prep Batch: XXX45520
 Prep Method: Sonication Extr Soil 8270 PAH SIM 5ml
 Prep Date/Time: 9/7/2021 12:12:24PM
 Prep Initial Wt./Vol.: 22.56g
 Prep Extract Vol: 5.00mL

Print Date: 09/23/2021 8:40:26AM



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1215638



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CLIENT: Arctic Data Services, LLC

CONTACT: RODNEY GURTZ **PHONE #:** 907 457 3147

PROJECT NAME: UNIVERSITY PARK SPAN INVESTIGATION PERMIT#

REPORTS TO: RODNEY GURTZ **E-MAIL:** RODNEY@ARCTICDATA SERVICES.COM

INVOICE TO: Arctic Data Services, LLC **Profile #:** **QUOTE #:** **QUOTE #:** **P.O. #:**

Section 1

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

Section 3

Preservative

#	CONTAINERS			Comp	Analysis*					REMARKS/LOC ID	
	MeOH	MeOH	MeOH		GRAB	MI (Multi-incremental)	GRAB	MI (Multi-incremental)	GRAB		MI (Multi-incremental)
1				GRAB							
2				GRAB							
3				GRAB							
4											

NOTE: *The following analyses require specific method and/or compound list: BTEX, Metals, PFAS

Section 2

RESERVED for lab use	SAMPLE IDENTIFICATION	DATE mm/dd/yy	TIME HH:MM	MATRIX/MATRIX CODE	Received By:
1	21-VPC-SB01	08/31/21	10:54	SO	[Signature]
2	21-VPC-SB02	08/31/21	10:58	SO	[Signature]
3	21-VPC-SB03	08/31/21	12:08	SO	[Signature]
4	TRAP BLANK	08/31/21	09:00	SO	[Signature]

Section 4

Section 4 **DOD Project?** Yes No **Data Deliverable Requirements:**

Cooler ID: DEBARGE **Level II, SAS XML**

Requested Turnaround Time and/or Special Instructions:

Section 5

Temp Blank °C: 4.1 **ANC:** 3.7 **D60**

Chain of Custody Seal: (Circle)

INTACT **BROKEN** **ABSENT**

Delivery Method: Hand Delivery **Commercial Delivery**

Received For Laboratory By: [Signature]

Received Time: 9/1/21 08:56



e-Sample Receipt Form

SGS Workorder #:

1215638



1 2 1 5 6 3 8

Review Criteria	Condition (Yes, No, N/A)	Exceptions Noted below
Chain of Custody / Temperature Requirements		
Were Custody Seals intact? Note # & location	Yes	1F
COC accompanied samples?	Yes	
DOD: Were samples received in COC corresponding coolers?	N/A	
N/A **Exemption permitted if chilled & collected <8 hours ago, or for samples where chilling is not required		
Temperature blank compliant* (i.e., 0-6 °C after CF)?	Yes	Cooler ID: 1 @ 3.7 °C Therm. ID: D60
If samples received without a temperature blank, the "cooler temperature" will be documented instead & "COOLER TEMP" will be noted to the right. "ambient" or "chilled" will be noted if neither is available.		Cooler ID: @ °C Therm. ID:
		Cooler ID: @ °C Therm. ID:
		Cooler ID: @ °C Therm. ID:
		Cooler ID: @ °C Therm. ID:
*If >6°C, were samples collected <8 hours ago?	N/A	
If <0°C, were sample containers ice free?	N/A	
Note: Identify containers received at non-compliant temperature . Use form FS-0029 if more space is needed.		
Holding Time / Documentation / Sample Condition Requirements		
Note: Refer to form F-083 "Sample Guide" for specific holding times.		
Were samples received within holding time?	Yes	
Do samples match COC** (i.e., sample IDs, dates/times collected)?	Yes	
**Note: If times differ <1hr, record details & login per COC.		
***Note: If sample information on containers differs from COC, SGS will default to COC information		
Were analytical requests clear? (i.e., method is specified for analyses with multiple option for analysis (Ex: BTEX, Metals)	Yes	
Were proper containers (type/mass/volume/preservative***) used?	Yes	N/A ***Exemption permitted for metals (e.g.200.8/6020B).
Volatile / LL-Hg Requirements		
Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples?	Yes	
Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)?	N/A	
Were all soil VOAs field extracted with MeOH+BFB?	Yes	
Note to Client: Any "No", answer above indicates non-compliance with standard procedures and may impact data quality.		
Additional notes (if applicable):		



Sample Containers and Preservatives

<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>	<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>
1215638001-A	No Preservative Required	OK			
1215638001-B	Methanol field pres. 4 C	OK			
1215638002-A	No Preservative Required	OK			
1215638002-B	Methanol field pres. 4 C	OK			
1215638003-A	No Preservative Required	OK			
1215638003-B	Methanol field pres. 4 C	OK			
1215638004-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.

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

DM - The container was received damaged.

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

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

NC- The container provided was not preserved or was under-preserved. The method does not allow for additional preservative added after collection.

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.

QN - Insufficient sample quantity provided.

Laboratory Data Review Checklist

Validation Completed By:

Alex Thompson

Validator Title:

Chemist

Date Completed:

2021-10-07

Consultant

Arctic Data Services, LLC

Laboratory Name:

SGS Environmental Services, Inc.

Laboratory Report Number:

1215638

Report Date:

09/23/2021 16:48:05

ADEC CS Site Name:

University Park Condos Spill

ADEC CS File Number:

100.38.162

ADEC Hazard Identification Number:

3806

Laboratory

1.a) Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses?

Yes No N/A

Comments:

All samples were submitted to and analyzed by SGS North America, Inc. in Anchorage, Alaska.

1.b) If 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 N/A

Comments:

No samples were transferred to another laboratory.

Chain of Custody

2.a) Chain of Custody information completed and custody maintained?

Yes No N/A

Comments:

2.b) Correct analyses requested?

Yes No N/A

Comments:

Laboratory Sample Receipt Documentation

3.a) Sample/cooler temperature documented and within range at receipt (0° to 6° C)?

Yes No N/A

Comments:

Samples were hand delivered in a single cooler to the SGS Fairbanks receiving office and received at 4.1 °C. The cooler was shipped to the SGS Anchorage laboratory and received within the acceptable temperature range at 3.7 °C.

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

Yes No N/A

Comments:

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

Yes No N/A

Comments:

Samples were received in good condition.

3.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 N/A

Comments:

There were no sample receiving discrepancies.

3.e) Data quality or usability affected?

Data quality and usability were not affected.

Case Narrative

4.a) Present and understandable?

Yes No N/A

Comments:

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

Yes No N/A

Comments:

The laboratory report case narrative documented a number of QC anomalies which are addressed in the following relevant sections of this checklist.

4.c) Were all corrective actions documented?

- Yes No N/A

Comments:

No corrective actions were documented or performed.

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

The case narrative makes no conclusions regarding data quality or usability.

Sample Results

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

- Yes No N/A

Comments:

5.b) All applicable holding times met?

- Yes No N/A

Comments:

5.c) All soils reported on a dry weight basis?

- Yes No N/A

Comments:

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

- Yes No N/A

Comments:

LOQs and LODs for non-detect results were compared to the following project action limits (PALs):

ADEC 18 AAC 75.341 Method Two, Table B1, Migration to Groundwater Soil Cleanup Levels for Soil matrix samples.

ADEC 18 AAC 75.341 Method Two, Table B1, Under 40 Inch Zone, Human Health Soil Cleanup Levels for Soil matrix samples.

ADEC 18 AAC 75.341 Method Two, Table B2, Petroleum Hydrocarbon Migration to Groundwater Soil Cleanup Levels for the Under 40-inch Zone for Soil matrix samples.

Seven non-detect results had LODs and/or LOQs exceeding the PAL for sample 21-UPC-SB02, five non-detect results had LODs and/or LOQs exceeding the PAL for sample 21-UPC-SB01, two non-detect results had LODs and/or LOQs exceeding the PAL for sample 21-UPC-SB03, and one non-detect result had LODs and/or LOQs exceeding the PAL for sample Trip Blank.

Refer to the table below for a full list of non-detect results lacking adequate analytical sensitivity.

Client Sample ID	Matrix	Method	Analyte	Units	LOD	LOQ	Result	PAL	PAL Source
21-UPC-SB01	Soil	8260D	1,2-Dibromoethane	ug/kg	22.0	44.0	ND	0.24	ADEC MTG SCL
21-UPC-SB01	Soil	8260D	1,2-Dichloroethane	ug/kg	29.4	58.7	ND	5.50	ADEC MTG SCL
21-UPC-SB01	Soil	8260D	Benzene	ug/kg	184	367	ND	22.00	ADEC MTG SCL
21-UPC-SB01	Soil	8260D	Methyl-tert-butyl ether (MTBE)	ug/kg	1470	2930	ND	400.00	ADEC MTG SCL
21-UPC-SB01	Soil	8270DSIM	Benzo(a)anthracene	ug/kg	625	1250	ND	700.00	ADEC MTG SCL
21-UPC-SB02	Soil	8260D	1,2-Dibromoethane	ug/kg	20.7	41.4	ND	0.24	ADEC MTG SCL
21-UPC-SB02	Soil	8260D	1,2-Dichloroethane	ug/kg	27.6	55.2	ND	5.50	ADEC MTG SCL
21-UPC-SB02	Soil	8260D	Benzene	ug/kg	173	345	ND	22.00	ADEC MTG SCL
21-UPC-SB02	Soil	8260D	Methyl-tert-butyl ether (MTBE)	ug/kg	1380	2760	ND	400.00	ADEC MTG SCL
21-UPC-SB02	Soil	8270DSIM	Benzo(a)anthracene	ug/kg	775	1550	ND	700.00	ADEC MTG SCL
21-UPC-SB02	Soil	8270DSIM	Benzo(a)pyrene	ug/kg	775	1550	ND	1500.00	ADEC U40 HH SCL
21-UPC-SB02	Soil	8270DSIM	Dibenzo(a,h)anthracene	ug/kg	775	1550	ND	1500.00	ADEC U40 HH SCL
21-UPC-SB03	Soil	8260D	1,2-Dibromoethane	ug/kg	1.29	2.58	ND	0.24	ADEC MTG SCL
21-UPC-SB03	Soil	8260D	Naphthalene	ug/kg	21.5	43.0	ND	38.00	ADEC MTG SCL
Trip Blank	Soil	8260D	1,2-Dibromoethane	ug/kg	0.760	1.52	ND	0.24	ADEC MTG SCL

5.e) Data quality and usability affected?

Data quality was not affected. Non-detect results where the LOD exceeds the PAL cannot be used to rule out the potential presence of the analyte at concentrations above the PAL for the sampled location.

QC Samples

Method/Lab Blank

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

Yes No N/A

Comments:

6.a.ii) All method blank results less than limit of quantitation (LOQ) or project specified objectives?

Yes No N/A

Comments:

One analyte was detected below the LOQ in an associated method blank sample. Refer to the table below for further details.

Method	Batch	Analyte	Units	Concentration	LOQ
AK101	VXX37836	Gasoline Range Organics (C6-C10)	mg/kg	1.24	2.5

6.a.iii) If above LOQ or project specified objectives, what samples are affected?

Project-sample results are considered affected if the analyte in question is detected within 10 times the associated method blank concentration. Two result(s) were considered affected by method blank contamination. Refer to the table below.

Sample_ID	Method	Analyte	Units	Result	LOQ	QC_Flag
21-UPC-SB03	AK101	GRO	mg/kg	1.94	4.30	B
Trip Blank	AK101	GRO	mg/kg	1.28	2.53	NA

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

Yes No N/A

Comments:

Affected results were qualified as estimated, and flagged "B" indicating a high bias and potential false-positive detection due to laboratory-based sample contamination. Please note that field QC samples are not flagged due to laboratory contamination. Refer to the relevant field blank section below for further discussion.

6.a.v) Data quality or usability affected?

Data quality is affected as described above. The impact to data usability is minimal, as the affected GRO result is below the most stringent applicable cleanup level, despite the high bias.

Laboratory Control Sample/Duplicate (LCS/LCSD)

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

Yes No N/A

Comments:

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

Yes No N/A

Comments:

There were no inorganic analyses performed in this work order.

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

Yes No N/A

Comments:

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

Yes No N/A

Comments:

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

No results were affected by LCS/LCSD recovery failures. No results were affected by LCS/LCSD RPD failures.

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

Yes No N/A

Comments:

No results were affected by LCS/LCSD recovery or RPD failures.

6.b.vii) Data quality or usability affected?

Data quality and usability were not affected.

Matrix Spike/Duplicate (MS/MSD)

Note: Select N/A if MS/MSDs are not required for the project.

6.c.i) Organics – One MS/MSD reported per matrix, analysis and 20 samples?

Yes No N/A

Comments:

MS/MSD analysis was not required for the organic methods performed in this work order.

6.c.ii) Metals/Inorganics – one MS and one MSD reported per matrix, analysis and 20 samples?

Yes No N/A

Comments:

There were no inorganic analyses performed in this work order.

6.c.iii) Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods: AK101 60%%-120%%, AK102 755%-125%%, AK103 60%%-120%%; all other analyses see the laboratory QC pages)

Yes No N/A

Comments:

6.c.iv) Precision – All relative percent differences (RPD) reported and less than method or laboratory limits and project specified objectives, if applicable? RPD reported from MS/MSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

Yes No N/A

Comments:

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

No results were affected by MS/MSD recovery failures. No results were affected by MS/MSD RPD failures.

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

Yes No N/A

Comments:

No results were affected by MS/MSD recovery or RPD failures.

6.c.vii) Data quality or usability affected?

Data quality and usability were not affected.

Surrogates

Note: Surrogates for organic analyses only or Isotope Dilution Analytes (IDA) for isotope dilution methods

6.d.i) Are surrogate/IDA recoveries reported for organic analyses – field, QC and laboratory samples?

Yes No N/A

Comments:

6.d.ii) Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods 50-150 %R for field samples and 60-120 %R for QC samples; all other analyses see the laboratory report pages)

Yes No N/A

Comments:

There were six surrogate recovery failures identified in project samples. Refer to the table below for further details.

Sample_ID	Matrix	Method	Surrogate	DF	Recovered	LCL	UCL	Recovery
21-UPC-SB02	Soil	AK101	4-Bromofluorobenzene	5.0	803.0	50.0	150.0	High
21-UPC-SB01	Soil	AK101	4-Bromofluorobenzene	10.0	1070.0	50.0	150.0	High (Heavy Dilution)
21-UPC-SB02	Soil	8270DSIM	Fluoranthene-d10	50.0	0.0	54.0	113.0	Low (Heavy Dilution)
21-UPC-SB02	Soil	8270DSIM	2-Methylnaphthalene-d10	50.0	0.0	58.0	103.0	Low (Heavy Dilution)
21-UPC-SB01	Soil	8270DSIM	Fluoranthene-d10	40.0	0.0	54.0	113.0	Low (Heavy Dilution)
21-UPC-SB01	Soil	8270DSIM	2-Methylnaphthalene-d10	40.0	0.0	58.0	103.0	Low (Heavy Dilution)

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

Yes No N/A

Comments:

One result was considered affected by a surrogate recovery failure. Project-sample results are not considered affected by surrogate recovery failures where the sample was heavily diluted (DF > 10). Project-sample results are not considered affected if the associated surrogate was recovered high and the associated analyte was non-detect.
Results affected by high surrogate recovery failures (Recovery > UCL) are qualified as estimated and flagged 'J+', indicating a high bias.

Client Sample ID	Lab Sample ID	Method	Analyte	Units	Result	QC_Flag
21-UPC-SB02	1215638002	AK101	Gasoline Range Organics (C6-C10)	mg/kg	155	J+

6.d.iv) Data quality or usability affected?

Data quality is affected as described above. Refer to the data quality assessment for discussion on the impacts to data usability.

Trip Blanks

Note: Only required for volatile analyses

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

Yes No N/A

Comments:

Sample(s) "Trip Blank" was submitted alongside project VOA samples and analyzed by the following volatile methods: 8260D, AK101.

6.e.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 N/A

Comments:

Samples were submitted in a single cooler.

6.e.iii) All results less than LOQ and project specified objectives?

Yes No N/A

Comments:

One analyte was detected in the submitted trip blank sample. Refer to the table below for further details.

TB	Lab_Sample_ID	QC_Type	Method	Analyte	CAS	TB_Result	LOQ
Trip Blank	1215638004	Trip_Blank	AK101	Gasoline Range Organics (C6-C10)	GRO-C6-C10	1.28	2.53

6.e.iv) If above LOQ or project specified objectives, what samples are affected?

The detection of GRO in the trip blank sample was attributable to laboratory-based contamination; as identified by a detection in an associated method blank sample (see section 6.a, above). Project-sample results are not considered additionally affected by this trip blank detection. No project-sample results were affected.

6.e.v) Data quality or usability affected?

Data quality and usability were not affected.

Field Duplicate(s) or Replicates

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

Yes No N/A

Comments:

One field duplicate sample was collected and submitted, compared to three total project samples (33% collection frequency), meeting or exceeding the minimum required frequency. Refer to the table below for a full list of primary samples and associated replicates.

Primary Sample	Association Type	Associated Samples
21-UPC-SB02	Field_Duplicate	21-UPC-SB01

6.f.ii) Submitted blind to lab?

Yes No N/A

Comments:

6.f.iii) Precision – All relative percent differences (RPD) less than specified project objectives? (Recommended: 30% Water/Air, 50% Soil)

Yes No N/A

Comments:

RPDs for each field duplicate sample pair were calculated and compared to the ADEC recommended measurement quality objectives (MQO) for the sample medium, where an analyte was quantitatively detected (above the LOQ) in at least one sample. There were no field duplicate sample pair RPD failures identified.

6.f.iv) Data quality or usability affected?

Data quality and usability were not affected.

Decontamination/Rinsate or Equipment Blanks

6.g.i) Decontamination or Equipment Blank submitted and analyzed (If not applicable, a comment stating why must be entered below)?

Yes No N/A

Comments:

An equipment/decontamination blank was not required nor submitted for the matrix/matrices and method(s) performed for this project.

6.g.ii) All results less than LOQ and project specified objectives?

Yes No N/A

Comments:

N/A; No equipment/decontamination blank samples were submitted.

6.g.iii) If above LOQ or project specified objectives, what samples are affected?

N/A; see above.

6.g.iv) Data quality or usability affected?

Data quality and usability were not affected.

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

7.a) Defined and Appropriate?

Yes No N/A

Comments:

There were no additionally applied laboratory qualifiers.

Summary of Qualified Results for SDG: 1215638

Table 1 - Summary of Qualified Data																
Lab	SDG	Client_Sample_ID	Matrix	Method	Analyte	CAS	Units	DL	LOD	LOQ	Result	Final Lab Flag	QC Flags	Note	Final QC Flag	Final Qualified Result
SGSA	1215638	21-UPC-SB02	Soil	AK101	Gasoline Range Organics (C6-C10)	GRO-C6-C10	mg/kg	5.17	8.60	17.2	155	NA	J+	SURR_%R	J+	155 J+
SGSA	1215638	21-UPC-SB03	Soil	AK101	Gasoline Range Organics (C6-C10)	GRO-C6-C10	mg/kg	1.29	2.15	4.30	1.94	J	B	MB	B	1.94 J B

Summary of Qualified Data

<p>Notes:</p> <p>SURR_%R: Surrogate recovery failure</p> <p>MB: Method blank detection</p>	<p>QC Flags:</p> <p>J+: The quantitation is considered estimated, biased high, due to a QC anomaly.</p> <p>B: The result is considered estimated, biased high, and a potential false-positive detection, due to contamination.</p>	<p>Definitions:</p> <p><i>Yellow highlight indicates a result should be used with caution</i></p> <p><i>Light red highlight indicates a result was rejected</i></p> <p>mg/kg: milligrams per kilogram</p> <p>CAS: Chemical Abstract Service registry number</p> <p>DL: detection limit</p> <p>LOD: limit of detection</p> <p>LOQ: limit of quantitation</p> <p>QC: quality control</p> <p>ND/U: non-detect</p> <p>NA: not applicable</p>
-----------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Analytical Sensitivity Summary for SDG: 1215638

Table 2 - Analytical Sensitivity Summary												
Client Sample ID	Matrix	Method	Analyte	CAS	Units	DL	LOD	LOQ	Result	Lab_Flags	PAL	PAL Source
21-UPC-SB01	Soil	8260D	1,2-Dibromoethane	106-93-4	µg/kg	22.0	22.0	44.0	ND	None	0.240	ADEC MTG SCL
21-UPC-SB01	Soil	8260D	1,2-Dichloroethane	107-06-2	µg/kg	20.5	29.4	58.7	ND	None	5.50	ADEC MTG SCL
21-UPC-SB01	Soil	8260D	Benzene	71-43-2	µg/kg	114	184	367	ND	None	22.0	ADEC MTG SCL
21-UPC-SB01	Soil	8260D	Methyl-tert-butyl ether (MTBE)	1634-04-4	µg/kg	910	1470	2930	ND	None	400	ADEC MTG SCL
21-UPC-SB01	Soil	8270DSIM	Benzo(a)anthracene	56-55-3	µg/kg	313	625	1250	ND	None	700	ADEC MTG SCL
21-UPC-SB02	Soil	8260D	1,2-Dibromoethane	106-93-4	µg/kg	20.7	20.7	41.4	ND	None	0.240	ADEC MTG SCL
21-UPC-SB02	Soil	8260D	1,2-Dichloroethane	107-06-2	µg/kg	19.3	27.6	55.2	ND	None	5.50	ADEC MTG SCL
21-UPC-SB02	Soil	8260D	Benzene	71-43-2	µg/kg	108	173	345	ND	None	22.0	ADEC MTG SCL
21-UPC-SB02	Soil	8260D	Methyl-tert-butyl ether (MTBE)	1634-04-4	µg/kg	855	1380	2760	ND	None	400	ADEC MTG SCL
21-UPC-SB02	Soil	8270DSIM	Benzo(a)anthracene	56-55-3	µg/kg	387	775	1550	ND	None	700	ADEC MTG SCL
21-UPC-SB02	Soil	8270DSIM	Benzo(a)pyrene	50-32-8	µg/kg	387	775	1550	ND	None	1500	ADEC U40 HH SCL
21-UPC-SB02	Soil	8270DSIM	Dibenzo(a,h)anthracene	53-70-3	µg/kg	387	775	1550	ND	None	1500	ADEC U40 HH SCL
21-UPC-SB03	Soil	8260D	1,2-Dibromoethane	106-93-4	µg/kg	1.29	1.29	2.58	ND	None	0.240	ADEC MTG SCL
21-UPC-SB03	Soil	8260D	Naphthalene	91-20-3	µg/kg	13.4	21.5	43.0	ND	None	38.0	ADEC MTG SCL
Trip Blank	Soil	8260D	1,2-Dibromoethane	106-93-4	µg/kg	0.758	0.760	1.52	ND	None	0.240	ADEC MTG SCL

Analytical Sensitivity Summary

Definitions:

Grey highlight indicates the result LOD exceeds the PAL

mg/kg: milligrams per kilogram

CAS: Chemical Abstract Service registry number

DL: detection limit

LOD: limit of detection

LOQ: limit of quantitation

QC: quality control

ND/U: non-detect

NA: not applicable

PAL: project action limit

ADEC: Alaska Department of Environmental Conservation

AAC: Alaska Administrative Code

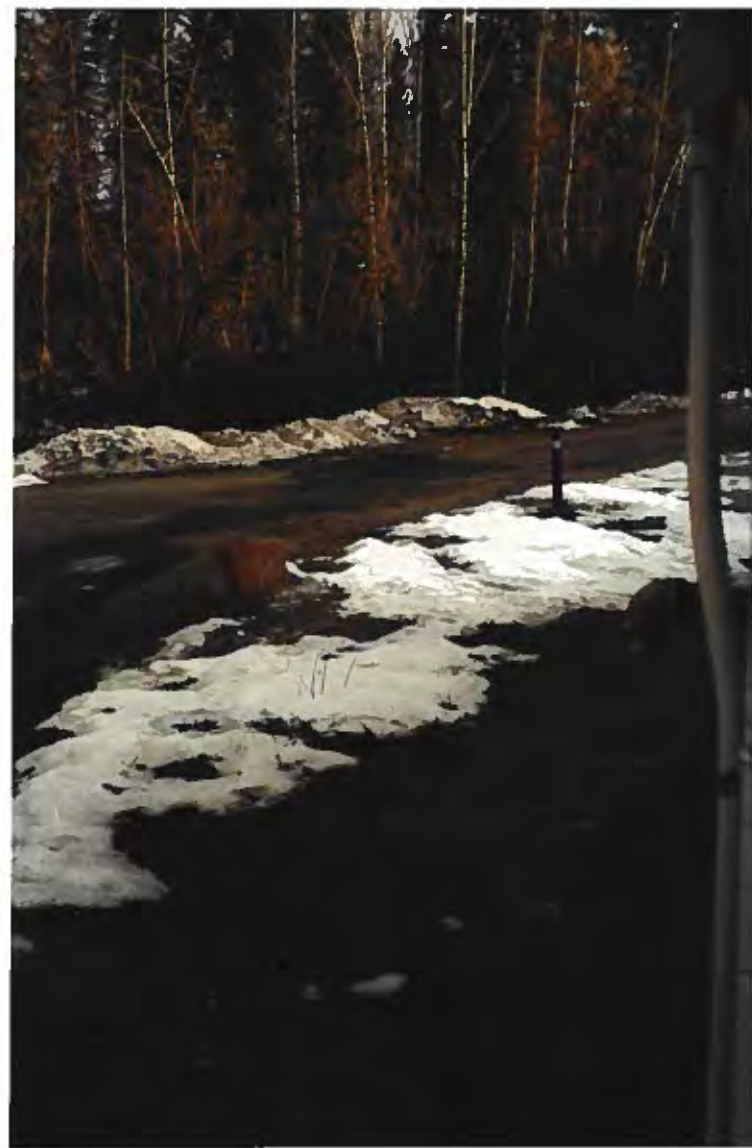
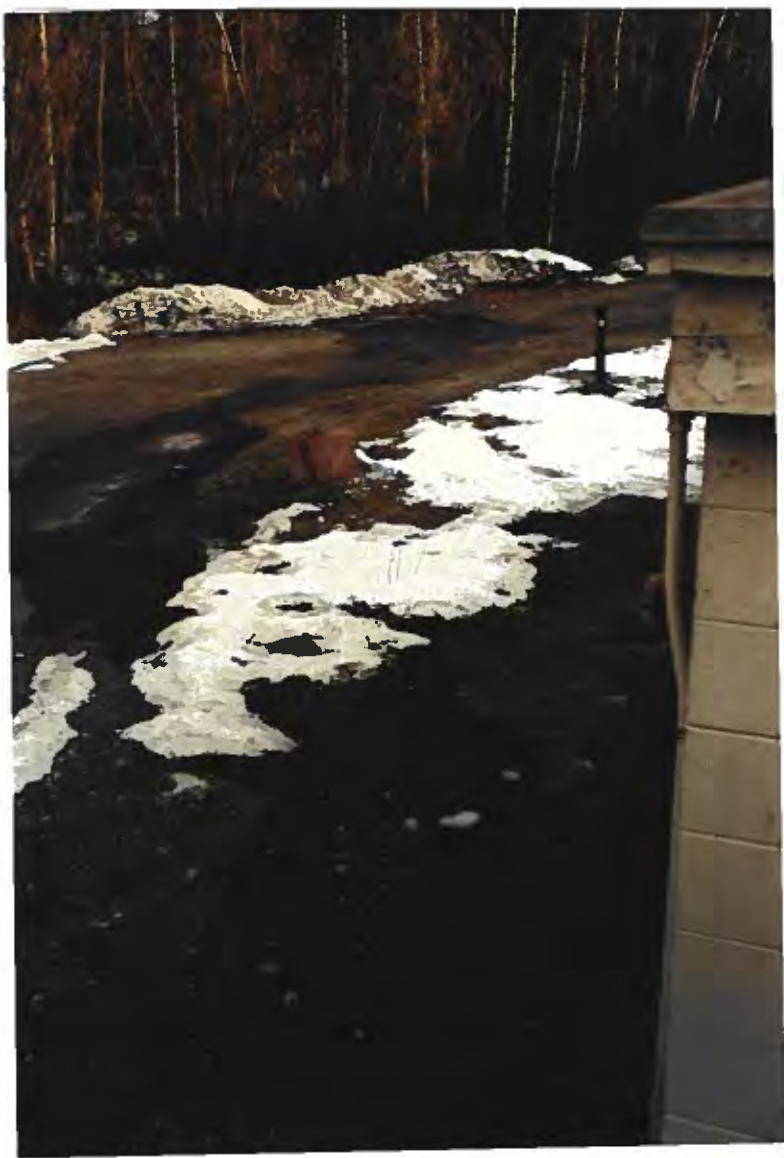
PAL Sources:

ADEC MTG SCL: ADEC 18 AAC 75.341 Method Two, Table B1, Migration to Groundwater Soil Cleanup Levels

ADEC U40 HH SCL: ADEC 18 AAC 75.341 Method Two, Table B1, Under 40 Inch Zone, Human Health Soil Cleanup Levels

APPENDIX D
HISTORIC SITE PHOTOGRAPHS





APPENDIX E
CONCEPTUAL SITE MODEL SCOPING AND GRAPHIC FORMS

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

Site Name:

File Number:

Completed by:

Introduction

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

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

1. General Information:

Sources (*check potential sources at the site*)

- | | |
|--------------------------------------------------------|------------------------------------------------------|
| <input type="checkbox"/> USTs | <input type="checkbox"/> Vehicles |
| <input type="checkbox"/> ASTs | <input type="checkbox"/> Landfills |
| <input type="checkbox"/> Dispensers/fuel loading racks | <input type="checkbox"/> Transformers |
| <input type="checkbox"/> Drums | <input type="checkbox"/> Other: <input type="text"/> |

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

- | | |
|---------------------------------|------------------------------------------------------|
| <input type="checkbox"/> Spills | <input type="checkbox"/> Direct discharge |
| <input type="checkbox"/> Leaks | <input type="checkbox"/> Burning |
| | <input type="checkbox"/> Other: <input type="text"/> |

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

- | | |
|--------------------------------------------------------|------------------------------------------------------|
| <input type="checkbox"/> Surface soil (0-2 feet bgs*) | <input type="checkbox"/> Groundwater |
| <input type="checkbox"/> Subsurface soil (>2 feet bgs) | <input type="checkbox"/> Surface water |
| <input type="checkbox"/> Air | <input type="checkbox"/> Biota |
| <input type="checkbox"/> Sediment | <input type="checkbox"/> Other: <input type="text"/> |

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

- | | |
|--------------------------------------------------------------------------|------------------------------------------------------|
| <input type="checkbox"/> Residents (adult or child) | <input type="checkbox"/> Site visitor |
| <input type="checkbox"/> Commercial or industrial worker | <input type="checkbox"/> Trespasser |
| <input type="checkbox"/> Construction worker | <input type="checkbox"/> Recreational user |
| <input type="checkbox"/> Subsistence harvester (i.e. gathers wild foods) | <input type="checkbox"/> Farmer |
| <input type="checkbox"/> Subsistence consumer (i.e. eats wild foods) | <input type="checkbox"/> Other: <input type="text"/> |

* bgs - below ground surface

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

a) Direct Contact -

1. Incidental Soil Ingestion

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

If the box is checked, label this pathway complete:

Comments:

2. Dermal Absorption of Contaminants from Soil

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

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

If both boxes are checked, label this pathway complete:

Comments:

b) Ingestion -

1. Ingestion of Groundwater

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

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

If both boxes are checked, label this pathway complete:

Comments:

2. Ingestion of Surface Water

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

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

If both boxes are checked, label this pathway complete:

Comments:

3. Ingestion of Wild and Farmed Foods

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

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

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

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

Comments:

c) Inhalation-

1. Inhalation of Outdoor Air

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

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

If both boxes are checked, label this pathway complete:

Comments:

2. Inhalation of Indoor Air

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

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

If both boxes are checked, label this pathway complete:

Comments:

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

Dermal Exposure to Contaminants in Groundwater and Surface Water

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

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

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

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

Comments:

Inhalation of Volatile Compounds in Tap Water

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

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

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

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

Comments:

Inhalation of Fugitive Dust

Inhalation of fugitive dust may be a complete pathway if:

- Nonvolatile compounds are found in the top 2 centimeters of soil. The top 2 centimeters of soil are likely to be dispersed in the wind as dust particles.
- Dust particles are less than 10 micrometers (Particulate Matter - PM₁₀). Particles of this size are called respirable particles and can reach the pulmonary parts of the lungs when inhaled.
- Chromium is present in soil that can be dispersed as dust particles of any size.

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

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

Comments:

Direct Contact with Sediment

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

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

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

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

Comments:

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

HUMAN HEALTH CONCEPTUAL SITE MODEL GRAPHIC FORM

Site: _____

Completed By: _____

Date Completed: _____

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

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

(3) Exposure Media	(4) Exposure Pathway/Route	(5) Current & Future Receptors						
		Residents (adults or children)	Commercial or Industrial workers	Site visitors, trespassers, or recreational users	Construction workers	Farmers or subsistence harvesters	Subsistence consumers	Other
<input type="checkbox"/> soil	<input type="checkbox"/> Incidental Soil Ingestion <input type="checkbox"/> Dermal Absorption of Contaminants from Soil <input type="checkbox"/> Inhalation of Fugitive Dust							
<input type="checkbox"/> groundwater	<input type="checkbox"/> Ingestion of Groundwater <input type="checkbox"/> Dermal Absorption of Contaminants in Groundwater <input type="checkbox"/> Inhalation of Volatile Compounds in Tap Water							
<input type="checkbox"/> air	<input type="checkbox"/> Inhalation of Outdoor Air <input type="checkbox"/> Inhalation of Indoor Air <input type="checkbox"/> Inhalation of Fugitive Dust							
<input type="checkbox"/> surface water	<input type="checkbox"/> Ingestion of Surface Water <input type="checkbox"/> Dermal Absorption of Contaminants in Surface Water <input type="checkbox"/> Inhalation of Volatile Compounds in Tap Water							
<input type="checkbox"/> sediment	<input type="checkbox"/> Direct Contact with Sediment							
<input type="checkbox"/> biota	<input type="checkbox"/> Ingestion of Wild or Farmed Foods							