April 2, 2020

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Subject: ARRC Talkeetna Library 2020 Site Investigation Letter Report Rev. 1.0
ADEC File # 2258.38.016

Mr. Grandel:

Restoration Science & Engineering, LLC (RSE) is providing the following letter report for field-related tasks conducted at the Alaska Railroad Corporation (ARRC) site located adjacent to Tract A, Talkeetna Library Subdivision (Tract A), Talkeetna, AK (hereafter referred to as the subject property). See Figure 1 in Attachment A for location. The field-related tasks for the subject property were: the installation of three (3) soil borings completed as monitoring wells (RSE-1, RSE-2 and RSE-3); the collection of soil and groundwater samples from these soil borings/monitoring wells; and a groundwater elevation survey of these three new wells and three existing wells on Tract A: MW-8, MW-10 and MW-22 (see Figures 2 in Attachment A for soil boring/monitoring well locations). This site is listed as File No. 2258.38.016 in the Alaska Department of Environmental Conservation (ADEC) contaminated sites database.

SITE BACKGROUND

In 1956, an ARRC trail derailment released approximately 70,500 gallons of JP-4. JP-4 at that time was comprised of a "wide cut" hydrocarbon mixture of about 25% to 50% gasoline with the balance comprised of kerosene (Martel, 1987). Based on this, residual fuel from a JP-4 release is expected to have a significant diesel range organic (DRO) component associated with kerosene. Former railroad engineer John Carlson indicated that the JP-4 ran down the slough and ultimately into the Talkeetna River (BGES, 2008). Tankless railroad car chassis currently remain on the northeastern and southeastern portions of the Hale's Tesoro site, which is located north adjacent to Tract A and northwest of the subject property. If the chassis remaining on the site were related to the 1956 derailment, their current locations were not the resting place immediately after derailment, but rather they were subsequently moved to the current location. RSE did not locate records of environmental cleanup activities associated with the 1956 spill.

The former Hale's Tesoro station had two (2) regulated underground storage tanks (USTs): one (1) 500-gallon gasoline UST and one (1) 1,000-gallon diesel UST. Both USTs were closed in 2000 and subsequently removed. During the removal of the USTs, evidence of petroleum release was observed by Denali Environmental. Groundwater sample results collected during the removal indicate the maximum concentrations identified in the groundwater are; benzene = 17.7 milligrams per liter (mg/L), ethylbenzene = 2.8 mg/L, toluene = 70.8 mg/L, and total xylenes = 45.7 mg/L. The maximum concentration of Gasoline Range Organics (GRO) identified in the soil samples was 3,910 milligrams per kilogram (mg/Kg) (BGES, 2008).

In 2007, BGES excavated approximately 350 cubic yards (cy) of contaminated soil from the former UST areas and placed it in a biocell on the southeastern corner of the Hale's Tesoro property. Additionally, hand soil borings were advanced in the northeastern and southeastern portion of the Hale's Tesoro site to evaluate whether fuel released during the 1956 ARRC train derailment had impacted the property. No visual, olfactory or field-screening evidence of hydrocarbon presence was observed, and associated laboratory samples were not collected (BGES, 2008). Soil impacted by fuel was discovered at the northeastern corner of the gas station building where a heating oil above ground storage tank (AST) was previously located (BGES, 2008).

In 2008, BGES excavated an additional 200 cubic yards of contaminated soil from west of the former USTs and placed it in the biocell. Analytical results from the western sidewall of the excavation exhibited hydrocarbon concentrations above ADEC cleanup levels. Three monitoring wells (MW1, MW2, MW3) were installed surrounding the UST excavation (BGES, 2008).

During the design phase of the proposed library at Tract A, geotechnical consultants noted hydrocarbon odors while advancing eight (8) soil borings adjacent to the subject property (BGES, 2013). In 2013, BGES advanced a total of 22 soil borings (see BGES 2013 Figure 6 [Excerpted] in Attachment A). BGES also installed three (3) permanent monitoring wells (MW8, MW10, MW22), and one temporary well: TW2 (see Figure 2 in Attachment A for well locations). Soil samples collected from soil borings in the central portion of the property exhibited GRO and/or benzene concentrations that exceed ADEC cleanup levels (BGES, 2013). BGES reporting indicates groundwater at approximately 7.6 feet (ft) below ground surface (bgs) and flow direction generally to the southeast (BGES, 2013).

A review of BGES 2013 report indicates that based on the soil and groundwater findings, there appears to be an on-site spill source located at the Tract A property centered in the vicinity of soil borings SB2, SB3 and SB4.

The 2013 BGES reported that soil borings SB-2, SB-3, and SB-4 showed significant concentrations of GRO and benzene, toluene, ethylbenzene and total xylenes (BTEX) compounds with DRO results nearly an order of magnitude lower than GRO compounds. DRO was absent or

below method detection limits in all of other soil boring soil samples reported by BGES in 2013. The soil boring logs for SB-2 and SB-3 yielded photo-ionization detector (PID) reading of greater than 1,000 ppmv at a depth of 5.5 to 6 ft bgs. These PID readings are the highest readings obtained at slightly shallower depths than other borings and may indicate proximity to a possible surface spill source.

In the 2013 BGES report, a temporary well sample from TW2-0319 detected GRO at 6.57 mg/L, DRO at 4.95 mg/L and benzene at 7.15 ug/L. The SGS report comments that the AK102 (DRO) "AK102 the pattern is consistent with weathered gasoline". RSE notes that MW8 yielded GRO at 2.89 mg/L and DRO at 1.92 mg/L and laboratory case narrative states "AK102- The pattern is consistent with weathered gasoline."

In 2015, at the former Hale's Station, Shannon & Wilson, Inc (S&W) advanced 21 soil borings, installed six (6) monitoring wells (MW4, MW5, MW6, MW7, MW8, and MW9). Further S&W excavated an additional 450 cubic yards of contaminated soil. MW3 was decommissioned in 2015. Monitoring well MW4, located at the southwest border of the Hale's property did not display evidence of hydrocarbon impacts to soil or groundwater. The existing biocell was used along with the new material to construct two new landfarms (S&W, 2016). S&W findings indicate a groundwater flow direction on the Hales property generally to the west. The former Hale's station site is now used as a residential property.

During 2018-2019, RSE measured groundwater depths at MW8, MW10, and MW22 at Tract A of the Talkeetna Library Subdivision 10 times, including (2) times at MW-1, MW-2, MW-5, MW-6, MW-7, MW-8, and MW-9 at the Hale's Tesoro site in 2018. RSE used these measurements to infer groundwater flow direction at Tract A. The groundwater was found to be between 7.53 and 11.05 feet bgs in wells MW8, MW10 and MW22 and was generally found to flow west (RSE, 2019). Figure 2 in Attachment A shows the groundwater flow direction observed during this 2018-2019 groundwater elevation survey study. The results of this study are provided in Attachment F. RSE 2018-2019 depth to groundwater (DTW) measurements for the Tract A wells are provided in Table 1.

Table 1: DTW measurements for Tract A wells (RSE, 2019)

	DATE	MW8 DTW (FEET)	MW10 DTW (FEET)	MW22 DTW (FEET)
TRACT A WELLS	5/25/2018	7.83	7.85	7.53
	6/19/2018	8.28	8.34	8.08
	8/1/2018	9.07	9.25	8.85
	8/16/2018	8.13	8.2	7.9
	9/18/2018	8.6	8.83	8.32
	11/4/2018	9.04	9.11	8.74
	1/8/2019	10.58	11.05	10.22
	2/17/2019	9.13	9.58	9.1
	3/26/2019	9.72	10.11	9.65
	4/22/2019	9.12	9.22	8.69

OBJECTIVES

The objectives of the 2020 field efforts were to provide site characterization data for the soils and groundwater on the leading west edge of the subject property, which is east and upgradient of Tract A of the Talkeetna Library Subdivision in Talkeetna, Alaska. To determine if upgradient impacts exist, RSE installed three (3) soil borings (RSE-1, RSE-2 and RSE-3), which were completed as monitoring wells (see Figure 2 in Attachment A for well locations). RSE collected soil and groundwater samples from these three soil borings/monitoring well. Additionally, RSE conducted a groundwater elevation survey of the three new wells: RSE-1, RSE-2 and RSE-3; and the three existing wells at Tract A: MW-8, MW-10 and MW-22, to determine the groundwater flow direction at the subject property at the time of measurement (Figure 2 in Attachment A).

FIELD EFFORTS

On October 8, 2020, RSE contracted Discovery Drilling, Inc. (Discovery) to install the three (3) soil borings (RSE-1, RSE-2 and RSE-3), which were completed as monitoring wells. Discovery installed each soil boring to fifteen feet bgs using a GeoProbe 6620DT equipped with Direct Push Technology (DPT) and a MacroCore soil sampling system.

RSE collected one field-screening sample approximately every 2 feet as soil recoveries allowed. Field-screening samples were analyzed using a PID calibrated to 100 ppmv isobutylene. Field screening samples were placed into a plastic bag and warmed to at least 60 °F prior to analyzing.

RSE collected two analytical soil samples from each soil boring for the contaminants of potential concern (COPCs) shown in Table 1. Each analytical soil sample was analyzed for DRO, GRO, residual range organics (RRO), petroleum volatile organic compounds (Petro VOCs) and polyaromatic aromatic hydrocarbons by select ion monitoring (PAH SIMs). RSE collected one

soil sample from the location with the highest PID reading, and one soil sample from the soil/groundwater interface, when possible. A blind duplicate soil sample, RSE-X of RSE-3D, was submitted to the laboratory for quality control purposes.

Table 2. COPC in Soil

COPC	Matrix	COPC Abbreviation	ADEC-Approved Lab Method	ADEC Soil Cleanup Level[1]
Diesel Range Organics	Soil	DRO	AK 102	250 mg/Kg
Gasoline Range Organics	Soil	GRO	AK 101	300 mg/Kg
Residual Range Organics	Soil	RRO	AK 103	11,000 mg/Kg
Petroleum Volatile Organic Compounds	Soil	Petro VOCs	EPA 8260	Varies
Polyaromatic Hydrocarbons by Select Ion Monitoring	Soil	PAH SIMs	EPA 8270D	Varies

[1]18 AAC 75 ADEC Method 2 soil cleanup level for migration to groundwater Tables B1 and B2

Analytical soil samples were collected using clean stainless-steel spoons placed into method-specific containers provided by the contract laboratory. The soil sample containers were placed into a cooler packed with gel-ice and maintained between 0° and 6° C. RSE field personnel noted the closure sample ID, location the depth below ground surface, sample time, and soil type. All soil closure samples were transported under chain-of-custody (COC) to SGS North America Inc. (SGS) in Anchorage, Alaska for analyses.

Discovery installed two-inch diameter monitoring wells in soil borings RSE-1, RSE-2 and RSE-3. Each was terminated 15 feet bgs and consisted of 0.010-inch slotted screen with a 10/20 sand pack. The 10-foot slotted screen was placed from 5 feet to 15 feet bgs in each well. The 10/20 sandpack was placed two feet above the top of the screen, on top of which a bentonite seal was installed. A 6-inch monument was placed over top of the PVC flush with the ground surface and protected by a concrete collar. RSE allowed the wells to develop for at least 24 hours prior to sampling.

On October 9, 2020, RSE measured the depth to the bottom of each well, and the depth to groundwater. Following this observation, RSE purged three well volumes from each monitoring well using a low-flow submersible pump. Water quality parameters were monitored using a YSI 556 for stabilization when readings collected 3-5 minutes apart are within the following, when possible:

- pH ± 0.1
- Temperature ±3% (minimum of ± 0.2ºC)
- Conductivity ± 3%
- Specific Conductance ±10 mv
- Dissolved Oxygen ±10

Water samples were collected using a positive-pressure submersible pump set to a low flow rate during purging and sampling.

Based upon the results of previous investigations, RSE has identified the COPCs for groundwater shown in Table 3:

Table 3: Contaminants of Potential Concern in Groundwater

COPC	Matrix	COPC Abbreviation	ADEC-Approved Lab Method	ADEC Table C Groundwater Cleanup[1]
Gasoline Range Organics	Water	GRO	AK 101	2.2 mg/L
Diesel Range Organics	Water	DRO	AK 102	1.5 mg/L
Residual Range Organics	Water	RRO	AK 103	1.1 mg/L
Petroleum Volatile Organic Compounds	Water	Petro VOCs	EPA 8260	Varies
Polyaromatic Hydrocarbons by Select Ion Monitoring	Water	PAH SIMs	EPA 8270	Varies

[1]18 AAC 75 ADEC Table C Groundwater cleanup level

One (1) primary groundwater sample was collected from each well and submitted for DRO, RRO, GRO, Petro VOCs and PAH SIMs. A blind duplicate groundwater sample, RSE-X from RSE-3, was submitted to the laboratory for quality control purposes.

Each water sample was collected using new dedicated tubing. The water level indicator and any other equipment that was not disposable or dedicated was decontaminated with distilled water and Alconox wash. As water samples were collected, care was taken to minimize volatile loss by excessive turbulence or air mixing. Field personnel avoided spilling or over-diluting acid sample preservatives. Water samples were placed directly into method specific containers and stored in a clean sample cooler chilled to between 0° and 6° C. Coolers were transported under COC to SGS.

GROUNDWATER ELEVATION SURVEY

RSE performed a radial survey of the three new monitoring wells (RSE-1, RSE-2 and RSE-3) and the three existing wells (MW-8, MW-10 and MW-22) using a Leica Rugby 620 and a Leica Rod Eye 160. RSE completed at least two surveys sets, moving the Rugby at least once to ensure accurate data. The tabulated data was uploaded into the Surfer software program for gradient modeling. The groundwater flow direction for at the site as measured on October 9, 2020 was found to be to the west, towards the Susitna River (See Figure 2 in Attachment A).

RESULTS

Soil Sample Results

RSE collected seven (7) soil samples from the three soil borings, including one (1) blind duplicate, RSE-X from parent sample RSE-3D. All soil samples were analyzed for GRO, DRO, RRO, Petro VOCs and PAH SIMs. All soil sample results were found to be either non-detect or below their ADEC Method 2 Migration to Groundwater (MTG) cleanup levels. The tabulated soil sample results are provided in Tables 2-4 in Attachment B.

Groundwater Sample Results

RSE collected four (4) groundwater samples from the three wells, including one (1) blind duplicate, RSE-X from parent sample RSE-3. All groundwater samples were analyzed for GRO, DRO, RRO, Petro VOCs and PAH SIMs. All groundwater sample results were found to be either non-detect or below their ADEC Table C Groundwater cleanup levels (GCLs). The tabulated groundwater sample results are provided in Tables 6-8 of Attachment B.

INVESTIGATIVE DERIVED WASTE

Consumables such as tubing, plastic bags and gloves were placed into a trash receptacle for disposal. Non-consumables such as the submersible pump, water level indicator, stainless steel spoons were decontaminated using Alconox and hot water between sampling at each well. Purge and decontamination waters from all wells were passed through a granular activated carbon (GAC) filter and discharging it to a vegetated area onsite a minimum of 100 feet away from surface water. Soil cuttings from soil borings RSE-1, RSE-2 and RSE-3 were containerized in a sealed container provided by Discovery and then stored on-site pending sample results. The excess soils from the three borings were transported to the ARRC Barrel Farm. These soils are destined to be combined with other non-hazardous soil waste and disposed of in the fall of 2021 at Alaska Soil Recycling.

QUALITY ASSURANCE AND QUALITY CONTROL

RSE collected each sample in general accordance with applicable ADEC regulation and guidance documents. Blind soil and groundwater duplicate samples were collected at a frequency of 10%, with no less than one (1) blind duplicate sample for both soil and groundwater collected. RSE submitted one (1) trip blank (soil and groundwater) with each sample cooler containing volatile samples. RSE completed a ADEC Laboratory Review Checklist (Attachment G) for the SGS

Laboratory Report No. 1205620 (Attachment F). No other deviations from the ADEC-approved work plan were conducted during field efforts. All data was found to be usable for the purposes of this report.

CONCLUSIONS

All soil and groundwater sample results were found to be either non-detect or below their associated cleanup levels. The groundwater flow direction was observed to be west, towards the Susitna River.

Based on the site groundwater conditions and historic gradient monitoring, site groundwater flow directions can vary from west to southwest to south and south east depending on the current hydrologic conditions with include: varying flood stages of the Talkeetna River with high water and floods occurring in 1971 and 1986; current hydrologic status of the wetland and Twister Creek east of the site with Twister Creek crossing under the Talkeetna Spur highway south of the subject properties. Groundwater Influences also include other surface water conveyances draining water from the wetland complexes located to the east of the subject property. Based on review of the site conceptual model, it is apparent that during Talkeetna River flood events groundwater can travel in an east direction. Further, contaminants can also migrate by diffusion from the Tract A source towards cross-gradient or slightly upgradient areas.

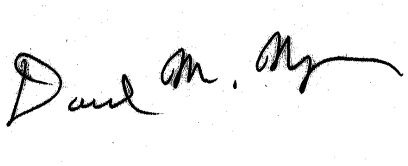
Approximately 70,000 gallons of JP-4 was released during the 1956 derailment. Residual fuel from a JP-4 release is expected to have a significant DRO component associated with the kerosene. Soil boring data from the BGES 2013 investigation did not identify pathway for migration of an offsite fuel source onto the subject property from the north (Hales Tesoro) or the east (subject property). Soil and groundwater sampling at soil boring/monitoring wells RSE-1, RSE-2, and RSE-3 showed low or non-detect concentrations of DRO and where detected, values were much lower than the GRO. Low level detections for GRO constituents were detected in soil boring/monitoring wells RSE-1, RSE-2, and RSE-3 and appear to be similar to and likely represent dissolved impacts from the Tract A property source area identified in the vicinity of SB2, SB3, and SB4. This indicates RSE-1, RSE-2 and RSE-3 findings are dissolved phase impacts from the SB2 -SB4 source area. Similar to the BGES Tract A site findings, based on the lab data and chromatograms, the DRO measured was consistent with weathered gasoline.

Additionally, SGS chemists were asked to review the RSE 2020 investigation results and conducted a library search for peaks in the VOC analyses by EPA Method 8260. This library search observed octane, hexane, nonane and decane straight-chain, lightweight petroleum paraffins and an absence of midweight paraffins consistent with kerosene (per. com. SGS 2021).

Based on this information to date, RSE provides the following conclusions:

- It appears the fuel detected in soil and groundwater on the Tract A property is from an on-site source.
- The fuel detected on the Tract A property is not consistent with JP-4 but appears to be a gasoline source.
- The hydrocarbon impacts noted in RSE-1, RSE-2 and RSE-3 likely represent the migration of hydrocarbons from the Tract A fuel source either due to diffusion or site groundwater gradients that can swing eastward under certain site hydrologic conditions.
- Soil borings SB2 and SB3 identified elevated PID values at depths of less than 6 ft bgs possibly indicating proximity to a surface spill source pathway to groundwater.
- A fenceline of soil boring/monitoring wells (RSE-1, RSE-2, and RSE-3) installed between the Tract A property hydrocarbon impacts and the site of the 1956 tank car derailment did not identify a pathway indicating offsite hydrocarbon impacts migrated onto the Tract A property.
- The low level DRO detected in soil sample RSE-3D/RSE-X and in groundwater samples RSE-1 and RSE-3/RSE-X appear to represent gasoline with sample DRO chromatograms and a mass spectrometer library search indicating the DRO results are actually weathered gasoline.
- GRO was detected in all soil samples except sample RSE-3 collected at a depth of 4.5 feet bgs.
- GRO was detected groundwater at monitoring wells RSE-1, and RSE-3/RSE-X.

To summarize, the hydrocarbon impacts identified at Tract A are gasoline and not associated with the 1956 release of JP-4 from the ARRC derailment. All groundwater and soil samples were collected by an ADEC Qualified Environmental Professional (QEP). Please contact Lisa Koeneman at (907) 278-1023, if you have any questions or comments. This report was prepared by an ADEC QEP in accordance with 18 AAC 75.



Lisa Koeneman, QEP
RESTORATION SCIENCE & ENGINEERING, LLC

David Nyman, PE QEP

ATTACHMENTS

Attachment A – Figures
Attachment B – Tabulated Sample Results
Attachment C – Select Site Photographs
Attachment D – Boring Logs
Attachment E – RSE 2018-2019 Groundwater Elevation Survey Data: Talkeetna Library Tract A
Attachment F – SGS North America Laboratory Report
Attachment G – ADEC Laboratory Data Quality Review Checklist

REFERENCES

Braunstein Geological and Environmental Services (BGES) 2013. Matanuska-Susitna Borough Tract A, Talkeetna Library Subdivision Talkeetna, Alaska 2013 Site Characterization Report. ADEC File No. 2258.38.016. October 2013.

Braunstein Geological and Environmental Services (BGES) 2009. 2008 Release Investigation/Corrective Action Report Hales Tesoro. October 2009.

Restoration Science & Engineering, LLC (RSE) 2019. ARRC Talkeetna 2018-2019 Groundwater Elevation Survey Letter Report Rev 1.0. RSE Project 18-1891. June 4, 2019.

Restoration Science & Engineering, LLC (RSE) 2018. ARRC Talkeetna Groundwater Elevation Survey Work Plan. RSE Project No. 18-1891. May 2018.

Shannon & Wilson, Inc (S&W). 2018. Hales Tesoro Site Characterization and Remediation Final Report. March 2018.

S&W. 2016. Hales Tesoro Site Characterization and Remediation Report. November 2016.

Attachment A:

Figures

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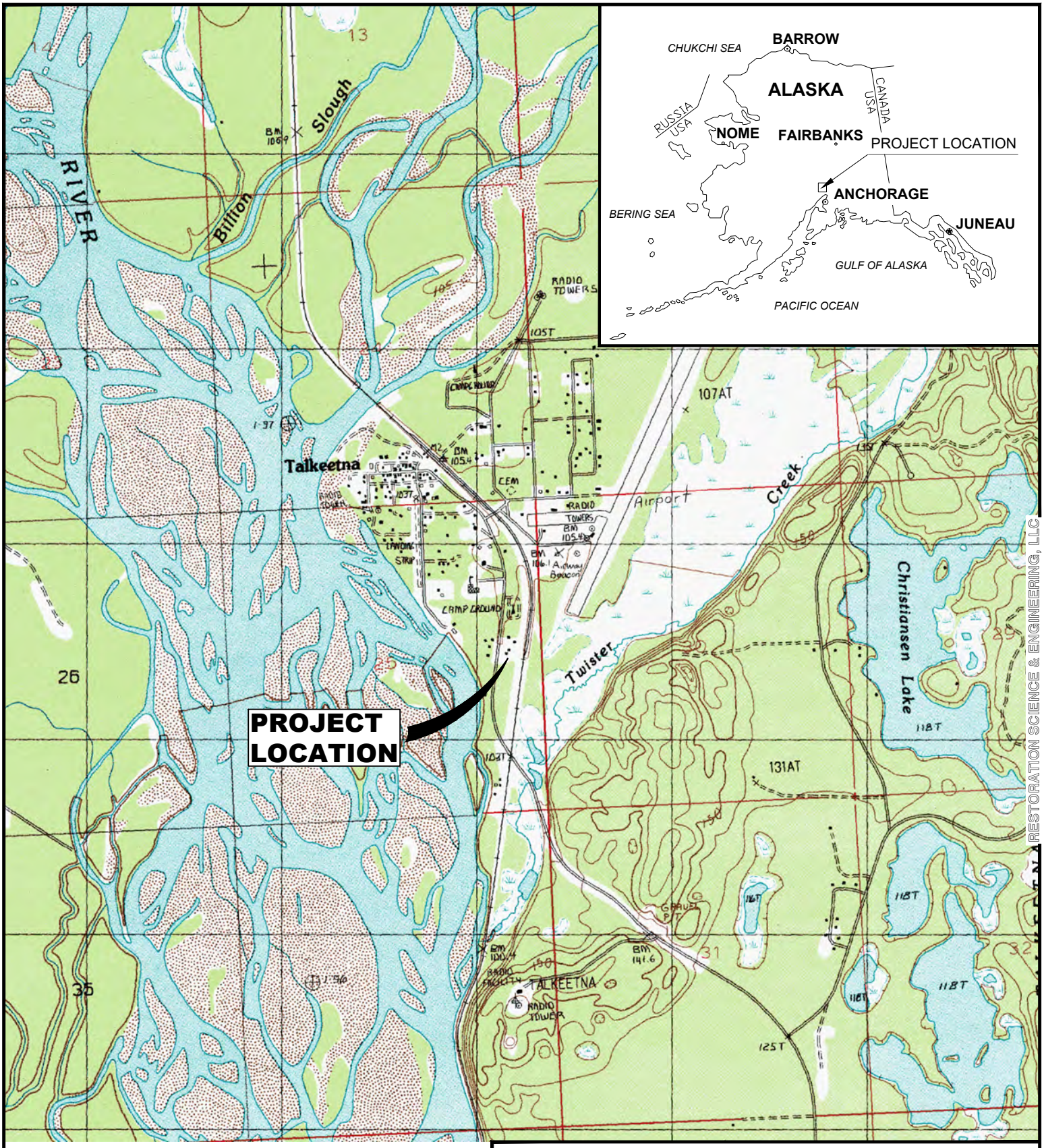

N.T.S.

ARRC TALKEETNA
2020 SITE CHARACTERIZATION

VICINITY MAP

TALKEETNA, ALASKA

JOB NO: 20-2219	DRAWN: MSB
DATE: 12.8.2020	CHECKED: LK

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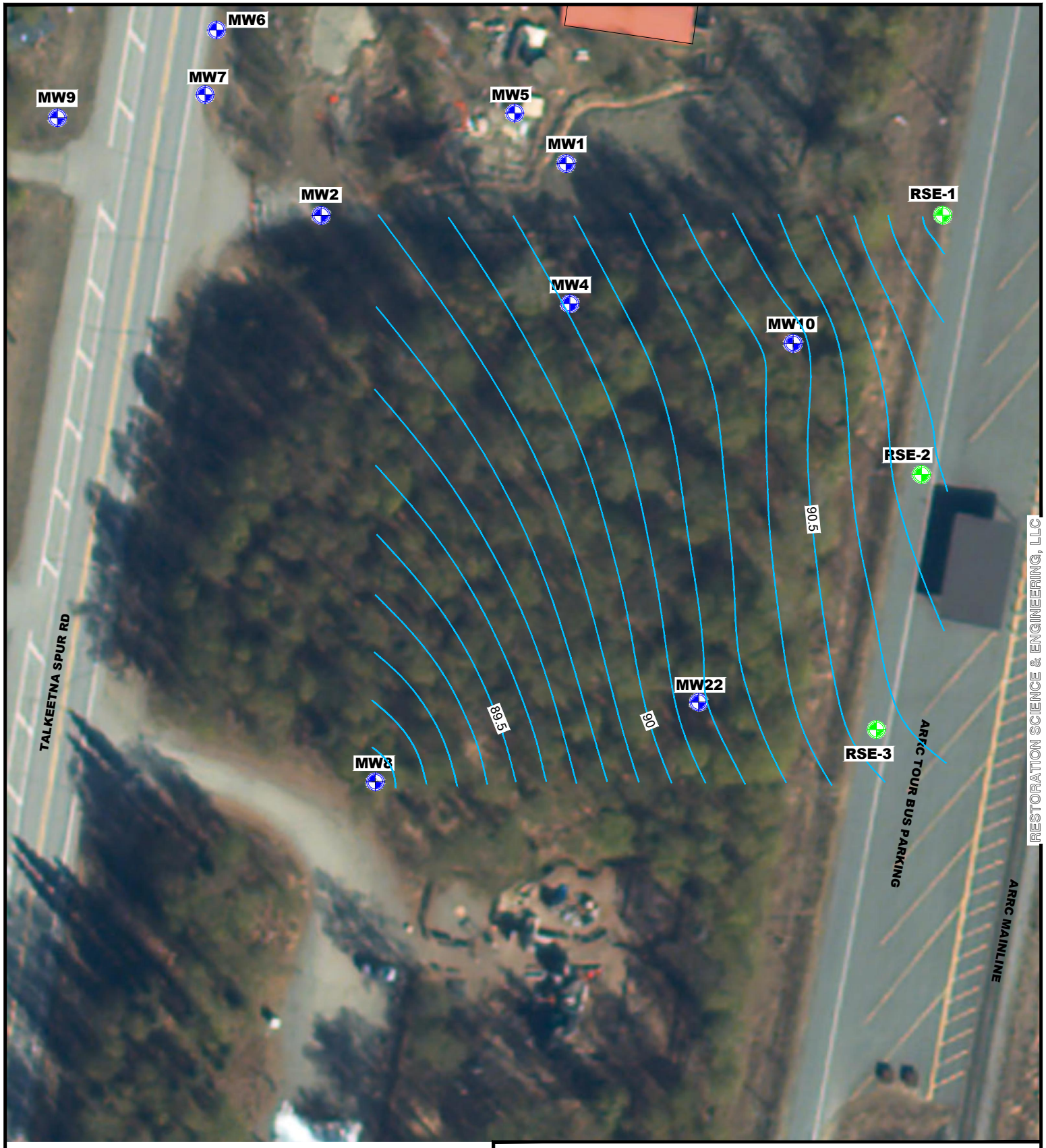
FIGURE 1



LEGEND

MW-8 GROUND WATER MONITORING WELL

RSE-1 NEW GROUND WATER MONITORING WELL

30 0 60

GRAPHIC SCALE
1"=60'

ARRC TALKEETNA LIBRARY WORK PLAN

OCTOBER 9, 2020 GROUND WATER MONITORING WELL LOCATION AND GRADIENT MAP

TALKEETNA, ALASKA

JOB NO: 20.2219	DRAWN: MSB
DATE: 12.20.2020	CHECKED: LK

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FIGURE 2

Attachment B:

Tabulated Laboratory Results

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TABLE 1
ALASKA RAILROAD CORPORATION
TALKEETNA SITE CHARACTERIZATION 2020
FIELD SCREENING RESULTS

FIELD SCREENING RESULTS					
SOIL BORING	**SAMPLE ID**	**DATE**	**SAMPLE DEPTH (FEET)**	**PID RESULTS (PPMV)**	**DESCRIPTION**
RSE-1	RSE-1A	10/8/2020	1	0.4	dry, light gray to light brown gravel with sand (fill)
	RSE-1B	10/8/2020	3	0.5	moist, tan, fine-grained sand
	RSE-1C	10/8/2020	7.5	0.4	moist, tan, coarse-grained sand with gravel
	RSE-1D	**10/8/2020**	**11**	**0.4**	**wet, heavily oxidized gravel**
	RSE-1E	**10/8/2020**	**13**	**0.5**	**wet, light gray gravel with coarse-grained sand**
RSE-2	RSE-2A	10/8/2020	1	3.0	dry, light gray to light brown sand with gravel (fill)
	RSE-2B	10/8/2020	5.5	1.7	moist, tan, fine-grained sand
	RSE-2C	10/8/2020	7.5	4.2	moist, heavily oxidized, coarse-grained sand with gravel
	RSE-2D	**10/8/2020**	**11**	**5.9**	**wet, heavily oxidized, coarse-grained sand with gravel, slight hydrocarbon odor**
	RSE-2E	**10/8/2020**	**13**	**6.9**	**wet, light gray gravel with coarse-grained sand, slight hydrocarbon odor**
RSE-3	RSE-3A	10/8/2020	2.5	0.5	dry, light gray to light brown sand with gravel (fill)
	RSE-3B	**10/8/2020**	**4.5**	**0.8**	**moist, light gray to orange brown silt**
	RSE-3C	10/8/2020	7.5	0.6	moist, light brown to tan, coarse-grained sand with gravel
	RSE-3D	**10/8/2020**	**12.5**	**485.3**	**wet, light gray gravel with coarse-grained sand, strong hydrocarbon odor**

NOTES:
1) Field-screening measurements collected with a RAE Systems MiniRAE Lite photo-ionization detector (PID) calibrated with 100 ppmv isobutylene.
2) "PPMV" means "parts per million by volume."
3) Bold text indicates the sample was submitted for laboratory analyses.

TABLE 2
ALASKA RAILROAD CORPORATION
TALKEETNA SITE CHARACTERIZATION 2020
HYDROCARBON CONCENTRATIONS IN SOIL

HYDROCARBON CONCENTRATIONS IN SOIL								
SAMPLE ID	**DATE**	**SAMPLE DEPTH (FEET)**	**PID RESULTS (PPMV)**	**TOTAL SOLIDS (%)**	**DIESEL RANGE ORGANICS (mg/Kg)**	**RESIDUAL RANGE ORGANICS (mg/Kg)**	**GASOLINE RANGE ORGANICS (mg/Kg)**	**SGS WORK ORDER**
RSE-1D	**10/08/20**	**11**	**0.4**	**88.8**	*11.2 U*	*56.0 U*	**1.73 J**	1205620
RSE-1E	**10/08/20**	**13**	**0.5**	**88.3**	*11.3 U*	*56.5 U*	**1.34 J**	
RSE-2D	**10/08/20**	**11**	**5.9**	**89.0**	*11.1 U*	*55.5 U*	**1.19 J**	
RSE-2E	**10/08/20**	**13**	**6.9**	**89.9**	*10.9 U*	*54.5 U*	**1.41 J**	
RSE-3B	**10/08/20**	**4.5**	**0.8**	**69.9**	*14.3 U*	*71.5 U*	*4.71 U*	
RSE-3D	**10/08/20**	**12.5**	**485.3**	**88.4**	**33.1**	*56.5 U*	**116**	
RSE-X	**10/08/20**	**12.5**	**485.3**	**88.4**	**33**	*56.0 U*	**69.4**	
ADEC TABLE B1 METHOD 2 MIGRATION TO GROUNDWATER CLEANUP LEVELS (18 AAC 75)					**250**	**11000**	**300**	

NOTES:

1) Gasoline Range Organics analyses by Method AK 101; Diesel Range Organics analyses by Method AK 102 ; Residual Range Organics analyses by Method AK103.

2) Bold font indicates that concentrations were detected above the detection limit (DL).

3) *Italicized* font with a U-flag indicates the analyte was not detected at the DL; value given is the limit of detection.

4) J flag indicates that the result is an estimated value .

5) "PPMV" = "parts per million by volume;" "mg/Kg" = "miligrams per kilogram."

6) Yellow highlighting indicates that the analyte was detected above the ADEC cleanup level.

7) RSE-X is a blind duplicate of RSE-3D.

TABLE 3
ALASKA RAILROAD CORPORATION
TALKEETNA SITE CHARACTERIZATION 2020
PETROLEUM VOLATILE ORGANIC COMPOUND CONCENTRATIONS IN SOIL

PETROLEUM VOLATILE ORGANIC COMPOUND CONCENTRATIONS IN SOIL								
SAMPLE ID	**RSE-1D**	**RSE-1E**	**RSE-2D**	**RSE-2E**	**RSE-3B**	**RSE-3D**	**RSE-X**	**ADEC METHOD 2 TABLE B1 MIGRATION TO GROUNDWATER SOIL CLEANUP LEVELS (ug/Kg)**
DATE	**10/08/20**	**10/08/20**	**10/08/20**	**10/08/20**	**10/08/20**	**10/08/20**	**10/08/20**	
SAMPLE DEPTH (FEET)	**11**	**13**	**11**	**13**	**4.5**	**12.5**	**12.5**	
SGS WORK ORDER	**1205620**	**1205620**	**1205620**	**1205620**	**1205620**	**1205620**	**1205620**	
UNITS	**(ug/Kg)**	**(ug/Kg)**	**(ug/Kg)**	**(ug/Kg)**	**(ug/Kg)**	**(ug/Kg)**	**(ug/Kg)**	
1,2,4-Trimethylbenzene	*37.8 U*	*36.2 U*	*31.8 U*	*63.0 U*	*94.5 U*	*32.2 U*	*37.0 U*	610
1,2-Dibromoethane	*0.755 U*	*0.725 U*	*0.635 U*	*0.720 U*	*1.89 U*	*0.645 U*	*0.740 U*	0.24
1,2-Dichloroethane	*1.51 U*	*1.45 U*	*1.27 U*	*1.44 U*	*3.77 U*	*1.29 U*	*1.48 U*	5.5
1,3,5-Trimethylbenzene	*18.9 U*	*18.1 U*	*15.9 U*	*18.0 U*	*47.1 U*	*16.1 U*	*18.5 U*	660
Benzene	*9.45 U*	*9.05 U*	*7.95 U*	*9.00 U*	*23.6 U*	*8.05 U*	*9.25 U*	22
Ethylbenzene	*18.9 U*	*18.1 U*	*15.9 U*	*18.0 U*	*47.1 U*	*16.1 U*	*18.5 U*	130
Isopropylbenzene (Cumene)	*18.9 U*	*18.1 U*	*15.9 U*	*18.0 U*	*47.1 U*	*16.1 U*	*18.5 U*	5600
Methyl-t-butyl ether	*75.5 U*	*72.5 U*	*63.5 U*	*72.0 U*	*189 U*	*64.5 U*	*74.0 U*	400
Naphthalene	*18.9 U*	*18.1 U*	*15.9 U*	*18.0 U*	*47.1 U*	*16.1 U*	*18.5 U*	38
P & M -Xylene	*37.8 U*	*36.2 U*	*31.8 U*	*36.0 U*	*94.5 U*	*32.2 U*	*37.0 U*	See total Xylenes
Toluene	*18.9 U*	*18.1 U*	*15.9 U*	*18.0 U*	*47.1 U*	*16.1 U*	*18.5 U*	6700
Xylenes (total)	*56.5 U*	*54.5 U*	*47.8 U*	*54.0 U*	*142 U*	*48.3 U*	*55.5 U*	1500
n-Butylbenzene	*18.9 U*	*18.1 U*	*15.9 U*	*18.0 U*	*47.1 U*	*16.1 U*	*18.5 U*	23000
o-Xylene	*18.9 U*	*18.1 U*	*15.9 U*	*18.0 U*	*47.1 U*	*16.1 U*	*18.5 U*	See total Xylenes
sec-Butylbenzene	*18.9 U*	*18.1 U*	*15.9 U*	*18.0 U*	*47.1 U*	*16.1 U*	*18.5 U*	42000
tert-Butylbenzene	*18.9 U*	*18.1 U*	*15.9 U*	*18.0 U*	*47.1 U*	*16.1 U*	*18.5 U*	11000

NOTES:

1) Petroleum Volatile Organic Compounds analyses by Method EPA SW8260D.

2) Bold font indicates that concentrations were detected above the detection limit (DL).

3) *Italicized* font with a U-flag indicates the analyte was not detected at the DL; value given is the limit of detection.

4) J flag indicates that the result is an estimated value .

5) Blue highlighting indicates that the DL is elevated above the cleanup level.

6) Yellow highlighting indicates that the analyte was detected above the ADEC cleanup level.

7) "ug/Kg" = "micrograms per kilogram."

8) RSE-X is a blind duplicate of RSE-3D.

TABLE 4
ALASKA RAILROAD CORPORATION
TALKEETNA SITE CHARACTERIZATION 2020
POLYCYCLIC AROMATIC HYDROCARBONS BY SELECT ION MONITORING CONCENTRATIONS IN SOIL

POLYCYCLIC AROMATIC HYDROCARBONS BY SELECT ION MONITORING CONCENTRATIONS IN SOIL								
SAMPLE NUMBER	**RSE-1D**	**RSE-1E**	**RSE-2D**	**RSE-2E**	**RSE-3B**	**RSE-3D**	**RSE-X**	
DATE	**10/08/20**	**10/08/20**	**10/08/20**	**10/08/20**	**10/08/20**	**10/08/20**	**10/08/20**	**ADEC TABLE B1 METHOD 2**
SAMPLE DEPTH (FEET)	**11**	**13**	**11**	**13**	**4.5**	**12.5**	**12.5**	**MIGRATION TO**
SGS WORK ORDER	**1205620**	**1205620**	**1205620**	**1205620**	**1205620**	**1205620**	**1205620**	**GROUNDWATER (ug/Kg)**
UNITS	**(ug/Kg)**	**(ug/Kg)**	**(ug/Kg)**	**(ug/Kg)**	**(ug/Kg)**	**(ug/Kg)**	**(ug/Kg)**	
1-Methylnaphthalene	*13.9 U*	*13.4 U*	*13.8 U*	*13.9 U*	*17.8 U*	*14.1 U*	*14.1 U*	330
2-Methylnaphthalene	*13.9 U*	*13.4 U*	*13.8 U*	*13.9 U*	*17.8 U*	*14.1 U*	*14.1 U*	410
Acenaphthene	*13.9 U*	*13.4 U*	*13.8 U*	*13.9 U*	*17.8 U*	*14.1 U*	*14.1 U*	37,000
Acenaphthylene	*13.9 U*	*13.4 U*	*13.8 U*	*13.9 U*	*17.8 U*	*14.1 U*	*14.1 U*	18,000
Anthracene	*13.9 U*	*13.4 U*	*13.8 U*	*13.9 U*	*17.8 U*	*14.1 U*	*14.1 U*	390,000
Benzo(a)Anthracene	*13.9 U*	*13.4 U*	*13.8 U*	*13.9 U*	*17.8 U*	*14.1 U*	*14.1 U*	700
Benzo[a]pyrene	*13.9 U*	*13.4 U*	*13.8 U*	*13.9 U*	*17.8 U*	*14.1 U*	*14.1 U*	1,900
Benzo[b]Fluoranthene	*13.9 U*	*13.4 U*	*13.8 U*	*13.9 U*	*17.8 U*	*14.1 U*	*14.1 U*	190,000
Benzo[g,h,i]perylene	*13.9 U*	*13.4 U*	*13.8 U*	*13.9 U*	*17.8 U*	*14.1 U*	*14.1 U*	15,000,000
Benzo[k]fluoranthene	*13.9 U*	*13.4 U*	*13.8 U*	*13.9 U*	*17.8 U*	*14.1 U*	*14.1 U*	190,000
Chrysene	*13.9 U*	*13.4 U*	*13.8 U*	*13.9 U*	*17.8 U*	*14.1 U*	*14.1 U*	600,000
Dibenzo[a,h]anthracene	*13.9 U*	*13.4 U*	*13.8 U*	*13.9 U*	*17.8 U*	*14.1 U*	*14.1 U*	6,300
Fluoranthene	*13.9 U*	*13.4 U*	*13.8 U*	*13.9 U*	*17.8 U*	*14.1 U*	*14.1 U*	590,000
Fluorene	*13.9 U*	*13.4 U*	*13.8 U*	*13.9 U*	*17.8 U*	*14.1 U*	*14.1 U*	36,000
Indeno[1,2,3-c,d] pyrene	*13.9 U*	*13.4 U*	*13.8 U*	*13.9 U*	*17.8 U*	*14.1 U*	*14.1 U*	65,000
Naphthalene	*11.2 U*	*10.8 U*	*11.0 U*	*11.1 U*	*14.2 U*	*11.2 U*	*11.3 U*	38
Phenanthrene	*13.9 U*	*13.4 U*	*13.8 U*	*13.9 U*	*17.8 U*	*14.1 U*	*14.1 U*	39,000
Pyrene	*13.9 U*	*13.4 U*	*13.8 U*	*13.9 U*	*17.8 U*	*14.1 U*	*14.1 U*	87,000

NOTES:

1) Polycyclic aromatic hydrocarbons by Select Ion Monitoring analyses by EPA 8270D.

2) Bold font indicates the analyte was detected above the laboratory Detection Limit (DL).

3) *Italicized* font with a U-qualifier indicates the analyte was not detected above the DL;
the value presented is the limit of detection.

4) J flag indicates the result is an estimated value.

5) Yellow highlighting indicates that the analyte was detected above the ADEC cleanup level.

6) "ug/Kg" means "micrograms per kilogram".

7) RSE-X is a blind duplicate of RSE-3D.

TABLE 5
ALASKA RAILROAD CORPORATION
TALKEETNA SITE CHARACTERIZATION 2020
GROUNDWATER QUALITY FIELD PARAMETERS

GROUNDWATER QUALITY FIELD PARAMETERS										
SAMPLE ID	DATE	DEPTH TO WATER (feet)	DEPTH TO BOTTOM (feet)	VOLUME PURGED (gal)	TEMP (°C)	pH (pH Units)	CONDUCTIVITY (mS/cm)	SPECIFIC CONDUCTANCE (µS/cm)	DISSOLVED OXYGEN %	OBSERVATIONS
RSE-1	10/9/2020	8.64	14.4	3	8.26	6.29	119	81	40.2	very turbid, heavily oxidized, no sheen or odor, PVC shavings, cleared up with purging
					8.19	6.33	119	81	26.2	
					8.07	6.35	119	81	21.4	
					7.98	6.35	118	79	19.6	
RSE-2	10/9/2020	8.99	14.48	2.8	7.68	6.34	154	104	43.2	turbid, heavily oxidized, no sheen or odor, PVC shavings, cleared up with purging
					7.68	6.36	145	97	40.7	
					7.67	6.37	139	93	37.2	
RSE-3	10/9/2020	8.67	14.01	2.75	8.98	6.05	128	89	27.5	very turbid, dark gray, no sheen or odor, PVC shavings, cleared up with purging
					9.26	7.53	100	70	28.5	
					9.29	7.5	86	60	26.4	

NOTES:

1) Water quality measurements performed using a YSI Model 556 Water Quality Meter.

2) "mS/cm" means "millisiemens per centimeter"; "µS/cm" means "micro Siemens per centimeter"; "ppt" means "parts per thousand"; "mV" means "millivolts"; "mg/L" means "milligram per liter"; "gal" means "gallon"; "°C " means "degrees Celsius".

TABLE 6
ALASKA RAILROAD CORPORATION
TALKEETNA SITE CHARACTERIZATION 2020
HYDROCARBON CONCENTRATIONS IN GROUNDWATER

HYDROCARBON CONCENTRATIONS IN GROUNDWATER					
SAMPLE ID	**DATE**	**DIESEL RANGE ORGANICS (mg/L)**	**RESIDUAL RANGE ORGANICS mg/L**	**GASOLINE RANGE ORGANICS (mg/L)**	**SGS WORK ORDER**
RSE-1	**10/9/2020**	**0.270 J**	**0.174 J**	**0.327 J**	1205620
RSE-2	**10/9/2020**	*0.269 U*	**0.181 J**	*0.0500 U*	
RSE-3	**10/9/2020**	**0.301 J**	*0.245 U*	**0.715**	
RSE-X	**10/9/2020**	**0.270 J**	*0.250 U*	**0.688**	
ADEC TABLE C GROUNDWATER CLEANUP LEVELS (18 AAC 75)		**1.5**	**1.1**	**2.2**	

NOTES:

1) Gasoline Range Organics (GRO) samples analyzed by AK Method 101;
Diesel Range Organics (DRO) samples analyzed by AK Method 102;
Residual Range Organics (RRO) samples analyzed by AK Method 103.

2) Bold font indicates the analyte was detected above the detection limit (DL).

3) *Italicized* font with a U-flag indicates the analyte was not detected at the DL; the value presented is the limit of detection.

4) J flag indicates the result is an estimated value.

5) "mg/L" means "milligrams per liter".

6) RSE-X is a blind duplicate of RSE-3.

TABLE 7
ALASKA RAILROAD CORPORATION
TALKEETNA SITE CHARACTERIZATION 2020
PETROLEUM VOLATILE ORGANIC COMPOUND CONCENTRATIONS IN GROUNDWATER

PETROLEUM VOLATILE ORGANIC COMPOUND CONCENTRATIONS IN GROUNDWATER					
SAMPLE ID	**RSE-1**	**RSE-2**	**RSE-3**	**RSE-X**	**ADEC TABLE C**
Date	**10/9/2020**	**10/9/2020**	**10/9/2020**	**10/9/2020**	**GROUNDWATER**
SGS Work Order	**1205620**	**1205620**	**1205620**	**1205620**	**CLEANUP LEVELS**
Units	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(µg/L)**
1,2,4-Trimethylbenzene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	56
1,2-Dibromoethane	*0.0375 U*	*0.0375 U*	*0.0375 U*	*0.0375 U*	0.075
1,2-Dichloroethane	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	1.7
1,3,5-Trimethylbenzene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	60
Benzene	*0.200 U*	*0.200 U*	*0.200 U*	*0.200 U*	4.6
Ethylbenzene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	15
Isopropylbenzene (Cumene)	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	450
Methyl-t-butyl ether	*5.00 U*	*5.00 U*	*5.00 U*	*5.00 U*	140
Naphthalene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	1.7
n-Butylbenzene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	1,000
o-Xylene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	See Total Xylenes
P & M -Xylene	*1.00 U*	*1.00 U*	*1.00 U*	*1.00 U*	See Total Xylenes
sec-Butylbenzene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	2,000
tert-Butylbenzene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	690
Toluene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	1,100
Xylenes (total)	*1.50 U*	*1.50 U*	*1.50 U*	*1.50 U*	190

NOTES:

1) Volatile organic compounds analyses by Method EPA SW8260C.

2) Bold font indicates the analyte was detected above the laboratory Detection Limit (DL).

3) *Italicized* font with a U-qualifier indicates the analyte was not detected above the DL; the value presented is the limit of detection.

4) J flag indicates the result is an estimated value.

5) "ug/L" means "micrograms per liter".

6) RSE-X is a blind duplicate of RSE-3.

TABLE 8
ALASKA RAILROAD CORPORATION
TALKEETNA SITE CHARACTERIZATION 2020
POLYCYCLIC AROMATIC HYDROCARBON CONCENTRATIONS IN GROUNDWATER

POLYCYCLIC AROMATIC HYDROCARBON CONCENTRATIONS IN GROUNDWATER					
SAMPLE NUMBER **DATE** **SGS WORK ORDER** **UNITS**	**RSE-1** **10/9/2020** **1205620** **(ug/L)**	**RSE-2** **10/9/2020** **1205620** **(ug/L)**	**RSE-3** **10/9/2020** **1205620** **(ug/L)**	**RSE-X** **10/9/2020** **1205620** **(ug/L)**	**ADEC TABLE C CLEANUP LEVELS (ug/L)**
1-Methylnaphthalene	*0.0245 U*	*0.0252 U*	*0.0245 U*	*0.0245 U*	11
2-Methylnaphthalene	*0.0245 U*	*0.0252 U*	*0.0245 U*	*0.0245 U*	36
Acenaphthene	*0.0245 U*	*0.0252 U*	*0.0245 U*	*0.0245 U*	530
Acenaphthylene	*0.0245 U*	*0.0252 U*	*0.0245 U*	*0.0245 U*	260
Anthracene	*0.0245 U*	*0.0252 U*	*0.0245 U*	*0.0245 U*	1800
Benzo(a)Anthracene	*0.0245 U*	*0.0252 U*	*0.0245 U*	*0.045 U*	0.30
Benzo[a]pyrene	*0.00980 U*	*0.0101 U*	*0.00980 U*	*0.00980 U*	0.25
Benzo[b]Fluoranthene	*0.0245 U*	*0.0252 U*	*0.0245 U*	*0.0245 U*	2.5
Benzo[g,h,i]perylene	*0.0245 U*	*0.0252 U*	*0.0245 U*	*0.0245 U*	600
Benzo[k]fluoranthene	*0.0245 U*	*0.0505 U*	*0.0245 U*	*0.0245 U*	25
Chrysene	*0.0245 U*	*0.0252 U*	*0.0245 U*	*0.0245 U*	250
Dibenzo[a,h]anthracene	*0.00980 U*	*0.101 U*	*0.00980 U*	*0.00980 U*	0.25
Fluoranthene	*0.0245 U*	*0.0252 U*	*0.0245 U*	*0.0245 U*	800
Fluorene	*0.0245 U*	*0.0252 U*	*0.0245 U*	*0.0245 U*	290
Indeno[1,2,3-c,d] pyrene	*0.0245 U*	*0.0252 U*	*0.0245 U*	*0.0245 U*	2.5
Naphthalene	*0.0490 U*	*0.505 U*	*0.0490 U*	*0.0490 U*	1.7
Phenanthrene	*0.0245 U*	*0.252 U*	*0.0245 U*	*0.0245 U*	170
Pyrene	*0.0245 U*	*0.0252 U*	*0.0245 U*	*0.0245 U*	120

NOTES:

1) Polycyclic aromatic hydrocarbons by Select ion Monitoring analyses by EPA 8270D.

2) Bold font indicates the analyte was detected above the laboratory Detection Limit (DL).

3) *Italicized* font with a U-qualifier indicates the analyte was not detected above the detection limit; the value presented is the limit of detection.

4) J flag indicates the result is an estimated value.

5) "ug/L" means "micrograms per liter".

6) RSE-X is a blind duplicate of RSE-3.

Attachment C:

Select Site Photographs

RESTORATION
Science & Engineering, LLC

Installing RSE-1; looking north

Installing soil boring RSE-2; looking northwest

Installing soil boring RSE-3; looking southeast

Soil core from RSE-3

Purge water from RSE-1

Groundwater sampling at RSE-2; looking south

Groundwater sampling at RSE-3; looking north

Purge water from RSE-3

Attachment D:

Boring Logs

RESTORATION
Science & Engineering, LLC

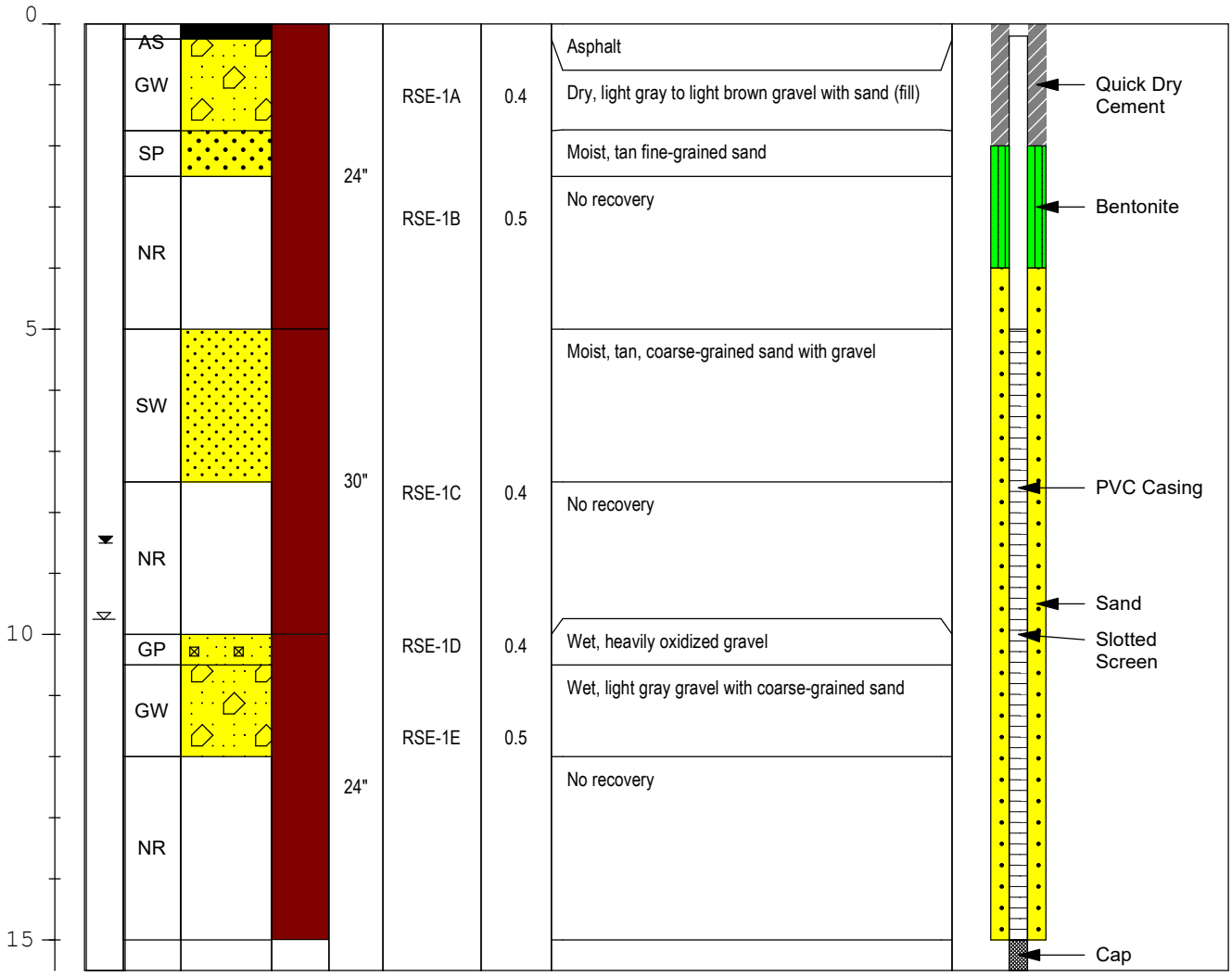
RESTORATION
Science & Engineering, LLC
911 W 8TH AVE, SUITE 100
ANCHORAGE, ALASKA 99501
PH. (907) 278-1023
FAX. (907) 277-5718

GEOENVIRONMENTAL BOREHOLE LOG

Soil Boring ID: RSE-1
Weather: 36 F
Total Depth: 15 Feet

Project:	ARRC Talkeetna Library	**Drilling Company:**	Discovery Drilling, Inc.
Site Location:	Talkeetna, Alaska	**Drill Operator:**	Derek/Tyler
Job Number:	20-2219	**Drill Rig Type:**	6127DT
Project Manager:	Lisa Koeneman	**Method of Drilling:**	Air Rotary
Logged By:	Lisa Koeneman	**Sampling Method:**	MacroCore
Dates Drilled:	10/8/2020	**Hammer Weight / Drop:**	N/A

Legend
Water level during drilling
Water level during sampling



1. "N/A" means "Not Applicable"; "NR" means "No Recovery"

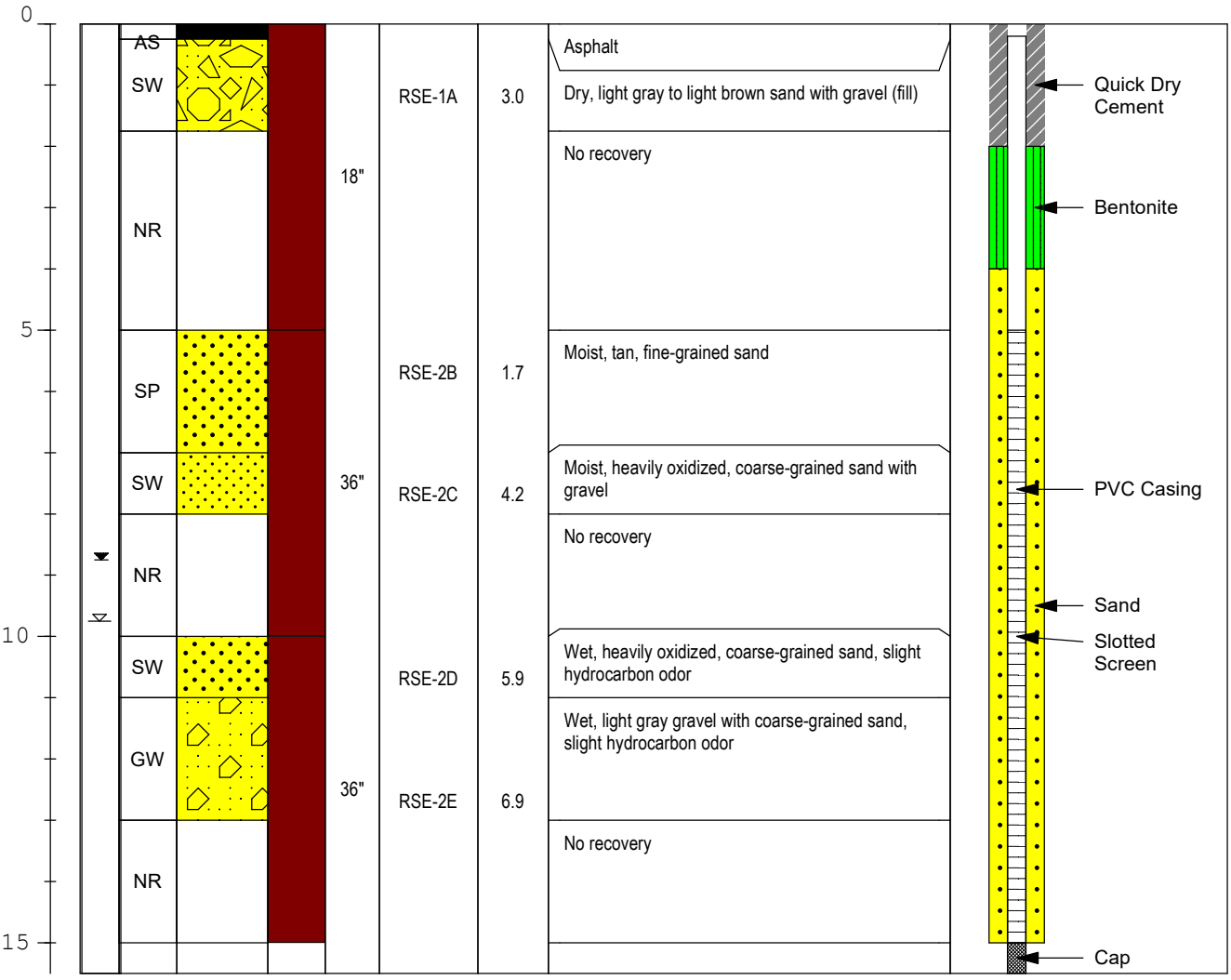
RESTORATION
Science & Engineering, LLC
911 W 8TH AVE, SUITE 100
ANCHORAGE, ALASKA 99501
PH. (907) 278-1023
FAX. (907) 277-5718

GEOENVIRONMENTAL BOREHOLE LOG

Soil Boring ID: RSE-2
Weather: 36 F
Total Depth: 15 Feet

Project:	ARRC Talkeetna Library	**Drilling Company:**	Discovery Drilling, Inc.
Site Location:	Talkeetna, Alaska	**Drill Operator:**	Derek/Tyler
Job Number:	20-2219	**Drill Rig Type:**	6127DT
Project Manager:	Lisa Koeneman	**Method of Drilling:**	Air Rotary
Logged By:	Lisa Koeneman	**Sampling Method:**	MacroCore
Dates Drilled:	10/8/2020	**Hammer Weight / Drop:**	N/A

Legend
Water level during drilling
Water level during sampling



1. "N/A" means "Not Applicable"; "NR" means "No Recovery"

RESTORATION
Science & Engineering, LLC
911 W 8TH AVE, SUITE 100
ANCHORAGE, ALASKA 99501
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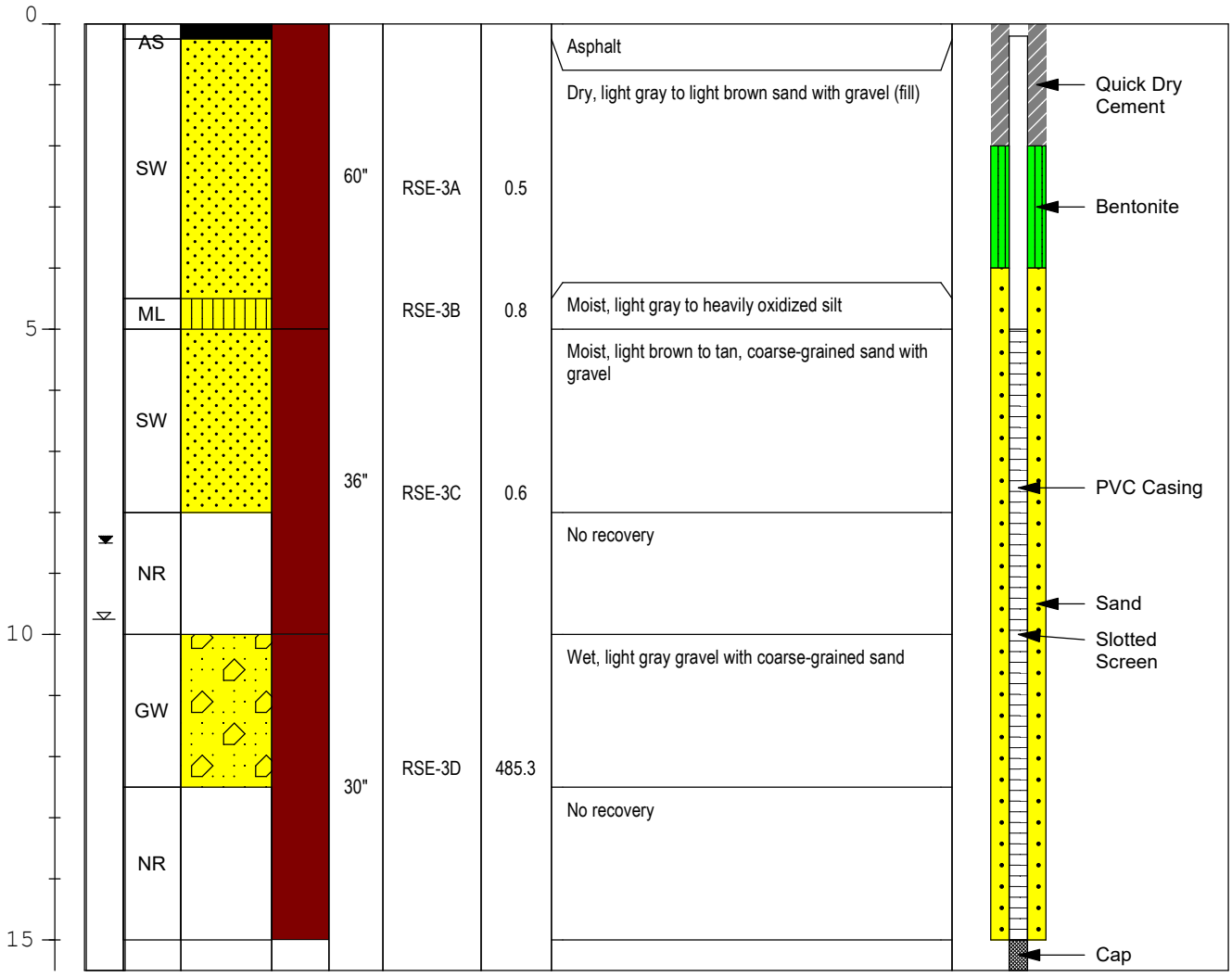
FAX. (907) 277-5718

GEOENVIRONMENTAL BOREHOLE LOG

Soil Boring ID: RSE-3
Weather: 36 F
Total Depth: 15 Feet

Project:	ARRC Talkeetna Library	**Drilling Company:**	Discovery Drilling, Inc.
Site Location:	Talkeetna, Alaska	**Drill Operator:**	Derek/Tyler
Job Number:	20-2219	**Drill Rig Type:**	6127DT
Project Manager:	Lisa Koeneman	**Method of Drilling:**	Air Rotary
Logged By:	Lisa Koeneman	**Sampling Method:**	MarcroCore
Dates Drilled:	10/8/2020	**Hammer Weight / Drop:**	N/A

Legend
Water level during drilling
Water level during sampling



1. "N/A" means "Not Applicable"; "NR" means "No Recovery"

Attachment E:
SGS North America Laboratory Report

RESTORATION
Science & Engineering, LLC

Laboratory Report of Analysis

To: AK Railroad Corp (ARRC)
327 W. Ship Creek Ave
Anchorage, AK 99501
907265-2429

Report Number: **1205620**

Client Project: **20-2219 ARRC Talkeetna**

Dear Russell Grandel,

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

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

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

Sincerely,
SGS North America Inc.

_____

Chuck Homestead Date
Project Manager
Charles.Homestead@sgs.com

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

Case Narrative

SGS Client: **AK Railroad Corp (ARRC)**
SGS Project: **1205620**
Project Name/Site: **20-2219 ARRC Talkeetna**
Project Contact: **Russell Grandel**

Refer to sample receipt form for information on sample condition.

RSE-3 (1205620003) PS

AK101 - Surrogate recovery for 4-bromofluorobenzene does not meet QC criteria due to matrix interference.

RSE-X (1205620004) PS

AK101 - Surrogate recovery for 4-bromofluorobenzene does not meet QC criteria due to matrix interference.

RSE-3D (1205620010) PS

8260D - Surrogate recovery for toluene-d8 does not meet QC criteria. The analytes associated with this surrogate were not detected above the LOQ.
AK101 - Surrogate recovery for 4-bromofluorobenzene does not meet QC criteria due to matrix interference.

RSE-X (1205620011) PS

AK101 - Surrogate recovery for 4-bromofluorobenzene does not meet QC criteria due to matrix interference.

Revised Report: Client changed to AKRR

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

Print Date: 11/17/2020 4:20:08PM

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, indenmification and jurisdiction issues defined therein.

Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a 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.

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Sample Summary

Client Sample ID	Lab Sample ID	Collected	Received	Matrix
RSE-1	1205620001	10/09/2020	10/12/2020	Water (Surface, Eff., Ground)
RSE-2	1205620002	10/09/2020	10/12/2020	Water (Surface, Eff., Ground)
RSE-3	1205620003	10/09/2020	10/12/2020	Water (Surface, Eff., Ground)
RSE-X	1205620004	10/09/2020	10/12/2020	Water (Surface, Eff., Ground)
RSE-1D	1205620005	10/08/2020	10/12/2020	Soil/Solid (dry weight)
RSE-1E	1205620006	10/08/2020	10/12/2020	Soil/Solid (dry weight)
RSE-2D	1205620007	10/08/2020	10/12/2020	Soil/Solid (dry weight)
RSE-2E	1205620008	10/08/2020	10/12/2020	Soil/Solid (dry weight)
RSE-3B	1205620009	10/08/2020	10/12/2020	Soil/Solid (dry weight)
RSE-3D	1205620010	10/08/2020	10/12/2020	Soil/Solid (dry weight)
RSE-X	1205620011	10/08/2020	10/12/2020	Soil/Solid (dry weight)
Trip Blank (Soil)	1205620012	10/08/2020	10/12/2020	Soil/Solid (dry weight)
Trip Blank (Water)	1205620013	10/08/2020	10/12/2020	Water (Surface, Eff., Ground)

Method	Method Description
8270D SIM LV (PAH)	8270 PAH SIM GC/MS LV
8270D SIM (PAH)	8270 PAH SIM Semi-Volatiles GC/MS
AK102	Diesel/Residual Range Organics
AK103	Diesel/Residual Range Organics
AK102	DRO/RRO Low Volume Water
AK103	DRO/RRO Low Volume Water
AK101	Gasoline Range Organics (S)
AK101	Gasoline Range Organics (W)
SM21 2540G	Percent Solids SM2540G
SW8260D	VOC 8260 (S) Field Extracted
SW8260D	Volatile Organic Compounds (W) FULL

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Detectable Results Summary

Client Sample ID: **RSE-1**
Lab Sample ID: 1205620001
Semivolatile Organic Fuels
Volatile Fuels

Parameter	Result	Units
Diesel Range Organics	0.270J	mg/L
Residual Range Organics	0.174J	mg/L
Gasoline Range Organics	0.0327J	mg/L

Client Sample ID: **RSE-2**
Lab Sample ID: 1205620002
Semivolatile Organic Fuels

Parameter	Result	Units
Diesel Range Organics	0.269J	mg/L
Residual Range Organics	0.181J	mg/L

Client Sample ID: **RSE-3**
Lab Sample ID: 1205620003
Semivolatile Organic Fuels
Volatile Fuels

Parameter	Result	Units
Diesel Range Organics	0.301J	mg/L
Gasoline Range Organics	0.715	mg/L

Client Sample ID: **RSE-X**
Lab Sample ID: 1205620004
Semivolatile Organic Fuels
Volatile Fuels

Parameter	Result	Units
Diesel Range Organics	0.270J	mg/L
Gasoline Range Organics	0.688	mg/L

Client Sample ID: **RSE-1D**
Lab Sample ID: 1205620005
Volatile Fuels

Parameter	Result	Units
Gasoline Range Organics	1.73J	mg/kg

Client Sample ID: **RSE-1E**
Lab Sample ID: 1205620006
Volatile Fuels

Parameter	Result	Units
Gasoline Range Organics	1.34J	mg/kg

Client Sample ID: **RSE-2D**
Lab Sample ID: 1205620007
Volatile Fuels

Parameter	Result	Units
Gasoline Range Organics	1.19J	mg/kg

Client Sample ID: **RSE-2E**
Lab Sample ID: 1205620008
Volatile Fuels

Parameter	Result	Units
Gasoline Range Organics	1.41J	mg/kg

Client Sample ID: **RSE-3D**
Lab Sample ID: 1205620010
Semivolatile Organic Fuels
Volatile Fuels

Parameter	Result	Units
Diesel Range Organics	33.1	mg/kg
Gasoline Range Organics	116	mg/kg

Client Sample ID: **RSE-X**
Lab Sample ID: 1205620011
Semivolatile Organic Fuels
Volatile Fuels

Parameter	Result	Units
Diesel Range Organics	33.0	mg/kg
Gasoline Range Organics	69.4	mg/kg

Client Sample ID: **Trip Blank (Soil)**
Lab Sample ID: 1205620012
Volatile Fuels

Parameter	Result	Units
Gasoline Range Organics	1.02J	mg/kg

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Results of **RSE-1**

Client Sample ID: **RSE-1**
Client Project ID: **20-2219 ARRC Talkeetna**
Lab Sample ID: 1205620001
Lab Project ID: 1205620

Collection Date: 10/09/20 14:10
Received Date: 10/12/20 10:41
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	0.0245	U	0.0490	0.0147	ug/L	1		10/19/20 19:21
2-Methylnaphthalene	0.0245	U	0.0490	0.0147	ug/L	1		10/19/20 19:21
Acenaphthene	0.0245	U	0.0490	0.0147	ug/L	1		10/19/20 19:21
Acenaphthylene	0.0245	U	0.0490	0.0147	ug/L	1		10/19/20 19:21
Anthracene	0.0245	U	0.0490	0.0147	ug/L	1		10/19/20 19:21
Benzo(a)Anthracene	0.0245	U	0.0490	0.0147	ug/L	1		10/19/20 19:21
Benzo[a]pyrene	0.00980	U	0.0196	0.00608	ug/L	1		10/19/20 19:21
Benzo[b]Fluoranthene	0.0245	U	0.0490	0.0147	ug/L	1		10/19/20 19:21
Benzo[g,h,i]perylene	0.0245	U	0.0490	0.0147	ug/L	1		10/19/20 19:21
Benzo[k]fluoranthene	0.0245	U	0.0490	0.0147	ug/L	1		10/19/20 19:21
Chrysene	0.0245	U	0.0490	0.0147	ug/L	1		10/19/20 19:21
Dibenzo[a,h]anthracene	0.00980	U	0.0196	0.00608	ug/L	1		10/19/20 19:21
Fluoranthene	0.0245	U	0.0490	0.0147	ug/L	1		10/19/20 19:21
Fluorene	0.0245	U	0.0490	0.0147	ug/L	1		10/19/20 19:21
Indeno[1,2,3-c,d] pyrene	0.0245	U	0.0490	0.0147	ug/L	1		10/19/20 19:21
Naphthalene	0.0490	U	0.0980	0.0304	ug/L	1		10/19/20 19:21
Phenanthrene	0.0245	U	0.0490	0.0147	ug/L	1		10/19/20 19:21
Pyrene	0.0245	U	0.0490	0.0147	ug/L	1		10/19/20 19:21
Surrogates								
2-Methylnaphthalene-d10 (surr)	64.7		37-78		%	1		10/19/20 19:21
Fluoranthene-d10 (surr)	64.7		24-116		%	1		10/19/20 19:21

Batch Information

Analytical Batch: XMS12357
Analytical Method: 8270D SIM LV (PAH)
Analyst: DSD
Analytical Date/Time: 10/19/20 19:21
Container ID: 1205620001-C

Prep Batch: XXX44049
Prep Method: SW3535A
Prep Date/Time: 10/13/20 09:59
Prep Initial Wt./Vol.: 255 mL
Prep Extract Vol: 1 mL

Print Date: 11/17/2020 4:20:18PM

J flagging is activated

Results of **RSE-1**

Client Sample ID: **RSE-1**
Client Project ID: **20-2219 ARRC Talkeetna**
Lab Sample ID: 1205620001
Lab Project ID: 1205620

Collection Date: 10/09/20 14:10
Received Date: 10/12/20 10:41
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	0.270	J	0.600	0.180	mg/L	1		10/21/20 20:55
Surrogates								
5a Androstane (surr)	96.9		50-150		%	1		10/21/20 20:55

Batch Information

Analytical Batch: XFC15783
Analytical Method: AK102
Analyst: CDM
Analytical Date/Time: 10/21/20 20:55
Container ID: 1205620001-A

Prep Batch: XXX44093
Prep Method: SW3520C
Prep Date/Time: 10/20/20 16:33
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	0.174	J	0.500	0.150	mg/L	1		10/21/20 20:55
Surrogates								
n-Triacontane-d62 (surr)	100		50-150		%	1		10/21/20 20:55

Batch Information

Analytical Batch: XFC15783
Analytical Method: AK103
Analyst: CDM
Analytical Date/Time: 10/21/20 20:55
Container ID: 1205620001-A

Prep Batch: XXX44093
Prep Method: SW3520C
Prep Date/Time: 10/20/20 16:33
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

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Results of **RSE-1**

Client Sample ID: **RSE-1**
Client Project ID: **20-2219 ARRC Talkeetna**
Lab Sample ID: 1205620001
Lab Project ID: 1205620

Collection Date: 10/09/20 14:10
Received Date: 10/12/20 10:41
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.0327	J	0.100	0.0310	mg/L	1		10/14/20 01:57
Surrogates								
4-Bromofluorobenzene (surr)	83		50-150		%	1		10/14/20 01:57

Batch Information

Analytical Batch: VFC15396
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 10/14/20 01:57
Container ID: 1205620001-E

Prep Batch: VXX36537
Prep Method: SW5030B
Prep Date/Time: 10/13/20 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Results of **RSE-1**

Client Sample ID: **RSE-1**
Client Project ID: **20-2219 ARRC Talkeetna**
Lab Sample ID: 1205620001
Lab Project ID: 1205620

Collection Date: 10/09/20 14:10
Received Date: 10/12/20 10:41
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS- Petroleum VOC Group**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2,4-Trimethylbenzene	0.500 U		1.00	0.310	ug/L	1		10/13/20 18:13
1,2-Dibromoethane	0.0375 U		0.0750	0.0180	ug/L	1		10/13/20 18:13
1,2-Dichloroethane	0.250 U		0.500	0.150	ug/L	1		10/13/20 18:13
1,3,5-Trimethylbenzene	0.500 U		1.00	0.310	ug/L	1		10/13/20 18:13
Benzene	0.200 U		0.400	0.120	ug/L	1		10/13/20 18:13
Ethylbenzene	0.500 U		1.00	0.310	ug/L	1		10/13/20 18:13
Isopropylbenzene (Cumene)	0.500 U		1.00	0.310	ug/L	1		10/13/20 18:13
Methyl-t-butyl ether	5.00 U		10.0	3.10	ug/L	1		10/13/20 18:13
Naphthalene	0.500 U		1.00	0.310	ug/L	1		10/13/20 18:13
n-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		10/13/20 18:13
o-Xylene	0.500 U		1.00	0.310	ug/L	1		10/13/20 18:13
P & M -Xylene	1.00 U		2.00	0.620	ug/L	1		10/13/20 18:13
sec-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		10/13/20 18:13
tert-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		10/13/20 18:13
Toluene	0.500 U		1.00	0.310	ug/L	1		10/13/20 18:13
Xylenes (total)	1.50 U		3.00	1.00	ug/L	1		10/13/20 18:13
Surrogates								
1,2-Dichloroethane-D4 (surr)	114		81-118		%	1		10/13/20 18:13
4-Bromofluorobenzene (surr)	95.3		85-114		%	1		10/13/20 18:13
Toluene-d8 (surr)	99.8		89-112		%	1		10/13/20 18:13

Batch Information

Analytical Batch: VMS20406
Analytical Method: SW8260D
Analyst: NRB
Analytical Date/Time: 10/13/20 18:13
Container ID: 1205620001-H

Prep Batch: VXX36534
Prep Method: SW5030B
Prep Date/Time: 10/13/20 14:30
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 11/17/2020 4:20:18PM

J flagging is activated

Results of **RSE-2**

Client Sample ID: **RSE-2**
Client Project ID: **20-2219 ARRC Talkeetna**
Lab Sample ID: 1205620002
Lab Project ID: 1205620

Collection Date: 10/09/20 12:15
Received Date: 10/12/20 10:41
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	0.0252	U	0.0504	0.0151	ug/L	1		10/19/20 19:42
2-Methylnaphthalene	0.0252	U	0.0504	0.0151	ug/L	1		10/19/20 19:42
Acenaphthene	0.0252	U	0.0504	0.0151	ug/L	1		10/19/20 19:42
Acenaphthylene	0.0252	U	0.0504	0.0151	ug/L	1		10/19/20 19:42
Anthracene	0.0252	U	0.0504	0.0151	ug/L	1		10/19/20 19:42
Benzo(a)Anthracene	0.0252	U	0.0504	0.0151	ug/L	1		10/19/20 19:42
Benzo[a]pyrene	0.0101	U	0.0202	0.00625	ug/L	1		10/19/20 19:42
Benzo[b]Fluoranthene	0.0252	U	0.0504	0.0151	ug/L	1		10/19/20 19:42
Benzo[g,h,i]perylene	0.0252	U	0.0504	0.0151	ug/L	1		10/19/20 19:42
Benzo[k]fluoranthene	0.0252	U	0.0504	0.0151	ug/L	1		10/19/20 19:42
Chrysene	0.0252	U	0.0504	0.0151	ug/L	1		10/19/20 19:42
Dibenzo[a,h]anthracene	0.0101	U	0.0202	0.00625	ug/L	1		10/19/20 19:42
Fluoranthene	0.0252	U	0.0504	0.0151	ug/L	1		10/19/20 19:42
Fluorene	0.0252	U	0.0504	0.0151	ug/L	1		10/19/20 19:42
Indeno[1,2,3-c,d] pyrene	0.0252	U	0.0504	0.0151	ug/L	1		10/19/20 19:42
Naphthalene	0.0505	U	0.101	0.0313	ug/L	1		10/19/20 19:42
Phenanthrene	0.0252	U	0.0504	0.0151	ug/L	1		10/19/20 19:42
Pyrene	0.0252	U	0.0504	0.0151	ug/L	1		10/19/20 19:42
Surrogates								
2-Methylnaphthalene-d10 (surr)	65.4		37-78		%	1		10/19/20 19:42
Fluoranthene-d10 (surr)	68.1		24-116		%	1		10/19/20 19:42

Batch Information

Analytical Batch: XMS12357
Analytical Method: 8270D SIM LV (PAH)
Analyst: DSD
Analytical Date/Time: 10/19/20 19:42
Container ID: 1205620002-C

Prep Batch: XXX44049
Prep Method: SW3535A
Prep Date/Time: 10/13/20 09:59
Prep Initial Wt./Vol.: 248 mL
Prep Extract Vol: 1 mL

Print Date: 11/17/2020 4:20:18PM

J flagging is activated

Results of **RSE-2**

Client Sample ID: **RSE-2**
Client Project ID: **20-2219 ARRC Talkeetna**
Lab Sample ID: 1205620002
Lab Project ID: 1205620

Collection Date: 10/09/20 12:15
Received Date: 10/12/20 10:41
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	0.269	J	0.600	0.180	mg/L	1		10/21/20 21:05
Surrogates								
5a Androstane (surr)	102		50-150		%	1		10/21/20 21:05

Batch Information

Analytical Batch: XFC15783
Analytical Method: AK102
Analyst: CDM
Analytical Date/Time: 10/21/20 21:05
Container ID: 1205620002-A

Prep Batch: XXX44093
Prep Method: SW3520C
Prep Date/Time: 10/20/20 16:33
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	0.181	J	0.500	0.150	mg/L	1		10/21/20 21:05
Surrogates								
n-Triacontane-d62 (surr)	104		50-150		%	1		10/21/20 21:05

Batch Information

Analytical Batch: XFC15783
Analytical Method: AK103
Analyst: CDM
Analytical Date/Time: 10/21/20 21:05
Container ID: 1205620002-A

Prep Batch: XXX44093
Prep Method: SW3520C
Prep Date/Time: 10/20/20 16:33
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

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Results of **RSE-2**

Client Sample ID: **RSE-2**
Client Project ID: **20-2219 ARRC Talkeetna**
Lab Sample ID: 1205620002
Lab Project ID: 1205620

Collection Date: 10/09/20 12:15
Received Date: 10/12/20 10:41
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.0500	U	0.100	0.0310	mg/L	1		10/14/20 14:25
Surrogates								
4-Bromofluorobenzene (surr)	69.1		50-150		%	1		10/14/20 14:25

Batch Information

Analytical Batch: VFC15398
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 10/14/20 14:25
Container ID: 1205620002-F

Prep Batch: VXX36543
Prep Method: SW5030B
Prep Date/Time: 10/14/20 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Results of **RSE-2**

Client Sample ID: **RSE-2**
Client Project ID: **20-2219 ARRC Talkeetna**
Lab Sample ID: 1205620002
Lab Project ID: 1205620

Collection Date: 10/09/20 12:15
Received Date: 10/12/20 10:41
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS- Petroleum VOC Group**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2,4-Trimethylbenzene	0.500 U		1.00	0.310	ug/L	1		10/13/20 18:27
1,2-Dibromoethane	0.0375 U		0.0750	0.0180	ug/L	1		10/13/20 18:27
1,2-Dichloroethane	0.250 U		0.500	0.150	ug/L	1		10/13/20 18:27
1,3,5-Trimethylbenzene	0.500 U		1.00	0.310	ug/L	1		10/13/20 18:27
Benzene	0.200 U		0.400	0.120	ug/L	1		10/13/20 18:27
Ethylbenzene	0.500 U		1.00	0.310	ug/L	1		10/13/20 18:27
Isopropylbenzene (Cumene)	0.500 U		1.00	0.310	ug/L	1		10/13/20 18:27
Methyl-t-butyl ether	5.00 U		10.0	3.10	ug/L	1		10/13/20 18:27
Naphthalene	0.500 U		1.00	0.310	ug/L	1		10/13/20 18:27
n-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		10/13/20 18:27
o-Xylene	0.500 U		1.00	0.310	ug/L	1		10/13/20 18:27
P & M -Xylene	1.00 U		2.00	0.620	ug/L	1		10/13/20 18:27
sec-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		10/13/20 18:27
tert-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		10/13/20 18:27
Toluene	0.500 U		1.00	0.310	ug/L	1		10/13/20 18:27
Xylenes (total)	1.50 U		3.00	1.00	ug/L	1		10/13/20 18:27
Surrogates								
1,2-Dichloroethane-D4 (surr)	114		81-118		%	1		10/13/20 18:27
4-Bromofluorobenzene (surr)	94.9		85-114		%	1		10/13/20 18:27
Toluene-d8 (surr)	99.2		89-112		%	1		10/13/20 18:27

Batch Information

Analytical Batch: VMS20406
Analytical Method: SW8260D
Analyst: NRB
Analytical Date/Time: 10/13/20 18:27
Container ID: 1205620002-H

Prep Batch: VXX36534
Prep Method: SW5030B
Prep Date/Time: 10/13/20 14:30
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 11/17/2020 4:20:18PM

J flagging is activated

Results of **RSE-3**

Client Sample ID: **RSE-3**
Client Project ID: **20-2219 ARRC Talkeetna**
Lab Sample ID: 1205620003
Lab Project ID: 1205620

Collection Date: 10/09/20 11:20
Received Date: 10/12/20 10:41
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	0.0245	U	0.0490	0.0147	ug/L	1		10/19/20 20:02
2-Methylnaphthalene	0.0245	U	0.0490	0.0147	ug/L	1		10/19/20 20:02
Acenaphthene	0.0245	U	0.0490	0.0147	ug/L	1		10/19/20 20:02
Acenaphthylene	0.0245	U	0.0490	0.0147	ug/L	1		10/19/20 20:02
Anthracene	0.0245	U	0.0490	0.0147	ug/L	1		10/19/20 20:02
Benzo(a)Anthracene	0.0245	U	0.0490	0.0147	ug/L	1		10/19/20 20:02
Benzo[a]pyrene	0.00980	U	0.0196	0.00608	ug/L	1		10/19/20 20:02
Benzo[b]Fluoranthene	0.0245	U	0.0490	0.0147	ug/L	1		10/19/20 20:02
Benzo[g,h,i]perylene	0.0245	U	0.0490	0.0147	ug/L	1		10/19/20 20:02
Benzo[k]fluoranthene	0.0245	U	0.0490	0.0147	ug/L	1		10/19/20 20:02
Chrysene	0.0245	U	0.0490	0.0147	ug/L	1		10/19/20 20:02
Dibenzo[a,h]anthracene	0.00980	U	0.0196	0.00608	ug/L	1		10/19/20 20:02
Fluoranthene	0.0245	U	0.0490	0.0147	ug/L	1		10/19/20 20:02
Fluorene	0.0245	U	0.0490	0.0147	ug/L	1		10/19/20 20:02
Indeno[1,2,3-c,d] pyrene	0.0245	U	0.0490	0.0147	ug/L	1		10/19/20 20:02
Naphthalene	0.0490	U	0.0980	0.0304	ug/L	1		10/19/20 20:02
Phenanthrene	0.0245	U	0.0490	0.0147	ug/L	1		10/19/20 20:02
Pyrene	0.0245	U	0.0490	0.0147	ug/L	1		10/19/20 20:02
Surrogates								
2-Methylnaphthalene-d10 (surr)	64		37-78		%	1		10/19/20 20:02
Fluoranthene-d10 (surr)	66.8		24-116		%	1		10/19/20 20:02

Batch Information

Analytical Batch: XMS12357
Analytical Method: 8270D SIM LV (PAH)
Analyst: DSD
Analytical Date/Time: 10/19/20 20:02
Container ID: 1205620003-C

Prep Batch: XXX44049
Prep Method: SW3535A
Prep Date/Time: 10/13/20 09:59
Prep Initial Wt./Vol.: 255 mL
Prep Extract Vol: 1 mL

Print Date: 11/17/2020 4:20:18PM

J flagging is activated

Results of **RSE-3**

Client Sample ID: **RSE-3**
Client Project ID: **20-2219 ARRC Talkeetna**
Lab Sample ID: 1205620003
Lab Project ID: 1205620

Collection Date: 10/09/20 11:20
Received Date: 10/12/20 10:41
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	0.301	J	0.588	0.176	mg/L	1		10/21/20 21:14
Surrogates								
5a Androstane (surr)	98.3		50-150		%	1		10/21/20 21:14

Batch Information

Analytical Batch: XFC15783
Analytical Method: AK102
Analyst: CDM
Analytical Date/Time: 10/21/20 21:14
Container ID: 1205620003-A

Prep Batch: XXX44093
Prep Method: SW3520C
Prep Date/Time: 10/20/20 16:33
Prep Initial Wt./Vol.: 255 mL
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	0.245	U	0.490	0.147	mg/L	1		10/21/20 21:14
Surrogates								
n-Triacontane-d62 (surr)	102		50-150		%	1		10/21/20 21:14

Batch Information

Analytical Batch: XFC15783
Analytical Method: AK103
Analyst: CDM
Analytical Date/Time: 10/21/20 21:14
Container ID: 1205620003-A

Prep Batch: XXX44093
Prep Method: SW3520C
Prep Date/Time: 10/20/20 16:33
Prep Initial Wt./Vol.: 255 mL
Prep Extract Vol: 1 mL

Print Date: 11/17/2020 4:20:18PM

J flagging is activated

Results of **RSE-3**

Client Sample ID: **RSE-3**
Client Project ID: **20-2219 ARRC Talkeetna**
Lab Sample ID: 1205620003
Lab Project ID: 1205620

Collection Date: 10/09/20 11:20
Received Date: 10/12/20 10:41
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.715		0.100	0.0310	mg/L	1		10/14/20 01:39
Surrogates								
4-Bromofluorobenzene (surr)	245	*	50-150		%	1		10/14/20 01:39

Batch Information

Analytical Batch: VFC15396
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 10/14/20 01:39
Container ID: 1205620003-E

Prep Batch: VXX36537
Prep Method: SW5030B
Prep Date/Time: 10/13/20 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 11/17/2020 4:20:18PM

J flagging is activated

Results of **RSE-3**

Client Sample ID: **RSE-3**
Client Project ID: **20-2219 ARRC Talkeetna**
Lab Sample ID: 1205620003
Lab Project ID: 1205620

Collection Date: 10/09/20 11:20
Received Date: 10/12/20 10:41
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS- Petroleum VOC Group**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2,4-Trimethylbenzene	0.500 U		1.00	0.310	ug/L	1		10/13/20 18:42
1,2-Dibromoethane	0.0375 U		0.0750	0.0180	ug/L	1		10/13/20 18:42
1,2-Dichloroethane	0.250 U		0.500	0.150	ug/L	1		10/13/20 18:42
1,3,5-Trimethylbenzene	0.500 U		1.00	0.310	ug/L	1		10/13/20 18:42
Benzene	0.200 U		0.400	0.120	ug/L	1		10/13/20 18:42
Ethylbenzene	0.500 U		1.00	0.310	ug/L	1		10/13/20 18:42
Isopropylbenzene (Cumene)	0.500 U		1.00	0.310	ug/L	1		10/13/20 18:42
Methyl-t-butyl ether	5.00 U		10.0	3.10	ug/L	1		10/13/20 18:42
Naphthalene	0.500 U		1.00	0.310	ug/L	1		10/13/20 18:42
n-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		10/13/20 18:42
o-Xylene	0.500 U		1.00	0.310	ug/L	1		10/13/20 18:42
P & M -Xylene	1.00 U		2.00	0.620	ug/L	1		10/13/20 18:42
sec-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		10/13/20 18:42
tert-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		10/13/20 18:42
Toluene	0.500 U		1.00	0.310	ug/L	1		10/13/20 18:42
Xylenes (total)	1.50 U		3.00	1.00	ug/L	1		10/13/20 18:42
Surrogates								
1,2-Dichloroethane-D4 (surr)	108		81-118		%	1		10/13/20 18:42
4-Bromofluorobenzene (surr)	99.4		85-114		%	1		10/13/20 18:42
Toluene-d8 (surr)	103		89-112		%	1		10/13/20 18:42

Batch Information

Analytical Batch: VMS20406
Analytical Method: SW8260D
Analyst: NRB
Analytical Date/Time: 10/13/20 18:42
Container ID: 1205620003-H

Prep Batch: VXX36534
Prep Method: SW5030B
Prep Date/Time: 10/13/20 14:30
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 11/17/2020 4:20:18PM

J flagging is activated

Results of **RSE-X**

Client Sample ID: **RSE-X**
Client Project ID: **20-2219 ARRC Talkeetna**
Lab Sample ID: 1205620004
Lab Project ID: 1205620

Collection Date: 10/09/20 10:00
Received Date: 10/12/20 10:41
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	0.0245	U	0.0490	0.0147	ug/L	1		10/19/20 20:23
2-Methylnaphthalene	0.0245	U	0.0490	0.0147	ug/L	1		10/19/20 20:23
Acenaphthene	0.0245	U	0.0490	0.0147	ug/L	1		10/19/20 20:23
Acenaphthylene	0.0245	U	0.0490	0.0147	ug/L	1		10/19/20 20:23
Anthracene	0.0245	U	0.0490	0.0147	ug/L	1		10/19/20 20:23
Benzo(a)Anthracene	0.0245	U	0.0490	0.0147	ug/L	1		10/19/20 20:23
Benzo[a]pyrene	0.00980	U	0.0196	0.00608	ug/L	1		10/19/20 20:23
Benzo[b]Fluoranthene	0.0245	U	0.0490	0.0147	ug/L	1		10/19/20 20:23
Benzo[g,h,i]perylene	0.0245	U	0.0490	0.0147	ug/L	1		10/19/20 20:23
Benzo[k]fluoranthene	0.0245	U	0.0490	0.0147	ug/L	1		10/19/20 20:23
Chrysene	0.0245	U	0.0490	0.0147	ug/L	1		10/19/20 20:23
Dibenzo[a,h]anthracene	0.00980	U	0.0196	0.00608	ug/L	1		10/19/20 20:23
Fluoranthene	0.0245	U	0.0490	0.0147	ug/L	1		10/19/20 20:23
Fluorene	0.0245	U	0.0490	0.0147	ug/L	1		10/19/20 20:23
Indeno[1,2,3-c,d] pyrene	0.0245	U	0.0490	0.0147	ug/L	1		10/19/20 20:23
Naphthalene	0.0490	U	0.0980	0.0304	ug/L	1		10/19/20 20:23
Phenanthrene	0.0245	U	0.0490	0.0147	ug/L	1		10/19/20 20:23
Pyrene	0.0245	U	0.0490	0.0147	ug/L	1		10/19/20 20:23
Surrogates								
2-Methylnaphthalene-d10 (surr)	61.1		37-78		%	1		10/19/20 20:23
Fluoranthene-d10 (surr)	66.7		24-116		%	1		10/19/20 20:23

Batch Information

Analytical Batch: XMS12357
Analytical Method: 8270D SIM LV (PAH)
Analyst: DSD
Analytical Date/Time: 10/19/20 20:23
Container ID: 1205620004-C

Prep Batch: XXX44049
Prep Method: SW3535A
Prep Date/Time: 10/13/20 09:59
Prep Initial Wt./Vol.: 255 mL
Prep Extract Vol: 1 mL

Print Date: 11/17/2020 4:20:18PM

J flagging is activated

Results of **RSE-X**

Client Sample ID: **RSE-X**
Client Project ID: **20-2219 ARRC Talkeetna**
Lab Sample ID: 1205620004
Lab Project ID: 1205620

Collection Date: 10/09/20 10:00
Received Date: 10/12/20 10:41
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	0.270	J	0.600	0.180	mg/L	1		10/21/20 21:24
Surrogates								
5a Androstane (surr)	98		50-150		%	1		10/21/20 21:24

Batch Information

Analytical Batch: XFC15783
Analytical Method: AK102
Analyst: CDM
Analytical Date/Time: 10/21/20 21:24
Container ID: 1205620004-A

Prep Batch: XXX44093
Prep Method: SW3520C
Prep Date/Time: 10/20/20 16:33
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	0.250	U	0.500	0.150	mg/L	1		10/21/20 21:24
Surrogates								
n-Triacontane-d62 (surr)	102		50-150		%	1		10/21/20 21:24

Batch Information

Analytical Batch: XFC15783
Analytical Method: AK103
Analyst: CDM
Analytical Date/Time: 10/21/20 21:24
Container ID: 1205620004-A

Prep Batch: XXX44093
Prep Method: SW3520C
Prep Date/Time: 10/20/20 16:33
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

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

Results of **RSE-X**

Client Sample ID: **RSE-X**
Client Project ID: **20-2219 ARRC Talkeetna**
Lab Sample ID: 1205620004
Lab Project ID: 1205620

Collection Date: 10/09/20 10:00
Received Date: 10/12/20 10:41
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.688		0.100	0.0310	mg/L	1		10/14/20 02:15
Surrogates								
4-Bromofluorobenzene (surr)	267	*	50-150		%	1		10/14/20 02:15

Batch Information

Analytical Batch: VFC15396
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 10/14/20 02:15
Container ID: 1205620004-E

Prep Batch: VXX36537
Prep Method: SW5030B
Prep Date/Time: 10/13/20 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 11/17/2020 4:20:18PM

J flagging is activated

Results of **RSE-X**

Client Sample ID: **RSE-X**
Client Project ID: **20-2219 ARRC Talkeetna**
Lab Sample ID: 1205620004
Lab Project ID: 1205620

Collection Date: 10/09/20 10:00
Received Date: 10/12/20 10:41
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS- Petroleum VOC Group**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2,4-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		10/13/20 18:57
1,2-Dibromoethane	0.0375	U	0.0750	0.0180	ug/L	1		10/13/20 18:57
1,2-Dichloroethane	0.250	U	0.500	0.150	ug/L	1		10/13/20 18:57
1,3,5-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		10/13/20 18:57
Benzene	0.200	U	0.400	0.120	ug/L	1		10/13/20 18:57
Ethylbenzene	0.500	U	1.00	0.310	ug/L	1		10/13/20 18:57
Isopropylbenzene (Cumene)	0.500	U	1.00	0.310	ug/L	1		10/13/20 18:57
Methyl-t-butyl ether	5.00	U	10.0	3.10	ug/L	1		10/13/20 18:57
Naphthalene	0.500	U	1.00	0.310	ug/L	1		10/13/20 18:57
n-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		10/13/20 18:57
o-Xylene	0.500	U	1.00	0.310	ug/L	1		10/13/20 18:57
P & M -Xylene	1.00	U	2.00	0.620	ug/L	1		10/13/20 18:57
sec-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		10/13/20 18:57
tert-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		10/13/20 18:57
Toluene	0.500	U	1.00	0.310	ug/L	1		10/13/20 18:57
Xylenes (total)	1.50	U	3.00	1.00	ug/L	1		10/13/20 18:57
Surrogates								
1,2-Dichloroethane-D4 (surr)	108		81-118		%	1		10/13/20 18:57
4-Bromofluorobenzene (surr)	96.8		85-114		%	1		10/13/20 18:57
Toluene-d8 (surr)	103		89-112		%	1		10/13/20 18:57

Batch Information

Analytical Batch: VMS20406
Analytical Method: SW8260D
Analyst: NRB
Analytical Date/Time: 10/13/20 18:57
Container ID: 1205620004-H

Prep Batch: VXX36534
Prep Method: SW5030B
Prep Date/Time: 10/13/20 14:30
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 11/17/2020 4:20:18PM

J flagging is activated

Results of **RSE-1D**

Client Sample ID: **RSE-1D**
Client Project ID: **20-2219 ARRC Talkeetna**
Lab Sample ID: 1205620005
Lab Project ID: 1205620

Collection Date: 10/08/20 14:00
Received Date: 10/12/20 10:41
Matrix: Soil/Solid (dry weight)
Solids (%):88.8
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	13.9	U	27.8	6.96	ug/kg	1		11/09/20 21:13
2-Methylnaphthalene	13.9	U	27.8	6.96	ug/kg	1		11/09/20 21:13
Acenaphthene	13.9	U	27.8	6.96	ug/kg	1		11/09/20 21:13
Acenaphthylene	13.9	U	27.8	6.96	ug/kg	1		11/09/20 21:13
Anthracene	13.9	U	27.8	6.96	ug/kg	1		11/09/20 21:13
Benzo(a)Anthracene	13.9	U	27.8	6.96	ug/kg	1		11/09/20 21:13
Benzo[a]pyrene	13.9	U	27.8	6.96	ug/kg	1		11/09/20 21:13
Benzo[b]Fluoranthene	13.9	U	27.8	6.96	ug/kg	1		11/09/20 21:13
Benzo[g,h,i]perylene	13.9	U	27.8	6.96	ug/kg	1		11/09/20 21:13
Benzo[k]fluoranthene	13.9	U	27.8	6.96	ug/kg	1		11/09/20 21:13
Chrysene	13.9	U	27.8	6.96	ug/kg	1		11/09/20 21:13
Dibenzo[a,h]anthracene	13.9	U	27.8	6.96	ug/kg	1		11/09/20 21:13
Fluoranthene	13.9	U	27.8	6.96	ug/kg	1		11/09/20 21:13
Fluorene	13.9	U	27.8	6.96	ug/kg	1		11/09/20 21:13
Indeno[1,2,3-c,d] pyrene	13.9	U	27.8	6.96	ug/kg	1		11/09/20 21:13
Naphthalene	11.2	U	22.3	5.56	ug/kg	1		11/09/20 21:13
Phenanthrene	13.9	U	27.8	6.96	ug/kg	1		11/09/20 21:13
Pyrene	13.9	U	27.8	6.96	ug/kg	1		11/09/20 21:13
Surrogates								
2-Methylnaphthalene-d10 (surr)	82.8		58-103		%	1		11/09/20 21:13
Fluoranthene-d10 (surr)	88		54-113		%	1		11/09/20 21:13

Batch Information

Analytical Batch: XMS12390
Analytical Method: 8270D SIM (PAH)
Analyst: DSD
Analytical Date/Time: 11/09/20 21:13
Container ID: 1205620005-A

Prep Batch: XXX44095
Prep Method: SW3550C
Prep Date/Time: 10/21/20 08:08
Prep Initial Wt./Vol.: 22.757 g
Prep Extract Vol: 5 mL

Print Date: 11/17/2020 4:20:18PM

J flagging is activated

Results of **RSE-1D**

Client Sample ID: **RSE-1D**
Client Project ID: **20-2219 ARRC Talkeetna**
Lab Sample ID: 1205620005
Lab Project ID: 1205620

Collection Date: 10/08/20 14:00
Received Date: 10/12/20 10:41
Matrix: Soil/Solid (dry weight)
Solids (%):88.8
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	11.2	U	22.4	6.94	mg/kg	1		10/20/20 13:15
Surrogates								
5a Androstane (surr)	96.3		50-150		%	1		10/20/20 13:15

Batch Information

Analytical Batch: XFC15781
Analytical Method: AK102
Analyst: CDM
Analytical Date/Time: 10/20/20 13:15
Container ID: 1205620005-A

Prep Batch: XXX44084
Prep Method: SW3550C
Prep Date/Time: 10/20/20 08:32
Prep Initial Wt./Vol.: 30.169 g
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	56.0	U	112	48.1	mg/kg	1		10/20/20 13:15
Surrogates								
n-Triacontane-d62 (surr)	99.2		50-150		%	1		10/20/20 13:15

Batch Information

Analytical Batch: XFC15781
Analytical Method: AK103
Analyst: CDM
Analytical Date/Time: 10/20/20 13:15
Container ID: 1205620005-A

Prep Batch: XXX44084
Prep Method: SW3550C
Prep Date/Time: 10/20/20 08:32
Prep Initial Wt./Vol.: 30.169 g
Prep Extract Vol: 5 mL

Print Date: 11/17/2020 4:20:18PM

J flagging is activated

Results of **RSE-1D**

Client Sample ID: **RSE-1D**
Client Project ID: **20-2219 ARRC Talkeetna**
Lab Sample ID: 1205620005
Lab Project ID: 1205620

Collection Date: 10/08/20 14:00
Received Date: 10/12/20 10:41
Matrix: Soil/Solid (dry weight)
Solids (%):88.8
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	1.73	J	3.78	1.13	mg/kg	1		10/16/20 22:20
Surrogates								
4-Bromofluorobenzene (surr)	83.8		50-150		%	1		10/16/20 22:20

Batch Information

Analytical Batch: VFC15402
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 10/16/20 22:20
Container ID: 1205620005-B

Prep Batch: VXX36562
Prep Method: SW5035A
Prep Date/Time: 10/08/20 14:00
Prep Initial Wt./Vol.: 44.695 g
Prep Extract Vol: 29.9901 mL

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Results of **RSE-1D**

Client Sample ID: **RSE-1D**
Client Project ID: **20-2219 ARRC Talkeetna**
Lab Sample ID: 1205620005
Lab Project ID: 1205620

Collection Date: 10/08/20 14:00
Received Date: 10/12/20 10:41
Matrix: Soil/Solid (dry weight)
Solids (%):88.8
Location:

Results by **Volatile GC/MS- Petroleum VOC Group**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2,4-Trimethylbenzene	37.8	U	75.5	22.7	ug/kg	1		10/16/20 13:40
1,2-Dibromoethane	0.755	U	1.51	0.604	ug/kg	1		10/16/20 13:40
1,2-Dichloroethane	1.51	U	3.02	1.06	ug/kg	1		10/16/20 13:40
1,3,5-Trimethylbenzene	18.9	U	37.8	11.8	ug/kg	1		10/16/20 13:40
Benzene	9.45	U	18.9	5.89	ug/kg	1		10/16/20 13:40
Ethylbenzene	18.9	U	37.8	11.8	ug/kg	1		10/16/20 13:40
Isopropylbenzene (Cumene)	18.9	U	37.8	11.8	ug/kg	1		10/16/20 13:40
Methyl-t-butyl ether	75.5	U	151	46.8	ug/kg	1		10/16/20 13:40
Naphthalene	18.9	U	37.8	11.8	ug/kg	1		10/16/20 13:40
n-Butylbenzene	18.9	U	37.8	11.8	ug/kg	1		10/16/20 13:40
o-Xylene	18.9	U	37.8	11.8	ug/kg	1		10/16/20 13:40
P & M -Xylene	37.8	U	75.5	22.7	ug/kg	1		10/16/20 13:40
sec-Butylbenzene	18.9	U	37.8	11.8	ug/kg	1		10/16/20 13:40
tert-Butylbenzene	18.9	U	37.8	11.8	ug/kg	1		10/16/20 13:40
Toluene	18.9	U	37.8	11.8	ug/kg	1		10/16/20 13:40
Xylenes (total)	56.5	U	113	34.4	ug/kg	1		10/16/20 13:40
Surrogates								
1,2-Dichloroethane-D4 (surr)	106		71-136		%	1		10/16/20 13:40
4-Bromofluorobenzene (surr)	84.2		55-151		%	1		10/16/20 13:40
Toluene-d8 (surr)	100		85-116		%	1		10/16/20 13:40

Batch Information

Analytical Batch: VMS20426
Analytical Method: SW8260D
Analyst: KAJ
Analytical Date/Time: 10/16/20 13:40
Container ID: 1205620005-B

Prep Batch: VXX36558
Prep Method: SW5035A
Prep Date/Time: 10/08/20 14:00
Prep Initial Wt./Vol.: 44.695 g
Prep Extract Vol: 29.9901 mL

Print Date: 11/17/2020 4:20:18PM

J flagging is activated

Results of **RSE-1E**

Client Sample ID: **RSE-1E**
Client Project ID: **20-2219 ARRC Talkeetna**
Lab Sample ID: 1205620006
Lab Project ID: 1205620

Collection Date: 10/08/20 14:05
Received Date: 10/12/20 10:41
Matrix: Soil/Solid (dry weight)
Solids (%):88.3
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	13.4	U	26.9	6.73	ug/kg	1		11/09/20 21:33
2-Methylnaphthalene	13.4	U	26.9	6.73	ug/kg	1		11/09/20 21:33
Acenaphthene	13.4	U	26.9	6.73	ug/kg	1		11/09/20 21:33
Acenaphthylene	13.4	U	26.9	6.73	ug/kg	1		11/09/20 21:33
Anthracene	13.4	U	26.9	6.73	ug/kg	1		11/09/20 21:33
Benzo(a)Anthracene	13.4	U	26.9	6.73	ug/kg	1		11/09/20 21:33
Benzo[a]pyrene	13.4	U	26.9	6.73	ug/kg	1		11/09/20 21:33
Benzo[b]Fluoranthene	13.4	U	26.9	6.73	ug/kg	1		11/09/20 21:33
Benzo[g,h,i]perylene	13.4	U	26.9	6.73	ug/kg	1		11/09/20 21:33
Benzo[k]fluoranthene	13.4	U	26.9	6.73	ug/kg	1		11/09/20 21:33
Chrysene	13.4	U	26.9	6.73	ug/kg	1		11/09/20 21:33
Dibenzo[a,h]anthracene	13.4	U	26.9	6.73	ug/kg	1		11/09/20 21:33
Fluoranthene	13.4	U	26.9	6.73	ug/kg	1		11/09/20 21:33
Fluorene	13.4	U	26.9	6.73	ug/kg	1		11/09/20 21:33
Indeno[1,2,3-c,d] pyrene	13.4	U	26.9	6.73	ug/kg	1		11/09/20 21:33
Naphthalene	10.8	U	21.5	5.38	ug/kg	1		11/09/20 21:33
Phenanthrene	13.4	U	26.9	6.73	ug/kg	1		11/09/20 21:33
Pyrene	13.4	U	26.9	6.73	ug/kg	1		11/09/20 21:33
Surrogates								
2-Methylnaphthalene-d10 (surr)	85.8		58-103		%	1		11/09/20 21:33
Fluoranthene-d10 (surr)	89.7		54-113		%	1		11/09/20 21:33

Batch Information

Analytical Batch: XMS12390
Analytical Method: 8270D SIM (PAH)
Analyst: DSD
Analytical Date/Time: 11/09/20 21:33
Container ID: 1205620006-A

Prep Batch: XXX44095
Prep Method: SW3550C
Prep Date/Time: 10/21/20 08:08
Prep Initial Wt./Vol.: 23.663 g
Prep Extract Vol: 5 mL

Print Date: 11/17/2020 4:20:18PM

J flagging is activated

Results of **RSE-1E**

Client Sample ID: **RSE-1E**
Client Project ID: **20-2219 ARRC Talkeetna**
Lab Sample ID: 1205620006
Lab Project ID: 1205620

Collection Date: 10/08/20 14:05
Received Date: 10/12/20 10:41
Matrix: Soil/Solid (dry weight)
Solids (%):88.3
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	11.3	U	22.6	7.01	mg/kg	1		10/20/20 13:25
Surrogates								
5a Androstane (surr)	98.2		50-150		%	1		10/20/20 13:25

Batch Information

Analytical Batch: XFC15781
Analytical Method: AK102
Analyst: CDM
Analytical Date/Time: 10/20/20 13:25
Container ID: 1205620006-A

Prep Batch: XXX44084
Prep Method: SW3550C
Prep Date/Time: 10/20/20 08:32
Prep Initial Wt./Vol.: 30.042 g
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	56.5	U	113	48.6	mg/kg	1		10/20/20 13:25
Surrogates								
n-Triacontane-d62 (surr)	101		50-150		%	1		10/20/20 13:25

Batch Information

Analytical Batch: XFC15781
Analytical Method: AK103
Analyst: CDM
Analytical Date/Time: 10/20/20 13:25
Container ID: 1205620006-A

Prep Batch: XXX44084
Prep Method: SW3550C
Prep Date/Time: 10/20/20 08:32
Prep Initial Wt./Vol.: 30.042 g
Prep Extract Vol: 5 mL

Print Date: 11/17/2020 4:20:18PM

J flagging is activated

Results of **RSE-1E**

Client Sample ID: **RSE-1E**
Client Project ID: **20-2219 ARRC Talkeetna**
Lab Sample ID: 1205620006
Lab Project ID: 1205620

Collection Date: 10/08/20 14:05
Received Date: 10/12/20 10:41
Matrix: Soil/Solid (dry weight)
Solids (%):88.3
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	1.34	J	3.62	1.09	mg/kg	1		10/16/20 22:38
Surrogates								
4-Bromofluorobenzene (surr)	88.7		50-150		%	1		10/16/20 22:38

Batch Information

Analytical Batch: VFC15402
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 10/16/20 22:38
Container ID: 1205620006-B

Prep Batch: VXX36562
Prep Method: SW5035A
Prep Date/Time: 10/08/20 14:05
Prep Initial Wt./Vol.: 47.804 g
Prep Extract Vol: 30.5693 mL

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Results of **RSE-1E**

Client Sample ID: **RSE-1E**
Client Project ID: **20-2219 ARRC Talkeetna**
Lab Sample ID: 1205620006
Lab Project ID: 1205620

Collection Date: 10/08/20 14:05
Received Date: 10/12/20 10:41
Matrix: Soil/Solid (dry weight)
Solids (%):88.3
Location:

Results by **Volatile GC/MS- Petroleum VOC Group**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2,4-Trimethylbenzene	36.2	U	72.4	21.7	ug/kg	1		10/16/20 13:56
1,2-Dibromoethane	0.725	U	1.45	0.579	ug/kg	1		10/16/20 13:56
1,2-Dichloroethane	1.45	U	2.90	1.01	ug/kg	1		10/16/20 13:56
1,3,5-Trimethylbenzene	18.1	U	36.2	11.3	ug/kg	1		10/16/20 13:56
Benzene	9.05	U	18.1	5.65	ug/kg	1		10/16/20 13:56
Ethylbenzene	18.1	U	36.2	11.3	ug/kg	1		10/16/20 13:56
Isopropylbenzene (Cumene)	18.1	U	36.2	11.3	ug/kg	1		10/16/20 13:56
Methyl-t-butyl ether	72.5	U	145	44.9	ug/kg	1		10/16/20 13:56
Naphthalene	18.1	U	36.2	11.3	ug/kg	1		10/16/20 13:56
n-Butylbenzene	18.1	U	36.2	11.3	ug/kg	1		10/16/20 13:56
o-Xylene	18.1	U	36.2	11.3	ug/kg	1		10/16/20 13:56
P & M -Xylene	36.2	U	72.4	21.7	ug/kg	1		10/16/20 13:56
sec-Butylbenzene	18.1	U	36.2	11.3	ug/kg	1		10/16/20 13:56
tert-Butylbenzene	18.1	U	36.2	11.3	ug/kg	1		10/16/20 13:56
Toluene	18.1	U	36.2	11.3	ug/kg	1		10/16/20 13:56
Xylenes (total)	54.5	U	109	33.0	ug/kg	1		10/16/20 13:56
Surrogates								
1,2-Dichloroethane-D4 (surr)	104		71-136		%	1		10/16/20 13:56
4-Bromofluorobenzene (surr)	94.3		55-151		%	1		10/16/20 13:56
Toluene-d8 (surr)	100		85-116		%	1		10/16/20 13:56

Batch Information

Analytical Batch: VMS20426
Analytical Method: SW8260D
Analyst: KAJ
Analytical Date/Time: 10/16/20 13:56
Container ID: 1205620006-B

Prep Batch: VXX36558
Prep Method: SW5035A
Prep Date/Time: 10/08/20 14:05
Prep Initial Wt./Vol.: 47.804 g
Prep Extract Vol: 30.5693 mL

Print Date: 11/17/2020 4:20:18PM

J flagging is activated

Results of **RSE-2D**

Client Sample ID: **RSE-2D**
Client Project ID: **20-2219 ARRC Talkeetna**
Lab Sample ID: 1205620007
Lab Project ID: 1205620

Collection Date: 10/08/20 11:40
Received Date: 10/12/20 10:41
Matrix: Soil/Solid (dry weight)
Solids (%):89.0
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	13.8	U	27.5	6.88	ug/kg	1		11/09/20 21:54
2-Methylnaphthalene	13.8	U	27.5	6.88	ug/kg	1		11/09/20 21:54
Acenaphthene	13.8	U	27.5	6.88	ug/kg	1		11/09/20 21:54
Acenaphthylene	13.8	U	27.5	6.88	ug/kg	1		11/09/20 21:54
Anthracene	13.8	U	27.5	6.88	ug/kg	1		11/09/20 21:54
Benzo(a)Anthracene	13.8	U	27.5	6.88	ug/kg	1		11/09/20 21:54
Benzo[a]pyrene	13.8	U	27.5	6.88	ug/kg	1		11/09/20 21:54
Benzo[b]Fluoranthene	13.8	U	27.5	6.88	ug/kg	1		11/09/20 21:54
Benzo[g,h,i]perylene	13.8	U	27.5	6.88	ug/kg	1		11/09/20 21:54
Benzo[k]fluoranthene	13.8	U	27.5	6.88	ug/kg	1		11/09/20 21:54
Chrysene	13.8	U	27.5	6.88	ug/kg	1		11/09/20 21:54
Dibenzo[a,h]anthracene	13.8	U	27.5	6.88	ug/kg	1		11/09/20 21:54
Fluoranthene	13.8	U	27.5	6.88	ug/kg	1		11/09/20 21:54
Fluorene	13.8	U	27.5	6.88	ug/kg	1		11/09/20 21:54
Indeno[1,2,3-c,d] pyrene	13.8	U	27.5	6.88	ug/kg	1		11/09/20 21:54
Naphthalene	11.0	U	22.0	5.50	ug/kg	1		11/09/20 21:54
Phenanthrene	13.8	U	27.5	6.88	ug/kg	1		11/09/20 21:54
Pyrene	13.8	U	27.5	6.88	ug/kg	1		11/09/20 21:54
Surrogates								
2-Methylnaphthalene-d10 (surr)	83.5		58-103		%	1		11/09/20 21:54
Fluoranthene-d10 (surr)	88.1		54-113		%	1		11/09/20 21:54

Batch Information

Analytical Batch: XMS12390
Analytical Method: 8270D SIM (PAH)
Analyst: DSD
Analytical Date/Time: 11/09/20 21:54
Container ID: 1205620007-A

Prep Batch: XXX44095
Prep Method: SW3550C
Prep Date/Time: 10/21/20 08:08
Prep Initial Wt./Vol.: 22.985 g
Prep Extract Vol: 5 mL

Print Date: 11/17/2020 4:20:18PM

J flagging is activated

Results of **RSE-2D**

Client Sample ID: **RSE-2D**
Client Project ID: **20-2219 ARRC Talkeetna**
Lab Sample ID: 1205620007
Lab Project ID: 1205620

Collection Date: 10/08/20 11:40
Received Date: 10/12/20 10:41
Matrix: Soil/Solid (dry weight)
Solids (%):89.0
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	11.1	U	22.1	6.85	mg/kg	1		10/20/20 13:35
Surrogates								
5a Androstane (surr)	93.2		50-150		%	1		10/20/20 13:35

Batch Information

Analytical Batch: XFC15781
Analytical Method: AK102
Analyst: CDM
Analytical Date/Time: 10/20/20 13:35
Container ID: 1205620007-A

Prep Batch: XXX44084
Prep Method: SW3550C
Prep Date/Time: 10/20/20 08:32
Prep Initial Wt./Vol.: 30.499 g
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	55.5	U	111	47.5	mg/kg	1		10/20/20 13:35
Surrogates								
n-Triacontane-d62 (surr)	94.3		50-150		%	1		10/20/20 13:35

Batch Information

Analytical Batch: XFC15781
Analytical Method: AK103
Analyst: CDM
Analytical Date/Time: 10/20/20 13:35
Container ID: 1205620007-A

Prep Batch: XXX44084
Prep Method: SW3550C
Prep Date/Time: 10/20/20 08:32
Prep Initial Wt./Vol.: 30.499 g
Prep Extract Vol: 5 mL

Print Date: 11/17/2020 4:20:18PM

J flagging is activated

Results of **RSE-2D**

Client Sample ID: **RSE-2D**
Client Project ID: **20-2219 ARRC Talkeetna**
Lab Sample ID: 1205620007
Lab Project ID: 1205620

Collection Date: 10/08/20 11:40
Received Date: 10/12/20 10:41
Matrix: Soil/Solid (dry weight)
Solids (%):89.0
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	1.19	J	3.18	0.955	mg/kg	1		10/16/20 22:56
Surrogates								
4-Bromofluorobenzene (surr)	92.9		50-150		%	1		10/16/20 22:56

Batch Information

Analytical Batch: VFC15402
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 10/16/20 22:56
Container ID: 1205620007-B

Prep Batch: VXX36562
Prep Method: SW5035A
Prep Date/Time: 10/08/20 11:40
Prep Initial Wt./Vol.: 54.796 g
Prep Extract Vol: 31.0346 mL

Print Date: 11/17/2020 4:20:18PM

J flagging is activated

Results of **RSE-2D**

Client Sample ID: **RSE-2D**
Client Project ID: **20-2219 ARRC Talkeetna**
Lab Sample ID: 1205620007
Lab Project ID: 1205620

Collection Date: 10/08/20 11:40
Received Date: 10/12/20 10:41
Matrix: Soil/Solid (dry weight)
Solids (%):89.0
Location:

Results by **Volatile GC/MS- Petroleum VOC Group**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2,4-Trimethylbenzene	31.8	U	63.6	19.1	ug/kg	1		10/16/20 14:13
1,2-Dibromoethane	0.635	U	1.27	0.509	ug/kg	1		10/16/20 14:13
1,2-Dichloroethane	1.27	U	2.55	0.891	ug/kg	1		10/16/20 14:13
1,3,5-Trimethylbenzene	15.9	U	31.8	9.93	ug/kg	1		10/16/20 14:13
Benzene	7.95	U	15.9	4.96	ug/kg	1		10/16/20 14:13
Ethylbenzene	15.9	U	31.8	9.93	ug/kg	1		10/16/20 14:13
Isopropylbenzene (Cumene)	15.9	U	31.8	9.93	ug/kg	1		10/16/20 14:13
Methyl-t-butyl ether	63.5	U	127	39.5	ug/kg	1		10/16/20 14:13
Naphthalene	15.9	U	31.8	9.93	ug/kg	1		10/16/20 14:13
n-Butylbenzene	15.9	U	31.8	9.93	ug/kg	1		10/16/20 14:13
o-Xylene	15.9	U	31.8	9.93	ug/kg	1		10/16/20 14:13
P & M -Xylene	31.8	U	63.6	19.1	ug/kg	1		10/16/20 14:13
sec-Butylbenzene	15.9	U	31.8	9.93	ug/kg	1		10/16/20 14:13
tert-Butylbenzene	15.9	U	31.8	9.93	ug/kg	1		10/16/20 14:13
Toluene	15.9	U	31.8	9.93	ug/kg	1		10/16/20 14:13
Xylenes (total)	47.8	U	95.5	29.0	ug/kg	1		10/16/20 14:13
Surrogates								
1,2-Dichloroethane-D4 (surr)	108		71-136		%	1		10/16/20 14:13
4-Bromofluorobenzene (surr)	97.6		55-151		%	1		10/16/20 14:13
Toluene-d8 (surr)	101		85-116		%	1		10/16/20 14:13

Batch Information

Analytical Batch: VMS20426
Analytical Method: SW8260D
Analyst: KAJ
Analytical Date/Time: 10/16/20 14:13
Container ID: 1205620007-B

Prep Batch: VXX36558
Prep Method: SW5035A
Prep Date/Time: 10/08/20 11:40
Prep Initial Wt./Vol.: 54.796 g
Prep Extract Vol: 31.0346 mL

Print Date: 11/17/2020 4:20:18PM

J flagging is activated

Results of **RSE-2E**

Client Sample ID: **RSE-2E**
Client Project ID: **20-2219 ARRC Talkeetna**
Lab Sample ID: 1205620008
Lab Project ID: 1205620

Collection Date: 10/08/20 11:45
Received Date: 10/12/20 10:41
Matrix: Soil/Solid (dry weight)
Solids (%):89.9
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	13.9	U	27.7	6.93	ug/kg	1		11/09/20 22:14
2-Methylnaphthalene	13.9	U	27.7	6.93	ug/kg	1		11/09/20 22:14
Acenaphthene	13.9	U	27.7	6.93	ug/kg	1		11/09/20 22:14
Acenaphthylene	13.9	U	27.7	6.93	ug/kg	1		11/09/20 22:14
Anthracene	13.9	U	27.7	6.93	ug/kg	1		11/09/20 22:14
Benzo(a)Anthracene	13.9	U	27.7	6.93	ug/kg	1		11/09/20 22:14
Benzo[a]pyrene	13.9	U	27.7	6.93	ug/kg	1		11/09/20 22:14
Benzo[b]Fluoranthene	13.9	U	27.7	6.93	ug/kg	1		11/09/20 22:14
Benzo[g,h,i]perylene	13.9	U	27.7	6.93	ug/kg	1		11/09/20 22:14
Benzo[k]fluoranthene	13.9	U	27.7	6.93	ug/kg	1		11/09/20 22:14
Chrysene	13.9	U	27.7	6.93	ug/kg	1		11/09/20 22:14
Dibenzo[a,h]anthracene	13.9	U	27.7	6.93	ug/kg	1		11/09/20 22:14
Fluoranthene	13.9	U	27.7	6.93	ug/kg	1		11/09/20 22:14
Fluorene	13.9	U	27.7	6.93	ug/kg	1		11/09/20 22:14
Indeno[1,2,3-c,d] pyrene	13.9	U	27.7	6.93	ug/kg	1		11/09/20 22:14
Naphthalene	11.1	U	22.2	5.54	ug/kg	1		11/09/20 22:14
Phenanthrene	13.9	U	27.7	6.93	ug/kg	1		11/09/20 22:14
Pyrene	13.9	U	27.7	6.93	ug/kg	1		11/09/20 22:14
Surrogates								
2-Methylnaphthalene-d10 (surr)	85.2		58-103		%	1		11/09/20 22:14
Fluoranthene-d10 (surr)	88.4		54-113		%	1		11/09/20 22:14

Batch Information

Analytical Batch: XMS12390
Analytical Method: 8270D SIM (PAH)
Analyst: DSD
Analytical Date/Time: 11/09/20 22:14
Container ID: 1205620008-A

Prep Batch: XXX44095
Prep Method: SW3550C
Prep Date/Time: 10/21/20 08:08
Prep Initial Wt./Vol.: 22.583 g
Prep Extract Vol: 5 mL

Print Date: 11/17/2020 4:20:18PM

J flagging is activated

Results of **RSE-2E**

Client Sample ID: **RSE-2E**
Client Project ID: **20-2219 ARRC Talkeetna**
Lab Sample ID: 1205620008
Lab Project ID: 1205620

Collection Date: 10/08/20 11:45
Received Date: 10/12/20 10:41
Matrix: Soil/Solid (dry weight)
Solids (%):89.9
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	10.9	U	21.9	6.79	mg/kg	1		10/20/20 13:45
Surrogates								
5a Androstane (surr)	93.9		50-150		%	1		10/20/20 13:45

Batch Information

Analytical Batch: XFC15781
Analytical Method: AK102
Analyst: CDM
Analytical Date/Time: 10/20/20 13:45
Container ID: 1205620008-A

Prep Batch: XXX44084
Prep Method: SW3550C
Prep Date/Time: 10/20/20 08:32
Prep Initial Wt./Vol.: 30.49 g
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	54.5	U	109	47.1	mg/kg	1		10/20/20 13:45
Surrogates								
n-Triacontane-d62 (surr)	96.4		50-150		%	1		10/20/20 13:45

Batch Information

Analytical Batch: XFC15781
Analytical Method: AK103
Analyst: CDM
Analytical Date/Time: 10/20/20 13:45
Container ID: 1205620008-A

Prep Batch: XXX44084
Prep Method: SW3550C
Prep Date/Time: 10/20/20 08:32
Prep Initial Wt./Vol.: 30.49 g
Prep Extract Vol: 5 mL

Print Date: 11/17/2020 4:20:18PM

J flagging is activated

Results of **RSE-2E**

Client Sample ID: **RSE-2E**
Client Project ID: **20-2219 ARRC Talkeetna**
Lab Sample ID: 1205620008
Lab Project ID: 1205620

Collection Date: 10/08/20 11:45
Received Date: 10/12/20 10:41
Matrix: Soil/Solid (dry weight)
Solids (%):89.9
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	1.41	J	3.60	1.08	mg/kg	1		10/16/20 23:14
Surrogates								
4-Bromofluorobenzene (surr)	88		50-150		%	1		10/16/20 23:14

Batch Information

Analytical Batch: VFC15402
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 10/16/20 23:14
Container ID: 1205620008-B

Prep Batch: VXX36562
Prep Method: SW5035A
Prep Date/Time: 10/08/20 11:45
Prep Initial Wt./Vol.: 45.84 g
Prep Extract Vol: 29.6417 mL

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

Results of **RSE-2E**

Client Sample ID: **RSE-2E**
Client Project ID: **20-2219 ARRC Talkeetna**
Lab Sample ID: 1205620008
Lab Project ID: 1205620

Collection Date: 10/08/20 11:45
Received Date: 10/12/20 10:41
Matrix: Soil/Solid (dry weight)
Solids (%):89.9
Location:

Results by **Volatile GC/MS- Petroleum VOC Group**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2,4-Trimethylbenzene	36.0 U		71.9	21.6	ug/kg	1		10/16/20 14:29
1,2-Dibromoethane	0.720 U		1.44	0.576	ug/kg	1		10/16/20 14:29
1,2-Dichloroethane	1.44 U		2.88	1.01	ug/kg	1		10/16/20 14:29
1,3,5-Trimethylbenzene	18.0 U		36.0	11.2	ug/kg	1		10/16/20 14:29
Benzene	9.00 U		18.0	5.61	ug/kg	1		10/16/20 14:29
Ethylbenzene	18.0 U		36.0	11.2	ug/kg	1		10/16/20 14:29
Isopropylbenzene (Cumene)	18.0 U		36.0	11.2	ug/kg	1		10/16/20 14:29
Methyl-t-butyl ether	72.0 U		144	44.6	ug/kg	1		10/16/20 14:29
Naphthalene	18.0 U		36.0	11.2	ug/kg	1		10/16/20 14:29
n-Butylbenzene	18.0 U		36.0	11.2	ug/kg	1		10/16/20 14:29
o-Xylene	18.0 U		36.0	11.2	ug/kg	1		10/16/20 14:29
P & M -Xylene	36.0 U		71.9	21.6	ug/kg	1		10/16/20 14:29
sec-Butylbenzene	18.0 U		36.0	11.2	ug/kg	1		10/16/20 14:29
tert-Butylbenzene	18.0 U		36.0	11.2	ug/kg	1		10/16/20 14:29
Toluene	18.0 U		36.0	11.2	ug/kg	1		10/16/20 14:29
Xylenes (total)	54.0 U		108	32.8	ug/kg	1		10/16/20 14:29
Surrogates								
1,2-Dichloroethane-D4 (surr)	106		71-136		%	1		10/16/20 14:29
4-Bromofluorobenzene (surr)	88.2		55-151		%	1		10/16/20 14:29
Toluene-d8 (surr)	101		85-116		%	1		10/16/20 14:29

Batch Information

Analytical Batch: VMS20426
Analytical Method: SW8260D
Analyst: KAJ
Analytical Date/Time: 10/16/20 14:29
Container ID: 1205620008-B

Prep Batch: VXX36558
Prep Method: SW5035A
Prep Date/Time: 10/08/20 11:45
Prep Initial Wt./Vol.: 45.84 g
Prep Extract Vol: 29.6417 mL

Print Date: 11/17/2020 4:20:18PM

J flagging is activated

Results of **RSE-3B**

Client Sample ID: **RSE-3B**
Client Project ID: **20-2219 ARRC Talkeetna**
Lab Sample ID: 1205620009
Lab Project ID: 1205620

Collection Date: 10/08/20 09:30
Received Date: 10/12/20 10:41
Matrix: Soil/Solid (dry weight)
Solids (%):69.9
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	17.8	U	35.5	8.87	ug/kg	1		11/09/20 22:35
2-Methylnaphthalene	17.8	U	35.5	8.87	ug/kg	1		11/09/20 22:35
Acenaphthene	17.8	U	35.5	8.87	ug/kg	1		11/09/20 22:35
Acenaphthylene	17.8	U	35.5	8.87	ug/kg	1		11/09/20 22:35
Anthracene	17.8	U	35.5	8.87	ug/kg	1		11/09/20 22:35
Benzo(a)Anthracene	17.8	U	35.5	8.87	ug/kg	1		11/09/20 22:35
Benzo[a]pyrene	17.8	U	35.5	8.87	ug/kg	1		11/09/20 22:35
Benzo[b]Fluoranthene	17.8	U	35.5	8.87	ug/kg	1		11/09/20 22:35
Benzo[g,h,i]perylene	17.8	U	35.5	8.87	ug/kg	1		11/09/20 22:35
Benzo[k]fluoranthene	17.8	U	35.5	8.87	ug/kg	1		11/09/20 22:35
Chrysene	17.8	U	35.5	8.87	ug/kg	1		11/09/20 22:35
Dibenzo[a,h]anthracene	17.8	U	35.5	8.87	ug/kg	1		11/09/20 22:35
Fluoranthene	17.8	U	35.5	8.87	ug/kg	1		11/09/20 22:35
Fluorene	17.8	U	35.5	8.87	ug/kg	1		11/09/20 22:35
Indeno[1,2,3-c,d] pyrene	17.8	U	35.5	8.87	ug/kg	1		11/09/20 22:35
Naphthalene	14.2	U	28.4	7.10	ug/kg	1		11/09/20 22:35
Phenanthrene	17.8	U	35.5	8.87	ug/kg	1		11/09/20 22:35
Pyrene	17.8	U	35.5	8.87	ug/kg	1		11/09/20 22:35
Surrogates								
2-Methylnaphthalene-d10 (surr)	75.1		58-103		%	1		11/09/20 22:35
Fluoranthene-d10 (surr)	78.5		54-113		%	1		11/09/20 22:35

Batch Information

Analytical Batch: XMS12390
Analytical Method: 8270D SIM (PAH)
Analyst: DSD
Analytical Date/Time: 11/09/20 22:35
Container ID: 1205620009-A

Prep Batch: XXX44095
Prep Method: SW3550C
Prep Date/Time: 10/21/20 08:08
Prep Initial Wt./Vol.: 22.683 g
Prep Extract Vol: 5 mL

Print Date: 11/17/2020 4:20:18PM

J flagging is activated

Results of **RSE-3B**

Client Sample ID: **RSE-3B**
Client Project ID: **20-2219 ARRC Talkeetna**
Lab Sample ID: 1205620009
Lab Project ID: 1205620

Collection Date: 10/08/20 09:30
Received Date: 10/12/20 10:41
Matrix: Soil/Solid (dry weight)
Solids (%):69.9
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	14.3	U	28.6	8.86	mg/kg	1		10/20/20 13:55
Surrogates								
5a Androstane (surr)	80		50-150		%	1		10/20/20 13:55

Batch Information

Analytical Batch: XFC15781
Analytical Method: AK102
Analyst: CDM
Analytical Date/Time: 10/20/20 13:55
Container ID: 1205620009-A

Prep Batch: XXX44084
Prep Method: SW3550C
Prep Date/Time: 10/20/20 08:32
Prep Initial Wt./Vol.: 30.03 g
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	71.5	U	143	61.5	mg/kg	1		10/20/20 13:55
Surrogates								
n-Triacontane-d62 (surr)	82		50-150		%	1		10/20/20 13:55

Batch Information

Analytical Batch: XFC15781
Analytical Method: AK103
Analyst: CDM
Analytical Date/Time: 10/20/20 13:55
Container ID: 1205620009-A

Prep Batch: XXX44084
Prep Method: SW3550C
Prep Date/Time: 10/20/20 08:32
Prep Initial Wt./Vol.: 30.03 g
Prep Extract Vol: 5 mL

Print Date: 11/17/2020 4:20:18PM

J flagging is activated

Results of **RSE-3B**

Client Sample ID: **RSE-3B**
Client Project ID: **20-2219 ARRC Talkeetna**
Lab Sample ID: 1205620009
Lab Project ID: 1205620

Collection Date: 10/08/20 09:30
Received Date: 10/12/20 10:41
Matrix: Soil/Solid (dry weight)
Solids (%):69.9
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	4.71	U	9.43	2.83	mg/kg	1		10/20/20 02:27
Surrogates								
4-Bromofluorobenzene (surr)	129		50-150		%	1		10/20/20 02:27

Batch Information

Analytical Batch: VFC15405
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 10/20/20 02:27
Container ID: 1205620009-B

Prep Batch: VXX36568
Prep Method: SW5035A
Prep Date/Time: 10/08/20 09:30
Prep Initial Wt./Vol.: 24.578 g
Prep Extract Vol: 32.4026 mL

Print Date: 11/17/2020 4:20:18PM

J flagging is activated

SGS

Results of **RSE-3B**

Client Sample ID: **RSE-3B**
Client Project ID: **20-2219 ARRC Talkeetna**
Lab Sample ID: 1205620009
Lab Project ID: 1205620

Collection Date: 10/08/20 09:30
Received Date: 10/12/20 10:41
Matrix: Soil/Solid (dry weight)
Solids (%):69.9
Location:

Results by **Volatile GC/MS- Petroleum VOC Group**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2,4-Trimethylbenzene	94.5	U	189	56.6	ug/kg	1		10/16/20 14:46
1,2-Dibromoethane	1.89	U	3.77	1.51	ug/kg	1		10/16/20 14:46
1,2-Dichloroethane	3.77	U	7.55	2.64	ug/kg	1		10/16/20 14:46
1,3,5-Trimethylbenzene	47.1	U	94.3	29.4	ug/kg	1		10/16/20 14:46
Benzene	23.6	U	47.2	14.7	ug/kg	1		10/16/20 14:46
Ethylbenzene	47.1	U	94.3	29.4	ug/kg	1		10/16/20 14:46
Isopropylbenzene (Cumene)	47.1	U	94.3	29.4	ug/kg	1		10/16/20 14:46
Methyl-t-butyl ether	189	U	377	117	ug/kg	1		10/16/20 14:46
Naphthalene	47.1	U	94.3	29.4	ug/kg	1		10/16/20 14:46
n-Butylbenzene	47.1	U	94.3	29.4	ug/kg	1		10/16/20 14:46
o-Xylene	47.1	U	94.3	29.4	ug/kg	1		10/16/20 14:46
P & M -Xylene	94.5	U	189	56.6	ug/kg	1		10/16/20 14:46
sec-Butylbenzene	47.1	U	94.3	29.4	ug/kg	1		10/16/20 14:46
tert-Butylbenzene	47.1	U	94.3	29.4	ug/kg	1		10/16/20 14:46
Toluene	47.1	U	94.3	29.4	ug/kg	1		10/16/20 14:46
Xylenes (total)	142	U	283	86.0	ug/kg	1		10/16/20 14:46
Surrogates								
1,2-Dichloroethane-D4 (surr)	106		71-136		%	1		10/16/20 14:46
4-Bromofluorobenzene (surr)	84.5		55-151		%	1		10/16/20 14:46
Toluene-d8 (surr)	101		85-116		%	1		10/16/20 14:46

Batch Information

Analytical Batch: VMS20426
Analytical Method: SW8260D
Analyst: KAJ
Analytical Date/Time: 10/16/20 14:46
Container ID: 1205620009-B

Prep Batch: VXX36558
Prep Method: SW5035A
Prep Date/Time: 10/08/20 09:30
Prep Initial Wt./Vol.: 24.578 g
Prep Extract Vol: 32.4026 mL

Print Date: 11/17/2020 4:20:18PM

J flagging is activated

Results of **RSE-3D**

Client Sample ID: **RSE-3D**
Client Project ID: **20-2219 ARRC Talkeetna**
Lab Sample ID: 1205620010
Lab Project ID: 1205620

Collection Date: 10/08/20 09:45
Received Date: 10/12/20 10:41
Matrix: Soil/Solid (dry weight)
Solids (%):88.4
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	14.1	U	28.1	7.01	ug/kg	1		11/09/20 22:55
2-Methylnaphthalene	14.1	U	28.1	7.01	ug/kg	1		11/09/20 22:55
Acenaphthene	14.1	U	28.1	7.01	ug/kg	1		11/09/20 22:55
Acenaphthylene	14.1	U	28.1	7.01	ug/kg	1		11/09/20 22:55
Anthracene	14.1	U	28.1	7.01	ug/kg	1		11/09/20 22:55
Benzo(a)Anthracene	14.1	U	28.1	7.01	ug/kg	1		11/09/20 22:55
Benzo[a]pyrene	14.1	U	28.1	7.01	ug/kg	1		11/09/20 22:55
Benzo[b]Fluoranthene	14.1	U	28.1	7.01	ug/kg	1		11/09/20 22:55
Benzo[g,h,i]perylene	14.1	U	28.1	7.01	ug/kg	1		11/09/20 22:55
Benzo[k]fluoranthene	14.1	U	28.1	7.01	ug/kg	1		11/09/20 22:55
Chrysene	14.1	U	28.1	7.01	ug/kg	1		11/09/20 22:55
Dibenzo[a,h]anthracene	14.1	U	28.1	7.01	ug/kg	1		11/09/20 22:55
Fluoranthene	14.1	U	28.1	7.01	ug/kg	1		11/09/20 22:55
Fluorene	14.1	U	28.1	7.01	ug/kg	1		11/09/20 22:55
Indeno[1,2,3-c,d] pyrene	14.1	U	28.1	7.01	ug/kg	1		11/09/20 22:55
Naphthalene	11.2	U	22.4	5.61	ug/kg	1		11/09/20 22:55
Phenanthrene	14.1	U	28.1	7.01	ug/kg	1		11/09/20 22:55
Pyrene	14.1	U	28.1	7.01	ug/kg	1		11/09/20 22:55
Surrogates								
2-Methylnaphthalene-d10 (surr)	80.7		58-103		%	1		11/09/20 22:55
Fluoranthene-d10 (surr)	85.2		54-113		%	1		11/09/20 22:55

Batch Information

Analytical Batch: XMS12390
Analytical Method: 8270D SIM (PAH)
Analyst: DSD
Analytical Date/Time: 11/09/20 22:55
Container ID: 1205620010-A

Prep Batch: XXX44095
Prep Method: SW3550C
Prep Date/Time: 10/21/20 08:08
Prep Initial Wt./Vol.: 22.682 g
Prep Extract Vol: 5 mL

Print Date: 11/17/2020 4:20:18PM

J flagging is activated

Results of **RSE-3D**

Client Sample ID: **RSE-3D**
Client Project ID: **20-2219 ARRC Talkeetna**
Lab Sample ID: 1205620010
Lab Project ID: 1205620

Collection Date: 10/08/20 09:45
Received Date: 10/12/20 10:41
Matrix: Soil/Solid (dry weight)
Solids (%):88.4
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	33.1		22.6	7.00	mg/kg	1		10/20/20 14:05
Surrogates								
5a Androstane (surr)	90.5		50-150		%	1		10/20/20 14:05

Batch Information

Analytical Batch: XFC15781
Analytical Method: AK102
Analyst: CDM
Analytical Date/Time: 10/20/20 14:05
Container ID: 1205620010-A

Prep Batch: XXX44084
Prep Method: SW3550C
Prep Date/Time: 10/20/20 08:32
Prep Initial Wt./Vol.: 30.049 g
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	56.5 U		113	48.6	mg/kg	1		10/20/20 14:05
Surrogates								
n-Triacontane-d62 (surr)	93.3		50-150		%	1		10/20/20 14:05

Batch Information

Analytical Batch: XFC15781
Analytical Method: AK103
Analyst: CDM
Analytical Date/Time: 10/20/20 14:05
Container ID: 1205620010-A

Prep Batch: XXX44084
Prep Method: SW3550C
Prep Date/Time: 10/20/20 08:32
Prep Initial Wt./Vol.: 30.049 g
Prep Extract Vol: 5 mL

Print Date: 11/17/2020 4:20:18PM

J flagging is activated

Results of **RSE-3D**

Client Sample ID: **RSE-3D**
Client Project ID: **20-2219 ARRC Talkeetna**
Lab Sample ID: 1205620010
Lab Project ID: 1205620

Collection Date: 10/08/20 09:45
Received Date: 10/12/20 10:41
Matrix: Soil/Solid (dry weight)
Solids (%):88.4
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	116		3.22	0.966	mg/kg	1		10/17/20 01:55
Surrogates								
4-Bromofluorobenzene (surr)	470	*	50-150		%	1		10/17/20 01:55

Batch Information

Analytical Batch: VFC15402
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 10/17/20 01:55
Container ID: 1205620010-B

Prep Batch: VXX36563
Prep Method: SW5035A
Prep Date/Time: 10/08/20 09:45
Prep Initial Wt./Vol.: 55.18 g
Prep Extract Vol: 31.4114 mL

Print Date: 11/17/2020 4:20:18PM

J flagging is activated

Results of **RSE-3D**

Client Sample ID: **RSE-3D**
Client Project ID: **20-2219 ARRC Talkeetna**
Lab Sample ID: 1205620010
Lab Project ID: 1205620

Collection Date: 10/08/20 09:45
Received Date: 10/12/20 10:41
Matrix: Soil/Solid (dry weight)
Solids (%):88.4
Location:

Results by **Volatile GC/MS- Petroleum VOC Group**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2,4-Trimethylbenzene	32.2 U		64.4	19.3	ug/kg	1		10/16/20 15:02
1,2-Dibromoethane	0.645 U		1.29	0.515	ug/kg	1		10/16/20 15:02
1,2-Dichloroethane	1.29 U		2.58	0.902	ug/kg	1		10/16/20 15:02
1,3,5-Trimethylbenzene	16.1 U		32.2	10.0	ug/kg	1		10/16/20 15:02
Benzene	8.05 U		16.1	5.02	ug/kg	1		10/16/20 15:02
Ethylbenzene	16.1 U		32.2	10.0	ug/kg	1		10/16/20 15:02
Isopropylbenzene (Cumene)	16.1 U		32.2	10.0	ug/kg	1		10/16/20 15:02
Methyl-t-butyl ether	64.5 U		129	39.9	ug/kg	1		10/16/20 15:02
Naphthalene	16.1 U		32.2	10.0	ug/kg	1		10/16/20 15:02
n-Butylbenzene	16.1 U		32.2	10.0	ug/kg	1		10/16/20 15:02
o-Xylene	16.1 U		32.2	10.0	ug/kg	1		10/16/20 15:02
P & M -Xylene	32.2 U		64.4	19.3	ug/kg	1		10/16/20 15:02
sec-Butylbenzene	16.1 U		32.2	10.0	ug/kg	1		10/16/20 15:02
tert-Butylbenzene	16.1 U		32.2	10.0	ug/kg	1		10/16/20 15:02
Toluene	16.1 U		32.2	10.0	ug/kg	1		10/16/20 15:02
Xylenes (total)	48.3 U		96.6	29.4	ug/kg	1		10/16/20 15:02
Surrogates								
1,2-Dichloroethane-D4 (surr)	91		71-136		%	1		10/16/20 15:02
4-Bromofluorobenzene (surr)	103		55-151		%	1		10/16/20 15:02
Toluene-d8 (surr)	117	*	85-116		%	1		10/16/20 15:02

Batch Information

Analytical Batch: VMS20426
Analytical Method: SW8260D
Analyst: KAJ
Analytical Date/Time: 10/16/20 15:02
Container ID: 1205620010-B

Prep Batch: VXX36558
Prep Method: SW5035A
Prep Date/Time: 10/08/20 09:45
Prep Initial Wt./Vol.: 55.18 g
Prep Extract Vol: 31.4114 mL

Print Date: 11/17/2020 4:20:18PM

J flagging is activated

Results of **RSE-X**

Client Sample ID: **RSE-X**
Client Project ID: **20-2219 ARRC Talkeetna**
Lab Sample ID: 1205620011
Lab Project ID: 1205620

Collection Date: 10/08/20 09:00
Received Date: 10/12/20 10:41
Matrix: Soil/Solid (dry weight)
Solids (%):88.0
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	14.1	U	28.2	7.06	ug/kg	1		11/09/20 23:16
2-Methylnaphthalene	14.1	U	28.2	7.06	ug/kg	1		11/09/20 23:16
Acenaphthene	14.1	U	28.2	7.06	ug/kg	1		11/09/20 23:16
Acenaphthylene	14.1	U	28.2	7.06	ug/kg	1		11/09/20 23:16
Anthracene	14.1	U	28.2	7.06	ug/kg	1		11/09/20 23:16
Benzo(a)Anthracene	14.1	U	28.2	7.06	ug/kg	1		11/09/20 23:16
Benzo[a]pyrene	14.1	U	28.2	7.06	ug/kg	1		11/09/20 23:16
Benzo[b]Fluoranthene	14.1	U	28.2	7.06	ug/kg	1		11/09/20 23:16
Benzo[g,h,i]perylene	14.1	U	28.2	7.06	ug/kg	1		11/09/20 23:16
Benzo[k]fluoranthene	14.1	U	28.2	7.06	ug/kg	1		11/09/20 23:16
Chrysene	14.1	U	28.2	7.06	ug/kg	1		11/09/20 23:16
Dibenzo[a,h]anthracene	14.1	U	28.2	7.06	ug/kg	1		11/09/20 23:16
Fluoranthene	14.1	U	28.2	7.06	ug/kg	1		11/09/20 23:16
Fluorene	14.1	U	28.2	7.06	ug/kg	1		11/09/20 23:16
Indeno[1,2,3-c,d] pyrene	14.1	U	28.2	7.06	ug/kg	1		11/09/20 23:16
Naphthalene	11.3	U	22.6	5.64	ug/kg	1		11/09/20 23:16
Phenanthrene	14.1	U	28.2	7.06	ug/kg	1		11/09/20 23:16
Pyrene	14.1	U	28.2	7.06	ug/kg	1		11/09/20 23:16
Surrogates								
2-Methylnaphthalene-d10 (surr)	81		58-103		%	1		11/09/20 23:16
Fluoranthene-d10 (surr)	85.5		54-113		%	1		11/09/20 23:16

Batch Information

Analytical Batch: XMS12390
Analytical Method: 8270D SIM (PAH)
Analyst: DSD
Analytical Date/Time: 11/09/20 23:16
Container ID: 1205620011-A

Prep Batch: XXX44095
Prep Method: SW3550C
Prep Date/Time: 10/21/20 08:08
Prep Initial Wt./Vol.: 22.639 g
Prep Extract Vol: 5 mL

Print Date: 11/17/2020 4:20:18PM

J flagging is activated

Results of **RSE-X**

Client Sample ID: **RSE-X**
Client Project ID: **20-2219 ARRC Talkeetna**
Lab Sample ID: 1205620011
Lab Project ID: 1205620

Collection Date: 10/08/20 09:00
Received Date: 10/12/20 10:41
Matrix: Soil/Solid (dry weight)
Solids (%):88.0
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	33.0		22.4	6.93	mg/kg	1		10/20/20 14:14
Surrogates								
5a Androstane (surr)	93.6		50-150		%	1		10/20/20 14:14

Batch Information

Analytical Batch: XFC15781
Analytical Method: AK102
Analyst: CDM
Analytical Date/Time: 10/20/20 14:14
Container ID: 1205620011-A

Prep Batch: XXX44084
Prep Method: SW3550C
Prep Date/Time: 10/20/20 08:32
Prep Initial Wt./Vol.: 30.483 g
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	56.0 U		112	48.1	mg/kg	1		10/20/20 14:14
Surrogates								
n-Triacontane-d62 (surr)	96.2		50-150		%	1		10/20/20 14:14

Batch Information

Analytical Batch: XFC15781
Analytical Method: AK103
Analyst: CDM
Analytical Date/Time: 10/20/20 14:14
Container ID: 1205620011-A

Prep Batch: XXX44084
Prep Method: SW3550C
Prep Date/Time: 10/20/20 08:32
Prep Initial Wt./Vol.: 30.483 g
Prep Extract Vol: 5 mL

Print Date: 11/17/2020 4:20:18PM

J flagging is activated

Results of **RSE-X**

Client Sample ID: **RSE-X**
Client Project ID: **20-2219 ARRC Talkeetna**
Lab Sample ID: 1205620011
Lab Project ID: 1205620

Collection Date: 10/08/20 09:00
Received Date: 10/12/20 10:41
Matrix: Soil/Solid (dry weight)
Solids (%):88.0
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	69.4		3.70	1.11	mg/kg	1		10/17/20 02:13
Surrogates								
4-Bromofluorobenzene (surr)	158	*	50-150		%	1		10/17/20 02:13

Batch Information

Analytical Batch: VFC15402
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 10/17/20 02:13
Container ID: 1205620011-B

Prep Batch: VXX36563
Prep Method: SW5035A
Prep Date/Time: 10/08/20 09:00
Prep Initial Wt./Vol.: 46.985 g
Prep Extract Vol: 30.6234 mL

Print Date: 11/17/2020 4:20:18PM

J flagging is activated

Results of **RSE-X**

Client Sample ID: **RSE-X**
Client Project ID: **20-2219 ARRC Talkeetna**
Lab Sample ID: 1205620011
Lab Project ID: 1205620

Collection Date: 10/08/20 09:00
Received Date: 10/12/20 10:41
Matrix: Soil/Solid (dry weight)
Solids (%):88.0
Location:

Results by **Volatile GC/MS- Petroleum VOC Group**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2,4-Trimethylbenzene	37.0	U	74.0	22.2	ug/kg	1		10/16/20 15:19
1,2-Dibromoethane	0.740	U	1.48	0.592	ug/kg	1		10/16/20 15:19
1,2-Dichloroethane	1.48	U	2.96	1.04	ug/kg	1		10/16/20 15:19
1,3,5-Trimethylbenzene	18.5	U	37.0	11.5	ug/kg	1		10/16/20 15:19
Benzene	9.25	U	18.5	5.77	ug/kg	1		10/16/20 15:19
Ethylbenzene	18.5	U	37.0	11.5	ug/kg	1		10/16/20 15:19
Isopropylbenzene (Cumene)	18.5	U	37.0	11.5	ug/kg	1		10/16/20 15:19
Methyl-t-butyl ether	74.0	U	148	45.9	ug/kg	1		10/16/20 15:19
Naphthalene	18.5	U	37.0	11.5	ug/kg	1		10/16/20 15:19
n-Butylbenzene	18.5	U	37.0	11.5	ug/kg	1		10/16/20 15:19
o-Xylene	18.5	U	37.0	11.5	ug/kg	1		10/16/20 15:19
P & M -Xylene	37.0	U	74.0	22.2	ug/kg	1		10/16/20 15:19
sec-Butylbenzene	18.5	U	37.0	11.5	ug/kg	1		10/16/20 15:19
tert-Butylbenzene	18.5	U	37.0	11.5	ug/kg	1		10/16/20 15:19
Toluene	18.5	U	37.0	11.5	ug/kg	1		10/16/20 15:19
Xylenes (total)	55.5	U	111	33.8	ug/kg	1		10/16/20 15:19
Surrogates								
1,2-Dichloroethane-D4 (surr)	94.1		71-136		%	1		10/16/20 15:19
4-Bromofluorobenzene (surr)	88.5		55-151		%	1		10/16/20 15:19
Toluene-d8 (surr)	112		85-116		%	1		10/16/20 15:19

Batch Information

Analytical Batch: VMS20426
Analytical Method: SW8260D
Analyst: KAJ
Analytical Date/Time: 10/16/20 15:19
Container ID: 1205620011-B

Prep Batch: VXX36558
Prep Method: SW5035A
Prep Date/Time: 10/08/20 09:00
Prep Initial Wt./Vol.: 46.985 g
Prep Extract Vol: 30.6234 mL

Print Date: 11/17/2020 4:20:18PM

J flagging is activated

Results of **Trip Blank (Soil)**

Client Sample ID: **Trip Blank (Soil)**
Client Project ID: **20-2219 ARRC Talkeetna**
Lab Sample ID: 1205620012
Lab Project ID: 1205620

Collection Date: 10/08/20 09:00
Received Date: 10/12/20 10:41
Matrix: Soil/Solid (dry weight)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	1.02	J	2.54	0.761	mg/kg	1		10/17/20 01:01
Surrogates								
4-Bromofluorobenzene (surr)	79.8		50-150		%	1		10/17/20 01:01

Batch Information

Analytical Batch: VFC15402
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 10/17/20 01:01
Container ID: 1205620012-A

Prep Batch: VXX36563
Prep Method: SW5035A
Prep Date/Time: 10/08/20 09:00
Prep Initial Wt./Vol.: 49.27 g
Prep Extract Vol: 25 mL

Print Date: 11/17/2020 4:20:18PM

J flagging is activated

Results of **Trip Blank (Soil)**

Client Sample ID: **Trip Blank (Soil)**
Client Project ID: **20-2219 ARRC Talkeetna**
Lab Sample ID: 1205620012
Lab Project ID: 1205620

Collection Date: 10/08/20 09:00
Received Date: 10/12/20 10:41
Matrix: Soil/Solid (dry weight)
Solids (%):
Location:

Results by **Volatile GC/MS- Petroleum VOC Group**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2,4-Trimethylbenzene	25.4	U	50.7	15.2	ug/kg	1		10/16/20 12:00
1,2-Dibromoethane	0.505	U	1.01	0.406	ug/kg	1		10/16/20 12:00
1,2-Dichloroethane	1.01	U	2.03	0.710	ug/kg	1		10/16/20 12:00
1,3,5-Trimethylbenzene	12.7	U	25.4	7.92	ug/kg	1		10/16/20 12:00
Benzene	6.35	U	12.7	3.96	ug/kg	1		10/16/20 12:00
Ethylbenzene	12.7	U	25.4	7.92	ug/kg	1		10/16/20 12:00
Isopropylbenzene (Cumene)	12.7	U	25.4	7.92	ug/kg	1		10/16/20 12:00
Methyl-t-butyl ether	50.5	U	101	31.5	ug/kg	1		10/16/20 12:00
Naphthalene	12.7	U	25.4	7.92	ug/kg	1		10/16/20 12:00
n-Butylbenzene	12.7	U	25.4	7.92	ug/kg	1		10/16/20 12:00
o-Xylene	12.7	U	25.4	7.92	ug/kg	1		10/16/20 12:00
P & M -Xylene	25.4	U	50.7	15.2	ug/kg	1		10/16/20 12:00
sec-Butylbenzene	12.7	U	25.4	7.92	ug/kg	1		10/16/20 12:00
tert-Butylbenzene	12.7	U	25.4	7.92	ug/kg	1		10/16/20 12:00
Toluene	12.7	U	25.4	7.92	ug/kg	1		10/16/20 12:00
Xylenes (total)	38.0	U	76.1	23.1	ug/kg	1		10/16/20 12:00
Surrogates								
1,2-Dichloroethane-D4 (surr)	109		71-136		%	1		10/16/20 12:00
4-Bromofluorobenzene (surr)	88.1		55-151		%	1		10/16/20 12:00
Toluene-d8 (surr)	100		85-116		%	1		10/16/20 12:00

Batch Information

Analytical Batch: VMS20426
Analytical Method: SW8260D
Analyst: KAJ
Analytical Date/Time: 10/16/20 12:00
Container ID: 1205620012-A

Prep Batch: VXX36558
Prep Method: SW5035A
Prep Date/Time: 10/08/20 09:00
Prep Initial Wt./Vol.: 49.27 g
Prep Extract Vol: 25 mL

Print Date: 11/17/2020 4:20:18PM

J flagging is activated

Results of **Trip Blank (Water)**

Client Sample ID: **Trip Blank (Water)**
Client Project ID: **20-2219 ARRC Talkeetna**
Lab Sample ID: 1205620013
Lab Project ID: 1205620

Collection Date: 10/08/20 09:00
Received Date: 10/12/20 10:41
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.0500	U	0.100	0.0310	mg/L	1		10/13/20 12:24
Surrogates								
4-Bromofluorobenzene (surr)	86.6		50-150		%	1		10/13/20 12:24

Batch Information

Analytical Batch: VFC15395
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 10/13/20 12:24
Container ID: 1205620013-A

Prep Batch: VXX36535
Prep Method: SW5030B
Prep Date/Time: 10/13/20 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Results of **Trip Blank (Water)**

Client Sample ID: **Trip Blank (Water)**
Client Project ID: **20-2219 ARRC Talkeetna**
Lab Sample ID: 1205620013
Lab Project ID: 1205620

Collection Date: 10/08/20 09:00
Received Date: 10/12/20 10:41
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS- Petroleum VOC Group**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2,4-Trimethylbenzene	0.500 U		1.00	0.310	ug/L	1		10/13/20 17:00
1,2-Dibromoethane	0.0375 U		0.0750	0.0180	ug/L	1		10/13/20 17:00
1,2-Dichloroethane	0.250 U		0.500	0.150	ug/L	1		10/13/20 17:00
1,3,5-Trimethylbenzene	0.500 U		1.00	0.310	ug/L	1		10/13/20 17:00
Benzene	0.200 U		0.400	0.120	ug/L	1		10/13/20 17:00
Ethylbenzene	0.500 U		1.00	0.310	ug/L	1		10/13/20 17:00
Isopropylbenzene (Cumene)	0.500 U		1.00	0.310	ug/L	1		10/13/20 17:00
Methyl-t-butyl ether	5.00 U		10.0	3.10	ug/L	1		10/13/20 17:00
Naphthalene	0.500 U		1.00	0.310	ug/L	1		10/13/20 17:00
n-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		10/13/20 17:00
o-Xylene	0.500 U		1.00	0.310	ug/L	1		10/13/20 17:00
P & M -Xylene	1.00 U		2.00	0.620	ug/L	1		10/13/20 17:00
sec-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		10/13/20 17:00
tert-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		10/13/20 17:00
Toluene	0.500 U		1.00	0.310	ug/L	1		10/13/20 17:00
Xylenes (total)	1.50 U		3.00	1.00	ug/L	1		10/13/20 17:00
Surrogates								
1,2-Dichloroethane-D4 (surr)	113		81-118		%	1		10/13/20 17:00
4-Bromofluorobenzene (surr)	95.6		85-114		%	1		10/13/20 17:00
Toluene-d8 (surr)	100		89-112		%	1		10/13/20 17:00

Batch Information

Analytical Batch: VMS20406
Analytical Method: SW8260D
Analyst: NRB
Analytical Date/Time: 10/13/20 17:00
Container ID: 1205620013-D

Prep Batch: VXX36534
Prep Method: SW5030B
Prep Date/Time: 10/13/20 14:30
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 11/17/2020 4:20:18PM

J flagging is activated

Method Blank

Blank ID: MB for HBN 1813179 [SPT/11157]
Blank Lab ID: 1588676

Matrix: Soil/Solid (dry weight)

QC for Samples:
1205620005, 1205620006, 1205620007, 1205620008, 1205620009, 1205620010, 1205620011

Results by **SM21 2540G**

Parameter	Results	LOQ/CL	DL	Units
Total Solids	100			%

Batch Information

Analytical Batch: SPT11157
Analytical Method: SM21 2540G
Instrument:
Analyst: EBH
Analytical Date/Time: 10/19/2020 6:20:00PM

Print Date: 11/17/2020 4:20:22PM

Duplicate Sample Summary

Original Sample ID: 1205633004
Duplicate Sample ID: 1588677

Analysis Date: 10/19/2020 18:20
Matrix: Soil/Solid (dry weight)

QC for Samples:

1205620005, 1205620006, 1205620007, 1205620008, 1205620009, 1205620010, 1205620011

Results by **SM21 2540G**

NAME	Original	Duplicate	Units	RPD (%)	RPD CL
Total Solids	92.5	93.1	%	0.66	(< 15)

Batch Information

Analytical Batch: SPT11157
Analytical Method: SM21 2540G
Instrument:
Analyst: EBH

Print Date: 11/17/2020 4:20:24PM

Method Blank

Blank ID: MB for HBN 1813006 [VXX/36534]
Blank Lab ID: 1587665

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1205620001, 1205620002, 1205620003, 1205620004, 1205620013

Results by **SW8260D**

Parameter	Results	LOQ/CL	DL	Units
1,2,4-Trimethylbenzene	0.500U	1.00	0.310	ug/L
1,2-Dibromoethane	0.0375U	0.0750	0.0180	ug/L
1,2-Dichloroethane	0.250U	0.500	0.150	ug/L
1,3,5-Trimethylbenzene	0.500U	1.00	0.310	ug/L
Benzene	0.200U	0.400	0.120	ug/L
Ethylbenzene	0.500U	1.00	0.310	ug/L
Isopropylbenzene (Cumene)	0.500U	1.00	0.310	ug/L
Methyl-t-butyl ether	5.00U	10.0	3.10	ug/L
Naphthalene	0.500U	1.00	0.310	ug/L
n-Butylbenzene	0.500U	1.00	0.310	ug/L
o-Xylene	0.500U	1.00	0.310	ug/L
P & M -Xylene	1.00U	2.00	0.620	ug/L
sec-Butylbenzene	0.500U	1.00	0.310	ug/L
tert-Butylbenzene	0.500U	1.00	0.310	ug/L
Toluene	0.500U	1.00	0.310	ug/L
Xylenes (total)	1.50U	3.00	1.00	ug/L
Surrogates				
1,2-Dichloroethane-D4 (surr)	113	81-118		%
4-Bromofluorobenzene (surr)	96.1	85-114		%
Toluene-d8 (surr)	101	89-112		%

Batch Information

Analytical Batch: VMS20406
Analytical Method: SW8260D
Instrument: Agilent 7890-75MS
Analyst: NRB
Analytical Date/Time: 10/13/2020 4:45:00PM

Prep Batch: VXX36534
Prep Method: SW5030B
Prep Date/Time: 10/13/2020 2:30:00PM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1205620 [VXX36534]
Blank Spike Lab ID: 1587666
Date Analyzed: 10/13/2020 15:32

Spike Duplicate ID: LCSD for HBN 1205620 [VXX36534]
Spike Duplicate Lab ID: 1587667
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1205620001, 1205620002, 1205620003, 1205620004, 1205620013

Results by **SW8260D**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
1,2,4-Trimethylbenzene	30	29.4	98	30	29.0	97	(79-124)	1.30	(< 20)
1,2-Dibromoethane	30	31.0	103	30	30.7	102	(77-121)	1.10	(< 20)
1,2-Dichloroethane	30	31.2	104	30	30.7	102	(73-128)	1.60	(< 20)
1,3,5-Trimethylbenzene	30	29.1	97	30	29.2	97	(75-124)	0.30	(< 20)
Benzene	30	29.7	99	30	29.1	97	(79-120)	2.00	(< 20)
Ethylbenzene	30	30.8	103	30	30.1	100	(79-121)	2.30	(< 20)
Isopropylbenzene (Cumene)	30	30.6	102	30	30.4	101	(72-131)	0.70	(< 20)
Methyl-t-butyl ether	45	43.3	96	45	42.9	95	(71-124)	1.10	(< 20)
Naphthalene	30	31.5	105	30	31.9	106	(61-128)	1.20	(< 20)
n-Butylbenzene	30	31.7	106	30	32.5	108	(75-128)	2.50	(< 20)
o-Xylene	30	30.2	101	30	29.9	100	(78-122)	1.10	(< 20)
P & M -Xylene	60	61.3	102	60	60.1	100	(80-121)	1.90	(< 20)
sec-Butylbenzene	30	30.5	102	30	30.7	102	(77-126)	0.44	(< 20)
tert-Butylbenzene	30	29.9	100	30	29.8	99	(78-124)	0.25	(< 20)
Toluene	30	29.7	99	30	29.3	98	(80-121)	1.10	(< 20)
Xylenes (total)	90	91.5	102	90	90.0	100	(79-121)	1.60	(< 20)
Surrogates									
1,2-Dichloroethane-D4 (surr)	30	107	107	30	106	106	(81-118)	0.50	
4-Bromofluorobenzene (surr)	30	95.6	96	30	95.2	95	(85-114)	0.43	
Toluene-d8 (surr)	30	99.8	100	30	101	101	(89-112)	1.40	

Batch Information

Analytical Batch: **VMS20406**
Analytical Method: **SW8260D**
Instrument: **Agilent 7890-75MS**
Analyst: **NRB**

Prep Batch: **VXX36534**
Prep Method: **SW5030B**
Prep Date/Time: **10/13/2020 14:30**
Spike Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1813009 [VXX/36535]
Blank Lab ID: 1587678

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1205620013

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	0.0500U	0.100	0.0310	mg/L
Surrogates				
4-Bromofluorobenzene (surr)	84.6	50-150		%

Batch Information

Analytical Batch: VFC15395
Analytical Method: AK101
Instrument: Agilent 7890A PID/FID
Analyst: ALJ
Analytical Date/Time: 10/13/2020 9:57:00AM

Prep Batch: VXX36535
Prep Method: SW5030B
Prep Date/Time: 10/13/2020 6:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1205620 [VXX36535]
Blank Spike Lab ID: 1587681
Date Analyzed: 10/13/2020 10:51

Spike Duplicate ID: LCSD for HBN 1205620 [VXX36535]
Spike Duplicate Lab ID: 1587682
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1205620013

Results by **AK101**

	Blank Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	1.00	1.14	114	1.00	1.14	114	(60-120)	0.38	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	0.0500	92.8	93	0.0500	94.3	94	(50-150)	1.60	

Batch Information

Analytical Batch: **VFC15395**
Analytical Method: **AK101**
Instrument: **Agilent 7890A PID/FID**
Analyst: **ALJ**

Prep Batch: **VXX36535**
Prep Method: **SW5030B**
Prep Date/Time: **10/13/2020 06:00**
Spike Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1813020 [VXX/36537]
Blank Lab ID: 1587736

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1205620001, 1205620003, 1205620004

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	0.0500U	0.100	0.0310	mg/L
Surrogates				
4-Bromofluorobenzene (surr)	82.5	50-150		%

Batch Information

Analytical Batch: VFC15396
Analytical Method: AK101
Instrument: Agilent 7890 PID/FID
Analyst: ALJ
Analytical Date/Time: 10/13/2020 2:05:00PM

Prep Batch: VXX36537
Prep Method: SW5030B
Prep Date/Time: 10/13/2020 6:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1205620 [VXX36537]
Blank Spike Lab ID: 1587739
Date Analyzed: 10/13/2020 20:55

Spike Duplicate ID: LCSD for HBN 1205620 [VXX36537]
Spike Duplicate Lab ID: 1587740
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1205620001, 1205620003, 1205620004

Results by **AK101**

	Blank Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	1.00	1.05	105	1.00	1.02	102	(60-120)	2.40	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	0.0500	105	105	0.0500	100	100	(50-150)	5.20	

Batch Information

Analytical Batch: **VFC15396**
Analytical Method: **AK101**
Instrument: **Agilent 7890 PID/FID**
Analyst: **ALJ**

Prep Batch: **VXX36537**
Prep Method: **SW5030B**
Prep Date/Time: **10/13/2020 06:00**
Spike Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1813055 [VXX/36543]
Blank Lab ID: 1587948

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1205620002

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	0.0500U	0.100	0.0310	mg/L
Surrogates				
4-Bromofluorobenzene (surr)	64.6	50-150		%

Batch Information

Analytical Batch: VFC15398
Analytical Method: AK101
Instrument: Agilent 7890 PID/FID
Analyst: ALJ
Analytical Date/Time: 10/14/2020 11:52:00AM

Prep Batch: VXX36543
Prep Method: SW5030B
Prep Date/Time: 10/14/2020 6:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1205620 [VXX36543]
Blank Spike Lab ID: 1587951
Date Analyzed: 10/14/2020 12:45

Spike Duplicate ID: LCSD for HBN 1205620 [VXX36543]
Spike Duplicate Lab ID: 1587952
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1205620002

Results by **AK101**

	Blank Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	1.00	1.03	103	1.00	0.942	94	(60-120)	8.60	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	0.0500	121	121	0.0500	84.3	84	(50-150)	35.70	

Batch Information

Analytical Batch: **VFC15398**
Analytical Method: **AK101**
Instrument: **Agilent 7890 PID/FID**
Analyst: **ALJ**

Prep Batch: **VXX36543**
Prep Method: **SW5030B**
Prep Date/Time: **10/14/2020 06:00**
Spike Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1813150 [VXX/36558]
Blank Lab ID: 1588498

Matrix: Soil/Solid (dry weight)

QC for Samples:
1205620005, 1205620006, 1205620007, 1205620008, 1205620009, 1205620010, 1205620011, 1205620012

Results by **SW8260D**

Parameter	Results	LOQ/CL	DL	Units
1,2,4-Trimethylbenzene	25.0U	50.0	15.0	ug/kg
1,2-Dibromoethane	0.500U	1.00	0.400	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)	106	71-136		%
4-Bromofluorobenzene (surr)	100	55-151		%
Toluene-d8 (surr)	100	85-116		%

Batch Information

Analytical Batch: VMS20426
Analytical Method: SW8260D
Instrument: VQA 7890/5975 GC/MS
Analyst: KAJ
Analytical Date/Time: 10/16/2020 8:38:00AM

Prep Batch: VXX36558
Prep Method: SW5035A
Prep Date/Time: 10/16/2020 6:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1205620 [VXX36558]
Blank Spike Lab ID: 1588499
Date Analyzed: 10/16/2020 08:55

Matrix: Soil/Solid (dry weight)

QC for Samples: 1205620005, 1205620006, 1205620007, 1205620008, 1205620009, 1205620010, 1205620011, 1205620012

Results by **SW8260D**

Blank Spike (ug/kg)

Parameter	Spike	Result	Rec (%)	CL
1,2,4-Trimethylbenzene	750	783	104	(75-123)
1,2-Dibromoethane	750	844	113	(78-122)
1,2-Dichloroethane	750	718	96	(73-128)
1,3,5-Trimethylbenzene	750	755	101	(73-124)
Benzene	750	753	100	(77-121)
Ethylbenzene	750	780	104	(76-122)
Isopropylbenzene (Cumene)	750	789	105	(68-134)
Methyl-t-butyl ether	1130	1100	97	(73-125)
Naphthalene	750	748	100	(62-129)
n-Butylbenzene	750	806	108	(70-128)
o-Xylene	750	770	103	(77-123)
P & M -Xylene	1500	1520	101	(77-124)
sec-Butylbenzene	750	796	106	(73-126)
tert-Butylbenzene	750	798	106	(73-125)
Toluene	750	751	100	(77-121)
Xylenes (total)	2250	2290	102	(78-124)
Surrogates				
1,2-Dichloroethane-D4 (surr)	750	92.6	93	(71-136)
4-Bromofluorobenzene (surr)	750	95.7	96	(55-151)
Toluene-d8 (surr)	750	104	104	(85-116)

Batch Information

Analytical Batch: **VMS20426**
Analytical Method: **SW8260D**
Instrument: **VQA 7890/5975 GC/MS**
Analyst: **KAJ**

Prep Batch: **VXX36558**
Prep Method: **SW5035A**
Prep Date/Time: **10/16/2020 06:00**
Spike Init Wt./Vol.: 750 ug/kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: Extract Vol:

Print Date: 11/17/2020 4:20:51PM

Matrix Spike Summary

Original Sample ID: 1588500
MS Sample ID: 1588501 MS
MSD Sample ID: 1588502 MSD

Analysis Date: 10/16/2020 12:33
Analysis Date: 10/16/2020 9:48
Analysis Date: 10/16/2020 10:05
Matrix: Solid/Soil (Wet Weight)

QC for Samples: 1205620005, 1205620006, 1205620007, 1205620008, 1205620009, 1205620010, 1205620011, 1205620012

Results by **SW8260D**

		Matrix Spike (ug/kg)				Spike Duplicate (ug/kg)					
Parameter	Sample	Spike	Result	Rec (%)		Spike	Result	Rec (%)		RPD (%)	RPD CL
1,2,4-Trimethylbenzene	21.0U	630	613	97		630	645	102		5.10	(< 20)
1,2-Dibromoethane	0.420U	630	675	107		630	674	107		0.04	(< 20)
1,2-Dichloroethane	0.840U	630	570	90		630	574	91		0.68	(< 20)
1,3,5-Trimethylbenzene	10.5U	630	621	99		630	670	106		7.60	(< 20)
Benzene	1550	630	1970	67	*	630	2030	76	*	2.90	(< 20)
Ethylbenzene	10.5U	630	612	97		630	623	99		1.90	(< 20)
Isopropylbenzene (Cumene)	10.5U	630	609	97		630	636	101		4.40	(< 20)
Methyl-t-butyl ether	42.0U	946	872	92		946	882	93		1.10	(< 20)
Naphthalene	10.5U	630	594	94		630	638	101		7.10	(< 20)
n-Butylbenzene	10.5U	630	634	101		630	684	108		7.60	(< 20)
o-Xylene	10.5U	630	615	98		630	614	97		0.08	(< 20)
P & M -Xylene	21.0U	1260	1200	95		1260	1220	97		1.70	(< 20)
sec-Butylbenzene	10.5U	630	606	96		630	664	105		9.10	(< 20)
tert-Butylbenzene	10.5U	630	616	98		630	665	105		7.70	(< 20)
Toluene	10.5U	630	593	94		630	600	95		1.20	(< 20)
Xylenes (total)	31.5U	1890	1810	96		1890	1830	97		1.10	(< 20)
Surrogates											
1,2-Dichloroethane-D4 (surr)		630	577	92		630	576	91		0.15	
4-Bromofluorobenzene (surr)		1050	744	71		1050	764	73		2.60	
Toluene-d8 (surr)		630	656	104		630	646	102		1.60	

Batch Information

Analytical Batch: VMS20426
Analytical Method: SW8260D
Instrument: VQA 7890/5975 GC/MS
Analyst: KAJ
Analytical Date/Time: 10/16/2020 9:48:00AM

Prep Batch: VXX36558
Prep Method: Vol. Extraction SW8260 Field Extracted L
Prep Date/Time: 10/16/2020 6:00:00AM
Prep Initial Wt./Vol.: 59.48g
Prep Extract Vol: 25.00mL

Print Date: 11/17/2020 4:20:53PM

Method Blank

Blank ID: MB for HBN 1813157 [VXX/36562]
Blank Lab ID: 1588526

Matrix: Soil/Solid (dry weight)

QC for Samples:
1205620005, 1205620006, 1205620007, 1205620008

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	1.25U	2.50	0.750	mg/kg
Surrogates				
4-Bromofluorobenzene (surr)	93.6	50-150		%

Batch Information

Analytical Batch: VFC15402
Analytical Method: AK101
Instrument: Agilent 7890 PID/FID
Analyst: ALJ
Analytical Date/Time: 10/16/2020 4:58:00PM

Prep Batch: VXX36562
Prep Method: SW5035A
Prep Date/Time: 10/16/2020 6:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1205620 [VXX36562]
Blank Spike Lab ID: 1588527
Date Analyzed: 10/16/2020 16:22

Spike Duplicate ID: LCSD for HBN 1205620 [VXX36562]
Spike Duplicate Lab ID: 1588528
Matrix: Soil/Solid (dry weight)

QC for Samples: 1205620005, 1205620006, 1205620007, 1205620008

Results by **AK101**

	Blank Spike (mg/kg)			Spike Duplicate (mg/kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	12.5	13.6	109	12.5	13.8	111	(60-120)	1.90	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	1.25	100	100	1.25	99.8	100	(50-150)	0.32	

Batch Information

Analytical Batch: **VFC15402**
Analytical Method: **AK101**
Instrument: **Agilent 7890 PID/FID**
Analyst: **ALJ**

Prep Batch: **VXX36562**
Prep Method: **SW5035A**
Prep Date/Time: **10/16/2020 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

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Method Blank

Blank ID: MB for HBN 1813161 [VXX/36563]
Blank Lab ID: 1588547

Matrix: Soil/Solid (dry weight)

QC for Samples:
1205620010, 1205620011, 1205620012

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	1.16J	2.50	0.750	mg/kg
Surrogates				
4-Bromofluorobenzene (surr)	90.4	50-150		%

Batch Information

Analytical Batch: VFC15402
Analytical Method: AK101
Instrument: Agilent 7890 PID/FID
Analyst: ALJ
Analytical Date/Time: 10/17/2020 12:43:00AM

Prep Batch: VXX36563
Prep Method: SW5035A
Prep Date/Time: 10/16/2020 6:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1205620 [VXX36563]
Blank Spike Lab ID: 1588548
Date Analyzed: 10/17/2020 00:08

Spike Duplicate ID: LCSD for HBN 1205620 [VXX36563]
Spike Duplicate Lab ID: 1588549
Matrix: Soil/Solid (dry weight)

QC for Samples: 1205620010, 1205620011, 1205620012

Results by **AK101**

	Blank Spike (mg/kg)			Spike Duplicate (mg/kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	12.5	14.4	115	12.5	14.1	113	(60-120)	2.10	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	1.25	97.6	98	1.25	94.1	94	(50-150)	3.60	

Batch Information

Analytical Batch: **VFC15402**
Analytical Method: **AK101**
Instrument: **Agilent 7890 PID/FID**
Analyst: **ALJ**

Prep Batch: **VXX36563**
Prep Method: **SW5035A**
Prep Date/Time: **10/16/2020 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

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Method Blank

Blank ID: MB for HBN 1813202 [VXX/36568]
Blank Lab ID: 1588753

Matrix: Soil/Solid (dry weight)

QC for Samples:
1205620009

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	1.25U	2.50	0.750	mg/kg
Surrogates				
4-Bromofluorobenzene (surr)	103	50-150		%

Batch Information

Analytical Batch: VFC15405
Analytical Method: AK101
Instrument: Agilent 7890A PID/FID
Analyst: ALJ
Analytical Date/Time: 10/19/2020 8:15:00PM

Prep Batch: VXX36568
Prep Method: SW5035A
Prep Date/Time: 10/19/2020 6:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1205620 [VXX36568]
Blank Spike Lab ID: 1588754
Date Analyzed: 10/19/2020 19:40

Spike Duplicate ID: LCSD for HBN 1205620 [VXX36568]
Spike Duplicate Lab ID: 1588755
Matrix: Soil/Solid (dry weight)

QC for Samples: 1205620009

Results by **AK101**

	Blank Spike (mg/kg)			Spike Duplicate (mg/kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	12.5	14.1	113	12.5	14.3	114	(60-120)	1.50	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	1.25	112	112	1.25	112	112	(50-150)	0.04	

Batch Information

Analytical Batch: **VFC15405**
Analytical Method: **AK101**
Instrument: **Agilent 7890A PID/FID**
Analyst: **ALJ**

Prep Batch: **VXX36568**
Prep Method: **SW5035A**
Prep Date/Time: **10/19/2020 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

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Method Blank

Blank ID: MB for HBN 1812924 [XXX/44049]
Blank Lab ID: 1587269

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1205620001, 1205620002, 1205620003, 1205620004

Results by **8270D SIM LV (PAH)**

Parameter	Results	LOQ/CL	DL	Units
1-Methylnaphthalene	0.0250U	0.0500	0.0150	ug/L
2-Methylnaphthalene	0.0250U	0.0500	0.0150	ug/L
Acenaphthene	0.0250U	0.0500	0.0150	ug/L
Acenaphthylene	0.0250U	0.0500	0.0150	ug/L
Anthracene	0.0250U	0.0500	0.0150	ug/L
Benzo(a)Anthracene	0.0250U	0.0500	0.0150	ug/L
Benzo[a]pyrene	0.0100U	0.0200	0.00620	ug/L
Benzo[b]Fluoranthene	0.0250U	0.0500	0.0150	ug/L
Benzo[g,h,i]perylene	0.0250U	0.0500	0.0150	ug/L
Benzo[k]fluoranthene	0.0250U	0.0500	0.0150	ug/L
Chrysene	0.0250U	0.0500	0.0150	ug/L
Dibenzo[a,h]anthracene	0.0100U	0.0200	0.00620	ug/L
Fluoranthene	0.0250U	0.0500	0.0150	ug/L
Fluorene	0.0250U	0.0500	0.0150	ug/L
Indeno[1,2,3-c,d] pyrene	0.0250U	0.0500	0.0150	ug/L
Naphthalene	0.0500U	0.100	0.0310	ug/L
Phenanthrene	0.0250U	0.0500	0.0150	ug/L
Pyrene	0.0250U	0.0500	0.0150	ug/L
Surrogates				
2-Methylnaphthalene-d10 (surr)	67.5	37-78		%
Fluoranthene-d10 (surr)	74.7	24-116		%

Batch Information

Analytical Batch: XMS12357
Analytical Method: 8270D SIM LV (PAH)
Instrument: SVA Agilent 780/5975 GC/MS
Analyst: DSD
Analytical Date/Time: 10/19/2020 1:54:00PM

Prep Batch: XXX44049
Prep Method: SW3535A
Prep Date/Time: 10/13/2020 9:59:11AM
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1205620 [XXX44049]
Blank Spike Lab ID: 1587270
Date Analyzed: 10/19/2020 14:14

Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1205620001, 1205620002, 1205620003, 1205620004

Results by **8270D SIM LV (PAH)**

Blank Spike (ug/L)

Parameter	Spike	Result	Rec (%)	CL
1-Methylnaphthalene	2	1.50	75	(41-115)
2-Methylnaphthalene	2	1.54	77	(39-114)
Acenaphthene	2	1.58	79	(48-114)
Acenaphthylene	2	1.62	81	(35-121)
Anthracene	2	1.61	80	(53-119)
Benzo(a)Anthracene	2	1.35	68	(59-120)
Benzo[a]pyrene	2	1.66	83	(53-120)
Benzo[b]Fluoranthene	2	1.68	84	(53-126)
Benzo[g,h,i]perylene	2	1.75	88	(44-128)
Benzo[k]fluoranthene	2	1.62	81	(54-125)
Chrysene	2	1.61	80	(57-120)
Dibenzo[a,h]anthracene	2	1.72	86	(44-131)
Fluoranthene	2	1.63	81	(58-120)
Fluorene	2	1.63	82	(50-118)
Indeno[1,2,3-c,d] pyrene	2	1.85	93	(48-130)
Naphthalene	2	1.58	79	(43-114)
Phenanthrene	2	1.56	78	(53-115)
Pyrene	2	1.56	78	(53-121)
Surrogates				
2-Methylnaphthalene-d10 (surr)	2	70.8	71	(37-78)
Fluoranthene-d10 (surr)	2	75.2	75	(24-116)

Batch Information

Analytical Batch: **XMS12357**
Analytical Method: **8270D SIM LV (PAH)**
Instrument: **SVA Agilent 780/5975 GC/MS**
Analyst: **DSD**

Prep Batch: **XXX44049**
Prep Method: **SW3535A**
Prep Date/Time: **10/13/2020 09:59**
Spike Init Wt./Vol.: 2 ug/L Extract Vol: 1 mL
Dupe Init Wt./Vol.: Extract Vol:

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Matrix Spike Summary

Original Sample ID: 1205586002
MS Sample ID: 1587271 MS
MSD Sample ID: 1587272 MSD

Analysis Date: 10/19/2020 14:55
Analysis Date: 10/19/2020 15:16
Analysis Date: 10/19/2020 15:36
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1205620001, 1205620002, 1205620003, 1205620004

Results by **8270D SIM LV (PAH)**

		Matrix Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
1-Methylnaphthalene	0.0236U	1.89	1.48	78	1.92	1.46	76	41-115	1.40	(< 20)
2-Methylnaphthalene	0.0236U	1.89	1.56	83	1.92	1.49	78	39-114	4.40	(< 20)
Acenaphthene	0.0236U	1.89	1.45	77	1.92	1.47	77	48-114	1.80	(< 20)
Acenaphthylene	0.0236U	1.89	1.56	83	1.92	1.52	79	35-121	2.30	(< 20)
Anthracene	0.0236U	1.89	1.49	79	1.92	1.47	77	53-119	1.00	(< 20)
Benzo(a)Anthracene	0.0236U	1.89	1.26	67	1.92	1.22	64	59-120	2.60	(< 20)
Benzo[a]pyrene	0.00945U	1.89	1.49	79	1.92	1.46	76	53-120	2.20	(< 20)
Benzo[b]Fluoranthene	0.0236U	1.89	1.46	77	1.92	1.45	75	53-126	0.68	(< 20)
Benzo[g,h,i]perylene	0.0236U	1.89	1.53	81	1.92	1.49	77	44-128	2.90	(< 20)
Benzo[k]fluoranthene	0.0236U	1.89	1.46	77	1.92	1.46	76	54-125	0.46	(< 20)
Chrysene	0.0236U	1.89	1.49	79	1.92	1.46	76	57-120	2.40	(< 20)
Dibenzo[a,h]anthracene	0.00945U	1.89	1.55	82	1.92	1.53	79	44-131	1.80	(< 20)
Fluoranthene	0.0236U	1.89	1.5	80	1.92	1.47	76	58-120	2.10	(< 20)
Fluorene	0.0236U	1.89	1.53	81	1.92	1.52	79	50-118	0.87	(< 20)
Indeno[1,2,3-c,d] pyrene	0.0236U	1.89	1.6	85	1.92	1.56	81	48-130	2.40	(< 20)
Naphthalene	0.0471U	1.89	1.59	84	1.92	1.60	83	43-114	0.53	(< 20)
Phenanthrene	0.0236U	1.89	1.45	77	1.92	1.45	76	53-115	0.22	(< 20)
Pyrene	0.0236U	1.89	1.42	76	1.92	1.41	73	53-121	1.10	(< 20)
Surrogates										
2-Methylnaphthalene-d10 (surr)		1.89	1.41	75	1.92	1.38	72	37-78	2.20	
Fluoranthene-d10 (surr)		1.89	1.38	73	1.92	1.34	70	24-116	2.60	

Batch Information

Analytical Batch: XMS12357
Analytical Method: 8270D SIM LV (PAH)
Instrument: SVA Agilent 780/5975 GC/MS
Analyst: DSD
Analytical Date/Time: 10/19/2020 3:16:00PM

Prep Batch: XXX44049
Prep Method: 3535 Solid Phase Ext for 8270 PAH SIM LV
Prep Date/Time: 10/13/2020 9:59:11AM
Prep Initial Wt./Vol.: 265.00mL
Prep Extract Vol: 1.00mL

Print Date: 11/17/2020 4:21:15PM

Method Blank

Blank ID: MB for HBN 1813178 [XXX/44084]
Blank Lab ID: 1588673

Matrix: Soil/Solid (dry weight)

QC for Samples:
1205620005, 1205620006, 1205620007, 1205620008, 1205620009, 1205620010, 1205620011

Results by **AK102**

Parameter	Results	LOQ/CL	DL	Units
Diesel Range Organics	10.0U	20.0	6.20	mg/kg
Surrogates				
5a Androstane (surr)	94.6	60-120		%

Batch Information

Analytical Batch: XFC15781
Analytical Method: AK102
Instrument: Agilent 7890B F
Analyst: CDM
Analytical Date/Time: 10/20/2020 12:46:00PM

Prep Batch: XXX44084
Prep Method: SW3550C
Prep Date/Time: 10/20/2020 8:32:32AM
Prep Initial Wt./Vol.: 30 g
Prep Extract Vol: 5 mL

Print Date: 11/17/2020 4:21:17PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1205620 [XXX44084]
Blank Spike Lab ID: 1588674
Date Analyzed: 10/20/2020 12:56

Spike Duplicate ID: LCSD for HBN 1205620 [XXX44084]
Spike Duplicate Lab ID: 1588675
Matrix: Soil/Solid (dry weight)

QC for Samples: 1205620005, 1205620006, 1205620007, 1205620008, 1205620009, 1205620010, 1205620011

Results by **AK102**

	Blank Spike (mg/kg)			Spike Duplicate (mg/kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Diesel Range Organics	833	667	80	833	683	82	(75-125)	2.40	(< 20)
Surrogates									
5a Androstane (surr)	16.7	97.4	97	16.7	103	103	(60-120)	5.20	

Batch Information

Analytical Batch: **XFC15781**
Analytical Method: **AK102**
Instrument: **Agilent 7890B F**
Analyst: **CDM**

Prep Batch: **XXX44084**
Prep Method: **SW3550C**
Prep Date/Time: **10/20/2020 08:32**
Spike Init Wt./Vol.: 833 mg/kg Extract Vol: 5 mL
Dupe Init Wt./Vol.: 833 mg/kg Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1813178 [XXX/44084]
Blank Lab ID: 1588673

Matrix: Soil/Solid (dry weight)

QC for Samples:
1205620005, 1205620006, 1205620007, 1205620008, 1205620009, 1205620010, 1205620011

Results by **AK103**

Parameter	Results	LOQ/CL	DL	Units
Residual Range Organics	50.0U	100	43.0	mg/kg
Surrogates				
n-Triacontane-d62 (surr)	98	60-120		%

Batch Information

Analytical Batch: XFC15781
Analytical Method: AK103
Instrument: Agilent 7890B F
Analyst: CDM
Analytical Date/Time: 10/20/2020 12:46:00PM

Prep Batch: XXX44084
Prep Method: SW3550C
Prep Date/Time: 10/20/2020 8:32:32AM
Prep Initial Wt./Vol.: 30 g
Prep Extract Vol: 5 mL

Print Date: 11/17/2020 4:21:23PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1205620 [XXX44084]
Blank Spike Lab ID: 1588674
Date Analyzed: 10/20/2020 12:56

Spike Duplicate ID: LCSD for HBN 1205620 [XXX44084]
Spike Duplicate Lab ID: 1588675
Matrix: Soil/Solid (dry weight)

QC for Samples: 1205620005, 1205620006, 1205620007, 1205620008, 1205620009, 1205620010, 1205620011

Results by **AK103**

	Blank Spike (mg/kg)			Spike Duplicate (mg/kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Residual Range Organics	833	659	79	833	685	82	(60-120)	3.90	(< 20)
Surrogates									
n-Triacontane-d62 (surr)	16.7	110	110	16.7	103	103	(60-120)	6.30	

Batch Information

Analytical Batch: **XFC15781**
Analytical Method: **AK103**
Instrument: **Agilent 7890B F**
Analyst: **CDM**

Prep Batch: **XXX44084**
Prep Method: **SW3550C**
Prep Date/Time: **10/20/2020 08:32**
Spike Init Wt./Vol.: 833 mg/kg Extract Vol: 5 mL
Dupe Init Wt./Vol.: 833 mg/kg Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1813224 [XXX/44093]
Blank Lab ID: 1588853

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1205620001, 1205620002, 1205620003, 1205620004

Results by **AK102**

Parameter	Results	LOQ/CL	DL	Units
Diesel Range Organics	0.300U	0.600	0.180	mg/L
Surrogates				
5a Androstane (surr)	99	60-120		%

Batch Information

Analytical Batch: XFC15783
Analytical Method: AK102
Instrument: Agilent 7890B F
Analyst: CDM
Analytical Date/Time: 10/21/2020 6:27:00PM

Prep Batch: XXX44093
Prep Method: SW3520C
Prep Date/Time: 10/20/2020 4:33:29PM
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Print Date: 11/17/2020 4:21:28PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1205620 [XXX44093]
Blank Spike Lab ID: 1588854
Date Analyzed: 10/21/2020 18:37

Spike Duplicate ID: LCSD for HBN 1205620 [XXX44093]
Spike Duplicate Lab ID: 1588855
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1205620001, 1205620002, 1205620003, 1205620004

Results by **AK102**

	Blank Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Diesel Range Organics	20	19.9	99	20	20.3	101	(75-125)	2.20	(< 20)
Surrogates									
5a Androstane (surr)	0.4	101	101	0.4	102	102	(60-120)	0.67	

Batch Information

Analytical Batch: **XFC15783**
Analytical Method: **AK102**
Instrument: **Agilent 7890B F**
Analyst: **CDM**

Prep Batch: **XXX44093**
Prep Method: **SW3520C**
Prep Date/Time: **10/20/2020 16:33**
Spike Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL
Dupe Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL

Print Date: 11/17/2020 4:21:30PM

Method Blank

Blank ID: MB for HBN 1813224 [XXX/44093]
Blank Lab ID: 1588853

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1205620001, 1205620002, 1205620003, 1205620004

Results by **AK103**

Parameter	Results	LOQ/CL	DL	Units
Residual Range Organics	0.250U	0.500	0.150	mg/L
Surrogates				
n-Triacontane-d62 (surr)	106	60-120		%

Batch Information

Analytical Batch: XFC15783
Analytical Method: AK103
Instrument: Agilent 7890B F
Analyst: CDM
Analytical Date/Time: 10/21/2020 6:27:00PM

Prep Batch: XXX44093
Prep Method: SW3520C
Prep Date/Time: 10/20/2020 4:33:29PM
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Print Date: 11/17/2020 4:21:33PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1205620 [XXX44093]
Blank Spike Lab ID: 1588854
Date Analyzed: 10/21/2020 18:37

Spike Duplicate ID: LCSD for HBN 1205620 [XXX44093]
Spike Duplicate Lab ID: 1588855
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1205620001, 1205620002, 1205620003, 1205620004

Results by **AK103**

	Blank Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Residual Range Organics	20	20.9	104	20	21.1	105	(60-120)	1.00	(< 20)
Surrogates									
n-Triacontane-d62 (surr)	0.4	106	106	0.4	107	107	(60-120)	0.93	

Batch Information

Analytical Batch: **XFC15783**
Analytical Method: **AK103**
Instrument: **Agilent 7890B F**
Analyst: **CDM**

Prep Batch: **XXX44093**
Prep Method: **SW3520C**
Prep Date/Time: **10/20/2020 16:33**
Spike Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL
Dupe Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL

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Method Blank

Blank ID: MB for HBN 1813234 [XXX/44095]
Blank Lab ID: 1588896

Matrix: Soil/Solid (dry weight)

QC for Samples:
1205620005, 1205620006, 1205620007, 1205620008, 1205620009, 1205620010, 1205620011

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

Parameter	Results	LOQ/CL	DL	Units
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)	86.7	58-103		%
Fluoranthene-d10 (surr)	90.9	54-113		%

Batch Information

Analytical Batch: XMS12390
Analytical Method: 8270D SIM (PAH)
Instrument: Agilent GC 7890B/5977A SWA
Analyst: DSD
Analytical Date/Time: 11/9/2020 8:32:00PM

Prep Batch: XXX44095
Prep Method: SW3550C
Prep Date/Time: 10/21/2020 8:08:41AM
Prep Initial Wt./Vol.: 22.5 g
Prep Extract Vol: 5 mL

Print Date: 11/17/2020 4:21:39PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1205620 [XXX44095]
Blank Spike Lab ID: 1588897
Date Analyzed: 11/09/2020 20:52

Matrix: Soil/Solid (dry weight)

QC for Samples: 1205620005, 1205620006, 1205620007, 1205620008, 1205620009, 1205620010, 1205620011

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

Blank Spike (ug/kg)

Parameter	Spike	Result	Rec (%)	CL
1-Methylnaphthalene	111	96.2	87	(43-111)
2-Methylnaphthalene	111	95.3	86	(39-114)
Acenaphthene	111	96.4	87	(44-111)
Acenaphthylene	111	99.8	90	(39-116)
Anthracene	111	104	93	(50-114)
Benzo(a)Anthracene	111	90.4	81	(54-122)
Benzo[a]pyrene	111	101	91	(50-125)
Benzo[b]Fluoranthene	111	109	99	(53-128)
Benzo[g,h,i]perylene	111	104	94	(49-127)
Benzo[k]fluoranthene	111	103	93	(56-123)
Chrysene	111	107	96	(57-118)
Dibenzo[a,h]anthracene	111	104	94	(50-129)
Fluoranthene	111	105	94	(55-119)
Fluorene	111	100	90	(47-114)
Indeno[1,2,3-c,d] pyrene	111	113	102	(49-130)
Naphthalene	111	98.9	89	(38-111)
Phenanthrene	111	107	97	(49-113)
Pyrene	111	101	91	(55-117)
Surrogates				
2-Methylnaphthalene-d10 (surr)	111	82.1	82	(58-103)
Fluoranthene-d10 (surr)	111	84.6	85	(54-113)

Batch Information

Analytical Batch: **XMS12390**
Analytical Method: **8270D SIM (PAH)**
Instrument: **Agilent GC 7890B/5977A SWA**
Analyst: **DSD**

Prep Batch: **XXX44095**
Prep Method: **SW3550C**
Prep Date/Time: **10/21/2020 08:08**
Spike Init Wt./Vol.: 111 ug/kg Extract Vol: 5 mL
Dupe Init Wt./Vol.: Extract Vol:

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Matrix Spike Summary

Original Sample ID: 1205715009
MS Sample ID: 1588898 MS
MSD Sample ID: 1588899 MSD

Analysis Date: 11/10/2020 0:17
Analysis Date: 11/10/2020 0:38
Analysis Date: 11/10/2020 0:58
Matrix: Soil/Solid (dry weight)

QC for Samples: 1205620005, 1205620006, 1205620007, 1205620008, 1205620009, 1205620010, 1205620011

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

		Matrix Spike (ug/kg)			Spike Duplicate (ug/kg)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
1-Methylnaphthalene	15.5U	138	118	85	139	117	84	43-111	1.00	(< 20)
2-Methylnaphthalene	15.5U	138	120	87	139	117	84	39-114	2.40	(< 20)
Acenaphthene	15.5U	138	115	84	139	118	85	44-111	1.80	(< 20)
Acenaphthylene	15.5U	138	125	91	139	124	89	39-116	0.76	(< 20)
Anthracene	15.5U	138	125	91	139	124	90	50-114	0.52	(< 20)
Benzo(a)Anthracene	15.5U	138	110	80	139	110	80	54-122	0.18	(< 20)
Benzo[a]pyrene	15.5U	138	126	91	139	125	91	50-125	0.31	(< 20)
Benzo[b]Fluoranthene	15.5U	138	133	96	139	125	90	53-128	6.10	(< 20)
Benzo[g,h,i]perylene	15.5U	138	122	88	139	120	87	49-127	1.40	(< 20)
Benzo[k]fluoranthene	15.5U	138	124	90	139	124	90	56-123	0.55	(< 20)
Chrysene	15.5U	138	130	95	139	126	92	57-118	2.90	(< 20)
Dibenzo[a,h]anthracene	15.5U	138	124	90	139	122	88	50-129	1.20	(< 20)
Fluoranthene	15.5U	138	129	93	139	125	90	55-119	2.80	(< 20)
Fluorene	15.5U	138	124	90	139	124	89	47-114	0.22	(< 20)
Indeno[1,2,3-c,d] pyrene	15.5U	138	134	98	139	133	96	49-130	1.30	(< 20)
Naphthalene	12.4U	138	121	88	139	120	86	38-111	1.20	(< 20)
Phenanthrene	15.5U	138	130	94	139	128	92	49-113	1.90	(< 20)
Pyrene	15.5U	138	125	90	139	123	89	55-117	1.20	(< 20)
Surrogates										
2-Methylnaphthalene-d10 (surr)		138	113	82	139	110	79	58-103	3.00	
Fluoranthene-d10 (surr)		138	119	86	139	116	83	54-113	3.20	

Batch Information

Analytical Batch: XMS12390
Analytical Method: 8270D SIM (PAH)
Instrument: Agilent GC 7890B/5977A SWA
Analyst: DSD
Analytical Date/Time: 11/10/2020 12:38:00AM

Prep Batch: XXX44095
Prep Method: Sonication Extr Soil 8270 PAH SIM 5ml
Prep Date/Time: 10/21/2020 8:08:41AM
Prep Initial Wt./Vol.: 22.68g
Prep Extract Vol: 5.00mL

Print Date: 11/17/2020 4:21:42PM

Homestead, Charles (Anchorage)

To: Homestead, Charles (Anchorage)
Subject: 1205620_CO

From: Homestead, Charles (Anchorage)
Sent: Thursday, November 12, 2020 4:17 PM
To: David Nyman <dnyman@restorsci.com>; Lucas Gamble (lgamble@restorsci.com) <lgamble@restorsci.com>
Subject: Work orders to be charged to ARRC

Hi, Here is the final list of all work orders that have to be switched to AK RR:

1205106 ARRC Hurricane
1205492 20-2217 ARRC Mammoth Trucking
1205453 ARRC Arctic Cooperage
1205620 20-2219 ARRC Talkeetna
1205748
1205841
1205847 ARRC Healy Benzene
1205848 Healy UST-6 GW
1205849 ARRC Healy Landspread
1205871
1205872
1205907
1206007
1206025

Thanks, CGH

Charles Homestead
Environment, Health and Safety
General Manager, Alaska Division

SGS North America Inc.
200 West Potter Drive
Anchorage, Alaska 99518

Phone: (907) 562-2343
Direct: (907) 550-3206
Fax: (907) 562-0119
E-mail : charles.homestead@sgs.com Data Deliverables At: Engage - Home (Engage Tutorials)

From: David Nyman <dnyman@restorsci.com>
Sent: Thursday, November 12, 2020 2:48 PM
To: Homestead, Charles (Anchorage) <Charles.Homestead@sgs.com>
Cc: Lucus Gamble <lgamble@restorsci.com>
Subject: [EXTERNAL] Work orders to be charged to ARRC

Chuck the following work orders should be billed to ARRC.

1205106 ARRC Hurricane
1205452 20-2217 ARRC Mammoth Trucking
1205453 ARRC Arctic Cooperage
1205620 20-2219 ARRC Talkeetna
1205748
1205841
1205847 ARRC Healy Benzene
1205848 Healy UST-6 GW
1205849 ARRC Healy Landspread
1205871
1205872
1205907
1206007
1206025

Thanks

David Nyman, PE
Restoration Science & Engineering, LLC
911 West 8th Avenue, Suite 100
Anchorage, Alaska 99501
907 278-1023 ext 103
Cell: 907 229 7333

SGS North America Inc.
CHAIN OF CUSTODY RECORD

1205620

Profile # 3627688 GM

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Page 1 of 2

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

Section 1

CLIENT: RSE

CONTACT: Lisa Koeneman — PHONE #: 278-1023

PROJECT NAME: AKRC ~~Talkeetna~~ — PROJECT/PWSID/PERMIT#: 20-2219

REPORTS TO: RSE — E-MAIL: lkoeneman@restorsci.com — Profile #:

INVOICE TO: RSE — QUOTE #: — P.O. #:

Section 3 — Preservative

Section 2

RESERVED for lab use	SAMPLE IDENTIFICATION	DATE mm/dd/yy	TIME HH:MM	MATRIX/ MATRIX CODE	# CONTAINERS	Comp Grab MI (Multi-incremental)	Analysis* DRO AK102	GRO AK101	PRO AK103	Petro VOC	PAH SIM	DRO AK102	GRO AK101	PRO AK103	Petro VOC	PAH SIM	REMARKS/LOC ID
							None	HCl	None	HCl	None	None	MeOH	None	MeOH	None	
1AJ	RSE-1	10/9/2020	14:10	water	10	G	X	X	X	X	X						
2AJ	RSE-2	10/9/2020	12:15	water	10	G	X	X	X	X	X						
3AJ	RSE-3	10/9/2020	11:20	water	10	G	X	X	X	X	X						
4AJ	RSE-X	10/9/2020	16:00	water	10	G	X	X	X	X	X						
5AB	RSE-1D	10/8/2020	14:00	soil	2	G						X	X	X	X	X	
6AB	RSE-1E	10/8/2020	14:05	soil	2	G						X	X	X	X	X	
7AB	RSE-2D	10/8/2020	11:40	soil	2	G						X	X	X	X	X	
8AB	RSE-2E	10/8/2020	11:45	soil	2	G						X	X	X	X	X	
9AB	RSE-3B	10/8/2020	9:30	soil	2	G						X	X	X	X	X	
10AB	RSE-3D	10/8/2020	9:45	soil	2	G						X	X	X	X	X	

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

Section 5

	Date	Time	
Relinquished By: (1)	10/12/20	10:46	Received By:
Relinquished By: (2)	Date	Time	Received By:
Relinquished By: (3)	Date	Time	Received By:
Relinquished By: (4)	Date 10/12/20	Time 1041	Received For Laboratory By:

Section 4

DOD Project? Yes No

Data Deliverable Requirements:

Cooler ID:

Requested Turnaround Time and/or Special Instructions:

Temp Blank °C: 1) 2.1 D45 2) 1.6 D30 or Ambient [ ]

Chain of Custody Seal: (Circle) INTACT BROKEN ABSENT

Delivery Method: Hand Delivery [ ] Commerical Delivery [ ]

SGS

SGS North America Inc.
CHAIN OF CUSTODY RECORD

1205620

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

Section 1

CLIENT: RSE

CONTACT: Lisa Koenemen

PHONE #: 278 1623

PROJECT NAME: ARRC Talkeetna

PROJECT/ PWSID/ PERMIT#: 20-2219

REPORTS TO: RSE

E-MAIL: lkoenemen Profile #: @reservsci.com

INVOICE TO: RSE

QUOTE #:

P.O. #:

Section 3 — Preservative: None | MeOH | None | MeOH | None

Section 2

RESERVED for lab use	SAMPLE IDENTIFICATION	DATE mm/dd/yy	TIME HH:MM	MATRIX/ MATRIX CODE	# CONTAINERS	Comp Grab MI (Multi-incremental)	Analysis*: DRO AK-102	GRO AK-101	PRO AK-103	BTEX 8021	PAH 8270					
MAB	RSE-X	10/8/2020	9:00	SOIL	2	G	X	X	X	X	X					
12A																
13AC																

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

REMARKS/LOC ID

Section 5

	Date	Time	
Relinquished By: (1)	10/12/20	10:41	Received By:
Relinquished By: (2)	Date	Time	Received By:
Relinquished By: (3)	Date	Time	Received By:
Relinquished By: (4)	10/12/20	1041	Received For Laboratory By:

Section 4

DOD Project? Yes No

Data Deliverable Requirements:

Cooler ID:

Requested Turnaround Time and/or Special Instructions:

Temp Blank °C: 1) 2.1 D45 2) 1.0 D30 or Ambient [ ]

Chain of Custody Seal: (Circle) INTACT BROKEN ABSENT

Delivery Method: Hand Delivery [ ] Commerical Delivery [ ]

e-Sample Receipt Form

SGS Workorder #: **1205620**

1205620

Review Criteria	Condition (Yes, No, N/A)	Exceptions Noted below
Chain of Custody / Temperature Requirements		Yes — Exemption permitted if sampler hand carries/delivers.
Were Custody Seals intact? Note # & location	N/A	absent
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 @ 2.1 °C Therm. ID: D45
	Yes	Cooler ID: 2 @ 1.0 °C Therm. ID: D30
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:
*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	
	N/A	***Exemption permitted for metals (e.g,200.8/6020A).
Were proper containers (type/mass/volume/preservative***)used?	Yes	
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)?	Yes	
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

Container Id	Preservative	Container Condition
1205620001-A	HCL to pH < 2	OK
1205620001-B	HCL to pH < 2	OK
1205620001-C	No Preservative Required	OK
1205620001-D	No Preservative Required	OK
1205620001-E	HCL to pH < 2	OK
1205620001-F	HCL to pH < 2	OK
1205620001-G	HCL to pH < 2	OK
1205620001-H	HCL to pH < 2	OK
1205620001-I	HCL to pH < 2	OK
1205620001-J	HCL to pH < 2	OK
1205620002-A	HCL to pH < 2	OK
1205620002-B	HCL to pH < 2	OK
1205620002-C	No Preservative Required	OK
1205620002-D	No Preservative Required	OK
1205620002-E	HCL to pH < 2	OK
1205620002-F	HCL to pH < 2	OK
1205620002-G	HCL to pH < 2	OK
1205620002-H	HCL to pH < 2	OK
1205620002-I	HCL to pH < 2	OK
1205620002-J	HCL to pH < 2	OK
1205620003-A	HCL to pH < 2	OK
1205620003-B	HCL to pH < 2	OK
1205620003-C	No Preservative Required	OK
1205620003-D	No Preservative Required	OK
1205620003-E	HCL to pH < 2	OK
1205620003-F	HCL to pH < 2	OK
1205620003-G	HCL to pH < 2	OK
1205620003-H	HCL to pH < 2	OK
1205620003-I	HCL to pH < 2	OK
1205620003-J	HCL to pH < 2	OK
1205620004-A	HCL to pH < 2	OK
1205620004-B	HCL to pH < 2	OK
1205620004-C	No Preservative Required	OK
1205620004-D	No Preservative Required	OK
1205620004-E	HCL to pH < 2	OK
1205620004-F	HCL to pH < 2	OK
1205620004-G	HCL to pH < 2	OK
1205620004-H	HCL to pH < 2	OK
1205620004-I	HCL to pH < 2	OK
1205620004-J	HCL to pH < 2	OK
1205620005-A	No Preservative Required	OK
1205620005-B	Methanol field pres. 4 C	OK
1205620006-A	No Preservative Required	OK
1205620006-B	Methanol field pres. 4 C	OK
1205620007-A	No Preservative Required	OK
1205620007-B	Methanol field pres. 4 C	OK
1205620008-A	No Preservative Required	OK
1205620008-B	Methanol field pres. 4 C	OK
1205620009-A	No Preservative Required	OK
1205620009-B	Methanol field pres. 4 C	OK
1205620010-A	No Preservative Required	OK
1205620010-B	Methanol field pres. 4 C	OK
1205620011-A	No Preservative Required	OK
1205620011-B	Methanol field pres. 4 C	OK
1205620012-A	Methanol field pres. 4 C	OK
1205620013-A	HCL to pH < 2	OK
1205620013-B	HCL to pH < 2	OK
1205620013-C	HCL to pH < 2	OK
1205620013-D	HCL to pH < 2	OK
1205620013-E	HCL to pH < 2	OK
1205620013-F	HCL to pH < 2	OK

Container Id	Preservative	Container Condition	Container Id	Preservative	Container Condition

Container Condition Glossary

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

OK - The container was received at an acceptable pH for the analysis requested.
BU - The container was received with headspace greater than 6mm.
DM - The container was received damaged.
FR - The container was received frozen and not usable for Bacteria or BOD analyses.
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.

Attachment F:
ADEC Laboratory Data Quality Review Checklist

RESTORATION
Science & Engineering, LLC

Laboratory Data Review Checklist

Completed By:

Lisa Koeneman

Title:

Qualified Environmental Professional

Date:

12/7/2020

Consultant Firm:

Restoration Science & Engineering, LLC

Laboratory Name:

SGS North America, Inc.

Laboratory Report Number:

1205620

Laboratory Report Date:

11/17/2020

CS Site Name:

Mat-Su Borough Talkeetna Library Subdivision Tract A

ADEC File Number:

2258.38.016

Hazard Identification Number:

26055

1205620

Laboratory Report Date:

11/17/2020

CS Site Name:

Mat-Su Borough Talkeetna Library Subdivision Tract A

Note: Any N/A or No box checked must have an explanation in the comments box.

1. Laboratory

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

   Yes☒ No☐ N/A☐ Comments:

SGS received all the samples and conducted all the analyses.

   b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS approved?

   Yes☐ No☐ N/A☒ Comments:

The samples were not transferred.

2. Chain of Custody (CoC)

   a. CoC information completed, signed, and dated (including released/received by)?

   Yes☒ No☐ N/A☐ Comments:

The completed, signed and data COC is provided with the lab report.

   b. Correct analyses requested?

   Yes☒ No☐ N/A☐ Comments:

The correct analyses were requested.

3. Laboratory Sample Receipt Documentation

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

   Yes☒ No☐ N/A☐ Comments:

The two sample coolers were delivered within the acceptable temperature range.

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

   Yes☒ No☐ N/A☐ Comments:

All sample preservations were acceptable.

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11/17/2020

CS Site Name:

Mat-Su Borough Talkeetna Library Subdivision Tract A

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

Yes☒ No☐ N/A☐ Comments:

All samples were delivered in good condition.

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

Yes☐ No☐ N/A☒ Comments:

No discrepancies were documented.

e. Data quality or usability affected?

Comments:

The Sample Receipt Form does not indicate that the data quality and usability are affected.

4. Case Narrative

a. Present and understandable?

Yes☒ No☐ N/A☐ Comments:

The Case Narrative is present and understandable.

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

Yes☒ No☐ N/A☐ Comments:

Several QC failures were identified by the lab.

c. Were all corrective actions documented?

Yes☐ No☐ N/A☒ Comments:

No corrective actions were conducted.

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

Comments:

The Case Narrative does not indicate that the data quality and usability are affected.

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Laboratory Report Date:

11/17/2020

CS Site Name:

Mat-Su Borough Talkeetna Library Subdivision Tract A

5. Samples Results

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

Yes☒ No☐ N/A☐ Comments:

The requested analyses were performed.

b. All applicable holding times met?

Yes☒ No☐ N/A☐ Comments:

All samples were delivered and extracted within the applicable holding times.

c. All soils reported on a dry weight basis?

Yes☒ No☐ N/A☐ Comments:

All soil samples are reported on a dry weight basis.

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

Yes☐ No☒ N/A☐ Comments:

Several non-target analyte LOQs are above their associated cleanup levels.

e. Data quality or usability affected?

The non-target analytes with LOQs above the ADEC cleanup levels are generally found to be non-detect. Additionally, these are not COPCs. Therefore, the data quality and usability are not affected. (The non-target analytes with LOQs above the ADEC cleanup levels are highlighted light blue in the data tables.)

6. QC Samples

a. Method Blank

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

Yes☒ No☐ N/A☐ Comments:

One Method Blank is reported per matrix, analysis and for every 20 samples.

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CS Site Name:

Mat-Su Borough Talkeetna Library Subdivision Tract A

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

Yes☒ No☐ N/A☐ Comments:

All Method Blank results are less than their LOQs.

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

Comments:

No samples are affected.

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

Yes☐ No☐ N/A☒ Comments:

No samples are affected.

v. Data quality or usability affected?

Comments:

The Method Blank results do not indicate that the data quality and usability are affected.

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

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

Yes☒ No☐ N/A☐ Comments:

One LCS and LCSD are reported per matrix analysis for every 20 samples.

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

Yes☐ No☐ N/A☒ Comments:

No metals or inorganics were analyzed.

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:

All LCS and LCSD %Rs are within lab limits.

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Laboratory Report Date:

11/17/2020

CS Site Name:

Mat-Su Borough Talkeetna Library Subdivision Tract A

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:

All LCS and LCSD RPDs are within lab limits.

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

Comments:

No samples are affected.

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

Yes☐ No☐ N/A☒ Comments:

No samples are affected.

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

Comments:

The LCS and LCSD results do not indicate that the data quality and usability are affected.

c. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

Note: Leave blank if not required for project

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

Yes☒ No☐ N/A☐ Comments:

One MS and MSD are reported per matrix and analysis for every 20 samples.

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

Yes☐ No☐ N/A☒ Comments:

No metals or inorganics were analyzed.

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable?

Yes☐ No☒ N/A☐ Comments:

Benzene %Rs for the MS and MSD were 67% and 76%, respectively, slightly below the lab limits range of 77-121%.

1205620

Laboratory Report Date:

11/17/2020

CS Site Name:

Mat-Su Borough Talkeetna Library Subdivision Tract A

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.

Yes☒ No☐ N/A☐ Comments:

All MS and MSD RPDs are within lab limits.

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

Comments:

All soil samples are affected.

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

Yes☒ No☐ N/A☐ Comments:

The samples are listed at the top of the page.

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

Comments:

The failed %Rs are only slightly below the acceptable range, indicating that the data will be biased slightly low, if at all. All other MS and MSD results do not indicate that the data quality and usability are affected.

d. Surrogates – Organics Only or Isotope Dilution Analytes (IDA) – Isotope Dilution Methods Only

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

Yes☒ No☐ N/A☐ Comments:

Surrogates are reported for organic analyses.

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:

Several surrogate %Rs are significantly above the lab limits.

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:

The samples are listed at the top of the page.

1205620

Laboratory Report Date:

11/17/2020

CS Site Name:

Mat-Su Borough Talkeetna Library Subdivision Tract A

iv. Data quality or usability affected?

Comments:

The failed %Rs are above the lab limits, indicating that the data will be biased high, if at all. The sample results associated with these failed surrogates are below ADEC cleanup levels, indicating that the data quality and usability are not affected for the purposes of this report.

e. Trip Blanks

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:

One Trip Blank is reported per matrix and analyses for each cooler.

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:

The cooler is clearly indicated.

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

Yes☒ No☐ N/A☐ Comments:

All Trip Blank results are less than their LOQs.

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

Comments:

No samples are affected.

v. Data quality or usability affected?

Comments:

The Trip Blank results do not indicate that the data quality and usability are affected.

f. Field Duplicate

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

Yes☒ No☐ N/A☐ Comments:

RSE-X (soil) is a blind duplicate of RSE-3B and RSE-X (water) is a blind duplicate of RSE-3.

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11/17/2020

CS Site Name:

Mat-Su Borough Talkeetna Library Subdivision Tract A

ii. Submitted blind to lab?

Yes☒ No☐ N/A☐ Comments:

RSE-X (soil) and RSE-X (water) were both submitted to the lab for quality control purposes.

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

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

Where R_1 = Sample Concentration
R_2 = Field Duplicate Concentration

Yes☒ No☐ N/A☐ Comments:

All RPDs are within lab limits for the target analytes.

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

Comments:

The Field Duplicate results do not indicate that the data quality and usability are affected.

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

Yes☐ No☐ N/A☒ Comments:

No Decontamination or Equipment Blank was submitted.

i. All results less than LOQ and project specified objectives?

Yes☐ No☐ N/A☒ Comments:

No Decontamination or Equipment Blank was submitted.

ii. If above LOQ or project specified objectives, what samples are affected?

Comments:

No Decontamination or Equipment Blank was submitted.

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11/17/2020

CS Site Name:

Mat-Su Borough Talkeetna Library Subdivision Tract A

iii. Data quality or usability affected?

Comments:

RSE uses new dedicated equipment when possible for collecting each sample. Non-dedicated equipment is decontaminated in between uses. No Decontamination or Equipment Blank was submitted.

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

a. Defined and appropriate?

Yes☐ No☐ N/A☒ Comments:

No other data flags were defined or reported by the lab.