Trench Installation for Preliminary Drum Assessment Report

Napaskiak, Alaska

Prepared for ECI/Hyer Architecture & Interiors

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TABLE OF CONTENTS

FIGURES

APPENDICES

ACRONYMS AND ABBREVIATIONS

°C.....degrees Celsius
°F.....degrees Fahrenheit
AAC.....Alaska Administrative Code
ADEC .....Alaska Department of Environmental Conservation
AST.....aboveground storage tank
BTEX.....benzene, toluene, ethylbenzene, and toluene
bgs .....below ground surface
BIA.....Bureau of Indian Affairs
COC.....chain of custody
CSM.....Conceptual Site Model
Cruz.....Cruz Construction, Inc.
COPC.....contaminant of potential concern
DRO.....diesel-range organics
ECI/Hyer.....ECI/Hyer Architecture & Interiors
EPA.....U.S. Environmental Protection Agency
ERM.....ERM Alaska, Inc.
ft.....feet
g .....gram
GRO.....gasoline-range organics
HAZWOPER.....Hazardous Waste Operations and Emergency Response
LKSD .....Lower Kuskokwim School District
mg/kg .....milligrams per kilogram
OASIS.....OASIS Environmental, Inc.
PAH.....polycyclic aromatic hydrocarbons
PCB.....polychlorinated biphenyl
PID.....photoionization detector
PPE .....personal protective equipment
QA/QC .....quality assurance/quality control
RRO .....residual-range organics
SSC.....subsurface clearance
SGS .....SGS Environmental Services, Inc.
SVOC.....semi-volatile organic compound
VOC.....volatile organic compound

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EXECUTIVE SUMMARY

ECI/Hyer Architecture & Interiors has tasked ERM Alaska, Inc., formerly OASIS Environmental, Inc., with completion of tasks associated with a preliminary assessment of possible buried drums at the former Bureau of Indian Affairs school site in Napaskiak, Alaska. The suspected drum site is within the proposed footprint of a grass play field, located adjacent to the new school building being designed for the Lower Kuskokwim School District (LKSD). This project was designed to help determine the presence and density of drums in the potential drum pit.

In accordance with the *Trench Installation for Preliminary Drum Assessment Work Plan*, two trenches, each 50 feet (ft) in length and up to 8 ft deep, were to be excavated to assess for the possible presence of drums. During excavation of these trenches, drums were encountered. All drums encountered appear to have been empty and punctured prior to burial. To better define the extent of the drum pit, the extent of the trenches was modified based on the locations where drums were found. Additional trenches and test pits were excavated to determine the limits of the buried drums.

In accordance with the work plan, analytical samples were collected to assess contaminants that have been released to site soils. The area was known to be impacted by fuel contamination at concentrations above the migration to groundwater cleanup level, but below cleanup levels protective of direct contact and outdoor inhalation. Low levels of fuel contamination were found, but visual evidence and analytical results suggest that the drums were empty when buried.

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1. INTRODUCTION

This report describes the site background, project objectives, contaminants of concern, completed field activities, soil sampling analytical results, quality assurance/quality control information, and the conceptual site model.

1.1. Background

1.1.1. Site Information

The project site is located in Napaskiak, a small village situated in southwestern Alaska on the Yukon-Kuskokwim Delta. It is positioned on the south bank of the Kuskokwim River, at the mouth of Napaskiak Slough, approximately 7 miles downriver from Bethel. The village lies at approximately 60.708060° north latitude and 161.766110° west longitude; section 08, township 007 north, range 071 west (T007N, R071W), Seward Meridian and is included in the Bethel Recording District. The village area encompasses approximately 3.5 square miles of land and 0.4 square miles of water. Napaskiak is strongly influenced by storms and patterns in the Bering Sea and also by inland continental weather. Average annual precipitation is 16 inches, including 50 inches of snowfall. Summer temperatures range from 42 to 62 degrees Fahrenheit (ºF), and winter temperatures range from -2 to 19˚ F (Alaska Community Database Community Information Summaries 2009) (Figure 1).

The village is located in the floodplain of the Kuskokwim River which consists of fluvial and floodplain deposits. Groundwater depth may vary seasonally, but is assumed to be approximately 7 to 9 feet (ft) below ground surface (bgs). A field team excavating test pits at the site in 2011 reported water seeping into the test pits at depths that generally ranged from 7 to 7.5 ft bgs (Alaska Department of Environmental Conservation [ADEC] 2012).

The former Bureau of Indian Affairs (BIA) school site is located in the western half of the village and approximately 150 ft south of the Napaskiak Slough (Figure 2).The BIA school was replaced in 1980 by the Z. John Williams Memorial School which is located approximately 350 ft southeast of the former BIA school site. The Z. John Williams Memorial School is scheduled for replacement, with ECI/Hyer Architecture & Interiors (ECI/Hyer) as the acting architectural firm. The former BIA school site is currently the planned location for the new school. There are presently two abandoned buildings on the site, including the former BIA school building (PK08) and the housing building (PK09/PK15). Two buildings (PK06 and PK07) were demolished in 2012 (Figure 2).

In October 2012, the Lower Kuskokwim School District (LKSD) provided ERM Alaska, Inc. (ERM), formerly OASIS Environmental, Inc. (OASIS), with photographs of a drawing dated March 1970 from the Department of the Interior, Bureau of Indian Affairs, Division of Plant Design and Construction. Notations include "*Napaskiak School,*

Napaskiak, Alaska, Kindergarten: Classroom and Quarters". This drawing has an annotation "*Existing Backfilled Pit – Verify*".

A second drawing is dated October 23, 1972 and titled *Napaskiak, Alaska, Water & Waste Treatment*. This drawing shows a "*pit filled with 55 gal. drums*" in the same area as in the 1970 drawing. The drawing contains a note to "*obtain fill from suitable remote area (not crest of hill) and backfill pit presently containing 55 gallon drums*." Prior to the assessment it was unclear whether or not the drums were still present and, if present, whether they were full or empty, intact or crushed when they were buried. When considered together, the two drawings seem to infer that the BIA had a plan to cover the drums where they were located in the pit. The drawings are presented in Appendix A.

1.1.2. Previous Assessment and Remediation Events

Previous assessment and remediation events have been conducted in this area. These efforts include a site reconnaissance in 2001, a site characterization in 2011, and hand auger boring and landfarming activities in 2012. Each is discussed below.

1.1.2.1. 2001 Site Reconnaissance

In 2001, OASIS conducted an area-wide reconnaissance of the Napaskiak tank farms (OASIS 2002). Adjacent to the abandoned BIA school and utility building, day tanks were present. The tanks are now gone but cribbing denoted the area where the tanks had existed. An area of stained soil was noted at this location and a sample collected from 3 ft bgs within the stained area had a diesel-range organics (DRO) concentration of 38,900 milligrams per kilogram (mg/kg). Other petroleum constituents were below the ADEC 18 Alaska Administrative Code (AAC) 75.341 Table B1 Method Two - Soil Cleanup Levels. The school's drinking water well was located about 550 ft southeast of the stained area at the Z. John Williams School (Figure 2).

Three other spill areas were identified in this immediate area. One was to the west of the day tank area and was a release from BIA piping. The second was located southwest of the day tank release at a former containment area; the spill was related to a cracked piping. The third release was a small area from a suspected leaking header valve just north of the utility building. A second former aboveground storage tank containment area was located south of the former school. This area was not sampled.

1.1.2.2. 2011 Site Characterization of Former BIA School Day Tanks

In 2011, site characterization was conducted to assess the site for potential environmental contamination from historical uses, in preparation for construction of the proposed new school. This assessment was documented in the report titled *Napaskiak Former BIA School Day Tanks; Site Characterization Report* (ADEC 2012a). Among the tasks associated with the site characterization, ERM assessed surface and subsurface soils by digging test pits in four areas of potential concern and collecting soil samples. Samples were analyzed for DRO, residual-range organics (RRO), gasoline-range organics (GRO),

benzene, toluene, ethylbenzene and xylenes (BTEX), and polycyclic aromatic hydrocarbons (PAH).

ERM and their subcontractor used a small excavator to dig a total of 25 test pits in the areas of potential concern (Figure 3). Each area contained test pits with DRO concentrations exceeding the ADEC 18 AAC 75.341 Table B2 Method Two – Petroleum Hydrocarbon Soil Cleanup Level of 250 mg/kg, for migration to groundwater. ERM utilized the soil sample analytical results to delineate the extent of impact in the four areas and designated these areas A, B, C and D. The suspected drum pit is located adjacent to Area D where 5 test pits were excavated (Figure 3); however, no drums were encountered in any of these test pits. Note that test pit D1 was only excavated to 0.5 ft bgs because of lack of excavator access. Test pits D2 and D3 extended to 8 ft bgs. Soil sample analytical results indicated three of the five tests pits in Area D had DRO levels that exceeded the soil cleanup level for migration to groundwater. All other DRO, RRO, GRO, and BTEX results were below cleanup levels. Table 1 below presents the soil sample analytical results of test pits with DRO concentrations exceeding the soil cleanup level for migration to groundwater.

TABLE 1: TEST PIT ANALYTICAL RESULTS FOR AREA D

Test Pit	Depth	DRO Results (mg/kg)
D1	0.5 ft bgs	26,100
D2	0.5 ft bgs	608
D3	2.0 ft bgs	2,420

1.1.2.3. 2012 Landfarming

Analytical results indicated concentrations of DRO exceeded the ADEC 18 AAC 75.341 Table B2 Method Two – Petroleum Hydrocarbon Soil Cleanup Level of 12,500 and 10,250 mg/kg for the inhalation and ingestion exposure pathways, respectively, in surface soil samples collected in the vicinity of the former school buildings. In-place landfarming was selected as the most feasible method to reduce concentrations of DRO in soil. Aggressive soil tilling was expected to provide two benefits: reduce contaminant concentrations to below the level at which they are toxic to bacteria (speeding biodegradation) and address potential human health risk via the ingestion and inhalation pathways. An area of stained soil sampled in 2011 contained a DRO concentration of 38,900 mg/kg. Otherwise, the maximum DRO concentration detected at the site in 2011 was 26,100 mg/kg. Fuel concentrations greater than approximately 25,000 mg/kg are considered inhibitory and/or toxic to aerobic bacteria (EPA 2004). Thus, soil concentrations greater than this threshold tend to decrease only very slowly over time. Aggressive soil tilling may reduce soil concentration to below this threshold, allowing microorganisms capable of degrading petroleum hydrocarbons conditions in which they can survive and thrive. The initial tilling was also expected to reduce average soil concentrations below 10,250 mg/kg, the DRO cleanup standard for the

ingestion exposure pathway (The inhalation standard is slightly higher at 12,500 mg/kg).

The LKSD constructed two in-place landfarm cells at the site. Thorough tilling of fuel-contaminated soil was performed over the course of eight tilling events during a four week period. Tilling took place to a depth of 18 inches below ground surface (bgs) (OASIS 2013a). After the initial tilling event, baseline samples were collected. Soils were placed on a surface slope of 0.5% towards runoff containment areas. Barriers were constructed 24-inches high surrounding the landfarm cells to prevent contaminant migration. An ERM field scientist remobilized to the site to collect post-treatment composite samples at the end of the treatment season to assess current residual contaminant concentrations. Soil sample analytical results indicated DRO concentrations were 3,098 and 2,964 mg/kg in landfarm cells A and B, respectively. These contaminant concentrations are below levels expected to pose a risk through the ingestion and inhalation exposure pathways. More information about this event is documented in the report titled *Napaskiak Remediation Report* (OASIS 2013a).

1.1.2.4. 2012 Hand Auger Borings

Staff members from LKSD mobilized to the former BIA school site in October 2012 to perform a preliminary assessment of the potential drum pit. Five hand auger borings were performed. Swing ties were used to locate the center of the potential drum pit, as shown on the historical drawings (Appendix A). The first boring was advanced at the approximate center of the area shown, the other four borings were advanced 7.5 ft away from the first boring, in each of the cardinal directions. The first boring was advanced to 8 ft bgs. The remaining four borings were advanced to 6 ft bgs. Boring locations are shown on Figure 3.

Visual inspection of soil cuttings was performed every foot upon auger removal. Soil samples were collected and field screened using a photoionization detector (PID). Samples were collected from the first boring at 4 ft bgs, 6 ft bgs, and 8 ft bgs. All borings were reported to have consistent soil types at each depth interval. At 1-2 ft bgs, soil appeared tilled and disturbed with a slight diesel-fuel odor present but no noticeable discoloration. From 2-4 ft bgs, soils were reportedly silty with some clay, dark brown in color, moist, with no odor. From 4-5 ft bgs, soil reportedly had a loose consistency and was composed of decomposing organic material, with a slight hydrocarbon odor present at 5 ft bgs. Fine sands were reported from 6-8 ft bgs, wet, and with a slight hydrocarbon odor. At 8 ft bgs, sand and silts were reported, and were saturated with a strong hydrocarbon odor.

TABLE 2: LKSD DRUM ASSESSMENT PID SCREENINGS

Location	Depth	PID Results (parts per million)
Boring 1 (headspace)	4 ft bgs	6.8
	6 ft bgs	8.2
	8 ft bgs	148.2
Boring 1 (open hole)	At surface	57
Boring 2 (open hole)	At surface	57
Boring 3 (open hole)	At surface	Not applicable (Water Present)
Boring 4 (open hole)	At surface	84
Boring 5 (open hole)	At surface	47

During the LKSD's investigation, no obstructions were encountered, and no drums or metal of any kind was found.

1.2. Project Objectives

The primary objective of this assessment was to assess whether or not drums were buried in the area shown on the historical drawings provided by the LKSD (Appendix A). Tasks associated with this objective included:

- Excavate a pair of trenches, in an "X" formation, over the potential drum disposal area/pit, to determine whether or not drums are present.
- If drums are encountered:
  - Determine the extent of the drum disposal area/pit, and estimate the density of drums present.
  - Collect and submit soil samples for analysis to characterize potential contamination in the drum disposal area/pit.

1.3. Contaminants of Concern and Regulatory Framework

Due to the potential presence of drums at this site and their unknown contents, ERM conferred with the ADEC to establish a suitable approach to performing the tasks associated with the project objectives. Based on ADEC recommendation, soil samples from the site were to be analyzed for a wide variety of contaminants of potential concern (COPC) if drums were encountered. COPCs typically associated with drum disposal sites in remote locations of Alaska include DRO, RRO, GRO, volatile organic compounds (VOC), semi-volatile organic compounds (SVOC), PAH, polychlorinated biphenyls (PCB), and lead. This selected suite of analytes would be indicative of fuels, lubricating oils, solvents, and/or transformer fluids.

Table 3, shown below, provides analytical methods for each COPC.

TABLE 3: DRUM COPC AND ANALYTICAL METHODS

COPC	Laboratory Method
VOC	EPA Method SW8260B
SVOC	EPA Method SW8270D
PAH	EPA Method SW8270D-SIM
GRO	Alaska Method AK101
DRO	Alaska Method AK102
RRO	Alaska Method AK103
PCB	EPA Method SW8082A
Lead	EPA Method SW6020

Soil sample collection was conducted in accordance with the sampling plan outlined in Section 3.1 of the document titled *Trench Installation for Preliminary Drum Assessment Work Plan* (OASIS 2013b) and all sampling methodologies were performed as described in the ADEC *Draft Field Sampling Guidance* (ADEC 2010a).

Personnel working at this site completed 40-hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training and 8-hour annual HAZWOPER refresher training, as applicable, prior to initiating project work. Personnel also obtained a physician's clearance to wear a respirator, received valid respirator fit test documentation, and acquired a half-face or full-face respirator with organic vapor cartridges.

ERM was instructed to report the release of any drum liquids to the ADEC Prevention and Emergency Response Program (Cob Carlson in Bethel bob.carlson@alaska.gov, 907-543-3215) on the Oil and Hazardous Substances Spill Notification Form (http://dec.alaska.gov/spar/spillreport.htm), and list the BIA and the Department of the Interior as the responsible party. ERM was also advised to notify Grant Lidren of the ADEC simultaneously. However, no release occurred.

2. FIELD ACTIVITIES

This section describes field activities conducted in support of the buried drum pit assessment objectives. ERM personnel provided oversight for drum assessment activities between October 4 and 6, 2013. Cruz Construction, Inc. (Cruz) personnel operated a locally-available backhoe to excavate assessment trenches. SGS Environmental Services, Inc. (SGS), a laboratory approved by ADEC for contaminated sites analysis, provided analytical support. The locations of the trenches, test pits, buried drums, and sample collection points with DRO results are presented on Figure 4. Project site historical plans/drawings are presented in Appendix A. A photographic log is included in Appendix B, and field notes are provided in Appendix C. Appendix D contains a summary of soil sample collection and analyses by date, time, and location. Table D-1 contains detected analytes only; Table D-2 contains all results.

2.1. Area Determination

Using the historical drawings (Appendix A) and swing-tie measurements off of three points on the eastern end of the abandoned BIA school (building PK08), ERM located the approximate center of the potential drum pit. ERM then measured 25 ft to the east and west of this center point to designate the placement of the initial 50-ft-long assessment trench.

2.2. Excavation

Two, 50-foot-long assessment trenches, each approximately perpendicular to the other in an "X" pattern, were planned for installation in the area overlying the potential drum pit. Figure 4 shows both the planned trench layout and the trenches and excavations that were actually dug. The trenches were excavated to a maximum depth of 8 ft bgs. In areas where drums were encountered, the depth of the excavation was limited by the presence of drums. The upper 4-ft layer of excavated soil was placed on one side of the trench, while the lower 4-ft layer of excavated soil was placed on the other side of the trench. This segregation of materials ensured the deeper potentially-contaminated soil was placed back into the trench before the shallower soil during backfill activities. Cruz personnel coordinated the use of, and operated, a locally-available 331 Bobcat with a backhoe attachment for the trench installations. ERM personnel provided project oversight and ensured the subsurface clearance (SSC) process was completed prior to excavation activities. The SSC process was implemented to avoid contact with subsurface structures and included ensuring a public utility locate was completed, utility-specific information from local, knowledgeable individuals was obtained, historical and current site plans and as-built drawings were researched, and a visual site inspection was conducted.

2.2.1. *West to East Trench*

Installation of the first assessment trench was initiated on the western end of the proposed trench location and continued to the east (Appendix B; Photograph 1). The soil horizons were visually analyzed once the maximum depth of 8 ft bgs was initially achieved (Appendix B; Photograph 3). Damp organic material was recorded from 0 - 1 ft bgs. Damp, grey silt, with some native woody material, was recorded from 1 – 8 ft bgs. Buried drums were encountered approximately 8 ft east of the trench installation starting point and approximately 2 - 3 ft bgs (Appendix B; Photograph 4). The buried drums extended an additional 22 ft to the east and were consistently 2 - 3 ft bgs. The assessment trench continued an additional 5 ft east of the buried drums and to a depth of 7 ft bgs. Damp organic material was recorded from 0 - 1 ft bgs. Damp, grey silt, with some native woody material, was recorded from 1 – 7 ft bgs. No additional drums or metal debris were encountered in this interval. Based on these field observations, the eastern and western margins of the buried drum pit appeared to be adequately delineated; however, a test pit was excavated to 5 ft bgs at the eastern extent of the proposed trench (approximately 20′ east of the buried drum pit's eastern margin) to further verify an absence of buried drums. No drums or metal debris were encountered in the test pit. The trench and test pit were backfilled after soil samples were collected and before continuing with the second trench. It should be noted that there was no sign of sheen, hydrocarbon odor, or other contaminant odor during the installation of this assessment trench.

2.2.2. *North to South Trench*

Based on the locations of the eastern and western margins of the buried drum pit, as verified by the initial east - west trending assessment trench, a second north – south trending trench was installed perpendicular to the initial trench, in the assumed center of the buried drum pit (Figure 4). The purpose of this second trench was to delineate the northern and southern margins of the buried drum pit.

Installation of the second assessment trench was initiated on the northern end of the proposed trench location and continued to the south (Figure 4). Buried drums were encountered approximately 11 ft south of the trench installation starting point and approximately 1.5 - 2 ft bgs (Appendix B; Photograph 5). The buried drums extended an additional 16 ft to the south and were consistently 1.5 – 3 ft bgs. The assessment trench continued an additional 2 ft south of the buried drums and to a depth of 7 ft bgs. No additional drums or metal debris were encountered in this interval. Based on these field observations, the northern and southern margins of the buried drum pit appeared to be adequately delineated; however, three test pits were excavated to 5 ft bgs at 5, 13, and 23 ft south of the buried drum pit's southern margin to further verify an absence of buried drums (Appendix B; Photographs 11 and 12). No additional drums or metal debris were encountered in the three test pits. The soil horizons were visually analyzed in each pit. Damp organic material was recorded from 0 - 1 ft bgs. Damp, grey silt, with some native woody material, was recorded from 1 – 5 ft bgs. The trench and test pits were backfilled

after soil samples were collected (Appendix B; Photograph 13). It should be noted that there was no sign of sheen, hydrocarbon odor, or other contaminant odor during the installation of this assessment trench or the associated test pits.

2.2.3. Additional Trenches

Four small additional trenches were installed to delineate the northwestern, northeastern, southwestern, and southeastern margin of the buried drum pit (Figure 4). The trenches were initiated outside of the assumed perimeter of, and commenced in a direction toward the buried drum pit until buried drums were encountered. The trenches ranged from approximately 3 – 7 ft in length and were excavated to approximately 5 ft bgs.

2.3. Drum Assessment

The buried drum pit is located below a portion of the eastern half of the currently-fenced-in landfarm (Cell A) and is an estimated 16 ft wide (north to south) and 22 ft long (east to west). The cluster of drums within the pit appears to be a single layer of 55-gallon steel drums lying on their sides and buried beneath approximately 1.5 to 3 ft of soil. All of the drums encountered appear to have had holes cut in them and the bungs removed prior to burial (Appendix B; Photographs 6 and 7). Most of the drums appeared fairly intact and were empty; however, some were rusted and/or crushed and contained small amounts of accumulated rainwater. There was no sign of sheen, hydrocarbon odor, or other contaminant odor in the area of buried drums. Some of the intact drums contained the markings "MONA LISA." Project Mona Lisa refers to a military program that supplied facilities (particularly Aircraft Control and Warning sites) in Alaska. The number 62 may refer to the year 1962 (Appendix B; Photograph 10). The Mona Lisa project began in 1953, and was renamed Cool Barge in 1966. This information provides some idea as to when the drums were originally shipped to Alaska; however, the drums may have been reused and changed hands before they were disposed of. The approximate perimeter of the buried drum pit was marked with yellow flagging prior to departing the site (Appendix B; Photograph 14).

2.4. Soil Sampling

Soil samples were collected from five locations within the drum pit assessment trenches (and one test pit) to characterize potential soil contamination. Two of the samples (S-02 and S-04) were collected from trench locations within the buried drum pit area and proximal to buried drums. These two samples were collected just below the layer containing the drums. Three of the samples (S-01, S-03, and S-05) were collected from trench and test pit locations outside of the buried drum pit area. The samples were collected from depths ranging from 3 to 7 ft bgs.

ERM personnel directed the excavator operator to scrape a bucket load of soil from the selected depth and collected the sample from undisturbed soil at the center of the bucket. The excavator bucket was cleaned prior to each sampling location using dry

decontamination procedures. New, unused stainless steel sample scoops were used for each sample. Soil samples were transferred into laboratory-provided sample containers; samples for volatile analysis were preserved with methanol. Sample containers were labeled with field sample identification numbers, the date and times of collection, and analyses requested.

Duplicate samples were collected at a frequency of 10% per method for quality assurance/quality control (QA/QC) purposes. Laboratory-prepared trip blanks accompanied all VOC and GRO samples from the laboratory, to the field, and back to the laboratory.

All samples were stored in a cooler with gel ice, maintaining the required temperature range of 4 degrees Celsius (°C) (within ±2°C). Chain-of-custody (COC) procedures were followed.

Due to the logistical difficulties involved in shipping cargo from Napaskiak to Anchorage, the soil samples were kept in Napaskiak until the project crew departed on October 6, 2013. The samples were transported on the same aircraft chartered for the return trip to Bethel. The samples were then shipped to Anchorage on Era Cargo.

Tables D-1 and D-2 of Appendix D summarize the soil samples collected, locations, requested analyses, and analytical results. Laboratory analytical results are discussed in Section 3.

2.5. Investigation-Derived Waste Management

Soil sampling activities generated the following investigation-derived wastes.

- Excess soil remaining after filling sample jars.
- Used disposable personal protective equipment (PPE) and sampling waste.

Excess soil was returned to the buried drum pit area. PPE and disposable sampling wastes were placed in trash bags and disposed of in Napaskiak's Class III landfill.

3. ANALYTICAL RESULTS

This section presents a discussion of the soil sample analytical results. The analytical results along with the regulatory standards used to evaluate the analytical data are presented in Table D-1 and D-2 in Appendix D of this report.

The laboratory analytical report and completed data quality review with ADEC checklist for the sample delivery group are provided in Appendix E and F, respectively.

3.1. Laboratory Analytical Results

3.1.1. Analytical Methods

Soil sample analytical results are summarized in Tables D-1 and D-2 of Appendix D and on Figure 4. Soil samples were submitted to the project laboratory, SGS, in Anchorage, AK, in accordance with standard COC procedures outlined in the work plan. Duplicate samples were collected at a frequency of 10% per method for QA/QC purposes. All samples were preserved and stored at a temperature of 4°C ± 2°C prior to delivery to SGS for laboratory analysis.

Soil samples were analyzed for the following target analytes using the methods specified:

- VOC (EPA Method SW8260B)
- SVOC (EPA Method SW8270 D)
- PAH (EPA Method 8270D - SIM)
- GRO (Alaska Method AK101)
- DRO/RRO (Alaska Method AK 102/103)
- PCB (EPA Method SW8082A)
- Metals – lead only (SW6020)

3.1.2. Soil Sampling Analytical Results

Soil samples were collected from five locations within, and proximal to, the area containing buried, empty drums. Because drums can contain a wide variety of potential contaminants, a wide variety of methods were used to analyze soil samples. In total, each sample was analyzed for 165 contaminants of potential concern. Of these 165 contaminants, 34 were detected. Each result was compared to cleanup levels established in ADEC 18 AAC 75 that are protective of the following exposure pathways: outdoor inhalation, direct contact/ingestion, and migration to groundwater. The sample collected from location SO-2 was the only sample to contain an analyte concentration above an 18 AAC 75 Method Two soil cleanup level. The DRO concentration at this location was 272 mg/kg which exceeded the 250 mg/kg 18 AAC 75.341 Table B2 Method Two – petroleum hydrocarbon soil cleanup level for migration to groundwater.

DRO concentrations at the remaining four sample locations were below the migration to groundwater cleanup level and ranged from 42.8 to 246 mg/kg. GRO, RRO, and lead, as well as various VOCs, SVOs, and PAHs were also detected in soil samples collected at the site, but were found to be well below the most stringent ADEC Table B1 and B2 Method Two soil cleanup levels for the under 40 inch zone (Table D-1 of Appendix D). In some cases, contaminants were not detected, but method detection limits and/or method reporting limits exceeded one or more of the cleanup levels. Such data has been highlighted in Table D-2 of Appendix D; however, when the site data and the analytical data are evaluated together, it is evident that the drums were buried empty.

4. QUALITY ASSURANCE/QUALITY CONTROL

Laboratory QA/QC data associated with the analysis of project samples have been reviewed to evaluate the integrity of the analytical data generated during the October 2013 soil sampling associated with the buried-drum assessment trench installation in Napaskiak, Alaska. Soil samples were shipped to SGS in Anchorage, Alaska and results were reported in one sample delivery group 1135014. Samples were collected, reported, and shipped in general accordance with the ADEC-approved work plan (OASIS 2013b).

All data were reviewed in accordance with appropriate U.S. Environmental Protection Agency (EPA) procedural guidance documents (EPA 2008; 2010) and ADEC regulatory guidance documents (ADEC 2009; 2012b). An ADEC laboratory checklist was completed (ADEC 2010b).

This data review focuses on criteria for the following QA/QC parameters and their effect on the quality of data and usability: sample handling and COC documentation; holding time compliance; field QA/QC (trip blanks, field duplicate) results; laboratory QA/QC (method blanks, laboratory control samples, surrogates, results and analytical methods; method reporting limits; precision and accuracy; and completeness.

Overall, QA/QC results for this project indicate that the analytical data are acceptable and defensible for project use with the following qualifications:

- GRO was detected in the trip blank. As a result, GRO results in samples 13-NK-01-SO and 13-NK-05-SO were qualified as not detected (UB).
- The field duplicate relative percent difference for the duplicate pair collected from sample location SO-2 was outside control limits for the following analytes: DRO, RRO, 1-methylnaphthalene, 2-methylnapthalene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, chrysene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene, naphthalene, phenanthrene, and pyrene. Results were qualified as estimated (JD).
- In PAH 8270-SIM analysis, naphthalene was detected in the method blank. The naphthalene result in samples 13-NK-02-SO, 13-NK-03-SO and 13-NK-06-SO was qualified as estimated with a high bias (JB).
- Surrogate 2-fluorobiphenyl percent recovery was above the limits in PAH-SIM analysis for sample 13-NK-05-SO. Associated positive results were qualified as estimated (JM).

4.1. Detection Limits and Reporting Limits

The detection limit and/or reporting limit was above the 18 AAC 75 cleanup levels for a number of compounds. Note that not detected results where the detection limit was above the ADEC established cleanup level cannot be used to assess the presence or absence of the analyte at concentrations above the cleanup criteria and below the

reported detection limit. The number of analytes with detection limits or reporting limits above cleanup levels was largely a function of the very broad range of the analyses performed; targets included 165 different indicator compounds and surrogates that are considered indicative of contamination from drum sites. This section details the causes for detection limits and/or reporting limits being above 18 AAC 75 cleanup levels.

The case narrative provide by the laboratory generally indicates that (in the AK102 range) the chromatographic pattern is consistent with a weathered middle distallate. These findings are consistent the presence of diesel fuel contamination that is known to be present throughout the area. Measured concentrations of DRO ranged from 42.8 to 272 mg/kg.

For SW8270D analysis, the detection limit and/or reporting limit was above the ADEC cleanup level for migration to groundwater in soil, noted in bold and highlighted in yellow in Table D-1, for the following analytes: 1,2,4-trichlorobenzene, 1,4-dichlorobenzene, 2,4-dinitrophenol, 2,4-dinitrotoluene, 2,6-dinitrotoluene, 3,3'-dichlorobenzidine (and its salts), dichloroethyl ether, hexachlorobenzene, hexachlorobutadiene, hexachlorocyclopentadiene, hexachloroethane, nitrobenzene, n-nitrosodimethylamine, n-nitrosodi-n-propylamine, p-chloroaniline, and pentachlorophenol. The detection limit and/or reporting limit was above the ADEC cleanup level for direct contact for benzo(a)pyrene and dibenzo(a,h)anthracene. Note that analytical method 8270D SIM was also used, which provides lower detection limits for PAH compounds.

For 8270D analysis, samples with elevated detection limits were generally analyzed at a dilution due to matrix interference with internal standards. This resulted in elevated detection limits for some compounds. For these analyses, non-target compounds (possibly biogenic compounds) interfered with internal standards. Soils were described as silt with some native woody debris, grey, and damp. Thus, they were known to have relatively high levels of naturally-occurring, non-target organic compounds.

For 8260B analysis, the detection limit and/or reporting limit was above the ADEC cleanup level for migration to groundwater in soil for the following analytes: 1,1,2,2-tetrachloroethane, 1,1,2-trichloroethane, 1,1-dichloroethene, 1,2,3-trichloropropane, 1,2-dichloroethane, 1,2-dichloropropane, carbon tetrachloride, dibromochloromethane, ethylene dibromide, methyl bromide, methylene chloride, and vinyl chloride. Elevated detection limits were likely due to a number of factors. For some compounds, such as vinyl chloride and ethylene dibromide, providing detection limits lower than the 18 AAC 75 migration to groundwater standard is generally not possible without specialized analytical techniques. Samples for 8260B analysis need to be fully covered with methanol. Within that requirement, the higher mass of soil provided the lower the detection limit will be. Ideally, samples will contain at least 50 grams (g) of soil for an initial weight. With some soil types, particularly soils that contain a high fraction of organics (which tend to be less dense), this can be difficult or impossible. Sample

weights are as follows: 13-NK-01-SO: 52.374 g, 13-NK-02-SO: 41.288 g, 13-NK-03-SO: 39.138 g, 13-NK-04-SO: 47.193 g, 13-NK-05-SO: 45.922 g, and 13-NK-06-SO: 48.109 g. So for some samples, low sample mass may have contributed to elevated detection limits. Finally, low percent solids (i.e. saturated soils) tend to produce elevated detection limits. Sample percent solids are as follows: 13-NK-01-SO: 72.4%, 13-NK-02-SO: 76.6%, 13-NK-03-SO: 75.7%, 13-NK-04-SO: 72.0%, 13-NK-05-SO: 74.1%, and 13-NK-06-SO: 68.0%. So, low percent solids may have contributed to elevated detection limits.

The total overall calculated completeness of the October 2013 set is 100%, which meets the established 85% completeness data quality objective. The full QA/QC report and ADEC Laboratory Data Review Checklists are included in Appendix F.

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5. CONCEPTUAL SITE MODEL

This section presents a human health conceptual site model (CSM) for the site. This CSM is an updated version of the baseline CSM. The baseline CSM was generated based on data collected during an initial site characterization event in August 2011. The baseline CSM, included in the document titled *Napaskiak Former Bureau of Indian Affairs School Day Tanks Site Characterization Report*, shows the exposure pathways that presented a potential concern at that time (ADEC 2012a). The baseline CSM was later updated in consideration of analytical results from soil samples collected in October 2012 following treatment (landfarming) of contaminated soils at the site. The updated CSM and graphic form, included in the document titled *Napaskiak Remediation Work Plan,* explain how each of the exposure pathways has been or will be addressed (OASIS 2013a). The baseline and updated CSM graphic and scoping forms are included in Appendix G. A revised CSM, based on data collected during the October 2013 buried drum assessment event, is not warranted, as additional completed exposure pathways were not identified.

5.1. Receptor Profile

Receptors for the current scenario include residents, construction workers, subsistence harvesters and consumers, and site visitors and trespassers. The LKSD plans to build a new school on the former BIA School site, so schoolchildren, faculty, and staff can be considered potential future receptors.

5.2. Exposure Pathways

At landfarm cells A and B, contamination is present in surface soils. The distribution of contamination at cell A also includes contamination as deep as 8 ft bgs. Increasing concentrations with depth at landfarm cell A suggest that contamination may have migrated to the groundwater table and then spread as a light non-aqueous phase liquid.

The presence of shallow groundwater and current groundwater use in the area make the groundwater ingestion, direct contact, and inhalation of volatile compounds potentially complete exposure pathways. Ongoing monitoring of the water supply will be required to protect drinking water wells located in the Water Treatment Plant and the School Well House. Contaminants above drinking water maximum contaminant levels, or in the case of DRO, the 18 AAC 75 Table C groundwater cleanup levels, represent a potentially unacceptable risk if ingestion were to occur. If contaminants were detected above these levels, it would trigger the need to take additional measures to eliminate these exposure pathways. Such additional measures might include treating the water or switching to an alternate water source.

The ADEC has not published cleanup levels that specifically consider subsistence activities. Thus, a potential risk associated with use of the area by subsistence harvesters and consumers is difficult to assess. Based on preliminary plans for school construction, both landfarm cells are to be capped. Per those same plans, the extent of landfarm cell B

would be located under the school building. This would prevent subsistence exposure and direct contact to the contamination in that area. School construction plans call for the extent of landfarm cell A to become a grass field. The cap would prevent exposure to the residual contamination.

While the site is close to Napaskiak Slough, the river is silty and likely not be used for drinking water making the surface water ingestion/contact and sediment contact pathways incomplete.

Table 4 summarizes the potential exposure pathways. Although the available data suggest that unacceptable exposure to site contaminants is not currently taking place, additional steps will be necessary to ensure that unacceptable exposure does not occur in the future. These steps are presented in Section 6.

Table 4: POTENTIAL EXPOSURE PATHWAYS

Exposure Pathway	Do Contaminant Concentrations Exceed Published Standards?	Exposure Pathway Complete?	Discussion
Incidental soil ingestion	No	No	Using landfarming, soil contamination near and beneath former above-ground storage tanks (AST) between 0 and 18 inches bgs was treated below concentrations that pose a potential risk due to the ingestion exposure pathway. Note that ADEC regulations consider surface soils to extent to 2 ft bgs. A cover, consisting of a geomembrane, 2 feet of structural fill, and 4 inches of top soil will prevent incidental ingestion.
Dermal absorption	No	No	Using land farming, soil contamination near and beneath former ASTs between 0 and 18 inches bgs was treated below concentrations that pose a potential risk due to dermal exposure. Note that ADEC regulations consider surface soils to extent to 2 ft bgs. A cover, consisting of a geomembrane, 2 feet of structural fill, and 4 inches of top soil will prevent dermal exposure.
Ingestion of groundwater	Yes (but not at drinking wells)	No	Drinking water wells in the area were not impacted during the 2011 or 2012 monitoring events event; however, groundwater contamination is present at concentrations that could pose a human health risk if it were to be used as drinking water. Continued monitoring is necessary to ensure that the water supply remains safe.
Ingestion/contact of surface water/sediment	Surface water and sediment samples have not been collected	No	Although surface water and sediment samples have not been collected, the available data do not indicate that they have been impacted. Silty water in slough is not used for drinking water.
Ingestion of wild food	No standards set	No	As detailed in the text, plans call for both landfarm cells to be capped, which would prevent exposure via this pathway.
Inhalation of outdoor air	No	No	Contaminant concentrations measured in soil are below values that would suggest a potential risk due to outdoor air inhalation.
Inhalation of indoor air	No standards set	No	A new school will be built on the site; the school will be built on piles. The method of construction will present an air gap between the contaminated soil and the building. This will minimize accumulation of vapors within the building and protect the occupants.

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6. CONCLUSIONS AND RECOMMENDATIONS

Review of historical drawings/as-built drawings indicated a potential buried drum pit existed in an area of the former BIA school site in Napaskiak, Alaska where future construction is planned for a new school. ERM conducted an assessment of possible buried drums in this area in order to determine the presence and density of suspected drums.

6.1. Conclusions

ERM and Cruz personnel excavated two approximately 50-ft-long trenches (plus additional test pits), in an "X" pattern, across the area of suspected buried drums in order to verify the presence of buried drums.

During the installation of the assessment trenches, a volume of buried drums was located below a portion of the eastern half of the currently-fenced-in landfarm (Cell A) and is an estimated 16 ft wide (north to south) and 22 ft long (east to west). The 55-gallon steel drums appear to be arranged in a single layer of drums lying on their sides and buried beneath approximately 1.5 to 3 ft of soil. All of the drums encountered appear to have had holes cut in them and the bungs removed prior to burial. No sign of sheen, hydrocarbon odor, or other contaminant odor was observed during the excavation of the assessment trenches. A total of five soil samples were collected from the floors of the trenches and test pits within, and proximal to, the area of buried drums to characterize potential contamination.

Analytical results provide additional evidence that the drums were likely empty when buried. The sample collected from location SO-2 was the only sample to contain an analyte concentration above an ADEC Soil Cleanup Level. The DRO concentration at this location was 272 mg/kg which exceeded the 250 mg/kg ADEC 18 AAC 75.341 Table B2 Method Two – petroleum hydrocarbon soil cleanup level for migration to groundwater. All other analytes were either below ADEC Table B1 and B2 Method Two - soil cleanup levels for the under 40-inch zone or were not detected.

In accordance with the final *Trench Installation for Preliminary Drum Assessment Work Plan*, samples were analyzed for a very broad array of compounds. It should be noted that of the 165 analytes the soil was analyzed for, 34 had method detection limits and/or method reporting limits that were above the soil cleanup levels.

6.2. Recommendations

Contamination concentrations in soils at depths less than 1.5 ft below ground surface are above the 18 AAC 75 migration to groundwater standard. Deeper soils are believed to contain higher concentrations of fuel contaminants. Continued protection of human health will rely on the measures being taken to prevent exposure:

- Over time, rusted, buried drums can pose a hazard. As they begin to rust out, the overlying soil can sluff into the void. This can create a tripping and cutting hazard for anyone who steps into the resulting hole. The drums should be removed and handled as solid waste (i.e. recycled or landfilled).
- School construction drawings call for the area to be covered with a layer of geotextile fabric, overlain by two feet of structural fill and four inches of topsoil. The area is then to be seeded and used as a grass play field. This cover is designed to prevent direct contact with the fuel contaminated soil.
- LKSD should establish measures to ensure that the cover remains in place.
- LKSD should conduct periodic monitoring of its drinking water system in accordance with 18 AAC 80. Because of the known presence of DRO, this monitoring should incorporate analysis of samples for DRO. Results should be compared to the 18 AAC 75 Table C groundwater cleanup standard. If results exceed this standard or drinking water maximum contaminant levels, additional steps such as treatment or provision of an alternate water supply should be evaluated.

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FIGURES

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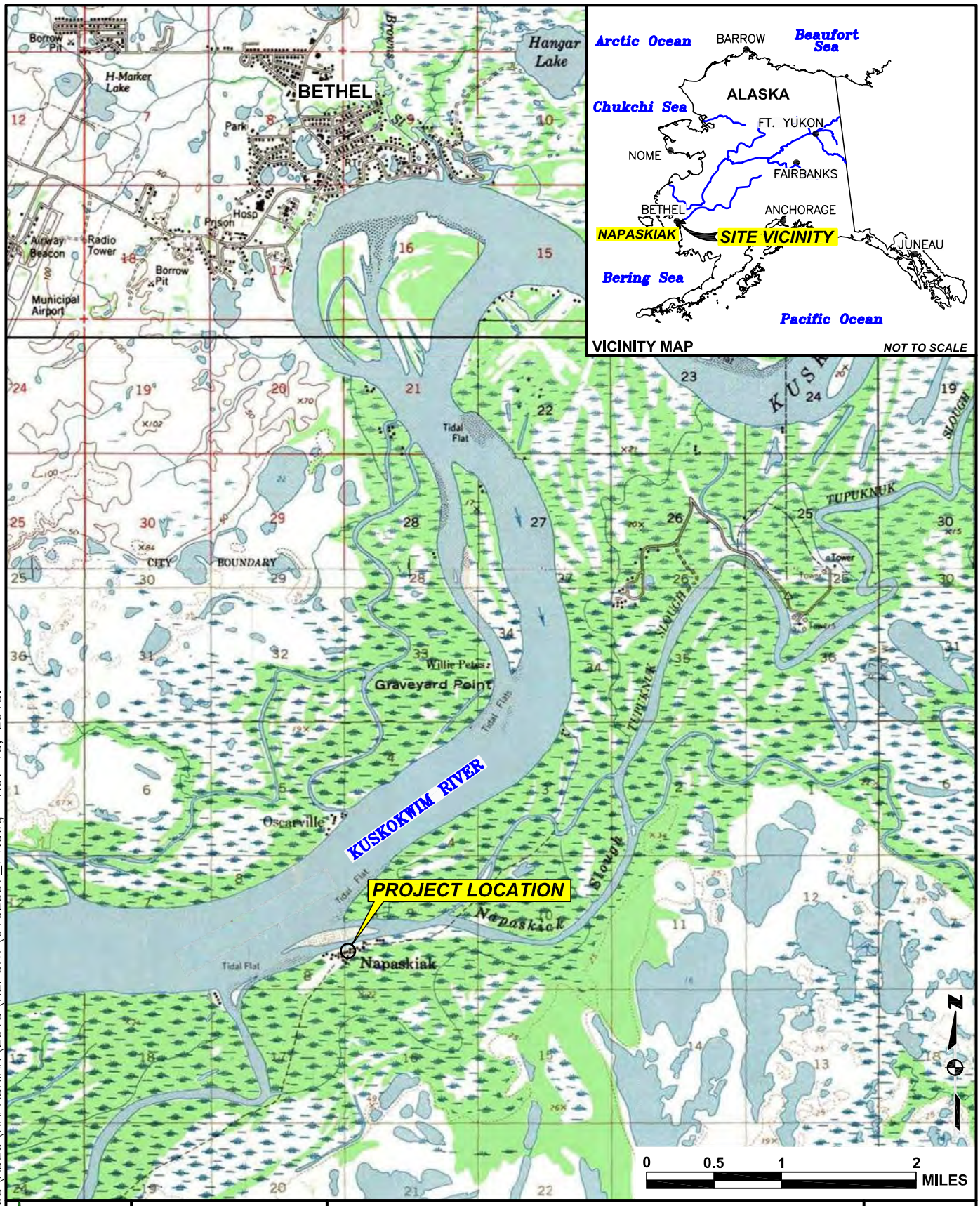

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ERM

DATE: NOV. 2013
CHKD: S.W.W
DRAWN: D.R.F.
PROJ. No.: 0162537

825 W. 8th Ave., Anchorage, AK 99501, (907) 258-4880

SITE LOCATION MAP

TRENCH INSTALLATION FOR PRELIMINARY DRUM ASSESSMENT REPORT
Napaskiak, Alaska

FIGURE

1

SOURCE: NATIONAL GEOGRAPHIC TOPO SOFTWARE PROGRAM 2007.

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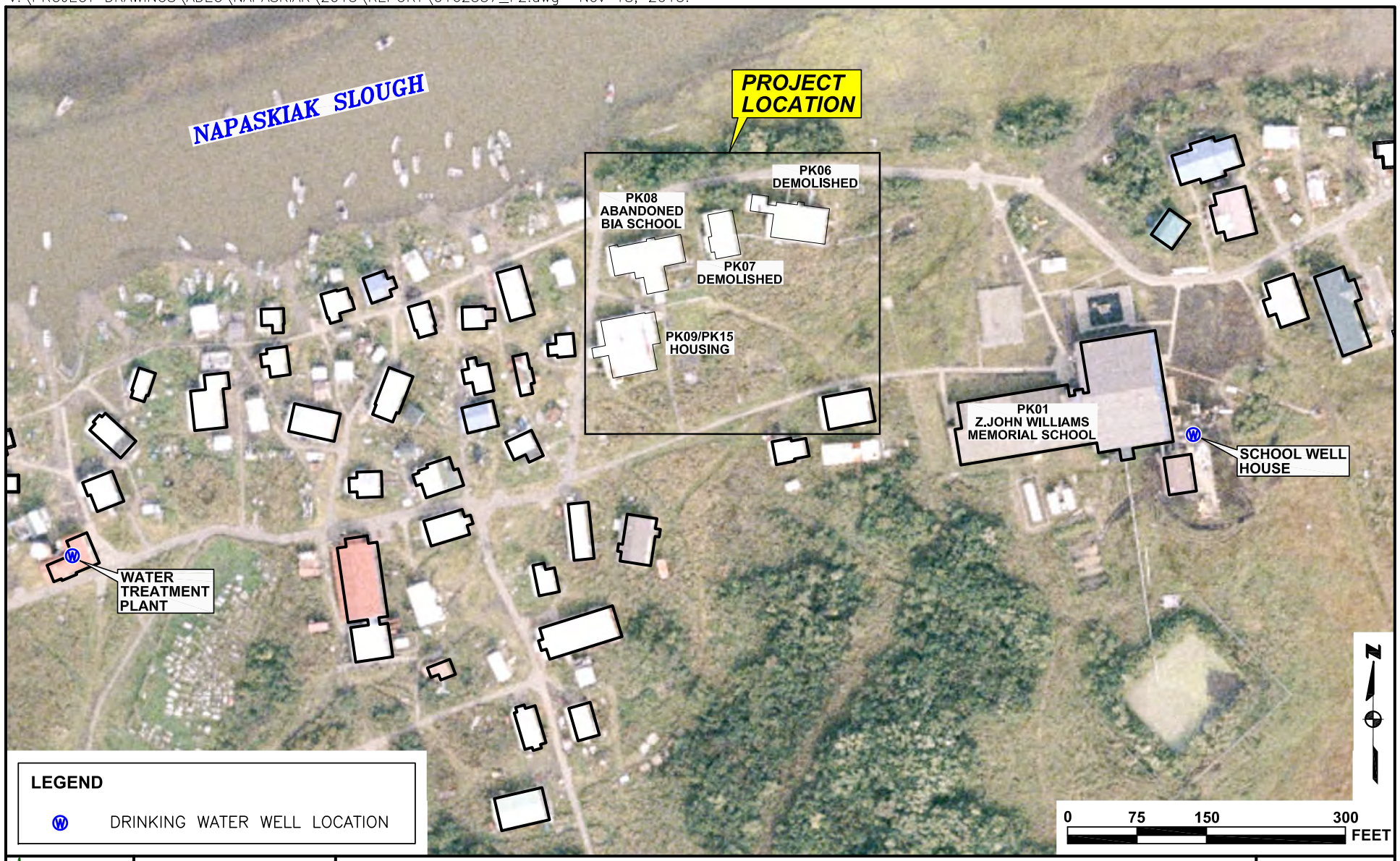

ERM

DATE: NOV. 2013
CHKD: S.W.W.
DRAWN: D.R.F.
PROJ. No.: 0162537

825 W. 8th Ave., Anchorage, AK 99501, (907) 258-4880

SITE DETAIL

TRENCH INSTALLATION FOR PRELIMINARY DRUM ASSESSMENT REPORT
Napaskiak, Alaska

FIGURE

2

SOURCE: IMAGE FROM GOOGLE EARTH PROFESSIONAL, DATED 8/12/20012

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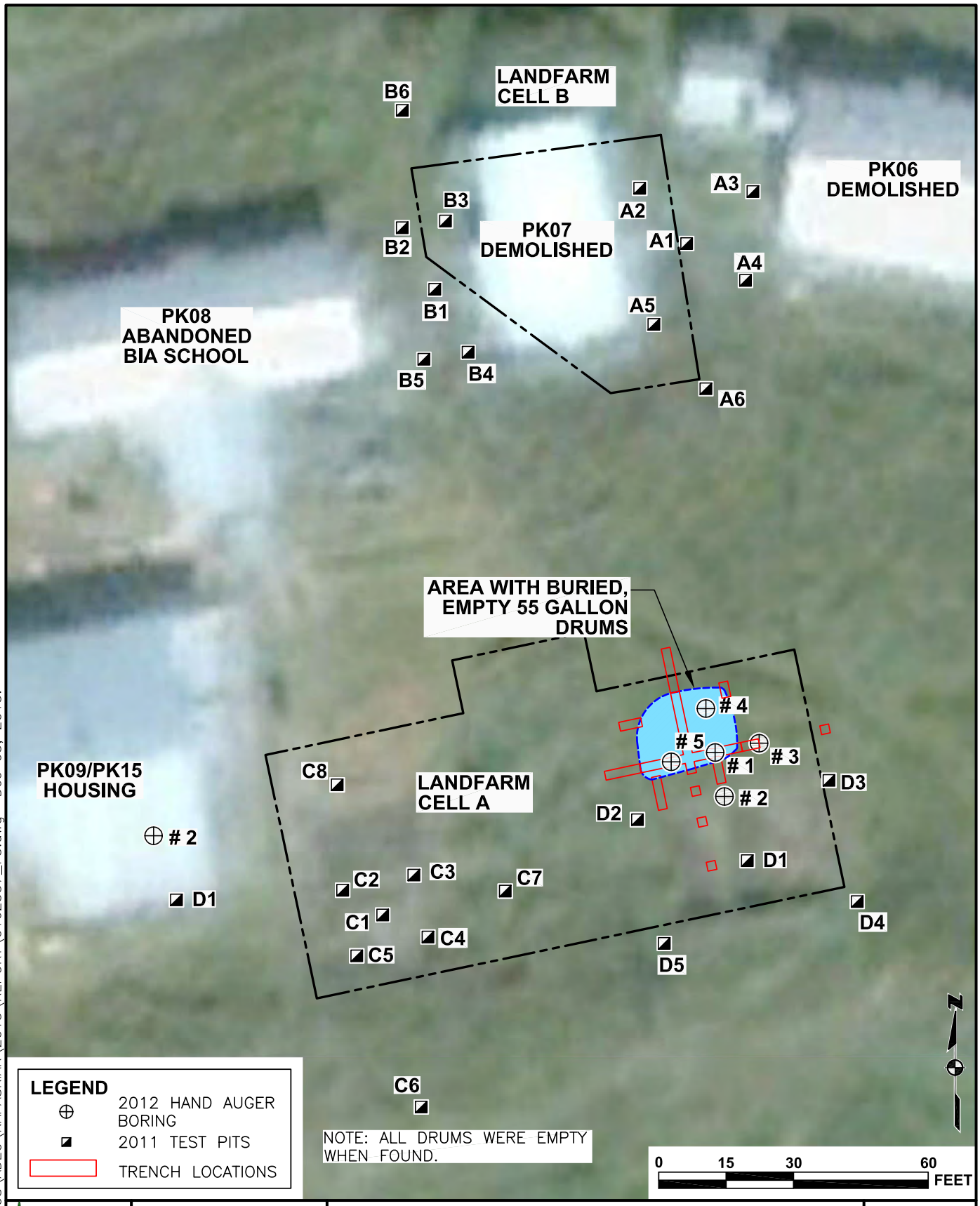

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ERM

DATE: DEC. 2013
CHKD: S.W.W.
DRAWN: D.R.F.
PROJ. No.: 0162537

825 W. 8th Ave., Anchorage, AK 99501, (907) 258-4880

TRENCH EXCAVATION LOCATIONS

TRENCH INSTALLATION FOR PRELIMINARY DRUM ASSESSMENT REPORT
Napaskiak, Alaska

FIGURE
3

SOURCE: IMAGE FROM GOOGLE EARTH PROFESSIONAL DATED 8/12/05.

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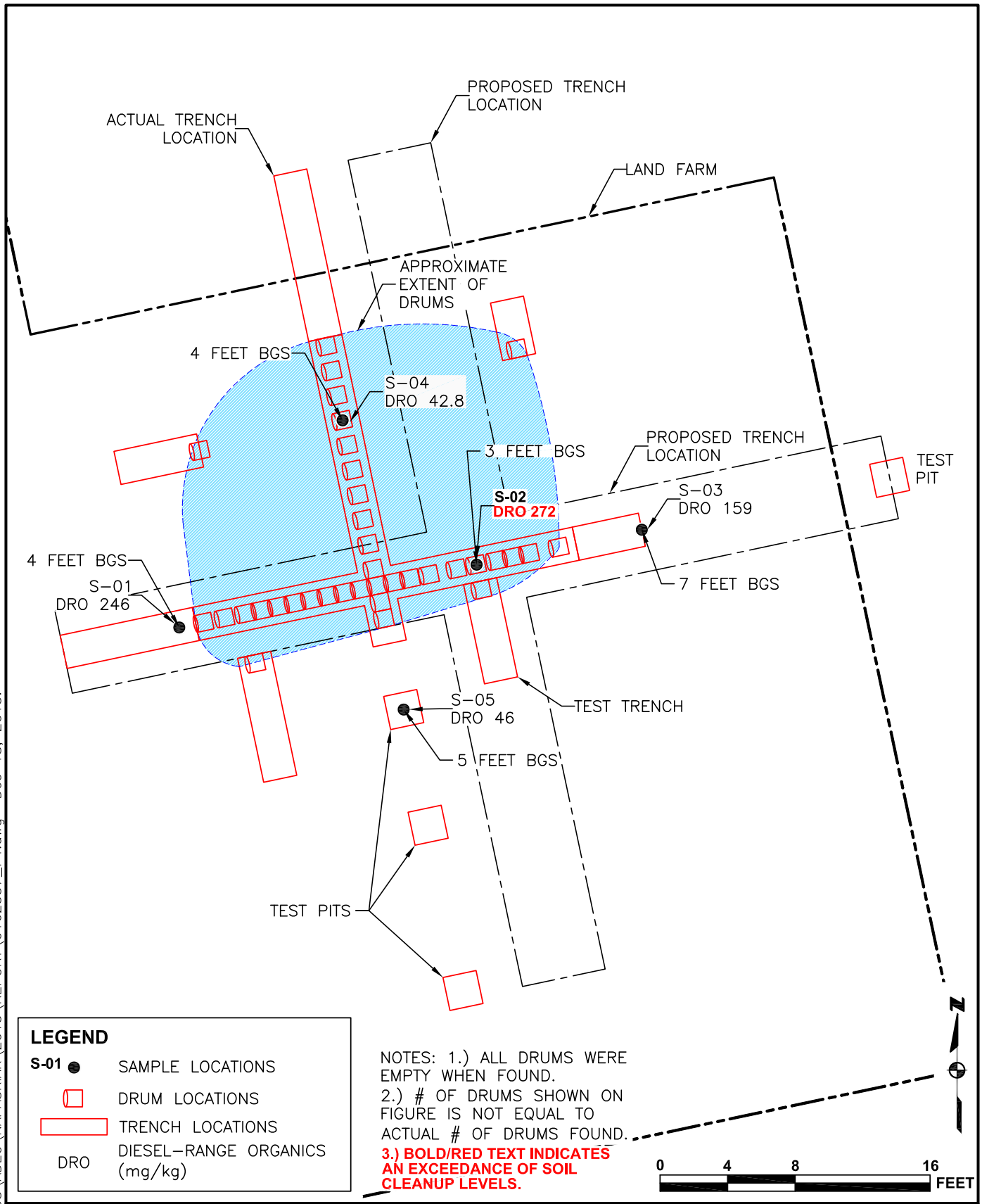

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DATE: DEC. 2013
CHKD: S.W.W.
DRAWN: D.R.F.
PROJ. No.: 0162537

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TRENCH AND DRUM LOCATIONS

TRENCH INSTALLATION FOR PRELIMINARY DRUM ASSESSMENT REPORT
Napaskiak, Alaska

FIGURE

4

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APPENDIX A

Historical Drawings

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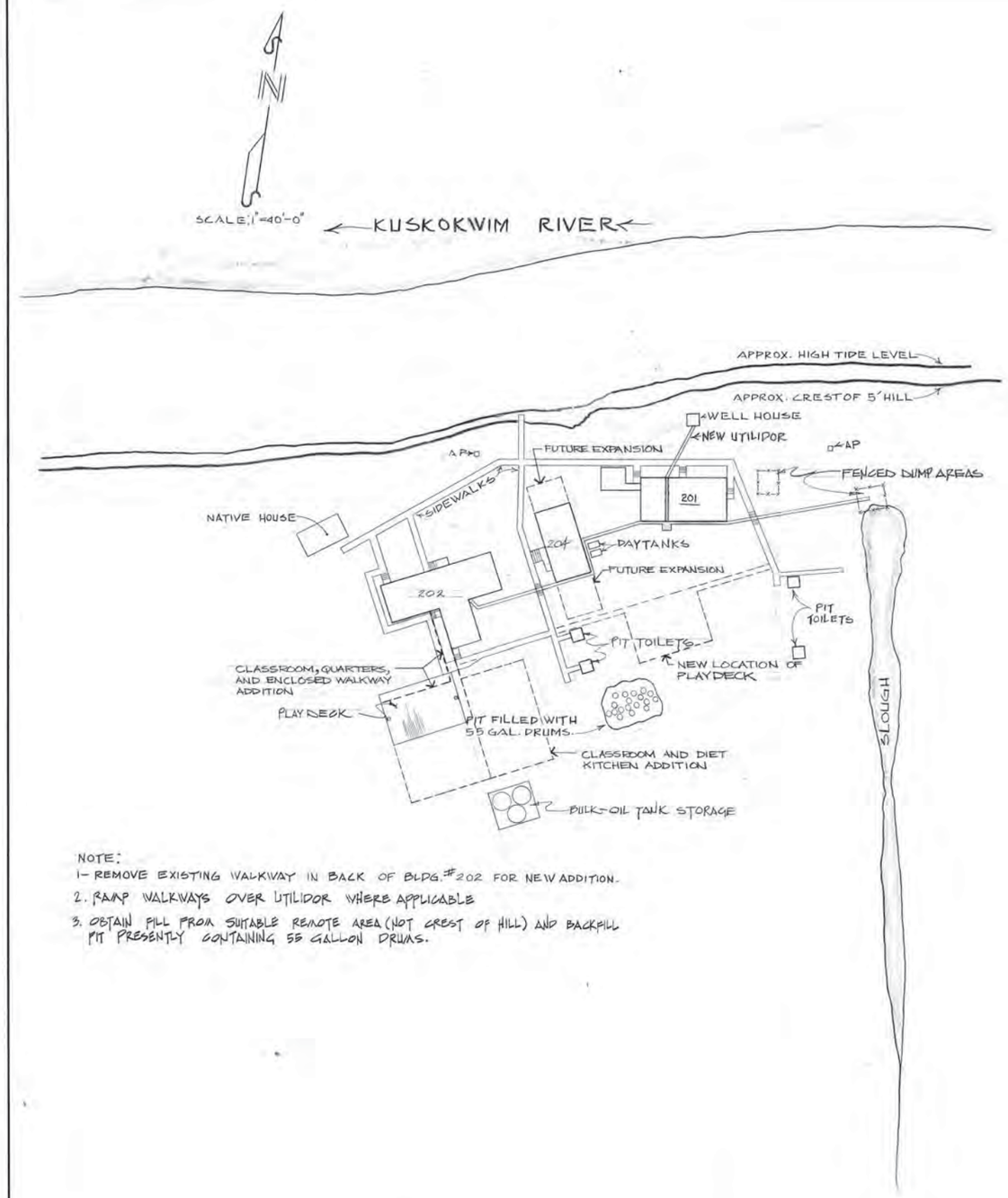

BLDG. NOS.

#201 - TEACHER'S QUARTERS
#204 - LIGHT PLANT & STORAGE BLDG.
#202 - SCHOOL BLDG.

LEGEND

FEATURE	EXISTING
BUILDINGS	
WALKWAYS	
ANTENNA POLES	AP
UTILIDOR	
TIDELINES	

NOTE:
1- REMOVE EXISTING WALKWAY IN BACK OF BLDG. #202 FOR NEW ADDITION.
2. RAMP WALKWAYS OVER UTILIDOR WHERE APPLICABLE
3. OBTAIN FILL FROM SUITABLE REMOTE AREA (NOT CREST OF HILL) AND BACKFILL PIT PRESENTLY CONTAINING 55 GALLON DRUMS.

REVISION	DATE	BRIEF	BY
2	7-11-74	CHANGES MADE & AS-BUILT DATA ADDED	R.H.
1	10-20-72	REVISE PLOT PLAN	WILLIAMS

DEPARTMENT OF THE INTERIOR
BUREAU OF INDIAN AFFAIRS
WASHINGTON, D.C.

A-1

PROJECT NUMBER E02-22/X/1120.0400/2463
NAPASKIAK, ALASKA
WATER & WASTE TREATMENT
SITE PLAN

SHEET NO. 2
TOTAL 16 SHEETS

PREPARED BY WILLIAMS | TRACED BY R. Williams | CHECKED BY Hulbert | DATE 6-23-72

BRANCH OF PLANT MANAGEMENT
JUNEAU AREA OFFICE

DRAWING NO. M-1410

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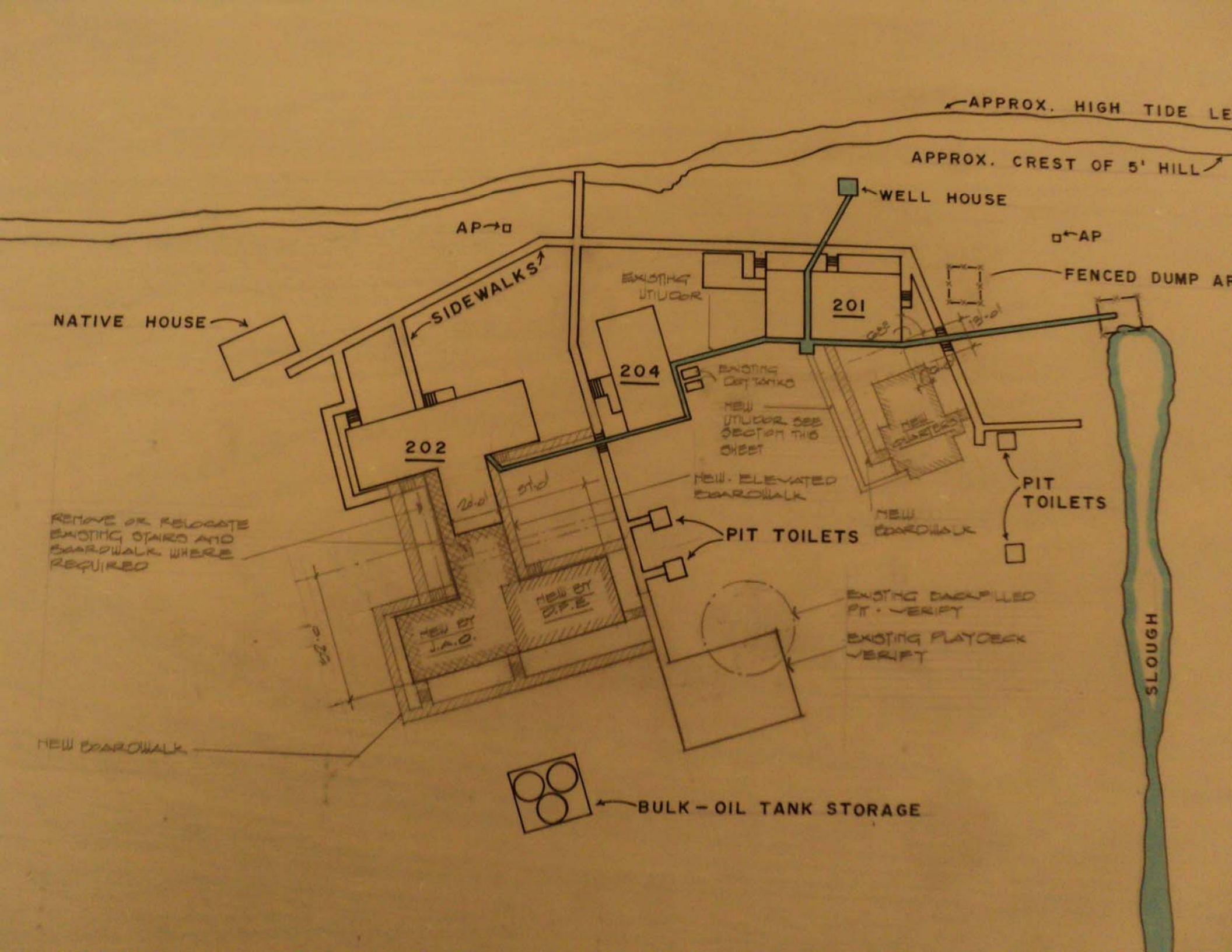
APPROX. HIGH TIDE LE
APPROX. CREST OF 5' HILL
WELL HOUSE
AP
AP
FENCED DUMP AR
NATIVE HOUSE
SIDEWALKS
EXISTING UTILIDOR
201
204
202
EXISTING DRY TANKS
NEW UTILIDOR SEE SECTION THIS SHEET
NEW ELEVATED BOARDWALK
NEW BOARDWALK
PIT TOILETS
PIT TOILETS
REMOVE OR RELOCATE EXISTING STAIRS AND BOARDWALK WHERE REQUIRED
NEW BY J.A.O.
NEW BY D.F.E.
EXISTING BACKFILLED PIT - VERIFY
EXISTING PLAYDECK VERIFY
SLOUGH
NEW BOARDWALK
BULK - OIL TANK STORAGE

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APPENDIX B

Photograph Log

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PHOTOGRAPH 1: BEGINNING TO EXCAVATE AT WEST END OF PROPOSED EAST/WEST TRENDING TRENCH IN AREA OF SUSPECTED BURIED DRUMS; LOOKING EAST. 10/04/2013.

PHOTOGRAPH 2: EXCAVATING TO PROPOSED DEPTH OF 8′ BELOW GROUND SURFACE AT WEST END OF PROPOSED EAST/WEST TRENDING TRENCH; LOOKING EAST 10/04/2103.

PHOTOGRAPH 3: CHECKING DEPTH OF TRENCH; LOOKING EAST. 10/04/2013.

PHOTOGRAPH 4: ENCOUNTERING BURIED DRUMS AND WOODEN PILINGS APPROXIMATELY 1.5 TO 2′ BELOW GROUND SURFACE AND 8′ EAST OF WESTERN STARTING POINT OF TRENCH EXCAVATION; LOOKING EAST. 10/04/2013.

PHOTOGRAPH 5: EXCAVATING TRENCH FROM NORTH TO SOUTH THROUGH ASSUMED CENTER OF BURIED DRUM CLUSTER. DRUMS ENCOUNTERED AND REMOVED FOR VISUAL INSPECTION; LOOKING SOUTH. 10/05/2013.

PHOTOGRAPH 6: DRUMS APPEAR TO HAVE BEEN PUNCTURED PRIOR TO BURIAL. 10/05/2013.

PHOTOGRAPH 7: DRUMS APPEAR TO HAVE BEEN PUNCTURED PRIOR TO BURIAL. 10/05/2013.

PHOTOGRAPH 8: MARKINGS OBSERVED ON BURIED DRUMS. 10/05/2013.

PHOTOGRAPH 9: MARKINGS OBSERVED ON BURIED DRUMS. 10/05/2013.

PHOTOGRAPH 10: MARKINGS OBSERVED ON BURIED DRUMS. 10/05/2013.

PHOTOGRAPH 11: DIGGING TEST PITS TO BETTER DELINEATE PERIMETER OF BURIED DRUM CLUSTER; LOOKING SOUTHEAST. 10/05/2013.

PHOTOGRAPH 12: TEST PITS EXCAVATED TO APPROXIMATELY 5′ BELOW GROUND SURFACE. SOIL HORIZONS TYPICALLY CONSIST OF 0-1′ ORGANICS AND 1-5′ SILT WITH SOME NATIVE WOODY MATERIAL. 10/05/2013.

PHOTOGRAPH 13: PLACING DRUMS BACK INTO TRENCHES AND RETURNING SOIL TO ITS APPROXIMATE ORIGINAL LOCATION; LOOKING SOUTHEAST. 10/05/2013.

PHOTOGRAPH 14: PLACE FLAGGING ALONG PERIMETER OF BURIED DRUM CLUSTER FOR VISUAL REFERENCE; LOOKING SOUTHEAST. 10/05/2013.

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APPENDIX C

Field Notes

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Outdoor writing products
for Outdoor writing people

RECYCLED
RECYCLABLE

This cover contains post-consumer recycled material

Rite in the Rain

A patented, environmentally responsible, all-weather writing paper that sheds water and enables you to write anywhere, in any weather.

Using a pencil or all-weather pen, *Rite in the Rain* ensures that your notes survive the rigors of the field, regardless of the conditions.

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www.RiteintheRain.com

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JOURNAL
№ 393N

Napaskiak Remediation
Project 01162537

 S. Christiansen Napaskiak Remediation

1500 ~~1300~~ Finish taking samples @ landfarm A. Stop for quick lunch & move on to Landfarm B

1530 ~~1230~~ Start jack hammering at landfarm B. Ground is frozen to 1' bgs

NK-12-SS-B-11 @ 1230

NK-12-SS-B-12 @ 1300

NK-12-SS-B-13 @ 1200

1600 Sarah breaks to go get water sample from Napaskiak treatment water facility. NK-12-SW-02 @ 135

All sample times conflict with times in field notebook due to markers freezing. Wrote all labels at once before going out to sample.

Go back to landfarm B to collect samples. Had limited volume due to ground be frozen

1700 Stopped sampling. Pack up gear & catch plane back to Bethel

1730 Drop coolers off at NAC to be shipped back to town

Catch plane back to Anchorage.

Sarah C

39°F Rain No wind

Napaskiak: Trench Installation
Project #0162537
R. Burich, T. Kastelor, J. Miner

4 Oct 2013

0700 - Organize and pack gear, equipment, and soil sampling supplies for fieldwork.

0840 - Arrive at airport for flight to Bethel.

0915 - Meet with subcontractors (T. Kastelor, J. Miner). They will operate the excavator.

0940 - Flight to Bethel from Anchorage.

1140 - Arrive in Bethel.

1200 - Taxi from Era Aviation to Yute Air.

1210 - Schedule charter to Napaskiak on Yute Air. Todd Kastelor pays for charter. All flights currently on hold for fog and poor visibility.

1220 - Take taxi to AC Value Center to purchase food, as Napaskiak will likely have limited food options.

1400 - Clouds at 600' above ground level (500' minimum for flight) Load gear, equipment, and supplies into Cessna 207 and depart for Napaskiak (8 airmiles from Bethel).

Napaskiak Trench Installation
Project # 0162537

4 Oct 2013 R. Bunch; T. Kosteler; J. Miner

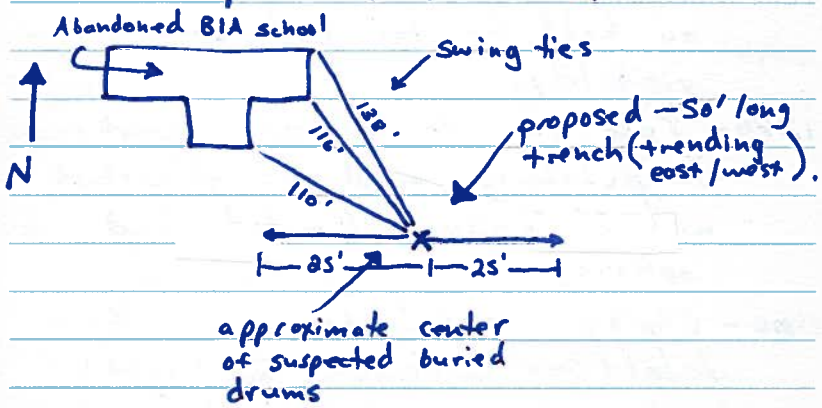
1420 - Arrive in Napaskiak and meet KSD representative / Yute Air agent / ex-Mayor of Napaskiak - Joe Bavilla.

1425 - Load gear onto trailer and four-wheeler and Joe takes us to the teacher housing where we'll be staying (across from project site).

1430 - Arrange use of excavator (Bobcat 331)

1445 - Read HSE plan and sign JHAs. Conduct tailgate safety meeting. Crew reads workplan.

1515 - Use swing ties measurements from abandoned building NW of site to find approximate center of suspected buried drums.



* not to scale

Napaskiak Trench Installation
Project # 0162537

R. Bunch; T. Kosteler; J. Miner 4 Oct 2013

1530 - Begin excavating on west end of proposed trench. Excavate to ~ 8' below ground surface. Make visual observation of undisturbed soil horizons.

0 - 1' organics; damp

1 - 8' silt w/ some native woody debris; grey; damp

Continue excavating to east.

1600 - Collect sample ~7' east of starting point from ~4' bgs.

1610 - Encounter buried drums ~8' east of starting point. Drums are located ~2-3' below ground surface and are rusted, fairly intact, and partially crushed/dented. Drums are lying on their sides within the grey silty soil horizon. and appear to be a single layer of drums. Debris consisting of insulation, some lumber, and wooden posts (~12" diam) are also in this area.

* Note: No visual markings on these drums.

Continue excavating to the east.

4 Oct 2013 R. Bunich; T. Kostelor; J. Miner

1610 cont. Note: Sub-surface clearance process initiated prior to excavation. Used public utility locates, historical site plans, current demolition plan, a knowledgeable site contact (Joe Bavilla - KSD rep.), and visual clues to verify there would be no sub-surface conflicts in the trenching area. Also, field notes from 9/13/11 indicate the only underground utilities in Napaskiak are the communication lines, and they are several miles from the project site.

1620 Continue excavating to the east to determine the extent and condition of buried drums. Remove upper 1.5-3' of overlying soil and determine drums to extend to ~30' east of the trench starting point.

1730 Collect sample from soil beneath drum ~25' east of starting point @ ~3' bgs. Collect field duplicate from this location.

R. Bunich; T. Kostelor; J. Miner 4 Oct 2013

1740 - From 30-32' east of starting point, excavate to ~7' below ground surface to verify absence of drums. Soil horizons are undisturbed and consistent with initial visual observations at beginning of trench excavation in area without drums.

0-1' Organics; damp

1-7' silt w/ some woody debris (native), grey; damp.

1800 - Excavated trench has been backfilled. Material has been replaced in the trench in its approximate original location. Material removed last was placed first, while material removed first was placed last.

1815 - Yellow caution flagging has been placed around the job site.

1830 - Crew departs site.

Ryan Bunich

Napaskiak Trench Installation
Project # 0162537

5 Oct 2013 R. Burich; T. Kasteler; J. Miner 43°F Rain Wind 10mph ESE

0900 - Arrive at project site.

0915 - Conduct tailgate safety meeting.

0930 - Decide to not excavate full 50' length of trench from west to east, as drums seem to be buried between 8' and 30' east of starting point.
From 30' to 32' east of starting point, no drums observed.
Decide to extend to 35' east, then excavate test pit at 50' east.

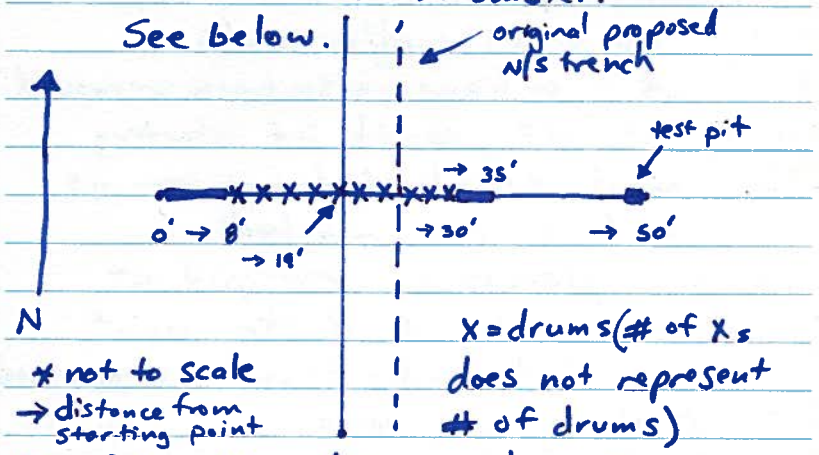
0945 - At 35' east of starting point, no drums encountered.
Excavate to ~ 7' bgs.
0-1' organics; damp
1-7' silt w/ some native woody debris; grey; damp.
Collect sample from this location at ~7 bgs.

1000 - At 50' east of starting point, excavate test pit to ~5' bgs.
No drums encountered.
0-1' organics; damp
1-5' silt w/ some native woody debris; grey; damp

Napaskiak Trench Installation
Project # 0162537

R. Burich; T. Kasteler; J. Miner 5 Oct 2013

1010 - Adjust North/South trench location so that it intersects the east/west trench at the approximate center of the buried drum cluster.
See below.



1030 Begin excavating trench from north.

1040 Encounter drums ~11' south of new starting point. Drums @ 1.5-2' bgs.
Markings observed on drums.
* FUEL OIL DIESEL * Mona Lisa G2
GRADE UF-A * Standard Oil Co. of CA
Collect sample below drum @ ~4' bgs.
Also observe lumber, insulation, and 12" diam. post, 2-3' in length.
Continue excavating to south.

Ryan Burich

Napaskiak Trench Installation
Project # 0162537

5 Oct 2013 R. Burich, T. Kosteler, J. Minor

1100 - At ~15' south of starting point, observe drums with thicker metal (lube oil?)
- Observe that drums have been punctured (historically) on sides and/or ends. Bungs have also been removed.

1115 - At ~27' south of starting point, extent of drums seems to have been reached.

1150 - Dig/excavate test pit at ~32' south of starting point to ~5' bgs. No drums encountered.
0-1' Organics; damp.
1-5' Silt w/some native woody debris; grey; damp.
Assume southern extent of drums has been verified, as test pit has been excavated to 5' bgs. Drums have consistently been encountered at 1-3' bgs.
Collect sample at this location from ~5' bgs.

Ryan Burich

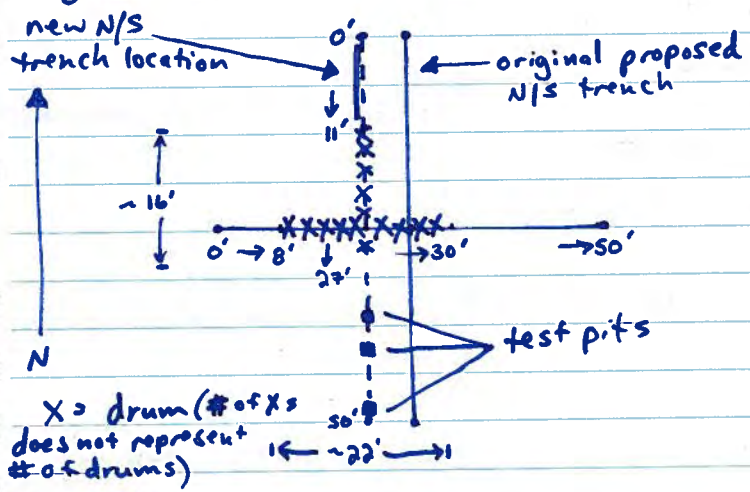
Napaskiak Trench Installation
Project # 0162537

R. Burich, T. Kosteler, J. Minor 5 Oct 2013

1200 - Excavate test pit at ~40' south of starting point to ~5' bgs. No drums encountered.
0-1' Organics; damp
1-5' Silt w/some native woody debris; grey; damp.

1210 - Excavate test pit at ~50' south of starting point to ~5' bgs. No drums encountered.
0-1' Organics; damp.
1-5' Silt w/some native woody debris; grey; damp.

Figure w/drum location below.



Napaskiak Trench Installation
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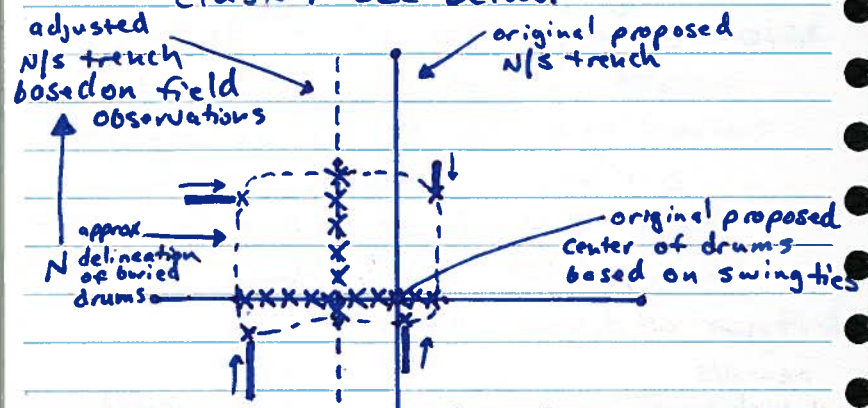
1300 - Review drum locations in trenches and decide to dig test pits/trenches in 4 quadrants to better-delineate buried drum cluster. See below.



X = drum
▬ = trench
(# of Xs does not represent # of drums)
*not to scale

* Note: No sheen or hydrocarbon odor observed.

Scale = 10'

1500 - Place yellow flagging along perimeter of delineated drum cluster and photograph.

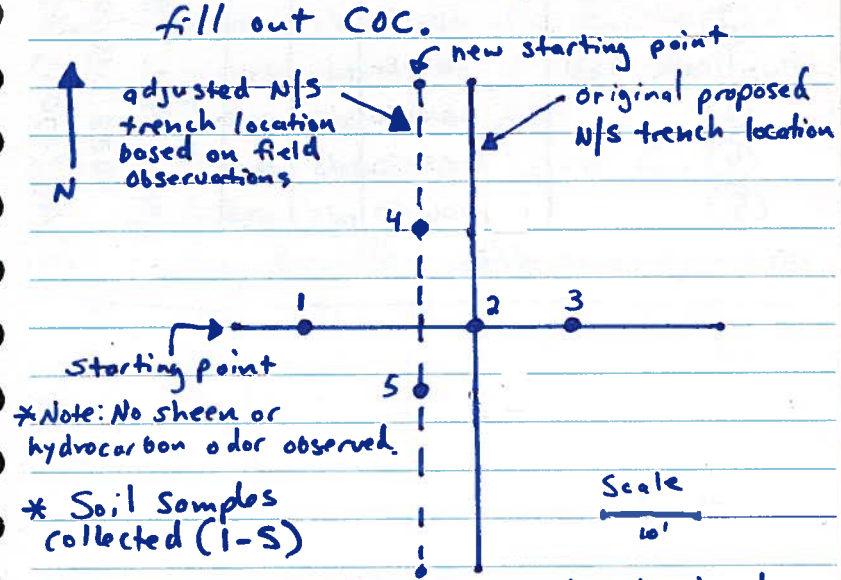
1600 - Backfill trenches. Put fencing in place around project site. Fencing was already in place, but moved for site access

Napaskiak Trench Installation
Project #0162537

R. Burich, T. Kosteler, J. Minor 5 Oct 2013

1630 - Return excavator to original location.

1700 - Process soil samples and fill out COC.



* Note: No sheen or hydrocarbon odor observed.

* Soil samples collected (1-5)

1 - 7' east of starting point; 4' bgs; no drums
2 - 25' east of starting point; 3' bgs; drums
3 - 35' east of starting point; 7' bgs; no drums
4 - 15' south of new starting point; 4' bgs; drums
5 - 32' south of new starting point; 5' bgs; no drums

By Ryan Burich

Napaskiak Trench Installation
Project # 0162537

5 Oct 2013 R. Burich, T. Kosteler, J. Minor

Soil Sample Information:

Sample location	ID	Date	Time	Analyses
1	13-NK-01-SO	10/4	1600	VOCs, SVOCs, PAH, GRO, DRO, RRO, PCBs, Total Metals (Lead)
2	-02-SO	10/4	1730	
Duplicate of 2	-03-SO	10/4	1800	
3	-04-SO	10/5	0945	
4	-05-SO	10/5	1040	
5	-06-SO	10/5	1150	

1800 – Depart site.

Ryan Burich

Napaskiak Trench Installation
Project # 0162537

43° F
Overcast
No wind

R. Burich, T. Kosteler, J. Minor 6 Oct 2013

0800 – Pack and organize gear, supplies, equipment, and samples for return trip to Anchorage.

0900 – Meet w/ KSD rep. Joe Bavilla and schedule charter flight to Bethel on Yute Air.

0930 – Clean apartment used for lodging.

1200 – Joe Bavilla picks us up and takes us to the airstrip. Return apartment keys to Joe.

1230 – Flight to Bethel.

1300 – Arrive in Bethel. Ship equipment and samples on ERA Cargo (to Anchorage).

1500 – Flight to Anchorage.

1700 – Arrive in Anchorage.

Ryan Burich

APPENDIX D

Analytical Data Tables

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TABLE D-1: SOIL SAMPLE ANALYTICAL RESULTS
TRENCH INSTALLATION FOR PRELIMINARY DRUM ASSESSMENT
SOIL SAMPLES COLLECTED OCTOBER 2013

					Sample Location	S-01				S-02				Field Duplicate of S-02				S-03				S-04				S-05			
					Sample ID	13-NK-01-SO				13-NK-02-SO				13-NK-03-SO				13-NK-04-SO				13-NK-05-SO				13-NK-06-SO			
					Collect Date and Time	10/4/2013 16:00				10/4/2013 17:30				10/4/2013 18:00				10/5/2013 9:45				10/5/2013 10:40				10/5/2013 11:50			
					Sample Depth (ft)	4				3				3				7				4				5			
					Matrix	Soil				Soil				Soil				Soil				Soil				Soil			
Method	Analyte/Chemical Name	CAS#	ADEC Cleanup Level for Under 40-inch Zone (Soil) - *Inhalation / Outdoor Inhalation*	ADEC Cleanup Level for Under 40-inch Zone (Soil) - *Ingestion / Direct Contact*	ADEC Cleanup Level (Soil) - *Migration to Groundwater*	Result	MRL	MDL	Lab Quals	Result	MRL	MDL	Lab Quals	Result	MRL	MDL	Lab Quals	Result	MRL	MDL	Lab Quals	Result	MRL	MDL	Lab Quals	Result	MRL	MDL	Lab Quals
						all results in mg/kg																							
AK101	Gasoline Range Organics	8006-61-9	1400	1400	300	1.97	3.12	1.56	J	7.94	3.28	1.64	–	6.57	3.50	1.75	–	5.78	3.38	1.69	–	2.37	3.26	1.63	J	–	–	–	–
AK102	Diesel Range Organics	68334-30-5	12500	10250	**250**	246	16.9	8.47	–	97.3	16.1	8.07	–	**272**	16.3	8.15	–	159	17.1	8.57	–	42.8	16.6	8.31	–	46.0	18.1	9.05	–
AK103	Residual Range Organics	CASID30160	22000	10000	11000	356	16.9	8.47	–	202	16.1	8.07	–	346	16.3	8.15	–	223	17.1	8.57	–	261	16.6	8.31	–	232	18.1	9.05	–
SW6020	Lead	7439-92-1	–	400	–	10.2	0.850	0.425	–	8.73	0.746	0.373	–	11.2	0.764	0.382	–	9.05	0.850	0.425	–	12.3	0.814	0.407	–	9.44	0.872	0.436	–
SW8260B	1,3,5-Trimethylbenzene	108-67-8	42	5100	23	–	–	–	–	–	–	–	–	–	–	–	–	0.0253	0.0350	0.0175	J	–	–	–	–	–	–	–	–
SW8260B	2-Phenylbutane	135-98-8	41	1000	12	–	–	–	–	–	–	–	–	–	–	–	–	0.0270	0.0350	0.0175	J	–	–	–	–	–	–	–	–
SW8260B	Benzene	71-43-2	11	150	0.025	–	–	–	–	–	–	–	–	–	–	–	–	0.0135	0.0175	0.00876	J	–	–	–	–	–	–	–	–
SW8260B	Cymene	99-87-6	–	–	–	0.0661	0.0324	0.0162	–	–	–	–	–	–	–	–	–	0.0455	0.0350	0.0175	J	–	–	–	–	–	–	–	–
SW8260B	o-Xylene	95-47-6	–	–	–	–	–	–	–	–	–	–	–	0.0384	0.0364	0.0182	J	–	–	–	–	–	–	–	–	–	–	–	–
SW8260B	Toluene	108-88-3	220	8100	6.5	0.0229	0.0324	0.0162	J	0.156	0.0342	0.0171	–	0.225	0.0364	0.0182	–	0.0444	0.0350	0.0175	J	0.0255	0.0338	0.0169	J	–	–	–	–
SW8260B	Xylenes	1330-20-7	63	20300	63	–	–	–	–	–	–	–	–	0.0710	0.106	0.0531	J	–	–	–	–	–	–	–	–	–	–	–	–
SW8270D	Acenaphthene	83-32-9	–	2800	180	0.226	0.214	0.107	J	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SW8270D	Fluoranthene	206-44-0	–	1900	1400	0.425	0.214	0.107	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SW8270D	Fluorene	86-73-7	–	2300	220	0.113	0.214	0.107	J	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SW8270D	Phenanthrene	85-01-8	–	20600	3000	0.474	0.214	0.107	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SW8270D	Pyrene	129-00-0	–	1400	1000	0.443	0.430	0.215	J	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SW8270D-SIM	1-Methylnaphthalene	90-12-0	760	280	6.2	0.0151	0.00408	0.00204	–	0.0168	0.0195	0.00976	J	0.00963	0.00396	0.00198	–	0.0427	0.00410	0.00205	–	0.00472	0.00402	0.00201	J	–	–	–	–
SW8270D-SIM	2-Methylnaphthalene	91-57-6	750	280	6.1	0.00576	0.00408	0.00204	J	0.0168	0.0195	0.00976	J	0.00883	0.00396	0.00198	–	0.0396	0.00410	0.00205	–	0.00544	0.00402	0.00201	J	–	–	–	–
SW8270D-SIM	Acenaphthene	83-32-9	–	2800	180	0.202	0.0408	0.0204	–	0.0101	0.0195	0.00976	J	0.0130	0.00396	0.00198	–	–	–	–	–	0.00403	0.00402	0.00201	J	–	–	–	–
SW8270D-SIM	Acenaphthylene	208-96-8	–	2800	180	0.00382	0.00408	0.00204	J	0.0144	0.0195	0.00976	J	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SW8270D-SIM	Anthracene	120-12-7	–	20600	3000	0.0255	0.00408	0.00204	–	0.0538	0.0195	0.00976	–	0.0367	0.00396	0.00198	–	–	–	–	–	–	–	–	–	–	–	–	–
SW8270D-SIM	Benzo(a)anthracene	56-55-3	–	4.9	3.6	0.0633	0.00408	0.00204	–	0.16	0.0976	0.0488	J	0.121	0.00396	0.00198	–	0.00726	0.00410	0.00205		–	–	–	–	–	–	–	–
SW8270D-SIM	Benzo(a)pyrene	50-32-8	–	0.49	2.1	0.0196	0.00408	0.00204	–	0.2	0.0195	0.00976	–	0.0949	0.00396	0.00198	–	0.00593	0.00410	0.00205	J	–	–	–	–	–	–	–	–
SW8270D-SIM	Benzo(b)fluoranthene	205-99-2	–	4.9	12	0.0413	0.00408	0.00204	–	0.284	0.0976	0.0488	–	0.138	0.0396	0.0198	–	0.00998	0.00410	0.00205	–	–	–	–	–	–	–	–	–
SW8270D-SIM	Benzo(g,h,i)perylene	191-24-2	–	1400	38700	0.00616	0.00408	0.00204	J	0.112	0.0195	0.00976	–	0.0455	0.00396	0.00198	–	0.00281	0.00410	0.00205	J	–	–	–	–	–	–	–	–
SW8270D-SIM	Benzo(k)fluoranthene	207-08-9	–	49	120	0.0115	0.00408	0.00204	–	–	–	–	–	–	–	–	–	0.00305	0.00410	0.00205	J	–	–	–	–	–	–	–	–
SW8270D-SIM	Chrysene	218-01-9	–	490	360	0.0374	0.00408	0.00204	–	0.245	0.0976	0.0488	–	0.118	0.00396	0.00198	–	0.00932	0.00410	0.00205	–	–	–	–	–	–	–	–	–
SW8270D-SIM	Dibenzo(a,h)anthracene	53-70-3	–	0.49	4.0	–	–	–	–	0.0287	0.0195	0.00976	J	0.0146	0.00396	0.00198	–	–	–	–	–	–	–	–	–	–	–	–	–
SW8270D-SIM	Fluoranthene	206-44-0	–	1900	1400	0.458	0.0408	0.0204	–	0.393	0.0976	0.0488	–	0.316	0.0396	0.0198	–	0.0219	0.00410	0.00205	–	–	–	–	–	–	–	–	–
SW8270D-SIM	Fluorene	86-73-7	–	2300	220	0.0831	0.00408	0.00204	–	0.0208	0.0195	0.00976	J	0.0206	0.00396	0.00198	–	–	–	–	–	0.00597	0.00402	0.00201	J	–	–	–	–
SW8270D-SIM	Indeno(1,2,3-cd)pyrene	193-39-5	–	4.9	41	0.00604	0.00408	0.00204	J	0.0871	0.0195	0.00976	–	0.0459	0.00396	0.00198	–	–	–	–	–	–	–	–	–	–	–	–	–
SW8270D-SIM	Naphthalene	91-20-3	28	1400	20	0.0138	0.00408	0.00204	–	0.0152	0.0195	0.00976	J	0.00577	0.00396	0.00198	J	0.0105	0.00410	0.00205	–	0.00870	0.00402	0.00201	–	0.00315	0.00434	0.00217	J
SW8270D-SIM	Phenanthrene	85-01-8	–	20600	3000	0.418	0.0408	0.0204	–	0.0685	0.0195	0.00976	–	0.0525	0.00396	0.00198	–	0.0118	0.00410	0.00205	–	0.00292	0.00402	0.00201	J	–	–	–	–
SW8270D-SIM	Pyrene	129-00-0	–	1400	1000	0.353	0.0408	0.0204	–	0.345	0.0976	0.0488	–	0.284	0.0396	0.0198	–	0.0236	0.00410	0.00205	–	–	–	–	–	–	–	–	–

NOTES AND ABBREVIATIONS:

ADEC = Alaska Department of Environmental Conservation

CAS# = Chemical Abstracts Service Number

J = indicates the concentration of a substance is between the MDL and MRL and is an estimated value

MDL = Method Detection Limit (lowest level of a substance that can be distinguished in a sample)

mg/kg = milligrams per kilogram

MRL = Method Reporting Limit (smallest amount of a substance that can be quantitated in a sample)

Quals = Data Qualifiers

Concentration exceeds ADEC Cleanup Level for Migration to Groundwater

*Only those analytes with concentrations detected above the method detection and/or reporting limit are included in this table.

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TABLE D-2: SOIL SAMPLE ANALYTICAL RESULTS
TRENCH INSTALLATION FOR PRELIMINARY DRUM ASSESSMENT
SOIL SAMPLES COLLECTED OCTOBER 2013

					Sample Location	S-01				S-02				Field Duplicate of S-02				S-03				S-04				S-05			
					Sample ID	13-NK-01-SO				13-NK-02-SO				13-NK-03-SO				13-NK-04-SO				13-NK-05-SO				13-NK-06-SO			
					Collect Date and Time	10/4/2013				10/4/2013				10/4/2013				10/5/2013				10/5/2013				10/5/2013			
					Start Depth (ft)	4				3				3				7				4				5			
					Matrix	Soil				Soil				Soil				Soil				Soil				Soil			
Method	Analyte/Chemical Name	CAS#	ADEC Cleanup Level for Under 40-inch Zone (Soil) - *Inhalation / Outdoor Inhalation*	ADEC Cleanup Level for Under 40-inch Zone (Soil) - *Ingestion / Direct Contact*	ADEC Cleanup Level (Soil) - *Migration to Groundwater*	Result	MRL	MDL	Lab Quals	Result	MRL	MDL	Lab Quals	Result	MRL	MDL	Lab Quals	Result	MRL	MDL	Lab Quals	Result	MRL	MDL	Lab Quals	Result	MRL	MDL	Lab Quals
						all results in mg/kg																							
AK101	Gasoline Range Organics	GRO	1400	1400	300	1.97	3.12	1.56	J	7.94	3.28	1.64	–	6.57	3.50	1.75	–	5.78	3.38	1.69	–	2.37	3.26	1.63	J	ND	3.70	1.85	U
AK102	Diesel Range Organics	DRO	12500	10250	**250**	246	16.9	8.47	–	97.3	16.1	8.07	–	**272**	16.3	8.15	–	159	17.1	8.57	–	42.8	16.6	8.31	–	46.0	18.1	9.05	–
AK103	Residual Range Organics	RRO	22000	10000	11000	356	16.9	8.47	–	202	16.1	8.07	–	346	16.3	8.15	–	223	17.1	8.57	–	261	16.6	8.31	–	232	18.1	9.05	–
SW6020	Lead	7439-92-1	–	400	–	10.2	0.850	0.425	–	8.73	0.746	0.373	–	11.2	0.764	0.382	–	9.05	0.850	0.425	–	12.3	0.814	0.407	–	9.44	0.872	0.436	–
SW8082A	Aroclor 1016	12674-11-2	–	–	–	ND	0.0406	0.0203	U	ND	0.0386	0.0193	U	ND	0.0390	0.0195	U	ND	0.0412	0.0206	U	ND	0.0400	0.0200	U	ND	0.0436	0.0218	U
SW8082A	Aroclor 1221	11104-28-2	–	–	–	ND	0.0406	0.0203	U	ND	0.0386	0.0193	U	ND	0.0390	0.0195	U	ND	0.0412	0.0206	U	ND	0.0400	0.0200	U	ND	0.0436	0.0218	U
SW8082A	Aroclor 1232	11141-16-5	–	–	–	ND	0.0406	0.0203	U	ND	0.0386	0.0193	U	ND	0.0390	0.0195	U	ND	0.0412	0.0206	U	ND	0.0400	0.0200	U	ND	0.0436	0.0218	U
SW8082A	Aroclor 1242	53469-21-9	–	–	–	ND	0.0406	0.0203	U	ND	0.0386	0.0193	U	ND	0.0390	0.0195	U	ND	0.0412	0.0206	U	ND	0.0400	0.0200	U	ND	0.0436	0.0218	U
SW8082A	Aroclor 1248	12672-29-6	–	–	–	ND	0.0406	0.0203	U	ND	0.0386	0.0193	U	ND	0.0390	0.0195	U	ND	0.0412	0.0206	U	ND	0.0400	0.0200	U	ND	0.0436	0.0218	U
SW8082A	Aroclor 1254	11097-69-1	–	–	–	ND	0.0406	0.0203	U	ND	0.0386	0.0193	U	ND	0.0390	0.0195	U	ND	0.0412	0.0206	U	ND	0.0400	0.0200	U	ND	0.0436	0.0218	U
SW8082A	Aroclor 1260	11096-82-5	–	–	–	ND	0.0406	0.0203	U	ND	0.0386	0.0193	U	ND	0.0390	0.0195	U	ND	0.0412	0.0206	U	ND	0.0400	0.0200	U	ND	0.0436	0.0218	U
SW8260B	1,1,1,2-Tetrachloroethane	630-20-6	–	–	–	ND	0.0324	0.0162	U	ND	0.0342	0.0171	U	ND	0.0364	0.0182	U	ND	0.0350	0.0175	U	ND	0.0338	0.0169	U	ND	0.0386	0.0193	U
SW8260B	1,1,1-Trichloroethane	71-55-6	360	20300	0.82	ND	0.0324	0.0162	U	ND	0.0342	0.0171	U	ND	0.0364	0.0182	U	ND	0.0350	0.0175	U	ND	0.0338	0.0169	U	ND	0.0386	0.0193	U
SW8260B	**1,1,2,2-Tetrachloroethane**	79-34-5	5.5	42	**0.017**	ND	**0.0624**	**0.0312**	U	ND	**0.0658**	**0.0329**	U	ND	**0.0698**	**0.0349**	U	ND	**0.0674**	**0.0337**	U	ND	**0.0650**	**0.0325**	U	ND	**0.0742**	**0.0371**	U
SW8260B	**1,1,2-Trichloroethane**	79-00-5	11	150	**0.018**	ND	**0.0324**	0.0162	U	ND	**0.0342**	0.0171	U	ND	**0.0364**	**0.0182**	**U**	ND	**0.0350**	0.0175	U	ND	**0.0338**	0.0169	U	ND	**0.0386**	**0.0193**	U
SW8260B	1,1-Dichloroethane	75-34-3	900	20300	25	ND	0.0324	0.0162	U	ND	0.0342	0.0171	U	ND	0.0364	0.0182	U	ND	0.0350	0.0175	U	ND	0.0338	0.0169	U	ND	0.0386	0.0193	U
SW8260B	**1,1-Dichloroethene**	75-35-4	0.85	14	**0.03**	ND	**0.0324**	0.0162	U	ND	**0.0342**	0.0171	U	ND	**0.0364**	0.0182	U	ND	**0.0350**	0.0175	U	ND	**0.0338**	0.0169	U	ND	**0.0386**	0.0193	U
SW8260B	1,1-Dichloropropene	563-58-6	–	–	–	ND	0.0324	0.0162	U	ND	0.0342	0.0171	U	ND	0.0364	0.0182	U	ND	0.0350	0.0175	U	ND	0.0338	0.0169	U	ND	0.0386	0.0193	U
SW8260B	1,2,3-Trichlorobenzene	87-61-6	–	–	–	ND	0.0624	0.0312	U	ND	0.0658	0.0329	U	ND	0.0698	0.0349	U	ND	0.0674	0.0337	U	ND	0.0650	0.0325	U	ND	0.0742	0.0371	U
SW8260B	**1,2,3-Trichloropropane**	96-18-4	0.17	1.2	**0.00053**	ND	**0.0324**	**0.0162**	U	ND	**0.0342**	**0.0171**	U	ND	**0.0364**	**0.0182**	U	ND	**0.0350**	**0.0175**	U	ND	**0.0338**	**0.0169**	U	ND	**0.0386**	**0.0193**	U
SW8260B	1,2,4-Trichlorobenzene	120-82-1	41	1000	0.85	ND	0.0324	0.0162	U	ND	0.0342	0.0171	U	ND	0.0364	0.0182	U	ND	0.0350	0.0175	U	ND	0.0338	0.0169	U	ND	0.0386	0.0193	U
SW8260B	1,2,4-Trimethylbenzene	95-63-6	49	5100	23	ND	0.0624	0.0312	U	ND	0.0658	0.0329	U	ND	0.0698	0.0349	U	ND	0.0674	0.0337	U	ND	0.0650	0.0325	U	ND	0.0742	0.0371	U
SW8260B	1,2-Dibromo-3-chloropropane	96-12-8	–	–	–	ND	0.129	0.0646	U	ND	0.136	0.0679	U	ND	0.144	0.0721	U	ND	0.139	0.0697	U	ND	0.134	0.0672	U	ND	0.153	0.0766	U
SW8260B	1,2-Dichlorobenzene	95-50-1	45	9100	5.1	ND	0.0324	0.0162	U	ND	0.0342	0.0171	U	ND	0.0364	0.0182	U	ND	0.0350	0.0175	U	ND	0.0338	0.0169	U	ND	0.0386	0.0193	U
SW8260B	**1,2-Dichloroethane**	107-06-2	4.8	91	**0.016**	ND	**0.0324**	**0.0162**	U	ND	**0.0342**	**0.0171**	U	ND	**0.0364**	**0.0182**	U	ND	**0.0350**	**0.0175**	U	ND	**0.0338**	**0.0169**	U	ND	**0.0386**	**0.0193**	U
SW8260B	**1,2-Dichloropropane**	78-87-5	5.3	120	**0.018**	ND	**0.0324**	0.0162	U	ND	**0.0342**	0.0171	U	ND	**0.0364**	**0.0182**	U	ND	**0.0350**	0.0175	U	ND	**0.0338**	0.0169	U	ND	**0.0386**	**0.0193**	U
SW8260B	1,3,5-Trimethylbenzene	108-67-8	42	5100	23	ND	0.0324	0.0162	U	ND	0.0342	0.0171	U	ND	0.0364	0.0182	U	0.0253	0.0350	0.0175	J	ND	0.0338	0.0169	U	ND	0.0386	0.0193	U
SW8260B	1,3-Dichlorobenzene	541-73-1	69	9100	28	ND	0.0324	0.0162	U	ND	0.0342	0.0171	U	ND	0.0364	0.0182	U	ND	0.0350	0.0175	U	ND	0.0338	0.0169	U	ND	0.0386	0.0193	U
SW8260B	1,3-Dichloropropane	142-28-9	–	–	–	ND	0.0324	0.0162	U	ND	0.0342	0.0171	U	ND	0.0364	0.0182	U	ND	0.0350	0.0175	U	ND	0.0338	0.0169	U	ND	0.0386	0.0193	U
SW8260B	1,4-Dichlorobenzene	106-46-7	30	350	0.64	ND	0.0324	0.0162	U	ND	0.0342	0.0171	U	ND	0.0364	0.0182	U	ND	0.0350	0.0175	U	ND	0.0338	0.0169	U	ND	0.0386	0.0193	U
SW8260B	2,2-Dichloropropane	594-20-7	–	–	–	ND	0.0324	0.0162	U	ND	0.0342	0.0171	U	ND	0.0364	0.0182	U	ND	0.0350	0.0175	U	ND	0.0338	0.0169	U	ND	0.0386	0.0193	U
SW8260B	2-Butanone	78-93-3	23300	60800	59	ND	0.324	0.162	U	ND	0.342	0.171	U	ND	0.364	0.182	U	ND	0.35	0.175	U	ND	0.338	0.169	U	ND	0.386	0.193	U
SW8260B	2-Hexanone	591-78-6	–	–	–	ND	0.324	0.162	U	ND	0.342	0.171	U	ND	0.364	0.182	U	ND	0.35	0.175	U	ND	0.338	0.169	U	ND	0.386	0.193	U
SW8260B	2-Phenylbutane	135-98-8	41	1000	12	ND	0.0324	0.0162	U	ND	0.0342	0.0171	U	ND	0.0364	0.0182	U	0.0270	0.0350	0.0175	J	ND	0.0338	0.0169	U	ND	0.0386	0.0193	U
SW8260B	4-Chlorotoluene	106-43-4	–	–	–	ND	0.0324	0.0162	U	ND	0.0342	0.0171	U	ND	0.0364	0.0182	U	ND	0.0350	0.0175	U	ND	0.0338	0.0169	U	ND	0.0386	0.0193	U
SW8260B	4-Methyl-2-pentanone	108-10-1	2100	8100	8.1	ND	0.324	0.162	U	ND	0.342	0.171	U	ND	0.364	0.182	U	ND	0.35	0.175	U	ND	0.338	0.169	U	ND	0.386	0.193	U
SW8260B	Benzene	71-43-2	11	150	0.025	ND	0.0162	0.00812	U	ND	0.0171	0.00855	U	ND	0.0182	0.00908	U	0.0135	0.0175	0.00876	J	ND	0.0169	0.00846	U	ND	0.0193	0.00964	U
SW8260B	Bromobenzene	108-86-1	–	–	–	ND	0.0324	0.0162	U	ND	0.0342	0.0171	U	ND	0.0364	0.0182	U	ND	0.0350	0.0175	U	ND	0.0338	0.0169	U	ND	0.0386	0.0193	U
SW8260B	Bromodichloromethane	75-27-4	10	130	0.044	ND	0.0324	0.0162	U	ND	0.0342	0.0171	U	ND	0.0364	0.0182	U	ND	0.0350	0.0175	U	ND	0.0338	0.0169	U	ND	0.0386	0.0193	U
SW8260B	Bromoform	75-25-2	420	1100	0.34	ND	0.0324	0.0162	U	ND	0.0342	0.0171	U	ND	0.0364	0.0182	U	ND	0.0350	0.0175	U	ND	0.0338	0.0169	U	ND	0.0386	0.0193	U
SW8260B	Carbon disulfide	75-15-0	250	4800	12	ND	0.129	0.0646	U	ND	0.136	0.0679	U	ND	0.144	0.0721	U	ND	0.139	0.0697	U	ND	0.134	0.0672	U	ND	0.153	0.0766	U
SW8260B	**Carbon tetrachloride**	56-23-5	3.1	64	**0.023**	ND	**0.0324**	0.0162	U	ND	**0.0342**	0.0171	U	ND	**0.0364**	0.0182	U	ND	**0.0350**	0.0175	U	ND	**0.0338**	0.0169	U	ND	**0.0386**	0.0193	U
SW8260B	Chlorobenzene	108-90-7	200	2000	0.63	ND	0.0324	0.0162	U	ND	0.0342	0.0171	U	ND	0.0364	0.0182	U	ND	0.0350	0.0175	U	ND	0.0338	0.0169	U	ND	0.0386	0.0193	U
SW8260B	Chlorobromomethane	74-97-5	–	–	–	ND	0.0324	0.0162	U	ND	0.0342	0.0171	U	ND	0.0364	0.0182	U	ND	0.0350	0.0175	U	ND	0.0338	0.0169	U	ND	0.0386	0.0193	U
SW8260B	Chloroethane	75-00-3	23	2900	580	ND	0.258	0.129	U	ND	0.272	0.136	U	ND	0.288	0.144	U	ND	0.278	0.139	U	ND	0.268	0.134	U	ND	0.306	0.153	U
SW8260B	Chloroform	67-66-3	3.2	1000	0.46	ND	0.0324	0.0162	U	ND	0.0342	0.0171	U	ND	0.0364	0.0182	U	ND	0.0350	0.0175	U	ND	0.0338	0.0169	U	ND	0.0386	0.0193	U
SW8260B	cis-1,2-Dichloroethene	156-59-2	130	1000	0.24	ND	0.0324	0.0162	U	ND	0.0342	0.0171	U	ND	0.0364	0.0182	U	ND	0.0350	0.0175	U	ND	0.0338	0.0169	U	ND	0.0386	0.0193	U
SW8260B	cis-1,3-Dichloropropene	10061-01-5	–	–	–	ND	0.0324	0.0162	U	ND	0.0342	0.0171	U	ND	0.0364	0.0182	U	ND	0.0350	0.0175	U	ND	0.0338	0.0169	U	ND	0.0386	0.0193	U
SW8260B	Cumene	98-82-8	62	10100	51	ND	0.0324	0.0162	U	ND	0.0342	0.0171	U	ND	0.0364	0.0182	U	ND	0.0350	0.0175	U	ND	0.0338	0.0169	U	ND	0.0386	0.0193	U
SW8260B	Cymene	99-87-6	–	–	–	0.0661	0.0324	0.0162	–	ND	0.0342	0.0171	U	ND	0.0364	0.0182	U	0.0455	0.0350	0.0175	J	ND	0.0338	0.0169	U	ND	0.0386	0.0193	U
SW8260B	**Dibromochloromethane**	124-48-1	14	99	**0.032**	ND	**0.0324**	0.0162	U	ND	**0.0342**	0.0171	U	ND	**0.0364**	0.0182	U	ND	**0.0350**	0.0175	U	ND	**0.0338**	0.0169	U	ND	**0.0386**	0.0193	U
SW8260B	Dibromomethane	74-95-3	370	1000	1.1	ND	0.0324	0.0162	U	ND	0.0342	0.0171	U	ND	0.0364	0.0182	U	ND	0.0350	0.0175	U	ND	0.0338	0.0169	U	ND	0.0386	0.0193	U
SW8260B	Ethylbenzene	100-41-4	110	10100	6.9	ND	0.0324	0.0162	U	ND	0.0342	0.0171	U	ND	0.0364	0.0182	U	ND	0.0350	0.0175	U	ND	0.0338	0.0169	U	ND	0.0386	0.0193	U
SW8260B	**Ethylene dibromide**	106-93-4	0.60	4.2	**0.00016**	ND	**0.0324**	**0.0162**	U	ND	**0.0342**	**0.0171**	U	ND	**0.0364**	**0.0182**	U	ND	**0.0350**	**0.0175**	U	ND	**0.0338**	**0.0169**	U	ND	**0.0386**	**0.0193**	U
SW8260B	Freon 11	75-69-4	990	30400	86	ND	0.0624	0.0312	U	ND	0.0658	0.0329	U	ND	0.0698	0.0349	U	ND	0.0674	0.0337	U	ND	0.0650	0.0325	U	ND	0.0742	0.0371	U

NOTES AND ABBREVIATIONS:

ADEC = Alaska Department of Environmental Conservation
CAS# = Chemical Abstracts Service Number
J = indicates the concentration of a substance is between the MDL and MRL and is an estimated value
MDL = Method Detection Limit (lowest level of a substance that can be distinguished in a sample)
mg/kg = milligrams per kilogram
MRL = Method Reporting Limit (smallest amount of a substance that can be quantitated in a sample)
ND = Indicates the analyte is not detected.
Quals = Data Qualifiers
U = Indicates the analyte was analyzed for but not detected.
Concentration exceeds ADEC Cleanup Level for Migration to Groundwater
The MDL and/or MRL is greater than the ADEC Cleanup Level

TABLE D-2: SOIL SAMPLE ANALYTICAL RESULTS
TRENCH INSTALLATION FOR PRELIMINARY DRUM ASSESSMENT
SOIL SAMPLES COLLECTED OCTOBER 2013

					Sample Location	S-01				S-02				Field Duplicate of S-02				S-03				S-04				S-05			
					Sample ID	13-NK-01-SO				13-NK-02-SO				13-NK-03-SO				13-NK-04-SO				13-NK-05-SO				13-NK-06-SO			
					Collect Date and Time	10/4/2013				10/4/2013				10/4/2013				10/5/2013				10/5/2013				10/5/2013			
					Start Depth (ft)	4				3				3				7				4				5			
					Matrix	Soil				Soil				Soil				Soil				Soil				Soil			
Method	Analyte/Chemical Name	CAS#	ADEC Cleanup Level for Under 40-inch Zone (Soil) - *Inhalation / Outdoor Inhalation*	ADEC Cleanup Level for Under 40-inch Zone (Soil) - *Ingestion / Direct Contact*	ADEC Cleanup Level (Soil) - *Migration to Groundwater*	Result	MRL	MDL	Lab Quals	Result	MRL	MDL	Lab Quals	Result	MRL	MDL	Lab Quals	Result	MRL	MDL	Lab Quals	Result	MRL	MDL	Lab Quals	Result	MRL	MDL	Lab Quals
						all results in mg/kg																							
SW8260B	Freon 12	75-71-8	380	20300	140	ND	0.0624	0.0312	U	ND	0.0658	0.0329	U	ND	0.0698	0.0349	U	ND	0.0674	0.0337	U	ND	0.0650	0.0325	U	ND	0.0742	0.0371	U
SW8260B	Hexachlorobutadiene	87-68-3	3.8	13	0.12	ND	0.0624	0.0312	U	ND	0.0658	0.0329	U	ND	0.0698	0.0349	U	ND	0.0674	0.0337	U	ND	0.0650	0.0325	U	ND	0.0742	0.0371	U
SW8260B	m,p Xylenes	179601-23-1	–	–	–	ND	0.0624	0.0312	U	ND	0.0658	0.0329	U	ND	0.0698	0.0349	U	ND	0.0674	0.0337	U	ND	0.0650	0.0325	U	ND	0.0742	0.0371	U
SW8260B	**Methyl bromide**	74-83-9	14	140	**0.16**	ND	**0.258**	0.129	U	ND	**0.272**	0.136	U	ND	**0.288**	0.144	U	ND	**0.278**	0.139	U	ND	**0.268**	0.134	U	ND	**0.306**	0.153	U
SW8260B	Methyl chloride	74-87-3	25	640	0.21	ND	0.0324	0.0162	U	ND	0.0342	0.0171	U	ND	0.0364	0.0182	U	ND	0.0350	0.0175	U	ND	0.0338	0.0169	U	ND	0.0386	0.0193	U
SW8260B	Methyl tert-butyl ether	1634-04-4	290	4600	1.3	ND	0.129	0.0646	U	ND	0.136	0.0679	U	ND	0.144	0.0721	U	ND	0.139	0.0697	U	ND	0.134	0.0672	U	ND	0.153	0.0766	U
SW8260B	**Methylene chloride**	75-09-2	160	1100	**0.016**	ND	**0.129**	**0.0646**	U	ND	**0.136**	**0.0679**	U	ND	**0.144**	**0.0721**	U	ND	**0.139**	**0.0697**	U	ND	**0.134**	**0.0672**	U	ND	**0.153**	**0.0766**	U
SW8260B	Naphthalene	91-20-3	28	1400	20	ND	0.0624	0.0312	U	ND	0.0658	0.0329	U	ND	0.0698	0.0349	U	ND	0.0674	0.0337	U	ND	0.0650	0.0325	U	ND	0.0742	0.0371	U
SW8260B	n-Butylbenzene	104-51-8	42	1000	15	ND	0.0324	0.0162	U	ND	0.0342	0.0171	U	ND	0.0364	0.0182	U	ND	0.0350	0.0175	U	ND	0.0338	0.0169	U	ND	0.0386	0.0193	U
SW8260B	n-Propylbenzene	103-65-1	42	1000	15	ND	0.0324	0.0162	U	ND	0.0342	0.0171	U	ND	0.0364	0.0182	U	ND	0.0350	0.0175	U	ND	0.0338	0.0169	U	ND	0.0386	0.0193	U
SW8260B	o-Chlorotoluene	95-49-8	–	–	–	ND	0.0324	0.0162	U	ND	0.0342	0.0171	U	ND	0.0364	0.0182	U	ND	0.0350	0.0175	U	ND	0.0338	0.0169	U	ND	0.0386	0.0193	U
SW8260B	o-Xylene	95-47-6	–	–	–	ND	0.0324	0.0162	U	ND	0.0342	0.0171	U	0.0384	0.0364	0.0182	J	ND	0.0350	0.0175	U	ND	0.0338	0.0169	U	ND	0.0386	0.0193	U
SW8260B	Styrene	100-42-5	200	20300	0.96	ND	0.0324	0.0162	U	ND	0.0342	0.0171	U	ND	0.0364	0.0182	U	ND	0.0350	0.0175	U	ND	0.0338	0.0169	U	ND	0.0386	0.0193	U
SW8260B	Tert-Butylbenzene	98-06-6	70	1000	12	ND	0.0324	0.0162	U	ND	0.0342	0.0171	U	ND	0.0364	0.0182	U	ND	0.0350	0.0175	U	ND	0.0338	0.0169	U	ND	0.0386	0.0193	U
SW8260B	Tetrachloroethene	127-18-4	10	15	0.024	ND	0.0162	0.00812	U	ND	0.0171	0.00855	U	ND	0.0182	0.00908	U	ND	0.0175	0.00876	U	ND	0.0169	0.00846	U	ND	0.0193	0.00964	U
SW8260B	Toluene	108-88-3	220	8100	6.5	0.0229	0.0324	0.0162	J	0.156	0.0342	0.0171		0.225	0.0364	0.0182		0.0444	0.0350	0.0175	J	0.0255	0.0338	0.0169	J	ND	0.0386	0.0193	U
SW8260B	trans-1,2-Dichloroethene	156-60-5	160	2000	0.37	ND	0.0324	0.0162	U	ND	0.0342	0.0171	U	ND	0.0364	0.0182	U	ND	0.0350	0.0175	U	ND	0.0338	0.0169	U	ND	0.0386	0.0193	U
SW8260B	trans-1,3-Dichloropropene	10061-02-6	–	–	–	ND	0.0324	0.0162	U	ND	0.0342	0.0171	U	ND	0.0364	0.0182	U	ND	0.0350	0.0175	U	ND	0.0338	0.0169	U	ND	0.0386	0.0193	U
SW8260B	Trichloroethene	79-01-6	0.57	21	0.020	ND	0.0162	0.00812	U	ND	0.0171	0.00855	U	ND	0.0182	0.00908	U	ND	0.0175	0.00876	U	ND	0.0169	0.00846	U	ND	0.0193	0.00964	U
SW8260B	**Vinyl chloride**	75-01-4	4.3	5.5	**0.0085**	ND	**0.0324**	**0.0162**	U	ND	**0.0342**	**0.0171**	U	ND	**0.0364**	**0.0182**	U	ND	**0.0350**	**0.0175**	U	ND	**0.0338**	**0.0169**	U	ND	**0.0386**	**0.0193**	U
SW8260B	Xylenes	1330-20-7	63	20300	63	ND	0.0950	0.0475	U	ND	0.1	0.0500	U	0.0710	0.106	0.0531	J	ND	0.102	0.0512	U	ND	0.0988	0.0494	U	ND	0.113	0.0563	U
SW8270D	**1,2,4-Trichlorobenzene**	120-82-1	41	1000	**0.85**	ND	0.214	0.107	U	ND	**1.01**	0.505	U	ND	**1.01**	0.505	U	ND	0.428	0.214	U	ND	0.420	0.210	U	ND	0.454	0.227	U
SW8270D	1,2-Dichlorobenzene	95-50-1	45	9100	5.1	ND	0.214	0.107	U	ND	1.01	0.505	U	ND	1.01	0.505	U	ND	0.428	0.214	U	ND	0.420	0.210	U	ND	0.454	0.227	U
SW8270D	1,3-Dichlorobenzene	541-73-1	69	9100	28	ND	0.214	0.107	U	ND	1.01	0.505	U	ND	1.01	0.505	U	ND	0.428	0.214	U	ND	0.420	0.210	U	ND	0.454	0.227	U
SW8270D	**1,4-Dichlorobenzene**	106-46-7	30	350	**0.64**	ND	0.214	0.107	U	ND	**1.01**	0.505	U	ND	**1.01**	0.505	U	ND	0.428	0.214	U	ND	0.420	0.210	U	ND	0.454	0.227	U
SW8270D	1-Chloronaphthalene	90-13-1	–	–	–	ND	0.214	0.107	U	ND	1.01	0.505	U	ND	1.01	0.505	U	ND	0.428	0.214	U	ND	0.420	0.210	U	ND	0.454	0.227	U
SW8270D	2,2-Oxybis(1-chloropropane)	108-60-1	–	–	–	ND	0.214	0.107	U	ND	1.01	0.505	U	ND	1.01	0.505	U	ND	0.428	0.214	U	ND	0.420	0.210	U	ND	0.454	0.227	U
SW8270D	2,4,5-Trichlorophenol	95-95-4	–	6500	67	ND	0.214	0.107	U	ND	1.01	0.505	U	ND	1.01	0.505	U	ND	0.428	0.214	U	ND	0.420	0.210	U	ND	0.454	0.227	U
SW8270D	2,4,6-Trichlorophenol	88-06-2	4100	460	1.4	ND	0.214	0.107	U	ND	1.01	0.505	U	ND	1.01	0.505	U	ND	0.428	0.214	U	ND	0.420	0.210	U	ND	0.454	0.227	U
SW8270D	2,4-Dichlorophenol	120-83-2	–	230	1.3	ND	0.214	0.107	U	ND	1.01	0.505	U	ND	1.01	0.505	U	ND	0.428	0.214	U	ND	0.420	0.210	U	ND	0.454	0.227	U
SW8270D	2,4-Dimethylphenol	105-67-9	–	1300	8.8	ND	0.214	0.107	U	ND	1.01	0.505	U	ND	1.01	0.505	U	ND	0.428	0.214	U	ND	0.420	0.210	U	ND	0.454	0.227	U
SW8270D	**2,4-Dinitrophenol**	51-28-5	–	160	**0.54**	ND	**2.58**	**1.29**	U	ND	**12.2**	**6.08**	U	ND	**12.2**	**6.08**	U	ND	**5.14**	**2.57**	U	ND	**5.06**	**2.53**	U	ND	**5.46**	**2.73**	U
SW8270D	**2,4-Dinitrotoluene**	121-14-2	–	8.8	**0.0093**	ND	0.214	**0.107**	U	ND	1.01	**0.505**	U	ND	1.01	**0.505**	U	ND	0.428	**0.214**	U	ND	0.420	**0.210**	U	ND	0.454	**0.227**	U
SW8270D	2,6-Dichlorophenol	87-65-0	–	–	–	ND	0.214	0.107	U	ND	1.01	0.505	U	ND	1.01	0.505	U	ND	0.428	0.214	U	ND	0.420	0.210	U	ND	0.454	0.227	U
SW8270D	**2,6-Dinitrotoluene**	606-20-2	–	8.9	**0.0094**	ND	**0.214**	**0.107**	U	ND	**1.01**	**0.505**	U	ND	**1.01**	**0.505**	U	ND	**0.428**	**0.214**	U	ND	**0.420**	**0.210**	U	ND	**0.454**	**0.227**	U
SW8270D	2-Chloronaphthalene	91-58-7	–	4700	120	ND	0.214	0.107	U	ND	1.01	0.505	U	ND	1.01	0.505	U	ND	0.428	0.214	U	ND	0.420	0.210	U	ND	0.454	0.227	U
SW8270D	2-Chlorophenol	95-57-8	2500	510	1.5	ND	0.214	0.107	U	ND	1.01	0.505	U	ND	1.01	0.505	U	ND	0.428	0.214	U	ND	0.420	0.210	U	ND	0.454	0.227	U
SW8270D	2-Methylnaphthalene	91-57-6	750	280	6.1	ND	0.214	0.107	U	ND	1.01	0.505	U	ND	1.01	0.505	U	ND	0.428	0.214	U	ND	0.420	0.210	U	ND	0.454	0.227	U
SW8270D	2-Nitroaniline	88-74-4	–	–	–	ND	0.214	0.107	U	ND	1.01	0.505	U	ND	1.01	0.505	U	ND	0.428	0.214	U	ND	0.420	0.210	U	ND	0.454	0.227	U
SW8270D	2-Nitrophenol	88-75-5	–	–	–	ND	0.214	0.107	U	ND	1.01	0.505	U	ND	1.01	0.505	U	ND	0.428	0.214	U	ND	0.420	0.210	U	ND	0.454	0.227	U
SW8270D	**3,3'-Dichlorobenzidine (and its salts)**	91-94-1	–	11	**0.19**	ND	**0.430**	**0.215**	U	ND	**1.01**	**0.505**	U	ND	**1.01**	**0.505**	U	ND	**0.428**	**0.214**	U	ND	**0.420**	**0.210**	U	ND	**0.454**	**0.227**	U
SW8270D	3-Nitroaniline	99-09-2	–	–	–	ND	0.414	0.207	U	ND	1.94	0.971	U	ND	1.94	0.971	U	ND	0.822	0.411	U	ND	0.806	0.403	U	ND	0.872	0.436	U
SW8270D	4-Bromophenyl phenyl ether	101-55-3	–	–	–	ND	0.214	0.107	U	ND	1.01	0.505	U	ND	1.01	0.505	U	ND	0.428	0.214	U	ND	0.420	0.210	U	ND	0.454	0.227	U
SW8270D	4-Chloro-3-methylphenol	59-50-7	–	–	–	ND	0.214	0.107	U	ND	1.01	0.505	U	ND	1.01	0.505	U	ND	0.428	0.214	U	ND	0.420	0.210	U	ND	0.454	0.227	U
SW8270D	4-Chlorophenyl phenyl ether	7005-72-3	–	–	–	ND	0.214	0.107	U	ND	1.01	0.505	U	ND	1.01	0.505	U	ND	0.428	0.214	U	ND	0.420	0.210	U	ND	0.454	0.227	U
SW8270D	4-Nitrophenol	100-02-7	–	–	–	ND	0.854	0.427	U	ND	4.02	2.01	U	ND	4.02	2.01	U	ND	1.70	0.849	U	ND	1.67	0.833	U	ND	1.80	0.901	U
SW8270D	Acenaphthene	83-32-9	–	2800	180	0.226	0.214	0.107	J	ND	1.01	0.505	U	ND	1.01	0.505	U	ND	0.428	0.214	U	ND	0.420	0.210	U	ND	0.454	0.227	U
SW8270D	Acenaphthylene	208-96-8	–	2800	180	ND	0.214	0.107	U	ND	1.01	0.505	U	ND	1.01	0.505	U	ND	0.428	0.214	U	ND	0.420	0.210	U	ND	0.454	0.227	U
SW8270D	Aniline	62-53-3	–	–	–	ND	1.71	0.854	U	ND	8.02	4.01	U	ND	8.02	4.01	U	ND	3.40	1.70	U	ND	3.34	1.67	U	ND	3.60	1.80	U
SW8270D	Anthracene	120-12-7	–	20600	3000	ND	0.214	0.107	U	ND	1.01	0.505	U	ND	1.01	0.505	U	ND	0.428	0.214	U	ND	0.420	0.210	U	ND	0.454	0.227	U
SW8270D	Azobenzene	103-33-3	–	–	–	ND	0.214	0.107	U	ND	1.01	0.505	U	ND	1.01	0.505	U	ND	0.428	0.214	U	ND	0.420	0.210	U	ND	0.454	0.227	U
SW8270D	Benzo(a)anthracene	56-55-3	–	4.9	3.6	ND	0.430	0.215	U	ND	1.01	0.505	U	ND	1.01	0.505	U	ND	0.428	0.214	U	ND	0.420	0.210	U	ND	0.454	0.227	U
SW8270D	**Benzo(a)pyrene**	50-32-8	–	**0.49**	2.1	ND	**1.07**	**0.537**	U	ND	**1.01**	**0.505**	U	ND	**1.01**	**0.505**	U	ND	**0.428**	0.214	U	ND	**1.05**	**0.524**	U	ND	**1.13**	**0.567**	U
SW8270D	Benzo(b)fluoranthene	205-99-2	–	4.9	12	ND	1.07	0.537	U	ND	1.01	0.505	U	ND	1.01	0.505	U	ND	0.428	0.214	U	ND	1.05	0.524	U	ND	1.13	0.567	U
SW8270D	Benzo(g,h,i)perylene	191-24-2	–	1400	38700	ND	1.07	0.537	U	ND	1.01	0.505	U	ND	1.01	0.505	U	ND	0.428	0.214	U	ND	1.05	0.524	U	ND	1.13	0.567	U

NOTES AND ABBREVIATIONS:

ADEC = Alaska Department of Environmental Conservation
CAS# = Chemical Abstracts Service Number
J = indicates the concentration of a substance is between the MDL and MRL and is an estimated value
MDL = Method Detection Limit (lowest level of a substance that can be distinguished in a sample)
mg/kg = milligrams per kilogram
MRL = Method Reporting Limit (smallest amount of a substance that can be quantitated in a sample)
ND = Indicates the analyte is not detected.
Quals = Data Qualifiers
U = Indicates the analyte was analyzed for but not detected.
The MDL and/or MRL is greater than the ADEC Cleanup Level

TABLE D-2: SOIL SAMPLE ANALYTICAL RESULTS
TRENCH INSTALLATION FOR PRELIMINARY DRUM ASSESSMENT
SOIL SAMPLES COLLECTED OCTOBER 2013

					Sample Location	S-01				S-02				Field Duplicate of S-02				S-03				S-04				S-05			
					Sample ID	13-NK-01-SO				13-NK-02-SO				13-NK-03-SO				13-NK-04-SO				13-NK-05-SO				13-NK-06-SO			
					Collect Date and Time	10/4/2013				10/4/2013				10/4/2013				10/5/2013				10/5/2013				10/5/2013			
					Start Depth (ft)	4				3				3				7				4				5			
					Matrix	Soil				Soil				Soil				Soil				Soil				Soil			
Method	Analyte/Chemical Name	CAS#	ADEC Cleanup Level for Under 40-inch Zone (Soil) - *Inhalation / Outdoor Inhalation*	ADEC Cleanup Level for Under 40-inch Zone (Soil) - *Ingestion / Direct Contact*	ADEC Cleanup Level (Soil) - *Migration to Groundwater*	Result	MRL	MDL	Lab Quals	Result	MRL	MDL	Lab Quals	Result	MRL	MDL	Lab Quals	Result	MRL	MDL	Lab Quals	Result	MRL	MDL	Lab Quals	Result	MRL	MDL	Lab Quals
						all results in mg/kg																							
SW8270D	Benzo(k)fluoranthene	207-08-9	–	49	120	ND	1.07	0.537	U	ND	1.01	0.505	U	ND	1.01	0.505	U	ND	0.428	0.214	U	ND	1.05	0.524	U	ND	1.13	0.567	U
SW8270D	Benzoic acid	65-85-0	–	317000	410	ND	2.06	1.03	U	ND	9.70	4.85	U	ND	9.70	4.85	U	ND	4.10	2.05	U	ND	4.04	2.02	U	ND	4.36	2.18	U
SW8270D	Benzyl alcohol	100-51-6	–	–	–	ND	0.214	0.107	U	ND	1.01	0.505	U	ND	1.01	0.505	U	ND	0.428	0.214	U	ND	0.420	0.210	U	ND	0.454	0.227	U
SW8270D	Benzyl butyl phthalate	85-68-7	–	2900	920	ND	0.430	0.215	U	ND	1.01	0.505	U	ND	1.01	0.505	U	ND	0.428	0.214	U	ND	0.420	0.210	U	ND	0.454	0.227	U
SW8270D	Bis(2-chloroethoxy)methane	111-91-1	–	–	–	ND	0.214	0.107	U	ND	1.01	0.505	U	ND	1.01	0.505	U	ND	0.428	0.214	U	ND	0.420	0.210	U	ND	0.454	0.227	U
SW8270D	Bis(2-ethylhexyl)phthalate	117-81-7	–	220	13	ND	0.430	0.215	U	ND	1.01	0.505	U	ND	1.01	0.505	U	ND	0.428	0.214	U	ND	0.420	0.210	U	ND	0.454	0.227	U
SW8270D	Carbazole	86-74-8	–	290	6.5	ND	0.214	0.107	U	ND	1.01	0.505	U	ND	1.01	0.505	U	ND	0.428	0.214	U	ND	0.420	0.210	U	ND	0.454	0.227	U
SW8270D	Chrysene	218-01-9	–	490	360	ND	0.430	0.215	U	ND	1.01	0.505	U	ND	1.01	0.505	U	ND	0.428	0.214	U	ND	0.420	0.210	U	ND	0.454	0.227	U
SW8270D	Cresol	1319-77-3	–	–	–	ND	0.854	0.427	U	ND	4.02	2.01	U	ND	4.02	2.01	U	ND	1.70	0.849	U	ND	1.67	0.833	U	ND	1.80	0.901	U
SW8270D	**Dibenzo(a,h)anthracene**	53-70-3	–	**0.49**	4.0	ND	**1.07**	**0.537**	U	ND	**1.01**	**0.505**	U	ND	**1.01**	**0.505**	U	ND	0.428	0.214	U	ND	**1.05**	**0.524**	U	ND	**1.13**	**0.567**	U
SW8270D	Dibenzofuran	132-64-9	–	200	11	ND	0.214	0.107	U	ND	1.01	0.505	U	ND	1.01	0.505	U	ND	0.428	0.214	U	ND	0.420	0.210	U	ND	0.454	0.227	U
SW8270D	Dibutyl phthalate	84-74-2	–	7900	80	ND	0.214	0.107	U	ND	1.01	0.505	U	ND	1.01	0.505	U	ND	0.428	0.214	U	ND	0.420	0.210	U	ND	0.454	0.227	U
SW8270D	**Dichloroethyl ether**	111-44-4	3.3	7.5	**0.0022**	ND	**0.214**	**0.107**	U	ND	**1.01**	**0.505**	U	ND	**1.01**	**0.505**	U	ND	**0.428**	**0.214**	U	ND	**0.420**	**0.210**	U	ND	**0.454**	**0.227**	U
SW8270D	Diethyl phthalate	84-66-2	–	61900	130	ND	0.214	0.107	U	ND	1.01	0.505	U	ND	1.01	0.505	U	ND	0.428	0.214	U	ND	0.420	0.210	U	ND	0.454	0.227	U
SW8270D	Dimethylphthalate	131-11-3	–	773000	1100	ND	0.214	0.107	U	ND	1.01	0.505	U	ND	1.01	0.505	U	ND	0.428	0.214	U	ND	0.420	0.210	U	ND	0.454	0.227	U
SW8270D	Dinitro-o-cresol	534-52-1	–	–	–	ND	1.71	0.854	U	ND	8.02	4.01	U	ND	8.02	4.01	U	ND	3.40	1.70	U	ND	3.34	1.67	U	ND	3.60	1.80	U
SW8270D	Di-n-octyl phthalate	117-84-0	–	3100	3800	ND	0.826	0.413	U	ND	1.94	0.971	U	ND	1.94	0.971	U	ND	0.822	0.411	U	ND	0.806	0.403	U	ND	0.872	0.436	U
SW8270D	Fluoranthene	206-44-0	–	1900	1400	0.425	0.214	0.107	–	ND	1.01	0.505	U	ND	1.01	0.505	U	ND	0.428	0.214	U	ND	0.420	0.210	U	ND	0.454	0.227	U
SW8270D	Fluorene	86-73-7	–	2300	220	0.113	0.214	0.107	J	ND	1.01	0.505	U	ND	1.01	0.505	U	ND	0.428	0.214	U	ND	0.420	0.210	U	ND	0.454	0.227	U
SW8270D	**Hexachlorobenzene**	118-74-1	1.5	3.2	**0.047**	ND	**0.214**	**0.107**	U	ND	**1.01**	**0.505**	U	ND	**1.01**	**0.505**	U	ND	**0.428**	**0.214**	U	ND	**0.420**	**0.210**	U	ND	**0.454**	**0.227**	U
SW8270D	**Hexachlorobutadiene**	87-68-3	3.8	13	**0.12**	ND	**0.214**	0.107	U	ND	**1.01**	**0.505**	U	ND	**1.01**	**0.505**	U	ND	**0.428**	**0.214**	U	ND	**0.420**	**0.210**	U	ND	**0.454**	**0.227**	U
SW8270D	**Hexachlorocyclopentadiene**	77-47-4	2.0	390	**1.3**	ND	0.550	0.275	U	ND	**2.58**	1.29	U	ND	**2.58**	1.29	U	ND	1.09	0.547	U	ND	1.08	0.538	U	ND	1.16	0.581	U
SW8270D	**Hexachloroethane**	67-72-1	170	65	**0.21**	ND	**0.214**	0.107	U	ND	**1.01**	**0.505**	U	ND	**1.01**	**0.505**	U	ND	**0.428**	**0.214**	U	ND	**0.420**	**0.210**	U	ND	**0.454**	**0.227**	U
SW8270D	Indeno(1,2,3-cd)pyrene	193-39-5	–	4.9	41	ND	1.07	0.537	U	ND	1.01	0.505	U	ND	1.01	0.505	U	ND	0.428	0.214	U	ND	1.05	0.524	U	ND	1.13	0.567	U
SW8270D	Isophorone	78-59-1	–	5300	3.1	ND	0.214	0.107	U	ND	1.01	0.505	U	ND	1.01	0.505	U	ND	0.428	0.214	U	ND	0.420	0.210	U	ND	0.454	0.227	U
SW8270D	Naphthalene	91-20-3	28	1400	20	ND	0.214	0.107	U	ND	1.01	0.505	U	ND	1.01	0.505	U	ND	0.428	0.214	U	ND	0.420	0.210	U	ND	0.454	0.227	U
SW8270D	**Nitrobenzene**	98-95-3	120	51	**0.094**	ND	**0.214**	**0.107**	U	ND	**1.01**	**0.505**	U	ND	**1.01**	**0.505**	U	ND	**0.428**	**0.214**	U	ND	**0.420**	**0.210**	U	ND	**0.454**	**0.227**	U
SW8270D	**n-Nitrosodimethylamine**	62-75-9	0.19	0.16	**0.000053**	ND	**0.214**	**0.107**	U	ND	**1.01**	**0.505**	U	ND	**1.01**	**0.505**	U	ND	**0.428**	**0.214**	U	ND	**0.420**	**0.210**	U	ND	**0.454**	**0.227**	U
SW8270D	**n-Nitrosodi-n-propylamine**	621-64-7	–	0.52	**0.0011**	ND	**0.214**	**0.107**	U	ND	**1.01**	**0.505**	U	ND	**1.01**	**0.505**	U	ND	**0.428**	**0.214**	U	ND	**0.420**	**0.210**	U	ND	**0.454**	**0.227**	U
SW8270D	n-Nitrosodiphenylamine	86-30-6	–	750	15	ND	0.214	0.107	U	ND	1.01	0.505	U	ND	1.01	0.505	U	ND	0.428	0.214	U	ND	0.420	0.210	U	ND	0.454	0.227	U
SW8270D	o-Cresol	95-48-7	–	3200	15	ND	0.214	0.107	U	ND	1.01	0.505	U	ND	1.01	0.505	U	ND	0.428	0.214	U	ND	0.420	0.210	U	ND	0.454	0.227	U
SW8270D	**p-Chloroaniline**	106-47-8	–	90	**0.057**	ND	**0.414**	**0.207**	U	ND	**1.94**	**0.971**	U	ND	**1.94**	**0.971**	U	ND	**0.822**	**0.411**	U	ND	**0.806**	**0.403**	U	ND	**0.872**	**0.436**	U
SW8270D	**Pentachlorophenol**	87-86-5	–	39	**0.047**	ND	**1.71**	**0.854**	U	ND	**8.02**	**4.01**	U	ND	**8.02**	**4.01**	U	ND	**3.40**	**1.70**	U	ND	**3.34**	**1.67**	U	ND	**3.60**	**1.80**	U
SW8270D	Phenanthrene	85-01-8	–	20600	3000	0.474	0.214	0.107	–	ND	1.01	0.505	U	ND	1.01	0.505	U	ND	0.428	0.214	U	ND	0.420	0.210	U	ND	0.454	0.227	U
SW8270D	Phenol	108-95-2	–	23200	68	ND	0.214	0.107	U	ND	1.01	0.505	U	ND	1.01	0.505	U	ND	0.428	0.214	U	ND	0.420	0.210	U	ND	0.454	0.227	U
SW8270D	p-Nitroaniline	100-01-6	–	–	–	ND	2.58	1.29	U	ND	12.2	6.08	U	ND	12.2	6.08	U	ND	5.14	2.57	U	ND	5.06	2.53	U	ND	5.46	2.73	U
SW8270D	Pyrene	129-00-0	–	1400	1000	0.443	0.430	0.215	J	ND	1.01	0.505	U	ND	1.01	0.505	U	ND	0.428	0.214	U	ND	0.420	0.210	U	ND	0.454	0.227	U
SW8270D-SIM	1-Methylnaphthalene	90-12-0	760	280	6.2	0.0151	0.00408	0.00204	–	0.0168	0.0195	0.00976	J	0.00963	0.00396	0.00198	–	0.0427	0.00410	0.00205	–	0.00472	0.00402	0.00201	J	ND	0.00434	0.00217	U
SW8270D-SIM	2-Methylnaphthalene	91-57-6	750	280	6.1	0.00576	0.00408	0.00204	J	0.0168	0.0195	0.00976	J	0.00883	0.00396	0.00198	–	0.0396	0.00410	0.00205	–	0.00544	0.00402	0.00201	J	ND	0.00434	0.00217	U
SW8270D-SIM	Acenaphthene	83-32-9	–	2800	180	0.202	0.0408	0.0204	–	0.0101	0.0195	0.00976	J	0.0130	0.00396	0.00198	–	ND	0.00410	0.00205	U	0.00403	0.00402	0.00201	J	ND	0.00434	0.00217	U
SW8270D-SIM	Acenaphthylene	208-96-8	–	2800	180	0.00382	0.00408	0.00204	J	0.0144	0.0195	0.00976	J	ND	0.00396	0.00198	U	ND	0.00410	0.00205	U	ND	0.00402	0.00201	U	ND	0.00434	0.00217	U
SW8270D-SIM	Anthracene	120-12-7	–	20600	3000	0.0255	0.00408	0.00204	–	0.0538	0.0195	0.00976	–	0.0367	0.00396	0.00198	–	ND	0.00410	0.00205	U	ND	0.00402	0.00201	U	ND	0.00434	0.00217	U
SW8270D-SIM	Benzo(a)anthracene	56-55-3	–	4.9	3.6	0.0633	0.00408	0.00204	–	0.16	0.0976	0.0488	J	0.121	0.00396	0.00198	–	0.00726	0.00410	0.00205	–	ND	0.00402	0.00201	U	ND	0.00434	0.00217	U
SW8270D-SIM	Benzo(a)pyrene	50-32-8	–	0.49	2.1	0.0196	0.00408	0.00204	–	0.2	0.0195	0.00976	–	0.0949	0.00396	0.00198	–	0.00593	0.00410	0.00205	J	ND	0.00402	0.00201	U	ND	0.00434	0.00217	U
SW8270D-SIM	Benzo(b)fluoranthene	205-99-2	–	4.9	12	0.0413	0.00408	0.00204	–	0.284	0.0976	0.0488	–	0.138	0.0396	0.0198	–	0.00998	0.00410	0.00205	–	ND	0.00402	0.00201	U	ND	0.00434	0.00217	U
SW8270D-SIM	Benzo(g,h,i)perylene	191-24-2	–	1400	38700	0.00616	0.00408	0.00204	J	0.112	0.0195	0.00976	–	0.0455	0.00396	0.00198	–	0.00281	0.00410	0.00205	J	ND	0.00402	0.00201	U	ND	0.00434	0.00217	U
SW8270D-SIM	Benzo(k)fluoranthene	207-08-9	–	49	120	0.0115	0.00408	0.00204	–	ND	0.0976	0.0488	U	ND	0.00396	0.00198	U	0.00305	0.00410	0.00205	J	ND	0.00402	0.00201	U	ND	0.00434	0.00217	U
SW8270D-SIM	Chrysene	218-01-9	–	490	360	0.0374	0.00408	0.00204	–	0.245	0.0976	0.0488	–	0.118	0.00396	0.00198	–	0.00932	0.00410	0.00205	–	ND	0.00402	0.00201	U	ND	0.00434	0.00217	U
SW8270D-SIM	Dibenzo(a,h)anthracene	53-70-3	–	0.49	4.0	ND	0.00408	0.00204	U	0.0287	0.0195	0.00976	J	0.0146	0.00396	0.00198	–	ND	0.00410	0.00205	U	ND	0.00402	0.00201	U	ND	0.00434	0.00217	U
SW8270D-SIM	Fluoranthene	206-44-0	–	1900	1400	0.458	0.0408	0.0204	–	0.393	0.0976	0.0488	–	0.316	0.0396	0.0198	–	0.0219	0.00410	0.00205	–	ND	0.00402	0.00201	U	ND	0.00434	0.00217	U
SW8270D-SIM	Fluorene	86-73-7	–	2300	220	0.0831	0.00408	0.00204	–	0.0208	0.0195	0.00976	J	0.0206	0.00396	0.00198	–	ND	0.00410	0.00205	U	0.00597	0.00402	0.00201	J	ND	0.00434	0.00217	U
SW8270D-SIM	Indeno(1,2,3-cd)pyrene	193-39-5	–	4.9	41	0.00604	0.00408	0.00204	J	0.0871	0.0195	0.00976	–	0.0459	0.00396	0.00198	–	ND	0.00410	0.00205	U	ND	0.00402	0.00201	U	ND	0.00434	0.00217	U
SW8270D-SIM	Naphthalene	91-20-3	28	1400	20	0.0138	0.00408	0.00204	–	0.0152	0.0195	0.00976	J	0.00577	0.00396	0.00198	J	0.0105	0.00410	0.00205	–	0.00870	0.00402	0.00201	–	0.00315	0.00434	0.00217	J
SW8270D-SIM	Phenanthrene	85-01-8	–	20600	3000	0.418	0.0408	0.0204	–	0.0685	0.0195	0.00976	–	0.0525	0.00396	0.00198	–	0.0118	0.00410	0.00205	–	0.00292	0.00402	0.00201	J	ND	0.00434	0.00217	U
SW8270D-SIM	Pyrene	129-00-0	–	1400	1000	0.353	0.0408	0.0204	–	0.345	0.0976	0.0488	–	0.284	0.0396	0.0198	–	0.0236	0.00410	0.00205	–	ND	0.00402	0.00201	U	ND	0.00434	0.00217	U

NOTES AND ABBREVIATIONS:

ADEC = Alaska Department of Environmental Conservation
CAS# = Chemical Abstracts Service Number
J = indicates the concentration of a substance is between the MDL and MRL and is an estimated value
MDL = Method Detection Limit (lowest level of a substance that can be distinguished in a sample)
mg/kg = milligrams per kilogram
MRL = Method Reporting Limit (smallest amount of a substance that can be quantitated in a sample)
ND = Indicates the analyte is not detected.
Quals = Data Qualifiers
U = Indicates the analyte was analyzed for but not detected.
The MDL and/or MRL is greater than the ADEC Cleanup Level

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APPENDIX E

Laboratory Analytical Report

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Laboratory Report of Analysis

To: Oasis Env/ERM-West, Inc.
825 W 8th Ave Suite 200
Anchorage, AK 99501
(907)258-4880

Report Number: **1135014**

Client Project: **Napaskiak Trench Installation**

Dear Stephen Witzmann,

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 five years in the event they are required for future reference. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. Any samples submitted to our laboratory will be retained for a maximum of fourteen (14) days from the date of this report unless other archiving requirements were included in the quote.

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

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

Sincerely,
SGS North America Inc.

_____

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

Print Date: 10/24/2013 8:39:19AM

Case Narrative

SGS Client: **Oasis Env/ERM-West, Inc.**
SGS Project: **1135014**
Project Name/Site: **Napaskiak Trench Installation**
Project Contact: **Stephen Witzmann**

Refer to sample receipt form for information on sample condition.

13-NK-01-SO (1135014001) PS

AK102 - The pattern is consistent with a weathered middle distillate.
AK103 - Unknown hydrocarbon with several peaks is present.
8270D - LOQs are elevated due to sample dilution. Sample analyzed at a dilution due to matrix interference with internal standards.

13-NK-02-SO (1135014002) PS

8270D SIM - LOQs are elevated due to sample dilution. Sample analyzed at a dilution due to matrix interference with internal standards.
AK102 - The pattern is consistent with a weathered middle distillate.
AK103 - Unknown hydrocarbon with several peaks is present.
8270D-SIM – Coeluting peak for benzo(b)fluoranthene and benzo(k)fluoranthene has been quantified as benzo(b)fluoranthene.
8270D - LOQs are elevated due to sample dilution. Sample analyzed at a dilution due to matrix.

13-NK-03-SO (1135014003) PS

AK102 - The pattern is consistent with a weathered middle distillate.
AK103 - Unknown hydrocarbon with several peaks is present.
8270D - LOQs are elevated due to sample dilution. Sample analyzed at a dilution due to matrix.

13-NK-04-SO (1135014004) PS

AK102 - The pattern is consistent with a weathered middle distillate.
AK103 - Unknown hydrocarbon with several peaks is present.
8270D - LOQs are elevated due to sample dilution. Sample analyzed at a dilution due to matrix.

13-NK-05-SO (1135014005) PS

AK102/103 - Unknown hydrocarbon with several peaks is present.
8270D SIM- Surrogate (2-fluorobiphenyl) recovery is outside of QC criteria due to sample dilution.
8270D - LOQs are elevated due to sample dilution. Sample analyzed at a dilution due to matrix interference with internal standards.

13-NK-06-SO (1135014006) PS

AK102/103 - Unknown hydrocarbon with several peaks is present.
8270D - LOQs are elevated due to sample dilution. Sample analyzed at a dilution due to matrix interference with internal standards.

CCV for HBN 1489145 (VMS/13827 (1185746) CCV

8260B - CCV recovery for vinyl chloride does not meet QC criteria (biased high). This analyte was not detected above the LOQ in the associated samples.

CCV for HBN 1489766 (VMS/13836 (1186199) CCV

8260B - CCV recovery for bromomethane does not meet QC criteria (biased high). This analyte was not detected above the LOQ in the associated samples.

1134936001MS (1184406) MS

8082A - MS/MSD recovery for Aroclor 1016 not meet QC criteria due to matrix interference. See the LCS for accuracy.

1135014002MS (1184704) MS

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Case Narrative

SGS Client: **Oasis Env/ERM-West, Inc.**
SGS Project: **1135014**
Project Name/Site: **Napaskiak Trench Installation**
Project Contact: **Stephen Witzmann**

Refer to sample receipt form for information on sample condition.

8270D SIM - MS/MSD recovery for multiple analytes is outside of QC criteria. Refer to LCS for accuracy.
8270D SIM - LOQs are elevated due to sample dilution. Sample analyzed at a dilution due to matrix interference with internal standards.
8270D SIM - Surrogate (2-fluorobiphenyl) recovery is outside of QC criteria due to sample dilution.

1135035001MS (1185117) MS

8270D - MS recovery for benzoic acid and hexachlorocyclopentadiene is outside of QC criteria (biased low). Refer to LCS for accuracy.

1138562004(1185742MS) (1185743) MS

8260B - MS recovery for hexachlorobutadiene does not meet QC criteria. Refer to LCS for accuracy.

1134936001MSD (1184407) MSD

8082A - MS/MSD recovery for Aroclor 1016 not meet QC criteria due to matrix interference. See the LCS for accuracy.

1135014002MSD (1184705) MSD

8270D SIM - MS/MSD recovery for multiple analytes is outside of QC criteria. Refer to LCS for accuracy.
8270D SIM - MS/MSD RPD for multiple analytes does not meet QC criteria.
8270D SIM - LOQs are elevated due to sample dilution. Sample analyzed at a dilution due to matrix interference with internal standards.
8270D-SIM – Coeluting peak for benzo(b)fluoranthene and benzo(k)fluoranthene has been quantified as benzo(b)fluoranthene.

1135035001MSD (1185118) MSD

8270D - MSD recovery for benzoic acid and hexachlorocyclopentadiene is outside of QC criteria (biased low). Refer to LCS for accuracy.

1138562004(1185742MSD) (1185744) MSD

8260B - MSD recoveries for 1,2,3-trcihlorobenzene, hexachlorobutadiene, and vinyl chloride do not meet QC criteria. Refer to LCS for accuracy.

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

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Report of Manual Integrations

Laboratory ID	Client Sample ID	Analytical Batch	Analyte	Reason
8270D SIMS (PAH)				
1135014001	13-NK-01-SO	XMS7676	Benzo[b]Fluoranthene	SP
1135014001	13-NK-01-SO	XMS7676	Benzo[k]fluoranthene	SP
1135014001	13-NK-01-SO	XMS7676	Chrysene	BLC
1135014002	13-NK-02-SO	XMS7676	Benzo(a)Anthracene	BLC
1135014002	13-NK-02-SO	XMS7676	Benzo[b]Fluoranthene	IT
1135014002	13-NK-02-SO	XMS7676	Chrysene	BLC
1135014003	13-NK-03-SO	XMS7677	Benzo[b]Fluoranthene	SP
1135014003	13-NK-03-SO	XMS7676	Chrysene	BLC
1135014003	13-NK-03-SO	XMS7676	Naphthalene	SP
1135014004	13-NK-04-SO	XMS7676	Benzo[b]Fluoranthene	SP
1135014004	13-NK-04-SO	XMS7676	Benzo[k]fluoranthene	SP
1135014004	13-NK-04-SO	XMS7676	Chrysene	BLC
1135014004	13-NK-04-SO	XMS7676	Naphthalene	SP
1184704	1135014002MS	XMS7676	Benzo[k]fluoranthene	SP
1184705	1135014002MSD	XMS7676	Benzo[b]Fluoranthene	IT
1184705	1135014002MSD	XMS7676	Chrysene	BLC
SW8082A				
1184406	1134936001MS	XGC8641	Aroclor-1016	BLC
1184407	1134936001MSD	XGC8641	Aroclor-1016	BLC
SW8270D				
1185116	LCS for HBN 1488576 [XXX/30142	XMS7695	1-Chloronaphthalene	RSP
1185116	LCS for HBN 1488576 [XXX/30142	XMS7695	2-Chloronaphthalene	RSP
1185117	1135035001MS	XMS7695	1-Chloronaphthalene	RSP
1185117	1135035001MS	XMS7695	2-Chloronaphthalene	RSP
1185118	1135035001MSD	XMS7695	1-Chloronaphthalene	PNF
1185118	1135035001MSD	XMS7695	2-Chloronaphthalene	RSP
1187402	CCV for HBN 1491185 [XMS/7712]	XMS7712	1-Chloronaphthalene	RP

Print Date: 10/24/2013 8:39:20AM

Report of Manual Integrations

Laboratory ID	Client Sample ID	Analytical Batch	Analyte	Reason

Manual Integration Reason Code Descriptions

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

All DRO/RRO analysis are integrated per SOP.

Print Date: 10/24/2013 8:39:20AM

Laboratory Qualifiers

Enclosed are the analytical results associated with the above work order. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. If you have any questions regarding this report, or if we can be of any other assistance, please contact your SGS Project Manager at 907-562-2343. All work is provided under SGS general terms and conditions (<http://www.sgs.com/terms_and_conditions.htm>), unless other written agreements have been accepted by both parties.

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

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

*	The analyte has exceeded allowable regulatory or control limits.
!	Surrogate out of control limits.
B	Indicates the analyte is found in a blank associated with the sample.
CCV	Continuing Calibration Verification
CL	Control Limit
D	The analyte concentration is the result of a dilution.
DF	Dilution Factor
DL	Detection Limit (i.e., maximum method detection limit)
E	The analyte result is above the calibrated range.
F	Indicates value that is greater than or equal to the DL
GT	Greater Than
IB	Instrument Blank
ICV	Initial Calibration Verification
J	The quantitation is an estimation.
JL	The analyte was positively identified, but the quantitation is a low estimation.
LCS(D)	Laboratory Control Spike (Duplicate)
LOD	Limit of Detection (i.e., 2xDL)
LOQ	Limit of Quantitation (i.e., reporting or practical quantitation limit)
LT	Less Than
M	A matrix effect was present.
MB	Method Blank
MS(D)	Matrix Spike (Duplicate)
ND	Indicates the analyte is not detected.
Q	QC parameter out of acceptance range.
R	Rejected
RPD	Relative Percent Difference
U	Indicates the analyte was analyzed for but not detected.

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

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Sample Summary

Client Sample ID	Lab Sample ID	Collected	Received	Matrix
13-NK-01-SO	1135014001	10/04/2013	10/07/2013	Soil/Solid (dry weight)
13-NK-02-SO	1135014002	10/04/2013	10/07/2013	Soil/Solid (dry weight)
13-NK-03-SO	1135014003	10/04/2013	10/07/2013	Soil/Solid (dry weight)
13-NK-04-SO	1135014004	10/05/2013	10/07/2013	Soil/Solid (dry weight)
13-NK-05-SO	1135014005	10/05/2013	10/07/2013	Soil/Solid (dry weight)
13-NK-06-SO	1135014006	10/05/2013	10/07/2013	Soil/Solid (dry weight)
Trip Blank	1135014007	10/04/2013	10/07/2013	Soil/Solid (dry weight)

Method	Method Description
8270D SIMS (PAH)	8270 PAH SIM Semi-Volatiles GC/MS
AK102	Diesel/Residual Range Organics
AK103	Diesel/Residual Range Organics
AK101	Gasoline Range Organics (S)
SW6020	Metals by ICP-MS (S)
SM21 2540G	Percent Solids SM2540G
SW8082A	SW8082 PCB's
SW8270D	SW846 8270 Semi-Volatiles by GC/MS (S)
SW8260B	VOC 8260 (S) Field Extracted

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Detectable Results Summary

Client Sample ID: **13-NK-01-SO**
Lab Sample ID: 1135014001

	Parameter	Result	Units
Metals by ICP/MS	Lead	10.2	mg/Kg
Polynuclear Aromatics GC/MS	1-Methylnaphthalene	15.1	ug/Kg
	2-Methylnaphthalene	5.76J	ug/Kg
	Acenaphthene	202	ug/Kg
	Acenaphthylene	3.82J	ug/Kg
	Anthracene	25.5	ug/Kg
	Benzo(a)Anthracene	63.3	ug/Kg
	Benzo[a]pyrene	19.6	ug/Kg
	Benzo[b]Fluoranthene	41.3	ug/Kg
	Benzo[g,h,i]perylene	6.16J	ug/Kg
	Benzo[k]fluoranthene	11.5	ug/Kg
	Chrysene	37.4	ug/Kg
	Fluoranthene	458	ug/Kg
	Fluorene	83.1	ug/Kg
	Indeno[1,2,3-c,d] pyrene	6.04J	ug/Kg
	Naphthalene	13.8	ug/Kg
	Phenanthrene	418	ug/Kg
	Pyrene	353	ug/Kg
Semivolatile Organic Fuels	Diesel Range Organics	246	mg/Kg
	Residual Range Organics	356	mg/Kg
Semivolatile Organic GC/MS	Acenaphthene	0.226J	mg/Kg
	Fluoranthene	0.425	mg/Kg
	Fluorene	0.113J	mg/Kg
	Phenanthrene	0.474	mg/Kg
	Pyrene	0.443J	mg/Kg
Volatile Fuels	Gasoline Range Organics	1.97J	mg/Kg
Volatile GC/MS	4-Isopropyltoluene	66.1	ug/Kg
	Toluene	22.9J	ug/Kg

Print Date: 10/24/2013 8:39:22AM

Detectable Results Summary

Client Sample ID: **13-NK-02-SO**
Lab Sample ID: 1135014002

	Parameter	Result	Units
Metals by ICP/MS	Lead	8.73	mg/Kg
Polynuclear Aromatics GC/MS	1-Methylnaphthalene	16.8J	ug/Kg
	2-Methylnaphthalene	16.8J	ug/Kg
	Acenaphthene	10.1J	ug/Kg
	Acenaphthylene	14.4J	ug/Kg
	Anthracene	53.8	ug/Kg
	Benzo(a)Anthracene	160J	ug/Kg
	Benzo[a]pyrene	200	ug/Kg
	Benzo[b]Fluoranthene	284	ug/Kg
	Benzo[g,h,i]perylene	112	ug/Kg
	Chrysene	245	ug/Kg
	Dibenzo[a,h]anthracene	28.7J	ug/Kg
	Fluoranthene	393	ug/Kg
	Fluorene	20.8J	ug/Kg
	Indeno[1,2,3-c,d] pyrene	87.1	ug/Kg
	Naphthalene	15.2J	ug/Kg
	Phenanthrene	68.5	ug/Kg
	Pyrene	345	ug/Kg
Semivolatile Organic Fuels	Diesel Range Organics	97.3	mg/Kg
	Residual Range Organics	202	mg/Kg
Volatile Fuels	Gasoline Range Organics	7.94	mg/Kg
Volatile GC/MS	Toluene	156	ug/Kg

Print Date: 10/24/2013 8:39:22AM

Detectable Results Summary

Client Sample ID: **13-NK-03-SO**
Lab Sample ID: 1135014003

	Parameter	Result	Units
Metals by ICP/MS	Lead	11.2	mg/Kg
Polynuclear Aromatics GC/MS	1-Methylnaphthalene	9.63	ug/Kg
	2-Methylnaphthalene	8.83	ug/Kg
	Acenaphthene	13.0	ug/Kg
	Anthracene	36.7	ug/Kg
	Benzo(a)Anthracene	121	ug/Kg
	Benzo[a]pyrene	94.9	ug/Kg
	Benzo[b]Fluoranthene	138	ug/Kg
	Benzo[g,h,i]perylene	45.5	ug/Kg
	Chrysene	118	ug/Kg
	Dibenzo[a,h]anthracene	14.6	ug/Kg
	Fluoranthene	316	ug/Kg
	Fluorene	20.6	ug/Kg
	Indeno[1,2,3-c,d] pyrene	45.9	ug/Kg
	Naphthalene	5.77J	ug/Kg
	Phenanthrene	52.5	ug/Kg
	Pyrene	284	ug/Kg
Semivolatile Organic Fuels	Diesel Range Organics	272	mg/Kg
	Residual Range Organics	346	mg/Kg
Volatile Fuels	Gasoline Range Organics	6.57	mg/Kg
Volatile GC/MS	o-Xylene	38.4J	ug/Kg
	Toluene	225	ug/Kg
	Xylenes (total)	71.0J	ug/Kg

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Detectable Results Summary

Client Sample ID: **13-NK-04-SO**
Lab Sample ID: 1135014004

	Parameter	Result	Units
Metals by ICP/MS	Lead	9.05	mg/Kg
Polynuclear Aromatics GC/MS	1-Methylnaphthalene	42.7	ug/Kg
	2-Methylnaphthalene	39.6	ug/Kg
	Benzo(a)Anthracene	7.26	ug/Kg
	Benzo[a]pyrene	5.93J	ug/Kg
	Benzo[b]Fluoranthene	9.98	ug/Kg
	Benzo[g,h,i]perylene	2.81J	ug/Kg
	Benzo[k]fluoranthene	3.05J	ug/Kg
	Chrysene	9.32	ug/Kg
	Fluoranthene	21.9	ug/Kg
	Naphthalene	10.5	ug/Kg
	Phenanthrene	11.8	ug/Kg
	Pyrene	23.6	ug/Kg
Semivolatile Organic Fuels	Diesel Range Organics	159	mg/Kg
	Residual Range Organics	223	mg/Kg
Volatile Fuels	Gasoline Range Organics	5.78	mg/Kg
Volatile GC/MS	1,3,5-Trimethylbenzene	25.3J	ug/Kg
	4-Isopropyltoluene	45.5J	ug/Kg
	Benzene	13.5J	ug/Kg
	sec-Butylbenzene	27.0J	ug/Kg
	Toluene	44.4J	ug/Kg

Client Sample ID: **13-NK-05-SO**
Lab Sample ID: 1135014005

	Parameter	Result	Units
Metals by ICP/MS	Lead	12.3	mg/Kg
Polynuclear Aromatics GC/MS	1-Methylnaphthalene	4.72J	ug/Kg
	2-Methylnaphthalene	5.44J	ug/Kg
	Acenaphthene	4.03J	ug/Kg
	Fluorene	5.97J	ug/Kg
	Naphthalene	8.70	ug/Kg
	Phenanthrene	2.92J	ug/Kg
Semivolatile Organic Fuels	Diesel Range Organics	42.8	mg/Kg
	Residual Range Organics	261	mg/Kg
Volatile Fuels	Gasoline Range Organics	2.37J	mg/Kg
Volatile GC/MS	Toluene	25.5J	ug/Kg

Client Sample ID: **13-NK-06-SO**
Lab Sample ID: 1135014006

	Parameter	Result	Units
Metals by ICP/MS	Lead	9.44	mg/Kg
Polynuclear Aromatics GC/MS	Naphthalene	3.15J	ug/Kg
Semivolatile Organic Fuels	Diesel Range Organics	46.0	mg/Kg
	Residual Range Organics	232	mg/Kg

Client Sample ID: **Trip Blank**
Lab Sample ID: 1135014007

	Parameter	Result	Units
Volatile Fuels	Gasoline Range Organics	0.839J	mg/Kg

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Results of **13-NK-01-SO**

Client Sample ID: **13-NK-01-SO**
Client Project ID: **Napaskiak Trench Installation**
Lab Sample ID: 1135014001
Lab Project ID: 1135014

Collection Date: 10/04/13 16:00
Received Date: 10/07/13 16:07
Matrix: Soil/Solid (dry weight)
Solids (%): 72.4

Results by **Metals by ICP/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Lead	10.2		1.37	0.425	mg/Kg	50		10/22/13 19:53

Batch Information

Analytical Batch: MMS8316
Analytical Method: SW6020
Analyst: HKS
Analytical Date/Time: 10/22/13 19:53
Container ID: 1135014001-A

Prep Batch: MXX27200
Prep Method: SW3050B
Prep Date/Time: 10/13/13 15:30
Prep Initial Wt./Vol.: 1.009 g
Prep Extract Vol: 50 mL

Print Date: 10/24/2013 8:39:23AM

Results of **13-NK-01-SO**

Client Sample ID: **13-NK-01-SO**
Client Project ID: **Napaskiak Trench Installation**
Lab Sample ID: 1135014001
Lab Project ID: 1135014

Collection Date: 10/04/13 16:00
Received Date: 10/07/13 16:07
Matrix: Soil/Solid (dry weight)
Solids (%): 72.4

Results by **Polychlorinated Biphenyls**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Aroclor-1016	40.6	U	67.8	20.3	ug/Kg	1		10/10/13 13:34
Aroclor-1221	40.6	U	67.8	20.3	ug/Kg	1		10/10/13 13:34
Aroclor-1232	40.6	U	67.8	20.3	ug/Kg	1		10/10/13 13:34
Aroclor-1242	40.6	U	67.8	20.3	ug/Kg	1		10/10/13 13:34
Aroclor-1248	40.6	U	67.8	20.3	ug/Kg	1		10/10/13 13:34
Aroclor-1254	40.6	U	67.8	20.3	ug/Kg	1		10/10/13 13:34
Aroclor-1260	40.6	U	67.8	20.3	ug/Kg	1		10/10/13 13:34
Surrogates								
Decachlorobiphenyl	103		60-125		%	1		10/10/13 13:34

Batch Information

Analytical Batch: XGC8641
Analytical Method: SW8082A
Analyst: RTS
Analytical Date/Time: 10/10/13 13:34
Container ID: 1135014001-A

Prep Batch: XXX30119
Prep Method: SW3550C
Prep Date/Time: 10/08/13 18:30
Prep Initial Wt./Vol.: 22.918 g
Prep Extract Vol: 5 mL

Print Date: 10/24/2013 8:39:23AM

Results of **13-NK-01-SO**

Client Sample ID: **13-NK-01-SO**
Client Project ID: **Napaskiak Trench Installation**
Lab Sample ID: 1135014001
Lab Project ID: 1135014

Collection Date: 10/04/13 16:00
Received Date: 10/07/13 16:07
Matrix: Soil/Solid (dry weight)
Solids (%): 72.4

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	15.1		6.80	2.04	ug/Kg	1		10/10/13 17:51
2-Methylnaphthalene	5.76	J	6.80	2.04	ug/Kg	1		10/10/13 17:51
Acenaphthene	202		68.0	20.4	ug/Kg	10		10/11/13 15:52
Acenaphthylene	3.82	J	6.80	2.04	ug/Kg	1		10/10/13 17:51
Anthracene	25.5		6.80	2.04	ug/Kg	1		10/10/13 17:51
Benzo(a)Anthracene	63.3		6.80	2.04	ug/Kg	1		10/10/13 17:51
Benzo[a]pyrene	19.6		6.80	2.04	ug/Kg	1		10/10/13 17:51
Benzo[b]Fluoranthene	41.3		6.80	2.04	ug/Kg	1		10/10/13 17:51
Benzo[g,h,i]perylene	6.16	J	6.80	2.04	ug/Kg	1		10/10/13 17:51
Benzo[k]fluoranthene	11.5		6.80	2.04	ug/Kg	1		10/10/13 17:51
Chrysene	37.4		6.80	2.04	ug/Kg	1		10/10/13 17:51
Dibenzo[a,h]anthracene	4.08	U	6.80	2.04	ug/Kg	1		10/10/13 17:51
Fluoranthene	458		68.0	20.4	ug/Kg	10		10/11/13 15:52
Fluorene	83.1		6.80	2.04	ug/Kg	1		10/10/13 17:51
Indeno[1,2,3-c,d] pyrene	6.04	J	6.80	2.04	ug/Kg	1		10/10/13 17:51
Naphthalene	13.8		6.80	2.04	ug/Kg	1		10/10/13 17:51
Phenanthrene	418		68.0	20.4	ug/Kg	10		10/11/13 15:52
Pyrene	353		68.0	20.4	ug/Kg	10		10/11/13 15:52
Surrogates								
2-Fluorobiphenyl	90		45-105		%	1		10/10/13 17:51
Terphenyl-d14	103		30-125		%	1		10/10/13 17:51

Batch Information

Analytical Batch: XMS7676
Analytical Method: 8270D SIMS (PAH)
Analyst: RTS
Analytical Date/Time: 10/10/13 17:51
Container ID: 1135014001-A

Prep Batch: XXX30130
Prep Method: SW3550C
Prep Date/Time: 10/09/13 18:05
Prep Initial Wt./Vol.: 22.845 g
Prep Extract Vol: 1 mL

Analytical Batch: XMS7677
Analytical Method: 8270D SIMS (PAH)
Analyst: RTS
Analytical Date/Time: 10/11/13 15:52
Container ID: 1135014001-A

Prep Batch: XXX30130
Prep Method: SW3550C
Prep Date/Time: 10/09/13 18:05
Prep Initial Wt./Vol.: 22.845 g
Prep Extract Vol: 1 mL

Print Date: 10/24/2013 8:39:23AM

Results of **13-NK-01-SO**

Client Sample ID: **13-NK-01-SO**
Client Project ID: **Napaskiak Trench Installation**
Lab Sample ID: 1135014001
Lab Project ID: 1135014

Collection Date: 10/04/13 16:00
Received Date: 10/07/13 16:07
Matrix: Soil/Solid (dry weight)
Solids (%): 72.4

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	246		27.3	8.47	mg/Kg	1		10/10/13 18:14
Surrogates								
5a Androstane	140		50-150		%	1		10/10/13 18:14

Batch Information

Analytical Batch: XFC11124
Analytical Method: AK102
Analyst: EAB
Analytical Date/Time: 10/10/13 18:14
Container ID: 1135014001-A

Prep Batch: XXX30120
Prep Method: SW3550C
Prep Date/Time: 10/08/13 20:45
Prep Initial Wt./Vol.: 30.336 g
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	356		27.3	8.47	mg/Kg	1		10/10/13 18:14
Surrogates								
n-Triacontane-d62	114		50-150		%	1		10/10/13 18:14

Batch Information

Analytical Batch: XFC11124
Analytical Method: AK103
Analyst: EAB
Analytical Date/Time: 10/10/13 18:14
Container ID: 1135014001-A

Prep Batch: XXX30120
Prep Method: SW3550C
Prep Date/Time: 10/08/13 20:45
Prep Initial Wt./Vol.: 30.336 g
Prep Extract Vol: 1 mL

Print Date: 10/24/2013 8:39:23AM

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Results of **13-NK-01-SO**

Client Sample ID: **13-NK-01-SO**
Client Project ID: **Napaskiak Trench Installation**
Lab Sample ID: 1135014001
Lab Project ID: 1135014

Collection Date: 10/04/13 16:00
Received Date: 10/07/13 16:07
Matrix: Soil/Solid (dry weight)
Solids (%): 72.4

Results by **Semivolatile Organic GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2,4-Trichlorobenzene	0.214	U	0.344	0.107	mg/Kg	1		10/16/13 10:34
1,2-Dichlorobenzene	0.214	U	0.344	0.107	mg/Kg	1		10/16/13 10:34
1,3-Dichlorobenzene	0.214	U	0.344	0.107	mg/Kg	1		10/16/13 10:34
1,4-Dichlorobenzene	0.214	U	0.344	0.107	mg/Kg	1		10/16/13 10:34
1-Chloronaphthalene	0.214	U	0.344	0.107	mg/Kg	1		10/16/13 10:34
2,4,5-Trichlorophenol	0.214	U	0.344	0.107	mg/Kg	1		10/16/13 10:34
2,4,6-Trichlorophenol	0.214	U	0.344	0.107	mg/Kg	1		10/16/13 10:34
2,4-Dichlorophenol	0.214	U	0.344	0.107	mg/Kg	1		10/16/13 10:34
2,4-Dimethylphenol	0.214	U	0.344	0.107	mg/Kg	1		10/16/13 10:34
2,4-Dinitrophenol	2.58	U	4.13	1.29	mg/Kg	1		10/16/13 10:34
2,4-Dinitrotoluene	0.214	U	0.344	0.107	mg/Kg	1		10/16/13 10:34
2,6-Dichlorophenol	0.214	U	0.344	0.107	mg/Kg	1		10/16/13 10:34
2,6-Dinitrotoluene	0.214	U	0.344	0.107	mg/Kg	1		10/16/13 10:34
2-Chloronaphthalene	0.214	U	0.344	0.107	mg/Kg	1		10/16/13 10:34
2-Chlorophenol	0.214	U	0.344	0.107	mg/Kg	1		10/16/13 10:34
2-Methyl-4,6-dinitrophenol	1.71	U	2.75	0.854	mg/Kg	1		10/16/13 10:34
2-Methylnaphthalene	0.214	U	0.344	0.107	mg/Kg	1		10/16/13 10:34
2-Methylphenol (o-Cresol)	0.214	U	0.344	0.107	mg/Kg	1		10/16/13 10:34
2-Nitroaniline	0.214	U	0.344	0.107	mg/Kg	1		10/16/13 10:34
2-Nitrophenol	0.214	U	0.344	0.107	mg/Kg	1		10/16/13 10:34
3&4-Methylphenol (p&m-Cresol)	0.854	U	1.38	0.427	mg/Kg	1		10/16/13 10:34
3,3-Dichlorobenzidine	0.430	U	0.688	0.215	mg/Kg	2		10/21/13 21:10
3-Nitroaniline	0.414	U	0.688	0.207	mg/Kg	1		10/16/13 10:34
4-Bromophenyl-phenylether	0.214	U	0.344	0.107	mg/Kg	1		10/16/13 10:34
4-Chloro-3-methylphenol	0.214	U	0.344	0.107	mg/Kg	1		10/16/13 10:34
4-Chloroaniline	0.414	U	0.688	0.207	mg/Kg	1		10/16/13 10:34
4-Chlorophenyl-phenylether	0.214	U	0.344	0.107	mg/Kg	1		10/16/13 10:34
4-Nitroaniline	2.58	U	4.13	1.29	mg/Kg	1		10/16/13 10:34
4-Nitrophenol	0.854	U	1.38	0.427	mg/Kg	1		10/16/13 10:34
Acenaphthene	0.226	J	0.344	0.107	mg/Kg	1		10/16/13 10:34
Acenaphthylene	0.214	U	0.344	0.107	mg/Kg	1		10/16/13 10:34
Aniline	1.71	U	2.75	0.854	mg/Kg	1		10/16/13 10:34
Anthracene	0.214	U	0.344	0.107	mg/Kg	1		10/16/13 10:34
Azobenzene	0.214	U	0.344	0.107	mg/Kg	1		10/16/13 10:34
Benzo(a)Anthracene	0.430	U	0.688	0.215	mg/Kg	2		10/21/13 21:10
Benzo[a]pyrene	1.07	U	1.72	0.537	mg/Kg	5		10/22/13 22:45

Print Date: 10/24/2013 8:39:23AM

Results of **13-NK-01-SO**

Client Sample ID: **13-NK-01-SO**
Client Project ID: **Napaskiak Trench Installation**
Lab Sample ID: 1135014001
Lab Project ID: 1135014

Collection Date: 10/04/13 16:00
Received Date: 10/07/13 16:07
Matrix: Soil/Solid (dry weight)
Solids (%): 72.4

Results by **Semivolatile Organic GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzo[b]Fluoranthene	1.07	U	1.72	0.537	mg/Kg	5		10/22/13 22:45
Benzo[g,h,i]perylene	1.07	U	1.72	0.537	mg/Kg	5		10/22/13 22:45
Benzo[k]fluoranthene	1.07	U	1.72	0.537	mg/Kg	5		10/22/13 22:45
Benzoic acid	2.06	U	2.07	1.03	mg/Kg	1		10/16/13 10:34
Benzyl alcohol	0.214	U	0.344	0.107	mg/Kg	1		10/16/13 10:34
Bis(2-Chloroethoxy)methane	0.214	U	0.344	0.107	mg/Kg	1		10/16/13 10:34
Bis(2-Chloroethyl)ether	0.214	U	0.344	0.107	mg/Kg	1		10/16/13 10:34
bis(2-Ethylhexyl)phthalate	0.430	U	0.688	0.215	mg/Kg	2		10/21/13 21:10
Bis(2chloro1methylethyl)Ether	0.214	U	0.344	0.107	mg/Kg	1		10/16/13 10:34
Butylbenzylphthalate	0.430	U	0.688	0.215	mg/Kg	2		10/21/13 21:10
Carbazole	0.214	U	0.344	0.107	mg/Kg	1		10/16/13 10:34
Chrysene	0.430	U	0.688	0.215	mg/Kg	2		10/21/13 21:10
Di-n-butylphthalate	0.214	U	0.344	0.107	mg/Kg	1		10/16/13 10:34
di-n-Octylphthalate	0.826	U	1.38	0.413	mg/Kg	2		10/21/13 21:10
Dibenzo[a,h]anthracene	1.07	U	1.72	0.537	mg/Kg	5		10/22/13 22:45
Dibenzofuran	0.214	U	0.344	0.107	mg/Kg	1		10/16/13 10:34
Diethylphthalate	0.214	U	0.344	0.107	mg/Kg	1		10/16/13 10:34
Dimethylphthalate	0.214	U	0.344	0.107	mg/Kg	1		10/16/13 10:34
Fluoranthene	0.425		0.344	0.107	mg/Kg	1		10/16/13 10:34
Fluorene	0.113	J	0.344	0.107	mg/Kg	1		10/16/13 10:34
Hexachlorobenzene	0.214	U	0.344	0.107	mg/Kg	1		10/16/13 10:34
Hexachlorobutadiene	0.214	U	0.344	0.107	mg/Kg	1		10/16/13 10:34
Hexachlorocyclopentadiene	0.550	U	0.964	0.275	mg/Kg	1		10/16/13 10:34
Hexachloroethane	0.214	U	0.344	0.107	mg/Kg	1		10/16/13 10:34
Indeno[1,2,3-c,d] pyrene	1.07	U	1.72	0.537	mg/Kg	5		10/22/13 22:45
Isophorone	0.214	U	0.344	0.107	mg/Kg	1		10/16/13 10:34
N-Nitroso-di-n-propylamine	0.214	U	0.344	0.107	mg/Kg	1		10/16/13 10:34
N-Nitrosodimethylamine	0.214	U	0.344	0.107	mg/Kg	1		10/16/13 10:34
N-Nitrosodiphenylamine	0.214	U	0.344	0.107	mg/Kg	1		10/16/13 10:34
Naphthalene	0.214	U	0.344	0.107	mg/Kg	1		10/16/13 10:34
Nitrobenzene	0.214	U	0.344	0.107	mg/Kg	1		10/16/13 10:34
Pentachlorophenol	1.71	U	2.75	0.854	mg/Kg	1		10/16/13 10:34
Phenanthrene	0.474		0.344	0.107	mg/Kg	1		10/16/13 10:34
Phenol	0.214	U	0.344	0.107	mg/Kg	1		10/16/13 10:34
Pyrene	0.443	J	0.688	0.215	mg/Kg	2		10/21/13 21:10

Surrogates

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Results of **13-NK-01-SO**

Client Sample ID: **13-NK-01-SO**
Client Project ID: **Napaskiak Trench Installation**
Lab Sample ID: 1135014001
Lab Project ID: 1135014

Collection Date: 10/04/13 16:00
Received Date: 10/07/13 16:07
Matrix: Soil/Solid (dry weight)
Solids (%): 72.4

Results by **Semivolatile Organic GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
2,4,6-Tribromophenol	98.3		35-125		%	1		10/16/13 10:34
2-Fluorobiphenyl	92.1		45-105		%	1		10/16/13 10:34
2-Fluorophenol	69.9		35-105		%	1		10/16/13 10:34
Nitrobenzene-d5	75.9		35-100		%	1		10/16/13 10:34
Phenol-d6	76.9		40-100		%	1		10/16/13 10:34
Terphenyl-d14	119		30-125		%	2		10/21/13 21:10

Batch Information

Analytical Batch: XMS7695
Analytical Method: SW8270D
Analyst: DSH
Analytical Date/Time: 10/16/13 10:34
Container ID: 1135014001-A

Prep Batch: XXX30142
Prep Method: SW3550C
Prep Date/Time: 10/11/13 12:30
Prep Initial Wt./Vol.: 22.581 g
Prep Extract Vol: 1 mL

Analytical Batch: XMS7712
Analytical Method: SW8270D
Analyst: DSH
Analytical Date/Time: 10/21/13 21:10
Container ID: 1135014001-A

Prep Batch: XXX30142
Prep Method: SW3550C
Prep Date/Time: 10/11/13 12:30
Prep Initial Wt./Vol.: 22.581 g
Prep Extract Vol: 1 mL

Analytical Batch: XMS7714
Analytical Method: SW8270D
Analyst: DSH
Analytical Date/Time: 10/22/13 22:45
Container ID: 1135014001-A

Prep Batch: XXX30142
Prep Method: SW3550C
Prep Date/Time: 10/11/13 12:30
Prep Initial Wt./Vol.: 22.581 g
Prep Extract Vol: 1 mL

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Results of **13-NK-01-SO**

Client Sample ID: **13-NK-01-SO**
Client Project ID: **Napaskiak Trench Installation**
Lab Sample ID: 1135014001
Lab Project ID: 1135014

Collection Date: 10/04/13 16:00
Received Date: 10/07/13 16:07
Matrix: Soil/Solid (dry weight)
Solids (%): 72.4

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	1.97	J	5.21	1.56	mg/Kg	1		10/10/13 02:05
Surrogates								
4-Bromofluorobenzene	123		50-150		%	1		10/10/13 02:05

Batch Information

Analytical Batch: VFC11680
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 10/10/13 02:05
Container ID: 1135014001-C

Prep Batch: VXX25318
Prep Method: SW5035A
Prep Date/Time: 10/04/13 16:00
Prep Initial Wt./Vol.: 52.374 g
Prep Extract Vol: 39.4719 mL

Print Date: 10/24/2013 8:39:23AM

Results of **13-NK-01-SO**

Client Sample ID: **13-NK-01-SO**
Client Project ID: **Napaskiak Trench Installation**
Lab Sample ID: 1135014001
Lab Project ID: 1135014

Collection Date: 10/04/13 16:00
Received Date: 10/07/13 16:07
Matrix: Soil/Solid (dry weight)
Solids (%): 72.4

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	32.4	U	52.1	16.2	ug/Kg	1		10/14/13 16:14
1,1,1-Trichloroethane	32.4	U	52.1	16.2	ug/Kg	1		10/14/13 16:14
1,1,2,2-Tetrachloroethane	62.4	U	104	31.2	ug/Kg	1		10/14/13 16:14
1,1,2-Trichloroethane	32.4	U	52.1	16.2	ug/Kg	1		10/14/13 16:14
1,1-Dichloroethane	32.4	U	52.1	16.2	ug/Kg	1		10/14/13 16:14
1,1-Dichloroethene	32.4	U	52.1	16.2	ug/Kg	1		10/14/13 16:14
1,1-Dichloropropene	32.4	U	52.1	16.2	ug/Kg	1		10/14/13 16:14
1,2,3-Trichlorobenzene	62.4	U	104	31.2	ug/Kg	1		10/14/13 16:14
1,2,3-Trichloropropane	32.4	U	52.1	16.2	ug/Kg	1		10/14/13 16:14
1,2,4-Trichlorobenzene	32.4	U	52.1	16.2	ug/Kg	1		10/14/13 16:14
1,2,4-Trimethylbenzene	62.4	U	104	31.2	ug/Kg	1		10/14/13 16:14
1,2-Dibromo-3-chloropropane	129	U	208	64.6	ug/Kg	1		10/14/13 16:14
1,2-Dibromoethane	32.4	U	52.1	16.2	ug/Kg	1		10/14/13 16:14
1,2-Dichlorobenzene	32.4	U	52.1	16.2	ug/Kg	1		10/14/13 16:14
1,2-Dichloroethane	32.4	U	52.1	16.2	ug/Kg	1		10/14/13 16:14
1,2-Dichloropropane	32.4	U	52.1	16.2	ug/Kg	1		10/14/13 16:14
1,3,5-Trimethylbenzene	32.4	U	52.1	16.2	ug/Kg	1		10/14/13 16:14
1,3-Dichlorobenzene	32.4	U	52.1	16.2	ug/Kg	1		10/14/13 16:14
1,3-Dichloropropane	32.4	U	52.1	16.2	ug/Kg	1		10/14/13 16:14
1,4-Dichlorobenzene	32.4	U	52.1	16.2	ug/Kg	1		10/14/13 16:14
2,2-Dichloropropane	32.4	U	52.1	16.2	ug/Kg	1		10/14/13 16:14
2-Butanone (MEK)	324	U	521	162	ug/Kg	1		10/14/13 16:14
2-Chlorotoluene	32.4	U	52.1	16.2	ug/Kg	1		10/14/13 16:14
2-Hexanone	324	U	521	162	ug/Kg	1		10/14/13 16:14
4-Chlorotoluene	32.4	U	52.1	16.2	ug/Kg	1		10/14/13 16:14
4-Isopropyltoluene	66.1		52.1	16.2	ug/Kg	1		10/14/13 16:14
4-Methyl-2-pentanone (MIBK)	324	U	521	162	ug/Kg	1		10/14/13 16:14
Benzene	16.2	U	26.0	8.12	ug/Kg	1		10/14/13 16:14
Bromobenzene	32.4	U	52.1	16.2	ug/Kg	1		10/14/13 16:14
Bromochloromethane	32.4	U	52.1	16.2	ug/Kg	1		10/14/13 16:14
Bromodichloromethane	32.4	U	52.1	16.2	ug/Kg	1		10/14/13 16:14
Bromoform	32.4	U	52.1	16.2	ug/Kg	1		10/14/13 16:14
Bromomethane	258	U	417	129	ug/Kg	1		10/14/13 16:14
Carbon disulfide	129	U	208	64.6	ug/Kg	1		10/14/13 16:14
Carbon tetrachloride	32.4	U	52.1	16.2	ug/Kg	1		10/14/13 16:14
Chlorobenzene	32.4	U	52.1	16.2	ug/Kg	1		10/14/13 16:14

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Results of **13-NK-01-SO**

Client Sample ID: **13-NK-01-SO**
Client Project ID: **Napaskiak Trench Installation**
Lab Sample ID: 1135014001
Lab Project ID: 1135014

Collection Date: 10/04/13 16:00
Received Date: 10/07/13 16:07
Matrix: Soil/Solid (dry weight)
Solids (%): 72.4

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroethane	258	U	417	129	ug/Kg	1		10/14/13 16:14
Chloroform	32.4	U	52.1	16.2	ug/Kg	1		10/14/13 16:14
Chloromethane	32.4	U	52.1	16.2	ug/Kg	1		10/14/13 16:14
cis-1,2-Dichloroethene	32.4	U	52.1	16.2	ug/Kg	1		10/14/13 16:14
cis-1,3-Dichloropropene	32.4	U	52.1	16.2	ug/Kg	1		10/14/13 16:14
Dibromochloromethane	32.4	U	52.1	16.2	ug/Kg	1		10/14/13 16:14
Dibromomethane	32.4	U	52.1	16.2	ug/Kg	1		10/14/13 16:14
Dichlorodifluoromethane	62.4	U	104	31.2	ug/Kg	1		10/14/13 16:14
Ethylbenzene	32.4	U	52.1	16.2	ug/Kg	1		10/14/13 16:14
Hexachlorobutadiene	62.4	U	104	31.2	ug/Kg	1		10/14/13 16:14
Isopropylbenzene (Cumene)	32.4	U	52.1	16.2	ug/Kg	1		10/14/13 16:14
Methyl-t-butyl ether	129	U	208	64.6	ug/Kg	1		10/14/13 16:14
Methylene chloride	129	U	208	64.6	ug/Kg	1		10/14/13 16:14
n-Butylbenzene	32.4	U	52.1	16.2	ug/Kg	1		10/14/13 16:14
n-Propylbenzene	32.4	U	52.1	16.2	ug/Kg	1		10/14/13 16:14
Naphthalene	62.4	U	104	31.2	ug/Kg	1		10/14/13 16:14
o-Xylene	32.4	U	52.1	16.2	ug/Kg	1		10/14/13 16:14
P & M -Xylene	62.4	U	104	31.2	ug/Kg	1		10/14/13 16:14
sec-Butylbenzene	32.4	U	52.1	16.2	ug/Kg	1		10/14/13 16:14
Styrene	32.4	U	52.1	16.2	ug/Kg	1		10/14/13 16:14
tert-Butylbenzene	32.4	U	52.1	16.2	ug/Kg	1		10/14/13 16:14
Tetrachloroethene	16.2	U	26.0	8.12	ug/Kg	1		10/14/13 16:14
Toluene	22.9	J	52.1	16.2	ug/Kg	1		10/14/13 16:14
trans-1,2-Dichloroethene	32.4	U	52.1	16.2	ug/Kg	1		10/14/13 16:14
trans-1,3-Dichloropropene	32.4	U	52.1	16.2	ug/Kg	1		10/14/13 16:14
Trichloroethene	16.2	U	26.0	8.12	ug/Kg	1		10/14/13 16:14
Trichlorofluoromethane	62.4	U	104	31.2	ug/Kg	1		10/14/13 16:14
Vinyl chloride	32.4	U	52.1	16.2	ug/Kg	1		10/14/13 16:14
Xylenes (total)	95.0	U	156	47.5	ug/Kg	1		10/14/13 16:14
Surrogates								
1,2-Dichloroethane-D4	107		79-118		%	1		10/14/13 16:14
4-Bromofluorobenzene	106		67-138		%	1		10/14/13 16:14
Toluene-d8	102		85-115		%	1		10/14/13 16:14

Print Date: 10/24/2013 8:39:23AM

Results of **13-NK-01-SO**

Client Sample ID: **13-NK-01-SO**
Client Project ID: **Napaskiak Trench Installation**
Lab Sample ID: 1135014001
Lab Project ID: 1135014

Collection Date: 10/04/13 16:00
Received Date: 10/07/13 16:07
Matrix: Soil/Solid (dry weight)
Solids (%): 72.4

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS13827
Analytical Method: SW8260B
Analyst: HM
Analytical Date/Time: 10/14/13 16:14
Container ID: 1135014001-C

Prep Batch: VXX25343
Prep Method: SW5035A
Prep Date/Time: 10/04/13 16:00
Prep Initial Wt./Vol.: 52.374 g
Prep Extract Vol: 39.4719 mL

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Results of **13-NK-02-SO**

Client Sample ID: **13-NK-02-SO**
Client Project ID: **Napaskiak Trench Installation**
Lab Sample ID: 1135014002
Lab Project ID: 1135014

Collection Date: 10/04/13 17:30
Received Date: 10/07/13 16:07
Matrix: Soil/Solid (dry weight)
Solids (%): 76.6

Results by **Metals by ICP/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Lead	8.73		1.20	0.373	mg/Kg	50		10/22/13 20:04

Batch Information

Analytical Batch: MMS8316
Analytical Method: SW6020
Analyst: HKS
Analytical Date/Time: 10/22/13 20:04
Container ID: 1135014002-A

Prep Batch: MXX27200
Prep Method: SW3050B
Prep Date/Time: 10/13/13 15:30
Prep Initial Wt./Vol.: 1.085 g
Prep Extract Vol: 50 mL

Print Date: 10/24/2013 8:39:23AM

Results of **13-NK-02-SO**

Client Sample ID: **13-NK-02-SO**
Client Project ID: **Napaskiak Trench Installation**
Lab Sample ID: 1135014002
Lab Project ID: 1135014

Collection Date: 10/04/13 17:30
Received Date: 10/07/13 16:07
Matrix: Soil/Solid (dry weight)
Solids (%): 76.6

Results by **Polychlorinated Biphenyls**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Aroclor-1016	38.6	U	64.3	19.3	ug/Kg	1		10/10/13 13:46
Aroclor-1221	38.6	U	64.3	19.3	ug/Kg	1		10/10/13 13:46
Aroclor-1232	38.6	U	64.3	19.3	ug/Kg	1		10/10/13 13:46
Aroclor-1242	38.6	U	64.3	19.3	ug/Kg	1		10/10/13 13:46
Aroclor-1248	38.6	U	64.3	19.3	ug/Kg	1		10/10/13 13:46
Aroclor-1254	38.6	U	64.3	19.3	ug/Kg	1		10/10/13 13:46
Aroclor-1260	38.6	U	64.3	19.3	ug/Kg	1		10/10/13 13:46
Surrogates								
Decachlorobiphenyl	105		60-125		%	1		10/10/13 13:46

Batch Information

Analytical Batch: XGC8641
Analytical Method: SW8082A
Analyst: RTS
Analytical Date/Time: 10/10/13 13:46
Container ID: 1135014002-A

Prep Batch: XXX30119
Prep Method: SW3550C
Prep Date/Time: 10/08/13 18:30
Prep Initial Wt./Vol.: 22.851 g
Prep Extract Vol: 5 mL

Print Date: 10/24/2013 8:39:23AM

Results of **13-NK-02-SO**

Client Sample ID: **13-NK-02-SO**
Client Project ID: **Napaskiak Trench Installation**
Lab Sample ID: 1135014002
Lab Project ID: 1135014

Collection Date: 10/04/13 17:30
Received Date: 10/07/13 16:07
Matrix: Soil/Solid (dry weight)
Solids (%): 76.6

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	16.8	J	32.5	9.76	ug/Kg	5		10/10/13 00:19
2-Methylnaphthalene	16.8	J	32.5	9.76	ug/Kg	5		10/10/13 00:19
Acenaphthene	10.1	J	32.5	9.76	ug/Kg	5		10/10/13 00:19
Acenaphthylene	14.4	J	32.5	9.76	ug/Kg	5		10/10/13 00:19
Anthracene	53.8		32.5	9.76	ug/Kg	5		10/10/13 00:19
Benzo(a)Anthracene	160	J	163	48.8	ug/Kg	25		10/10/13 16:00
Benzo[a]pyrene	200		32.5	9.76	ug/Kg	5		10/10/13 00:19
Benzo[b]Fluoranthene	284		163	48.8	ug/Kg	25		10/10/13 16:00
Benzo[g,h,i]perylene	112		32.5	9.76	ug/Kg	5		10/10/13 00:19
Benzo[k]fluoranthene	97.6	U	163	48.8	ug/Kg	25		10/10/13 16:00
Chrysene	245		163	48.8	ug/Kg	25		10/10/13 16:00
Dibenzo[a,h]anthracene	28.7	J	32.5	9.76	ug/Kg	5		10/10/13 00:19
Fluoranthene	393		163	48.8	ug/Kg	25		10/10/13 16:00
Fluorene	20.8	J	32.5	9.76	ug/Kg	5		10/10/13 00:19
Indeno[1,2,3-c,d] pyrene	87.1		32.5	9.76	ug/Kg	5		10/10/13 00:19
Naphthalene	15.2	J	32.5	9.76	ug/Kg	5		10/10/13 00:19
Phenanthrene	68.5		32.5	9.76	ug/Kg	5		10/10/13 00:19
Pyrene	345		163	48.8	ug/Kg	25		10/10/13 16:00
Surrogates								
2-Fluorobiphenyl	96.1		45-105		%	5		10/10/13 00:19
Terphenyl-d14	111		30-125		%	5		10/10/13 00:19

Batch Information

Analytical Batch: XMS7672
Analytical Method: 8270D SIMS (PAH)
Analyst: RTS
Analytical Date/Time: 10/10/13 00:19
Container ID: 1135014002-A

Prep Batch: XXX30130
Prep Method: SW3550C
Prep Date/Time: 10/09/13 18:05
Prep Initial Wt./Vol.: 22.559 g
Prep Extract Vol: 1 mL

Analytical Batch: XMS7676
Analytical Method: 8270D SIMS (PAH)
Analyst: RTS
Analytical Date/Time: 10/10/13 16:00
Container ID: 1135014002-A

Prep Batch: XXX30130
Prep Method: SW3550C
Prep Date/Time: 10/09/13 18:05
Prep Initial Wt./Vol.: 22.559 g
Prep Extract Vol: 1 mL

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Results of **13-NK-02-SO**

Client Sample ID: **13-NK-02-SO**
Client Project ID: **Napaskiak Trench Installation**
Lab Sample ID: 1135014002
Lab Project ID: 1135014

Collection Date: 10/04/13 17:30
Received Date: 10/07/13 16:07
Matrix: Soil/Solid (dry weight)
Solids (%): 76.6

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	97.3		26.0	8.07	mg/Kg	1		10/10/13 18:24
Surrogates								
5a Androstane	89.7		50-150		%	1		10/10/13 18:24

Batch Information

Analytical Batch: XFC11124
Analytical Method: AK102
Analyst: EAB
Analytical Date/Time: 10/10/13 18:24
Container ID: 1135014002-A

Prep Batch: XXX30120
Prep Method: SW3550C
Prep Date/Time: 10/08/13 20:45
Prep Initial Wt./Vol.: 30.086 g
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	202		26.0	8.07	mg/Kg	1		10/10/13 18:24
Surrogates								
n-Triacontane-d62	99.4		50-150		%	1		10/10/13 18:24

Batch Information

Analytical Batch: XFC11124
Analytical Method: AK103
Analyst: EAB
Analytical Date/Time: 10/10/13 18:24
Container ID: 1135014002-A

Prep Batch: XXX30120
Prep Method: SW3550C
Prep Date/Time: 10/08/13 20:45
Prep Initial Wt./Vol.: 30.086 g
Prep Extract Vol: 1 mL

Print Date: 10/24/2013 8:39:23AM

Results of **13-NK-02-SO**

Client Sample ID: **13-NK-02-SO**
Client Project ID: **Napaskiak Trench Installation**
Lab Sample ID: 1135014002
Lab Project ID: 1135014

Collection Date: 10/04/13 17:30
Received Date: 10/07/13 16:07
Matrix: Soil/Solid (dry weight)
Solids (%): 76.6

Results by **Semivolatile Organic GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2,4-Trichlorobenzene	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:29
1,2-Dichlorobenzene	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:29
1,3-Dichlorobenzene	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:29
1,4-Dichlorobenzene	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:29
1-Chloronaphthalene	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:29
2,4,5-Trichlorophenol	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:29
2,4,6-Trichlorophenol	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:29
2,4-Dichlorophenol	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:29
2,4-Dimethylphenol	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:29
2,4-Dinitrophenol	12.2	U	19.4	6.08	mg/Kg	5		10/21/13 21:29
2,4-Dinitrotoluene	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:29
2,6-Dichlorophenol	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:29
2,6-Dinitrotoluene	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:29
2-Chloronaphthalene	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:29
2-Chlorophenol	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:29
2-Methyl-4,6-dinitrophenol	8.02	U	12.9	4.01	mg/Kg	5		10/21/13 21:29
2-Methylnaphthalene	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:29
2-Methylphenol (o-Cresol)	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:29
2-Nitroaniline	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:29
2-Nitrophenol	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:29
3&4-Methylphenol (p&m-Cresol)	4.02	U	6.47	2.01	mg/Kg	5		10/21/13 21:29
3,3-Dichlorobenzidine	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:29
3-Nitroaniline	1.94	U	3.24	0.971	mg/Kg	5		10/21/13 21:29
4-Bromophenyl-phenylether	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:29
4-Chloro-3-methylphenol	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:29
4-Chloroaniline	1.94	U	3.24	0.971	mg/Kg	5		10/21/13 21:29
4-Chlorophenyl-phenylether	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:29
4-Nitroaniline	12.2	U	19.4	6.08	mg/Kg	5		10/21/13 21:29
4-Nitrophenol	4.02	U	6.47	2.01	mg/Kg	5		10/21/13 21:29
Acenaphthene	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:29
Acenaphthylene	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:29
Aniline	8.02	U	12.9	4.01	mg/Kg	5		10/21/13 21:29
Anthracene	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:29
Azobenzene	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:29
Benzo(a)Anthracene	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:29
Benzo[a]pyrene	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:29

Print Date: 10/24/2013 8:39:23AM

Results of **13-NK-02-SO**

Client Sample ID: **13-NK-02-SO**
Client Project ID: **Napaskiak Trench Installation**
Lab Sample ID: 1135014002
Lab Project ID: 1135014

Collection Date: 10/04/13 17:30
Received Date: 10/07/13 16:07
Matrix: Soil/Solid (dry weight)
Solids (%): 76.6

Results by **Semivolatile Organic GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzo[b]Fluoranthene	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:29
Benzo[g,h,i]perylene	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:29
Benzo[k]fluoranthene	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:29
Benzoic acid	9.70	U	9.71	4.85	mg/Kg	5		10/21/13 21:29
Benzyl alcohol	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:29
Bis(2-Chloroethoxy)methane	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:29
Bis(2-Chloroethyl)ether	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:29
bis(2-Ethylhexyl)phthalate	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:29
Bis(2chloro1methylethyl)Ether	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:29
Butylbenzylphthalate	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:29
Carbazole	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:29
Chrysene	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:29
Di-n-butylphthalate	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:29
di-n-Octylphthalate	1.94	U	3.24	0.971	mg/Kg	5		10/21/13 21:29
Dibenzo[a,h]anthracene	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:29
Dibenzofuran	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:29
Diethylphthalate	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:29
Dimethylphthalate	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:29
Fluoranthene	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:29
Fluorene	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:29
Hexachlorobenzene	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:29
Hexachlorobutadiene	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:29
Hexachlorocyclopentadiene	2.58	U	4.53	1.29	mg/Kg	5		10/21/13 21:29
Hexachloroethane	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:29
Indeno[1,2,3-c,d] pyrene	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:29
Isophorone	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:29
N-Nitroso-di-n-propylamine	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:29
N-Nitrosodimethylamine	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:29
N-Nitrosodiphenylamine	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:29
Naphthalene	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:29
Nitrobenzene	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:29
Pentachlorophenol	8.02	U	12.9	4.01	mg/Kg	5		10/21/13 21:29
Phenanthrene	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:29
Phenol	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:29
Pyrene	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:29

Surrogates

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Results of **13-NK-02-SO**

Client Sample ID: **13-NK-02-SO**
Client Project ID: **Napaskiak Trench Installation**
Lab Sample ID: 1135014002
Lab Project ID: 1135014

Collection Date: 10/04/13 17:30
Received Date: 10/07/13 16:07
Matrix: Soil/Solid (dry weight)
Solids (%): 76.6

Results by **Semivolatile Organic GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
2,4,6-Tribromophenol	79.7		35-125		%	5		10/21/13 21:29
2-Fluorobiphenyl	90.6		45-105		%	5		10/21/13 21:29
2-Fluorophenol	69.6		35-105		%	5		10/21/13 21:29
Nitrobenzene-d5	76.6		35-100		%	5		10/21/13 21:29
Phenol-d6	79.9		40-100		%	5		10/21/13 21:29
Terphenyl-d14	106		30-125		%	5		10/21/13 21:29

Batch Information

Analytical Batch: XMS7712
Analytical Method: SW8270D
Analyst: DSH
Analytical Date/Time: 10/21/13 21:29
Container ID: 1135014002-A

Prep Batch: XXX30142
Prep Method: SW3550C
Prep Date/Time: 10/11/13 12:30
Prep Initial Wt./Vol.: 22.694 g
Prep Extract Vol: 1 mL

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Results of **13-NK-02-SO**

Client Sample ID: **13-NK-02-SO**
Client Project ID: **Napaskiak Trench Installation**
Lab Sample ID: 1135014002
Lab Project ID: 1135014

Collection Date: 10/04/13 17:30
Received Date: 10/07/13 16:07
Matrix: Soil/Solid (dry weight)
Solids (%): 76.6

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	7.94		5.48	1.64	mg/Kg	1		10/10/13 02:24
Surrogates								
4-Bromofluorobenzene	101		50-150		%	1		10/10/13 02:24

Batch Information

Analytical Batch: VFC11680
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 10/10/13 02:24
Container ID: 1135014002-C

Prep Batch: VXX25318
Prep Method: SW5035A
Prep Date/Time: 10/04/13 17:30
Prep Initial Wt./Vol.: 41.288 g
Prep Extract Vol: 34.6548 mL

Print Date: 10/24/2013 8:39:23AM

Results of **13-NK-02-SO**

Client Sample ID: **13-NK-02-SO**
Client Project ID: **Napaskiak Trench Installation**
Lab Sample ID: 1135014002
Lab Project ID: 1135014

Collection Date: 10/04/13 17:30
Received Date: 10/07/13 16:07
Matrix: Soil/Solid (dry weight)
Solids (%): 76.6

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	34.2	U	54.8	17.1	ug/Kg	1		10/14/13 16:30
1,1,1-Trichloroethane	34.2	U	54.8	17.1	ug/Kg	1		10/14/13 16:30
1,1,2,2-Tetrachloroethane	65.8	U	110	32.9	ug/Kg	1		10/14/13 16:30
1,1,2-Trichloroethane	34.2	U	54.8	17.1	ug/Kg	1		10/14/13 16:30
1,1-Dichloroethane	34.2	U	54.8	17.1	ug/Kg	1		10/14/13 16:30
1,1-Dichloroethene	34.2	U	54.8	17.1	ug/Kg	1		10/14/13 16:30
1,1-Dichloropropene	34.2	U	54.8	17.1	ug/Kg	1		10/14/13 16:30
1,2,3-Trichlorobenzene	65.8	U	110	32.9	ug/Kg	1		10/14/13 16:30
1,2,3-Trichloropropane	34.2	U	54.8	17.1	ug/Kg	1		10/14/13 16:30
1,2,4-Trichlorobenzene	34.2	U	54.8	17.1	ug/Kg	1		10/14/13 16:30
1,2,4-Trimethylbenzene	65.8	U	110	32.9	ug/Kg	1		10/14/13 16:30
1,2-Dibromo-3-chloropropane	136	U	219	67.9	ug/Kg	1		10/14/13 16:30
1,2-Dibromoethane	34.2	U	54.8	17.1	ug/Kg	1		10/14/13 16:30
1,2-Dichlorobenzene	34.2	U	54.8	17.1	ug/Kg	1		10/14/13 16:30
1,2-Dichloroethane	34.2	U	54.8	17.1	ug/Kg	1		10/14/13 16:30
1,2-Dichloropropane	34.2	U	54.8	17.1	ug/Kg	1		10/14/13 16:30
1,3,5-Trimethylbenzene	34.2	U	54.8	17.1	ug/Kg	1		10/14/13 16:30
1,3-Dichlorobenzene	34.2	U	54.8	17.1	ug/Kg	1		10/14/13 16:30
1,3-Dichloropropane	34.2	U	54.8	17.1	ug/Kg	1		10/14/13 16:30
1,4-Dichlorobenzene	34.2	U	54.8	17.1	ug/Kg	1		10/14/13 16:30
2,2-Dichloropropane	34.2	U	54.8	17.1	ug/Kg	1		10/14/13 16:30
2-Butanone (MEK)	342	U	548	171	ug/Kg	1		10/14/13 16:30
2-Chlorotoluene	34.2	U	54.8	17.1	ug/Kg	1		10/14/13 16:30
2-Hexanone	342	U	548	171	ug/Kg	1		10/14/13 16:30
4-Chlorotoluene	34.2	U	54.8	17.1	ug/Kg	1		10/14/13 16:30
4-Isopropyltoluene	34.2	U	54.8	17.1	ug/Kg	1		10/14/13 16:30
4-Methyl-2-pentanone (MIBK)	342	U	548	171	ug/Kg	1		10/14/13 16:30
Benzene	17.1	U	27.4	8.55	ug/Kg	1		10/14/13 16:30
Bromobenzene	34.2	U	54.8	17.1	ug/Kg	1		10/14/13 16:30
Bromochloromethane	34.2	U	54.8	17.1	ug/Kg	1		10/14/13 16:30
Bromodichloromethane	34.2	U	54.8	17.1	ug/Kg	1		10/14/13 16:30
Bromoform	34.2	U	54.8	17.1	ug/Kg	1		10/14/13 16:30
Bromomethane	272	U	438	136	ug/Kg	1		10/14/13 16:30
Carbon disulfide	136	U	219	67.9	ug/Kg	1		10/14/13 16:30
Carbon tetrachloride	34.2	U	54.8	17.1	ug/Kg	1		10/14/13 16:30
Chlorobenzene	34.2	U	54.8	17.1	ug/Kg	1		10/14/13 16:30

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Results of **13-NK-02-SO**

Client Sample ID: **13-NK-02-SO**
Client Project ID: **Napaskiak Trench Installation**
Lab Sample ID: 1135014002
Lab Project ID: 1135014

Collection Date: 10/04/13 17:30
Received Date: 10/07/13 16:07
Matrix: Soil/Solid (dry weight)
Solids (%): 76.6

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroethane	272	U	438	136	ug/Kg	1		10/14/13 16:30
Chloroform	34.2	U	54.8	17.1	ug/Kg	1		10/14/13 16:30
Chloromethane	34.2	U	54.8	17.1	ug/Kg	1		10/14/13 16:30
cis-1,2-Dichloroethene	34.2	U	54.8	17.1	ug/Kg	1		10/14/13 16:30
cis-1,3-Dichloropropene	34.2	U	54.8	17.1	ug/Kg	1		10/14/13 16:30
Dibromochloromethane	34.2	U	54.8	17.1	ug/Kg	1		10/14/13 16:30
Dibromomethane	34.2	U	54.8	17.1	ug/Kg	1		10/14/13 16:30
Dichlorodifluoromethane	65.8	U	110	32.9	ug/Kg	1		10/14/13 16:30
Ethylbenzene	34.2	U	54.8	17.1	ug/Kg	1		10/14/13 16:30
Hexachlorobutadiene	65.8	U	110	32.9	ug/Kg	1		10/14/13 16:30
Isopropylbenzene (Cumene)	34.2	U	54.8	17.1	ug/Kg	1		10/14/13 16:30
Methyl-t-butyl ether	136	U	219	67.9	ug/Kg	1		10/14/13 16:30
Methylene chloride	136	U	219	67.9	ug/Kg	1		10/14/13 16:30
n-Butylbenzene	34.2	U	54.8	17.1	ug/Kg	1		10/14/13 16:30
n-Propylbenzene	34.2	U	54.8	17.1	ug/Kg	1		10/14/13 16:30
Naphthalene	65.8	U	110	32.9	ug/Kg	1		10/14/13 16:30
o-Xylene	34.2	U	54.8	17.1	ug/Kg	1		10/14/13 16:30
P & M -Xylene	65.8	U	110	32.9	ug/Kg	1		10/14/13 16:30
sec-Butylbenzene	34.2	U	54.8	17.1	ug/Kg	1		10/14/13 16:30
Styrene	34.2	U	54.8	17.1	ug/Kg	1		10/14/13 16:30
tert-Butylbenzene	34.2	U	54.8	17.1	ug/Kg	1		10/14/13 16:30
Tetrachloroethene	17.1	U	27.4	8.55	ug/Kg	1		10/14/13 16:30
Toluene	156		54.8	17.1	ug/Kg	1		10/14/13 16:30
trans-1,2-Dichloroethene	34.2	U	54.8	17.1	ug/Kg	1		10/14/13 16:30
trans-1,3-Dichloropropene	34.2	U	54.8	17.1	ug/Kg	1		10/14/13 16:30
Trichloroethene	17.1	U	27.4	8.55	ug/Kg	1		10/14/13 16:30
Trichlorofluoromethane	65.8	U	110	32.9	ug/Kg	1		10/14/13 16:30
Vinyl chloride	34.2	U	54.8	17.1	ug/Kg	1		10/14/13 16:30
Xylenes (total)	100	U	164	50.0	ug/Kg	1		10/14/13 16:30
Surrogates								
1,2-Dichloroethane-D4	108		79-118		%	1		10/14/13 16:30
4-Bromofluorobenzene	99.4		67-138		%	1		10/14/13 16:30
Toluene-d8	104		85-115		%	1		10/14/13 16:30

Print Date: 10/24/2013 8:39:23AM

Results of **13-NK-02-SO**

Client Sample ID: **13-NK-02-SO**
Client Project ID: **Napaskiak Trench Installation**
Lab Sample ID: 1135014002
Lab Project ID: 1135014

Collection Date: 10/04/13 17:30
Received Date: 10/07/13 16:07
Matrix: Soil/Solid (dry weight)
Solids (%): 76.6

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS13827
Analytical Method: SW8260B
Analyst: HM
Analytical Date/Time: 10/14/13 16:30
Container ID: 1135014002-C

Prep Batch: VXX25343
Prep Method: SW5035A
Prep Date/Time: 10/04/13 17:30
Prep Initial Wt./Vol.: 41.288 g
Prep Extract Vol: 34.6548 mL

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Results of **13-NK-03-SO**

Client Sample ID: **13-NK-03-SO**
Client Project ID: **Napaskiak Trench Installation**
Lab Sample ID: 1135014003
Lab Project ID: 1135014

Collection Date: 10/04/13 18:00
Received Date: 10/07/13 16:07
Matrix: Soil/Solid (dry weight)
Solids (%): 75.7

Results by **Metals by ICP/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Lead	11.2		1.23	0.382	mg/Kg	50		10/22/13 20:06

Batch Information

Analytical Batch: MMS8316
Analytical Method: SW6020
Analyst: HKS
Analytical Date/Time: 10/22/13 20:06
Container ID: 1135014003-A

Prep Batch: MXX27200
Prep Method: SW3050B
Prep Date/Time: 10/13/13 15:30
Prep Initial Wt./Vol.: 1.072 g
Prep Extract Vol: 50 mL

Print Date: 10/24/2013 8:39:23AM

Results of **13-NK-03-SO**

Client Sample ID: **13-NK-03-SO**
Client Project ID: **Napaskiak Trench Installation**
Lab Sample ID: 1135014003
Lab Project ID: 1135014

Collection Date: 10/04/13 18:00
Received Date: 10/07/13 16:07
Matrix: Soil/Solid (dry weight)
Solids (%): 75.7

Results by **Polychlorinated Biphenyls**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Aroclor-1016	39.0	U	65.1	19.5	ug/Kg	1		10/10/13 14:21
Aroclor-1221	39.0	U	65.1	19.5	ug/Kg	1		10/10/13 14:21
Aroclor-1232	39.0	U	65.1	19.5	ug/Kg	1		10/10/13 14:21
Aroclor-1242	39.0	U	65.1	19.5	ug/Kg	1		10/10/13 14:21
Aroclor-1248	39.0	U	65.1	19.5	ug/Kg	1		10/10/13 14:21
Aroclor-1254	39.0	U	65.1	19.5	ug/Kg	1		10/10/13 14:21
Aroclor-1260	39.0	U	65.1	19.5	ug/Kg	1		10/10/13 14:21
Surrogates								
Decachlorobiphenyl	101		60-125		%	1		10/10/13 14:21

Batch Information

Analytical Batch: XGC8641
Analytical Method: SW8082A
Analyst: RTS
Analytical Date/Time: 10/10/13 14:21
Container ID: 1135014003-A

Prep Batch: XXX30119
Prep Method: SW3550C
Prep Date/Time: 10/08/13 18:30
Prep Initial Wt./Vol.: 22.818 g
Prep Extract Vol: 5 mL

Print Date: 10/24/2013 8:39:23AM

Results of **13-NK-03-SO**

Client Sample ID: **13-NK-03-SO**
Client Project ID: **Napaskiak Trench Installation**
Lab Sample ID: 1135014003
Lab Project ID: 1135014

Collection Date: 10/04/13 18:00
Received Date: 10/07/13 16:07
Matrix: Soil/Solid (dry weight)
Solids (%): 75.7

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	9.63		6.59	1.98	ug/Kg	1		10/10/13 18:05
2-Methylnaphthalene	8.83		6.59	1.98	ug/Kg	1		10/10/13 18:05
Acenaphthene	13.0		6.59	1.98	ug/Kg	1		10/10/13 18:05
Acenaphthylene	3.96	U	6.59	1.98	ug/Kg	1		10/10/13 18:05
Anthracene	36.7		6.59	1.98	ug/Kg	1		10/10/13 18:05
Benzo(a)Anthracene	121		6.59	1.98	ug/Kg	1		10/10/13 18:05
Benzo[a]pyrene	94.9		6.59	1.98	ug/Kg	1		10/10/13 18:05
Benzo[b]Fluoranthene	138		65.9	19.8	ug/Kg	10		10/11/13 16:06
Benzo[g,h,i]perylene	45.5		6.59	1.98	ug/Kg	1		10/10/13 18:05
Benzo[k]fluoranthene	3.96	U	6.59	1.98	ug/Kg	1		10/10/13 18:05
Chrysene	118		6.59	1.98	ug/Kg	1		10/10/13 18:05
Dibenzo[a,h]anthracene	14.6		6.59	1.98	ug/Kg	1		10/10/13 18:05
Fluoranthene	316		65.9	19.8	ug/Kg	10		10/11/13 16:06
Fluorene	20.6		6.59	1.98	ug/Kg	1		10/10/13 18:05
Indeno[1,2,3-c,d] pyrene	45.9		6.59	1.98	ug/Kg	1		10/10/13 18:05
Naphthalene	5.77	J	6.59	1.98	ug/Kg	1		10/10/13 18:05
Phenanthrene	52.5		6.59	1.98	ug/Kg	1		10/10/13 18:05
Pyrene	284		65.9	19.8	ug/Kg	10		10/11/13 16:06
Surrogates								
2-Fluorobiphenyl	98.3		45-105		%	1		10/10/13 18:05
Terphenyl-d14	111		30-125		%	1		10/10/13 18:05

Batch Information

Analytical Batch: XMS7676
Analytical Method: 8270D SIMS (PAH)
Analyst: RTS
Analytical Date/Time: 10/10/13 18:05
Container ID: 1135014003-A

Prep Batch: XXX30130
Prep Method: SW3550C
Prep Date/Time: 10/09/13 18:05
Prep Initial Wt./Vol.: 22.548 g
Prep Extract Vol: 1 mL

Analytical Batch: XMS7677
Analytical Method: 8270D SIMS (PAH)
Analyst: RTS
Analytical Date/Time: 10/11/13 16:06
Container ID: 1135014003-A

Prep Batch: XXX30130
Prep Method: SW3550C
Prep Date/Time: 10/09/13 18:05
Prep Initial Wt./Vol.: 22.548 g
Prep Extract Vol: 1 mL

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Results of **13-NK-03-SO**

Client Sample ID: **13-NK-03-SO**
Client Project ID: **Napaskiak Trench Installation**
Lab Sample ID: 1135014003
Lab Project ID: 1135014

Collection Date: 10/04/13 18:00
Received Date: 10/07/13 16:07
Matrix: Soil/Solid (dry weight)
Solids (%): 75.7

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	272		26.3	8.15	mg/Kg	1		10/10/13 18:33
Surrogates								
5a Androstane	97.8		50-150		%	1		10/10/13 18:33

Batch Information

Analytical Batch: XFC11124
Analytical Method: AK102
Analyst: EAB
Analytical Date/Time: 10/10/13 18:33
Container ID: 1135014003-A

Prep Batch: XXX30120
Prep Method: SW3550C
Prep Date/Time: 10/08/13 20:45
Prep Initial Wt./Vol.: 30.123 g
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	346		26.3	8.15	mg/Kg	1		10/10/13 18:33
Surrogates								
n-Triacontane-d62	110		50-150		%	1		10/10/13 18:33

Batch Information

Analytical Batch: XFC11124
Analytical Method: AK103
Analyst: EAB
Analytical Date/Time: 10/10/13 18:33
Container ID: 1135014003-A

Prep Batch: XXX30120
Prep Method: SW3550C
Prep Date/Time: 10/08/13 20:45
Prep Initial Wt./Vol.: 30.123 g
Prep Extract Vol: 1 mL

Print Date: 10/24/2013 8:39:23AM

Results of **13-NK-03-SO**

Client Sample ID: **13-NK-03-SO**
Client Project ID: **Napaskiak Trench Installation**
Lab Sample ID: 1135014003
Lab Project ID: 1135014

Collection Date: 10/04/13 18:00
Received Date: 10/07/13 16:07
Matrix: Soil/Solid (dry weight)
Solids (%): 75.7

Results by **Semivolatile Organic GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2,4-Trichlorobenzene	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:48
1,2-Dichlorobenzene	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:48
1,3-Dichlorobenzene	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:48
1,4-Dichlorobenzene	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:48
1-Chloronaphthalene	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:48
2,4,5-Trichlorophenol	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:48
2,4,6-Trichlorophenol	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:48
2,4-Dichlorophenol	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:48
2,4-Dimethylphenol	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:48
2,4-Dinitrophenol	12.2	U	19.4	6.08	mg/Kg	5		10/21/13 21:48
2,4-Dinitrotoluene	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:48
2,6-Dichlorophenol	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:48
2,6-Dinitrotoluene	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:48
2-Chloronaphthalene	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:48
2-Chlorophenol	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:48
2-Methyl-4,6-dinitrophenol	8.02	U	12.9	4.01	mg/Kg	5		10/21/13 21:48
2-Methylnaphthalene	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:48
2-Methylphenol (o-Cresol)	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:48
2-Nitroaniline	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:48
2-Nitrophenol	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:48
3&4-Methylphenol (p&m-Cresol)	4.02	U	6.47	2.01	mg/Kg	5		10/21/13 21:48
3,3-Dichlorobenzidine	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:48
3-Nitroaniline	1.94	U	3.24	0.971	mg/Kg	5		10/21/13 21:48
4-Bromophenyl-phenylether	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:48
4-Chloro-3-methylphenol	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:48
4-Chloroaniline	1.94	U	3.24	0.971	mg/Kg	5		10/21/13 21:48
4-Chlorophenyl-phenylether	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:48
4-Nitroaniline	12.2	U	19.4	6.08	mg/Kg	5		10/21/13 21:48
4-Nitrophenol	4.02	U	6.47	2.01	mg/Kg	5		10/21/13 21:48
Acenaphthene	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:48
Acenaphthylene	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:48
Aniline	8.02	U	12.9	4.01	mg/Kg	5		10/21/13 21:48
Anthracene	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:48
Azobenzene	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:48
Benzo(a)Anthracene	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:48
Benzo[a]pyrene	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:48

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Results of **13-NK-03-SO**

Client Sample ID: **13-NK-03-SO**
Client Project ID: **Napaskiak Trench Installation**
Lab Sample ID: 1135014003
Lab Project ID: 1135014

Collection Date: 10/04/13 18:00
Received Date: 10/07/13 16:07
Matrix: Soil/Solid (dry weight)
Solids (%): 75.7

Results by **Semivolatile Organic GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzo[b]Fluoranthene	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:48
Benzo[g,h,i]perylene	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:48
Benzo[k]fluoranthene	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:48
Benzoic acid	9.70	U	9.71	4.85	mg/Kg	5		10/21/13 21:48
Benzyl alcohol	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:48
Bis(2-Chloroethoxy)methane	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:48
Bis(2-Chloroethyl)ether	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:48
bis(2-Ethylhexyl)phthalate	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:48
Bis(2chloro1methylethyl)Ether	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:48
Butylbenzylphthalate	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:48
Carbazole	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:48
Chrysene	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:48
Di-n-butylphthalate	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:48
di-n-Octylphthalate	1.94	U	3.24	0.971	mg/Kg	5		10/21/13 21:48
Dibenzo[a,h]anthracene	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:48
Dibenzofuran	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:48
Diethylphthalate	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:48
Dimethylphthalate	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:48
Fluoranthene	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:48
Fluorene	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:48
Hexachlorobenzene	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:48
Hexachlorobutadiene	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:48
Hexachlorocyclopentadiene	2.58	U	4.53	1.29	mg/Kg	5		10/21/13 21:48
Hexachloroethane	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:48
Indeno[1,2,3-c,d] pyrene	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:48
Isophorone	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:48
N-Nitroso-di-n-propylamine	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:48
N-Nitrosodimethylamine	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:48
N-Nitrosodiphenylamine	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:48
Naphthalene	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:48
Nitrobenzene	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:48
Pentachlorophenol	8.02	U	12.9	4.01	mg/Kg	5		10/21/13 21:48
Phenanthrene	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:48
Phenol	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:48
Pyrene	1.01	U	1.62	0.505	mg/Kg	5		10/21/13 21:48

Surrogates

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Results of **13-NK-03-SO**

Client Sample ID: **13-NK-03-SO**
Client Project ID: **Napaskiak Trench Installation**
Lab Sample ID: 1135014003
Lab Project ID: 1135014

Collection Date: 10/04/13 18:00
Received Date: 10/07/13 16:07
Matrix: Soil/Solid (dry weight)
Solids (%): 75.7

Results by **Semivolatile Organic GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
2,4,6-Tribromophenol	86.5		35-125		%	5		10/21/13 21:48
2-Fluorobiphenyl	92.6		45-105		%	5		10/21/13 21:48
2-Fluorophenol	67.6		35-105		%	5		10/21/13 21:48
Nitrobenzene-d5	75		35-100		%	5		10/21/13 21:48
Phenol-d6	78.7		40-100		%	5		10/21/13 21:48
Terphenyl-d14	112		30-125		%	5		10/21/13 21:48

Batch Information

Analytical Batch: XMS7712
Analytical Method: SW8270D
Analyst: DSH
Analytical Date/Time: 10/21/13 21:48
Container ID: 1135014003-A

Prep Batch: XXX30142
Prep Method: SW3550C
Prep Date/Time: 10/11/13 12:30
Prep Initial Wt./Vol.: 22.948 g
Prep Extract Vol: 1 mL

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Results of **13-NK-03-SO**

Client Sample ID: **13-NK-03-SO**
Client Project ID: **Napaskiak Trench Installation**
Lab Sample ID: 1135014003
Lab Project ID: 1135014

Collection Date: 10/04/13 18:00
Received Date: 10/07/13 16:07
Matrix: Soil/Solid (dry weight)
Solids (%): 75.7

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	6.57		5.82	1.75	mg/Kg	1		10/10/13 02:42
Surrogates								
4-Bromofluorobenzene	100		50-150		%	1		10/10/13 02:42

Batch Information

Analytical Batch: VFC11680
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 10/10/13 02:42
Container ID: 1135014003-C

Prep Batch: VXX25318
Prep Method: SW5035A
Prep Date/Time: 10/04/13 18:00
Prep Initial Wt./Vol.: 39.138 g
Prep Extract Vol: 34.4931 mL

Print Date: 10/24/2013 8:39:23AM

Results of **13-NK-03-SO**

Client Sample ID: **13-NK-03-SO**
Client Project ID: **Napaskiak Trench Installation**
Lab Sample ID: 1135014003
Lab Project ID: 1135014

Collection Date: 10/04/13 18:00
Received Date: 10/07/13 16:07
Matrix: Soil/Solid (dry weight)
Solids (%): 75.7

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	36.4	U	58.2	18.2	ug/Kg	1		10/14/13 16:47
1,1,1-Trichloroethane	36.4	U	58.2	18.2	ug/Kg	1		10/14/13 16:47
1,1,2,2-Tetrachloroethane	69.8	U	116	34.9	ug/Kg	1		10/14/13 16:47
1,1,2-Trichloroethane	36.4	U	58.2	18.2	ug/Kg	1		10/14/13 16:47
1,1-Dichloroethane	36.4	U	58.2	18.2	ug/Kg	1		10/14/13 16:47
1,1-Dichloroethene	36.4	U	58.2	18.2	ug/Kg	1		10/14/13 16:47
1,1-Dichloropropene	36.4	U	58.2	18.2	ug/Kg	1		10/14/13 16:47
1,2,3-Trichlorobenzene	69.8	U	116	34.9	ug/Kg	1		10/14/13 16:47
1,2,3-Trichloropropane	36.4	U	58.2	18.2	ug/Kg	1		10/14/13 16:47
1,2,4-Trichlorobenzene	36.4	U	58.2	18.2	ug/Kg	1		10/14/13 16:47
1,2,4-Trimethylbenzene	69.8	U	116	34.9	ug/Kg	1		10/14/13 16:47
1,2-Dibromo-3-chloropropane	144	U	233	72.1	ug/Kg	1		10/14/13 16:47
1,2-Dibromoethane	36.4	U	58.2	18.2	ug/Kg	1		10/14/13 16:47
1,2-Dichlorobenzene	36.4	U	58.2	18.2	ug/Kg	1		10/14/13 16:47
1,2-Dichloroethane	36.4	U	58.2	18.2	ug/Kg	1		10/14/13 16:47
1,2-Dichloropropane	36.4	U	58.2	18.2	ug/Kg	1		10/14/13 16:47
1,3,5-Trimethylbenzene	36.4	U	58.2	18.2	ug/Kg	1		10/14/13 16:47
1,3-Dichlorobenzene	36.4	U	58.2	18.2	ug/Kg	1		10/14/13 16:47
1,3-Dichloropropane	36.4	U	58.2	18.2	ug/Kg	1		10/14/13 16:47
1,4-Dichlorobenzene	36.4	U	58.2	18.2	ug/Kg	1		10/14/13 16:47
2,2-Dichloropropane	36.4	U	58.2	18.2	ug/Kg	1		10/14/13 16:47
2-Butanone (MEK)	364	U	582	182	ug/Kg	1		10/14/13 16:47
2-Chlorotoluene	36.4	U	58.2	18.2	ug/Kg	1		10/14/13 16:47
2-Hexanone	364	U	582	182	ug/Kg	1		10/14/13 16:47
4-Chlorotoluene	36.4	U	58.2	18.2	ug/Kg	1		10/14/13 16:47
4-Isopropyltoluene	36.4	U	58.2	18.2	ug/Kg	1		10/14/13 16:47
4-Methyl-2-pentanone (MIBK)	364	U	582	182	ug/Kg	1		10/14/13 16:47
Benzene	18.2	U	29.1	9.08	ug/Kg	1		10/14/13 16:47
Bromobenzene	36.4	U	58.2	18.2	ug/Kg	1		10/14/13 16:47
Bromochloromethane	36.4	U	58.2	18.2	ug/Kg	1		10/14/13 16:47
Bromodichloromethane	36.4	U	58.2	18.2	ug/Kg	1		10/14/13 16:47
Bromoform	36.4	U	58.2	18.2	ug/Kg	1		10/14/13 16:47
Bromomethane	288	U	465	144	ug/Kg	1		10/14/13 16:47
Carbon disulfide	144	U	233	72.1	ug/Kg	1		10/14/13 16:47
Carbon tetrachloride	36.4	U	58.2	18.2	ug/Kg	1		10/14/13 16:47
Chlorobenzene	36.4	U	58.2	18.2	ug/Kg	1		10/14/13 16:47

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Results of **13-NK-03-SO**

Client Sample ID: **13-NK-03-SO**
Client Project ID: **Napaskiak Trench Installation**
Lab Sample ID: 1135014003
Lab Project ID: 1135014

Collection Date: 10/04/13 18:00
Received Date: 10/07/13 16:07
Matrix: Soil/Solid (dry weight)
Solids (%): 75.7

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroethane	288	U	465	144	ug/Kg	1		10/14/13 16:47
Chloroform	36.4	U	58.2	18.2	ug/Kg	1		10/14/13 16:47
Chloromethane	36.4	U	58.2	18.2	ug/Kg	1		10/14/13 16:47
cis-1,2-Dichloroethene	36.4	U	58.2	18.2	ug/Kg	1		10/14/13 16:47
cis-1,3-Dichloropropene	36.4	U	58.2	18.2	ug/Kg	1		10/14/13 16:47
Dibromochloromethane	36.4	U	58.2	18.2	ug/Kg	1		10/14/13 16:47
Dibromomethane	36.4	U	58.2	18.2	ug/Kg	1		10/14/13 16:47
Dichlorodifluoromethane	69.8	U	116	34.9	ug/Kg	1		10/14/13 16:47
Ethylbenzene	36.4	U	58.2	18.2	ug/Kg	1		10/14/13 16:47
Hexachlorobutadiene	69.8	U	116	34.9	ug/Kg	1		10/14/13 16:47
Isopropylbenzene (Cumene)	36.4	U	58.2	18.2	ug/Kg	1		10/14/13 16:47
Methyl-t-butyl ether	144	U	233	72.1	ug/Kg	1		10/14/13 16:47
Methylene chloride	144	U	233	72.1	ug/Kg	1		10/14/13 16:47
n-Butylbenzene	36.4	U	58.2	18.2	ug/Kg	1		10/14/13 16:47
n-Propylbenzene	36.4	U	58.2	18.2	ug/Kg	1		10/14/13 16:47
Naphthalene	69.8	U	116	34.9	ug/Kg	1		10/14/13 16:47
o-Xylene	38.4	J	58.2	18.2	ug/Kg	1		10/14/13 16:47
P & M -Xylene	69.8	U	116	34.9	ug/Kg	1		10/14/13 16:47
sec-Butylbenzene	36.4	U	58.2	18.2	ug/Kg	1		10/14/13 16:47
Styrene	36.4	U	58.2	18.2	ug/Kg	1		10/14/13 16:47
tert-Butylbenzene	36.4	U	58.2	18.2	ug/Kg	1		10/14/13 16:47
Tetrachloroethene	18.2	U	29.1	9.08	ug/Kg	1		10/14/13 16:47
Toluene	225		58.2	18.2	ug/Kg	1		10/14/13 16:47
trans-1,2-Dichloroethene	36.4	U	58.2	18.2	ug/Kg	1		10/14/13 16:47
trans-1,3-Dichloropropene	36.4	U	58.2	18.2	ug/Kg	1		10/14/13 16:47
Trichloroethene	18.2	U	29.1	9.08	ug/Kg	1		10/14/13 16:47
Trichlorofluoromethane	69.8	U	116	34.9	ug/Kg	1		10/14/13 16:47
Vinyl chloride	36.4	U	58.2	18.2	ug/Kg	1		10/14/13 16:47
Xylenes (total)	71.0	J	175	53.1	ug/Kg	1		10/14/13 16:47
Surrogates								
1,2-Dichloroethane-D4	105		79-118		%	1		10/14/13 16:47
4-Bromofluorobenzene	98.5		67-138		%	1		10/14/13 16:47
Toluene-d8	102		85-115		%	1		10/14/13 16:47

Print Date: 10/24/2013 8:39:23AM

Results of **13-NK-03-SO**

Client Sample ID: **13-NK-03-SO**
Client Project ID: **Napaskiak Trench Installation**
Lab Sample ID: 1135014003
Lab Project ID: 1135014

Collection Date: 10/04/13 18:00
Received Date: 10/07/13 16:07
Matrix: Soil/Solid (dry weight)
Solids (%): 75.7

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS13827
Analytical Method: SW8260B
Analyst: HM
Analytical Date/Time: 10/14/13 16:47
Container ID: 1135014003-C

Prep Batch: VXX25343
Prep Method: SW5035A
Prep Date/Time: 10/04/13 18:00
Prep Initial Wt./Vol.: 39.138 g
Prep Extract Vol: 34.4931 mL

Print Date: 10/24/2013 8:39:23AM

Results of **13-NK-04-SO**

Client Sample ID: **13-NK-04-SO**
Client Project ID: **Napaskiak Trench Installation**
Lab Sample ID: 1135014004
Lab Project ID: 1135014

Collection Date: 10/05/13 09:45
Received Date: 10/07/13 16:07
Matrix: Soil/Solid (dry weight)
Solids (%): 72.0

Results by **Metals by ICP/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Lead	9.05		1.37	0.425	mg/Kg	50		10/22/13 20:09

Batch Information

Analytical Batch: MMS8316
Analytical Method: SW6020
Analyst: HKS
Analytical Date/Time: 10/22/13 20:09
Container ID: 1135014004-A

Prep Batch: MXX27200
Prep Method: SW3050B
Prep Date/Time: 10/13/13 15:30
Prep Initial Wt./Vol.: 1.013 g
Prep Extract Vol: 50 mL

Print Date: 10/24/2013 8:39:23AM

Results of **13-NK-04-SO**

Client Sample ID: **13-NK-04-SO**
Client Project ID: **Napaskiak Trench Installation**
Lab Sample ID: 1135014004
Lab Project ID: 1135014

Collection Date: 10/05/13 09:45
Received Date: 10/07/13 16:07
Matrix: Soil/Solid (dry weight)
Solids (%): 72.0

Results by **Polychlorinated Biphenyls**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Aroclor-1016	41.2	U	68.6	20.6	ug/Kg	1		10/10/13 14:32
Aroclor-1221	41.2	U	68.6	20.6	ug/Kg	1		10/10/13 14:32
Aroclor-1232	41.2	U	68.6	20.6	ug/Kg	1		10/10/13 14:32
Aroclor-1242	41.2	U	68.6	20.6	ug/Kg	1		10/10/13 14:32
Aroclor-1248	41.2	U	68.6	20.6	ug/Kg	1		10/10/13 14:32
Aroclor-1254	41.2	U	68.6	20.6	ug/Kg	1		10/10/13 14:32
Aroclor-1260	41.2	U	68.6	20.6	ug/Kg	1		10/10/13 14:32
Surrogates								
Decachlorobiphenyl	103		60-125		%	1		10/10/13 14:32

Batch Information

Analytical Batch: XGC8641
Analytical Method: SW8082A
Analyst: RTS
Analytical Date/Time: 10/10/13 14:32
Container ID: 1135014004-A

Prep Batch: XXX30119
Prep Method: SW3550C
Prep Date/Time: 10/08/13 18:30
Prep Initial Wt./Vol.: 22.753 g
Prep Extract Vol: 5 mL

Print Date: 10/24/2013 8:39:23AM

Results of **13-NK-04-SO**

Client Sample ID: **13-NK-04-SO**
Client Project ID: **Napaskiak Trench Installation**
Lab Sample ID: 1135014004
Lab Project ID: 1135014

Collection Date: 10/05/13 09:45
Received Date: 10/07/13 16:07
Matrix: Soil/Solid (dry weight)
Solids (%): 72.0

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	42.7		6.83	2.05	ug/Kg	1		10/10/13 18:19
2-Methylnaphthalene	39.6		6.83	2.05	ug/Kg	1		10/10/13 18:19
Acenaphthene	4.10	U	6.83	2.05	ug/Kg	1		10/10/13 18:19
Acenaphthylene	4.10	U	6.83	2.05	ug/Kg	1		10/10/13 18:19
Anthracene	4.10	U	6.83	2.05	ug/Kg	1		10/10/13 18:19
Benzo(a)Anthracene	7.26		6.83	2.05	ug/Kg	1		10/10/13 18:19
Benzo[a]pyrene	5.93	J	6.83	2.05	ug/Kg	1		10/10/13 18:19
Benzo[b]Fluoranthene	9.98		6.83	2.05	ug/Kg	1		10/10/13 18:19
Benzo[g,h,i]perylene	2.81	J	6.83	2.05	ug/Kg	1		10/10/13 18:19
Benzo[k]fluoranthene	3.05	J	6.83	2.05	ug/Kg	1		10/10/13 18:19
Chrysene	9.32		6.83	2.05	ug/Kg	1		10/10/13 18:19
Dibenzo[a,h]anthracene	4.10	U	6.83	2.05	ug/Kg	1		10/10/13 18:19
Fluoranthene	21.9		6.83	2.05	ug/Kg	1		10/10/13 18:19
Fluorene	4.10	U	6.83	2.05	ug/Kg	1		10/10/13 18:19
Indeno[1,2,3-c,d] pyrene	4.10	U	6.83	2.05	ug/Kg	1		10/10/13 18:19
Naphthalene	10.5		6.83	2.05	ug/Kg	1		10/10/13 18:19
Phenanthrene	11.8		6.83	2.05	ug/Kg	1		10/10/13 18:19
Pyrene	23.6		6.83	2.05	ug/Kg	1		10/10/13 18:19
Surrogates								
2-Fluorobiphenyl	102		45-105		%	1		10/10/13 18:19
Terphenyl-d14	107		30-125		%	1		10/10/13 18:19

Batch Information

Analytical Batch: XMS7676
Analytical Method: 8270D SIMS (PAH)
Analyst: RTS
Analytical Date/Time: 10/10/13 18:19
Container ID: 1135014004-A

Prep Batch: XXX30130
Prep Method: SW3550C
Prep Date/Time: 10/09/13 18:05
Prep Initial Wt./Vol.: 22.874 g
Prep Extract Vol: 1 mL

Print Date: 10/24/2013 8:39:23AM

Results of **13-NK-04-SO**

Client Sample ID: **13-NK-04-SO**
Client Project ID: **Napaskiak Trench Installation**
Lab Sample ID: 1135014004
Lab Project ID: 1135014

Collection Date: 10/05/13 09:45
Received Date: 10/07/13 16:07
Matrix: Soil/Solid (dry weight)
Solids (%): 72.0

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	159		27.6	8.57	mg/Kg	1		10/10/13 18:53
Surrogates								
5a Androstane	92.9		50-150		%	1		10/10/13 18:53

Batch Information

Analytical Batch: XFC11124
Analytical Method: AK102
Analyst: EAB
Analytical Date/Time: 10/10/13 18:53
Container ID: 1135014004-A

Prep Batch: XXX30120
Prep Method: SW3550C
Prep Date/Time: 10/08/13 20:45
Prep Initial Wt./Vol.: 30.135 g
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	223		27.6	8.57	mg/Kg	1		10/10/13 18:53
Surrogates								
n-Triacontane-d62	117		50-150		%	1		10/10/13 18:53

Batch Information

Analytical Batch: XFC11124
Analytical Method: AK103
Analyst: EAB
Analytical Date/Time: 10/10/13 18:53
Container ID: 1135014004-A

Prep Batch: XXX30120
Prep Method: SW3550C
Prep Date/Time: 10/08/13 20:45
Prep Initial Wt./Vol.: 30.135 g
Prep Extract Vol: 1 mL

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Results of **13-NK-04-SO**

Client Sample ID: **13-NK-04-SO**
Client Project ID: **Napaskiak Trench Installation**
Lab Sample ID: 1135014004
Lab Project ID: 1135014

Collection Date: 10/05/13 09:45
Received Date: 10/07/13 16:07
Matrix: Soil/Solid (dry weight)
Solids (%): 72.0

Results by **Semivolatile Organic GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2,4-Trichlorobenzene	0.428	U	0.684	0.214	mg/Kg	2		10/21/13 22:07
1,2-Dichlorobenzene	0.428	U	0.684	0.214	mg/Kg	2		10/21/13 22:07
1,3-Dichlorobenzene	0.428	U	0.684	0.214	mg/Kg	2		10/21/13 22:07
1,4-Dichlorobenzene	0.428	U	0.684	0.214	mg/Kg	2		10/21/13 22:07
1-Chloronaphthalene	0.428	U	0.684	0.214	mg/Kg	2		10/21/13 22:07
2,4,5-Trichlorophenol	0.428	U	0.684	0.214	mg/Kg	2		10/21/13 22:07
2,4,6-Trichlorophenol	0.428	U	0.684	0.214	mg/Kg	2		10/21/13 22:07
2,4-Dichlorophenol	0.428	U	0.684	0.214	mg/Kg	2		10/21/13 22:07
2,4-Dimethylphenol	0.428	U	0.684	0.214	mg/Kg	2		10/21/13 22:07
2,4-Dinitrophenol	5.14	U	8.21	2.57	mg/Kg	2		10/21/13 22:07
2,4-Dinitrotoluene	0.428	U	0.684	0.214	mg/Kg	2		10/21/13 22:07
2,6-Dichlorophenol	0.428	U	0.684	0.214	mg/Kg	2		10/21/13 22:07
2,6-Dinitrotoluene	0.428	U	0.684	0.214	mg/Kg	2		10/21/13 22:07
2-Chloronaphthalene	0.428	U	0.684	0.214	mg/Kg	2		10/21/13 22:07
2-Chlorophenol	0.428	U	0.684	0.214	mg/Kg	2		10/21/13 22:07
2-Methyl-4,6-dinitrophenol	3.40	U	5.47	1.70	mg/Kg	2		10/21/13 22:07
2-Methylnaphthalene	0.428	U	0.684	0.214	mg/Kg	2		10/21/13 22:07
2-Methylphenol (o-Cresol)	0.428	U	0.684	0.214	mg/Kg	2		10/21/13 22:07
2-Nitroaniline	0.428	U	0.684	0.214	mg/Kg	2		10/21/13 22:07
2-Nitrophenol	0.428	U	0.684	0.214	mg/Kg	2		10/21/13 22:07
3&4-Methylphenol (p&m-Cresol)	1.70	U	2.74	0.849	mg/Kg	2		10/21/13 22:07
3,3-Dichlorobenzidine	0.428	U	0.684	0.214	mg/Kg	2		10/21/13 22:07
3-Nitroaniline	0.822	U	1.37	0.411	mg/Kg	2		10/21/13 22:07
4-Bromophenyl-phenylether	0.428	U	0.684	0.214	mg/Kg	2		10/21/13 22:07
4-Chloro-3-methylphenol	0.428	U	0.684	0.214	mg/Kg	2		10/21/13 22:07
4-Chloroaniline	0.822	U	1.37	0.411	mg/Kg	2		10/21/13 22:07
4-Chlorophenyl-phenylether	0.428	U	0.684	0.214	mg/Kg	2		10/21/13 22:07
4-Nitroaniline	5.14	U	8.21	2.57	mg/Kg	2		10/21/13 22:07
4-Nitrophenol	1.70	U	2.74	0.849	mg/Kg	2		10/21/13 22:07
Acenaphthene	0.428	U	0.684	0.214	mg/Kg	2		10/21/13 22:07
Acenaphthylene	0.428	U	0.684	0.214	mg/Kg	2		10/21/13 22:07
Aniline	3.40	U	5.47	1.70	mg/Kg	2		10/21/13 22:07
Anthracene	0.428	U	0.684	0.214	mg/Kg	2		10/21/13 22:07
Azobenzene	0.428	U	0.684	0.214	mg/Kg	2		10/21/13 22:07
Benzo(a)Anthracene	0.428	U	0.684	0.214	mg/Kg	2		10/21/13 22:07
Benzo[a]pyrene	0.428	U	0.684	0.214	mg/Kg	2		10/21/13 22:07

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Results of **13-NK-04-SO**

Client Sample ID: **13-NK-04-SO**
Client Project ID: **Napaskiak Trench Installation**
Lab Sample ID: 1135014004
Lab Project ID: 1135014

Collection Date: 10/05/13 09:45
Received Date: 10/07/13 16:07
Matrix: Soil/Solid (dry weight)
Solids (%): 72.0

Results by **Semivolatile Organic GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzo[b]Fluoranthene	0.428	U	0.684	0.214	mg/Kg	2		10/21/13 22:07
Benzo[g,h,i]perylene	0.428	U	0.684	0.214	mg/Kg	2		10/21/13 22:07
Benzo[k]fluoranthene	0.428	U	0.684	0.214	mg/Kg	2		10/21/13 22:07
Benzoic acid	4.10	U	4.11	2.05	mg/Kg	2		10/21/13 22:07
Benzyl alcohol	0.428	U	0.684	0.214	mg/Kg	2		10/21/13 22:07
Bis(2-Chloroethoxy)methane	0.428	U	0.684	0.214	mg/Kg	2		10/21/13 22:07
Bis(2-Chloroethyl)ether	0.428	U	0.684	0.214	mg/Kg	2		10/21/13 22:07
bis(2-Ethylhexyl)phthalate	0.428	U	0.684	0.214	mg/Kg	2		10/21/13 22:07
Bis(2chloro1methylethyl)Ether	0.428	U	0.684	0.214	mg/Kg	2		10/21/13 22:07
Butylbenzylphthalate	0.428	U	0.684	0.214	mg/Kg	2		10/21/13 22:07
Carbazole	0.428	U	0.684	0.214	mg/Kg	2		10/21/13 22:07
Chrysene	0.428	U	0.684	0.214	mg/Kg	2		10/21/13 22:07
Di-n-butylphthalate	0.428	U	0.684	0.214	mg/Kg	2		10/21/13 22:07
di-n-Octylphthalate	0.822	U	1.37	0.411	mg/Kg	2		10/21/13 22:07
Dibenzo[a,h]anthracene	0.428	U	0.684	0.214	mg/Kg	2		10/21/13 22:07
Dibenzofuran	0.428	U	0.684	0.214	mg/Kg	2		10/21/13 22:07
Diethylphthalate	0.428	U	0.684	0.214	mg/Kg	2		10/21/13 22:07
Dimethylphthalate	0.428	U	0.684	0.214	mg/Kg	2		10/21/13 22:07
Fluoranthene	0.428	U	0.684	0.214	mg/Kg	2		10/21/13 22:07
Fluorene	0.428	U	0.684	0.214	mg/Kg	2		10/21/13 22:07
Hexachlorobenzene	0.428	U	0.684	0.214	mg/Kg	2		10/21/13 22:07
Hexachlorobutadiene	0.428	U	0.684	0.214	mg/Kg	2		10/21/13 22:07
Hexachlorocyclopentadiene	1.09	U	1.92	0.547	mg/Kg	2		10/21/13 22:07
Hexachloroethane	0.428	U	0.684	0.214	mg/Kg	2		10/21/13 22:07
Indeno[1,2,3-c,d] pyrene	0.428	U	0.684	0.214	mg/Kg	2		10/21/13 22:07
Isophorone	0.428	U	0.684	0.214	mg/Kg	2		10/21/13 22:07
N-Nitroso-di-n-propylamine	0.428	U	0.684	0.214	mg/Kg	2		10/21/13 22:07
N-Nitrosodimethylamine	0.428	U	0.684	0.214	mg/Kg	2		10/21/13 22:07
N-Nitrosodiphenylamine	0.428	U	0.684	0.214	mg/Kg	2		10/21/13 22:07
Naphthalene	0.428	U	0.684	0.214	mg/Kg	2		10/21/13 22:07
Nitrobenzene	0.428	U	0.684	0.214	mg/Kg	2		10/21/13 22:07
Pentachlorophenol	3.40	U	5.47	1.70	mg/Kg	2		10/21/13 22:07
Phenanthrene	0.428	U	0.684	0.214	mg/Kg	2		10/21/13 22:07
Phenol	0.428	U	0.684	0.214	mg/Kg	2		10/21/13 22:07
Pyrene	0.428	U	0.684	0.214	mg/Kg	2		10/21/13 22:07

Surrogates

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Results of **13-NK-04-SO**

Client Sample ID: **13-NK-04-SO**
Client Project ID: **Napaskiak Trench Installation**
Lab Sample ID: 1135014004
Lab Project ID: 1135014

Collection Date: 10/05/13 09:45
Received Date: 10/07/13 16:07
Matrix: Soil/Solid (dry weight)
Solids (%): 72.0

Results by **Semivolatile Organic GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
2,4,6-Tribromophenol	89		35-125		%	2		10/21/13 22:07
2-Fluorobiphenyl	90.5		45-105		%	2		10/21/13 22:07
2-Fluorophenol	72.2		35-105		%	2		10/21/13 22:07
Nitrobenzene-d5	76.8		35-100		%	2		10/21/13 22:07
Phenol-d6	78.9		40-100		%	2		10/21/13 22:07
Terphenyl-d14	112		30-125		%	2		10/21/13 22:07

Batch Information

Analytical Batch: XMS7712
Analytical Method: SW8270D
Analyst: DSH
Analytical Date/Time: 10/21/13 22:07
Container ID: 1135014004-A

Prep Batch: XXX30142
Prep Method: SW3550C
Prep Date/Time: 10/11/13 12:30
Prep Initial Wt./Vol.: 22.82 g
Prep Extract Vol: 1 mL

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Results of **13-NK-04-SO**

Client Sample ID: **13-NK-04-SO**
Client Project ID: **Napaskiak Trench Installation**
Lab Sample ID: 1135014004
Lab Project ID: 1135014

Collection Date: 10/05/13 09:45
Received Date: 10/07/13 16:07
Matrix: Soil/Solid (dry weight)
Solids (%): 72.0

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	5.78		5.62	1.69	mg/Kg	1		10/10/13 03:01
Surrogates								
4-Bromofluorobenzene	116		50-150		%	1		10/10/13 03:01

Batch Information

Analytical Batch: VFC11680
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 10/10/13 03:01
Container ID: 1135014004-C

Prep Batch: VXX25318
Prep Method: SW5035A
Prep Date/Time: 10/05/13 09:45
Prep Initial Wt./Vol.: 47.193 g
Prep Extract Vol: 38.1966 mL

Print Date: 10/24/2013 8:39:23AM

Results of **13-NK-04-SO**

Client Sample ID: **13-NK-04-SO**
Client Project ID: **Napaskiak Trench Installation**
Lab Sample ID: 1135014004
Lab Project ID: 1135014

Collection Date: 10/05/13 09:45
Received Date: 10/07/13 16:07
Matrix: Soil/Solid (dry weight)
Solids (%): 72.0

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	35.0	U	56.2	17.5	ug/Kg	1		10/14/13 17:04
1,1,1-Trichloroethane	35.0	U	56.2	17.5	ug/Kg	1		10/14/13 17:04
1,1,2,2-Tetrachloroethane	67.4	U	112	33.7	ug/Kg	1		10/14/13 17:04
1,1,2-Trichloroethane	35.0	U	56.2	17.5	ug/Kg	1		10/14/13 17:04
1,1-Dichloroethane	35.0	U	56.2	17.5	ug/Kg	1		10/14/13 17:04
1,1-Dichloroethene	35.0	U	56.2	17.5	ug/Kg	1		10/14/13 17:04
1,1-Dichloropropene	35.0	U	56.2	17.5	ug/Kg	1		10/14/13 17:04
1,2,3-Trichlorobenzene	67.4	U	112	33.7	ug/Kg	1		10/14/13 17:04
1,2,3-Trichloropropane	35.0	U	56.2	17.5	ug/Kg	1		10/14/13 17:04
1,2,4-Trichlorobenzene	35.0	U	56.2	17.5	ug/Kg	1		10/14/13 17:04
1,2,4-Trimethylbenzene	67.4	U	112	33.7	ug/Kg	1		10/14/13 17:04
1,2-Dibromo-3-chloropropane	139	U	225	69.7	ug/Kg	1		10/14/13 17:04
1,2-Dibromoethane	35.0	U	56.2	17.5	ug/Kg	1		10/14/13 17:04
1,2-Dichlorobenzene	35.0	U	56.2	17.5	ug/Kg	1		10/14/13 17:04
1,2-Dichloroethane	35.0	U	56.2	17.5	ug/Kg	1		10/14/13 17:04
1,2-Dichloropropane	35.0	U	56.2	17.5	ug/Kg	1		10/14/13 17:04
1,3,5-Trimethylbenzene	25.3	J	56.2	17.5	ug/Kg	1		10/14/13 17:04
1,3-Dichlorobenzene	35.0	U	56.2	17.5	ug/Kg	1		10/14/13 17:04
1,3-Dichloropropane	35.0	U	56.2	17.5	ug/Kg	1		10/14/13 17:04
1,4-Dichlorobenzene	35.0	U	56.2	17.5	ug/Kg	1		10/14/13 17:04
2,2-Dichloropropane	35.0	U	56.2	17.5	ug/Kg	1		10/14/13 17:04
2-Butanone (MEK)	350	U	562	175	ug/Kg	1		10/14/13 17:04
2-Chlorotoluene	35.0	U	56.2	17.5	ug/Kg	1		10/14/13 17:04
2-Hexanone	350	U	562	175	ug/Kg	1		10/14/13 17:04
4-Chlorotoluene	35.0	U	56.2	17.5	ug/Kg	1		10/14/13 17:04
4-Isopropyltoluene	45.5	J	56.2	17.5	ug/Kg	1		10/14/13 17:04
4-Methyl-2-pentanone (MIBK)	350	U	562	175	ug/Kg	1		10/14/13 17:04
Benzene	13.5	J	28.1	8.76	ug/Kg	1		10/14/13 17:04
Bromobenzene	35.0	U	56.2	17.5	ug/Kg	1		10/14/13 17:04
Bromochloromethane	35.0	U	56.2	17.5	ug/Kg	1		10/14/13 17:04
Bromodichloromethane	35.0	U	56.2	17.5	ug/Kg	1		10/14/13 17:04
Bromoform	35.0	U	56.2	17.5	ug/Kg	1		10/14/13 17:04
Bromomethane	278	U	449	139	ug/Kg	1		10/14/13 17:04
Carbon disulfide	139	U	225	69.7	ug/Kg	1		10/14/13 17:04
Carbon tetrachloride	35.0	U	56.2	17.5	ug/Kg	1		10/14/13 17:04
Chlorobenzene	35.0	U	56.2	17.5	ug/Kg	1		10/14/13 17:04

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Results of **13-NK-04-SO**

Client Sample ID: **13-NK-04-SO**
Client Project ID: **Napaskiak Trench Installation**
Lab Sample ID: 1135014004
Lab Project ID: 1135014

Collection Date: 10/05/13 09:45
Received Date: 10/07/13 16:07
Matrix: Soil/Solid (dry weight)
Solids (%): 72.0

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroethane	278	U	449	139	ug/Kg	1		10/14/13 17:04
Chloroform	35.0	U	56.2	17.5	ug/Kg	1		10/14/13 17:04
Chloromethane	35.0	U	56.2	17.5	ug/Kg	1		10/14/13 17:04
cis-1,2-Dichloroethene	35.0	U	56.2	17.5	ug/Kg	1		10/14/13 17:04
cis-1,3-Dichloropropene	35.0	U	56.2	17.5	ug/Kg	1		10/14/13 17:04
Dibromochloromethane	35.0	U	56.2	17.5	ug/Kg	1		10/14/13 17:04
Dibromomethane	35.0	U	56.2	17.5	ug/Kg	1		10/14/13 17:04
Dichlorodifluoromethane	67.4	U	112	33.7	ug/Kg	1		10/14/13 17:04
Ethylbenzene	35.0	U	56.2	17.5	ug/Kg	1		10/14/13 17:04
Hexachlorobutadiene	67.4	U	112	33.7	ug/Kg	1		10/14/13 17:04
Isopropylbenzene (Cumene)	35.0	U	56.2	17.5	ug/Kg	1		10/14/13 17:04
Methyl-t-butyl ether	139	U	225	69.7	ug/Kg	1		10/14/13 17:04
Methylene chloride	139	U	225	69.7	ug/Kg	1		10/14/13 17:04
n-Butylbenzene	35.0	U	56.2	17.5	ug/Kg	1		10/14/13 17:04
n-Propylbenzene	35.0	U	56.2	17.5	ug/Kg	1		10/14/13 17:04
Naphthalene	67.4	U	112	33.7	ug/Kg	1		10/14/13 17:04
o-Xylene	35.0	U	56.2	17.5	ug/Kg	1		10/14/13 17:04
P & M -Xylene	67.4	U	112	33.7	ug/Kg	1		10/14/13 17:04
sec-Butylbenzene	27.0	J	56.2	17.5	ug/Kg	1		10/14/13 17:04
Styrene	35.0	U	56.2	17.5	ug/Kg	1		10/14/13 17:04
tert-Butylbenzene	35.0	U	56.2	17.5	ug/Kg	1		10/14/13 17:04
Tetrachloroethene	17.5	U	28.1	8.76	ug/Kg	1		10/14/13 17:04
Toluene	44.4	J	56.2	17.5	ug/Kg	1		10/14/13 17:04
trans-1,2-Dichloroethene	35.0	U	56.2	17.5	ug/Kg	1		10/14/13 17:04
trans-1,3-Dichloropropene	35.0	U	56.2	17.5	ug/Kg	1		10/14/13 17:04
Trichloroethene	17.5	U	28.1	8.76	ug/Kg	1		10/14/13 17:04
Trichlorofluoromethane	67.4	U	112	33.7	ug/Kg	1		10/14/13 17:04
Vinyl chloride	35.0	U	56.2	17.5	ug/Kg	1		10/14/13 17:04
Xylenes (total)	102	U	169	51.2	ug/Kg	1		10/14/13 17:04
Surrogates								
1,2-Dichloroethane-D4	106		79-118		%	1		10/14/13 17:04
4-Bromofluorobenzene	108		67-138		%	1		10/14/13 17:04
Toluene-d8	103		85-115		%	1		10/14/13 17:04

Print Date: 10/24/2013 8:39:23AM

Results of **13-NK-04-SO**

Client Sample ID: **13-NK-04-SO**
Client Project ID: **Napaskiak Trench Installation**
Lab Sample ID: 1135014004
Lab Project ID: 1135014

Collection Date: 10/05/13 09:45
Received Date: 10/07/13 16:07
Matrix: Soil/Solid (dry weight)
Solids (%): 72.0

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS13827
Analytical Method: SW8260B
Analyst: HM
Analytical Date/Time: 10/14/13 17:04
Container ID: 1135014004-C

Prep Batch: VXX25343
Prep Method: SW5035A
Prep Date/Time: 10/05/13 09:45
Prep Initial Wt./Vol.: 47.193 g
Prep Extract Vol: 38.1966 mL

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Results of **13-NK-05-SO**

Client Sample ID: **13-NK-05-SO**
Client Project ID: **Napaskiak Trench Installation**
Lab Sample ID: 1135014005
Lab Project ID: 1135014

Collection Date: 10/05/13 10:40
Received Date: 10/07/13 16:07
Matrix: Soil/Solid (dry weight)
Solids (%): 74.1

Results by **Metals by ICP/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Lead	12.3		1.31	0.407	mg/Kg	50		10/22/13 20:11

Batch Information

Analytical Batch: MMS8316
Analytical Method: SW6020
Analyst: HKS
Analytical Date/Time: 10/22/13 20:11
Container ID: 1135014005-A

Prep Batch: MXX27200
Prep Method: SW3050B
Prep Date/Time: 10/13/13 15:30
Prep Initial Wt./Vol.: 1.029 g
Prep Extract Vol: 50 mL

Print Date: 10/24/2013 8:39:23AM

Results of **13-NK-05-SO**

Client Sample ID: **13-NK-05-SO**
Client Project ID: **Napaskiak Trench Installation**
Lab Sample ID: 1135014005
Lab Project ID: 1135014

Collection Date: 10/05/13 10:40
Received Date: 10/07/13 16:07
Matrix: Soil/Solid (dry weight)
Solids (%): 74.1

Results by **Polychlorinated Biphenyls**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Aroclor-1016	40.0	U	66.6	20.0	ug/Kg	1		10/10/13 15:07
Aroclor-1221	40.0	U	66.6	20.0	ug/Kg	1		10/10/13 15:07
Aroclor-1232	40.0	U	66.6	20.0	ug/Kg	1		10/10/13 15:07
Aroclor-1242	40.0	U	66.6	20.0	ug/Kg	1		10/10/13 15:07
Aroclor-1248	40.0	U	66.6	20.0	ug/Kg	1		10/10/13 15:07
Aroclor-1254	40.0	U	66.6	20.0	ug/Kg	1		10/10/13 15:07
Aroclor-1260	40.0	U	66.6	20.0	ug/Kg	1		10/10/13 15:07
Surrogates								
Decachlorobiphenyl	110		60-125		%	1		10/10/13 15:07

Batch Information

Analytical Batch: XGC8641
Analytical Method: SW8082A
Analyst: RTS
Analytical Date/Time: 10/10/13 15:07
Container ID: 1135014005-A

Prep Batch: XXX30119
Prep Method: SW3550C
Prep Date/Time: 10/08/13 18:30
Prep Initial Wt./Vol.: 22.778 g
Prep Extract Vol: 5 mL

Print Date: 10/24/2013 8:39:23AM

Results of **13-NK-05-SO**

Client Sample ID: **13-NK-05-SO**
Client Project ID: **Napaskiak Trench Installation**
Lab Sample ID: 1135014005
Lab Project ID: 1135014

Collection Date: 10/05/13 10:40
Received Date: 10/07/13 16:07
Matrix: Soil/Solid (dry weight)
Solids (%): 74.1

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	4.72	J	6.70	2.01	ug/Kg	1		10/10/13 18:33
2-Methylnaphthalene	5.44	J	6.70	2.01	ug/Kg	1		10/10/13 18:33
Acenaphthene	4.03	J	6.70	2.01	ug/Kg	1		10/10/13 18:33
Acenaphthylene	4.02	U	6.70	2.01	ug/Kg	1		10/10/13 18:33
Anthracene	4.02	U	6.70	2.01	ug/Kg	1		10/10/13 18:33
Benzo(a)Anthracene	4.02	U	6.70	2.01	ug/Kg	1		10/10/13 18:33
Benzo[a]pyrene	4.02	U	6.70	2.01	ug/Kg	1		10/10/13 18:33
Benzo[b]Fluoranthene	4.02	U	6.70	2.01	ug/Kg	1		10/10/13 18:33
Benzo[g,h,i]perylene	4.02	U	6.70	2.01	ug/Kg	1		10/10/13 18:33
Benzo[k]fluoranthene	4.02	U	6.70	2.01	ug/Kg	1		10/10/13 18:33
Chrysene	4.02	U	6.70	2.01	ug/Kg	1		10/10/13 18:33
Dibenzo[a,h]anthracene	4.02	U	6.70	2.01	ug/Kg	1		10/10/13 18:33
Fluoranthene	4.02	U	6.70	2.01	ug/Kg	1		10/10/13 18:33
Fluorene	5.97	J	6.70	2.01	ug/Kg	1		10/10/13 18:33
Indeno[1,2,3-c,d] pyrene	4.02	U	6.70	2.01	ug/Kg	1		10/10/13 18:33
Naphthalene	8.70		6.70	2.01	ug/Kg	1		10/10/13 18:33
Phenanthrene	2.92	J	6.70	2.01	ug/Kg	1		10/10/13 18:33
Pyrene	4.02	U	6.70	2.01	ug/Kg	1		10/10/13 18:33
Surrogates								
2-Fluorobiphenyl	106	*	45-105		%	1		10/10/13 18:33
Terphenyl-d14	110		30-125		%	1		10/10/13 18:33

Batch Information

Analytical Batch: XMS7676
Analytical Method: 8270D SIMS (PAH)
Analyst: RTS
Analytical Date/Time: 10/10/13 18:33
Container ID: 1135014005-A

Prep Batch: XXX30130
Prep Method: SW3550C
Prep Date/Time: 10/09/13 18:05
Prep Initial Wt./Vol.: 22.658 g
Prep Extract Vol: 1 mL

Print Date: 10/24/2013 8:39:23AM

Results of **13-NK-05-SO**

Client Sample ID: **13-NK-05-SO**
Client Project ID: **Napaskiak Trench Installation**
Lab Sample ID: 1135014005
Lab Project ID: 1135014

Collection Date: 10/05/13 10:40
Received Date: 10/07/13 16:07
Matrix: Soil/Solid (dry weight)
Solids (%): 74.1

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	42.8		26.8	8.31	mg/Kg	1		10/10/13 19:02
Surrogates								
5a Androstane	91.4		50-150		%	1		10/10/13 19:02

Batch Information

Analytical Batch: XFC11124
Analytical Method: AK102
Analyst: EAB
Analytical Date/Time: 10/10/13 19:02
Container ID: 1135014005-A

Prep Batch: XXX30120
Prep Method: SW3550C
Prep Date/Time: 10/08/13 20:45
Prep Initial Wt./Vol.: 30.218 g
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	261		26.8	8.31	mg/Kg	1		10/10/13 19:02
Surrogates								
n-Triacontane-d62	124		50-150		%	1		10/10/13 19:02

Batch Information

Analytical Batch: XFC11124
Analytical Method: AK103
Analyst: EAB
Analytical Date/Time: 10/10/13 19:02
Container ID: 1135014005-A

Prep Batch: XXX30120
Prep Method: SW3550C
Prep Date/Time: 10/08/13 20:45
Prep Initial Wt./Vol.: 30.218 g
Prep Extract Vol: 1 mL

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Results of **13-NK-05-SO**

Client Sample ID: **13-NK-05-SO**
Client Project ID: **Napaskiak Trench Installation**
Lab Sample ID: 1135014005
Lab Project ID: 1135014

Collection Date: 10/05/13 10:40
Received Date: 10/07/13 16:07
Matrix: Soil/Solid (dry weight)
Solids (%): 74.1

Results by **Semivolatile Organic GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2,4-Trichlorobenzene	0.420	U	0.672	0.210	mg/Kg	2		10/21/13 22:25
1,2-Dichlorobenzene	0.420	U	0.672	0.210	mg/Kg	2		10/21/13 22:25
1,3-Dichlorobenzene	0.420	U	0.672	0.210	mg/Kg	2		10/21/13 22:25
1,4-Dichlorobenzene	0.420	U	0.672	0.210	mg/Kg	2		10/21/13 22:25
1-Chloronaphthalene	0.420	U	0.672	0.210	mg/Kg	2		10/21/13 22:25
2,4,5-Trichlorophenol	0.420	U	0.672	0.210	mg/Kg	2		10/21/13 22:25
2,4,6-Trichlorophenol	0.420	U	0.672	0.210	mg/Kg	2		10/21/13 22:25
2,4-Dichlorophenol	0.420	U	0.672	0.210	mg/Kg	2		10/21/13 22:25
2,4-Dimethylphenol	0.420	U	0.672	0.210	mg/Kg	2		10/21/13 22:25
2,4-Dinitrophenol	5.06	U	8.06	2.53	mg/Kg	2		10/21/13 22:25
2,4-Dinitrotoluene	0.420	U	0.672	0.210	mg/Kg	2		10/21/13 22:25
2,6-Dichlorophenol	0.420	U	0.672	0.210	mg/Kg	2		10/21/13 22:25
2,6-Dinitrotoluene	0.420	U	0.672	0.210	mg/Kg	2		10/21/13 22:25
2-Chloronaphthalene	0.420	U	0.672	0.210	mg/Kg	2		10/21/13 22:25
2-Chlorophenol	0.420	U	0.672	0.210	mg/Kg	2		10/21/13 22:25
2-Methyl-4,6-dinitrophenol	3.34	U	5.38	1.67	mg/Kg	2		10/21/13 22:25
2-Methylnaphthalene	0.420	U	0.672	0.210	mg/Kg	2		10/21/13 22:25
2-Methylphenol (o-Cresol)	0.420	U	0.672	0.210	mg/Kg	2		10/21/13 22:25
2-Nitroaniline	0.420	U	0.672	0.210	mg/Kg	2		10/21/13 22:25
2-Nitrophenol	0.420	U	0.672	0.210	mg/Kg	2		10/21/13 22:25
3&4-Methylphenol (p&m-Cresol)	1.67	U	2.69	0.833	mg/Kg	2		10/21/13 22:25
3,3-Dichlorobenzidine	0.420	U	0.672	0.210	mg/Kg	2		10/21/13 22:25
3-Nitroaniline	0.806	U	1.34	0.403	mg/Kg	2		10/21/13 22:25
4-Bromophenyl-phenylether	0.420	U	0.672	0.210	mg/Kg	2		10/21/13 22:25
4-Chloro-3-methylphenol	0.420	U	0.672	0.210	mg/Kg	2		10/21/13 22:25
4-Chloroaniline	0.806	U	1.34	0.403	mg/Kg	2		10/21/13 22:25
4-Chlorophenyl-phenylether	0.420	U	0.672	0.210	mg/Kg	2		10/21/13 22:25
4-Nitroaniline	5.06	U	8.06	2.53	mg/Kg	2		10/21/13 22:25
4-Nitrophenol	1.67	U	2.69	0.833	mg/Kg	2		10/21/13 22:25
Acenaphthene	0.420	U	0.672	0.210	mg/Kg	2		10/21/13 22:25
Acenaphthylene	0.420	U	0.672	0.210	mg/Kg	2		10/21/13 22:25
Aniline	3.34	U	5.38	1.67	mg/Kg	2		10/21/13 22:25
Anthracene	0.420	U	0.672	0.210	mg/Kg	2		10/21/13 22:25
Azobenzene	0.420	U	0.672	0.210	mg/Kg	2		10/21/13 22:25
Benzo(a)Anthracene	0.420	U	0.672	0.210	mg/Kg	2		10/21/13 22:25
Benzo[a]pyrene	1.05	U	1.68	0.524	mg/Kg	5		10/22/13 23:03

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Results of **13-NK-05-SO**

Client Sample ID: **13-NK-05-SO**
Client Project ID: **Napaskiak Trench Installation**
Lab Sample ID: 1135014005
Lab Project ID: 1135014

Collection Date: 10/05/13 10:40
Received Date: 10/07/13 16:07
Matrix: Soil/Solid (dry weight)
Solids (%): 74.1

Results by **Semivolatile Organic GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzo[b]Fluoranthene	1.05	U	1.68	0.524	mg/Kg	5		10/22/13 23:03
Benzo[g,h,i]perylene	1.05	U	1.68	0.524	mg/Kg	5		10/22/13 23:03
Benzo[k]fluoranthene	1.05	U	1.68	0.524	mg/Kg	5		10/22/13 23:03
Benzoic acid	4.03	U	4.03	2.02	mg/Kg	2		10/21/13 22:25
Benzyl alcohol	0.420	U	0.672	0.210	mg/Kg	2		10/21/13 22:25
Bis(2-Chloroethoxy)methane	0.420	U	0.672	0.210	mg/Kg	2		10/21/13 22:25
Bis(2-Chloroethyl)ether	0.420	U	0.672	0.210	mg/Kg	2		10/21/13 22:25
bis(2-Ethylhexyl)phthalate	0.420	U	0.672	0.210	mg/Kg	2		10/21/13 22:25
Bis(2chloro1methylethyl)Ether	0.420	U	0.672	0.210	mg/Kg	2		10/21/13 22:25
Butylbenzylphthalate	0.420	U	0.672	0.210	mg/Kg	2		10/21/13 22:25
Carbazole	0.420	U	0.672	0.210	mg/Kg	2		10/21/13 22:25
Chrysene	0.420	U	0.672	0.210	mg/Kg	2		10/21/13 22:25
Di-n-butylphthalate	0.420	U	0.672	0.210	mg/Kg	2		10/21/13 22:25
di-n-Octylphthalate	0.806	U	1.34	0.403	mg/Kg	2		10/21/13 22:25
Dibenzo[a,h]anthracene	1.05	U	1.68	0.524	mg/Kg	5		10/22/13 23:03
Dibenzofuran	0.420	U	0.672	0.210	mg/Kg	2		10/21/13 22:25
Diethylphthalate	0.420	U	0.672	0.210	mg/Kg	2		10/21/13 22:25
Dimethylphthalate	0.420	U	0.672	0.210	mg/Kg	2		10/21/13 22:25
Fluoranthene	0.420	U	0.672	0.210	mg/Kg	2		10/21/13 22:25
Fluorene	0.420	U	0.672	0.210	mg/Kg	2		10/21/13 22:25
Hexachlorobenzene	0.420	U	0.672	0.210	mg/Kg	2		10/21/13 22:25
Hexachlorobutadiene	0.420	U	0.672	0.210	mg/Kg	2		10/21/13 22:25
Hexachlorocyclopentadiene	1.08	U	1.88	0.538	mg/Kg	2		10/21/13 22:25
Hexachloroethane	0.420	U	0.672	0.210	mg/Kg	2		10/21/13 22:25
Indeno[1,2,3-c,d] pyrene	1.05	U	1.68	0.524	mg/Kg	5		10/22/13 23:03
Isophorone	0.420	U	0.672	0.210	mg/Kg	2		10/21/13 22:25
N-Nitroso-di-n-propylamine	0.420	U	0.672	0.210	mg/Kg	2		10/21/13 22:25
N-Nitrosodimethylamine	0.420	U	0.672	0.210	mg/Kg	2		10/21/13 22:25
N-Nitrosodiphenylamine	0.420	U	0.672	0.210	mg/Kg	2		10/21/13 22:25
Naphthalene	0.420	U	0.672	0.210	mg/Kg	2		10/21/13 22:25
Nitrobenzene	0.420	U	0.672	0.210	mg/Kg	2		10/21/13 22:25
Pentachlorophenol	3.34	U	5.38	1.67	mg/Kg	2		10/21/13 22:25
Phenanthrene	0.420	U	0.672	0.210	mg/Kg	2		10/21/13 22:25
Phenol	0.420	U	0.672	0.210	mg/Kg	2		10/21/13 22:25
Pyrene	0.420	U	0.672	0.210	mg/Kg	2		10/21/13 22:25

Surrogates

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Results of **13-NK-05-SO**

Client Sample ID: **13-NK-05-SO**
Client Project ID: **Napaskiak Trench Installation**
Lab Sample ID: 1135014005
Lab Project ID: 1135014

Collection Date: 10/05/13 10:40
Received Date: 10/07/13 16:07
Matrix: Soil/Solid (dry weight)
Solids (%): 74.1

Results by **Semivolatile Organic GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
2,4,6-Tribromophenol	92		35-125		%	2		10/21/13 22:25
2-Fluorobiphenyl	93.9		45-105		%	2		10/21/13 22:25
2-Fluorophenol	74.8		35-105		%	2		10/21/13 22:25
Nitrobenzene-d5	78.4		35-100		%	2		10/21/13 22:25
Phenol-d6	80		40-100		%	2		10/21/13 22:25
Terphenyl-d14	111		30-125		%	2		10/21/13 22:25

Batch Information

Analytical Batch: XMS7712
Analytical Method: SW8270D
Analyst: DSH
Analytical Date/Time: 10/21/13 22:25
Container ID: 1135014005-A

Prep Batch: XXX30142
Prep Method: SW3550C
Prep Date/Time: 10/11/13 12:30
Prep Initial Wt./Vol.: 22.59 g
Prep Extract Vol: 1 mL

Analytical Batch: XMS7714
Analytical Method: SW8270D
Analyst: DSH
Analytical Date/Time: 10/22/13 23:03
Container ID: 1135014005-A

Prep Batch: XXX30142
Prep Method: SW3550C
Prep Date/Time: 10/11/13 12:30
Prep Initial Wt./Vol.: 22.59 g
Prep Extract Vol: 1 mL

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Results of **13-NK-05-SO**

Client Sample ID: **13-NK-05-SO**
Client Project ID: **Napaskiak Trench Installation**
Lab Sample ID: 1135014005
Lab Project ID: 1135014

Collection Date: 10/05/13 10:40
Received Date: 10/07/13 16:07
Matrix: Soil/Solid (dry weight)
Solids (%): 74.1

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	2.37	J	5.42	1.63	mg/Kg	1		10/10/13 03:38
Surrogates								
4-Bromofluorobenzene	104		50-150		%	1		10/10/13 03:38

Batch Information

Analytical Batch: VFC11680
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 10/10/13 03:38
Container ID: 1135014005-C

Prep Batch: VXX25318
Prep Method: SW5035A
Prep Date/Time: 10/05/13 10:40
Prep Initial Wt./Vol.: 45.922 g
Prep Extract Vol: 36.89 mL

Print Date: 10/24/2013 8:39:23AM

Results of **13-NK-05-SO**

Client Sample ID: **13-NK-05-SO**
Client Project ID: **Napaskiak Trench Installation**
Lab Sample ID: 1135014005
Lab Project ID: 1135014

Collection Date: 10/05/13 10:40
Received Date: 10/07/13 16:07
Matrix: Soil/Solid (dry weight)
Solids (%): 74.1

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	33.8	U	54.2	16.9	ug/Kg	1		10/14/13 17:21
1,1,1-Trichloroethane	33.8	U	54.2	16.9	ug/Kg	1		10/14/13 17:21
1,1,2,2-Tetrachloroethane	65.0	U	108	32.5	ug/Kg	1		10/14/13 17:21
1,1,2-Trichloroethane	33.8	U	54.2	16.9	ug/Kg	1		10/14/13 17:21
1,1-Dichloroethane	33.8	U	54.2	16.9	ug/Kg	1		10/14/13 17:21
1,1-Dichloroethene	33.8	U	54.2	16.9	ug/Kg	1		10/14/13 17:21
1,1-Dichloropropene	33.8	U	54.2	16.9	ug/Kg	1		10/14/13 17:21
1,2,3-Trichlorobenzene	65.0	U	108	32.5	ug/Kg	1		10/14/13 17:21
1,2,3-Trichloropropane	33.8	U	54.2	16.9	ug/Kg	1		10/14/13 17:21
1,2,4-Trichlorobenzene	33.8	U	54.2	16.9	ug/Kg	1		10/14/13 17:21
1,2,4-Trimethylbenzene	65.0	U	108	32.5	ug/Kg	1		10/14/13 17:21
1,2-Dibromo-3-chloropropane	134	U	217	67.2	ug/Kg	1		10/14/13 17:21
1,2-Dibromoethane	33.8	U	54.2	16.9	ug/Kg	1		10/14/13 17:21
1,2-Dichlorobenzene	33.8	U	54.2	16.9	ug/Kg	1		10/14/13 17:21
1,2-Dichloroethane	33.8	U	54.2	16.9	ug/Kg	1		10/14/13 17:21
1,2-Dichloropropane	33.8	U	54.2	16.9	ug/Kg	1		10/14/13 17:21
1,3,5-Trimethylbenzene	33.8	U	54.2	16.9	ug/Kg	1		10/14/13 17:21
1,3-Dichlorobenzene	33.8	U	54.2	16.9	ug/Kg	1		10/14/13 17:21
1,3-Dichloropropane	33.8	U	54.2	16.9	ug/Kg	1		10/14/13 17:21
1,4-Dichlorobenzene	33.8	U	54.2	16.9	ug/Kg	1		10/14/13 17:21
2,2-Dichloropropane	33.8	U	54.2	16.9	ug/Kg	1		10/14/13 17:21
2-Butanone (MEK)	338	U	542	169	ug/Kg	1		10/14/13 17:21
2-Chlorotoluene	33.8	U	54.2	16.9	ug/Kg	1		10/14/13 17:21
2-Hexanone	338	U	542	169	ug/Kg	1		10/14/13 17:21
4-Chlorotoluene	33.8	U	54.2	16.9	ug/Kg	1		10/14/13 17:21
4-Isopropyltoluene	33.8	U	54.2	16.9	ug/Kg	1		10/14/13 17:21
4-Methyl-2-pentanone (MIBK)	338	U	542	169	ug/Kg	1		10/14/13 17:21
Benzene	16.9	U	27.1	8.46	ug/Kg	1		10/14/13 17:21
Bromobenzene	33.8	U	54.2	16.9	ug/Kg	1		10/14/13 17:21
Bromochloromethane	33.8	U	54.2	16.9	ug/Kg	1		10/14/13 17:21
Bromodichloromethane	33.8	U	54.2	16.9	ug/Kg	1		10/14/13 17:21
Bromoform	33.8	U	54.2	16.9	ug/Kg	1		10/14/13 17:21
Bromomethane	268	U	434	134	ug/Kg	1		10/14/13 17:21
Carbon disulfide	134	U	217	67.2	ug/Kg	1		10/14/13 17:21
Carbon tetrachloride	33.8	U	54.2	16.9	ug/Kg	1		10/14/13 17:21
Chlorobenzene	33.8	U	54.2	16.9	ug/Kg	1		10/14/13 17:21

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Results of **13-NK-05-SO**

Client Sample ID: **13-NK-05-SO**
Client Project ID: **Napaskiak Trench Installation**
Lab Sample ID: 1135014005
Lab Project ID: 1135014

Collection Date: 10/05/13 10:40
Received Date: 10/07/13 16:07
Matrix: Soil/Solid (dry weight)
Solids (%): 74.1

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroethane	268	U	434	134	ug/Kg	1		10/14/13 17:21
Chloroform	33.8	U	54.2	16.9	ug/Kg	1		10/14/13 17:21
Chloromethane	33.8	U	54.2	16.9	ug/Kg	1		10/14/13 17:21
cis-1,2-Dichloroethene	33.8	U	54.2	16.9	ug/Kg	1		10/14/13 17:21
cis-1,3-Dichloropropene	33.8	U	54.2	16.9	ug/Kg	1		10/14/13 17:21
Dibromochloromethane	33.8	U	54.2	16.9	ug/Kg	1		10/14/13 17:21
Dibromomethane	33.8	U	54.2	16.9	ug/Kg	1		10/14/13 17:21
Dichlorodifluoromethane	65.0	U	108	32.5	ug/Kg	1		10/14/13 17:21
Ethylbenzene	33.8	U	54.2	16.9	ug/Kg	1		10/14/13 17:21
Hexachlorobutadiene	65.0	U	108	32.5	ug/Kg	1		10/14/13 17:21
Isopropylbenzene (Cumene)	33.8	U	54.2	16.9	ug/Kg	1		10/14/13 17:21
Methyl-t-butyl ether	134	U	217	67.2	ug/Kg	1		10/14/13 17:21
Methylene chloride	134	U	217	67.2	ug/Kg	1		10/14/13 17:21
n-Butylbenzene	33.8	U	54.2	16.9	ug/Kg	1		10/14/13 17:21
n-Propylbenzene	33.8	U	54.2	16.9	ug/Kg	1		10/14/13 17:21
Naphthalene	65.0	U	108	32.5	ug/Kg	1		10/14/13 17:21
o-Xylene	33.8	U	54.2	16.9	ug/Kg	1		10/14/13 17:21
P & M -Xylene	65.0	U	108	32.5	ug/Kg	1		10/14/13 17:21
sec-Butylbenzene	33.8	U	54.2	16.9	ug/Kg	1		10/14/13 17:21
Styrene	33.8	U	54.2	16.9	ug/Kg	1		10/14/13 17:21
tert-Butylbenzene	33.8	U	54.2	16.9	ug/Kg	1		10/14/13 17:21
Tetrachloroethene	16.9	U	27.1	8.46	ug/Kg	1		10/14/13 17:21
Toluene	25.5	J	54.2	16.9	ug/Kg	1		10/14/13 17:21
trans-1,2-Dichloroethene	33.8	U	54.2	16.9	ug/Kg	1		10/14/13 17:21
trans-1,3-Dichloropropene	33.8	U	54.2	16.9	ug/Kg	1		10/14/13 17:21
Trichloroethene	16.9	U	27.1	8.46	ug/Kg	1		10/14/13 17:21
Trichlorofluoromethane	65.0	U	108	32.5	ug/Kg	1		10/14/13 17:21
Vinyl chloride	33.8	U	54.2	16.9	ug/Kg	1		10/14/13 17:21
Xylenes (total)	98.8	U	163	49.4	ug/Kg	1		10/14/13 17:21
Surrogates								
1,2-Dichloroethane-D4	105		79-118		%	1		10/14/13 17:21
4-Bromofluorobenzene	103		67-138		%	1		10/14/13 17:21
Toluene-d8	102		85-115		%	1		10/14/13 17:21

Print Date: 10/24/2013 8:39:23AM

Results of **13-NK-05-SO**

Client Sample ID: **13-NK-05-SO**
Client Project ID: **Napaskiak Trench Installation**
Lab Sample ID: 1135014005
Lab Project ID: 1135014

Collection Date: 10/05/13 10:40
Received Date: 10/07/13 16:07
Matrix: Soil/Solid (dry weight)
Solids (%): 74.1

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS13827
Analytical Method: SW8260B
Analyst: HM
Analytical Date/Time: 10/14/13 17:21
Container ID: 1135014005-C

Prep Batch: VXX25343
Prep Method: SW5035A
Prep Date/Time: 10/05/13 10:40
Prep Initial Wt./Vol.: 45.922 g
Prep Extract Vol: 36.89 mL

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Results of **13-NK-06-SO**

Client Sample ID: **13-NK-06-SO**
Client Project ID: **Napaskiak Trench Installation**
Lab Sample ID: 1135014006
Lab Project ID: 1135014

Collection Date: 10/05/13 11:50
Received Date: 10/07/13 16:07
Matrix: Soil/Solid (dry weight)
Solids (%): 68.0

Results by **Metals by ICP/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Lead	9.44		1.41	0.436	mg/Kg	50		10/22/13 20:14

Batch Information

Analytical Batch: MMS8316
Analytical Method: SW6020
Analyst: HKS
Analytical Date/Time: 10/22/13 20:14
Container ID: 1135014006-A

Prep Batch: MXX27200
Prep Method: SW3050B
Prep Date/Time: 10/13/13 15:30
Prep Initial Wt./Vol.: 1.045 g
Prep Extract Vol: 50 mL

Print Date: 10/24/2013 8:39:23AM

Results of **13-NK-06-SO**

Client Sample ID: **13-NK-06-SO**
Client Project ID: **Napaskiak Trench Installation**
Lab Sample ID: 1135014006
Lab Project ID: 1135014

Collection Date: 10/05/13 11:50
Received Date: 10/07/13 16:07
Matrix: Soil/Solid (dry weight)
Solids (%): 68.0

Results by **Polychlorinated Biphenyls**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Aroclor-1016	43.6	U	72.6	21.8	ug/Kg	1		10/10/13 15:19
Aroclor-1221	43.6	U	72.6	21.8	ug/Kg	1		10/10/13 15:19
Aroclor-1232	43.6	U	72.6	21.8	ug/Kg	1		10/10/13 15:19
Aroclor-1242	43.6	U	72.6	21.8	ug/Kg	1		10/10/13 15:19
Aroclor-1248	43.6	U	72.6	21.8	ug/Kg	1		10/10/13 15:19
Aroclor-1254	43.6	U	72.6	21.8	ug/Kg	1		10/10/13 15:19
Aroclor-1260	43.6	U	72.6	21.8	ug/Kg	1		10/10/13 15:19
Surrogates								
Decachlorobiphenyl	108		60-125		%	1		10/10/13 15:19

Batch Information

Analytical Batch: XGC8641
Analytical Method: SW8082A
Analyst: RTS
Analytical Date/Time: 10/10/13 15:19
Container ID: 1135014006-A

Prep Batch: XXX30119
Prep Method: SW3550C
Prep Date/Time: 10/08/13 18:30
Prep Initial Wt./Vol.: 22.781 g
Prep Extract Vol: 5 mL

Print Date: 10/24/2013 8:39:23AM

Results of **13-NK-06-SO**

Client Sample ID: **13-NK-06-SO**
Client Project ID: **Napaskiak Trench Installation**
Lab Sample ID: 1135014006
Lab Project ID: 1135014

Collection Date: 10/05/13 11:50
Received Date: 10/07/13 16:07
Matrix: Soil/Solid (dry weight)
Solids (%): 68.0

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	4.34	U	7.25	2.17	ug/Kg	1		10/10/13 18:47
2-Methylnaphthalene	4.34	U	7.25	2.17	ug/Kg	1		10/10/13 18:47
Acenaphthene	4.34	U	7.25	2.17	ug/Kg	1		10/10/13 18:47
Acenaphthylene	4.34	U	7.25	2.17	ug/Kg	1		10/10/13 18:47
Anthracene	4.34	U	7.25	2.17	ug/Kg	1		10/10/13 18:47
Benzo(a)Anthracene	4.34	U	7.25	2.17	ug/Kg	1		10/10/13 18:47
Benzo[a]pyrene	4.34	U	7.25	2.17	ug/Kg	1		10/10/13 18:47
Benzo[b]Fluoranthene	4.34	U	7.25	2.17	ug/Kg	1		10/10/13 18:47
Benzo[g,h,i]perylene	4.34	U	7.25	2.17	ug/Kg	1		10/10/13 18:47
Benzo[k]fluoranthene	4.34	U	7.25	2.17	ug/Kg	1		10/10/13 18:47
Chrysene	4.34	U	7.25	2.17	ug/Kg	1		10/10/13 18:47
Dibenzo[a,h]anthracene	4.34	U	7.25	2.17	ug/Kg	1		10/10/13 18:47
Fluoranthene	4.34	U	7.25	2.17	ug/Kg	1		10/10/13 18:47
Fluorene	4.34	U	7.25	2.17	ug/Kg	1		10/10/13 18:47
Indeno[1,2,3-c,d] pyrene	4.34	U	7.25	2.17	ug/Kg	1		10/10/13 18:47
Naphthalene	3.15	J	7.25	2.17	ug/Kg	1		10/10/13 18:47
Phenanthrene	4.34	U	7.25	2.17	ug/Kg	1		10/10/13 18:47
Pyrene	4.34	U	7.25	2.17	ug/Kg	1		10/10/13 18:47
Surrogates								
2-Fluorobiphenyl	87.8		45-105		%	1		10/10/13 18:47
Terphenyl-d14	102		30-125		%	1		10/10/13 18:47

Batch Information

Analytical Batch: XMS7676
Analytical Method: 8270D SIMS (PAH)
Analyst: RTS
Analytical Date/Time: 10/10/13 18:47
Container ID: 1135014006-A

Prep Batch: XXX30130
Prep Method: SW3550C
Prep Date/Time: 10/09/13 18:05
Prep Initial Wt./Vol.: 22.829 g
Prep Extract Vol: 1 mL

Print Date: 10/24/2013 8:39:23AM

Results of **13-NK-06-SO**

Client Sample ID: **13-NK-06-SO**
Client Project ID: **Napaskiak Trench Installation**
Lab Sample ID: 1135014006
Lab Project ID: 1135014

Collection Date: 10/05/13 11:50
Received Date: 10/07/13 16:07
Matrix: Soil/Solid (dry weight)
Solids (%): 68.0

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	46.0		29.2	9.05	mg/Kg	1		10/10/13 19:12
Surrogates								
5a Androstane	82.9		50-150		%	1		10/10/13 19:12

Batch Information

Analytical Batch: XFC11124
Analytical Method: AK102
Analyst: EAB
Analytical Date/Time: 10/10/13 19:12
Container ID: 1135014006-A

Prep Batch: XXX30120
Prep Method: SW3550C
Prep Date/Time: 10/08/13 20:45
Prep Initial Wt./Vol.: 30.227 g
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	232		29.2	9.05	mg/Kg	1		10/10/13 19:12
Surrogates								
n-Triacontane-d62	107		50-150		%	1		10/10/13 19:12

Batch Information

Analytical Batch: XFC11124
Analytical Method: AK103
Analyst: EAB
Analytical Date/Time: 10/10/13 19:12
Container ID: 1135014006-A

Prep Batch: XXX30120
Prep Method: SW3550C
Prep Date/Time: 10/08/13 20:45
Prep Initial Wt./Vol.: 30.227 g
Prep Extract Vol: 1 mL

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Results of **13-NK-06-SO**

Client Sample ID: **13-NK-06-SO**
Client Project ID: **Napaskiak Trench Installation**
Lab Sample ID: 1135014006
Lab Project ID: 1135014

Collection Date: 10/05/13 11:50
Received Date: 10/07/13 16:07
Matrix: Soil/Solid (dry weight)
Solids (%): 68.0

Results by **Semivolatile Organic GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2,4-Trichlorobenzene	0.454	U	0.726	0.227	mg/Kg	2		10/21/13 22:44
1,2-Dichlorobenzene	0.454	U	0.726	0.227	mg/Kg	2		10/21/13 22:44
1,3-Dichlorobenzene	0.454	U	0.726	0.227	mg/Kg	2		10/21/13 22:44
1,4-Dichlorobenzene	0.454	U	0.726	0.227	mg/Kg	2		10/21/13 22:44
1-Chloronaphthalene	0.454	U	0.726	0.227	mg/Kg	2		10/21/13 22:44
2,4,5-Trichlorophenol	0.454	U	0.726	0.227	mg/Kg	2		10/21/13 22:44
2,4,6-Trichlorophenol	0.454	U	0.726	0.227	mg/Kg	2		10/21/13 22:44
2,4-Dichlorophenol	0.454	U	0.726	0.227	mg/Kg	2		10/21/13 22:44
2,4-Dimethylphenol	0.454	U	0.726	0.227	mg/Kg	2		10/21/13 22:44
2,4-Dinitrophenol	5.46	U	8.72	2.73	mg/Kg	2		10/21/13 22:44
2,4-Dinitrotoluene	0.454	U	0.726	0.227	mg/Kg	2		10/21/13 22:44
2,6-Dichlorophenol	0.454	U	0.726	0.227	mg/Kg	2		10/21/13 22:44
2,6-Dinitrotoluene	0.454	U	0.726	0.227	mg/Kg	2		10/21/13 22:44
2-Chloronaphthalene	0.454	U	0.726	0.227	mg/Kg	2		10/21/13 22:44
2-Chlorophenol	0.454	U	0.726	0.227	mg/Kg	2		10/21/13 22:44
2-Methyl-4,6-dinitrophenol	3.60	U	5.81	1.80	mg/Kg	2		10/21/13 22:44
2-Methylnaphthalene	0.454	U	0.726	0.227	mg/Kg	2		10/21/13 22:44
2-Methylphenol (o-Cresol)	0.454	U	0.726	0.227	mg/Kg	2		10/21/13 22:44
2-Nitroaniline	0.454	U	0.726	0.227	mg/Kg	2		10/21/13 22:44
2-Nitrophenol	0.454	U	0.726	0.227	mg/Kg	2		10/21/13 22:44
3&4-Methylphenol (p&m-Cresol)	1.80	U	2.91	0.901	mg/Kg	2		10/21/13 22:44
3,3-Dichlorobenzidine	0.454	U	0.726	0.227	mg/Kg	2		10/21/13 22:44
3-Nitroaniline	0.872	U	1.45	0.436	mg/Kg	2		10/21/13 22:44
4-Bromophenyl-phenylether	0.454	U	0.726	0.227	mg/Kg	2		10/21/13 22:44
4-Chloro-3-methylphenol	0.454	U	0.726	0.227	mg/Kg	2		10/21/13 22:44
4-Chloroaniline	0.872	U	1.45	0.436	mg/Kg	2		10/21/13 22:44
4-Chlorophenyl-phenylether	0.454	U	0.726	0.227	mg/Kg	2		10/21/13 22:44
4-Nitroaniline	5.46	U	8.72	2.73	mg/Kg	2		10/21/13 22:44
4-Nitrophenol	1.80	U	2.91	0.901	mg/Kg	2		10/21/13 22:44
Acenaphthene	0.454	U	0.726	0.227	mg/Kg	2		10/21/13 22:44
Acenaphthylene	0.454	U	0.726	0.227	mg/Kg	2		10/21/13 22:44
Aniline	3.60	U	5.81	1.80	mg/Kg	2		10/21/13 22:44
Anthracene	0.454	U	0.726	0.227	mg/Kg	2		10/21/13 22:44
Azobenzene	0.454	U	0.726	0.227	mg/Kg	2		10/21/13 22:44
Benzo(a)Anthracene	0.454	U	0.726	0.227	mg/Kg	2		10/21/13 22:44
Benzo[a]pyrene	1.13	U	1.82	0.567	mg/Kg	5		10/22/13 23:22

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Results of **13-NK-06-SO**

Client Sample ID: **13-NK-06-SO**
Client Project ID: **Napaskiak Trench Installation**
Lab Sample ID: 1135014006
Lab Project ID: 1135014

Collection Date: 10/05/13 11:50
Received Date: 10/07/13 16:07
Matrix: Soil/Solid (dry weight)
Solids (%): 68.0

Results by **Semivolatile Organic GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzo[b]Fluoranthene	1.13	U	1.82	0.567	mg/Kg	5		10/22/13 23:22
Benzo[g,h,i]perylene	1.13	U	1.82	0.567	mg/Kg	5		10/22/13 23:22
Benzo[k]fluoranthene	1.13	U	1.82	0.567	mg/Kg	5		10/22/13 23:22
Benzoic acid	4.36	U	4.36	2.18	mg/Kg	2		10/21/13 22:44
Benzyl alcohol	0.454	U	0.726	0.227	mg/Kg	2		10/21/13 22:44
Bis(2-Chloroethoxy)methane	0.454	U	0.726	0.227	mg/Kg	2		10/21/13 22:44
Bis(2-Chloroethyl)ether	0.454	U	0.726	0.227	mg/Kg	2		10/21/13 22:44
bis(2-Ethylhexyl)phthalate	0.454	U	0.726	0.227	mg/Kg	2		10/21/13 22:44
Bis(2chloro1methylethyl)Ether	0.454	U	0.726	0.227	mg/Kg	2		10/21/13 22:44
Butylbenzylphthalate	0.454	U	0.726	0.227	mg/Kg	2		10/21/13 22:44
Carbazole	0.454	U	0.726	0.227	mg/Kg	2		10/21/13 22:44
Chrysene	0.454	U	0.726	0.227	mg/Kg	2		10/21/13 22:44
Di-n-butylphthalate	0.454	U	0.726	0.227	mg/Kg	2		10/21/13 22:44
di-n-Octylphthalate	0.872	U	1.45	0.436	mg/Kg	2		10/21/13 22:44
Dibenzo[a,h]anthracene	1.13	U	1.82	0.567	mg/Kg	5		10/22/13 23:22
Dibenzofuran	0.454	U	0.726	0.227	mg/Kg	2		10/21/13 22:44
Diethylphthalate	0.454	U	0.726	0.227	mg/Kg	2		10/21/13 22:44
Dimethylphthalate	0.454	U	0.726	0.227	mg/Kg	2		10/21/13 22:44
Fluoranthene	0.454	U	0.726	0.227	mg/Kg	2		10/21/13 22:44
Fluorene	0.454	U	0.726	0.227	mg/Kg	2		10/21/13 22:44
Hexachlorobenzene	0.454	U	0.726	0.227	mg/Kg	2		10/21/13 22:44
Hexachlorobutadiene	0.454	U	0.726	0.227	mg/Kg	2		10/21/13 22:44
Hexachlorocyclopentadiene	1.16	U	2.03	0.581	mg/Kg	2		10/21/13 22:44
Hexachloroethane	0.454	U	0.726	0.227	mg/Kg	2		10/21/13 22:44
Indeno[1,2,3-c,d] pyrene	1.13	U	1.82	0.567	mg/Kg	5		10/22/13 23:22
Isophorone	0.454	U	0.726	0.227	mg/Kg	2		10/21/13 22:44
N-Nitroso-di-n-propylamine	0.454	U	0.726	0.227	mg/Kg	2		10/21/13 22:44
N-Nitrosodimethylamine	0.454	U	0.726	0.227	mg/Kg	2		10/21/13 22:44
N-Nitrosodiphenylamine	0.454	U	0.726	0.227	mg/Kg	2		10/21/13 22:44
Naphthalene	0.454	U	0.726	0.227	mg/Kg	2		10/21/13 22:44
Nitrobenzene	0.454	U	0.726	0.227	mg/Kg	2		10/21/13 22:44
Pentachlorophenol	3.60	U	5.81	1.80	mg/Kg	2		10/21/13 22:44
Phenanthrene	0.454	U	0.726	0.227	mg/Kg	2		10/21/13 22:44
Phenol	0.454	U	0.726	0.227	mg/Kg	2		10/21/13 22:44
Pyrene	0.454	U	0.726	0.227	mg/Kg	2		10/21/13 22:44

Surrogates

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Results of **13-NK-06-SO**

Client Sample ID: **13-NK-06-SO**
Client Project ID: **Napaskiak Trench Installation**
Lab Sample ID: 1135014006
Lab Project ID: 1135014

Collection Date: 10/05/13 11:50
Received Date: 10/07/13 16:07
Matrix: Soil/Solid (dry weight)
Solids (%): 68.0

Results by **Semivolatile Organic GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
2,4,6-Tribromophenol	89		35-125		%	2		10/21/13 22:44
2-Fluorobiphenyl	91.6		45-105		%	2		10/21/13 22:44
2-Fluorophenol	68.8		35-105		%	2		10/21/13 22:44
Nitrobenzene-d5	73.4		35-100		%	2		10/21/13 22:44
Phenol-d6	76.5		40-100		%	2		10/21/13 22:44
Terphenyl-d14	117		30-125		%	2		10/21/13 22:44

Batch Information

Analytical Batch: XMS7712
Analytical Method: SW8270D
Analyst: DSH
Analytical Date/Time: 10/21/13 22:44
Container ID: 1135014006-A

Prep Batch: XXX30142
Prep Method: SW3550C
Prep Date/Time: 10/11/13 12:30
Prep Initial Wt./Vol.: 22.783 g
Prep Extract Vol: 1 mL

Analytical Batch: XMS7714
Analytical Method: SW8270D
Analyst: DSH
Analytical Date/Time: 10/22/13 23:22
Container ID: 1135014006-A

Prep Batch: XXX30142
Prep Method: SW3550C
Prep Date/Time: 10/11/13 12:30
Prep Initial Wt./Vol.: 22.783 g
Prep Extract Vol: 1 mL

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Results of **13-NK-06-SO**

Client Sample ID: **13-NK-06-SO**
Client Project ID: **Napaskiak Trench Installation**
Lab Sample ID: 1135014006
Lab Project ID: 1135014

Collection Date: 10/05/13 11:50
Received Date: 10/07/13 16:07
Matrix: Soil/Solid (dry weight)
Solids (%): 68.0

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	3.70	U	6.18	1.85	mg/Kg	1		10/10/13 03:56
Surrogates								
4-Bromofluorobenzene	104		50-150		%	1		10/10/13 03:56

Batch Information

Analytical Batch: VFC11680
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 10/10/13 03:56
Container ID: 1135014006-C

Prep Batch: VXX25318
Prep Method: SW5035A
Prep Date/Time: 10/05/13 11:50
Prep Initial Wt./Vol.: 48.109 g
Prep Extract Vol: 40.4022 mL

Print Date: 10/24/2013 8:39:23AM

Results of **13-NK-06-SO**

Client Sample ID: **13-NK-06-SO**
Client Project ID: **Napaskiak Trench Installation**
Lab Sample ID: 1135014006
Lab Project ID: 1135014

Collection Date: 10/05/13 11:50
Received Date: 10/07/13 16:07
Matrix: Soil/Solid (dry weight)
Solids (%): 68.0

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	38.6	U	61.8	19.3	ug/Kg	1		10/16/13 13:53
1,1,1-Trichloroethane	38.6	U	61.8	19.3	ug/Kg	1		10/16/13 13:53
1,1,2,2-Tetrachloroethane	74.2	U	124	37.1	ug/Kg	1		10/16/13 13:53
1,1,2-Trichloroethane	38.6	U	61.8	19.3	ug/Kg	1		10/16/13 13:53
1,1-Dichloroethane	38.6	U	61.8	19.3	ug/Kg	1		10/16/13 13:53
1,1-Dichloroethene	38.6	U	61.8	19.3	ug/Kg	1		10/16/13 13:53
1,1-Dichloropropene	38.6	U	61.8	19.3	ug/Kg	1		10/16/13 13:53
1,2,3-Trichlorobenzene	74.2	U	124	37.1	ug/Kg	1		10/16/13 13:53
1,2,3-Trichloropropane	38.6	U	61.8	19.3	ug/Kg	1		10/16/13 13:53
1,2,4-Trichlorobenzene	38.6	U	61.8	19.3	ug/Kg	1		10/16/13 13:53
1,2,4-Trimethylbenzene	74.2	U	124	37.1	ug/Kg	1		10/16/13 13:53
1,2-Dibromo-3-chloropropane	153	U	247	76.6	ug/Kg	1		10/16/13 13:53
1,2-Dibromoethane	38.6	U	61.8	19.3	ug/Kg	1		10/16/13 13:53
1,2-Dichlorobenzene	38.6	U	61.8	19.3	ug/Kg	1		10/16/13 13:53
1,2-Dichloroethane	38.6	U	61.8	19.3	ug/Kg	1		10/16/13 13:53
1,2-Dichloropropane	38.6	U	61.8	19.3	ug/Kg	1		10/16/13 13:53
1,3,5-Trimethylbenzene	38.6	U	61.8	19.3	ug/Kg	1		10/16/13 13:53
1,3-Dichlorobenzene	38.6	U	61.8	19.3	ug/Kg	1		10/16/13 13:53
1,3-Dichloropropane	38.6	U	61.8	19.3	ug/Kg	1		10/16/13 13:53
1,4-Dichlorobenzene	38.6	U	61.8	19.3	ug/Kg	1		10/16/13 13:53
2,2-Dichloropropane	38.6	U	61.8	19.3	ug/Kg	1		10/16/13 13:53
2-Butanone (MEK)	386	U	618	193	ug/Kg	1		10/16/13 13:53
2-Chlorotoluene	38.6	U	61.8	19.3	ug/Kg	1		10/16/13 13:53
2-Hexanone	386	U	618	193	ug/Kg	1		10/16/13 13:53
4-Chlorotoluene	38.6	U	61.8	19.3	ug/Kg	1		10/16/13 13:53
4-Isopropyltoluene	38.6	U	61.8	19.3	ug/Kg	1		10/16/13 13:53
4-Methyl-2-pentanone (MIBK)	386	U	618	193	ug/Kg	1		10/16/13 13:53
Benzene	19.3	U	30.9	9.64	ug/Kg	1		10/16/13 13:53
Bromobenzene	38.6	U	61.8	19.3	ug/Kg	1		10/16/13 13:53
Bromochloromethane	38.6	U	61.8	19.3	ug/Kg	1		10/16/13 13:53
Bromodichloromethane	38.6	U	61.8	19.3	ug/Kg	1		10/16/13 13:53
Bromoform	38.6	U	61.8	19.3	ug/Kg	1		10/16/13 13:53
Bromomethane	306	U	494	153	ug/Kg	1		10/16/13 13:53
Carbon disulfide	153	U	247	76.6	ug/Kg	1		10/16/13 13:53
Carbon tetrachloride	38.6	U	61.8	19.3	ug/Kg	1		10/16/13 13:53
Chlorobenzene	38.6	U	61.8	19.3	ug/Kg	1		10/16/13 13:53

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Results of **13-NK-06-SO**

Client Sample ID: **13-NK-06-SO**
Client Project ID: **Napaskiak Trench Installation**
Lab Sample ID: 1135014006
Lab Project ID: 1135014

Collection Date: 10/05/13 11:50
Received Date: 10/07/13 16:07
Matrix: Soil/Solid (dry weight)
Solids (%): 68.0

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroethane	306	U	494	153	ug/Kg	1		10/16/13 13:53
Chloroform	38.6	U	61.8	19.3	ug/Kg	1		10/16/13 13:53
Chloromethane	38.6	U	61.8	19.3	ug/Kg	1		10/16/13 13:53
cis-1,2-Dichloroethene	38.6	U	61.8	19.3	ug/Kg	1		10/16/13 13:53
cis-1,3-Dichloropropene	38.6	U	61.8	19.3	ug/Kg	1		10/16/13 13:53
Dibromochloromethane	38.6	U	61.8	19.3	ug/Kg	1		10/16/13 13:53
Dibromomethane	38.6	U	61.8	19.3	ug/Kg	1		10/16/13 13:53
Dichlorodifluoromethane	74.2	U	124	37.1	ug/Kg	1		10/16/13 13:53
Ethylbenzene	38.6	U	61.8	19.3	ug/Kg	1		10/16/13 13:53
Hexachlorobutadiene	74.2	U	124	37.1	ug/Kg	1		10/16/13 13:53
Isopropylbenzene (Cumene)	38.6	U	61.8	19.3	ug/Kg	1		10/16/13 13:53
Methyl-t-butyl ether	153	U	247	76.6	ug/Kg	1		10/16/13 13:53
Methylene chloride	153	U	247	76.6	ug/Kg	1		10/16/13 13:53
n-Butylbenzene	38.6	U	61.8	19.3	ug/Kg	1		10/16/13 13:53
n-Propylbenzene	38.6	U	61.8	19.3	ug/Kg	1		10/16/13 13:53
Naphthalene	74.2	U	124	37.1	ug/Kg	1		10/16/13 13:53
o-Xylene	38.6	U	61.8	19.3	ug/Kg	1		10/16/13 13:53
P & M -Xylene	74.2	U	124	37.1	ug/Kg	1		10/16/13 13:53
sec-Butylbenzene	38.6	U	61.8	19.3	ug/Kg	1		10/16/13 13:53
Styrene	38.6	U	61.8	19.3	ug/Kg	1		10/16/13 13:53
tert-Butylbenzene	38.6	U	61.8	19.3	ug/Kg	1		10/16/13 13:53
Tetrachloroethene	19.3	U	30.9	9.64	ug/Kg	1		10/16/13 13:53
Toluene	38.6	U	61.8	19.3	ug/Kg	1		10/16/13 13:53
trans-1,2-Dichloroethene	38.6	U	61.8	19.3	ug/Kg	1		10/16/13 13:53
trans-1,3-Dichloropropene	38.6	U	61.8	19.3	ug/Kg	1		10/16/13 13:53
Trichloroethene	19.3	U	30.9	9.64	ug/Kg	1		10/16/13 13:53
Trichlorofluoromethane	74.2	U	124	37.1	ug/Kg	1		10/16/13 13:53
Vinyl chloride	38.6	U	61.8	19.3	ug/Kg	1		10/16/13 13:53
Xylenes (total)	113	U	185	56.3	ug/Kg	1		10/16/13 13:53
Surrogates								
1,2-Dichloroethane-D4	106		79-118		%	1		10/16/13 13:53
4-Bromofluorobenzene	101		67-138		%	1		10/16/13 13:53
Toluene-d8	105		85-115		%	1		10/16/13 13:53

Print Date: 10/24/2013 8:39:23AM

Results of **13-NK-06-SO**

Client Sample ID: **13-NK-06-SO**
Client Project ID: **Napaskiak Trench Installation**
Lab Sample ID: 1135014006
Lab Project ID: 1135014

Collection Date: 10/05/13 11:50
Received Date: 10/07/13 16:07
Matrix: Soil/Solid (dry weight)
Solids (%): 68.0

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS13836
Analytical Method: SW8260B
Analyst: HM
Analytical Date/Time: 10/16/13 13:53
Container ID: 1135014006-C

Prep Batch: VXX25355
Prep Method: SW5035A
Prep Date/Time: 10/05/13 11:50
Prep Initial Wt./Vol.: 48.109 g
Prep Extract Vol: 40.4022 mL

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Results of **Trip Blank**

Client Sample ID: **Trip Blank**
Client Project ID: **Napaskiak Trench Installation**
Lab Sample ID: 1135014007
Lab Project ID: 1135014

Collection Date: 10/04/13 16:00
Received Date: 10/07/13 16:07
Matrix: Soil/Solid (dry weight)
Solids (%):

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.839	J	2.52	0.756	mg/Kg	1		10/09/13 23:37
Surrogates								
4-Bromofluorobenzene	102		50-150		%	1		10/09/13 23:37

Batch Information

Analytical Batch: VFC11680
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 10/09/13 23:37
Container ID: 1135014007-A

Prep Batch: VXX25318
Prep Method: SW5035A
Prep Date/Time: 10/04/13 16:00
Prep Initial Wt./Vol.: 49.596 g
Prep Extract Vol: 25 mL

Print Date: 10/24/2013 8:39:23AM

Results of **Trip Blank**

Client Sample ID: **Trip Blank**
Client Project ID: **Napaskiak Trench Installation**
Lab Sample ID: 1135014007
Lab Project ID: 1135014

Collection Date: 10/04/13 16:00
Received Date: 10/07/13 16:07
Matrix: Soil/Solid (dry weight)
Solids (%):

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	15.7	U	25.2	7.86	ug/Kg	1		10/16/13 12:45
1,1,1-Trichloroethane	15.7	U	25.2	7.86	ug/Kg	1		10/16/13 12:45
1,1,2,2-Tetrachloroethane	30.2	U	50.4	15.1	ug/Kg	1		10/16/13 12:45
1,1,2-Trichloroethane	15.7	U	25.2	7.86	ug/Kg	1		10/16/13 12:45
1,1-Dichloroethane	15.7	U	25.2	7.86	ug/Kg	1		10/16/13 12:45
1,1-Dichloroethene	15.7	U	25.2	7.86	ug/Kg	1		10/16/13 12:45
1,1-Dichloropropene	15.7	U	25.2	7.86	ug/Kg	1		10/16/13 12:45
1,2,3-Trichlorobenzene	30.2	U	50.4	15.1	ug/Kg	1		10/16/13 12:45
1,2,3-Trichloropropane	15.7	U	25.2	7.86	ug/Kg	1		10/16/13 12:45
1,2,4-Trichlorobenzene	15.7	U	25.2	7.86	ug/Kg	1		10/16/13 12:45
1,2,4-Trimethylbenzene	30.2	U	50.4	15.1	ug/Kg	1		10/16/13 12:45
1,2-Dibromo-3-chloropropane	62.6	U	101	31.3	ug/Kg	1		10/16/13 12:45
1,2-Dibromoethane	15.7	U	25.2	7.86	ug/Kg	1		10/16/13 12:45
1,2-Dichlorobenzene	15.7	U	25.2	7.86	ug/Kg	1		10/16/13 12:45
1,2-Dichloroethane	15.7	U	25.2	7.86	ug/Kg	1		10/16/13 12:45
1,2-Dichloropropane	15.7	U	25.2	7.86	ug/Kg	1		10/16/13 12:45
1,3,5-Trimethylbenzene	15.7	U	25.2	7.86	ug/Kg	1		10/16/13 12:45
1,3-Dichlorobenzene	15.7	U	25.2	7.86	ug/Kg	1		10/16/13 12:45
1,3-Dichloropropane	15.7	U	25.2	7.86	ug/Kg	1		10/16/13 12:45
1,4-Dichlorobenzene	15.7	U	25.2	7.86	ug/Kg	1		10/16/13 12:45
2,2-Dichloropropane	15.7	U	25.2	7.86	ug/Kg	1		10/16/13 12:45
2-Butanone (MEK)	157	U	252	78.6	ug/Kg	1		10/16/13 12:45
2-Chlorotoluene	15.7	U	25.2	7.86	ug/Kg	1		10/16/13 12:45
2-Hexanone	157	U	252	78.6	ug/Kg	1		10/16/13 12:45
4-Chlorotoluene	15.7	U	25.2	7.86	ug/Kg	1		10/16/13 12:45
4-Isopropyltoluene	15.7	U	25.2	7.86	ug/Kg	1		10/16/13 12:45
4-Methyl-2-pentanone (MIBK)	157	U	252	78.6	ug/Kg	1		10/16/13 12:45
Benzene	7.86	U	12.6	3.93	ug/Kg	1		10/16/13 12:45
Bromobenzene	15.7	U	25.2	7.86	ug/Kg	1		10/16/13 12:45
Bromochloromethane	15.7	U	25.2	7.86	ug/Kg	1		10/16/13 12:45
Bromodichloromethane	15.7	U	25.2	7.86	ug/Kg	1		10/16/13 12:45
Bromoform	15.7	U	25.2	7.86	ug/Kg	1		10/16/13 12:45
Bromomethane	125	U	202	62.5	ug/Kg	1		10/16/13 12:45
Carbon disulfide	62.6	U	101	31.3	ug/Kg	1		10/16/13 12:45
Carbon tetrachloride	15.7	U	25.2	7.86	ug/Kg	1		10/16/13 12:45
Chlorobenzene	15.7	U	25.2	7.86	ug/Kg	1		10/16/13 12:45

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Results of **Trip Blank**

Client Sample ID: **Trip Blank**
Client Project ID: **Napaskiak Trench Installation**
Lab Sample ID: 1135014007
Lab Project ID: 1135014

Collection Date: 10/04/13 16:00
Received Date: 10/07/13 16:07
Matrix: Soil/Solid (dry weight)
Solids (%):

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroethane	125	U	202	62.5	ug/Kg	1		10/16/13 12:45
Chloroform	15.7	U	25.2	7.86	ug/Kg	1		10/16/13 12:45
Chloromethane	15.7	U	25.2	7.86	ug/Kg	1		10/16/13 12:45
cis-1,2-Dichloroethene	15.7	U	25.2	7.86	ug/Kg	1		10/16/13 12:45
cis-1,3-Dichloropropene	15.7	U	25.2	7.86	ug/Kg	1		10/16/13 12:45
Dibromochloromethane	15.7	U	25.2	7.86	ug/Kg	1		10/16/13 12:45
Dibromomethane	15.7	U	25.2	7.86	ug/Kg	1		10/16/13 12:45
Dichlorodifluoromethane	30.2	U	50.4	15.1	ug/Kg	1		10/16/13 12:45
Ethylbenzene	15.7	U	25.2	7.86	ug/Kg	1		10/16/13 12:45
Hexachlorobutadiene	30.2	U	50.4	15.1	ug/Kg	1		10/16/13 12:45
Isopropylbenzene (Cumene)	15.7	U	25.2	7.86	ug/Kg	1		10/16/13 12:45
Methyl-t-butyl ether	62.6	U	101	31.3	ug/Kg	1		10/16/13 12:45
Methylene chloride	62.6	U	101	31.3	ug/Kg	1		10/16/13 12:45
n-Butylbenzene	15.7	U	25.2	7.86	ug/Kg	1		10/16/13 12:45
n-Propylbenzene	15.7	U	25.2	7.86	ug/Kg	1		10/16/13 12:45
Naphthalene	30.2	U	50.4	15.1	ug/Kg	1		10/16/13 12:45
o-Xylene	15.7	U	25.2	7.86	ug/Kg	1		10/16/13 12:45
P & M -Xylene	30.2	U	50.4	15.1	ug/Kg	1		10/16/13 12:45
sec-Butylbenzene	15.7	U	25.2	7.86	ug/Kg	1		10/16/13 12:45
Styrene	15.7	U	25.2	7.86	ug/Kg	1		10/16/13 12:45
tert-Butylbenzene	15.7	U	25.2	7.86	ug/Kg	1		10/16/13 12:45
Tetrachloroethene	7.86	U	12.6	3.93	ug/Kg	1		10/16/13 12:45
Toluene	15.7	U	25.2	7.86	ug/Kg	1		10/16/13 12:45
trans-1,2-Dichloroethene	15.7	U	25.2	7.86	ug/Kg	1		10/16/13 12:45
trans-1,3-Dichloropropene	15.7	U	25.2	7.86	ug/Kg	1		10/16/13 12:45
Trichloroethene	7.86	U	12.6	3.93	ug/Kg	1		10/16/13 12:45
Trichlorofluoromethane	30.2	U	50.4	15.1	ug/Kg	1		10/16/13 12:45
Vinyl chloride	15.7	U	25.2	7.86	ug/Kg	1		10/16/13 12:45
Xylenes (total)	62.6	U	101	31.3	ug/Kg	1		10/16/13 12:45
Surrogates								
1,2-Dichloroethane-D4	101		79-118		%	1		10/16/13 12:45
4-Bromofluorobenzene	105		67-138		%	1		10/16/13 12:45
Toluene-d8	99.9		85-115		%	1		10/16/13 12:45

Print Date: 10/24/2013 8:39:23AM

Results of **Trip Blank**

Client Sample ID: **Trip Blank**
Client Project ID: **Napaskiak Trench Installation**
Lab Sample ID: 1135014007
Lab Project ID: 1135014

Collection Date: 10/04/13 16:00
Received Date: 10/07/13 16:07
Matrix: Soil/Solid (dry weight)
Solids (%):

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS13836
Analytical Method: SW8260B
Analyst: HM
Analytical Date/Time: 10/16/13 12:45
Container ID: 1135014007-A

Prep Batch: VXX25355
Prep Method: SW5035A
Prep Date/Time: 10/04/13 16:00
Prep Initial Wt./Vol.: 49.596 g
Prep Extract Vol: 25 mL

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Method Blank

Blank ID: MB for HBN 1489074 [MXX/27200]
Blank Lab ID: 1185453

Matrix: Soil/Solid (dry weight)

QC for Samples:
1135014001, 1135014002, 1135014003, 1135014004, 1135014005, 1135014006

Results by **SW6020**

Parameter	Results	LOQ/CL	DL	Units
Lead	0.124U	0.200	0.0620	mg/Kg

Batch Information

Analytical Batch: MMS8316
Analytical Method: SW6020
Instrument: Perkin Elmer Sciex ICP-MS P3
Analyst: HKS
Analytical Date/Time: 10/22/2013 7:32:02PM

Prep Batch: MXX27200
Prep Method: SW3050B
Prep Date/Time: 10/13/2013 3:30:00PM
Prep Initial Wt./Vol.: 1 g
Prep Extract Vol: 50 mL

Print Date: 10/24/2013 8:39:26AM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1135014 [MXX27200]
Blank Spike Lab ID: 1185454
Date Analyzed: 10/22/2013 19:34

Spike Duplicate ID: LCSD for HBN 1135014 [MXX27200]
Spike Duplicate Lab ID: 1185455
Matrix: Soil/Solid (dry weight)

QC for Samples: 1135014001, 1135014002, 1135014003, 1135014004, 1135014005, 1135014006

Results by **SW6020**

	Blank Spike (mg/Kg)			Spike Duplicate (mg/Kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Lead	50	53.4	107	50	57.4	115	(80-120)	7.31	(< 20)

Batch Information

Analytical Batch: **MMS8316**
Analytical Method: **SW6020**
Instrument: **Perkin Elmer Sciex ICP-MS P3**
Analyst: **HKS**

Prep Batch: **MXX27200**
Prep Method: **SW3050B**
Prep Date/Time: **10/13/2013 15:30**
Spike Init Wt./Vol.: 50 mg/Kg Extract Vol: 50 mL
Dupe Init Wt./Vol.: 50 mg/Kg Extract Vol: 50 mL

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Method Blank

Blank ID: MB for HBN 1488264 [SPT/9175]
Blank Lab ID: 1184454

Matrix: Soil/Solid (dry weight)

QC for Samples:
1135014001, 1135014002, 1135014003, 1135014004, 1135014005, 1135014006

Results by **SM21 2540G**

Parameter	Results	LOQ/CL	DL	Units
Total Solids	100			%

Batch Information

Analytical Batch: SPT9175
Analytical Method: SM21 2540G
Instrument:
Analyst: THV
Analytical Date/Time: 10/8/2013 5:30:00PM

Print Date: 10/24/2013 8:39:28AM

Duplicate Sample Summary

Original Sample ID: 1135014001
Duplicate Sample ID: 1184455

Analysis Date: 10/08/2013 17:30
Matrix: Soil/Solid (dry weight)

QC for Samples:

1135014001, 1135014002, 1135014003, 1135014004, 1135014005, 1135014006

Results by **SM21 2540G**

NAME	Original ()	Duplicate ()	RPD (%)	RPD CL
Total Solids	72.4	72.1	0.32	15.00

Batch Information

Analytical Batch: SPT9175
Analytical Method: SM21 2540G
Instrument:
Analyst: THV

Print Date: 10/24/2013 8:39:29AM

Method Blank

Blank ID: MB for HBN 1488386 [VXX/25318]
Blank Lab ID: 1184854

Matrix: Soil/Solid (dry weight)

QC for Samples:
1135014001, 1135014002, 1135014003, 1135014004, 1135014005, 1135014006, 1135014007

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	1.50U	2.50	0.750	mg/Kg
Surrogates				
4-Bromofluorobenzene	93.1	50-150		%

Batch Information

Analytical Batch: VFC11680
Analytical Method: AK101
Instrument: Agilent 7890A PID/FID
Analyst: ST
Analytical Date/Time: 10/9/2013 6:42:00PM

Prep Batch: VXX25318
Prep Method: SW5035A
Prep Date/Time: 10/9/2013 8:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

Print Date: 10/24/2013 8:39:29AM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1135014 [VXX25318]
Blank Spike Lab ID: 1184857
Date Analyzed: 10/09/2013 19:37

Spike Duplicate ID: LCSD for HBN 1135014 [VXX25318]
Spike Duplicate Lab ID: 1184858
Matrix: Soil/Solid (dry weight)

QC for Samples: 1135014001, 1135014002, 1135014003, 1135014004, 1135014005, 1135014006, 1135014007

Results by **AK101**

	Blank Spike (mg/Kg)			Spike Duplicate (mg/Kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	10.0	9.57	96	10.0	9.32	93	(60-120)	2.70	(< 20)
Surrogates									
4-Bromofluorobenzene	1.25	95.2	95	1.25	96.6	97	(50-150)	1.50	

Batch Information

Analytical Batch: **VFC11680**
Analytical Method: **AK101**
Instrument: **Agilent 7890A PID/FID**
Analyst: **ST**

Prep Batch: **VXX25318**
Prep Method: **SW5035A**
Prep Date/Time: **10/09/2013 08:00**
Spike Init Wt./Vol.: 10.0 mg/Kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: 10.0 mg/Kg Extract Vol: 25 mL

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Method Blank

Blank ID: MB for HBN 1489144 [VXX/25343]
Blank Lab ID: 1185740

Matrix: Soil/Solid (dry weight)

QC for Samples:
1135014001, 1135014002, 1135014003, 1135014004, 1135014005

Results by **SW8260B**

Parameter	Results	LOQ/CL	DL	Units
1,1,1,2-Tetrachloroethane	15.6U	25.0	7.80	ug/Kg
1,1,1-Trichloroethane	15.6U	25.0	7.80	ug/Kg
1,1,2,2-Tetrachloroethane	30.0U	50.0	15.0	ug/Kg
1,1,2-Trichloroethane	15.6U	25.0	7.80	ug/Kg
1,1-Dichloroethane	15.6U	25.0	7.80	ug/Kg
1,1-Dichloroethene	15.6U	25.0	7.80	ug/Kg
1,1-Dichloropropene	15.6U	25.0	7.80	ug/Kg
1,2,3-Trichlorobenzene	30.0U	50.0	15.0	ug/Kg
1,2,3-Trichloropropane	15.6U	25.0	7.80	ug/Kg
1,2,4-Trichlorobenzene	15.6U	25.0	7.80	ug/Kg
1,2,4-Trimethylbenzene	30.0U	50.0	15.0	ug/Kg
1,2-Dibromo-3-chloropropane	62.0U	100	31.0	ug/Kg
1,2-Dibromoethane	15.6U	25.0	7.80	ug/Kg
1,2-Dichlorobenzene	15.6U	25.0	7.80	ug/Kg
1,2-Dichloroethane	15.6U	25.0	7.80	ug/Kg
1,2-Dichloropropane	15.6U	25.0	7.80	ug/Kg
1,3,5-Trimethylbenzene	15.6U	25.0	7.80	ug/Kg
1,3-Dichlorobenzene	15.6U	25.0	7.80	ug/Kg
1,3-Dichloropropane	15.6U	25.0	7.80	ug/Kg
1,4-Dichlorobenzene	15.6U	25.0	7.80	ug/Kg
2,2-Dichloropropane	15.6U	25.0	7.80	ug/Kg
2-Butanone (MEK)	156U	250	78.0	ug/Kg
2-Chlorotoluene	15.6U	25.0	7.80	ug/Kg
2-Hexanone	156U	250	78.0	ug/Kg
4-Chlorotoluene	15.6U	25.0	7.80	ug/Kg
4-Isopropyltoluene	15.6U	25.0	7.80	ug/Kg
4-Methyl-2-pentanone (MIBK)	156U	250	78.0	ug/Kg
Benzene	7.80U	12.5	3.90	ug/Kg
Bromobenzene	15.6U	25.0	7.80	ug/Kg
Bromochloromethane	15.6U	25.0	7.80	ug/Kg
Bromodichloromethane	15.6U	25.0	7.80	ug/Kg
Bromoform	15.6U	25.0	7.80	ug/Kg
Bromomethane	124U	200	62.0	ug/Kg
Carbon disulfide	62.0U	100	31.0	ug/Kg
Carbon tetrachloride	15.6U	25.0	7.80	ug/Kg
Chlorobenzene	15.6U	25.0	7.80	ug/Kg
Chloroethane	124U	200	62.0	ug/Kg
Chloroform	15.6U	25.0	7.80	ug/Kg

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Method Blank

Blank ID: MB for HBN 1489144 [VXX/25343]
Blank Lab ID: 1185740

Matrix: Soil/Solid (dry weight)

QC for Samples:
1135014001, 1135014002, 1135014003, 1135014004, 1135014005

Results by **SW8260B**

Parameter	Results	LOQ/CL	DL	Units
Chloromethane	15.6U	25.0	7.80	ug/Kg
cis-1,2-Dichloroethene	15.6U	25.0	7.80	ug/Kg
cis-1,3-Dichloropropene	15.6U	25.0	7.80	ug/Kg
Dibromochloromethane	15.6U	25.0	7.80	ug/Kg
Dibromomethane	15.6U	25.0	7.80	ug/Kg
Dichlorodifluoromethane	30.0U	50.0	15.0	ug/Kg
Ethylbenzene	15.6U	25.0	7.80	ug/Kg
Hexachlorobutadiene	30.0U	50.0	15.0	ug/Kg
Isopropylbenzene (Cumene)	15.6U	25.0	7.80	ug/Kg
Methylene chloride	62.0U	100	31.0	ug/Kg
Methyl-t-butyl ether	62.0U	100	31.0	ug/Kg
Naphthalene	30.0U	50.0	15.0	ug/Kg
n-Butylbenzene	15.6U	25.0	7.80	ug/Kg
n-Propylbenzene	15.6U	25.0	7.80	ug/Kg
o-Xylene	15.6U	25.0	7.80	ug/Kg
P & M -Xylene	30.0U	50.0	15.0	ug/Kg
sec-Butylbenzene	15.6U	25.0	7.80	ug/Kg
Styrene	15.6U	25.0	7.80	ug/Kg
tert-Butylbenzene	15.6U	25.0	7.80	ug/Kg
Tetrachloroethene	7.80U	12.5	3.90	ug/Kg
Toluene	15.6U	25.0	7.80	ug/Kg
trans-1,2-Dichloroethene	15.6U	25.0	7.80	ug/Kg
trans-1,3-Dichloropropene	15.6U	25.0	7.80	ug/Kg
Trichloroethene	7.80U	12.5	3.90	ug/Kg
Trichlorofluoromethane	30.0U	50.0	15.0	ug/Kg
Vinyl chloride	15.6U	25.0	7.80	ug/Kg
Xylenes (total)	45.6U	75.0	22.8	ug/Kg
Surrogates				
1,2-Dichloroethane-D4	104	79-118		%
4-Bromofluorobenzene	104	67-138		%
Toluene-d8	102	85-115		%

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Method Blank

Blank ID: MB for HBN 1489144 [VXX/25343]
Blank Lab ID: 1185740

Matrix: Soil/Solid (dry weight)

QC for Samples:
1135014001, 1135014002, 1135014003, 1135014004, 1135014005

Results by **SW8260B**

Parameter	Results	LOQ/CL	DL	Units

Batch Information

Analytical Batch: VMS13827
Analytical Method: SW8260B
Instrument: Agilent 7890-75MS
Analyst: HM
Analytical Date/Time: 10/14/2013 10:41:01AM

Prep Batch: VXX25343
Prep Method: SW5035A
Prep Date/Time: 10/14/2013 8:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

Print Date: 10/24/2013 8:39:31AM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1135014 [VXX25343]
Blank Spike Lab ID: 1185741
Date Analyzed: 10/14/2013 11:03

Matrix: Soil/Solid (dry weight)

QC for Samples: 1135014001, 1135014002, 1135014003, 1135014004, 1135014005

Results by **SW8260B**

	Blank Spike (ug/Kg)			
Parameter	Spike	Result	Rec (%)	CL
1,1,1,2-Tetrachloroethane	750	810	108	(75-125)
1,1,1-Trichloroethane	750	755	101	(70-135)
1,1,2,2-Tetrachloroethane	750	753	100	(55-130)
1,1,2-Trichloroethane	750	783	104	(60-125)
1,1-Dichloroethane	750	763	102	(75-125)
1,1-Dichloroethene	750	790	105	(65-135)
1,1-Dichloropropene	750	840	112	(70-135)
1,2,3-Trichlorobenzene	750	696	93	(60-135)
1,2,3-Trichloropropane	750	735	98	(65-130)
1,2,4-Trichlorobenzene	750	736	98	(65-130)
1,2,4-Trimethylbenzene	750	816	109	(65-135)
1,2-Dibromo-3-chloropropane	750	739	99	(40-135)
1,2-Dibromoethane	750	814	109	(70-125)
1,2-Dichlorobenzene	750	782	104	(75-120)
1,2-Dichloroethane	750	800	107	(70-135)
1,2-Dichloropropane	750	808	108	(70-120)
1,3,5-Trimethylbenzene	750	841	112	(65-135)
1,3-Dichlorobenzene	750	803	107	(70-125)
1,3-Dichloropropane	750	794	106	(75-125)
1,4-Dichlorobenzene	750	803	107	(70-125)
2,2-Dichloropropane	750	780	104	(65-135)
2-Butanone (MEK)	2250	2220	99	(30-160)
2-Chlorotoluene	750	823	110	(70-130)
2-Hexanone	2250	2290	102	(45-145)
4-Chlorotoluene	750	821	109	(75-125)
4-Isopropyltoluene	750	832	111	(75-135)
4-Methyl-2-pentanone (MIBK)	2250	2280	101	(45-145)
Benzene	750	819	109	(75-125)
Bromobenzene	750	791	106	(65-120)
Bromochloromethane	750	800	107	(70-125)
Bromodichloromethane	750	820	109	(70-130)
Bromoform	750	777	104	(55-135)
Bromomethane	750	839	112	(30-160)

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1135014 [VXX25343]
Blank Spike Lab ID: 1185741
Date Analyzed: 10/14/2013 11:03

Matrix: Soil/Solid (dry weight)

QC for Samples: 1135014001, 1135014002, 1135014003, 1135014004, 1135014005

Results by **SW8260B**

	Blank Spike (ug/Kg)			
Parameter	Spike	Result	Rec (%)	CL
Carbon disulfide	1130	1160	103	(45-160)
Carbon tetrachloride	750	767	102	(65-135)
Chlorobenzene	750	824	110	(75-125)
Chloroethane	750	845	113	(40-155)
Chloroform	750	764	102	(70-125)
Chloromethane	750	796	106	(50-130)
cis-1,2-Dichloroethene	750	788	105	(65-125)
cis-1,3-Dichloropropene	750	823	110	(70-125)
Dibromochloromethane	750	755	101	(65-130)
Dibromomethane	750	805	107	(75-130)
Dichlorodifluoromethane	750	826	110	(35-135)
Ethylbenzene	750	818	109	(75-125)
Hexachlorobutadiene	750	776	103	(55-140)
Isopropylbenzene (Cumene)	750	827	110	(75-130)
Methyl-t-butyl ether	1130	1130	101	(63-149)
Methylene chloride	750	742	99	(55-140)
n-Butylbenzene	750	879	117	(65-140)
n-Propylbenzene	750	815	109	(65-135)
Naphthalene	750	648	86	(40-125)
o-Xylene	750	811	108	(75-125)
P & M -Xylene	1500	1630	109	(80-125)
sec-Butylbenzene	750	836	111	(65-130)
Styrene	750	829	111	(75-125)
tert-Butylbenzene	750	816	109	(65-130)
Tetrachloroethene	750	834	111	(65-140)
Toluene	750	820	109	(70-125)
trans-1,2-Dichloroethene	750	687	92	(65-135)
trans-1,3-Dichloropropene	750	821	109	(65-125)
Trichloroethene	750	757	101	(75-125)
Trichlorofluoromethane	750	827	110	(25-185)
Vinyl chloride	750	913	122	(60-125)
Xylenes (total)	2250	2440	109	(80-125)

Surrogates

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1135014 [VXX25343]
Blank Spike Lab ID: 1185741
Date Analyzed: 10/14/2013 11:03

Matrix: Soil/Solid (dry weight)

QC for Samples: 1135014001, 1135014002, 1135014003, 1135014004, 1135014005

Results by **SW8260B**

		Blank Spike (%)		
Parameter	Spike	Result	Rec (%)	CL
1,2-Dichloroethane-D4	750	111	111	(79-118)
4-Bromofluorobenzene	750	108	108	(67-138)
Toluene-d8	750	108	108	(85-115)

Batch Information

Analytical Batch: **VMS13827**
Analytical Method: **SW8260B**
Instrument: **Agilent 7890-75MS**
Analyst: **HM**

Prep Batch: **VXX25343**
Prep Method: **SW5035A**
Prep Date/Time: **10/14/2013 08:00**
Spike Init Wt./Vol.: 750 ug/Kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: Extract Vol:

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Matrix Spike Summary

Original Sample ID: 1185742 — Analysis Date: 10/14/2013 12:51
MS Sample ID: 1185743 MS — Analysis Date: 10/14/2013 11:26
MSD Sample ID: 1185744 MSD — Analysis Date: 10/14/2013 11:43
Matrix: Solid/Soil (Wet Weight)

QC for Samples: 1135014001, 1135014002, 1135014003, 1135014004, 1135014005

Results by **SW8260B**

		Matrix Spike (ug/Kg)			Spike Duplicate (ug/Kg)						
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)		CL	RPD (%)	RPD CL
1,1,1,2-Tetrachloroethane	11.5U	551	582	106	551	615	112		75-125		
1,1,1-Trichloroethane	11.5U	551	557	101	551	566	103		70-135		
1,1,2,2-Tetrachloroethane	22.0U	551	638	116	551	650	118		55-130		
1,1,2-Trichloroethane	11.5U	551	589	107	551	612	111		60-125		
1,1-Dichloroethane	11.5U	551	551	100	551	564	102		75-125		
1,1-Dichloroethene	11.5U	551	581	106	551	556	101		65-135		
1,1-Dichloropropene	11.5U	551	614	111	551	619	112		70-135		
1,2,3-Trichlorobenzene	22.0U	551	647	117	551	901	164	*	60-135		
1,2,3-Trichloropropane	11.5U	551	408	74	551	418	76		65-130		
1,2,4-Trichlorobenzene	11.5U	551	509	92	551	604	110		65-130		
1,2,4-Trimethylbenzene	18.4J	551	463	81	551	472	82		65-135		
1,2-Dibromo-3-chloropropane	45.6U	551	462	84	551	524	95		40-135		
1,2-Dibromoethane	11.5U	551	581	105	551	600	109		70-125		
1,2-Dichlorobenzene	11.5U	551	440	80	551	450	82		75-120		
1,2-Dichloroethane	11.5U	551	568	103	551	581	105		70-135		
1,2-Dichloropropane	11.5U	551	577	105	551	588	107		70-120		
1,3,5-Trimethylbenzene	30.7	551	490	83	551	492	84		65-135		
1,3-Dichlorobenzene	11.5U	551	443	81	551	450	82		70-125		
1,3-Dichloropropane	11.5U	551	568	103	551	584	106		75-125		
1,4-Dichlorobenzene	11.5U	551	443	80	551	450	82		70-125		
2,2-Dichloropropane	11.5U	551	575	104	551	586	106		65-135		
2-Butanone (MEK)	115U	1650	1620	98	1650	1700	103		30-160		
2-Chlorotoluene	11.5U	551	435	79	551	438	80		70-130		
2-Hexanone	115U	1650	1700	103	1650	1760	106		45-145		
4-Chlorotoluene	11.5U	551	433	79	551	435	79		75-125		
4-Isopropyltoluene	11.5U	551	510	93	551	512	93		75-135		
4-Methyl-2-pentanone (MIBK)	115U	1650	1680	102	1650	1750	106		45-145		
Benzene	6.61J	551	594	107	551	615	111		75-125		
Bromobenzene	11.5U	551	424	77	551	425	77		65-120		
Bromochloromethane	11.5U	551	570	103	551	591	107		70-125		
Bromodichloromethane	11.5U	551	590	107	551	605	110		70-130		
Bromoform	11.5U	551	569	103	551	589	107		55-135		
Bromomethane	91.0U	551	609	111	551	662	120		30-160		
Carbon disulfide	45.6U	826	875	106	826	851	103		45-160		
Carbon tetrachloride	11.5U	551	571	104	551	582	106		65-135		
Chlorobenzene	11.5U	551	594	108	551	614	111		75-125		
Chloroethane	91.0U	551	628	114	551	600	109		40-155		

Print Date: 10/24/2013 8:39:32AM

Matrix Spike Summary

Original Sample ID: 1185742 — Analysis Date: 10/14/2013 12:51
MS Sample ID: 1185743 MS — Analysis Date: 10/14/2013 11:26
MSD Sample ID: 1185744 MSD — Analysis Date: 10/14/2013 11:43
Matrix: Solid/Soil (Wet Weight)

QC for Samples: 1135014001, 1135014002, 1135014003, 1135014004, 1135014005

Results by **SW8260B**

		Matrix Spike (ug/Kg)				Spike Duplicate (ug/Kg)						
Parameter	Sample	Spike	Result	Rec (%)		Spike	Result	Rec (%)		CL	RPD (%)	RPD CL
Chloroform	11.5U	551	550	100		551	564	102		70-125		
Chloromethane	11.5U	551	587	107		551	614	112		50-130		
cis-1,2-Dichloroethene	11.5U	551	573	104		551	591	107		65-125		
cis-1,3-Dichloropropene	11.5U	551	593	108		551	606	110		70-125		
Dibromochloromethane	11.5U	551	543	99		551	560	102		65-130		
Dibromomethane	11.5U	551	569	103		551	582	106		75-130		
Dichlorodifluoromethane	22.0U	551	602	109		551	633	115		35-135		
Ethylbenzene	11.5U	551	585	106		551	606	110		75-125		
Hexachlorobutadiene	22.0U	551	790	143	*	551	915	166	*	55-140		
Isopropylbenzene (Cumene)	11.5U	551	608	110		551	624	113		75-130		
Methyl-t-butyl ether	45.6U	826	805	97		826	825	100		63-149		
Methylene chloride	45.6U	551	548	100		551	524	95		55-140		
n-Butylbenzene	11.5U	551	618	112		551	627	114		65-140		
n-Propylbenzene	11.5U	551	449	82		551	450	82		65-135		
Naphthalene	22.0U	551	412	75		551	491	89		40-125		
o-Xylene	11.5U	551	587	107		551	611	111		75-125		
P & M -Xylene	22.0U	1100	1180	107		1100	1200	109		80-125		
sec-Butylbenzene	11.5U	551	487	88		551	496	90		65-130		
Styrene	11.5U	551	599	109		551	615	112		75-125		
tert-Butylbenzene	11.5U	551	464	84		551	466	85		65-130		
Tetrachloroethene	5.72U	551	611	111		551	631	114		65-140		
Toluene	11.5U	551	593	108		551	611	111		70-125		
trans-1,2-Dichloroethene	11.5U	551	500	91		551	513	93		65-135		
trans-1,3-Dichloropropene	11.5U	551	580	105		551	606	110		65-125		
Trichloroethene	5.72U	551	557	101		551	566	103		75-125		
Trichlorofluoromethane	22.0U	551	623	113		551	590	107		25-185		
Vinyl chloride	11.5U	551	658	120		551	703	128	*	60-125		
Xylenes (total)	45.6U	1650	1760	107		1650	1810	110		80-125		
Surrogates												
1,2-Dichloroethane-D4		551	569	103						79-118		
4-Bromofluorobenzene		1470	1090	74						67-138		
Toluene-d8		551	567	103						85-115		

Print Date: 10/24/2013 8:39:32AM

Matrix Spike Summary

Original Sample ID: 1185742
MS Sample ID: 1185743 MS
MSD Sample ID: 1185744 MSD

Analysis Date:
Analysis Date: 10/14/2013 11:26
Analysis Date:
Matrix: Solid/Soil (Wet Weight)

QC for Samples: 1135014001, 1135014002, 1135014003, 1135014004, 1135014005

Results by **SW8260B**

		Matrix Spike (%)			Spike Duplicate (%)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL

Batch Information

Analytical Batch: VMS13827
Analytical Method: SW8260B
Instrument: Agilent 7890-75MS
Analyst: HM
Analytical Date/Time: 10/14/2013 11:26:00AM

Prep Batch: VXX25343
Prep Method: Vol. Extraction SW8260 Field Extracted L
Prep Date/Time: 10/14/2013 8:00:00AM
Prep Initial Wt./Vol.: 68.08g
Prep Extract Vol: 25.00mL

Print Date: 10/24/2013 8:39:32AM

Method Blank

Blank ID: MB for HBN 1489765 [VXX/25355]
Blank Lab ID: 1186184

Matrix: Soil/Solid (dry weight)

QC for Samples:
1135014006, 1135014007

Results by **SW8260B**

Parameter	Results	LOQ/CL	DL	Units
1,1,1,2-Tetrachloroethane	15.6U	25.0	7.80	ug/Kg
1,1,1-Trichloroethane	15.6U	25.0	7.80	ug/Kg
1,1,2,2-Tetrachloroethane	30.0U	50.0	15.0	ug/Kg
1,1,2-Trichloroethane	15.6U	25.0	7.80	ug/Kg
1,1-Dichloroethane	15.6U	25.0	7.80	ug/Kg
1,1-Dichloroethene	15.6U	25.0	7.80	ug/Kg
1,1-Dichloropropene	15.6U	25.0	7.80	ug/Kg
1,2,3-Trichlorobenzene	30.0U	50.0	15.0	ug/Kg
1,2,3-Trichloropropane	15.6U	25.0	7.80	ug/Kg
1,2,4-Trichlorobenzene	15.6U	25.0	7.80	ug/Kg
1,2,4-Trimethylbenzene	30.0U	50.0	15.0	ug/Kg
1,2-Dibromo-3-chloropropane	62.0U	100	31.0	ug/Kg
1,2-Dibromoethane	15.6U	25.0	7.80	ug/Kg
1,2-Dichlorobenzene	15.6U	25.0	7.80	ug/Kg
1,2-Dichloroethane	15.6U	25.0	7.80	ug/Kg
1,2-Dichloropropane	15.6U	25.0	7.80	ug/Kg
1,3,5-Trimethylbenzene	15.6U	25.0	7.80	ug/Kg
1,3-Dichlorobenzene	15.6U	25.0	7.80	ug/Kg
1,3-Dichloropropane	15.6U	25.0	7.80	ug/Kg
1,4-Dichlorobenzene	15.6U	25.0	7.80	ug/Kg
2,2-Dichloropropane	15.6U	25.0	7.80	ug/Kg
2-Butanone (MEK)	156U	250	78.0	ug/Kg
2-Chlorotoluene	15.6U	25.0	7.80	ug/Kg
2-Hexanone	156U	250	78.0	ug/Kg
4-Chlorotoluene	15.6U	25.0	7.80	ug/Kg
4-Isopropyltoluene	15.6U	25.0	7.80	ug/Kg
4-Methyl-2-pentanone (MIBK)	156U	250	78.0	ug/Kg
Benzene	7.80U	12.5	3.90	ug/Kg
Bromobenzene	15.6U	25.0	7.80	ug/Kg
Bromochloromethane	15.6U	25.0	7.80	ug/Kg
Bromodichloromethane	15.6U	25.0	7.80	ug/Kg
Bromoform	15.6U	25.0	7.80	ug/Kg
Bromomethane	124U	200	62.0	ug/Kg
Carbon disulfide	62.0U	100	31.0	ug/Kg
Carbon tetrachloride	15.6U	25.0	7.80	ug/Kg
Chlorobenzene	15.6U	25.0	7.80	ug/Kg
Chloroethane	124U	200	62.0	ug/Kg
Chloroform	15.6U	25.0	7.80	ug/Kg

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Method Blank

Blank ID: MB for HBN 1489765 [VXX/25355]
Blank Lab ID: 1186184

Matrix: Soil/Solid (dry weight)

QC for Samples:
1135014006, 1135014007

Results by **SW8260B**

Parameter	Results	LOQ/CL	DL	Units
Chloromethane	15.6U	25.0	7.80	ug/Kg
cis-1,2-Dichloroethene	15.6U	25.0	7.80	ug/Kg
cis-1,3-Dichloropropene	15.6U	25.0	7.80	ug/Kg
Dibromochloromethane	15.6U	25.0	7.80	ug/Kg
Dibromomethane	15.6U	25.0	7.80	ug/Kg
Dichlorodifluoromethane	30.0U	50.0	15.0	ug/Kg
Ethylbenzene	15.6U	25.0	7.80	ug/Kg
Hexachlorobutadiene	30.0U	50.0	15.0	ug/Kg
Isopropylbenzene (Cumene)	15.6U	25.0	7.80	ug/Kg
Methylene chloride	62.0U	100	31.0	ug/Kg
Methyl-t-butyl ether	62.0U	100	31.0	ug/Kg
Naphthalene	30.0U	50.0	15.0	ug/Kg
n-Butylbenzene	15.6U	25.0	7.80	ug/Kg
n-Propylbenzene	15.6U	25.0	7.80	ug/Kg
o-Xylene	15.6U	25.0	7.80	ug/Kg
P & M -Xylene	30.0U	50.0	15.0	ug/Kg
sec-Butylbenzene	15.6U	25.0	7.80	ug/Kg
Styrene	15.6U	25.0	7.80	ug/Kg
tert-Butylbenzene	15.6U	25.0	7.80	ug/Kg
Tetrachloroethene	7.80U	12.5	3.90	ug/Kg
Toluene	15.6U	25.0	7.80	ug/Kg
trans-1,2-Dichloroethene	15.6U	25.0	7.80	ug/Kg
trans-1,3-Dichloropropene	15.6U	25.0	7.80	ug/Kg
Trichloroethene	7.80U	12.5	3.90	ug/Kg
Trichlorofluoromethane	30.0U	50.0	15.0	ug/Kg
Vinyl chloride	15.6U	25.0	7.80	ug/Kg
Xylenes (total)	45.6U	75.0	22.8	ug/Kg
Surrogates				
1,2-Dichloroethane-D4	97.6	79-118		%
4-Bromofluorobenzene	99.1	67-138		%
Toluene-d8	98.6	85-115		%

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Method Blank

Blank ID: MB for HBN 1489765 [VXX/25355]
Blank Lab ID: 1186184

QC for Samples:
1135014006, 1135014007

Matrix: Soil/Solid (dry weight)

Results by **SW8260B**

Parameter	Results	LOQ/CL	DL	Units

Batch Information

Analytical Batch: VMS13836
Analytical Method: SW8260B
Instrument: Agilent 7890-75MS
Analyst: HM
Analytical Date/Time: 10/16/2013 10:03:01AM

Prep Batch: VXX25355
Prep Method: SW5035A
Prep Date/Time: 10/16/2013 8:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

Print Date: 10/24/2013 8:39:33AM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1135014 [VXX25355]
Blank Spike Lab ID: 1186185
Date Analyzed: 10/16/2013 10:43

Matrix: Soil/Solid (dry weight)

QC for Samples: 1135014006, 1135014007

Results by **SW8260B**

	Blank Spike (ug/Kg)			
Parameter	Spike	Result	Rec (%)	CL
1,1,1,2-Tetrachloroethane	750	815	109	(75-125)
1,1,1-Trichloroethane	750	750	100	(70-135)
1,1,2,2-Tetrachloroethane	750	800	107	(55-130)
1,1,2-Trichloroethane	750	804	107	(60-125)
1,1-Dichloroethane	750	794	106	(75-125)
1,1-Dichloroethene	750	768	102	(65-135)
1,1-Dichloropropene	750	817	109	(70-135)
1,2,3-Trichlorobenzene	750	666	89	(60-135)
1,2,3-Trichloropropane	750	788	105	(65-130)
1,2,4-Trichlorobenzene	750	734	98	(65-130)
1,2,4-Trimethylbenzene	750	806	108	(65-135)
1,2-Dibromo-3-chloropropane	750	712	95	(40-135)
1,2-Dibromoethane	750	787	105	(70-125)
1,2-Dichlorobenzene	750	812	108	(75-120)
1,2-Dichloroethane	750	805	107	(70-135)
1,2-Dichloropropane	750	791	105	(70-120)
1,3,5-Trimethylbenzene	750	805	107	(65-135)
1,3-Dichlorobenzene	750	819	109	(70-125)
1,3-Dichloropropane	750	809	108	(75-125)
1,4-Dichlorobenzene	750	817	109	(70-125)
2,2-Dichloropropane	750	721	96	(65-135)
2-Butanone (MEK)	2250	2340	104	(30-160)
2-Chlorotoluene	750	792	106	(70-130)
2-Hexanone	2250	2450	109	(45-145)
4-Chlorotoluene	750	790	105	(75-125)
4-Isopropyltoluene	750	850	113	(75-135)
4-Methyl-2-pentanone (MIBK)	2250	2400	107	(45-145)
Benzene	750	754	101	(75-125)
Bromobenzene	750	785	105	(65-120)
Bromochloromethane	750	756	101	(70-125)
Bromodichloromethane	750	819	109	(70-130)
Bromoform	750	705	94	(55-135)
Bromomethane	750	966	129	(30-160)

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1135014 [VXX25355]
Blank Spike Lab ID: 1186185
Date Analyzed: 10/16/2013 10:43

Matrix: Soil/Solid (dry weight)

QC for Samples: 1135014006, 1135014007

Results by **SW8260B**

	Blank Spike (ug/Kg)			
Parameter	Spike	Result	Rec (%)	CL
Carbon disulfide	1130	1090	97	(45-160)
Carbon tetrachloride	750	739	99	(65-135)
Chlorobenzene	750	790	105	(75-125)
Chloroethane	750	773	103	(40-155)
Chloroform	750	795	106	(70-125)
Chloromethane	750	745	99	(50-130)
cis-1,2-Dichloroethene	750	804	107	(65-125)
cis-1,3-Dichloropropene	750	810	108	(70-125)
Dibromochloromethane	750	732	98	(65-130)
Dibromomethane	750	781	104	(75-130)
Dichlorodifluoromethane	750	716	95	(35-135)
Ethylbenzene	750	803	107	(75-125)
Hexachlorobutadiene	750	752	100	(55-140)
Isopropylbenzene (Cumene)	750	759	101	(75-130)
Methyl-t-butyl ether	1130	1150	102	(63-149)
Methylene chloride	750	718	96	(55-140)
n-Butylbenzene	750	780	104	(65-140)
n-Propylbenzene	750	822	110	(65-135)
Naphthalene	750	688	92	(40-125)
o-Xylene	750	796	106	(75-125)
P & M -Xylene	1500	1610	107	(80-125)
sec-Butylbenzene	750	844	113	(65-130)
Styrene	750	805	107	(75-125)
tert-Butylbenzene	750	828	110	(65-130)
Tetrachloroethene	750	740	99	(65-140)
Toluene	750	795	106	(70-125)
trans-1,2-Dichloroethene	750	810	108	(65-135)
trans-1,3-Dichloropropene	750	811	108	(65-125)
Trichloroethene	750	749	100	(75-125)
Trichlorofluoromethane	750	777	104	(25-185)
Vinyl chloride	750	737	98	(60-125)
Xylenes (total)	2250	2410	107	(80-125)

Surrogates

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1135014 [VXX25355]
Blank Spike Lab ID: 1186185
Date Analyzed: 10/16/2013 10:43

Matrix: Soil/Solid (dry weight)

QC for Samples: 1135014006, 1135014007

Results by **SW8260B**

		Blank Spike (%)		
Parameter	Spike	Result	Rec (%)	CL
1,2-Dichloroethane-D4	750	100	100	(79-118)
4-Bromofluorobenzene	750	101	101	(67-138)
Toluene-d8	750	103	103	(85-115)

Batch Information

Analytical Batch: **VMS13836**
Analytical Method: **SW8260B**
Instrument: **Agilent 7890-75MS**
Analyst: **HM**

Prep Batch: **VXX25355**
Prep Method: **SW5035A**
Prep Date/Time: **10/16/2013 08:00**
Spike Init Wt./Vol.: 750 ug/Kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: Extract Vol:

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Matrix Spike Summary

Original Sample ID: 1186186
MS Sample ID: 1186187 MS
MSD Sample ID: 1186188 MSD

QC for Samples: 1135014006, 1135014007

Analysis Date: 10/16/2013 13:36
Analysis Date: 10/16/2013 11:21
Analysis Date: 10/16/2013 11:38
Matrix: Solid/Soil (Wet Weight)

Results by **SW8260B**

		Matrix Spike (ug/Kg)			Spike Duplicate (ug/Kg)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
1,1,1,2-Tetrachloroethane	12.4U	596	643	108	596	670	112	75-125	4.20	(< 20)
1,1,1-Trichloroethane	12.4U	596	572	96	596	600	101	70-135	4.70	(< 20)
1,1,2,2-Tetrachloroethane	23.8U	596	637	107	596	673	113	55-130	5.40	(< 20)
1,1,2-Trichloroethane	12.4U	596	631	106	596	659	111	60-125	4.40	(< 20)
1,1-Dichloroethane	12.4U	596	600	101	596	620	104	75-125	3.30	(< 20)
1,1-Dichloroethene	12.4U	596	634	106	596	728	122	65-135	13.70	(< 20)
1,1-Dichloropropene	12.4U	596	613	103	596	646	108	70-135	5.20	(< 20)
1,2,3-Trichlorobenzene	23.8U	596	557	93	596	663	111	60-135	17.40	(< 20)
1,2,3-Trichloropropane	12.4U	596	633	106	596	668	112	65-130	5.40	(< 20)
1,2,4-Trichlorobenzene	12.4U	596	583	98	596	640	107	65-130	9.30	(< 20)
1,2,4-Trimethylbenzene	23.8U	596	613	103	596	643	108	65-135	4.80	(< 20)
1,2-Dibromo-3-chloropropane	49.2U	596	578	97	596	646	108	40-135	11.00	(< 20)
1,2-Dibromoethane	12.4U	596	619	104	596	650	109	70-125	4.90	(< 20)
1,2-Dichlorobenzene	12.4U	596	629	106	596	657	110	75-120	4.30	(< 20)
1,2-Dichloroethane	12.4U	596	628	105	596	649	109	70-135	3.40	(< 20)
1,2-Dichloropropane	12.4U	596	614	103	596	637	107	70-120	3.60	(< 20)
1,3,5-Trimethylbenzene	12.4U	596	626	105	596	647	108	65-135	3.20	(< 20)
1,3-Dichlorobenzene	12.4U	596	634	106	596	663	111	70-125	4.40	(< 20)
1,3-Dichloropropane	12.4U	596	632	106	596	664	111	75-125	4.90	(< 20)
1,4-Dichlorobenzene	12.4U	596	634	106	596	663	111	70-125	4.40	(< 20)
2,2-Dichloropropane	12.4U	596	557	93	596	587	98	65-135	5.20	(< 20)
2-Butanone (MEK)	124U	1790	1890	106	1790	2010	112	30-160	5.90	(< 20)
2-Chlorotoluene	12.4U	596	610	102	596	633	106	70-130	3.70	(< 20)
2-Hexanone	124U	1790	1940	109	1790	2070	116	45-145	6.50	(< 20)
4-Chlorotoluene	12.4U	596	609	102	596	633	106	75-125	3.90	(< 20)
4-Isopropyltoluene	12.4U	596	642	108	596	659	110	75-135	2.60	(< 20)
4-Methyl-2-pentanone (MIBK)	124U	1790	1930	108	1790	2020	113	45-145	4.80	(< 20)
Benzene	5.17J	596	587	98	596	614	102	75-125	4.60	(< 20)
Bromobenzene	12.4U	596	611	102	596	638	107	65-120	4.40	(< 20)
Bromochloromethane	12.4U	596	600	101	596	608	102	70-125	1.30	(< 20)
Bromodichloromethane	12.4U	596	644	108	596	671	113	70-130	4.20	(< 20)
Bromoform	12.4U	596	563	95	596	596	100	55-135	5.70	(< 20)
Bromomethane	98.6U	596	683	115	596	720	121	30-160	5.30	(< 20)
Carbon disulfide	49.2U	894	942	105	894	1100	123	45-160	15.80	(< 20)
Carbon tetrachloride	12.4U	596	562	94	596	593	100	65-135	5.50	(< 20)
Chlorobenzene	12.4U	596	612	103	596	640	107	75-125	4.40	(< 20)
Chloroethane	98.6U	596	551	92	596	627	105	40-155	13.00	(< 20)

Print Date: 10/24/2013 8:39:34AM

Matrix Spike Summary

Original Sample ID: 1186186
MS Sample ID: 1186187 MS
MSD Sample ID: 1186188 MSD

QC for Samples: 1135014006, 1135014007

Analysis Date: 10/16/2013 13:36
Analysis Date: 10/16/2013 11:21
Analysis Date: 10/16/2013 11:38
Matrix: Solid/Soil (Wet Weight)

Results by **SW8260B**

		Matrix Spike (ug/Kg)			Spike Duplicate (ug/Kg)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Chloroform	12.4U	596	614	103	596	638	107	70-125	3.80	(< 20)
Chloromethane	12.4U	596	508	85	596	557	94	50-130	9.30	(< 20)
cis-1,2-Dichloroethene	12.4U	596	615	103	596	636	107	65-125	3.30	(< 20)
cis-1,3-Dichloropropene	12.4U	596	638	107	596	665	112	70-125	4.20	(< 20)
Dibromochloromethane	12.4U	596	581	97	596	609	102	65-130	4.80	(< 20)
Dibromomethane	12.4U	596	611	103	596	637	107	75-130	4.10	(< 20)
Dichlorodifluoromethane	23.8U	596	498	84	596	551	92	35-135	10.10	(< 20)
Ethylbenzene	12.4U	596	620	104	596	654	110	75-125	5.30	(< 20)
Hexachlorobutadiene	23.8U	596	556	93	596	590	99	55-140	6.00	(< 20)
Isopropylbenzene (Cumene)	12.4U	596	582	98	596	610	102	75-130	4.70	(< 20)
Methyl-t-butyl ether	49.2U	894	879	98	894	904	101	63-149	2.80	(< 20)
Methylene chloride	49.2U	596	574	96	596	555	93	55-140	3.30	(< 20)
n-Butylbenzene	12.4U	596	585	98	596	599	101	65-140	2.30	(< 20)
n-Propylbenzene	12.4U	596	622	104	596	645	108	65-135	3.70	(< 20)
Naphthalene	23.8U	596	589	99	596	681	114	40-125	14.40	(< 20)
o-Xylene	12.4U	596	621	104	596	649	109	75-125	4.40	(< 20)
P & M -Xylene	23.8U	1190	1240	104	1190	1320	110	80-125	5.90	(< 20)
sec-Butylbenzene	12.4U	596	641	108	596	658	110	65-130	2.60	(< 20)
Styrene	12.4U	596	627	105	596	658	110	75-125	4.90	(< 20)
tert-Butylbenzene	12.4U	596	634	106	596	652	109	65-130	2.80	(< 20)
Tetrachloroethene	6.20U	596	564	95	596	601	101	65-140	6.30	(< 20)
Toluene	11.5J	596	618	102	596	644	106	70-125	4.10	(< 20)
trans-1,2-Dichloroethene	12.4U	596	599	101	596	622	104	65-135	3.70	(< 20)
trans-1,3-Dichloropropene	12.4U	596	642	108	596	670	112	65-125	4.20	(< 20)
Trichloroethene	6.20U	596	575	96	596	603	101	75-125	4.80	(< 20)
Trichlorofluoromethane	23.8U	596	554	93	596	619	104	25-185	11.10	(< 20)
Vinyl chloride	12.4U	596	538	90	596	591	99	60-125	9.40	(< 20)
Xylenes (total)	49.2U	1790	1860	104	1790	1960	110	80-125	5.40	(< 20)
Surrogates										
1,2-Dichloroethane-D4		596	569	96	596	567	95	79-118	0.35	
4-Bromofluorobenzene		1590	1400	88	1590	1410	88	67-138	0.64	
Toluene-d8		596	548	92	596	539	90	85-115	1.80	

Print Date: 10/24/2013 8:39:34AM

Matrix Spike Summary

Original Sample ID: 1186186
MS Sample ID: 1186187 MS
MSD Sample ID: 1186188 MSD

QC for Samples: 1135014006, 1135014007

Analysis Date:
Analysis Date: 10/16/2013 11:21
Analysis Date: 10/16/2013 11:38
Matrix: Solid/Soil (Wet Weight)

Results by **SW8260B**

		Matrix Spike (%)			Spike Duplicate (%)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL

Batch Information

Analytical Batch: VMS13836
Analytical Method: SW8260B
Instrument: Agilent 7890-75MS
Analyst: HM
Analytical Date/Time: 10/16/2013 11:21:00AM

Prep Batch: VXX25355
Prep Method: Vol. Extraction SW8260 Field Extracted L
Prep Date/Time: 10/16/2013 8:00:00AM
Prep Initial Wt./Vol.: 62.90g
Prep Extract Vol: 25.00mL

Print Date: 10/24/2013 8:39:34AM

Method Blank

Blank ID: MB for HBN 1488218 [XXX/30119]
Blank Lab ID: 1184404

Matrix: Soil/Solid (dry weight)

QC for Samples:
1135014001, 1135014002, 1135014003, 1135014004, 1135014005, 1135014006

Results by **SW8082A**

Parameter	Results	LOQ/CL	DL	Units
Aroclor-1016	30.0U	50.0	15.0	ug/Kg
Aroclor-1221	30.0U	50.0	15.0	ug/Kg
Aroclor-1232	30.0U	50.0	15.0	ug/Kg
Aroclor-1242	30.0U	50.0	15.0	ug/Kg
Aroclor-1248	30.0U	50.0	15.0	ug/Kg
Aroclor-1254	30.0U	50.0	15.0	ug/Kg
Aroclor-1260	30.0U	50.0	15.0	ug/Kg
Surrogates				
Decachlorobiphenyl	110	60-125		%

Batch Information

Analytical Batch: XGC8641
Analytical Method: SW8082A
Instrument: HP 6890 Series II ECD SV K F
Analyst: RTS
Analytical Date/Time: 10/10/2013 12:13:00PM

Prep Batch: XXX30119
Prep Method: SW3550C
Prep Date/Time: 10/8/2013 6:30:00PM
Prep Initial Wt./Vol.: 22.5 g
Prep Extract Vol: 5 mL

Print Date: 10/24/2013 8:39:35AM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1135014 [XXX30119]
Blank Spike Lab ID: 1184405
Date Analyzed: 10/10/2013 12:25

Matrix: Soil/Solid (dry weight)

QC for Samples: 1135014001, 1135014002, 1135014003, 1135014004, 1135014005, 1135014006

Results by **SW8082A**

	Blank Spike (ug/Kg)			
Parameter	Spike	Result	Rec (%)	CL
Aroclor-1016	222	182	82	(40-140)
Aroclor-1260	222	258	116	(60-130)
Surrogates				
Decachlorobiphenyl	222	109	109	(60-125)

Batch Information

Analytical Batch: **XGC8641**
Analytical Method: **SW8082A**
Instrument: **HP 6890 Series II ECD SV K F**
Analyst: **RTS**

Prep Batch: **XXX30119**
Prep Method: **SW3550C**
Prep Date/Time: **10/08/2013 18:30**
Spike Init Wt./Vol.: 222 ug/Kg Extract Vol: 5 mL
Dupe Init Wt./Vol.: Extract Vol:

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Matrix Spike Summary

Original Sample ID: 1134936001
MS Sample ID: 1184406 MS
MSD Sample ID: 1184407 MSD

Analysis Date: 10/10/2013 12:36
Analysis Date: 10/10/2013 12:48
Analysis Date: 10/10/2013 12:59
Matrix: Soil/Solid (dry weight)

QC for Samples: 1135014001, 1135014002, 1135014003, 1135014004, 1135014005, 1135014006

Results by **SW8082A**

		Matrix Spike (ug/Kg)				Spike Duplicate (ug/Kg)					
Parameter	Sample	Spike	Result	Rec (%)		Spike	Result	Rec (%)		CL	RPD (%)	RPD CL
Aroclor-1016	35.0U	252	464	184	*	258	370	143	*	40-140	22.50	(< 30)
Aroclor-1260	35.0U	252	272	108		258	277	107		60-130	1.70	(< 30)
Surrogates												
Decachlorobiphenyl		252	272	108		258	256	99		60-125	6.07	

Batch Information

Analytical Batch: XGC8641
Analytical Method: SW8082A
Instrument: HP 6890 Series II ECD SV K F
Analyst: RTS
Analytical Date/Time: 10/10/2013 12:48:00PM

Prep Batch: XXX30119
Prep Method: Sonication Extraction Soil SW8080 PCB
Prep Date/Time: 10/8/2013 6:30:00PM
Prep Initial Wt./Vol.: 23.30g
Prep Extract Vol: 5.00mL

Print Date: 10/24/2013 8:39:36AM

Method Blank

Blank ID: MB for HBN 1488223 [XXX/30120]
Blank Lab ID: 1184429

Matrix: Soil/Solid (dry weight)

QC for Samples:
1135014001, 1135014002, 1135014003, 1135014004, 1135014005, 1135014006

Results by **AK102**

Parameter	Results	LOQ/CL	DL	Units
Diesel Range Organics	12.4U	20.0	6.20	mg/Kg
Surrogates				
5a Androstane	71.4	60-120		%

Batch Information

Analytical Batch: XFC11124
Analytical Method: AK102
Instrument: HP 6890 Series II FID SV D F
Analyst: EAB
Analytical Date/Time: 10/10/2013 5:16:00PM

Prep Batch: XXX30120
Prep Method: SW3550C
Prep Date/Time: 10/8/2013 8:45:00PM
Prep Initial Wt./Vol.: 30 g
Prep Extract Vol: 1 mL

Print Date: 10/24/2013 8:39:36AM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1135014 [XXX30120]
Blank Spike Lab ID: 1184430
Date Analyzed: 10/10/2013 17:25

Spike Duplicate ID: LCSD for HBN 1135014 [XXX30120]
Spike Duplicate Lab ID: 1184431
Matrix: Soil/Solid (dry weight)

QC for Samples: 1135014001, 1135014002, 1135014003, 1135014004, 1135014005, 1135014006

Results by **AK102**

	Blank Spike (mg/Kg)			Spike Duplicate (mg/Kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Diesel Range Organics	167	166	100	167	156	94	(75-125)	6.50	(< 20)
Surrogates									
5a Androstane	3.33	91.4	91	3.33	93.4	93	(60-120)	2.20	

Batch Information

Analytical Batch: **XFC11124**
Analytical Method: **AK102**
Instrument: **HP 6890 Series II FID SV D F**
Analyst: **EAB**

Prep Batch: **XXX30120**
Prep Method: **SW3550C**
Prep Date/Time: **10/08/2013 20:45**
Spike Init Wt./Vol.: 167 mg/Kg Extract Vol: 1 mL
Dupe Init Wt./Vol.: 167 mg/Kg Extract Vol: 1 mL

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Method Blank

Blank ID: MB for HBN 1488223 [XXX/30120]
Blank Lab ID: 1184429

Matrix: Soil/Solid (dry weight)

QC for Samples:
1135014001, 1135014002, 1135014003, 1135014004, 1135014005, 1135014006

Results by **AK103**

Parameter	Results	LOQ/CL	DL	Units
Residual Range Organics	12.4U	20.0	6.20	mg/Kg
Surrogates				
n-Triacontane-d62	80.6	60-120		%

Batch Information

Analytical Batch: XFC11124
Analytical Method: AK103
Instrument: HP 6890 Series II FID SV D F
Analyst: EAB
Analytical Date/Time: 10/10/2013 5:16:00PM

Prep Batch: XXX30120
Prep Method: SW3550C
Prep Date/Time: 10/8/2013 8:45:00PM
Prep Initial Wt./Vol.: 30 g
Prep Extract Vol: 1 mL

Print Date: 10/24/2013 8:39:37AM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1135014 [XXX30120]
Blank Spike Lab ID: 1184430
Date Analyzed: 10/10/2013 17:25

Spike Duplicate ID: LCSD for HBN 1135014 [XXX30120]
Spike Duplicate Lab ID: 1184431
Matrix: Soil/Solid (dry weight)

QC for Samples: 1135014001, 1135014002, 1135014003, 1135014004, 1135014005, 1135014006

Results by **AK103**

	Blank Spike (mg/Kg)			Spike Duplicate (mg/Kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Residual Range Organics	167	173	104	167	160	96	(60-120)	7.80	(< 20)
Surrogates									
n-Triacontane-d62	3.33	97.1	97	3.33	91.3	91	(60-120)	6.10	

Batch Information

Analytical Batch: **XFC11124**
Analytical Method: **AK103**
Instrument: **HP 6890 Series II FID SV D F**
Analyst: **EAB**

Prep Batch: **XXX30120**
Prep Method: **SW3550C**
Prep Date/Time: **10/08/2013 20:45**
Spike Init Wt./Vol.: 167 mg/Kg Extract Vol: 1 mL
Dupe Init Wt./Vol.: 167 mg/Kg Extract Vol: 1 mL

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Method Blank

Blank ID: MB for HBN 1488315 [XXX/30130]
Blank Lab ID: 1184702

Matrix: Soil/Solid (dry weight)

QC for Samples:
1135014001, 1135014002, 1135014003, 1135014004, 1135014005, 1135014006

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

Parameter	Results	LOQ/CL	DL	Units
1-Methylnaphthalene	3.00U	5.00	1.50	ug/Kg
2-Methylnaphthalene	3.00U	5.00	1.50	ug/Kg
Acenaphthene	3.00U	5.00	1.50	ug/Kg
Acenaphthylene	3.00U	5.00	1.50	ug/Kg
Anthracene	3.00U	5.00	1.50	ug/Kg
Benzo(a)Anthracene	3.00U	5.00	1.50	ug/Kg
Benzo[a]pyrene	3.00U	5.00	1.50	ug/Kg
Benzo[b]Fluoranthene	3.00U	5.00	1.50	ug/Kg
Benzo[g,h,i]perylene	3.00U	5.00	1.50	ug/Kg
Benzo[k]fluoranthene	3.00U	5.00	1.50	ug/Kg
Chrysene	3.00U	5.00	1.50	ug/Kg
Dibenzo[a,h]anthracene	3.00U	5.00	1.50	ug/Kg
Fluoranthene	3.00U	5.00	1.50	ug/Kg
Fluorene	3.00U	5.00	1.50	ug/Kg
Indeno[1,2,3-c,d] pyrene	3.00U	5.00	1.50	ug/Kg
Naphthalene	1.56J	5.00	1.50	ug/Kg
Phenanthrene	3.00U	5.00	1.50	ug/Kg
Pyrene	3.00U	5.00	1.50	ug/Kg
Surrogates				
2-Fluorobiphenyl	83.3	45-105		%
Terphenyl-d14	113	30-125		%

Batch Information

Analytical Batch: XMS7672
Analytical Method: 8270D SIMS (PAH)
Instrument: HP 6890/5973 MS SVQA
Analyst: RTS
Analytical Date/Time: 10/9/2013 9:59:00PM

Prep Batch: XXX30130
Prep Method: SW3550C
Prep Date/Time: 10/9/2013 6:05:00PM
Prep Initial Wt./Vol.: 22.5 g
Prep Extract Vol: 1 mL

Print Date: 10/24/2013 8:39:39AM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1135014 [XXX30130]
Blank Spike Lab ID: 1184703
Date Analyzed: 10/11/2013 10:29

Matrix: Soil/Solid (dry weight)

QC for Samples: 1135014001, 1135014002, 1135014003, 1135014004, 1135014005, 1135014006

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

	Blank Spike (ug/Kg)			
Parameter	Spike	Result	Rec (%)	CL
1-Methylnaphthalene	22.2	17.7	80	(44-107)
2-Methylnaphthalene	22.2	16.0	72	(45-105)
Acenaphthene	22.2	17.0	76	(45-110)
Acenaphthylene	22.2	17.2	77	(45-105)
Anthracene	22.2	19.1	86	(55-105)
Benzo(a)Anthracene	22.2	18.6	84	(50-110)
Benzo[a]pyrene	22.2	16.8	76	(50-110)
Benzo[b]Fluoranthene	22.2	20.2	91	(45-115)
Benzo[g,h,i]perylene	22.2	21.4	97	(40-125)
Benzo[k]fluoranthene	22.2	23.8	107	(45-125)
Chrysene	22.2	23.6	106	(55-110)
Dibenzo[a,h]anthracene	22.2	21.5	97	(40-125)
Fluoranthene	22.2	21.8	98	(55-115)
Fluorene	22.2	18.7	84	(50-110)
Indeno[1,2,3-c,d] pyrene	22.2	22.4	101	(40-120)
Naphthalene	22.2	17.2	77	(40-105)
Phenanthrene	22.2	19.0	85	(50-110)
Pyrene	22.2	20.9	94	(45-125)
Surrogates				
2-Fluorobiphenyl	22.2	85	85	(45-105)
Terphenyl-d14	22.2	102	102	(30-125)

Batch Information

Analytical Batch: **XMS7677**
Analytical Method: **8270D SIMS (PAH)**
Instrument: **HP 6890/5973 MS SVQA**
Analyst: **RTS**

Prep Batch: **XXX30130**
Prep Method: **SW3550C**
Prep Date/Time: **10/09/2013 18:05**
Spike Init Wt./Vol.: 22.2 ug/Kg Extract Vol: 1 mL
Dupe Init Wt./Vol.: Extract Vol:

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Matrix Spike Summary

Original Sample ID: 1135014002
MS Sample ID: 1184704 MS
MSD Sample ID: 1184705 MSD

Analysis Date: 10/10/2013 0:19
Analysis Date: 10/10/2013 0:33
Analysis Date: 10/10/2013 0:47
Matrix: Soil/Solid (dry weight)

QC for Samples: 1135014001, 1135014002, 1135014003, 1135014004, 1135014005, 1135014006

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

		Matrix Spike (ug/Kg)				Spike Duplicate (ug/Kg)						
Parameter	Sample	Spike	Result	Rec (%)		Spike	Result	Rec (%)		CL	RPD (%)	RPD CL
1-Methylnaphthalene	16.8J	28.7	61.5	155	*	28.9	59.8	149	*	44-107	2.70	(< 30)
2-Methylnaphthalene	16.8J	28.7	46.2	102		28.9	49.7	114	*	45-105	7.50	(< 30)
Acenaphthene	10.1J	28.7	56.1	160	*	28.9	48.3	132	*	45-110	15.00	(< 30)
Acenaphthylene	14.4J	28.7	87.2	254	*	28.9	55.6	143	*	45-105	44.20	* (< 30)
Anthracene	53.8	28.7	285	802	*	28.9	123	240	*	55-105	79.10	* (< 30)
Benzo[a]pyrene	200	28.7	922	2510	*	28.9	427	784	*	50-110	73.50	* (< 30)
Benzo[g,h,i]perylene	112	28.7	484	1300	*	28.9	244	460	*	40-125	65.80	* (< 30)
Dibenzo[a,h]anthracene	28.7J	28.7	150	424	*	28.9	84.5	193	*	40-125	56.20	* (< 30)
Fluorene	20.8J	28.7	106	297	*	28.9	70.6	173	*	50-110	40.20	* (< 30)
Indeno[1,2,3-c,d] pyrene	87.1	28.7	467	1320	*	28.9	192	364	*	40-120	83.40	* (< 30)
Naphthalene	15.2J	28.7	45.8	107	*	28.9	38.4	80		40-105	17.80	(< 30)
Phenanthrene	68.5	28.7	312	846	*	28.9	155	302	*	50-110	66.80	* (< 30)
Benzo(a)Anthracene	160J	28.7	1072	3170	*	28.9	523	1260	*	50-110	68.70	* (< 30)
Benzo[b]Fluoranthene	284	28.7	1303	3550	*	28.9	785	1730	*	45-115	49.70	* (< 30)
Benzo[k]fluoranthene	97.6U	28.7	484	1690	*	28.9	97.6U	0	*	45-125	0.00	(< 30)
Chrysene	245	28.7	1488	4320	*	28.9	614	1280	*	55-110	83.00	* (< 30)
Fluoranthene	393	28.7	1971	5500	*	28.9	984	2050	*	55-115	66.80	* (< 30)
Pyrene	345	28.7	1671	4600	*	28.9	860	1790	*	45-125	63.80	* (< 30)
Surrogates												
2-Fluorobiphenyl		28.7	30.7	107	*	28.9	30.0	104		45-105	2.10	
Terphenyl-d14		28.7	30.4	106		28.9	34.9	121		30-125	13.80	

Batch Information

Analytical Batch: XMS7672
Analytical Method: 8270D SIMS (PAH)
Instrument: HP 6890/5973 MS SVQA
Analyst: RTS
Analytical Date/Time: 10/10/2013 12:33:00AM

Prep Batch: XXX30130
Prep Method: Sonication Extraction Soil 8270 PAH SIM
Prep Date/Time: 10/9/2013 6:05:00PM
Prep Initial Wt./Vol.: 22.73g
Prep Extract Vol: 1.00mL

Print Date: 10/24/2013 8:39:40AM

Method Blank

Blank ID: MB for HBN 1488576 [XXX/30142]
Blank Lab ID: 1185115

Matrix: Soil/Solid (dry weight)

QC for Samples:
1135014001, 1135014002, 1135014003, 1135014004, 1135014005, 1135014006

Results by **SW8270D**

Parameter	Results	LOQ/CL	DL	Units
1,2,4-Trichlorobenzene	0.156U	0.250	0.0780	mg/Kg
1,2-Dichlorobenzene	0.156U	0.250	0.0780	mg/Kg
1,3-Dichlorobenzene	0.156U	0.250	0.0780	mg/Kg
1,4-Dichlorobenzene	0.156U	0.250	0.0780	mg/Kg
1-Chloronaphthalene	0.156U	0.250	0.0780	mg/Kg
2,4,5-Trichlorophenol	0.156U	0.250	0.0780	mg/Kg
2,4,6-Trichlorophenol	0.156U	0.250	0.0780	mg/Kg
2,4-Dichlorophenol	0.156U	0.250	0.0780	mg/Kg
2,4-Dimethylphenol	0.156U	0.250	0.0780	mg/Kg
2,4-Dinitrophenol	1.88U	3.00	0.940	mg/Kg
2,4-Dinitrotoluene	0.156U	0.250	0.0780	mg/Kg
2,6-Dichlorophenol	0.156U	0.250	0.0780	mg/Kg
2,6-Dinitrotoluene	0.156U	0.250	0.0780	mg/Kg
2-Chloronaphthalene	0.156U	0.250	0.0780	mg/Kg
2-Chlorophenol	0.156U	0.250	0.0780	mg/Kg
2-Methyl-4,6-dinitrophenol	1.24U	2.00	0.620	mg/Kg
2-Methylnaphthalene	0.156U	0.250	0.0780	mg/Kg
2-Methylphenol (o-Cresol)	0.156U	0.250	0.0780	mg/Kg
2-Nitroaniline	0.156U	0.250	0.0780	mg/Kg
2-Nitrophenol	0.156U	0.250	0.0780	mg/Kg
3&4-Methylphenol (p&m-Cresol)	0.620U	1.00	0.310	mg/Kg
3,3-Dichlorobenzidine	0.156U	0.250	0.0780	mg/Kg
3-Nitroaniline	0.300U	0.500	0.150	mg/Kg
4-Bromophenyl-phenylether	0.156U	0.250	0.0780	mg/Kg
4-Chloro-3-methylphenol	0.156U	0.250	0.0780	mg/Kg
4-Chloroaniline	0.300U	0.500	0.150	mg/Kg
4-Chlorophenyl-phenylether	0.156U	0.250	0.0780	mg/Kg
4-Nitroaniline	1.88U	3.00	0.940	mg/Kg
4-Nitrophenol	0.620U	1.00	0.310	mg/Kg
Acenaphthene	0.156U	0.250	0.0780	mg/Kg
Acenaphthylene	0.156U	0.250	0.0780	mg/Kg
Aniline	1.24U	2.00	0.620	mg/Kg
Anthracene	0.156U	0.250	0.0780	mg/Kg
Azobenzene	0.156U	0.250	0.0780	mg/Kg
Benzo(a)Anthracene	0.156U	0.250	0.0780	mg/Kg
Benzo[a]pyrene	0.156U	0.250	0.0780	mg/Kg
Benzo[b]Fluoranthene	0.156U	0.250	0.0780	mg/Kg
Benzo[g,h,i]perylene	0.156U	0.250	0.0780	mg/Kg

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Method Blank

Blank ID: MB for HBN 1488576 [XXX/30142]
Blank Lab ID: 1185115

Matrix: Soil/Solid (dry weight)

QC for Samples:
1135014001, 1135014002, 1135014003, 1135014004, 1135014005, 1135014006

Results by **SW8270D**

Parameter	Results	LOQ/CL	DL	Units
Benzo[k]fluoranthene	0.156U	0.250	0.0780	mg/Kg
Benzoic acid	1.50U	1.50	0.750	mg/Kg
Benzyl alcohol	0.156U	0.250	0.0780	mg/Kg
Bis(2chloro1methylethyl)Ether	0.156U	0.250	0.0780	mg/Kg
Bis(2-Chloroethoxy)methane	0.156U	0.250	0.0780	mg/Kg
Bis(2-Chloroethyl)ether	0.156U	0.250	0.0780	mg/Kg
bis(2-Ethylhexyl)phthalate	0.156U	0.250	0.0780	mg/Kg
Butylbenzylphthalate	0.156U	0.250	0.0780	mg/Kg
Carbazole	0.156U	0.250	0.0780	mg/Kg
Chrysene	0.156U	0.250	0.0780	mg/Kg
Dibenzo[a,h]anthracene	0.156U	0.250	0.0780	mg/Kg
Dibenzofuran	0.156U	0.250	0.0780	mg/Kg
Diethylphthalate	0.156U	0.250	0.0780	mg/Kg
Dimethylphthalate	0.156U	0.250	0.0780	mg/Kg
Di-n-butylphthalate	0.156U	0.250	0.0780	mg/Kg
di-n-Octylphthalate	0.300U	0.500	0.150	mg/Kg
Fluoranthene	0.156U	0.250	0.0780	mg/Kg
Fluorene	0.156U	0.250	0.0780	mg/Kg
Hexachlorobenzene	0.156U	0.250	0.0780	mg/Kg
Hexachlorobutadiene	0.156U	0.250	0.0780	mg/Kg
Hexachlorocyclopentadiene	0.400U	0.700	0.200	mg/Kg
Hexachloroethane	0.156U	0.250	0.0780	mg/Kg
Indeno[1,2,3-c,d] pyrene	0.156U	0.250	0.0780	mg/Kg
Isophorone	0.156U	0.250	0.0780	mg/Kg
Naphthalene	0.156U	0.250	0.0780	mg/Kg
Nitrobenzene	0.156U	0.250	0.0780	mg/Kg
N-Nitrosodimethylamine	0.156U	0.250	0.0780	mg/Kg
N-Nitroso-di-n-propylamine	0.156U	0.250	0.0780	mg/Kg
N-Nitrosodiphenylamine	0.156U	0.250	0.0780	mg/Kg
Pentachlorophenol	1.24U	2.00	0.620	mg/Kg
Phenanthrene	0.156U	0.250	0.0780	mg/Kg
Phenol	0.156U	0.250	0.0780	mg/Kg
Pyrene	0.156U	0.250	0.0780	mg/Kg
Surrogates				
2,4,6-Tribromophenol	83.1	35-125		%
2-Fluorobiphenyl	78.9	45-105		%
2-Fluorophenol	58.2	35-105		%
Nitrobenzene-d5	63.8	35-100		%

Print Date: 10/24/2013 8:39:40AM

Method Blank

Blank ID: MB for HBN 1488576 [XXX/30142]
Blank Lab ID: 1185115

Matrix: Soil/Solid (dry weight)

QC for Samples:
1135014001, 1135014002, 1135014003, 1135014004, 1135014005, 1135014006

Results by **SW8270D**

Parameter	Results	LOQ/CL	DL	Units
Phenol-d6	64.2	40-100		%
Terphenyl-d14	101	30-125		%

Batch Information

Analytical Batch: XMS7695
Analytical Method: SW8270D
Instrument: HP 6890/5973 SSA
Analyst: DSH
Analytical Date/Time: 10/16/2013 12:32:00AM

Prep Batch: XXX30142
Prep Method: SW3550C
Prep Date/Time: 10/11/2013 12:30:00PM
Prep Initial Wt./Vol.: 22.5 g
Prep Extract Vol: 1 mL

Print Date: 10/24/2013 8:39:40AM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1135014 [XXX30142]
Blank Spike Lab ID: 1185116
Date Analyzed: 10/16/2013 02:09

Matrix: Soil/Solid (dry weight)

QC for Samples: 1135014001, 1135014002, 1135014003, 1135014004, 1135014005, 1135014006

Results by **SW8270D**

	Blank Spike (mg/Kg)			
Parameter	Spike	Result	Rec (%)	CL
1,2,4-Trichlorobenzene	4.44	2.94	66	(45-110)
1,2-Dichlorobenzene	4.44	2.77	62	(45-100)
1,3-Dichlorobenzene	4.44	2.71	61	(40-100)
1,4-Dichlorobenzene	4.44	2.77	62	(35-105)
1-Chloronaphthalene	1.78	1.48	83	(44-105)
2,4,5-Trichlorophenol	4.44	4.18	94	(50-110)
2,4,6-Trichlorophenol	4.44	3.91	88	(45-110)
2,4-Dichlorophenol	4.44	3.24	73	(45-110)
2,4-Dimethylphenol	4.44	3.42	77	(30-105)
2,4-Dinitrophenol	8	7.24	91	(15-130)
2,4-Dinitrotoluene	4.44	4.67	105	(50-115)
2,6-Dichlorophenol	1.78	1.39	78	(52-102)
2,6-Dinitrotoluene	4.44	4.32	97	(50-110)
2-Chloronaphthalene	4.44	3.58	81	(45-105)
2-Chlorophenol	4.44	2.81	63	(45-105)
2-Methyl-4,6-dinitrophenol	8	8.77	110	(30-135)
2-Methylnaphthalene	4.44	3.25	73	(45-105)
2-Methylphenol (o-Cresol)	4.44	3.08	69	(40-105)
2-Nitroaniline	4.44	4.52	102	(45-120)
2-Nitrophenol	4.44	3.26	73	(40-110)
3&4-Methylphenol (p&m-Cresol)	6.22	5.23	84	(40-105)
3,3-Dichlorobenzidine	4.44	4.01	90	(10-130)
3-Nitroaniline	4.44	4.43	100	(25-110)
4-Bromophenyl-phenylether	4.44	4.24	95	(45-115)
4-Chloro-3-methylphenol	4.44	3.85	87	(45-115)
4-Chloroaniline	4.44	3.31	75	(10-100)
4-Chlorophenyl-phenylether	4.44	4.05	91	(45-110)
4-Nitroaniline	4.44	4.74	107	(35-115)
4-Nitrophenol	6.22	5.76	93	(15-140)
Acenaphthene	4.44	3.70	83	(45-110)
Acenaphthylene	4.44	3.87	87	(45-105)
Aniline	4.44	2.77	62	(20-84)
Anthracene	4.44	4.12	93	(55-105)

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1135014 [XXX30142]
Blank Spike Lab ID: 1185116
Date Analyzed: 10/16/2013 02:09

Matrix: Soil/Solid (dry weight)

QC for Samples: 1135014001, 1135014002, 1135014003, 1135014004, 1135014005, 1135014006

Results by **SW8270D**

	Blank Spike (mg/Kg)			
Parameter	Spike	Result	Rec (%)	CL
Azobenzene	4.44	4.20	94	(63-117)
Benzo(a)Anthracene	4.44	4.33	98	(50-110)
Benzo[a]pyrene	4.44	4.46	100	(50-110)
Benzo[b]Fluoranthene	4.44	4.81	108	(45-115)
Benzo[g,h,i]perylene	4.44	4.27	96	(40-125)
Benzo[k]fluoranthene	4.44	4.54	102	(45-125)
Benzoic acid	6.22	5.59	90	(10-110)
Benzyl alcohol	4.44	3.29	74	(20-125)
Bis(2-Chloroethoxy)methane	4.44	3.23	73	(45-110)
Bis(2-Chloroethyl)ether	4.44	2.83	64	(40-105)
bis(2-Ethylhexyl)phthalate	4.44	4.50	101	(45-125)
Bis(2chloro1methylethyl)Ether	4.44	2.96	67	(20-115)
Butylbenzylphthalate	4.44	4.50	101	(50-125)
Carbazole	4.44	4.53	102	(45-115)
Chrysene	4.44	4.60	103	(55-110)
Di-n-butylphthalate	4.44	4.49	101	(55-110)
di-n-Octylphthalate	4.44	4.54	102	(40-130)
Dibenzo[a,h]anthracene	4.44	4.44	100	(40-125)
Dibenzofuran	4.44	4.00	90	(50-105)
Diethylphthalate	4.44	4.45	100	(50-115)
Dimethylphthalate	4.44	4.17	94	(50-110)
Fluoranthene	4.44	4.46	100	(55-115)
Fluorene	4.44	4.01	90	(50-110)
Hexachlorobenzene	4.44	4.14	93	(45-120)
Hexachlorobutadiene	4.44	3.10	70	(40-115)
Hexachlorocyclopentadiene	4.44	3.17	71	(48-108)
Hexachloroethane	4.44	2.75	62	(35-110)
Indeno[1,2,3-c,d] pyrene	4.44	4.26	96	(40-120)
Isophorone	4.44	3.48	78	(45-110)
N-Nitroso-di-n-propylamine	4.44	3.48	78	(40-115)
N-Nitrosodimethylamine	4.44	2.69	61	(20-115)
N-Nitrosodiphenylamine	4.44	3.46	78	(50-115)
Naphthalene	4.44	3.08	69	(40-105)

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1135014 [XXX30142]
Blank Spike Lab ID: 1185116
Date Analyzed: 10/16/2013 02:09

Matrix: Soil/Solid (dry weight)

QC for Samples: 1135014001, 1135014002, 1135014003, 1135014004, 1135014005, 1135014006

Results by **SW8270D**

	Blank Spike (mg/Kg)			
Parameter	Spike	Result	Rec (%)	CL
Nitrobenzene	4.44	3.06	69	(40-115)
Pentachlorophenol	6.22	5.76	93	(25-120)
Phenanthrene	4.44	4.25	96	(50-110)
Phenol	4.44	2.94	66	(40-100)
Pyrene	4.44	4.29	97	(45-125)
Surrogates				
2,4,6-Tribromophenol	8.89	99.7	100	(35-125)
2-Fluorobiphenyl	4.44	83.2	83	(45-105)
2-Fluorophenol	8.89	64.5	65	(35-105)
Nitrobenzene-d5	4.44	69.4	69	(35-100)
Phenol-d6	8.89	69.9	70	(40-100)
Terphenyl-d14	4.44	106	106	(30-125)

Batch Information

Analytical Batch: **XMS7695**
Analytical Method: **SW8270D**
Instrument: **HP 6890/5973 SSA**
Analyst: **DSH**

Prep Batch: **XXX30142**
Prep Method: **SW3550C**
Prep Date/Time: **10/11/2013 12:30**
Spike Init Wt./Vol.: 4.44 mg/Kg Extract Vol: 1 mL
Dupe Init Wt./Vol.: Extract Vol:

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Matrix Spike Summary

Original Sample ID: 1135035001
MS Sample ID: 1185117 MS
MSD Sample ID: 1185118 MSD

Analysis Date: 10/16/2013 9:36
Analysis Date: 10/16/2013 9:55
Analysis Date: 10/16/2013 10:15
Matrix: Soil/Solid (dry weight)

QC for Samples: 1135014001, 1135014002, 1135014003, 1135014004, 1135014005, 1135014006

Results by **SW8270D**

		Matrix Spike (mg/Kg)				Spike Duplicate (mg/Kg)						
Parameter	Sample	Spike	Result	Rec (%)		Spike	Result	Rec (%)		CL	RPD (%)	RPD CL
1,2,4-Trichlorobenzene	0.798U	4.58	3.70	81		4.58	3.62	79		45-110	2.00	(< 30)
1,2-Dichlorobenzene	0.798U	4.58	3.45	75		4.58	3.57	78		45-100	3.70	(< 30)
1,3-Dichlorobenzene	0.798U	4.58	3.37	74		4.58	3.45	75		40-100	2.00	(< 30)
1,4-Dichlorobenzene	0.798U	4.58	3.45	75		4.58	3.54	77		35-105	2.80	(< 30)
1-Chloronaphthalene	0.798U	1.83	1.61	88		1.83	1.60	88		44-105	0.43	(< 30)
2,4,5-Trichlorophenol	0.798U	4.58	3.64	80		4.58	3.69	81		50-110	1.10	(< 30)
2,4,6-Trichlorophenol	0.798U	4.58	3.79	83		4.58	3.95	86		45-110	4.10	(< 30)
2,4-Dichlorophenol	0.798U	4.58	3.51	77		4.58	3.53	77		45-110	0.65	(< 30)
2,4-Dimethylphenol	0.798U	4.58	3.90	85		4.58	4.00	87		30-105	2.40	(< 30)
2,4-Dinitrophenol	9.62U	8.25	9.62U	0	*	8.25	9.62U	0	*	15-130	0.00	(< 30)
2,4-Dinitrotoluene	0.798U	4.58	3.72	81		4.58	3.69	81		50-115	0.62	(< 30)
2,6-Dichlorophenol	0.798U	1.83	1.59	87		1.83	1.58	86		52-102	0.29	(< 30)
2,6-Dinitrotoluene	0.798U	4.58	3.89	85		4.58	4.06	89		50-110	4.00	(< 30)
2-Chloronaphthalene	0.798U	4.58	3.99	87		4.58	4.23	92		45-105	6.00	(< 30)
2-Chlorophenol	0.798U	4.58	3.46	76		4.58	3.51	77		45-105	1.50	(< 30)
2-Methyl-4,6-dinitrophenol	6.34U	8.25	7.46J	90		8.25	7.25J	88		30-135	2.90	(< 30)
2-Methylnaphthalene	0.798U	4.58	3.79	83		4.58	3.86	85		45-105	2.00	(< 30)
2-Methylphenol (o-Cresol)	0.798U	4.58	3.57	78		4.58	3.73	82		40-105	4.40	(< 30)
2-Nitroaniline	0.798U	4.58	4.10	90		4.58	4.32	94		45-120	5.30	(< 30)
2-Nitrophenol	0.798U	4.58	3.80	83		4.58	4.00	87		40-110	5.00	(< 30)
3&4-Methylphenol (p&m-Cresol)	3.16U	6.41	5.75	90		6.41	5.90	92		40-105	2.40	(< 30)
3-Nitroaniline	1.53U	4.58	3.78	83		4.58	3.76	82		25-110	0.67	(< 30)
4-Bromophenyl-phenylether	0.798U	4.58	4.00	87		4.58	4.39	96		45-115	9.20	(< 30)
4-Chloro-3-methylphenol	0.798U	4.58	3.44	75		4.58	3.44	75		45-115	0.00	(< 30)
4-Chloroaniline	1.53U	4.58	3.57	78		4.58	3.36	74		10-100	5.90	(< 30)
4-Chlorophenyl-phenylether	0.798U	4.58	3.84	84		4.58	3.98	87		45-110	3.40	(< 30)
4-Nitroaniline	9.62U	4.58	9.62U	0	*	4.58	9.62U	0	*	35-115	0.00	(< 30)
4-Nitrophenol	3.16U	6.41	3.79J	59		6.41	3.88J	61		15-140	2.30	(< 30)
Acenaphthene	0.798U	4.58	3.95	86		4.58	4.16	91		45-110	5.50	(< 30)
Acenaphthylene	0.798U	4.58	4.11	90		4.58	4.26	93		45-105	3.40	(< 30)
Aniline	6.34U	4.58	6.34U	0	*	4.58	6.34U	0	*	20-84	0.00	(< 30)
Anthracene	0.798U	4.58	4.15	91		4.58	4.18	91		55-105	0.88	(< 30)
Azobenzene	0.798U	4.58	4.43	97		4.58	4.76	104		63-117	7.00	(< 30)
Benzoic acid	7.66U	6.41	7.66U	0	*	6.41	7.66U	0	*	10-110	0.00	(< 30)
Benzyl alcohol	0.798U	4.58	3.49	76		4.58	3.69	81		20-125	5.50	(< 30)
Bis(2-Chloroethoxy)methane	0.798U	4.58	4.13	90		4.58	4.24	93		45-110	2.50	(< 30)
Bis(2-Chloroethyl)ether	0.798U	4.58	3.62	79		4.58	3.71	81		40-105	2.40	(< 30)

Print Date: 10/24/2013 8:39:41AM

Matrix Spike Summary

Original Sample ID: 1135035001
MS Sample ID: 1185117 MS
MSD Sample ID: 1185118 MSD

Analysis Date: 10/16/2013 9:36
Analysis Date: 10/16/2013 9:55
Analysis Date: 10/16/2013 10:15
Matrix: Soil/Solid (dry weight)

QC for Samples: 1135014001, 1135014002, 1135014003, 1135014004, 1135014005, 1135014006

Results by **SW8270D**

		Matrix Spike (mg/Kg)				Spike Duplicate (mg/Kg)					
Parameter	Sample	Spike	Result	Rec (%)		Spike	Result	Rec (%)		CL	RPD (%)	RPD CL
Bis(2chloro1methylethyl)Ether	0.798U	4.58	3.77	82		4.58	3.93	86		20-115	3.90	(< 30)
Carbazole	0.798U	4.58	4.31	94		4.58	4.24	93		45-115	1.80	(< 30)
Di-n-butylphthalate	0.798U	4.58	4.23	92		4.58	4.43	97		55-110	4.80	(< 30)
Dibenzofuran	0.798U	4.58	3.87	85		4.58	4.27	93		50-105	9.70	(< 30)
Diethylphthalate	0.798U	4.58	4.28	93		4.58	4.47	97		50-115	4.20	(< 30)
Dimethylphthalate	0.798U	4.58	4.12	90		4.58	4.41	96		50-110	6.70	(< 30)
Fluoranthene	0.798U	4.58	3.75	82		4.58	3.41	74		55-115	9.70	(< 30)
Fluorene	0.798U	4.58	3.99	87		4.58	4.23	92		50-110	5.90	(< 30)
Hexachlorobenzene	0.798U	4.58	3.85	84		4.58	4.06	89		45-120	5.40	(< 30)
Hexachlorobutadiene	0.798U	4.58	4.00	87		4.58	4.03	88		40-115	0.86	(< 30)
Hexachlorocyclopentadiene	2.04U	4.58	1.85J	40	*	4.58	1.52J	33	*	48-108	20.10	(< 30)
Hexachloroethane	0.798U	4.58	3.30	72		4.58	3.43	75		35-110	3.70	(< 30)
Isophorone	0.798U	4.58	3.93	86		4.58	4.09	89		45-110	4.20	(< 30)
N-Nitroso-di-n-propylamine	0.798U	4.58	3.89	85		4.58	3.97	87		40-115	2.00	(< 30)
N-Nitrosodimethylamine	0.798U	4.58	2.98	65		4.58	3.06	67		20-115	2.70	(< 30)
N-Nitrosodiphenylamine	0.798U	4.58	3.57	78		4.58	3.76	82		50-115	5.10	(< 30)
Naphthalene	0.798U	4.58	3.83	84		4.58	3.87	85		40-105	1.00	(< 30)
Nitrobenzene	0.798U	4.58	3.89	85		4.58	4.01	88		40-115	2.80	(< 30)
Pentachlorophenol	6.34U	6.41	4.78J	75		6.41	4.99J	78		25-120	4.40	(< 30)
Phenanthrene	0.798U	4.58	4.01	88		4.58	4.23	92		50-110	5.20	(< 30)
Phenol	0.798U	4.58	3.42	75		4.58	3.47	76		40-100	1.50	(< 30)
3,3-Dichlorobenzidine	3.20U	4.58	4.49J	98		4.58	4.42J	97		10-130	1.40	(< 30)
Benzo(a)Anthracene	3.20U	4.58	4.23J	92		4.58	4.35J	95		50-110	3.00	(< 30)
bis(2-Ethylhexyl)phthalate	3.20U	4.58	5.47	119		4.58	5.68	124		45-125	3.80	(< 30)
Butylbenzylphthalate	3.20U	4.58	5.43	119		4.58	5.67	124		50-125	4.30	(< 30)
Chrysene	3.20U	4.58	4.21J	92		4.58	4.42J	97		55-110	5.10	(< 30)
di-n-Octylphthalate	6.14U	4.58	5.44J	119		4.58	5.58J	122		40-130	2.50	(< 30)
Pyrene	3.20U	4.58	4.51J	98		4.58	4.85J	106		45-125	7.40	(< 30)
Surrogates												
2,4,6-Tribromophenol		9.16	7.85	86		9.16	7.90	86		35-125	0.67	
2-Fluorobiphenyl		4.58	4.26	93		4.58	4.56	100		45-105	7.00	
2-Fluorophenol		9.16	6.30	69		9.16	6.53	71		35-105	3.60	
Nitrobenzene-d5		4.58	3.93	86		4.58	4.00	87		35-100	1.90	
Phenol-d6		9.16	6.95	76		9.16	7.24	79		40-100	4.10	
Terphenyl-d14		4.58	4.97	109		4.58	5.28	115		30-125	5.90	

Print Date: 10/24/2013 8:39:41AM

Matrix Spike Summary

Original Sample ID: 1135035001
MS Sample ID: 1185117 MS
MSD Sample ID: 1185118 MSD

Analysis Date:
Analysis Date: 10/23/2013 0:00
Analysis Date: 10/23/2013 0:19
Matrix: Soil/Solid (dry weight)

QC for Samples: 1135014001, 1135014002, 1135014003, 1135014004, 1135014005, 1135014006

Results by **SW8270D**

		Matrix Spike (%)			Spike Duplicate (%)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL

Batch Information

Analytical Batch: XMS7695
Analytical Method: SW8270D
Instrument: HP 6890/5973 SSA
Analyst: DSH
Analytical Date/Time: 10/16/2013 9:55:00AM

Prep Batch: XXX30142
Prep Method: Sonication Extraction Soil SW8270
Prep Date/Time: 10/11/2013 12:30:00PM
Prep Initial Wt./Vol.: 22.68g
Prep Extract Vol: 1.00mL

Print Date: 10/24/2013 8:39:41AM

SGS

SGS North America Inc.
CHAIN OF CUSTODY RECORD

1135014

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

Page 1 of 1

Section 1

CLIENT: ERM Alaska, Inc.

CONTACT: Stephen Witzmann PHONE NO: 907-646-1089

PROJECT NAME: Napaskiak Trench Installation PROJECT/ PWSID/ PERMIT#: 0162537

REPORTS TO: Stephen Witzmann E-MAIL: stephen.witzmann@erm.com

INVOICE TO: Stephen Witzmann QUOTE #: P.O. #: 0162537

Section 2

RESERVED for lab use	SAMPLE IDENTIFICATION	DATE mm/dd/yy	TIME HH:MM	MATRIX/ MATRIX CODE	# CONTAINERS	Type C = COMP G = GRAB MI = Multi Incremental Soils	GRO tbc	GRO (AK101) MeOH	VOC (SW8260) MeOH	DRO (AK102)	RRO (AK103)	PCB (SW8081)	Total Lead (SW6020)	SVOC (SW8270)	PAH (SW8270 SIM)	REMARKS/ LOC ID
1 A-C	13-NK-01-SO	10/4/13	1600	SO	3	G		X	X	X	X	X	X	X	X	
2 A-C	13-NK-02-SO	10/4/13	1730	SO	3	G		X	X	X	X	X	X	X	X	
3 A-C	13-NK-03-SO	10/4/13	1800	SO	3	G		X	X	X	X	X	X	X	X	
4 A-C	13-NK-04-SO	10/5/13	0945	SO	3	G		X	X	X	X	X	X	X	X	
5 A-C	13-NK-05-SO	10/5/13	1040	SO	3	G		X	X	X	X	X	X	X	X	
6 A-C	13-NK-06-SO	10/5/13	1150	SO	3	G		X	X	X	X	X	X	X	X	
7 A																

Section 5

Relinquished By:	Date	Time	Received By:
(1) S. Witzmann for Ryan Burch	10/7/13	1530	
(2)	10/7/13	1545	
(3)	10/7/13	16:07	
(4)	10/7/13	16:07	Received For Laboratory By:

Section 4

DOD Project? Yes No

Cooler ID:

Data Deliverable Requirements:

Requested Turnaround Time and/or Special Instructions: Standard

Temp Blank °C: 5.2 / #238 2F

or Ambient [ ]

(See attached Sample Receipt Form)

Chain of Custody Seal: (Circle) INTACT BROKEN ABSENT

(See attached Sample Receipt Form)

[ ] 200 W. Potter Drive Anchorage, AK 99518 Tel: (907) 562-2343 Fax: (907) 561-5301
[ ] 5500 Business Drive Wilmington, NC 28405 Tel: (910) 350-1903 Fax: (910) 350-1557

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

SGS

1135014

SAMPLE RECEIPT FORM

Review Criteria:	Condition:	Comments/Action Taken:
Were **custody seals** intact? Note # & location, if applicable. COC accompanied samples?	Yes No N/A Yes No N/A	2F
Temperature blank compliant* (i.e., 0-6°C after CF)? ** Note: Exemption permitted for chilled samples collected less than 8 hours ago.* Cooler ID: _____ @ 5.2 w/ Therm.ID: 230 Cooler ID: _____ @ _____ w/ Therm.ID: _____ Cooler ID: _____ @ _____ w/ Therm.ID: _____ Cooler ID: _____ @ _____ w/ Therm.ID: _____ Cooler ID: _____ @ _____ w/ Therm.ID: _____ *Note: If non-compliant, use form FS-0029 to document affected samples/analyses.* If samples are received without a temperature blank, the "cooler temperature" will be documented in lieu of the temperature blank & "**COOLER TEMP**" will be noted to the right. In cases where neither a temp blank nor cooler temp can be obtained, note "ambient" or "chilled." **If temperature(s) <0°C, were all sample containers ice free?**	Yes No N/A Yes No N/A	
Delivery method (specify all that apply): Client USPS Alert Courier C&D Delivery AK Air Lynden Carlile ERA PenAir FedEx UPS NAC Other: → *For WO# with airbills, was the WO# & airbill info recorded in the Front Counter eLog?*	Note ABN/ tracking # See Attached or N/A Yes No N/A	
→ For samples received with payment, note amount ($) and cash / check / CC **(circle one)** or note: N/A → For samples **received in FBKS**, ANCH staff will verify all criteria are reviewed. SRF Initiated by: MBO N/A		
Were samples received within hold time? *Note: Refer to form F-083 "Sample Guide" for hold time information.* Do samples **match COC*** (i.e., sample IDs, dates/times collected)? ** Note: Exemption permitted if times differ <1hr; in that case, use times on COC.* Were analyses requested unambiguous?	Yes No N/A Yes No N/A Yes No N/A	
Were samples in **good condition** (no leaks/cracks/breakage)? Packing material used (specify all that apply): Bubble Wrap Separate plastic bags Vermiculite Other:	Yes No N/A	
Were all VOA vials **free of headspace** (i.e., bubbles ≤6 mm)? Were all soil VOAs **field extracted** with MeOH+BFB?	Yes No N/A Yes No N/A	
Were **proper containers** (type/mass/volume/preservative*) used? ** Note: Exemption permitted for waters to be analyzed for metals.* Were **Trip Blanks** (i.e., VOAs, LL-Hg) in cooler with samples?	Yes No N/A Yes No N/A	
For **special handling** (e.g., "MI" or foreign soils, lab filter, limited volume, Ref Lab), were bottles/paperwork flagged (e.g., sticker)?	Yes No N/A	
For preserved waters (other than VOA vials, LL-Mercury or microbiological analyses), was **pH verified and compliant**? If pH was adjusted, were bottles flagged (i.e., stickers)?	Yes No N/A Yes No N/A	
For **RUSH/SHORT Hold Time**, were COC/Bottles flagged accordingly? Was Rush/Short HT email sent, if applicable?	Yes No N/A	
For **SITE-SPECIFIC QC, e.g. BMS/BMSD/BDUP**, were containers / paperwork flagged accordingly?	Yes No N/A	
For any question answered "No," has the PM been notified and the problem resolved (or paperwork put in their bin)?	Yes No N/A	SRF Completed by: MBO PM = CGH N/A
Was **PEER REVIEW** of ***sample numbering/labeling completed?***	Yes No N/A	Peer Reviewed by: MD N/A

Additional notes (if applicable):

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

SGS North America Inc.
200 W. Potter Dr., Anchorage, AK 99518 (ph) 907-562-2343, (fax) 907-561-5301
3180 Peger Rd., Fairbanks, AK 99701 (ph) 907-474-8656, (fax) 907-474-9685

Sample Kit Request

☑ **Client pickup Date:** 10/3/2013 **Time:** 16:00
Be sure to ask if client will ship by ground (DOT) or air carrier (IATA)
☐ **Deliver to client:**
☐ **Ship by/Air Carrier:**
Airbill Number:
Date to ship by:
Notes:
Kit request taken by: CGH **Date:** 10/3/2013
Kit prepared by: CES **Date:** 10/3/2013
Kit checked by: KAT **Date:** 10/3/13
Kit packed &shipped by: **Date:**

Client Name: ERM Alaska
Ordered By: Ryan Burich **e-mail:** ryan.burich@erm.com
Phone #: (907) 264-4408
Project Name: Napaskiak
Quote #:
Delivery:

1135014

PM Reminders:
☐ **Track all Lot#** ☐ **QAPP/SOW/SAP/DQOs** ☐ **Total # includes bottles for % Solids** ☐ **Foreign Soil**
☐ **ETA for samples returning to lab** ☐ **Profile Build/Project Notice** ☐ **Regulatory/Special Requirements** ☐ **Problem Matrix**

Notes:

No. Samples	Matrix	Analysis	Container Size & Type		Pres.	Bottle Lot #	Preservative Lot #	Hold Time	# QC Bottles	Total Bottles
6	soil	GRO/VOC AK101/SW8260	1 x 4-oz prewt'd	with septa	MeOH+BFB			14 days		6
6	soil	DRO/RRO AK102/103	1 x 4-oz	amber				14 days		6
6	soil	PCB SW 8081						1 year		
6	soil	T. Lead SW6020	1 x 4-oz	amber				28/180 days		6
6	soil	SVOC SW8270						14 days		
6	soil	PAH SW 8270 SIM						14 days		

☐ Pack for Shipping via *ground* (DOT)
☑ Pack for Shipping via *air carrier* (IATA)
☑ Temperature Blank (*circle one:* 120-ml
☑ Soil VOA Trip Blank - Lot#: VW8-57-6
☐ Water VOA Trip Blank - Lot#:
☐ 524 VOA Trip Blank - Lot#:
☐ Low Level Mercury Trip Blank- Lot#:
☑ SGS COCs - *Circle req'd format:* * Blank COC * COC initiated by PM (attached)
☑ Custody Seals * Drinking Water COC template * WasteWater COC template
☑ Labels * UST COC template * Mining COC template
☑ Coolers * Landfill COC template * TCLP COC template
☑ Bubble Wrap
☑ Gel Ice (*circle one:* in each cooler OR in a separate cooler)
☐ Pack similar bottles together OR custom packing *(circle one)*
☐ Send additional instructions/documents *(Note to PM: Be sure to attach copy of requested form.)*

Other Notes/Reminders for Kit Prep:

Attention Client/Sampler:
Please remember the following sampling guidelines -
1. Do not rinse container before filling and be aware of any acid preservative in container.
2. Fill container to top, but do not overfill (except volatiles which should be headspace free).
3. Label the container with your sample/site ID, as well as the date & time of collection.
4. Fill in the Chain of Custody.
5. Add frozen gel packs or ice to your cooler & pack to prevent breakage.

Charges may be invoiced for bottles which are unused or improperly used.
If you have any questions concerning this sample kit, please contact your Project Manager for assistance. ***Thank you.***

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APPENDIX F

Quality Assurance Review and ADEC Checklist

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1. QUALITY ASSURANCE REVIEW

Laboratory QA/QC data associated with the analysis of project samples has been reviewed to evaluate the integrity of the analytical data generated during the October 2013 soil sampling events at the Napaskiak Trench Installation site, Napaskiak, Alaska. Samples were collected, reported, and shipped in general accordance with the ADEC-approved work plan (ERM 2013).

All data were reviewed in accordance with appropriate EPA procedural guidance documents (EPA 2009; 2010) and ADEC regulatory guidance documents (ADEC 2009; 2012). An ADEC laboratory checklist was performed (ADEC 2010). This data review focuses on criteria for the following QA/QC parameters and their effect on the quality of data and usability: sample handling and chain-of-custody (CoC) documentation; holding time compliance; field QA/QC (trip blanks, field duplicate) results; laboratory QA/QC (method blanks, laboratory control samples, surrogates, matrix spike duplicate [MS/MSD]); results and analytical methods; method reporting limits; precision and accuracy; and completeness.

The details of this review and qualification of the data are summarized in the following sections

1.1. Sample Handling and Chain of Custody

Soil samples were analyzed by SGS in Anchorage, Alaska.

- Gasoline range organic compounds (GRO; Alaska Method (AK) 101)
- Diesel range organic compounds (DRO; AK102)
- Residual range organic compounds (RRO; AK103)
- Volatile Organic Compounds (VOC; EPA Method SW8260)
- Metals (Lead; EPA Method SW6020)
- Semi-Volatile by GC/MS (EPA Method 8270)
- Polycyclic aromatic compounds (PAH; EPA Method 8270-SIM)
- Polychlorinated biphenyls (PCB;EPA Method SW8082A)

SGS analytical results were reported in one sample delivery groups (SDG): 1135014.

All sample coolers were shipped with custody seals intact. CoC forms, laboratory sample receipt forms, and case narratives were reviewed to evaluate the integrity of the samples and the quality of the associated data.

All sample containers in the sample coolers were received at the laboratory intact and within the specified temperature range of 4°C +/- 2°C.

1.2. Holding Time Compliance

All samples were extracted, digested and analyzed within the holding time criteria for the applicable analytical methods and in accordance with work plan specifications.

1.3. Field QA/QC

Field QA/QC protocols are designed to measure for potential sample bias as a result of sampling procedures and possible contamination during collection and transport of samples. Collection and analysis of field duplicates facilitates an evaluation of precision that takes into account potential variables associated with sampling procedures, site heterogeneity and laboratory analyses. Trip blanks are used to monitor sample containers and possible cross-contamination of samples. For this project, both trip blanks and field duplicates were submitted.

1.3.1. Trip Blanks

Trip blanks were prepared by the laboratory, shipped to the site with the empty sample bottles/containers, stored with sample containers during the field event, and transported with the collected samples back to the laboratory for analysis.

Trip blanks were placed in the cooler with associated matrix-specific volatile organics samples (GRO/BTEX). All analytes detected in the trip blanks were below the detection llimit (DL) for all analytes, with one exception. GRO was detected in the trip blank at 0.839 mg/Kg. GRO results in samples 13-NK-01-SO and 13-NK-05-SO were qualified as not detected (UB). All other sample results were greater than the LOQ and did not require qualification.

1.3.2. Field Duplicates

Of the 6 total soil samples submitted, there was 1 field duplicate sample submitted – primary 13-NK-02-SO with duplicate 13-NK-03-SO.

When analytes were detected in both duplicate pairs above the RL, the relative percent differences (RPDs) between the analytes were calculated. When analytes were present at concentrations below the DL in one or both samples, no valid comparison could be made. All RPDs between primary and duplicate met the ADEC recommended limit of RPDs <50% for soil samples, with the following exceptions.

RPDs between the primary 13-NK-02-SO and duplicate 13-NK-03-SO exceeded the <50% RPD for soils in the following analytes: DRO (94.6%), RRO (52.6%), 1-methylnaphthalene (54.3%), 2-methylnapthalene (62.2%), benzo(a)pyrene (71.3%), benzo(b)fluoranthene (69.2%), benzo(g,h,i)perylene (84.4%), chrysene (69.97%), dibenzo(a,h)anthracene (65.1%), indeno(1,2,3-cd)pyrene (61.95%), naphthalene (61.95%), phenanthrene (66.7%), and pyrene (66.7%). Results were qualified as estimated (JD).

1.4. Laboratory QA/QC

1.4.1. Laboratory Blanks

Laboratory/ Method blanks were analyzed concurrent with an analytical batch of 20 or fewer primary samples for each of the analytical methods performed on project samples. Target analytes were not detected (U) in any laboratory blanks, with the following

exception. In PAH 8270-SIM analysis, naphthalene was detected in the method blank at 1.56 ug/Kg. The naphthalene result in samples 13-NK-02-SO, 13-NK-03-SO and 13-NK-06-SO was qualified as estimated with a high bias (JB). All other associated sample results were greater than the LOQ and did not require qualification.

1.4.2. Surrogates

System Monitoring Compounds (surrogates) are specified for organic chromatographic analytical procedures. Surrogates are compounds similar to target analytes and are added to each sample prior to collection or extraction. Subsequent surrogate recovery indicates overall method performance. Surrogate recoveries were within prescribed control limits for all primary samples, method blanks, LCS/LCSD, MS/MSD and other QA/QC samples, with one exception.

Surrogate 2-fluorobiphenyl percent recovery was above the limits in PAH-SIM analysis for sample 13-NK-05-SO. Associated positive results were qualified as estimated (JM).

1.4.3. Laboratory Control Samples

The laboratory monitors internal precision and accuracy for each analytical batch with a set of laboratory control samples and laboratory control sample duplicate (LCS/LCSD). Two sample aliquots of the same sample are taken in the analytical laboratory and analyzed separately with identical procedures. Analyses of the sample and duplicate give a measure of the precision associated with laboratory procedures but not with sample collection, preservation or storage procedures. A known quantity of target analytes are added to blank laboratory control samples prior to extraction and analysis and recoveries are calculated. Acceptable recovery criteria vary with each analytical method and matrix. All LCS/LCSD samples met laboratory and project QC goals for target analytes in all SDGs.

1.4.4. Matrix Spikes

Matrix spike/matrix spike duplicate (MS/MSD) analyses were performed. Matrix spikes have a known quantity of target analytes added (spiked) to field samples. Spike recoveries are calculated and are used to evaluate both site conditions and laboratory quality control. Matrix spikes met recovery percentages (%R) and relative percent difference (RPD) limits in all SDGs, with the following exceptions.

The %R in MSD exceeded the limits in 1,2,3-trichlorobenzene and vinyl chloride. The MS/MSD %R exceeded the limits in hexachlorobutadiene in 8260 analysis. All associated results in samples were not detected and the LCS/LCSD percent recoveries were within limits. Data did not require qualification.

The %R in MS/MSD exceeded the limits in Aroclor-1016. All associated results in samples were not detected and the LCS percent recoveries were within limits. Data did not require qualification.

The %R in MS/MSDs were outside the limits in all 8270D-SIM analytes and the RPDs exceeded the limits in acenaphthalene, anthracene, fluorene, benzo(a)pyrene, benzo(g,h,i)perylene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene, phenanthrene, benzo(a)anthracene, benzo(b)fluoranthene, chrysene, fluoranthene, and pyrene. The LCS percent recoveries were within limits. Data did not require qualification.

The MS/MSD %R in hexachlorocyclopentadiene was below the limits. The LCS percent recoveries were within limits. Data did not require qualification.

The MS/MSD %R in 2,4-dinitrophenol, 4-nitroaniline, aniline and benzoic acid did not recover. The LCS percent recoveries were within limits. Data did not require qualification.

1.4.5. Detection Limits (Sensitivity)

Sample results that were between the DL and the Limit of Quanitation (LOQ) were qualified as estimated (J). Sample results that were below the DL were qualified as not detected (U) at the Limit of Detection (LOD), which is twice the DL. The laboratory established detection limit (DL) were below the ADEC cleanup levels, with the following exceptions.

For SW8270D analysis, the DL and/or reporting limit was above the ADEC cleanup level for migration to groundwater in soil, noted in bold and highlighted in yellow in the data tables, for the following analytes: 1,2,4-trichlorobenzene, 1,4-dichlorobenzene, 2,4-dinitrophenol, 2,4-dinitrotoluene, 2,6-dinitrotoluene, 3,3'-dichlorobenzidine (and its salts), dichloroethyl ether, hexachlorobenzene, hexachlorobutadiene, hexachlorocyclopentadiene, hexachloroethane, nitrobenzene, n-nitrosodimethylamine, n-nitrosodi-n-propylamine, p-chloroaniline, and pentachlorophenol. The DL and/or reporting limit was above the ADEC cleanup level for direct contact for benzo(a)pyrene and dibenzo(a,h)anthracene. For 8260B analysis, the DL and/or reporting limit was above the ADEC cleanup level for migration to groundwater in soil for the following analytes: 1,1,2,2-tetrachloroethane, 1,1,2-trichloroethane, 1,1-dichloroethene, 1,2,3-trichloropropane, 1,2-dichloroethane, 1,2-dichloropropane, carbon tetrachloride, dibromochloromethane, ethylene dibromide, methyl bromide, methylene chloride, and vinyl chloride. Not detected results where the DL was above the ADEC established cleanup levels cannot be used to assess the presence or absence of the analyte at concentrations above the cleanup criteria and below the reported DL.

1.5. Precision and Accuracy

Precision criteria monitor analytical reproducibility. Accuracy criteria monitor agreement of measured results with “true values” established by spiking applicable samples with a known quantity of analyte or surrogate. Precision and accuracy were evaluated by comparing LCS/LCSDs MS/MSDs and field duplicate pairs for this project. Field duplicates and MS/MSD samples were collected in accordance with work plan specifications. Field duplicate RPDs met applicable control limits. Recoveries and RPDs

for all LCS/LSCD and MS/MSD samples were within required limits except as noted in Laboratory QC section.

1.5.1. Completeness

Data completeness is defined as the percentage of usable data (usable data divided by the total possible data). The overall project completeness goal is 90%:

$$\% \text{ completeness} = \frac{\text{number of valid (i.e., non-R flagged) results}}{\text{number of possible results}}$$

All requested analyses were performed in accordance with Work Plan specifications. No samples were qualified as unusable (i.e., “R”). Completeness for this project is 100.0%.

1.5.2. Representativeness

Data representativeness expresses the degree to which sample data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, or environmental condition. The number and selection of samples were specified in the work plan and verified in the field to account accurately for site variations and sample matrices. The data quality objective (DQO) for representativeness was met.

1.5.3. Comparability

Comparability is a qualitative parameter expressing the confidence with which one data set can be compared to another. Data produced for this project followed applicable field sampling techniques and specific analytical methodology. The DQO for comparability was met.

1.6. Data Summary

In general, the overall quality of the data was acceptable. The data quality was determined as acceptable or estimated. Acceptable data are associated with QC data that meet all QC criteria or with QC samples that did not meet QC criteria but data quality objectives were not affected. Estimated J results are considered inaccurate or estimated QC acceptance criteria which were not met. No results were rejected. The EPA National Functional Guidelines (EPA 2008; 2010) were used to evaluate the acceptability of the data.

Data quality meets established DQO established for this project. With the exceptions noted above, all data are suitable for their intended use.

2. REFERENCES

ADEC. 2009. Technical Memorandum: Environmental Laboratory Data and Quality Assurance Requirements. March.

ADEC. 2010. Laboratory Data Review Checklist. Version 2.7. January.

ADEC. 2012. Technical Memorandum: Guidelines for Data Reporting, Data Reduction, and Treatment of Non-detect Values. June.

EPA. 2008. *Contract Laboratory Program National Functional Guidelines for Organic Data Review* (EPA 540/R-94/012). June.

EPA. 2010. *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (USEPA-540-R-10-011). January.

ERM. 2013. Final Napaskiak Trench Installation for Preliminary Drum Assessment Work Plan. August 13.

Laboratory Data Review Checklist

Completed by:	Melissa Pike		
Title:	Environmental Scientist	Date:	Nov 5, 2013
CS Report Name:	Napaskiak Trench Installation Monitoring Report	Report Date:	November 2013
Consultant Firm:	ERM Alaska, Inc.		
Laboratory Name:	SGS North America	Laboratory Report Number:	1135014
ADEC File Number:		ADEC RecKey Number:	

1. Laboratory

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

(●) Yes ( ) No ( ) NA (Please explain.) Comments:

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

( ) Yes ( ) No (●) NA (Please explain) Comments:

No samples were transferred or subcontracted.

2. Chain of Custody (COC)

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

(●) Yes ( ) No ( ) NA (Please explain) Comments:

b. Correct analyses requested?

(●) Yes ( ) No ( ) NA (Please explain) Comments:

3. Laboratory Sample Receipt Documentation

a. Sample/cooler temperature documented and within range at receipt (4° ± 2° C)?

(●) Yes ( ) No ( ) NA (Please explain) Comments:

Sample coolers were received at 5.2°C.

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

(●) Yes ( ) No ( ) NA (Please explain) Comments:

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

(●) Yes ( ) No ( ) NA (Please explain) Comments:

Samples arrived in good condition.

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

( ) Yes ( ) No (●) NA (Please explain) Comments:

There were no discrepancies.

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

Comments:

Data quality and usability was not affected with respect to the laboratory sample receipt documentation.

4. Case Narrative

a. Present and understandable?

(●) Yes ( ) No ( ) NA (Please explain) Comments:

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

(●) Yes ( ) No ( ) NA (Please explain) Comments:

c. Were all corrective actions documented?

( ) Yes ( ) No (●) NA (Please explain) Comments:

There were no corrective actions.

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

Comments:

Data quality and usability is not affected with respect to the case narrative.

5. Samples Results

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

(●) Yes ( ) No ( ) NA (Please explain) Comments:

b. All applicable holding times met?

(●) Yes ( ) No ( ) NA (Please explain) Comments:

c. All soils reported on a dry weight basis?

(●) Yes ( ) No ( ) NA (Please explain) Comments:

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

(●) Yes ( ) No ( ) NA (Please explain) Comments:

Lab report uses LOQ terminology. All PQLs/LOQs were less than or equal to cleanup levels.

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

Comments:

Data quality and usability is not affected with respect to the reported sample results.

6. QC Samples

a. Method Blank

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

(●) Yes ( ) No ( ) NA (Please explain) Comments:

ii. All method blank results less than PQL?

( ) Yes (●) No ( ) NA (Please explain) Comments:

Napthalene was detected in the method blank.

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

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

(●) Yes ( ) No ( ) NA (Please explain) Comments:

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

Data quality and usability is somewhat affected. Refer to QAR for additional details.

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

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

(●) Yes ( ) No ( ) NA (Please explain) Comments:

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

(●) Yes ( ) No ( ) NA (Please explain) Comments:

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

( ) Yes (●) No ( ) NA (Please explain) Comments:

The MS/MSD %R were outside the limits in several PAH 8270-SIM analytes, 8270D, some 8260 analytes and PCB.

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

( ) Yes (●) No ( ) NA (Please explain) Comments:

The MS/MSD RPDs were outside the limits in several PAH 8270-SIM analytes.

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

Comments:

Refer to QAR for samples impacted.

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

(●) Yes ( ) No ( ) NA (Please explain) Comments:

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

Data quality and usability is somewhat affected. Refer to QAR for additional details.

c. Surrogates - Organics Only

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

(●) Yes ( ) No ( ) NA (Please explain) Comments:

ii. Accuracy - All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods 50-150 %R; all other analyses see the laboratory report pages)

( ) Yes (●) No ( ) NA (Please explain) Comments:

2-Fluorobiphenyl surrogate %Rs was above the limits in PAH-SIM for sample 13-NK-05-SO.

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

(●) Yes ( ) No ( ) NA (Please explain) Comments:

All associated results were not detected.

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

Data quality and usability somewhat affected. Refer to QAR for additional information.

d. Trip Blank - Volatile analyses only (GRO, BTEX, Volatile Chlorinated Solvents, etc.): Water and Soil

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

(●) Yes ( ) No ( ) NA (Please explain.) Comments:

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)

(●) Yes ( ) No ( ) NA (Please explain.) Comments:

iii. All results less than PQL?

○ Yes ◉ No ○ NA (Please explain.) Comments:

GRO was present in the trip blank at 0.839 mg/Kg.

iv. If above PQL, what samples are affected?

Comments:

Refer to QAR for samples affected.

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

Comments:

Data quality and usability is somewhat affected. Refer to QAR for additional information.

e. Field Duplicate

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

◉ Yes ○ No ○ NA (Please explain) Comments:

Primary 13-NK-02-SO / duplicate 13-NK-03-SO

ii. Submitted blind to lab?

◉ Yes ○ No ○ NA (Please explain.) Comments:

iii. Precision - All relative percent differences (RPD) less than specified DQOs? (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 ○ NA (Please explain) Comments:

Refer to QAR for analytes that exceeded the ADEC limits.

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

◉ Yes ○ No ○ NA (Please explain) Comments:

Data quality and usability is somewhat affected. Refer to QAR for additional details.

f. Decontamination or Equipment Blank (if applicable)

○ Yes ○ No ◉ NA (Please explain) Comments:

Decontamination and equipment blanks were not required. All sampling equipment was disposable.

i. All results less than PQL?

○ Yes ○ No ◉ NA (Please explain) Comments:

Decontamination and equipment blanks were not required. All sampling equipment was disposable.

ii. If above PQL, what samples are affected?

Comments:

NA. Decontamination and equipment blanks were not required. All sampling equipment was disposable.

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

Comments:

NA. Decontamination and equipment blanks were not required. All sampling equipment was disposable.

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

a. Defined and appropriate?

Comments:

◉ Yes ○ No ○ NA (Please explain)

Refer to laboratory qualifiers section of the lab report.

Reset Form

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APPENDIX G

Conceptual Site Model

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HUMAN HEALTH CONCEPTUAL SITE MODEL GRAPHIC FORM

Site: Former BIA School
Napaskiak, Alaska

Completed By: Lisa Nicholson
Date Completed: November 9, 2011

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

(1)
Check the media that could be directly affected by the release.

(2)
For each medium identified in (1), follow the top arrow and check possible transport mechanisms. Check additional media under (1) if the media acts as a secondary source.

Media / Transport Mechanisms

Media	Transport Mechanisms	
☑ Surface Soil (0-2 ft bgs)	Direct release to surface soil	check soil
	☐ Migration to subsurface	check soil
	☐ Migration to groundwater	check groundwater
	☐ Volatilization	check air
	☐ Runoff or erosion	check surface water
	☐ Uptake by plants or animals	check biota
	☐ Other (list):	
☑ Subsurface Soil (2-15 ft bgs)	Direct release to subsurface soil	check soil
	☐ Migration to groundwater	check groundwater
	☐ Volatilization	check air
	☐ Uptake by plants or animals	check biota
	☐ Other (list):	
☐ Ground-water	Direct release to groundwater	check groundwater
	☐ Volatilization	check air
	☐ Flow to surface water body	check surface water
	☐ Flow to sediment	check sediment
	☐ Uptake by plants or animals	check biota
	☐ Other (list):	
☐ Surface Water	Direct release to surface water	check surface water
	☐ Volatilization	check air
	☐ Sedimentation	check sediment
	☐ Uptake by plants or animals	check biota
	☐ Other (list):	
☐ Sediment	Direct release to sediment	check sediment
	☐ Resuspension, runoff, or erosion	check surface water
	☐ Uptake by plants or animals	check biota
	☐ Other (list):	

(3)
Check all exposure media identified in (2).

(4)
*Check all pathways that could be complete. The pathways identified in this column **must** agree with Sections 2 and 3 of the Human Health CSM Scoping Form.*

(5)
Identify the receptors potentially affected by each exposure pathway: Enter "C" for current receptors, "F" for future receptors, "C/F" for both current and future receptors, or "I" for insignificant exposure.

Exposure Media / Exposure Pathway/Route / Current & Future Receptors

Exposure Media	Exposure Pathway/Route	Residents (adults or children)	Commercial or industrial workers	Site visitors, trespassers, or recreational users	Construction workers	Farmers or subsistence harvesters	Subsistence consumers	Other
☑ soil	☑ Incidental Soil Ingestion	C/F	F	C/F	C/F	C/F	C/F	
	☑ Dermal Absorption of Contaminants from Soil	C/F	F	C/F	C/F	C/F	C/F	
	☐ Inhalation of Fugitive Dust							
☑ groundwater	☑ Ingestion of Groundwater	C/F		C/F				
	☑ Dermal Absorption of Contaminants in Groundwater	C/F			C/F			
	☑ Inhalation of Volatile Compounds in Tap Water	C/F						
☑ air	☑ Inhalation of Outdoor Air	C/F		C/F	C/F	C/F		
	☑ Inhalation of Indoor Air	C/F	C/F	C/F	C/F			
	☐ Inhalation of Fugitive Dust							
☑ surface water	☐ Ingestion of Surface Water							
	☐ Dermal Absorption of Contaminants in Surface Water							
	☐ Inhalation of Volatile Compounds in Tap Water							
☐ sediment	☐ Direct Contact with Sediment							
☑ biota	☑ Ingestion of Wild or Farmed Foods						C/F	

Revised, 10/01/2010

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HUMAN HEALTH CONCEPTUAL SITE MODEL GRAPHIC FORM

Site: Former BIA School
Napaskiak, Alaska

Completed By: Lisa Nicholson
Date Completed: November 9, 2011

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

These exposure pathways were addressed in the top 18" of soil through landfarming

On going monitoring of the water supply will be required to protect these exposure pathways

Potential risk associated with inhalation of outdoor air was addressed through landfarming

Potential risk associated with inhalation of indoor air will be addressed through the proposed construction technique (building on piles creating an air gap)

This exposure pathway was addressed in the top 18" of soil through landfarming

ed in (1), follow the
sible transport
tional media under
secondary source.

Media	Transport Mechanisms	
Su S (0-2	Direct release to surface soil	check soil
		check soil
		check groundwater
		check air
		check surface water
		check biota
	Other (list):	
	Direct release to subsurface soil	check soil
		check groundwater
		check air
		check biota
Ground-water	Direct release to groundwater	check groundwater
	Volatilization	check air
	Flow to surface water body	check surface water
		check sediment
		check biota
Surfac Water		check surface water
		check air
		check sediment
		check biota
	Other (list):	
		check sediment
		check surface water
		check biota
	Other (list):	

(3) *Check all exposure media identified in (2).*

(4) *Check all pathways that could be complete. The pathways identified in this column **must** agree with Sections 2 and 3 of the Human Health CSM Scoping Form.*

(5) *Identify the receptors potentially affected by each exposure pathway: Enter "C" for current receptors, "F" for future receptors, "C/F" for both current and future receptors, or "I" for insignificant exposure.*

Current & Future Receptors

Exposure Media	Exposure Pathway/Route	Residents (adults or children)	Commercial or industrial workers	Site visitors, trespassers, or recreational users	Construction workers	Farmers or subsistence harvesters	Subsistence consumers	Other
☑ soil	☑ Incidental Soil Ingestion	C/F	F	C/F	C/F	C/F	C/F	
	☑ Dermal Absorption of Contaminants from Soil	C/F	F	C/F	C/F	C/F	C/F	
	☐ Inhalation of Fugitive Dust							
☑ groundwater	☑ Ingestion of Groundwater	C/F		C/F				
	☑ Dermal Absorption of Contaminants in Groundwater	C/F			C/F			
	☑ Inhalation of Volatile Compounds in Tap Water	C/F						
☑ air	☑ Inhalation of Outdoor Air	C/F		C/F	C/F	C/F		
	☑ Inhalation of Indoor Air	C/F	C/F	C/F	C/F			
	☐ Inhalation of Fugitive Dust							
☑ surface water	☐ Ingestion of Surface Water							
	☐ Dermal Absorption of Contaminants in Surface Water							
	☐ Inhalation of Volatile Compounds in Tap Water							
☐ sediment	☐ Direct Contact with Sediment							
☑ biota	☑ Ingestion of Wild or Farmed Foods						C/F	

Revised, 10/01/2010

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Print Form

Human Health Conceptual Site Model
Scoping Form

Site Name: Former BIA School, Napaskiak, Alaska

File Number: 2433.38.004

Completed by: Lisa Nicholson, C.P.G.

Introduction

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

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

1. General Information:

Sources *(check potential sources at the site)*

- ☐ USTs
- ☒ ASTs
- ☐ Dispensers/fuel loading racks
- ☐ Drums
- ☐ Vehicles
- ☐ Landfills
- ☐ Transformers
- ☐ Other:

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

- ☒ Spills
- ☒ Leaks
- ☐ Direct discharge
- ☐ Burning
- ☐ Other:

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

- ☒ Surface soil (0-2 feet bgs*)
- ☒ Subsurface soil (>2 feet bgs)
- ☒ Air
- ☐ Sediment
- ☒ Groundwater
- ☐ Surface water
- ☐ Biota
- ☐ Other:

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

- ☒ Residents (adult or child)
- ☒ Commercial or industrial worker
- ☒ Construction worker
- ☒ Subsistence harvester (i.e. gathers wild foods)
- ☒ Subsistence consumer (i.e. eats wild foods)
- ☒ Site visitor
- ☒ Trespasser
- ☐ Recreational user
- ☐ Farmer
- ☐ Other:

* bgs - below ground surface

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

a) Direct Contact -

1. Incidental Soil Ingestion

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

If the box is checked, label this pathway complete: Complete

Comments:

2. Dermal Absorption of Contaminants from Soil

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

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

If both boxes are checked, label this pathway complete: Complete

Comments:

PAHs are present in soil

b) Ingestion -

1. Ingestion of Groundwater

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

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

If both boxes are checked, label this pathway complete: Complete

Comments:

Drinking water well within 550 feet of site

2. Ingestion of Surface Water

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

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

If both boxes are checked, label this pathway complete: Incomplete

Comments:

Napaskiak slough is silty and is not likely to be used for drinking or swimming.

3. Ingestion of Wild and Farmed Foods

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

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

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

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

Comments:

PAH compounds are present in the soil

c) Inhalation-

1. Inhalation of Outdoor Air

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

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

If both boxes are checked, label this pathway complete: Complete

Comments:

2. Inhalation of Indoor Air

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

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

If both boxes are checked, label this pathway complete: Complete

Comments:

Buildings are currently occupied by Napaskiak residents. New school will be built in this area.

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

Dermal Exposure to Contaminants in Groundwater and Surface Water

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

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

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

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

Comments:

Construction workers may be exposed to groundwater.

Inhalation of Volatile Compounds in Tap Water

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

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

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

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

Comments:

Volatile compounds are not present in the groundwater

Inhalation of Fugitive Dust

Inhalation of fugitive dust may be a complete pathway if:

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

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

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

Comments:

Direct Contact with Sediment

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

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

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

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

Comments:

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

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