



Tanana Commercial / Environmental Management LLC JV

PO Box 70069 | 100 Front Street | Tanana, AK 99777
(907) 388-2361 | (907) 451-6161 (fax)
dale@tananacommercial.com

March 3, 2022

Jade Miller
Alaska Department of Environmental Conservation
610 University Avenue
Fairbanks, Alaska 99709

Via: jade.miller@alaska.gov

RE: Shungnak School Tank Heating Oil Release, Shungnak, Alaska; ADEC Spill ID: 20389917201

Subj: 2021 Site Characterization Report

This report describes the site characterization field activities conducted at the site of the June 20, 2020 Shungnak School Tank Heating Oil Release in Shungnak, Alaska. This report outlines the field activities conducted on July 15, 2021.

The site assessment work was conducted by Tanana Commercial and Environmental Management Joint Venture (TC-EM JV) in accordance with our June 17, 2021 work plan that was approved by the ADEC on June 21, 2021.

BACKGROUND

The site is an active Alaska Department of Environmental Conservation (ADEC) Spills site, identified as the Shungnak School Tank Heating Oil Release, ADEC File No. 20389917201. Shungnak is situated on the Kobuk River in northwest Alaska approximately 153 air miles from Kotzebue, Alaska and 466 air miles from Anchorage, Alaska. The Kobuk River lies directly southeast of the bluff where the spill occurred. The Kobuk River is the source of drinking water for Shungnak, and the drinking water collection gallery for the municipal water intake is shown on Figure 1.

According to the ADEC database, on June 20, 2020 approximately 15,000 gallons of fuel was released from the Shungnak school heating oil tank farm Tank No. 1. The release was due to a three-way valve being in the wrong position and incorrectly directing fuel from the fuel barge to the school heating oil tank farm, eventually overflowing the already partially full tank.

Fuel overtopping Tank #1 was reported to have pooled under and around the wood tank platform saturating the ground and filling a roughly 8 feet by 12 feet by 2-foot-deep depression located approximately 15 feet northwest of the tanks adjacent to the fence (Figure 5). The fuel then flowed southwest along the bluff (downgradient) and parallel to a fence for approximately 200 feet before flowing downhill into a forested slope. It was reported by personnel in Shungnak that the spill path southwest of the tanks formed a fairly consolidated channel which limited the spill footprint (Figure 2).

An initial cleanup effort included the removal the top 3 to 4 feet of fuel-contaminated soil (approximately 350 yards) from the surface of the spill area. The excavated soil is temporarily stored at the landfill and will be transported to the Blue Dot Pit for long term storage and treatment in 2021. Based on conversations with Shungnak personnel, an estimated 250 to 500 gallons of pooled free product was pumped into drums. These drums were located near the southwest corner of the school maintenance building (Figure 2). Some fuel is reported to have spilled on the ground near the school maintenance building as part of this operation.

In July 2020, TC-EM JV mobilized to the site to advance test pits to identify the extent of contamination at the site. Observations on the estimated spill path and areas where fuel was pooled after the release were also noted and shown on Figure 2. Contamination remains in the test pits that were advanced in the spill path, including on the slope towards the Kobuk River. The July 2020 sample locations are shown on Figure 3.

PURPOSE AND OBJECTIVES

The purpose of this project is to investigate the extent of contamination to develop future cleanup plans. The project objectives were to advance hand borings and/or test pits in select areas of the site. In addition, a survey was conducted of the Blue Dot Pit, the location of the future landfarm for this project. The information from the survey will be used to site and design the landfarm cells to treat the previously-generated contaminated soils and described in future cleanup plans for the site.

METHODOLOGY

Field activities were conducted on July 15, 2021. Field screening and analytical sampling was conducted in accordance with the procedures presented in the ADEC *Field Sampling Guidance*, October 2019, and our June 17, 2021 ADEC-approved work plan. Further details on the field screening and soil sampling methods, and laboratory analysis are provided below.

Field Screening Methods

Headspace field screening samples were collected in one-foot increments from the test pits. Headspace samples were collected by filling re-sealable quart size bags approximately 1/3 to 1/2 full with soil. The bags were then agitated before being allowed to develop for at least 10 minutes, but not longer than an hour. All headspace samples were at least 40 degrees Fahrenheit (°F) at the time of readings. After the samples had been allowed to develop, the probe of the MiniRAE 2000 photoionization detector (PID) was inserted into the bag and the displayed reading was recorded in the field notes along with other pertinent information including the location of the sample.

Soil Sampling Methods

Analytical soil samples were collected using clean stainless-steel spoons and placed directly into clean laboratory-provided containers. Volatile samples were collected before semi-volatile and non-volatile samples. Volatile samples were immediately preserved with 25-mL of methanol.

Analytical Methods

The analytical samples were submitted to SGS North America, Inc. (SGS) of Anchorage, Alaska. Each sample was analyzed for gasoline range organics (GRO), diesel range organics (DRO), residual range organics (RRO), petroleum-list volatile organic compounds (petro-VOCs), and polycyclic aromatic hydrocarbon (PAH) compounds.

FIELD ACTIVITIES

Field activities were conducted July 15, 2021. Field activities included soil screening and collecting analytical samples from the test pits advanced at the site. ADEC Qualified Environmental Professional, Shayla Marshall, conducted the field sampling activities and Dale Erickson conducted the drone mapping. The City of Shungnak provided a Caterpillar mini excavator and an operator to advance the test pits.

The test pits were advanced on private property owned by Henry and Willard Commick, and Matilda Cleveland. The property owners provided approval to advance the test pits and were present during the field activities.

Field notes, including GPS coordinates, are included in Attachment 1. Photographs of the field activities are provided in Attachment 2.

Work Plan Variances

The following variances from the ADEC-approved work plan are noted:

- Indication of contamination was noted in Test Pit TP7. However, TC-EM JV was unable to advance the test pit until there was no indication of contamination or to a maximum depth of 8 feet bgs, as noted in the work plan, with the tools. In addition, TC-EM JV did not advance a step out test pit from Test Pit TP7 due to time restraints.

Test Pits and Sampling

A total of eight test pits were advanced to delineate and assess the extent of the release downgradient of the source area and surrounding areas. The test pits were advanced in the following locations:

- Test Pits TP1 and TP2 were advanced near the base of the slope where the topography levels out. These two test pits were advanced on the Commick's property where a relative's cabin previously stood (Photos 8 and 9).
- Test Pit TP3 was advanced on the slope just downgradient from the spill path (Photos 10 through 12).
- Test Pit TP4 was advanced at approximately the same elevation as and to the southwest of Test Pit TP3. The property is owned by Matilda Cleveland (Photo 11).
- Test Pit TP5 was advanced at approximately the same elevation as and to the northeast of Test Pit TP3. (Photo 10)
- Test Pit TP6 was advanced immediately downgradient of Test Pit TP3. (Photo 13)
- Test Pits TP7 and TP8 were advanced on the slope, downgradient of the sorbent boom and ditch placed at the toe of the clearing in 2020 (Photos 14 and 15).

Test pit locations are shown in Figure 3. The test pits were advanced to the maximum excavator reach or until clean soil soils were documented via in-situ PID screening from the excavator bucket.

Investigative Derived Waste

Investigation derived waste was limited to personal protective equipment, including nitrile gloves, Ziploc bags used for headspace analysis and glass vials previously containing methanol sample preservative for the soil samples. This waste was transported out the community of Shungnak and disposed of as general solid waste when field personnel reached Fairbanks.

RESULTS

A total of eight analytical soil samples, plus one duplicate, were collected from the project site. Soil field screening results are presented in Table 1. The analytical results are presented in Table 2.

Soil Descriptions

The soils across the site were primarily brown silty sand with a limited amount of gravel. A red-brown gravel was observed in Test Pit TP5 only.

Layers of silt/clay was encountered at the site in 2020 and 2021. During the 2021 silt/clay was observed in Test Pit TP7 at 2 feet bgs (Photo 14). In 2020 thin lenses of this confining layer was noted in Test Pits TP-1, TP-4, and TP-7; and consolidated clay was encountered at 3 feet bgs in Test Pit TP-8 and depths greater than 8 feet bgs in Test Pits TP-9 and TP-10.

Groundwater was not encountered in any of the 2021 test pits. The only location where groundwater has been encountered was at the 2020 Test Pit TP-13, which was excavated adjacent to the Kobuk River. Permafrost was not encountered in any of the test pits.

Surface staining was not observed during the 2021 field activities. Stained soils were encountered in Test Pit TP3 at 1 and 2 feet bgs (Photo 12).

Headspace and Surface Soil Screening Results

Samples were collected and screened from each test pit. Headspace results are provided below.

Table 1 – Soil Headspace Field Screening Results

| Depth (ft bgs) | Headspace Field Result (in ppmv) | | | | | | | |
|-------------------|----------------------------------|------|-------------|------|------|------|-------------|------|
| | TP-1 | TP-2 | TP-3 | TP-4 | TP-5 | TP-6 | TP-7 | TP-8 |
| 1 | 0.5^ | 0.0 | 521 | 0.0 | 0.0 | 0.2^ | 214 | 0.0^ |
| 2 | 0.3 | 0.2^ | 51.5 | 0.0 | 0.0 | 0.0 | 431^ | 0.0 |
| 3 | 0.0 | 0.0 | 23.7^ | 0.0^ | 0.0^ | 0.0 | - | - |
| 4 | 0.0 | 0.0 | 40.7 | 0.0 | 0.0 | 0.0 | - | - |
| 5 | 0.0 | 0.0 | 4.1^ | 0.0 | 0.0 | 0.0 | - | - |
| 6 | 0.0 | 0.0 | - | - | - | 0.0 | - | - |
| 7 | 0.1 | 0.0 | - | - | - | - | - | - |
| 8 | - | - | - | - | - | - | - | - |

Notes:

- ppmv Parts per million by volume
- bgs Below ground surface
- ^ Analytical sample collected
- No data for this sample depth
- 521** Elevated PID reading and hydrocarbon odor noted.

Analytical Soil Sample Results

A total of nine soil samples plus a duplicate were collected from test pits excavated at the site. A summary of the reported concentrations are provided in Table 2.

Of the samples collected, only one contained concentrations greater than ADEC Method 2 Migration to Groundwater (MTG) Cleanup Levels. These contaminants included DRO, 1-methylnaphthalene, 2-methylnaphthalene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, ethylbenzene, naphthalene, and xylenes. None of the concentrations exceeded ADEC Human Health (HH) or Maximum Allowable Concentrations (MAC).

Table 2 - July 15, 2021 Site Characterization Soil Results

| Analyte | Analysis | Unit | Action Level | 18130 TP1S1 | 18130 TP2S2 | 18130 TP3S3 | 18130 TP3S5 | 18130 TP4S3 | 18130 TP5S3 | 18130 TP6S1 | 18130 TP6S11~ | 18130 TP7S2 | 18130 TP8S1 | 18130 STB |
|--|-----------------|-------|--------------|----------------|----------------|----------------|----------------|---------------|----------------|---------------|---------------|---------------|---------------|---------------|
| Field Headspace | PID | ppmv | - | 0.5 | 0.2 | 23.7 | 4.1 | 0.0 | 0.0 | 0.2 | 0.2 | 431 | 0.0 | - |
| Depth | - | ft | - | 1 | 2 | 3 | 5 | 3 | 3 | 1 | 1 | 2 | 1 | - |
| Gasoline Range Organics | AK101 | mg/kg | 300 | 1.90 U | 2.43 U | 2.42 U | 2.47 U | 2.66 U | 1.95 U | 3.03 U | 2.72 U | 149 | 3.38 U | 2.53 U |
| Diesel Range Organics | AK102/103 | mg/kg | 250 | 20.5 U | 20.8 U | 20.7 U | 21.0 U | 20.9 U | 21.2 U | 21.4 U | 29.1 | 3,310 | 22.6 U | - |
| Residual Range Organics | AK102/103 | mg/kg | 11000 | 103 U | 104 U | 104 U | 105 U | 104 U | 106 U | 117 | 352 | 119 U | 113 U | - |
| Polycyclic Aromatic Hydrocarbons (PAH) | | | | | | | | | | | | | | |
| 1-Methylnaphthalene | 8270D SIM (PAH) | ug/kg | 410 | 25.5 U | 26.1 U | 26.1 U | 26.1 U | 26.2 U | 26.6 U | 26.6 U | 26.5 U | 437 | 27.9 U | - |
| 2-Methylnaphthalene | 8270D SIM (PAH) | ug/kg | 1300 | 25.5 U | 26.1 U | 26.1 U | 26.1 U | 26.2 U | 26.6 U | 26.6 U | 26.5 U | 414 | 27.9 U | - |
| Naphthalene | 8270D SIM (PAH) | ug/kg | 38 | 20.4 U | 20.9 U | 20.9 U | 20.8 U | 20.9 U | 21.3 U | 21.3 U | 21.2 U | 465 | 22.3 U | - |
| Other PAHs | 8270D SIM (PAH) | ug/kg | varies | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | - |
| Volatile Organic Compounds (VOC) | | | | | | | | | | | | | | |
| 1,2,4-Trimethylbenzene | SW8260D | ug/kg | 610 | 38.0 U | 48.7 U | 48.5 U | 49.4 U | 53.1 U | 39.0 U | 60.6 U | 54.5 U | 8,290 | 67.6 U | 50.5 U |
| 1,2-Dibromoethane | SW8260D | ug/kg | 0.24 | <i>0.760 U</i> | <i>0.973 U</i> | <i>0.969 U</i> | <i>0.988 U</i> | <i>1.06 U</i> | <i>0.780 U</i> | <i>1.21 U</i> | <i>1.09 U</i> | <i>2.08 U</i> | <i>1.35 U</i> | <i>1.01 U</i> |
| 1,3,5-Trimethylbenzene | SW8260D | ug/kg | 660 | 19.0 U | 24.3 U | 24.2 U | 24.7 U | 26.6 U | 19.5 U | 30.3 U | 27.2 U | 7,190 | 38.5 | 25.3 U |
| Benzene | SW8260D | ug/kg | 22 | 9.51 U | 12.2 U | 12.1 U | 12.4 U | 13.3 U | 9.75 U | 15.1 U | 13.6 U | <i>26.0 U</i> | 16.9 U | 12.6 U |
| Ethylbenzene | SW8260D | ug/kg | 130 | 19.0 U | 24.3 U | 24.2 U | 24.7 U | 26.6 U | 19.5 U | 30.3 U | 27.2 U | 1,200 | 33.8 U | 25.3 U |
| Isopropylbenzene (Cumene) | SW8260D | ug/kg | 5600 | 19.0 U | 24.3 U | 24.2 U | 24.7 U | 26.6 U | 19.5 U | 30.3 U | 27.2 U | 1,010 | 33.8 U | 25.3 U |
| Naphthalene | SW8260D | ug/kg | 38 | 19.0 U | 24.3 U | 24.2 U | 24.7 U | 26.6 U | 19.5 U | 30.3 U | 27.2 U | 588 | 33.8 U | 25.3 U |
| Toluene | SW8260D | ug/kg | 6700 | 19.0 U | 24.3 U | 24.2 U | 24.7 U | 26.6 U | 19.5 U | 30.3 U | 27.2 U | 346 | 33.8 U | 25.3 U |
| Xylenes (total) | SW8260D | ug/kg | 1500 | 57.0 U | 73.0 U | 72.7 U | 74.1 U | 79.7 U | 58.5 U | 90.9 U | 81.7 U | 5,690 | 101 U | 75.8 U |
| sec-Butylbenzene | SW8260D | ug/kg | 42000 | 19.0 U | 24.3 U | 24.2 U | 24.7 U | 26.6 U | 19.5 U | 30.3 U | 27.2 U | 2,200 | 33.8 U | 25.3 U |
| tert-Butylbenzene | SW8260D | ug/kg | 11000 | 19.0 U | 24.3 U | 24.2 U | 24.7 U | 26.6 U | 19.5 U | 30.3 U | 27.2 U | 98.7 | 33.8 U | 25.3 U |
| Other VOCs | SW8260D | ug/kg | varies | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |

Notes:

- * Tables B1 or B2, Migration to Groundwater (MTG) for Under 40 Inch Zone, Method Two Soil Cleanup Levels (18 AAC 75, October 27, 2018)
- ~ Duplicate of preceding sample
- ND Not detected
- 1.90 U Analyte was not detected above the laboratory reporting limit of 3.77 mg/kg
- 149** Analyte was detected
- 3,310** Analyte was detected at a concentration greater than the MTG cleanup level
- ppmv Parts per million by volume
- mg/kg Milligrams per kilogram
- ug/kg Micrograms per kilogram

DISCUSSION

The purpose of the site characterization was to investigate the extent of contamination to develop future cleanup plans. Note, there are areas on the site which also need further delineation, including the area in the vicinity of the satellite dish and near the staining from the fuel transfer near the school maintenance building. These locations were not evaluated during this field effort.

Based on site observations and field screening information, the downgradient extent of impact has been identified and appears to be within approximately 145 feet from the Kobuk River. The estimated area of extent of impact has been updated from the 2020 estimate and is reflected on Figure 2.

The geology of the site and topography of the site contributes significantly to the transport of the contamination from the June 2020 spill. Much of the site is comprised of sand, however silt/clay layers have been encountered in various locations across the site. This silt/clay layer may be serving as a confining layer, minimizing the vertical migration of the contamination. However, due to the loose sand present at the site, the contamination may be migrating laterally and downgradient in the subsurface, as evidence by the presence of contamination in Test Pit TP3, located approximately 260 feet downgradient of the spill source. This silt/clay layer was not observed in the toe of the slope, where the hillside flattens from the approximately 22-degree slope. The contamination at the toe of the slope was limited to Test Pit TP3, with adjacent test pits at the same relative elevation and downgradient containing no indication of contamination (i.e., elevated field headspace readings, odor, staining).

CONCLUSIONS AND RECOMMENDATIONS

Petroleum contamination is present and remains in the location of the Shungnak School tank farm. Approximately 350 cubic yards of soil was initially excavated from the site during the 2020 initial spill response, but this investigation indicates there is additional contamination remaining at the site.

Based on the 2020 and 2021 data, petroleum contamination is greatest in the vicinity of the tank farm and area of the former tanks (2020 Test Pit TP4), and diminishes along the spill path to the southwest. Contamination remains on the slope and extends to the base of the slope towards the Kobuk River. While the initial excavation of approximately 3 to 4 feet of soil from the site (approximately 30 by 200-foot area) removed the gross contamination, additional removal of impacted soil may be necessary to limit the migration of contamination through the sandy soils present on the site. The depth of contamination ranges from greater than 9 feet near the source area, 6 feet on the top of the hill downgradient of the spill, and between 2 to 3 feet along the hillside slope.

Note, contamination was encountered in Test Pit TP4, advanced in 2020, but field screening results from the surface and the presence of stained soils indicated that the contamination is likely a result of a historic source such as the drum storage noted in historical aerial photographs.

Based on the data obtained from the July 2020 and 2021 field activities, TC-EM JV recommends the following:

- A stockpile of contaminated soil generated in 2020 remains on the site. During the July 15, 2021 site visit, portions of the stockpile were no longer covered with the liner (Photos 1 and 2). We recommend the stockpile be re-covered to minimize infiltration of rainwater into the contaminated soil and minimize members of the community, including school kids, from playing on the stockpile.
- Additional investigation is required in the following locations:
 - The area northwest of the tanks, in the area of the 3-way valve and the piping network, and near the existing satellite dish. This location is where the ADEC Spills Department's

preliminary investigation of this area during the initial response indicated the presence of fuel contamination.

- Near the school maintenance building where during the staging of drums containing recovered fuel, splashes and spills were noted to have impacted the ground surface.
- Based on initial sample results from the drinking water sample and regular observations for the presence of sheen on the Kobuk River from Shungnak personnel, contamination from this spill does not appear to have migrated to the Kobuk River and drinking water source. Observations for the presence of sheen and periodic sampling of the drinking water source should continue.
- Contaminated soil remains on the top of the hillside, near the source area and within the former fuel pathway, along the slope, and at the toe of the hillside slope. During contaminated soil removal, the following should be considered:
 - The soils are primarily sand that slough when excavated to depths greater than 8 feet below ground surface. While there are areas where contamination may extend beyond 8 feet below ground surface, it may be possible that soils may not be able to be removed given the equipment available in the community.
 - Due to the elevated concentrations remaining in the spill area and proximity to the school, teaching housing, and elderly residences, air monitoring may be necessary during future removal efforts.
 - Contamination is present along the slope. However, heavy equipment cannot safely operate along the slope, limiting the removal actions. Installation of a barrier near the toe of the slope and into the silt/clay layer may minimize the transport of contamination downgradient.
 - Contamination is present on land owned by private parties. Coordination and approval from the landowners will be necessary prior to the removal of contaminated soil and clearing of trees at the toe of the slope.
 - Contamination is present in the vicinity of site infrastructure, including at the tanks, piping, and likely near the AT&T satellite dish. Removal of the contamination in these areas will require removal of the infrastructure and locates of utilities that may not be captured during the standard locate requests.
- Concentrations in soils at the site exceed ADEC human health/maximum allowable concentrations in several samples collected in 2020. Based on ADEC guidance for landfarm construction, the soils will require a bottom liner.

If you have any questions or wish to discuss this project further, please do not hesitate to contact the undersigned at (907) 223-3544.

Tanana Commercial/Environmental Management JV



Shayla Marshall, QEP
Project Manager

Attached:

Figure 1 – Vicinity Map

Figure 2 – Site Plan

Figure 3 – July 15, 2021 Sample Locations

Attachment 1 – Field Notes

Attachment 2 – Photo Pages

Attachment 3 – Laboratory Report and Laboratory Data Review Checklist



GRAPHIC SCALE (IN FEET)

VICINITY MAP

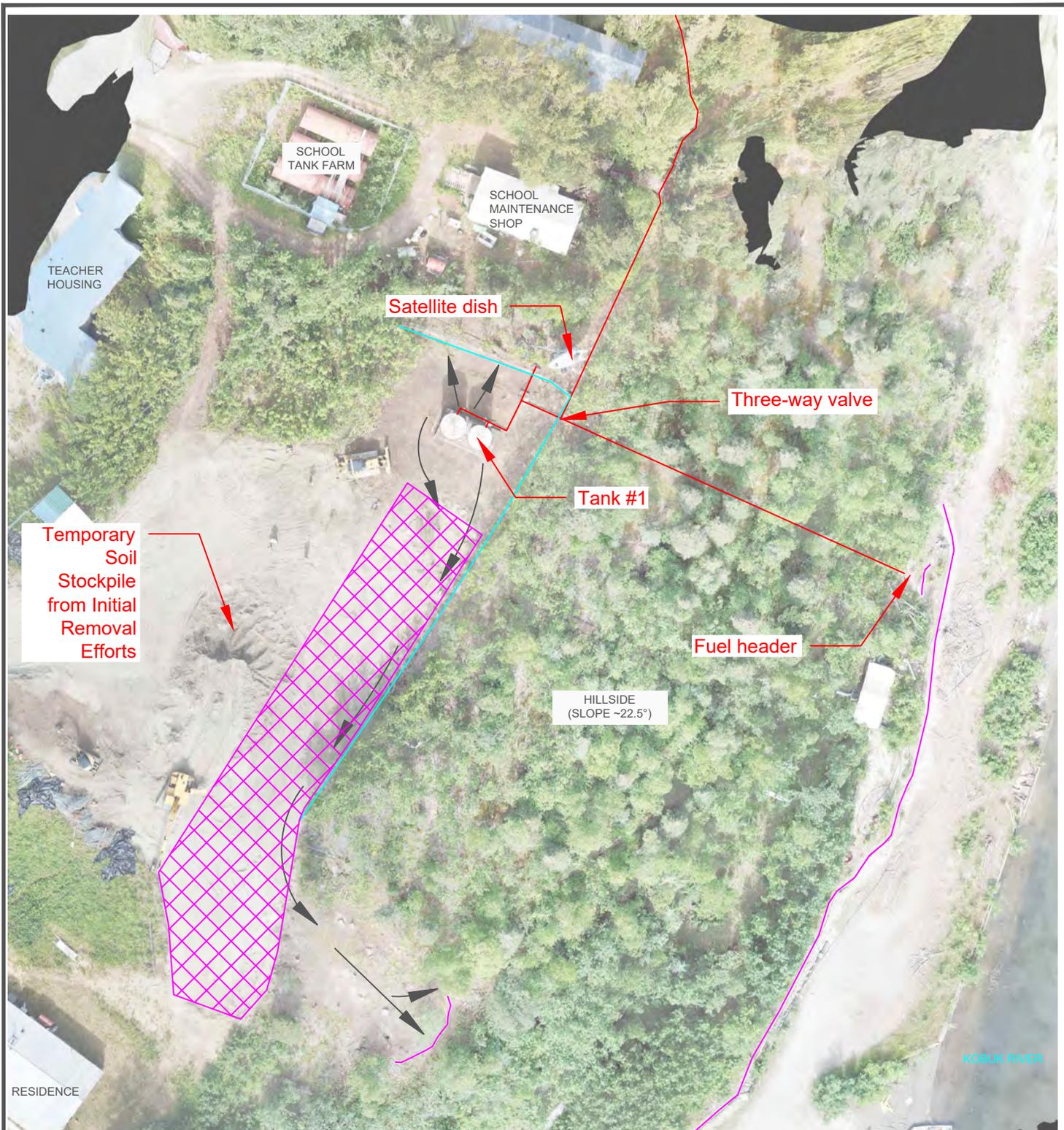
SHUNGNAC SPILL
SHUNGNAC, ALASKA

TC-EM JV

EMI JOB: 18130
DRAWN: SIM
REVIEWED: SIM
DATE: 8/5/2020

FIGURE

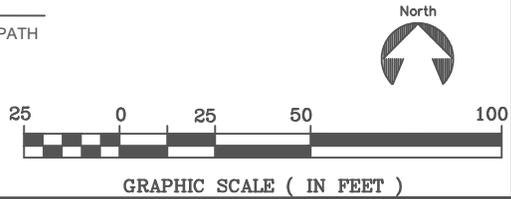
1



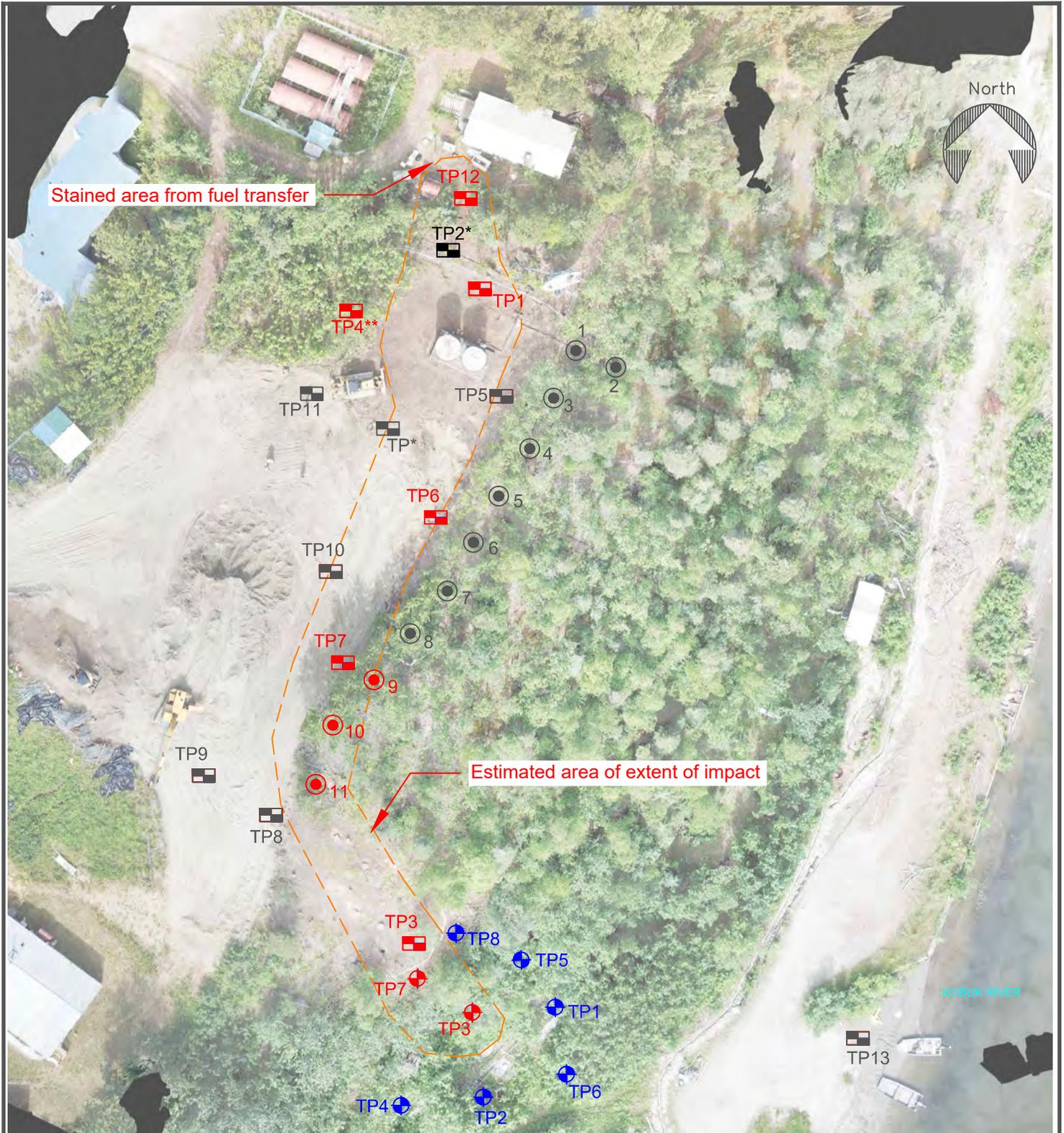
BACKGROUND IMAGE FROM DRONE IMAGERY COLLECTED BY TC-EM JV ON JULY 14, 2020.

LEGEND

- APPROXIMATE LOCATION OF PIPELINE
- APPROXIMATE LOCATION OF FORMER FENCE
- APPROXIMATE LOCATION OF SORBENT BOOM
- X APPROXIMATE LOCATION OF INITIAL EXCAVATION
- ➔ APPROXIMATE LOCATION OF SPILL FLOW PATH



| | | | | |
|------------------|--|-----------------|---|---------------------|
| SITE PLAN | SHUNGNAK SPILL SHUNGNAK, ALASKA | TC-EM JV | EMI JOB: 18130 DRAWN: PB REVIEWED: SIM DATE: 7/28/2020 | FIGURE 2 |
|------------------|--|-----------------|---|---------------------|

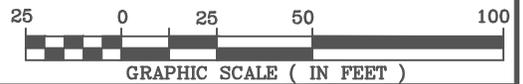


LEGEND

- ⊕ APPROXIMATE LOCATION OF JULY 15, 2021 TEST PIT LOCATION.
- APPROXIMATE LOCATION OF SURFACE SOIL SCREENING SAMPLE (JULY 2020)
- APPROXIMATE LOCATION OF ELEVATED SURFACE SOIL SCREENING SAMPLE (JULY 2020)
- ⊕ APPROXIMATE LOCATION OF JULY 2020 TEST PIT WITH SAMPLES ABOVE ADEC CLEANUP LEVEL
- ⊖ APPROXIMATE LOCATION OF JULY 2020 TEST PIT LOCATION BELOW ADEC CLEANUP LEVEL

BACKGROUND IMAGE FROM DRONE IMAGERY COLLECTED BY TC-EM JV ON JULY 14, 2020.

- ⊕ APPROXIMATE LOCATION OF ELEVATED TEST PIT SAMPLE (JULY 2021)
- *
 TEST PIT ADVANCED IN JULY 2020 BUT NO SAMPLES COLLECTED
- ** CONTAMINATION APPEARS TO BE FROM HISTORIC RELEASE



JULY 15, 2021
SAMPLE LOCATIONS

SHUNGNAK SPILL
SHUNGNAK, ALASKA

TC-EM JV

EMI JOB: 18130
DRAWN: SIM
REVIEWED: SIM
DATE: 7/16/2021

FIGURE
3

ATTACHMENT 1

Field Notes

July 15, 2021 - Shungnak Site Character

Weather - ~100° increase w/ clouds of mosquito

0545 - At ANC airport to Fols

0713 - Land in Fols - Nancy picks

we up - G to SGS to pick
up case

0910 - At Carl's hangar - take off

for Tanana to pick up Pale

1014 - Arrive in ~~Shungnak~~ Tanana

1200 - Hungry - time to pick up Wp

(from airport + take us
W Pale + Stanley) to meet Evelyn
Arrive in Shungnak

1245 - At site walk to proposed

sample locations w/ Jerry (?)

operator - he leaves to pick

up mini-ex -

1305 - Arrive @ Blue Dot pit - area

has been cleared of vegetation -

larger portion of water @ base

of site - appears longer than

erial taken w/ drone last year

- Not a lot of flat area -

may need grading + grade

away from portion where we

appears to go off site

July 15, 2021 - Shungnak

1325 - At landfill - covered

Stockpiles - ~100 yd and another

out ~200 yd - 25 - around

that is last years soil

1347 - At site - top of slope -

water site w/ Pale - M. Jim

older @ top of slope

Stockpile covered mostly

ground very sandy - no

action where soil is highly stained

- some debris @ site - Pale did

not recall debris from before (2000s)

- At flange where goes down slope

some stumps in ground + w/ @ flange

part

1430 - Back @ bottom of slope to

begin test pits

- Hungry + Willard Commence

at site - they are owners of

property where turn test pits

around

1520 - Miranda Clearland on site -

property owner to to west of test pits

Asked us adjacency test pit + test pits

@ proposed pits

July 15, 2021 - Shungwan

TP1 - (R)

| Depth | ID | Time Cell | Time Rd | PID | descript |
|-------|------------|-----------|---------|-----|-----------------------|
| * 1 | TP1S1 | 1432 | 1504 | 0.5 | Br. SAND w/ s/ gravel |
| 2 | TP1S2 | 1434 | 1509 | 0.3 | |
| 3 | TP1S3 | 1435 | 1505 | 0.0 | ↓ |
| 4 | TP1S4 | 1436 | 1506 | 0.0 | |
| 5 | TP1S5 | 1438 | 1506 | 0.0 | |
| 6 | TP1S6 | 1439 | 1507 | 0.0 | ↓ |
| 7 | TP1S7 | 1440 | 1507 | 0.1 | |
| 8 | Storage in | | | | |

Analytical:
TP1S1 - Moisture 810 - 1539

TP2 (L)

| Depth | ID | Time Cell | Time Rd | PID | descript |
|-------|------------|-----------|---------|-----|--------------------------------------|
| 1 | TP2S1 | 1442 | 1505 | 0.0 | Br. SAND w/ s/ gravel w/ organics |
| * 2 | TP2S2 | 1443 | 1506 | 0.2 | |
| 3 | TP2S3 | 1445 | 1507 | 0.0 | Br. SAND w/ s/ gravel |
| 4 | TP2S4 | 1446 | 1509 | 0.0 | |
| 5 | TP2S5 | 1448 | 1510 | 0.0 | |
| 6 | TP2S6 | 1450 | 1511 | 0.0 | ↓ |
| 7 | TP2S7 | 1451 | 1513 | 0.0 | |
| 8 | Storage in | | | | |

TP2S2 - 1524 - Analytical

* Permeation organic lenser + moisture P110

July 15, 2021 - Shungwan

TP3 - up gradient slope

| Depth | ID | Cell | Read | PIP | descript |
|-------|-------|------|------|------|---------------------------|
| 1 | TP3S1 | 1514 | 1600 | 5.21 | Gray SAND w/ s/ gravel HC |
| 2 | TP3S2 | 1515 | 1601 | 5.15 | |
| * 3 | TP3S3 | 1546 | 1602 | 23.7 | Br. SAND w/ gravel |
| 4 | TP3S4 | 1549 | 1603 | 40.7 | |
| * 5 | TP3S5 | 1550 | 1604 | 4.1 | |

Analytical

TP3S3 - below KIC elev 1620
TP3S5 - lower 1620

- Adv used to 1 pit w 5 ft up gradient - strong HC adv
TP3 further down grad - no samples collected from this pit.

TP4 - Mahida's - same elev as TP3 - L of TP3

| Depth | ID | Cell | Read | PIP | descript |
|-------|-------|------|------|-----|----------------------|
| 1 | TP4S1 | 1605 | 1627 | 0.0 | Br SAND w/ gravel HC |
| 2 | TP4S2 | 1606 | 1628 | 0.0 | |
| * 3 | TP4S3 | 1608 | 1629 | 0.0 | ↓ |
| 4 | TP4S4 | 1611 | 1630 | 0.0 | |
| 5 | TP4S5 | 1614 | 1632 | 0.0 | |

Note: TP4S5 1637 - same elev as TP3S3
no further - no indication of per

* per Mahida - 02 - no more tree

plug used from the previous + leave test pit unfilled. (4pp)

* Per Willard's then my - due to slope, do not backfill TP3 - rest of TPS were backfilled

July 15, 2021 - Shingraak
 TPS (RS) Right of TP3

| Depth | ID | Time/Cell | Rd | PID | Recept |
|-------|-------|-----------|------|-----|---------------------|
| 1 | TP5S1 | 1645 | 1655 | 0.0 | Rd Br Ground / Road |
| 2 | TP5S2 | 1646 | 1655 | 0.0 | |
| * 3 | TP5S3 | 1646 | 1650 | 0.0 | ↓ |
| 4 | TP5S4 | 1647 | 1651 | 0.0 | |
| 5 | TP5S5 | 1648 | 1651 | 0.0 | |

Analytical: TP5S3 1658 - Same as TP3S3
 no indication of POC so did not extend the Bat

TP6 Demographic of TP3

| Depth | ID | Cell | Rd | PID | Recept |
|-------|-------|------|------|-----|---------------|
| * 1 | TP6S1 | 1700 | 1712 | 0.2 | Ar Sand 51 gr |
| 2 | TP6S2 | 1700 | 1713 | 0.0 | |
| 3 | TP6S3 | 1701 | 1713 | 0.0 | ↓ |
| 4 | TP6S4 | 1701 | 1714 | 0.0 | |
| 5 | TP6S5 | 1702 | 1715 | 0.0 | |
| 6 | TP6S6 | 1702 | 1716 | 0.0 | ↓ |

Anal. TP6S1 1718
 TP6S11
 No indication of POC so did not extend the Bat

July 15, 2021 - Shingraak

TP7 - Hand Test Pit

| Depth | ID | Cell | Rd | PID | Recept |
|-------|-------|------|------|-----|--------------------------------|
| 1 | TP7S1 | 1730 | 1741 | 214 | Ar Sand 51 etc color |
| * 2 | TP7S2 | 1731 | 1741 | 431 | Gray Green 51 etc w/ lime sand |

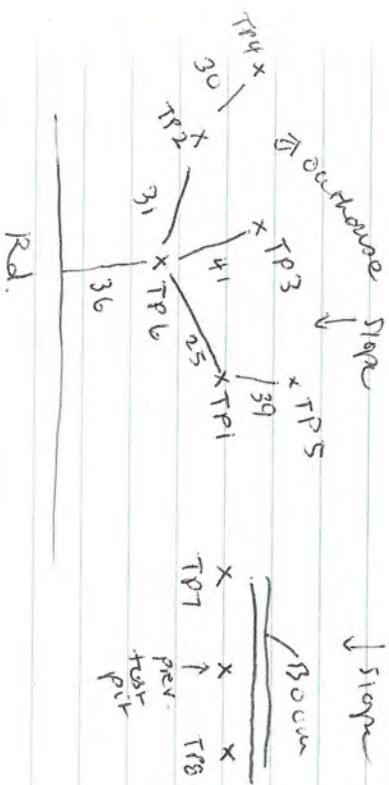
Analytical: TP7S2 1748 -
 * Sit hand + difficult + no external beyond.

TP8 Hand Test Pit

| Depth | ID | Cell | Rd | PID | Recept |
|-------|-------|------|------|-----|-----------------|
| * 1 | TP8S1 | 1732 | 1750 | 0.0 | Br Sand |
| 2 | TP8S2 | 1733 | 1750 | 0.0 | Br Sand to 5111 |

Analytical: TP8S1 - 1755

* Note: All cells meter unless indicated otherwise



July 15, 2021 Shurgrave

1725 - Office

- Dale calls Evelyn (764-0488 call)
OK to leave KTV @ airport

1810 - Leave Shurgrave
Trinity Ave - Paper

2010 - Back in Fykes - dropped off @ TC
airport - Religion in COC/leader
to Dale - he will drop off to
SOS tomorrow morning.

2040 - At FAI airport - check in
2243 - Arrive @ ANC

ends

Sheryl M. Anderson

Shungnak July 15, 2021 GPS Coordinates

| | | |
|------|---------------|----------------|
| TP 1 | 66°53'19.859" | -157°7'55.113" |
| TP 2 | 66°53'19.654" | -157°7'55.345" |
| TP 3 | 66°53'19.955" | -157°7'55.507" |
| TP 4 | 66°53'19.824" | -157°7'56.062" |
| TP 5 | 66°53'20.088" | -157°7'55.182" |
| TP 6 | 66°53'19.874" | -157°7'54.342" |
| TP 7 | 66°53'20.235" | -157°7'55.621" |
| TP8 | 66°53'20.165" | -157°7'55.529" |

ATTACHMENT 2

Photo Pages

2021 Site Characterization Field Activities Photo Log



Photo 1: Spill site; looking northeast. (July 15, 2021)



Photo 2: Spill site and contaminated soil stockpile; looking southwest. (July 15, 2021)

2021 Site Characterization Field Activities

Photo Log



Photo 3: Slope and spill pathway; looking southeast. (July 15, 2021)



Photo 4: Blue Dot Pit; looking southwest. (July 15, 2021)

2021 Site Characterization Field Activities Photo Log



Photo 5: Blue Dot Pit; looking west. (July 15, 2021)



Photo 6: Standing water at Blue Dot Pit; looking northeast. (July 15, 2021)

2021 Site Characterization Field Activities

Photo Log



Photo 7: Stockpile of soil generated in 2020 stored at landfill. (July 15, 2021)



Photo 8: Test Pit TP1; looking east-northeast. (July 15, 2021)

2021 Site Characterization Field Activities Photo Log



Photo 9: Test Pit TP2; looking west. (July 15, 2021)



Photo 10: Test Pit TP3 (left) and advancing Test Pit TP5. Back end of mini-excavator is where Test Pit TP1 was advanced; looking northwest. (July 15, 2021)

2021 Site Characterization Field Activities

Photo Log



Photo 11: Advancing Test Pit TP4 with completed Test Pit TP3 in foreground; looking west. (July 15, 2021)



Photo 12: Soil with elevated PID readings in Test Pit TP3 was from gray soil layer. (July 15, 2021)

2021 Site Characterization Field Activities

Photo Log



Photo 13: Test Pit TP6; looking east-southeast. (July 15, 2021)



Photo 14: Gray silt layer in Test Pit TP7. (July 15, 2021)

2021 Site Characterization Field Activities Photo Log



Photo 15: Advancing Test Pit TP7 and completed Test Pit TP8 in the foreground; looking southwest. (July 15, 2021)

ATTACHMENT 3

Laboratory Report and Laboratory Data Review Checklist

Laboratory Report of Analysis

To: Environmental Mgmt Inc (EMI)
206 E Fireweed Ln #201
Anchorage, AK 99503
907-275-4159

Report Number: **1214397**

Client Project: **Shungnak**

Dear Shayla Marshall,

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 Alexandra 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.



Alexandra Daniel
2021.08.09 16:47:30 -08'00'

Alexandra Daniel
Project Manager
Alexandra.Daniel@sgs.com

Date

Case Narrative

SGS Client: **Environmental Mgmt Inc (EMI)**

SGS Project: **1214397**

Project Name/Site: **Shungnak**

Project Contact: **Shayla Marshall**

Refer to sample receipt form for information on sample condition.

18130 TP7S2 (1214397009) 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.

*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: 08/06/2021 4:59:24PM

Report of Manual Integrations

| <u>Laboratory ID</u> | <u>Client Sample ID</u> | <u>Analytical Batch</u> | <u>Analyte</u> | <u>Reason</u> |
|------------------------|-------------------------|-------------------------|----------------------|---------------|
| 8270D SIM (PAH) | | | | |
| 1214397009 | 18130 TP7S2 | XMS12787 | Naphthalene | RP |
| 1625376 | 1214350007MS | XMS12787 | Benzo[k]fluoranthene | RP |
| 1625377 | 1214350007MSD | XMS12787 | Benzo[k]fluoranthene | RP |
| SW8260D | | | | |
| 1214397009 | 18130 TP7S2 | VMS20981 | Naphthalene | RP |

Manual Integration Reason Code Descriptions

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

All DRO/RRO analysis are integrated per SOP.

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 (Provisionally Certified as of 05/27/2021 for Nitrate as N by SM 4500NO3-F) & 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

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> |
|-------------------------|----------------------|------------------|-----------------|-------------------------|
| 18130 TP1S1 | 1214397001 | 07/15/2021 | 07/20/2021 | Soil/Solid (dry weight) |
| 18130 TP2S2 | 1214397002 | 07/15/2021 | 07/20/2021 | Soil/Solid (dry weight) |
| 18130 TP3S3 | 1214397003 | 07/15/2021 | 07/20/2021 | Soil/Solid (dry weight) |
| 18130 TP3S5 | 1214397004 | 07/15/2021 | 07/20/2021 | Soil/Solid (dry weight) |
| 18130 TP4S3 | 1214397005 | 07/15/2021 | 07/20/2021 | Soil/Solid (dry weight) |
| 18130 TP5S3 | 1214397006 | 07/15/2021 | 07/20/2021 | Soil/Solid (dry weight) |
| 18130 TP6S1 | 1214397007 | 07/15/2021 | 07/20/2021 | Soil/Solid (dry weight) |
| 18130 TP6S11 | 1214397008 | 07/15/2021 | 07/20/2021 | Soil/Solid (dry weight) |
| 18130 TP7S2 | 1214397009 | 07/15/2021 | 07/20/2021 | Soil/Solid (dry weight) |
| 18130 TP8S1 | 1214397010 | 07/15/2021 | 07/20/2021 | Soil/Solid (dry weight) |
| 18130 STB | 1214397011 | 07/15/2021 | 07/20/2021 | Soil/Solid (dry weight) |

| <u>Method</u> | <u>Method Description</u> |
|-----------------|-----------------------------------|
| 8270D SIM (PAH) | 8270 PAH SIM Semi-Volatiles GC/MS |
| AK102 | Diesel/Residual Range Organics |
| AK103 | Diesel/Residual Range Organics |
| AK101 | Gasoline Range Organics (S) |
| SM21 2540G | Percent Solids SM2540G |
| SW8260D | VOC 8260 (S) Field Extracted |

Detectable Results Summary

Client Sample ID: **18130 TP6S1**

Lab Sample ID: 1214397007

Semivolatile Organic Fuels

| <u>Parameter</u> | <u>Result</u> | <u>Units</u> |
|-------------------------|---------------|--------------|
| Residual Range Organics | 117 | mg/kg |

Client Sample ID: **18130 TP6S11**

Lab Sample ID: 1214397008

Semivolatile Organic Fuels

| <u>Parameter</u> | <u>Result</u> | <u>Units</u> |
|-------------------------|---------------|--------------|
| Diesel Range Organics | 29.1 | mg/kg |
| Residual Range Organics | 352 | mg/kg |

Client Sample ID: **18130 TP7S2**

Lab Sample ID: 1214397009

Polynuclear Aromatics GC/MS

| <u>Parameter</u> | <u>Result</u> | <u>Units</u> |
|---------------------------|---------------|--------------|
| 1-Methylnaphthalene | 437 | ug/kg |
| 2-Methylnaphthalene | 414 | ug/kg |
| Naphthalene | 465 | ug/kg |
| Diesel Range Organics | 3310 | mg/kg |
| Gasoline Range Organics | 149 | mg/kg |
| 1,2,4-Trimethylbenzene | 8290 | ug/kg |
| 1,3,5-Trimethylbenzene | 7190 | ug/kg |
| Ethylbenzene | 1200 | ug/kg |
| Isopropylbenzene (Cumene) | 1010 | ug/kg |
| Naphthalene | 588 | ug/kg |
| o-Xylene | 4130 | ug/kg |
| P & M -Xylene | 1560 | ug/kg |
| sec-Butylbenzene | 2200 | ug/kg |
| tert-Butylbenzene | 98.7 | ug/kg |
| Toluene | 346 | ug/kg |
| Xylenes (total) | 5690 | ug/kg |

Semivolatile Organic Fuels

Volatile Fuels

Volatile GC/MS- Petroleum VOC Group

Client Sample ID: **18130 TP8S1**

Lab Sample ID: 1214397010

Volatile GC/MS- Petroleum VOC Group

| <u>Parameter</u> | <u>Result</u> | <u>Units</u> |
|------------------------|---------------|--------------|
| 1,3,5-Trimethylbenzene | 38.5 | ug/kg |



Results of 18130 TP1S1

Client Sample ID: 18130 TP1S1
Client Project ID: Shungnak
Lab Sample ID: 1214397001
Lab Project ID: 1214397

Collection Date: 07/15/21 15:39
Received Date: 07/20/21 11:06
Matrix: Soil/Solid (dry weight)
Solids (%):96.8
Location:

Results by Polynuclear Aromatics GC/MS

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

Surrogates

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Lists surrogate compounds like 2-Methylnaphthalene-d10 and Fluoranthene-d10.

Batch Information

Analytical Batch: XMS12787
Analytical Method: 8270D SIM (PAH)
Analyst: LAW
Analytical Date/Time: 07/29/21 02:15
Container ID: 1214397001-B

Prep Batch: XXX45226
Prep Method: SW3550C
Prep Date/Time: 07/24/21 13:20
Prep Initial Wt./Vol.: 22.815 g
Prep Extract Vol: 5 mL



Results of 18130 TP1S1

Client Sample ID: 18130 TP1S1
Client Project ID: Shungnak
Lab Sample ID: 1214397001
Lab Project ID: 1214397

Collection Date: 07/15/21 15:39
Received Date: 07/20/21 11:06
Matrix: Soil/Solid (dry weight)
Solids (%):96.8
Location:

Results by Semivolatile Organic Fuels

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|-----------------------|-------------|--------|------|-------|----|------------------|----------------|
| Diesel Range Organics | 20.5 U | 20.5 | 6.36 | mg/kg | 1 | | 07/30/21 21:47 |
| Surrogates | | | | | | | |
| 5a Androstane (surr) | 109 | 50-150 | | % | 1 | | 07/30/21 21:47 |

Batch Information

Analytical Batch: XFC16024
Analytical Method: AK102
Analyst: A.A
Analytical Date/Time: 07/30/21 21:47
Container ID: 1214397001-B

Prep Batch: XXX45230
Prep Method: SW3550C
Prep Date/Time: 07/25/21 11:27
Prep Initial Wt./Vol.: 30.227 g
Prep Extract Vol: 5 mL

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|--------------------------|-------------|--------|------|-------|----|------------------|----------------|
| Residual Range Organics | 103 U | 103 | 44.1 | mg/kg | 1 | | 07/30/21 21:47 |
| Surrogates | | | | | | | |
| n-Triacontane-d62 (surr) | 109 | 50-150 | | % | 1 | | 07/30/21 21:47 |

Batch Information

Analytical Batch: XFC16024
Analytical Method: AK103
Analyst: A.A
Analytical Date/Time: 07/30/21 21:47
Container ID: 1214397001-B

Prep Batch: XXX45230
Prep Method: SW3550C
Prep Date/Time: 07/25/21 11:27
Prep Initial Wt./Vol.: 30.227 g
Prep Extract Vol: 5 mL

Print Date: 08/06/2021 4:59:35PM

Results of 18130 TP1S1

Client Sample ID: **18130 TP1S1**
 Client Project ID: **Shungnak**
 Lab Sample ID: 1214397001
 Lab Project ID: 1214397

Collection Date: 07/15/21 15:39
 Received Date: 07/20/21 11:06
 Matrix: Soil/Solid (dry weight)
 Solids (%):96.8
 Location:

Results by Volatile Fuels

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|-----------------------------|-------------|--------|-------|-------|----|------------------|----------------|
| Gasoline Range Organics | 1.90 U | 1.90 | 0.570 | mg/kg | 1 | | 07/29/21 20:31 |
| Surrogates | | | | | | | |
| 4-Bromofluorobenzene (surr) | 87 | 50-150 | | % | 1 | | 07/29/21 20:31 |

Batch Information

Analytical Batch: VFC15739
 Analytical Method: AK101
 Analyst: MDT
 Analytical Date/Time: 07/29/21 20:31
 Container ID: 1214397001-A

Prep Batch: VXX37528
 Prep Method: SW5035A
 Prep Date/Time: 07/15/21 15:39
 Prep Initial Wt./Vol.: 74.341 g
 Prep Extract Vol: 27.3653 mL



Results of 18130 TP1S1

Client Sample ID: **18130 TP1S1**
 Client Project ID: **Shungnak**
 Lab Sample ID: 1214397001
 Lab Project ID: 1214397

Collection Date: 07/15/21 15:39
 Received Date: 07/20/21 11:06
 Matrix: Soil/Solid (dry weight)
 Solids (%):96.8
 Location:

Results by Volatile GC/MS- Petroleum VOC Group

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|------------------------------|-------------|--------|-------|-------|----|------------------|----------------|
| 1,2,4-Trimethylbenzene | 38.0 U | 38.0 | 11.4 | ug/kg | 1 | | 07/28/21 18:04 |
| 1,2-Dibromoethane | 0.760 U | 0.760 | 0.304 | ug/kg | 1 | | 07/28/21 18:04 |
| 1,2-Dichloroethane | 1.52 U | 1.52 | 0.532 | ug/kg | 1 | | 07/28/21 18:04 |
| 1,3,5-Trimethylbenzene | 19.0 U | 19.0 | 5.93 | ug/kg | 1 | | 07/28/21 18:04 |
| Benzene | 9.51 U | 9.51 | 2.97 | ug/kg | 1 | | 07/28/21 18:04 |
| Ethylbenzene | 19.0 U | 19.0 | 5.93 | ug/kg | 1 | | 07/28/21 18:04 |
| Isopropylbenzene (Cumene) | 19.0 U | 19.0 | 5.93 | ug/kg | 1 | | 07/28/21 18:04 |
| Methyl-t-butyl ether | 76.0 U | 76.0 | 23.6 | ug/kg | 1 | | 07/28/21 18:04 |
| Naphthalene | 19.0 U | 19.0 | 5.93 | ug/kg | 1 | | 07/28/21 18:04 |
| n-Butylbenzene | 19.0 U | 19.0 | 5.93 | ug/kg | 1 | | 07/28/21 18:04 |
| o-Xylene | 19.0 U | 19.0 | 5.93 | ug/kg | 1 | | 07/28/21 18:04 |
| P & M -Xylene | 38.0 U | 38.0 | 11.4 | ug/kg | 1 | | 07/28/21 18:04 |
| sec-Butylbenzene | 19.0 U | 19.0 | 5.93 | ug/kg | 1 | | 07/28/21 18:04 |
| tert-Butylbenzene | 19.0 U | 19.0 | 5.93 | ug/kg | 1 | | 07/28/21 18:04 |
| Toluene | 19.0 U | 19.0 | 5.93 | ug/kg | 1 | | 07/28/21 18:04 |
| Xylenes (total) | 57.0 U | 57.0 | 17.3 | ug/kg | 1 | | 07/28/21 18:04 |
| Surrogates | | | | | | | |
| 1,2-Dichloroethane-D4 (surr) | 110 | 71-136 | | % | 1 | | 07/28/21 18:04 |
| 4-Bromofluorobenzene (surr) | 106 | 55-151 | | % | 1 | | 07/28/21 18:04 |
| Toluene-d8 (surr) | 99.3 | 85-116 | | % | 1 | | 07/28/21 18:04 |

Batch Information

Analytical Batch: VMS20981
 Analytical Method: SW8260D
 Analyst: S.S
 Analytical Date/Time: 07/28/21 18:04
 Container ID: 1214397001-A

Prep Batch: VXX37523
 Prep Method: SW5035A
 Prep Date/Time: 07/15/21 15:39
 Prep Initial Wt./Vol.: 74.341 g
 Prep Extract Vol: 27.3653 mL



Results of 18130 TP2S2

Client Sample ID: **18130 TP2S2**
 Client Project ID: **Shungnak**
 Lab Sample ID: 1214397002
 Lab Project ID: 1214397

Collection Date: 07/15/21 15:24
 Received Date: 07/20/21 11:06
 Matrix: Soil/Solid (dry weight)
 Solids (%):95.4
 Location:

Results by Polynuclear Aromatics GC/MS

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|--------------------------------|-------------|--------|------|-------|----|------------------|----------------|
| 1-Methylnaphthalene | 26.1 U | 26.1 | 6.53 | ug/kg | 1 | | 07/29/21 02:35 |
| 2-Methylnaphthalene | 26.1 U | 26.1 | 6.53 | ug/kg | 1 | | 07/29/21 02:35 |
| Acenaphthene | 26.1 U | 26.1 | 6.53 | ug/kg | 1 | | 07/29/21 02:35 |
| Acenaphthylene | 26.1 U | 26.1 | 6.53 | ug/kg | 1 | | 07/29/21 02:35 |
| Anthracene | 26.1 U | 26.1 | 6.53 | ug/kg | 1 | | 07/29/21 02:35 |
| Benzo(a)Anthracene | 26.1 U | 26.1 | 6.53 | ug/kg | 1 | | 07/29/21 02:35 |
| Benzo[a]pyrene | 26.1 U | 26.1 | 6.53 | ug/kg | 1 | | 07/29/21 02:35 |
| Benzo[b]Fluoranthene | 26.1 U | 26.1 | 6.53 | ug/kg | 1 | | 07/29/21 02:35 |
| Benzo[g,h,i]perylene | 26.1 U | 26.1 | 6.53 | ug/kg | 1 | | 07/29/21 02:35 |
| Benzo[k]fluoranthene | 26.1 U | 26.1 | 6.53 | ug/kg | 1 | | 07/29/21 02:35 |
| Chrysene | 26.1 U | 26.1 | 6.53 | ug/kg | 1 | | 07/29/21 02:35 |
| Dibenzo[a,h]anthracene | 26.1 U | 26.1 | 6.53 | ug/kg | 1 | | 07/29/21 02:35 |
| Fluoranthene | 26.1 U | 26.1 | 6.53 | ug/kg | 1 | | 07/29/21 02:35 |
| Fluorene | 26.1 U | 26.1 | 6.53 | ug/kg | 1 | | 07/29/21 02:35 |
| Indeno[1,2,3-c,d] pyrene | 26.1 U | 26.1 | 6.53 | ug/kg | 1 | | 07/29/21 02:35 |
| Naphthalene | 20.9 U | 20.9 | 5.23 | ug/kg | 1 | | 07/29/21 02:35 |
| Phenanthrene | 26.1 U | 26.1 | 6.53 | ug/kg | 1 | | 07/29/21 02:35 |
| Pyrene | 26.1 U | 26.1 | 6.53 | ug/kg | 1 | | 07/29/21 02:35 |
| Surrogates | | | | | | | |
| 2-Methylnaphthalene-d10 (surr) | 83.5 | 58-103 | | % | 1 | | 07/29/21 02:35 |
| Fluoranthene-d10 (surr) | 81.3 | 54-113 | | % | 1 | | 07/29/21 02:35 |

Batch Information

Analytical Batch: XMS12787
 Analytical Method: 8270D SIM (PAH)
 Analyst: LAW
 Analytical Date/Time: 07/29/21 02:35
 Container ID: 1214397002-B

Prep Batch: XXX45226
 Prep Method: SW3550C
 Prep Date/Time: 07/24/21 13:20
 Prep Initial Wt./Vol.: 22.563 g
 Prep Extract Vol: 5 mL

Print Date: 08/06/2021 4:59:35PM



Results of 18130 TP2S2

Client Sample ID: 18130 TP2S2
Client Project ID: Shungnak
Lab Sample ID: 1214397002
Lab Project ID: 1214397

Collection Date: 07/15/21 15:24
Received Date: 07/20/21 11:06
Matrix: Soil/Solid (dry weight)
Solids (%):95.4
Location:

Results by Semivolatile Organic Fuels

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|-----------------------|-------------|--------|------|-------|----|------------------|----------------|
| Diesel Range Organics | 20.8 U | 20.8 | 6.44 | mg/kg | 1 | | 07/30/21 22:07 |
| Surrogates | | | | | | | |
| 5a Androstane (surr) | 98.5 | 50-150 | | % | 1 | | 07/30/21 22:07 |

Batch Information

Analytical Batch: XFC16024
Analytical Method: AK102
Analyst: A.A
Analytical Date/Time: 07/30/21 22:07
Container ID: 1214397002-B

Prep Batch: XXX45230
Prep Method: SW3550C
Prep Date/Time: 07/25/21 11:27
Prep Initial Wt./Vol.: 30.29 g
Prep Extract Vol: 5 mL

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|--------------------------|-------------|--------|------|-------|----|------------------|----------------|
| Residual Range Organics | 104 U | 104 | 44.6 | mg/kg | 1 | | 07/30/21 22:07 |
| Surrogates | | | | | | | |
| n-Triacontane-d62 (surr) | 98.1 | 50-150 | | % | 1 | | 07/30/21 22:07 |

Batch Information

Analytical Batch: XFC16024
Analytical Method: AK103
Analyst: A.A
Analytical Date/Time: 07/30/21 22:07
Container ID: 1214397002-B

Prep Batch: XXX45230
Prep Method: SW3550C
Prep Date/Time: 07/25/21 11:27
Prep Initial Wt./Vol.: 30.29 g
Prep Extract Vol: 5 mL

Results of 18130 TP2S2

Client Sample ID: **18130 TP2S2**
 Client Project ID: **Shungnak**
 Lab Sample ID: 1214397002
 Lab Project ID: 1214397

Collection Date: 07/15/21 15:24
 Received Date: 07/20/21 11:06
 Matrix: Soil/Solid (dry weight)
 Solids (%):95.4
 Location:

Results by Volatile Fuels

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|-----------------------------|-------------|--------|-------|-------|----|------------------|----------------|
| Gasoline Range Organics | 2.43 U | 2.43 | 0.730 | mg/kg | 1 | | 07/29/21 20:49 |
| Surrogates | | | | | | | |
| 4-Bromofluorobenzene (surr) | 84 | 50-150 | | % | 1 | | 07/29/21 20:49 |

Batch Information

Analytical Batch: VFC15739
 Analytical Method: AK101
 Analyst: MDT
 Analytical Date/Time: 07/29/21 20:49
 Container ID: 1214397002-A

Prep Batch: VXX37528
 Prep Method: SW5035A
 Prep Date/Time: 07/15/21 15:24
 Prep Initial Wt./Vol.: 59.759 g
 Prep Extract Vol: 27.7451 mL



Results of 18130 TP2S2

Client Sample ID: **18130 TP2S2**
 Client Project ID: **Shungnak**
 Lab Sample ID: 1214397002
 Lab Project ID: 1214397

Collection Date: 07/15/21 15:24
 Received Date: 07/20/21 11:06
 Matrix: Soil/Solid (dry weight)
 Solids (%):95.4
 Location:

Results by Volatile GC/MS- Petroleum VOC Group

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|------------------------------|-------------|--------|-------|-------|----|------------------|----------------|
| 1,2,4-Trimethylbenzene | 48.7 U | 48.7 | 14.6 | ug/kg | 1 | | 07/28/21 18:21 |
| 1,2-Dibromoethane | 0.973 U | 0.973 | 0.389 | ug/kg | 1 | | 07/28/21 18:21 |
| 1,2-Dichloroethane | 1.95 U | 1.95 | 0.681 | ug/kg | 1 | | 07/28/21 18:21 |
| 1,3,5-Trimethylbenzene | 24.3 U | 24.3 | 7.59 | ug/kg | 1 | | 07/28/21 18:21 |
| Benzene | 12.2 U | 12.2 | 3.80 | ug/kg | 1 | | 07/28/21 18:21 |
| Ethylbenzene | 24.3 U | 24.3 | 7.59 | ug/kg | 1 | | 07/28/21 18:21 |
| Isopropylbenzene (Cumene) | 24.3 U | 24.3 | 7.59 | ug/kg | 1 | | 07/28/21 18:21 |
| Methyl-t-butyl ether | 97.3 U | 97.3 | 30.2 | ug/kg | 1 | | 07/28/21 18:21 |
| Naphthalene | 24.3 U | 24.3 | 7.59 | ug/kg | 1 | | 07/28/21 18:21 |
| n-Butylbenzene | 24.3 U | 24.3 | 7.59 | ug/kg | 1 | | 07/28/21 18:21 |
| o-Xylene | 24.3 U | 24.3 | 7.59 | ug/kg | 1 | | 07/28/21 18:21 |
| P & M -Xylene | 48.7 U | 48.7 | 14.6 | ug/kg | 1 | | 07/28/21 18:21 |
| sec-Butylbenzene | 24.3 U | 24.3 | 7.59 | ug/kg | 1 | | 07/28/21 18:21 |
| tert-Butylbenzene | 24.3 U | 24.3 | 7.59 | ug/kg | 1 | | 07/28/21 18:21 |
| Toluene | 24.3 U | 24.3 | 7.59 | ug/kg | 1 | | 07/28/21 18:21 |
| Xylenes (total) | 73.0 U | 73.0 | 22.2 | ug/kg | 1 | | 07/28/21 18:21 |
| Surrogates | | | | | | | |
| 1,2-Dichloroethane-D4 (surr) | 110 | 71-136 | | % | 1 | | 07/28/21 18:21 |
| 4-Bromofluorobenzene (surr) | 107 | 55-151 | | % | 1 | | 07/28/21 18:21 |
| Toluene-d8 (surr) | 98.3 | 85-116 | | % | 1 | | 07/28/21 18:21 |

Batch Information

Analytical Batch: VMS20981
 Analytical Method: SW8260D
 Analyst: S.S
 Analytical Date/Time: 07/28/21 18:21
 Container ID: 1214397002-A

Prep Batch: VXX37523
 Prep Method: SW5035A
 Prep Date/Time: 07/15/21 15:24
 Prep Initial Wt./Vol.: 59.759 g
 Prep Extract Vol: 27.7451 mL



Results of 18130 TP3S3

Client Sample ID: **18130 TP3S3**
 Client Project ID: **Shungnak**
 Lab Sample ID: 1214397003
 Lab Project ID: 1214397

Collection Date: 07/15/21 16:20
 Received Date: 07/20/21 11:06
 Matrix: Soil/Solid (dry weight)
 Solids (%):95.1
 Location:

Results by Polynuclear Aromatics GC/MS

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|--------------------------------|-------------|--------|------|-------|----|------------------|----------------|
| 1-Methylnaphthalene | 26.1 U | 26.1 | 6.52 | ug/kg | 1 | | 07/29/21 02:56 |
| 2-Methylnaphthalene | 26.1 U | 26.1 | 6.52 | ug/kg | 1 | | 07/29/21 02:56 |
| Acenaphthene | 26.1 U | 26.1 | 6.52 | ug/kg | 1 | | 07/29/21 02:56 |
| Acenaphthylene | 26.1 U | 26.1 | 6.52 | ug/kg | 1 | | 07/29/21 02:56 |
| Anthracene | 26.1 U | 26.1 | 6.52 | ug/kg | 1 | | 07/29/21 02:56 |
| Benzo(a)Anthracene | 26.1 U | 26.1 | 6.52 | ug/kg | 1 | | 07/29/21 02:56 |
| Benzo[a]pyrene | 26.1 U | 26.1 | 6.52 | ug/kg | 1 | | 07/29/21 02:56 |
| Benzo[b]Fluoranthene | 26.1 U | 26.1 | 6.52 | ug/kg | 1 | | 07/29/21 02:56 |
| Benzo[g,h,i]perylene | 26.1 U | 26.1 | 6.52 | ug/kg | 1 | | 07/29/21 02:56 |
| Benzo[k]fluoranthene | 26.1 U | 26.1 | 6.52 | ug/kg | 1 | | 07/29/21 02:56 |
| Chrysene | 26.1 U | 26.1 | 6.52 | ug/kg | 1 | | 07/29/21 02:56 |
| Dibenzo[a,h]anthracene | 26.1 U | 26.1 | 6.52 | ug/kg | 1 | | 07/29/21 02:56 |
| Fluoranthene | 26.1 U | 26.1 | 6.52 | ug/kg | 1 | | 07/29/21 02:56 |
| Fluorene | 26.1 U | 26.1 | 6.52 | ug/kg | 1 | | 07/29/21 02:56 |
| Indeno[1,2,3-c,d] pyrene | 26.1 U | 26.1 | 6.52 | ug/kg | 1 | | 07/29/21 02:56 |
| Naphthalene | 20.9 U | 20.9 | 5.22 | ug/kg | 1 | | 07/29/21 02:56 |
| Phenanthrene | 26.1 U | 26.1 | 6.52 | ug/kg | 1 | | 07/29/21 02:56 |
| Pyrene | 26.1 U | 26.1 | 6.52 | ug/kg | 1 | | 07/29/21 02:56 |
| Surrogates | | | | | | | |
| 2-Methylnaphthalene-d10 (surr) | 74.1 | 58-103 | | % | 1 | | 07/29/21 02:56 |
| Fluoranthene-d10 (surr) | 74.2 | 54-113 | | % | 1 | | 07/29/21 02:56 |

Batch Information

Analytical Batch: XMS12787
 Analytical Method: 8270D SIM (PAH)
 Analyst: LAW
 Analytical Date/Time: 07/29/21 02:56
 Container ID: 1214397003-B

Prep Batch: XXX45226
 Prep Method: SW3550C
 Prep Date/Time: 07/24/21 13:20
 Prep Initial Wt./Vol.: 22.679 g
 Prep Extract Vol: 5 mL

Print Date: 08/06/2021 4:59:35PM



Results of 18130 TP3S3

Client Sample ID: 18130 TP3S3
Client Project ID: Shungnak
Lab Sample ID: 1214397003
Lab Project ID: 1214397

Collection Date: 07/15/21 16:20
Received Date: 07/20/21 11:06
Matrix: Soil/Solid (dry weight)
Solids (%):95.1
Location:

Results by Semivolatile Organic Fuels

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|-----------------------|-------------|--------|------|-------|----|------------------|----------------|
| Diesel Range Organics | 20.7 U | 20.7 | 6.42 | mg/kg | 1 | | 07/30/21 21:57 |
| Surrogates | | | | | | | |
| 5a Androstane (surr) | 99.9 | 50-150 | | % | 1 | | 07/30/21 21:57 |

Batch Information

Analytical Batch: XFC16024
Analytical Method: AK102
Analyst: A.A
Analytical Date/Time: 07/30/21 21:57
Container ID: 1214397003-B

Prep Batch: XXX45230
Prep Method: SW3550C
Prep Date/Time: 07/25/21 11:27
Prep Initial Wt./Vol.: 30.488 g
Prep Extract Vol: 5 mL

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|--------------------------|-------------|--------|------|-------|----|------------------|----------------|
| Residual Range Organics | 104 U | 104 | 44.5 | mg/kg | 1 | | 07/30/21 21:57 |
| Surrogates | | | | | | | |
| n-Triacontane-d62 (surr) | 100 | 50-150 | | % | 1 | | 07/30/21 21:57 |

Batch Information

Analytical Batch: XFC16024
Analytical Method: AK103
Analyst: A.A
Analytical Date/Time: 07/30/21 21:57
Container ID: 1214397003-B

Prep Batch: XXX45230
Prep Method: SW3550C
Prep Date/Time: 07/25/21 11:27
Prep Initial Wt./Vol.: 30.488 g
Prep Extract Vol: 5 mL

Results of 18130 TP3S3

Client Sample ID: **18130 TP3S3**
 Client Project ID: **Shungnak**
 Lab Sample ID: 1214397003
 Lab Project ID: 1214397

Collection Date: 07/15/21 16:20
 Received Date: 07/20/21 11:06
 Matrix: Soil/Solid (dry weight)
 Solids (%):95.1
 Location:

Results by Volatile Fuels

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|-----------------------------|-------------|--------|-------|-------|----|------------------|----------------|
| Gasoline Range Organics | 2.42 U | 2.42 | 0.727 | mg/kg | 1 | | 07/29/21 21:06 |
| Surrogates | | | | | | | |
| 4-Bromofluorobenzene (surr) | 84 | 50-150 | | % | 1 | | 07/29/21 21:06 |

Batch Information

Analytical Batch: VFC15739
 Analytical Method: AK101
 Analyst: MDT
 Analytical Date/Time: 07/29/21 21:06
 Container ID: 1214397003-A

Prep Batch: VXX37528
 Prep Method: SW5035A
 Prep Date/Time: 07/15/21 16:20
 Prep Initial Wt./Vol.: 60.815 g
 Prep Extract Vol: 28.0078 mL



Results of 18130 TP3S3

Client Sample ID: **18130 TP3S3**
 Client Project ID: **Shungnak**
 Lab Sample ID: 1214397003
 Lab Project ID: 1214397

Collection Date: 07/15/21 16:20
 Received Date: 07/20/21 11:06
 Matrix: Soil/Solid (dry weight)
 Solids (%):95.1
 Location:

Results by Volatile GC/MS- Petroleum VOC Group

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|------------------------------|-------------|--------|-------|-------|----|------------------|----------------|
| 1,2,4-Trimethylbenzene | 48.5 U | 48.5 | 14.5 | ug/kg | 1 | | 07/28/21 18:37 |
| 1,2-Dibromoethane | 0.969 U | 0.969 | 0.388 | ug/kg | 1 | | 07/28/21 18:37 |
| 1,2-Dichloroethane | 1.94 U | 1.94 | 0.678 | ug/kg | 1 | | 07/28/21 18:37 |
| 1,3,5-Trimethylbenzene | 24.2 U | 24.2 | 7.56 | ug/kg | 1 | | 07/28/21 18:37 |
| Benzene | 12.1 U | 12.1 | 3.78 | ug/kg | 1 | | 07/28/21 18:37 |
| Ethylbenzene | 24.2 U | 24.2 | 7.56 | ug/kg | 1 | | 07/28/21 18:37 |
| Isopropylbenzene (Cumene) | 24.2 U | 24.2 | 7.56 | ug/kg | 1 | | 07/28/21 18:37 |
| Methyl-t-butyl ether | 96.9 U | 96.9 | 30.0 | ug/kg | 1 | | 07/28/21 18:37 |
| Naphthalene | 24.2 U | 24.2 | 7.56 | ug/kg | 1 | | 07/28/21 18:37 |
| n-Butylbenzene | 24.2 U | 24.2 | 7.56 | ug/kg | 1 | | 07/28/21 18:37 |
| o-Xylene | 24.2 U | 24.2 | 7.56 | ug/kg | 1 | | 07/28/21 18:37 |
| P & M -Xylene | 48.5 U | 48.5 | 14.5 | ug/kg | 1 | | 07/28/21 18:37 |
| sec-Butylbenzene | 24.2 U | 24.2 | 7.56 | ug/kg | 1 | | 07/28/21 18:37 |
| tert-Butylbenzene | 24.2 U | 24.2 | 7.56 | ug/kg | 1 | | 07/28/21 18:37 |
| Toluene | 24.2 U | 24.2 | 7.56 | ug/kg | 1 | | 07/28/21 18:37 |
| Xylenes (total) | 72.7 U | 72.7 | 22.1 | ug/kg | 1 | | 07/28/21 18:37 |
| Surrogates | | | | | | | |
| 1,2-Dichloroethane-D4 (surr) | 109 | 71-136 | | % | 1 | | 07/28/21 18:37 |
| 4-Bromofluorobenzene (surr) | 100 | 55-151 | | % | 1 | | 07/28/21 18:37 |
| Toluene-d8 (surr) | 99.2 | 85-116 | | % | 1 | | 07/28/21 18:37 |

Batch Information

Analytical Batch: VMS20981
 Analytical Method: SW8260D
 Analyst: S.S
 Analytical Date/Time: 07/28/21 18:37
 Container ID: 1214397003-A

Prep Batch: VXX37523
 Prep Method: SW5035A
 Prep Date/Time: 07/15/21 16:20
 Prep Initial Wt./Vol.: 60.815 g
 Prep Extract Vol: 28.0078 mL



Results of 18130 TP3S5

Client Sample ID: **18130 TP3S5**
 Client Project ID: **Shungnak**
 Lab Sample ID: 1214397004
 Lab Project ID: 1214397

Collection Date: 07/15/21 16:22
 Received Date: 07/20/21 11:06
 Matrix: Soil/Solid (dry weight)
 Solids (%):94.0
 Location:

Results by Polynuclear Aromatics GC/MS

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|--------------------------------|-------------|--------|------|-------|----|------------------|----------------|
| 1-Methylnaphthalene | 26.1 U | 26.1 | 6.52 | ug/kg | 1 | | 07/29/21 03:16 |
| 2-Methylnaphthalene | 26.1 U | 26.1 | 6.52 | ug/kg | 1 | | 07/29/21 03:16 |
| Acenaphthene | 26.1 U | 26.1 | 6.52 | ug/kg | 1 | | 07/29/21 03:16 |
| Acenaphthylene | 26.1 U | 26.1 | 6.52 | ug/kg | 1 | | 07/29/21 03:16 |
| Anthracene | 26.1 U | 26.1 | 6.52 | ug/kg | 1 | | 07/29/21 03:16 |
| Benzo(a)Anthracene | 26.1 U | 26.1 | 6.52 | ug/kg | 1 | | 07/29/21 03:16 |
| Benzo[a]pyrene | 26.1 U | 26.1 | 6.52 | ug/kg | 1 | | 07/29/21 03:16 |
| Benzo[b]Fluoranthene | 26.1 U | 26.1 | 6.52 | ug/kg | 1 | | 07/29/21 03:16 |
| Benzo[g,h,i]perylene | 26.1 U | 26.1 | 6.52 | ug/kg | 1 | | 07/29/21 03:16 |
| Benzo[k]fluoranthene | 26.1 U | 26.1 | 6.52 | ug/kg | 1 | | 07/29/21 03:16 |
| Chrysene | 26.1 U | 26.1 | 6.52 | ug/kg | 1 | | 07/29/21 03:16 |
| Dibenzo[a,h]anthracene | 26.1 U | 26.1 | 6.52 | ug/kg | 1 | | 07/29/21 03:16 |
| Fluoranthene | 26.1 U | 26.1 | 6.52 | ug/kg | 1 | | 07/29/21 03:16 |
| Fluorene | 26.1 U | 26.1 | 6.52 | ug/kg | 1 | | 07/29/21 03:16 |
| Indeno[1,2,3-c,d] pyrene | 26.1 U | 26.1 | 6.52 | ug/kg | 1 | | 07/29/21 03:16 |
| Naphthalene | 20.8 U | 20.8 | 5.21 | ug/kg | 1 | | 07/29/21 03:16 |
| Phenanthrene | 26.1 U | 26.1 | 6.52 | ug/kg | 1 | | 07/29/21 03:16 |
| Pyrene | 26.1 U | 26.1 | 6.52 | ug/kg | 1 | | 07/29/21 03:16 |
| Surrogates | | | | | | | |
| 2-Methylnaphthalene-d10 (surr) | 76.1 | 58-103 | | % | 1 | | 07/29/21 03:16 |
| Fluoranthene-d10 (surr) | 75.7 | 54-113 | | % | 1 | | 07/29/21 03:16 |

Batch Information

Analytical Batch: XMS12787
 Analytical Method: 8270D SIM (PAH)
 Analyst: LAW
 Analytical Date/Time: 07/29/21 03:16
 Container ID: 1214397004-B

Prep Batch: XXX45226
 Prep Method: SW3550C
 Prep Date/Time: 07/24/21 13:20
 Prep Initial Wt./Vol.: 22.954 g
 Prep Extract Vol: 5 mL

Print Date: 08/06/2021 4:59:35PM



Results of 18130 TP3S5

Client Sample ID: 18130 TP3S5
Client Project ID: Shungnak
Lab Sample ID: 1214397004
Lab Project ID: 1214397

Collection Date: 07/15/21 16:22
Received Date: 07/20/21 11:06
Matrix: Soil/Solid (dry weight)
Solids (%):94.0
Location:

Results by Semivolatile Organic Fuels

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|-----------------------|-------------|--------|------|-------|----|------------------|----------------|
| Diesel Range Organics | 21.0 U | 21.0 | 6.52 | mg/kg | 1 | | 07/30/21 22:26 |
| Surrogates | | | | | | | |
| 5a Androstane (surr) | 104 | 50-150 | | % | 1 | | 07/30/21 22:26 |

Batch Information

Analytical Batch: XFC16024
Analytical Method: AK102
Analyst: A.A
Analytical Date/Time: 07/30/21 22:26
Container ID: 1214397004-B

Prep Batch: XXX45230
Prep Method: SW3550C
Prep Date/Time: 07/25/21 11:27
Prep Initial Wt./Vol.: 30.334 g
Prep Extract Vol: 5 mL

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|--------------------------|-------------|--------|------|-------|----|------------------|----------------|
| Residual Range Organics | 105 U | 105 | 45.2 | mg/kg | 1 | | 07/30/21 22:26 |
| Surrogates | | | | | | | |
| n-Triacontane-d62 (surr) | 104 | 50-150 | | % | 1 | | 07/30/21 22:26 |

Batch Information

Analytical Batch: XFC16024
Analytical Method: AK103
Analyst: A.A
Analytical Date/Time: 07/30/21 22:26
Container ID: 1214397004-B

Prep Batch: XXX45230
Prep Method: SW3550C
Prep Date/Time: 07/25/21 11:27
Prep Initial Wt./Vol.: 30.334 g
Prep Extract Vol: 5 mL

Print Date: 08/06/2021 4:59:35PM

Results of 18130 TP3S5

Client Sample ID: **18130 TP3S5**
 Client Project ID: **Shungnak**
 Lab Sample ID: 1214397004
 Lab Project ID: 1214397

Collection Date: 07/15/21 16:22
 Received Date: 07/20/21 11:06
 Matrix: Soil/Solid (dry weight)
 Solids (%):94.0
 Location:

Results by Volatile Fuels

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|-----------------------------|-------------|--------|-------|-------|----|------------------|----------------|
| Gasoline Range Organics | 2.47 U | 2.47 | 0.741 | mg/kg | 1 | | 07/29/21 21:24 |
| Surrogates | | | | | | | |
| 4-Bromofluorobenzene (surr) | 85.3 | 50-150 | | % | 1 | | 07/29/21 21:24 |

Batch Information

Analytical Batch: VFC15739
 Analytical Method: AK101
 Analyst: MDT
 Analytical Date/Time: 07/29/21 21:24
 Container ID: 1214397004-A

Prep Batch: VXX37528
 Prep Method: SW5035A
 Prep Date/Time: 07/15/21 16:22
 Prep Initial Wt./Vol.: 61.754 g
 Prep Extract Vol: 28.6889 mL



Results of 18130 TP3S5

Client Sample ID: 18130 TP3S5
Client Project ID: Shungnak
Lab Sample ID: 1214397004
Lab Project ID: 1214397

Collection Date: 07/15/21 16:22
Received Date: 07/20/21 11:06
Matrix: Soil/Solid (dry weight)
Solids (%):94.0
Location:

Results by Volatile GC/MS- Petroleum VOC Group

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows include various hydrocarbons like 1,2,4-Trimethylbenzene, Benzene, and Xylenes (total), along with Surrogates.

Batch Information

Analytical Batch: VMS20981
Analytical Method: SW8260D
Analyst: S.S
Analytical Date/Time: 07/28/21 18:54
Container ID: 1214397004-A

Prep Batch: VXX37523
Prep Method: SW5035A
Prep Date/Time: 07/15/21 16:22
Prep Initial Wt./Vol.: 61.754 g
Prep Extract Vol: 28.6889 mL



Results of 18130 TP4S3

Client Sample ID: **18130 TP4S3**
 Client Project ID: **Shungnak**
 Lab Sample ID: 1214397005
 Lab Project ID: 1214397

Collection Date: 07/15/21 16:37
 Received Date: 07/20/21 11:06
 Matrix: Soil/Solid (dry weight)
 Solids (%):94.8
 Location:

Results by Polynuclear Aromatics GC/MS

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|--------------------------------|-------------|--------|------|-------|----|------------------|----------------|
| 1-Methylnaphthalene | 26.2 U | 26.2 | 6.54 | ug/kg | 1 | | 07/29/21 03:37 |
| 2-Methylnaphthalene | 26.2 U | 26.2 | 6.54 | ug/kg | 1 | | 07/29/21 03:37 |
| Acenaphthene | 26.2 U | 26.2 | 6.54 | ug/kg | 1 | | 07/29/21 03:37 |
| Acenaphthylene | 26.2 U | 26.2 | 6.54 | ug/kg | 1 | | 07/29/21 03:37 |
| Anthracene | 26.2 U | 26.2 | 6.54 | ug/kg | 1 | | 07/29/21 03:37 |
| Benzo(a)Anthracene | 26.2 U | 26.2 | 6.54 | ug/kg | 1 | | 07/29/21 03:37 |
| Benzo[a]pyrene | 26.2 U | 26.2 | 6.54 | ug/kg | 1 | | 07/29/21 03:37 |
| Benzo[b]Fluoranthene | 26.2 U | 26.2 | 6.54 | ug/kg | 1 | | 07/29/21 03:37 |
| Benzo[g,h,i]perylene | 26.2 U | 26.2 | 6.54 | ug/kg | 1 | | 07/29/21 03:37 |
| Benzo[k]fluoranthene | 26.2 U | 26.2 | 6.54 | ug/kg | 1 | | 07/29/21 03:37 |
| Chrysene | 26.2 U | 26.2 | 6.54 | ug/kg | 1 | | 07/29/21 03:37 |
| Dibenzo[a,h]anthracene | 26.2 U | 26.2 | 6.54 | ug/kg | 1 | | 07/29/21 03:37 |
| Fluoranthene | 26.2 U | 26.2 | 6.54 | ug/kg | 1 | | 07/29/21 03:37 |
| Fluorene | 26.2 U | 26.2 | 6.54 | ug/kg | 1 | | 07/29/21 03:37 |
| Indeno[1,2,3-c,d] pyrene | 26.2 U | 26.2 | 6.54 | ug/kg | 1 | | 07/29/21 03:37 |
| Naphthalene | 20.9 U | 20.9 | 5.23 | ug/kg | 1 | | 07/29/21 03:37 |
| Phenanthrene | 26.2 U | 26.2 | 6.54 | ug/kg | 1 | | 07/29/21 03:37 |
| Pyrene | 26.2 U | 26.2 | 6.54 | ug/kg | 1 | | 07/29/21 03:37 |
| Surrogates | | | | | | | |
| 2-Methylnaphthalene-d10 (surr) | 78.8 | 58-103 | | % | 1 | | 07/29/21 03:37 |
| Fluoranthene-d10 (surr) | 77.2 | 54-113 | | % | 1 | | 07/29/21 03:37 |

Batch Information

Analytical Batch: XMS12787
 Analytical Method: 8270D SIM (PAH)
 Analyst: LAW
 Analytical Date/Time: 07/29/21 03:37
 Container ID: 1214397005-B

Prep Batch: XXX45226
 Prep Method: SW3550C
 Prep Date/Time: 07/24/21 13:20
 Prep Initial Wt./Vol.: 22.671 g
 Prep Extract Vol: 5 mL

Print Date: 08/06/2021 4:59:35PM



Results of 18130 TP4S3

Client Sample ID: 18130 TP4S3
Client Project ID: Shungnak
Lab Sample ID: 1214397005
Lab Project ID: 1214397

Collection Date: 07/15/21 16:37
Received Date: 07/20/21 11:06
Matrix: Soil/Solid (dry weight)
Solids (%):94.8
Location:

Results by Semivolatile Organic Fuels

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|-----------------------|-------------|--------|------|-------|----|------------------|----------------|
| Diesel Range Organics | 20.9 U | 20.9 | 6.46 | mg/kg | 1 | | 07/30/21 22:17 |
| Surrogates | | | | | | | |
| 5a Androstane (surr) | 98.6 | 50-150 | | % | 1 | | 07/30/21 22:17 |

Batch Information

Analytical Batch: XFC16024
Analytical Method: AK102
Analyst: A.A
Analytical Date/Time: 07/30/21 22:17
Container ID: 1214397005-B

Prep Batch: XXX45230
Prep Method: SW3550C
Prep Date/Time: 07/25/21 11:27
Prep Initial Wt./Vol.: 30.35 g
Prep Extract Vol: 5 mL

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|--------------------------|-------------|--------|------|-------|----|------------------|----------------|
| Residual Range Organics | 104 U | 104 | 44.8 | mg/kg | 1 | | 07/30/21 22:17 |
| Surrogates | | | | | | | |
| n-Triacontane-d62 (surr) | 99.8 | 50-150 | | % | 1 | | 07/30/21 22:17 |

Batch Information

Analytical Batch: XFC16024
Analytical Method: AK103
Analyst: A.A
Analytical Date/Time: 07/30/21 22:17
Container ID: 1214397005-B

Prep Batch: XXX45230
Prep Method: SW3550C
Prep Date/Time: 07/25/21 11:27
Prep Initial Wt./Vol.: 30.35 g
Prep Extract Vol: 5 mL

Results of 18130 TP4S3

Client Sample ID: **18130 TP4S3**
 Client Project ID: **Shungnak**
 Lab Sample ID: 1214397005
 Lab Project ID: 1214397

Collection Date: 07/15/21 16:37
 Received Date: 07/20/21 11:06
 Matrix: Soil/Solid (dry weight)
 Solids (%):94.8
 Location:

Results by Volatile Fuels

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|-----------------------------|-------------|--------|-------|-------|----|------------------|----------------|
| Gasoline Range Organics | 2.66 U | 2.66 | 0.797 | mg/kg | 1 | | 07/29/21 21:42 |
| Surrogates | | | | | | | |
| 4-Bromofluorobenzene (surr) | 84 | 50-150 | | % | 1 | | 07/29/21 21:42 |

Batch Information

Analytical Batch: VFC15739
 Analytical Method: AK101
 Analyst: MDT
 Analytical Date/Time: 07/29/21 21:42
 Container ID: 1214397005-A

Prep Batch: VXX37528
 Prep Method: SW5035A
 Prep Date/Time: 07/15/21 16:37
 Prep Initial Wt./Vol.: 55.349 g
 Prep Extract Vol: 27.8749 mL



Results of 18130 TP4S3

Client Sample ID: **18130 TP4S3**
 Client Project ID: **Shungnak**
 Lab Sample ID: 1214397005
 Lab Project ID: 1214397

Collection Date: 07/15/21 16:37
 Received Date: 07/20/21 11:06
 Matrix: Soil/Solid (dry weight)
 Solids (%):94.8
 Location:

Results by Volatile GC/MS- Petroleum VOC Group

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|------------------------------|-------------|--------|-------|-------|----|------------------|----------------|
| 1,2,4-Trimethylbenzene | 53.1 U | 53.1 | 15.9 | ug/kg | 1 | | 07/28/21 19:10 |
| 1,2-Dibromoethane | 1.06 U | 1.06 | 0.425 | ug/kg | 1 | | 07/28/21 19:10 |
| 1,2-Dichloroethane | 2.12 U | 2.12 | 0.744 | ug/kg | 1 | | 07/28/21 19:10 |
| 1,3,5-Trimethylbenzene | 26.6 U | 26.6 | 8.29 | ug/kg | 1 | | 07/28/21 19:10 |
| Benzene | 13.3 U | 13.3 | 4.14 | ug/kg | 1 | | 07/28/21 19:10 |
| Ethylbenzene | 26.6 U | 26.6 | 8.29 | ug/kg | 1 | | 07/28/21 19:10 |
| Isopropylbenzene (Cumene) | 26.6 U | 26.6 | 8.29 | ug/kg | 1 | | 07/28/21 19:10 |
| Methyl-t-butyl ether | 106 U | 106 | 32.9 | ug/kg | 1 | | 07/28/21 19:10 |
| Naphthalene | 26.6 U | 26.6 | 8.29 | ug/kg | 1 | | 07/28/21 19:10 |
| n-Butylbenzene | 26.6 U | 26.6 | 8.29 | ug/kg | 1 | | 07/28/21 19:10 |
| o-Xylene | 26.6 U | 26.6 | 8.29 | ug/kg | 1 | | 07/28/21 19:10 |
| P & M -Xylene | 53.1 U | 53.1 | 15.9 | ug/kg | 1 | | 07/28/21 19:10 |
| sec-Butylbenzene | 26.6 U | 26.6 | 8.29 | ug/kg | 1 | | 07/28/21 19:10 |
| tert-Butylbenzene | 26.6 U | 26.6 | 8.29 | ug/kg | 1 | | 07/28/21 19:10 |
| Toluene | 26.6 U | 26.6 | 8.29 | ug/kg | 1 | | 07/28/21 19:10 |
| Xylenes (total) | 79.7 U | 79.7 | 24.2 | ug/kg | 1 | | 07/28/21 19:10 |
| Surrogates | | | | | | | |
| 1,2-Dichloroethane-D4 (surr) | 109 | 71-136 | | % | 1 | | 07/28/21 19:10 |
| 4-Bromofluorobenzene (surr) | 107 | 55-151 | | % | 1 | | 07/28/21 19:10 |
| Toluene-d8 (surr) | 98.9 | 85-116 | | % | 1 | | 07/28/21 19:10 |

Batch Information

Analytical Batch: VMS20981
 Analytical Method: SW8260D
 Analyst: S.S
 Analytical Date/Time: 07/28/21 19:10
 Container ID: 1214397005-A

Prep Batch: VXX37523
 Prep Method: SW5035A
 Prep Date/Time: 07/15/21 16:37
 Prep Initial Wt./Vol.: 55.349 g
 Prep Extract Vol: 27.8749 mL

Print Date: 08/06/2021 4:59:35PM



Results of 18130 TP5S3

Client Sample ID: **18130 TP5S3**
 Client Project ID: **Shungnak**
 Lab Sample ID: 1214397006
 Lab Project ID: 1214397

Collection Date: 07/15/21 16:58
 Received Date: 07/20/21 11:06
 Matrix: Soil/Solid (dry weight)
 Solids (%):93.7
 Location:

Results by Polynuclear Aromatics GC/MS

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|--------------------------------|-------------|--------|------|-------|----|------------------|----------------|
| 1-Methylnaphthalene | 26.6 U | 26.6 | 6.65 | ug/kg | 1 | | 07/29/21 03:57 |
| 2-Methylnaphthalene | 26.6 U | 26.6 | 6.65 | ug/kg | 1 | | 07/29/21 03:57 |
| Acenaphthene | 26.6 U | 26.6 | 6.65 | ug/kg | 1 | | 07/29/21 03:57 |
| Acenaphthylene | 26.6 U | 26.6 | 6.65 | ug/kg | 1 | | 07/29/21 03:57 |
| Anthracene | 26.6 U | 26.6 | 6.65 | ug/kg | 1 | | 07/29/21 03:57 |
| Benzo(a)Anthracene | 26.6 U | 26.6 | 6.65 | ug/kg | 1 | | 07/29/21 03:57 |
| Benzo[a]pyrene | 26.6 U | 26.6 | 6.65 | ug/kg | 1 | | 07/29/21 03:57 |
| Benzo[b]Fluoranthene | 26.6 U | 26.6 | 6.65 | ug/kg | 1 | | 07/29/21 03:57 |
| Benzo[g,h,i]perylene | 26.6 U | 26.6 | 6.65 | ug/kg | 1 | | 07/29/21 03:57 |
| Benzo[k]fluoranthene | 26.6 U | 26.6 | 6.65 | ug/kg | 1 | | 07/29/21 03:57 |
| Chrysene | 26.6 U | 26.6 | 6.65 | ug/kg | 1 | | 07/29/21 03:57 |
| Dibenzo[a,h]anthracene | 26.6 U | 26.6 | 6.65 | ug/kg | 1 | | 07/29/21 03:57 |
| Fluoranthene | 26.6 U | 26.6 | 6.65 | ug/kg | 1 | | 07/29/21 03:57 |
| Fluorene | 26.6 U | 26.6 | 6.65 | ug/kg | 1 | | 07/29/21 03:57 |
| Indeno[1,2,3-c,d] pyrene | 26.6 U | 26.6 | 6.65 | ug/kg | 1 | | 07/29/21 03:57 |
| Naphthalene | 21.3 U | 21.3 | 5.32 | ug/kg | 1 | | 07/29/21 03:57 |
| Phenanthrene | 26.6 U | 26.6 | 6.65 | ug/kg | 1 | | 07/29/21 03:57 |
| Pyrene | 26.6 U | 26.6 | 6.65 | ug/kg | 1 | | 07/29/21 03:57 |
| Surrogates | | | | | | | |
| 2-Methylnaphthalene-d10 (surr) | 89.2 | 58-103 | | % | 1 | | 07/29/21 03:57 |
| Fluoranthene-d10 (surr) | 85.7 | 54-113 | | % | 1 | | 07/29/21 03:57 |

Batch Information

Analytical Batch: XMS12787
 Analytical Method: 8270D SIM (PAH)
 Analyst: LAW
 Analytical Date/Time: 07/29/21 03:57
 Container ID: 1214397006-B

Prep Batch: XXX45226
 Prep Method: SW3550C
 Prep Date/Time: 07/24/21 13:20
 Prep Initial Wt./Vol.: 22.552 g
 Prep Extract Vol: 5 mL

Print Date: 08/06/2021 4:59:35PM



Results of 18130 TP5S3

Client Sample ID: 18130 TP5S3
Client Project ID: Shungnak
Lab Sample ID: 1214397006
Lab Project ID: 1214397

Collection Date: 07/15/21 16:58
Received Date: 07/20/21 11:06
Matrix: Soil/Solid (dry weight)
Solids (%):93.7
Location:

Results by Semivolatile Organic Fuels

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows include Diesel Range Organics and Surrogates (5a Androstane).

Batch Information

Analytical Batch: XFC16024
Analytical Method: AK102
Analyst: A.A
Analytical Date/Time: 07/30/21 22:46
Container ID: 1214397006-B

Prep Batch: XXX45230
Prep Method: SW3550C
Prep Date/Time: 07/25/21 11:27
Prep Initial Wt./Vol.: 30.139 g
Prep Extract Vol: 5 mL

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows include Residual Range Organics and Surrogates (n-Triacontane-d62).

Batch Information

Analytical Batch: XFC16024
Analytical Method: AK103
Analyst: A.A
Analytical Date/Time: 07/30/21 22:46
Container ID: 1214397006-B

Prep Batch: XXX45230
Prep Method: SW3550C
Prep Date/Time: 07/25/21 11:27
Prep Initial Wt./Vol.: 30.139 g
Prep Extract Vol: 5 mL

Results of 18130 TP5S3

Client Sample ID: **18130 TP5S3**
 Client Project ID: **Shungnak**
 Lab Sample ID: 1214397006
 Lab Project ID: 1214397

Collection Date: 07/15/21 16:58
 Received Date: 07/20/21 11:06
 Matrix: Soil/Solid (dry weight)
 Solids (%):93.7
 Location:

Results by Volatile Fuels

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|-----------------------------|-------------|--------|-------|-------|----|------------------|----------------|
| Gasoline Range Organics | 1.95 U | 1.95 | 0.585 | mg/kg | 1 | | 07/29/21 22:18 |
| Surrogates | | | | | | | |
| 4-Bromofluorobenzene (surr) | 87.2 | 50-150 | | % | 1 | | 07/29/21 22:18 |

Batch Information

Analytical Batch: VFC15739
 Analytical Method: AK101
 Analyst: MDT
 Analytical Date/Time: 07/29/21 22:18
 Container ID: 1214397006-A

Prep Batch: VXX37528
 Prep Method: SW5035A
 Prep Date/Time: 07/15/21 16:58
 Prep Initial Wt./Vol.: 82.494 g
 Prep Extract Vol: 30.1573 mL



Results of 18130 TP5S3

Client Sample ID: **18130 TP5S3**
 Client Project ID: **Shungnak**
 Lab Sample ID: 1214397006
 Lab Project ID: 1214397

Collection Date: 07/15/21 16:58
 Received Date: 07/20/21 11:06
 Matrix: Soil/Solid (dry weight)
 Solids (%):93.7
 Location:

Results by Volatile GC/MS- Petroleum VOC Group

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|------------------------------|-------------|--------|-------|-------|----|------------------|----------------|
| 1,2,4-Trimethylbenzene | 39.0 U | 39.0 | 11.7 | ug/kg | 1 | | 07/28/21 19:27 |
| 1,2-Dibromoethane | 0.780 U | 0.780 | 0.312 | ug/kg | 1 | | 07/28/21 19:27 |
| 1,2-Dichloroethane | 1.56 U | 1.56 | 0.546 | ug/kg | 1 | | 07/28/21 19:27 |
| 1,3,5-Trimethylbenzene | 19.5 U | 19.5 | 6.08 | ug/kg | 1 | | 07/28/21 19:27 |
| Benzene | 9.75 U | 9.75 | 3.04 | ug/kg | 1 | | 07/28/21 19:27 |
| Ethylbenzene | 19.5 U | 19.5 | 6.08 | ug/kg | 1 | | 07/28/21 19:27 |
| Isopropylbenzene (Cumene) | 19.5 U | 19.5 | 6.08 | ug/kg | 1 | | 07/28/21 19:27 |
| Methyl-t-butyl ether | 78.0 U | 78.0 | 24.2 | ug/kg | 1 | | 07/28/21 19:27 |
| Naphthalene | 19.5 U | 19.5 | 6.08 | ug/kg | 1 | | 07/28/21 19:27 |
| n-Butylbenzene | 19.5 U | 19.5 | 6.08 | ug/kg | 1 | | 07/28/21 19:27 |
| o-Xylene | 19.5 U | 19.5 | 6.08 | ug/kg | 1 | | 07/28/21 19:27 |
| P & M -Xylene | 39.0 U | 39.0 | 11.7 | ug/kg | 1 | | 07/28/21 19:27 |
| sec-Butylbenzene | 19.5 U | 19.5 | 6.08 | ug/kg | 1 | | 07/28/21 19:27 |
| tert-Butylbenzene | 19.5 U | 19.5 | 6.08 | ug/kg | 1 | | 07/28/21 19:27 |
| Toluene | 19.5 U | 19.5 | 6.08 | ug/kg | 1 | | 07/28/21 19:27 |
| Xylenes (total) | 58.5 U | 58.5 | 17.8 | ug/kg | 1 | | 07/28/21 19:27 |
| Surrogates | | | | | | | |
| 1,2-Dichloroethane-D4 (surr) | 109 | 71-136 | | % | 1 | | 07/28/21 19:27 |
| 4-Bromofluorobenzene (surr) | 110 | 55-151 | | % | 1 | | 07/28/21 19:27 |
| Toluene-d8 (surr) | 98.6 | 85-116 | | % | 1 | | 07/28/21 19:27 |

Batch Information

Analytical Batch: VMS20981
 Analytical Method: SW8260D
 Analyst: S.S
 Analytical Date/Time: 07/28/21 19:27
 Container ID: 1214397006-A

Prep Batch: VXX37523
 Prep Method: SW5035A
 Prep Date/Time: 07/15/21 16:58
 Prep Initial Wt./Vol.: 82.494 g
 Prep Extract Vol: 30.1573 mL



Results of 18130 TP6S1

Client Sample ID: **18130 TP6S1**
 Client Project ID: **Shungnak**
 Lab Sample ID: 1214397007
 Lab Project ID: 1214397

Collection Date: 07/15/21 17:15
 Received Date: 07/20/21 11:06
 Matrix: Soil/Solid (dry weight)
 Solids (%):92.9
 Location:

Results by Polynuclear Aromatics GC/MS

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|--------------------------------|-------------|--------|------|-------|----|------------------|----------------|
| 1-Methylnaphthalene | 26.6 U | 26.6 | 6.66 | ug/kg | 1 | | 07/29/21 04:18 |
| 2-Methylnaphthalene | 26.6 U | 26.6 | 6.66 | ug/kg | 1 | | 07/29/21 04:18 |
| Acenaphthene | 26.6 U | 26.6 | 6.66 | ug/kg | 1 | | 07/29/21 04:18 |
| Acenaphthylene | 26.6 U | 26.6 | 6.66 | ug/kg | 1 | | 07/29/21 04:18 |
| Anthracene | 26.6 U | 26.6 | 6.66 | ug/kg | 1 | | 07/29/21 04:18 |
| Benzo(a)Anthracene | 26.6 U | 26.6 | 6.66 | ug/kg | 1 | | 07/29/21 04:18 |
| Benzo[a]pyrene | 26.6 U | 26.6 | 6.66 | ug/kg | 1 | | 07/29/21 04:18 |
| Benzo[b]Fluoranthene | 26.6 U | 26.6 | 6.66 | ug/kg | 1 | | 07/29/21 04:18 |
| Benzo[g,h,i]perylene | 26.6 U | 26.6 | 6.66 | ug/kg | 1 | | 07/29/21 04:18 |
| Benzo[k]fluoranthene | 26.6 U | 26.6 | 6.66 | ug/kg | 1 | | 07/29/21 04:18 |
| Chrysene | 26.6 U | 26.6 | 6.66 | ug/kg | 1 | | 07/29/21 04:18 |
| Dibenzo[a,h]anthracene | 26.6 U | 26.6 | 6.66 | ug/kg | 1 | | 07/29/21 04:18 |
| Fluoranthene | 26.6 U | 26.6 | 6.66 | ug/kg | 1 | | 07/29/21 04:18 |
| Fluorene | 26.6 U | 26.6 | 6.66 | ug/kg | 1 | | 07/29/21 04:18 |
| Indeno[1,2,3-c,d] pyrene | 26.6 U | 26.6 | 6.66 | ug/kg | 1 | | 07/29/21 04:18 |
| Naphthalene | 21.3 U | 21.3 | 5.33 | ug/kg | 1 | | 07/29/21 04:18 |
| Phenanthrene | 26.6 U | 26.6 | 6.66 | ug/kg | 1 | | 07/29/21 04:18 |
| Pyrene | 26.6 U | 26.6 | 6.66 | ug/kg | 1 | | 07/29/21 04:18 |
| Surrogates | | | | | | | |
| 2-Methylnaphthalene-d10 (surr) | 85.4 | 58-103 | | % | 1 | | 07/29/21 04:18 |
| Fluoranthene-d10 (surr) | 81.2 | 54-113 | | % | 1 | | 07/29/21 04:18 |

Batch Information

Analytical Batch: XMS12787
 Analytical Method: 8270D SIM (PAH)
 Analyst: LAW
 Analytical Date/Time: 07/29/21 04:18
 Container ID: 1214397007-B

Prep Batch: XXX45226
 Prep Method: SW3550C
 Prep Date/Time: 07/24/21 13:20
 Prep Initial Wt./Vol.: 22.738 g
 Prep Extract Vol: 5 mL

Print Date: 08/06/2021 4:59:35PM



Results of 18130 TP6S1

Client Sample ID: 18130 TP6S1
Client Project ID: Shungnak
Lab Sample ID: 1214397007
Lab Project ID: 1214397

Collection Date: 07/15/21 17:15
Received Date: 07/20/21 11:06
Matrix: Soil/Solid (dry weight)
Solids (%):92.9
Location:

Results by Semivolatile Organic Fuels

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|-----------------------|-------------|--------|------|-------|----|------------------|----------------|
| Diesel Range Organics | 21.4 U | 21.4 | 6.62 | mg/kg | 1 | | 07/30/21 22:36 |
| Surrogates | | | | | | | |
| 5a Androstane (surr) | 98.3 | 50-150 | | % | 1 | | 07/30/21 22:36 |

Batch Information

Analytical Batch: XFC16024
Analytical Method: AK102
Analyst: A.A
Analytical Date/Time: 07/30/21 22:36
Container ID: 1214397007-B

Prep Batch: XXX45230
Prep Method: SW3550C
Prep Date/Time: 07/25/21 11:27
Prep Initial Wt./Vol.: 30.255 g
Prep Extract Vol: 5 mL

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|--------------------------|-------------|--------|------|-------|----|------------------|----------------|
| Residual Range Organics | 117 | 107 | 45.9 | mg/kg | 1 | | 07/30/21 22:36 |
| Surrogates | | | | | | | |
| n-Triacontane-d62 (surr) | 99.6 | 50-150 | | % | 1 | | 07/30/21 22:36 |

Batch Information

Analytical Batch: XFC16024
Analytical Method: AK103
Analyst: A.A
Analytical Date/Time: 07/30/21 22:36
Container ID: 1214397007-B

Prep Batch: XXX45230
Prep Method: SW3550C
Prep Date/Time: 07/25/21 11:27
Prep Initial Wt./Vol.: 30.255 g
Prep Extract Vol: 5 mL

Results of 18130 TP6S1

Client Sample ID: **18130 TP6S1**
 Client Project ID: **Shungnak**
 Lab Sample ID: 1214397007
 Lab Project ID: 1214397

Collection Date: 07/15/21 17:15
 Received Date: 07/20/21 11:06
 Matrix: Soil/Solid (dry weight)
 Solids (%):92.9
 Location:

Results by Volatile Fuels

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|-----------------------------|-------------|--------|-------|-------|----|------------------|----------------|
| Gasoline Range Organics | 3.03 U | 3.03 | 0.909 | mg/kg | 1 | | 07/29/21 22:36 |
| Surrogates | | | | | | | |
| 4-Bromofluorobenzene (surr) | 72.5 | 50-150 | | % | 1 | | 07/29/21 22:36 |

Batch Information

Analytical Batch: VFC15739
 Analytical Method: AK101
 Analyst: MDT
 Analytical Date/Time: 07/29/21 22:36
 Container ID: 1214397007-A

Prep Batch: VXX37528
 Prep Method: SW5035A
 Prep Date/Time: 07/15/21 17:15
 Prep Initial Wt./Vol.: 50.902 g
 Prep Extract Vol: 28.6371 mL



Results of 18130 TP6S1

Client Sample ID: 18130 TP6S1
Client Project ID: Shungnak
Lab Sample ID: 1214397007
Lab Project ID: 1214397

Collection Date: 07/15/21 17:15
Received Date: 07/20/21 11:06
Matrix: Soil/Solid (dry weight)
Solids (%):92.9
Location:

Results by Volatile GC/MS- Petroleum VOC Group

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

Batch Information

Analytical Batch: VMS20981
Analytical Method: SW8260D
Analyst: S.S
Analytical Date/Time: 07/28/21 19:44
Container ID: 1214397007-A

Prep Batch: VXX37523
Prep Method: SW5035A
Prep Date/Time: 07/15/21 17:15
Prep Initial Wt./Vol.: 50.902 g
Prep Extract Vol: 28.6371 mL



Results of 18130 TP6S11

Client Sample ID: 18130 TP6S11
Client Project ID: Shungnak
Lab Sample ID: 1214397008
Lab Project ID: 1214397

Collection Date: 07/15/21 17:18
Received Date: 07/20/21 11:06
Matrix: Soil/Solid (dry weight)
Solids (%):93.2
Location:

Results by Polynuclear Aromatics GC/MS

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

Surrogates

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Lists surrogate compounds like 2-Methylnaphthalene-d10 and Fluoranthene-d10.

Batch Information

Analytical Batch: XMS12787
Analytical Method: 8270D SIM (PAH)
Analyst: LAW
Analytical Date/Time: 07/29/21 04:38
Container ID: 1214397008-B

Prep Batch: XXX45226
Prep Method: SW3550C
Prep Date/Time: 07/24/21 13:20
Prep Initial Wt./Vol.: 22.749 g
Prep Extract Vol: 5 mL



Results of 18130 TP6S11

Client Sample ID: 18130 TP6S11
Client Project ID: Shungnak
Lab Sample ID: 1214397008
Lab Project ID: 1214397

Collection Date: 07/15/21 17:18
Received Date: 07/20/21 11:06
Matrix: Soil/Solid (dry weight)
Solids (%):93.2
Location:

Results by Semivolatile Organic Fuels

| Parameter | Result | Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|-----------------------|--------|------|--------|------|-------|----|------------------|----------------|
| Diesel Range Organics | 29.1 | | 21.5 | 6.65 | mg/kg | 1 | | 07/30/21 22:56 |
| Surrogates | | | | | | | | |
| 5a Androstane (surr) | 102 | | 50-150 | | % | 1 | | 07/30/21 22:56 |

Batch Information

Analytical Batch: XFC16024
Analytical Method: AK102
Analyst: A.A
Analytical Date/Time: 07/30/21 22:56
Container ID: 1214397008-B

Prep Batch: XXX45230
Prep Method: SW3550C
Prep Date/Time: 07/25/21 11:27
Prep Initial Wt./Vol.: 30.012 g
Prep Extract Vol: 5 mL

| Parameter | Result | Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|--------------------------|--------|------|--------|------|-------|----|------------------|----------------|
| Residual Range Organics | 352 | | 107 | 46.1 | mg/kg | 1 | | 07/30/21 22:56 |
| Surrogates | | | | | | | | |
| n-Triacontane-d62 (surr) | 104 | | 50-150 | | % | 1 | | 07/30/21 22:56 |

Batch Information

Analytical Batch: XFC16024
Analytical Method: AK103
Analyst: A.A
Analytical Date/Time: 07/30/21 22:56
Container ID: 1214397008-B

Prep Batch: XXX45230
Prep Method: SW3550C
Prep Date/Time: 07/25/21 11:27
Prep Initial Wt./Vol.: 30.012 g
Prep Extract Vol: 5 mL



Results of **18130 TP6S11**

Client Sample ID: **18130 TP6S11**
Client Project ID: **Shungnak**
Lab Sample ID: 1214397008
Lab Project ID: 1214397

Collection Date: 07/15/21 17:18
Received Date: 07/20/21 11:06
Matrix: Soil/Solid (dry weight)
Solids (%):93.2
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 | 2.72 U | 2.72 | 0.817 | mg/kg | 1 | | 07/29/21 22:54 |
| Surrogates | | | | | | | |
| 4-Bromofluorobenzene (surr) | 74.5 | 50-150 | | % | 1 | | 07/29/21 22:54 |

Batch Information

Analytical Batch: VFC15739
Analytical Method: AK101
Analyst: MDT
Analytical Date/Time: 07/29/21 22:54
Container ID: 1214397008-A

Prep Batch: VXX37528
Prep Method: SW5035A
Prep Date/Time: 07/15/21 17:18
Prep Initial Wt./Vol.: 56.94 g
Prep Extract Vol: 28.8873 mL

Print Date: 08/06/2021 4:59:35PM



Results of 18130 TP6S11

Client Sample ID: 18130 TP6S11
Client Project ID: Shungnak
Lab Sample ID: 1214397008
Lab Project ID: 1214397

Collection Date: 07/15/21 17:18
Received Date: 07/20/21 11:06
Matrix: Soil/Solid (dry weight)
Solids (%):93.2
Location:

Results by Volatile GC/MS- Petroleum VOC Group

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

Batch Information

Analytical Batch: VMS20981
Analytical Method: SW8260D
Analyst: S.S
Analytical Date/Time: 07/28/21 20:00
Container ID: 1214397008-A

Prep Batch: VXX37523
Prep Method: SW5035A
Prep Date/Time: 07/15/21 17:18
Prep Initial Wt./Vol.: 56.94 g
Prep Extract Vol: 28.8873 mL



Results of 18130 TP7S2

Client Sample ID: **18130 TP7S2**
 Client Project ID: **Shungnak**
 Lab Sample ID: 1214397009
 Lab Project ID: 1214397

Collection Date: 07/15/21 17:48
 Received Date: 07/20/21 11:06
 Matrix: Soil/Solid (dry weight)
 Solids (%):83.3
 Location:

Results by Polynuclear Aromatics GC/MS

| Parameter | Result | Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|--------------------------------|--------|------|--------|------|-------|----|------------------|----------------|
| 1-Methylnaphthalene | 437 | | 29.7 | 7.42 | ug/kg | 1 | | 07/29/21 04:59 |
| 2-Methylnaphthalene | 414 | | 29.7 | 7.42 | ug/kg | 1 | | 07/29/21 04:59 |
| Acenaphthene | 29.7 | U | 29.7 | 7.42 | ug/kg | 1 | | 07/29/21 04:59 |
| Acenaphthylene | 29.7 | U | 29.7 | 7.42 | ug/kg | 1 | | 07/29/21 04:59 |
| Anthracene | 29.7 | U | 29.7 | 7.42 | ug/kg | 1 | | 07/29/21 04:59 |
| Benzo(a)Anthracene | 29.7 | U | 29.7 | 7.42 | ug/kg | 1 | | 07/29/21 04:59 |
| Benzo[a]pyrene | 29.7 | U | 29.7 | 7.42 | ug/kg | 1 | | 07/29/21 04:59 |
| Benzo[b]Fluoranthene | 29.7 | U | 29.7 | 7.42 | ug/kg | 1 | | 07/29/21 04:59 |
| Benzo[g,h,i]perylene | 29.7 | U | 29.7 | 7.42 | ug/kg | 1 | | 07/29/21 04:59 |
| Benzo[k]fluoranthene | 29.7 | U | 29.7 | 7.42 | ug/kg | 1 | | 07/29/21 04:59 |
| Chrysene | 29.7 | U | 29.7 | 7.42 | ug/kg | 1 | | 07/29/21 04:59 |
| Dibenzo[a,h]anthracene | 29.7 | U | 29.7 | 7.42 | ug/kg | 1 | | 07/29/21 04:59 |
| Fluoranthene | 29.7 | U | 29.7 | 7.42 | ug/kg | 1 | | 07/29/21 04:59 |
| Fluorene | 29.7 | U | 29.7 | 7.42 | ug/kg | 1 | | 07/29/21 04:59 |
| Indeno[1,2,3-c,d] pyrene | 29.7 | U | 29.7 | 7.42 | ug/kg | 1 | | 07/29/21 04:59 |
| Naphthalene | 465 | | 23.7 | 5.93 | ug/kg | 1 | | 07/29/21 04:59 |
| Phenanthrene | 29.7 | U | 29.7 | 7.42 | ug/kg | 1 | | 07/29/21 04:59 |
| Pyrene | 29.7 | U | 29.7 | 7.42 | ug/kg | 1 | | 07/29/21 04:59 |
| Surrogates | | | | | | | | |
| 2-Methylnaphthalene-d10 (surr) | 112 | * | 58-103 | | % | 1 | | 07/29/21 04:59 |
| Fluoranthene-d10 (surr) | 72.5 | | 54-113 | | % | 1 | | 07/29/21 04:59 |

Batch Information

Analytical Batch: XMS12787
 Analytical Method: 8270D SIM (PAH)
 Analyst: LAW
 Analytical Date/Time: 07/29/21 04:59
 Container ID: 1214397009-B

Prep Batch: XXX45226
 Prep Method: SW3550C
 Prep Date/Time: 07/24/21 13:20
 Prep Initial Wt./Vol.: 22.769 g
 Prep Extract Vol: 5 mL

Print Date: 08/06/2021 4:59:35PM



Results of 18130 TP7S2

Client Sample ID: 18130 TP7S2
Client Project ID: Shungnak
Lab Sample ID: 1214397009
Lab Project ID: 1214397

Collection Date: 07/15/21 17:48
Received Date: 07/20/21 11:06
Matrix: Soil/Solid (dry weight)
Solids (%):83.3
Location:

Results by Semivolatile Organic Fuels

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|-----------------------|-------------|--------|------|-------|----|------------------|----------------|
| Diesel Range Organics | 3310 | 23.7 | 7.36 | mg/kg | 1 | | 07/30/21 23:06 |
| Surrogates | | | | | | | |
| 5a Androstane (surr) | 97.2 | 50-150 | | % | 1 | | 07/30/21 23:06 |

Batch Information

Analytical Batch: XFC16024
Analytical Method: AK102
Analyst: A.A
Analytical Date/Time: 07/30/21 23:06
Container ID: 1214397009-B

Prep Batch: XXX45230
Prep Method: SW3550C
Prep Date/Time: 07/25/21 11:27
Prep Initial Wt./Vol.: 30.349 g
Prep Extract Vol: 5 mL

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|--------------------------|-------------|--------|------|-------|----|------------------|----------------|
| Residual Range Organics | 119 U | 119 | 51.1 | mg/kg | 1 | | 07/30/21 23:06 |
| Surrogates | | | | | | | |
| n-Triacontane-d62 (surr) | 95.9 | 50-150 | | % | 1 | | 07/30/21 23:06 |

Batch Information

Analytical Batch: XFC16024
Analytical Method: AK103
Analyst: A.A
Analytical Date/Time: 07/30/21 23:06
Container ID: 1214397009-B

Prep Batch: XXX45230
Prep Method: SW3550C
Prep Date/Time: 07/25/21 11:27
Prep Initial Wt./Vol.: 30.349 g
Prep Extract Vol: 5 mL

Results of 18130 TP7S2

Client Sample ID: **18130 TP7S2**
 Client Project ID: **Shungnak**
 Lab Sample ID: 1214397009
 Lab Project ID: 1214397

Collection Date: 07/15/21 17:48
 Received Date: 07/20/21 11:06
 Matrix: Soil/Solid (dry weight)
 Solids (%):83.3
 Location:

Results by Volatile Fuels

| Parameter | Result | Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|-----------------------------|--------|------|--------|------|-------|----|------------------|----------------|
| Gasoline Range Organics | 149 | | 5.19 | 1.56 | mg/kg | 1 | | 07/30/21 01:16 |
| Surrogates | | | | | | | | |
| 4-Bromofluorobenzene (surr) | 437 | * | 50-150 | | % | 1 | | 07/30/21 01:16 |

Batch Information

Analytical Batch: VFC15739
 Analytical Method: AK101
 Analyst: MDT
 Analytical Date/Time: 07/30/21 01:16
 Container ID: 1214397009-A

Prep Batch: VXX37529
 Prep Method: SW5035A
 Prep Date/Time: 07/15/21 17:48
 Prep Initial Wt./Vol.: 35.854 g
 Prep Extract Vol: 31.0021 mL



Results of 18130 TP7S2

Client Sample ID: **18130 TP7S2**
 Client Project ID: **Shungnak**
 Lab Sample ID: 1214397009
 Lab Project ID: 1214397

Collection Date: 07/15/21 17:48
 Received Date: 07/20/21 11:06
 Matrix: Soil/Solid (dry weight)
 Solids (%):83.3
 Location:

Results by Volatile GC/MS- Petroleum VOC Group

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|------------------------------|-------------|--------|-------|-------|----|------------------|----------------|
| 1,2,4-Trimethylbenzene | 8290 | 1040 | 312 | ug/kg | 10 | | 07/29/21 20:27 |
| 1,2-Dibromoethane | 2.08 U | 2.08 | 0.831 | ug/kg | 1 | | 07/28/21 20:17 |
| 1,2-Dichloroethane | 4.15 U | 4.15 | 1.45 | ug/kg | 1 | | 07/28/21 20:17 |
| 1,3,5-Trimethylbenzene | 7190 | 519 | 162 | ug/kg | 10 | | 07/29/21 20:27 |
| Benzene | 26.0 U | 26.0 | 8.10 | ug/kg | 1 | | 07/28/21 20:17 |
| Ethylbenzene | 1200 | 51.9 | 16.2 | ug/kg | 1 | | 07/28/21 20:17 |
| Isopropylbenzene (Cumene) | 1010 | 51.9 | 16.2 | ug/kg | 1 | | 07/28/21 20:17 |
| Methyl-t-butyl ether | 208 U | 208 | 64.4 | ug/kg | 1 | | 07/28/21 20:17 |
| Naphthalene | 588 | 51.9 | 16.2 | ug/kg | 1 | | 07/28/21 20:17 |
| n-Butylbenzene | 51.9 U | 51.9 | 16.2 | ug/kg | 1 | | 07/28/21 20:17 |
| o-Xylene | 4130 | 51.9 | 16.2 | ug/kg | 1 | | 07/28/21 20:17 |
| P & M -Xylene | 1560 | 104 | 31.2 | ug/kg | 1 | | 07/28/21 20:17 |
| sec-Butylbenzene | 2200 | 51.9 | 16.2 | ug/kg | 1 | | 07/28/21 20:17 |
| tert-Butylbenzene | 98.7 | 51.9 | 16.2 | ug/kg | 1 | | 07/28/21 20:17 |
| Toluene | 346 | 51.9 | 16.2 | ug/kg | 1 | | 07/28/21 20:17 |
| Xylenes (total) | 5690 | 156 | 47.4 | ug/kg | 1 | | 07/28/21 20:17 |
| Surrogates | | | | | | | |
| 1,2-Dichloroethane-D4 (surr) | 112 | 71-136 | | % | 1 | | 07/28/21 20:17 |
| 4-Bromofluorobenzene (surr) | 96.6 | 55-151 | | % | 1 | | 07/28/21 20:17 |
| Toluene-d8 (surr) | 98.8 | 85-116 | | % | 1 | | 07/28/21 20:17 |

Batch Information

Analytical Batch: VMS20981
 Analytical Method: SW8260D
 Analyst: S.S
 Analytical Date/Time: 07/28/21 20:17
 Container ID: 1214397009-A

Prep Batch: VXX37523
 Prep Method: SW5035A
 Prep Date/Time: 07/15/21 17:48
 Prep Initial Wt./Vol.: 35.854 g
 Prep Extract Vol: 31.0021 mL

Analytical Batch: VMS20983
 Analytical Method: SW8260D
 Analyst: S.S
 Analytical Date/Time: 07/29/21 20:27
 Container ID: 1214397009-A

Prep Batch: VXX37526
 Prep Method: SW5035A
 Prep Date/Time: 07/15/21 17:48
 Prep Initial Wt./Vol.: 35.854 g
 Prep Extract Vol: 31.0021 mL

Print Date: 08/06/2021 4:59:35PM



Results of 18130 TP8S1

Client Sample ID: **18130 TP8S1**
 Client Project ID: **Shungnak**
 Lab Sample ID: 1214397010
 Lab Project ID: 1214397

Collection Date: 07/15/21 17:55
 Received Date: 07/20/21 11:06
 Matrix: Soil/Solid (dry weight)
 Solids (%):88.0
 Location:

Results by Polynuclear Aromatics GC/MS

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|--------------------------------|-------------|--------|------|-------|----|------------------|----------------|
| 1-Methylnaphthalene | 27.9 U | 27.9 | 6.97 | ug/kg | 1 | | 07/29/21 05:19 |
| 2-Methylnaphthalene | 27.9 U | 27.9 | 6.97 | ug/kg | 1 | | 07/29/21 05:19 |
| Acenaphthene | 27.9 U | 27.9 | 6.97 | ug/kg | 1 | | 07/29/21 05:19 |
| Acenaphthylene | 27.9 U | 27.9 | 6.97 | ug/kg | 1 | | 07/29/21 05:19 |
| Anthracene | 27.9 U | 27.9 | 6.97 | ug/kg | 1 | | 07/29/21 05:19 |
| Benzo(a)Anthracene | 27.9 U | 27.9 | 6.97 | ug/kg | 1 | | 07/29/21 05:19 |
| Benzo[a]pyrene | 27.9 U | 27.9 | 6.97 | ug/kg | 1 | | 07/29/21 05:19 |
| Benzo[b]Fluoranthene | 27.9 U | 27.9 | 6.97 | ug/kg | 1 | | 07/29/21 05:19 |
| Benzo[g,h,i]perylene | 27.9 U | 27.9 | 6.97 | ug/kg | 1 | | 07/29/21 05:19 |
| Benzo[k]fluoranthene | 27.9 U | 27.9 | 6.97 | ug/kg | 1 | | 07/29/21 05:19 |
| Chrysene | 27.9 U | 27.9 | 6.97 | ug/kg | 1 | | 07/29/21 05:19 |
| Dibenzo[a,h]anthracene | 27.9 U | 27.9 | 6.97 | ug/kg | 1 | | 07/29/21 05:19 |
| Fluoranthene | 27.9 U | 27.9 | 6.97 | ug/kg | 1 | | 07/29/21 05:19 |
| Fluorene | 27.9 U | 27.9 | 6.97 | ug/kg | 1 | | 07/29/21 05:19 |
| Indeno[1,2,3-c,d] pyrene | 27.9 U | 27.9 | 6.97 | ug/kg | 1 | | 07/29/21 05:19 |
| Naphthalene | 22.3 U | 22.3 | 5.58 | ug/kg | 1 | | 07/29/21 05:19 |
| Phenanthrene | 27.9 U | 27.9 | 6.97 | ug/kg | 1 | | 07/29/21 05:19 |
| Pyrene | 27.9 U | 27.9 | 6.97 | ug/kg | 1 | | 07/29/21 05:19 |
| Surrogates | | | | | | | |
| 2-Methylnaphthalene-d10 (surr) | 85.3 | 58-103 | | % | 1 | | 07/29/21 05:19 |
| Fluoranthene-d10 (surr) | 82 | 54-113 | | % | 1 | | 07/29/21 05:19 |

Batch Information

Analytical Batch: XMS12787
 Analytical Method: 8270D SIM (PAH)
 Analyst: LAW
 Analytical Date/Time: 07/29/21 05:19
 Container ID: 1214397010-B

Prep Batch: XXX45226
 Prep Method: SW3550C
 Prep Date/Time: 07/24/21 13:20
 Prep Initial Wt./Vol.: 22.911 g
 Prep Extract Vol: 5 mL

Print Date: 08/06/2021 4:59:35PM



Results of 18130 TP8S1

Client Sample ID: 18130 TP8S1
Client Project ID: Shungnak
Lab Sample ID: 1214397010
Lab Project ID: 1214397

Collection Date: 07/15/21 17:55
Received Date: 07/20/21 11:06
Matrix: Soil/Solid (dry weight)
Solids (%):88.0
Location:

Results by Semivolatile Organic Fuels

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows include Diesel Range Organics and Surrogates (5a Androstane).

Batch Information

Analytical Batch: XFC16024
Analytical Method: AK102
Analyst: A.A
Analytical Date/Time: 07/30/21 23:26
Container ID: 1214397010-B

Prep Batch: XXX45230
Prep Method: SW3550C
Prep Date/Time: 07/25/21 11:27
Prep Initial Wt./Vol.: 30.138 g
Prep Extract Vol: 5 mL

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows include Residual Range Organics and Surrogates (n-Triacontane-d62).

Batch Information

Analytical Batch: XFC16024
Analytical Method: AK103
Analyst: A.A
Analytical Date/Time: 07/30/21 23:26
Container ID: 1214397010-B

Prep Batch: XXX45230
Prep Method: SW3550C
Prep Date/Time: 07/25/21 11:27
Prep Initial Wt./Vol.: 30.138 g
Prep Extract Vol: 5 mL



Results of **18130 TP8S1**

Client Sample ID: **18130 TP8S1**
Client Project ID: **Shungnak**
Lab Sample ID: 1214397010
Lab Project ID: 1214397

Collection Date: 07/15/21 17:55
Received Date: 07/20/21 11:06
Matrix: Soil/Solid (dry weight)
Solids (%):88.0
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 | 3.38 U | 3.38 | 1.01 | mg/kg | 1 | | 07/30/21 01:34 |
| Surrogates | | | | | | | |
| 4-Bromofluorobenzene (surr) | 86.3 | 50-150 | | % | 1 | | 07/30/21 01:34 |

Batch Information

Analytical Batch: VFC15739
Analytical Method: AK101
Analyst: MDT
Analytical Date/Time: 07/30/21 01:34
Container ID: 1214397010-A

Prep Batch: VXX37529
Prep Method: SW5035A
Prep Date/Time: 07/15/21 17:55
Prep Initial Wt./Vol.: 52.584 g
Prep Extract Vol: 31.2852 mL

Print Date: 08/06/2021 4:59:35PM



Results of 18130 TP8S1

Client Sample ID: **18130 TP8S1**
 Client Project ID: **Shungnak**
 Lab Sample ID: 1214397010
 Lab Project ID: 1214397

Collection Date: 07/15/21 17:55
 Received Date: 07/20/21 11:06
 Matrix: Soil/Solid (dry weight)
 Solids (%):88.0
 Location:

Results by Volatile GC/MS- Petroleum VOC Group

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|------------------------------|-------------|--------|-------|-------|----|------------------|----------------|
| 1,2,4-Trimethylbenzene | 67.6 U | 67.6 | 20.3 | ug/kg | 1 | | 07/28/21 20:33 |
| 1,2-Dibromoethane | 1.35 U | 1.35 | 0.541 | ug/kg | 1 | | 07/28/21 20:33 |
| 1,2-Dichloroethane | 2.70 U | 2.70 | 0.946 | ug/kg | 1 | | 07/28/21 20:33 |
| 1,3,5-Trimethylbenzene | 38.5 | 33.8 | 10.5 | ug/kg | 1 | | 07/28/21 20:33 |
| Benzene | 16.9 U | 16.9 | 5.27 | ug/kg | 1 | | 07/28/21 20:33 |
| Ethylbenzene | 33.8 U | 33.8 | 10.5 | ug/kg | 1 | | 07/28/21 20:33 |
| Isopropylbenzene (Cumene) | 33.8 U | 33.8 | 10.5 | ug/kg | 1 | | 07/28/21 20:33 |
| Methyl-t-butyl ether | 135 U | 135 | 41.9 | ug/kg | 1 | | 07/28/21 20:33 |
| Naphthalene | 33.8 U | 33.8 | 10.5 | ug/kg | 1 | | 07/29/21 15:29 |
| n-Butylbenzene | 33.8 U | 33.8 | 10.5 | ug/kg | 1 | | 07/28/21 20:33 |
| o-Xylene | 33.8 U | 33.8 | 10.5 | ug/kg | 1 | | 07/28/21 20:33 |
| P & M -Xylene | 67.6 U | 67.6 | 20.3 | ug/kg | 1 | | 07/28/21 20:33 |
| sec-Butylbenzene | 33.8 U | 33.8 | 10.5 | ug/kg | 1 | | 07/28/21 20:33 |
| tert-Butylbenzene | 33.8 U | 33.8 | 10.5 | ug/kg | 1 | | 07/28/21 20:33 |
| Toluene | 33.8 U | 33.8 | 10.5 | ug/kg | 1 | | 07/28/21 20:33 |
| Xylenes (total) | 101 U | 101 | 30.8 | ug/kg | 1 | | 07/28/21 20:33 |
| Surrogates | | | | | | | |
| 1,2-Dichloroethane-D4 (surr) | 111 | 71-136 | | % | 1 | | 07/28/21 20:33 |
| 4-Bromofluorobenzene (surr) | 107 | 55-151 | | % | 1 | | 07/28/21 20:33 |
| Toluene-d8 (surr) | 99.1 | 85-116 | | % | 1 | | 07/28/21 20:33 |

Batch Information

Analytical Batch: VMS20983
 Analytical Method: SW8260D
 Analyst: S.S
 Analytical Date/Time: 07/29/21 15:29
 Container ID: 1214397010-A

Prep Batch: VXX37526
 Prep Method: SW5035A
 Prep Date/Time: 07/15/21 17:55
 Prep Initial Wt./Vol.: 52.584 g
 Prep Extract Vol: 31.2852 mL

Analytical Batch: VMS20981
 Analytical Method: SW8260D
 Analyst: S.S
 Analytical Date/Time: 07/28/21 20:33
 Container ID: 1214397010-A

Prep Batch: VXX37523
 Prep Method: SW5035A
 Prep Date/Time: 07/15/21 17:55
 Prep Initial Wt./Vol.: 52.584 g
 Prep Extract Vol: 31.2852 mL

Print Date: 08/06/2021 4:59:35PM

Results of 18130 STB

Client Sample ID: **18130 STB**
 Client Project ID: **Shungnak**
 Lab Sample ID: 1214397011
 Lab Project ID: 1214397

Collection Date: 07/15/21 15:00
 Received Date: 07/20/21 11:06
 Matrix: Soil/Solid (dry weight)
 Solids (%):
 Location:

Results by Volatile Fuels

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|-----------------------------|-------------|--------|-------|-------|----|------------------|----------------|
| Gasoline Range Organics | 2.53 U | 2.53 | 0.758 | mg/kg | 1 | | 07/30/21 00:58 |
| Surrogates | | | | | | | |
| 4-Bromofluorobenzene (surr) | 80.4 | 50-150 | | % | 1 | | 07/30/21 00:58 |

Batch Information

Analytical Batch: VFC15739
 Analytical Method: AK101
 Analyst: MDT
 Analytical Date/Time: 07/30/21 00:58
 Container ID: 1214397011-A

Prep Batch: VXX37529
 Prep Method: SW5035A
 Prep Date/Time: 07/15/21 15:00
 Prep Initial Wt./Vol.: 49.487 g
 Prep Extract Vol: 25 mL



Results of 18130 STB

Client Sample ID: **18130 STB**
 Client Project ID: **Shungnak**
 Lab Sample ID: 1214397011
 Lab Project ID: 1214397

Collection Date: 07/15/21 15:00
 Received Date: 07/20/21 11:06
 Matrix: Soil/Solid (dry weight)
 Solids (%):
 Location:

Results by Volatile GC/MS- Petroleum VOC Group

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|------------------------------|-------------|--------|-------|-------|----|------------------|----------------|
| 1,2,4-Trimethylbenzene | 50.5 U | 50.5 | 15.2 | ug/kg | 1 | | 07/27/21 13:39 |
| 1,2-Dibromoethane | 1.01 U | 1.01 | 0.404 | ug/kg | 1 | | 07/27/21 13:39 |
| 1,2-Dichloroethane | 2.02 U | 2.02 | 0.707 | ug/kg | 1 | | 07/27/21 13:39 |
| 1,3,5-Trimethylbenzene | 25.3 U | 25.3 | 7.88 | ug/kg | 1 | | 07/27/21 13:39 |
| Benzene | 12.6 U | 12.6 | 3.94 | ug/kg | 1 | | 07/27/21 13:39 |
| Ethylbenzene | 25.3 U | 25.3 | 7.88 | ug/kg | 1 | | 07/27/21 13:39 |
| Isopropylbenzene (Cumene) | 25.3 U | 25.3 | 7.88 | ug/kg | 1 | | 07/27/21 13:39 |
| Methyl-t-butyl ether | 101 U | 101 | 31.3 | ug/kg | 1 | | 07/27/21 13:39 |
| Naphthalene | 25.3 U | 25.3 | 7.88 | ug/kg | 1 | | 07/27/21 13:39 |
| n-Butylbenzene | 25.3 U | 25.3 | 7.88 | ug/kg | 1 | | 07/27/21 13:39 |
| o-Xylene | 25.3 U | 25.3 | 7.88 | ug/kg | 1 | | 07/27/21 13:39 |
| P & M -Xylene | 50.5 U | 50.5 | 15.2 | ug/kg | 1 | | 07/27/21 13:39 |
| sec-Butylbenzene | 25.3 U | 25.3 | 7.88 | ug/kg | 1 | | 07/27/21 13:39 |
| tert-Butylbenzene | 25.3 U | 25.3 | 7.88 | ug/kg | 1 | | 07/27/21 13:39 |
| Toluene | 25.3 U | 25.3 | 7.88 | ug/kg | 1 | | 07/27/21 13:39 |
| Xylenes (total) | 75.8 U | 75.8 | 23.0 | ug/kg | 1 | | 07/27/21 13:39 |
| Surrogates | | | | | | | |
| 1,2-Dichloroethane-D4 (surr) | 111 | 71-136 | | % | 1 | | 07/27/21 13:39 |
| 4-Bromofluorobenzene (surr) | 92.9 | 55-151 | | % | 1 | | 07/27/21 13:39 |
| Toluene-d8 (surr) | 99.7 | 85-116 | | % | 1 | | 07/27/21 13:39 |

Batch Information

Analytical Batch: VMS20977
 Analytical Method: SW8260D
 Analyst: S.S
 Analytical Date/Time: 07/27/21 13:39
 Container ID: 1214397011-A

Prep Batch: VXX37513
 Prep Method: SW5035A
 Prep Date/Time: 07/15/21 15:00
 Prep Initial Wt./Vol.: 49.487 g
 Prep Extract Vol: 25 mL

Print Date: 08/06/2021 4:59:35PM



Method Blank

Blank ID: MB for HBN 1822949 [SPT/11332]
Blank Lab ID: 1625518

Matrix: Soil/Solid (dry weight)

QC for Samples:

1214397001, 1214397002, 1214397003, 1214397004, 1214397005, 1214397006, 1214397007, 1214397008, 1214397009, 1214397010

Results by SM21 2540G

| <u>Parameter</u> | <u>Results</u> | <u>LOQ/CL</u> | <u>DL</u> | <u>Units</u> |
|------------------|----------------|---------------|-----------|--------------|
| Total Solids | 99.0 | | | % |

Batch Information

Analytical Batch: SPT11332
Analytical Method: SM21 2540G
Instrument:
Analyst: TMM
Analytical Date/Time: 7/24/2021 5:00:00PM

Print Date: 08/06/2021 4:59:40PM

Duplicate Sample Summary

Original Sample ID: 1214397004

Analysis Date: 07/24/2021 17:00

Duplicate Sample ID: 1625519

Matrix: Soil/Solid (dry weight)

QC for Samples:

1214397001, 1214397002, 1214397003, 1214397004, 1214397005, 1214397006, 1214397007, 1214397008, 1214397009, 1214397010

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 | 94.0 | 94.2 | % | 0.21 | (< 15) |

Batch Information

Analytical Batch: SPT11332

Analytical Method: SM21 2540G

Instrument:

Analyst: TMM

Print Date: 08/06/2021 4:59:42PM



Duplicate Sample Summary

Original Sample ID: 1214496004

Duplicate Sample ID: 1625542

QC for Samples:

1214397005, 1214397006, 1214397007, 1214397008, 1214397009, 1214397010

Analysis Date: 07/26/2021 09:09

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 | 38.6 | 39.1 | % | 1.30 | (< 15) |

Batch Information

Analytical Batch: SPT11332

Analytical Method: SM21 2540G

Instrument:

Analyst: TMM

Print Date: 08/06/2021 4:59:42PM

Method Blank

Blank ID: MB for HBN 1823114 [VXX/37513]
 Blank Lab ID: 1626160

Matrix: Soil/Solid (dry weight)

QC for Samples:
 1214397011

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) | 112 | 71-136 | | % |
| 4-Bromofluorobenzene (surr) | 92.4 | 55-151 | | % |
| Toluene-d8 (surr) | 98.3 | 85-116 | | % |

Batch Information

Analytical Batch: VMS20977
 Analytical Method: SW8260D
 Instrument: VRA Agilent GC/MS 7890B/5977A
 Analyst: S.S
 Analytical Date/Time: 7/27/2021 10:01:00AM

Prep Batch: VXX37513
 Prep Method: SW5035A
 Prep Date/Time: 7/27/2021 6:00:00AM
 Prep Initial Wt./Vol.: 50 g
 Prep Extract Vol: 25 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1214397 [VXX37513]

Blank Spike Lab ID: 1626161

Date Analyzed: 07/27/2021 10:16

Matrix: Soil/Solid (dry weight)

QC for Samples: 1214397011

Results by SW8260D

Blank Spike (ug/kg)

| Parameter | Spike | Result | Rec (%) | CL |
|---------------------------|-------|--------|---------|------------|
| 1,2,4-Trimethylbenzene | 750 | 770 | 103 | (75-123) |
| 1,2-Dibromoethane | 750 | 902 | 120 | (78-122) |
| 1,2-Dichloroethane | 750 | 827 | 110 | (73-128) |
| 1,3,5-Trimethylbenzene | 750 | 748 | 100 | (73-124) |
| Benzene | 750 | 769 | 102 | (77-121) |
| Ethylbenzene | 750 | 757 | 101 | (76-122) |
| Isopropylbenzene (Cumene) | 750 | 797 | 106 | (68-134) |
| Methyl-t-butyl ether | 1130 | 1220 | 109 | (73-125) |
| Naphthalene | 750 | 885 | 118 | (62-129) |
| n-Butylbenzene | 750 | 768 | 102 | (70-128) |
| o-Xylene | 750 | 784 | 105 | (77-123) |
| P & M -Xylene | 1500 | 1520 | 101 | (77-124) |
| sec-Butylbenzene | 750 | 752 | 100 | (73-126) |
| tert-Butylbenzene | 750 | 751 | 100 | (73-125) |
| Toluene | 750 | 770 | 103 | (77-121) |
| Xylenes (total) | 2250 | 2300 | 102 | (78-124) |

Surrogates

| | | | |
|------------------------------|-----|-----|------------|
| 1,2-Dichloroethane-D4 (surr) | 750 | 111 | (71-136) |
| 4-Bromofluorobenzene (surr) | 750 | 89 | (55-151) |
| Toluene-d8 (surr) | 750 | 101 | (85-116) |

Batch Information

Analytical Batch: **VMS20977**
 Analytical Method: **SW8260D**
 Instrument: **VRA Agilent GC/MS 7890B/5977A**
 Analyst: **S.S**

Prep Batch: **VXX37513**
 Prep Method: **SW5035A**
 Prep Date/Time: **07/27/2021 06:00**
 Spike Init Wt./Vol.: 750 ug/kg Extract Vol: 25 mL
 Dupe Init Wt./Vol.: Extract Vol:



Matrix Spike Summary

Original Sample ID: 1626162
 MS Sample ID: 1626163 MS
 MSD Sample ID: 1626164 MSD

Analysis Date: 07/27/2021 14:41
 Analysis Date: 07/27/2021 12:22
 Analysis Date: 07/27/2021 12:37
 Matrix: Solid/Soil (Wet Weight)

QC for Samples: 1214397011

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 | 24.0U | 720 | 730 | 102 | 720 | 743 | 103 | 75-123 | 1.70 | (< 20) |
| 1,2-Dibromoethane | 0.479U | 720 | 859 | 119 | 720 | 816 | 113 | 78-122 | 5.10 | (< 20) |
| 1,2-Dichloroethane | 0.960U | 720 | 791 | 110 | 720 | 767 | 107 | 73-128 | 3.10 | (< 20) |
| 1,3,5-Trimethylbenzene | 12.0U | 720 | 713 | 99 | 720 | 733 | 102 | 73-124 | 2.80 | (< 20) |
| Benzene | 6.00U | 720 | 730 | 101 | 720 | 718 | 100 | 77-121 | 1.70 | (< 20) |
| Ethylbenzene | 12.0U | 720 | 740 | 103 | 720 | 700 | 97 | 76-122 | 5.50 | (< 20) |
| Isopropylbenzene (Cumene) | 12.0U | 720 | 766 | 106 | 720 | 736 | 102 | 68-134 | 4.10 | (< 20) |
| Methyl-t-butyl ether | 48.0U | 1080 | 1170 | 108 | 1080 | 1160 | 107 | 73-125 | 0.99 | (< 20) |
| Naphthalene | 12.2J | 720 | 880 | 121 | 720 | 919 | 126 | 62-129 | 4.40 | (< 20) |
| n-Butylbenzene | 12.0U | 720 | 751 | 104 | 720 | 774 | 108 | 70-128 | 3.00 | (< 20) |
| o-Xylene | 12.0U | 720 | 749 | 104 | 720 | 719 | 100 | 77-123 | 4.00 | (< 20) |
| P & M -Xylene | 24.0U | 1440 | 1450 | 101 | 1440 | 1390 | 97 | 77-124 | 4.00 | (< 20) |
| sec-Butylbenzene | 12.0U | 720 | 732 | 102 | 720 | 731 | 102 | 73-126 | 0.26 | (< 20) |
| tert-Butylbenzene | 12.0U | 720 | 724 | 101 | 720 | 743 | 103 | 73-125 | 2.60 | (< 20) |
| Toluene | 12.0U | 720 | 738 | 103 | 720 | 711 | 99 | 77-121 | 3.70 | (< 20) |
| Xylenes (total) | 36.0U | 2160 | 2200 | 102 | 2160 | 2110 | 98 | 78-124 | 4.00 | (< 20) |
| Surrogates | | | | | | | | | | |
| 1,2-Dichloroethane-D4 (surr) | | 720 | 795 | 110 | 720 | 773 | 107 | 71-136 | 2.80 | |
| 4-Bromofluorobenzene (surr) | | 1200 | 1020 | 85 | 1200 | 1030 | 86 | 55-151 | 1.50 | |
| Toluene-d8 (surr) | | 720 | 732 | 102 | 720 | 720 | 100 | 85-116 | 1.60 | |

Batch Information

Analytical Batch: VMS20977
 Analytical Method: SW8260D
 Instrument: VRA Agilent GC/MS 7890B/5977A
 Analyst: S.S
 Analytical Date/Time: 7/27/2021 12:22:00PM

Prep Batch: VXX37513
 Prep Method: Vol. Extraction SW8260 Field Extracted L
 Prep Date/Time: 7/27/2021 6:00:00AM
 Prep Initial Wt./Vol.: 52.12g
 Prep Extract Vol: 25.00mL

Print Date: 08/06/2021 4:59:53PM

Method Blank

Blank ID: MB for HBN 1823192 [VXX/37523]
 Blank Lab ID: 1626498

Matrix: Soil/Solid (dry weight)

QC for Samples:

1214397001, 1214397002, 1214397003, 1214397004, 1214397005, 1214397006, 1214397007, 1214397008, 1214397009, 1214397010

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) | 108 | 55-151 | % |
| Toluene-d8 (surr) | 101 | 85-116 | % |

Batch Information

Analytical Batch: VMS20981
 Analytical Method: SW8260D
 Instrument: VQA 7890/5975 GC/MS
 Analyst: S.S
 Analytical Date/Time: 7/28/2021 11:30:00AM

Prep Batch: VXX37523
 Prep Method: SW5035A
 Prep Date/Time: 7/28/2021 6:00:00AM
 Prep Initial Wt./Vol.: 50 g
 Prep Extract Vol: 25 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1214397 [VXX37523]

Blank Spike Lab ID: 1626499

Date Analyzed: 07/28/2021 11:47

Matrix: Soil/Solid (dry weight)

QC for Samples: 1214397001, 1214397002, 1214397003, 1214397004, 1214397005, 1214397006, 1214397007, 1214397008, 1214397009, 1214397010

Results by SW8260D

| Parameter | Blank Spike (ug/kg) | | | CL |
|---------------------------|---------------------|--------|---------|----------|
| | Spike | Result | Rec (%) | |
| 1,2,4-Trimethylbenzene | 750 | 834 | 111 | (75-123) |
| 1,2-Dibromoethane | 750 | 828 | 110 | (78-122) |
| 1,2-Dichloroethane | 750 | 689 | 92 | (73-128) |
| 1,3,5-Trimethylbenzene | 750 | 844 | 113 | (73-124) |
| Benzene | 750 | 765 | 102 | (77-121) |
| Ethylbenzene | 750 | 739 | 99 | (76-122) |
| Isopropylbenzene (Cumene) | 750 | 758 | 101 | (68-134) |
| Methyl-t-butyl ether | 1130 | 1030 | 91 | (73-125) |
| Naphthalene | 750 | 742 | 99 | (62-129) |
| n-Butylbenzene | 750 | 799 | 107 | (70-128) |
| o-Xylene | 750 | 756 | 101 | (77-123) |
| P & M -Xylene | 1500 | 1460 | 97 | (77-124) |
| sec-Butylbenzene | 750 | 799 | 107 | (73-126) |
| tert-Butylbenzene | 750 | 818 | 109 | (73-125) |
| Toluene | 750 | 753 | 100 | (77-121) |
| Xylenes (total) | 2250 | 2210 | 98 | (78-124) |

Surrogates

| | | | |
|------------------------------|-----|-----|----------|
| 1,2-Dichloroethane-D4 (surr) | 750 | 93 | (71-136) |
| 4-Bromofluorobenzene (surr) | 750 | 102 | (55-151) |
| Toluene-d8 (surr) | 750 | 99 | (85-116) |

Batch Information

Analytical Batch: VMS20981

Analytical Method: SW8260D

Instrument: VQA 7890/5975 GC/MS

Analyst: S.S

Prep Batch: VXX37523

Prep Method: SW5035A

Prep Date/Time: 07/28/2021 06:00

Spike Init Wt./Vol.: 750 ug/kg Extract Vol: 25 mL

Dupe Init Wt./Vol.: Extract Vol:

Matrix Spike Summary

Original Sample ID: 1626500
 MS Sample ID: 1626501 MS
 MSD Sample ID: 1626502 MSD

Analysis Date: 07/28/2021 15:52
 Analysis Date: 07/28/2021 13:23
 Analysis Date: 07/28/2021 13:40
 Matrix: Solid/Soil (Wet Weight)

QC for Samples: 1214397001, 1214397002, 1214397003, 1214397004, 1214397005, 1214397006, 1214397007, 1214397008, 1214397009, 1214397010

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 | 25.9U | 778 | 814 | 105 | 778 | 813 | 105 | 75-123 | 0.06 | (< 20) |
| 1,2-Dibromoethane | 0.520U | 778 | 860 | 111 | 778 | 854 | 110 | 78-122 | 0.73 | (< 20) |
| 1,2-Dichloroethane | 1.03U | 778 | 710 | 91 | 778 | 694 | 89 | 73-128 | 2.30 | (< 20) |
| 1,3,5-Trimethylbenzene | 12.9U | 778 | 821 | 106 | 778 | 774 | 100 | 73-124 | 5.90 | (< 20) |
| Benzene | 6.50U | 778 | 761 | 98 | 778 | 741 | 95 | 77-121 | 2.60 | (< 20) |
| Ethylbenzene | 12.9U | 778 | 746 | 96 | 778 | 724 | 93 | 76-122 | 3.00 | (< 20) |
| Isopropylbenzene (Cumene) | 12.9U | 778 | 753 | 97 | 778 | 736 | 95 | 68-134 | 2.40 | (< 20) |
| Methyl-t-butyl ether | 52.0U | 1170 | 1050 | 90 | 1170 | 1060 | 91 | 73-125 | 0.83 | (< 20) |
| Naphthalene | 12.9U | 778 | 818 | 105 | 778 | 843 | 108 | 62-129 | 2.90 | (< 20) |
| n-Butylbenzene | 12.9U | 778 | 803 | 103 | 778 | 783 | 101 | 70-128 | 2.50 | (< 20) |
| o-Xylene | 12.9U | 778 | 765 | 98 | 778 | 755 | 97 | 77-123 | 1.30 | (< 20) |
| P & M -Xylene | 25.9U | 1560 | 1470 | 94 | 1560 | 1440 | 92 | 77-124 | 2.10 | (< 20) |
| sec-Butylbenzene | 12.9U | 778 | 781 | 100 | 778 | 763 | 98 | 73-126 | 2.30 | (< 20) |
| tert-Butylbenzene | 12.9U | 778 | 799 | 103 | 778 | 784 | 101 | 73-125 | 2.00 | (< 20) |
| Toluene | 12.9U | 778 | 758 | 98 | 778 | 745 | 96 | 77-121 | 1.70 | (< 20) |
| Xylenes (total) | 38.9U | 2330 | 2230 | 96 | 2330 | 2190 | 94 | 78-124 | 1.80 | (< 20) |
| Surrogates | | | | | | | | | | |
| 1,2-Dichloroethane-D4 (surr) | | 778 | 740 | 95 | 778 | 729 | 94 | 71-136 | 1.50 | |
| 4-Bromofluorobenzene (surr) | | 1300 | 1080 | 83 | 1300 | 1070 | 82 | 55-151 | 1.30 | |
| Toluene-d8 (surr) | | 778 | 769 | 99 | 778 | 771 | 99 | 85-116 | 0.24 | |

Batch Information

Analytical Batch: VMS20981
 Analytical Method: SW8260D
 Instrument: VQA 7890/5975 GC/MS
 Analyst: S.S
 Analytical Date/Time: 7/28/2021 1:23:00PM

Prep Batch: VXX37523
 Prep Method: Vol. Extraction SW8260 Field Extracted L
 Prep Date/Time: 7/28/2021 6:00:00AM
 Prep Initial Wt./Vol.: 48.23g
 Prep Extract Vol: 25.00mL

Method Blank

Blank ID: MB for HBN 1823207 [VXX/37526]
Blank Lab ID: 1626563

Matrix: Soil/Solid (dry weight)

QC for Samples:
1214397009, 1214397010

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 |
| 1,3,5-Trimethylbenzene | 12.5U | 25.0 | 7.80 | ug/kg |
| Naphthalene | 12.5U | 25.0 | 7.80 | ug/kg |
| Surrogates | | | | |
| 1,2-Dichloroethane-D4 (surr) | 110 | 71-136 | | % |
| 4-Bromofluorobenzene (surr) | 99.6 | 55-151 | | % |
| Toluene-d8 (surr) | 99.2 | 85-116 | | % |

Batch Information

Analytical Batch: VMS20983
Analytical Method: SW8260D
Instrument: VQA 7890/5975 GC/MS
Analyst: S.S
Analytical Date/Time: 7/29/2021 10:21:00AM

Prep Batch: VXX37526
Prep Method: SW5035A
Prep Date/Time: 7/29/2021 6:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1214397 [VXX37526]

Blank Spike Lab ID: 1626564

Date Analyzed: 07/29/2021 10:38

Matrix: Soil/Solid (dry weight)

QC for Samples: 1214397009, 1214397010

Results by SW8260D

| Parameter | Blank Spike (ug/kg) | | | CL (Range) |
|------------------------------|---------------------|--------|---------|-----------------|
| | Spike | Result | Rec (%) | |
| 1,2,4-Trimethylbenzene | 750 | 775 | 103 | (75-123) |
| 1,3,5-Trimethylbenzene | 750 | 789 | 105 | (73-124) |
| Naphthalene | 750 | 758 | 101 | (62-129) |
| Surrogates | | | | |
| 1,2-Dichloroethane-D4 (surr) | 750 | | 94 | (71-136) |
| 4-Bromofluorobenzene (surr) | 750 | | 96 | (55-151) |
| Toluene-d8 (surr) | 750 | | 99 | (85-116) |

Batch Information

Analytical Batch: **VMS20983**

Analytical Method: **SW8260D**

Instrument: **VQA 7890/5975 GC/MS**

Analyst: **S.S**

Prep Batch: **VXX37526**

Prep Method: **SW5035A**

Prep Date/Time: **07/29/2021 06:00**

Spike Init Wt./Vol.: 750 ug/kg Extract Vol: 25 mL

Dupe Init Wt./Vol.: Extract Vol:

Matrix Spike Summary

Original Sample ID: 1626565
 MS Sample ID: 1626566 MS
 MSD Sample ID: 1626567 MSD

Analysis Date: 07/29/2021 14:07
 Analysis Date: 07/29/2021 12:44
 Analysis Date: 07/29/2021 13:01
 Matrix: Solid/Soil (Wet Weight)

QC for Samples: 1214397009, 1214397010

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 | 25.9U | 778 | 815 | 105 | 778 | 788 | 101 | 75-123 | 3.40 | (< 20) |
| 1,3,5-Trimethylbenzene | 12.9U | 778 | 815 | 105 | 778 | 790 | 102 | 73-124 | 3.20 | (< 20) |
| Naphthalene | 12.9U | 778 | 784 | 101 | 778 | 790 | 102 | 62-129 | 0.79 | (< 20) |
| Surrogates | | | | | | | | | | |
| 1,2-Dichloroethane-D4 (surr) | | 778 | 714 | 92 | 778 | 708 | 91 | 71-136 | 0.95 | |
| 4-Bromofluorobenzene (surr) | | 1300 | 1070 | 82 | 1300 | 1040 | 80 | 55-151 | 2.70 | |
| Toluene-d8 (surr) | | 778 | 772 | 99 | 778 | 776 | 100 | 85-116 | 0.47 | |

Batch Information

Analytical Batch: VMS20983
 Analytical Method: SW8260D
 Instrument: VQA 7890/5975 GC/MS
 Analyst: S.S
 Analytical Date/Time: 7/29/2021 12:44:00PM

Prep Batch: VXX37526
 Prep Method: Vol. Extraction SW8260 Field Extracted L
 Prep Date/Time: 7/29/2021 6:00:00AM
 Prep Initial Wt./Vol.: 48.23g
 Prep Extract Vol: 25.00mL



Method Blank

Blank ID: MB for HBN 1823232 [VXX/37528]
Blank Lab ID: 1626717

Matrix: Soil/Solid (dry weight)

QC for Samples:

1214397001, 1214397002, 1214397003, 1214397004, 1214397005, 1214397006, 1214397007, 1214397008

Results by AK101

| <u>Parameter</u> | <u>Results</u> | <u>LOQ/CL</u> | <u>DL</u> | <u>Units</u> |
|-----------------------------|----------------|---------------|-----------|--------------|
| Gasoline Range Organics | 1.04J | 2.50 | 0.750 | mg/kg |
| Surrogates | | | | |
| 4-Bromofluorobenzene (surr) | 81.8 | 50-150 | | % |

Batch Information

Analytical Batch: VFC15739
Analytical Method: AK101
Instrument: Agilent 7890A PID/FID
Analyst: MDT
Analytical Date/Time: 7/29/2021 12:57:00PM

Prep Batch: VXX37528
Prep Method: SW5035A
Prep Date/Time: 7/29/2021 6:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

Print Date: 08/06/2021 5:00:12PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1214397 [VXX37528]
 Blank Spike Lab ID: 1626718
 Date Analyzed: 07/29/2021 12:22

Spike Duplicate ID: LCSD for HBN 1214397 [VXX37528]
 Spike Duplicate Lab ID: 1626719
 Matrix: Soil/Solid (dry weight)

QC for Samples: 1214397001, 1214397002, 1214397003, 1214397004, 1214397005, 1214397006, 1214397007, 1214397008

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 | 12.5 | 100 | 12.5 | 12.0 | 96 | (60-120) | 3.90 | (< 20) |
| Surrogates | | | | | | | | | |
| 4-Bromofluorobenzene (surr) | 1.25 | | 80 | 1.25 | | 87 | (50-150) | 8.90 | |

Batch Information

Analytical Batch: **VFC15739**
 Analytical Method: **AK101**
 Instrument: **Agilent 7890A PID/FID**
 Analyst: **MDT**

Prep Batch: **VXX37528**
 Prep Method: **SW5035A**
 Prep Date/Time: **07/29/2021 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



Method Blank

Blank ID: MB for HBN 1823233 [VXX/37529]
Blank Lab ID: 1626720

Matrix: Soil/Solid (dry weight)

QC for Samples:
1214397009, 1214397010, 1214397011

Results by AK101

| <u>Parameter</u> | <u>Results</u> | <u>LOQ/CL</u> | <u>DL</u> | <u>Units</u> |
|-----------------------------|----------------|---------------|-----------|--------------|
| Gasoline Range Organics | 1.04J | 2.50 | 0.750 | mg/kg |
| Surrogates | | | | |
| 4-Bromofluorobenzene (surr) | 83.9 | 50-150 | | % |

Batch Information

Analytical Batch: VFC15739
Analytical Method: AK101
Instrument: Agilent 7890A PID/FID
Analyst: MDT
Analytical Date/Time: 7/29/2021 11:47:00PM

Prep Batch: VXX37529
Prep Method: SW5035A
Prep Date/Time: 7/29/2021 6:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

Print Date: 08/06/2021 5:00:19PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1214397 [VXX37529]
 Blank Spike Lab ID: 1626721
 Date Analyzed: 07/29/2021 23:11

Spike Duplicate ID: LCSD for HBN 1214397 [VXX37529]
 Spike Duplicate Lab ID: 1626722
 Matrix: Soil/Solid (dry weight)

QC for Samples: 1214397009, 1214397010, 1214397011

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 | 12.3 | 98 | 12.5 | 12.1 | 97 | (60-120) | 1.40 | (< 20) |
| Surrogates | | | | | | | | | |
| 4-Bromofluorobenzene (surr) | 1.25 | | 87 | 1.25 | | 88 | (50-150) | 1.70 | |

Batch Information

Analytical Batch: **VFC15739**
 Analytical Method: **AK101**
 Instrument: **Agilent 7890A PID/FID**
 Analyst: **MDT**

Prep Batch: **VXX37529**
 Prep Method: **SW5035A**
 Prep Date/Time: **07/29/2021 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



Method Blank

Blank ID: MB for HBN 1822910 [XXX/45226]
Blank Lab ID: 1625374

Matrix: Soil/Solid (dry weight)

QC for Samples:

1214397001, 1214397002, 1214397003, 1214397004, 1214397005, 1214397006, 1214397007, 1214397008, 1214397009, 1214397010

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) | 91 | 58-103 | | % |
| Fluoranthene-d10 (surr) | 85.3 | 54-113 | | % |

Batch Information

Analytical Batch: XMS12787
Analytical Method: 8270D SIM (PAH)
Instrument: SVA Agilent 780/5975 GC/MS
Analyst: LAW
Analytical Date/Time: 7/28/2021 11:31:00PM

Prep Batch: XXX45226
Prep Method: SW3550C
Prep Date/Time: 7/24/2021 1:20:17PM
Prep Initial Wt./Vol.: 22.5 g
Prep Extract Vol: 5 mL

Print Date: 08/06/2021 5:00:27PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1214397 [XXX45226]

Blank Spike Lab ID: 1625375

Date Analyzed: 07/28/2021 23:51

Matrix: Soil/Solid (dry weight)

QC for Samples: 1214397001, 1214397002, 1214397003, 1214397004, 1214397005, 1214397006, 1214397007, 1214397008, 1214397009, 1214397010

Results by 8270D SIM (PAH)

| Parameter | Blank Spike (ug/kg) | | | CL |
|--------------------------|---------------------|--------|---------|----------|
| | Spike | Result | Rec (%) | |
| 1-Methylnaphthalene | 111 | 100 | 90 | (43-111) |
| 2-Methylnaphthalene | 111 | 103 | 93 | (39-114) |
| Acenaphthene | 111 | 104 | 93 | (44-111) |
| Acenaphthylene | 111 | 106 | 95 | (39-116) |
| Anthracene | 111 | 108 | 98 | (50-114) |
| Benzo(a)Anthracene | 111 | 102 | 92 | (54-122) |
| Benzo[a]pyrene | 111 | 108 | 98 | (50-125) |
| Benzo[b]Fluoranthene | 111 | 108 | 97 | (53-128) |
| Benzo[g,h,i]perylene | 111 | 115 | 103 | (49-127) |
| Benzo[k]fluoranthene | 111 | 110 | 99 | (56-123) |
| Chrysene | 111 | 104 | 94 | (57-118) |
| Dibenzo[a,h]anthracene | 111 | 125 | 113 | (50-129) |
| Fluoranthene | 111 | 95.7 | 86 | (55-119) |
| Fluorene | 111 | 106 | 95 | (47-114) |
| Indeno[1,2,3-c,d] pyrene | 111 | 118 | 106 | (49-130) |
| Naphthalene | 111 | 98.6 | 89 | (38-111) |
| Phenanthrene | 111 | 105 | 95 | (49-113) |
| Pyrene | 111 | 95.7 | 86 | (55-117) |

Surrogates

| | | | | |
|--------------------------------|-----|--|----|----------|
| 2-Methylnaphthalene-d10 (surr) | 111 | | 91 | (58-103) |
| Fluoranthene-d10 (surr) | 111 | | 85 | (54-113) |

Batch Information

Analytical Batch: XMS12787

Analytical Method: 8270D SIM (PAH)

Instrument: SVA Agilent 780/5975 GC/MS

Analyst: LAW

Prep Batch: XXX45226

Prep Method: SW3550C

Prep Date/Time: 07/24/2021 13:20

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

Dupe Init Wt./Vol.: Extract Vol:

Matrix Spike Summary

Original Sample ID: 1214350007
 MS Sample ID: 1625376 MS
 MSD Sample ID: 1625377 MSD

Analysis Date: 07/29/2021 0:53
 Analysis Date: 07/29/2021 1:13
 Analysis Date: 07/29/2021 1:34
 Matrix: Soil/Solid (dry weight)

QC for Samples: 1214397001, 1214397002, 1214397003, 1214397004, 1214397005, 1214397006, 1214397007, 1214397008, 1214397009, 1214397010

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 | 9.24J | 136 | 131 | 96 | 136 | 121 | 89 | 43-111 | 7.20 | (< 20) |
| 2-Methylnaphthalene | 23.5J | 136 | 147 | 108 | 136 | 138 | 102 | 39-114 | 6.20 | (< 20) |
| Naphthalene | 16.6J | 136 | 137 | 101 | 136 | 127 | 94 | 38-111 | 6.70 | (< 20) |
| Surrogates | | | | | | | | | | |
| 2-Methylnaphthalene-d10 (surr) | | 136 | 119 | 88 | 136 | 109 | 80 | 58-103 | 9.20 | |
| Fluoranthene-d10 (surr) | | 136 | 114 | 84 | 136 | 106 | 78 | 54-113 | 7.30 | |

Batch Information

Analytical Batch: XMS12787
 Analytical Method: 8270D SIM (PAH)
 Instrument: SVA Agilent 780/5975 GC/MS
 Analyst: LAW
 Analytical Date/Time: 7/29/2021 1:13:00AM

Prep Batch: XXX45226
 Prep Method: Sonication Extr Soil 8270 PAH SIM 5ml
 Prep Date/Time: 7/24/2021 1:20:17PM
 Prep Initial Wt./Vol.: 22.52g
 Prep Extract Vol: 5.00mL



Method Blank

Blank ID: MB for HBN 1822937 [XXX/45230]
Blank Lab ID: 1625497

Matrix: Soil/Solid (dry weight)

QC for Samples:

1214397001, 1214397002, 1214397003, 1214397004, 1214397005, 1214397006, 1214397007, 1214397008, 1214397009, 1214397010

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) | 108 | 60-120 | | % |

Batch Information

Analytical Batch: XFC16024
Analytical Method: AK102
Instrument: Agilent 7890B R
Analyst: A.A
Analytical Date/Time: 7/30/2021 8:38:00PM

Prep Batch: XXX45230
Prep Method: SW3550C
Prep Date/Time: 7/25/2021 11:27:29AM
Prep Initial Wt./Vol.: 30 g
Prep Extract Vol: 5 mL

Print Date: 08/06/2021 5:00:34PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1214397 [XXX45230]
 Blank Spike Lab ID: 1625498
 Date Analyzed: 07/30/2021 20:48

Spike Duplicate ID: LCSD for HBN 1214397 [XXX45230]
 Spike Duplicate Lab ID: 1625499
 Matrix: Soil/Solid (dry weight)

QC for Samples: 1214397001, 1214397002, 1214397003, 1214397004, 1214397005, 1214397006, 1214397007, 1214397008, 1214397009, 1214397010

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 | 732 | 110 | 667 | 728 | 109 | (75-125) | 0.57 | (< 20) |
| Surrogates | | | | | | | | | |
| 5a Androstane (surr) | 16.7 | | 117 | 16.7 | | 117 | (60-120) | 0.12 | |

Batch Information

Analytical Batch: **XFC16024**
 Analytical Method: **AK102**
 Instrument: **Agilent 7890B R**
 Analyst: **A.A**

Prep Batch: **XXX45230**
 Prep Method: **SW3550C**
 Prep Date/Time: **07/25/2021 11:27**
 Spike Init Wt./Vol.: 667 mg/kg Extract Vol: 5 mL
 Dupe Init Wt./Vol.: 667 mg/kg Extract Vol: 5 mL

Method Blank

Blank ID: MB for HBN 1822937 [XXX/45230]
Blank Lab ID: 1625497

Matrix: Soil/Solid (dry weight)

QC for Samples:

1214397001, 1214397002, 1214397003, 1214397004, 1214397005, 1214397006, 1214397007, 1214397008, 1214397009, 1214397010

Results by AK103

| <u>Parameter</u> | <u>Results</u> | <u>LOQ/CL</u> | <u>DL</u> | <u>Units</u> |
|--------------------------|----------------|---------------|-----------|--------------|
| Residual Range Organics | 50.0U | 100 | 43.0 | mg/kg |
| Surrogates | | | | |
| n-Triacontane-d62 (surr) | 112 | 60-120 | | % |

Batch Information

Analytical Batch: XFC16024
Analytical Method: AK103
Instrument: Agilent 7890B R
Analyst: A.A
Analytical Date/Time: 7/30/2021 8:38:00PM

Prep Batch: XXX45230
Prep Method: SW3550C
Prep Date/Time: 7/25/2021 11:27:29AM
Prep Initial Wt./Vol.: 30 g
Prep Extract Vol: 5 mL

Print Date: 08/06/2021 5:00:41PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1214397 [XXX45230]
 Blank Spike Lab ID: 1625498
 Date Analyzed: 07/30/2021 20:48

Spike Duplicate ID: LCSD for HBN 1214397 [XXX45230]
 Spike Duplicate Lab ID: 1625499
 Matrix: Soil/Solid (dry weight)

QC for Samples: 1214397001, 1214397002, 1214397003, 1214397004, 1214397005, 1214397006, 1214397007, 1214397008, 1214397009, 1214397010

Results by AK103

| Parameter | Blank Spike (mg/kg) | | | Spike Duplicate (mg/kg) | | | CL | RPD (%) | RPD CL |
|--------------------------|---------------------|--------|---------|-------------------------|--------|---------|------------|---------|---------|
| | Spike | Result | Rec (%) | Spike | Result | Rec (%) | | | |
| Residual Range Organics | 667 | 698 | 105 | 667 | 700 | 105 | (60-120) | 0.32 | (< 20) |
| Surrogates | | | | | | | | | |
| n-Triacontane-d62 (surr) | 16.7 | | 118 | 16.7 | | 117 | (60-120) | 1.40 | |

Batch Information

Analytical Batch: **XFC16024**
 Analytical Method: **AK103**
 Instrument: **Agilent 7890B R**
 Analyst: **A.A**

Prep Batch: **XXX45230**
 Prep Method: **SW3550C**
 Prep Date/Time: **07/25/2021 11:27**
 Spike Init Wt./Vol.: 667 mg/kg Extract Vol: 5 mL
 Dupe Init Wt./Vol.: 667 mg/kg Extract Vol: 5 mL



1214397



SGS North America Inc.
CHAIN OF CUSTODY RECORD

Profile # 334904 CR

www.us.sgs.com

Page 1 of 2

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

| | | | | | | | |
|---------------------------------|--|---|--|--|--|--|--|
| CLIENT: EMI | | PHONE #: 907-223-3544 | | Section 3 | | Preservative | |
| CONTACT: Shayla Marshall | | PROJECT/ PWSID/ PERMIT#: | | Section 4 | | DOD Project? Yes <input type="radio"/> No <input checked="" type="radio"/> | |
| PROJECT NAME: Shungvale | | E-MAIL: smarshall@emi-alaska.com | | Temp Blank °C: 47 | | Chain of Custody Seal: (Circle) INTACT BROKEN ABSENT | |
| REPORTS TO: Shayla | | Profile #: emi-alaska.com | | or Ambient: <input type="checkbox"/> | | Delivery Method: <input type="checkbox"/> Hand Delivery <input checked="" type="checkbox"/> Commercial Delivery <input type="checkbox"/> | |
| INVOICE TO: EMI | | QUOTE #: | | Delivery Method: <input type="checkbox"/> Hand Delivery <input checked="" type="checkbox"/> Commercial Delivery <input type="checkbox"/> | | Data Deliverable Requirements: Level 2 | |
| P.O. #: 18130 | | | | Temp Blank °C: 47 | | Delivery Method: <input type="checkbox"/> Hand Delivery <input checked="" type="checkbox"/> Commercial Delivery <input type="checkbox"/> | |

| RESERVED for lab use | SAMPLE IDENTIFICATION | DATE mm/dd/yy | TIME HH:MM | MATRIX MATRIX CODE | # CONTAINERS | Comp Grab MI (Multi-Incremental) | Analysis* | REMARKS/LOC ID |
|----------------------|-----------------------|---------------|------------|--------------------|--------------|----------------------------------|--------------|----------------|
| | 1A-B 18130 TP1S1 | 07/15/21 | 1539 | Soil | 2 | X | GRO/VOCP/PAH | |
| | 2A-B 18130 TP2S2 | | 1524 | | | X | DRO/RO/PAH | |
| | 3A-B 18130 TP3S3 | | 1620 | | | X | | |
| | 4A-B 18130 TP3S5 | | 1622 | | | X | | |
| | 5A-B 18130 TP4S3 | | 1637 | | | X | | |
| | 10A-B 18130 TP5S3 | | 1658 | | | X | | |
| | 7A-B 18130 TP6S1 | | 1715 | | | X | | |
| | 8A-B 18130 TP6S11 | | 1718 | | | X | | |
| | 9A-B 18130 TP7S2 | | 1748 | | | X | | |
| | 10A-B 18130 TP8S1 | | 1755 | | | X | | |

| | | | |
|---|----------------------|--------------------|--|
| Relinquished By: (1) Shayla Marshall | Date: 7/15/21 | Time: 1930 | Received By: Willie Holt |
| Relinquished By: (2) Shayla Marshall | Date: 7/16/21 | Time: 10:47 | Received By: Willie Holt |
| Relinquished By: (3) Willie Holt | Date: 7/19/21 | Time: 10:47 | Received By: Willie Holt |
| Relinquished By: (4) | Date: 7/20/21 | Time: 11:06 | Received For Laboratory By: Willie Holt |

| | | |
|--|--|---|
| Section 4 | Temp Blank °C: 47 | Chain of Custody Seal: (Circle) INTACT BROKEN ABSENT |
| Cooler ID: 1081 | Delivery Method: <input type="checkbox"/> Hand Delivery <input checked="" type="checkbox"/> Commercial Delivery <input type="checkbox"/> | |
| Requested Turnaround Time and/or Special Instructions: Standard | | |



SGS North America Inc.
CHAIN OF CUSTODY RECORD

www.us.sgs.com

Page 2 of 2

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 | | | | | | | |
|---|--|--|--|--|--|--|--|--|--|--|--|---|--|--|--|--|--|--|--|---|--|--|--|
| CLIENT: EMI CONTACT: Shawna Marshall PHONE #: 907-223-3544 | | | | PROJECT NAME: Smuggler REPORTS TO: Shawna INVOICE TO: EMI P.O. #: 18130 | | | | PROJECT/ PWSID/ PERMIT#: _____ E-MAIL: smarshall@emi-alaska.com Profile #: _____ QUOTE #: _____ | | | | # CONTAINERS Comp Grab MI (Multi-Incre-mental) Meets Analysis* | | | | Preservative Section 4 DOD Project? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | | | | Relinquished By: (1) _____ Date: 7/15/21 Time: 1930 Received By: [Signature] | | | |
| Relinquished By: (2) _____ Date: 7/16/21 Time: 10:47 Received By: [Signature] | | | | Relinquished By: (3) _____ Date: _____ Time: _____ Received By: _____ | | | | Relinquished By: (4) _____ Date: _____ Time: _____ Received For Laboratory By: _____ | | | | Temp Blank °C: 47 Chain of Custody Seal: (Circle) INTACT ABSENT Delivery Method: Hand Delivery <input type="checkbox"/> Commercial Delivery <input type="checkbox"/> | | | | | | | | | | | |
| RESERVED for lab use 18130 STR DATE mm/dd/yy: 07/15/21 TIME HH:MM: 1500 MATRIX CODE: Soil | | | | Section 3 Grab X GRO/VOC (Perm) | | | | Section 4 DOD Project? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Data Deliverable Requirements: Level 2 Cooler ID: 1 of 1 Requested Turnaround Time and/or Special Instructions: Standard | | | | NOTE: The following analyses require specific method and/or compound list: BTEX, Metals, PFAS REMARKS/LOC ID | | | | | | | | | | | |

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

| | | | |
|--|--|--------------------------|--|
| Review Criteria | | Condition (Yes, No, N/A) | |
| Chain of Custody / Temperature Requirements | | | |
| Were Custody Seals intact? Note # & location | | N/A | |
| COC accompanied samples? | | Yes | |
| DOD: Were samples received in COC corresponding coolers? | | 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 | |
| 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? | | <input type="checkbox"/> | |
| If <0°C, were sample containers ice free? | | <input type="checkbox"/> | |
| Note: Identify containers received at non-compliant temperature. Use form FS-0029 if more space is needed. | | | |
| Holding Time / Documentation / Sample Condition Requirements | | | |
| Do samples match COC** (i.e., sample IDs, dates/times collected)? | | N/C | |
| **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 samples in good condition (no leaks/cracks/breakage)? | | Yes | |
| Were analytical requests clear? (i.e., method is specified for analyses with multiple option for analysis (EX: BTEX, Metals)) | | Yes | |
| 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+BF3? | | N/C | |
| For Rush/Short Hold Time, was RUSH/Short HT email sent? | | N/A | |
| Note to Client: Any "No", answer above indicates non-compliance with standard procedures and may impact data quality. | | | |
| Additional notes (if applicable): | | | |
| SGS Profile # | | 0 | |



e-Sample Receipt Form

SGS Workorder #:

1214397



1 2 1 4 3 9 7

| 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, 1B |
| COC accompanied samples? | Yes | |
| DOD: Were samples received in COC corresponding coolers? | N/A | |
| Yes **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)? | N/A | Cooler ID: 1 @ 4.0 °C Therm. ID: D64 |
| | | 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.200.8/6020B). |
| Volatile / LL-Hg Requirements | | |
| Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples? | Yes | |
| Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)? | N/A | |
| Were all soil VOAs field extracted with MeOH+BFB? | Yes | |
| Note to Client: Any "No", answer above indicates non-compliance with standard procedures and may impact data quality. | | |
| Additional notes (if applicable): | | |
| | | |



Sample Containers and Preservatives

| <u>Container Id</u> | <u>Preservative</u> | <u>Container Condition</u> | <u>Container Id</u> | <u>Preservative</u> | <u>Container Condition</u> |
|---------------------|--------------------------|----------------------------|---------------------|---------------------|----------------------------|
| 1214397001-A | Methanol field pres. 4 C | OK | | | |
| 1214397001-B | No Preservative Required | OK | | | |
| 1214397002-A | Methanol field pres. 4 C | OK | | | |
| 1214397002-B | No Preservative Required | OK | | | |
| 1214397003-A | Methanol field pres. 4 C | OK | | | |
| 1214397003-B | No Preservative Required | OK | | | |
| 1214397004-A | Methanol field pres. 4 C | OK | | | |
| 1214397004-B | No Preservative Required | OK | | | |
| 1214397005-A | Methanol field pres. 4 C | OK | | | |
| 1214397005-B | No Preservative Required | OK | | | |
| 1214397006-A | Methanol field pres. 4 C | OK | | | |
| 1214397006-B | No Preservative Required | OK | | | |
| 1214397007-A | Methanol field pres. 4 C | OK | | | |
| 1214397007-B | No Preservative Required | OK | | | |
| 1214397008-A | Methanol field pres. 4 C | OK | | | |
| 1214397008-B | No Preservative Required | OK | | | |
| 1214397009-A | Methanol field pres. 4 C | OK | | | |
| 1214397009-B | No Preservative Required | OK | | | |
| 1214397010-A | Methanol field pres. 4 C | OK | | | |
| 1214397010-B | No Preservative Required | OK | | | |
| 1214397011-A | Methanol field pres. 4 C | OK | | | |

Container Condition Glossary

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

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

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

DM - The container was received damaged.

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

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

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

PA - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt and the container is now at the correct pH. See the Sample Receipt Form for details on the amount and lot # of the preservative added.

PH - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt, but was insufficient to bring the container to the correct pH for the analysis requested. See the Sample Receipt Form for details on the amount and lot # of the preservative added.

QN - Insufficient sample quantity provided.

Laboratory Data Review Checklist

Completed By:

Shayla Marshall

Title:

Qualified Environmental Professional

Date:

September 29, 2021

Consultant Firm:

Environmental Management, Inc.

Laboratory Name:

SGS North America

Laboratory Report Number:

1214397

Laboratory Report Date:

August 9, 2021

CS Site Name:

Shungnak School Tank Heating Oil Release

ADEC File Number:

Spill No. 20389917201

Hazard Identification Number:

NA

1214397

Laboratory Report Date:

August 9, 2021

CS Site Name:

Shungnak School Tank Heating Oil Release

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:

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:

4.0 ° C

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

Yes No N/A Comments:

1214397

Laboratory Report Date:

August 9, 2021

CS Site Name:

Shungnak School Tank Heating Oil Release

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

Yes No N/A Comments:

No issues noted

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

Yes No N/A Comments:

No issues were noted.

e. Data quality or usability affected?

Comments:

No issues were noted, therefore the data is considered usable.

4. Case Narrative

a. Present and understandable?

Yes No N/A Comments:

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

Yes No N/A Comments:

For Sample TP7S2:

-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

c. Were all corrective actions documented?

Yes No N/A Comments:

No corrective actions were documented.

1214397

Laboratory Report Date:

August 9, 2021

CS Site Name:

Shungnak School Tank Heating Oil Release

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

Comments:

The case narrative did not note the effect on data quality/usability.

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:

1,2-Dibromoethane LOQ is greater than the Cleanup Level for each sample, including the trip blank. Benzene LOQ for Sample TP7S2 also exceeded the Cleanup Level.

e. Data quality or usability affected?

With the exception of Sample TP7S2, the sample concentrations were either non-detect or well below cleanup levels. Therefore, the data is considered usable, despite the elevated LOQ for 1,2-dibromoethane.

Although the benzene LOQ for Sample TP7S2 exceeded cleanup level, there were numerous other analytes that exceeded cleanup level. As a result, this is considered usable for this project purpose of determining of contamination is present.

1214397

Laboratory Report Date:

August 9, 2021

CS Site Name:

Shungnak School Tank Heating Oil Release

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:

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

Comments:

Not applicable

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

Yes No N/A Comments:

No Method Blank detections above LOQ

v. Data quality or usability affected?

Comments:

Not applicable

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:

Metals were not analyzed

1214397

Laboratory Report Date:

August 9, 2021

CS Site Name:

Shungnak School Tank Heating Oil Release

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:

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:

Not applicable

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

Yes No N/A Comments:

LCS/LCSD all within QC criteria

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

Comments:

No QC issues so data is considered usable.

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:

1214397

Laboratory Report Date:

August 9, 2021

CS Site Name:

Shungnak School Tank Heating Oil Release

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:

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:

1214397

Laboratory Report Date:

August 9, 2021

CS Site Name:

Shungnak School Tank Heating Oil Release

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:

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:

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:

Only one cooler was used

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

Yes No N/A Comments:

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

Comments:

Not applicable

1214397

Laboratory Report Date:

August 9, 2021

CS Site Name:

Shungnak School Tank Heating Oil Release

v. Data quality or usability affected?

Comments:

Trip blank results within QC criteria; data is considered usable.

f. Field Duplicate

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

Yes No N/A Comments:

Samples TP6S1 and TP6S11

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)

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

Where R_1 = Sample Concentration
 R_2 = Field Duplicate Concentration

Yes No N/A Comments:

RRO – 117 mg/kg (TP6S1) and 352 mg/kg (TP6S11); RPD = 100%

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

Comments:

Both concentrations were less than ADEC Cleanup Levels, so the data is considered usable for this project purpose.

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

Yes No N/A Comments:

Disposal equipment was used for sampling

1214397

Laboratory Report Date:

August 9, 2021

CS Site Name:

Shungnak School Tank Heating Oil Release

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

Yes No N/A Comments:

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

Comments:

Not applicable

iii. Data quality or usability affected?

Comments:

Not applicable—disposable equipment was used.

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

a. Defined and appropriate?

Yes No N/A Comments:

No others noted