FINAL - Phase I Environmental Site Assessment and Limited Subsurface Investigation

Vacant Land, Naujaat, NU

NUNAMI
STANTEC LIMITED

Prepared for:
Kivalliq Alternative Energy Ltd.

Prepared by:
Nunami Stantec Limited
P.O. Box 188
Rankin Inlet, NU X0C 0G0

Job No.: 111477087

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Executive Summary

Site Description and Current Operations

Nunami Stantec Limited (Nunami Stantec) conducted a Phase I Environmental Site Assessment (Phase I ESA) and Limited Subsurface Investigation of the property located on a vacant parcel of land in Naujaat, Nunavut, herein referred to as the "Site". The Phase I ESA was conducted for Kivalliq Alternative Energy Ltd. as part of a feasibility study for the development of a utility scale solar energy facility at the Site. The purpose of the Phase I ESA was to assess if evidence of potential or actual environmental contamination exists in connection with the Site, as a result of current or past activities on the Site or neighbouring properties.

The Site is located on the eastern edge of Naujaat, an Inuit hamlet located on the shores of Hudson Bay, at the south end of the Melville Peninsula, in the Kivalliq Region of Nunavut, Canada. It is bounded by vacant, low-lying land, followed by an unnamed road to the north; a ridge followed by a small stream to the east; a garbage dump followed by the sewage lagoon to the south; and waste oil drum/other waste storage to the west, followed by an unnamed road. The Site is currently undeveloped land.

Records Review

Based on the historical information gathered during the Phase I ESA, the Site has been undeveloped land since at least 1969. Scrap metal dumping was occurring on the northern portion of the Site by 1998 but was no longer present by 2006.

The Department of Environment and Natural Resources Database of Hazardous Materials Spills was searched to obtain information for spills occurring on the Site and properties within a 250 m radius of the Site. From the information provided, it appears that five spills have potentially been reported for the Site and/or adjacent properties. These spills represent a potential environmental concern to the Site.

Phase I ESA Site Visit/Interviews

The site visit was conducted by Summer Hull, of Nunami Stantec, on September 22, 2022. The Site and readily visible and publicly accessible portions of adjoining and neighbouring properties were observed for the presence of potential sources of environmental contamination. Nunami Stantec was shown the Site by Mayor Alan Robinson and accompanied during the site visit by Phillip Angotautok, both from the Hamlet of Naujaat. Interviews were carried out to obtain or confirm information on the historical operations and activities on the Site. Mayor Robinson was interviewed during the course of the site visit.

The surfaces of the Site were partially snow-covered at the time of the site visit. A small drainage channel was visible in the northern half of the Site, which was draining to the northwest. Multiple areas of standing water were observed. Scrap metal and domestic waste items were scattered throughout the Site. An approximately 8 m by 10 m stockpile of gravel was also observed, reportedly from road work.

Waste oil drums and soil totes with diesel-impacted soil were being stored along the western edge of the Site, potentially encroaching onto the Site. Current land use south of the Site includes a garbage dump, followed by the Hamlet sewage lagoon. A photograph provided to Nunami Stantec indicates that the Hamlet dumps snow near the northern edge of the Site. Its location could not be confirmed during site interviews; however, it is believed to occur north of the northern boundary of the Site.

Phase I ESA Summary

The Phase I ESA has revealed evidence of potential environmental contamination associated with the Site. The following environmental concerns were identified:

- Historical On-Site Scrap Metal Dump: The former presence of a scrap metal dump, as well as the current remaining scrap metal debris on the Site presents a potential environmental concern.
- Current and Historical Off-Site Garbage Dump: The presence of a garbage dump adjacent to the southern edge of the Site presents a potential environmental concern to the Site.
- Current Off-Site Snow Dumping: Snow dumping activities adjacent to the northern edge of the Site presents a potential environmental concern to the Site.

Executive Summary (continued)

Phase I ESA Summary (continued)

- On- and Off-Site Reported Spills: The historical review indicated that several fuel spills have potentially occurred on the Site or immediately adjacent to the Site. These spills are considered a potential environmental concern to the Site.
- Current and Historical Off-Site Waste Oil and Other Storage: Waste oil drums were observed being stored west of the Site during the site visit. The historical reviews indicated that waste storage has been occurring west of the Site since at least 1989. Based on the close proximity of these activities to the Site, this off-site waste storage presents a potential environmental concern to the Site.

Therefore, Nunami Stantec conducted a Limited Subsurface Investigation.

Limited Subsurface Investigation

Four surface soil samples were collected on the Site at 0.15 m below ground surface and submitted to BV Labs for analysis of benzene, toluene, ethylbenzene (BTEX), petroleum hydrocarbon fractions 1 to 4 (PHC F1 to F4), metals, and polycyclic aromatic hydrocarbons (PAHs).

BTEX, PHC F1 to F4, and PAHs in the four soil samples submitted for laboratory analysis were not detected at concentrations above the laboratory's reportable detection limit (RDL) and were below the applied guidelines. Concentrations of several metals, including barium, chromium and zinc, were measured above the laboratory's RDL; however, these measured concentrations did not exceed the applied guidelines.

Based on the analytical results gathered from the September 22, 2022, limited subsurface investigation, impacts were not identified. Further assessment or remediation is not warranted at this time. Nunami Stantec recommends that remaining on-site scrap metal and domestic waste items be removed and disposed of at an appropriate off-site location.

The statements made in this Executive Summary are subject to the same limitations included in the Closure (Section 12.0) and are to be read in conjunction with the remainder of this report.

1.0 General Information

Client Information:
Kivalliq Alternative Energy Ltd.

12-71 Nuvua Street, PO Box 188
Rankin Inlet, NU X0C 0G0

Project Information:
Naujaat Solar Energy Storage Project, Hamlet of Naujaat, Nunavut
111477087

Site Information:
Naujaat Solar Energy Storage Project
Vacant Land
Naujaat, NU

Consultant Information:
Nunami Stantec Limited
P.O. Box 188
Rankin Inlet, NU X0C 0G0

Phone: (204) 918-4150
E-mail Address: summer.hull@stantec.com
Site Visit Date: 09/22/2022
Report Date: December 5, 2022
Site Assessor: Summer Hull, B.Env.Sc.
Report Preparer: Summer Hull, B.Env.Sc.
Senior Reviewer: Evelyn Bostwick, M.Eng., P.Eng.

Site Assessor:

Summer Hull, B.Env.Sc.
Environmental Site Assessor

Report Preparer:

Summer Hull, B.Env.Sc.
Environmental Site Assessor

Senior Reviewer:

Evelyn Bostwick, M.Eng., P.Eng.
Principal

2.0 Introduction

2.1 Objectives

Nunami Stantec Limited (Nunami Stantec) conducted a Phase I Environmental Site Assessment (Phase I ESA) and Limited Subsurface Investigation of the property located on a vacant parcel of land in Naujaat, Nunavut, herein referred to as the "Site". The Phase I ESA was conducted for Kivalliq Alternative Energy Ltd. as part of a feasibility study for the development of a utility scale solar energy facility at the Site. The purpose of the Phase I ESA was to assess if evidence of potential or actual environmental contamination exists in connection with the Site, as a result of current or past activities on the Site or neighbouring properties.

Sections 3.0 to 6.0 provide details on the scope and results of the Phase I ESA. Sections 7.0 to 11.0 present the details on the objectives, scope, methodologies and results of the Limited Subsurface Investigation.

A site plan is included in **Appendix A** and selected photographs of the Site are included in **Appendix B**.

2.2 Scope of Work

The Phase I ESA carried out by Nunami Stantec on this Site was conducted in general accordance with Nunami Stantec's proposal number 925115 dated August 22, 2022, and the Canadian Standards Association's (CSA) *Phase I Environmental Site Assessment* Standard Z768-01 (R2022). The Phase I ESA consisted of the following:

- Records review including, but not limited to, publicly available city directories, aerial photographs, fire insurance plans, geological and topographic maps.
- Territorial government regulatory search.
- Review of available environmental databases and records.
- Review of previous environmental reports and existing title searches, if made available.
- Interviews with persons having knowledge of the Site.
- A site visit.
- Evaluation of information and preparation of the report provided herein.

A Phase I ESA does not include sampling or testing of air, soil, groundwater, surface water or building materials. For this Phase I ESA, no enhancements to the CSA standard were made, however, a Limited Subsurface Investigation was completed.

This assessment did not include a review or audit of operational environmental compliance issues, or of any environmental management systems, which may exist for the Site.

The assessment of the Site for the potential presence of hazardous building materials was not completed, as there were no buildings on the property at the time of the site visit. No sampling of materials was conducted. A Phase I ESA does not constitute a Hazardous Materials Survey or Designated Substances Survey.

The assessment of the Site for microbial contamination and moisture damage was not completed, as there were no buildings on the property at the time of the site visit. No sampling or intrusive investigation was conducted.

The professional qualifications of the project team are provided in **Appendix C**.

The site visit was conducted by Summer Hull, B.Env.Sc, of Nunami Stantec, on September 22, 2022. The Site and readily visible and publicly accessible portions of adjoining and neighbouring properties were observed for the presence of potential sources of environmental contamination. The Site was partially snow-covered at the time of the site visit. Nunami Stantec was shown the Site by Mayor Alan Robinson and accompanied during the site visit by Phillip Angotautok, both from the Hamlet of Naujaat. Mayor Robinson has been associated with the Site since 1987, and Mr. Angotautok has been in the community since 2008.

Interviews were carried out to obtain or confirm information on the historical operations and activities on the Site. Mayor Robinson was interviewed during the course of the site visit.

2.0 Introduction (continued)

2.3 Regulatory Framework

During a Phase I ESA samples are not collected; however, if there are previous soil or groundwater sample results available, the results are compared to applicable federal and territorial regulations and guidelines. For this Enhanced Phase I ESA, a limited subsurface investigation was conducted, which included soil sampling and analysis (refer to Sections 7.0 to 11.0).

The management and investigation of contaminated sites in Nunavut is regulated under the *Environmental Guideline for the Management of Contaminated Sites* (April 1999, revised December 2014) by the Department of Environment, Government of Nunavut (GN). The federal government has jurisdiction over surface water and groundwater, and these bodies use a combination of criteria from the Canadian Council of Ministers of the Environment (CCME) and other regulatory jurisdictions. The territorial Environmental Protection Act (EPA) gives the GN, under the Minister of the Department of Environment, the authority to ensure protection of the environment pertaining to the release of substances in any amount that causes or may cause a significant adverse effect. When a release occurs, the release must be reported to the Department of Environment and remedial measures must be implemented. The EPA authorizes the Department of Environment to issue Closure reports when contaminated land has been remediated.

A Phase I ESA involves a review of any site buildings for the potential presence of hazardous materials related to building components and materials. Specific federal or provincial regulations, guidelines or codes of practice exist for these individual hazardous materials. Where required, this documentation was utilized to determine appropriate conclusions and formulate appropriate recommendations.

3.0 Records Review

3.1 Information Sources

The applicable search distance for the records review included the Site, properties immediately adjoining the Site and other neighbouring properties where activities considered to be potential sources of environmental contamination were apparent. Information sources obtained and reviewed as part of the records review are listed below.

SOURCE	INFORMATION/CONTACT
Aerial Photographs	Natural Resources Canada, National Air Photo Library: 1969, 1978, 1989 and 1998. Google Earth imagery: 2006, 2017 and 2021.
Fire Insurance Plans	No fire insurance plans were available for the Site and surrounding area.
City Directories	No city directories were available for the Site and surrounding area.
Previous Environmental Reports	No previous reports for the Site were made available.
Company Records	No company records for the Site were made available.
Geological and Geotechnical Reports	Geological Survey of Canada. 1994. "A" Series Map 1850A https://doi.org/10.4095/203636 The Geological Survey of Canada, Department of Mines and Technical Surveys. 1956. Bedrock Geology Map: 1:10,000,000. https://ftp.geogratis.gc.ca/pub/nrcan_rncan/raster/atlas_3_ed/eng/environment/land/016.jpg.
Reportable Spill Occurrences	Nunavut Department of Environment and Natural Resources, Hazardous Materials Spill Database; Environmental Risk Information Services (ERIS) Report.

3.2 Previous Reports

No previous reports were made available to Nunami Stantec. It is understood that none are available.

3.3 Regulatory Information

Available environmental databases and records were searched to determine if pertinent environmental records for the Site, adjacent, or neighbouring properties were available.

Environmental Risk Information Services (ERIS)

An ERIS database report was ordered for spill records at the Site and surrounding properties only, as it would not typically return any records for other databases. No records were found for the Site or surrounding properties. A copy of the report is included in **Appendix D**.

Department of Environment and Natural Resources

The Department of Environment and Natural Resources Database of Hazardous Materials Spills was searched to obtain information for spills occurring on the Site and properties within a 250 m radius of the Site. Spill records

3.0 Records Review (continued)

3.3 Regulatory Information (continued)

were available and accessed online. A total of 73 records dated between 1978 and 2022 were located in the Hamlet of Naujaat (formerly Repulse Bay), many of which did not include a specific location within the Hamlet. From the information provided, it appears that five spills have potentially been reported for the Site and nearby properties. Locations for these records are variously named "municipal dump", "community dump", Hamlet dump", "dump" and "metal dump site". It is unknown whether these pertain to the Site and adjacent land south of the Site or other such dump sites, and no geo-location was provided. A copy of the spill report database is included in **Appendix D**. The following is a summary of pertinent information retrieved from the spills database.

- Spill report 2000238 occurred on August 22, 2000, at the municipal dump. An unknown quantity of diesel P-50 leaked from a storage tank with a volume of <4,000 litres.
- Spill report 1991180 occurred on Sept 18, 1991, at the community dump. An unknown quantity of used oil leaked from a storage tank with a volume of <4,000 litres.
- Spill report 1993072 occurred on May 20, 1993, at the Hamlet Dump. 615 litres of used oil leaked from a storage tank with a volume of <4,000 litres.
- Spill report 1993074 occurred on May 26, 1993, adjacent to the dump. 40 litres of ammonium nitrate leaked from a truck.
- Spill report 1999124 occurred on September 29, 1999, at the metal dump site. 207 litres of used oil leaked from a drum or barrel.

Since these spill records may refer to the Site or property adjacent to the Site, they represent a potential environmental concern to the Site.

3.4 Physical Setting

3.4.1 Surficial Geology

Based on an available surficial geology map, the native surficial soils of the Site consist of offshore and sub-littoral deposits: stratified sand and silt with few ice rafted boulders and dropstones, in some places gravelly near the surface; sparsely fossiliferous. Blanket deposits, 1-10 m thick, form plains, extensively covered by mudboils.

A site-specific determination would be required to obtain detailed soil profile and permeability information.

3.4.2 Surface Water Drainage

The surfaces of the Site consist of peat, sand, gravel, and low vegetation. The Site was partially snow-covered at the time of the site visit. Multiple low-lying areas had ponded water. Stormwater is anticipated to drain by infiltration and/or overland flow, which was observed to be travelling in a northwesterly direction.

3.4.3 Topography and Regional Drainage

The Site is situated in a relatively flat, low-lying area of the Hamlet of Naujaat. Based on an available topographic map and the observed site topography, regional surface drainage (anticipated shallow groundwater flow direction) appears to be to the southeast towards an inlet approximately 110 m from the Site, which drains to Repulse Bay.

It should be noted that the direction of the shallow groundwater flow in limited areas can also be influenced by the presence of underground utility corridors and is not necessarily a reflection of regional or local groundwater flow or a replica of the Site or area topography.

3.0 Records Review (continued)

3.4 Physical Setting (continued)

3.4.4 Bedrock Geology

Based on an available bedrock geology map, bedrock in the area of the Site consists of Archean and/or Proterozoic intrusive rocks - mainly acid rocks: granodiorite, granite, quartz diorite; granite gneiss. It includes a large amount of granitized sedimentary and volcanic rock.

4.0 Site Description

4.1 Property Information

The Site is located on the eastern edge of Naujaat, an Inuit hamlet located on the shores of Hudson Bay, at the south end of the Melville Peninsula, in the Kivalliq Region of Nunavut, Canada. It is bounded by vacant, low-lying land, followed by an unnamed road to the north; a ridge followed by a small stream to the east; a garbage dump followed by the sewage lagoon to the south; and waste oil drum/other waste storage to the west, followed by an unnamed road. The Site is currently undeveloped land.

Current Site Owner:	Repulse Bay Inuit Owned Land (Nunavut Lands Claims Agreement)
Legal Description:	Land not surveyed: no legal description assigned
Property Area:	Approximately 3.22 hectares
Utility Providers:	
Water:	Site not serviced
Storm and Sanitary Sewers:	Site not serviced
Electricity:	Site not serviced
Natural Gas:	Site not serviced

4.2 On-Site Buildings and Structures

The Site is currently undeveloped land with no buildings or structures present.

4.3 Historical Land Use

Historical land use for the Site was determined through historical records listed in Section 3.1 (aerial photographs). A summary of the historical information is presented below. Aerial photographs are included in **Appendix D.**

Period/Date:	Land Use:
1969	The Site and surrounding area are undeveloped. Several low-lying areas are present throughout the northern portion.
1978	The Site remains undeveloped; however, a trail is entering its centre from the west side. Roads have been developed north and west of the Site and clearing/disturbances are present to the south and west.
1989	The Site remains undeveloped. Storage/disposal is occurring along the western edge of the Site. Surrounding land remains unchanged from the previous photograph.
1998	Scrap metal dumping is occurring in the northern half of the Site. Surrounding land remains unchanged from the previous photograph.
2006	The scrap metal storage on the Site is no longer present. A ridge has been formed at the southwest corner of the Site. The sewage pump out for the sewage lagoon is present south of the Site, as is waste storage.
2017	Sea cans are present west of the Site, across the unnamed road. The Site and surrounding area are otherwise largely unchanged.
2021	Small waste piles are present in the southern portion of the Site. Surrounding land remains largely unchanged from the previous photograph.

5.0 Site Visit Findings

5.1 Current Site Operations

The Site is currently undeveloped land.

5.2 Waste Generation and Storage

5.2.1 Solid and Liquid Wastes

No hazardous waste generation was identified to be conducted on the Site. Waste oil drums and soil totes with diesel-impacted soil were being stored along the western edge of the Site, potentially encroaching onto the Site.

The Request for Fee Proposal included several photographs of the Site. One photograph indicates that the Hamlet dumps snow near the northern edge of the Site. Its location could not be confirmed during site interviews; however, it is believed to occur north of the northern boundary of the Site.

5.2.2 Drains, Sumps, Septic Systems and Oil Water Separators

No floor drains, sumps, septic systems, interceptors, or separators were identified on the Site.

5.2.3 Air Discharges and Odours

No sources of air emissions that are suspected to result in residual contamination to the property were identified on the Site. Odours from the neighbouring sewage lagoon to the south of the Site were noted during the site visit.

5.3 Fuel and Chemical Storage

5.3.1 Underground Storage Tanks (USTs)

No chemical or fuel storage USTs were identified on the Site. Further, no vent or fill pipes indicating the potential presence of an abandoned or decommissioned UST were observed.

5.3.2 Aboveground Storage Tanks (ASTs)

No chemical or fuel storage ASTs were identified on the Site.

5.3.3 Other Storage Containers

No other storage containers were observed on the Site at the time of the site visit.

5.4 Building Systems/Equipment

5.4.1 Heating and Cooling Systems

No heating or cooling systems are on the Site, as the Site is undeveloped.

5.4.2 Hydraulic Equipment

No hydraulic equipment is on the Site, as the Site is undeveloped.

5.0 Site Visit Findings (continued)

5.5 Exterior Site Observations

5.5.1 Surface Features

The surfaces of the Site were partially snow-covered at the time of the site visit. No stained surficial materials or stressed vegetation was observed on the surfaces of the Site that were visible. No pits, lagoons or ditches were identified on the Site. A small drainage channel was visible in the northern half of the Site, which appeared to be draining to the northwest. Multiple areas of standing water were observed. Scrap metal and domestic waste items were scattered throughout the Site. An approximately 8 m by 10 m stockpile of gravel was also observed.

5.5.2 Fill Materials

A stockpile of gravel was noted on the Site, reportedly from road work. Additionally, a ridge, likely made up of local materials, was developed in the southern portion of the Site by at least 2006. No evidence of a large quantity of imported fill materials was observed. The Site generally appears to be at grade with the adjacent roadways and adjoining properties. Therefore, it is unlikely that significant quantities of fill materials were brought onto the Site.

5.5.3 Wells

No abandoned or existing wells (water, oil, gas or disposal) were identified on the Site.

5.6 Hazardous Building Materials

5.6.1 Asbestos-Containing Materials (ACMs)

The common use of friable (crumbles easily by hand pressure) asbestos-containing materials (ACMs) in construction generally ceased voluntarily in the mid to late 1970s. Non-friable asbestos-containing products continued to be manufactured, imported and used in Canada until asbestos products were formally banned in December 2018. Asbestos was used in thousands of building products and the common uses of friable ACMs included boiler and pipe insulation, and spray-on fireproofing. Asbestos was also used in many manufactured products such as floor tiles, ceiling tiles, transite cement products and various other construction materials. Vermiculite used as insulation may be contaminated with asbestos fibres.

As the Site is undeveloped, no suspected ACMs were identified on the Site during the site visit.

5.6.2 Polychlorinated Biphenyls (PCBs)

From the 1930s to the 1970s, PCBs were widely used as coolants and lubricants for electrical equipment, including transformers and capacitors, and in a number of industrial materials, including sealing and caulking compounds, inks and paint additives. The use of PCBs was prohibited in heat transfer and electrical equipment installed after September 1, 1977, and in transformers and capacitors installed after July 1, 1980. Regulations now require that PCB-containing equipment be taken out of service prior to regulated deadlines.

As the Site is undeveloped, no electrical equipment with the potential to contain PCBs was identified on the Site.

5.6.3 Lead-Based Materials

In 1976, the lead content in interior paint was limited to 0.5% by weight under the federal Hazardous Products Act. Lead based water supply pipes were used greater than 50 years ago. Between 1930 and 1986, most buildings used copper pipe with lead-solder joints. Other lead-based products include wall shielding (x-ray rooms).

As the Site is undeveloped, no lead-based materials were identified on the Site.

5.0 Site Visit Findings (continued)

5.6 Hazardous Building Materials (continued)

5.6.4 Urea Formaldehyde Foam Insulation (UFFI)

Urea Formaldehyde Foam Insulation (UFFI) was used as an insulation product for existing houses between the mid-1970s and its ban in Canada in 1980. It was not commonly used for commercial or industrial buildings.

As the Site is undeveloped, no UFFI was identified on the Site.

5.6.5 Ozone-Depleting Substances (ODSs)

Refrigeration and air conditioning equipment in place before 1998 may contain refrigerants containing ODSs. Non-ODS refrigerants have been developed and are available to replace these materials in newer equipment.

As the Site is undeveloped, no equipment containing ODSs was identified on the Site.

5.7 Special Attention Items

5.7.1 Radon Gas

Radon is a radioactive gas associated with uranium rich black shale and/or granite bedrock. Radon emits alpha particles and produces several solid radioactive products called radon daughters. Harmful levels of radon and radon daughters can accumulate in confined air spaces, such as basements and crawl spaces.

There are insufficient existing data available to make an accurate assessment of the potential for radon gas issues at this Site. Such conditions would have to be determined by the completion of a study which is beyond the scope of work of this project. However, as there are no buildings on the Site, radon gas accumulation is not currently considered an environmental concern at the Site.

5.7.2 Microbial Contamination (Mold) and Indoor Air Quality

The growth of mould in indoor environments is typically due to a moisture problem related to building envelope or mechanical systems deficiencies or design, and can produce adverse health effects. There is no practical way to eliminate all mould and mould spores in the indoor environment. The way to control mould is to control moisture.

No visual evidence of suspected indoor mould growth was observed on the Site, at the time of the site visit, as no buildings or structures exist.

5.7.3 Electromagnetic Frequencies (EMFs)

Electrical currents induce electromagnetic fields. No scientific data supports definitive answers to questions about the existence or non-existence of health risks related to electromagnetic fields.

No high-voltage transmission lines or electrical substations, which could generate significant electromagnetic fields, were identified on or adjacent to the Site.

5.7.4 Noise and Vibration

The effects of noise and vibration on human health vary according to the susceptibility of the individual exposed, the nature of the noise/vibration and whether exposure occurs in the working environment or in the home.

No major or persistent sources of noise and vibration were identified on the Site at the time of the site visit.

5.0 Site Visit Findings (continued)

5.8 Adjoining Property Information

The current activities on neighbouring properties observed at the time of the site visit and a summary of historical information gathered through the records review are presented in the following sections.

Direction From Site:	Relation to Property:	Current Use:	Across What
North	Adjacent	Undeveloped	Site boundary
Occupant Name:		**Address:**	
N/A		N/A	
Current Activities:			
Surrounding properties north of the Site are undeveloped. The Hamlet reportedly dumps snow near the northern edge of the Site. Its location could not be confirmed during site interviews; however, it is believed to occur north of the northern boundary of the Site.			
Historical Activities			
Based on available historical aerial photographs, the land north of the Site has been undeveloped since at least 1969. The unnamed road has been present since at least 1978.			
Potential Environmental Concerns:			
Snow dumping activities north of the Site present a potential environmental concern to the Site.			

Direction From Site:	Relation to Property:	Current Use:	Across What
East	Adjacent	Undeveloped	Site boundary
Occupant Name:		**Address:**	
N/A		N/A	
Current Activities:			
Surrounding properties east of the Site are undeveloped.			
Historical Activities			
Based on available historical aerial photographs, the land east of the Site has been undeveloped since at least 1969.			
Potential Environmental Concerns:			
None of the properties to the east of the Site appear to represent a potential environmental concern to the Site.			

Direction From Site:	Relation to Property:	Current Use:	Across What
South	Adjacent	Garbage dump; sewage lagoon	Site boundary
Occupant Name:		**Address:**	
N/A		N/A	
Current Activities:			
Current land use south of the Site includes a garbage dump, followed by the Hamlet sewage lagoon.			
Historical Activities			
An area of disturbance has been present south of the Site since at least 1978. By 2006, the sewage pump out for the sewage lagoon was present south of the Site, as was the garbage dump.			
Potential Environmental Concerns:			
Based on its distance and downgradient location from the Site, the sewage lagoon does not appear to represent a potential environmental concern to the Site. Based on its close proximity to the Site, the adjacent garbage dump presents a potential environmental concern.			

Direction From Site:	Relation to Property:	Current Use:	Across What
West	Adjacent; Neighbouring	Waste oil drum and diesel-impacted soil tote storage; construction material storage	Site boundary; unnamed road
Occupant Name:		**Address:**	
N/A		N/A	
Current Activities:			
Surrounding properties west of the Site include waste oil drum and other waste storage, followed by an unnamed road and construction material storage. According to the site contact, multiple drums and totes had already been removed from this area, and the remainder would be removed in short order.			

5.0 Site Visit Findings (continued)

5.8 Adjoining Property Information (continued)

Historical Activities
The unnamed road and an area of clearing/disturbance have been present west of the Site since at least 1978. Storage/disposal was occurring along the western edge of the Site since at least 1989. By 2017, sea cans were present west of the Site, across the unnamed road. They reportedly store construction materials.
Potential Environmental Concerns:
Based on its close proximity to the Site, current and historical waste oil storage adjacent to the western edge of the Site represents a potential environmental concern to the Site.

5.9 Client-Specific Items

To assess for potential environmental impacts at the Site, Nunami Stantec conducted a Limited Subsurface Investigation. Sections 7.0 to 11.0 present details on the scope, objectives, methodology and results of the investigation.

6.0 Phase I ESA Conclusions

The Phase I ESA has revealed evidence of potential environmental contamination associated with the Site. The following environmental concerns were identified:

- Historical On-Site Scrap Metal Dump: The former presence of a scrap metal dump, as well as the current remaining scrap metal debris on the Site presents a potential environmental concern.
- Current and Historical Off-Site Garbage Dump: The presence of a garbage dump adjacent to the southern edge of the Site presents a potential environmental concern to the Site.
- Current Off-Site Snow Dumping: Snow dumping activities adjacent to the northern edge of the Site presents a potential environmental concern to the Site.
- On- and Off-Site Reported Spills: The historical review indicated that several fuel spills have potentially occurred on the Site or immediately adjacent to the Site. These spills are considered a potential environmental concern to the Site.
- Current and Historical Off-Site Waste Oil and Other Storage: Waste oil drums were being stored west of the Site during the site visit. The historical reviews indicated that waste storage has been occurring west of the Site since at least 1989. Based on the close proximity of these activities to the Site, this off-site waste storage presents a potential environmental concern to the Site.

Therefore, Nunami Stantec conducted a Limited Subsurface Investigation (refer to the following Sections 7.0 to 11.0).

LIMITED SUBSURFACE INVESTIGATION

7.0 Objective

The objective of the Limited Subsurface Investigation was to assess soil quality with respect to potential environmental concerns identified in the Phase I ESA. The following provides a summary of the scope of work:

- Preparation of an HSSE plan with appropriate COVID-19 mitigations to maintain physical distancing.
- Attendance at the Site by environmental personnel to complete visual assessment of Site features, including areas of staining, and to layout sample locations.
- Collection of four shallow soil samples in areas of potential concern.
- Submission of soil samples for grain size analysis for guideline determination.
- Submission of soil samples to an accredited laboratory for analysis of potential contaminants of concern (PCOCs) including benzene, toluene, ethylbenzene (BTEX), petroleum hydrocarbon fractions 1 to 4 (PHC F1 to F4), metals, and polycyclic aromatic hydrocarbons (PAHs).

8.0 Selection of Appropriate Generic Standards

The GN's *Environmental Guideline for Contaminated Site Remediation* (April 1999, revised March 2009) incorporates the Canadian Council of Ministers of the Environment (CCME) Canada Wide Standards for Petroleum Hydrocarbon Contamination. These guidelines allow three management options for PHCs: Tier 1, Tier 2 and Tier 3. Remediation of a site under a Tier 1 involves the direct adoption of remediation criteria. Tier 2 allows for the consideration of site-specific conditions through the modification of the criteria-based (Tier 1) guidelines. Tier 3 involves the use of risk assessment, which involves risk management through exposure barriers or administrative controls based on site-specific risk assessment. Utilization of any of the three approaches is subject to the approval of the Department of Environment.

The guidelines presented in this document are for soil only. Where available, Tier I guidelines for a site with commercial land use and coarse-grained soil have been applied. Part of the Site is reportedly zoned industrial; however, the remainder of the Site zoning could not be confirmed. Therefore, the more stringent commercial guidelines were applied. Where no GN guidelines are available, the CCME Canadian Soil Quality Guidelines have been referenced (largely for PAHs).

Herein, these soil guidelines are referred to as "the applied guidelines".

9.0 Investigation Methodology

The Limited Subsurface Investigation carried out by Nunami Stantec on this property was conducted in general accordance with CSA's Phase II Environmental Site Assessment Standard Z769-00 (R2018) and Nunami Stantec's standard operating procedures (SOPs).

Service and Utilities Locates - The Hamlet confirmed there were no underground utilities on the Site prior to the advancement of the surface soil samples.

Surface sampling - Surface soil samples were collected manually with a trowel. To limit cross contamination, the trowel was cleaned using a solution of water and biodegradable soap and rinsed with water after each sample collection. A new pair of nitrile gloves was worn by the sampler for each sample collection and samples were placed in laboratory supplied glass jars for laboratory analysis.

Quality Assurance/ Quality Control - All samples were collected following Nunami Stantec's SOPs. Samples were uniquely labelled and control was maintained through the use of chain of custody forms. All samples were collected in laboratory supplied containers and preserved in insulated coolers.

9.1 Surface Soil Samples

Surface soil samples were collected at 0.15 m below ground surface (bgs). Sampling locations are shown on Figure 3, **Appendix A**. The rationale for each location is as follows:

- SS-01 - Surface sample collected to evaluate adjacent garbage dump to the south and adjacent waste oil drum storage to the west, which appears to have encroached on the Site. Represents approximate southern property boundary.
- SS-02 - Surface sample collected to evaluate adjacent waste oil drum storage to the west. Represents approximate western property boundary.
- SS-03 - Surface sample collected to evaluate historical scrap metal dump, as well as the current remaining scrap metal debris on the Site. Represents approximate centre of property.
- SS-04 - Surface sample collected to evaluate historical scrap metal dump, as well as the current remaining scrap metal debris on the Site. It was also collected to evaluate snow dumping activities north of the Site. Represents approximate western property boundary as well as the northern portion of the Site.

9.2 Laboratory Analysis

Four surface soil samples were submitted to BV Labs for BTEX, PHC F1 to F4, metals, and PAH analysis.

10.0 Results of the Investigation

10.1 Stratigraphy

Four surface soil samples (SS-01 to SS-04) were collected on the Site as part of the Limited Subsurface Investigation conducted on September 22, 2022. The Site is largely surfaced by peat and low-lying vegetation, underlain by sand and silt to the maximum investigated depth of 0.15 m bgs.

10.2 Groundwater

Groundwater/active zone water sampling and analysis was not part of the investigation.

10.3 Subsurface Vapour Readings

Headspace soil vapours (i.e., total organic vapours [TOVs] and combustible vapour [CV] concentrations) were not measured during the completion of the field program.

10.4 Laboratory Analytical Results

Soil analytical results are provided in Table 1, **Appendix E**. A copy of the laboratory certificate of analysis (which includes the grain size results) is also provided in **Appendix E**.

10.4.1 Soil

BTEX, PHC F1 to F4, and PAHs in the four soil samples submitted for laboratory analysis were not detected at concentrations above the laboratory's reportable detection limits (RDLs) and were below the applied guidelines. Concentrations of several metals, including barium, chromium and zinc, were measured above the laboratory's RDLs; however, these measured concentrations did not exceed the applied guidelines.

10.4.2 Groundwater

No groundwater/active zone water samples were collected or submitted for laboratory analysis.

11.0 Summary

Nunami Stantec completed a Limited Subsurface Investigation at the Site to assess potential environmental concerns identified by the Phase I ESA. The Limited Subsurface Investigation consisted of soil sampling and analysis.

11.1 Quality Assurance/Quality Control (QA/QC) Results

A QA/QC program was conducted to assess data reliability. Soil samples were collected in general accordance with Nunami Stantec's SOPs, were uniquely labelled, and control was maintained using chain-of-custody procedures. The location, sample type, sample name and the sample location where each sample was collected is summarized in Table 1 in **Appendix E**. The data quality objective (DQO) of the QA/QC program was to collect data that were reproducible, complete, and suitable for comparison with the applied guidelines.

11.1.1 Sample Containers

Samples were collected in the laboratory-provided sample containers and appropriately preserved according to the parameters analyzed.

11.1.2 Temperature

Sample temperatures were recorded upon arrival at the laboratory by measuring up to three random sample container temperatures and calculating the average result to obtain a representative temperature. The ideal temperature should be approximately 4C. Samples that arrive at the laboratory with temperatures measured above 4C may have reported concentrations that are biased low as a result of the elevated sample temperatures. Although it is ideal to have sample temperatures below 4C, BV Labs has noted the difficulty in maintaining samples below 4C. As such, BV Labs considers a temperature range of 4C to 10C as acceptable.

Submitted samples were measured by BV Labs to be 6.8C, and as such were within the acceptable temperature range.

11.1.3 Sample Hold Times

A review of sample hold times indicated that the samples were submitted within the recommended hold times for the parameters analyzed.

11.1.4 Laboratory QA/QC

In addition to the Nunami Stantec QA/QC procedures, the laboratory analyzes and assesses method blanks, method spikes, and surrogate recoveries to monitor data quality. These results were considered acceptable and are presented as part of laboratory certificates of analysis in **Appendix E**.

11.1.5 QA/QC Summary

Based on the results of the assessment above, the DQO was considered to have been met and the data were considered valid.

11.2 Discussion and Recommendations

Based on the analytical results gathered from the September 22, 2022, Limited Subsurface Investigation, impacts were not identified. Further assessment or remediation is not warranted at this time. Nunami Stantec recommends that remaining on-site scrap metal and domestic waste items be removed and disposed of at an appropriate off-site location.

12.0 Closure

This report documents work that was performed in accordance with generally accepted professional standards at the time and location in which the services were provided. No other representations, warranties or guarantees are made concerning the accuracy or completeness of the data or conclusions contained within this report, including no assurance that this work has uncovered all potential liabilities associated with the identified property.

This report provides an evaluation of selected environmental conditions associated with the identified portion of the property that was assessed at the time the work was conducted and is based on information obtained by and/or provided to Nunami Stantec at that time. There are no assurances regarding the accuracy and completeness of this information. All information received from the client or third parties in the preparation of this report has been assumed by Nunami Stantec to be correct. Nunami Stantec assumes no responsibility for any deficiency or inaccuracy in information received from others.

The opinions in this report can only be relied upon as they relate to the condition of the portion of the identified property that was assessed at the time the work was conducted. Activities at the property subsequent to Nunami Stantec's assessment may have significantly altered the property's condition. Nunami Stantec cannot comment on other areas of the property that were not assessed.

Conclusions made within this report consist of Nunami Stantec's professional opinion as of the time of the writing of this report and are based solely on the scope of work described in the report, the limited data available and the results of the work. They are not a certification of the property's environmental condition. This report should not be construed as legal advice.

This report has been prepared for the exclusive use of the client identified herein and any use by any third party is prohibited. Nunami Stantec assumes no responsibility for losses, damages, liabilities or claims, howsoever arising, from third party use of this report.

This report is limited by the following:

- *Historical records of the Site were not made available to Nunami Stantec.*
- *The ground was partially snow-covered at the time of the site visit.*
- *Stantec only spent a limited amount of time at the Site.*
- *Stantec completed surface soil sampling at a limited number of locations. Vertical and horizontal delineation may not have been obtained.*
- *Stantec collected a limited number of analytical samples for only the analytical parameters indicated.*

The locations of any utilities, buildings and structures, and property boundaries illustrated in or described within this report, if any, including pole lines, conduits, water mains, sewers and other surface or sub-surface utilities and structures are not guaranteed. Before starting work, the exact location of all such utilities and structures should be confirmed and Nunami Stantec assumes no liability for damage to them.

The conclusions are based on the site conditions encountered by Nunami Stantec at the time the work was performed at the specific testing and/or sampling locations, and conditions may vary among sampling locations. Factors such as areas of potential concern identified in previous studies, site conditions (e.g., utilities) and cost may have constrained the sampling locations used in this assessment. In addition, analysis has been carried out for only a limited number of chemical parameters, and it should not be inferred that other chemical species are not present. Due to the nature of the investigation and the limited data available, Nunami Stantec does not warrant against undiscovered environmental liabilities nor that the sampling results are indicative of the condition of the entire site. As the purpose of this report is to identify site conditions which may pose an environmental risk; the identification of non-environmental risks to structures or people on the site is beyond the scope of this assessment.

Should additional information become available which differs significantly from our understanding of conditions presented in this report, Nunami Stantec specifically disclaims any responsibility to update the conclusions in this report.

This report was prepared by Summer Hull and reviewed by Evelyn Bostwick.

Appendix A

Site Plans

Legend

Site Location

0 10 20 km

(At original document size of 8.5x11)
1:1,000,000

N

Stantec

Project Location
Naujaat,
Nunavut

Prepared by ADC on 2022-10-14
Review by SH on 2022-10-14

Client/Project 111477087
Kivalliq Alternative Energy Ltd.
Vacant Land, Hamlet of Naujaat, Nunavut

Figure No.
1

Title
Site Location

Notes
1. Coordinate System: NAD 1983 UTM Zone 16N
2. Data Sources: Government of Nunavut, Government of Canada
3. Background: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

3. Aerial Imagery: Microsoft product screenshot reprinted with permission from Microsoft Corp.

G:\ GIS Project Folder\111477087 Naujaat NUVArcMaps\111477087_001_Site Location_REVA_20221013.mxd Revised: 2022-10-14 By: acampigiotto

Legend

Approximate Site Boundary

0 100 200 Metres

(At original document size of 8.5x11)
1:10,000

N

Stantec

Project Location
Naujaat,
Nunavut

Prepared by ADC on 2022-10-21
Review by SH on 2022-10-21

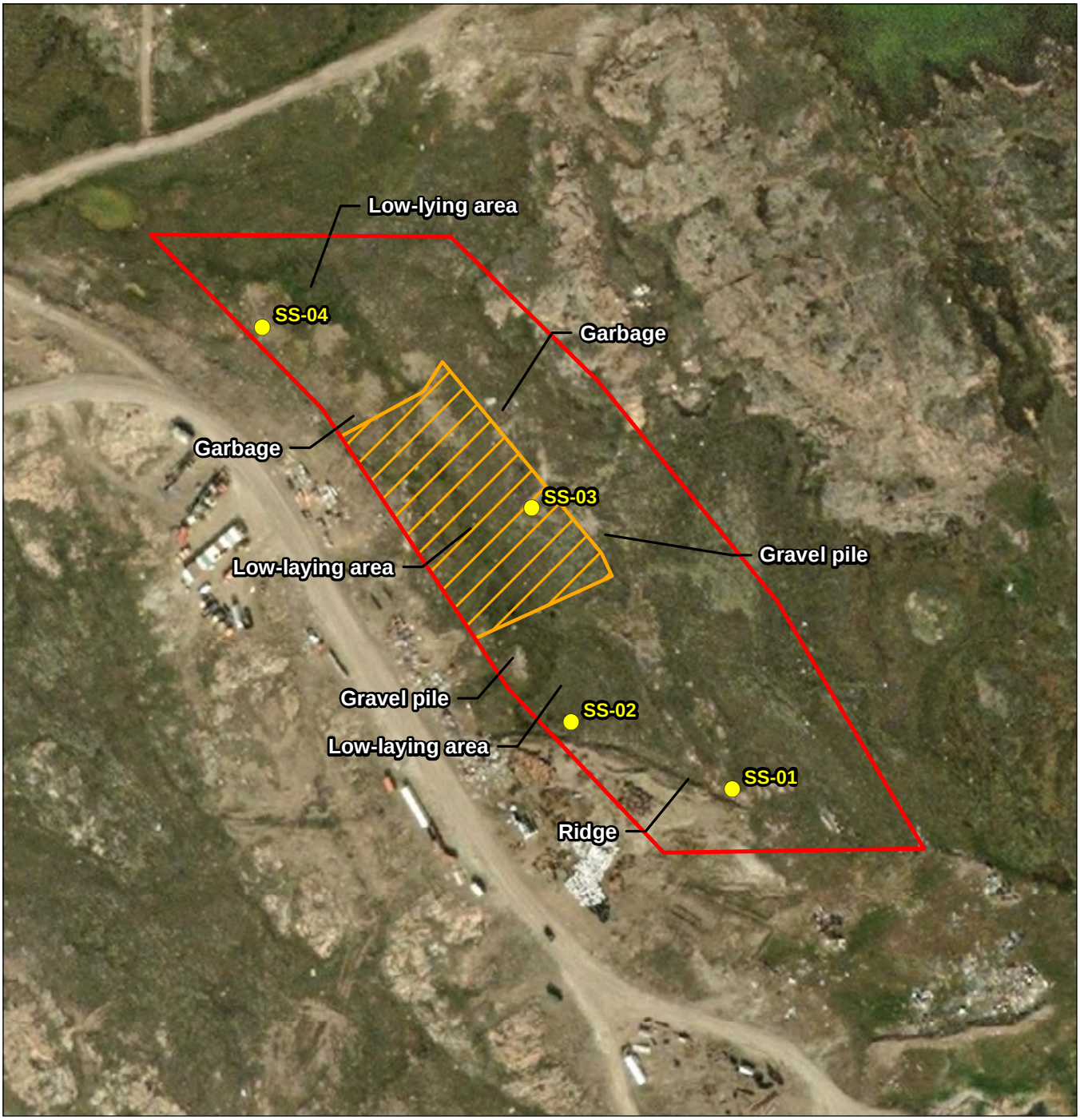
Client/Project 111477087
Kivalliq Alternative Energy Ltd.
Vacant Land, Hamlet of Naujaat, Nunavut

Figure No.
2

Title
Neighbouring Properties Diagram

Notes
1. Coordinate System: NAD 1983 UTM Zone 16N
2. Data Sources: Government of Nunavut, Government of Canada
3. Background: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

G:\ GIS Project Folder\111477087 Naujaat NU\ArcMaps\111477087 002 Neighbouring Properties REVA 20221013.mxd Revised: 2022-10-21 By: acampigiotto



Legend

- Approximate Site Boundary
- Surface Soil Sample Location
- Approximate Scrap Metal Extent

0 25 50 Metres

(At original document size of 8.5x11)
1:2,500

N

Stantec

Project Location
Naujaat,
Nunavut

Prepared by ADC on 2022-10-21
Review by SH on 2022-10-21

Client/Project 111477087
Kivalliq Alternative Energy Ltd.
Vacant Land, Hamlet of Naujaat, Nunavut

Figure No.
3

Title
Site Diagram

Notes
1. Coordinate System: NAD 1983 UTM Zone 16N
2. Data Sources: Government of Nunavut, Government of Canada
3. Background: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

G:\ GIS Project Folder\111477087 Naujaat NU\ArcMaps\111477087 003 Site Diagram REVA 20221013.mxd Revised: 2022-10-21 By: acampigiotto

Appendix B

Photographs

View of Site from northern edge, facing south

View of Site from approximate centre, facing west

View of Site from west side, facing northeast

On-site gravel pile

On-site garbage pile

On-site scrap metal and low-lying areas with ponding

View of undeveloped property north of the Site

View of ridge line adjacent to the eastern edge of the Site

View of garbage dump, south of the Site

View of sewage pump out, south of the Site

View of waste oil drum storage, west of the Site

Surface staining near waste oil drums, west of the Site

View of diesel-impacted soil totes, west of the Site

View of construction material storage, west of the Site across an unnamed road

Surface soil sample location SS-01

Surface soil sample location SS-02

Surface soil sample location SS-03

Surface soil sample location SS-04

Appendix C

Phase I ESA Assessor Qualifications

Summer Hull, B.Env.Sc.

Environmental Scientist

Profile

Summer Hull has been working in the area of Phase I Environmental Site Assessments (ESAs) since 2008. Ms. Hull has completed Phase I and II ESAs of residential, commercial, institutional, and industrial properties for financial institutions, property developers, insurance firms, real estate investments trusts, municipal/provincial/federal government agencies, and others.

EDUCATION

B.Env.Sc. – University of Manitoba, 2004
Winnipeg, MB
Environmental Science

COMPENTENCY

Site Visit

Report Writer

Stantec Consulting Ltd.
130 Somerset Street, Saint John, NB E2K 2X4

Phase I Environmental Site Assessment (ESA)
Assessor Qualifications – Evelyn Bostwick

Evelyn Bostwick, M.Eng., P.Eng.
Principal, Environmental Engineer

Profile

Evelyn Bostwick, M.Eng., P.Eng. is a Principal with Stantec's Environmental Services in the Saint John, NB office. Ms. Bostwick has 30 years of environmental experience in phased environmental site assessments and large commercial transactional due diligence projects.

Education

M.Eng. (Water Resources) – Technical University of Nova Scotia (2000)

B.Eng. (Civil Engineering) – Technical University of Nova Scotia (1992)

B.Sc. (Mathematics) - Dalhousie University (1989)

Associations

Engineers of Nova Scotia

Association of Professional Engineers and Geoscientists of New Brunswick

Engineers Yukon

Northwest Territories and Nunavut Association of Professional Engineers and Geoscientists (NAPEG)

Competencies

Senior Review

Appendix D

Phase I ESA Supporting Documentation

DATABASE REPORT

Project Property:	*111477087* *111477087* *Naujaat NU*
Project No:	*111477087*
Report Type:	*Quote - Custom-Build Your Own Report*
Order No:	*22092523799*
Requested by:	*Stantec Consulting Ltd.*
Date Completed:	*September 28, 2022*

Environmental Risk Information Services
A division of Glacier Media Inc.
1.866.517.5204 | info@erisinfo.com | erisinfo.com

Table of Contents

Executive Summary

Property Information:

Project Property:	*111477087* *111477087 Naujaat NU*
Project No:	*111477087*

Order Information:

Order No:	*22092523799*
Date Requested:	*September 25, 2022*
Requested by:	*Stantec Consulting Ltd.*
Report Type:	*Quote - Custom-Build Your Own Report*

Historical/Products:

Aerial Photographs	*Aerials - National Collection*
ERIS Xplorer	*ERIS Xplorer*

Executive Summary: Report Summary

Database	Name	Searched	Project Property	Boundary to 0.25km	Total
AUWR	Automobile Wrecking & Supplies	N	-	-	-
CDRY	Dry Cleaning Facilities	N	-	-	-
CFST	Crown Land Fuel Storage Tanks	N	-	-	-
CHM	Chemical Register	N	-	-	-
CNG	Compressed Natural Gas Stations	N	-	-	-
EHS	ERIS Historical Searches	N	-	-	-
FCON	Federal Convictions	N	-	-	-
FCS	Contaminated Sites on Federal Land	N	-	-	-
FRST	Federal Identification Registry for Storage Tank Systems (FIRSTS)	N	-	-	-
GHG	Greenhouse Gas Emissions from Large Facilities	N	-	-	-
IAFT	Indian & Northern Affairs Fuel Tanks	N	-	-	-
MINE	Canadian Mine Locations	N	-	-	-
MNR	Mineral Occurrences	N	-	-	-
NATE	National Analysis of Trends in Emergencies System (NATES)	N	-	-	-
NDSP	National Defense & Canadian Forces Spills	N	-	-	-
NDWD	National Defence & Canadian Forces Waste Disposal Sites	N	-	-	-
NEBI	National Energy Board Pipeline Incidents	N	-	-	-
NEBT	National Energy Board Wells	N	-	-	-
NEES	National Environmental Emergencies System (NEES)	N	-	-	-
NPCB	National PCB Inventory	N	-	-	-
NPRI	National Pollutant Release Inventory	N	-	-	-
OGWE	Oil and Gas Wells	N	-	-	-
RST	Retail Fuel Storage Tanks	N	-	-	-
SCT	Scott's Manufacturing Directory	N	-	-	-
SPL	Spills	Y	0	0	0
	Total:		0	0	0

Executive Summary: Site Report Summary - Project Property

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev diff (m)	Page Number

No records found in the selected databases for the project property.

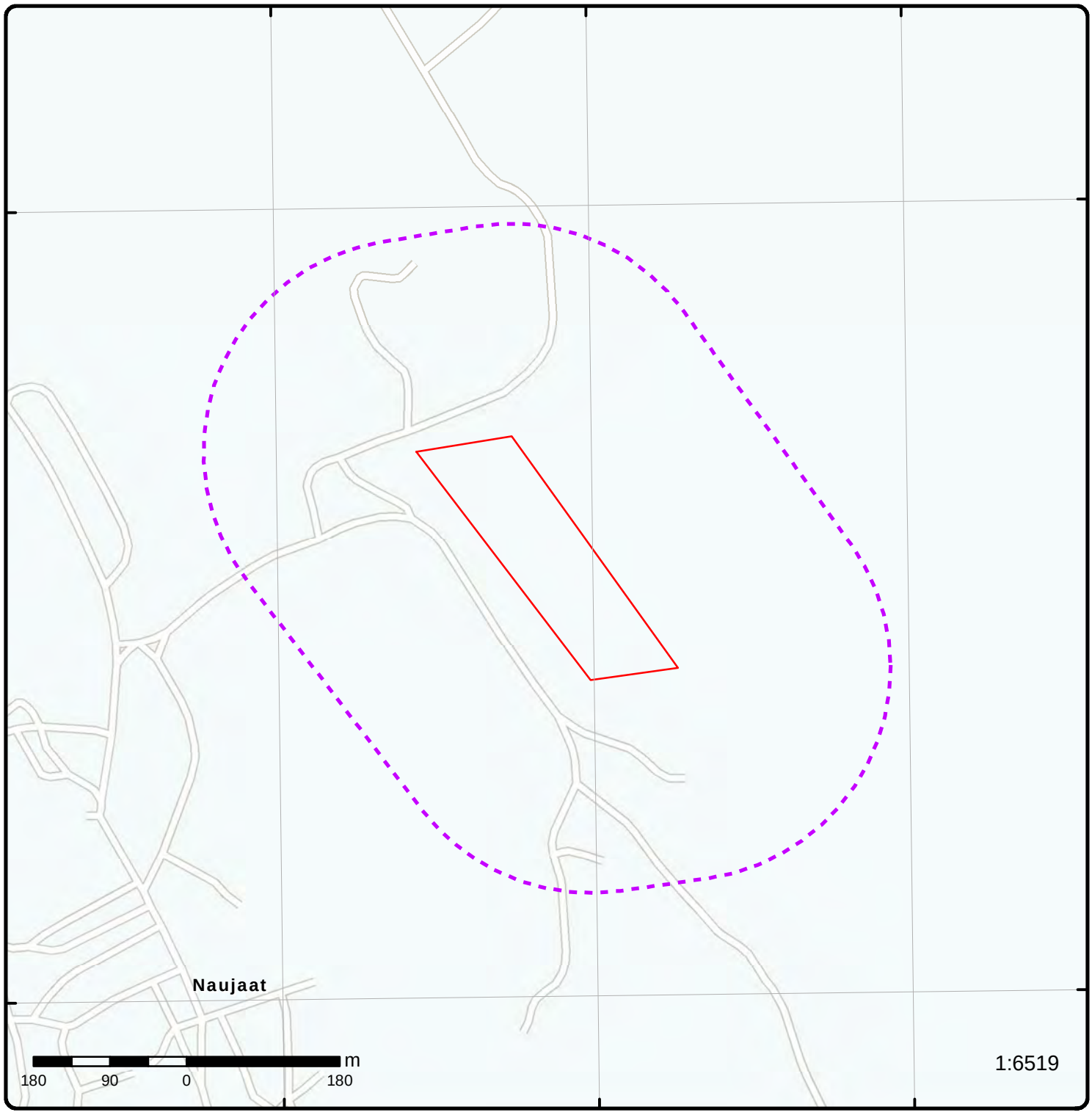
Executive Summary: Site Report Summary - Surrounding Properties

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev Diff (m)	Page Number

No records found in the selected databases for the surrounding properties.

Executive Summary: Summary By Data Source

No records found in the selected databases for the project property or surrounding properties.



Map: 0.25 Kilometer Radius

Order Number: 22092523799

Address: 111477087, Naujaat, NU

- Project Property
- Buffer Outline
- Eris Sites with Higher Elevation
- Eris Sites with Same Elevation
- Eris Sites with Lower Elevation
- Eris Sites with Unknown Elevation
- Freeways; Highways
- Traffic Circle; Ramp
- Major Arterial; Minor Arterial
- Local Road
- Service Road; Traffic Circle; Ramp
- Rail
- Beach
- Airport
- Industrial Area
- Military Base
- Aircraft Roads
- Native Reservation
- Hospital
- Shopping & Sports Area
- University/College
- Cemetery; Golf Course
- Parkt (National)
- Park (City/County)

86°13'30"W

Aerial **Year: 2020**

Address: 111477087, Naujaat, NU

Source: ESRI World Imagery

Order Number: 22092523799

ERIS

Topographic Map

Address: 111477087, NU

Source: ESRI World Topographic Map

Order Number: 22092523799

ERIS

Detail Report

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

No records found in the selected databases for the project property or surrounding properties.

Unplottable Summary

Total: 0 Unplottable sites

DB	Company Name/Site Name	Address	City	Postal

Unplottable Report

No unplottable records were found that may be relevant for the search criteria.

Appendix: Database Descriptions

Environmental Risk Information Services (ERIS) can search the following databases. The extent of historical information varies with each database and current information is determined by what is publicly available to ERIS at the time of update. ***Note:*** *Databases denoted with " * " indicates that the database will no longer be updated. See the individual database description for more information.*

Automobile Wrecking & Supplies: Private AUWR

This database provides an inventory of known locations that are involved in the scrap metal, automobile wrecking/recycling, and automobile parts & supplies industry. Information is provided on the company name, location and business type.

Government Publication Date: 1999-May 31, 2022

Dry Cleaning Facilities: Federal CDRY

List of dry cleaning facilities made available by Environment and Climate Change Canada. Environment and Climate Change Canada's Tetrachloroethylene (Use in Dry Cleaning and Reporting Requirements) Regulations (SOR/2003-79) are intended to reduce releases of tetrachloroethylene to the environment from dry cleaning facilities.

Government Publication Date: Jan 2004-Dec 2020

Crown Land Fuel Storage Tanks: Territorial CFST

The Department of Indian and Northern Affairs Canada mandates that all fuel storage tanks on Crown Land be recorded, when an individual applies for a land use permit or surface lease. Please note that there are numerous records in the database where the "Commencement Date" is previous to 1997. However, since INAC only began registering tank locations in 1997, any tanks installed previous to that may or may not be in the database, due to lack of regulations. Note the following descriptions: Commencement Date is the original file date, Fuel Application Date is the date an application was submitted for a tank, and the Fuel Confirmation Date is the date the department accepted the application and confirmed the information submitted.

Government Publication Date: Oct 1997-Apr 2022

Chemical Register: Private CHM

This database includes a listing of locations of facilities within the Province or Territory that either manufacture and/or distributes chemicals.

Government Publication Date: 1999-May 31, 2022

Compressed Natural Gas Stations: Private CNG

Canada has a network of public access compressed natural gas (CNG) refuelling stations. These stations dispense natural gas in compressed form at 3,000 pounds per square inch (psi), the pressure which is allowed within the current Canadian codes and standards. The majority of natural gas refuelling is located at existing retail gasoline that have a separate refuelling island for natural gas. This list of stations is made available by the Canadian Natural Gas Vehicle Alliance.

Government Publication Date: Dec 2012 -Apr 2022

ERIS Historical Searches: Private EHS

ERIS has compiled a database of all environmental risk reports completed since March 1999. Available fields for this database include: site location, date of report, type of report, and search radius. As per all other databases, the ERIS database can be referenced on both the map and "Statistical Profile" page.

Government Publication Date: 1999-Jul 31, 2022

Federal Convictions: Federal FCON

Environment Canada maintains a database referred to as the "Environmental Registry" that details prosecutions under the Canadian Environmental Protection Act (CEPA) and the Fisheries Act (FA). Information is provided on the company name, location, charge date, offence and penalty.

Government Publication Date: 1988-Jun 2007*

Contaminated Sites on Federal Land: Federal FCS

The Federal Contaminated Sites Inventory includes information on known federal contaminated sites under the custodianship of departments, agencies and consolidated Crown corporations as well as those that are being or have been investigated to determine whether they have contamination arising from past use that could pose a risk to human health or the environment. The inventory also includes non-federal contaminated sites for which the Government of Canada has accepted some or all financial responsibility. It does not include sites where contamination has been caused by, and which are under the control of, enterprise Crown corporations, private individuals, firms or other levels of government. Includes fire training sites and sites at which Per- and Polyfluoroalkyl Substances (PFAS) are a concern.

Government Publication Date: Jun 2000-Jun 2022

Federal Identification Registry for Storage Tank Systems (FIRSTS): Federal FRST

A list of federally regulated Storage tanks from the Federal Identification Registry for Storage Tank Systems (FIRSTS). FIRSTS is Environment and Climate Change Canada's database of storage tank systems subject to the Storage Tank for Petroleum Products and Allied Petroleum Products Regulations. The main objective of the Regulations is to prevent soil and groundwater contamination from storage tank systems located on federal and aboriginal lands. Storage tank systems that do not have a valid identification number displayed in a readily visible location on or near the storage tank system may be refused product delivery.

Government Publication Date: May 31, 2018

Greenhouse Gas Emissions from Large Facilities: Federal GHG

List of greenhouse gas emissions from large facilities made available by Environment Canada. Greenhouse gas emissions in kilotonnes of carbon dioxide equivalents (kt CO2 eq).

Government Publication Date: 2013-Dec 2019

Indian & Northern Affairs Fuel Tanks: Federal IAFT

The Department of Indian & Northern Affairs Canada (INAC) maintains an inventory of aboveground & underground fuel storage tanks located on both federal and crown land. Our inventory provides information on the reserve name, location, facility type, site/facility name, tank type, material & ID number, tank contents & capacity, and date of tank installation.

Government Publication Date: 1950-Aug 2003*

Canadian Mine Locations: Private MINE

This information is collected from the Canadian & American Mines Handbook. The Mines database is a national database that provides over 290 listings on mines (listed as public companies) dealing primarily with precious metals and hard rocks. Listed are mines that are currently in operation, closed, suspended, or are still being developed (advanced projects). Their locations are provided as geographic coordinates (x, y and/or longitude, latitude). As of 2002, data pertaining to Canadian smelters and refineries has been appended to this database.

Government Publication Date: 1998-2009*

Mineral Occurrences: Territorial MNR

The C.S. Lord Northern Geoscience Centre maintains a database of mineral showings (commodity occurrences) for both the Northwest Territories and Nunavut. The database provides Showing ID, latitude, longitude, Showing Name, commodity type, current development stage, and general comments on lithology, mineralization and geological settings.

Government Publication Date: 1900-Jul 2022

National Analysis of Trends in Emergencies System (NATES): Federal NATE

In 1974 Environment Canada established the National Analysis of Trends in Emergencies System (NATES) database, for the voluntary reporting of significant spill incidents. The data was to be used to assist in directing the work of the emergencies program. NATES ran from 1974 to 1994. Extensive information is available within this database including company names, place where the spill occurred, date of spill, cause, reason and source of spill, damage incurred, and amount, concentration, and volume of materials released.

Government Publication Date: 1974-1994*

National Defense & Canadian Forces Spills: Federal NDSP

The Department of National Defense and the Canadian Forces maintains an inventory of spills to land and water. All spill sites have been classified under the "Transportation of Dangerous Goods Act - 1992". Our inventory provides information on the facility name, location, spill ID #, spill date, type of spill, as well as the quantity of substance spilled & recovered.

Government Publication Date: Mar 1999-Apr 2018

National Defence & Canadian Forces Waste Disposal Sites: Federal NDWD

The Department of National Defence and the Canadian Forces maintains an inventory of waste disposal sites located on DND lands. Where available, our inventory provides information on the base name, location, type of waste received, area of site, depth of site, year site opened/closed and status.

Government Publication Date: 2001-Apr 2007*

National Energy Board Pipeline Incidents: Federal NEBI

Locations of pipeline incidents from 2008 to present, made available by the Canada Energy Regulator (CER) - previously the National Energy Board (NEB). Includes incidents reported under the Onshore Pipeline Regulations and the Processing Plant Regulations related to pipelines under federal jurisdiction, does not include incident data related to pipelines under provincial or territorial jurisdiction.

Government Publication Date: 2008-Jun 30, 2021

National Energy Board Wells: Federal NEBT

The NEBW database contains information on onshore & offshore oil and gas wells that are outside provincial jurisdiction(s) and are thereby regulated by the National Energy Board. Data is provided regarding the operator, well name, well ID No./UWI, status, classification, well depth, spud and release date.

Government Publication Date: 1920-Feb 2003*

National Environmental Emergencies System (NEES): Federal NEES

In 2000, the Emergencies program implemented NEES, a reporting system for spills of hazardous substances. For the most part, this system only captured data from the Atlantic Provinces, some from Quebec and Ontario and a portion from British Columbia. Data for Alberta, Saskatchewan, Manitoba and the Territories was not captured. However, NEES is also a repository for previous Environment Canada spill datasets. NEES is composed of the historic datasets ' or Trends ' which dates from approximately 1974 to present. NEES Trends is a compilation of historic databases, which were merged and includes data from NATES (National Analysis of Trends in Emergencies System), ARTS (Atlantic Regional Trends System), and NEES. In 2001, the Emergencies Program determined that variations in reporting regimes and requirements between federal and provincial agencies made national spill reporting and trend analysis difficult to achieve. As a consequence, the department has focused efforts on capturing data on spills of substances which fall under its legislative authority only (CEPA and FA). As such, the NEES database will be decommissioned in December 2004.

Government Publication Date: 1974-2003*

National PCB Inventory: Federal NPCB

Environment Canada's National PCB inventory includes information on in-use PCB containing equipment in Canada including federal, provincial and private facilities. Federal out-of-service PCB containing equipment and PCB waste owned by the federal government or by federally regulated industries such as airlines, railway companies, broadcasting companies, telephone and telecommunications companies, pipeline companies, etc. are also listed. Although it is not Environment Canada's mandate to collect data on non-federal PCB waste, the National PCB inventory includes some information on provincial and private PCB waste and storage sites. Some addresses provided may be Head Office addresses and are not necessarily the location of where the waste is being used or stored.

Government Publication Date: 1988-2008*

National Pollutant Release Inventory: Federal NPRI

Environment Canada has defined the National Pollutant Release Inventory ("NPRI") as a federal government initiative designed to collect comprehensive national data regarding releases to air, water, or land, and waste transfers for recycling for more than 300 listed substances.

Government Publication Date: 1993-May 2017

Oil and Gas Wells: Private OGWE

The Nickle's Energy Group (publisher of the Daily Oil Bulletin) collects information on drilling activity including operator and well statistics. The well information database includes name, location, class, status and depth. The main Nickle's database is updated on a daily basis, however, this database is updated on a monthly basis. More information is available at www.nickles.com.

Government Publication Date: 1988-Aug 31, 2022

Retail Fuel Storage Tanks: Private RST

This database includes an inventory of retail fuel outlet locations (including marinas) that have on their property gasoline, oil, waste oil, natural gas and / or propane storage tanks.

Government Publication Date: 1999-May 31, 2022

Scott's Manufacturing Directory: Private SCT

Scott's Directories is a data bank containing information on over 200,000 manufacturers across Canada. Even though Scott's listings are voluntary, it is the most comprehensive database of Canadian manufacturers available. Information concerning a company's address, plant size, and main products are included in this database.

Government Publication Date: 1992-Mar 2011*

Spills: Territorial SPL

The Department of Environment and Natural Resource (ENR) in Yellowknife maintains an inventory of spill locations through the "Hazardous Materials Spills Database". Information is provided on the spill number, date, location, spill description, quantity & commodity spilled and all applicable parties involved. Data previously maintained and made available by the Department of Resources, Wildlife & Economic Development (RWED).

Government Publication Date: Nov 30,2021

Definitions

Database Descriptions: This section provides a detailed explanation for each database including: source, information available, time coverage, and acronyms used. They are listed in alphabetic order.

Detail Report: This is the section of the report which provides the most detail for each individual record. Records are summarized by location, starting with the project property followed by records in closest proximity.

Distance: The distance value is the distance between plotted points, not necessarily the distance between the sites' boundaries. All values are an approximation.

Direction: The direction value is the compass direction of the site in respect to the project property and/or center point of the report.

Elevation: The elevation value is taken from the location at which the records for the site address have been plotted. All values are an approximation. Source: Google Elevation API.

Executive Summary: This portion of the report is divided into 3 sections:

'Report Summary'- Displays a chart indicating how many records fall on the project property and, within the report search radii.

'Site Report Summary'-Project Property'- This section lists all the records which fall on the project property. For more details, see the 'Detail Report' section.

'Site Report Summary-Surrounding Properties'- This section summarizes all records on adjacent properties, listing them in order of proximity from the project property. For more details, see the 'Detail Report' section.

Map Key: The map key number is assigned according to closest proximity from the project property. Map Key numbers always start at #1. The project property will always have a map key of '1' if records are available. If there is a number in brackets beside the main number, this will indicate the number of records on that specific property. If there is no number in brackets, there is only one record for that property.

The symbol and colour used indicates 'elevation': the red inverted triangle will dictate 'ERIS Sites with Lower Elevation', the yellow triangle will dictate 'ERIS Sites with Higher Elevation' and the orange square will dictate 'ERIS Sites with Same Elevation.'

Unplottables: These are records that could not be mapped due to various reasons, including limited geographic information. These records may or may not be in your study area, and are included as reference.

Spill	Occurance Date	Spill Region	Location	Location Description	Product Spilled	Quantity	Measurement	Spill Cause	Lead Agency
spill-2022493	8-Oct-22	Keewatin	Repulse Bay	Community Hall Naujaat Northwestern Passage 166m Naujaat	Other	Unknown	0	Other	CIRNAC - Crown-Indigenous Relations and Northern Affairs Canada
spill-2022444	1-Sep-22	Keewatin	Repulse Bay,	Naujaat	Petroleum - fuel oil (jet A, diesel, turbo A, heat)	4	Litres	Fitting Leak	GN - Government of Nunavut
spill-2021415	25-Sep-21	Keewatin	Repulse Bay,	lot 245 Naujaat NU (Coordinates 66.5454965905497, -85.96442650279523 in the Geolocation search bar are estimates produced by by ECCC NEEC LTa)	Petroleum - fuel oil (jet A, diesel, turbo A, heat)	600	Litres	Breakage	GN - Government of Nunavut
spill-2021413	24-Sep-21	Keewatin	Repulse Bay,	Naujaat Water Treatment Plant	Other	90	Litres	Overflow Event	CIRNAC - Crown-Indigenous Relations and Northern Affairs Canada
spill-2021153	4-May-21	Keewatin	Repulse Bay,	Unit 139-143 5 Plex	Petroleum - fuel oil (jet A, diesel, turbo A, heat)	46	Litres	Tank Leak	GN - Government of Nunavut
spill-2021005	6-Jan-21	Keewatin	Repulse Bay,	Near Co-Op Warehouse / Najaat, NU / Repulse Bay	Petroleum - fuel oil (jet A, diesel, turbo A, heat)	20	Litres	Breakage	GN - Government of Nunavut
spill-2020432	10-Nov-20	Keewatin	Repulse Bay,	QEC Naujaat Power Plant EC-00000189	Petroleum - other (bunker, asphalt, propane)	130	Litres		GN - Government of Nunavut
spill-2020363	24-Sep-20	Keewatin	Repulse Bay,	Naujaat, road to Water Lake	Petroleum - fuel oil (jet A, diesel, turbo A, heat)	140	Litres	Vehicle Overturn	GN - Government of Nunavut
spill-2020295	29-Aug-20	Baffin	Repulse Bay,	Repulse Bay on top of the landing beach.	Petroleum - waste oil (slops, sludge)	85	Litres	Other	CIRNAC - Crown-Indigenous Relations and Northern Affairs Canada
spill-2019412	2-Oct-19	Keewatin	Repulse Bay,	Unit 71	Petroleum - fuel oil (jet A, diesel, turbo A, heat)	46	Litres	Breakage	GN - Government of Nunavut
spill-2019311	3-Aug-19	Keewatin	Repulse Bay,	Unit 180	Petroleum - fuel oil (jet A, diesel, turbo A, heat)	207	Litres	Tank Leak	GN - Government of Nunavut
spill-2019243	17-Jun-19	Keewatin	Repulse Bay,	Nunavut Arctic College, Lot 217	Petroleum - fuel oil (jet A, diesel, turbo A, heat)	20	Litres	Tank Leak	GN - Government of Nunavut
spill-2019187	6-May-19		Repulse Bay,	Unit 71 in Naujaat lot 187	Petroleum - fuel oil (jet A, diesel, turbo A, heat)	225	Litres	Breakage	GN - Government of Nunavut
spill-2019185	25-Apr-19	Keewatin	Repulse Bay,	ILA Centre	Petroleum - fuel oil (jet A, diesel, turbo A, heat)	150	Litres	Tank Leak	GN - Government of Nunavut
spill-2018258	30-Jun-18	Keewatin	Repulse Bay,	house unit 93, lot 202	Petroleum - fuel oil (jet A, diesel, turbo A, heat)	460	Litres		GN - Government of Nunavut
spill-2018212	3-Jun-18	Keewatin	Repulse Bay,	house 82 on lot 113	Petroleum - fuel oil (jet A, diesel, turbo A, heat)	30	Litres	Tank Leak	GN - Government of Nunavut
spill-2018187	22-May-18	Keewatin	Repulse Bay,	arena	Petroleum - fuel oil (jet A, diesel, turbo A, heat)	80	Litres	Breakage	GN - Government of Nunavut
spill-2017155	10-May-17	Baffin	Repulse Bay,	Housing Unit 99	Petroleum - fuel oil (jet A, diesel, turbo A, heat)	90	Litres	Tank Leak	GN - Government of Nunavut
spill-2017154	9-May-17	Keewatin	Repulse Bay,	Housing Unit 95	Petroleum - fuel oil (jet A, diesel, turbo A, heat)	38	Litres	Fitting Leak	GN - Government of Nunavut
spill-2015392	9-Sep-15	Keewatin	Repulse Bay,	Tusarvik School (Behind)	Petroleum - fuel oil (jet A, diesel, turbo A, heat)	30	Litres	Overflow Event	GN - Government of Nunavut
spill-2014343	24-Sep-14	Keewatin	Repulse Bay	House 129 A-B	Petroleum - fuel oil (jet A, diesel, turbo A, heat)	30	Litres	Unknown Cause	GN - Government of Nunavut
spill-2014328	12-Sep-14	Keewatin	Repulse Bay	House 66	Petroleum - fuel oil (jet A, diesel, turbo A, heat)	60	Litres	Breakage	GN - Government of Nunavut
spill-2014293	8-Aug-14	Keewatin	Repulse Bay	House 17B	Petroleum - fuel oil (jet A, diesel, turbo A, heat)	207	Litres	Tank Leak	GN - Government of Nunavut
spill-2014178	23-May-14	Keewatin	Repulse Bay	Repulse Bay Unit 16	Petroleum - fuel oil (jet A, diesel, turbo A, heat)	3	Litres	Tank Leak	GN - Government of Nunavut
spill-2013297	5-Aug-13	Baffin	Repulse Bay	Resolute Bay	Petroleum - fuel oil (jet A, diesel, turbo A, heat)	20	Litres	Tank Leak	GN - Government of Nunavut
spill-2012233	5-Jun-12	Keewatin	Repulse Bay	House 23	Petroleum - fuel oil (jet A, diesel, turbo A, heat)	20	Litres	Tank Leak	GN - Government of Nunavut
spill-2012114	3-Apr-12	Keewatin	Repulse Bay,	Repulse Bay Tank Farm	Petroleum - fuel oil (jet A, diesel, turbo A, heat)	161	Litres	Overflow Event	GN - Government of Nunavut
spill-2010468	22-Dec-10	Keewatin	Repulse Bay	Repulse Bay Nursing Station	Petroleum - fuel oil (jet A, diesel, turbo A, heat)	0	Litres	Tank Leak	GN - Government of Nunavut
spill-2010280	7-Jul-10	Keewatin	Repulse Bay	Repulse Bay Tank Farm	Petroleum - fuel oil (jet A, diesel, turbo A, heat)	3000	Litres	Overflow Event	GN - Government of Nunavut
spill-2009259	2-Jun-09	Keewatin	Repulse Bay	S.A.D. Garage	Petroleum - fuel oil (jet A, diesel, turbo A, heat)	0	Litres	Tank Leak	GN - Government of Nunavut
spill-2009239	28-May-09	Keewatin	Repulse Bay	Tank Farm	Petroleum - fuel oil (jet A, diesel, turbo A, heat)	92	Litres	Overflow Event	GN - Government of Nunavut
spill-2009173	26-Apr-09	Keewatin	Repulse Bay	4 Plex	Petroleum - fuel oil (jet A, diesel, turbo A, heat)	2100	Litres	Other	GN - Government of Nunavut
spill-2008551	15-Nov-08	Baffin	Repulse Bay	Glad Tidings Church	Petroleum - fuel oil (jet A, diesel, turbo A, heat)	205	Litres	Tank Leak	GN - Government of Nunavut
spill-2008213	16-May-08	Keewatin	Repulse Bay	Repulse Bay	Petroleum - fuel oil (jet A, diesel, turbo A, heat)	2000	Litres	Pipe Leaks	GN - Government of Nunavut
spill-2008094	14-Mar-08	Keewatin	Repulse Bay	Power Plant Yard	Chemicals (including transformer oils)	20	Litres	Collision or Crash	GN - Government of Nunavut
spill-2008114	10-Mar-08	Keewatin	Repulse Bay	Tank Farm	Petroleum - gasoline (aviation, turbo B, jet B)	8	Litres	Overflow Event	GN - Government of Nunavut
spill-2008076	8-Mar-08	Keewatin	Repulse Bay	Moses Siusangnark House Tank	Petroleum - fuel oil (jet A, diesel, turbo A, heat)	70	Litres	Pipe Leaks	GN - Government of Nunavut
spill-2008063	28-Feb-08	Keewatin	Repulse Bay	Four Plex 132-133	Petroleum - fuel oil (jet A, diesel, turbo A, heat)	2081	Litres	Pipe Leaks	GN - Government of Nunavut
spill-2007448	24-Sep-07	Keewatin	Repulse Bay,	Naujat Coop	Petroleum - fuel oil (jet A, diesel, turbo A, heat)	150	Litres	Overflow Event	GN - Government of Nunavut
spill-2007010	10-Jan-07	Keewatin	Repulse Bay	Naujat Co-op Hotel	Petroleum - gasoline (aviation, turbo B, jet B)	400	Litres	Other	GN - Government of Nunavut
spill-2006076	5-Mar-06	Keewatin	Repulse Bay	North End New Area	Petroleum - fuel oil (jet A, diesel, turbo A, heat)	2454	Litres	Pipe Leaks	GN - Government of Nunavut
spill-2006021	26-Jan-06	Keewatin	Repulse Bay	Health Center Garage	Petroleum - fuel oil (jet A, diesel, turbo A, heat)	115	Litres	Pipe Leaks	GN - Government of Nunavut
spill-2005484	11-Oct-05	Keewatin	Repulse Bay	Michael Kopak House	Petroleum - fuel oil (jet A, diesel, turbo A, heat)	205	Litres	Other	GN - Government of Nunavut
spill-2004635	29-Oct-04	Keewatin	Repulse Bay	Fuel Dispenser Station	Petroleum - fuel oil (jet A, diesel, turbo A, heat)	200	Litres	Overflow Event	GN - Government of Nunavut
spill-2004560	24-Aug-04	Keewatin	Repulse Bay	Hamlet Parking Garage	Petroleum - fuel oil (jet A, diesel, turbo A, heat)	114	Litres	Deliberate Discharge	GN - Government of Nunavut
spill-2003538	16-Aug-03	Keewatin	Repulse Bay	Airport	Petroleum - fuel oil (jet A, diesel, turbo A, heat)	27	Litres	Fitting Leak	GN - Government of Nunavut
spill-2002425	19-Jul-02	Keewatin	Repulse Bay	Airport Apron	Petroleum - fuel oil (jet A, diesel, turbo A, heat)	0	Litres	Fitting Leak	GN - Government of Nunavut
spill-2001014	15-Jan-01	Keewatin	Repulse Bay	Repulse Bay Gas Station	Petroleum - gasoline (aviation, turbo B, jet B)	23	Litres	Collision or Crash	GN - Government of Nunavut
spill-1999124	10-Jun-99	Keewatin	Repulse Bay	Metal Dump Site	Petroleum - waste oil (slops, sludge)	207	Litres	Other	GN - Government of Nunavut
spill-1998174	28-Oct-98	Keewatin	Repulse Bay,	Power Plant	Petroleum - fuel oil (jet A, diesel, turbo A, heat)	120	Litres	Other	GN - Government of Nunavut
spill-1998145	27-Aug-98	Keewatin	Repulse Bay	Tursavik School Building	Petroleum - fuel oil (jet A, diesel, turbo A, heat)	1380	Litres	Overflow Event	GNWT - Department of Environment and Natural Resources
spill-1998108	7-Jul-98	Keewatin	Repulse Bay	Hamlet Community Complex (Office)	Petroleum - fuel oil (jet A, diesel, turbo A, heat)	65	Litres	Overflow Event	GNWT - Department of Environment and Natural Resources
spill-1998040	25-Mar-98	Keewatin	Repulse Bay	Airport Near Entrance Ramp/Apron	Petroleum - fuel oil (jet A, diesel, turbo A, heat)	100	Litres	Pipe Leaks	CIRNAC - Crown-Indigenous Relations and Northern Affairs Canada
spill-1998041	25-Mar-98	Keewatin	Repulse Bay	Airport Apron	Petroleum - fuel oil (jet A, diesel, turbo A, heat)	100	Litres	Overflow Event	CIRNAC - Crown-Indigenous Relations and Northern Affairs Canada
spill-1995141	27-Aug-95	Keewatin	Repulse Bay	Petroleum Products Div. Tank Farm	Petroleum - gasoline (aviation, turbo B, jet B)	100	Litres	Overflow Event	GNWT - Department of Environment and Natural Resources

Spill	Occurance Date	Spill Region	Location	Location Description	Product Spilled	Quantity	Measurement	Spill Cause	Lead Agency
spill-1995026	27-Feb-95	Keewatin	Repulse Bay	NWTPC Tank Farm	Petroleum - fuel oil (jet A, diesel, turbo A, heat)	105000	Litres	Pipe Leaks	GNWT - Department of Environment and Natural Resources
spill-1994117	27-Jun-94	Keewatin	Repulse Bay		Wastewater (sewage, mine tailings)	0		Overflow Event	GNWT - Department of Environment and Natural Resources
spill-1994103	16-Jun-94	Keewatin	Repulse Bay	Northern Staff House	Petroleum - fuel oil (jet A, diesel, turbo A, heat)	545	Litres	Pipe Leaks	GNWT - Department of Environment and Natural Resources
spill-1993142	23-Aug-93	Keewatin	Repulse Bay	In Town	Petroleum - fuel oil (jet A, diesel, turbo A, heat)	110	Litres	Fitting Leak	GNWT - Department of Environment and Natural Resources
spill-1993079	7-Jun-93	Keewatin	Repulse Bay	NWTPC Tank Farm	Petroleum - fuel oil (jet A, diesel, turbo A, heat)	5552	Litres	Overflow Event	GNWT - Department of Environment and Natural Resources
spill-1993074	26-May-93	Keewatin	Repulse Bay	Adjacent to Dump	Chemicals (including transformer oils)	40	Litres	Unknown Cause	GNWT - Department of Environment and Natural Resources
spill-1993072	21-May-93	Keewatin	Repulse Bay	Hamlet Dump	Petroleum - waste oil (slops, sludge)	615	Litres	Tank Leak	GNWT - Department of Environment and Natural Resources
spill-1991180	19-Sep-91	Keewatin	Repulse Bay	Community Dump	Petroleum - waste oil (slops, sludge)	0	Litres	Unknown Cause	GNWT - Department of Environment and Natural Resources
spill-1991076	24-May-91	Keewatin	Repulse Bay	Between Hamlet & Housing Corp Garage	Petroleum - waste oil (slops, sludge)	0	Litres	Deliberate Discharge	GNWT - Department of Environment and Natural Resources
spill-1989022	8-Mar-89	Keewatin	Repulse Bay	Repulse Bay Co-op Hotel	Petroleum - fuel oil (jet A, diesel, turbo A, heat)	90	Litres	Fitting Leak	GNWT - Department of Environment and Natural Resources
spill-1989016	20-Feb-89	Keewatin	Repulse Bay	Powerhouse	Petroleum - fuel oil (jet A, diesel, turbo A, heat)	2270	Litres	Overflow Event	GNWT - Department of Environment and Natural Resources
spill-1988081	29-Jun-88	Keewatin	Repulse Bay		Petroleum - fuel oil (jet A, diesel, turbo A, heat)	205	Litres	Overflow Event	GNWT - Department of Environment and Natural Resources
spill-1978044	27-Dec-78	Keewatin	Repulse Bay	Tank Farm	Petroleum - fuel oil (jet A, diesel, turbo A, heat)	386410	Litres	Fitting Leak	
spill-1973028		Keewatin	Repulse Bay	Area Around Naujoa & Haviland Harbour	Petroleum - waste oil (slops, sludge)	0	Litres	Other	
spill-2000238		Keewatin	Repulse Bay	Municipal Dump	Petroleum - fuel oil (jet A, diesel, turbo A, heat)	0	Litres	Tank Leak	GN - Government of Nunavut
spill-2002376		Keewatin	Repulse Bay	Repulse Bay	Petroleum - lubricating oil (lube, hydraulic)	23	Litres	Unknown Cause	GN - Government of Nunavut
spill-2002498		Keewatin	Repulse Bay	Airport	Petroleum - unknown	0	Litres	Unknown Cause	GN - Government of Nunavut
spill-2005344		Keewatin	Repulse Bay	Pumphouse Water Lake	Petroleum - fuel oil (jet A, diesel, turbo A, heat)	568	Litres	Tank Leak	GN - Government of Nunavut

HISTORICAL AERIALS

Project Property:	111477087 111477087 Naujaat NU
Project No:	111477087
Requested By:	Stantec Consulting Ltd.
Order No:	22092523799
Date Completed:	September 27, 2022

Environmental Risk Information Services
A division of Glacier Media Inc.
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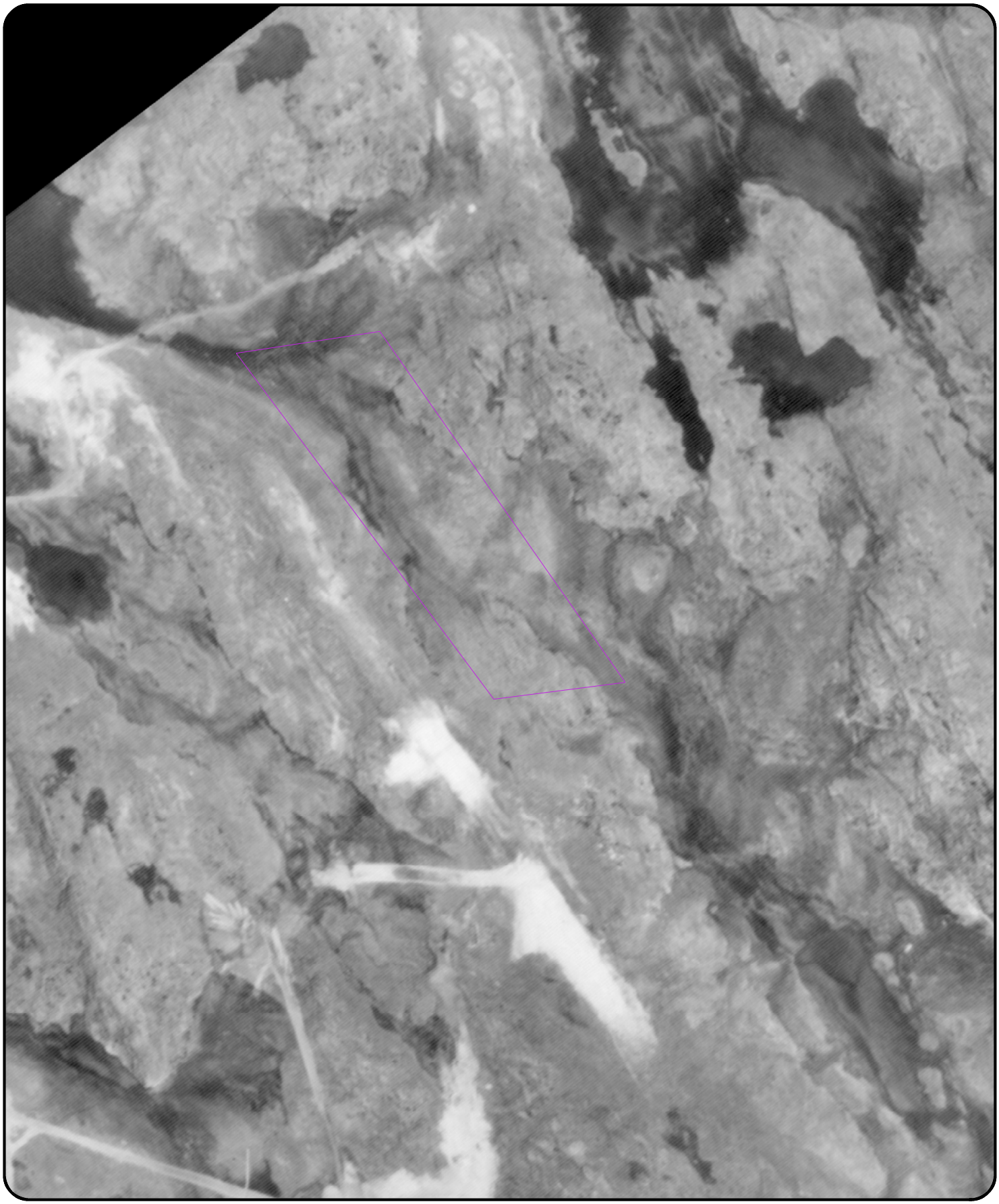
Decade	Year	Image Scale	Source
1940	Not Available		
1950	Not Available		
1960	1969	12000	NAPL
1970	1978	8000	NAPL
1980	1989	15000	NAPL
1990	1998	10000	NAPL
2000	Not Available		



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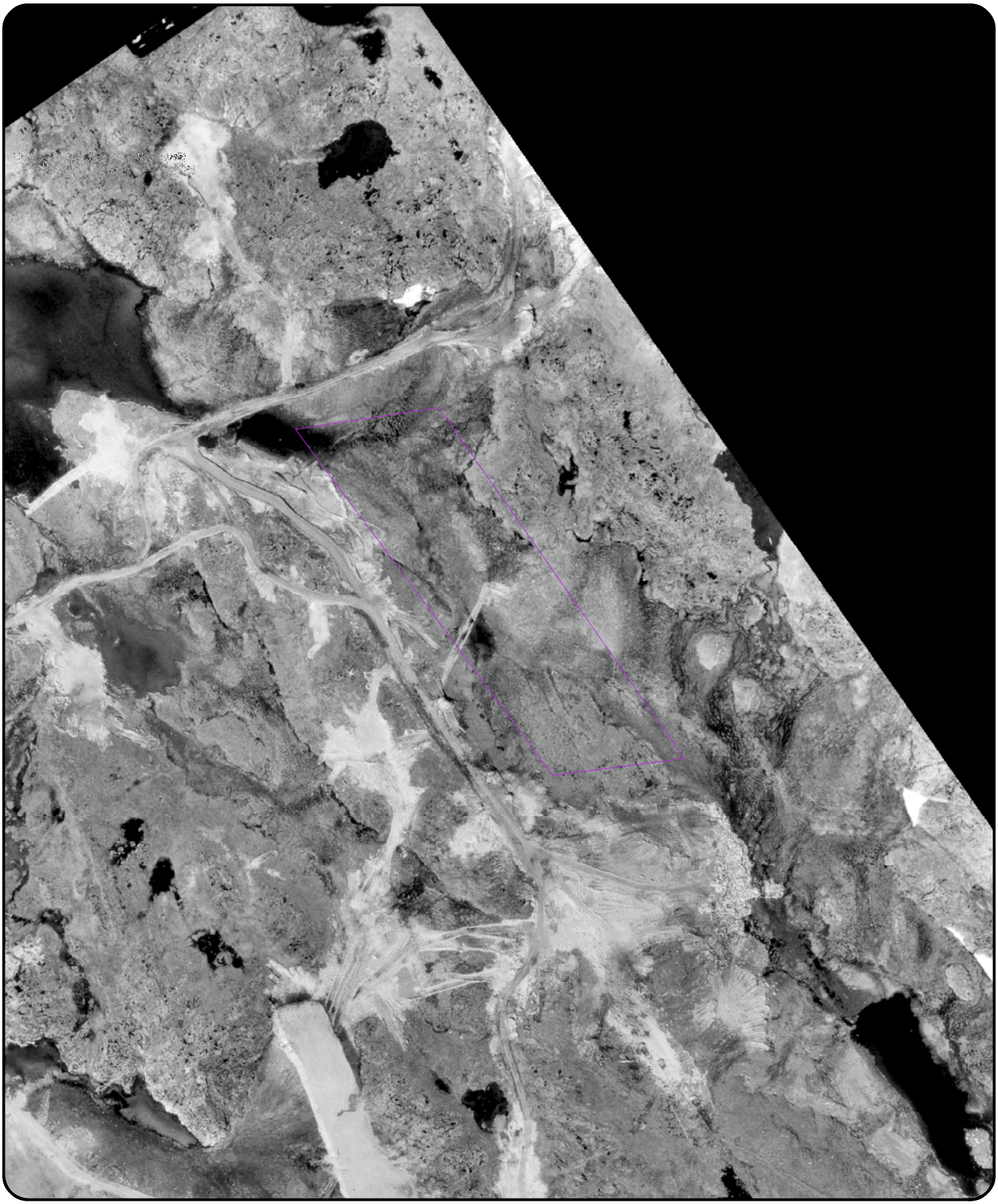
Kilometers

Order Number: 22092523799

Year: 1969
Source: NAPL
Map Scale: 1: 10000
Comments:



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Kilometers

Order Number: 22092523799

Year: 1978
Source: NAPL
Map Scale: 1: 10000
Comments: Adjacent Frame Unavailable

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Kilometers

Order Number: 22092523799

Year: 1989
Source: NAPL
Map Scale: 1: 10000
Comments:

0 0.125 0.25 0.5
Kilometers

Order Number: 22092523799

Year: 1998
Source: NAPL
Map Scale: 1: 10000
Comments:

Appendix E

Monitoring and Laboratory Analytical Results

Table 1
Summary of Soil Analytical Results
Enhanced Phase I ESA
Vacant Land, Naujaat, NU

Sample Location				SS-01	SS-02		SS-03	SS-04	
Sample Date				22-Sep-22	22-Sep-22	22-Sep-22	22-Sep-22	22-Sep-22	22-Sep-22
Sample ID				SS-01	SS-02	SS-02 Lab-Dup	SS-03	SS-04	SS-04 Lab-Dup
Sample Depth				0.15 m	0.15 m	0.15 m	0.15 m	0.15 m	0.15 m
Sampling Company				STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC
Laboratory				BV	BV	BV	BV	BV	BV
Laboratory Work Order				C274555	C274555	C274555	C274555	C274555	C274555
Laboratory Sample ID				BCV459	BCV460	BCV460	BCV461	BCV462	BCV462
Sample Type	Units	Nunavut	CCME			Lab Replicate			Lab Replicate
Physical Properties									
Grain Size	none	n/v	n/v	COARSE	COARSE	-	COARSE	COARSE	-
Moisture Content	%	n/v	n/v	12	5.8	-	22	14	-
Sieve - #10 (>2.00mm)	%	n/v	n/v	31	6.9	-	48	16	-
Sieve - #200 (>0.075mm)	%	n/v	n/v	53	51	-	90	87	-
Sieve - Pan	%	n/v	n/v	47	49	-	10	13	-
BTEX and Petroleum Hydrocarbons									
Benzene	mg/kg	0.03[A]	na	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	-
Toluene	mg/kg	0.37[A]	na	<0.050	<0.050	<0.050	<0.050	<0.050	-
Ethylbenzene	mg/kg	0.082[A]	na	<0.010	<0.010	<0.010	<0.010	<0.010	-
Xylene, m & p-	mg/kg	n/v	n/v	<0.040	<0.040	<0.040	<0.040	<0.040	-
Xylene, o-	mg/kg	n/v	n/v	<0.020	<0.020	<0.020	<0.020	<0.020	-
Xylenes, Total	mg/kg	11[A]	na	<0.045	<0.045	-	<0.045	<0.045	-
PHC F1 (C6-C10 range)	mg/kg	n/v	na	<10	-	-	<10	<10	-
PHC F1 (C6-C10 range) minus BTEX	mg/kg	240[B]	na	<10	-	-	<10	<10	-
PHC F2 (>C10-C16 range)	mg/kg	260[B]	na	<10	<10	-	<10	<10	-
PHC F3 (>C16-C34 range)	mg/kg	1,700[B]	na	<50	<50	-	<50	<50	-
PHC F4 (>C34-C50 range)	mg/kg	3,300[B]	na	<50	<50	-	<50	<50	-
Chromatogram to baseline at C50	none	n/v	n/v	YES	YES	-	YES	YES	-
Metals									
Antimony	mg/kg	n/v	40[C]	<0.50	<0.50	-	<0.50	<0.50	<0.50
Arsenic	mg/kg	12[A]	na	1.0	2.6	-	<1.0	<1.0	<1.0
Barium	mg/kg	2,000[A]	na	36	29	-	20	14 MA	12
Beryllium	mg/kg	n/v	8[C]	<0.40	<0.40	-	<0.40	<0.40	<0.40
Cadmium	mg/kg	22[A]	na	<0.050	<0.050	-	<0.050	<0.050	<0.050
Chromium	mg/kg	87[A]	na	26	39	-	19	61	58
Cobalt	mg/kg	n/v	300[C]	5.0	3.7	-	3.2	1.7	1.7
Copper	mg/kg	91[A]	na	11	10	-	10	5.4	4.6
Lead	mg/kg	260[A]	na	5.7	3.8	-	3.6	1.8	1.8
Mercury	mg/kg	24[A]	na	<0.050	<0.050	-	<0.050	<0.050 MA	<0.050
Molybdenum	mg/kg	n/v	40[C]	<0.40	0.86	-	<0.40	1.6	1.6
Nickel	mg/kg	50[A]	na	16	21	-	11	28 MA	26
Selenium	mg/kg	2.9[A]	na	<0.50	<0.50	-	<0.50	<0.50	<0.50
Silver	mg/kg	n/v	40[C]	<0.20	<0.20	-	<0.20	<0.20	<0.20
Thallium	mg/kg	1[A]	na	0.22	0.15	-	0.15	<0.10	<0.10
Tin	mg/kg	n/v	300[C]	<1.0	<1.0	-	<1.0	<1.0	<1.0
Vanadium	mg/kg	130[A]	na	22	22	-	17	10	10
Zinc	mg/kg	360[A]	na	25	20	-	20	11	<10
Polycyclic Aromatic Hydrocarbons									
Acenaphthene	mg/kg	n/v	0.28[I]	<0.0050	<0.0050	-	<0.0050	<0.0050	-
Acenaphthylene	mg/kg	n/v	320[I]	<0.0050	<0.0050	-	<0.0050	<0.0050	-
Acridine	mg/kg	n/v	n/v	<0.010	<0.010	-	<0.010	<0.010	-
Anthracene	mg/kg	n/v	32[EHJ]	<0.0040	<0.0040	-	<0.0040	<0.0040	-
Benzo(a)anthracene	mg/kg	n/v	10[EG]	<0.0050	<0.0050	-	<0.0050	<0.0050	-
Benzo(a)pyrene	mg/kg	n/v	72[EHJ] 8,800[I]	<0.0050	<0.0050	-	<0.0050	<0.0050	-
Benzo(b)pyridine (Quinoline)	mg/kg	n/v	n/v	<0.010	<0.010	-	<0.010	<0.010	-
Benzo(b/j)fluoranthene	mg/kg	n/v	10[EG]	<0.0050	<0.0050	-	<0.0050	<0.0050	-
Benzo(c)phenanthrene	mg/kg	n/v	n/v	<0.0050	<0.0050	-	<0.0050	<0.0050	-
Benzo(e)pyrene	mg/kg	n/v	n/v	<0.0050	<0.0050	-	<0.0050	<0.0050	-
Benzo(g,h,i)perylene	mg/kg	n/v	n/v	<0.0050	<0.0050	-	<0.0050	<0.0050	-
Benzo(k)fluoranthene	mg/kg	n/v	10[EG]	<0.0050	<0.0050	-	<0.0050	<0.0050	-
Chrysene	mg/kg	n/v	n/v	<0.0050	<0.0050	-	<0.0050	<0.0050	-
Dibenzo(a,h)anthracene	mg/kg	n/v	10[EG]	<0.0050	<0.0050	-	<0.0050	<0.0050	-
Fluoranthene	mg/kg	n/v	180[EHJ]	<0.0050	<0.0050	-	<0.0050	<0.0050	-
Fluorene	mg/kg	n/v	0.25[I]	<0.0050	<0.0050	-	<0.0050	<0.0050	-
Indeno(1,2,3-cd)pyrene	mg/kg	n/v	10[EG]	<0.0050	<0.0050	-	<0.0050	<0.0050	-
Methylnaphthalene, 2-	mg/kg	n/v	n/v	<0.0050	<0.0050	-	<0.0050	<0.0050	-
Naphthalene	mg/kg	n/v	0.013_e[EI] 22[G]	<0.0050	<0.0050	-	<0.0050	<0.0050	-
Perylene	mg/kg	n/v	n/v	<0.0050	<0.0050	-	<0.0050	<0.0050	-
Phenanthrene	mg/kg	n/v	0.046_e[EI] 50[G]	<0.0050	<0.0050	-	<0.0050	<0.0050	-
Pyrene	mg/kg	n/v	100[EG]	<0.0050	<0.0050	-	<0.0050	<0.0050	-
Total PAH	mg/kg	n/v	n/v	<0.010	<0.010	-	<0.010	<0.010	-
Benzo(a)pyrene Total Potency Equivalents	mg/kg	n/v	$5.3_{a,b,c}$[D]	<0.0071	<0.0071	-	<0.0071	<0.0071	-
High Molecular Weight PAHs	mg/kg	n/v	n/v	<0.0050	<0.0050	-	<0.0050	<0.0050	-
Low Molecular Weight PAHs	mg/kg	n/v	n/v	<0.010	<0.010	-	<0.010	<0.010	-
Index of Additive Cancer Risk	none	n/v	$\leq 1.0_d$[F]	<0.060	<0.060	-	<0.060	<0.060	-

Notes:

Nunavut	Environmental Guideline for the Management of Contaminated Sites, Department of Environment Government of Nunavut (2014)
A	Table A3.1 - Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health - Commercial Land Use - Surface Soil - Coarse Grained Soil
B	Table 2 - Tier 1 Levels for PHC for Surface Soils - Commercial Land Use - Coarse Grained Soil
CCME	Canadian Council of Ministers of the Environment
C	Canadian Environmental Quality Guidelines, Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health, on-line summary table, for commercial land use and coarse grained soil
D	Canadian Soil Quality Guideline for the Protection of Environmental and Human Health, PAH, 2008. revised 2010, for a Commercial land use (Table 1 - Direct contact)
E	Canadian Soil Quality Guideline for the Protection of Environmental and Human Health, PAH, 2008. revised 2010, for a Commercial land use (Table 1 - Environmental health guidelines based on non-carcinogenic effects of PAHs)
F	Canadian Soil Quality Guideline for the Protection of Environmental and Human Health, PAH, 2008. revised 2010, for a Commercial land use (Table 1 - Protection of potable water)
G	Canadian Soil Quality Guideline for the Protection of Environmental and Human Health, PAH, 2008. revised 2010, for a Commercial land use (Table 2 - Interim/Provisional Soil Quality Critera, CCME 1991)
H	Canadian Soil Quality Guideline for the Protection of Environmental and Human Health, PAH, 2008. revised 2010, for a Commercial land use (Table 2 - Soil Quality Guideline for Environmental Health)
I	Canadian Soil Quality Guideline for the Protection of Environmental and Human Health, PAH, 2008. revised 2010, for a Commercial land use (Table 2 - Soil Quality Guideline for Protection of freshwater life)
J	Canadian Soil Quality Guideline for the Protection of Environmental and Human Health, PAH, 2008. revised 2010, for a Commercial land use (Table 2 - Soil Quality Guideline for Soil Contact)
K	Canada Wide Standards for PHC in Soil - Commercial land use - Coarse-grained Surface Soil, Tier 1 (Revised Jan 2008, Table 3), lowest guideline, excluding protection of potable GW pathway
L	Canada Wide Standards for PHC in Soil - Commercial - Coarse, Surface Soil - Protection of Potable Groundwater (Revised Jan 2008)
6.5[A]	Concentration exceeds the indicated standard.
15.2	Measured concentration did not exceed the indicated standard.
<0.03	Analyte was not detected at a concentration greater than the laboratory reporting limit.
n/v	No standard/guideline value.
na	Not Applicable - CCME guideline applicable only if no Government of Nunavut guideline available.
-	Parameter not analyzed / not available.
a,b,c	SQG based on an incremental lifetime cancer risk (ILCR) of 1 in 100,000 (10e-5). B[a]P TPE = Benzo[a]pyrene Total Potency Equivalents, which is the sum of estimated cancer potency relative to B[a]P for all potentially carcinogenic unsubstituted PAHs. The B[a]P TPE for a soil sample is calculated by multiplying the concentration of each PAH in the sample by its B[a]P Potency Equivalence Factor (PEF), given below, and summing the products: Benz[a]anthracene = 0.1, Benzo[a]pyrene = 1, Benzo[b+j+k]fluoranthene = 0.1, Benzo[g,h,i]perylene = 0.01, Chrysene = 0.01, Dibenz[a,h]anthracene =1, Indeno[1,2,3-cd]pyrene = 0.1.
d	The Index of Additive Cancer Risk (IACR) assesses potential threats to potable groundwater quality from leaching of carcinogenic PAH mixtures from soil. The IACR is calculated by dividing the soil concentration (numerator) of each carcinogenic PAH by its soil quality guideline for protection of potable water component value (denominator) to calculate a hazard index for each PAH, and then summing the hazard indices for the entire PAH mixture, as follows: IACR = (Benzo[a]anthracene/0.33)+(Benzo[b+j+k]fluoranthene/0.16)+(Benzo[g,h,i]perylene/6.8)+(Benzo[a]pyrene/0.37)+(Chrysene/2.1)+(Dibenzo[a,h])anthracene/0.23)+(Indeno[1,2,3-cd]pyrene/2.7)
e	This value is the Soil Quality Guideline for the Protection of Freshwater Life. Users may wish to consider the application, on a site-specific basis, of this value where potential impacts to nearby surface waters are a concern (the value may be less than the common limit of detection in some jurisdictions; contact jurisdiction for guidance). If impact to surface water is not a concern, it is recommended to revert to the 1997 provisional SQGE for naphthalene and the 1991 Interim Soil Quality Criteria for phenanthrene.
MA	Matrix Spike outside acceptance limits due to matrix interference. Reanalysis yields similar results.

NUNAMI
STANTEC LIMITED

Your Project #: 111477087
Your C.O.C. #: 675797-01-01

Attention: SUMMER HULL

STANTEC CONSULTING LTD
500-311 PORTAGE AVENUE
WINNIPEG, MB
CANADA R3B 2B9

Report Date: 2022/10/14
Report #: R3248321
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

BUREAU VERITAS JOB #: C274555
Received: 2022/09/26, 08:30

Sample Matrix: Soil
Samples Received: 4

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
BTEX/F1 by HS GC/MS/FID (MeOH extract) (1)	1	2022/09/28	2022/09/28	AB SOP-00039	CCME CWS/EPA 8260d m
BTEX/F1 by HS GC/MS/FID (MeOH extract) (1)	1	2022/09/29	2022/09/30	AB SOP-00039	CCME CWS/EPA 8260d m
BTEX/F1 by HS GC/MS/FID (MeOH extract) (1, 3)	2	N/A	2022/09/29	AB SOP-00039	CCME CWS/EPA 8260d m
F1-BTEX (1)	1	N/A	2022/09/30		Auto Calc
F1-BTEX (1)	1	N/A	2022/10/01		Auto Calc
F1-BTEX (1)	2	N/A	2022/10/03		Auto Calc
CCME Hydrocarbons (F2-F4 in soil) (1, 4)	1	2022/09/28	2022/09/29	AB SOP-00036	CCME PHC-CWS m
CCME Hydrocarbons (F2-F4 in soil) (1, 4)	1	2022/09/29	2022/09/30	AB SOP-00036	CCME PHC-CWS m
CCME Hydrocarbons (F2-F4 in soil) (1, 4)	2	2022/10/01	2022/10/04	AB SOP-00036	CCME PHC-CWS m
Elements by ICPMS - Soils (1)	2	2022/09/30	2022/09/30	AB SOP-00001 / AB SOP-00043	EPA 6020b R2 m
Elements by ICPMS - Soils (2)	2	2022/09/30	2022/10/08	BBY7SOP-00001	EPA 6020b R2 m
Moisture (1)	1	N/A	2022/09/29	AB SOP-00002	CCME PHC-CWS m
Moisture (1)	1	N/A	2022/09/30	AB SOP-00002	CCME PHC-CWS m
Moisture (1)	2	N/A	2022/10/02	AB SOP-00002	CCME PHC-CWS m
Index of Additive Cancer Risk (1)	1	N/A	2022/09/30		Auto Calc
Index of Additive Cancer Risk (1)	1	N/A	2022/10/01		Auto Calc
Index of Additive Cancer Risk (1)	2	N/A	2022/10/04		Auto Calc
Benzo[a]pyrene Equivalency (1)	1	N/A	2022/09/30		Auto Calc
Benzo[a]pyrene Equivalency (1)	1	N/A	2022/10/01		Auto Calc
Benzo[a]pyrene Equivalency (1)	2	N/A	2022/10/04		Auto Calc
PAH in Soil by GC/MS (1)	1	2022/09/28	2022/09/29	AB SOP-00036 / AB SOP-00003	EPA 3540C/8270E m
PAH in Soil by GC/MS (1)	1	2022/09/29	2022/09/30	AB SOP-00036 / AB SOP-00003	EPA 3540C/8270E m
PAH in Soil by GC/MS (1)	2	2022/10/01	2022/10/03	AB SOP-00036 / AB SOP-00003	EPA 3540C/8270E m
Total LMW, HMW, Total PAH Calc (1)	1	N/A	2022/09/30		Auto Calc
Total LMW, HMW, Total PAH Calc (1)	1	N/A	2022/10/01		Auto Calc
Total LMW, HMW, Total PAH Calc (1)	2	N/A	2022/10/04		Auto Calc
Particle Size by Sieve (75 micron) (1)	4	N/A	2022/10/14		Auto Calc
Particle Size by Sieve (1)	4	N/A	2022/10/14	AB SOP-00022	ASTM D6913-17 m

Bureau Veritas Winnipeg: Unit D, 675 Berry Street R3H 1A7 Telephone (204) 772-7276 Fax (204) 772-2386

Your Project #: 111477087
Your C.O.C. #: 675797-01-01

Attention: SUMMER HULL

STANTEC CONSULTING LTD
500-311 PORTAGE AVENUE
WINNIPEG, MB
CANADA R3B 2B9

Report Date: 2022/10/14
Report #: R3248321
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

BUREAU VERITAS JOB #: C274555
Received: 2022/09/26, 08:30

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) This test was performed by Bureau Veritas Calgary, 4000 - 19 St. , Calgary, AB, T2E 6P8
(2) This test was performed by Bureau Veritas Vancouver, 4606 Canada Way , Burnaby, BC, V5G 1K5
(3) No lab extraction date is given for F1BTEX & VOC samples that are field preserved with methanol. Extraction date is date sampled unless otherwise stated.
(4) All CCME results met required criteria unless otherwise stated in the report. The CWS PHC methods employed by Bureau Veritas conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following Alberta Environment’s Interpretation of the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil, Validation of Performance-Based Alternative Methods September 2003. Documentation is available upon request. Modifications from Reference Method for the Canada-wide Standard for Petroleum Hydrocarbons in Soil-Tier 1 Method: F2/F3/F4 data reported using validated cold solvent extraction instead of Soxhlet extraction.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Geraldlyn Gouthro, Key Account Specialist
Email: geraldlyn.gouthro@bureauveritas.com
Phone# (780)577-7173

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Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Bureau Veritas ID		BCV461		
Sampling Date		2022/09/22 13:40		
COC Number		675797-01-01		
	UNITS	SS-03	RDL	QC Batch
Ext. Pet. Hydrocarbon				
F2 (C10-C16 Hydrocarbons)	mg/kg	<10	10	A734073
F3 (C16-C34 Hydrocarbons)	mg/kg	<50	50	A734073
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	50	A734073
Reached Baseline at C50	mg/kg	Yes	N/A	A734073
Volatiles				
Benzene	mg/kg	<0.0050	0.0050	A732919
Toluene	mg/kg	<0.050	0.050	A732919
Ethylbenzene	mg/kg	<0.010	0.010	A732919
m & p-Xylene	mg/kg	<0.040	0.040	A732919
o-Xylene	mg/kg	<0.020	0.020	A732919
Xylenes (Total)	mg/kg	<0.045	0.045	A732169
F1 (C6-C10) - BTEX	mg/kg	<10	10	A732169
F1 (C6-C10)	mg/kg	<10	10	A732919
Surrogate Recovery (%)				
1,4-Difluorobenzene (sur.)	%	100	N/A	A732919
4-Bromofluorobenzene (sur.)	%	100	N/A	A732919
D10-o-Xylene (sur.)	%	99	N/A	A732919
D4-1,2-Dichloroethane (sur.)	%	103	N/A	A732919
O-TERPHENYL (sur.)	%	103	N/A	A734073

RDL = Reportable Detection Limit
N/A = Not Applicable

Bureau Veritas Winnipeg: Unit D, 675 Berry Street R3H 1A7 Telephone (204) 772-7276 Fax (204) 772-2386

AT1 BTEX AND F1-F4 IN SOIL (VIALS)

Bureau Veritas ID		BCV459		BCV460		BCV462		
Sampling Date		2022/09/22 12:10		2022/09/22 12:45		2022/09/22 14:35		
COC Number		675797-01-01		675797-01-01		675797-01-01		
	UNITS	SS-01	QC Batch	SS-02	QC Batch	SS-04	RDL	QC Batch
Ext. Pet. Hydrocarbon								
F2 (C10-C16 Hydrocarbons)	mg/kg	<10	A738695	<10	A734519	<10	10	A738695
F3 (C16-C34 Hydrocarbons)	mg/kg	<50	A738695	<50	A734519	<50	50	A738695
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	A738695	<50	A734519	<50	50	A738695
Reached Baseline at C50	mg/kg	Yes	A738695	Yes	A734519	Yes	N/A	A738695
Volatiles								
Xylenes (Total)	mg/kg	<0.045	A732169	N/A	N/A	<0.045	0.045	A732169
F1 (C6-C10) - BTEX	mg/kg	<10	A732169	N/A	N/A	<10	10	A732169
Field Preserved Volatiles								
Benzene	mg/kg	<0.0050	A734226	N/A	N/A	<0.0050	0.0050	A734226
Toluene	mg/kg	<0.050	A734226	N/A	N/A	<0.050	0.050	A734226
Ethylbenzene	mg/kg	<0.010	A734226	N/A	N/A	<0.010	0.010	A734226
m & p-Xylene	mg/kg	<0.040	A734226	N/A	N/A	<0.040	0.040	A734226
o-Xylene	mg/kg	<0.020	A734226	N/A	N/A	<0.020	0.020	A734226
F1 (C6-C10)	mg/kg	<10	A734226	N/A	N/A	<10	10	A734226
Surrogate Recovery (%)								
1,4-Difluorobenzene (sur.)	%	97	A734226	N/A	N/A	98	N/A	A734226
4-Bromofluorobenzene (sur.)	%	94	A734226	N/A	N/A	94	N/A	A734226
D10-o-Xylene (sur.)	%	90	A734226	N/A	N/A	108	N/A	A734226
D4-1,2-Dichloroethane (sur.)	%	90	A734226	N/A	N/A	88	N/A	A734226
O-TERPHENYL (sur.)	%	118	A738695	97	A734519	106	N/A	A738695

RDL = Reportable Detection Limit
N/A = Not Applicable

Bureau Veritas Winnipeg: Unit D, 675 Berry Street R3H 1A7 Telephone (204) 772-7276 Fax (204) 772-2386

PAH IN SOIL BY GC/MS (SOIL)

Bureau Veritas ID		BCV459		BCV460		BCV461		
Sampling Date		2022/09/22 12:10		2022/09/22 12:45		2022/09/22 13:40		
COC Number		675797-01-01		675797-01-01		675797-01-01		
	UNITS	SS-01	QC Batch	SS-02	QC Batch	SS-03	RDL	QC Batch
Polycyclic Aromatics								
Index of Additive Cancer Risk(IACR)	N/A	<0.060	A731825	<0.060	A731825	<0.060	0.060	A731825
Acenaphthene	mg/kg	<0.0050	A738697	<0.0050	A736048	<0.0050	0.0050	A732805
B[a]P TPE Total Potency Equivalents	mg/kg	<0.0071	A731392	<0.0071	A731392	<0.0071	0.0071	A731392
Acenaphthylene	mg/kg	<0.0050	A738697	<0.0050	A736048	<0.0050	0.0050	A732805
Acridine	mg/kg	<0.010	A738697	<0.010	A736048	<0.010	0.010	A732805
Anthracene	mg/kg	<0.0040	A738697	<0.0040	A736048	<0.0040	0.0040	A732805
Benzo(a)anthracene	mg/kg	<0.0050	A738697	<0.0050	A736048	<0.0050	0.0050	A732805
Benzo(b&j)fluoranthene	mg/kg	<0.0050	A738697	<0.0050	A736048	<0.0050	0.0050	A732805
Benzo(k)fluoranthene	mg/kg	<0.0050	A738697	<0.0050	A736048	<0.0050	0.0050	A732805
Benzo(g,h,i)perylene	mg/kg	<0.0050	A738697	<0.0050	A736048	<0.0050	0.0050	A732805
Benzo(c)phenanthrene	mg/kg	<0.0050	A738697	<0.0050	A736048	<0.0050	0.0050	A732805
Benzo(a)pyrene	mg/kg	<0.0050	A738697	<0.0050	A736048	<0.0050	0.0050	A732805
Benzo(e)pyrene	mg/kg	<0.0050	A738697	<0.0050	A736048	<0.0050	0.0050	A732805
Chrysene	mg/kg	<0.0050	A738697	<0.0050	A736048	<0.0050	0.0050	A732805
Dibenz(a,h)anthracene	mg/kg	<0.0050	A738697	<0.0050	A736048	<0.0050	0.0050	A732805
Fluoranthene	mg/kg	<0.0050	A738697	<0.0050	A736048	<0.0050	0.0050	A732805
Fluorene	mg/kg	<0.0050	A738697	<0.0050	A736048	<0.0050	0.0050	A732805
Indeno(1,2,3-cd)pyrene	mg/kg	<0.0050	A738697	<0.0050	A736048	<0.0050	0.0050	A732805
2-Methylnaphthalene	mg/kg	<0.0050	A738697	<0.0050	A736048	<0.0050	0.0050	A732805
Naphthalene	mg/kg	<0.0050	A738697	<0.0050	A736048	<0.0050	0.0050	A732805
Phenanthrene	mg/kg	<0.0050	A738697	<0.0050	A736048	<0.0050	0.0050	A732805
Perylene	mg/kg	<0.0050	A738697	<0.0050	A736048	<0.0050	0.0050	A732805
Pyrene	mg/kg	<0.0050	A738697	<0.0050	A736048	<0.0050	0.0050	A732805
Quinoline	mg/kg	<0.010	A738697	<0.010	A736048	<0.010	0.010	A732805
Low Molecular Weight PAH`s	mg/kg	<0.010	A732252	<0.010	A732252	<0.010	0.010	A732252
High Molecular Weight PAH`s	mg/kg	<0.0050	A732252	<0.0050	A732252	<0.0050	0.0050	A732252
Total PAH	mg/kg	<0.010	A732252	<0.010	A732252	<0.010	0.010	A732252
Surrogate Recovery (%)								
D10-ANTHRACENE (sur.)	%	102	A738697	107	A736048	104	N/A	A732805
D8-ACENAPHTHYLENE (sur.)	%	108	A738697	106	A736048	109	N/A	A732805
D8-NAPHTHALENE (sur.)	%	97	A738697	96	A736048	98	N/A	A732805

RDL = Reportable Detection Limit
N/A = Not Applicable

Bureau Veritas Winnipeg: Unit D, 675 Berry Street R3H 1A7 Telephone (204) 772-7276 Fax (204) 772-2386

PAH IN SOIL BY GC/MS (SOIL)

Bureau Veritas ID		BCV459		BCV460		BCV461		
Sampling Date		2022/09/22 12:10		2022/09/22 12:45		2022/09/22 13:40		
COC Number		675797-01-01		675797-01-01		675797-01-01		
	UNITS	**SS-01**	**QC Batch**	**SS-02**	**QC Batch**	**SS-03**	**RDL**	**QC Batch**
TERPHENYL-D14 (sur.)	%	100	A738697	96	A736048	91	N/A	A732805

RDL = Reportable Detection Limit
N/A = Not Applicable

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PAH IN SOIL BY GC/MS (SOIL)

Bureau Veritas ID		BCV462		
Sampling Date		2022/09/22 14:35		
COC Number		675797-01-01		
	UNITS	SS-04	RDL	QC Batch
Polycyclic Aromatics				
Index of Additive Cancer Risk(IACR)	N/A	<0.060	0.060	A731825
Acenaphthene	mg/kg	<0.0050	0.0050	A738697
B[a]P TPE Total Potency Equivalents	mg/kg	<0.0071	0.0071	A731392
Acenaphthylene	mg/kg	<0.0050	0.0050	A738697
Acridine	mg/kg	<0.010	0.010	A738697
Anthracene	mg/kg	<0.0040	0.0040	A738697
Benzo(a)anthracene	mg/kg	<0.0050	0.0050	A738697
Benzo(b&j)fluoranthene	mg/kg	<0.0050	0.0050	A738697
Benzo(k)fluoranthene	mg/kg	<0.0050	0.0050	A738697
Benzo(g,h,i)perylene	mg/kg	<0.0050	0.0050	A738697
Benzo(c)phenanthrene	mg/kg	<0.0050	0.0050	A738697
Benzo(a)pyrene	mg/kg	<0.0050	0.0050	A738697
Benzo(e)pyrene	mg/kg	<0.0050	0.0050	A738697
Chrysene	mg/kg	<0.0050	0.0050	A738697
Dibenz(a,h)anthracene	mg/kg	<0.0050	0.0050	A738697
Fluoranthene	mg/kg	<0.0050	0.0050	A738697
Fluorene	mg/kg	<0.0050	0.0050	A738697
Indeno(1,2,3-cd)pyrene	mg/kg	<0.0050	0.0050	A738697
2-Methylnaphthalene	mg/kg	<0.0050	0.0050	A738697
Naphthalene	mg/kg	<0.0050	0.0050	A738697
Phenanthrene	mg/kg	<0.0050	0.0050	A738697
Perylene	mg/kg	<0.0050	0.0050	A738697
Pyrene	mg/kg	<0.0050	0.0050	A738697
Quinoline	mg/kg	<0.010	0.010	A738697
Low Molecular Weight PAH`s	mg/kg	<0.010	0.010	A732252
High Molecular Weight PAH`s	mg/kg	<0.0050	0.0050	A732252
Total PAH	mg/kg	<0.010	0.010	A732252
Surrogate Recovery (%)				
D10-ANTHRACENE (sur.)	%	104	N/A	A738697
D8-ACENAPHTHYLENE (sur.)	%	106	N/A	A738697
D8-NAPHTHALENE (sur.)	%	94	N/A	A738697

RDL = Reportable Detection Limit
N/A = Not Applicable

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PAH IN SOIL BY GC/MS (SOIL)

Bureau Veritas ID		BCV462		
Sampling Date		2022/09/22 14:35		
COC Number		675797-01-01		
	UNITS	**SS-04**	**RDL**	**QC Batch**
TERPHENYL-D14 (sur.)	%	97	N/A	A738697

RDL = Reportable Detection Limit
N/A = Not Applicable

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PARTICLE SIZE BY SIEVE (75 UM)

Bureau Veritas ID		BCV459	BCV460	BCV461	BCV462		
Sampling Date		2022/09/22 12:10	2022/09/22 12:45	2022/09/22 13:40	2022/09/22 14:35		
COC Number		675797-01-01	675797-01-01	675797-01-01	675797-01-01		
	UNITS	**SS-01**	**SS-02**	**SS-03**	**SS-04**	**RDL**	**QC Batch**
Physical Properties							
Grain Size	N/A	COARSE	COARSE	COARSE	COARSE	N/A	A754436
Sieve - #10 (>2.00mm)	%	31	6.9	48	16	0.20	A756639
Sieve - #200 (>0.075mm)	%	53	51	90	87	0.20	A756639
Sieve - Pan	%	47	49	10	13	0.20	A756639

RDL = Reportable Detection Limit
N/A = Not Applicable

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PHYSICAL TESTING (SOIL)

Bureau Veritas ID		BCV459		BCV460		BCV461		BCV462		
Sampling Date		2022/09/22 12:10		2022/09/22 12:45		2022/09/22 13:40		2022/09/22 14:35		
COC Number		675797-01-01		675797-01-01		675797-01-01		675797-01-01		
	UNITS	SS-01	QC Batch	SS-02	QC Batch	SS-03	QC Batch	SS-04	RDL	QC Batch
Physical Properties										
Moisture	%	12	A738693	5.8	A736055	22	A734373	14	0.30	A738693

RDL = Reportable Detection Limit

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ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Bureau Veritas ID		BCV459		BCV460		BCV461		BCV462		
Sampling Date		2022/09/22 12:10		2022/09/22 12:45		2022/09/22 13:40		2022/09/22 14:35		
COC Number		675797-01-01		675797-01-01		675797-01-01		675797-01-01		
	UNITS	SS-01	QC Batch	SS-02	QC Batch	SS-03	QC Batch	SS-04	RDL	QC Batch
Elements										
Total Antimony (Sb)	mg/kg	<0.50	A736223	<0.50	A736243	<0.50	A736223	<0.50	0.50	A736243
Total Arsenic (As)	mg/kg	1.0	A736223	2.6	A736243	<1.0	A736223	<1.0	1.0	A736243
Total Barium (Ba)	mg/kg	36	A736223	29	A736243	20	A736223	14 (1)	1.0	A736243
Total Beryllium (Be)	mg/kg	<0.40	A736223	<0.40	A736243	<0.40	A736223	<0.40	0.40	A736243
Total Cadmium (Cd)	mg/kg	<0.050	A736223	<0.050	A736243	<0.050	A736223	<0.050	0.050	A736243
Total Chromium (Cr)	mg/kg	26	A736223	39	A736243	19	A736223	61	1.0	A736243
Total Cobalt (Co)	mg/kg	5.0	A736223	3.7	A736243	3.2	A736223	1.7	0.50	A736243
Total Copper (Cu)	mg/kg	11	A736223	10	A736243	10	A736223	5.4	1.0	A736243
Total Lead (Pb)	mg/kg	5.7	A736223	3.8	A736243	3.6	A736223	1.8	0.50	A736243
Total Mercury (Hg)	mg/kg	<0.050	A736223	<0.050	A736243	<0.050	A736223	<0.050 (1)	0.050	A736243
Total Molybdenum (Mo)	mg/kg	<0.40	A736223	0.86	A736243	<0.40	A736223	1.6	0.40	A736243
Total Nickel (Ni)	mg/kg	16	A736223	21	A736243	11	A736223	28 (1)	1.0	A736243
Total Selenium (Se)	mg/kg	<0.50	A736223	<0.50	A736243	<0.50	A736223	<0.50	0.50	A736243
Total Silver (Ag)	mg/kg	<0.20	A736223	<0.20	A736243	<0.20	A736223	<0.20	0.20	A736243
Total Thallium (Tl)	mg/kg	0.22	A736223	0.15	A736243	0.15	A736223	<0.10	0.10	A736243
Total Tin (Sn)	mg/kg	<1.0	A736223	<1.0	A736243	<1.0	A736223	<1.0	1.0	A736243
Total Vanadium (V)	mg/kg	22	A736223	22	A736243	17	A736223	10	1.0	A736243
Total Zinc (Zn)	mg/kg	25	A736223	20	A736243	20	A736223	11	10	A736243

RDL = Reportable Detection Limit

(1) Matrix Spike exceeds acceptance limits due to matrix interference. Reanalysis yields similar results.

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ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Bureau Veritas ID		BCV462		
Sampling Date		2022/09/22 14:35		
COC Number		675797-01-01		
	UNITS	SS-04 Lab-Dup	RDL	QC Batch
Elements				
Total Antimony (Sb)	mg/kg	<0.50	0.50	A736243
Total Arsenic (As)	mg/kg	<1.0	1.0	A736243
Total Barium (Ba)	mg/kg	12	1.0	A736243
Total Beryllium (Be)	mg/kg	<0.40	0.40	A736243
Total Cadmium (Cd)	mg/kg	<0.050	0.050	A736243
Total Chromium (Cr)	mg/kg	58	1.0	A736243
Total Cobalt (Co)	mg/kg	1.7	0.50	A736243
Total Copper (Cu)	mg/kg	4.6	1.0	A736243
Total Lead (Pb)	mg/kg	1.8	0.50	A736243
Total Mercury (Hg)	mg/kg	<0.050	0.050	A736243
Total Molybdenum (Mo)	mg/kg	1.6	0.40	A736243
Total Nickel (Ni)	mg/kg	26	1.0	A736243
Total Selenium (Se)	mg/kg	<0.50	0.50	A736243
Total Silver (Ag)	mg/kg	<0.20	0.20	A736243
Total Thallium (Tl)	mg/kg	<0.10	0.10	A736243
Total Tin (Sn)	mg/kg	<1.0	1.0	A736243
Total Vanadium (V)	mg/kg	10	1.0	A736243
Total Zinc (Zn)	mg/kg	<10	10	A736243

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate

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VOLATILE ORGANICS BY GC-MS (SOIL)

Bureau Veritas ID		BCV460	BCV460		
Sampling Date		2022/09/22 12:45	2022/09/22 12:45		
COC Number		675797-01-01	675797-01-01		
	UNITS	SS-02	SS-02 Lab-Dup	RDL	QC Batch
Volatiles					
Benzene	mg/kg	<0.0050	<0.0050	0.0050	A736324
Toluene	mg/kg	<0.050	<0.050	0.050	A736324
Ethylbenzene	mg/kg	<0.010	<0.010	0.010	A736324
m & p-Xylene	mg/kg	<0.040	<0.040	0.040	A736324
o-Xylene	mg/kg	<0.020	<0.020	0.020	A736324
Xylenes (Total)	mg/kg	<0.045	N/A	0.045	A734307
Surrogate Recovery (%)					
1,4-Difluorobenzene (sur.)	%	98	100	N/A	A736324
4-Bromofluorobenzene (sur.)	%	92	93	N/A	A736324
D10-o-Xylene (sur.)	%	87	87	N/A	A736324
D4-1,2-Dichloroethane (sur.)	%	88	91	N/A	A736324

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

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GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	6.8°C

Version 2: Additional parameters have been included as per request from client 2022/10/13:

SS-01 Sieve
SS-02 Sieve
SS-03 Sieve
SS-04 Sieve

Sample BCV460 [SS-02] : Sample received was not in compliance with CCME sampling requirements for VOC/BTEX/F1 in soil.

Sample BCV461 [SS-03] : Sample received was not in compliance with CCME sampling requirements for VOC/BTEX/F1 in soil.

Results relate only to the items tested.

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QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
A732805	NK3	Matrix Spike	D10-ANTHRACENE (sur.)	2022/09/28		100	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2022/09/28		89	%	50 - 130
			D8-NAPHTHALENE (sur.)	2022/09/28		89	%	50 - 130
			TERPHENYL-D14 (sur.)	2022/09/28		109	%	50 - 130
			Acenaphthene	2022/09/28		89	%	50 - 130
			Acenaphthylene	2022/09/28		87	%	50 - 130
			Acridine	2022/09/28		60	%	50 - 130
			Anthracene	2022/09/28		89	%	50 - 130
			Benzo(a)anthracene	2022/09/28		100	%	50 - 130
			Benzo(b&j)fluoranthene	2022/09/28		97	%	50 - 130
			Benzo(k)fluoranthene	2022/09/28		86	%	50 - 130
			Benzo(g,h,i)perylene	2022/09/28		93	%	50 - 130
			Benzo(c)phenanthrene	2022/09/28		98	%	50 - 130
			Benzo(a)pyrene	2022/09/28		102	%	50 - 130
			Benzo(e)pyrene	2022/09/28		88	%	50 - 130
			Chrysene	2022/09/28		92	%	50 - 130
			Dibenz(a,h)anthracene	2022/09/28		100	%	50 - 130
			Fluoranthene	2022/09/28		104	%	50 - 130
			Fluorene	2022/09/28		95	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2022/09/28		100	%	50 - 130
			2-Methylnaphthalene	2022/09/28		94	%	50 - 130
			Naphthalene	2022/09/28		84	%	50 - 130
			Phenanthrene	2022/09/28		88	%	50 - 130
			Perylene	2022/09/28		84	%	50 - 130
			Pyrene	2022/09/28		102	%	50 - 130
			Quinoline	2022/09/28		86	%	50 - 130
A732805	NK3	Spiked Blank	D10-ANTHRACENE (sur.)	2022/09/28		112	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2022/09/28		98	%	50 - 130
			D8-NAPHTHALENE (sur.)	2022/09/28		97	%	50 - 130
			TERPHENYL-D14 (sur.)	2022/09/28		122	%	50 - 130
			Acenaphthene	2022/09/28		99	%	50 - 130
			Acenaphthylene	2022/09/28		99	%	50 - 130
			Acridine	2022/09/28		71	%	50 - 130
			Anthracene	2022/09/28		101	%	50 - 130
			Benzo(a)anthracene	2022/09/28		115	%	50 - 130
			Benzo(b&j)fluoranthene	2022/09/28		110	%	50 - 130
			Benzo(k)fluoranthene	2022/09/28		99	%	50 - 130
			Benzo(g,h,i)perylene	2022/09/28		106	%	50 - 130
			Benzo(c)phenanthrene	2022/09/28		113	%	50 - 130
			Benzo(a)pyrene	2022/09/28		106	%	50 - 130
			Benzo(e)pyrene	2022/09/28		101	%	50 - 130
			Chrysene	2022/09/28		106	%	50 - 130
			Dibenz(a,h)anthracene	2022/09/28		112	%	50 - 130
			Fluoranthene	2022/09/28		117	%	50 - 130
			Fluorene	2022/09/28		106	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2022/09/28		113	%	50 - 130
			2-Methylnaphthalene	2022/09/28		106	%	50 - 130
			Naphthalene	2022/09/28		95	%	50 - 130
			Phenanthrene	2022/09/28		99	%	50 - 130
			Perylene	2022/09/28		97	%	50 - 130
			Pyrene	2022/09/28		110	%	50 - 130
			Quinoline	2022/09/28		89	%	50 - 130
A732805	NK3	Method Blank	D10-ANTHRACENE (sur.)	2022/09/28		109	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2022/09/28		94	%	50 - 130

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			D8-NAPHTHALENE (sur.)	2022/09/28		96	%	50 - 130
			TERPHENYL-D14 (sur.)	2022/09/28		126	%	50 - 130
			Acenaphthene	2022/09/28	<0.0050		mg/kg	
			Acenaphthylene	2022/09/28	<0.0050		mg/kg	
			Acridine	2022/09/28	<0.010		mg/kg	
			Anthracene	2022/09/28	<0.0040		mg/kg	
			Benzo(a)anthracene	2022/09/28	<0.0050		mg/kg	
			Benzo(b&j)fluoranthene	2022/09/28	<0.0050		mg/kg	
			Benzo(k)fluoranthene	2022/09/28	<0.0050		mg/kg	
			Benzo(g,h,i)perylene	2022/09/28	<0.0050		mg/kg	
			Benzo(c)phenanthrene	2022/09/28	<0.0050		mg/kg	
			Benzo(a)pyrene	2022/09/28	<0.0050		mg/kg	
			Benzo(e)pyrene	2022/09/28	<0.0050		mg/kg	
			Chrysene	2022/09/28	<0.0050		mg/kg	
			Dibenz(a,h)anthracene	2022/09/28	<0.0050		mg/kg	
			Fluoranthene	2022/09/28	<0.0050		mg/kg	
			Fluorene	2022/09/28	<0.0050		mg/kg	
			Indeno(1,2,3-cd)pyrene	2022/09/28	<0.0050		mg/kg	
			2-Methylnaphthalene	2022/09/28	<0.0050		mg/kg	
			Naphthalene	2022/09/28	<0.0050		mg/kg	
			Phenanthrene	2022/09/28	<0.0050		mg/kg	
			Perylene	2022/09/28	<0.0050		mg/kg	
			Pyrene	2022/09/28	<0.0050		mg/kg	
			Quinoline	2022/09/28	<0.010		mg/kg	
A732805	NK3	RPD	Acenaphthene	2022/09/28	NC		%	50
			Acenaphthylene	2022/09/28	NC		%	50
			Acridine	2022/09/28	NC		%	50
			Anthracene	2022/09/28	NC		%	50
			Benzo(a)anthracene	2022/09/28	NC		%	50
			Benzo(b&j)fluoranthene	2022/09/28	NC		%	50
			Benzo(k)fluoranthene	2022/09/28	NC		%	50
			Benzo(g,h,i)perylene	2022/09/28	NC		%	50
			Benzo(c)phenanthrene	2022/09/28	NC		%	50
			Benzo(a)pyrene	2022/09/28	NC		%	50
			Benzo(e)pyrene	2022/09/28	NC		%	50
			Chrysene	2022/09/28	NC		%	50
			Dibenz(a,h)anthracene	2022/09/28	NC		%	50
			Fluoranthene	2022/09/28	NC		%	50
			Fluorene	2022/09/28	NC		%	50
			Indeno(1,2,3-cd)pyrene	2022/09/28	NC		%	50
			2-Methylnaphthalene	2022/09/28	NC		%	50
			Naphthalene	2022/09/28	NC		%	50
			Phenanthrene	2022/09/28	NC		%	50
			Perylene	2022/09/28	0		%	50
			Pyrene	2022/09/28	NC		%	50
			Quinoline	2022/09/28	NC		%	50
A732919	WPK	Matrix Spike	1,4-Difluorobenzene (sur.)	2022/09/28		102	%	50 - 140
			4-Bromofluorobenzene (sur.)	2022/09/28		99	%	50 - 140
			D10-o-Xylene (sur.)	2022/09/28		106	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2022/09/28		98	%	50 - 140
			Benzene	2022/09/28		84	%	50 - 140
			Toluene	2022/09/28		82	%	50 - 140
			Ethylbenzene	2022/09/28		91	%	50 - 140
			m & p-Xylene	2022/09/28		87	%	50 - 140

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			o-Xylene	2022/09/28		85	%	50 - 140
			F1 (C6-C10)	2022/09/28		105	%	60 - 140
A732919	WPK	Spiked Blank	1,4-Difluorobenzene (sur.)	2022/09/28		109	%	50 - 140
			4-Bromofluorobenzene (sur.)	2022/09/28		106	%	50 - 140
			D10-o-Xylene (sur.)	2022/09/28		98	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2022/09/28		105	%	50 - 140
			Benzene	2022/09/28		87	%	60 - 130
			Toluene	2022/09/28		82	%	60 - 130
			Ethylbenzene	2022/09/28		87	%	60 - 130
			m & p-Xylene	2022/09/28		84	%	60 - 130
			o-Xylene	2022/09/28		85	%	60 - 130
			F1 (C6-C10)	2022/09/28		100	%	60 - 140
A732919	WPK	Method Blank	1,4-Difluorobenzene (sur.)	2022/09/28		106	%	50 - 140
			4-Bromofluorobenzene (sur.)	2022/09/28		99	%	50 - 140
			D10-o-Xylene (sur.)	2022/09/28		100	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2022/09/28		100	%	50 - 140
			Benzene	2022/09/28	<0.0050		mg/kg	
			Toluene	2022/09/28	<0.050		mg/kg	
			Ethylbenzene	2022/09/28	<0.010		mg/kg	
			m & p-Xylene	2022/09/28	<0.040		mg/kg	
			o-Xylene	2022/09/28	<0.020		mg/kg	
			F1 (C6-C10)	2022/09/28	<10		mg/kg	
A732919	WPK	RPD	Benzene	2022/09/28	NC		%	50
			Toluene	2022/09/28	NC		%	50
			Ethylbenzene	2022/09/28	NC		%	50
			m & p-Xylene	2022/09/28	NC		%	50
			o-Xylene	2022/09/28	NC		%	50
			F1 (C6-C10)	2022/09/28	NC		%	40
A734073	GG3	Matrix Spike	O-TERPHENYL (sur.)	2022/09/28		87	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2022/09/28		83	%	60 - 140
			F3 (C16-C34 Hydrocarbons)	2022/09/28		86	%	60 - 140
			F4 (C34-C50 Hydrocarbons)	2022/09/28		84	%	60 - 140
A734073	GG3	Spiked Blank	O-TERPHENYL (sur.)	2022/09/28		89	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2022/09/28		86	%	60 - 140
			F3 (C16-C34 Hydrocarbons)	2022/09/28		90	%	60 - 140
			F4 (C34-C50 Hydrocarbons)	2022/09/28		87	%	60 - 140
A734073	GG3	Method Blank	O-TERPHENYL (sur.)	2022/09/28		100	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2022/09/28	<10		mg/kg	
			F3 (C16-C34 Hydrocarbons)	2022/09/28	<50		mg/kg	
			F4 (C34-C50 Hydrocarbons)	2022/09/28	<50		mg/kg	
A734073	GG3	RPD	F2 (C10-C16 Hydrocarbons)	2022/09/28	NC		%	40
			F3 (C16-C34 Hydrocarbons)	2022/09/28	NC		%	40
			F4 (C34-C50 Hydrocarbons)	2022/09/28	NC		%	40
A734226	WPK	Matrix Spike	1,4-Difluorobenzene (sur.)	2022/09/29		97	%	50 - 140
			4-Bromofluorobenzene (sur.)	2022/09/29		94	%	50 - 140
			D10-o-Xylene (sur.)	2022/09/29		104	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2022/09/29		88	%	50 - 140
			Benzene	2022/09/29		85	%	50 - 140
			Toluene	2022/09/29		91	%	50 - 140
			Ethylbenzene	2022/09/29		92	%	50 - 140
			m & p-Xylene	2022/09/29		97	%	50 - 140
			o-Xylene	2022/09/29		96	%	50 - 140
			F1 (C6-C10)	2022/09/29		93	%	60 - 140
A734226	WPK	Spiked Blank	1,4-Difluorobenzene (sur.)	2022/09/29		96	%	50 - 140

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QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			4-Bromofluorobenzene (sur.)	2022/09/29		95	%	50 - 140
			D10-o-Xylene (sur.)	2022/09/29		93	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2022/09/29		89	%	50 - 140
			Benzene	2022/09/29		84	%	60 - 130
			Toluene	2022/09/29		88	%	60 - 130
			Ethylbenzene	2022/09/29		90	%	60 - 130
			m & p-Xylene	2022/09/29		94	%	60 - 130
			o-Xylene	2022/09/29		95	%	60 - 130
			F1 (C6-C10)	2022/09/29		84	%	60 - 140
A734226	WPK	Method Blank	1,4-Difluorobenzene (sur.)	2022/09/29		98	%	50 - 140
			4-Bromofluorobenzene (sur.)	2022/09/29		93	%	50 - 140
			D10-o-Xylene (sur.)	2022/09/29		90	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2022/09/29		89	%	50 - 140
			Benzene	2022/09/29	<0.0050		mg/kg	
			Toluene	2022/09/29	<0.050		mg/kg	
			Ethylbenzene	2022/09/29	<0.010		mg/kg	
			m & p-Xylene	2022/09/29	<0.040		mg/kg	
			o-Xylene	2022/09/29	<0.020		mg/kg	
			F1 (C6-C10)	2022/09/29	<10		mg/kg	
A734226	WPK	RPD	Benzene	2022/09/29	NC		%	50
			Toluene	2022/09/29	NC		%	50
			Ethylbenzene	2022/09/29	NC		%	50
			m & p-Xylene	2022/09/29	NC		%	50
			o-Xylene	2022/09/29	NC		%	50
			F1 (C6-C10)	2022/09/29	NC		%	30
A734373	MGL	Method Blank	Moisture	2022/09/29	<0.30		%	
A734373	MGL	RPD	Moisture	2022/09/29	3.2		%	20
A734519	GG3	Matrix Spike	O-TERPHENYL (sur.)	2022/09/29		98	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2022/09/29		91	%	60 - 140
			F3 (C16-C34 Hydrocarbons)	2022/09/29		97	%	60 - 140
			F4 (C34-C50 Hydrocarbons)	2022/09/29		97	%	60 - 140
A734519	GG3	Spiked Blank	O-TERPHENYL (sur.)	2022/09/29		101	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2022/09/29		94	%	60 - 140
			F3 (C16-C34 Hydrocarbons)	2022/09/29		95	%	60 - 140
			F4 (C34-C50 Hydrocarbons)	2022/09/29		89	%	60 - 140
A734519	GG3	Method Blank	O-TERPHENYL (sur.)	2022/09/29		119	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2022/09/29	<10		mg/kg	
			F3 (C16-C34 Hydrocarbons)	2022/09/29	<50		mg/kg	
			F4 (C34-C50 Hydrocarbons)	2022/09/29	<50		mg/kg	
A734519	GG3	RPD	F2 (C10-C16 Hydrocarbons)	2022/09/29	NC		%	40
			F3 (C16-C34 Hydrocarbons)	2022/09/29	NC		%	40
			F4 (C34-C50 Hydrocarbons)	2022/09/29	NC		%	40
A736048	SJ1	Matrix Spike	D10-ANTHRACENE (sur.)	2022/09/30		99	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2022/09/30		99	%	50 - 130
			D8-NAPHTHALENE (sur.)	2022/09/30		88	%	50 - 130
			TERPHENYL-D14 (sur.)	2022/09/30		84	%	50 - 130
			Acenaphthene	2022/09/30		78	%	50 - 130
			Acenaphthylene	2022/09/30		94	%	50 - 130
			Acridine	2022/09/30		54	%	50 - 130
			Anthracene	2022/09/30		84	%	50 - 130
			Benzo(a)anthracene	2022/09/30		86	%	50 - 130
			Benzo(b&j)fluoranthene	2022/09/30		80	%	50 - 130
			Benzo(k)fluoranthene	2022/09/30		75	%	50 - 130
			Benzo(g,h,i)perylene	2022/09/30		79	%	50 - 130

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Benzo(c)phenanthrene	2022/09/30		87	%	50 - 130
			Benzo(a)pyrene	2022/09/30		80	%	50 - 130
			Benzo(e)pyrene	2022/09/30		74	%	50 - 130
			Chrysene	2022/09/30		84	%	50 - 130
			Dibenz(a,h)anthracene	2022/09/30		78	%	50 - 130
			Fluoranthene	2022/09/30		84	%	50 - 130
			Fluorene	2022/09/30		87	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2022/09/30		78	%	50 - 130
			2-Methylnaphthalene	2022/09/30		88	%	50 - 130
			Naphthalene	2022/09/30		85	%	50 - 130
			Phenanthrene	2022/09/30		76	%	50 - 130
			Perylene	2022/09/30		64	%	50 - 130
			Pyrene	2022/09/30		81	%	50 - 130
			Quinoline	2022/09/30		93	%	50 - 130
A736048	SJ1	Spiked Blank	D10-ANTHRACENE (sur.)	2022/09/30		107	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2022/09/30		110	%	50 - 130
			D8-NAPHTHALENE (sur.)	2022/09/30		99	%	50 - 130
			TERPHENYL-D14 (sur.)	2022/09/30		94	%	50 - 130
			Acenaphthene	2022/09/30		89	%	50 - 130
			Acenaphthylene	2022/09/30		107	%	50 - 130
			Acridine	2022/09/30		72	%	50 - 130
			Anthracene	2022/09/30		85	%	50 - 130
			Benzo(a)anthracene	2022/09/30		98	%	50 - 130
			Benzo(b&j)fluoranthene	2022/09/30		91	%	50 - 130
			Benzo(k)fluoranthene	2022/09/30		100	%	50 - 130
			Benzo(g,h,i)perylene	2022/09/30		94	%	50 - 130
			Benzo(c)phenanthrene	2022/09/30		98	%	50 - 130
			Benzo(a)pyrene	2022/09/30		91	%	50 - 130
			Benzo(e)pyrene	2022/09/30		86	%	50 - 130
			Chrysene	2022/09/30		98	%	50 - 130
			Dibenz(a,h)anthracene	2022/09/30		84	%	50 - 130
			Fluoranthene	2022/09/30		98	%	50 - 130
			Fluorene	2022/09/30		102	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2022/09/30		81	%	50 - 130
			2-Methylnaphthalene	2022/09/30		99	%	50 - 130
			Naphthalene	2022/09/30		96	%	50 - 130
			Phenanthrene	2022/09/30		85	%	50 - 130
			Perylene	2022/09/30		74	%	50 - 130
			Pyrene	2022/09/30		97	%	50 - 130
			Quinoline	2022/09/30		92	%	50 - 130
A736048	SJ1	Method Blank	D10-ANTHRACENE (sur.)	2022/09/30		110	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2022/09/30		113	%	50 - 130
			D8-NAPHTHALENE (sur.)	2022/09/30		103	%	50 - 130
			TERPHENYL-D14 (sur.)	2022/09/30		99	%	50 - 130
			Acenaphthene	2022/09/30	<0.0050		mg/kg	
			Acenaphthylene	2022/09/30	<0.0050		mg/kg	
			Acridine	2022/09/30	<0.010		mg/kg	
			Anthracene	2022/09/30	<0.0040		mg/kg	
			Benzo(a)anthracene	2022/09/30	<0.0050		mg/kg	
			Benzo(b&j)fluoranthene	2022/09/30	<0.0050		mg/kg	
			Benzo(k)fluoranthene	2022/09/30	<0.0050		mg/kg	
			Benzo(g,h,i)perylene	2022/09/30	<0.0050		mg/kg	
			Benzo(c)phenanthrene	2022/09/30	<0.0050		mg/kg	
			Benzo(a)pyrene	2022/09/30	<0.0050		mg/kg	

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QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Benzo(e)pyrene	2022/09/30	<0.0050		mg/kg	
			Chrysene	2022/09/30	<0.0050		mg/kg	
			Dibenz(a,h)anthracene	2022/09/30	<0.0050		mg/kg	
			Fluoranthene	2022/09/30	<0.0050		mg/kg	
			Fluorene	2022/09/30	<0.0050		mg/kg	
			Indeno(1,2,3-cd)pyrene	2022/09/30	<0.0050		mg/kg	
			2-Methylnaphthalene	2022/09/30	<0.0050		mg/kg	
			Naphthalene	2022/09/30	<0.0050		mg/kg	
			Phenanthrene	2022/09/30	<0.0050		mg/kg	
			Perylene	2022/09/30	<0.0050		mg/kg	
			Pyrene	2022/09/30	<0.0050		mg/kg	
			Quinoline	2022/09/30	<0.010		mg/kg	
A736048	SJ1	RPD	Acenaphthene	2022/09/30	NC		%	50
			Acenaphthylene	2022/09/30	NC		%	50
			Acridine	2022/09/30	19		%	50
			Anthracene	2022/09/30	NC		%	50
			Benzo(a)anthracene	2022/09/30	NC		%	50
			Benzo(b&j)fluoranthene	2022/09/30	NC		%	50
			Benzo(k)fluoranthene	2022/09/30	NC		%	50
			Benzo(g,h,i)perylene	2022/09/30	NC		%	50
			Benzo(c)phenanthrene	2022/09/30	NC		%	50
			Benzo(a)pyrene	2022/09/30	NC		%	50
			Benzo(e)pyrene	2022/09/30	NC		%	50
			Chrysene	2022/09/30	NC		%	50
			Dibenz(a,h)anthracene	2022/09/30	NC		%	50
			Fluoranthene	2022/09/30	NC		%	50
			Fluorene	2022/09/30	NC		%	50
			Indeno(1,2,3-cd)pyrene	2022/09/30	NC		%	50
			2-Methylnaphthalene	2022/09/30	NC		%	50
			Naphthalene	2022/09/30	NC		%	50
			Phenanthrene	2022/09/30	NC		%	50
			Perylene	2022/09/30	NC		%	50
			Pyrene	2022/09/30	3.9		%	50
			Quinoline	2022/09/30	NC		%	50
A736055	A1H	Method Blank	Moisture	2022/09/30	<0.30		%	
A736055	A1H	RPD	Moisture	2022/09/30	8.2		%	20
A736223	JLP	Matrix Spike	Total Antimony (Sb)	2022/10/08		94	%	75 - 125
			Total Arsenic (As)	2022/10/08		97	%	75 - 125
			Total Barium (Ba)	2022/10/08		NC	%	75 - 125
			Total Beryllium (Be)	2022/10/08		101	%	75 - 125
			Total Cadmium (Cd)	2022/10/08		98	%	75 - 125
			Total Chromium (Cr)	2022/10/08		123	%	75 - 125
			Total Cobalt (Co)	2022/10/08		98	%	75 - 125
			Total Copper (Cu)	2022/10/08		94	%	75 - 125
			Total Lead (Pb)	2022/10/08		97	%	75 - 125
			Total Mercury (Hg)	2022/10/08		98	%	75 - 125
			Total Molybdenum (Mo)	2022/10/08		101	%	75 - 125
			Total Nickel (Ni)	2022/10/08		95	%	75 - 125
			Total Selenium (Se)	2022/10/08		97	%	75 - 125
			Total Silver (Ag)	2022/10/08		104	%	75 - 125
			Total Thallium (Tl)	2022/10/08		95	%	75 - 125
			Total Tin (Sn)	2022/10/08		103	%	75 - 125
			Total Vanadium (V)	2022/10/08		145 (1)	%	75 - 125
			Total Zinc (Zn)	2022/10/08		NC	%	75 - 125

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QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
A736223	JLP	QC Standard	Total Antimony (Sb)	2022/10/08		112	%	15 - 182
			Total Arsenic (As)	2022/10/08		96	%	53 - 147
			Total Barium (Ba)	2022/10/08		101	%	80 - 119
			Total Cadmium (Cd)	2022/10/08		102	%	72 - 128
			Total Chromium (Cr)	2022/10/08		104	%	59 - 141
			Total Cobalt (Co)	2022/10/08		100	%	58 - 142
			Total Copper (Cu)	2022/10/08		111	%	83 - 117
			Total Lead (Pb)	2022/10/08		115	%	79 - 121
			Total Molybdenum (Mo)	2022/10/08		101	%	67 - 133
			Total Nickel (Ni)	2022/10/08		107	%	79 - 121
			Total Silver (Ag)	2022/10/08		113	%	47 - 153
			Total Tin (Sn)	2022/10/08		102	%	67 - 133
			Total Vanadium (V)	2022/10/08		105	%	79 - 121
			Total Zinc (Zn)	2022/10/08		105	%	79 - 121
A736223	JLP	Spiked Blank	Total Antimony (Sb)	2022/10/08		106	%	80 - 120
			Total Arsenic (As)	2022/10/08		98	%	80 - 120
			Total Barium (Ba)	2022/10/08		98	%	80 - 120
			Total Beryllium (Be)	2022/10/08		99	%	80 - 120
			Total Cadmium (Cd)	2022/10/08		102	%	80 - 120
			Total Chromium (Cr)	2022/10/08		103	%	80 - 120
			Total Cobalt (Co)	2022/10/08		104	%	80 - 120
			Total Copper (Cu)	2022/10/08		104	%	80 - 120
			Total Lead (Pb)	2022/10/08		103	%	80 - 120
			Total Mercury (Hg)	2022/10/08		99	%	80 - 120
			Total Molybdenum (Mo)	2022/10/08		104	%	80 - 120
			Total Nickel (Ni)	2022/10/08		103	%	80 - 120
			Total Selenium (Se)	2022/10/08		101	%	80 - 120
			Total Silver (Ag)	2022/10/08		105	%	80 - 120
			Total Thallium (Tl)	2022/10/08		101	%	80 - 120
			Total Tin (Sn)	2022/10/08		107	%	80 - 120
			Total Vanadium (V)	2022/10/08		101	%	80 - 120
			Total Zinc (Zn)	2022/10/08		105	%	80 - 120
A736223	JLP	Method Blank	Total Antimony (Sb)	2022/10/08	<0.50		mg/kg	
			Total Arsenic (As)	2022/10/08	<1.0		mg/kg	
			Total Barium (Ba)	2022/10/08	<1.0		mg/kg	
			Total Beryllium (Be)	2022/10/08	<0.40		mg/kg	
			Total Cadmium (Cd)	2022/10/08	<0.050		mg/kg	
			Total Chromium (Cr)	2022/10/08	<1.0		mg/kg	
			Total Cobalt (Co)	2022/10/08	<0.50		mg/kg	
			Total Copper (Cu)	2022/10/08	<1.0		mg/kg	
			Total Lead (Pb)	2022/10/08	<0.50		mg/kg	
			Total Mercury (Hg)	2022/10/08	<0.050		mg/kg	
			Total Molybdenum (Mo)	2022/10/08	<0.40		mg/kg	
			Total Nickel (Ni)	2022/10/08	<1.0		mg/kg	
			Total Selenium (Se)	2022/10/08	<0.50		mg/kg	
			Total Silver (Ag)	2022/10/08	<0.20		mg/kg	
			Total Thallium (Tl)	2022/10/08	<0.10		mg/kg	
			Total Tin (Sn)	2022/10/08	<1.0		mg/kg	
			Total Vanadium (V)	2022/10/08	<1.0		mg/kg	
			Total Zinc (Zn)	2022/10/08	<10		mg/kg	
A736223	JLP	RPD	Total Antimony (Sb)	2022/10/08	12		%	30
			Total Arsenic (As)	2022/10/08	3.4		%	30
			Total Barium (Ba)	2022/10/08	24		%	35
			Total Beryllium (Be)	2022/10/08	11		%	30

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			Total Cadmium (Cd)	2022/10/08	6.9		%	30
			Total Chromium (Cr)	2022/10/08	0.36		%	30
			Total Cobalt (Co)	2022/10/08	8.8		%	30
			Total Copper (Cu)	2022/10/08	7.6		%	30
			Total Lead (Pb)	2022/10/08	8.3		%	35
			Total Mercury (Hg)	2022/10/08	5.2		%	35
			Total Molybdenum (Mo)	2022/10/08	10		%	35
			Total Nickel (Ni)	2022/10/08	9.6		%	30
			Total Selenium (Se)	2022/10/08	NC		%	30
			Total Silver (Ag)	2022/10/08	NC		%	35
			Total Thallium (Tl)	2022/10/08	12		%	30
			Total Tin (Sn)	2022/10/08	NC		%	35
			Total Vanadium (V)	2022/10/08	0.85		%	30
			Total Zinc (Zn)	2022/10/08	8.2		%	30
A736243	MKJ	Matrix Spike [BCV462-01]	Total Antimony (Sb)	2022/09/30		108	%	75 - 125
			Total Arsenic (As)	2022/09/30		107	%	75 - 125
			Total Barium (Ba)	2022/09/30		128 (1)	%	75 - 125
			Total Beryllium (Be)	2022/09/30		81	%	75 - 125
			Total Cadmium (Cd)	2022/09/30		111	%	75 - 125
			Total Chromium (Cr)	2022/09/30		NC	%	75 - 125
			Total Cobalt (Co)	2022/09/30		108	%	75 - 125
			Total Copper (Cu)	2022/09/30		99	%	75 - 125
			Total Lead (Pb)	2022/09/30		100	%	75 - 125
			Total Mercury (Hg)	2022/09/30		59 (1)	%	75 - 125
			Total Molybdenum (Mo)	2022/09/30		110	%	75 - 125
			Total Nickel (Ni)	2022/09/30		72 (1)	%	75 - 125
			Total Selenium (Se)	2022/09/30		104	%	75 - 125
			Total Silver (Ag)	2022/09/30		103	%	75 - 125
			Total Thallium (Tl)	2022/09/30		105	%	75 - 125
			Total Tin (Sn)	2022/09/30		115	%	75 - 125
			Total Vanadium (V)	2022/09/30		113	%	75 - 125
			Total Zinc (Zn)	2022/09/30		107	%	75 - 125
A736243	MKJ	QC Standard	Total Antimony (Sb)	2022/09/30		115	%	15 - 182
			Total Arsenic (As)	2022/09/30		114	%	53 - 147
			Total Barium (Ba)	2022/09/30		103	%	80 - 119
			Total Cadmium (Cd)	2022/09/30		107	%	72 - 128
			Total Chromium (Cr)	2022/09/30		108	%	59 - 141
			Total Cobalt (Co)	2022/09/30		90	%	58 - 142
			Total Copper (Cu)	2022/09/30		104	%	83 - 117
			Total Lead (Pb)	2022/09/30		109	%	79 - 121
			Total Molybdenum (Mo)	2022/09/30		109	%	67 - 133
			Total Nickel (Ni)	2022/09/30		104	%	79 - 121
			Total Silver (Ag)	2022/09/30		123	%	47 - 153
			Total Tin (Sn)	2022/09/30		118	%	67 - 133
			Total Vanadium (V)	2022/09/30		105	%	79 - 121
			Total Zinc (Zn)	2022/09/30		107	%	79 - 121
A736243	MKJ	Spiked Blank	Total Antimony (Sb)	2022/09/30		100	%	80 - 120
			Total Arsenic (As)	2022/09/30		98	%	80 - 120
			Total Barium (Ba)	2022/09/30		97	%	80 - 120
			Total Beryllium (Be)	2022/09/30		93	%	80 - 120
			Total Cadmium (Cd)	2022/09/30		102	%	80 - 120
			Total Chromium (Cr)	2022/09/30		96	%	80 - 120
			Total Cobalt (Co)	2022/09/30		93	%	80 - 120
			Total Copper (Cu)	2022/09/30		96	%	80 - 120

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Lead (Pb)	2022/09/30		91	%	80 - 120
			Total Mercury (Hg)	2022/09/30		105	%	80 - 120
			Total Molybdenum (Mo)	2022/09/30		103	%	80 - 120
			Total Nickel (Ni)	2022/09/30		94	%	80 - 120
			Total Selenium (Se)	2022/09/30		97	%	80 - 120
			Total Silver (Ag)	2022/09/30		95	%	80 - 120
			Total Thallium (Tl)	2022/09/30		95	%	80 - 120
			Total Tin (Sn)	2022/09/30		105	%	80 - 120
			Total Vanadium (V)	2022/09/30		96	%	80 - 120
			Total Zinc (Zn)	2022/09/30		99	%	80 - 120
A736243	MKJ	Method Blank	Total Antimony (Sb)	2022/09/30	<0.50		mg/kg	
			Total Arsenic (As)	2022/09/30	<1.0		mg/kg	
			Total Barium (Ba)	2022/09/30	<1.0		mg/kg	
			Total Beryllium (Be)	2022/09/30	<0.40		mg/kg	
			Total Cadmium (Cd)	2022/09/30	<0.050		mg/kg	
			Total Chromium (Cr)	2022/09/30	<1.0		mg/kg	
			Total Cobalt (Co)	2022/09/30	<0.50		mg/kg	
			Total Copper (Cu)	2022/09/30	<1.0		mg/kg	
			Total Lead (Pb)	2022/09/30	<0.50		mg/kg	
			Total Mercury (Hg)	2022/09/30	<0.050		mg/kg	
			Total Molybdenum (Mo)	2022/09/30	<0.40		mg/kg	
			Total Nickel (Ni)	2022/09/30	<1.0		mg/kg	
			Total Selenium (Se)	2022/09/30	<0.50		mg/kg	
			Total Silver (Ag)	2022/09/30	<0.20		mg/kg	
			Total Thallium (Tl)	2022/09/30	<0.10		mg/kg	
			Total Tin (Sn)	2022/09/30	<1.0		mg/kg	
			Total Vanadium (V)	2022/09/30	<1.0		mg/kg	
			Total Zinc (Zn)	2022/09/30	<10		mg/kg	
A736243	MKJ	RPD [BCV462-01]	Total Antimony (Sb)	2022/09/30	NC		%	30
			Total Arsenic (As)	2022/09/30	NC		%	30
			Total Barium (Ba)	2022/09/30	9.6		%	35
			Total Beryllium (Be)	2022/09/30	NC		%	30
			Total Cadmium (Cd)	2022/09/30	NC		%	30
			Total Chromium (Cr)	2022/09/30	4.9		%	30
			Total Cobalt (Co)	2022/09/30	2.9		%	30
			Total Copper (Cu)	2022/09/30	16		%	30
			Total Lead (Pb)	2022/09/30	2.1		%	35
			Total Mercury (Hg)	2022/09/30	NC		%	35
			Total Molybdenum (Mo)	2022/09/30	0.45		%	35
			Total Nickel (Ni)	2022/09/30	8.2		%	30
			Total Selenium (Se)	2022/09/30	NC		%	30
			Total Silver (Ag)	2022/09/30	NC		%	35
			Total Thallium (Tl)	2022/09/30	NC		%	30
			Total Tin (Sn)	2022/09/30	NC		%	35
			Total Vanadium (V)	2022/09/30	2.0		%	30
			Total Zinc (Zn)	2022/09/30	11		%	30
A736324	QW1	Matrix Spike [BCV460-02]	1,4-Difluorobenzene (sur.)	2022/09/30		99	%	50 - 140
			4-Bromofluorobenzene (sur.)	2022/09/30		96	%	50 - 140
			D10-o-Xylene (sur.)	2022/09/30		90	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2022/09/30		87	%	50 - 140
			Benzene	2022/09/30		82	%	50 - 140
			Toluene	2022/09/30		89	%	50 - 140
			Ethylbenzene	2022/09/30		89	%	50 - 140
			m & p-Xylene	2022/09/30		95	%	50 - 140

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			o-Xylene	2022/09/30		95	%	50 - 140
A736324	QW1	Spiked Blank	1,4-Difluorobenzene (sur.)	2022/09/30		100	%	50 - 140
			4-Bromofluorobenzene (sur.)	2022/09/30		94	%	50 - 140
			D10-o-Xylene (sur.)	2022/09/30		92	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2022/09/30		90	%	50 - 140
			Benzene	2022/09/30		80	%	60 - 130
			Toluene	2022/09/30		85	%	60 - 130
			Ethylbenzene	2022/09/30		87	%	60 - 130
			m & p-Xylene	2022/09/30		91	%	60 - 130
			o-Xylene	2022/09/30		92	%	60 - 130
A736324	QW1	Method Blank	1,4-Difluorobenzene (sur.)	2022/09/30		98	%	50 - 140
			4-Bromofluorobenzene (sur.)	2022/09/30		92	%	50 - 140
			D10-o-Xylene (sur.)	2022/09/30		88	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2022/09/30		90	%	50 - 140
			Benzene	2022/09/30	<0.0050		mg/kg	
			Toluene	2022/09/30	<0.050		mg/kg	
			Ethylbenzene	2022/09/30	<0.010		mg/kg	
			m & p-Xylene	2022/09/30	<0.040		mg/kg	
			o-Xylene	2022/09/30	<0.020		mg/kg	
A736324	QW1	RPD [BCV460-02]	Benzene	2022/09/30	NC		%	50
			Toluene	2022/09/30	NC		%	50
			Ethylbenzene	2022/09/30	NC		%	50
			m & p-Xylene	2022/09/30	NC		%	50
			o-Xylene	2022/09/30	NC		%	50
A738693	GES	Method Blank	Moisture	2022/10/02	<0.30		%	
A738693	GES	RPD	Moisture	2022/10/02	0		%	20
A738695	CAU	Matrix Spike	O-TERPHENYL (sur.)	2022/10/04		107	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2022/10/04		100	%	60 - 140
			F3 (C16-C34 Hydrocarbons)	2022/10/04		111	%	60 - 140
			F4 (C34-C50 Hydrocarbons)	2022/10/04		110	%	60 - 140
A738695	CAU	Spiked Blank	O-TERPHENYL (sur.)	2022/10/03		108	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2022/10/03		104	%	60 - 140
			F3 (C16-C34 Hydrocarbons)	2022/10/03		113	%	60 - 140
			F4 (C34-C50 Hydrocarbons)	2022/10/03		111	%	60 - 140
A738695	CAU	Method Blank	O-TERPHENYL (sur.)	2022/10/03		106	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2022/10/03	<10		mg/kg	
			F3 (C16-C34 Hydrocarbons)	2022/10/03	<50		mg/kg	
			F4 (C34-C50 Hydrocarbons)	2022/10/03	<50		mg/kg	
A738695	CAU	RPD	F2 (C10-C16 Hydrocarbons)	2022/10/04	NC		%	40
			F3 (C16-C34 Hydrocarbons)	2022/10/04	11		%	40
			F4 (C34-C50 Hydrocarbons)	2022/10/04	15		%	40
A738697	NK3	Matrix Spike	D10-ANTHRACENE (sur.)	2022/10/04		76	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2022/10/04		77	%	50 - 130
			D8-NAPHTHALENE (sur.)	2022/10/04		67	%	50 - 130
			TERPHENYL-D14 (sur.)	2022/10/04		65	%	50 - 130
			Acenaphthene	2022/10/04		82	%	50 - 130
			Acenaphthylene	2022/10/04		103	%	50 - 130
			Acridine	2022/10/04		69	%	50 - 130
			Anthracene	2022/10/04		91	%	50 - 130
			Benzo(a)anthracene	2022/10/04		92	%	50 - 130
			Benzo(b&j)fluoranthene	2022/10/04		82	%	50 - 130
			Benzo(k)fluoranthene	2022/10/04		82	%	50 - 130
			Benzo(g,h,i)perylene	2022/10/04		79	%	50 - 130
			Benzo(c)phenanthrene	2022/10/04		94	%	50 - 130

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Benzo(a)pyrene	2022/10/04		95	%	50 - 130
			Benzo(e)pyrene	2022/10/04		76	%	50 - 130
			Chrysene	2022/10/04		84	%	50 - 130
			Dibenz(a,h)anthracene	2022/10/04		83	%	50 - 130
			Fluoranthene	2022/10/04		89	%	50 - 130
			Fluorene	2022/10/04		92	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2022/10/04		83	%	50 - 130
			2-Methylnaphthalene	2022/10/04		95	%	50 - 130
			Naphthalene	2022/10/04		88	%	50 - 130
			Phenanthrene	2022/10/04		79	%	50 - 130
			Perylene	2022/10/04		72	%	50 - 130
			Pyrene	2022/10/04		88	%	50 - 130
			Quinoline	2022/10/04		115	%	50 - 130
A738697	NK3	Spiked Blank	D10-ANTHRACENE (sur.)	2022/10/03		108	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2022/10/03		110	%	50 - 130
			D8-NAPHTHALENE (sur.)	2022/10/03		97	%	50 - 130
			TERPHENYL-D14 (sur.)	2022/10/03		100	%	50 - 130
			Acenaphthene	2022/10/03		83	%	50 - 130
			Acenaphthylene	2022/10/03		102	%	50 - 130
			Acridine	2022/10/03		73	%	50 - 130
			Anthracene	2022/10/03		84	%	50 - 130
			Benzo(a)anthracene	2022/10/03		96	%	50 - 130
			Benzo(b&j)fluoranthene	2022/10/03		92	%	50 - 130
			Benzo(k)fluoranthene	2022/10/03		103	%	50 - 130
			Benzo(g,h,i)perylene	2022/10/03		86	%	50 - 130
			Benzo(c)phenanthrene	2022/10/03		102	%	50 - 130
			Benzo(a)pyrene	2022/10/03		86	%	50 - 130
			Benzo(e)pyrene	2022/10/03		84	%	50 - 130
			Chrysene	2022/10/03		100	%	50 - 130
			Dibenz(a,h)anthracene	2022/10/03		81	%	50 - 130
			Fluoranthene	2022/10/03		92	%	50 - 130
			Fluorene	2022/10/03		94	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2022/10/03		78	%	50 - 130
			2-Methylnaphthalene	2022/10/03		96	%	50 - 130
			Naphthalene	2022/10/03		91	%	50 - 130
			Phenanthrene	2022/10/03		83	%	50 - 130
			Perylene	2022/10/03		71	%	50 - 130
			Pyrene	2022/10/03		91	%	50 - 130
			Quinoline	2022/10/03		90	%	50 - 130
A738697	NK3	Method Blank	D10-ANTHRACENE (sur.)	2022/10/03		105	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2022/10/03		110	%	50 - 130
			D8-NAPHTHALENE (sur.)	2022/10/03		98	%	50 - 130
			TERPHENYL-D14 (sur.)	2022/10/03		101	%	50 - 130
			Acenaphthene	2022/10/03	<0.0050		mg/kg	
			Acenaphthylene	2022/10/03	<0.0050		mg/kg	
			Acridine	2022/10/03	<0.010		mg/kg	
			Anthracene	2022/10/03	<0.0040		mg/kg	
			Benzo(a)anthracene	2022/10/03	<0.0050		mg/kg	
			Benzo(b&j)fluoranthene	2022/10/03	<0.0050		mg/kg	
			Benzo(k)fluoranthene	2022/10/03	<0.0050		mg/kg	
			Benzo(g,h,i)perylene	2022/10/03	<0.0050		mg/kg	
			Benzo(c)phenanthrene	2022/10/03	<0.0050		mg/kg	
			Benzo(a)pyrene	2022/10/03	<0.0050		mg/kg	
			Benzo(e)pyrene	2022/10/03	<0.0050		mg/kg	

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Chrysene	2022/10/03	<0.0050		mg/kg	
			Dibenz(a,h)anthracene	2022/10/03	<0.0050		mg/kg	
			Fluoranthene	2022/10/03	<0.0050		mg/kg	
			Fluorene	2022/10/03	<0.0050		mg/kg	
			Indeno(1,2,3-cd)pyrene	2022/10/03	<0.0050		mg/kg	
			2-Methylnaphthalene	2022/10/03	<0.0050		mg/kg	
			Naphthalene	2022/10/03	<0.0050		mg/kg	
			Phenanthrene	2022/10/03	<0.0050		mg/kg	
			Perylene	2022/10/03	<0.0050		mg/kg	
			Pyrene	2022/10/03	<0.0050		mg/kg	
			Quinoline	2022/10/03	<0.010		mg/kg	
A738697	NK3	RPD	Acenaphthene	2022/10/04	NC		%	50
			Acenaphthylene	2022/10/04	NC		%	50
			Acridine	2022/10/04	NC		%	50
			Anthracene	2022/10/04	17		%	50
			Benzo(a)anthracene	2022/10/04	NC		%	50
			Benzo(b&j)fluoranthene	2022/10/04	78 (1)		%	50
			Benzo(k)fluoranthene	2022/10/04	NC		%	50
			Benzo(g,h,i)perylene	2022/10/04	NC		%	50
			Benzo(c)phenanthrene	2022/10/04	NC		%	50
			Benzo(a)pyrene	2022/10/04	87 (1)		%	50
			Benzo(e)pyrene	2022/10/04	NC		%	50
			Chrysene	2022/10/04	NC		%	50
			Dibenz(a,h)anthracene	2022/10/04	NC		%	50
			Fluoranthene	2022/10/04	19		%	50
			Fluorene	2022/10/04	NC		%	50
			Indeno(1,2,3-cd)pyrene	2022/10/04	99 (1)		%	50
			2-Methylnaphthalene	2022/10/04	22		%	50
			Naphthalene	2022/10/04	3.3		%	50
			Phenanthrene	2022/10/04	30		%	50
			Perylene	2022/10/04	NC		%	50
			Pyrene	2022/10/04	14		%	50
			Quinoline	2022/10/04	NC		%	50
A756639	VSO	QC Standard	Sieve - #200 (>0.075mm)	2022/10/14		100	%	75 - 125
			Sieve - Pan	2022/10/14		100	%	75 - 125
A756639	VSO	RPD	Sieve - #10 (>2.00mm)	2022/10/14	NC		%	30
			Sieve - #200 (>0.075mm)	2022/10/14	2.3		%	30
			Sieve - Pan	2022/10/14	3.8		%	30

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

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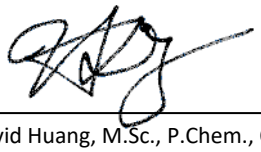
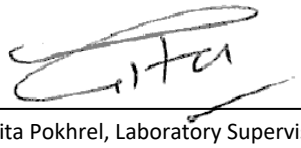
VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

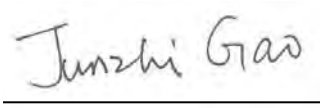


David Huang, M.Sc., P.Chem., QP, Scientific Services Manager

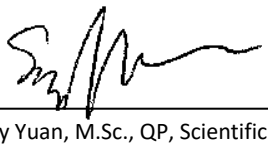
Elizabeth Chacko, Senior Analyst, Organics



Gita Pokhrel, Laboratory Supervisor



Janet Gao, B.Sc., QP, Supervisor, Organics



Sandy Yuan, M.Sc., QP, Scientific Specialist

Suwan (Sze Yeung) Fock, B.Sc., Scientific Specialist

Veronica Falk, B.Sc., P.Chem., QP, Scientific Specialist, Organics

Bureau Veritas Winnipeg: Unit D, 675 Berry Street R3H 1A7 Telephone (204) 772-7276 Fax (204) 772-2386

Bureau Veritas
D-675 Berry Street, Winnipeg, Manitoba Canada R3H 1A7 Tel (204) 772-7276 Toll-free:800-563-6266 Fax (204) 772-2386 www.bvna.com

Chain Of Custody Record

INVOICE TO:		Report Information		Project Information		Laboratory Use Only	
Company Name	#4222 STANTEC CONSULTING LTD	Company Name	Stantec	Quotation #	C20254	Bureau Veritas Job #	Bottle Order #:
Contact Name	ACCOUNTS PAYABLE	Contact Name	SUMMER HULL	P.O. #		C274555	675797
Address	500-311 PORTAGE AVENUE WINNIPEG MB R3B 2B9	Address	500-311 Portage Ave Winnipeg MB R3B 2B9	Project #	1114970B7	Chain Of Custody Record	Project Manager
Phone	(204) 489-5900 Fax:	Phone	204-918-4150 Fax:	Project Name	Naujaat, NU	C#675797-01-01	Geraldlyn Gouthro
Email	SAPinvoices@stantec.com	Email	Summer.hull@stantec.com	Site #			
				Sampled By	Summer Hull		

Regulatory Criteria

Special Instructions: Following initial analysis, please hold for possible further analysis

Note: For regulated drinking water samples - please use the Drinking Water Chain of Custody Form

Samples must be kept cool (< 10°C) from time of sampling until delivery to Bureau Veritas

Analysis Requested

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Regulated Drinking Water ? (Y/N)	Metals Field Filtered ? (Y/N)	BTEX, F1-F4 in Soil (Vials)	PAH in Soil by GC/MS	CCME Metals SOIL Pkg (ICPMS+Hg)	# of Bottles	Comments
1		SS-01	20220922	12:10	SOIL			✓	✓	✓	5	Following initial analysis please hold for possible further analysis
2		SS-02	20220922	12:45	SOIL			✓	✓	✓	5	
3		SS-03	20220922	13:40	SOIL			✓	✓	✓	5	
4		SS-04	20220922	14:35	SOIL			✓	✓	✓	5	
5												
6												
7												
8												
9												
10												

Turnaround Time (TAT) Required

Please provide advance notice for rush projects

Regular (Standard) TAT ✓

(will be applied if Rush TAT is not specified)

Standard TAT = 5-7 Working days for most tests.

Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)

Date Required: _____ Time Required: _____

Rush Confirmation Number _____ *(call lab for #)*

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
S Hull / Summer Hull	22/09/25	14:00	BVL Brooklyn Hiebert	22/09/26	08:30	
			JORDAN RAJU	2022/09/27	08:50	

Lab Use Only

Time Sensitive	Temperature (°C) on Receipt	Custody Seal Intact on Cooler?
☐	6.3, 7.5, 6.7	☑ Yes ☐ No

BVL 5, 6, 6
6, 7, 5
SLE 7.0

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BUREAU VERITAS'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVNA.COM/TERMS-AND-CONDITIONS.

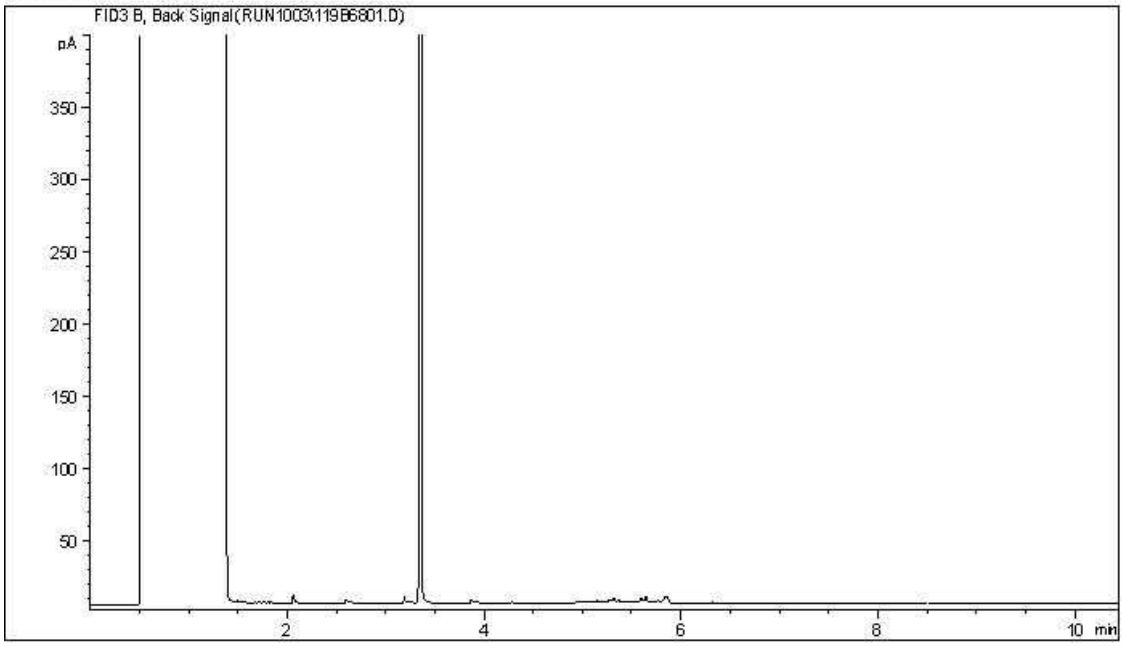
* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

White: Bureau Veritas Yellow: Client

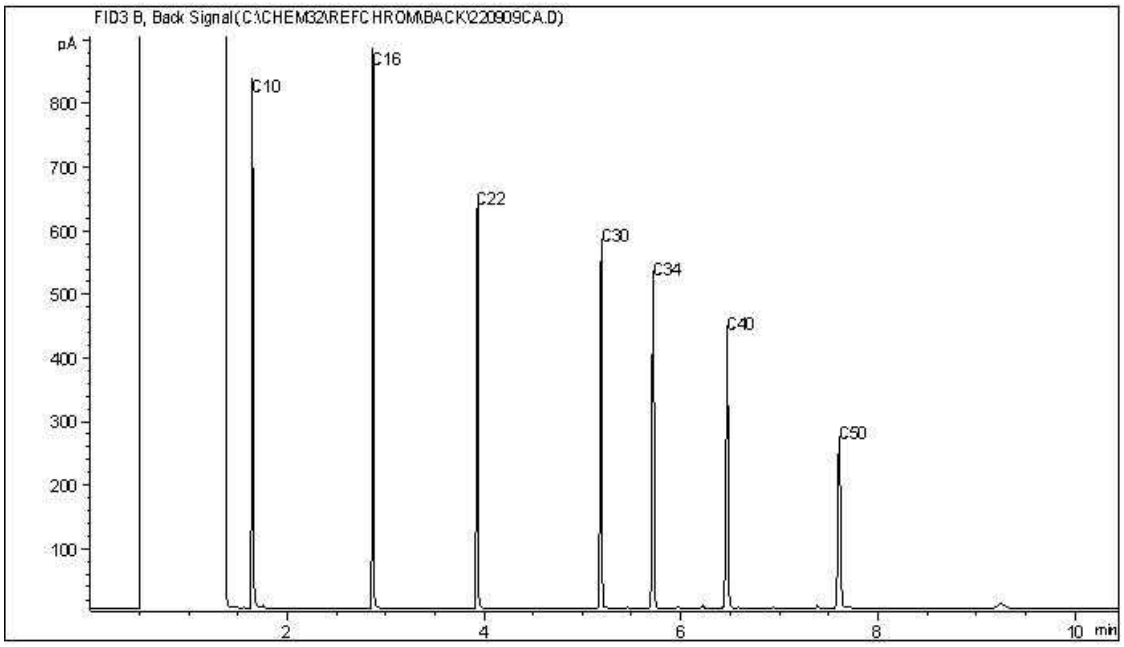
Bureau Veritas Canada (2019) Inc.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC13



Carbon Range Distribution - Reference Chromatogram



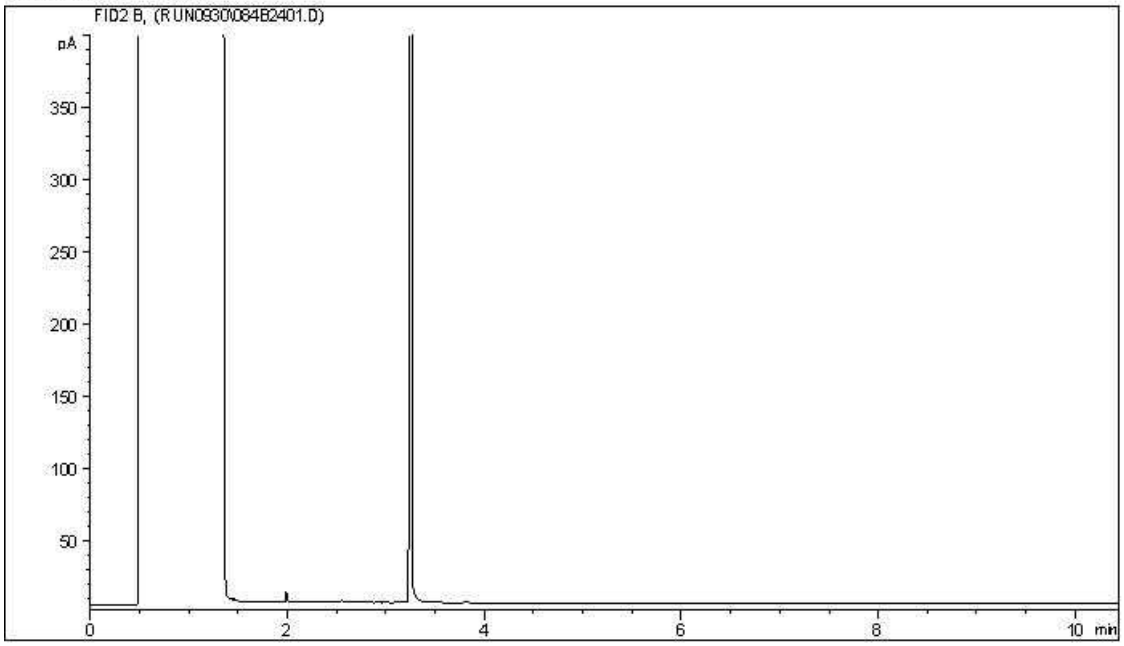
TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

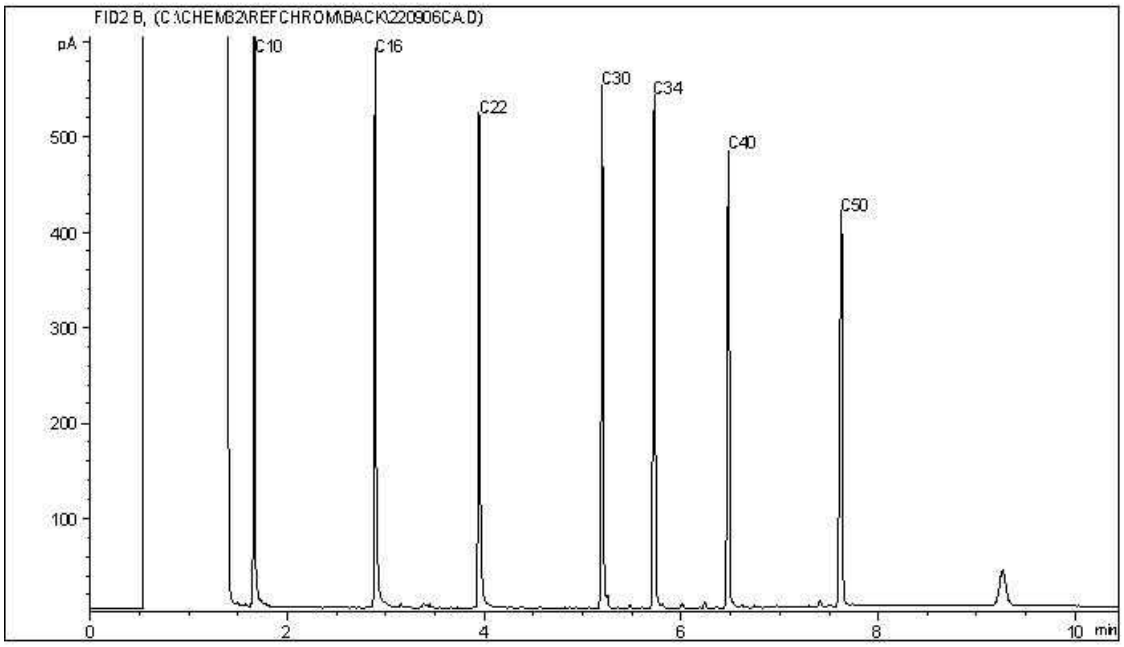
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC21



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

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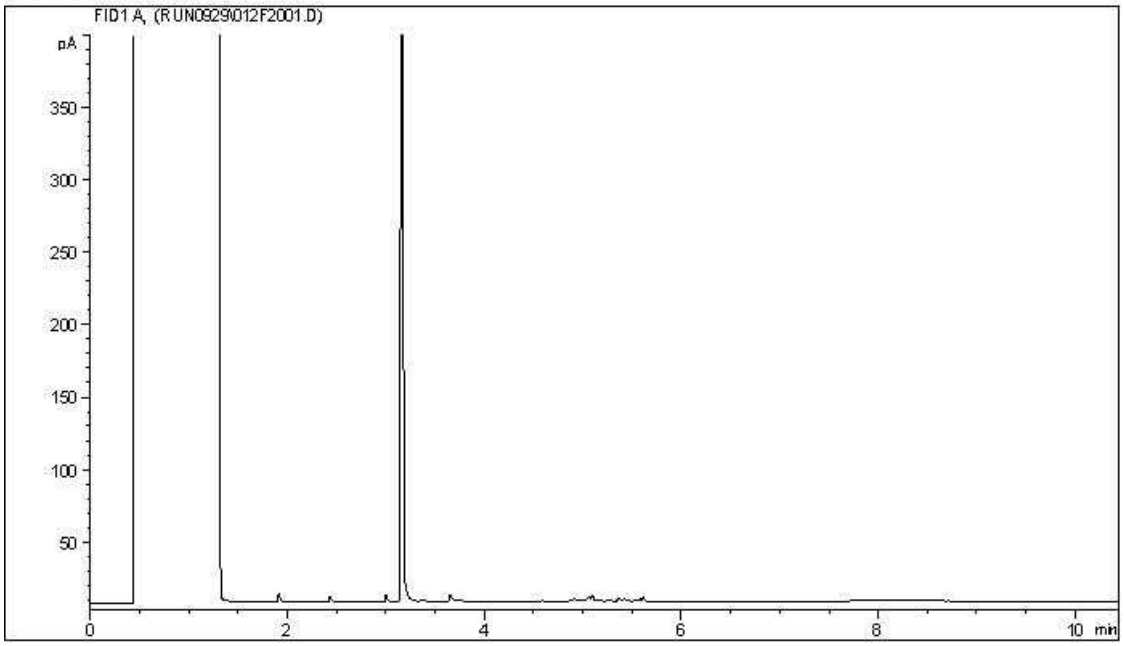
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

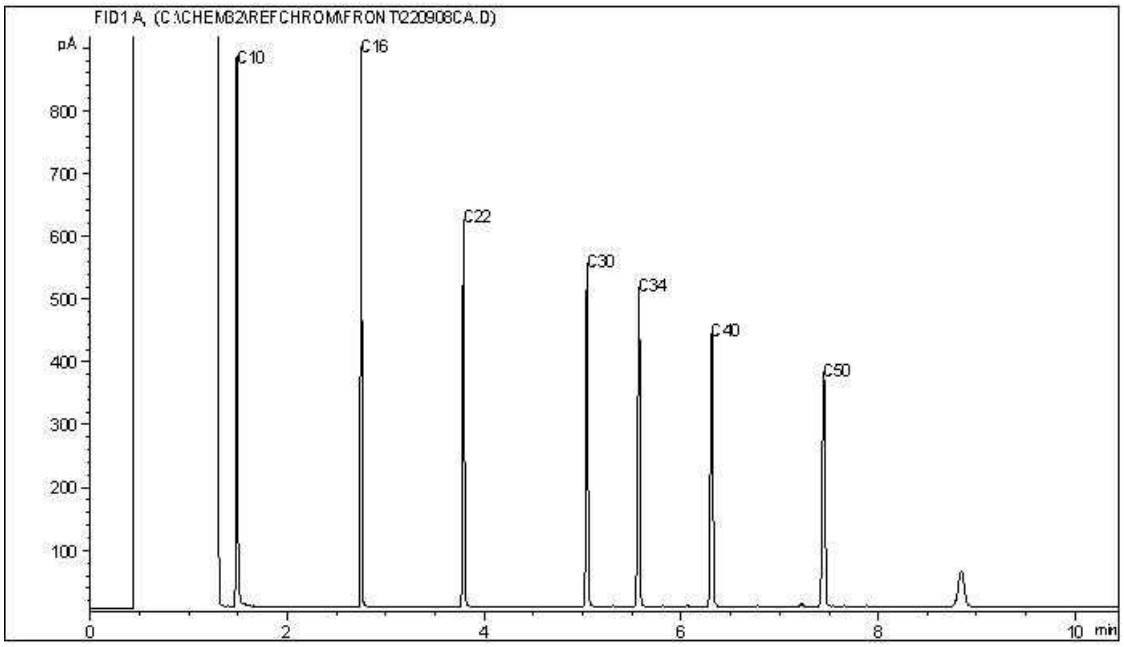
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC7



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

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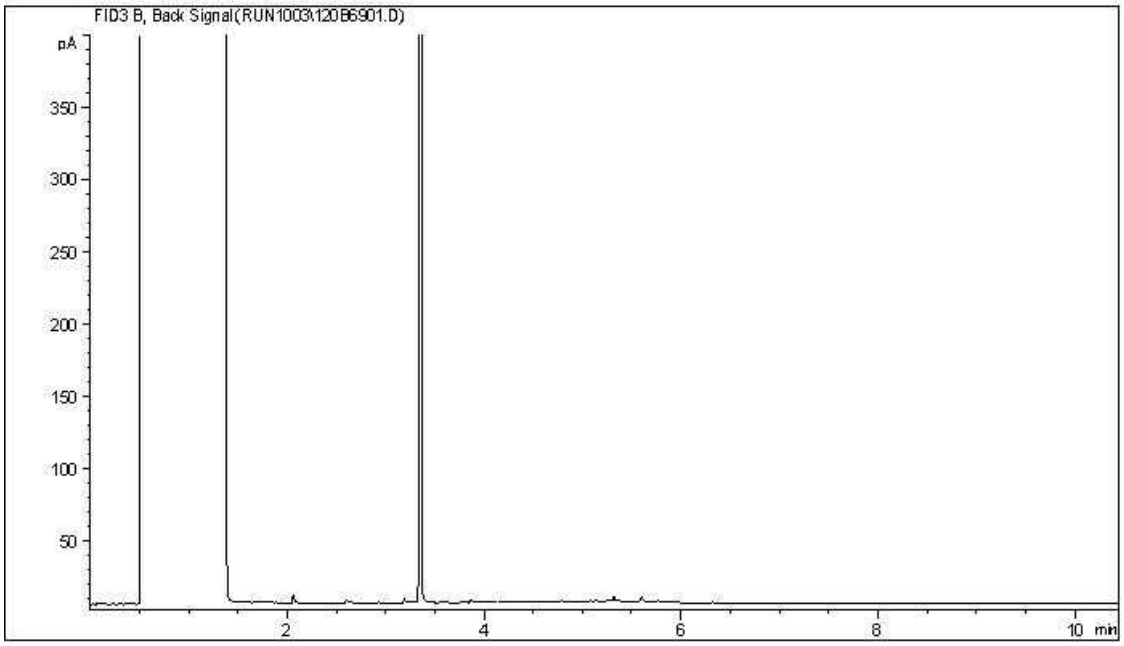
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

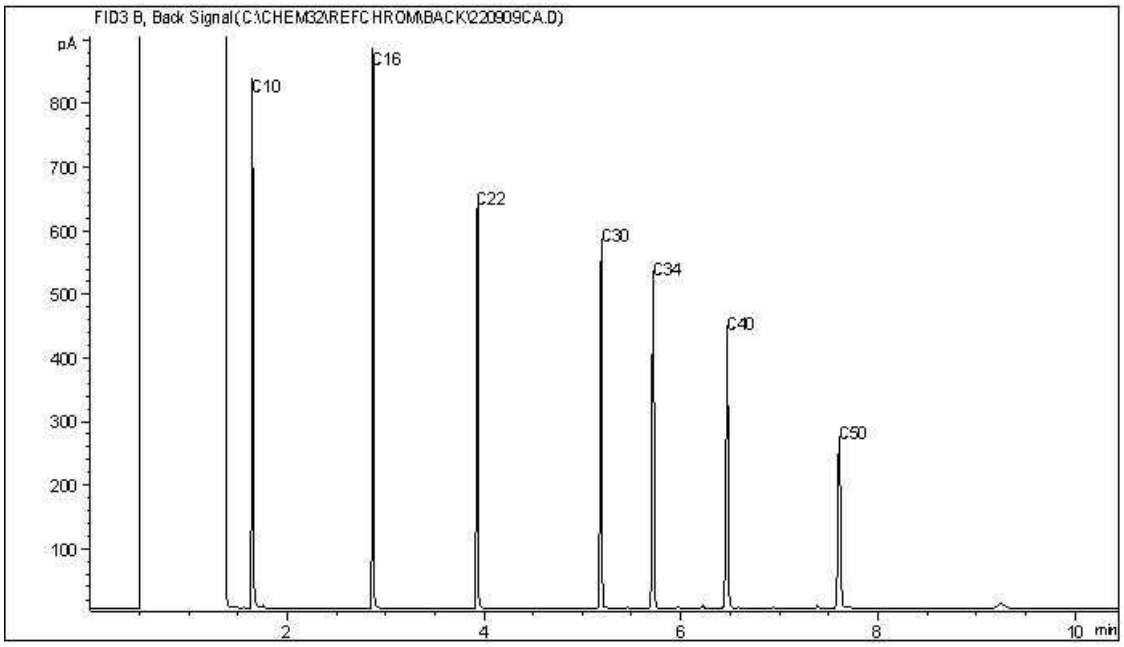
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC13



Carbon Range Distribution - Reference Chromatogram



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Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

#476928

Escalation
N/A

Subject
RE: Final Report-Job#: C274555, ATT: SUMMER HULL Prj: 111477087

Description

Hi Geraldlyn,

Would you be able to have these analyzed these for particle size by sieve (75 micron) as well? This would be on a rush TAT if possible.

Thanks!

Summer

Summer Hull B.Env.Sc.
Project Manager, Environmental Services

Direct: 204-928-8810
Mobile: 204-918-4150
summer.hull@stantec.com (mailto:summer.hull@stantec.com)

Stantec
500–311 Portage Avenue
Winnipeg MB R3B 2B9

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(https://urldefense.com/v3/__http://www.stantec.com/__;!!NslPjgbbnDqexg!MoqPr2Fl2zmEg9T90CrfwfS8zuXiuX5tjSZb

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From: geraldlyn.gouthro@bureauveritas.com <geraldlyn.gouthro@bureauveritas.com>
Sent: Thursday, October 13, 2022 2:08 PM
To: Hull, Summer <Summer.Hull@stantec.com>; EDD <EDD@stantec.com>
Subject: Final Report-Job#: C274555, ATT: SUMMER HULL Prj: 111477087
Importance: High

Thank you for choosing Bureau Veritas for your analytical services. Attached you will find your Certificate of Analysis. Should you have any questions or concerns, please contact your local Customer Service Representative / Project Manager - Geraldlyn Gouthro at (780)577-7173. We welcome any feedback you would care to share with us. To do so, please contact us at **comments@bureauveritas.com (mailto:comments@bureauveritas.com)**

Your result File C274555V1-R2022-10-13_14-04-02_R006.pdf; C274555V1-R2022-10-13_14-04-55_N001.xlsx; 111477087_C274555V1-R2022-10-13_14-06-

21_N047.zip is attached..

Please note that the reportable detection limit for silicon in water from the ICPOES scan will be updated to 0.5 mg/L from 0.1 mg/L as of September 6, 2022. This applies only to samples analyzed in the Calgary laboratory. Please contact your Customer Service Representative if you have any questions.
CustomerSolutionsWest@bureauveritas.com (mailto:CustomerSolutionsWest@bureauveritas.com).

Bureau Veritas
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Conversation Details

Ticket created on **Thu Oct 13 2022 2:24:21 PM**

Comments

by **Hull, Summer** on **Thu Oct 13 2022 2:30:40 PM** as **Public Note**

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by **Geraldlyn Gouthro** on **Thu Oct 13 2022 2:28:15 PM** as **Public Note**
Hi Summer,

I'll have the analysis added on a rush. ETA would be end of day tomorrow. Do you require on all samples?

Thanks,

Geraldlyn Gouthro
Key Account Specialist - Western Canada
Environmental Laboratories & Specialty Services
Bureau Veritas

Mobile: 403 831 9380
(mailto:geraldlyn.gouthro@bvlabs.com)
geraldlyn.gouthro@bureauveritas.com (mailto:geraldlyn.gouthro@bvlabs.com)
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