

**Supplemental Soil Characterization Report
Anchorage Fueling and Service Company Cross-Town Pipeline
Arctic Boulevard and Tudor Road Intersection
Anchorage, Alaska**



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APPROVAL PAGE

This report for soil sampling at the Anchorage Fueling Service Company Cross-town pipeline site in Anchorage, Alaska, has been prepared for Menzies Aviation by Ahtna Engineering Services, LLC.

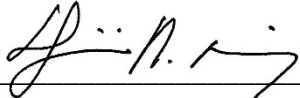
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ACRONYMS AND ABBREVIATIONS

°CCelsius
AACAlaska Administrative Code
ADECAlaska Department of Environmental Conservation
AFSC	.....Anchorage Fueling Service Company
Ahtna	.....Ahtna Engineering Services, LLC
bgs	.....below ground surface
CSM	.....conceptual site model
DRO	.....diesel-range organics
EPA	.....United States Environmental Protection Agency
GPS	.....Global Positioning System
GRO	.....gasoline-range organics
IDW	.....investigation derived waste
LNAPL	.....light, non-aqueous phase liquid
PAH	.....polycyclic aromatic hydrocarbon
PID	.....photoionization detector
PPE	.....personal protective equipment
ppmV	.....parts per million, Volumetric
VESvacuum-enhanced skimming
VOC-Ffuel-related volatile organic compound

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1.0 INTRODUCTION

Anchorage Fueling and Services Company (AFSC) and Menzies Aviation (Menzies) has contracted Ahtna Engineering Services, LLC, (Ahtna) to conduct a supplemental soil characterization assessment project at the former AFSC Cross-town Pipeline project at the of Arctic Boulevard and Tudor Road in Anchorage (Figure 1). The site is located on the northwest corner of the intersection and the southeast corner of the Idle Wheels trailer park. Work was conducted to assess soils above the zone of contaminated groundwater present at the site.

1.1 Project Objectives

This work was conducted to assess current soil impacts at the southeast corner of the Idle Wheels Trailer Park at the northwest corner of Arctic Boulevard and Tudor Road (Figure 2). The area under investigation was the section of the property over which a dissolved-phase petroleum plume and light non-aqueous phase liquid (LNAPL) are known to exist. A former pipeline owned by AFSC released jet fuel along the east side of the property.

The objectives for this project were as follows:

- Assess the lateral and vertical extent and level of soil petroleum impacts in the project area from the surface downward to assist in assessment of a potential soil vapor exposure pathway to trailers that may be placed in this area in the future, and to evaluate whether further vapor intrusion assessment is needed as well as remedial options for further site cleanup.
 - Sample soils in the upper 15 feet of the soil column to assess potential soil ingestion and outdoor air inhalation pathways
 - Sample soil from 15 to 30 feet below ground surface (bgs) to assess the potential for indoor air exposure pathway.
- Replace monitoring well MW-122, which was destroyed during 2019 construction at the site, to allow for monitoring of the leading edge of the dissolved plume currently and during any future groundwater remedial efforts

1.2 Project History

The Cross-town Pipeline was used to transport Jet A fuel from the Anchorage Port to Ted Stevens International Airport from 1962 to 1999 (Ecology and Environment, Inc [E&E], 2002). Petroleum hydrocarbon impacts in soil and groundwater beneath the site are a result of a subsurface release of Jet A fuel, which originated from a faulty weld in the former Cross-town Pipeline that ran north-south along the west side of Arctic Boulevard.

In August 1999, fuel was removed from the pipeline and in May 2000, an approximately 500-foot section of the pipe was removed. The remaining sections were plugged and abandoned in place. Initial site characterization was performed between October 2000 and July 2002 and involved a subsurface investigation consisting of analysis of soil from 30 soil borings. Analytical results from

this investigation indicated the presence of free-phase petroleum hydrocarbons and dissolved diesel-range organics (DRO) spreading from the area of petroleum-contaminated soil. Manual product recovery and operation of an automated pilot free product recovery system removed 5,500 gallons of Jet A fuel from the newly installed recovery wells at the site between 2000 and 2001 (E&E, 2002).

To further remediate the petroleum impacts to soil and groundwater at the site, a vacuum-enhanced skimming (VES) system for recovery of LNAPLs was installed and operated at the site from 2001 until August 2009. Approximately 12,800 gallons of LNAPL were recovered. An LNAPL drawdown test was conducted in 2010 and the recovery rate was below 0.001 gallons per hour, which is below the practicable recovery rate of 0.005 gallons per hour; therefore, system operations were ceased (OASIS Environmental [OASIS], 2010).

In fall 2017, with Alaska Department of Environmental Conservation (ADEC) and landowner approval, the aboveground portion of the recovery system, including all the pumps, buildings, and associated piping, were removed and several LNAPL recovery wells were partially decommissioned by Ahtna. In 2018, before recovery wells were removed, a new ADEC site manager stated that ADEC thought further LNAPL recovery was feasible. To assess this, in the winter of 2019, an LNAPL transmissivity test was performed at the site on recovery wells RW-1 and RW-115. Results of this test also indicated that further product recovery was not practicable (Ahtna, 2019). Decommissioning was completed during the 2021 field season (Ahtna, 2021d).

1.3 Contaminants of Concern and Reporting Limit Limitations

The release at this site was jet fuel. The contaminants of concern are fuel-related volatile organic compounds (VOC-F), gasoline-range organics (GRO), DRO, and polycyclic aromatic hydrocarbons (PAHs). ADEC soil cleanup levels for these analytes are the most stringent of those listed under 18 Alaska Administrative Code (AAC) Chapter 75 (18 AAC 75) Table B1 and B2, Under 40-inch Zone, Human Health or Migration to Groundwater (ADEC, 2021). These cleanup levels and associated laboratory methods are presented in Table 1.

Analytical laboratory reporting limits will meet or be below project cleanup levels except for 1,2-dibromoethane and 1,2-dichloroethane. However, these compounds are not components of jet fuel and therefore will not affect the assessment of the data.

1.4 Regulatory Framework

Regulatory documents relating to tasks planned and completed as part of this project are presented as follows:

- *ADEC Monitoring Well Guidance*, September (ADEC, 2013)
- *ADEC Guidance on Developing Conceptual Site Models* (ADEC, 2017)
- *ADEC 18 AAC 75 Oil and Other Hazardous Substances Pollution Control* (ADEC, 2021)
- *ADEC Field Sampling Guidance* (ADEC, 2019)

2.0 FIELD ACTIVITIES

To achieve the project objectives, Ahtna performed the following work at the Arctic and Tudor site week of June 28, 2021. All work was performed in accordance with the ADEC *Field Sampling Guidance* (ADEC, 2019) and the Work Plan (Ahtna, 2021a). Field notes and daily tailgate forms are provided in Appendix A, a photographic log is included in Appendix B, and boring logs and monitoring well construction logs are included as Appendix C.

Soil in the central area of contamination has not been sampled for 15–20 years, prior to LNAPL recovery operations. The boring locations were selected to gather additional information about the area of highest contaminant concentration and soils at the edge of soil contamination.

Supplemental soil characterization field activities performed at the site include advancement of 10 soil characterization soil borings and replacement of monitoring well MW-122. This work was completed in conjunction with the decommissioning of onsite recovery wells. Decommissioning activities are described and presented under a separate report (Ahtna, 2021c).

2.1 Notifications

Work Plan approval for work to be completed as part of the supplemental soil characterization at the site was provided by Mr. Shawn Tisdell of ADEC on June 8, 2021. Ahtna notified Ms. Laurie Butler of Menzies of the intent to perform work at the site and obtained property owner permission for site access prior to mobilizing or completing any work at the site.

2.2 Utility Locates

Prior to intrusive activities, Ahtna personnel performed a utility locate for public utilities located at the site utilizing the local 811 utility locate service. Additional as-built information regarding location of private utilities on site was obtained and a private utility locate was performed along the northern edge of the investigation area.

2.3 Mobilization

Ahtna personnel mobilized field sampling equipment and Discovery Drilling Inc. mobilized drilling equipment and tooling to the Arctic and Tudor site on June 28, 2021. All site work and demobilization of equipment and waste was completed on July 1, 2021.

2.4 Soil Boring Advancement

Drilling services were provided by Discovery Drilling with a Geoprobe® 7822 direct-push drill rig utilizing Macro-Core® MC5 tooling. A total of 10 characterization soil borings (SB-1 through SB-10) and one soil boring for the installation of monitoring well MW-128 were advanced in the Arctic and Tudor investigation area (Figure 2).

Seven of the characterization borings were advanced to 15 feet bgs (SB-2, SB-4, SB-5, SB-6, SB-7, SB-8, and SB-9) to assess near-surface soil with potential exposure risk. The remaining three characterization borings (SB-1, SB-3, and SB-10) were advanced to 35 feet bgs to characterize deeper soil impacts down to the groundwater interface. An additional soil boring was advanced to 38 feet for the installation of monitoring well MW-128. Detailed soil boring logs are provided in Appendix C. The locations of all soil borings and monitoring wells with associated soil borings are presented on Figure 2.

2.5 Soil Screening

All soil cores were in-situ screened with a photoionization detector (PID) to help guide soil analytical sampling. Soils were screened in 1-foot increments directly after opening the core liner to prevent excess volatilization of vapors in the soil. PID results were recorded on the soil boring logs. PID screening observations are described in Section 4.2.

2.6 Soil Analytical Sampling and Sample Handling

A total of 18 primary and two duplicate samples were collected from the soil borings. Table 2 presents a summary of the analytical samples collected for this project. One analytical soil sample was collected from each of the 15-foot bgs soil characterization borings (SB-2, SB-4, SB-5, SB-6, SB-7, SB-8, and SB-9). This sample was proposed to be collected from the location of the highest PID reading in the boring; however, due to no observed indications of fuel-related soil impacts, all analytical samples were collected from the bottom of each of the soil borings from 13 to 15 feet bgs to indicate the presence or absence of jet-fuel related analytes at the bottom depth of the boring. Additionally, the 13–15-foot-bgs sampling interval was chosen in almost all borings because this is generally the deepest depth at which soils will be brought to the surface for an excavation (ADEC, 2017).

Three primary analytical soil samples were collected from each of the 30-foot-bgs borings (SB-1, SB-3, and SB-10). A duplicate sample was also collected from both soil borings SB-3 and SB-10.

In soil boring SB-1, one sample was collected at from 13 to 15 feet bgs, the second was collected from 22 to 24 feet bgs approximately midway between the 15-foot sample and the groundwater interface. The third sample was collected from 31 to 33 feet bgs at the groundwater interface. No staining or odor was observed in the soil boring.

In soil boring SB-3, one sample was collected at from 13 to 15 feet bgs due to there being no indications of fuel-related soil impacts in the top 15 feet of soil. The second sample was collected from 26 to 28 feet bgs, at the interval just above the observed fuel odor and just above the groundwater interface. No staining or odor were observed at this sampling location. The third sample and a duplicate were collected from the groundwater interface from 30 to 32 feet bgs where the strongest hydrocarbon odor and staining were noted.

In soil boring SB-10, one sample was collected at from 18 to 20 feet bgs immediately above soil with observed hydrocarbon odor. The second sample was collected from 28 to 30 feet bgs at the depth of greatest PID screening values and strongest hydrocarbon odor, just above the soil/groundwater interface. The third sample and a duplicate were collected from the soil/groundwater interface from 31 to 33 feet bgs where hydrocarbon odor and staining were noted.

In the soil boring at MW-128, one soil sample was collected from 13 to 15 feet bgs due to there being no indications of fuel-related soil impacts. A second sample was collected at the groundwater interface from 31 to 33 feet bgs.

All soil samples were submitted for analysis of the following:

- VOC-F by the United States Environmental Protection Agency (EPA) Method 8260C
- GRO by Alaska Method (AK) 101
- DRO by AK 102
- PAHs by EPA Method 8270D-selected ion monitoring

All sampling was conducted ADEC *Field Sampling Guidance* (ADEC, 2019) and the Work Plan (Ahtna, 2021a). All soil samples collected for offsite laboratory analysis were collected using dedicated stainless-steel spoons. Volatile sample fractions (VOC-F and GRO) were not homogenized but placed directly into one 4-ounce, pre-tared, laboratory-provided jars and immediately preserved in the field with 25 milliliters of methanol provided by the laboratory. Soil submitted for DRO and PAH analysis was homogenized prior to placement into laboratory-supplied containers. Sample containers were sealed, labeled, and placed on gel ice immediately following collection. All samples were immediately placed on ice after collection and chilled to 4 degrees Celsius ($^{\circ}\text{C}$), $\pm 2^{\circ}\text{C}$. Samples were submitted to the Anchorage, Alaska, SGS laboratory on July 1, 2021, following standard chain-of-custody procedures.

2.7 Monitoring Well Installation

Replacement monitoring well MW-128 was installed near the former location of MW-122 and is shown on Figure 2. MW-128 was installed to a total depth of 37.9 feet bgs and constructed of 2-inch-diameter, Schedule 40 polyvinyl chloride casing with a 10-foot-long, 0.010-inch slotted screen interval. The screened interval was set from 27.6 to 37.6 feet bgs with a filter pack consisting of Colorado 10-20 silica sand around the screened interval and up to 26 feet bgs. A hydrated bentonite seal was placed above the sand interval from 26 to 2 feet bgs. Groundwater was observed at 32.34 feet bgs after well installation was completed. The well was completed as a flush mount with a protective monument concreted in place. The well was marked with a reference point on the well casing using a permanent marker located on the north side of the well casing. Well installation details were recorded on a monitoring well construction log (Appendix C).

2.8 Monitoring Well Development

Following installation, monitoring well MW-128 was developed to ensure proper hydraulic connection to the surrounding aquifer allowing for the free flow of formation water into the well for sampling.

Well development was completed by vigorously surging the well with a surge block for approximately 10 minutes, followed by purging the well with a submersible pump, until relatively turbidity-free water is obtained. A total of 15 gallons of water (slightly over 15 well volumes) was removed from the well during purging before turbidity-free water (visual) was consistently observed. This information was recorded in the field notebook included in Appendix A. Development water was collected in 5-gallon buckets and transferred to a drum for disposal.

Monitoring well MW-128 was sampled along with other wells at the site as part of the annual monitoring program. This sampling was performed upon ADEC approval in September 2021 and will be detailed in a separate report (Ahtna, 2021b).

2.9 GPS Survey

The locations of all 10 soil borings (SB-1 through SB-10) and the new monitoring well (MW-128) were surveyed using an Arrow 100 Global Positioning System (GPS) receiver with an accuracy of at minimum 0.75 meter. The elevation of monitoring well MW-128 was obtained by a level loop survey as part of the groundwater sampling event and is documented in a separate report (Ahtna, 2021b).

2.10 Investigation-Derived Waste

Investigation-derived waste (IDW) consisted of soil cuttings, purge and decontamination water, disposable sampling gear, and personal protective equipment (PPE). Disposable sampling equipment and PPE was bagged, taped shut and disposed of as municipal waste. Soil and purge water generated during project activities were stored in 55-gallon drums on site.

All drums were labelled with contents, generator contact information, and date of generation. On July 1, 2021, US Ecology mobilized to the site and picked up and transported the soil and purge water IDW to its Viking Road facility for disposal.

2.11 Deviations from Work Plan

The following deviation from the approved Work Plan (Ahtna, 2021a) occurred during the field activities: The three deep soil borings (SB-1, SB-3, and SB-10) were advanced deeper than the 30 feet stipulated by the Work Plan in order to ensure complete soil characterization to the groundwater interface, which was observed from 31.5 to 32.0 feet bgs in all three soil borings.

3.0 SITE OBSERVATIONS

This section describes observations noted in the field.

3.1 Site Soil and Groundwater Observations

Detailed soil boring information regarding all soil types, groundwater, and hydrocarbon staining or odor are presented the soil boring logs provided in Appendix C.

Soils observed in all soil borings consisted of interbedded silty sands and silt gravels. Surficial soils were generally more silty gravels becoming silt and silty sands toward the bottom of the borings. These soils are consistent with glacial outwash materials observed elsewhere throughout Anchorage.

Groundwater was observed in the following four soil borings: SB-1 (32 feet bgs), SB-3 (31.5 feet bgs), SB-10 (32 feet bgs), and MW-128 (32 feet bgs). No other soil borings intercepted groundwater and no confining layers or perched groundwater were observed.

Petroleum hydrocarbon staining and odor were observed in two soil borings, SB-3 and SB-10. SB-3 had light staining and odor from 27 to 30 feet bgs and strong staining and odor from 30 to 35 feet bgs, extending below the groundwater interface. SB-10 had moderate staining and odor from 20 to 29.5 feet bgs and lighter staining and odor from 30 to 35 feet bgs in soils below the groundwater interface. No staining or hydrocarbon odor were observed in any of the remaining soil borings.

3.2 Soil Boring Field Screening

PID screening was conducted at all 10 soil borings and the MW-128 installation boring. Table 3 presents a summary of the PID screening results.

Soil boring SB-10 had PID screening values ranging from 1 to 542 parts per million, Volumetric (ppmV) from 19 to 35 feet bgs. With the interval of highest values indicative of possible fuel impacts were present from 20 to 30 feet bgs. All other intervals had 0-ppmV screening values.

Soil boring SB-3 had PID screening values ranging from <1 to 515 ppmV from 28 to 35 feet bgs. With the interval of highest values indicative of possible fuel impacts were present from 30 to 35 feet bgs. All other intervals were observed to have 0-ppmV screening values.

Soil boring SB-6 had a low level PID screening value of 5 ppmV at the surface but was attributed to a high percentage of organic material present at the surface as opposed to fuel. All other intervals had 0-ppmV screening values.

All other soil borings had screening values of 0 ppmV for the entire depth of the soil boring.

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4.0 ANALYTICAL RESULTS AND QUALITY ASSURANCE

This section presents the analytical sample results and summarize the data quality review. Soil analytical results are presented on Tables 4 and 5. Table 4 presents the GRO and VOC-F analytical results while Table 5 presents the DRO and PAH results.

4.1 Soil Analytical Results

A total of 18 primary and two duplicate samples were collected from 11 soil borings. The samples collected from soil borings SB-2, SB-4, SB-5, SB-6, SB-7, SB-8, SB-9, SB-1, and MW-128 had no analytes detected at concentrations above their respective ADEC soil cleanup level. Many of these samples had low-level detections of DRO, but at concentrations below the cleanup level. There were low level detections of GRO in all the samples collected during this field event, however these values are estimated and attributed to method blank and trip blank contamination and may not be indicative of the actual presence of GRO. All samples collected during this project had non-detect results that exceeded the ADEC cleanup level for 1,2-dibromomethane. This compound, however, is not a component of jet fuel and therefore is not expected to be present in soils at this site.

Three primary samples and one duplicate were collected from SB-3. The samples collected from 12 to 15 feet bgs and the vertical sample from 26 to 28 feet bgs had no analytes detected at concentrations above their respective ADEC cleanup levels. Only the sample collected from 26 to 28 feet bgs had a low level detection of DRO and two PAHs. The sample and duplicate collected from 30 to 32 feet bgs had concentrations of DRO, GRO, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, ethylbenzene, naphthalene, total xylenes, 1-methylnaphthalene, and 2-methylnaphthalene that exceeded their respective cleanup levels. Compounds 1,2-dichloroethane, benzene, and methyl-tert-butyl ether had non-detect results that exceeded their respective cleanup levels.

Three primary samples and one duplicate were collected from SB-10. The sample collected from 18 to 20 feet bgs had no analytes detected at concentrations above their respective ADEC cleanup levels. Low levels of DRO and GRO were detected at concentrations below their cleanup levels. The sample and duplicate collected from 28 to 30 bgs had concentrations of naphthalene and DRO that exceeded their respective cleanup levels. Low levels of various VOC-F compounds and GRO were detected at concentrations below their cleanup levels. The sample collected from 31 to 33 feet bgs had concentrations of benzene and naphthalene that exceeded their respective cleanup levels. Low levels of 2-methylnaphthalene, phenanthrene, DRO, GRO, and various VOC-F compounds were detected at concentrations below cleanup levels.

4.2 Data Quality Assurance Summary

A data quality review of analytical sampling conducted during the 2021 field effort was prepared by Ahtna chemists. All samples were included in a single laboratory sample delivery group, which was evaluated for precision, accuracy, sensitivity, representativeness, comparability, and

completeness of the data. The comprehensive laboratory report is also provided in Appendix D and an ADEC Laboratory Data Review Checklist and the Ahtna Data Quality Review Report are included in Appendix E.

Based on the data review completed, some GRO data were qualified due to GRO method blank and trip blank contamination. However, all affected GRO sample results were well below regulatory cleanup levels and there was no impact on data usability. Limited volatile organic compound data were qualified as estimated due to poor field duplicate precision. Although qualified results are considered estimated, they are considered usable. All other sample results are valid with no data qualifiers assigned. No data were rejected and therefore the project completeness goal was met. All samples were collected in accordance with the Work Plan (USACE, 2021) and considered representative of site conditions. All analytical data are considered usable for the purpose of evaluating the presence or absence and magnitude of the suspected site contaminants.

Project sample results affected by the quality control anomalies described in the data quality review have been flagged accordingly in the appended analytical result tables.

5.0 CONCEPTUAL SITE MODEL

An updated ADEC conceptual site model (CSM) has been developed for the Arctic and Tudor Cross-town Pipeline site based on the results of the 2021 supplemental soil characterization investigation. The completed ADEC CSM scoping form and graphic are included in Appendix F. The CSM was developed in accordance with ADEC's *Guidance on Developing Conceptual Site Models* (ADEC, 2017).

The source and release mechanism for the contamination at the Arctic and Tudor site are leaks from the former jet fuel pipeline. Media impacted from this release include subsurface soils from 28 to 32 feet bgs, groundwater, and indoor air. Receptors that could potentially be affected by contamination at the site include residents, commercial or industrial workers, construction workers, site visitors, and trespassers.

Exposure pathways that are considered complete include ingestion of groundwater, inhalation of indoor air, and dermal exposure to contaminants in groundwater. Ingestion of groundwater is considered complete because ADEC has not determined that groundwater is not a reasonable future source for drinking water. A residential drinking water well exists at 4303 Cope Street. The sentinel monitoring well MW-200 has not shown any analytical exceedances in the past and the drinking water well is screened in a different/deeper aquifer. It is unlikely that the drinking water well is impacted by the groundwater contamination. Inhalation of indoor air is considered complete but insignificant. Buildings have the potential to be within 30 horizontal or vertical feet from impacted soils or groundwater. The soil/groundwater contamination located at a depth of 28 to 32 feet bgs below potential site buildings makes impacts to indoor air unlikely. Dermal exposure to contaminants in groundwater is considered complete but insignificant. Groundwater at the site exists at approximately 30 feet bgs and it is unlikely an excavation to 30 feet bgs would be created to allow dermal exposure to groundwater.

Incomplete pathways include incidental soil ingestion, dermal adsorption of contaminants from soil, ingestion of surface water, ingestion of wild and farmed foods, inhalation of outdoor air, inhalation of volatile compounds in tap water, inhalation of fugitive dust, and direct contact with sediment. The pathways of incidental soil ingestion, dermal adsorption of contaminants from soil, and inhalation of outdoor air are considered incomplete because no contaminated media exist from 0 to 15 feet bgs. Ingestion of wild and farmed foods is considered incomplete because no contaminants that were detected have the ability to bioaccumulate. Ingestion of surface water or sediment is considered incomplete because those media do not exist at the site. Inhalation of volatile compounds in tap water is considered incomplete because contaminated groundwater is not being used for household purposes. Inhalation of fugitive dust is considered incomplete because the first 2 centimeters of soil are not contaminated.

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6.0 CONCLUSIONS AND RECOMMENDATIONS

Ahtna performed field work at the Arctic and Tudor site to meet the project objectives. Ten soil borings were advanced to assess the impacts of the fuel pipeline leak on the subsurface soils. Seven soil borings were advanced to 15 feet bgs to assess the impacts to subsurface soils within the zone of likely exposure to receptors. Three soil borings were advanced to a depth of 35 feet bgs to assess soil contamination within the smear zone and at the groundwater interface. One additional soil boring was advanced for the installation of monitoring well MW-128, which is replacing the decommissioned monitoring well MW-122. A total of 18 primary and two duplicate analytical soil samples were collected during project activities.

6.1 Conclusions

Based on data collected from soil analytical sampling, contamination above the ADEC cleanup levels only exists in subsurface soils from approximately 28 to 32 feet bgs; these impacts are most likely associated with the groundwater smear zone. Soil borings SB-3 and SB-10 had analyte exceedances that exceeded the ADEC cleanup levels. No samples collected above 28 feet bgs had analyte concentrations that exceeded the ADEC cleanup levels. Contamination at this depth limits receptor exposure and it is unlikely that any site receptors will be exposed to contamination at this depth. Exposure pathways that remain complete include ingestion of groundwater, inhalation of indoor air, and dermal exposure to contaminants in ground water.

This assessment suggests that the focus of further site remediation should be directed towards remediation of groundwater. In addition, this work suggest that placement of trailers in this area would not pose a human health risk to residents occupying the trailers.

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7.0 REFERENCES

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TABLES

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Table 1: Project Cleanup Values
Supplemental Soil Characterization Report - Arctic Blvd. and Tudor Rd.
Anchorage, AK

Analyte	Laboratory Method	Soil Cleanup Level ¹ (mg/kg)
GRO	AK 101	300
DRO	AK 102	250
Benzene	VOC-F EPA Method 8260C	0.022
Toluene		6.7
Ethylbenzene		0.13
Total Xylenes		1.5
n-Butylbenzene		20
sec-Butylbenzene ²		28
tert-Butylbenzene ²		11
1,2-Dibromoethane ³		0.00024
1,2-Dichloroethane ³		0.0055
Isopropylbenzene (Cumene)		5.6
Methyl-t-butyl ether		0.4
Naphthalene		0.038
1,2,4-Trimethylbenzene		0.61
1,3,5-Trimethylbenzene		0.66
Acenaphthene		PAH EPA Method 8270D-SIM	37
Acenaphthylene	18	
Anthracene	390	
Benzo(a)anthracene	0.7	
Benzo(a)pyrene ²	1.5	
Benzo(b)fluoranthene ²	15	
Benzo(g,h,i)perylene ²	2300	
Benzo(k)fluoranthene ²	150	
Chrysene	600	
Dibenzo(a,h)anthracene ²	1.5	
Fluoranthene	590	
Fluorene	36	
Indeno(1,2,3-cd)pyrene ²	15	
Naphthalene	0.038	
Phenanthrene	39	
Pyrene	87	
1-Methylnaphthalene	0.41	
2-Methylnaphthalene	1.3	

Notes:

¹ = Values shown are the MTG clean up levels unless U40HH cleanup values are more conservative (denoted with ²)

² = Values shown are the U40HH cleanup values

³ = Lead scavengers not used in Jet fuel

DRO = Diesel Range Organics

GRO = Gasoline range organics

mg/kg = milligrams per kilogram

MTG = 18AAC75 Tables B1/B2 Method 2 Soil Cleanup Levels Migration to Groundwater, amended 06/2021

PAH = polycyclic aromatic hydrocarbons

SIM = Selected ion monitoring

U40HH = 18AAC75 Tables B1/B2 Method 2 Soil Cleanup Levels Human Health Under 40 Inch Zone, amended 06/2021

VOC-F = Fuel-related-volatile organic compounds

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Table 2: Analytical Sample Summary
Supplemental Soil Characterization Report - Arctic Blvd. and Tudor Rd.
Anchorage, AK

Sample ID	Sample Date	Sample Time	Location ID	Matrix	Depth (in feet bgs)	Containers	Sampler	QC Type (if applicable)	Analyses				SDG No.	Notes - Decision Unit, any changes to COC, etc
									GRO - AK101	DRO/RRO - AK102/103	PAH 8270-SIM	VOC-FR - 8260		
AT-21-SB-04-13	6/28/2021	10:18	SB-4	Soil	13-15	2	ME	Primary	X	X	X	X	1213875	
AT-21-SB-08-13	6/28/2021	11:00	SB-8	Soil	13-15	2	ME	Primary	X	X	X	X	1213875	
AT-21-SB-05-13	6/28/2021	11:28	SB-5	Soil	13-15	2	ME	Primary	X	X	X	X	1213875	
AT-21-SB-02-13	6/28/2021	12:05	SB-2	Soil	13-15	2	ME	Primary	X	X	X	X	1213875	
AT-21-SB-09-13	6/28/2021	13:45	SB-9	Soil	13-15	2	ME	Primary	X	X	X	X	1213875	
AT-21-SB-06-13	6/28/2021	14:30	SB-6	Soil	13-15	2	ME	Primary	X	X	X	X	1213875	
AT-21-SB-07-13	6/28/2021	15:05	SB-7	Soil	13-15	2	ME	Primary	X	X	X	X	1213875	
AT-21-SB-03-26	6/29/2021	15:55	SB-3	Soil	26-28	2	ME	Primary	X	X	X	X	1213875	
AT-21-SB-03-13	6/29/2021	16:15	SB-3	Soil	13-15	2	ME	Primary	X	X	X	X	1213875	
AT-21-SB-03-30	6/29/2021	16:20	SB-3	Soil	30-32	2	ME	Primary	X	X	X	X	1213875	
AT-21-SB-15-30	6/29/2021	16:25	SB-3	Soil	30-32	2	ME	Duplicate	X	X	X	X	1213875	Duplicate of AT-21-SB-03-30
AT-21-SB-MW128-31	6/30/2021	9:50	MW-128	Soil	31-33	2	ME	Primary	X	X	X	X	1213875	
AT-21-SB-MW128-13	6/30/2021	10:05	MW-128	Soil	13-15	2	ME	Primary	X	X	X	X	1213875	
AT-21-SB-01-31	6/30/2021	13:50	SB-1	Soil	31-33	2	ME	Primary	X	X	X	X	1213875	
AT-21-SB-01-22	6/30/2021	13:55	SB-1	Soil	22-24	2	ME	Primary	X	X	X	X	1213875	
AT-21-SB-01-13	6/30/2021	14:00	SB-1	Soil	13-15	2	ME	Primary	X	X	X	X	1213875	
AT-21-SB-10-18	6/30/2021	14:55	SB-10	Soil	18-20	2	ME	Primary	X	X	X	X	1213875	
AT-21-SB-10-31	6/30/2021	15:15	SB-10	Soil	31-33	2	ME	Primary	X	X	X	X	1213875	
AT-21-SB-10-28	6/30/2021	15:20	SB-10	Soil	28-30	2	ME	Primary	X	X	X	X	1213875	
AT-21-SB-16-28	6/30/2021	15:25	SB-10	Soil	28-30	2	ME	Duplicate	X	X	X	X	1213875	Duplicate of AT-21-SB-16-28
AT-21-TB-01	6/28/2021	8:00	N/A	Soil	N/A	1	ME	Field QC	X			X	1213875	Trip Blank

Key:
COC = chain of custody
DRO = diesel-range organics
ft bgs - feet below ground surface
GRO = gasoline-range organics
ID = identifier
ME = Mike Ebert
PAH =
N/A = not applicable
QC = quality control
RRO = residual-range organics
SDG No. = Sample Delivery Group number
TB = trip blank
VOC-F = fuel related volatile organic compounds

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Table 3: PID Screening Summary
Supplemental Soil Characterization Report - Arctic Blvd. and Tudor Rd.
Anchorage, AK

Soil Boring	Depth Range (feet bgs)	PID Result (ppmV)	Comments
SB-1	0-35	0	No results above background
SB-2	0-15	0	No results above background
SB-3	0-28	0	No results above background
	28-29	0.5	
	29-30	2	
	30-31	515	
	31-32	313	
	32-33	478	
	33-34	457	
	34-35	254	
SB-4	0-15	0	No results above background
SB-5	0-15	0	No results above background
SB-6	0-1	4.8	Small piece of wood caused this reading, not related to fuel contamination
	1-15	0	No results above background
SB-7	0-15	0	No results above background
SB-8	0-15	0	No results above background
SB-9	0-15	0	No results above background
SB-10	0-18	0	No results above background
	19-20	6	
	20-21	30.2	
	21-22	142	
	22-23	230	
	23-24	115	
	24-25	36	
	25-26	18	
	26-27	85	
	27-28	115	
	28-29	542	
	29-30	122	
	30-31	4.1	
	31-32	2.8	
	32-33	1.1	
33-34	0.7		
34-35	0.7		
MW-128	0-38	0	No results above background

Notes:

bgs = below ground surface

mg/kg = milligrams per kilogram

PID = photionization detector

ppmV = parts per million, Volumetric

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Table 4: GRO and VOC-F Soil Analytical Results
Supplemental Soil Characterization Report - Arctic Blvd. and Tudor Rd.
Anchorage, AK

Date	6/28/2021		6/28/2021		6/28/2021		6/28/2021		6/28/2021		6/28/2021		6/30/2021		6/30/2021		6/30/2021	
	Time	1205	1018	1128	1430	1505	1100	1345	1400	1355	1350							
Sample ID	AT-21-SB-02-13	AT-21-SB-04-13	AT-21-SB-05-13	AT-21-SB-06-13	AT-21-SB-07-13	AT-21-SB-08-13	AT-21-SB-09-13	AT-21-SB-01-13	AT-21-SB-01-22	AT-21-SB-01-31								
Location ID	SB-2	SB-4	SB-5	SB-6	SB-7	SB-8	SB-9	SB-1	SB-1	SB-1								
Sample QC Type	--	--	--	--	--	--	--	--	--	--								
Sample Characterization Type	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Characterization	GW Interface							
Depth	13-15' bgs	13-15' bgs	13-15' bgs	13-15' bgs	13-15' bgs	13-15' bgs	13-15' bgs	13-15' bgs	13-15' bgs	22-24' bgs	31-33' bgs							
Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil							
Method	Analyte	CUL ¹	Unit	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
AK101	Gas Range Organics	300	mg/kg	2.30 B	2.06 B	1.95 B	1.88 B	1.32 B	2.01 B	1.93 B	1.63 B	1.82 B	1.90 B					
VOC-F SW8260D	1,2,4-Trimethylbenzene	0.61	mg/kg	ND (0.0520)	ND (0.0505)	ND (0.0459)	ND (0.0459)	ND (0.0363)	ND (0.0488)	ND (0.0465)	ND (0.0442)	ND (0.0392)	ND (0.0449)					
	1,2-Dibromoethane	0.00024	mg/kg	ND (0.00103)	ND (0.00101)	ND (0.000920)	ND (0.000915)	ND (0.000725)	ND (0.000975)	ND (0.000930)	ND (0.000885)	ND (0.000785)	ND (0.000895)					
	1,2-Dichloroethane	0.0055	mg/kg	ND (0.00208)	ND (0.00202)	ND (0.00184)	ND (0.00184)	ND (0.00146)	ND (0.00195)	ND (0.00186)	ND (0.00177)	ND (0.00156)	ND (0.00179)					
	1,3,5-Trimethylbenzene	0.66	mg/kg	ND (0.0259)	ND (0.0253)	ND (0.0229)	ND (0.0229)	ND (0.0181)	ND (0.0244)	ND (0.0233)	ND (0.0221)	ND (0.0196)	ND (0.0224)					
	Benzene	0.022	mg/kg	ND (0.0129)	ND (0.0126)	ND (0.0114)	ND (0.0114)	ND (0.00910)	ND (0.0122)	ND (0.0116)	ND (0.0111)	ND (0.00980)	ND (0.0112)					
	Cumene	5.6	mg/kg	ND (0.0259)	ND (0.0253)	ND (0.0229)	ND (0.0229)	ND (0.0181)	ND (0.0244)	ND (0.0233)	ND (0.0221)	ND (0.0196)	ND (0.0224)					
	Ethylbenzene	0.13	mg/kg	ND (0.0259)	ND (0.0253)	ND (0.0229)	ND (0.0229)	ND (0.0181)	ND (0.0244)	ND (0.0233)	ND (0.0221)	ND (0.0196)	ND (0.0224)					
	Methyl-tert-butyl ether	0.4	mg/kg	ND (0.104)	ND (0.101)	ND (0.0920)	ND (0.0915)	ND (0.0725)	ND (0.0975)	ND (0.0930)	ND (0.0885)	ND (0.0785)	ND (0.0895)					
	Naphthalene	0.038	mg/kg	ND (0.0259)	ND (0.0253)	ND (0.0229)	ND (0.0229)	ND (0.0181)	ND (0.0244)	ND (0.0233)	ND (0.0221)	ND (0.0196)	ND (0.0224)					
	n-Butylbenzene	20	mg/kg	ND (0.0259)	ND (0.0253)	ND (0.0229)	ND (0.0229)	ND (0.0181)	ND (0.0244)	ND (0.0233)	ND (0.0221)	ND (0.0196)	ND (0.0224)					
	sec-Butylbenzene	28	mg/kg	ND (0.0259)	ND (0.0253)	ND (0.0229)	ND (0.0229)	ND (0.0181)	ND (0.0244)	ND (0.0233)	ND (0.0221)	ND (0.0196)	ND (0.0224)					
	tert-Butylbenzene	11	mg/kg	ND (0.0259)	ND (0.0253)	ND (0.0229)	ND (0.0229)	ND (0.0181)	ND (0.0244)	ND (0.0233)	ND (0.0221)	ND (0.0196)	ND (0.0224)					
Toluene	6.7	mg/kg	ND (0.0259)	ND (0.0253)	ND (0.0229)	ND (0.0229)	ND (0.0181)	ND (0.0244)	ND (0.0233)	ND (0.0221)	ND (0.0196)	ND (0.0224)						
Xylenes	1.5	mg/kg	ND (0.0780)	ND (0.0755)	ND (0.0690)	ND (0.0690)	ND (0.0545)	ND (0.0730)	ND (0.0695)	ND (0.0665)	ND (0.0590)	ND (0.0675)						
Date	6/29/2021	6/29/2021	6/29/2021	6/29/2021	6/30/2021	6/30/2021	6/30/2021	6/30/2021	6/30/2021	6/30/2021	6/30/2021	6/30/2021	6/28/2021					
Time	1615	1555	1620	1625	1455	1520	1525	1515	1005	0950	0800							
Sample ID	AT-21-SB-03-13	AT-21-SB-03-26	AT-21-SB-03-30	AT-21-SB-15-30	AT-21-SB-10-18	AT-21-SB-10-28	AT-21-SB-16-28	AT-21-SB-10-31	AT-21-SB-MW128-13	AT-21-SB-MW128-31	AT-21-TB-01							
Location ID	SB-3	SB-3	SB-3	SB-3	SB-10	SB-10	SB-10	SB-10	MW-128	MW-128	--							
Sample QC Type	--	--	Primary	Field Duplicate of AT-21-SB-03-30	--	Primary	Field Duplicate of AT-21-SB-10-28	--	--	--	Trip Blank							
Sample Type	Shallow	Vertical	GW Interface	GW Interface	Vertical	Highest PID	Highest PID	GW Interface	Shallow	GW Interface	--							
Depth	13-15' bgs	26-28' bgs	30-32' bgs	30-32' bgs	18-20' bgs	28-30' bgs	28-30' bgs	31-33' bgs	13-15' bgs	31-33' bgs	--							
Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil							
Method	Analyte	CUL ¹	Unit	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
AK101	Gas Range Organics	300	mg/kg	1.74 B	1.48 B	373	473	1.60 B	72.5	96.4	3.97 B	3.03 B	1.87 B	1.42 B				
VOC-F SW8260D	1,2,4-Trimethylbenzene	0.61	mg/kg	ND (0.0448)	0.0204	55.5	39.1	ND (0.0420)	0.0913	0.0691	0.325	ND (0.0535)	ND (0.0423)	ND (0.0260)				
	1,2-Dibromoethane	0.00024	mg/kg	ND (0.000895)	ND (0.000610)	ND (0.0178)	ND (0.00700)	ND (0.000840)	ND (0.000995)	ND (0.000865)	ND (0.000655)	ND (0.00107)	ND (0.000845)	ND (0.000520)				
	1,2-Dichloroethane	0.0055	mg/kg	ND (0.00179)	ND (0.00122)	ND (0.0356)	ND (0.0140)	ND (0.00168)	ND (0.00199)	ND (0.00173)	ND (0.00130)	ND (0.00214)	ND (0.00169)	ND (0.0104)				
	1,3,5-Trimethylbenzene	0.66	mg/kg	ND (0.0224)	0.0104	20.4 QN	12.2 QN	ND (0.0210)	0.0501	0.0324	0.124	ND (0.0268)	ND (0.0211)	ND (0.0130)				
	Benzene	0.022	mg/kg	ND (0.0112)	ND (0.00760)	ND (0.223)	ND (0.0875)	ND (0.0105)	ND (0.0124)	ND (0.0108)	0.0732	ND (0.0134)	ND (0.0106)	ND (0.00650)				
	Cumene	5.6	mg/kg	ND (0.0224)	ND (0.0152)	4.12	2.87	ND (0.0210)	0.0268	0.0177	0.0389	ND (0.0268)	ND (0.0211)	ND (0.0130)				
	Ethylbenzene	0.13	mg/kg	ND (0.0224)	ND (0.0152)	3.63	2.96	ND (0.0210)	0.0323	0.0251	0.122	ND (0.0268)	ND (0.0211)	ND (0.0130)				
	Methyl-tert-butyl ether	0.4	mg/kg	ND (0.0895)	ND (0.0610)	ND (1.78)	ND (0.7)	ND (0.0840)	ND (0.0995)	ND (0.0865)	ND (0.0655)	ND (0.107)	ND (0.0845)	ND (0.0520)				
	Naphthalene	0.038	mg/kg	ND (0.0224)	ND (0.0152)	15.3	14.7	ND (0.0210)	0.107	0.0907	0.124	ND (0.0268)	ND (0.0211)	ND (0.0130)				
	n-Butylbenzene	20	mg/kg	ND (0.0224)	ND (0.0152)	ND (0.445)	ND (0.175)	ND (0.0210)	ND (0.0248)	ND (0.0216)	ND (0.0164)	ND (0.0268)	ND (0.0211)	ND (0.0130)				
	sec-Butylbenzene	28	mg/kg	ND (0.0224)	ND (0.0152)	5.44 QN	3.01 QN	ND (0.0210)	0.14	0.135	ND (0.0164)	ND (0.0268)	ND (0.0211)	ND (0.0130)				
	tert-Butylbenzene	11	mg/kg	ND (0.0224)	ND (0.0152)	0.694 QN	0.347 QN	ND (0.0210)	ND (0.0248)	0.0479	ND (0.0164)	ND (0.0268)	ND (0.0211)	ND (0.0130)				
Toluene	6.7	mg/kg	ND (0.0224)	ND (0.0152)	ND (0.445)	0.179	ND (0.0210)	0.0467	0.0393	0.167	ND (0.0268)	ND (0.0211)	ND (0.0130)					
Xylenes	1.5	mg/kg	ND (0.0670)	0.0338	23	18.6	ND (0.0630)	0.256	0.199	1.04	ND (0.0800)	ND (0.0635)	ND (0.0390)					

Notes:

¹ = Values shown are the most stringent of the MTG and U40HH cleanup values

Bold = Analyte detected

Bold = Detected result exceeds the most stringent of the MTG and U40HH cleanup values

Bold = Non-detect result exceeds the most stringent of the MTG and U40HH cleanup values

MTG = 18AAC75 Tables B1/B2 Method 2 Soil Cleanup Levels Migration to Groundwater, amended 06/2021

U40HH = 18AAC75 Tables B1/B2 Method 2 Soil Cleanup Levels Human Health Under 40 Inch Zone, amended 06/2021

¹ bgs = feet below ground surface

B = analytes qualified as estimated due to method blank and trip blank contamination

GW = groundwater

mg/kg = milligrams per kilogram

ND = not detected, reporting limit shown in parentheses

VOC-F = Fuel-related-volatile organic compounds

QN = analyte qualified as estimated with unknown bias due to duplicate precision

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Table 5: DRO and PAH Soil Analytical Results
Supplemental Soil Characterization Report - Arctic Blvd. and Tudor Rd.
Anchorage, AK

Method	Analyte	CUL ¹	Unit	Date	6/28/2021	6/28/2021	6/28/2021	6/28/2021	6/28/2021	6/28/2021	6/28/2021	6/30/2021	6/30/2021	6/30/2021
				Time	1205	1018	1128	1430	1505	1100	1345	1400	1355	1350
Sample ID				AT-21-SB-02-13	AT-21-SB-04-13	AT-21-SB-05-13	AT-21-SB-06-13	AT-21-SB-07-13	AT-21-SB-08-13	AT-21-SB-09-13	AT-21-SB-01-13	AT-21-SB-01-22	AT-21-SB-01-31	
Location ID				SB-2	SB-4	SB-5	SB-6	SB-7	SB-8	SB-9	SB-1	SB-1	SB-1	
Sample QC Type				--	--	--	--	--	--	--	--	--	--	
Sample Characterization Type				Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Characterization	GW Interface	
Depth				13-15' bgs	13-15' bgs	13-15' bgs	13-15' bgs	13-15' bgs	13-15' bgs	13-15' bgs	13-15' bgs	22-24' bgs	31-33' bgs	
Matrix				Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	
Method	Analyte	CUL ¹	Unit	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
AK102	Diesel Range Organics	250	mg/kg	ND (13.1)	9.01	ND (12.7)	ND (13.1)	8.34	ND (12.9)	8.04	13.8	12.7	14.0	
SW8270D-SIM PAH	1-Methylnaphthalene	0.41	mg/kg	ND (0.0161)	ND (0.0161)	ND (0.0159)	ND (0.0164)	ND (0.0153)	ND (0.0159)	ND (0.0161)	ND (0.0162)	ND (0.0130)	ND (0.0148)	
	2-Methylnaphthalene	1.3	mg/kg	ND (0.0161)	ND (0.0161)	ND (0.0159)	ND (0.0164)	ND (0.0153)	ND (0.0159)	ND (0.0161)	ND (0.0162)	ND (0.0130)	ND (0.0148)	
	Acenaphthene	37	mg/kg	ND (0.0161)	ND (0.0161)	ND (0.0159)	ND (0.0164)	ND (0.0153)	ND (0.0159)	ND (0.0161)	ND (0.0162)	ND (0.0130)	ND (0.0148)	
	Acenaphthylene	18	mg/kg	ND (0.0161)	ND (0.0161)	ND (0.0159)	ND (0.0164)	ND (0.0153)	ND (0.0159)	ND (0.0161)	ND (0.0162)	ND (0.0130)	ND (0.0148)	
	Anthracene	390	mg/kg	ND (0.0161)	ND (0.0161)	ND (0.0159)	ND (0.0164)	ND (0.0153)	ND (0.0159)	ND (0.0161)	ND (0.0162)	ND (0.0130)	ND (0.0148)	
	Benz[a]anthracene	0.7	mg/kg	ND (0.0161)	ND (0.0161)	ND (0.0159)	ND (0.0164)	ND (0.0153)	ND (0.0159)	ND (0.0161)	ND (0.0162)	ND (0.0130)	ND (0.0148)	
	Benzo[a]pyrene	1.5	mg/kg	ND (0.0161)	ND (0.0161)	ND (0.0159)	ND (0.0164)	ND (0.0153)	ND (0.0159)	ND (0.0161)	ND (0.0162)	ND (0.0130)	ND (0.0148)	
	Benzo(b)fluoranthene	15	mg/kg	ND (0.0161)	ND (0.0161)	ND (0.0159)	ND (0.0164)	ND (0.0153)	ND (0.0159)	ND (0.0161)	ND (0.0162)	ND (0.0130)	ND (0.0148)	
	Benzo[g,h,i]perylene	2300	mg/kg	ND (0.0161)	ND (0.0161)	ND (0.0159)	ND (0.0164)	ND (0.0153)	ND (0.0159)	ND (0.0161)	ND (0.0162)	ND (0.0130)	ND (0.0148)	
	Chrysene	600	mg/kg	ND (0.0161)	ND (0.0161)	ND (0.0159)	ND (0.0164)	ND (0.0153)	ND (0.0159)	ND (0.0161)	ND (0.0162)	ND (0.0130)	ND (0.0148)	
	Fluoranthene	590	mg/kg	ND (0.0161)	ND (0.0161)	ND (0.0159)	ND (0.0164)	ND (0.0153)	ND (0.0159)	ND (0.0161)	ND (0.0162)	ND (0.0130)	ND (0.0148)	
	Fluorene	36	mg/kg	ND (0.0161)	ND (0.0161)	ND (0.0159)	ND (0.0164)	ND (0.0153)	ND (0.0159)	ND (0.0161)	ND (0.0162)	ND (0.0130)	ND (0.0148)	
	Indeno(1,2,3-cd)pyrene	15	mg/kg	ND (0.0161)	ND (0.0161)	ND (0.0159)	ND (0.0164)	ND (0.0153)	ND (0.0159)	ND (0.0161)	ND (0.0162)	ND (0.0130)	ND (0.0148)	
	Naphthalene	0.038	mg/kg	ND (0.0129)	ND (0.0129)	ND (0.0127)	ND (0.0132)	ND (0.0122)	ND (0.0127)	ND (0.0129)	ND (0.0129)	ND (0.0104)	ND (0.0118)	
Phenanthrene	39	mg/kg	ND (0.0161)	ND (0.0161)	ND (0.0159)	ND (0.0164)	ND (0.0153)	ND (0.0159)	ND (0.0161)	ND (0.0162)	ND (0.0130)	ND (0.0148)		
Pyrene	87	mg/kg	ND (0.0161)	ND (0.0161)	ND (0.0159)	ND (0.0164)	ND (0.0153)	ND (0.0159)	ND (0.0161)	ND (0.0162)	ND (0.0130)	ND (0.0148)		
Method	Analyte	CUL ¹	Unit	Date	6/29/2021	6/29/2021	6/29/2021	6/29/2021	6/30/2021	6/30/2021	6/30/2021	6/30/2021	6/30/2021	6/30/2021
Sample ID				AT-21-SB-03-13	AT-21-SB-03-26	AT-21-SB-03-30	AT-21-SB-15-30	AT-21-SB-10-18	AT-21-SB-10-28	AT-21-SB-16-28	AT-21-SB-10-31	AT-21-SB-MW128-13	AT-21-SB-MW128-31	
Location ID				SB-3	SB-3	SB-3	SB-3	SB-10	SB-10	SB-10	SB-10	MW-128	MW-128	
Sample QC Type				--	--	Primary	Field Duplicate of AT-21-SB-03-30	--	Primary	Field Duplicate of AT-21-SB-10-28	--	--	--	
Sample Type				Shallow	Vertical	GW Interface	GW Interface	Vertical	Highest PID	Highest PID	GW Interface	Shallow	GW Interface	
Depth				13-15' bgs	26-28' bgs	30-32' bgs	30-32' bgs	18-20' bgs	28-30' bgs	28-30' bgs	31-33' bgs	13-15' bgs	31-33' bgs	
Matrix				Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	
Method	Analyte	CUL ¹	Unit	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
AK102	Diesel Range Organics	250	mg/kg	ND (12.3)	6.56	10500	10300	13.5	4960	7020	31.2	11.5	9.67	
SW8270D-SIM PAH	1-Methylnaphthalene	0.41	mg/kg	ND (0.0154)	ND (0.0132)	12.6	10.8	ND (0.0156)	ND (0.141)	ND (0.283)	ND (0.0150)	ND (0.0164)	ND (0.0151)	
	2-Methylnaphthalene	1.3	mg/kg	ND (0.0154)	ND (0.0132)	15.1	12.4	ND (0.0156)	ND (0.141)	ND (0.283)	0.0156	ND (0.0164)	ND (0.0151)	
	Acenaphthene	37	mg/kg	ND (0.0154)	ND (0.0132)	ND (0.75)	ND (0.755)	ND (0.0156)	ND (0.141)	ND (0.283)	ND (0.0150)	ND (0.0164)	ND (0.0151)	
	Acenaphthylene	18	mg/kg	ND (0.0154)	ND (0.0132)	ND (0.75)	ND (0.755)	ND (0.0156)	ND (0.141)	ND (0.283)	ND (0.0150)	ND (0.0164)	ND (0.0151)	
	Anthracene	390	mg/kg	ND (0.0154)	ND (0.0132)	ND (0.75)	ND (0.755)	ND (0.0156)	ND (0.141)	ND (0.283)	ND (0.0150)	ND (0.0164)	ND (0.0151)	
	Benz[a]anthracene	0.7	mg/kg	ND (0.0154)	ND (0.0132)	ND (0.75)	ND (0.755)	ND (0.0156)	ND (0.141)	ND (0.283)	ND (0.0150)	ND (0.0164)	ND (0.0151)	
	Benzo(b)fluoranthene	15	mg/kg	ND (0.0154)	ND (0.0132)	ND (0.75)	ND (0.755)	ND (0.0156)	ND (0.141)	ND (0.283)	ND (0.0150)	ND (0.0164)	ND (0.0151)	
	Benzo(k)fluoranthene	150	mg/kg	ND (0.0154)	ND (0.0132)	ND (0.75)	ND (0.755)	ND (0.0156)	ND (0.141)	ND (0.283)	ND (0.0150)	ND (0.0164)	ND (0.0151)	
	Chrysene	600	mg/kg	ND (0.0154)	ND (0.0132)	ND (0.75)	ND (0.755)	ND (0.0156)	ND (0.141)	ND (0.283)	ND (0.0150)	ND (0.0164)	ND (0.0151)	
	Dibenz[a,h]anthracene	1.5	mg/kg	ND (0.0154)	ND (0.0132)	ND (0.75)	ND (0.755)	ND (0.0156)	ND (0.141)	ND (0.283)	ND (0.0150)	ND (0.0164)	ND (0.0151)	
	Fluoranthene	590	mg/kg	ND (0.0154)	ND (0.0132)	ND (0.75)	ND (0.755)	ND (0.0156)	ND (0.141)	ND (0.283)	ND (0.0150)	ND (0.0164)	ND (0.0151)	
	Fluorene	36	mg/kg	ND (0.0154)	ND (0.0132)	0.577	0.517	ND (0.0156)	ND (0.141)	ND (0.283)	ND (0.0150)	ND (0.0164)	ND (0.0151)	
	Indeno(1,2,3-cd)pyrene	15	mg/kg	ND (0.0154)	ND (0.0132)	ND (0.75)	ND (0.755)	ND (0.0156)	ND (0.141)	ND (0.283)	ND (0.0150)	ND (0.0164)	ND (0.0151)	
	Naphthalene	0.038	mg/kg	ND (0.0123)	ND (0.0106)	10.7	9.24	ND (0.0125)	ND (0.113)	ND (0.227)	ND (0.0120)	ND (0.0131)	ND (0.0121)	
Phenanthrene	39	mg/kg	ND (0.0154)	ND (0.0132)	ND (0.75)	ND (0.755)	ND (0.0156)	ND (0.141)	ND (0.283)	0.0207	ND (0.0164)	ND (0.0151)		
Pyrene	87	mg/kg	ND (0.0154)	ND (0.0132)	ND (0.75)	ND (0.755)	ND (0.0156)	ND (0.141)	ND (0.283)	ND (0.0150)	ND (0.0164)	ND (0.0151)		

Notes:

¹ = Values shown are the most stringent of the MTG and U40HH cleanup values

Bold = Analyte detected

Bold = Detected result exceeds the most stringent of the MTG and U40HH cleanup values

Bold = Non-detected result exceeds the most stringent of the MTG and U40HH cleanup values

MTG = 18AAC75 Tables B1/B2 Method 2 Soil Cleanup Levels Migration to Groundwater, amended 06/2021

U40HH = 18AAC75 Tables B1/B2 Method 2 Soil Cleanup Levels Human Health Under 40 Inch Zone, amended 06/2021

' bgs = feet below ground surface

GW = groundwater

mg/kg = milligrams per kilogram

ND = not detected, reporting limit shown in parentheses

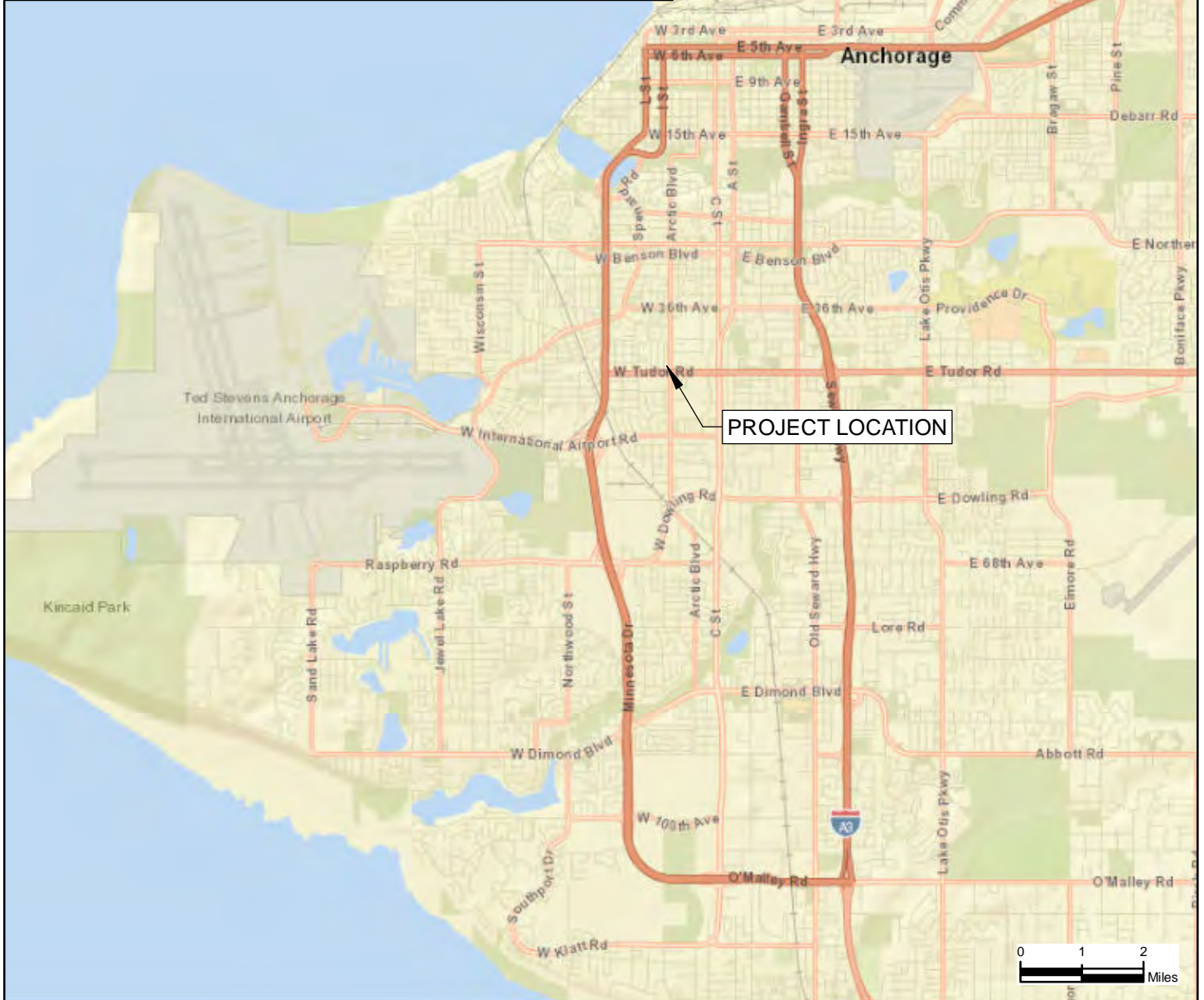
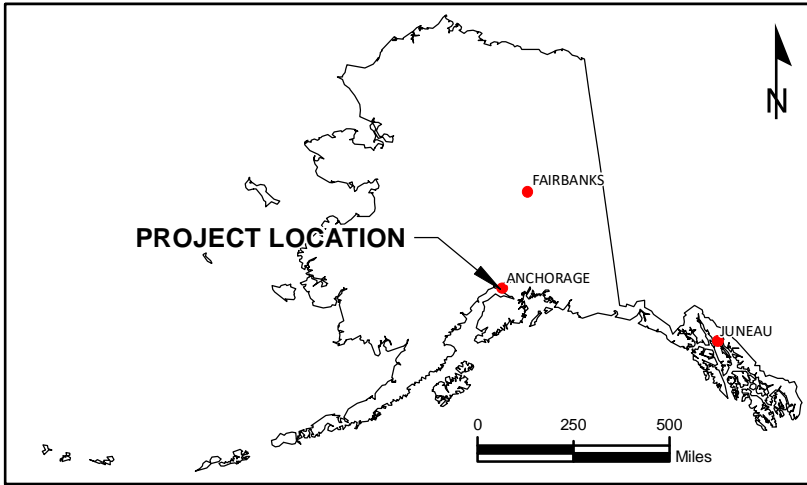
PAH = polycyclic aromatic hydrocarbons

SIM = selected ion monitoring

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FIGURES

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AFSC CROSTOWN PIPELINE, ARCTIC AND TUDOR



State and Site Vicinity

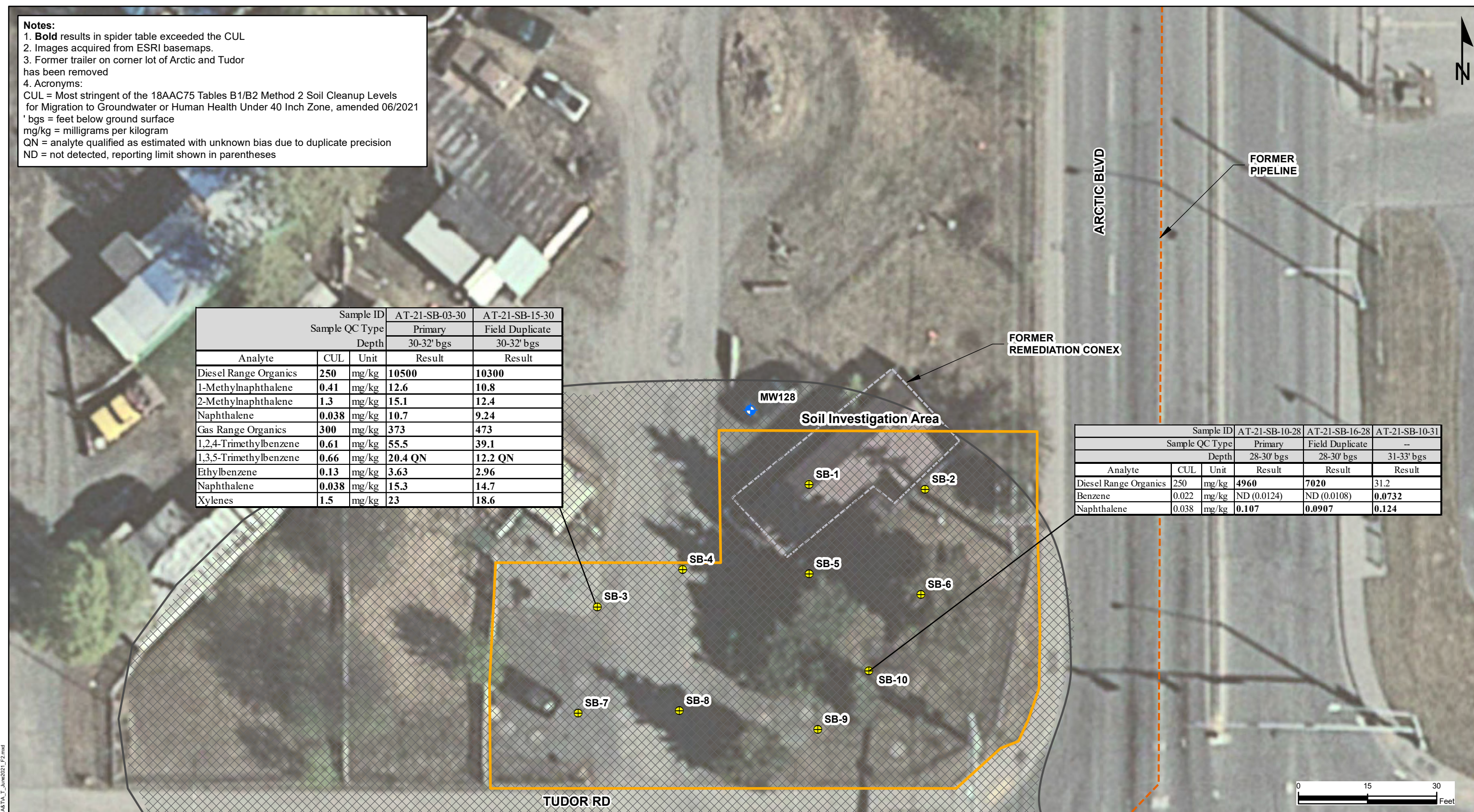
Project Number: 20204.063	Figure Number: 1
Date: 9/23/2021	
Drafted By: R.H.	

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Notes:
 1. **Bold** results in spider table exceeded the CUL
 2. Images acquired from ESRI basemaps.
 3. Former trailer on corner lot of Arctic and Tudor has been removed
 4. Acronyms:
 CUL = Most stringent of the 18AAC75 Tables B1/B2 Method 2 Soil Cleanup Levels for Migration to Groundwater or Human Health Under 40 Inch Zone, amended 06/2021
 ' bgs = feet below ground surface
 mg/kg = milligrams per kilogram
 QN = analyte qualified as estimated with unknown bias due to duplicate precision
 ND = not detected, reporting limit shown in parentheses

Analyte	CUL	Unit	Sample ID	AT-21-SB-03-30	AT-21-SB-15-30
			Sample QC Type	Primary	Field Duplicate
			Depth	30-32' bgs	30-32' bgs
Diesel Range Organics	250	mg/kg		10500	10300
1-Methylnaphthalene	0.41	mg/kg		12.6	10.8
2-Methylnaphthalene	1.3	mg/kg		15.1	12.4
Naphthalene	0.038	mg/kg		10.7	9.24
Gas Range Organics	300	mg/kg		373	473
1,2,4-Trimethylbenzene	0.61	mg/kg		55.5	39.1
1,3,5-Trimethylbenzene	0.66	mg/kg		20.4 QN	12.2 QN
Ethylbenzene	0.13	mg/kg		3.63	2.96
Naphthalene	0.038	mg/kg		15.3	14.7
Xylenes	1.5	mg/kg		23	18.6

Analyte	CUL	Unit	Sample ID	AT-21-SB-10-28	AT-21-SB-16-28	AT-21-SB-10-31
			Sample QC Type	Primary	Field Duplicate	--
			Depth	28-30' bgs	28-30' bgs	31-33' bgs
Diesel Range Organics	250	mg/kg		4960	7020	31.2
Benzene	0.022	mg/kg		ND (0.0124)	ND (0.0108)	0.0732
Naphthalene	0.038	mg/kg		0.107	0.0907	0.124

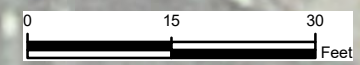


LEGEND

Soil Borings Collected 2021	Dissolved Phase DRO Plume
Monitoring Well 2021	Soil Investigation Area
Former Pipeline	Former Remediation Conex Footprint
Dissolved Phase DRO extent	

AFSC CROSTOWN PIPELINE, ARCTIC AND TUDOR

Soil Boring Locations and Analytical Exceedances



Project Number:
20204.055
Date:
11/26/2021
Drafted By:
VZ

Figure Number:
2

Document Path: L:\Ahtna\Projects\AFSC\Crosstown Pipeline\Arctic and Tudor\Map\Map_2021_11_26.mxd

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Notes:
 1. All locations are approximate.
 2. Images acquired from ESRI basemaps.
 3. Former trailer on corner lot of Arctic and Tudor has been removed



LEGEND	
	Newly Installed Monitoring Well
	In-Place Recovery Well
	Decommissioned Recovery Well
	Former Pipeline
	Dissolved Phase DRO extent
	Dissolved Phase DRO Plume
	Soil Investigation Area
	Former Remediation Conex Footprint

AFSC CROSSTOWN PIPELINE, ARCTIC AND TUDOR

Monitoring and Recovery Well Locations



Project Number:
20204.055
 Date:
11/26/2021
 Drafted By:
VZ

Figure Number:
3

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APPENDIX A

FIELD NOTES AND NON-HAZARDOUS WASTE DISPOSAL FORM

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18 M. Ebert
Blount

A+T Soil

6/28/21

- 830 Arrive on site and meet w/ Gen
Discovery Drillers Derek and Troy
and Menzies Client Laurita
- 900 Hold safety meeting
- 910 Walk site and stake out locations
- 930 Calibrate PID
Zero cal - 0.0 PPM
Span cal - 100.0
- 935 Start drilling at SB-4. SB-4 AND
SB-8 WILL BE DRILLED FIRST AS
THEY ARE IN THE PARK'S TRAFFIC LANE.
- 0950 M. EBERT BEGINS FIELD SCREENING
SB-4
- 1004 START DRILLING AT SB-8, 15'
BORING WILL BE PRIORITY TODAY AS
DISCOVERY DRILLING IS AWAITING SUPPLIES
- 1005 DEREK DELL OF DISCOVERY TELLS FIELD
TEAM THAT GEOPROBE CAPABLE OF
INSTALLING THE WELL WILL NOT BE
AVAILABLE TUESDAY. LURIE BUTLER
WAS ON SITE AND COORDINATED FOR
CARS PARKED AT SB-3, SB-7 TO BE
MOVED ON WEDNESDAY
- 1018 COLLECT SAMPLE AT-21-SB-04-13 FROM
INTERVAL 13-15', AS THERE WERE NO VOLATILES
READ ON PID

M. EBERT
& LENHART

A+T SOIL

6/28/21
19

- 1018 CONT SAMPLE COLLECTED FOR VOC, GEO, DRO, PAN
THIS ANALYTICAL SUITE WILL BE TYPICAL
FOR REMAINDER OF FIELD EVENT.
- 1020 PHONE CALL W/ NINO MUNIZ CONFIRMS THAT
IF NOT VOLATILES ARE ENCOUNTERED, SAMPLE
WILL BE COLLECTED FROM BOTTOM OF BORING
- 1030 M. EBERT BEGINS SCREENING SB-8 W/
PID.
- 1045 BEGIN DRILLING AT SB-5
- 1100 COLLECT SAMPLE AT-21-SB-08-13
AT SB-8 FROM 13-15' AS NO VOLATILES
WERE READ ON PID FIELD SCREEN.
- 1110 M. EBERT BEGINS PID FIELD SCREENING SB-5
BORINGS
- 1115 BEGIN DRILLING AT SB-2
- 1128 COLLECT SAMPLE AT-21-SB-05-13
AT SB-5 FROM 13-15' AS NO VOLATILES
WERE READ ON PID FIELD SCREENING
- 1130 IT SHOULD BE NOTED THAT ALL SOIL
DESCRIPTIONS AT ALL BORING LOCATIONS
ARE PROVIDED IN SEPERATE BORING LOG
FORMS.
- 1135 M. EBERT BEGINS FIELD SCREENING
SB-2 BORINGS
- 1140 DRILLERS DEPART FOR LUNCH BREAK

R. P.

20 M EBERT
B LENHART

A+T SOIL

6/28/21

- 1205 COLLECT SAMPLE AT-21-SB-02-13
AT SB-2 FROM 13-15' AS NO VOLATILES
WERE READ ON PID FIELD SCREEN.
- 1240 CONFIRM W/ NING MONIZ THAT SB-10
WILL BE MOVED NORTH ~10-12' TO AVOID
UTILITIES
- 1245 BREAK FOR LUNCH
- 1305 RETURN TO SITE, DISCOVERY DRILLING
DELIVERING MINI EXCAVATOR TO BE USED
IN WELL DECOMMISSIONING
- 1320 BEGIN DRILLING AT SB-9
- 1325 M EBERT BEGINS FIELD SCREENING
SB-9 BORINGS
- 1345 COLLECT SAMPLE AT-21-SB-09-13
AT SB-9 FROM 13-15' AS NO VOLATILES
WERE READ ON PID FIELD SCREEN.
- 1350 BEGIN DRILLING AT SB-6
- 1357 M EBERT BEGINS FIELD SCREENING
SB-6 SOIL BORINGS
- 1400 BLENHART STAKES OUT SB-7 LOCATION
- 1405 MEBERT DETECTS 4.8 PPM IN THE 0-2'
INTERVAL, SAMPLE AT-21-SB-06-00
WAS COLLECTED PENDING SUBMISSION, UPON
SAMPLING, WOOD DEBRIS WAS FOUND THAT
READ ~16 PPM ON THE PID

M EBERT
B LENHART

A+T SOIL

6/28/21 21

- 1430 COLLECT SAMPLE AT-21-SB-06-13
AT SB-6 FROM 13-15' AS THE
SHALLOW PID DETECTION WAS SUSPECTED
TO BE NON-POL RELATED AND NO OTHER
VOLATILES WERE DETECTED.
- 1435 BEGIN DRILLING AT SB-7.
- 1445 BLENHART COLLECTS BORING LOCATIONS
ON ARC COLLECTOR USING EOS ARROW
100 GPS.
- 1505 COLLECT SAMPLE AT-21-SB-07-13
AT SB-7 FROM 13-15' AS NO VOLATILES
WERE READ ON PID FIELD SCREEN.
- 1525 DISCOVERY DRILLING PACE CLEAR AND
LOADS EQUIPMENT AS DIFFERENT PIG
WILL BE USED ON SITE TOMORROW, PLAN
TO BRING MORE DRILL ROD TO
DECOMMISSION WELLS AND INSTALL 30'
BORINGS.
- 1540 PICK UP SUPPLIES AND DEPART SITE. BLENHART
TO START SAMPLE COC AND Q.C. M EBERT
TO WAREHOUSE FOR SAMPLE STORAGE.
- 1550 END OF DAY

[Signature] 6/28

Return in the Rain

22 MEBERT
B LENHART

A+T SOIL

6/29/21

- 0800 ARRIVE AT SITE CONDUCE SHEET MEETING, PLAN ON BEGINNING WITH WELL MONUMENT REMOVAL
- 0810 UPON INSPECTION ALL WELL CASINGS/WELLS HAVE BEEN DECOMMISSIONED IN PLACE. REMAINING WORK IS TO REMOVE WELL MONUMENTS
- 0820 BEGIN WORK AT RW-116 w/ MINI EXCAVATOR. DISCOVERY DRILLING WILL COORDINATE BACKFILL ONCE AN ESTIMATED VOLUME CAN BE CALCULATED.
- 0830 PHONE CALL w/ NINO MONTE. HE IS SENDING FIELD TEAM AS-BUILT DRAWINGS OF PRIVATE WATER UTILITY FOR LOCATION PRIOR TO SUBSURFACE WORK @ SB-1/MW-12P
- 0855 SUCCESSFULLY REMOVE VAULT @ RW-116. HOLE WILL BE MOSTLY BACKFILLED w/ ORIGINAL MATERIAL, SUPPLEMENTED w/ DI BACKFILL, AND THEN CAPPED w/ ORIGINAL MATERIAL.
- 0925 REMOVE MONUMENT AT RW-2, DISCOVER COMPACTING FIRST LIFT OF FILL w/ HAND COMPACTING MACHINE AT RW-116
- 1005 BEGIN REMOVING MONUMENT AT RW-31
- 1025 SUCCESSFULLY REMOVE MONUMENT AT RW-31. BEGIN BACKFILL, LEAVING SOME BEHIND FOR FINAL CAP AS TYPICAL.

M. EBERT
B. LENHART

A+T SOIL

6/29/21 23

- 1100 CREW CONSOLIDATES DEBRIS FROM RECOVERY WELLS AND COMPACTS FIRST LIFTS OF FILL.
- 1145 LAURIE BUTLER ARRIVES ON SITE, SHE IS WORKING TO PROVIDE MORE PRIVATE UTILITY INFORMATION
- 1230 BEGIN REMOVING MONUMENT AT RW-120
- 1250 SUCCESSFULLY REMOVE RW-120 MONUMENT
- 1255 BEGIN REMOVING MONUMENT AT RW-3
- 1320 SUCCESSFULLY REMOVE MONUMENT AT RW-3 BEGIN BACKFILL OF RW-120/RW-3
- 1400 BEGIN MONUMENT REMOVAL AT RW-115
- 1420 SUCCESSFULLY REMOVE MONUMENT AT RW-115 BEGIN BACKFILL
- 1450 BEGIN DRILLING AT SB-3
- 1455 M. EBERT BEGINS LOGGING CORES AND FIELD SCREENING BORINGS FROM SB-3
- 1550 FOEL ENCOUNTERED ON PID AT 0.5 PPM @ 28' BGS IN SB-3
- 1555 COLLECT SAMPLE AT-21-SB-03-26 FOR VERTICAL DELINEATION OF HOLE
- 1615 COLLECT SAMPLE AT-21-SB-03-13 FOR SHALLOW CHARACTERIZATION OF SB-3, EXTENDING BORING BELOW 30' TO FIND SOIL/WATER INTERFACE BOUNDARY.

Rite in the Rain

26 M EBERT
B WESTWICK
B LENHART

A+T SOIL

6/30/21

- 1015 WGL AND FILTER PACK SET AT MW-128
- 1038 39.34 = DISTANCE TO WATER (BGS)
37.89 = DISTANCE TO BOTTOM (BGS)
WELL INSTALLED W/ FILTER PACK TO
26.0' BGS, BENTONITE SEAL INSTALLED
FROM 26' TO 2' BGS. ALL INFORMATION
IS PROVIDED ON SEPARATE WELL INSTALLATION
FORM
- 1040 DISCOVERY DRILLING BEGINS LOADING DEBRIS
ONTO FLATBED TRUCK FROM RN VAULT
REMOVAL FOR TRANSFER TO LANDFILL.
- 1120 DISCOVERY DRILLING DEPARTS W/ DEBRIS
- 1130 DISCOVERY BEGINS SPREADING BACKFILL IN
HOLES TO PREPARE FOR COMPACTION AND
GRADING.
- 1135 LUNCH. DISCOVERY DEPARTING TO GATHER
MATERIALS FOR WELL MONUMENT.
- 1248 BEGIN DRILLING AT SB-1
- 1250 M EBERT / B WESTWICK BEGIN LOGGING LOGS
- 1350 COLLECT SAMPLE AT-21-SB-01-31 AT
SB-1 FROM 31-33' AT THE SILT/WATER
INTERFACE. NO VOLATILES WERE DETECTED
W/ PID IN ENTIRE BORING
- 1355 COLLECT SAMPLE AT-21-SB-01-22 AT
SB-1 FROM 22-24'

M EBERT
R WESTWICK
B LENHART

A+T SOIL

6/30/21 27

- 1400 COLLECT SAMPLE AT-21-SB-01-13 AT
SB-1 FROM 13-15' FOR SHALLOV
CHARACTERIZATION AS NO VOLATILES WERE
DETECTED.
- 1405 BEGIN DRILLING AT SB-10
- 1410 BEGIN FIELD SCREENING
- 1455 COLLECT SAMPLE AT-21-SB-10-18
AT SB-10 FROM 18-20' AT THE FIELD
SCREENING DETERMINED UPPER BOUNDARY OF
CONTAMINATION
- ^{BL} 1500 1515 COLLECT SAMPLE AT-21-SB-10-31
AT SB-10 FROM 31-33' AT THE
GROUNDWATER INTERFACE
- 1520 COLLECT SAMPLE AT-21-SB-10-28
AT SB-10 FROM 28-30' AT THE
HIGHEST PID READING (542 PPM)
- 1525 COLLECT SAMPLE ^{BL} DUPLICATE SAMPLE
AT-21-SB-10-28 AT SB-10
FROM 28-30'
- 1530 MINI EXCAVATOR PICKED UP BY RENTAL
COMPANY, FINAL SITE LANDSCAPING
WILL BE PERFORMED BY DISCOVERY
DRILLING W/ COMPACTOR AND HAND
TOOLS.

Rite in the Rain

28
WILSON
B WESTWICK
B LEMHART

A+T SOIL

6/30/21

1545 COMPLETE INSTALLATION OF MONITORING WELL
MONUMENT

1620 COMPLETE SITE LANDSCAPING, BEGIN
DEMOBILIZATION

MILBERT
B Westw. vic

A+T SOIL

11/21 28
Sunny 65°

800 Arrive at office and Manage
Samples

1015 Drop samples off at SGS

1030 Arrive on site to develop well
MW-128.

1115 Measure TD - 37.75 FT BTOL
DTW 32.18 FT BTOL

Water Column = 5.57 Feet

Well Volume = 0.95 gal

Sx Well Volume = 4.73 gal

1130 Begin surging well

1140 Begin Pumping well

2 gal pumped Turbidity over range
Color Dark grey

5 gal pumped Turbidity over range
Color light grey

7 gal Turbidity over range
Color ~~grey~~ Milky ^{grey} light

10 gal Turbidity over range
Color Milky grey

12 gal Turbidity over range
Color Clear

15 gal Turbidity over range
Color Clear

30 M Exert
B West wk

A+T Soil

7/1/21
Sunday 65

1245 finish purging well. Turbidity
meter not functioning properly. Not
able to get a ~~clear~~¹⁰⁰ reading.
water was clear after pumping
15 gallons of water out of well

1305 Met with US Ecology to
pick up drums from site. Soil
and water drum were picked
up.

1315 all field activities complete
and field team leaves site for
Demob



425 Outer Springer Loop Rd Palmer, AK 99645
 Phone: (907) 258-1558, Fax: (907) 746-3651

Please send payment remittance details to
NRCUSRemit@usecology.com

FOR PAYMENTS VIA ACH (preferred)
 Bank of America Merrill Lynch
 Routing/ABA number: 021000322
 Beneficiary: US Ecology US Holding Company, LLC
 Account# 483065987219

Please call to remit payment via credit card at
 1-631-224-9141.

Customer:	AHTNA ENGINEERING SERVICES 110 W 38TH AVE SUITE 200A ATTN: ACCOUNTS PAYABLE Anchorage, AK, 99503	Invoice #:	752708
		NRC Job #:	170662
		Customer PO#:	20204.064.02
		Reference #:	MENZIES AVIATION
Invoice Date:	28-OCT-21	Contact:	HOFFMANN, LUKE
Job Description:	WASTE DISPOSAL	Phone:	907-868-8215
		Fax:	
		E-Mail:	lhoffmann@ahtna.net
		Terms:	30 NET
Job Location:	US ECOLOGY ALASKA - VIKING DRIVE FACILITY 2020 VIKING DR Anchorage, AK, 99501	Job Date (s):	09/23/21
		Progress Billing:	No
		Final Billing:	Yes

Description(See Attached Details)	EXTENDED PRICE
LABOR	75.00
DISPOSAL - INTERNAL	191.00
OTHER NRC	35.91
	INVOICE SUBTOTAL 301.91
	SALES TAX 0.00
	INVOICE TOTAL 301.91

Currency: USD

THANK YOU FOR YOUR BUSINESS

Direct Phone: For billing questions, please contact
Email: Amy Durgeloh at (907) 761-6677

FED ID #: 26-0025054

REMITTANCE OPTION/INSTRUCTIONS

CHECKS DRAWN ON A U.S. BANK ACCOUNT:

US Ecology US Holding Company, LLC
 P.O. BOX 74007491
 CHICAGO, IL 60674-7491

WIRE TRANSFER MADE FROM WITHIN THE U.S.

Bank of America Merrill Lynch
 Routing/ABA number: 026009593
 Beneficiary: US Ecology US Holding Company, LLC
 Account #: 483065987219

PAYMENTS MADE VIA ACH:

Bank of America Merrill Lynch
 Routing/ABA number: 021000322
 Beneficiary: US Ecology US Holding Company, LLC
 Account #: 483065987219

WIRE TRANSFERS MADE FROM OUTSIDE THE U.S.

Bank of America Merrill Lynch
 SWIFT Code: BOFAUS3N
 Beneficiary: US Ecology US Holding Company, LLC
 Account #: 483065987219

A 1.5% per month finance charge will be assessed for all past due invoices to include the flat late fee amount.



INVOICE DETAILS SHEET

JOB NO 170662

INVOICE NO 752708

Page No

2/2

LABOR

Date	Name/Item(s)	Description	Billing Code	UOM	Qty	Rate	Amount
20-SEP-21	Kuhnke, Morgan	Regular Time	PROJECT ADMINISTRATOR	Hours	1	75.00	75.00

Sub Total 75.00

DISPOSAL - INTERNAL

Date	Name/Item(s)	Description	Billing Code	UOM	Qty	Rate	Amount
23-SEP-21	AF-72002 FACILITY DROP OFF FEE			Each	1	55.00	55.00
23-SEP-21	AT-91003 DOC. IN-HOUSE A	170662A / US ECOLOGY AK		Each	1	53.00	53.00
23-SEP-21	AD-10015 WATER WTH <5% SOLIDS	170062A, 1-D38579		DRUM-15G	1	83.00	83.00

Sub Total 191.00

OTHER NRC

Date	Name/Item(s)	Description	Billing Code	UOM	Qty	Rate	Amount
23-SEP-21	ESIC FEE			Each	1	35.91	35.91

Sub Total 35.91

Grand Total 301.91

NON-HAZARDOUS WASTE MANIFEST

Please print or type (Form designed for use on elite (12 pitch) typewriter)

NON-HAZARDOUS WASTE MANIFEST		1. Generator's US EPA ID No. EXEMPT		Manifest Document No. 170662A	2. Page 1 of 1
3. Generator's Name and Mailing Address MENZIES AVIATION 6900 WEST END ROAD ANCHORAGE, AK 99502		MENZIES AVIATION 6000 DE HAVILLAND AVENUE ANCHORAGE, AK 99502			
4. Generator's Phone (907-248-5000)					
5. Transporter 1 Company Name CLIENT DELIVERED		6. US EPA ID Number		A. State Transporter's ID	
				B. Transporter 1 Phone	
7. Transporter 2 Company Name		8. US EPA ID Number		C. State Transporter's ID	
				D. Transporter 2 Phone	
9. Designated Facility Name and Site Address US ECOLOGY ALASKA LLC 2020 VIKING DRIVE ANCHORAGE, AK 99501		10. US EPA ID Number AKR000004184		E. State Facility's ID	
				F. Facility's Phone 907-258-1558	
11. WASTE DESCRIPTION			Containers		13. Total Quantity
			No.	Type	14. Unit Wt./Vol.
a. HIM MATERIAL NOT REGULATED BY D.O.T.			1	DF	80 P
b.					
c.					
d.					
G. Additional Descriptions for Materials Listed Above) EA0302 IDW DECON WATER / GROUNDWATER (DF15)			H. Handling Codes for Wastes Listed Above D38579 D38579		
15. Special Handling Instructions and Additional Information Shipper's Certification: This is to certify that the above-named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation					
16. GENERATOR'S CERTIFICATION: I hereby certify that the contents of this shipment are fully and accurately described and are in all respects in proper condition for transport. The materials described on this manifest are not subject to federal hazardous waste regulations.					
Printed/Typed Name					Date
<input checked="" type="checkbox"/> Luke Hoffmann on behalf of Menzies					Month Day Year 9 | 23 | 21
Signature					Date
					Month Day Year 9 | 23 | 21
17. Transporter 1 Acknowledgement of Receipt of Materials					Date
Printed/Typed Name					Month Day Year
<input checked="" type="checkbox"/> Luke Hoffmann aka Menzies					9 | 23 | 21
Signature					Date
					Month Day Year
18. Transporter 2 Acknowledgement of Receipt of Materials					Date
Printed/Typed Name					Month Day Year
19. Discrepancy Indication Space					
20. Facility Owner or Operator: Certification of receipt of the waste materials covered by this manifest, except as noted in item 19.					
Printed/Typed Name					Date
Daniil Girard					Month Day Year 09 | 30 | 21
Signature					Date
					Month Day Year 09 | 30 | 21

NON-HAZARDOUS WASTE GENERATOR TRANSPORTER FACILITY



CERTIFICATE OF DISPOSAL/RECYCLE

GENERATOR: MENZIES AVIATION
6000 DE HAVILLAND AVENUE
ANCHORAGE, AK 99502

DISPOSAL FACILITY: US ECOLOGY ALASKA LLC
2020 VIKING DRIVE
ANCHORAGE, AK 99501

EPA ID NUMBER: EXEMPT
MANIFEST/DOCUMENT #: 170662A
DATE OF DISPOSAL/RECYCLE: SEP-30-2021

<u>LINE</u>	<u>WASTE DESCRIPTION</u>	<u>CONTAINERS</u>	<u>TYPE</u>	<u>QUANTITY</u>	<u>UOM</u>
1	IDW DECON WATER / GROUNDWATER (DF15)	1	DF	80	P

I certify, on behalf of the above listed treatment facility, that to the best of my knowledge, the above described waste was managed in compliance with all applicable laws, regulations, permits and licenses on the date listed above.

PREPARED BY: Daryl Guvand

SIGNATURE: Daryl Guvand

DATE: SEP 30 2021

APPENDIX B

PHOTOGRAPHIC LOG

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Photograph 1: Soil boring SB-10 location at stake from work plan figure. Location was move to the northwest approximately 10 feet to avoid utilities. View northeast.



Photograph 2: Soil boring SB-10 location at stake from work plan figure. Location was move to the northwest approximately 10 feet to avoid utilities. View west.



Photograph 3: Drilling at the new location of SB-10. View south.



Photograph 4: Soil borings SB-4 and SB-8 at staked locations in road. Locations were moved slightly to the west to avoid gas utility marked in yellow paint. View south.



Photograph 5: Drilling at soil boring location SB-04. View south.



Photograph 6: PID screening soils. View north.



Photograph 7: Drilling at location SB-6. View east.



Photograph 8: Wood debris found in soil boring SB-06 causing elevated PID readings. View close-up.



Photograph 9: Drilling at soil boring location SB-7. View southwest.



Photograph 10: Drilling at the location for MW-128. View north.



Photograph 11: PID screening soils for monitoring well installation. View west.



Photograph 12: Collecting soil analytical samples. View southeast.



Photograph 13: Installing monitoring well MW-128. View close-up.



Photograph 14: Completed monitoring well MW-128. View close-up.

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APPENDIX C

SOIL BORING LOGS AND WELL CONSTRUCTION FORM

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Soil Boring Log

Boring Number: SB-1

Project Number: 20204.063

Project Name Supplemental Soil Characterization

Recovery Device Macro Core

X/Y Coordinates 61.18111099/-149.8984163

Site Arctic and Tudor

Device Diameter 2 -inch

X/Y Datum Lat/Long

Client Menzies

Sample Method Macro Core

Ground Elevation 135.24

Field Scientist/Engineer Mike Ebert

of Samples 3

Elevation Datum _____

Date 6/30/2021

Drilling Company Discovery Drilling

Extra Field Notes:

Weather Sunny

Rig Type Geoprobe 7822

Total Depth 35 feet bgs

Boring Size 2 -inch

Analytical Samples	Depth	Water Level	Soil Recovery Inches Recovered/ Inches Driven	Soil Graphic	Soil Description and Notes	PID Screening		
	0							
	5	▽	50/60		Silty SAND with gravel (SM); light brown; dry; no odor; no staining.	0		
					Silty SAND (SM); light brown; damp; no odor; no staining.	0		
	10		60/60		Silty SAND with gravel (SM); brown; damp; no odor; no staining.	0		
					SILT with gravel (ML); tan; damp; no odor; no staining; large cobbles.	0		
	15		60/60		SILT (ML); tan; wet; no odor; no staining.	0		
AT-21-SB-01-13							0	
	20		44/60			FINE SAND (SP); brown; dry to damp; no odor; no staining.	0	
								0
	25		50/60					0
AT-21-SB-01-22								0
	30	52/60				0		
						0		
AT-21-SB-01-31		56/60		FINE SAND (SP); grayish brown; saturated; no odor; no staining.	0			
	35				0			

End of Boring: 35 feet bgs.



Soil Boring Log

Boring Number: SB-2

Project Number: 20204.063

Project Name Supplemental Soil Characterization

Recovery Device Macro Core

X/Y Coordinates 61.18110788/-149.8982738

Site Arctic and Tudor

Device Diameter 2 -inch

X/Y Datum Lat/Long

Client Menzies

Sample Method Macro Core

Ground Elevation 135.80

Field Scientist/Engineer Mike Ebert

of Samples 1

Elevation Datum _____

Date 6/28/2021

Drilling Company Discovery Drilling


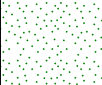

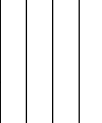
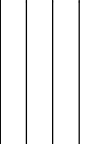
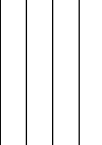
Extra Field Notes:

Weather Cloudy

Rig Type Geoprobe 7822

Total Depth 15 feet bgs

Boring Size 2 -inch

Analytical Samples	Depth	Water Level	Soil Recovery Inches Recovered/ Inches Driven	Soil Graphic	Soil Description and Notes	PID Screening
	0.0					
	2.5		46/60		Gravelly SAND (SW); brownish tan; dry; no odor; no staining.	0
					SAND (SP); light brown; damp; no odor; no staining.	0
	5.0				Silty SAND with gravel (SW); light brown; damp; no odor; no staining.	0
	7.5		42/60			0
	10.0				SILT with minor gravel (ML); tan; damp; no odor; no staining.	0
	12.5		56/60		SILT with very fine sand (ML); tan; wet; no odor; no staining.	0
AT-21-SB-02-13	15.0					0

End of Boring: 15 feet bgs.



Soil Boring Log

Boring Number: SB-3

Project Number: 20204.063

Project Name Supplemental Soil Characterization

Recovery Device Macro Core

X/Y Coordinates 61.18103864/-149.8986769

Site Arctic and Tudor

Device Diameter 2 -inch

X/Y Datum Lat/Long

Client Menzies

Sample Method Macro Core

Ground Elevation 134.75

Field Scientist/Engineer Mike Ebert

of Samples 4

Elevation Datum

Date 6/29/3021

Drilling Company Discovery Drilling

Extra Field Notes:

Weather Sunny

Rig Type Geoprobe 7822

Total Depth 35 feet bgs

Boring Size 2 -inch

Analytical Samples	Depth	Water Level	Soil Recovery Inches Recovered/ Inches Driven	Soil Graphic	Soil Description and Notes	PID Screening
	0					
			48/60		Sandy GRAVEL with silt (GW); brown; damp; no odor; no staining; gravel from road.	0
	5				Sandy SILT (ML); brownish tan; very dense; damp; no odor; no staining.	0
					FINE SAND (SP); light brown; moist; no odor; no staining.	0
					Gravelly SILT (GM); tan; very dense; moist; no odor; no staining.	0
	10		54/60		SILT (ML); tan; very dense; wet; no odor; no staining; small (0.1 foot) sand lens at 7.5 feet bgs.	0
						0
						0
			56/60		FINE SAND (SP); tan; moist; no odor; no staining.	0
AT-21-SB-03-13	15				SILT (ML); tan; wet; no odor; no staining.	0
						0
	20		54/60		SAND (ML); light brown; moist; no odor; no staining.	0
						0
						0
			48/60		SAND (SP); light brown; moist; slight hydrocarbon odor; no staining.	0
	25					0
						0
			56/60		SAND (SP); light brown; moist; slight hydrocarbon odor; no staining.	0.5
AT-21-SB-03-26	30					2.0
AT-21-SB-03-30 AT-21-SB-15-30		▽			SAND (SP); gray; wet to saturated; strong hydrocarbon odor; hydrocarbon staining.	515
						313
			60/60			478
						457
	35					254

End of Boring: 35 feet bgs.



Soil Boring Log

Boring Number: SB-4

Project Number: 20204.063

Project Name Supplemental Soil Characterization

Recovery Device Macro Core

X/Y Coordinates 61.18106065/-149.898572

Site Arctic and Tudor

Device Diameter 2 -inch

X/Y Datum Lat/Long

Client Menzies

Sample Method Macro Core

Ground Elevation 134.41

Field Scientist/Engineer Mike Ebert

of Samples 1

Elevation Datum

Date 6/28/2021

Drilling Company Discovery Drilling

Extra Field Notes:

Weather Cloudy

Rig Type Geoprobe 7822

Total Depth 15 feet bgs

Boring Size 2 -inch

Analytical Samples	Depth	Water Level	Soil Recovery Inches Recovered/ Inches Driven	Soil Graphic	Soil Description and Notes	PID Screening
	0.0					
	2.5		40/60		Sandy GRAVEL (GW); gray; dry; no odor; no staining; road gravel, small layer of asphalt on top of unit.	0
	5.0				SAND (SW); gray; damp; no odor; no staining; stratified with lenses of fine sand.	0
	7.5		48/60		Silty GRAVEL (GM); tan; very dense; damp; no odor; no staining.	0
	10.0				Sandy SILT (ML); tan; damp to wet; no odor; no staining.	0
	12.5		50/60			0
AT-21-SB-04-13	15.0					0

End of Boring: 15 feet bgs.



Soil Boring Log

Boring Number: SB-5

Project Number: 20204.063

Project Name Supplemental Soil Characterization

Recovery Device Macro Core

X/Y Coordinates 61.18105799/-149.8984164

Site Arctic and Tudor

Device Diameter 2 -inch

X/Y Datum Lat/Long

Client Menzies

Sample Method Macro Core

Ground Elevation 135.24

Field Scientist/Engineer Mike Ebert

of Samples 1

Elevation Datum _____

Date 6/28/2021

Drilling Company Discovery Drilling

Extra Field Notes:

Weather Cloudy

Rig Type Geoprobe 7822

Total Depth 15 feet bgs

Boring Size 2 -inch

Analytical Samples	Depth	Water Level	Soil Recovery Inches Recovered/ Inches Driven	Soil Graphic	Soil Description and Notes	PID Screening
	0.0					
	2.5		30/60		Sandy GRAVEL (GW); brownish tan; no odor; no staining; fill soil from vapor extraction piping decommissioning. Pea gravel from 4 to 4.5.	0
	5.0				FINE SAND (SP); brownish tan; damp; no odor; no staining.	0
	7.5		36/60		Silty GRAVEL (GM); brownish tan; very dense; damp; no odor; no staining; silt only lens from 9.5 to 9.75.	0
	10.0					0
	12.5		24/60		SILT with very fine sand (ML); tan; very dense; wet; no odor; no staining.	0
AT-21-SB-05-13	15.0					0

End of Boring: 15 feet bgs.



Soil Boring Log

Boring Number: SB-6

Project Number: 20204.063

Project Name Supplemental Soil Characterization

Recovery Device Macro Core

X/Y Coordinates 61.18104561/-149.8982792

Site Arctic and Tudor

Device Diameter 2 -inch

X/Y Datum Lat/Long

Client Menzies

Sample Method Macro Core

Ground Elevation 135.80

Field Scientist/Engineer Mike Ebert

of Samples 1

Elevation Datum _____

Date 6/28/2021

Drilling Company Discovery Drilling

Extra Field Notes:

Weather Cloudy

Rig Type Geoprobe 7822

Total Depth 15 feet bgs

Boring Size 2 -inch

Analytical Samples	Depth	Water Level	Soil Recovery Inches Recovered/ Inches Driven	Soil Graphic	Soil Description and Notes	PID Screening
	0.0					
	2.5		58/60		Silty SAND (SM); brown; loose; dry; organic odor; no staining; piece of wood was found at 1 foot bgs. Screened the wood with PID which resulted in a reading of 17 ppm. Wood seems to be cause of elevated PID reading from 0-1 feet bgs.	4.8 0
	5.0				SILT with very fine sand (ML); light brown; no odor; no staining.	0 0
	7.5		56/60		Silty SAND (SM); light brown; moist; no odor; no staining.	0 0
	10.0				Silty GRAVEL (GM); light brown; very dense; damp; no odor; no staining.	0 0
	12.5		48/60		SILT with minor gravel (ML); light brown; damp to wet; no odor; no staining.	0 0
AT-21-SB-06-13	15.0					0 0

End of Boring: 15 feet bgs.



Soil Boring Log

Boring Number: SB-7

Project Number: 20204.063

Project Name Supplemental Soil Characterization

Recovery Device Macro Core

X/Y Coordinates 61.1809757/-149.8987008

Site Arctic and Tudor

Device Diameter 2 -inch

X/Y Datum Lat/Long

Client Menzies

Sample Method Macro Core

Ground Elevation 134.12

Field Scientist/Engineer Mike Ebert

of Samples 1

Elevation Datum _____

Date 6/28/2021

Drilling Company Discovery Drilling

Extra Field Notes:

Weather Cloudy

Rig Type Geoprobe 7822

Total Depth 15 feet bgs

Boring Size 2 -inch

Analytical Samples	Depth	Water Level	Soil Recovery Inches Recovered/ Inches Driven	Soil Graphic	Soil Description and Notes	PID Screening
	0.0					
	2.5		36/60		Sandy GRAVEL with silt (GW); brown; damp; no odor; no staining.	0
	5.0					0
	7.5		48/60		Silty SAND (SM); brown; damp to wet; no odor; no staining; stratified silt and sand layers.	0
	10.0					0
	12.5		42/60		Silty GRAVEL (GM); light brown; very dense; damp; no odor; no staining.	0
	15.0				SILT with minor gravel (ML); tan; damp to wet; no odor; no staining.	0
AT-21-SB-07-13						0

End of Boring: 15 feet bgs.



Soil Boring Log

Boring Number: SB-8

Project Number: 20204.063

Project Name Supplemental Soil Characterization

Recovery Device Macro Core

X/Y Coordinates 61.18097695/-149.8985765

Site Arctic and Tudor

Device Diameter 2 -inch

X/Y Datum Lat/Long

Client Menzies

Sample Method Macro Core

Ground Elevation 133.91

Field Scientist/Engineer Mike Ebert

of Samples 1

Elevation Datum _____

Date 6/28/2021

Drilling Company Discovery Drilling

Extra Field Notes:

Weather Cloudy

Rig Type Geoprobe 7822

Total Depth 15 feet bgs

Boring Size 2 -inch

Analytical Samples	Depth	Water Level	Soil Recovery Inches Recovered/ Inches Driven	Soil Graphic	Soil Description and Notes	PID Screening
	0.0					
	2.5		46/60		Sandy GRAVEL with silt (GW); brown; dry; no odor; no staining.	0
					SAND (SP); tan; damp; no odor; no staining.	0
	5.0		46/60		Silty GRAVEL (GM); tan; damp; no odor; no staining.	0
					Silty SAND (SM); tan; damp; no odor; no staining; stratified.	0
	7.5		46/60		Gravelly SAND (SW); brownish tan; damp; no odor; no staining.	0
					SAND (SP); brownish tan; damp; no odor; no staining.	0
	10.0				SILT with gravel (ML); tan; very dense; damp; no odor; no staining.	0
	12.5		36/60		Sandy SILT (ML); tan; damp; no odor; no staining; two large cobbles from 14-15 feet bgs, no other large clasts were noted.	0
AT-21-SB-08-13	15.0					0

End of Boring: 15 feet bgs.



Soil Boring Log

Boring Number: SB-9

Project Number: 20204.063

Project Name Supplemental Soil Characterization

Recovery Device Macro Core

X/Y Coordinates 61.18096582/-149.8984062

Site Arctic and Tudor

Device Diameter 2 -inch

X/Y Datum Lat/Long

Client Menzies

Sample Method Macro Core

Ground Elevation 135.44

Field Scientist/Engineer Mike Ebert

of Samples 1

Elevation Datum _____

Date 6/28/2021

Drilling Company Discovery Drilling

Extra Field Notes:

Weather Cloudy

Rig Type Geoprobe 7822

Total Depth 15 feet bgs

Boring Size 2 -inch

Analytical Samples	Depth	Water Level	Soil Recovery Inches Recovered/ Inches Driven	Soil Graphic	Soil Description and Notes	PID Screening
	0.0					
	2.5		60/60		SILT with very fine sand (ML); light brown; dry; no odor; no staining.	0
	5.0					0
	7.5		60/60		Silty GRAVEL (GM); light brown; very dense; dry to moist; no odor; no staining.	0
	10.0				SILT with minor gravel (ML); light brown; moist; no odor; no staining.	0
	12.5		42/60		SILT (ML); light brown; moist; no odor; no staining.	0
AT-21-SB-09-13	15.0					0

End of Boring: 15 feet bgs.



Soil Boring Log

Boring Number: SB-10

Project Number: 20204.063

Project Name Supplemental Soil Characterization **Recovery Device** Macro Core **X/Y Coordinates** 61.1810005/-149.8983432
Site Arctic and Tudor **Device Diameter** 2 -inch **X/Y Datum** Lat/Long
Client Menzies **Sample Method** Macro Core **Ground Elevation** 135.44
Field Scientist/Engineer Mike Ebert **# of Samples** 4 **Elevation Datum** _____
Date 6/30/2021 **Drilling Company** Discovery Drilling **Extra Field Notes:**
Weather Sunny **Rig Type** Geoprobe 7822
Total Depth 35 feet bgs **Boring Size** 2 -inch

Analytical Samples	Depth	Water Level	Soil Recovery Inches Recovered/ Inches Driven	Soil Graphic	Soil Description and Notes	PID Screening
	0					
	5		24/60		Silty SAND with gravel (SM); brown; dry; no odor; no staining; rock was lodged in cutting shoe preventing good recovery.	0 0 0 0
	10		63/60		Silty GRAVEL (GM); light brown; damp; no odor; no staining.	0 0 0
	15		46/60		SILT with gravel (ML); light brown; damp; no odor; no staining.	0 0 0
	20		60/60		SILT (ML); tan; wet; no odor; no staining.	0 0 0 0 0 0 0 0
AT-21-SB-10-18	20					0
	25		60/60		SAND (SP); grayish brown; damp to saturated; hydrocarbon odor; no staining.	6.0 30.2 142 230 115 36 18 85 115
AT-21-SB-10-28 AT-21-SB-16-28	30		44/60			542 122
	35	▽	58/60		SILT (ML); gray; damp to saturated; hydrocarbon odor; hydrocarbon staining.	4.1 2.8 1.1 0.7 0.7

End of Boring: 35 feet bgs.



Soil Boring Log

Boring Number: MW-128

Project Number: 20204.063

Project Name Supplemental Soil Characterization	Recovery Device Macro Core	X/Y Coordinates 61.18116163/-149.8984391
Site Arctic and Tudor	Device Diameter 2 -inch	X/Y Datum Lat/Long
Client Menzies	Sample Method Macro Core	Ground Elevation 134.82
Field Scientist/Engineer Mike Ebert	# of Samples 2	Elevation Datum
Date 6/30/2021	Drilling Company Discovery Drilling	Extra Field Notes:
Weather Sunny	Rig Type Geoprobe 7822	
Total Depth 38 feet bgs	Boring Size 4.5 -inch	

Analytical Samples	Depth	Water Level	Soil Recovery Inches Recovered/Inches Driven	Soil Graphic	Soil Description and Notes	PID Screening
	0					
	5		42/60		Silty SAND (SM); light brown; damp; no odor; no staining.	0
	10		60/60		SAND (SP); brown; damp; no odor; no staining. Silty GRAVEL (GM); light brown; damp; no odor; no staining.	0
AT-21-SB-MW128-13	15		60/60		SILT (ML); tan; damp to wet; no odor; no staining.	0
	20		60/60		SAND (SP); light brown; damp; no odor; no staining.	0
	25		52/60			0
	30		56/60			0
AT-21-SB-MW128-31	35	▽	64/60		SAND (SP); gray to brown; saturated; no odor; no staining; sand begins to fine at 33 feet bgs.	0
	38		36/36			0

End of Boring: 38 feet bgs.

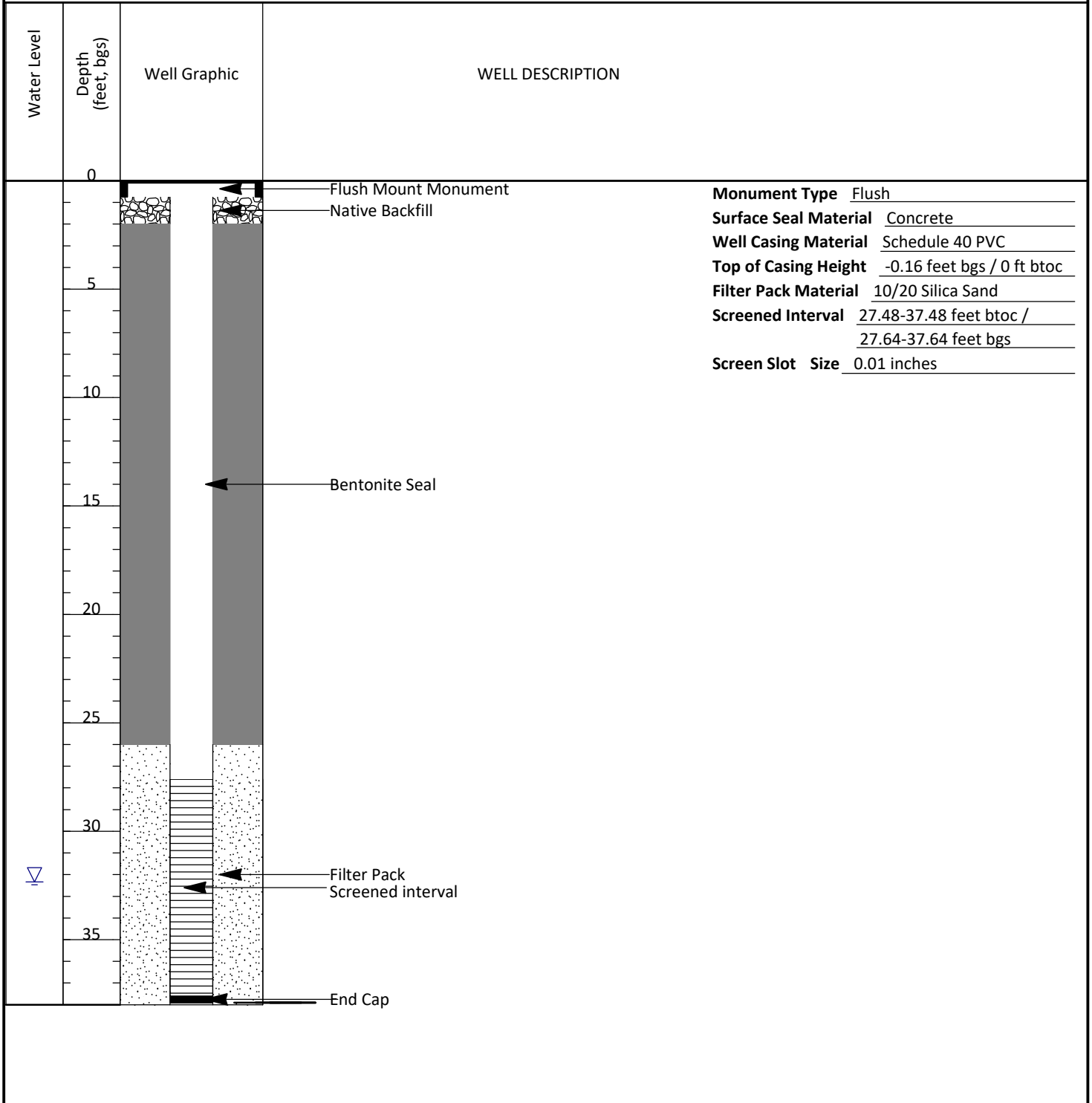
MONITORING WELL CONSTRUCTION LOG

Project Number: 20204.063

Well Number: MW-128

Project Name Supplemental Soil Characterization **Site** Arctic and Tudor
Client Menzies **Field Scientist/Engineer** Mike Ebert
Date 6/30/2021 **Weather** Sunny
Drilling Company Discovery Drilling **Rig Type** Geoprobe 7822
Boring Size 4.5 inches **Drilling Method** Direct Push Dual Tube 45
Well Diameter 2 inches **# of Samples** 2
Total Depth 37.73 ft btoc / 37.89 ft bgs **Depth to GW** 32.18 ft btoc / 32.34 ft bgs
X/Y Coordinates / **Elevation** feet

Extra Field Notes:
 ags = above ground surface
 bgs = below ground surface
 btoc = below top of casing
 ft = feet



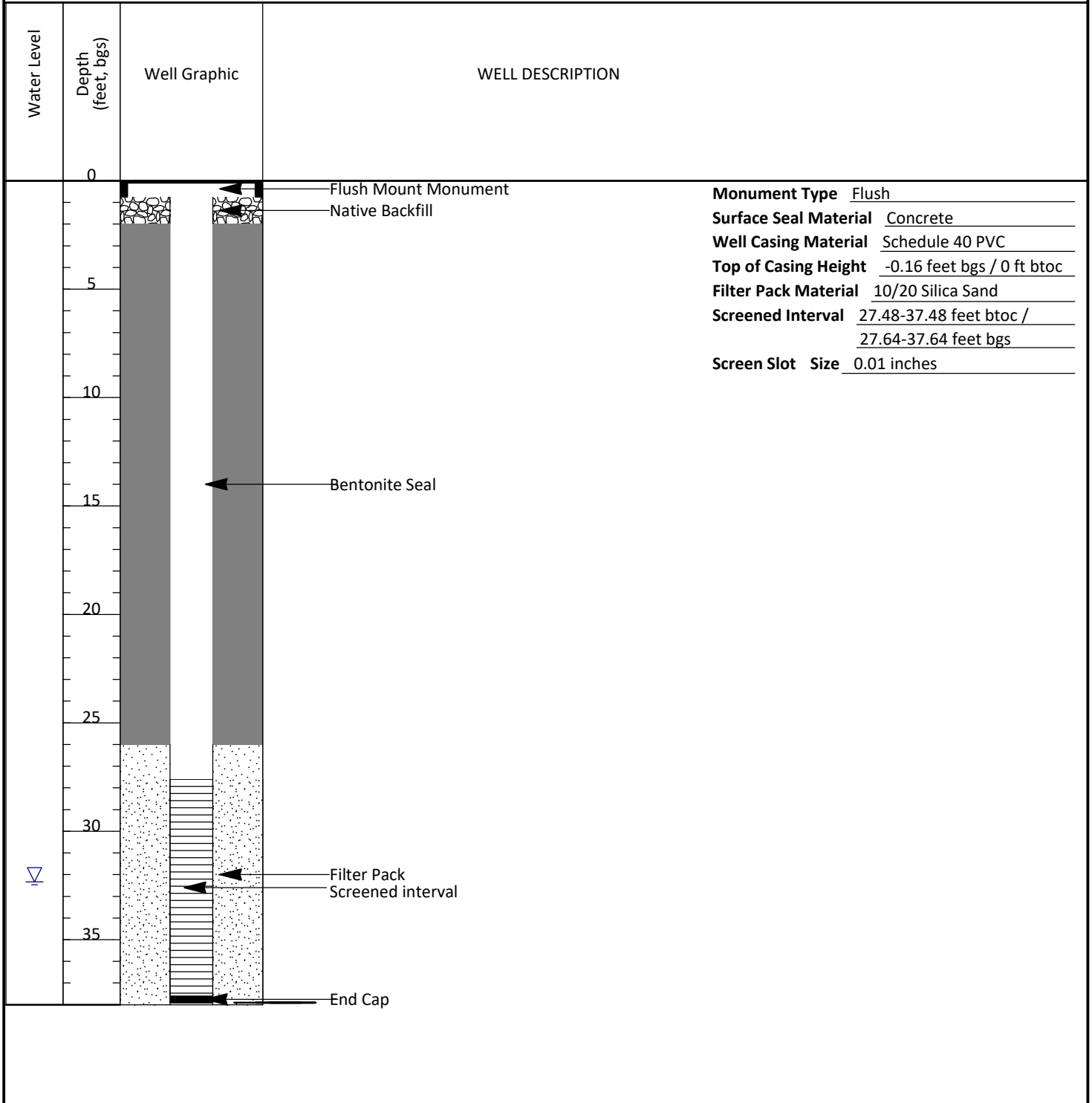
MONITORING WELL CONSTRUCTION LOG

Project Number: 20204.063

Well Number: MW-128

Project Name Supplemental Soil Characterization **Site** Arctic and Tudor
Client Menzies **Field Scientist/Engineer** Mike Ebert
Date 6/30/2021 **Weather** Sunny
Drilling Company Discovery Drilling **Rig Type** Geoprobe 7822
Boring Size 4.5 inches **Drilling Method** Direct Push Dual Tube 45
Well Diameter 2 inches **# of Samples** 2
Total Depth 37.73 ft btoc / 37.89 ft bgs **Depth to GW** 32.18 ft btoc / 32.34 ft bgs
X/Y Coordinates / **Elevation** feet

Extra Field Notes:
 ags = above ground surface
 bgs = below ground surface
 btoc = below top of casing
 ft = feet



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APPENDIX D

LABORATORY REPORT

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Laboratory Report of Analysis

To: Ahtna Engineering Svs
110 W 38th Ave #100e
Anchorage, AK 99503
(907)433-0731

Report Number: **1213875**

Client Project: **Arctic and Tudor**

Dear Nino Muniz,

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 Justin at (907) 562-2343. We will be happy to answer any questions or concerns which you may have.

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

Sincerely,
SGS North America Inc.

Justin Nelson
Project Manager
Justin.Nelson@sgs.com

Date

Case Narrative

SGS Client: **Ahtna Engineering Svs**
SGS Project: **1213875**
Project Name/Site: **Arctic and Tudor**
Project Contact: **Nino Muniz**

Refer to sample receipt form for information on sample condition.

AT-21-SB-03-30 (1213875010) PS

AK101 - Surrogate recovery for 4-bromofluorobenzene does not meet QC criteria, due to matrix interference.
8270D SIM - PAH surrogate recoveries for 2-methylnaphthalene-d10 and fluoranthene-d10 do not meet QC criteria due to sample dilution. The sample was diluted due to high concentrations of non-target compounds.

AT-21-SB-15-30 (1213875011) PS

AK101 - Surrogate recovery for 4-bromofluorobenzene does not meet QC criteria, due to matrix interference.
8270D SIM - PAH surrogate recoveries for 2-methylnaphthalene-d10 and fluoranthene-d10 do not meet QC criteria due to sample dilution. The sample was diluted due to high concentrations of non-target compounds.

AT-21-SB-10-28 (1213875019) PS

AK101 - Surrogate recovery for 4-bromofluorobenzene does not meet QC criteria, due to matrix interference.
8270D SIM - PAH surrogate recovery for 2-methylnaphthalene-d10 does not meet QC criteria due to matrix interference.
8270D SIM - The PAH LOQs are elevated due to sample dilution. The sample was analyzed at a dilution due to high concentrations of non-target compounds.

AT-21-SB-16-28 (1213875020) PS

AK101 - Surrogate recovery for 4-bromofluorobenzene does not meet QC criteria, due to matrix interference.
8270D SIM - PAH surrogate recovery for 2-methylnaphthalene-d10 does not meet QC criteria due to matrix interference.
8270D SIM - The PAH LOQs are elevated due to sample dilution. The sample was analyzed at a dilution due to high concentrations of non-target compounds.

LCS for HBN 1822003 [VXX/37376 (1621874) LCS

8260D - LCS recovery for Trichlorofluoromethane does not meet QC criteria. This analyte was not detected above the LOQ in the associated samples.

MB for HBN 1822484 [VXX/37430] (1623638) MB

AK101 - GRO was detected in the MB greater than 1/2 the LOQ, but less than the LOQ.

MB for HBN 1822613 [VXX/37449] (1624243) MB

AK101 - MB recovery for GRO does not meet QC criteria, however the value is below the LOQ.

1214003002(1621875MS) (1621876) MS

8260D - MS recovery for Trichlorofluoromethane does not meet QC criteria. This analyte was not detected above the LOQ in the PS.

1213889038(1622008MS) (1622009) MS

8260D - MS recovery for n-hexane does not meet QC criteria. See LCS for accuracy requirements.

1213875004(1622272MS) (1622273) MS

8260D - MS recovery for Trichlorofluoromethane does not meet QC criteria. Refer to LCS for accuracy requirements.

1214123002(1622502MS) (1622503) MS

8260D - MS recovery for Trichlorofluoromethane does not meet QC criteria. See LCS for accuracy requirements.

1214003002(1621875MSD) (1621877) MSD

8260D - MSD recovery for Trichlorofluoromethane does not meet QC criteria. This analyte was not detected above the LOQ in the PS.

Case Narrative

SGS Client: **Ahtna Engineering Svs**
SGS Project: **1213875**
Project Name/Site: **Arctic and Tudor**
Project Contact: **Nino Muniz**

1213889038(1622008MSD) (1622010) MSD

8260D - MSD recovery for n-hexane does not meet QC criteria. See LCS for accuracy requirements.

1214123002(1622502MSD) (1622504) MSD

8260D - MSD recovery for Trichlorofluoromethane does not meet QC criteria. See LCS for accuracy requirements.

*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: 08/10/2021 3:50:14PM

Laboratory Qualifiers

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

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

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

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

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

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



Sample Summary

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>Collected</u>	<u>Received</u>	<u>Matrix</u>
AT-21-SB-04-13	1213875001	06/28/2021	07/01/2021	Soil/Solid (dry weight)
AT-21-SB-08-13	1213875002	06/28/2021	07/01/2021	Soil/Solid (dry weight)
AT-21-SB-05-13	1213875003	06/28/2021	07/01/2021	Soil/Solid (dry weight)
AT-21-SB-02-13	1213875004	06/28/2021	07/01/2021	Soil/Solid (dry weight)
AT-21-SB-09-13	1213875005	06/28/2021	07/01/2021	Soil/Solid (dry weight)
AT-21-SB-06-13	1213875006	06/28/2021	07/01/2021	Soil/Solid (dry weight)
AT-21-SB-07-13	1213875007	06/28/2021	07/01/2021	Soil/Solid (dry weight)
AT-21-SB-03-26	1213875008	06/29/2021	07/01/2021	Soil/Solid (dry weight)
AT-21-SB-03-13	1213875009	06/29/2021	07/01/2021	Soil/Solid (dry weight)
AT-21-SB-03-30	1213875010	06/29/2021	07/01/2021	Soil/Solid (dry weight)
AT-21-SB-15-30	1213875011	06/29/2021	07/01/2021	Soil/Solid (dry weight)
AT-21-SB-MW128-31	1213875012	06/30/2021	07/01/2021	Soil/Solid (dry weight)
AT-21-SB-MW128-13	1213875013	06/30/2021	07/01/2021	Soil/Solid (dry weight)
AT-21-SB-01-31	1213875014	06/30/2021	07/01/2021	Soil/Solid (dry weight)
AT-21-SB-01-22	1213875015	06/30/2021	07/01/2021	Soil/Solid (dry weight)
AT-21-SB-01-13	1213875016	06/30/2021	07/01/2021	Soil/Solid (dry weight)
AT-21-SB-10-18	1213875017	06/30/2021	07/01/2021	Soil/Solid (dry weight)
AT-21-SB-10-31	1213875018	06/30/2021	07/01/2021	Soil/Solid (dry weight)
AT-21-SB-10-28	1213875019	06/30/2021	07/01/2021	Soil/Solid (dry weight)
AT-21-SB-16-28	1213875020	06/30/2021	07/01/2021	Soil/Solid (dry weight)
AT-21-TB-01	1213875021	06/28/2021	07/01/2021	Soil/Solid (dry weight)

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

Print Date: 08/10/2021 3:50:17PM



Detectable Results Summary

Client Sample ID: **AT-21-SB-04-13**

Lab Sample ID: 1213875001

Semivolatile Organic Fuels

Volatile Fuels

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	9.01J	mg/kg
Gasoline Range Organics	2.06J	mg/kg

Client Sample ID: **AT-21-SB-08-13**

Lab Sample ID: 1213875002

Volatile Fuels

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Gasoline Range Organics	2.01J	mg/kg

Client Sample ID: **AT-21-SB-05-13**

Lab Sample ID: 1213875003

Volatile Fuels

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Gasoline Range Organics	1.95J	mg/kg

Client Sample ID: **AT-21-SB-02-13**

Lab Sample ID: 1213875004

Volatile Fuels

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Gasoline Range Organics	2.30J	mg/kg

Client Sample ID: **AT-21-SB-09-13**

Lab Sample ID: 1213875005

Semivolatile Organic Fuels

Volatile Fuels

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	8.04J	mg/kg
Gasoline Range Organics	1.93J	mg/kg

Client Sample ID: **AT-21-SB-06-13**

Lab Sample ID: 1213875006

Volatile Fuels

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Gasoline Range Organics	1.88J	mg/kg

Client Sample ID: **AT-21-SB-07-13**

Lab Sample ID: 1213875007

Semivolatile Organic Fuels

Volatile Fuels

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	8.34J	mg/kg
Gasoline Range Organics	1.32J	mg/kg

Client Sample ID: **AT-21-SB-03-26**

Lab Sample ID: 1213875008

Semivolatile Organic Fuels

Volatile Fuels

Volatile GC/MS- Petroleum VOC Group

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	6.56J	mg/kg
Gasoline Range Organics	1.48J	mg/kg
1,2,4-Trimethylbenzene	20.4J	ug/kg
1,3,5-Trimethylbenzene	10.4J	ug/kg
o-Xylene	11.0J	ug/kg
P & M -Xylene	22.8J	ug/kg
Xylenes (total)	33.8J	ug/kg

Client Sample ID: **AT-21-SB-03-13**

Lab Sample ID: 1213875009

Volatile Fuels

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Gasoline Range Organics	1.74J	mg/kg

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Detectable Results Summary

Client Sample ID: **AT-21-SB-03-30**

Lab Sample ID: 1213875010

Polynuclear Aromatics GC/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
1-Methylnaphthalene	12600	ug/kg
2-Methylnaphthalene	15100	ug/kg
Fluorene	577J	ug/kg
Naphthalene	10700	ug/kg
Semivolatile Organic Fuels	Diesel Range Organics	10500 mg/kg
Volatile Fuels	Gasoline Range Organics	373 mg/kg
Volatile GC/MS- Petroleum VOC Group	1,2,4-Trimethylbenzene	50800 ug/kg
	1,3,5-Trimethylbenzene	21100 ug/kg
	Ethylbenzene	3410 ug/kg
	Isopropylbenzene (Cumene)	3930 ug/kg
	Naphthalene	15300 ug/kg
	o-Xylene	7310 ug/kg
	P & M -Xylene	14700 ug/kg
	sec-Butylbenzene	5880 ug/kg
	Xylenes (total)	22000 ug/kg

Client Sample ID: **AT-21-SB-15-30**

Lab Sample ID: 1213875011

Polynuclear Aromatics GC/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
1-Methylnaphthalene	10800	ug/kg
2-Methylnaphthalene	12400	ug/kg
Fluorene	517J	ug/kg
Naphthalene	9240	ug/kg
Semivolatile Organic Fuels	Diesel Range Organics	10300 mg/kg
Volatile Fuels	Gasoline Range Organics	473 mg/kg
Volatile GC/MS- Petroleum VOC Group	1,2,4-Trimethylbenzene	39100 ug/kg
	1,3,5-Trimethylbenzene	14700 ug/kg
	Ethylbenzene	3050 ug/kg
	Isopropylbenzene (Cumene)	3140 ug/kg
	Naphthalene	17900 ug/kg
	o-Xylene	6540 ug/kg
	P & M -Xylene	12800 ug/kg
	sec-Butylbenzene	3980 ug/kg
	Xylenes (total)	19300 ug/kg

Client Sample ID: **AT-21-SB-MW128-31**

Lab Sample ID: 1213875012

Semivolatile Organic Fuels

Volatile Fuels

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	9.67J	mg/kg
Gasoline Range Organics	1.87J	mg/kg

Client Sample ID: **AT-21-SB-MW128-13**

Lab Sample ID: 1213875013

Semivolatile Organic Fuels

Volatile Fuels

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	11.5J	mg/kg
Gasoline Range Organics	3.03J	mg/kg

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Detectable Results Summary

Client Sample ID: **AT-21-SB-01-31**

Lab Sample ID: 1213875014

Semivolatile Organic Fuels

Volatile Fuels

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	14.0J	mg/kg
Gasoline Range Organics	1.90J	mg/kg

Client Sample ID: **AT-21-SB-01-22**

Lab Sample ID: 1213875015

Semivolatile Organic Fuels

Volatile Fuels

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	12.7J	mg/kg
Gasoline Range Organics	1.82J	mg/kg

Client Sample ID: **AT-21-SB-01-13**

Lab Sample ID: 1213875016

Semivolatile Organic Fuels

Volatile Fuels

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	13.8J	mg/kg
Gasoline Range Organics	1.63J	mg/kg

Client Sample ID: **AT-21-SB-10-18**

Lab Sample ID: 1213875017

Semivolatile Organic Fuels

Volatile Fuels

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	13.5J	mg/kg
Gasoline Range Organics	1.60J	mg/kg

Client Sample ID: **AT-21-SB-10-31**

Lab Sample ID: 1213875018

Polynuclear Aromatics GC/MS

Semivolatile Organic Fuels

Volatile Fuels

Volatile GC/MS- Petroleum VOC Group

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
2-Methylnaphthalene	15.6J	ug/kg
Phenanthrene	20.7J	ug/kg
Diesel Range Organics	31.2	mg/kg
Gasoline Range Organics	3.97	mg/kg
1,2,4-Trimethylbenzene	325	ug/kg
1,3,5-Trimethylbenzene	124	ug/kg
Benzene	73.2	ug/kg
Ethylbenzene	122	ug/kg
Isopropylbenzene (Cumene)	38.9	ug/kg
Naphthalene	124	ug/kg
o-Xylene	433	ug/kg
P & M -Xylene	611	ug/kg
Toluene	167	ug/kg
Xylenes (total)	1040	ug/kg

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Detectable Results Summary

Client Sample ID: **AT-21-SB-10-28**

Lab Sample ID: 1213875019

Semivolatile Organic Fuels

Volatiles Fuels

Volatiles GC/MS- Petroleum VOC Group

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	4960	mg/kg
Gasoline Range Organics	72.5	mg/kg
1,2,4-Trimethylbenzene	91.3J	ug/kg
1,3,5-Trimethylbenzene	50.1	ug/kg
Ethylbenzene	32.3J	ug/kg
Isopropylbenzene (Cumene)	26.8J	ug/kg
Naphthalene	107	ug/kg
o-Xylene	87.4	ug/kg
P & M -Xylene	168	ug/kg
sec-Butylbenzene	140	ug/kg
Toluene	46.7J	ug/kg
Xylenes (total)	256	ug/kg

Client Sample ID: **AT-21-SB-16-28**

Lab Sample ID: 1213875020

Semivolatile Organic Fuels

Volatiles Fuels

Volatiles GC/MS- Petroleum VOC Group

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	7020	mg/kg
Gasoline Range Organics	96.4	mg/kg
1,2,4-Trimethylbenzene	69.1J	ug/kg
1,3,5-Trimethylbenzene	32.4J	ug/kg
Ethylbenzene	25.1J	ug/kg
Isopropylbenzene (Cumene)	17.7J	ug/kg
Naphthalene	90.7	ug/kg
o-Xylene	63.1	ug/kg
P & M -Xylene	136	ug/kg
sec-Butylbenzene	135	ug/kg
tert-Butylbenzene	47.9	ug/kg
Toluene	39.3J	ug/kg
Xylenes (total)	199	ug/kg

Client Sample ID: **AT-21-TB-01**

Lab Sample ID: 1213875021

Volatiles Fuels

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Gasoline Range Organics	1.42J	mg/kg



Results of **AT-21-SB-04-13**

Client Sample ID: **AT-21-SB-04-13**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875001
Lab Project ID: 1213875

Collection Date: 06/28/21 10:18
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):77.2
Location:

Results by **Polynuclear Aromatics GC/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
1-Methylnaphthalene	16.1 U	32.3	8.07	ug/kg	1		07/18/21 14:38
2-Methylnaphthalene	16.1 U	32.3	8.07	ug/kg	1		07/18/21 14:38
Acenaphthene	16.1 U	32.3	8.07	ug/kg	1		07/18/21 14:38
Acenaphthylene	16.1 U	32.3	8.07	ug/kg	1		07/18/21 14:38
Anthracene	16.1 U	32.3	8.07	ug/kg	1		07/18/21 14:38
Benzo(a)Anthracene	16.1 U	32.3	8.07	ug/kg	1		07/18/21 14:38
Benzo[a]pyrene	16.1 U	32.3	8.07	ug/kg	1		07/18/21 14:38
Benzo[b]Fluoranthene	16.1 U	32.3	8.07	ug/kg	1		07/18/21 14:38
Benzo[g,h,i]perylene	16.1 U	32.3	8.07	ug/kg	1		07/18/21 14:38
Benzo[k]fluoranthene	16.1 U	32.3	8.07	ug/kg	1		07/18/21 14:38
Chrysene	16.1 U	32.3	8.07	ug/kg	1		07/18/21 14:38
Dibenzo[a,h]anthracene	16.1 U	32.3	8.07	ug/kg	1		07/18/21 14:38
Fluoranthene	16.1 U	32.3	8.07	ug/kg	1		07/18/21 14:38
Fluorene	16.1 U	32.3	8.07	ug/kg	1		07/18/21 14:38
Indeno[1,2,3-c,d] pyrene	16.1 U	32.3	8.07	ug/kg	1		07/18/21 14:38
Naphthalene	12.9 U	25.8	6.46	ug/kg	1		07/18/21 14:38
Phenanthrene	16.1 U	32.3	8.07	ug/kg	1		07/18/21 14:38
Pyrene	16.1 U	32.3	8.07	ug/kg	1		07/18/21 14:38
Surrogates							
2-Methylnaphthalene-d10 (surr)	89.3	58-103		%	1		07/18/21 14:38
Fluoranthene-d10 (surr)	86.3	54-113		%	1		07/18/21 14:38

Batch Information

Analytical Batch: XMS12757
Analytical Method: 8270D SIM (PAH)
Analyst: LAW
Analytical Date/Time: 07/18/21 14:38
Container ID: 1213875001-A

Prep Batch: XXX45113
Prep Method: SW3550C
Prep Date/Time: 07/08/21 06:18
Prep Initial Wt./Vol.: 22.57 g
Prep Extract Vol: 5 mL



Results of **AT-21-SB-04-13**

Client Sample ID: **AT-21-SB-04-13**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875001
Lab Project ID: 1213875

Collection Date: 06/28/21 10:18
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):77.2
Location:

Results by **Semivolatile Organic Fuels**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	9.01 J	25.7	7.97	mg/kg	1		07/08/21 17:20
Surrogates							
5a Androstane (surr)	93.3	50-150		%	1		07/08/21 17:20

Batch Information

Analytical Batch: XFC15990
Analytical Method: AK102
Analyst: IVM
Analytical Date/Time: 07/08/21 17:20
Container ID: 1213875001-A

Prep Batch: XXX45118
Prep Method: SW3550C
Prep Date/Time: 07/08/21 10:14
Prep Initial Wt./Vol.: 30.262 g
Prep Extract Vol: 5 mL



Results of **AT-21-SB-04-13**

Client Sample ID: **AT-21-SB-04-13**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875001
Lab Project ID: 1213875

Collection Date: 06/28/21 10:18
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):77.2
Location:

Results by **Volatile Fuels**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	2.06 J	5.05	1.51	mg/kg	1		07/15/21 22:35
Surrogates							
4-Bromofluorobenzene (surr)	111	50-150		%	1		07/15/21 22:35

Batch Information

Analytical Batch: VFC15714
Analytical Method: AK101
Analyst: MDT
Analytical Date/Time: 07/15/21 22:35
Container ID: 1213875001-B

Prep Batch: VXX37429
Prep Method: SW5035A
Prep Date/Time: 06/28/21 10:18
Prep Initial Wt./Vol.: 45.429 g
Prep Extract Vol: 35.3748 mL



Results of **AT-21-SB-04-13**

Client Sample ID: **AT-21-SB-04-13**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875001
Lab Project ID: 1213875

Collection Date: 06/28/21 10:18
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):77.2
Location:

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

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
1,2,4-Trimethylbenzene	50.5 U	101	30.3	ug/kg	1		07/08/21 20:00
1,2-Dibromoethane	1.01 U	2.02	0.807	ug/kg	1		07/08/21 20:00
1,2-Dichloroethane	2.02 U	4.04	1.41	ug/kg	1		07/08/21 20:00
1,3,5-Trimethylbenzene	25.3 U	50.5	15.7	ug/kg	1		07/08/21 20:00
Benzene	12.6 U	25.2	7.87	ug/kg	1		07/08/21 20:00
Ethylbenzene	25.3 U	50.5	15.7	ug/kg	1		07/08/21 20:00
Isopropylbenzene (Cumene)	25.3 U	50.5	15.7	ug/kg	1		07/08/21 20:00
Methyl-t-butyl ether	101 U	202	62.6	ug/kg	1		07/08/21 20:00
Naphthalene	25.3 U	50.5	15.7	ug/kg	1		07/08/21 20:00
n-Butylbenzene	25.3 U	50.5	15.7	ug/kg	1		07/08/21 20:00
o-Xylene	25.3 U	50.5	15.7	ug/kg	1		07/08/21 20:00
P & M -Xylene	50.5 U	101	30.3	ug/kg	1		07/08/21 20:00
sec-Butylbenzene	25.3 U	50.5	15.7	ug/kg	1		07/08/21 20:00
tert-Butylbenzene	25.3 U	50.5	15.7	ug/kg	1		07/08/21 20:00
Toluene	25.3 U	50.5	15.7	ug/kg	1		07/08/21 20:00
Xylenes (total)	75.5 U	151	46.0	ug/kg	1		07/08/21 20:00
Surrogates							
1,2-Dichloroethane-D4 (surr)	109	71-136		%	1		07/08/21 20:00
4-Bromofluorobenzene (surr)	98.6	55-151		%	1		07/08/21 20:00
Toluene-d8 (surr)	99.8	85-116		%	1		07/08/21 20:00

Batch Information

Analytical Batch: VMS20900
Analytical Method: SW8260D
Analyst: S.S
Analytical Date/Time: 07/08/21 20:00
Container ID: 1213875001-B

Prep Batch: VXX37383
Prep Method: SW5035A
Prep Date/Time: 06/28/21 10:18
Prep Initial Wt./Vol.: 45.429 g
Prep Extract Vol: 35.3748 mL



Results of **AT-21-SB-08-13**

Client Sample ID: **AT-21-SB-08-13**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875002
Lab Project ID: 1213875

Collection Date: 06/28/21 11:00
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):77.3
Location:

Results by **Polynuclear Aromatics GC/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
1-Methylnaphthalene	15.9 U	31.7	7.92	ug/kg	1		07/19/21 03:47
2-Methylnaphthalene	15.9 U	31.7	7.92	ug/kg	1		07/19/21 03:47
Acenaphthene	15.9 U	31.7	7.92	ug/kg	1		07/19/21 03:47
Acenaphthylene	15.9 U	31.7	7.92	ug/kg	1		07/19/21 03:47
Anthracene	15.9 U	31.7	7.92	ug/kg	1		07/19/21 03:47
Benzo(a)Anthracene	15.9 U	31.7	7.92	ug/kg	1		07/19/21 03:47
Benzo[a]pyrene	15.9 U	31.7	7.92	ug/kg	1		07/19/21 03:47
Benzo[b]Fluoranthene	15.9 U	31.7	7.92	ug/kg	1		07/19/21 03:47
Benzo[g,h,i]perylene	15.9 U	31.7	7.92	ug/kg	1		07/19/21 03:47
Benzo[k]fluoranthene	15.9 U	31.7	7.92	ug/kg	1		07/19/21 03:47
Chrysene	15.9 U	31.7	7.92	ug/kg	1		07/19/21 03:47
Dibenzo[a,h]anthracene	15.9 U	31.7	7.92	ug/kg	1		07/19/21 03:47
Fluoranthene	15.9 U	31.7	7.92	ug/kg	1		07/19/21 03:47
Fluorene	15.9 U	31.7	7.92	ug/kg	1		07/19/21 03:47
Indeno[1,2,3-c,d] pyrene	15.9 U	31.7	7.92	ug/kg	1		07/19/21 03:47
Naphthalene	12.7 U	25.3	6.34	ug/kg	1		07/19/21 03:47
Phenanthrene	15.9 U	31.7	7.92	ug/kg	1		07/19/21 03:47
Pyrene	15.9 U	31.7	7.92	ug/kg	1		07/19/21 03:47
Surrogates							
2-Methylnaphthalene-d10 (surr)	82.5	58-103		%	1		07/19/21 03:47
Fluoranthene-d10 (surr)	86.6	54-113		%	1		07/19/21 03:47

Batch Information

Analytical Batch: XMS12758
Analytical Method: 8270D SIM (PAH)
Analyst: LAW
Analytical Date/Time: 07/19/21 03:47
Container ID: 1213875002-A

Prep Batch: XXX45119
Prep Method: SW3550C
Prep Date/Time: 07/08/21 10:53
Prep Initial Wt./Vol.: 22.953 g
Prep Extract Vol: 5 mL



Results of **AT-21-SB-08-13**

Client Sample ID: **AT-21-SB-08-13**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875002
Lab Project ID: 1213875

Collection Date: 06/28/21 11:00
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):77.3
Location:

Results by **Semivolatile Organic Fuels**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	12.9 U	25.8	8.00	mg/kg	1		07/08/21 17:29
Surrogates							
5a Androstane (surr)	92	50-150		%	1		07/08/21 17:29

Batch Information

Analytical Batch: XFC15990
Analytical Method: AK102
Analyst: IVM
Analytical Date/Time: 07/08/21 17:29
Container ID: 1213875002-A

Prep Batch: XXX45118
Prep Method: SW3550C
Prep Date/Time: 07/08/21 10:14
Prep Initial Wt./Vol.: 30.055 g
Prep Extract Vol: 5 mL



Results of **AT-21-SB-08-13**

Client Sample ID: **AT-21-SB-08-13**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875002
Lab Project ID: 1213875

Collection Date: 06/28/21 11:00
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):77.3
Location:

Results by **Volatile Fuels**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	2.01 J	4.88	1.46	mg/kg	1		07/15/21 22:53
Surrogates							
4-Bromofluorobenzene (surr)	105	50-150		%	1		07/15/21 22:53

Batch Information

Analytical Batch: VFC15714
Analytical Method: AK101
Analyst: MDT
Analytical Date/Time: 07/15/21 22:53
Container ID: 1213875002-B

Prep Batch: VXX37429
Prep Method: SW5035A
Prep Date/Time: 06/28/21 11:00
Prep Initial Wt./Vol.: 47.312 g
Prep Extract Vol: 35.7204 mL



Results of **AT-21-SB-08-13**

Client Sample ID: **AT-21-SB-08-13**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875002
Lab Project ID: 1213875

Collection Date: 06/28/21 11:00
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):77.3
Location:

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

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
1,2,4-Trimethylbenzene	48.8 U	97.6	29.3	ug/kg	1		07/08/21 19:00
1,2-Dibromoethane	0.975 U	1.95	0.781	ug/kg	1		07/08/21 19:00
1,2-Dichloroethane	1.95 U	3.90	1.37	ug/kg	1		07/08/21 19:00
1,3,5-Trimethylbenzene	24.4 U	48.8	15.2	ug/kg	1		07/08/21 19:00
Benzene	12.2 U	24.4	7.61	ug/kg	1		07/08/21 19:00
Ethylbenzene	24.4 U	48.8	15.2	ug/kg	1		07/08/21 19:00
Isopropylbenzene (Cumene)	24.4 U	48.8	15.2	ug/kg	1		07/08/21 19:00
Methyl-t-butyl ether	97.5 U	195	60.5	ug/kg	1		07/08/21 19:00
Naphthalene	24.4 U	48.8	15.2	ug/kg	1		07/08/21 19:00
n-Butylbenzene	24.4 U	48.8	15.2	ug/kg	1		07/08/21 19:00
o-Xylene	24.4 U	48.8	15.2	ug/kg	1		07/08/21 19:00
P & M -Xylene	48.8 U	97.6	29.3	ug/kg	1		07/08/21 19:00
sec-Butylbenzene	24.4 U	48.8	15.2	ug/kg	1		07/08/21 19:00
tert-Butylbenzene	24.4 U	48.8	15.2	ug/kg	1		07/08/21 19:00
Toluene	24.4 U	48.8	15.2	ug/kg	1		07/08/21 19:00
Xylenes (total)	73.0 U	146	44.5	ug/kg	1		07/08/21 19:00
Surrogates							
1,2-Dichloroethane-D4 (surr)	103	71-136		%	1		07/08/21 19:00
4-Bromofluorobenzene (surr)	101	55-151		%	1		07/08/21 19:00
Toluene-d8 (surr)	99.2	85-116		%	1		07/08/21 19:00

Batch Information

Analytical Batch: VMS20896
Analytical Method: SW8260D
Analyst: S.S
Analytical Date/Time: 07/08/21 19:00
Container ID: 1213875002-B

Prep Batch: VXX37376
Prep Method: SW5035A
Prep Date/Time: 06/28/21 11:00
Prep Initial Wt./Vol.: 47.312 g
Prep Extract Vol: 35.7204 mL



Results of **AT-21-SB-05-13**

Client Sample ID: **AT-21-SB-05-13**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875003
Lab Project ID: 1213875

Collection Date: 06/28/21 11:28
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):78.6
Location:

Results by **Polynuclear Aromatics GC/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
1-Methylnaphthalene	15.9 U	31.8	7.94	ug/kg	1		07/18/21 14:59
2-Methylnaphthalene	15.9 U	31.8	7.94	ug/kg	1		07/18/21 14:59
Acenaphthene	15.9 U	31.8	7.94	ug/kg	1		07/18/21 14:59
Acenaphthylene	15.9 U	31.8	7.94	ug/kg	1		07/18/21 14:59
Anthracene	15.9 U	31.8	7.94	ug/kg	1		07/18/21 14:59
Benzo(a)Anthracene	15.9 U	31.8	7.94	ug/kg	1		07/18/21 14:59
Benzo[a]pyrene	15.9 U	31.8	7.94	ug/kg	1		07/18/21 14:59
Benzo[b]Fluoranthene	15.9 U	31.8	7.94	ug/kg	1		07/18/21 14:59
Benzo[g,h,i]perylene	15.9 U	31.8	7.94	ug/kg	1		07/18/21 14:59
Benzo[k]fluoranthene	15.9 U	31.8	7.94	ug/kg	1		07/18/21 14:59
Chrysene	15.9 U	31.8	7.94	ug/kg	1		07/18/21 14:59
Dibenzo[a,h]anthracene	15.9 U	31.8	7.94	ug/kg	1		07/18/21 14:59
Fluoranthene	15.9 U	31.8	7.94	ug/kg	1		07/18/21 14:59
Fluorene	15.9 U	31.8	7.94	ug/kg	1		07/18/21 14:59
Indeno[1,2,3-c,d] pyrene	15.9 U	31.8	7.94	ug/kg	1		07/18/21 14:59
Naphthalene	12.7 U	25.4	6.36	ug/kg	1		07/18/21 14:59
Phenanthrene	15.9 U	31.8	7.94	ug/kg	1		07/18/21 14:59
Pyrene	15.9 U	31.8	7.94	ug/kg	1		07/18/21 14:59
Surrogates							
2-Methylnaphthalene-d10 (surr)	88.6	58-103		%	1		07/18/21 14:59
Fluoranthene-d10 (surr)	88.6	54-113		%	1		07/18/21 14:59

Batch Information

Analytical Batch: XMS12757
Analytical Method: 8270D SIM (PAH)
Analyst: LAW
Analytical Date/Time: 07/18/21 14:59
Container ID: 1213875003-A

Prep Batch: XXX45113
Prep Method: SW3550C
Prep Date/Time: 07/08/21 06:18
Prep Initial Wt./Vol.: 22.534 g
Prep Extract Vol: 5 mL



Results of **AT-21-SB-05-13**

Client Sample ID: **AT-21-SB-05-13**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875003
Lab Project ID: 1213875

Collection Date: 06/28/21 11:28
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):78.6
Location:

Results by **Semivolatile Organic Fuels**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	12.7 U	25.4	7.88	mg/kg	1		07/08/21 17:39
Surrogates							
5a Androstane (surr)	87.9	50-150		%	1		07/08/21 17:39

Batch Information

Analytical Batch: XFC15990
Analytical Method: AK102
Analyst: IVM
Analytical Date/Time: 07/08/21 17:39
Container ID: 1213875003-A

Prep Batch: XXX45118
Prep Method: SW3550C
Prep Date/Time: 07/08/21 10:14
Prep Initial Wt./Vol.: 30.062 g
Prep Extract Vol: 5 mL



Results of **AT-21-SB-05-13**

Client Sample ID: **AT-21-SB-05-13**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875003
Lab Project ID: 1213875

Collection Date: 06/28/21 11:28
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):78.6
Location:

Results by **Volatile Fuels**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	1.95 J	4.59	1.38	mg/kg	1		07/15/21 23:11
Surrogates							
4-Bromofluorobenzene (surr)	104	50-150		%	1		07/15/21 23:11

Batch Information

Analytical Batch: VFC15714
Analytical Method: AK101
Analyst: MDT
Analytical Date/Time: 07/15/21 23:11
Container ID: 1213875003-B

Prep Batch: VXX37429
Prep Method: SW5035A
Prep Date/Time: 06/28/21 11:28
Prep Initial Wt./Vol.: 49.355 g
Prep Extract Vol: 35.5848 mL



Results of **AT-21-SB-05-13**

Client Sample ID: **AT-21-SB-05-13**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875003
Lab Project ID: 1213875

Collection Date: 06/28/21 11:28
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):78.6
Location:

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

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
1,2,4-Trimethylbenzene	45.9 U	91.8	27.5	ug/kg	1		07/08/21 19:15
1,2-Dibromoethane	0.920 U	1.84	0.734	ug/kg	1		07/08/21 19:15
1,2-Dichloroethane	1.84 U	3.67	1.28	ug/kg	1		07/08/21 19:15
1,3,5-Trimethylbenzene	22.9 U	45.9	14.3	ug/kg	1		07/08/21 19:15
Benzene	11.4 U	22.9	7.16	ug/kg	1		07/08/21 19:15
Ethylbenzene	22.9 U	45.9	14.3	ug/kg	1		07/08/21 19:15
Isopropylbenzene (Cumene)	22.9 U	45.9	14.3	ug/kg	1		07/08/21 19:15
Methyl-t-butyl ether	92.0 U	184	56.9	ug/kg	1		07/08/21 19:15
Naphthalene	22.9 U	45.9	14.3	ug/kg	1		07/08/21 19:15
n-Butylbenzene	22.9 U	45.9	14.3	ug/kg	1		07/08/21 19:15
o-Xylene	22.9 U	45.9	14.3	ug/kg	1		07/08/21 19:15
P & M -Xylene	45.9 U	91.8	27.5	ug/kg	1		07/08/21 19:15
sec-Butylbenzene	22.9 U	45.9	14.3	ug/kg	1		07/08/21 19:15
tert-Butylbenzene	22.9 U	45.9	14.3	ug/kg	1		07/08/21 19:15
Toluene	22.9 U	45.9	14.3	ug/kg	1		07/08/21 19:15
Xylenes (total)	69.0 U	138	41.9	ug/kg	1		07/08/21 19:15
Surrogates							
1,2-Dichloroethane-D4 (surr)	102	71-136		%	1		07/08/21 19:15
4-Bromofluorobenzene (surr)	103	55-151		%	1		07/08/21 19:15
Toluene-d8 (surr)	97.7	85-116		%	1		07/08/21 19:15

Batch Information

Analytical Batch: VMS20896
Analytical Method: SW8260D
Analyst: S.S
Analytical Date/Time: 07/08/21 19:15
Container ID: 1213875003-B

Prep Batch: VXX37376
Prep Method: SW5035A
Prep Date/Time: 06/28/21 11:28
Prep Initial Wt./Vol.: 49.355 g
Prep Extract Vol: 35.5848 mL



Results of **AT-21-SB-02-13**

Client Sample ID: **AT-21-SB-02-13**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875004
Lab Project ID: 1213875

Collection Date: 06/28/21 12:05
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):76.2
Location:

Results by **Polynuclear Aromatics GC/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
1-Methylnaphthalene	16.1 U	32.3	8.08	ug/kg	1		07/18/21 15:19
2-Methylnaphthalene	16.1 U	32.3	8.08	ug/kg	1		07/18/21 15:19
Acenaphthene	16.1 U	32.3	8.08	ug/kg	1		07/18/21 15:19
Acenaphthylene	16.1 U	32.3	8.08	ug/kg	1		07/18/21 15:19
Anthracene	16.1 U	32.3	8.08	ug/kg	1		07/18/21 15:19
Benzo(a)Anthracene	16.1 U	32.3	8.08	ug/kg	1		07/18/21 15:19
Benzo[a]pyrene	16.1 U	32.3	8.08	ug/kg	1		07/18/21 15:19
Benzo[b]Fluoranthene	16.1 U	32.3	8.08	ug/kg	1		07/18/21 15:19
Benzo[g,h,i]perylene	16.1 U	32.3	8.08	ug/kg	1		07/18/21 15:19
Benzo[k]fluoranthene	16.1 U	32.3	8.08	ug/kg	1		07/18/21 15:19
Chrysene	16.1 U	32.3	8.08	ug/kg	1		07/18/21 15:19
Dibenzo[a,h]anthracene	16.1 U	32.3	8.08	ug/kg	1		07/18/21 15:19
Fluoranthene	16.1 U	32.3	8.08	ug/kg	1		07/18/21 15:19
Fluorene	16.1 U	32.3	8.08	ug/kg	1		07/18/21 15:19
Indeno[1,2,3-c,d] pyrene	16.1 U	32.3	8.08	ug/kg	1		07/18/21 15:19
Naphthalene	12.9 U	25.9	6.46	ug/kg	1		07/18/21 15:19
Phenanthrene	16.1 U	32.3	8.08	ug/kg	1		07/18/21 15:19
Pyrene	16.1 U	32.3	8.08	ug/kg	1		07/18/21 15:19
Surrogates							
2-Methylnaphthalene-d10 (surr)	88.7	58-103		%	1		07/18/21 15:19
Fluoranthene-d10 (surr)	82.4	54-113		%	1		07/18/21 15:19

Batch Information

Analytical Batch: XMS12757
Analytical Method: 8270D SIM (PAH)
Analyst: LAW
Analytical Date/Time: 07/18/21 15:19
Container ID: 1213875004-A

Prep Batch: XXX45113
Prep Method: SW3550C
Prep Date/Time: 07/08/21 06:18
Prep Initial Wt./Vol.: 22.853 g
Prep Extract Vol: 5 mL



Results of **AT-21-SB-02-13**

Client Sample ID: **AT-21-SB-02-13**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875004
Lab Project ID: 1213875

Collection Date: 06/28/21 12:05
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):76.2
Location:

Results by **Semivolatile Organic Fuels**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	13.1 U	26.2	8.12	mg/kg	1		07/08/21 17:49
Surrogates							
5a Androstane (surr)	93.7	50-150		%	1		07/08/21 17:49

Batch Information

Analytical Batch: XFC15990
Analytical Method: AK102
Analyst: IVM
Analytical Date/Time: 07/08/21 17:49
Container ID: 1213875004-A

Prep Batch: XXX45118
Prep Method: SW3550C
Prep Date/Time: 07/08/21 10:14
Prep Initial Wt./Vol.: 30.073 g
Prep Extract Vol: 5 mL



Results of **AT-21-SB-02-13**

Client Sample ID: **AT-21-SB-02-13**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875004
Lab Project ID: 1213875

Collection Date: 06/28/21 12:05
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):76.2
Location:

Results by **Volatile Fuels**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	2.30 J	5.19	1.56	mg/kg	1		07/15/21 23:47
Surrogates							
4-Bromofluorobenzene (surr)	109	50-150		%	1		07/15/21 23:47

Batch Information

Analytical Batch: VFC15714
Analytical Method: AK101
Analyst: MDT
Analytical Date/Time: 07/15/21 23:47
Container ID: 1213875004-B

Prep Batch: VXX37429
Prep Method: SW5035A
Prep Date/Time: 06/28/21 12:05
Prep Initial Wt./Vol.: 45.323 g
Prep Extract Vol: 35.803 mL



Results of **AT-21-SB-02-13**

Client Sample ID: **AT-21-SB-02-13**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875004
Lab Project ID: 1213875

Collection Date: 06/28/21 12:05
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):76.2
Location:

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

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
1,2,4-Trimethylbenzene	52.0 U	104	31.1	ug/kg	1		07/09/21 14:27
1,2-Dibromoethane	1.03 U	2.07	0.830	ug/kg	1		07/09/21 14:27
1,2-Dichloroethane	2.08 U	4.15	1.45	ug/kg	1		07/09/21 14:27
1,3,5-Trimethylbenzene	25.9 U	51.9	16.2	ug/kg	1		07/09/21 14:27
Benzene	12.9 U	25.9	8.09	ug/kg	1		07/09/21 14:27
Ethylbenzene	25.9 U	51.9	16.2	ug/kg	1		07/09/21 14:27
Isopropylbenzene (Cumene)	25.9 U	51.9	16.2	ug/kg	1		07/09/21 14:27
Methyl-t-butyl ether	104 U	207	64.3	ug/kg	1		07/09/21 14:27
Naphthalene	25.9 U	51.9	16.2	ug/kg	1		07/09/21 14:27
n-Butylbenzene	25.9 U	51.9	16.2	ug/kg	1		07/09/21 14:27
o-Xylene	25.9 U	51.9	16.2	ug/kg	1		07/09/21 14:27
P & M -Xylene	52.0 U	104	31.1	ug/kg	1		07/09/21 14:27
sec-Butylbenzene	25.9 U	51.9	16.2	ug/kg	1		07/09/21 14:27
tert-Butylbenzene	25.9 U	51.9	16.2	ug/kg	1		07/09/21 14:27
Toluene	25.9 U	51.9	16.2	ug/kg	1		07/09/21 14:27
Xylenes (total)	78.0 U	156	47.3	ug/kg	1		07/09/21 14:27
Surrogates							
1,2-Dichloroethane-D4 (surr)	112	71-136		%	1		07/09/21 14:27
4-Bromofluorobenzene (surr)	101	55-151		%	1		07/09/21 14:27
Toluene-d8 (surr)	98.8	85-116		%	1		07/09/21 14:27

Batch Information

Analytical Batch: VMS20904
Analytical Method: SW8260D
Analyst: S.S
Analytical Date/Time: 07/09/21 14:27
Container ID: 1213875004-B

Prep Batch: VXX37391
Prep Method: SW5035A
Prep Date/Time: 06/28/21 12:05
Prep Initial Wt./Vol.: 45.323 g
Prep Extract Vol: 35.803 mL



Results of **AT-21-SB-09-13**

Client Sample ID: **AT-21-SB-09-13**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875005
Lab Project ID: 1213875

Collection Date: 06/28/21 13:45
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):77.4
Location:

Results by **Polynuclear Aromatics GC/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
1-Methylnaphthalene	16.1 U	32.3	8.07	ug/kg	1		07/18/21 15:40
2-Methylnaphthalene	16.1 U	32.3	8.07	ug/kg	1		07/18/21 15:40
Acenaphthene	16.1 U	32.3	8.07	ug/kg	1		07/18/21 15:40
Acenaphthylene	16.1 U	32.3	8.07	ug/kg	1		07/18/21 15:40
Anthracene	16.1 U	32.3	8.07	ug/kg	1		07/18/21 15:40
Benzo(a)Anthracene	16.1 U	32.3	8.07	ug/kg	1		07/18/21 15:40
Benzo[a]pyrene	16.1 U	32.3	8.07	ug/kg	1		07/18/21 15:40
Benzo[b]Fluoranthene	16.1 U	32.3	8.07	ug/kg	1		07/18/21 15:40
Benzo[g,h,i]perylene	16.1 U	32.3	8.07	ug/kg	1		07/18/21 15:40
Benzo[k]fluoranthene	16.1 U	32.3	8.07	ug/kg	1		07/18/21 15:40
Chrysene	16.1 U	32.3	8.07	ug/kg	1		07/18/21 15:40
Dibenzo[a,h]anthracene	16.1 U	32.3	8.07	ug/kg	1		07/18/21 15:40
Fluoranthene	16.1 U	32.3	8.07	ug/kg	1		07/18/21 15:40
Fluorene	16.1 U	32.3	8.07	ug/kg	1		07/18/21 15:40
Indeno[1,2,3-c,d] pyrene	16.1 U	32.3	8.07	ug/kg	1		07/18/21 15:40
Naphthalene	12.9 U	25.8	6.46	ug/kg	1		07/18/21 15:40
Phenanthrene	16.1 U	32.3	8.07	ug/kg	1		07/18/21 15:40
Pyrene	16.1 U	32.3	8.07	ug/kg	1		07/18/21 15:40
Surrogates							
2-Methylnaphthalene-d10 (surr)	80	58-103		%	1		07/18/21 15:40
Fluoranthene-d10 (surr)	88.3	54-113		%	1		07/18/21 15:40

Batch Information

Analytical Batch: XMS12757
Analytical Method: 8270D SIM (PAH)
Analyst: LAW
Analytical Date/Time: 07/18/21 15:40
Container ID: 1213875005-A

Prep Batch: XXX45113
Prep Method: SW3550C
Prep Date/Time: 07/08/21 06:18
Prep Initial Wt./Vol.: 22.527 g
Prep Extract Vol: 5 mL



Results of **AT-21-SB-09-13**

Client Sample ID: **AT-21-SB-09-13**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875005
Lab Project ID: 1213875

Collection Date: 06/28/21 13:45
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):77.4
Location:

Results by **Semivolatile Organic Fuels**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	8.04 J	25.6	7.95	mg/kg	1		07/08/21 17:59
Surrogates							
5a Androstane (surr)	93.7	50-150		%	1		07/08/21 17:59

Batch Information

Analytical Batch: XFC15990
Analytical Method: AK102
Analyst: IVM
Analytical Date/Time: 07/08/21 17:59
Container ID: 1213875005-A

Prep Batch: XXX45118
Prep Method: SW3550C
Prep Date/Time: 07/08/21 10:14
Prep Initial Wt./Vol.: 30.244 g
Prep Extract Vol: 5 mL



Results of **AT-21-SB-09-13**

Client Sample ID: **AT-21-SB-09-13**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875005
Lab Project ID: 1213875

Collection Date: 06/28/21 13:45
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):77.4
Location:

Results by **Volatile Fuels**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	1.93 J	4.65	1.39	mg/kg	1		07/16/21 00:05
Surrogates							
4-Bromofluorobenzene (surr)	106	50-150		%	1		07/16/21 00:05

Batch Information

Analytical Batch: VFC15714
Analytical Method: AK101
Analyst: MDT
Analytical Date/Time: 07/16/21 00:05
Container ID: 1213875005-B

Prep Batch: VXX37429
Prep Method: SW5035A
Prep Date/Time: 06/28/21 13:45
Prep Initial Wt./Vol.: 50.746 g
Prep Extract Vol: 36.4921 mL



Results of **AT-21-SB-09-13**

Client Sample ID: **AT-21-SB-09-13**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875005
Lab Project ID: 1213875

Collection Date: 06/28/21 13:45
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):77.4
Location:

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

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
1,2,4-Trimethylbenzene	46.5 U	93.0	27.9	ug/kg	1		07/09/21 14:44
1,2-Dibromoethane	0.930 U	1.86	0.744	ug/kg	1		07/09/21 14:44
1,2-Dichloroethane	1.86 U	3.72	1.30	ug/kg	1		07/09/21 14:44
1,3,5-Trimethylbenzene	23.3 U	46.5	14.5	ug/kg	1		07/09/21 14:44
Benzene	11.6 U	23.2	7.25	ug/kg	1		07/09/21 14:44
Ethylbenzene	23.3 U	46.5	14.5	ug/kg	1		07/09/21 14:44
Isopropylbenzene (Cumene)	23.3 U	46.5	14.5	ug/kg	1		07/09/21 14:44
Methyl-t-butyl ether	93.0 U	186	57.6	ug/kg	1		07/09/21 14:44
Naphthalene	23.3 U	46.5	14.5	ug/kg	1		07/09/21 14:44
n-Butylbenzene	23.3 U	46.5	14.5	ug/kg	1		07/09/21 14:44
o-Xylene	23.3 U	46.5	14.5	ug/kg	1		07/09/21 14:44
P & M -Xylene	46.5 U	93.0	27.9	ug/kg	1		07/09/21 14:44
sec-Butylbenzene	23.3 U	46.5	14.5	ug/kg	1		07/09/21 14:44
tert-Butylbenzene	23.3 U	46.5	14.5	ug/kg	1		07/09/21 14:44
Toluene	23.3 U	46.5	14.5	ug/kg	1		07/09/21 14:44
Xylenes (total)	69.5 U	139	42.4	ug/kg	1		07/09/21 14:44
Surrogates							
1,2-Dichloroethane-D4 (surr)	111	71-136		%	1		07/09/21 14:44
4-Bromofluorobenzene (surr)	99.7	55-151		%	1		07/09/21 14:44
Toluene-d8 (surr)	99	85-116		%	1		07/09/21 14:44

Batch Information

Analytical Batch: VMS20904
Analytical Method: SW8260D
Analyst: S.S
Analytical Date/Time: 07/09/21 14:44
Container ID: 1213875005-B

Prep Batch: VXX37391
Prep Method: SW5035A
Prep Date/Time: 06/28/21 13:45
Prep Initial Wt./Vol.: 50.746 g
Prep Extract Vol: 36.4921 mL



Results of **AT-21-SB-06-13**

Client Sample ID: **AT-21-SB-06-13**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875006
Lab Project ID: 1213875

Collection Date: 06/28/21 14:30
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):75.7
Location:

Results by **Polynuclear Aromatics GC/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
1-Methylnaphthalene	16.4 U	32.9	8.23	ug/kg	1		07/18/21 16:01
2-Methylnaphthalene	16.4 U	32.9	8.23	ug/kg	1		07/18/21 16:01
Acenaphthene	16.4 U	32.9	8.23	ug/kg	1		07/18/21 16:01
Acenaphthylene	16.4 U	32.9	8.23	ug/kg	1		07/18/21 16:01
Anthracene	16.4 U	32.9	8.23	ug/kg	1		07/18/21 16:01
Benzo(a)Anthracene	16.4 U	32.9	8.23	ug/kg	1		07/18/21 16:01
Benzo[a]pyrene	16.4 U	32.9	8.23	ug/kg	1		07/18/21 16:01
Benzo[b]Fluoranthene	16.4 U	32.9	8.23	ug/kg	1		07/18/21 16:01
Benzo[g,h,i]perylene	16.4 U	32.9	8.23	ug/kg	1		07/18/21 16:01
Benzo[k]fluoranthene	16.4 U	32.9	8.23	ug/kg	1		07/18/21 16:01
Chrysene	16.4 U	32.9	8.23	ug/kg	1		07/18/21 16:01
Dibenzo[a,h]anthracene	16.4 U	32.9	8.23	ug/kg	1		07/18/21 16:01
Fluoranthene	16.4 U	32.9	8.23	ug/kg	1		07/18/21 16:01
Fluorene	16.4 U	32.9	8.23	ug/kg	1		07/18/21 16:01
Indeno[1,2,3-c,d] pyrene	16.4 U	32.9	8.23	ug/kg	1		07/18/21 16:01
Naphthalene	13.2 U	26.3	6.59	ug/kg	1		07/18/21 16:01
Phenanthrene	16.4 U	32.9	8.23	ug/kg	1		07/18/21 16:01
Pyrene	16.4 U	32.9	8.23	ug/kg	1		07/18/21 16:01
Surrogates							
2-Methylnaphthalene-d10 (surr)	89.9	58-103		%	1		07/18/21 16:01
Fluoranthene-d10 (surr)	87	54-113		%	1		07/18/21 16:01

Batch Information

Analytical Batch: XMS12757
Analytical Method: 8270D SIM (PAH)
Analyst: LAW
Analytical Date/Time: 07/18/21 16:01
Container ID: 1213875006-A

Prep Batch: XXX45113
Prep Method: SW3550C
Prep Date/Time: 07/08/21 06:18
Prep Initial Wt./Vol.: 22.568 g
Prep Extract Vol: 5 mL



Results of **AT-21-SB-06-13**

Client Sample ID: **AT-21-SB-06-13**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875006
Lab Project ID: 1213875

Collection Date: 06/28/21 14:30
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):75.7
Location:

Results by **Semivolatile Organic Fuels**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	13.1 U	26.1	8.09	mg/kg	1		07/08/21 18:09
Surrogates							
5a Androstane (surr)	92	50-150		%	1		07/08/21 18:09

Batch Information

Analytical Batch: XFC15990
Analytical Method: AK102
Analyst: IVM
Analytical Date/Time: 07/08/21 18:09
Container ID: 1213875006-A

Prep Batch: XXX45118
Prep Method: SW3550C
Prep Date/Time: 07/08/21 10:14
Prep Initial Wt./Vol.: 30.377 g
Prep Extract Vol: 5 mL



Results of **AT-21-SB-06-13**

Client Sample ID: **AT-21-SB-06-13**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875006
Lab Project ID: 1213875

Collection Date: 06/28/21 14:30
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):75.7
Location:

Results by **Volatile Fuels**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	1.88 J	4.58	1.38	mg/kg	1		07/16/21 01:53
Surrogates							
4-Bromofluorobenzene (surr)	109	50-150		%	1		07/16/21 01:53

Batch Information

Analytical Batch: VFC15714
Analytical Method: AK101
Analyst: MDT
Analytical Date/Time: 07/16/21 01:53
Container ID: 1213875006-B

Prep Batch: VXX37430
Prep Method: SW5035A
Prep Date/Time: 06/28/21 14:30
Prep Initial Wt./Vol.: 55.441 g
Prep Extract Vol: 38.4763 mL



Results of **AT-21-SB-06-13**

Client Sample ID: **AT-21-SB-06-13**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875006
Lab Project ID: 1213875

Collection Date: 06/28/21 14:30
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):75.7
Location:

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

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
1,2,4-Trimethylbenzene	45.9 U	91.7	27.5	ug/kg	1		07/09/21 15:00
1,2-Dibromoethane	0.915 U	1.83	0.733	ug/kg	1		07/09/21 15:00
1,2-Dichloroethane	1.84 U	3.67	1.28	ug/kg	1		07/09/21 15:00
1,3,5-Trimethylbenzene	22.9 U	45.8	14.3	ug/kg	1		07/09/21 15:00
Benzene	11.4 U	22.9	7.15	ug/kg	1		07/09/21 15:00
Ethylbenzene	22.9 U	45.8	14.3	ug/kg	1		07/09/21 15:00
Isopropylbenzene (Cumene)	22.9 U	45.8	14.3	ug/kg	1		07/09/21 15:00
Methyl-t-butyl ether	91.5 U	183	56.8	ug/kg	1		07/09/21 15:00
Naphthalene	22.9 U	45.8	14.3	ug/kg	1		07/09/21 15:00
n-Butylbenzene	22.9 U	45.8	14.3	ug/kg	1		07/09/21 15:00
o-Xylene	22.9 U	45.8	14.3	ug/kg	1		07/09/21 15:00
P & M -Xylene	45.9 U	91.7	27.5	ug/kg	1		07/09/21 15:00
sec-Butylbenzene	22.9 U	45.8	14.3	ug/kg	1		07/09/21 15:00
tert-Butylbenzene	22.9 U	45.8	14.3	ug/kg	1		07/09/21 15:00
Toluene	22.9 U	45.8	14.3	ug/kg	1		07/09/21 15:00
Xylenes (total)	69.0 U	138	41.8	ug/kg	1		07/09/21 15:00
Surrogates							
1,2-Dichloroethane-D4 (surr)	110	71-136		%	1		07/09/21 15:00
4-Bromofluorobenzene (surr)	106	55-151		%	1		07/09/21 15:00
Toluene-d8 (surr)	100	85-116		%	1		07/09/21 15:00

Batch Information

Analytical Batch: VMS20904
Analytical Method: SW8260D
Analyst: S.S
Analytical Date/Time: 07/09/21 15:00
Container ID: 1213875006-B

Prep Batch: VXX37391
Prep Method: SW5035A
Prep Date/Time: 06/28/21 14:30
Prep Initial Wt./Vol.: 55.441 g
Prep Extract Vol: 38.4763 mL



Results of **AT-21-SB-07-13**

Client Sample ID: **AT-21-SB-07-13**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875007
Lab Project ID: 1213875

Collection Date: 06/28/21 15:05
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):81.6
Location:

Results by **Polynuclear Aromatics GC/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
1-Methylnaphthalene	15.3 U	30.5	7.62	ug/kg	1		07/18/21 16:21
2-Methylnaphthalene	15.3 U	30.5	7.62	ug/kg	1		07/18/21 16:21
Acenaphthene	15.3 U	30.5	7.62	ug/kg	1		07/18/21 16:21
Acenaphthylene	15.3 U	30.5	7.62	ug/kg	1		07/18/21 16:21
Anthracene	15.3 U	30.5	7.62	ug/kg	1		07/18/21 16:21
Benzo(a)Anthracene	15.3 U	30.5	7.62	ug/kg	1		07/18/21 16:21
Benzo[a]pyrene	15.3 U	30.5	7.62	ug/kg	1		07/18/21 16:21
Benzo[b]Fluoranthene	15.3 U	30.5	7.62	ug/kg	1		07/18/21 16:21
Benzo[g,h,i]perylene	15.3 U	30.5	7.62	ug/kg	1		07/18/21 16:21
Benzo[k]fluoranthene	15.3 U	30.5	7.62	ug/kg	1		07/18/21 16:21
Chrysene	15.3 U	30.5	7.62	ug/kg	1		07/18/21 16:21
Dibenzo[a,h]anthracene	15.3 U	30.5	7.62	ug/kg	1		07/18/21 16:21
Fluoranthene	15.3 U	30.5	7.62	ug/kg	1		07/18/21 16:21
Fluorene	15.3 U	30.5	7.62	ug/kg	1		07/18/21 16:21
Indeno[1,2,3-c,d] pyrene	15.3 U	30.5	7.62	ug/kg	1		07/18/21 16:21
Naphthalene	12.2 U	24.4	6.10	ug/kg	1		07/18/21 16:21
Phenanthrene	15.3 U	30.5	7.62	ug/kg	1		07/18/21 16:21
Pyrene	15.3 U	30.5	7.62	ug/kg	1		07/18/21 16:21
Surrogates							
2-Methylnaphthalene-d10 (surr)	86.5	58-103		%	1		07/18/21 16:21
Fluoranthene-d10 (surr)	87.3	54-113		%	1		07/18/21 16:21

Batch Information

Analytical Batch: XMS12757
Analytical Method: 8270D SIM (PAH)
Analyst: LAW
Analytical Date/Time: 07/18/21 16:21
Container ID: 1213875007-A

Prep Batch: XXX45113
Prep Method: SW3550C
Prep Date/Time: 07/08/21 06:18
Prep Initial Wt./Vol.: 22.617 g
Prep Extract Vol: 5 mL



Results of **AT-21-SB-07-13**

Client Sample ID: **AT-21-SB-07-13**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875007
Lab Project ID: 1213875

Collection Date: 06/28/21 15:05
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):81.6
Location:

Results by **Semivolatile Organic Fuels**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	8.34 J	24.4	7.56	mg/kg	1		07/08/21 18:19
Surrogates							
5a Androstane (surr)	94.9	50-150		%	1		07/08/21 18:19

Batch Information

Analytical Batch: XFC15990
Analytical Method: AK102
Analyst: IVM
Analytical Date/Time: 07/08/21 18:19
Container ID: 1213875007-A

Prep Batch: XXX45118
Prep Method: SW3550C
Prep Date/Time: 07/08/21 10:14
Prep Initial Wt./Vol.: 30.137 g
Prep Extract Vol: 5 mL



Results of **AT-21-SB-07-13**

Client Sample ID: **AT-21-SB-07-13**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875007
Lab Project ID: 1213875

Collection Date: 06/28/21 15:05
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):81.6
Location:

Results by **Volatile Fuels**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	1.32 J	3.63	1.09	mg/kg	1		07/16/21 02:11
Surrogates							
4-Bromofluorobenzene (surr)	111	50-150		%	1		07/16/21 02:11

Batch Information

Analytical Batch: VFC15714
Analytical Method: AK101
Analyst: MDT
Analytical Date/Time: 07/16/21 02:11
Container ID: 1213875007-B

Prep Batch: VXX37430
Prep Method: SW5035A
Prep Date/Time: 06/28/21 15:05
Prep Initial Wt./Vol.: 61.194 g
Prep Extract Vol: 36.2692 mL



Results of **AT-21-SB-07-13**

Client Sample ID: **AT-21-SB-07-13**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875007
Lab Project ID: 1213875

Collection Date: 06/28/21 15:05
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):81.6
Location:

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

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
1,2,4-Trimethylbenzene	36.3 U	72.6	21.8	ug/kg	1		07/09/21 15:17
1,2-Dibromoethane	0.725 U	1.45	0.581	ug/kg	1		07/09/21 15:17
1,2-Dichloroethane	1.46 U	2.91	1.02	ug/kg	1		07/09/21 15:17
1,3,5-Trimethylbenzene	18.1 U	36.3	11.3	ug/kg	1		07/09/21 15:17
Benzene	9.10 U	18.2	5.67	ug/kg	1		07/09/21 15:17
Ethylbenzene	18.1 U	36.3	11.3	ug/kg	1		07/09/21 15:17
Isopropylbenzene (Cumene)	18.1 U	36.3	11.3	ug/kg	1		07/09/21 15:17
Methyl-t-butyl ether	72.5 U	145	45.0	ug/kg	1		07/09/21 15:17
Naphthalene	18.1 U	36.3	11.3	ug/kg	1		07/09/21 15:17
n-Butylbenzene	18.1 U	36.3	11.3	ug/kg	1		07/09/21 15:17
o-Xylene	18.1 U	36.3	11.3	ug/kg	1		07/09/21 15:17
P & M -Xylene	36.3 U	72.6	21.8	ug/kg	1		07/09/21 15:17
sec-Butylbenzene	18.1 U	36.3	11.3	ug/kg	1		07/09/21 15:17
tert-Butylbenzene	18.1 U	36.3	11.3	ug/kg	1		07/09/21 15:17
Toluene	18.1 U	36.3	11.3	ug/kg	1		07/09/21 15:17
Xylenes (total)	54.5 U	109	33.1	ug/kg	1		07/09/21 15:17
Surrogates							
1,2-Dichloroethane-D4 (surr)	108	71-136		%	1		07/09/21 15:17
4-Bromofluorobenzene (surr)	107	55-151		%	1		07/09/21 15:17
Toluene-d8 (surr)	99.3	85-116		%	1		07/09/21 15:17

Batch Information

Analytical Batch: VMS20904
Analytical Method: SW8260D
Analyst: S.S
Analytical Date/Time: 07/09/21 15:17
Container ID: 1213875007-B

Prep Batch: VXX37391
Prep Method: SW5035A
Prep Date/Time: 06/28/21 15:05
Prep Initial Wt./Vol.: 61.194 g
Prep Extract Vol: 36.2692 mL



Results of **AT-21-SB-03-26**

Client Sample ID: **AT-21-SB-03-26**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875008
Lab Project ID: 1213875

Collection Date: 06/29/21 15:55
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):94.7
Location:

Results by **Polynuclear Aromatics GC/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
1-Methylnaphthalene	13.2 U	26.4	6.59	ug/kg	1		07/19/21 04:49
2-Methylnaphthalene	13.2 U	26.4	6.59	ug/kg	1		07/19/21 04:49
Acenaphthene	13.2 U	26.4	6.59	ug/kg	1		07/19/21 04:49
Acenaphthylene	13.2 U	26.4	6.59	ug/kg	1		07/19/21 04:49
Anthracene	13.2 U	26.4	6.59	ug/kg	1		07/19/21 04:49
Benzo(a)Anthracene	13.2 U	26.4	6.59	ug/kg	1		07/19/21 04:49
Benzo[a]pyrene	13.2 U	26.4	6.59	ug/kg	1		07/19/21 04:49
Benzo[b]Fluoranthene	13.2 U	26.4	6.59	ug/kg	1		07/19/21 04:49
Benzo[g,h,i]perylene	13.2 U	26.4	6.59	ug/kg	1		07/19/21 04:49
Benzo[k]fluoranthene	13.2 U	26.4	6.59	ug/kg	1		07/19/21 04:49
Chrysene	13.2 U	26.4	6.59	ug/kg	1		07/19/21 04:49
Dibenzo[a,h]anthracene	13.2 U	26.4	6.59	ug/kg	1		07/19/21 04:49
Fluoranthene	13.2 U	26.4	6.59	ug/kg	1		07/19/21 04:49
Fluorene	13.2 U	26.4	6.59	ug/kg	1		07/19/21 04:49
Indeno[1,2,3-c,d] pyrene	13.2 U	26.4	6.59	ug/kg	1		07/19/21 04:49
Naphthalene	10.6 U	21.1	5.27	ug/kg	1		07/19/21 04:49
Phenanthrene	13.2 U	26.4	6.59	ug/kg	1		07/19/21 04:49
Pyrene	13.2 U	26.4	6.59	ug/kg	1		07/19/21 04:49
Surrogates							
2-Methylnaphthalene-d10 (surr)	86.7	58-103		%	1		07/19/21 04:49
Fluoranthene-d10 (surr)	86.2	54-113		%	1		07/19/21 04:49

Batch Information

Analytical Batch: XMS12758
Analytical Method: 8270D SIM (PAH)
Analyst: LAW
Analytical Date/Time: 07/19/21 04:49
Container ID: 1213875008-A

Prep Batch: XXX45119
Prep Method: SW3550C
Prep Date/Time: 07/08/21 10:53
Prep Initial Wt./Vol.: 22.537 g
Prep Extract Vol: 5 mL



Results of **AT-21-SB-03-26**

Client Sample ID: **AT-21-SB-03-26**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875008
Lab Project ID: 1213875

Collection Date: 06/29/21 15:55
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):94.7
Location:

Results by **Semivolatile Organic Fuels**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	6.56 J	20.8	6.46	mg/kg	1		07/08/21 18:29
Surrogates							
5a Androstane (surr)	96.9	50-150		%	1		07/08/21 18:29

Batch Information

Analytical Batch: XFC15990
Analytical Method: AK102
Analyst: IVM
Analytical Date/Time: 07/08/21 18:29
Container ID: 1213875008-A

Prep Batch: XXX45118
Prep Method: SW3550C
Prep Date/Time: 07/08/21 10:14
Prep Initial Wt./Vol.: 30.406 g
Prep Extract Vol: 5 mL



Results of **AT-21-SB-03-26**

Client Sample ID: **AT-21-SB-03-26**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875008
Lab Project ID: 1213875

Collection Date: 06/29/21 15:55
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):94.7
Location:

Results by **Volatile Fuels**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	1.48 J	3.04	0.913	mg/kg	1		07/16/21 02:29
Surrogates							
4-Bromofluorobenzene (surr)	108	50-150		%	1		07/16/21 02:29

Batch Information

Analytical Batch: VFC15714
Analytical Method: AK101
Analyst: MDT
Analytical Date/Time: 07/16/21 02:29
Container ID: 1213875008-B

Prep Batch: VXX37430
Prep Method: SW5035A
Prep Date/Time: 06/29/21 15:55
Prep Initial Wt./Vol.: 47.762 g
Prep Extract Vol: 27.5367 mL



Results of **AT-21-SB-03-26**

Client Sample ID: **AT-21-SB-03-26**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875008
Lab Project ID: 1213875

Collection Date: 06/29/21 15:55
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):94.7
Location:

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

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
1,2,4-Trimethylbenzene	20.4 J	60.9	18.3	ug/kg	1		07/09/21 15:33
1,2-Dibromoethane	0.610 U	1.22	0.487	ug/kg	1		07/09/21 15:33
1,2-Dichloroethane	1.22 U	2.44	0.852	ug/kg	1		07/09/21 15:33
1,3,5-Trimethylbenzene	10.4 J	30.4	9.50	ug/kg	1		07/09/21 15:33
Benzene	7.60 U	15.2	4.75	ug/kg	1		07/09/21 15:33
Ethylbenzene	15.2 U	30.4	9.50	ug/kg	1		07/09/21 15:33
Isopropylbenzene (Cumene)	15.2 U	30.4	9.50	ug/kg	1		07/09/21 15:33
Methyl-t-butyl ether	61.0 U	122	37.8	ug/kg	1		07/09/21 15:33
Naphthalene	15.2 U	30.4	9.50	ug/kg	1		07/09/21 15:33
n-Butylbenzene	15.2 U	30.4	9.50	ug/kg	1		07/09/21 15:33
o-Xylene	11.0 J	30.4	9.50	ug/kg	1		07/09/21 15:33
P & M -Xylene	22.8 J	60.9	18.3	ug/kg	1		07/09/21 15:33
sec-Butylbenzene	15.2 U	30.4	9.50	ug/kg	1		07/09/21 15:33
tert-Butylbenzene	15.2 U	30.4	9.50	ug/kg	1		07/09/21 15:33
Toluene	15.2 U	30.4	9.50	ug/kg	1		07/09/21 15:33
Xylenes (total)	33.8 J	91.3	27.8	ug/kg	1		07/09/21 15:33
Surrogates							
1,2-Dichloroethane-D4 (surr)	110	71-136		%	1		07/09/21 15:33
4-Bromofluorobenzene (surr)	98.7	55-151		%	1		07/09/21 15:33
Toluene-d8 (surr)	98.7	85-116		%	1		07/09/21 15:33

Batch Information

Analytical Batch: VMS20904
Analytical Method: SW8260D
Analyst: S.S
Analytical Date/Time: 07/09/21 15:33
Container ID: 1213875008-B

Prep Batch: VXX37391
Prep Method: SW5035A
Prep Date/Time: 06/29/21 15:55
Prep Initial Wt./Vol.: 47.762 g
Prep Extract Vol: 27.5367 mL



Results of **AT-21-SB-03-13**

Client Sample ID: **AT-21-SB-03-13**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875009
Lab Project ID: 1213875

Collection Date: 06/29/21 16:15
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):80.8
Location:

Results by **Polynuclear Aromatics GC/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
1-Methylnaphthalene	15.4 U	30.8	7.70	ug/kg	1		07/19/21 05:09
2-Methylnaphthalene	15.4 U	30.8	7.70	ug/kg	1		07/19/21 05:09
Acenaphthene	15.4 U	30.8	7.70	ug/kg	1		07/19/21 05:09
Acenaphthylene	15.4 U	30.8	7.70	ug/kg	1		07/19/21 05:09
Anthracene	15.4 U	30.8	7.70	ug/kg	1		07/19/21 05:09
Benzo(a)Anthracene	15.4 U	30.8	7.70	ug/kg	1		07/19/21 05:09
Benzo[a]pyrene	15.4 U	30.8	7.70	ug/kg	1		07/19/21 05:09
Benzo[b]Fluoranthene	15.4 U	30.8	7.70	ug/kg	1		07/19/21 05:09
Benzo[g,h,i]perylene	15.4 U	30.8	7.70	ug/kg	1		07/19/21 05:09
Benzo[k]fluoranthene	15.4 U	30.8	7.70	ug/kg	1		07/19/21 05:09
Chrysene	15.4 U	30.8	7.70	ug/kg	1		07/19/21 05:09
Dibenzo[a,h]anthracene	15.4 U	30.8	7.70	ug/kg	1		07/19/21 05:09
Fluoranthene	15.4 U	30.8	7.70	ug/kg	1		07/19/21 05:09
Fluorene	15.4 U	30.8	7.70	ug/kg	1		07/19/21 05:09
Indeno[1,2,3-c,d] pyrene	15.4 U	30.8	7.70	ug/kg	1		07/19/21 05:09
Naphthalene	12.3 U	24.6	6.16	ug/kg	1		07/19/21 05:09
Phenanthrene	15.4 U	30.8	7.70	ug/kg	1		07/19/21 05:09
Pyrene	15.4 U	30.8	7.70	ug/kg	1		07/19/21 05:09
Surrogates							
2-Methylnaphthalene-d10 (surr)	79.9	58-103		%	1		07/19/21 05:09
Fluoranthene-d10 (surr)	82.4	54-113		%	1		07/19/21 05:09

Batch Information

Analytical Batch: XMS12758
Analytical Method: 8270D SIM (PAH)
Analyst: LAW
Analytical Date/Time: 07/19/21 05:09
Container ID: 1213875009-A

Prep Batch: XXX45119
Prep Method: SW3550C
Prep Date/Time: 07/08/21 10:53
Prep Initial Wt./Vol.: 22.61 g
Prep Extract Vol: 5 mL



Results of **AT-21-SB-03-13**

Client Sample ID: **AT-21-SB-03-13**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875009
Lab Project ID: 1213875

Collection Date: 06/29/21 16:15
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):80.8
Location:

Results by **Semivolatile Organic Fuels**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	12.3 U	24.5	7.60	mg/kg	1		07/08/21 18:39
Surrogates							
5a Androstane (surr)	87.9	50-150		%	1		07/08/21 18:39

Batch Information

Analytical Batch: XFC15990
Analytical Method: AK102
Analyst: IVM
Analytical Date/Time: 07/08/21 18:39
Container ID: 1213875009-A

Prep Batch: XXX45118
Prep Method: SW3550C
Prep Date/Time: 07/08/21 10:14
Prep Initial Wt./Vol.: 30.29 g
Prep Extract Vol: 5 mL



Results of **AT-21-SB-03-13**

Client Sample ID: **AT-21-SB-03-13**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875009
Lab Project ID: 1213875

Collection Date: 06/29/21 16:15
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):80.8
Location:

Results by **Volatile Fuels**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	1.74 J	4.48	1.34	mg/kg	1		07/16/21 02:47
Surrogates							
4-Bromofluorobenzene (surr)	107	50-150		%	1		07/16/21 02:47

Batch Information

Analytical Batch: VFC15714
Analytical Method: AK101
Analyst: MDT
Analytical Date/Time: 07/16/21 02:47
Container ID: 1213875009-B

Prep Batch: VXX37430
Prep Method: SW5035A
Prep Date/Time: 06/29/21 16:15
Prep Initial Wt./Vol.: 47.139 g
Prep Extract Vol: 34.074 mL



Results of **AT-21-SB-03-13**

Client Sample ID: **AT-21-SB-03-13**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875009
Lab Project ID: 1213875

Collection Date: 06/29/21 16:15
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):80.8
Location:

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

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
1,2,4-Trimethylbenzene	44.8 U	89.5	26.9	ug/kg	1		07/09/21 15:50
1,2-Dibromoethane	0.895 U	1.79	0.716	ug/kg	1		07/09/21 15:50
1,2-Dichloroethane	1.79 U	3.58	1.25	ug/kg	1		07/09/21 15:50
1,3,5-Trimethylbenzene	22.4 U	44.8	14.0	ug/kg	1		07/09/21 15:50
Benzene	11.2 U	22.4	6.98	ug/kg	1		07/09/21 15:50
Ethylbenzene	22.4 U	44.8	14.0	ug/kg	1		07/09/21 15:50
Isopropylbenzene (Cumene)	22.4 U	44.8	14.0	ug/kg	1		07/09/21 15:50
Methyl-t-butyl ether	89.5 U	179	55.5	ug/kg	1		07/09/21 15:50
Naphthalene	22.4 U	44.8	14.0	ug/kg	1		07/09/21 15:50
n-Butylbenzene	22.4 U	44.8	14.0	ug/kg	1		07/09/21 15:50
o-Xylene	22.4 U	44.8	14.0	ug/kg	1		07/09/21 15:50
P & M -Xylene	44.8 U	89.5	26.9	ug/kg	1		07/09/21 15:50
sec-Butylbenzene	22.4 U	44.8	14.0	ug/kg	1		07/09/21 15:50
tert-Butylbenzene	22.4 U	44.8	14.0	ug/kg	1		07/09/21 15:50
Toluene	22.4 U	44.8	14.0	ug/kg	1		07/09/21 15:50
Xylenes (total)	67.0 U	134	40.8	ug/kg	1		07/09/21 15:50
Surrogates							
1,2-Dichloroethane-D4 (surr)	110	71-136		%	1		07/09/21 15:50
4-Bromofluorobenzene (surr)	101	55-151		%	1		07/09/21 15:50
Toluene-d8 (surr)	99.8	85-116		%	1		07/09/21 15:50

Batch Information

Analytical Batch: VMS20904
Analytical Method: SW8260D
Analyst: S.S
Analytical Date/Time: 07/09/21 15:50
Container ID: 1213875009-B

Prep Batch: VXX37391
Prep Method: SW5035A
Prep Date/Time: 06/29/21 16:15
Prep Initial Wt./Vol.: 47.139 g
Prep Extract Vol: 34.074 mL



Results of **AT-21-SB-03-30**

Client Sample ID: **AT-21-SB-03-30**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875010
Lab Project ID: 1213875

Collection Date: 06/29/21 16:20
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):82.2
Location:

Results by **Polynuclear Aromatics GC/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
1-Methylnaphthalene	12600	1500	376	ug/kg	50		07/19/21 14:24
2-Methylnaphthalene	15100	1500	376	ug/kg	50		07/19/21 14:24
Acenaphthene	750 U	1500	376	ug/kg	50		07/19/21 14:24
Acenaphthylene	750 U	1500	376	ug/kg	50		07/19/21 14:24
Anthracene	750 U	1500	376	ug/kg	50		07/19/21 14:24
Benzo(a)Anthracene	750 U	1500	376	ug/kg	50		07/19/21 14:24
Benzo[a]pyrene	750 U	1500	376	ug/kg	50		07/19/21 14:24
Benzo[b]Fluoranthene	750 U	1500	376	ug/kg	50		07/19/21 14:24
Benzo[g,h,i]perylene	750 U	1500	376	ug/kg	50		07/19/21 14:24
Benzo[k]fluoranthene	750 U	1500	376	ug/kg	50		07/19/21 14:24
Chrysene	750 U	1500	376	ug/kg	50		07/19/21 14:24
Dibenzo[a,h]anthracene	750 U	1500	376	ug/kg	50		07/19/21 14:24
Fluoranthene	750 U	1500	376	ug/kg	50		07/19/21 14:24
Fluorene	577 J	1500	376	ug/kg	50		07/19/21 14:24
Indeno[1,2,3-c,d] pyrene	750 U	1500	376	ug/kg	50		07/19/21 14:24
Naphthalene	10700	1200	301	ug/kg	50		07/19/21 14:24
Phenanthrene	750 U	1500	376	ug/kg	50		07/19/21 14:24
Pyrene	750 U	1500	376	ug/kg	50		07/19/21 14:24
Surrogates							
2-Methylnaphthalene-d10 (surr)	0	*	58-103	%	50		07/19/21 14:24
Fluoranthene-d10 (surr)	0	*	54-113	%	50		07/19/21 14:24

Batch Information

Analytical Batch: XMS12764
Analytical Method: 8270D SIM (PAH)
Analyst: LAW
Analytical Date/Time: 07/19/21 14:24
Container ID: 1213875010-A

Prep Batch: XXX45119
Prep Method: SW3550C
Prep Date/Time: 07/08/21 10:53
Prep Initial Wt./Vol.: 22.725 g
Prep Extract Vol: 5 mL



Results of **AT-21-SB-03-30**

Client Sample ID: **AT-21-SB-03-30**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875010
Lab Project ID: 1213875

Collection Date: 06/29/21 16:20
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):82.2
Location:

Results by **Semivolatile Organic Fuels**

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	10500		96.5	29.9	mg/kg	4		07/09/21 00:37
Surrogates								
5a Androstane (surr)	102		50-150		%	4		07/09/21 00:37

Batch Information

Analytical Batch: XFC15990
Analytical Method: AK102
Analyst: IVM
Analytical Date/Time: 07/09/21 00:37
Container ID: 1213875010-A

Prep Batch: XXX45118
Prep Method: SW3550C
Prep Date/Time: 07/08/21 10:14
Prep Initial Wt./Vol.: 30.255 g
Prep Extract Vol: 5 mL



Results of **AT-21-SB-03-30**

Client Sample ID: **AT-21-SB-03-30**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875010
Lab Project ID: 1213875

Collection Date: 06/29/21 16:20
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):82.2
Location:

Results by **Volatile Fuels**

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	373		89.0	26.7	mg/kg	20		07/16/21 01:35
Surrogates								
4-Bromofluorobenzene (surr)	3080	*	50-150		%	20		07/16/21 01:35

Batch Information

Analytical Batch: VFC15714
Analytical Method: AK101
Analyst: MDT
Analytical Date/Time: 07/16/21 01:35
Container ID: 1213875010-B

Prep Batch: VXX37430
Prep Method: SW5035A
Prep Date/Time: 06/29/21 16:20
Prep Initial Wt./Vol.: 45.092 g
Prep Extract Vol: 33.0102 mL



Results of AT-21-SB-03-30

Client Sample ID: **AT-21-SB-03-30**
 Client Project ID: **Arctic and Tudor**
 Lab Sample ID: 1213875010
 Lab Project ID: 1213875

Collection Date: 06/29/21 16:20
 Received Date: 07/01/21 10:11
 Matrix: Soil/Solid (dry weight)
 Solids (%):82.2
 Location:

Results by Volatile GC/MS- Petroleum VOC Group

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
1,2,4-Trimethylbenzene	50800	1780	534	ug/kg	20		07/12/21 01:25
1,2-Dibromoethane	17.8 U	35.6	14.2	ug/kg	20		07/12/21 01:25
1,2-Dichloroethane	35.6 U	71.2	24.9	ug/kg	20		07/12/21 01:25
1,3,5-Trimethylbenzene	21100	890	278	ug/kg	20		07/12/21 01:25
Benzene	223 U	445	139	ug/kg	20		07/12/21 01:25
Ethylbenzene	3410	890	278	ug/kg	20		07/12/21 01:25
Isopropylbenzene (Cumene)	3930	890	278	ug/kg	20		07/12/21 01:25
Methyl-t-butyl ether	1780 U	3560	1100	ug/kg	20		07/12/21 01:25
Naphthalene	15300	890	278	ug/kg	20		07/12/21 01:25
n-Butylbenzene	445 U	890	278	ug/kg	20		07/12/21 01:25
o-Xylene	7310	890	278	ug/kg	20		07/12/21 01:25
P & M -Xylene	14700	1780	534	ug/kg	20		07/12/21 01:25
sec-Butylbenzene	5880	890	278	ug/kg	20		07/12/21 01:25
tert-Butylbenzene	445 U	890	278	ug/kg	20		07/12/21 01:25
Toluene	445 U	890	278	ug/kg	20		07/12/21 01:25
Xylenes (total)	22000	2670	812	ug/kg	20		07/12/21 01:25
Surrogates							
1,2-Dichloroethane-D4 (surr)	2120	*	71-136	%	20		07/12/21 01:25
4-Bromofluorobenzene (surr)	289	*	55-151	%	20		07/12/21 01:25
Toluene-d8 (surr)	1960	*	85-116	%	20		07/12/21 01:25

Batch Information

Analytical Batch: VMS20910
 Analytical Method: SW8260D
 Analyst: S.S
 Analytical Date/Time: 07/12/21 01:25
 Container ID: 1213875010-B

Prep Batch: VXX37401
 Prep Method: SW5035A
 Prep Date/Time: 06/29/21 16:20
 Prep Initial Wt./Vol.: 45.092 g
 Prep Extract Vol: 33.0102 mL



Results of **AT-21-SB-15-30**

Client Sample ID: **AT-21-SB-15-30**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875011
Lab Project ID: 1213875

Collection Date: 06/29/21 16:25
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):82.2
Location:

Results by **Polynuclear Aromatics GC/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
1-Methylnaphthalene	10800	1510	377	ug/kg	50		07/19/21 14:44
2-Methylnaphthalene	12400	1510	377	ug/kg	50		07/19/21 14:44
Acenaphthene	755 U	1510	377	ug/kg	50		07/19/21 14:44
Acenaphthylene	755 U	1510	377	ug/kg	50		07/19/21 14:44
Anthracene	755 U	1510	377	ug/kg	50		07/19/21 14:44
Benzo(a)Anthracene	755 U	1510	377	ug/kg	50		07/19/21 14:44
Benzo[a]pyrene	755 U	1510	377	ug/kg	50		07/19/21 14:44
Benzo[b]Fluoranthene	755 U	1510	377	ug/kg	50		07/19/21 14:44
Benzo[g,h,i]perylene	755 U	1510	377	ug/kg	50		07/19/21 14:44
Benzo[k]fluoranthene	755 U	1510	377	ug/kg	50		07/19/21 14:44
Chrysene	755 U	1510	377	ug/kg	50		07/19/21 14:44
Dibenzo[a,h]anthracene	755 U	1510	377	ug/kg	50		07/19/21 14:44
Fluoranthene	755 U	1510	377	ug/kg	50		07/19/21 14:44
Fluorene	517 J	1510	377	ug/kg	50		07/19/21 14:44
Indeno[1,2,3-c,d] pyrene	755 U	1510	377	ug/kg	50		07/19/21 14:44
Naphthalene	9240	1210	301	ug/kg	50		07/19/21 14:44
Phenanthrene	755 U	1510	377	ug/kg	50		07/19/21 14:44
Pyrene	755 U	1510	377	ug/kg	50		07/19/21 14:44
Surrogates							
2-Methylnaphthalene-d10 (surr)	0	*	58-103	%	50		07/19/21 14:44
Fluoranthene-d10 (surr)	0	*	54-113	%	50		07/19/21 14:44

Batch Information

Analytical Batch: XMS12764
Analytical Method: 8270D SIM (PAH)
Analyst: LAW
Analytical Date/Time: 07/19/21 14:44
Container ID: 1213875011-A

Prep Batch: XXX45119
Prep Method: SW3550C
Prep Date/Time: 07/08/21 10:53
Prep Initial Wt./Vol.: 22.702 g
Prep Extract Vol: 5 mL



Results of **AT-21-SB-15-30**

Client Sample ID: **AT-21-SB-15-30**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875011
Lab Project ID: 1213875

Collection Date: 06/29/21 16:25
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):82.2
Location:

Results by **Semivolatile Organic Fuels**

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable</u> <u>Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	10300		96.0	29.8	mg/kg	4		07/09/21 00:47
Surrogates								
5a Androstane (surr)	99.7		50-150		%	4		07/09/21 00:47

Batch Information

Analytical Batch: XFC15990
Analytical Method: AK102
Analyst: IVM
Analytical Date/Time: 07/09/21 00:47
Container ID: 1213875011-A

Prep Batch: XXX45118
Prep Method: SW3550C
Prep Date/Time: 07/08/21 10:14
Prep Initial Wt./Vol.: 30.397 g
Prep Extract Vol: 5 mL



Results of **AT-21-SB-15-30**

Client Sample ID: **AT-21-SB-15-30**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875011
Lab Project ID: 1213875

Collection Date: 06/29/21 16:25
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):82.2
Location:

Results by **Volatile Fuels**

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	473		175	52.6	mg/kg	50		07/16/21 01:17
Surrogates								
4-Bromofluorobenzene (surr)	5540	*	50-150		%	50		07/16/21 01:17

Batch Information

Analytical Batch: VFC15714
Analytical Method: AK101
Analyst: MDT
Analytical Date/Time: 07/16/21 01:17
Container ID: 1213875011-B

Prep Batch: VXX37430
Prep Method: SW5035A
Prep Date/Time: 06/29/21 16:25
Prep Initial Wt./Vol.: 62.707 g
Prep Extract Vol: 36.1401 mL



Results of **AT-21-SB-15-30**

Client Sample ID: **AT-21-SB-15-30**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875011
Lab Project ID: 1213875

Collection Date: 06/29/21 16:25
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):82.2
Location:

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

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
1,2,4-Trimethylbenzene	39100	3500	1050	ug/kg	50		07/12/21 01:41
1,2-Dibromoethane	35.0 U	70.1	28.0	ug/kg	50		07/12/21 01:41
1,2-Dichloroethane	70.0 U	140	49.1	ug/kg	50		07/12/21 01:41
1,3,5-Trimethylbenzene	14700	1750	547	ug/kg	50		07/12/21 01:41
Benzene	438 U	876	273	ug/kg	50		07/12/21 01:41
Ethylbenzene	3050	1750	547	ug/kg	50		07/12/21 01:41
Isopropylbenzene (Cumene)	3140	1750	547	ug/kg	50		07/12/21 01:41
Methyl-t-butyl ether	3505 U	7010	2170	ug/kg	50		07/12/21 01:41
Naphthalene	17900	1750	547	ug/kg	50		07/12/21 01:41
n-Butylbenzene	875 U	1750	547	ug/kg	50		07/12/21 01:41
o-Xylene	6540	1750	547	ug/kg	50		07/12/21 01:41
P & M -Xylene	12800	3500	1050	ug/kg	50		07/12/21 01:41
sec-Butylbenzene	3980	1750	547	ug/kg	50		07/12/21 01:41
tert-Butylbenzene	875 U	1750	547	ug/kg	50		07/12/21 01:41
Toluene	875 U	1750	547	ug/kg	50		07/12/21 01:41
Xylenes (total)	19300	5260	1600	ug/kg	50		07/12/21 01:41
Surrogates							
1,2-Dichloroethane-D4 (surr)	5300	*	71-136	%	50		07/12/21 01:41
4-Bromofluorobenzene (surr)	168	*	55-151	%	50		07/12/21 01:41
Toluene-d8 (surr)	4910	*	85-116	%	50		07/12/21 01:41

Batch Information

Analytical Batch: VMS20910
Analytical Method: SW8260D
Analyst: S.S
Analytical Date/Time: 07/12/21 01:41
Container ID: 1213875011-B

Prep Batch: VXX37401
Prep Method: SW5035A
Prep Date/Time: 06/29/21 16:25
Prep Initial Wt./Vol.: 62.707 g
Prep Extract Vol: 36.1401 mL



Results of **AT-21-SB-MW128-31**

Client Sample ID: **AT-21-SB-MW128-31**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875012
Lab Project ID: 1213875

Collection Date: 06/30/21 09:50
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):82.8
Location:

Results by **Polynuclear Aromatics GC/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
1-Methylnaphthalene	15.1 U	30.1	7.53	ug/kg	1		07/19/21 05:29
2-Methylnaphthalene	15.1 U	30.1	7.53	ug/kg	1		07/19/21 05:29
Acenaphthene	15.1 U	30.1	7.53	ug/kg	1		07/19/21 05:29
Acenaphthylene	15.1 U	30.1	7.53	ug/kg	1		07/19/21 05:29
Anthracene	15.1 U	30.1	7.53	ug/kg	1		07/19/21 05:29
Benzo(a)Anthracene	15.1 U	30.1	7.53	ug/kg	1		07/19/21 05:29
Benzo[a]pyrene	15.1 U	30.1	7.53	ug/kg	1		07/19/21 05:29
Benzo[b]Fluoranthene	15.1 U	30.1	7.53	ug/kg	1		07/19/21 05:29
Benzo[g,h,i]perylene	15.1 U	30.1	7.53	ug/kg	1		07/19/21 05:29
Benzo[k]fluoranthene	15.1 U	30.1	7.53	ug/kg	1		07/19/21 05:29
Chrysene	15.1 U	30.1	7.53	ug/kg	1		07/19/21 05:29
Dibenzo[a,h]anthracene	15.1 U	30.1	7.53	ug/kg	1		07/19/21 05:29
Fluoranthene	15.1 U	30.1	7.53	ug/kg	1		07/19/21 05:29
Fluorene	15.1 U	30.1	7.53	ug/kg	1		07/19/21 05:29
Indeno[1,2,3-c,d] pyrene	15.1 U	30.1	7.53	ug/kg	1		07/19/21 05:29
Naphthalene	12.1 U	24.1	6.03	ug/kg	1		07/19/21 05:29
Phenanthrene	15.1 U	30.1	7.53	ug/kg	1		07/19/21 05:29
Pyrene	15.1 U	30.1	7.53	ug/kg	1		07/19/21 05:29
Surrogates							
2-Methylnaphthalene-d10 (surr)	81.9	58-103		%	1		07/19/21 05:29
Fluoranthene-d10 (surr)	84.4	54-113		%	1		07/19/21 05:29

Batch Information

Analytical Batch: XMS12758
Analytical Method: 8270D SIM (PAH)
Analyst: LAW
Analytical Date/Time: 07/19/21 05:29
Container ID: 1213875012-A

Prep Batch: XXX45119
Prep Method: SW3550C
Prep Date/Time: 07/08/21 10:53
Prep Initial Wt./Vol.: 22.553 g
Prep Extract Vol: 5 mL



Results of **AT-21-SB-MW128-31**

Client Sample ID: **AT-21-SB-MW128-31**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875012
Lab Project ID: 1213875

Collection Date: 06/30/21 09:50
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):82.8
Location:

Results by **Semivolatile Organic Fuels**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	9.67 J	23.8	7.37	mg/kg	1		07/08/21 18:49
Surrogates							
5a Androstane (surr)	82.7	50-150		%	1		07/08/21 18:49

Batch Information

Analytical Batch: XFC15990
Analytical Method: AK102
Analyst: IVM
Analytical Date/Time: 07/08/21 18:49
Container ID: 1213875012-A

Prep Batch: XXX45118
Prep Method: SW3550C
Prep Date/Time: 07/08/21 10:14
Prep Initial Wt./Vol.: 30.49 g
Prep Extract Vol: 5 mL



Results of **AT-21-SB-MW128-31**

Client Sample ID: **AT-21-SB-MW128-31**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875012
Lab Project ID: 1213875

Collection Date: 06/30/21 09:50
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):82.8
Location:

Results by **Volatile Fuels**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	1.87 J	4.22	1.27	mg/kg	1		07/16/21 03:06
Surrogates							
4-Bromofluorobenzene (surr)	106	50-150		%	1		07/16/21 03:06

Batch Information

Analytical Batch: VFC15714
Analytical Method: AK101
Analyst: MDT
Analytical Date/Time: 07/16/21 03:06
Container ID: 1213875012-B

Prep Batch: VXX37430
Prep Method: SW5035A
Prep Date/Time: 06/30/21 09:50
Prep Initial Wt./Vol.: 47.443 g
Prep Extract Vol: 33.1768 mL



Results of AT-21-SB-MW128-31

Client Sample ID: **AT-21-SB-MW128-31**
 Client Project ID: **Arctic and Tudor**
 Lab Sample ID: 1213875012
 Lab Project ID: 1213875

Collection Date: 06/30/21 09:50
 Received Date: 07/01/21 10:11
 Matrix: Soil/Solid (dry weight)
 Solids (%):82.8
 Location:

Results by Volatile GC/MS- Petroleum VOC Group

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
1,2,4-Trimethylbenzene	42.3 U	84.5	25.3	ug/kg	1		07/09/21 16:06
1,2-Dibromoethane	0.845 U	1.69	0.676	ug/kg	1		07/09/21 16:06
1,2-Dichloroethane	1.69 U	3.38	1.18	ug/kg	1		07/09/21 16:06
1,3,5-Trimethylbenzene	21.1 U	42.2	13.2	ug/kg	1		07/09/21 16:06
Benzene	10.6 U	21.1	6.59	ug/kg	1		07/09/21 16:06
Ethylbenzene	21.1 U	42.2	13.2	ug/kg	1		07/09/21 16:06
Isopropylbenzene (Cumene)	21.1 U	42.2	13.2	ug/kg	1		07/09/21 16:06
Methyl-t-butyl ether	84.5 U	169	52.4	ug/kg	1		07/09/21 16:06
Naphthalene	21.1 U	42.2	13.2	ug/kg	1		07/09/21 16:06
n-Butylbenzene	21.1 U	42.2	13.2	ug/kg	1		07/09/21 16:06
o-Xylene	21.1 U	42.2	13.2	ug/kg	1		07/09/21 16:06
P & M -Xylene	42.3 U	84.5	25.3	ug/kg	1		07/09/21 16:06
sec-Butylbenzene	21.1 U	42.2	13.2	ug/kg	1		07/09/21 16:06
tert-Butylbenzene	21.1 U	42.2	13.2	ug/kg	1		07/09/21 16:06
Toluene	21.1 U	42.2	13.2	ug/kg	1		07/09/21 16:06
Xylenes (total)	63.5 U	127	38.5	ug/kg	1		07/09/21 16:06
Surrogates							
1,2-Dichloroethane-D4 (surr)	110	71-136		%	1		07/09/21 16:06
4-Bromofluorobenzene (surr)	97.5	55-151		%	1		07/09/21 16:06
Toluene-d8 (surr)	99.5	85-116		%	1		07/09/21 16:06

Batch Information

Analytical Batch: VMS20904
 Analytical Method: SW8260D
 Analyst: S.S
 Analytical Date/Time: 07/09/21 16:06
 Container ID: 1213875012-B

Prep Batch: VXX37391
 Prep Method: SW5035A
 Prep Date/Time: 06/30/21 09:50
 Prep Initial Wt./Vol.: 47.443 g
 Prep Extract Vol: 33.1768 mL



Results of **AT-21-SB-MW128-13**

Client Sample ID: **AT-21-SB-MW128-13**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875013
Lab Project ID: 1213875

Collection Date: 06/30/21 10:05
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):76.3
Location:

Results by **Polynuclear Aromatics GC/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
1-Methylnaphthalene	16.4 U	32.7	8.17	ug/kg	1		07/19/21 05:50
2-Methylnaphthalene	16.4 U	32.7	8.17	ug/kg	1		07/19/21 05:50
Acenaphthene	16.4 U	32.7	8.17	ug/kg	1		07/19/21 05:50
Acenaphthylene	16.4 U	32.7	8.17	ug/kg	1		07/19/21 05:50
Anthracene	16.4 U	32.7	8.17	ug/kg	1		07/19/21 05:50
Benzo(a)Anthracene	16.4 U	32.7	8.17	ug/kg	1		07/19/21 05:50
Benzo[a]pyrene	16.4 U	32.7	8.17	ug/kg	1		07/19/21 05:50
Benzo[b]Fluoranthene	16.4 U	32.7	8.17	ug/kg	1		07/19/21 05:50
Benzo[g,h,i]perylene	16.4 U	32.7	8.17	ug/kg	1		07/19/21 05:50
Benzo[k]fluoranthene	16.4 U	32.7	8.17	ug/kg	1		07/19/21 05:50
Chrysene	16.4 U	32.7	8.17	ug/kg	1		07/19/21 05:50
Dibenzo[a,h]anthracene	16.4 U	32.7	8.17	ug/kg	1		07/19/21 05:50
Fluoranthene	16.4 U	32.7	8.17	ug/kg	1		07/19/21 05:50
Fluorene	16.4 U	32.7	8.17	ug/kg	1		07/19/21 05:50
Indeno[1,2,3-c,d] pyrene	16.4 U	32.7	8.17	ug/kg	1		07/19/21 05:50
Naphthalene	13.1 U	26.1	6.53	ug/kg	1		07/19/21 05:50
Phenanthrene	16.4 U	32.7	8.17	ug/kg	1		07/19/21 05:50
Pyrene	16.4 U	32.7	8.17	ug/kg	1		07/19/21 05:50
Surrogates							
2-Methylnaphthalene-d10 (surr)	85.5	58-103		%	1		07/19/21 05:50
Fluoranthene-d10 (surr)	85.6	54-113		%	1		07/19/21 05:50

Batch Information

Analytical Batch: XMS12758
Analytical Method: 8270D SIM (PAH)
Analyst: LAW
Analytical Date/Time: 07/19/21 05:50
Container ID: 1213875013-A

Prep Batch: XXX45119
Prep Method: SW3550C
Prep Date/Time: 07/08/21 10:53
Prep Initial Wt./Vol.: 22.575 g
Prep Extract Vol: 5 mL



Results of **AT-21-SB-MW128-13**

Client Sample ID: **AT-21-SB-MW128-13**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875013
Lab Project ID: 1213875

Collection Date: 06/30/21 10:05
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):76.3
Location:

Results by **Semivolatile Organic Fuels**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	11.5 J	25.9	8.04	mg/kg	1		07/08/21 18:59
Surrogates							
5a Androstane (surr)	87.2	50-150		%	1		07/08/21 18:59

Batch Information

Analytical Batch: XFC15990
Analytical Method: AK102
Analyst: IVM
Analytical Date/Time: 07/08/21 18:59
Container ID: 1213875013-A

Prep Batch: XXX45118
Prep Method: SW3550C
Prep Date/Time: 07/08/21 10:14
Prep Initial Wt./Vol.: 30.322 g
Prep Extract Vol: 5 mL



Results of **AT-21-SB-MW128-13**

Client Sample ID: **AT-21-SB-MW128-13**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875013
Lab Project ID: 1213875

Collection Date: 06/30/21 10:05
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):76.3
Location:

Results by **Volatile Fuels**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	3.03 J	5.35	1.60	mg/kg	1		07/16/21 03:23
Surrogates							
4-Bromofluorobenzene (surr)	102	50-150		%	1		07/16/21 03:23

Batch Information

Analytical Batch: VFC15714
Analytical Method: AK101
Analyst: MDT
Analytical Date/Time: 07/16/21 03:23
Container ID: 1213875013-B

Prep Batch: VXX37430
Prep Method: SW5035A
Prep Date/Time: 06/30/21 10:05
Prep Initial Wt./Vol.: 43.226 g
Prep Extract Vol: 35.2564 mL



Results of **AT-21-SB-MW128-13**

Client Sample ID: **AT-21-SB-MW128-13**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875013
Lab Project ID: 1213875

Collection Date: 06/30/21 10:05
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):76.3
Location:

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

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
1,2,4-Trimethylbenzene	53.5 U	107	32.1	ug/kg	1		07/09/21 16:23
1,2-Dibromoethane	1.07 U	2.14	0.855	ug/kg	1		07/09/21 16:23
1,2-Dichloroethane	2.14 U	4.28	1.50	ug/kg	1		07/09/21 16:23
1,3,5-Trimethylbenzene	26.8 U	53.5	16.7	ug/kg	1		07/09/21 16:23
Benzene	13.4 U	26.7	8.34	ug/kg	1		07/09/21 16:23
Ethylbenzene	26.8 U	53.5	16.7	ug/kg	1		07/09/21 16:23
Isopropylbenzene (Cumene)	26.8 U	53.5	16.7	ug/kg	1		07/09/21 16:23
Methyl-t-butyl ether	107 U	214	66.3	ug/kg	1		07/09/21 16:23
Naphthalene	26.8 U	53.5	16.7	ug/kg	1		07/09/21 16:23
n-Butylbenzene	26.8 U	53.5	16.7	ug/kg	1		07/09/21 16:23
o-Xylene	26.8 U	53.5	16.7	ug/kg	1		07/09/21 16:23
P & M -Xylene	53.5 U	107	32.1	ug/kg	1		07/09/21 16:23
sec-Butylbenzene	26.8 U	53.5	16.7	ug/kg	1		07/09/21 16:23
tert-Butylbenzene	26.8 U	53.5	16.7	ug/kg	1		07/09/21 16:23
Toluene	26.8 U	53.5	16.7	ug/kg	1		07/09/21 16:23
Xylenes (total)	80.0 U	160	48.8	ug/kg	1		07/09/21 16:23
Surrogates							
1,2-Dichloroethane-D4 (surr)	111	71-136		%	1		07/09/21 16:23
4-Bromofluorobenzene (surr)	99.9	55-151		%	1		07/09/21 16:23
Toluene-d8 (surr)	99.7	85-116		%	1		07/09/21 16:23

Batch Information

Analytical Batch: VMS20904
Analytical Method: SW8260D
Analyst: S.S
Analytical Date/Time: 07/09/21 16:23
Container ID: 1213875013-B

Prep Batch: VXX37391
Prep Method: SW5035A
Prep Date/Time: 06/30/21 10:05
Prep Initial Wt./Vol.: 43.226 g
Prep Extract Vol: 35.2564 mL



Results of **AT-21-SB-01-31**

Client Sample ID: **AT-21-SB-01-31**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875014
Lab Project ID: 1213875

Collection Date: 06/30/21 13:50
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):83.3
Location:

Results by **Polynuclear Aromatics GC/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
1-Methylnaphthalene	14.8 U	29.5	7.37	ug/kg	1		07/19/21 06:10
2-Methylnaphthalene	14.8 U	29.5	7.37	ug/kg	1		07/19/21 06:10
Acenaphthene	14.8 U	29.5	7.37	ug/kg	1		07/19/21 06:10
Acenaphthylene	14.8 U	29.5	7.37	ug/kg	1		07/19/21 06:10
Anthracene	14.8 U	29.5	7.37	ug/kg	1		07/19/21 06:10
Benzo(a)Anthracene	14.8 U	29.5	7.37	ug/kg	1		07/19/21 06:10
Benzo[a]pyrene	14.8 U	29.5	7.37	ug/kg	1		07/19/21 06:10
Benzo[b]Fluoranthene	14.8 U	29.5	7.37	ug/kg	1		07/19/21 06:10
Benzo[g,h,i]perylene	14.8 U	29.5	7.37	ug/kg	1		07/19/21 06:10
Benzo[k]fluoranthene	14.8 U	29.5	7.37	ug/kg	1		07/19/21 06:10
Chrysene	14.8 U	29.5	7.37	ug/kg	1		07/19/21 06:10
Dibenzo[a,h]anthracene	14.8 U	29.5	7.37	ug/kg	1		07/19/21 06:10
Fluoranthene	14.8 U	29.5	7.37	ug/kg	1		07/19/21 06:10
Fluorene	14.8 U	29.5	7.37	ug/kg	1		07/19/21 06:10
Indeno[1,2,3-c,d] pyrene	14.8 U	29.5	7.37	ug/kg	1		07/19/21 06:10
Naphthalene	11.8 U	23.6	5.89	ug/kg	1		07/19/21 06:10
Phenanthrene	14.8 U	29.5	7.37	ug/kg	1		07/19/21 06:10
Pyrene	14.8 U	29.5	7.37	ug/kg	1		07/19/21 06:10
Surrogates							
2-Methylnaphthalene-d10 (surr)	74.4	58-103		%	1		07/19/21 06:10
Fluoranthene-d10 (surr)	73.7	54-113		%	1		07/19/21 06:10

Batch Information

Analytical Batch: XMS12758
Analytical Method: 8270D SIM (PAH)
Analyst: LAW
Analytical Date/Time: 07/19/21 06:10
Container ID: 1213875014-A

Prep Batch: XXX45119
Prep Method: SW3550C
Prep Date/Time: 07/08/21 10:53
Prep Initial Wt./Vol.: 22.928 g
Prep Extract Vol: 5 mL



Results of **AT-21-SB-01-31**

Client Sample ID: **AT-21-SB-01-31**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875014
Lab Project ID: 1213875

Collection Date: 06/30/21 13:50
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):83.3
Location:

Results by **Semivolatile Organic Fuels**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	14.0 J	23.8	7.38	mg/kg	1		07/08/21 19:58
Surrogates							
5a Androstane (surr)	71.8	50-150		%	1		07/08/21 19:58

Batch Information

Analytical Batch: XFC15990
Analytical Method: AK102
Analyst: IVM
Analytical Date/Time: 07/08/21 19:58
Container ID: 1213875014-A

Prep Batch: XXX45118
Prep Method: SW3550C
Prep Date/Time: 07/08/21 10:14
Prep Initial Wt./Vol.: 30.257 g
Prep Extract Vol: 5 mL



Results of **AT-21-SB-01-31**

Client Sample ID: **AT-21-SB-01-31**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875014
Lab Project ID: 1213875

Collection Date: 06/30/21 13:50
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):83.3
Location:

Results by **Volatile Fuels**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	1.90 J	4.49	1.35	mg/kg	1		07/16/21 03:41
Surrogates							
4-Bromofluorobenzene (surr)	101	50-150		%	1		07/16/21 03:41

Batch Information

Analytical Batch: VFC15714
Analytical Method: AK101
Analyst: MDT
Analytical Date/Time: 07/16/21 03:41
Container ID: 1213875014-B

Prep Batch: VXX37430
Prep Method: SW5035A
Prep Date/Time: 06/30/21 13:50
Prep Initial Wt./Vol.: 43.138 g
Prep Extract Vol: 32.2246 mL



Results of **AT-21-SB-01-31**

Client Sample ID: **AT-21-SB-01-31**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875014
Lab Project ID: 1213875

Collection Date: 06/30/21 13:50
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):83.3
Location:

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

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
1,2,4-Trimethylbenzene	44.9 U	89.7	26.9	ug/kg	1		07/09/21 16:39
1,2-Dibromoethane	0.895 U	1.79	0.718	ug/kg	1		07/09/21 16:39
1,2-Dichloroethane	1.79 U	3.59	1.26	ug/kg	1		07/09/21 16:39
1,3,5-Trimethylbenzene	22.4 U	44.9	14.0	ug/kg	1		07/09/21 16:39
Benzene	11.2 U	22.4	7.00	ug/kg	1		07/09/21 16:39
Ethylbenzene	22.4 U	44.9	14.0	ug/kg	1		07/09/21 16:39
Isopropylbenzene (Cumene)	22.4 U	44.9	14.0	ug/kg	1		07/09/21 16:39
Methyl-t-butyl ether	89.5 U	179	55.6	ug/kg	1		07/09/21 16:39
Naphthalene	22.4 U	44.9	14.0	ug/kg	1		07/09/21 16:39
n-Butylbenzene	22.4 U	44.9	14.0	ug/kg	1		07/09/21 16:39
o-Xylene	22.4 U	44.9	14.0	ug/kg	1		07/09/21 16:39
P & M -Xylene	44.9 U	89.7	26.9	ug/kg	1		07/09/21 16:39
sec-Butylbenzene	22.4 U	44.9	14.0	ug/kg	1		07/09/21 16:39
tert-Butylbenzene	22.4 U	44.9	14.0	ug/kg	1		07/09/21 16:39
Toluene	22.4 U	44.9	14.0	ug/kg	1		07/09/21 16:39
Xylenes (total)	67.5 U	135	40.9	ug/kg	1		07/09/21 16:39
Surrogates							
1,2-Dichloroethane-D4 (surr)	110	71-136		%	1		07/09/21 16:39
4-Bromofluorobenzene (surr)	95.1	55-151		%	1		07/09/21 16:39
Toluene-d8 (surr)	99.4	85-116		%	1		07/09/21 16:39

Batch Information

Analytical Batch: VMS20904
Analytical Method: SW8260D
Analyst: S.S
Analytical Date/Time: 07/09/21 16:39
Container ID: 1213875014-B

Prep Batch: VXX37391
Prep Method: SW5035A
Prep Date/Time: 06/30/21 13:50
Prep Initial Wt./Vol.: 43.138 g
Prep Extract Vol: 32.2246 mL



Results of **AT-21-SB-01-22**

Client Sample ID: **AT-21-SB-01-22**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875015
Lab Project ID: 1213875

Collection Date: 06/30/21 14:00
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):94.8
Location:

Results by **Polynuclear Aromatics GC/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
1-Methylnaphthalene	13.0 U	26.0	6.49	ug/kg	1		07/19/21 06:31
2-Methylnaphthalene	13.0 U	26.0	6.49	ug/kg	1		07/19/21 06:31
Acenaphthene	13.0 U	26.0	6.49	ug/kg	1		07/19/21 06:31
Acenaphthylene	13.0 U	26.0	6.49	ug/kg	1		07/19/21 06:31
Anthracene	13.0 U	26.0	6.49	ug/kg	1		07/19/21 06:31
Benzo(a)Anthracene	13.0 U	26.0	6.49	ug/kg	1		07/19/21 06:31
Benzo[a]pyrene	13.0 U	26.0	6.49	ug/kg	1		07/19/21 06:31
Benzo[b]Fluoranthene	13.0 U	26.0	6.49	ug/kg	1		07/19/21 06:31
Benzo[g,h,i]perylene	13.0 U	26.0	6.49	ug/kg	1		07/19/21 06:31
Benzo[k]fluoranthene	13.0 U	26.0	6.49	ug/kg	1		07/19/21 06:31
Chrysene	13.0 U	26.0	6.49	ug/kg	1		07/19/21 06:31
Dibenzo[a,h]anthracene	13.0 U	26.0	6.49	ug/kg	1		07/19/21 06:31
Fluoranthene	13.0 U	26.0	6.49	ug/kg	1		07/19/21 06:31
Fluorene	13.0 U	26.0	6.49	ug/kg	1		07/19/21 06:31
Indeno[1,2,3-c,d] pyrene	13.0 U	26.0	6.49	ug/kg	1		07/19/21 06:31
Naphthalene	10.4 U	20.8	5.19	ug/kg	1		07/19/21 06:31
Phenanthrene	13.0 U	26.0	6.49	ug/kg	1		07/19/21 06:31
Pyrene	13.0 U	26.0	6.49	ug/kg	1		07/19/21 06:31
Surrogates							
2-Methylnaphthalene-d10 (surr)	78.5	58-103		%	1		07/19/21 06:31
Fluoranthene-d10 (surr)	79.9	54-113		%	1		07/19/21 06:31

Batch Information

Analytical Batch: XMS12758
Analytical Method: 8270D SIM (PAH)
Analyst: LAW
Analytical Date/Time: 07/19/21 06:31
Container ID: 1213875015-A

Prep Batch: XXX45119
Prep Method: SW3550C
Prep Date/Time: 07/08/21 10:53
Prep Initial Wt./Vol.: 22.838 g
Prep Extract Vol: 5 mL



Results of **AT-21-SB-01-22**

Client Sample ID: **AT-21-SB-01-22**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875015
Lab Project ID: 1213875

Collection Date: 06/30/21 14:00
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):94.8
Location:

Results by **Semivolatile Organic Fuels**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	12.7 J	21.0	6.52	mg/kg	1		07/08/21 20:08
Surrogates							
5a Androstane (surr)	85.4	50-150		%	1		07/08/21 20:08

Batch Information

Analytical Batch: XFC15990
Analytical Method: AK102
Analyst: IVM
Analytical Date/Time: 07/08/21 20:08
Container ID: 1213875015-A

Prep Batch: XXX45118
Prep Method: SW3550C
Prep Date/Time: 07/08/21 10:14
Prep Initial Wt./Vol.: 30.066 g
Prep Extract Vol: 5 mL



Results of **AT-21-SB-01-22**

Client Sample ID: **AT-21-SB-01-22**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875015
Lab Project ID: 1213875

Collection Date: 06/30/21 14:00
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):94.8
Location:

Results by **Volatile Fuels**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	1.82 J	3.92	1.18	mg/kg	1		07/16/21 03:59
Surrogates							
4-Bromofluorobenzene (surr)	106	50-150		%	1		07/16/21 03:59

Batch Information

Analytical Batch: VFC15714
Analytical Method: AK101
Analyst: MDT
Analytical Date/Time: 07/16/21 03:59
Container ID: 1213875015-B

Prep Batch: VXX37430
Prep Method: SW5035A
Prep Date/Time: 06/30/21 14:00
Prep Initial Wt./Vol.: 36.157 g
Prep Extract Vol: 26.8712 mL



Results of **AT-21-SB-01-22**

Client Sample ID: **AT-21-SB-01-22**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875015
Lab Project ID: 1213875

Collection Date: 06/30/21 14:00
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):94.8
Location:

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

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
1,2,4-Trimethylbenzene	39.2 U	78.4	23.5	ug/kg	1		07/09/21 16:56
1,2-Dibromoethane	0.785 U	1.57	0.627	ug/kg	1		07/09/21 16:56
1,2-Dichloroethane	1.56 U	3.13	1.10	ug/kg	1		07/09/21 16:56
1,3,5-Trimethylbenzene	19.6 U	39.2	12.2	ug/kg	1		07/09/21 16:56
Benzene	9.80 U	19.6	6.11	ug/kg	1		07/09/21 16:56
Ethylbenzene	19.6 U	39.2	12.2	ug/kg	1		07/09/21 16:56
Isopropylbenzene (Cumene)	19.6 U	39.2	12.2	ug/kg	1		07/09/21 16:56
Methyl-t-butyl ether	78.5 U	157	48.6	ug/kg	1		07/09/21 16:56
Naphthalene	19.6 U	39.2	12.2	ug/kg	1		07/09/21 16:56
n-Butylbenzene	19.6 U	39.2	12.2	ug/kg	1		07/09/21 16:56
o-Xylene	19.6 U	39.2	12.2	ug/kg	1		07/09/21 16:56
P & M -Xylene	39.2 U	78.4	23.5	ug/kg	1		07/09/21 16:56
sec-Butylbenzene	19.6 U	39.2	12.2	ug/kg	1		07/09/21 16:56
tert-Butylbenzene	19.6 U	39.2	12.2	ug/kg	1		07/09/21 16:56
Toluene	19.6 U	39.2	12.2	ug/kg	1		07/09/21 16:56
Xylenes (total)	59.0 U	118	35.7	ug/kg	1		07/09/21 16:56
Surrogates							
1,2-Dichloroethane-D4 (surr)	109	71-136		%	1		07/09/21 16:56
4-Bromofluorobenzene (surr)	99.5	55-151		%	1		07/09/21 16:56
Toluene-d8 (surr)	101	85-116		%	1		07/09/21 16:56

Batch Information

Analytical Batch: VMS20904
Analytical Method: SW8260D
Analyst: S.S
Analytical Date/Time: 07/09/21 16:56
Container ID: 1213875015-B

Prep Batch: VXX37391
Prep Method: SW5035A
Prep Date/Time: 06/30/21 14:00
Prep Initial Wt./Vol.: 36.157 g
Prep Extract Vol: 26.8712 mL



Results of **AT-21-SB-01-13**

Client Sample ID: **AT-21-SB-01-13**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875016
Lab Project ID: 1213875

Collection Date: 06/30/21 14:55
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):76.9
Location:

Results by **Polynuclear Aromatics GC/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
1-Methylnaphthalene	16.2 U	32.4	8.10	ug/kg	1		07/19/21 06:51
2-Methylnaphthalene	16.2 U	32.4	8.10	ug/kg	1		07/19/21 06:51
Acenaphthene	16.2 U	32.4	8.10	ug/kg	1		07/19/21 06:51
Acenaphthylene	16.2 U	32.4	8.10	ug/kg	1		07/19/21 06:51
Anthracene	16.2 U	32.4	8.10	ug/kg	1		07/19/21 06:51
Benzo(a)Anthracene	16.2 U	32.4	8.10	ug/kg	1		07/19/21 06:51
Benzo[a]pyrene	16.2 U	32.4	8.10	ug/kg	1		07/19/21 06:51
Benzo[b]Fluoranthene	16.2 U	32.4	8.10	ug/kg	1		07/19/21 06:51
Benzo[g,h,i]perylene	16.2 U	32.4	8.10	ug/kg	1		07/19/21 06:51
Benzo[k]fluoranthene	16.2 U	32.4	8.10	ug/kg	1		07/19/21 06:51
Chrysene	16.2 U	32.4	8.10	ug/kg	1		07/19/21 06:51
Dibenzo[a,h]anthracene	16.2 U	32.4	8.10	ug/kg	1		07/19/21 06:51
Fluoranthene	16.2 U	32.4	8.10	ug/kg	1		07/19/21 06:51
Fluorene	16.2 U	32.4	8.10	ug/kg	1		07/19/21 06:51
Indeno[1,2,3-c,d] pyrene	16.2 U	32.4	8.10	ug/kg	1		07/19/21 06:51
Naphthalene	12.9 U	25.9	6.48	ug/kg	1		07/19/21 06:51
Phenanthrene	16.2 U	32.4	8.10	ug/kg	1		07/19/21 06:51
Pyrene	16.2 U	32.4	8.10	ug/kg	1		07/19/21 06:51
Surrogates							
2-Methylnaphthalene-d10 (surr)	89.3	58-103		%	1		07/19/21 06:51
Fluoranthene-d10 (surr)	94.2	54-113		%	1		07/19/21 06:51

Batch Information

Analytical Batch: XMS12758
Analytical Method: 8270D SIM (PAH)
Analyst: LAW
Analytical Date/Time: 07/19/21 06:51
Container ID: 1213875016-A

Prep Batch: XXX45119
Prep Method: SW3550C
Prep Date/Time: 07/08/21 10:53
Prep Initial Wt./Vol.: 22.597 g
Prep Extract Vol: 5 mL



Results of **AT-21-SB-01-13**

Client Sample ID: **AT-21-SB-01-13**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875016
Lab Project ID: 1213875

Collection Date: 06/30/21 14:55
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):76.9
Location:

Results by **Semivolatile Organic Fuels**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	13.8 J	25.9	8.03	mg/kg	1		07/08/21 20:18
Surrogates							
5a Androstane (surr)	85.5	50-150		%	1		07/08/21 20:18

Batch Information

Analytical Batch: XFC15990
Analytical Method: AK102
Analyst: IVM
Analytical Date/Time: 07/08/21 20:18
Container ID: 1213875016-A

Prep Batch: XXX45118
Prep Method: SW3550C
Prep Date/Time: 07/08/21 10:14
Prep Initial Wt./Vol.: 30.131 g
Prep Extract Vol: 5 mL



Results of **AT-21-SB-01-13**

Client Sample ID: **AT-21-SB-01-13**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875016
Lab Project ID: 1213875

Collection Date: 06/30/21 14:55
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):76.9
Location:

Results by **Volatile Fuels**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	1.63 J	4.42	1.33	mg/kg	1		07/16/21 04:18
Surrogates							
4-Bromofluorobenzene (surr)	105	50-150		%	1		07/16/21 04:18

Batch Information

Analytical Batch: VFC15714
Analytical Method: AK101
Analyst: MDT
Analytical Date/Time: 07/16/21 04:18
Container ID: 1213875016-B

Prep Batch: VXX37430
Prep Method: SW5035A
Prep Date/Time: 06/30/21 14:55
Prep Initial Wt./Vol.: 55.763 g
Prep Extract Vol: 37.8958 mL



Results of **AT-21-SB-01-13**

Client Sample ID: **AT-21-SB-01-13**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875016
Lab Project ID: 1213875

Collection Date: 06/30/21 14:55
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):76.9
Location:

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

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
1,2,4-Trimethylbenzene	44.2 U	88.4	26.5	ug/kg	1		07/09/21 17:12
1,2-Dibromoethane	0.885 U	1.77	0.707	ug/kg	1		07/09/21 17:12
1,2-Dichloroethane	1.77 U	3.54	1.24	ug/kg	1		07/09/21 17:12
1,3,5-Trimethylbenzene	22.1 U	44.2	13.8	ug/kg	1		07/09/21 17:12
Benzene	11.1 U	22.1	6.90	ug/kg	1		07/09/21 17:12
Ethylbenzene	22.1 U	44.2	13.8	ug/kg	1		07/09/21 17:12
Isopropylbenzene (Cumene)	22.1 U	44.2	13.8	ug/kg	1		07/09/21 17:12
Methyl-t-butyl ether	88.5 U	177	54.8	ug/kg	1		07/09/21 17:12
Naphthalene	22.1 U	44.2	13.8	ug/kg	1		07/09/21 17:12
n-Butylbenzene	22.1 U	44.2	13.8	ug/kg	1		07/09/21 17:12
o-Xylene	22.1 U	44.2	13.8	ug/kg	1		07/09/21 17:12
P & M -Xylene	44.2 U	88.4	26.5	ug/kg	1		07/09/21 17:12
sec-Butylbenzene	22.1 U	44.2	13.8	ug/kg	1		07/09/21 17:12
tert-Butylbenzene	22.1 U	44.2	13.8	ug/kg	1		07/09/21 17:12
Toluene	22.1 U	44.2	13.8	ug/kg	1		07/09/21 17:12
Xylenes (total)	66.5 U	133	40.3	ug/kg	1		07/09/21 17:12
Surrogates							
1,2-Dichloroethane-D4 (surr)	109	71-136		%	1		07/09/21 17:12
4-Bromofluorobenzene (surr)	108	55-151		%	1		07/09/21 17:12
Toluene-d8 (surr)	99.9	85-116		%	1		07/09/21 17:12

Batch Information

Analytical Batch: VMS20904
Analytical Method: SW8260D
Analyst: S.S
Analytical Date/Time: 07/09/21 17:12
Container ID: 1213875016-B

Prep Batch: VXX37391
Prep Method: SW5035A
Prep Date/Time: 06/30/21 14:55
Prep Initial Wt./Vol.: 55.763 g
Prep Extract Vol: 37.8958 mL



Results of **AT-21-SB-10-18**

Client Sample ID: **AT-21-SB-10-18**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875017
Lab Project ID: 1213875

Collection Date: 06/30/21 15:15
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):78.5
Location:

Results by **Polynuclear Aromatics GC/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
1-Methylnaphthalene	15.6 U	31.2	7.80	ug/kg	1		07/19/21 07:12
2-Methylnaphthalene	15.6 U	31.2	7.80	ug/kg	1		07/19/21 07:12
Acenaphthene	15.6 U	31.2	7.80	ug/kg	1		07/19/21 07:12
Acenaphthylene	15.6 U	31.2	7.80	ug/kg	1		07/19/21 07:12
Anthracene	15.6 U	31.2	7.80	ug/kg	1		07/19/21 07:12
Benzo(a)Anthracene	15.6 U	31.2	7.80	ug/kg	1		07/19/21 07:12
Benzo[a]pyrene	15.6 U	31.2	7.80	ug/kg	1		07/19/21 07:12
Benzo[b]Fluoranthene	15.6 U	31.2	7.80	ug/kg	1		07/19/21 07:12
Benzo[g,h,i]perylene	15.6 U	31.2	7.80	ug/kg	1		07/19/21 07:12
Benzo[k]fluoranthene	15.6 U	31.2	7.80	ug/kg	1		07/19/21 07:12
Chrysene	15.6 U	31.2	7.80	ug/kg	1		07/19/21 07:12
Dibenzo[a,h]anthracene	15.6 U	31.2	7.80	ug/kg	1		07/19/21 07:12
Fluoranthene	15.6 U	31.2	7.80	ug/kg	1		07/19/21 07:12
Fluorene	15.6 U	31.2	7.80	ug/kg	1		07/19/21 07:12
Indeno[1,2,3-c,d] pyrene	15.6 U	31.2	7.80	ug/kg	1		07/19/21 07:12
Naphthalene	12.5 U	25.0	6.24	ug/kg	1		07/19/21 07:12
Phenanthrene	15.6 U	31.2	7.80	ug/kg	1		07/19/21 07:12
Pyrene	15.6 U	31.2	7.80	ug/kg	1		07/19/21 07:12
Surrogates							
2-Methylnaphthalene-d10 (surr)	87.8	58-103		%	1		07/19/21 07:12
Fluoranthene-d10 (surr)	86.4	54-113		%	1		07/19/21 07:12

Batch Information

Analytical Batch: XMS12758
Analytical Method: 8270D SIM (PAH)
Analyst: LAW
Analytical Date/Time: 07/19/21 07:12
Container ID: 1213875017-A

Prep Batch: XXX45119
Prep Method: SW3550C
Prep Date/Time: 07/08/21 10:53
Prep Initial Wt./Vol.: 22.96 g
Prep Extract Vol: 5 mL



Results of AT-21-SB-10-18

Client Sample ID: **AT-21-SB-10-18**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875017
Lab Project ID: 1213875

Collection Date: 06/30/21 15:15
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):78.5
Location:

Results by Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	13.5 J	25.1	7.78	mg/kg	1		07/08/21 20:28
Surrogates							
5a Androstane (surr)	87.4	50-150		%	1		07/08/21 20:28

Batch Information

Analytical Batch: XFC15990
Analytical Method: AK102
Analyst: IVM
Analytical Date/Time: 07/08/21 20:28
Container ID: 1213875017-A

Prep Batch: XXX45118
Prep Method: SW3550C
Prep Date/Time: 07/08/21 10:14
Prep Initial Wt./Vol.: 30.473 g
Prep Extract Vol: 5 mL



Results of **AT-21-SB-10-18**

Client Sample ID: **AT-21-SB-10-18**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875017
Lab Project ID: 1213875

Collection Date: 06/30/21 15:15
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):78.5
Location:

Results by **Volatile Fuels**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	1.60 J	4.20	1.26	mg/kg	1		07/16/21 04:36
Surrogates							
4-Bromofluorobenzene (surr)	105	50-150		%	1		07/16/21 04:36

Batch Information

Analytical Batch: VFC15714
Analytical Method: AK101
Analyst: MDT
Analytical Date/Time: 07/16/21 04:36
Container ID: 1213875017-B

Prep Batch: VXX37430
Prep Method: SW5035A
Prep Date/Time: 06/30/21 15:15
Prep Initial Wt./Vol.: 56.361 g
Prep Extract Vol: 37.1212 mL



Results of **AT-21-SB-10-18**

Client Sample ID: **AT-21-SB-10-18**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875017
Lab Project ID: 1213875

Collection Date: 06/30/21 15:15
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):78.5
Location:

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

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
1,2,4-Trimethylbenzene	42.0 U	83.9	25.2	ug/kg	1		07/09/21 17:29
1,2-Dibromoethane	0.840 U	1.68	0.671	ug/kg	1		07/09/21 17:29
1,2-Dichloroethane	1.68 U	3.36	1.17	ug/kg	1		07/09/21 17:29
1,3,5-Trimethylbenzene	21.0 U	42.0	13.1	ug/kg	1		07/09/21 17:29
Benzene	10.5 U	21.0	6.54	ug/kg	1		07/09/21 17:29
Ethylbenzene	21.0 U	42.0	13.1	ug/kg	1		07/09/21 17:29
Isopropylbenzene (Cumene)	21.0 U	42.0	13.1	ug/kg	1		07/09/21 17:29
Methyl-t-butyl ether	84.0 U	168	52.0	ug/kg	1		07/09/21 17:29
Naphthalene	21.0 U	42.0	13.1	ug/kg	1		07/09/21 17:29
n-Butylbenzene	21.0 U	42.0	13.1	ug/kg	1		07/09/21 17:29
o-Xylene	21.0 U	42.0	13.1	ug/kg	1		07/09/21 17:29
P & M -Xylene	42.0 U	83.9	25.2	ug/kg	1		07/09/21 17:29
sec-Butylbenzene	21.0 U	42.0	13.1	ug/kg	1		07/09/21 17:29
tert-Butylbenzene	21.0 U	42.0	13.1	ug/kg	1		07/09/21 17:29
Toluene	21.0 U	42.0	13.1	ug/kg	1		07/09/21 17:29
Xylenes (total)	63.0 U	126	38.3	ug/kg	1		07/09/21 17:29
Surrogates							
1,2-Dichloroethane-D4 (surr)	110	71-136		%	1		07/09/21 17:29
4-Bromofluorobenzene (surr)	99.5	55-151		%	1		07/09/21 17:29
Toluene-d8 (surr)	99.8	85-116		%	1		07/09/21 17:29

Batch Information

Analytical Batch: VMS20904
Analytical Method: SW8260D
Analyst: S.S
Analytical Date/Time: 07/09/21 17:29
Container ID: 1213875017-B

Prep Batch: VXX37391
Prep Method: SW5035A
Prep Date/Time: 06/30/21 15:15
Prep Initial Wt./Vol.: 56.361 g
Prep Extract Vol: 37.1212 mL



Results of **AT-21-SB-10-31**

Client Sample ID: **AT-21-SB-10-31**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875018
Lab Project ID: 1213875

Collection Date: 06/30/21 15:15
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):82.5
Location:

Results by **Polynuclear Aromatics GC/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
1-Methylnaphthalene	15.0 U	30.0	7.50	ug/kg	1		07/19/21 13:02
2-Methylnaphthalene	15.6 J	30.0	7.50	ug/kg	1		07/19/21 13:02
Acenaphthene	15.0 U	30.0	7.50	ug/kg	1		07/19/21 13:02
Acenaphthylene	15.0 U	30.0	7.50	ug/kg	1		07/19/21 13:02
Anthracene	15.0 U	30.0	7.50	ug/kg	1		07/19/21 13:02
Benzo(a)Anthracene	15.0 U	30.0	7.50	ug/kg	1		07/19/21 13:02
Benzo[a]pyrene	15.0 U	30.0	7.50	ug/kg	1		07/19/21 13:02
Benzo[b]Fluoranthene	15.0 U	30.0	7.50	ug/kg	1		07/19/21 13:02
Benzo[g,h,i]perylene	15.0 U	30.0	7.50	ug/kg	1		07/19/21 13:02
Benzo[k]fluoranthene	15.0 U	30.0	7.50	ug/kg	1		07/19/21 13:02
Chrysene	15.0 U	30.0	7.50	ug/kg	1		07/19/21 13:02
Dibenzo[a,h]anthracene	15.0 U	30.0	7.50	ug/kg	1		07/19/21 13:02
Fluoranthene	15.0 U	30.0	7.50	ug/kg	1		07/19/21 13:02
Fluorene	15.0 U	30.0	7.50	ug/kg	1		07/19/21 13:02
Indeno[1,2,3-c,d] pyrene	15.0 U	30.0	7.50	ug/kg	1		07/19/21 13:02
Naphthalene	12.0 U	24.0	6.00	ug/kg	1		07/19/21 13:02
Phenanthrene	20.7 J	30.0	7.50	ug/kg	1		07/19/21 13:02
Pyrene	15.0 U	30.0	7.50	ug/kg	1		07/19/21 13:02
Surrogates							
2-Methylnaphthalene-d10 (surr)	86.2	58-103		%	1		07/19/21 13:02
Fluoranthene-d10 (surr)	88.5	54-113		%	1		07/19/21 13:02

Batch Information

Analytical Batch: XMS12764
Analytical Method: 8270D SIM (PAH)
Analyst: LAW
Analytical Date/Time: 07/19/21 13:02
Container ID: 1213875018-A

Prep Batch: XXX45119
Prep Method: SW3550C
Prep Date/Time: 07/08/21 10:53
Prep Initial Wt./Vol.: 22.726 g
Prep Extract Vol: 5 mL



Results of **AT-21-SB-10-31**

Client Sample ID: **AT-21-SB-10-31**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875018
Lab Project ID: 1213875

Collection Date: 06/30/21 15:15
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):82.5
Location:

Results by **Semivolatile Organic Fuels**

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable</u> <u>Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	31.2		24.2	7.49	mg/kg	1		07/08/21 20:38
Surrogates								
5a Androstane (surr)	95.1		50-150		%	1		07/08/21 20:38

Batch Information

Analytical Batch: XFC15990
Analytical Method: AK102
Analyst: IVM
Analytical Date/Time: 07/08/21 20:38
Container ID: 1213875018-A

Prep Batch: XXX45118
Prep Method: SW3550C
Prep Date/Time: 07/08/21 10:14
Prep Initial Wt./Vol.: 30.094 g
Prep Extract Vol: 5 mL



Results of **AT-21-SB-10-31**

Client Sample ID: **AT-21-SB-10-31**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875018
Lab Project ID: 1213875

Collection Date: 06/30/21 15:15
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):82.5
Location:

Results by **Volatile Fuels**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	3.97	3.27	0.980	mg/kg	1		07/16/21 05:12
Surrogates							
4-Bromofluorobenzene (surr)	95.9	50-150		%	1		07/16/21 05:12

Batch Information

Analytical Batch: VFC15714
Analytical Method: AK101
Analyst: MDT
Analytical Date/Time: 07/16/21 05:12
Container ID: 1213875018-B

Prep Batch: VXX37430
Prep Method: SW5035A
Prep Date/Time: 06/30/21 15:15
Prep Initial Wt./Vol.: 68.694 g
Prep Extract Vol: 37.0306 mL



Results of **AT-21-SB-10-31**

Client Sample ID: **AT-21-SB-10-31**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875018
Lab Project ID: 1213875

Collection Date: 06/30/21 15:15
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):82.5
Location:

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

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
1,2,4-Trimethylbenzene	325	65.4	19.6	ug/kg	1		07/09/21 17:45
1,2-Dibromoethane	0.655 U	1.31	0.523	ug/kg	1		07/09/21 17:45
1,2-Dichloroethane	1.30 U	2.61	0.915	ug/kg	1		07/09/21 17:45
1,3,5-Trimethylbenzene	124	32.7	10.2	ug/kg	1		07/09/21 17:45
Benzene	73.2	16.3	5.10	ug/kg	1		07/09/21 17:45
Ethylbenzene	122	32.7	10.2	ug/kg	1		07/09/21 17:45
Isopropylbenzene (Cumene)	38.9	32.7	10.2	ug/kg	1		07/09/21 17:45
Methyl-t-butyl ether	65.5 U	131	40.5	ug/kg	1		07/09/21 17:45
Naphthalene	124	32.7	10.2	ug/kg	1		07/09/21 17:45
n-Butylbenzene	16.4 U	32.7	10.2	ug/kg	1		07/09/21 17:45
o-Xylene	433	32.7	10.2	ug/kg	1		07/09/21 17:45
P & M -Xylene	611	65.4	19.6	ug/kg	1		07/09/21 17:45
sec-Butylbenzene	16.4 U	32.7	10.2	ug/kg	1		07/09/21 17:45
tert-Butylbenzene	16.4 U	32.7	10.2	ug/kg	1		07/09/21 17:45
Toluene	167	32.7	10.2	ug/kg	1		07/09/21 17:45
Xylenes (total)	1040	98.0	29.8	ug/kg	1		07/09/21 17:45
Surrogates							
1,2-Dichloroethane-D4 (surr)	108	71-136		%	1		07/09/21 17:45
4-Bromofluorobenzene (surr)	78.2	55-151		%	1		07/09/21 17:45
Toluene-d8 (surr)	99.9	85-116		%	1		07/09/21 17:45

Batch Information

Analytical Batch: VMS20904
Analytical Method: SW8260D
Analyst: S.S
Analytical Date/Time: 07/09/21 17:45
Container ID: 1213875018-B

Prep Batch: VXX37391
Prep Method: SW5035A
Prep Date/Time: 06/30/21 15:15
Prep Initial Wt./Vol.: 68.694 g
Prep Extract Vol: 37.0306 mL



Results of **AT-21-SB-10-28**

Client Sample ID: **AT-21-SB-10-28**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875019
Lab Project ID: 1213875

Collection Date: 06/30/21 15:20
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):88.1
Location:

Results by **Polynuclear Aromatics GC/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
1-Methylnaphthalene	141 U	282	70.5	ug/kg	10		07/19/21 15:05
2-Methylnaphthalene	141 U	282	70.5	ug/kg	10		07/19/21 15:05
Acenaphthene	141 U	282	70.5	ug/kg	10		07/19/21 15:05
Acenaphthylene	141 U	282	70.5	ug/kg	10		07/19/21 15:05
Anthracene	141 U	282	70.5	ug/kg	10		07/19/21 15:05
Benzo(a)Anthracene	141 U	282	70.5	ug/kg	10		07/19/21 15:05
Benzo[a]pyrene	141 U	282	70.5	ug/kg	10		07/19/21 15:05
Benzo[b]Fluoranthene	141 U	282	70.5	ug/kg	10		07/19/21 15:05
Benzo[g,h,i]perylene	141 U	282	70.5	ug/kg	10		07/19/21 15:05
Benzo[k]fluoranthene	141 U	282	70.5	ug/kg	10		07/19/21 15:05
Chrysene	141 U	282	70.5	ug/kg	10		07/19/21 15:05
Dibenzo[a,h]anthracene	141 U	282	70.5	ug/kg	10		07/19/21 15:05
Fluoranthene	141 U	282	70.5	ug/kg	10		07/19/21 15:05
Fluorene	141 U	282	70.5	ug/kg	10		07/19/21 15:05
Indeno[1,2,3-c,d] pyrene	141 U	282	70.5	ug/kg	10		07/19/21 15:05
Naphthalene	113 U	226	56.4	ug/kg	10		07/19/21 15:05
Phenanthrene	141 U	282	70.5	ug/kg	10		07/19/21 15:05
Pyrene	141 U	282	70.5	ug/kg	10		07/19/21 15:05
Surrogates							
2-Methylnaphthalene-d10 (surr)	268	*	58-103	%	10		07/19/21 15:05
Fluoranthene-d10 (surr)	78.8		54-113	%	10		07/19/21 15:05

Batch Information

Analytical Batch: XMS12764
Analytical Method: 8270D SIM (PAH)
Analyst: LAW
Analytical Date/Time: 07/19/21 15:05
Container ID: 1213875019-A

Prep Batch: XXX45119
Prep Method: SW3550C
Prep Date/Time: 07/08/21 10:53
Prep Initial Wt./Vol.: 22.622 g
Prep Extract Vol: 5 mL



Results of **AT-21-SB-10-28**

Client Sample ID: **AT-21-SB-10-28**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875019
Lab Project ID: 1213875

Collection Date: 06/30/21 15:20
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):88.1
Location:

Results by **Semivolatile Organic Fuels**

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	4960		90.1	27.9	mg/kg	4		07/09/21 00:57
Surrogates								
5a Androstane (surr)	87.3		50-150		%	4		07/09/21 00:57

Batch Information

Analytical Batch: XFC15990
Analytical Method: AK102
Analyst: IVM
Analytical Date/Time: 07/09/21 00:57
Container ID: 1213875019-A

Prep Batch: XXX45118
Prep Method: SW3550C
Prep Date/Time: 07/08/21 10:14
Prep Initial Wt./Vol.: 30.234 g
Prep Extract Vol: 5 mL



Results of **AT-21-SB-10-28**

Client Sample ID: **AT-21-SB-10-28**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875019
Lab Project ID: 1213875

Collection Date: 06/30/21 15:20
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):88.1
Location:

Results by **Volatile Fuels**

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	72.5		4.96	1.49	mg/kg	1		07/16/21 05:30
Surrogates								
4-Bromofluorobenzene (surr)	593	*	50-150		%	1		07/16/21 05:30

Batch Information

Analytical Batch: VFC15714
Analytical Method: AK101
Analyst: MDT
Analytical Date/Time: 07/16/21 05:30
Container ID: 1213875019-B

Prep Batch: VXX37430
Prep Method: SW5035A
Prep Date/Time: 06/30/21 15:20
Prep Initial Wt./Vol.: 33.063 g
Prep Extract Vol: 28.9261 mL



Results of **AT-21-SB-10-28**

Client Sample ID: **AT-21-SB-10-28**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875019
Lab Project ID: 1213875

Collection Date: 06/30/21 15:20
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):88.1
Location:

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

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
1,2,4-Trimethylbenzene	91.3 J	99.3	29.8	ug/kg	1		07/09/21 18:02
1,2-Dibromoethane	0.995 U	1.99	0.794	ug/kg	1		07/09/21 18:02
1,2-Dichloroethane	1.99 U	3.97	1.39	ug/kg	1		07/09/21 18:02
1,3,5-Trimethylbenzene	50.1	49.6	15.5	ug/kg	1		07/09/21 18:02
Benzene	12.4 U	24.8	7.74	ug/kg	1		07/09/21 18:02
Ethylbenzene	32.3 J	49.6	15.5	ug/kg	1		07/09/21 18:02
Isopropylbenzene (Cumene)	26.8 J	49.6	15.5	ug/kg	1		07/09/21 18:02
Methyl-t-butyl ether	99.5 U	199	61.6	ug/kg	1		07/09/21 18:02
Naphthalene	107	49.6	15.5	ug/kg	1		07/09/21 18:02
n-Butylbenzene	24.8 U	49.6	15.5	ug/kg	1		07/09/21 18:02
o-Xylene	87.4	49.6	15.5	ug/kg	1		07/09/21 18:02
P & M -Xylene	168	99.3	29.8	ug/kg	1		07/09/21 18:02
sec-Butylbenzene	140	49.6	15.5	ug/kg	1		07/09/21 18:02
tert-Butylbenzene	24.8 U	49.6	15.5	ug/kg	1		07/09/21 18:02
Toluene	46.7 J	49.6	15.5	ug/kg	1		07/09/21 18:02
Xylenes (total)	256	149	45.3	ug/kg	1		07/09/21 18:02
Surrogates							
1,2-Dichloroethane-D4 (surr)	110	71-136		%	1		07/09/21 18:02
4-Bromofluorobenzene (surr)	91	55-151		%	1		07/09/21 18:02
Toluene-d8 (surr)	110	85-116		%	1		07/09/21 18:02

Batch Information

Analytical Batch: VMS20904
Analytical Method: SW8260D
Analyst: S.S
Analytical Date/Time: 07/09/21 18:02
Container ID: 1213875019-B

Prep Batch: VXX37391
Prep Method: SW5035A
Prep Date/Time: 06/30/21 15:20
Prep Initial Wt./Vol.: 33.063 g
Prep Extract Vol: 28.9261 mL



Results of **AT-21-SB-16-28**

Client Sample ID: **AT-21-SB-16-28**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875020
Lab Project ID: 1213875

Collection Date: 06/30/21 15:25
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):88.1
Location:

Results by **Polynuclear Aromatics GC/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
1-Methylnaphthalene	283 U	566	141	ug/kg	20		07/19/21 15:25
2-Methylnaphthalene	283 U	566	141	ug/kg	20		07/19/21 15:25
Acenaphthene	283 U	566	141	ug/kg	20		07/19/21 15:25
Acenaphthylene	283 U	566	141	ug/kg	20		07/19/21 15:25
Anthracene	283 U	566	141	ug/kg	20		07/19/21 15:25
Benzo(a)Anthracene	283 U	566	141	ug/kg	20		07/19/21 15:25
Benzo[a]pyrene	283 U	566	141	ug/kg	20		07/19/21 15:25
Benzo[b]Fluoranthene	283 U	566	141	ug/kg	20		07/19/21 15:25
Benzo[g,h,i]perylene	283 U	566	141	ug/kg	20		07/19/21 15:25
Benzo[k]fluoranthene	283 U	566	141	ug/kg	20		07/19/21 15:25
Chrysene	283 U	566	141	ug/kg	20		07/19/21 15:25
Dibenzo[a,h]anthracene	283 U	566	141	ug/kg	20		07/19/21 15:25
Fluoranthene	283 U	566	141	ug/kg	20		07/19/21 15:25
Fluorene	283 U	566	141	ug/kg	20		07/19/21 15:25
Indeno[1,2,3-c,d] pyrene	283 U	566	141	ug/kg	20		07/19/21 15:25
Naphthalene	227 U	453	113	ug/kg	20		07/19/21 15:25
Phenanthrene	283 U	566	141	ug/kg	20		07/19/21 15:25
Pyrene	283 U	566	141	ug/kg	20		07/19/21 15:25
Surrogates							
2-Methylnaphthalene-d10 (surr)	304	*	58-103	%	20		07/19/21 15:25
Fluoranthene-d10 (surr)	75.5		54-113	%	20		07/19/21 15:25

Batch Information

Analytical Batch: XMS12764
Analytical Method: 8270D SIM (PAH)
Analyst: LAW
Analytical Date/Time: 07/19/21 15:25
Container ID: 1213875020-A

Prep Batch: XXX45119
Prep Method: SW3550C
Prep Date/Time: 07/08/21 10:53
Prep Initial Wt./Vol.: 22.558 g
Prep Extract Vol: 5 mL



Results of **AT-21-SB-16-28**

Client Sample ID: **AT-21-SB-16-28**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875020
Lab Project ID: 1213875

Collection Date: 06/30/21 15:25
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):88.1
Location:

Results by **Semivolatile Organic Fuels**

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable</u> <u>Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	7020		90.4	28.0	mg/kg	4		07/09/21 01:07
Surrogates								
5a Androstane (surr)	84.8		50-150		%	4		07/09/21 01:07

Batch Information

Analytical Batch: XFC15990
Analytical Method: AK102
Analyst: IVM
Analytical Date/Time: 07/09/21 01:07
Container ID: 1213875020-A

Prep Batch: XXX45118
Prep Method: SW3550C
Prep Date/Time: 07/08/21 10:14
Prep Initial Wt./Vol.: 30.135 g
Prep Extract Vol: 5 mL



Results of **AT-21-SB-16-28**

Client Sample ID: **AT-21-SB-16-28**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875020
Lab Project ID: 1213875

Collection Date: 06/30/21 15:25
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):88.1
Location:

Results by **Volatile Fuels**

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	96.4		4.32	1.30	mg/kg	1		07/16/21 05:48
Surrogates								
4-Bromofluorobenzene (surr)	860	*	50-150		%	1		07/16/21 05:48

Batch Information

Analytical Batch: VFC15714
Analytical Method: AK101
Analyst: MDT
Analytical Date/Time: 07/16/21 05:48
Container ID: 1213875020-B

Prep Batch: VXX37430
Prep Method: SW5035A
Prep Date/Time: 06/30/21 15:25
Prep Initial Wt./Vol.: 38.889 g
Prep Extract Vol: 29.613 mL



Results of **AT-21-SB-16-28**

Client Sample ID: **AT-21-SB-16-28**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875020
Lab Project ID: 1213875

Collection Date: 06/30/21 15:25
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):88.1
Location:

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

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
1,2,4-Trimethylbenzene	69.1 J	86.4	25.9	ug/kg	1		07/09/21 18:19
1,2-Dibromoethane	0.865 U	1.73	0.691	ug/kg	1		07/09/21 18:19
1,2-Dichloroethane	1.73 U	3.46	1.21	ug/kg	1		07/09/21 18:19
1,3,5-Trimethylbenzene	32.4 J	43.2	13.5	ug/kg	1		07/09/21 18:19
Benzene	10.8 U	21.6	6.74	ug/kg	1		07/09/21 18:19
Ethylbenzene	25.1 J	43.2	13.5	ug/kg	1		07/09/21 18:19
Isopropylbenzene (Cumene)	17.7 J	43.2	13.5	ug/kg	1		07/09/21 18:19
Methyl-t-butyl ether	86.5 U	173	53.6	ug/kg	1		07/09/21 18:19
Naphthalene	90.7	43.2	13.5	ug/kg	1		07/09/21 18:19
n-Butylbenzene	21.6 U	43.2	13.5	ug/kg	1		07/09/21 18:19
o-Xylene	63.1	43.2	13.5	ug/kg	1		07/09/21 18:19
P & M -Xylene	136	86.4	25.9	ug/kg	1		07/09/21 18:19
sec-Butylbenzene	135	43.2	13.5	ug/kg	1		07/09/21 18:19
tert-Butylbenzene	47.9	43.2	13.5	ug/kg	1		07/09/21 18:19
Toluene	39.3 J	43.2	13.5	ug/kg	1		07/09/21 18:19
Xylenes (total)	199	130	39.4	ug/kg	1		07/09/21 18:19
Surrogates							
1,2-Dichloroethane-D4 (surr)	106	71-136		%	1		07/09/21 18:19
4-Bromofluorobenzene (surr)	110	55-151		%	1		07/09/21 18:19
Toluene-d8 (surr)	113	85-116		%	1		07/09/21 18:19

Batch Information

Analytical Batch: VMS20904
Analytical Method: SW8260D
Analyst: S.S
Analytical Date/Time: 07/09/21 18:19
Container ID: 1213875020-B

Prep Batch: VXX37391
Prep Method: SW5035A
Prep Date/Time: 06/30/21 15:25
Prep Initial Wt./Vol.: 38.889 g
Prep Extract Vol: 29.613 mL



Results of **AT-21-TB-01**

Client Sample ID: **AT-21-TB-01**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875021
Lab Project ID: 1213875

Collection Date: 06/28/21 08:00
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):
Location:

Results by **Volatile Fuels**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	1.42 J	2.60	0.780	mg/kg	1		07/19/21 22:23
Surrogates							
4-Bromofluorobenzene (surr)	92.6	50-150		%	1		07/19/21 22:23

Batch Information

Analytical Batch: VFC15719
Analytical Method: AK101
Analyst: MDT
Analytical Date/Time: 07/19/21 22:23
Container ID: 1213875021-A

Prep Batch: VXX37449
Prep Method: SW5035A
Prep Date/Time: 06/28/21 08:00
Prep Initial Wt./Vol.: 48.085 g
Prep Extract Vol: 25 mL



Results of **AT-21-TB-01**

Client Sample ID: **AT-21-TB-01**
Client Project ID: **Arctic and Tudor**
Lab Sample ID: 1213875021
Lab Project ID: 1213875

Collection Date: 06/28/21 08:00
Received Date: 07/01/21 10:11
Matrix: Soil/Solid (dry weight)
Solids (%):
Location:

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

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
1,2,4-Trimethylbenzene	26.0 U	52.0	15.6	ug/kg	1		07/09/21 18:35
1,2-Dibromoethane	0.520 U	1.04	0.416	ug/kg	1		07/09/21 18:35
1,2-Dichloroethane	1.04 U	2.08	0.728	ug/kg	1		07/09/21 18:35
1,3,5-Trimethylbenzene	13.0 U	26.0	8.11	ug/kg	1		07/09/21 18:35
Benzene	6.50 U	13.0	4.06	ug/kg	1		07/09/21 18:35
Ethylbenzene	13.0 U	26.0	8.11	ug/kg	1		07/09/21 18:35
Isopropylbenzene (Cumene)	13.0 U	26.0	8.11	ug/kg	1		07/09/21 18:35
Methyl-t-butyl ether	52.0 U	104	32.2	ug/kg	1		07/09/21 18:35
Naphthalene	13.0 U	26.0	8.11	ug/kg	1		07/09/21 18:35
n-Butylbenzene	13.0 U	26.0	8.11	ug/kg	1		07/09/21 18:35
o-Xylene	13.0 U	26.0	8.11	ug/kg	1		07/09/21 18:35
P & M -Xylene	26.0 U	52.0	15.6	ug/kg	1		07/09/21 18:35
sec-Butylbenzene	13.0 U	26.0	8.11	ug/kg	1		07/09/21 18:35
tert-Butylbenzene	13.0 U	26.0	8.11	ug/kg	1		07/09/21 18:35
Toluene	13.0 U	26.0	8.11	ug/kg	1		07/09/21 18:35
Xylenes (total)	39.0 U	78.0	23.7	ug/kg	1		07/09/21 18:35
Surrogates							
1,2-Dichloroethane-D4 (surr)	108	71-136		%	1		07/09/21 18:35
4-Bromofluorobenzene (surr)	96.3	55-151		%	1		07/09/21 18:35
Toluene-d8 (surr)	99.5	85-116		%	1		07/09/21 18:35

Batch Information

Analytical Batch: VMS20904
Analytical Method: SW8260D
Analyst: S.S
Analytical Date/Time: 07/09/21 18:35
Container ID: 1213875021-A

Prep Batch: VXX37391
Prep Method: SW5035A
Prep Date/Time: 06/28/21 08:00
Prep Initial Wt./Vol.: 48.085 g
Prep Extract Vol: 25 mL



Method Blank

Blank ID: MB for HBN 1821710 [SPT/11314]
Blank Lab ID: 1620487

Matrix: Soil/Solid (dry weight)

QC for Samples:

1213875001, 1213875002, 1213875003, 1213875004, 1213875005, 1213875006, 1213875007, 1213875008, 1213875009,
1213875010, 1213875011, 1213875012, 1213875013, 1213875014, 1213875015, 1213875016, 1213875017, 1213875018,
1213875019, 1213875020

Results by SM21 2540G

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

Batch Information

Analytical Batch: SPT11314
Analytical Method: SM21 2540G
Instrument:
Analyst: TMM
Analytical Date/Time: 7/2/2021 5:00:00PM

Print Date: 08/10/2021 3:50:26PM



Duplicate Sample Summary

Original Sample ID: 1213875001

Duplicate Sample ID: 1620488

Analysis Date: 07/02/2021 17:00

Matrix: Soil/Solid (dry weight)

QC for Samples:

1213875001, 1213875002, 1213875003, 1213875004, 1213875005, 1213875006, 1213875007, 1213875008, 1213875009, 1213875010, 1213875011, 1213875012, 1213875013, 1213875014, 1213875015

Results by SM21 2540G

<u>NAME</u>	<u>Original</u>	<u>Duplicate</u>	<u>Units</u>	<u>RPD (%)</u>	<u>RPD CL</u>
Total Solids	77.2	77.6	%	0.57	(< 15)

Batch Information

Analytical Batch: SPT11314

Analytical Method: SM21 2540G

Instrument:

Analyst: TMM

Print Date: 08/10/2021 3:50:28PM



Duplicate Sample Summary

Original Sample ID: 1213875015

Duplicate Sample ID: 1620489

Analysis Date: 07/02/2021 17:00

Matrix: Soil/Solid (dry weight)

QC for Samples:

1213875002, 1213875003, 1213875004, 1213875005, 1213875006, 1213875007, 1213875008, 1213875009, 1213875010, 1213875011, 1213875012, 1213875013, 1213875014, 1213875015, 1213875016, 1213875017,

Results by SM21 2540G

<u>NAME</u>	<u>Original</u>	<u>Duplicate</u>	<u>Units</u>	<u>RPD (%)</u>	<u>RPD CL</u>
Total Solids	94.8	95.0	%	0.16	(< 15)

Batch Information

Analytical Batch: SPT11314

Analytical Method: SM21 2540G

Instrument:

Analyst: TMM

Print Date: 08/10/2021 3:50:28PM



Duplicate Sample Summary

Original Sample ID: 1213889012

Duplicate Sample ID: 1620490

QC for Samples:

1213875016, 1213875017, 1213875018, 1213875019, 1213875020

Analysis Date: 07/02/2021 17:00

Matrix: Soil/Solid (dry weight)

Results by SM21 2540G

<u>NAME</u>	<u>Original</u>	<u>Duplicate</u>	<u>Units</u>	<u>RPD (%)</u>	<u>RPD CL</u>
Total Solids	98.4	98.3	%	0.09	(< 15)

Batch Information

Analytical Batch: SPT11314

Analytical Method: SM21 2540G

Instrument:

Analyst: TMM

Print Date: 08/10/2021 3:50:28PM



Method Blank

Blank ID: MB for HBN 1822003 [VXX/37376]

Blank Lab ID: 1621873

QC for Samples:

1213875002, 1213875003

Matrix: Soil/Solid (dry weight)

Results by SW8260D

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
1,2,4-Trimethylbenzene	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)	104	71-136		%
4-Bromofluorobenzene (surr)	98.7	55-151		%
Toluene-d8 (surr)	99.5	85-116		%

Batch Information

Analytical Batch: VMS20896

Analytical Method: SW8260D

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

Analyst: S.S

Analytical Date/Time: 7/8/2021 10:22:00AM

Prep Batch: VXX37376

Prep Method: SW5035A

Prep Date/Time: 7/8/2021 6:00:00AM

Prep Initial Wt./Vol.: 50 g

Prep Extract Vol: 25 mL

Print Date: 08/10/2021 3:50:31PM



Blank Spike Summary

Blank Spike ID: LCS for HBN 1213875 [VXX37376]

Blank Spike Lab ID: 1621874

Date Analyzed: 07/08/2021 10:37

Matrix: Soil/Solid (dry weight)

QC for Samples: 1213875002, 1213875003

Results by SW8260D

Blank Spike (ug/kg)

Parameter	Spike	Result	Rec (%)	CL
1,2,4-Trimethylbenzene	750	725	97	(75-123)
1,2-Dibromoethane	750	828	110	(78-122)
1,2-Dichloroethane	750	751	100	(73-128)
1,3,5-Trimethylbenzene	750	735	98	(73-124)
Benzene	750	742	99	(77-121)
Ethylbenzene	750	707	94	(76-122)
Isopropylbenzene (Cumene)	750	715	95	(68-134)
Methyl-t-butyl ether	1130	1150	103	(73-125)
Naphthalene	750	735	98	(62-129)
n-Butylbenzene	750	710	95	(70-128)
o-Xylene	750	722	96	(77-123)
P & M -Xylene	1500	1390	92	(77-124)
sec-Butylbenzene	750	698	93	(73-126)
tert-Butylbenzene	750	716	96	(73-125)
Toluene	750	720	96	(77-121)
Xylenes (total)	2250	2110	94	(78-124)

Surrogates

1,2-Dichloroethane-D4 (surr)	750		105	(71-136)
4-Bromofluorobenzene (surr)	750		95	(55-151)
Toluene-d8 (surr)	750		100	(85-116)

Batch Information

Analytical Batch: **VMS20896**
 Analytical Method: **SW8260D**
 Instrument: **VRA Agilent GC/MS 7890B/5977A**
 Analyst: **S.S**

Prep Batch: **VXX37376**
 Prep Method: **SW5035A**
 Prep Date/Time: **07/08/2021 06:00**
 Spike Init Wt./Vol.: 750 ug/kg Extract Vol: 25 mL
 Dupe Init Wt./Vol.: Extract Vol:

Print Date: 08/10/2021 3:50:34PM



Matrix Spike Summary

Original Sample ID: 1621875
 MS Sample ID: 1621876 MS
 MSD Sample ID: 1621877 MSD

Analysis Date: 07/08/2021 14:37
 Analysis Date: 07/08/2021 12:33
 Analysis Date: 07/08/2021 12:49
 Matrix: Solid/Soil (Wet Weight)

QC for Samples: 1213875002, 1213875003

Results by SW8260D

Parameter	Sample	Matrix Spike (ug/kg)			Spike Duplicate (ug/kg)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
1,2,4-Trimethylbenzene	368	560	901	95	560	918	98	75-123	1.80	(< 20)
1,2-Dibromoethane	0.374U	560	620	111	560	613	109	78-122	1.10	(< 20)
1,2-Dichloroethane	0.745U	560	559	100	560	543	97	73-128	3.10	(< 20)
1,3,5-Trimethylbenzene	103	560	642	96	560	654	98	73-124	1.70	(< 20)
Benzene	4.67U	560	544	97	560	538	96	77-121	1.20	(< 20)
Ethylbenzene	28.4	560	544	92	560	537	91	76-122	1.20	(< 20)
Isopropylbenzene (Cumene)	14.9J	560	532	92	560	525	91	68-134	1.40	(< 20)
Methyl-t-butyl ether	37.4U	841	868	103	841	839	100	73-125	3.30	(< 20)
Naphthalene	132	560	700	101	560	692	100	62-129	1.30	(< 20)
n-Butylbenzene	9.35U	560	671	120	560	671	120	70-128	0.11	(< 20)
o-Xylene	9.35U	560	535	96	560	529	94	77-123	1.20	(< 20)
P & M -Xylene	97.3	1120	1110	90	1120	1110	90	77-124	0.37	(< 20)
sec-Butylbenzene	23.2	560	552	94	560	556	95	73-126	0.81	(< 20)
tert-Butylbenzene	9.35U	560	535	95	560	555	99	73-125	3.70	(< 20)
Toluene	9.35U	560	534	95	560	527	94	77-121	1.20	(< 20)
Xylenes (total)	97.3	1680	1650	92	1680	1640	92	78-124	0.65	(< 20)
Surrogates										
1,2-Dichloroethane-D4 (surr)		560	580	103	560	557	99	71-136	4.00	
4-Bromofluorobenzene (surr)		934	793	85	934	809	87	55-151	2.00	
Toluene-d8 (surr)		560	558	100	560	563	100	85-116	0.77	

Batch Information

Analytical Batch: VMS20896
 Analytical Method: SW8260D
 Instrument: VRA Agilent GC/MS 7890B/5977A
 Analyst: S.S
 Analytical Date/Time: 7/8/2021 12:33:00PM

Prep Batch: VXX37376
 Prep Method: Vol. Extraction SW8260 Field Extracted L
 Prep Date/Time: 7/8/2021 6:00:00AM
 Prep Initial Wt./Vol.: 66.91g
 Prep Extract Vol: 25.00mL

Print Date: 08/10/2021 3:50:35PM



Method Blank

Blank ID: MB for HBN 1822027 [VXX/37383]

Blank Lab ID: 1622006

QC for Samples:

1213875001

Matrix: Soil/Solid (dry weight)

Results by SW8260D

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
1,2,4-Trimethylbenzene	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)	108	71-136		%
4-Bromofluorobenzene (surr)	94	55-151		%
Toluene-d8 (surr)	99.8	85-116		%

Batch Information

Analytical Batch: VMS20900
Analytical Method: SW8260D
Instrument: VQA 7890/5975 GC/MS
Analyst: S.S
Analytical Date/Time: 7/8/2021 10:25:00AM

Prep Batch: VXX37383
Prep Method: SW5035A
Prep Date/Time: 7/8/2021 6:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

Print Date: 08/10/2021 3:50:37PM



Blank Spike Summary

Blank Spike ID: LCS for HBN 1213875 [VXX37383]

Blank Spike Lab ID: 1622007

Date Analyzed: 07/08/2021 10:41

Matrix: Soil/Solid (dry weight)

QC for Samples: 1213875001

Results by SW8260D

Blank Spike (ug/kg)

Parameter	Spike	Result	Rec (%)	CL
1,2,4-Trimethylbenzene	750	725	97	(75-123)
1,2-Dibromoethane	750	848	113	(78-122)
1,2-Dichloroethane	750	697	93	(73-128)
1,3,5-Trimethylbenzene	750	699	93	(73-124)
Benzene	750	749	100	(77-121)
Ethylbenzene	750	703	94	(76-122)
Isopropylbenzene (Cumene)	750	705	94	(68-134)
Methyl-t-butyl ether	1130	1110	99	(73-125)
Naphthalene	750	717	96	(62-129)
n-Butylbenzene	750	664	89	(70-128)
o-Xylene	750	725	97	(77-123)
P & M -Xylene	1500	1420	95	(77-124)
sec-Butylbenzene	750	663	88	(73-126)
tert-Butylbenzene	750	691	92	(73-125)
Toluene	750	719	96	(77-121)
Xylenes (total)	2250	2150	95	(78-124)

Surrogates

1,2-Dichloroethane-D4 (surr)	750		95	(71-136)
4-Bromofluorobenzene (surr)	750		92	(55-151)
Toluene-d8 (surr)	750		100	(85-116)

Batch Information

Analytical Batch: **VMS20900**
 Analytical Method: **SW8260D**
 Instrument: **VQA 7890/5975 GC/MS**
 Analyst: **S.S**

Prep Batch: **VXX37383**
 Prep Method: **SW5035A**
 Prep Date/Time: **07/08/2021 06:00**
 Spike Init Wt./Vol.: 750 ug/kg Extract Vol: 25 mL
 Dupe Init Wt./Vol.: Extract Vol:

Print Date: 08/10/2021 3:50:39PM



Matrix Spike Summary

Original Sample ID: 1622008
 MS Sample ID: 1622009 MS
 MSD Sample ID: 1622010 MSD

Analysis Date: 07/08/2021 14:30
 Analysis Date: 07/08/2021 12:34
 Analysis Date: 07/08/2021 12:51
 Matrix: Solid/Soil (Wet Weight)

QC for Samples: 1213875001

Results by SW8260D

Parameter	Sample	Matrix Spike (ug/kg)			Spike Duplicate (ug/kg)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
1,2,4-Trimethylbenzene	16.2U	486	449	92	486	453	93	75-123	0.93	(< 20)
1,2-Dibromoethane	0.324U	486	540	111	486	555	114	78-122	2.70	(< 20)
1,2-Dichloroethane	0.650U	486	438	90	486	451	93	73-128	2.80	(< 20)
1,3,5-Trimethylbenzene	8.10U	486	451	93	486	433	89	73-124	4.00	(< 20)
Benzene	4.05U	486	463	95	486	474	98	77-121	2.60	(< 20)
Ethylbenzene	8.10U	486	438	90	486	436	90	76-122	0.44	(< 20)
Isopropylbenzene (Cumene)	8.10U	486	440	91	486	437	90	68-134	0.78	(< 20)
Methyl-t-butyl ether	32.4U	729	708	97	729	728	100	73-125	2.80	(< 20)
Naphthalene	8.10U	486	438	90	486	468	96	62-129	6.80	(< 20)
n-Butylbenzene	8.10U	486	421	87	486	414	85	70-128	1.70	(< 20)
o-Xylene	8.10U	486	453	93	486	451	93	77-123	0.36	(< 20)
P & M -Xylene	16.2U	972	896	92	972	885	91	77-124	1.20	(< 20)
sec-Butylbenzene	8.10U	486	406	84	486	405	83	73-126	0.08	(< 20)
tert-Butylbenzene	8.10U	486	421	87	486	420	87	73-125	0.12	(< 20)
Toluene	8.10U	486	454	94	486	453	93	77-121	0.39	(< 20)
Xylenes (total)	24.3U	1460	1350	93	1460	1340	92	78-124	0.94	(< 20)
Surrogates										
1,2-Dichloroethane-D4 (surr)		486	460	95	486	470	97	71-136	2.20	
4-Bromofluorobenzene (surr)		810	728	90	810	729	90	55-151	0.24	
Toluene-d8 (surr)		486	489	101	486	489	101	85-116	0.00	

Batch Information

Analytical Batch: VMS20900
 Analytical Method: SW8260D
 Instrument: VQA 7890/5975 GC/MS
 Analyst: S.S
 Analytical Date/Time: 7/8/2021 12:34:00PM

Prep Batch: VXX37383
 Prep Method: Vol. Extraction SW8260 Field Extracted L
 Prep Date/Time: 7/8/2021 6:00:00AM
 Prep Initial Wt./Vol.: 77.19g
 Prep Extract Vol: 25.00mL

Print Date: 08/10/2021 3:50:41PM



Method Blank

Blank ID: MB for HBN 1822147 [VXX/37391]
Blank Lab ID: 1622270

Matrix: Soil/Solid (dry weight)

QC for Samples:

1213875004, 1213875005, 1213875006, 1213875007, 1213875008, 1213875009, 1213875012, 1213875013, 1213875014, 1213875015, 1213875016, 1213875017, 1213875018, 1213875019, 1213875020, 1213875021

Results by SW8260D

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
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)	110	71-136		%
4-Bromofluorobenzene (surr)	94.7	55-151		%
Toluene-d8 (surr)	100	85-116		%

Batch Information

Analytical Batch: VMS20904
Analytical Method: SW8260D
Instrument: VQA 7890/5975 GC/MS
Analyst: S.S
Analytical Date/Time: 7/9/2021 10:26:00AM

Prep Batch: VXX37391
Prep Method: SW5035A
Prep Date/Time: 7/9/2021 6:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

Print Date: 08/10/2021 3:50:42PM



Blank Spike Summary

Blank Spike ID: LCS for HBN 1213875 [VXX37391]

Blank Spike Lab ID: 1622271

Date Analyzed: 07/09/2021 10:43

Matrix: Soil/Solid (dry weight)

QC for Samples: 1213875004, 1213875005, 1213875006, 1213875007, 1213875008, 1213875009, 1213875012, 1213875013, 1213875014, 1213875015, 1213875016, 1213875017, 1213875018, 1213875019, 1213875020, 1213875021

Results by SW8260D

Blank Spike (ug/kg)

Parameter	Spike	Result	Rec (%)	CL
1,2,4-Trimethylbenzene	750	737	98	(75-123)
1,2-Dibromoethane	750	844	113	(78-122)
1,2-Dichloroethane	750	699	93	(73-128)
1,3,5-Trimethylbenzene	750	751	100	(73-124)
Benzene	750	746	100	(77-121)
Ethylbenzene	750	704	94	(76-122)
Isopropylbenzene (Cumene)	750	716	95	(68-134)
Methyl-t-butyl ether	1130	1100	98	(73-125)
Naphthalene	750	697	93	(62-129)
n-Butylbenzene	750	681	91	(70-128)
o-Xylene	750	733	98	(77-123)
P & M -Xylene	1500	1420	95	(77-124)
sec-Butylbenzene	750	679	91	(73-126)
tert-Butylbenzene	750	702	94	(73-125)
Toluene	750	722	96	(77-121)
Xylenes (total)	2250	2150	96	(78-124)

Surrogates

1,2-Dichloroethane-D4 (surr)	750		94	(71-136)
4-Bromofluorobenzene (surr)	750		93	(55-151)
Toluene-d8 (surr)	750		100	(85-116)

Batch Information

Analytical Batch: VMS20904
Analytical Method: SW8260D
Instrument: VQA 7890/5975 GC/MS
Analyst: S.S

Prep Batch: VXX37391
Prep Method: SW5035A
Prep Date/Time: 07/09/2021 06:00
Spike Init Wt./Vol.: 750 ug/kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: Extract Vol:

Print Date: 08/10/2021 3:50:44PM



Matrix Spike Summary

Original Sample ID: 1622272
 MS Sample ID: 1622273 MS
 MSD Sample ID: 1622274 MSD

Analysis Date: 07/09/2021 14:27
 Analysis Date: 07/09/2021 12:15
 Analysis Date: 07/09/2021 12:31
 Matrix: Solid/Soil (Wet Weight)

QC for Samples: 1213875004, 1213875005, 1213875006, 1213875007, 1213875008, 1213875009, 1213875012, 1213875013, 1213875014, 1213875015, 1213875016, 1213875017, 1213875018, 1213875019, 1213875020, 1213875021

Results by SW8260D

Parameter	Sample	Matrix Spike (ug/kg)			Spike Duplicate (ug/kg)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
1,2,4-Trimethylbenzene	27.6U	827	799	97	827	800	97	75-123	0.04	(< 20)
1,2-Dibromoethane	0.550U	827	937	113	827	938	113	78-122	0.12	(< 20)
1,2-Dichloroethane	1.11U	827	770	93	827	767	93	73-128	0.39	(< 20)
1,3,5-Trimethylbenzene	13.8U	827	795	96	827	771	93	73-124	3.00	(< 20)
Benzene	6.90U	827	826	100	827	820	99	77-121	0.70	(< 20)
Ethylbenzene	13.8U	827	782	95	827	769	93	76-122	1.70	(< 20)
Isopropylbenzene (Cumene)	13.8U	827	790	96	827	779	94	68-134	1.40	(< 20)
Methyl-t-butyl ether	55.0U	1240	1230	99	1240	1230	99	73-125	0.43	(< 20)
Naphthalene	13.8U	827	758	92	827	792	96	62-129	4.40	(< 20)
n-Butylbenzene	13.8U	827	729	88	827	719	87	70-128	1.40	(< 20)
o-Xylene	13.8U	827	808	98	827	797	96	77-123	1.30	(< 20)
P & M -Xylene	27.6U	1650	1570	95	1650	1560	94	77-124	0.35	(< 20)
sec-Butylbenzene	13.8U	827	732	89	827	722	87	73-126	1.40	(< 20)
tert-Butylbenzene	13.8U	827	763	92	827	753	91	73-125	1.40	(< 20)
Toluene	13.8U	827	799	97	827	788	95	77-121	1.40	(< 20)
Xylenes (total)	41.4U	2480	2380	96	2480	2360	95	78-124	0.69	(< 20)
Surrogates										
1,2-Dichloroethane-D4 (surr)		827	785	95	827	778	94	71-136	0.85	
4-Bromofluorobenzene (surr)		1380	915	66	1380	912	66	55-151	0.24	
Toluene-d8 (surr)		827	834	101	827	828	100	85-116	0.73	

Batch Information

Analytical Batch: VMS20904
 Analytical Method: SW8260D
 Instrument: VQA 7890/5975 GC/MS
 Analyst: S.S
 Analytical Date/Time: 7/9/2021 12:15:00PM

Prep Batch: VXX37391
 Prep Method: Vol. Extraction SW8260 Field Extracted L
 Prep Date/Time: 7/9/2021 6:00:00AM
 Prep Initial Wt./Vol.: 45.32g
 Prep Extract Vol: 25.00mL

Print Date: 08/10/2021 3:50:46PM



Method Blank

Blank ID: MB for HBN 1822200 [VXX/37401]

Blank Lab ID: 1622500

QC for Samples:

1213875010, 1213875011

Matrix: Soil/Solid (dry weight)

Results by SW8260D

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
1,2,4-Trimethylbenzene	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)	104	71-136		%
4-Bromofluorobenzene (surr)	97.9	55-151		%
Toluene-d8 (surr)	98.8	85-116		%

Batch Information

Analytical Batch: VMS20910

Analytical Method: SW8260D

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

Analyst: S.S

Analytical Date/Time: 7/11/2021 3:44:00PM

Prep Batch: VXX37401

Prep Method: SW5035A

Prep Date/Time: 7/11/2021 6:00:00AM

Prep Initial Wt./Vol.: 50 g

Prep Extract Vol: 25 mL

Print Date: 08/10/2021 3:50:47PM



Blank Spike Summary

Blank Spike ID: LCS for HBN 1213875 [VXX37401]

Blank Spike Lab ID: 1622501

Date Analyzed: 07/11/2021 16:00

Matrix: Soil/Solid (dry weight)

QC for Samples: 1213875010, 1213875011

Results by SW8260D

Blank Spike (ug/kg)

Parameter	Spike	Result	Rec (%)	CL
1,2,4-Trimethylbenzene	750	731	97	(75-123)
1,2-Dibromoethane	750	821	109	(78-122)
1,2-Dichloroethane	750	741	99	(73-128)
1,3,5-Trimethylbenzene	750	714	95	(73-124)
Benzene	750	713	95	(77-121)
Ethylbenzene	750	683	91	(76-122)
Isopropylbenzene (Cumene)	750	692	92	(68-134)
Methyl-t-butyl ether	1130	1150	102	(73-125)
Naphthalene	750	724	97	(62-129)
n-Butylbenzene	750	736	98	(70-128)
o-Xylene	750	707	94	(77-123)
P & M -Xylene	1500	1330	89	(77-124)
sec-Butylbenzene	750	715	95	(73-126)
tert-Butylbenzene	750	710	95	(73-125)
Toluene	750	701	93	(77-121)
Xylenes (total)	2250	2040	91	(78-124)

Surrogates

1,2-Dichloroethane-D4 (surr)	750		103	(71-136)
4-Bromofluorobenzene (surr)	750		96	(55-151)
Toluene-d8 (surr)	750		99	(85-116)

Batch Information

Analytical Batch: **VMS20910**
 Analytical Method: **SW8260D**
 Instrument: **VRA Agilent GC/MS 7890B/5977A**
 Analyst: **S.S**

Prep Batch: **VXX37401**
 Prep Method: **SW5035A**
 Prep Date/Time: **07/11/2021 06:00**
 Spike Init Wt./Vol.: 750 ug/kg Extract Vol: 25 mL
 Dupe Init Wt./Vol.: Extract Vol:

Print Date: 08/10/2021 3:50:50PM



Matrix Spike Summary

Original Sample ID: 1622502
 MS Sample ID: 1622503 MS
 MSD Sample ID: 1622504 MSD

Analysis Date: 07/11/2021 20:47
 Analysis Date: 07/11/2021 18:13
 Analysis Date: 07/11/2021 18:28
 Matrix: Solid/Soil (Wet Weight)

QC for Samples: 1213875010, 1213875011

Results by SW8260D

Parameter	Sample	Matrix Spike (ug/kg)			Spike Duplicate (ug/kg)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
1,2,4-Trimethylbenzene	119J	2150	2180	96	2150	2130	94	75-123	2.00	(< 20)
1,2-Dibromoethane	1.44U	2150	2420	113	2150	2380	111	78-122	1.90	(< 20)
1,2-Dichloroethane	2.87U	2150	2190	102	2150	2160	101	73-128	1.20	(< 20)
1,3,5-Trimethylbenzene	43.0J	2150	2080	95	2150	2060	94	73-124	1.00	(< 20)
Benzene	17.9U	2150	2130	99	2150	2100	98	77-121	1.40	(< 20)
Ethylbenzene	35.9U	2150	2010	94	2150	1980	92	76-122	1.40	(< 20)
Isopropylbenzene (Cumene)	35.9U	2150	2060	96	2150	2000	93	68-134	2.90	(< 20)
Methyl-t-butyl ether	144U	3220	3420	106	3220	3390	105	73-125	0.82	(< 20)
Naphthalene	35.9U	2150	2240	104	2150	2230	104	62-129	0.13	(< 20)
n-Butylbenzene	35.9U	2150	2070	97	2150	1990	93	70-128	4.00	(< 20)
o-Xylene	23.7J	2150	2070	95	2150	2040	94	77-123	1.60	(< 20)
P & M -Xylene	64.5J	4290	4040	93	4290	3910	90	77-124	3.20	(< 20)
sec-Butylbenzene	35.9U	2150	1990	93	2150	2000	93	73-126	0.58	(< 20)
tert-Butylbenzene	35.9U	2150	2030	95	2150	1990	93	73-125	2.20	(< 20)
Toluene	35.9U	2150	2080	97	2150	2050	96	77-121	1.40	(< 20)
Xylenes (total)	88.2J	6440	6110	94	6440	5950	91	78-124	2.60	(< 20)
Surrogates										
1,2-Dichloroethane-D4 (surr)		2150	2230	104	2150	2210	103	71-136	0.97	
4-Bromofluorobenzene (surr)		2160	1560	72	2160	1560	72	55-151	0.46	
Toluene-d8 (surr)		2150	2160	100	2150	2150	100	85-116	0.33	

Batch Information

Analytical Batch: VMS20910
 Analytical Method: SW8260D
 Instrument: VRA Agilent GC/MS 7890B/5977A
 Analyst: S.S
 Analytical Date/Time: 7/11/2021 6:13:00PM

Prep Batch: VXX37401
 Prep Method: Vol. Extraction SW8260 Field Extracted L
 Prep Date/Time: 7/11/2021 6:00:00AM
 Prep Initial Wt./Vol.: 28.88g
 Prep Extract Vol: 41.40mL

Print Date: 08/10/2021 3:50:51PM



Method Blank

Blank ID: MB for HBN 1822482 [VXX/37429]
Blank Lab ID: 1623631

Matrix: Soil/Solid (dry weight)

QC for Samples:
1213875001, 1213875002, 1213875003, 1213875004, 1213875005

Results by AK101

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Gasoline Range Organics	1.23J	2.50	0.750	mg/kg
Surrogates				
4-Bromofluorobenzene (surr)	99.8	50-150		%

Batch Information

Analytical Batch: VFC15714
Analytical Method: AK101
Instrument: Agilent 7890 PID/FID
Analyst: MDT
Analytical Date/Time: 7/15/2021 6:03:00PM

Prep Batch: VXX37429
Prep Method: SW5035A
Prep Date/Time: 7/15/2021 6:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

Print Date: 08/10/2021 3:50:53PM



Blank Spike Summary

Blank Spike ID: LCS for HBN 1213875 [VXX37429]
Blank Spike Lab ID: 1623632
Date Analyzed: 07/15/2021 17:27

Spike Duplicate ID: LCSD for HBN 1213875 [VXX37429]
Spike Duplicate Lab ID: 1623633
Matrix: Soil/Solid (dry weight)

QC for Samples: 1213875001, 1213875002, 1213875003, 1213875004, 1213875005

Results by AK101

Parameter	Blank Spike (mg/kg)			Spike Duplicate (mg/kg)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Gasoline Range Organics	12.5	13.9	111	12.5	13.4	108	(60-120)	3.50	(< 20)

Surrogates

4-Bromofluorobenzene (surr)	1.25		114	1.25		115	(50-150)	1.10	
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Batch Information

Analytical Batch: VFC15714
Analytical Method: AK101
Instrument: Agilent 7890 PID/FID
Analyst: MDT

Prep Batch: VXX37429
Prep Method: SW5035A
Prep Date/Time: 07/15/2021 06:00
Spike Init Wt./Vol.: 12.5 mg/Kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: 12.5 mg/Kg Extract Vol: 25 mL

Print Date: 08/10/2021 3:50:55PM



Method Blank

Blank ID: MB for HBN 1822484 [VXX/37430]
Blank Lab ID: 1623638

Matrix: Soil/Solid (dry weight)

QC for Samples:

1213875006, 1213875007, 1213875008, 1213875009, 1213875010, 1213875011, 1213875012, 1213875013, 1213875014, 1213875015, 1213875016, 1213875017, 1213875018, 1213875019, 1213875020

Results by AK101

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Gasoline Range Organics	1.27J	2.50	0.750	mg/kg
Surrogates				
4-Bromofluorobenzene (surr)	89.2	50-150		%

Batch Information

Analytical Batch: VFC15714
Analytical Method: AK101
Instrument: Agilent 7890 PID/FID
Analyst: MDT
Analytical Date/Time: 7/16/2021 12:59:00AM

Prep Batch: VXX37430
Prep Method: SW5035A
Prep Date/Time: 7/15/2021 6:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

Print Date: 08/10/2021 3:50:57PM



Blank Spike Summary

Blank Spike ID: LCS for HBN 1213875 [VXX37430]
 Blank Spike Lab ID: 1623639
 Date Analyzed: 07/16/2021 00:23

Spike Duplicate ID: LCSD for HBN 1213875 [VXX37430]
 Spike Duplicate Lab ID: 1623640
 Matrix: Soil/Solid (dry weight)

QC for Samples: 1213875006, 1213875007, 1213875008, 1213875009, 1213875010, 1213875011, 1213875012, 1213875013, 1213875014, 1213875015, 1213875016, 1213875017, 1213875018, 1213875019, 1213875020

Results by AK101

Parameter	Blank Spike (mg/kg)			Spike Duplicate (mg/kg)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Gasoline Range Organics	12.5	13.2	106	12.5	12.8	102	(60-120)	3.50	(< 20)

Surrogates

4-Bromofluorobenzene (surr)	1.25		104	1.25		98	(50-150)	5.30	
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Batch Information

Analytical Batch: VFC15714
 Analytical Method: AK101
 Instrument: Agilent 7890 PID/FID
 Analyst: MDT

Prep Batch: VXX37430
 Prep Method: SW5035A
 Prep Date/Time: 07/15/2021 06:00
 Spike Init Wt./Vol.: 12.5 mg/Kg Extract Vol: 25 mL
 Dupe Init Wt./Vol.: 12.5 mg/Kg Extract Vol: 25 mL

Print Date: 08/10/2021 3:50:59PM



Method Blank

Blank ID: MB for HBN 1822613 [VXX/37449]
Blank Lab ID: 1624243

Matrix: Soil/Solid (dry weight)

QC for Samples:
1213875021

Results by AK101

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Gasoline Range Organics	1.59J	2.50	0.750	mg/kg
Surrogates				
4-Bromofluorobenzene (surr)	80.3	50-150		%

Batch Information

Analytical Batch: VFC15719
Analytical Method: AK101
Instrument: Agilent 7890 PID/FID
Analyst: MDT
Analytical Date/Time: 7/19/2021 9:10:00PM

Prep Batch: VXX37449
Prep Method: SW5035A
Prep Date/Time: 7/19/2021 6:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

Print Date: 08/10/2021 3:51:01PM



Blank Spike Summary

Blank Spike ID: LCS for HBN 1213875 [VXX37449]
Blank Spike Lab ID: 1624244
Date Analyzed: 07/19/2021 20:34

Spike Duplicate ID: LCSD for HBN 1213875
[VXX37449]
Spike Duplicate Lab ID: 1624245
Matrix: Soil/Solid (dry weight)

QC for Samples: 1213875021

Results by AK101

Parameter	Blank Spike (mg/kg)			Spike Duplicate (mg/kg)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Gasoline Range Organics	12.5	13.6	109	12.5	13.2	105	(60-120)	3.00	(< 20)

Surrogates

4-Bromofluorobenzene (surr)	1.25		91	1.25		87	(50-150)	4.50	
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Batch Information

Analytical Batch: **VFC15719**
Analytical Method: **AK101**
Instrument: **Agilent 7890 PID/FID**
Analyst: **MDT**

Prep Batch: **VXX37449**
Prep Method: **SW5035A**
Prep Date/Time: **07/19/2021 06:00**
Spike Init Wt./Vol.: 12.5 mg/Kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: 12.5 mg/Kg Extract Vol: 25 mL

Print Date: 08/10/2021 3:51:03PM



Method Blank

Blank ID: MB for HBN 1821894 [XXX/45113]
Blank Lab ID: 1621296

Matrix: Soil/Solid (dry weight)

QC for Samples:
1213875001, 1213875003, 1213875004, 1213875005, 1213875006, 1213875007

Results by 8270D SIM (PAH)

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
1-Methylnaphthalene	12.5U	25.0	6.25	ug/kg
2-Methylnaphthalene	12.5U	25.0	6.25	ug/kg
Acenaphthene	12.5U	25.0	6.25	ug/kg
Acenaphthylene	12.5U	25.0	6.25	ug/kg
Anthracene	12.5U	25.0	6.25	ug/kg
Benzo(a)Anthracene	12.5U	25.0	6.25	ug/kg
Benzo[a]pyrene	12.5U	25.0	6.25	ug/kg
Benzo[b]Fluoranthene	12.5U	25.0	6.25	ug/kg
Benzo[g,h,i]perylene	12.5U	25.0	6.25	ug/kg
Benzo[k]fluoranthene	12.5U	25.0	6.25	ug/kg
Chrysene	12.5U	25.0	6.25	ug/kg
Dibenzo[a,h]anthracene	12.5U	25.0	6.25	ug/kg
Fluoranthene	12.5U	25.0	6.25	ug/kg
Fluorene	12.5U	25.0	6.25	ug/kg
Indeno[1,2,3-c,d] pyrene	12.5U	25.0	6.25	ug/kg
Naphthalene	10.0U	20.0	5.00	ug/kg
Phenanthrene	12.5U	25.0	6.25	ug/kg
Pyrene	12.5U	25.0	6.25	ug/kg
Surrogates				
2-Methylnaphthalene-d10 (surr)	83.6	58-103		%
Fluoranthene-d10 (surr)	84.3	54-113		%

Batch Information

Analytical Batch: XMS12755
Analytical Method: 8270D SIM (PAH)
Instrument: Agilent GC 7890B/5977A SWA
Analyst: LAW
Analytical Date/Time: 7/18/2021 1:21:00AM

Prep Batch: XXX45113
Prep Method: SW3550C
Prep Date/Time: 7/8/2021 6:18:33AM
Prep Initial Wt./Vol.: 22.5 g
Prep Extract Vol: 5 mL

Print Date: 08/10/2021 3:51:06PM



Blank Spike Summary

Blank Spike ID: LCS for HBN 1213875 [XXX45113]

Blank Spike Lab ID: 1621297

Date Analyzed: 07/18/2021 01:42

Matrix: Soil/Solid (dry weight)

QC for Samples: 1213875001, 1213875003, 1213875004, 1213875005, 1213875006, 1213875007

Results by 8270D SIM (PAH)

Blank Spike (ug/kg)

Parameter	Spike	Result	Rec (%)	CL
1-Methylnaphthalene	111	99.0	89	(43-111)
2-Methylnaphthalene	111	99.7	90	(39-114)
Acenaphthene	111	104	94	(44-111)
Acenaphthylene	111	101	91	(39-116)
Anthracene	111	104	94	(50-114)
Benzo(a)Anthracene	111	102	92	(54-122)
Benzo[a]pyrene	111	106	95	(50-125)
Benzo[b]Fluoranthene	111	110	99	(53-128)
Benzo[g,h,i]perylene	111	107	96	(49-127)
Benzo[k]fluoranthene	111	109	98	(56-123)
Chrysene	111	108	97	(57-118)
Dibenzo[a,h]anthracene	111	108	98	(50-129)
Fluoranthene	111	104	94	(55-119)
Fluorene	111	104	94	(47-114)
Indeno[1,2,3-c,d] pyrene	111	110	99	(49-130)
Naphthalene	111	99.4	89	(38-111)
Phenanthrene	111	107	96	(49-113)
Pyrene	111	105	94	(55-117)
Surrogates				
2-Methylnaphthalene-d10 (surr)	111		84	(58-103)
Fluoranthene-d10 (surr)	111		87	(54-113)

Batch Information

Analytical Batch: XMS12755

Analytical Method: 8270D SIM (PAH)

Instrument: Agilent GC 7890B/5977A SWA

Analyst: LAW

Prep Batch: XXX45113

Prep Method: SW3550C

Prep Date/Time: 07/08/2021 06:18

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

Dupe Init Wt./Vol.: Extract Vol:

Print Date: 08/10/2021 3:51:08PM



Matrix Spike Summary

Original Sample ID: 1213889029
 MS Sample ID: 1621298 MS
 MSD Sample ID: 1621299 MSD

Analysis Date: 07/18/2021 4:47
 Analysis Date: 07/18/2021 5:07
 Analysis Date: 07/18/2021 5:28
 Matrix: Soil/Solid (dry weight)

QC for Samples: 1213875001, 1213875003, 1213875004, 1213875005, 1213875006, 1213875007

Results by 8270D SIM (PAH)

Parameter	Sample	Matrix Spike (ug/kg)			Spike Duplicate (ug/kg)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
1-Methylnaphthalene	12.7U	112	105	93	111	96.0	86	43-111	9.20	(< 20)
2-Methylnaphthalene	12.7U	112	112	100	111	99.1	89	39-114	12.60	(< 20)
Acenaphthene	12.7U	112	115	102	111	103	92	44-111	11.30	(< 20)
Acenaphthylene	12.7U	112	110	98	111	98.2	88	39-116	11.50	(< 20)
Anthracene	12.7U	112	112	99	111	98.3	88	50-114	13.00	(< 20)
Benzo(a)Anthracene	12.7U	112	105	94	111	94.4	85	54-122	11.30	(< 20)
Benzo(a)pyrene	12.7U	112	104	92	111	95.2	85	50-125	9.10	(< 20)
Benzo[b]Fluoranthene	12.7U	112	111	99	111	102	91	53-128	9.10	(< 20)
Benzo[g,h,i]perylene	12.7U	112	102	90	111	93.4	84	49-127	8.40	(< 20)
Benzo[k]fluoranthene	12.7U	112	103	92	111	96.8	87	56-123	6.60	(< 20)
Chrysene	12.7U	112	108	96	111	99.8	89	57-118	8.50	(< 20)
Dibenzo[a,h]anthracene	12.7U	112	102	91	111	93.6	84	50-129	9.00	(< 20)
Fluoranthene	12.7U	112	105	94	111	96.9	87	55-119	8.40	(< 20)
Fluorene	12.7U	112	115	103	111	98.4	88	47-114	16.30	(< 20)
Indeno[1,2,3-c,d] pyrene	12.7U	112	105	93	111	95.4	85	49-130	9.60	(< 20)
Naphthalene	10.2U	112	111	99	111	101	91	38-111	9.60	(< 20)
Phenanthrene	12.7U	112	115	102	111	104	93	49-113	10.40	(< 20)
Pyrene	12.7U	112	103	92	111	97.0	87	55-117	6.60	(< 20)
Surrogates										
2-Methylnaphthalene-d10 (surr)		112	102	91	111	89.6	80	58-103	13.00	
Fluoranthene-d10 (surr)		112	95.4	85	111	89.2	80	54-113	6.70	

Batch Information

Analytical Batch: XMS12755
 Analytical Method: 8270D SIM (PAH)
 Instrument: Agilent GC 7890B/5977A SWA
 Analyst: LAW
 Analytical Date/Time: 7/18/2021 5:07:00AM

Prep Batch: XXX45113
 Prep Method: Sonication Extr Soil 8270 PAH SIM 5ml
 Prep Date/Time: 7/8/2021 6:18:33AM
 Prep Initial Wt./Vol.: 22.64g
 Prep Extract Vol: 5.00mL

Print Date: 08/10/2021 3:51:09PM



Method Blank

Blank ID: MB for HBN 1821903 [XXX/45118]
Blank Lab ID: 1621347

Matrix: Soil/Solid (dry weight)

QC for Samples:

1213875001, 1213875002, 1213875003, 1213875004, 1213875005, 1213875006, 1213875007, 1213875008, 1213875009, 1213875010, 1213875011, 1213875012, 1213875013, 1213875014, 1213875015, 1213875016, 1213875017, 1213875018, 1213875019, 1213875020

Results by AK102

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Diesel Range Organics	10.0U	20.0	6.20	mg/kg
Surrogates				
5a Androstane (surr)	99.6	60-120		%

Batch Information

Analytical Batch: XFC15990
Analytical Method: AK102
Instrument: Agilent 7890B R
Analyst: IVM
Analytical Date/Time: 7/8/2021 4:28:00PM

Prep Batch: XXX45118
Prep Method: SW3550C
Prep Date/Time: 7/8/2021 10:14:50AM
Prep Initial Wt./Vol.: 30 g
Prep Extract Vol: 5 mL

Print Date: 08/10/2021 3:51:11PM



Blank Spike Summary

Blank Spike ID: LCS for HBN 1213875 [XXX45118]
 Blank Spike Lab ID: 1621348
 Date Analyzed: 07/08/2021 16:38

Spike Duplicate ID: LCSD for HBN 1213875 [XXX45118]
 Spike Duplicate Lab ID: 1621349
 Matrix: Soil/Solid (dry weight)

QC for Samples: 1213875001, 1213875002, 1213875003, 1213875004, 1213875005, 1213875006, 1213875007, 1213875008, 1213875009, 1213875010, 1213875011, 1213875012, 1213875013, 1213875014, 1213875015, 1213875016, 1213875017, 1213875018, 1213875019, 1213875020

Results by AK102

Parameter	Blank Spike (mg/kg)			Spike Duplicate (mg/kg)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Diesel Range Organics	667	725	109	667	691	104	(75-125)	4.90	(< 20)

Surrogates

5a Androstane (surr)	16.7	110	16.7	104	(60-120)	4.90
----------------------	------	-----	------	-----	------------	------

Batch Information

Analytical Batch: **XFC15990**
 Analytical Method: **AK102**
 Instrument: **Agilent 7890B R**
 Analyst: **IVM**

Prep Batch: **XXX45118**
 Prep Method: **SW3550C**
 Prep Date/Time: **07/08/2021 10:14**
 Spike Init Wt./Vol.: 667 mg/kg Extract Vol: 5 mL
 Dupe Init Wt./Vol.: 667 mg/kg Extract Vol: 5 mL

Print Date: 08/10/2021 3:51:13PM



Method Blank

Blank ID: MB for HBN 1821909 [XXX/45119]
Blank Lab ID: 1621370

Matrix: Soil/Solid (dry weight)

QC for Samples:

1213875002, 1213875008, 1213875009, 1213875010, 1213875011, 1213875012, 1213875013, 1213875014, 1213875015, 1213875016, 1213875017, 1213875018, 1213875019, 1213875020

Results by 8270D SIM (PAH)

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
1-Methylnaphthalene	12.5U	25.0	6.25	ug/kg
2-Methylnaphthalene	12.5U	25.0	6.25	ug/kg
Acenaphthene	12.5U	25.0	6.25	ug/kg
Acenaphthylene	12.5U	25.0	6.25	ug/kg
Anthracene	12.5U	25.0	6.25	ug/kg
Benzo(a)Anthracene	12.5U	25.0	6.25	ug/kg
Benzo[a]pyrene	12.5U	25.0	6.25	ug/kg
Benzo[b]Fluoranthene	12.5U	25.0	6.25	ug/kg
Benzo[g,h,i]perylene	12.5U	25.0	6.25	ug/kg
Benzo[k]fluoranthene	12.5U	25.0	6.25	ug/kg
Chrysene	12.5U	25.0	6.25	ug/kg
Dibenzo[a,h]anthracene	12.5U	25.0	6.25	ug/kg
Fluoranthene	12.5U	25.0	6.25	ug/kg
Fluorene	12.5U	25.0	6.25	ug/kg
Indeno[1,2,3-c,d] pyrene	12.5U	25.0	6.25	ug/kg
Naphthalene	10.0U	20.0	5.00	ug/kg
Phenanthrene	12.5U	25.0	6.25	ug/kg
Pyrene	12.5U	25.0	6.25	ug/kg
Surrogates				
2-Methylnaphthalene-d10 (surr)	88	58-103		%
Fluoranthene-d10 (surr)	86.4	54-113		%

Batch Information

Analytical Batch: XMS12758
Analytical Method: 8270D SIM (PAH)
Instrument: Agilent GC 7890B/5977A SWA
Analyst: LAW
Analytical Date/Time: 7/19/2021 2:05:00AM

Prep Batch: XXX45119
Prep Method: SW3550C
Prep Date/Time: 7/8/2021 10:53:20AM
Prep Initial Wt./Vol.: 22.5 g
Prep Extract Vol: 5 mL

Print Date: 08/10/2021 3:51:15PM



Blank Spike Summary

Blank Spike ID: LCS for HBN 1213875 [XXX45119]

Blank Spike Lab ID: 1621371

Date Analyzed: 07/19/2021 02:26

Matrix: Soil/Solid (dry weight)

QC for Samples: 1213875002, 1213875008, 1213875009, 1213875010, 1213875011, 1213875012, 1213875013, 1213875014, 1213875015, 1213875016, 1213875017, 1213875018, 1213875019, 1213875020

Results by 8270D SIM (PAH)

Blank Spike (ug/kg)

Parameter	Spike	Result	Rec (%)	CL
1-Methylnaphthalene	111	94.8	85	(43-111)
2-Methylnaphthalene	111	96.8	87	(39-114)
Acenaphthene	111	98.3	89	(44-111)
Acenaphthylene	111	94.9	85	(39-116)
Anthracene	111	99.9	90	(50-114)
Benzo(a)Anthracene	111	96.8	87	(54-122)
Benzo[a]pyrene	111	99.2	89	(50-125)
Benzo[b]Fluoranthene	111	98.5	89	(53-128)
Benzo[g,h,i]perylene	111	98.9	89	(49-127)
Benzo[k]fluoranthene	111	102	92	(56-123)
Chrysene	111	99.6	90	(57-118)
Dibenzo[a,h]anthracene	111	102	92	(50-129)
Fluoranthene	111	101	91	(55-119)
Fluorene	111	103	93	(47-114)
Indeno[1,2,3-c,d] pyrene	111	102	92	(49-130)
Naphthalene	111	97.9	88	(38-111)
Phenanthrene	111	100	90	(49-113)
Pyrene	111	100	90	(55-117)

Surrogates

2-Methylnaphthalene-d10 (surr)	111		84	(58-103)
Fluoranthene-d10 (surr)	111		88	(54-113)

Batch Information

Analytical Batch: XMS12758

Analytical Method: 8270D SIM (PAH)

Instrument: Agilent GC 7890B/5977A SWA

Analyst: LAW

Prep Batch: XXX45119

Prep Method: SW3550C

Prep Date/Time: 07/08/2021 10:53

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

Dupe Init Wt./Vol.: Extract Vol:

Print Date: 08/10/2021 3:51:18PM



Matrix Spike Summary

Original Sample ID: 1213875002
 MS Sample ID: 1621372 MS
 MSD Sample ID: 1621373 MSD

Analysis Date: 07/19/2021 3:47
 Analysis Date: 07/19/2021 4:08
 Analysis Date: 07/19/2021 4:28
 Matrix: Soil/Solid (dry weight)

QC for Samples: 1213875002, 1213875008, 1213875009, 1213875010, 1213875011, 1213875012, 1213875013, 1213875014, 1213875015, 1213875016, 1213875017, 1213875018, 1213875019, 1213875020

Results by 8270D SIM (PAH)

Parameter	Sample	Matrix Spike (ug/kg)			Spike Duplicate (ug/kg)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
1-Methylnaphthalene	15.9U	142	120	85	144	118	82	43-111	2.30	(< 20)
2-Methylnaphthalene	15.9U	142	124	87	144	120	84	39-114	2.60	(< 20)
Acenaphthene	15.9U	142	121	86	144	121	84	44-111	0.67	(< 20)
Acenaphthylene	15.9U	142	122	86	144	122	85	39-116	0.01	(< 20)
Anthracene	15.9U	142	127	89	144	126	88	50-114	0.46	(< 20)
Benzo(a)Anthracene	15.9U	142	122	86	144	120	84	54-122	1.70	(< 20)
Benzo(a)pyrene	15.9U	142	119	84	144	116	81	50-125	3.10	(< 20)
Benzo(b)Fluoranthene	15.9U	142	120	84	144	121	85	53-128	1.20	(< 20)
Benzo(g,h,i)perylene	15.9U	142	114	81	144	111	78	49-127	2.80	(< 20)
Benzo(k)fluoranthene	15.9U	142	125	88	144	119	83	56-123	5.20	(< 20)
Chrysene	15.9U	142	124	88	144	124	87	57-118	0.34	(< 20)
Dibenzo(a,h)anthracene	15.9U	142	118	83	144	114	80	50-129	3.30	(< 20)
Fluoranthene	15.9U	142	127	89	144	125	88	55-119	1.10	(< 20)
Fluorene	15.9U	142	133	94	144	128	90	47-114	3.80	(< 20)
Indeno[1,2,3-c,d] pyrene	15.9U	142	118	83	144	115	80	49-130	2.50	(< 20)
Naphthalene	12.7U	142	128	90	144	123	86	38-111	3.70	(< 20)
Phenanthrene	15.9U	142	133	94	144	131	91	49-113	2.30	(< 20)
Pyrene	15.9U	142	128	91	144	124	87	55-117	3.50	(< 20)
Surrogates										
2-Methylnaphthalene-d10 (surr)		142	125	88	144	118	82	58-103	5.60	
Fluoranthene-d10 (surr)		142	123	86	144	121	85	54-113	0.92	

Batch Information

Analytical Batch: XMS12758
 Analytical Method: 8270D SIM (PAH)
 Instrument: Agilent GC 7890B/5977A SWA
 Analyst: LAW
 Analytical Date/Time: 7/19/2021 4:08:00AM

Prep Batch: XXX45119
 Prep Method: Sonication Extr Soil 8270 PAH SIM 5ml
 Prep Date/Time: 7/8/2021 10:53:20AM
 Prep Initial Wt./Vol.: 22.80g
 Prep Extract Vol: 5.00mL

Print Date: 08/10/2021 3:51:19PM

Nelson, Justin (Anchorage)

From: Marty Brewer <mbrewer@ahтна.net>
Sent: Thursday, August 5, 2021 10:39 AM
To: Nelson, Justin (Anchorage)
Subject: [EXTERNAL] FW: Arctic and Tudor Soil
Attachments: 1213875.pdf; VOC-F-List.pdf

*** WARNING: this message is from an EXTERNAL SENDER. Please be cautious, particularly with links and attachments. ***

Justin,
Can you reissue this report to include only fuel related VOCs?

Much thanks,
Marty

From: Nino Muniz <nmuniz@ahтна.net>
Sent: Thursday, August 5, 2021 10:35 AM
To: Ahtna Lab <ahtnalab@ahтна.net>
Subject: Arctic and Tudor Soil

All,

Project samples were supposed to be run only for fuel related VOCs (see VOC- F-List). Can you please request SGS reissue the report with just the VOC-F.

Thanks,

N

Herminio (Nino) Muniz, PG



Sr. Hydrogeologist
Ahtna Solutions, LLC
110 West 38th Avenue, Suite 200L, Anchorage, AK 99503
907.433.0731 OF | 907.306.2040 CL | nmuniz@ahтна.net

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1213875



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359285

CLIENT: Ahtna Eng. Services, LLC
CONTACT: Nino Muniz
PHONE #: 20311
PROJECT PWSID/ PERMIT#: Arctic and Tudor
REPORTS TO: Nino Muniz
E-MAIL: nmuniz@ahna.net
ahnalab@ahna.net
INVOICE TO: AES
QUOTE #: 20204.063
P.O. #: 20204.063

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

Section 1		Section 2		Section 3		Section 4		Section 5	
RESERVED for lab use	SAMPLE IDENTIFICATION	DATE	TIME	MATRIX/ MATRIX CODE	Pres: Type:	MeOH	MeOH	MeOH	MeOH

RESERVED for lab use	SAMPLE IDENTIFICATION	DATE	TIME	MATRIX/ MATRIX CODE	Pres: Type:	MeOH	MeOH	MeOH	MeOH	Preservative	REMARKS/ LOC ID
(LAB)	AT-21-SB-04-13	6/28/2021	10:18	S	Grab	X	X	X	X	PAHs - 8270D SIM	
(QAB)	AT-21-SB-08-13	6/28/2021	11:00	S	Grab	X	X	X	X	DRO - AK102	
(LAB)	AT-21-SB-05-13	6/28/2021	11:28	S	Grab	X	X	X	X		
(LAB)	AT-21-SB-02-13	6/28/2021	12:05	S	Grab	X	X	X	X		
(SAB)	AT-21-SB-09-13	6/28/2021	13:45	S	Grab	X	X	X	X		
(BAB)	AT-21-SB-06-13	6/28/2021	14:30	S	Grab	X	X	X	X		
(ZAB)	AT-21-SB-07-13	6/28/2021	15:05	S	Grab	X	X	X	X		
(SAB)	AT-21-SB-03-26	6/29/2021	15:55	S	Grab	X	X	X	X		
(QAB)	AT-21-SB-03-13	6/29/2021	16:15	S	Grab	X	X	X	X		
(QAB)	AT-21-SB-03-30	6/29/2021	16:20	S	Grab	X	X	X	X		

Relinquished By: (1)	Date	Time	Received By:
<i>Bobby Lambert</i>	7/1/21	0910	

Relinquished By: (2)	Date	Time	Received By:

Relinquished By: (3)	Date	Time	Received By:

Relinquished By: (4)	Date	Time	Received For Laboratory By:
	7/1/21	10:11	<i>Mr. C. RSC</i>

Temp Blank °C:	0.7
or Ambient []	0.7
Chain of Custody Seal: (Circle)	<input checked="" type="checkbox"/> INTACT <input type="checkbox"/> BROKEN <input type="checkbox"/> ABSENT
Delivery Method: (Check) Hand Delivered [] Commercial Delivered []	<input checked="" type="checkbox"/> Hand Delivered <input type="checkbox"/> Commercial Delivered

Requested Turnaround Time and/or Special Instructions: STD TAT

Data Deliverable Requirements: Call Contact

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



SGS North America Inc. CHAIN OF CUSTODY RECORD

Locations Nationwide
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Maryland
New Jersey
North Carolina

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Form containing client information (Ahtna Eng. Services, LLC), project details (Arctic and Tudor), and a table of sample identifications with columns for reserved use, sample ID, date, time, matrix code, and analysis results.

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

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



e-Sample Receipt Form

SGS Workorder #:

1213875

1213875

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	Yes 1F	
COC accompanied samples?	Yes	
DOD: Were samples received in COC corresponding coolers?	N/A	
N/A **Exemption permitted if chilled & collected <8 hours ago, or for samples where chilling is not required		
Temperature blank compliant* (i.e., 0-6 °C after CF)?	Yes	Cooler ID: 1 @ 0.7 °C Therm. ID: D65
		Cooler ID: @ °C Therm. ID:
		Cooler ID: @ °C Therm. ID:
		Cooler ID: @ °C Therm. ID:
		Cooler ID: @ °C Therm. ID:
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.		
*If >6°C, were samples collected <8 hours ago?	N/A	
If <0°C, were sample containers ice free?	N/A	
Note: Identify containers received at non-compliant temperature . Use form FS-0029 if more space is needed.		
Holding Time / Documentation / Sample Condition Requirements		Note: Refer to form F-083 "Sample Guide" for specific holding times.
Were samples received within holding time?	Yes	
Do samples match COC** (i.e., sample IDs, dates/times collected)?	Yes	
**Note: If times differ <1hr, record details & login per COC.		
***Note: If sample information on containers differs from COC, SGS will default to COC information		
Were analytical requests clear? (i.e., method is specified for analyses with multiple option for analysis (Ex: BTEX, Metals)	Yes	
Were proper containers (type/mass/volume/preservative***) used?	Yes	N/A ***Exemption permitted for metals (e.g.200.8/6020A).
Volatile / LL-Hg Requirements		
Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples?	Yes	
Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)?	N/A	
Were all soil VOAs field extracted with MeOH+BFB?	Yes	
Note to Client: Any "No", answer above indicates non-compliance with standard procedures and may impact data quality.		
Additional notes (if applicable):		



Sample Containers and Preservatives

<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>	<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>
1213875001-A	No Preservative Required	OK			
1213875001-B	Methanol field pres. 4 C	OK			
1213875002-A	No Preservative Required	OK			
1213875002-B	Methanol field pres. 4 C	OK			
1213875003-A	No Preservative Required	OK			
1213875003-B	Methanol field pres. 4 C	OK			
1213875004-A	No Preservative Required	OK			
1213875004-B	Methanol field pres. 4 C	OK			
1213875005-A	No Preservative Required	OK			
1213875005-B	Methanol field pres. 4 C	OK			
1213875006-A	No Preservative Required	OK			
1213875006-B	Methanol field pres. 4 C	OK			
1213875007-A	No Preservative Required	OK			
1213875007-B	Methanol field pres. 4 C	OK			
1213875008-A	No Preservative Required	OK			
1213875008-B	Methanol field pres. 4 C	OK			
1213875009-A	No Preservative Required	OK			
1213875009-B	Methanol field pres. 4 C	OK			
1213875010-A	No Preservative Required	OK			
1213875010-B	Methanol field pres. 4 C	OK			
1213875011-A	No Preservative Required	OK			
1213875011-B	Methanol field pres. 4 C	OK			
1213875012-A	No Preservative Required	OK			
1213875012-B	Methanol field pres. 4 C	OK			
1213875013-A	No Preservative Required	OK			
1213875013-B	Methanol field pres. 4 C	OK			
1213875014-A	No Preservative Required	OK			
1213875014-B	Methanol field pres. 4 C	OK			
1213875015-A	No Preservative Required	OK			
1213875015-B	Methanol field pres. 4 C	OK			
1213875016-A	No Preservative Required	OK			
1213875016-B	Methanol field pres. 4 C	OK			
1213875017-A	No Preservative Required	OK			
1213875017-B	Methanol field pres. 4 C	OK			
1213875018-A	No Preservative Required	OK			
1213875018-B	Methanol field pres. 4 C	OK			
1213875019-A	No Preservative Required	OK			
1213875019-B	Methanol field pres. 4 C	OK			
1213875020-A	No Preservative Required	OK			
1213875020-B	Methanol field pres. 4 C	OK			
1213875021-A	Methanol field pres. 4 C	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.

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APPENDIX E
DATA QUALITY REVIEW
AND
ADEC LABORATORY DATA REVIEW CHECKLIST

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DATA QUALITY REVIEW

Date: 08/02/2021

Project: Menzies Arctic & Tudor Soil 2021

Laboratory: SGS North America, Inc.

Work Order: 1213875

Reviewer Name: Marty Brewer, Ahtna

Reviewer Title: Project Chemist

1.0 INTRODUCTION

A Stage 2A data review was conducted accordance with the United States Environmental Protection Agency (USEPA) document *Test Methods for Evaluating Solid Wastes, SW-846*, revision 8 (July 2014 and updates), *USEPA Contract Laboratory Program National Functional Guidelines for Organic* (January 2017) *Methods Data Review*, and Alaska Department of Environmental Conservation's (ADEC's) *Minimum Quality Assurance Requirements for Sample Handling, Reports, and Laboratory Data Technical Memorandum* (October 2019) where and when applicable.

The key data quality indicators (DQIs) of precision, accuracy, representativeness, comparability, completeness, and sensitivity (PARCCS) of the project data were evaluated in this Data Quality Review (DQR) by reviewing, where appropriate, the following parameters:

- Chain of Custody (COC) and Sample Receipt Conditions
- Holding times and preservation
- Analytical reporting limits (limits of quantitation [LOQ] and limits of detection [LOD])
- Blank analysis results
- Surrogate recoveries (organics only)
- Field duplicates
- Laboratory control sample (LCS)/laboratory control sample duplicate (LCSD) results
- Matrix spike (MS) and matrix spike duplicate (MSD) results

1.1 Data Qualifier Definitions

For the purpose of this DQR the following code letters and associated definitions are provided for use by the project chemist to summarize the data quality.

- B Result is considered biased high due to blank contamination (method, trip, or equipment blank).
- J Result is considered estimated because it was detected above detection limit (DL), but below LOQ.

- Q Result is considered an estimated value because quality control (QC) criteria were not met; may be biased high (QH) or low (QL) or unknown (QN).
- R Result is rejected and unusable.
- U Analyte is reported as not detected at the LOD.

In the case where a sample result was affected by more than one sample-handling anomaly or QC failure that would result in differing qualifiers, a determination was made as to which qualifier was most conservative, and only that qualifier was retained and reported with the results. The ranking of the qualifiers is generally as follows: R>B>Q>J>U.

1.2 Chain of Custody (CoC) and Sample Receipt Condition

Samples were submitted to SGS, North America, Inc. located in Anchorage, Alaska. Eighteen soil samples, two field duplicates, and a trip blank were submitted in under intact custody seals. Data was reported on SDG 1213875. The sample summary table presents field and sample identification (ID) and sampling details.

Table 1 summarizes field quality control samples by matrix and analyses.

TABLE 1: FIELD QUALITY CONTROL SAMPLES

Field ID	Lab ID	Analyses	Quality Control
AT-21-SB-04-13	1213875001	GRO, DRO, F-VOC, PAH	Primary
AT-21-SB-08-13	1213875002	GRO, DRO, F-VOC, PAH	Primary
AT-21-SB-05-13	1213875003	GRO, DRO, F-VOC, PAH	Primary
AT-21-SB-02-13	1213875004	GRO, DRO, F-VOC, PAH	Primary
AT-21-SB-09-13	1213875005	GRO, DRO, F-VOC, PAH	Primary
AT-21-SB-06-13	1213875006	GRO, DRO, F-VOC, PAH	Primary
AT-21-SB-07-13	1213875007	GRO, DRO, F-VOC, PAH	Primary
AT-21-SB-03-26	1213875008	GRO, DRO, F-VOC, PAH	Primary
AT-21-SB-03-13	1213875009	GRO, DRO, F-VOC, PAH	Primary
AT-21-SB-03-30	1213875010	GRO, DRO, F-VOC, PAH	Primary
AT-21-SB-15-30	1213875011	GRO, DRO, F-VOC, PAH	Duplicate of AT-21-SB-03-30
AT-21-SB-MW128-31	1213875012	GRO, DRO, F-VOC, PAH	Primary
AT-21-SB-MW128-13	1213875013	GRO, DRO, F-VOC, PAH	Primary
AT-21-SB-01-31	1213875014	GRO, DRO, F-VOC, PAH	Primary
AT-21-SB-01-22	1213875015	GRO, DRO, F-VOC, PAH	Primary
AT-21-SB-01-13	1213875016	GRO, DRO, F-VOC, PAH	Primary
AT-21-SB-10-18	1213875017	GRO, DRO, F-VOC, PAH	Primary
AT-21-SB-10-31	1213875018	GRO, DRO, F-VOC, PAH	Primary

AT-21-SB-10-28	1213875019	GRO, DRO, F-VOC, PAH	Primary
AT-21-SB-16-28	1213875020	GRO, DRO, F-VOC, PAH	Duplicate of AT-21-SB-10-28
AT-21-TB-01	1213875021	GRO, F-VOC	Trip Blank

Key:

GRO gasoline range organics
DRO diesel range organics
PAH polyaromatic hydrocarbons
F-VOC fuel related volatile organic compounds

1.3 Holding Times and Preservation

Samples were received in good condition, within acceptable temperature range, properly preserved, and within the method specified hold times.

1.4 Analytical Reporting Limits

Analytical reporting limits were compared to project action/screening limits to determine if the lab had adequate analytical sensitivity to support project data quality objectives. Project action limits were based upon 18 AAC 75 Table B1 and B2 Human Health and Migration to Groundwater Soil Cleanup Levels.

1.5 Blanks

1.5.1 Trip Blanks

A trip blank accompanied the sample cooler that contained samples for volatiles analyses. There were no trip blank detections above the analytical limit of quantitation (LOQ), but GRO was detected at 1.42mg/kg. The following GRO sample results were within one-fifth of the trip blank concentration and were therefore qualified B as estimated with high bias.

- AT-21-SB-04-13
- AT-21-SB-08-13
- AT-21-SB-05-13
- AT-21-SB-02-13
- AT-21-SB-09-13
- AT-21-SB-06-13
- AT-21-SB-07-13
- AT-21-SB-03-26
- AT-21-SB-03-13
- AT-21-SB-MW128-31
- AT-21-SB-MW128-13
- AT-21-SB-01-31
- AT-21-SB-01-22
- AT-21-SB-01-13
- AT-21-SB-10-18

- AT-21-SB-10-31

1.5.2 Method Blanks

No analytes were detected in the method blanks greater than the LOQ, but low levels of GRO were detected in the method blanks. The following GRO sample results were within one-fifth of their associated method blank concentration and were therefore qualified B as estimated with high bias.

- AT-21-SB-04-13
- AT-21-SB-08-13
- AT-21-SB-05-13
- AT-21-SB-02-13
- AT-21-SB-09-13
- AT-21-SB-06-13
- AT-21-SB-07-13
- AT-21-SB-03-26
- AT-21-SB-03-13
- AT-21-SB-MW128-31
- AT-21-SB-MW128-13
- AT-21-SB-01-31
- AT-21-SB-01-22
- AT-21-SB-01-13
- AT-21-SB-10-18
- AT-21-SB-10-31
- AT-21-TB-01

1.5.3 Equipment Blanks

No equipment blanks were submitted. Disposable sampling equipment was used during field sample collection.

1.6 Surrogates

Surrogate spike recoveries were evaluated as a measure of analytical accuracy and assessment of potential matrix effects. Several surrogate recoveries failed quality control criteria due to matrix interference and required sample dilution.

AT-21-SB-03-30 PAH surrogates 2-Methylnaphthalene-d10 and Fluoranthene-d10 were not recovered because the sample was run at a 50 X dilution.

AT-21-SB-03-30 GRO surrogate 4-bromofluorobenzene was recovered outside criteria high due to matrix interference requiring 20 X dilution.

No data qualifications were made based upon these surrogate recovery failures.

1.7 Field Duplicates

Field duplicates were collected at the required frequency as specified in the work plan. Two sets of duplicate soil pairs were submitted to the lab for analysis.

- AT 21-SB-10-28 and AT-21-SB-16-28
- AT-21-SB-03-30 and AT-21-SB-15-30

The relative percent difference (RPD) between the primary and field duplicate sample results were evaluated as a measure of field precision. Duplicate RPDs were calculated when a given analyte was detected in both samples and presented in Table 2. Duplicate RPDs were compared to the 50% criteria for soils.

TABLE 2: FIELD DUPLICATE RELATIVE PERCENT DIFFERENCE (RPD)

		Field ID	AT-21-SB-03-30	AT-21-SB-15-30	
		Lab ID	1213875010	1213875011	
Analysis	Analyte	Unit			RPD
8270D-SIM	1-Methylnaphthalene	µg/kg	12600	10800	15.4
8270D-SIM	2-Methylnaphthalene	µg/kg	15100	12400	19.6
8270D-SIM	Fluorene	µg/kg	577	517	11.0
8270D-SIM	Naphthalene	µg/kg	10700	9240	14.6
AK101	Gasoline Range Organics	mg/kg	373	473	23.6
AK102	Diesel Range Organics	mg/kg	10500	10300	1.9
SW8260D	1,2,4-Trimethylbenzene	µg/kg	55500	39100	34.7
SW8260D	1,3,5-Trimethylbenzene	µg/kg	20400	12200	50.3
SW8260D	4-Isopropyltoluene	µg/kg	4450	1800	84.8
SW8260D	Ethylbenzene	µg/kg	3630	2960	20.3
SW8260D	Isopropylbenzene (Cumene)	µg/kg	4120	2870	35.8
SW8260D	Naphthalene	µg/kg	15300	14700	4.0
SW8260D	P & M -Xylene	µg/kg	15100	12200	21.2
SW8260D	Xylenes (total)	µg/kg	23000	18600	21.2
SW8260D	n-Propylbenzene	µg/kg	6880	4460	42.7
SW8260D	o-Xylene	µg/kg	7830	6370	20.6
SW8260D	sec-Butylbenzene	µg/kg	5440	3010	57.5
SW8260D	tert-Butylbenzene	µg/kg	694	347	66.7
		Field ID	AT-21-SB-10-28	AT-21-SB-16-28	
		Lab ID	1213875019	1213875020	
Analysis	Analyte	Unit			RPD
AK101	Gasoline Range Organics	mg/kg	72.5	96.4	28.3
AK102	Diesel Range Organics	mg/kg	4960	7020	34.4
SW8260D	1,2,4-Trimethylbenzene	µg/kg	91.3	69.1	27.7
SW8260D	1,3,5-Trimethylbenzene	µg/kg	50.1	32.4	42.9

SW8260D	4-Isopropyltoluene	µg/kg	210	173	19.3
SW8260D	Ethylbenzene	µg/kg	32.3	25.1	25.1
SW8260D	Isopropylbenzene (Cumene)	µg/kg	26.8	17.7	40.9
SW8260D	Naphthalene	µg/kg	107	90.7	16.5
SW8260D	P & M -Xylene	µg/kg	168	136	21.1
SW8260D	Toluene	µg/kg	46.7	39.3	17.2
SW8260D	Xylenes (total)	µg/kg	256	199	25.1
SW8260D	o-Xylene	µg/kg	87.4	63.1	32.3
SW8260D	sec-Butylbenzene	µg/kg	140	135	3.6

Key:

ID identity

mg/kg milligrams per kilogram

RPD relative percent difference

µg/kg microgram per kilogram

1.8 Laboratory Control Spike/Laboratory Control Spike Duplicate (LCS/LCSD)

Percent recoveries of spiked analyte concentrations were evaluated for the Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (LCSD) samples as a measure of analytical accuracy. RPDs of LCS/LCSD analyte concentrations were evaluated to assess analytical precision.

All LCS/LCSD percent recoveries were within QC limits except for trichlorofluoromethane in LCS 1621874 outside criteria high. Trichlorofluoromethane was not a project specific target analyte and therefore no data were qualified based on LCS/LCSD accuracy.

All LCS/LCSD RPDs were within QC limits and no sample data were qualified based on LCS/LCSD precision.

1.9 Matrix Spikes/Matrix Spike Duplicate (MS/MSD)

No project specific MS/MSD were requested, but the laboratory analyzed sample AT-21-SB-08-13 for PAH MS/MSD. Percent recoveries and RPDs were evaluated for this MS/MSD and there were no exceedances of QC criteria.

2.0 OVERALL ASSESSMENT

All data necessary to complete this review were provided. Based on the data review completed, some GRO data were qualified due to GRO method blank and trip blank contamination. However, all affected GRO sample results were well below regulatory cleanup levels and there was no impact on data usability. Limited VOC data were qualified as estimated due to poor field duplicate precision. Although qualified results are considered estimated, they are considered usable. All other sample results are valid with no data qualifiers assigned. No data were rejected and therefore the project completeness goal was met. All samples were collected in accordance with the work plan and considered representative of site conditions. All analytical data is considered usable for the purpose of evaluating the presence or absence and magnitude of the suspected site contaminants.

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3.0 REFERENCES

Alaska Department of Environmental Conservation (ADEC), 2019. *Field Sampling Guidance for Contaminated Sites and Leaking Underground Storage Tank Sites.*

ADEC. 2019. *Minimum Quality Assurance Requirements for Sample Handling, Reports, and Laboratory Data.*

EPA, 2017. *National Functional Guidelines for Organic Superfund Methods Data Review (SOM02.4).*

EPA, 2014. *SW-846 Update V: Test Methods for Evaluating Solid Waste: Physical/Chemical Methods.*

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Laboratory Data Review Checklist

Completed By:

Marty Brewer

Title:

Project Chemist

Date:

08/02/21

Consultant Firm:

Ahtna Engineering Services

Laboratory Name:

SGS North America, Inc.

Laboratory Report Number:

1213875

Laboratory Report Date:

07/28/21

CS Site Name:

Arctic & Tudor

ADEC File Number:

2100.38.438

Hazard Identification Number:

2018

1213875

Laboratory Report Date:

07/28/21

CS Site Name:

Arctic & Tudor

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 North America, Inc. in Anchorage, Alaska

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:

2. Chain of Custody (CoC)

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

Yes No N/A Comments:

b. Correct analyses requested?

Yes No N/A Comments:

3. Laboratory Sample Receipt Documentation

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

Yes No N/A Comments:

0.7°C

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

Yes No N/A Comments:

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

Yes No N/A Comments:

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:

e. Data quality or usability affected?

Comments:

Data quality/usability not affected by sample receipt

4. Case Narrative

a. Present and understandable?

Yes No N/A Comments:

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

Yes No N/A Comments:

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AT-21-SB-03-30 (1213875010) AK101 - Surrogate recovery for 4-bromofluorobenzene does not meet QC criteria, due to matrix interference.

AT-21-SB-03-30 (1213875010) 8270D SIM - PAH surrogate recoveries for 2-methylnaphthalene-d10 and fluoranthene-d10 do not meet QC criteria due to sample dilution. The sample was diluted due to high concentrations of non-target compounds.

AT-21-SB-15-30 (1213875011) AK101 - Surrogate recovery for 4-bromofluorobenzene does not meet QC criteria, due to matrix interference.

AT-21-SB-15-30 (1213875011) 8270D SIM - PAH surrogate recoveries for 2-methylnaphthalene-d10 and fluoranthene-d10 do not meet QC criteria due to sample dilution. The sample was diluted due to high concentrations of non-target compounds.

AT-21-SB-10-28 (1213875019) AK101 - Surrogate recovery for 4-bromofluorobenzene does not meet QC criteria, due to matrix interference.

AT-21-SB-10-28 (1213875019) 8270D SIM - PAH surrogate recovery for 2-methylnaphthalene-d10 does not meet QC criteria due to matrix interference.

8270D SIM - The PAH LOQs are elevated due to sample dilution. The sample was analyzed at a dilution due to high concentrations of non-target compounds.

AT-21-SB-16-28 (1213875020) AK101 - Surrogate recovery for 4-bromofluorobenzene does not meet QC criteria, due to matrix interference.

AT-21-SB-16-28 (1213875020) 8270D SIM - PAH surrogate recovery for 2-methylnaphthalene-d10 does not meet QC criteria due to matrix interference.

8270D SIM - The PAH LOQs are elevated due to sample dilution. The sample was analyzed at a dilution due to high concentrations of non-target compounds.

LCS (1621874) 8260D - LCS recovery for Trichlorofluoromethane does not meet QC criteria. This analyte was not detected above the LOQ in the associated samples.

AK101 - GRO was detected in the MB (1623638) greater than 1/2 the LOQ, but less than the LOQ.

1214003002(1621875MS)

8260D - MS recovery for Trichlorofluoromethane does not meet QC criteria. This analyte was not detected above the LOQ in the PS.

1213889038(1622008MS) 260D - MS recovery for n-hexane does not meet QC criteria. See LCS for accuracy requirements.

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1213875004(1622272MS) 8260D - MS recovery for Trichlorofluoromethane does not meet QC criteria. Refer to LCS for accuracy requirements.

1214123002(1622502MS) 8260D - MS recovery for Trichlorofluoromethane does not meet QC criteria. See LCS for accuracy requirements.

1214003002(1621875MSD)
8260D - MSD recovery for Trichlorofluoromethane does not meet QC criteria. This analyte was not detected above the LOQ in the PS.

c. Were all corrective actions documented?

Yes No N/A Comments:

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

Comments:

Data quality/usability not affected according to laboratory case narrative.

5. Samples Results

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

Yes No N/A Comments:

b. All applicable holding times met?

Yes No N/A Comments:

c. All soils reported on a dry weight basis?

Yes No N/A Comments:

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 samples required dilutions thus elevating analytical limits.

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e. Data quality or usability affected?

Data quality/usability not affected.

6. QC Samples

a. Method Blank

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

Yes No N/A Comments:

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

Yes No N/A Comments:

No method blank analytes detected >LOQ, but GRO detected at 1.23mg/kg in method blank 1623631; 1.27mg/kg in method blank 1623638; and 1.59mg/kg in method blank 1624243.

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

Comments:

No method blank detections >LOQ, but GRO detected in method blanks. Associated GRO results within 5X of method blank detections include:
AT-21-SB-04-13
AT-21-SB-08-13
AT-21-SB-05-13
AT-21-SB-02-13
AT-21-SB-09-13
AT-21-SB-06-13
AT-21-SB-07-13
AT-21-SB-03-26
AT-21-SB-03-13
AT-21-SB-MW128-31
AT-21-SB-MW128-13
AT-21-SB-01-31
AT-21-SB-01-22
AT-21-SB-01-13
AT-21-SB-10-18
AT-21-SB-10-31
AT-21-TB-01

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

Yes No N/A Comments:

Lab did not qualify the GRO results as the method blank concentration <LOQ

v. Data quality or usability affected?

Comments:

Following GRO sample results were within 5X the method blank concentration & should be qualified B as estimated with high bias:
AT-21-SB-04-13
AT-21-SB-08-13
AT-21-SB-05-13
AT-21-SB-02-13
AT-21-SB-09-13
AT-21-SB-06-13
AT-21-SB-07-13
AT-21-SB-03-26
AT-21-SB-03-13
AT-21-SB-MW128-31
AT-21-SB-MW128-13
AT-21-SB-01-31
AT-21-SB-01-22
AT-21-SB-01-13
AT-21-SB-10-18
AT-21-SB-10-31
AT-21-TB-01

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:

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

Yes No N/A Comments:

No metals/inorganics

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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:

LCS 1621874 Trichlorofluoromethane %R out high

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:

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

Comments:

None. Trichlorofluoromethane is not a project target analyte.

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

Yes No N/A Comments:

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

Comments:

Data quality/usability not affected by LCS/LCSD

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:

No project specific MS/MSD requested but lab analyzed AT-21-SB-08-13 for PAH MS/MSD.

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

Yes No N/A Comments:

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

Yes No N/A Comments:

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:

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

Comments:

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

Yes No N/A Comments:

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

Comments:

Data quality/usability not affected by MS/MSD

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:

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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:

AT-21-SB-03-30 PAH surrogate 2-Methylnaphthalene-d10 & Fluoranthene-d10 were not recovered because sample was run at 50X dilution
AT-21-SB-03-30 GRO surrogate 4-bromofluorobenzene was recovered out high due to matrix interference requiring 20X dilution

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:

iv. Data quality or usability affected?

Comments:

Data quality/usability not affected.

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:

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:

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

Yes No N/A Comments:

No trip blank detections >LOQ, but GRO detected at 1.42mg/kg.

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

Comments:

AT-21-SB-04-13
AT-21-SB-08-13
AT-21-SB-05-13
AT-21-SB-02-13
AT-21-SB-09-13
AT-21-SB-06-13
AT-21-SB-07-13
AT-21-SB-03-26
AT-21-SB-03-13
AT-21-SB-MW128-31
AT-21-SB-MW128-13
AT-21-SB-01-31
AT-21-SB-01-22
AT-21-SB-01-13
AT-21-SB-10-18
AT-21-SB-10-31

v. Data quality or usability affected?

Comments:

Following associated GRO results within 5X trip blank concentration & should be qualified B and considered estimated with high bias:

AT-21-SB-04-13
AT-21-SB-08-13
AT-21-SB-05-13
AT-21-SB-02-13
AT-21-SB-09-13
AT-21-SB-06-13
AT-21-SB-07-13
AT-21-SB-03-26
AT-21-SB-03-13
AT-21-SB-MW128-31
AT-21-SB-MW128-13
AT-21-SB-01-31
AT-21-SB-01-22
AT-21-SB-01-13
AT-21-SB-10-18
AT-21-SB-10-31

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f. Field Duplicate

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

Yes No N/A Comments:

AT 21-SB-10-28 & AT-21-SB-16-28
AT-21-SB-03-30 & AT-21-SB-15-30

ii. Submitted blind to lab?

Yes No N/A Comments:

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

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

Where R₁ = Sample Concentration
R₂ = Field Duplicate Concentration

Yes No N/A Comments:

AT-21-SB-03-30 & AT-21-SB-15-30 RPDs for 1,3,5-Trimethylbenzene, 4-Isopropyltoluene, sec-Butylbenzene, and tert-Butylbenzene exceeded 50% soil criteria

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

Comments:

AT-21-SB-03-30 & AT-21-SB-15-30 results for 1,3,5-Trimethylbenzene, 4-Isopropyltoluene, sec-Butylbenzene, and tert-Butylbenzene should be qualified QN as estimated with unknown bias.

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

Yes No N/A Comments:

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

Yes No N/A Comments:

Several samples required dilutions thus elevating analytical limits.

1213875

Laboratory Report Date:

07/28/21

CS Site Name:

Arctic & Tudor

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

Comments:

Several samples required dilutions due to high target analyte concentrations.

iii. Data quality or usability affected?

Comments:

Data quality/usability not affected.

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

a. Defined and appropriate?

Yes No N/A

Comments:

APPENDIX F

CONCEPTUAL SITE MODEL

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

Site Name:

File Number:

Completed by:

Introduction

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

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

1. General Information:

Sources (*check potential sources at the site*)

- | | |
|--|---|
| <input type="checkbox"/> USTs | <input type="checkbox"/> Vehicles |
| <input type="checkbox"/> ASTs | <input type="checkbox"/> Landfills |
| <input type="checkbox"/> Dispensers/fuel loading racks | <input type="checkbox"/> Transformers |
| <input type="checkbox"/> Drums | <input checked="" type="checkbox"/> Other: <input type="text" value="Release of jet fuel from an AFSC pipeline"/> |

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

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

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

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

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

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

* bgs - below ground surface

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

a) Direct Contact -

1. Incidental Soil Ingestion

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

If the box is checked, label this pathway complete:

Incomplete

Comments:

Soil sampling program conducted in spring 2021 showed no soil impacts above 15 feet bgs.

2. Dermal Absorption of Contaminants from Soil

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

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

If both boxes are checked, label this pathway complete:

Incomplete

Comments:

Soil sampling program conducted in spring 2021 showed no soil impacts above 15 feet bgs.

b) Ingestion -

1. Ingestion of Groundwater

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

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

If both boxes are checked, label this pathway complete:

Complete

Comments:

DEC hasn't determined that water is not a reasonably expected future drinking source.

2. Ingestion of Surface Water

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

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

If both boxes are checked, label this pathway complete:

Incomplete

Comments:

No surface water on site.

3. Ingestion of Wild and Farmed Foods

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

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

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

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

Incomplete

Comments:

No contaminants that were detected have the ability to bioaccumulate.

c) Inhalation-

1. Inhalation of Outdoor Air

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

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

If both boxes are checked, label this pathway complete:

Incomplete

Comments:

Soil sampling program conducted in spring 2021 showed no soil impacts above 15 feet bgs.

2. Inhalation of Indoor Air

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

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

If both boxes are checked, label this pathway complete:

Complete

Comments:

Soil sampling program conducted in spring 2021 showed no soil impacts above 28 to 30 feet bgs. Inhalation of indoor air is a complete pathway but insignificant pathway as depth to contaminants makes impacts unlikely.

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

Dermal Exposure to Contaminants in Groundwater and Surface Water

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

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

Generally, DEC groundwater cleanup levels in 18 AAC 75, Table C, are deemed protective of this pathway because dermal absorption is incorporated into the groundwater exposure equation for residential uses.

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

Comments:

Soil sampling program conducted in spring 2021 showed no soil impacts above 15 feet bgs, groundwater present at about 30 feet bgs. Pathway is complete but insignificant due to the fact that excavation to 30 feet bgs to allow contact with impacted GW is unlikely.

Inhalation of Volatile Compounds in Tap Water

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

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

DEC groundwater cleanup levels in 18 AAC 75, Table C are protective of this pathway because the inhalation of vapors during normal household activities is incorporated into the groundwater exposure equation.

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

Comments:

Inhalation of Fugitive Dust

Inhalation of fugitive dust may be a complete pathway if:

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

DEC human health soil cleanup levels in Table B1 of 18 AAC 75 are protective of this pathway because the inhalation of particulates is incorporated into the soil exposure equation.

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

Comments:

Direct Contact with Sediment

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

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

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

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

Comments:

No sediment on site.

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

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HUMAN HEALTH CONCEPTUAL SITE MODEL GRAPHIC FORM

Site: Arctic Blvd and Tudor Rd Intersection, Anchorage, AK

Completed By: Ahtna Engineering Services

Date Completed: Updated 8/10/2021

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

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

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

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APPENDIX G

ADEC REPORT ACCEPTANCE LETTER

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THE STATE
of **ALASKA**
GOVERNOR MIKE DUNLEAVY

Department of Environmental Conservation

SPILL PREVENTION & RESPONSE
Contaminated Sites Program

610 University Avenue
Fairbanks, Alaska 99709
Main: 907.451.2143
Fax: 907.451.2155
www.dec.alaska.gov

File: 2100.38.438

March 2, 2022

Electronic Delivery Only
Laurie Butler
Menzies Aviation
6000 De Havilland Drive
Anchorage, AK 99502

**RE: AIA AFSC Former Cross-town Pipeline Arctic Boulevard and Tudor Road Intersection;
Supplemental Soil Characterization;**

Dear Ms. Butler:

Thank you for providing the Alaska Department of Environmental Conservation (ADEC), Contaminated Sites Program (CSP) with the *Supplemental Soil Characterization Report*, Cross-town Pipeline Groundwater Sampling, Arctic Boulevard and Tudor Road Intersection, Anchorage, The report was written by Ahtna Engineering Services, LLC (Ahtna), and submitted to the ADEC on December 9, 2021.

The report has been reviewed and the ADEC concurs that project objectives for the 2021 site characterization effort have been achieved. These objectives included assessment of the petroleum soil vapor pathway in an area that may receive mobile homes in the future and replacement of a monitoring well along a leading edge of the groundwater plume.

To prepare for additional cleanup activities at the site the DEC recommends a review of site closure policies to identify remaining data gaps and seek agreement on the metrics and data that are necessary to achieve these goals. The 2022 ADEC Field Sampling Guidance (Section 3.0) presents a systematic planning process designed to assist in identifying specific milestones necessary to demonstrate that cleanup activities continue to lead towards closure goals. The DEC would like to meet with you and your consultants to discuss the next phase of work plan development and the systematic data quality objective planning process. Please reply to this letter with a proposed timeline for a planning meeting.

If you have any questions or concerns regarding ADEC management of this site, please contact me by phone at (907)451-2752 or email me at shawn.tisdell@alaska.gov.

Sincerely,

Shawn Tisdell
Environmental Program Specialist

Enclosure: 1/2022 ADEC Field Sampling Guidance

cc (via email): Nino Muniz, Ahtna
Andy Baugh, SNS LLC
Michael Farris, Menzies Aviation