GEMTEC
www.gemtec.ca

Step 3 Initial Testing Program and Step 4 Site Classification Former Pinetree Line Radar Station Spotted Island NL17AS01

Contract Number: 65745

GEMTEC Project: 10550.04.02 (Final)

experience • knowledge • integrity expérience • connaissance • intégrité

GEMTEC
www.gemtec.ca

Submitted to:

Defence Construction Canada
180 Kent Street, 14th Floor
Ottawa, Ontario
K1P 0B6

Step 3 Initial Testing Program and Step 4 Site Classification Former Pinetree Line Radar Station Spotted Island NL17AS01

Contract Number: 65745

November 23, 2018
GEMTEC Project: 10550.04.02 (Final)

experience • knowledge • integrity

GEMTEC Consulting Engineers and Scientists Limited
191 Doak Road
Fredericton, NB, Canada
E3C 2E6

November 23, 2018 File: 10550.04.02 (Final)

Defence Construction Canada
180 Kent Street, 14th Floor
Ottawa, Ontario
K1P 0B6

Attention: Maria Drake, Regional Service Line Leader, Environmental Services

Re: Final Report: Step 3 Initial Testing Program and Step 4 Site Classification and Step 4 Site Classification, Former Pine Tree Line Radar Station, Spotted Island, Labrador, DCC Project Number: NL17AS01, Contract Number 65745

Please find enclosed the Final Report: Step 3 Initial Testing Program and Step 4 Site Classification, Former Pine Tree Line Radar Station, Spotted Island, Labrador, DCC Project Number: NL17AS01, Contract Number 65745.

If you have any questions regarding the contents of this report, please do not hesitate to contact the undersigned at (506) 453-1025 or at abigail.garnett@gemtec.ca. This report was prepared by Melanie Langille, M.Env.Sc. and Shaun Pelkey, M.Sc.E., P.Eng., and reviewed by Abigail Garnett, M.Sc.Eng., P.Eng. and Steve Livingstone, M.Sc., P.Geo., on behalf of GEMTEC Consulting Engineers and Scientists Limited (GEMTEC).

Melanie Langille, M.Env.Sc.
Environmental Scientist

Abigail Garnett, M.Sc.Eng., P.Eng.
Senior Environmental Engineer / Hydrogeologist

Enclosures
N:\files\10500\10550.04\7_Spotted Island\Reports\Final\2_Final (Final)\NL17AS01_Step 3_Spotted Island_FINAL REPORT.docx

EXECUTIVE SUMMARY

GEMTEC Consulting Engineers and Scientists Limited (GEMTEC) was retained by Defence Construction Canada (DCC) to conduct a Federal Approach to Contaminated Sites (FACS) Step 3 Initial Testing Program and Step 4 Site Classification, for a former United States Air Force (USAF) Pinetree Gap Filler Line Radar Station located on Spotted Island, Labrador (herein referred to as the "Site"). The objectives of the work was to complete Steps 3 and 4 of the FACS. Step 3 of the FACS involves an Initial Testing Program (also known as a Phase II Environmental Site Assessment (ESA)) and Step 4 of the FACS involves the completion of the Canadian Council of Ministers of the Environment (CCME) National Classification System for Contaminated Sites (NCSCS). The work was initiated based on the results of a FACS Step 2 Historical Review (also known as a Phase I ESA), in which potential contamination was identified based on historical activities at the Site (GHD, 2016). The objective of the work was to determine the presence/absence of impacts at the Site, and to determine a priority for action should impacts exist (NCSCS Classification).

The Site is a former manned Pinetree Line Gap Filler Radar Station for the USAF Cartwright Air Station, located on Spotted Island, Labrador. The Site was operated by the USAF between the mid-1950's and early 1960's. The Site is identified as having an Upper Site and a Lower Site, with approximately 3 kilometres (km) of gravel roadway separating the two sites. Diesel fuel was stored at both the Upper and Lower Sites in (approximately) 1,500,000 litre (L) aboveground storage tanks (ASTs) and an aboveground pipeline connected the two ASTs. A fuel pump house was also reportedly located at both the Upper and Lower Sites. Fuel was also reported to have been stored in portable ASTs and drums, in various locations across the Upper and Lower Sites.

The Upper Site consisted of: a main building with an attached radar and radio tower (radome); a garage; a heating and power plant; a barracks (housing 25-50 personnel); an office building; and a dining hall. The Upper Site also contained: two communication antennae; catch basins; a water pumping station and associated supply lines (from a nearby freshwater lake); a disaster shack; a storage shed with an antenna; a helicopter landing pad; and a landfill. A seasonal community (formerly an Indigenous community) is located adjacent to the Lower Site. Access to the Upper and Lower Sites are not restricted.

The following is a summary of the Step 3 Initial Testing Program and Step 4 Site Classification using the NCSCS:

Areas of Potential Environmental Concern (APECs):

- Based on the document review, 13 preliminary APECs were identified for field investigation.
- Following the completion of a Site Reconnaissance, the locations and chemicals of potential concern (COPCs) were adjusted for some APECs, as compared to what was proposed in the GEMTEC work plan, and two additional APECs were identified: a presumed pump house associated with the Lower Site AST (APEC #14), and a possible bury/landfill site (APEC #15).

Field Program/Testing Program:

- A total of 64 surface soil samples (each collected at 0 - 0.05 metres below ground surface), five sediment samples, five surface water samples, one paint sample, and nine suspected asbestos containing materials (ACMs), were collected from the Site in September, 2017.
- Concentrations of COPCs were compared to the applicable provincial (petroleum hydrocarbons (PHCs) only) and federal screening levels. The regulatory framework includes residential guidelines, for areas within 250 m of a seasonal community located near the Lower Site and commercial guidelines for areas greater than 250 m from the seasonal community (i.e., the Upper Site, portions of the roadway, and APECs between the Upper and Lower Sites); non-potable groundwater use; and coarse-grained soil. Concentrations of COPCs were compared to the applicable ecological and human health guidelines.

Data Evaluation:

- Based on the results of the analytical program, the following were identified at concentrations exceeding the referenced human health and/or ecological screening levels:
    - Soil: PHCs, polycyclic aromatic hydrocarbons (PAHs), and metals;
    - Sediment: PHCs, PAHs, and metals; and
    - Surface water: metals.
- Delineation of these impacts has generally not been achieved based on the Step 3 Initial Testing Program.
- Asbestos containing debris including cement board, vinyl floor tiles, and mastic, were confirmed to be present at the following APECs: APEC #3 (Disaster Shack, Upper Site), APEC #5 (Main Building and Motor Pool, Upper Site), APEC #10 (Dump Site, assumed location, near Upper Site), and APEC #11 (1987 Landfill/Bury Site #2, assumed location, near Lower Site).

NCSCS Scoring and Database:

- The calculated NCSCS score for the Site is 67.9. Based on this score, the Site is classified as Class 2, indicating a Medium priority for action; and
- The Department of National Defence (DND) Environmental Geospatial Information System (GIS) Data Template was updated with all data collected as part of this mandate.

Based on the results of this Step 3 Initial Testing Program and Step 4 Site Classification, preliminary estimates of the area and volume of impacted soil are provided in Table E.1.1, for each of the now confirmed APECs. Areas provided below include both human and ecological exceedances, when compared to both federal and provincial guidelines, and are considered preliminary estimates only, as delineation was not achieved during the Step 3 Initial Testing Program.

Table E.1.1 Preliminary Estimates of Impacted Areas

Sample ID	COPC	Matrix	Preliminary Estimates		
			Estimated Depth[1] (m)	Estimated Area[2] (m^2)	Estimated Volume[3,4] (m^3)
APEC #2 (Helicopter Pad)					
SS_SP_03	Copper	Soil	0.15	150	30
SS_SP_04	Copper	Soil	0.15	300	50
APEC #3 (Disaster Shack)					
BS_SP_02B	Crysotile Asbestos	Asbestos/Soil Mixture	0.05	800	40
SS_SP_06 SS_SP_07	Copper	Soil	0.30	300	90
APEC #4 (Drum Cache)					
SS_SP_13 SS_SP_1	F4	Soil	0.15	350	60
SS_SP_16	F4	Soil	0.15	200	30
APEC #5 (Main Building and Motor Pool)					
BS_SP_02A	Crysotile Asbestos	Asbestos/Soil Mixture	0.05	2100	110
SS_SP_20	Copper	Soil	0.15	150	30
SS_SP_21	F2, F3	Soil	0.15	150	30
APEC #6 (1987 Landfill/Bury Site #1)					
SS_SP_23, SS_SP_24, SS_SP_25	Copper, lead, phenanthrene	Soil	0.60	450	270

Table E.1.1 Preliminary Estimates of Impacted Areas

Sample ID	COPC	Matrix	Preliminary Estimates		
			Estimated Depth[1] (m)	Estimated Area[2] (m^2)	Estimated Volume[3,4] (m^3)
APEC #8 (USAF Dump)					
SS_SP_30	Copper	Soil	0.30	250	80
SS_SP_33	Copper, lead,	Soil	0.30	100	30
APEC #9 (Pump House and Water Source)					
SW_SP_02	aluminum, iron	Surface water	1	150	150
SW_SP_03	aluminum, iron	Surface water	1	200	200
APEC #10 (Dump Site (assumed location, near Upper Site))					
BS_SP_08A BS_SP_09A	Crysotile Asbestos	Asbestos/Soil Mixture	0.05	400	20
APEC #11 (1987 Landfill/Bury Site #2 / Unknown Former Structure)					
BS_SP_06A BS_SP_07A	Crysotile Asbestos	Asbestos/Soil Mixture	0.05	1100	60
SS_SP_45	zinc	Soil	0.15	150	30
APEC #13 (Waterbody, Lower Site)					
SW_SP_04	copper, aluminum, iron, anthracene modified TPH	Surface Water	0.15	150	30
SD_SP_04	Several PAHs, aluminum, arsenic, cadmium, copper, iron, lead, zinc, and PCBs	Sediment	0.15	150	30
APEC #14 (Former Fuel Pump House, Lower Site)					
BS_SP_02C	Crysotile Asbestos	Asbestos/Soil Mixture	0.05	400	20
SS_SP_60, SS_SP_61, SS_SP_62	lead, modified TPH, F1, F2, F3	Soil	0.15	400	60
Total Estimated Volume of Impacted Soil at the Site					**790**
Total Estimated Volume of Asbestos/Soil Mixture					**250**
Total Estimated Volume of Impacted Sediment at the Site					**30**
Total Estimated Volume of Impacted Surface Water at the Site					**380**

Table E.1.1 Preliminary Estimates of Impacted Areas

Sample ID	COPC	Matrix	Preliminary Estimates		
			Estimated Depth[1] (m)	Estimated Area[2] (m^2)	Estimated Volume[3,4] (m^3)

Notes:
m = metres; m^2 = square metres; and m^3 = cubic metres
1) Depth inferred on an APEC by APEC basis is based on observations made at the time of sampling; however, impacts were not delineated vertically during the Step 3 Initial Testing Program. These depths are estimates only.
2) Area estimates were determined on a number of factors that are detailed in Section 7.3.5 of the report.
3) Volume estimates are preliminary at this stage as delineation was not achieved during the Step 3 Initial Testing Program. As such, the presented volume estimates have been rounded up to the nearest 10 m^3.
4) All estimates presented herein should be revised following completion of a Step 5 Detailed Testing Program.

Based on the information gathered in the Step 3 Initial Testing Program and Step 4 Site Classification, and taking into consideration the anticipated land use (vacant, adjacent to a seasonal community with no municipal infrastructure), additional environmental site assessment (*i.e.*, completion of a FACS Step 5 Detailed Testing Program and a Step 6 Site Re-Classification using the CCME NCSCS) is recommended to further delineate and characterize the APECs and to further refine and prioritize the contaminant risk.

The proposed scope of work for the Step 5 Detailed Testing Program and Step 6 Site Re-Classification using the CCME NSCSC is as follows:

- Complete interviews, if possible, with seasonal residents of Spotted Island to determine:
    - The source of drinking water in the area (groundwater, surface water, or off-island source). As the USAF used surface water for drinking, current use of surface water for potable purposes has not been ruled out; and
    - Whether the remains of a structure at APEC #11 (Unknown structure), and the unidentified potential former structure located at 583202E, 5929875N, Zone 21U are a result of USAF operations (or alternately obtain additional sources of information, if available, to determine this).
- Complete additional field data gathering including:
    - Supplemental background soil sampling to determine background conditions outside the influence of the former Site activities.
    - Collect surface and subsurface (where possible) soil samples, sediment samples, and surface water samples to delineate the extent of the identified COPC. Atlantic RBCA hydrocarbon analytical methodology should be considered, if future comparison to the Atlantic RBCA framework is anticipated;
    - Assessment of potential presence/absence of abandoned/sunken equipment and/or waste materials within the surface water body at APEC #13. This could be achieved using a small inflatable boat and underwater camera;

    - Pending a feasibility and safety assessment, access and collect soil samples at the base and/or face of the cliff at APEC #8 (USAF and current landfill); and
    - Complete geophysical surveys of the on-site landfills (suspected and confirmed) to determine the volume of debris, to aid in future remediation cost estimates.
- Complete data analysis and evaluation:
    - Analyse the degree of contamination on the Site (i.e., compare data to applicable pathway specific provincial and federal guidelines for human health and ecological health);
    - Update the DND Environmental GIS Data Template with all data collected as part of the mandate;
    - Refine/update the preliminary CSMs for human and ecological receptors, as required;
    - Re-Classify the Site using the NCSCS (Step 6);
    - Determine the need for additional environmental site assessment and/or risk assessment work (if any); and
    - Identifying any management actions that may be necessary.
- Complete the FACS Step 6 Site Re-Classification using the CCME NCSCS.

A cost estimate to complete the Step 5 Detailed Testing Program and Step 6 Site Re-Classification is provided under separate cover. Actual costs to complete additional phases of work at the Site will be dictated by Site conditions, the scope of the programs completed, and market values (for professional fees, analytical testing and transportation) at the time the work is completed.

The statements made in this Executive Summary should be read in conjunction with the remainder of the report.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF DRAWINGS

LIST OF APPENDICES

1.0 INTRODUCTION

GEMTEC Consulting Engineers and Scientists Limited (GEMTEC) was retained by Defence Construction Canada (DCC) to conduct a Federal Approach to Contaminated Sites (FACS) Step 3 Initial Testing Program and a Step 4 Site Classification for a former United States Air Force (USAF) Pinetree Line Radar Station located on Spotted Island, Labrador (herein referred to as the "Site"; Drawing 1, Appendix A). The objectives of the work were to complete Steps 3 and 4 of the FACS. Step 3 of the FACS involves an Initial Testing Program (also known as a Phase II Environmental Site Assessment (ESA)) and Step 4 of the FACS involves the completion of the Canadian Council of Ministers of the Environment (CCME) National Classification System for Contaminated Sites (NCSCS). The work was initiated based on the results of a FACS Step 2 Historical Review (also known as a Phase I Environmental Site Assessment) in which potential contamination was identified based on historical activities at the Site (GHD, 2016).

The purpose of the work completed under this mandate was to determine the presence/absence of impacts at the Site, and determine a priority for action should impacts exist (NCSCS Classification).

1.1 Scope of Work

The scope of work for this Step 3 Initial Testing Program and Step 4 Site Classification included the following:

- Preparing a Health and Safety Plan (HSP);
- Completing documentation review;
- Updating the work plan for the Step 3 Initial Testing Program;
- Conducting the Step 3 Initial Testing Program consisting of sampling and analysis of surface soil, surface water, sediment, building materials, and paint;
- Conducting a site inventory including infrastructure, buildings, and/or debris identified at the Site;
- Developing a regulatory framework to assess Site analytical data;
- Classifying the Site using the CCME NCSCS;
- Updating the Department of National Defence (DND) Environmental Geospatial Information System (GIS) Data Template with all data collected as part of this mandate;
- Developing a preliminary Conceptual Site Model (CSM) for the Site;
- Preparing a written report and manageable electronic files of all data collected in the specified format; and
- Providing a work plan for additional environmental site assessment work required (if any), to delineate and further characterize any on-site impacts.

1.2 Previous Environmental Site Assessments

The following environmental site assessment was previously completed for the Site:

- Phase I Environmental Site Assessment, Former United States Military Site, Spotted Island, NL. Prepared for the Department of Environment and Conservation (Newfoundland and Labrador). March 2016. GHD Limited.

The above-noted document was reviewed by GEMTEC as part of this mandate. Relevant details are cited throughout this report.

1.3 Background and Site Description

Spotted Island is an island situated off the eastern coast of Labrador. It is located approximately 314 kilometres (km) east of Happy Valley-Goose Bay, Labrador and 85 km southeast of Cartwright, Labrador. Black Tickle Island is located approximately 1 km to the south of Spotted Island. The Site occupies the eastern portion of Spotted Island (Drawing 2, Appendix A).and covers an approximate are of 594,807 square metres (m^2) (DCC, 2017). The Site is identified as having an Upper Site and a Lower Site, with approximately 3 km of gravel roadway separating the two sites.

The Site is a former manned Pinetree Line Gap Filler Radar Station for the USAF Cartwright Air Station. The Pinetree Line was a network of Aircraft Control and Warning (AC&W) stations used in the detection of Soviet aircraft flying toward the US and Canada during the Cold War. The radar station on Spotted Island was established in 1957 and operated until 1961. Soon after, the facility was transferred to the Canadian Armed Forces and was deactivated and closed. In 1964, the property ownership was transferred to the Province of Newfoundland and Labrador (GHD, 2016). The Province of Newfoundland and Labrador remains the current Site owner.

While in operation, the Upper Site consisted of a:

- Main two-storey building, which housed a motor pool/maintenance garage in the southern portion; a heating and power plant in the central portion; and a barracks in the northern portion (housing 25-50 personnel, office space, and a dining hall);
- Tower, housing radar equipment, which was connected to the main building by an enclosed corridor;
- Total of two communication antennae;
- Disaster shack;
- Fuel pump house;
- 1,575,000 litre (L) above ground storage tank (AST) containing diesel/fuel oil; and
- Helicopter pad.

An above ground pipeline, which transferred fuel from the Lower Site to the Upper Site, was located along the western side of the roadway. Remnant features of the Upper Site are shown on Drawing 3 (Appendix A).

An area of dumping/landfilling associated with the USAF was identified between the Upper Site and the Lower Site (Drawing 4, Appendix A). A freshwater lake, located south of the Upper Site, was used as a source of drinking water; a water pump house, installed at the northern boundary of the lake, transported water to the Upper Site via an above-ground pipeline (Drawing 5, Appendix A). Sections of the roadway/above ground diesel pipeline are shown on Drawings 6 and 7 (Appendix A), along with areas of potential environmental concern, identified in Section 2.6.

The Lower Site (Drawings 7 and 8, Appendix A) consisted of a 1,625,000 L diesel/fuel oil AST and a pump house; the AST was filled via an above ground pipeline that was accessible by boat.

In 1987, the Site was decommissioned. The decommissioning contract included the razing of on-site structures and the burning of all materials, followed by the burying and covering of all building materials. The contractor reportedly did not complete all the work at the Site. All material brought to the radar station, during its construction and operation, remains on-site in various states in landfills.

2.0 DOCUMENTATION REVIEW

2.1 Geology and Hydrogeology

Surficial geology mapping (Fulton, 1986), indicates that surficial geology deposits at the Site are Late Wisconsinan morainal deposits dominated by sandy and gravelly till that includes ablation till and minor amounts of other glacial sediments; generally less than one metre thick and including scattered outcrops. In many places the morphology mimics underlying bedrock; locally contains other glacial deposits; and in some areas consists entirely of boulders, which in places may overlie thicker till. Based on the geology mapping, it appears that the area of the existing roadway on the island is the area with these morainal deposits. The remainder of the Site is identified as being comprised of Pre-Quaternary rock and rock thinly covered in drift colluvium, and vegetation; generally hilly and hummocky, steep slopes common; includes small areas of other units and small swampy hollows.

Bedrock geology mapping indicates that bedrock at Spotted island is comprised of two types: Late Labradorian anorthositic and mafic intrusions (1660 – 1600 Ma; e.g., White Bear Arm complex and Sand Hill Big Pond Intrusion), made up of massive to strongly foliated gabro and norite, commonly layered; subophitic and locally coronitic; and Early Labradorian Granitoid and associated rocks (ca. 1678 and 1671 Ma; e.g., Neveisik Island and Red Island events), made up of foliated to gneissic granodiorite and compositionally equivalent well-banded gneiss (Gower, 2010).

Based on the information presented in the “Hydrogeology of Labrador” (AECOM, 2013), the Site is located in the Pre-Cambrian age geological province referred to as the “Grenville Province”. The Grenville Province is located in the southern portion of Labrador and is west to northeast trending, and consists of high grade metamorphic rocks (*i.e.*, gneiss, formed by the metamorphosis of granite or sedimentary rock) and associated intrusive rocks (AECOM, 2013).

Granitic and gneissic rocks of the Grenville Province were found to have low to moderate yields ranging from 0.6 to 315 Liters per minute (Lpm), with a geometric mean of 8.6 Lpm (AECOM, 2013). It is therefore anticipated that the rock at the Site is gneissic and has a relatively low hydraulic conductivity.

2.2 Permafrost

The southern portion of Labrador has isolated patches of permafrost (ground that remains frozen for more than one year) (AECOM, 2013). Permafrost was not encountered at the Site during the manual test pitting; based on the location of the Site and soil conditions encountered at the Site, permafrost is not likely to be present.

2.3 Topography and Drainage

Labrador is part of the Canadian Shield physiographic region of Canada. The Mecantina Plateau, located in southeastern Labrador (*i.e.*, the area of the Site) consists of changes in elevation from sea level (at the eastern and southern coasts) to 600 metres above sea level, at the center of the plateau (ESWG, 1996).

Site topography is depicted on Drawing 2 in Appendix A and shown on images obtained from Google Earth Pro® in Appendix B. The Upper Site is situated at 70 metres above sea level (masl), while the Lower Site is situated at an elevation less than 20 masl (Natural Resources Canada, 2017). The terrain at Spotted Island is rugged, with steep cliffs, particularly along the eastern and northern shore of the island. Much of the Site surfaces are exposed bedrock, with some small herbaceous vegetation.

Groundwater flow direction is expected to mimic the local topography, flowing from high elevations to low elevations along the coast. Based on the topography mapping and geology, drainage is expected to occur primarily by overland flow, following the surface topography, which generally slopes toward the Labrador Sea.

2.4 Climate

The closest weather station to the Site is in Cartwright, which is located approximately 150 km to the southeast of the Site. Based on Environment Canada Climate Normals from 1971 to 2000 (EC, 2018), the daily average temperature in Cartwright is -0.5 degrees Celsius, with January and February being the coldest months (January (-14.8) and February (-14.1) and July and August being the hottest months (both 12.1 degrees Celsius). Total annual precipitation is 1050.1 millimetres (mm), which includes 573 mm of rainfall and 477.1 mm as rainfall equivalents (includes annual snowfall of 487.6 cm). The average wind speed is 20.2 kilometres per hour (km/hr).

2.5 Environmentally Sensitive areas, Shallow Soil Conditions, Surface Water Bodies

A review of ecologically significant areas (CCEA, 2017), revealed no area of ecological significance within 5 km of the Site. The nearest protected ecological area is the Gannet Islands Ecological Reserve, located approximately 68 km west of the Site. No unique or special habitat was identified at the Site.

Numerous small surface water bodies are scattered throughout the Site and the entire island, giving it a “Spotted” look.

2.6 Preliminary Identification of Areas of Potential Environmental Concern

In preparing the work plan for this Step 3 Initial Testing Program and Step 4 Site Classification, GEMTEC reviewed:

- The previous Step 2 Historical Review prepared by GHD (GHD, 2016). It is noted that, at the request of the client of the Step 2 Historical Review (Province of Newfoundland and Labrador), a Site visit was not completed by GHD; and
- High-resolution aerial imagery, purchased from Sikumiat Environmental Management Limited.

Based on the review of the above information, 13 Areas of Potential Environmental Concern (APECs) were identified (GEMTEC, 2017). A summary of preliminary APECs, activities historically conducted at the Site and the associated Chemicals of Potential Concern (COPCs) is provided in Table 2.1. Selected Site photographs are presented in Appendix B.

Table 2.1 Preliminary APECs and COPCs

APEC (Preliminary)		Historical Activities	COPCs
#	**Description**		
1	AST (Upper Site)	Storage of up to 1,575,000 L of diesel/fuel oil	PHCs
		Burning of Site structures	PAHs
2	Helicopter Pad (Upper Site)	Thousands of fuel drums were reportedly stored, and portable fueling station for fueling helicopters	PHCs (fuel stored) Metals (from metal drums)
		Burning of Site structures	PAHs
3	Disaster Shack (Upper Site)	Emergency plan assumed to have included storage of fuel for heating and / or aircraft use	PHCs (fuel stored)
		Potential lead or mercury-based paint on exterior of building	Metals
		Burning of Site structures	PAHs
4	Drum cache (Upper Site)	Drums (presumed to contain petroleum hydrocarbons (PHCs)) interpreted from most recent satellite imagery	PHCs
5	Main Building and Motor Pool	Fueling and maintenance of Site machinery	PHCs
		Metal works in maintenance of Site machinery. Potential lead or mercury-based paint on exterior of building	Metals
		Presumed use of solvents in machinery maintenance	VOCs
		Electricity generation	PCBs

Table 2.1 Preliminary APECs and COPCs

APEC (Preliminary)		Historical Activities	COPCs
#	**Description**		
6	1987 Landfill/Bury Site #1 (assumed location)	Potential for any Site materials to be buried/disposed in a landfill/bury site	PHCs, metals, PCBs, PAHS
7	Aboveground Fuel Line	Transport of diesel fuel between the 1,625,000 L Lower Site AST and the 1,575,000 L Upper Site AST	PHCs
8	USAF Dump	Potential for any Site materials to be buried/disposed in a landfill/bury site	PHCs, PAHs, metals, PCBs
9	Pump House & Water Source	Anticipated use of fuel to power water pumps. Potential impacts to waterbody could be widespread if fuel was released into the water. Location of intake and other infrastructure not known, and as such, potential impacts may not be limited to the area of the former pump house	PHCs
10	Bury/Dump Site (assumed)	Potential for any Site materials to be buried/disposed in a landfill/bury site	PHCs, PAHs, metals, PCBs
11	1987 Landfill/Bury Site #2 (assumed location)	Potential for any Site materials to be buried/disposed in a landfill/bury site	PHCs, PAHs, metals, PCBs
12	AST (Lower Site)	Storage of up to 1,575,000 L of diesel/fuel oil	PHCs
		Burning of Site structures	PAHs
13	Waterbody	Due to its proximity to the Lower Site AST, and as the landfill/bury sites were not apparent in the aerial imagery, potential use of the waterbody as a disposal site for Site decommissioning debris	PHCs, PAHs, heavy metals, PCBs, VOCs

COPCs = chemicals of potential concern
PHCs = petroleum hydrocarbons, including benzene, ethylbenzene, toluene, and xylenes (BTEX) and Modified Total Petroleum Hydrocarbons (TPH)
PCBs = polychlorinated biphenyls
PAHs = polycyclic aromatic hydrocarbons
VOCs = volatile organic compounds

In addition to the sampling described above, background samples were collected for analysis of PHCs, metals, and PCBs. A background concentration is defined as the concentration of analytical parameters in environment media (*i.e.*, soil, surface water, *etc.*) surrounding a Site, that have not been influenced by activities at a Site or related to any releases on contaminants to the environment. Background concentrations can be naturally occurring (*e.g.*, erosion of naturally occurring mineral deposits) or as a result of anthropogenic activities that have occurred off-site and are unrelated to Site activities.

The document review was supplemented by Site Reconnaissance by air and on land, as discussed in Section 5.0.

2.7 Neighbouring Land Use

A small seasonal community (approximately 30 buildings) is located adjacent to the Lower Site. The nearest building is located approximately 30 metres (m) northwest of APEC #12 (AST, Lower Site). At the time of the USAF operation of the Site, this community was an Indigenous community. Based on personal communication with DCC representatives, the community is no longer occupied by Indigenous peoples. The current neighbouring land use is seasonal residential.

3.0 SITE DESCRIPTION

3.1 Site Characterization

The Site, including the Upper and Lower Sites, is currently vacant with the exception of remnant structures (*e.g.*, foundations, *etc.*); as identified in Section 2.7, a seasonal community is currently located within 30 m of the Lower Site. The historical land use was mixed commercial and residential; US military personnel were housed on-site to operate the radar station and a community has historically been located near the Lower Site. During the time of the USAF operations, the community was Indigenous, however, it is currently a non-Indigenous seasonal community. Access to both the Upper and Lower Sites is not restricted to people within the seasonal community or other visitors to the Site by air or boat. The Site is not located in a developed residential area, nor is such development anticipated due to the remote and rocky nature of the Site.

Based on Site observations (graffiti on the concrete berm of the former Lower Site AST, and recent/modern garbage dumped nearby), it is presumed that residents regularly access the Lower Site. As such, the Lower Site (APEC #11 to APEC #15) and portions of the roadway/former pipeline (APEC #7) have been considered “residential” for the purpose of this assessment. A “residential” scenario assumes exposure of 24 hours per day, 365 days per year, for toddlers, children and adults (CCME, 2006).

The seasonal community is located more than 2 Km south of the Upper Site. Access to the Site is not restricted thus people, including toddlers, may visit. The Upper Site is accessible by land; via the gravel roadway that connects the Upper and Lower Sites. It is anticipated that residents of the seasonal community may occasionally visit the Upper Site, and that any such visiting would be consistent with (or less frequent than) a commercial exposure scenario (*i.e.*, 10 hours per day, 5 days per week, 48 weeks per year (CCME, 2006), for toddlers, children and adults). As such, the applicable human health receptor scenario for the Upper Site has been considered to be “commercial”.

Although the USAF obtained drinking water from a surface water body, sources of water used in the nearby seasonal community were not confirmed during the current assessment. Based the location of the Site, it is highly unlikely that a municipal water distribution system is available. Steel drums were observed outside many of the seasonal cottages, which appeared to be used for water storage; however, this could not be confirmed at the time of the assessment. Private groundwater wells were not observed in the community during the Site visit. The likelihood of drilled wells on the island is considered low, as the island is accessible only by boat, and mobilization cost of a standard drill rig would be very high. Hand-dug wells are unlikely in this area due to the shallow bedrock and close proximity to the sea (salt water intrusion would be a concern for groundwater resources in this area). No signs of water input pipes were observed in any of the waterbodies visited, thus use of freshwater bodies as drinking water was not apparent. Due to the seasonal nature of the community, residents may transport water from off-island; however this has not been confirmed. The resident encountered dumping their domestic garbage at APEC #8 did not mention their water source. As result of the above, non-potable soil guidelines were selected, as groundwater is not anticipated to be a source of drinking water now or in the future.

Based on the Site reconnaissance, herbaceous and woody vegetation, moss, and wildlife (including hares and birds) are present at the Site. Based on the overall healthy vegetation community observed at the Site, with the exception of the stressed vegetation observed at APEC # 12 (Lower Site AST), the soil invertebrate population is expected to be intact. Based on a provincial database (Province of Newfoundland and Labrador, 2018), the mapped range of polar bears and wolverines (both considered Species at Risk) overlap the Site; other SAR are also potentially present on the Site. The potential for Species at Risk located at the Site was not ruled out as part of this mandate.

Coarse-grained soil texture has been assumed based on field observations, and as it is conservative for screening purposes.

Based on the above, the “residential” land use scenario is applicable to the Lower Site (part of APEC #7 (roadway) and APEC #11 to APEC #15), and the “commercial” land use scenario is applicable to the remainder of the APECs in the Upper Site and APECs between the Upper and Lower Sites (APEC #1 - APEC #10, and parts of the roadway (APEC #7) that are greater than 250 m from the community). The Site characteristics used in selecting screening criteria are summarized in Table 3.1.

Table 3.1 Site Characteristics

Site Characteristic	Selection
Land Use	Residential (Lower Site: APECs #11-15, and portions of APEC #7 near APECs #11-15)
	Commercial (Upper Site: APECs #1-10, and remaining portions of APEC #7)
Groundwater Use	Non-Potable
Soil Type	Coarse-grained

3.2 Contaminant Sources

Potential sources of contamination (COPCs) at the Site include the following, resulting from the historical use of the Site by the USAF:

- Fuel storage and use (PHCs);
- Burning of Site structures (PAHs);
- Metal drums or structures, lead-based paint on former buildings (VOCs, metals);
- Disposed electrical equipment (PCBs);
- Waste incineration (furans and dioxin-like compounds).

3.3 Potential Receptors

3.3.1 Human Receptors

Based on the residential (Lower Site) and commercial (Upper Site) characterization, human receptors on the Site include:

- Adults;
- Children; and
- Toddlers.

3.3.2 Ecological Receptors

Based on the residential (Lower Site) and commercial (Upper Site) characterization, ecological receptors on the Site include:

- Mammals;
- Birds;
- Plants and Invertebrates;
- Freshwater Aquatic Life; and
- Potential Species at Risk.

3.4 Exposure Pathways

3.4.1 Human Health Receptors

Source media, transport mechanisms, potential exposure pathways and an assessment of whether the exposure pathway is incomplete or complete, is presented for human receptors on and off the site, respectively, in Table 3.2.

Table 3.2 Human Health Exposure Pathway Assessment

Source Media	Transport Mechanism	Potential Exposure Pathway	Human Health Pathway Assessment	Exposure Pathway Complete or Incomplete?
Surface Soil	Vegetation Uptake	Consumption of Vegetation	The Site and surrounding area are not currently used for agricultural purposes. The Site location/topography and rocky surface, with limited surficial soils, would preclude agricultural use of the Site or surrounding areas in the future.	Incomplete
	-	Soil/Dust Dermal Contact and Ingestion	On-site receptors may come into contact with COPCs in surface soil or dust, via dermal contact and incidental ingestion, in the absence of a barrier (such as concrete) or during construction activities.	**Complete**
	Wind Erosion – Atmospheric Dispersion	Inhalation of Particles	Possible at Site.	**Complete**
Surface Soil	Volatilization (Organic Contaminants) – Atmospheric Dispersion	Inhalation of Outdoor Vapours	Possible at Site.	**Complete**
	Volatilization (Organic Contaminants) – Enclosed Space Accumulation	Inhalation of Indoor Vapours	There are no buildings or structures at the Site and hence no enclosed spaces. However, a seasonal community is located approximately 30 m from the Lower Site.	**Complete**

Table 3.2 Human Health Exposure Pathway Assessment

Source Media	Transport Mechanism	Potential Exposure Pathway	Human Health Pathway Assessment	Exposure Pathway Complete or Incomplete?
Groundwater	Soil Leaching to Groundwater	Groundwater Transport – Inhalation of Vapours (Organic Contaminants)	There are no buildings or structures at the Site and hence no enclosed spaces. However, a seasonal community is located approximately 30 m from the Lower Site.	**Complete**
		Groundwater Incidental Ingestion	Groundwater is not used as a source of drinking water (i.e., there are no potable wells on the Site) and groundwater does not daylight at the Site. It is very unlikely that groundwater resources would be developed on the Site, based on the geology and close proximity to the sea (i.e., sea water intrusion would be a concern near the coast).	Incomplete
		Groundwater Dermal Contact		Incomplete
Surface Water /Sediment	-	Surface Water/Sediment Incidental Ingestion	Surface water has in the past and may be currently used as a source of potable water (for the seasonal community). Future use of surface water as potable resource, cannot be ruled out.	**Complete**
		Surface Water/Sediment Dermal Contact		

3.4.2 Ecological Receptors

Source media, exposure media, potential exposure pathways and an assessment of whether the exposure pathway is incomplete or complete, is presented for ecological receptors on and off the Site, respectively, in Table 3.3. The potential for SAR in the area has not been ruled out as part of this mandate.

Table 3.3 Ecological Health Exposure Pathway Assessment

Source Media	Exposure Media	Potential Exposure Pathway	Ecological Health Pathway Assessment	Exposure Pathway Complete or Incomplete?
Surface Soil	Direct Exposure & Ingestion	Plants & Invertebrates	With the exception of the concrete foundations and gravel roadway, Site surfaces are generally rock covered or covered in short vegetation/mosses. Therefore, invertebrates and plants are likely to be in direct contact with impacted surface soil.	**Complete**
		Wildlife (mammals/birds)	Incidental ingestion of soil by wildlife, while anticipated to be low (as wildlife are not anticipated to remain in the previously developed areas of the Site for the duration of their lifetime), cannot be ruled out.	**Complete**
Groundwater	Ingestion/Plant Uptake	Plants/ invertebrates	Although it is unlikely based on the geology of the Site and encountered soil conditions, it is still possible for plants and invertebrates to come into contact with groundwater.	**Complete**
		Mammals/birds	No shallow waterbodies or dugouts for wildlife watering were observed at the Site.	Incomplete

Table 3.3 Ecological Health Exposure Pathway Assessment

Source Media	Exposure Media	Potential Exposure Pathway	Ecological Health Pathway Assessment	Exposure Pathway Complete or Incomplete?
Surface Water/ Sediment	Surface Water and Freshwater Sediment	Direct Exposure and/or Ingestion	There are surface water bodies on the Site; therefore, freshwater aquatic life may be present.	**Complete**

4.0 APPLICABLE GUIDELINES (REGULATORY FRAMEWORK)

4.1 Rationale for Selected Screening Levels

Screening levels are selected based on the applicable contaminant sources, potential exposure pathways, and potential receptors at the Site. Sources, pathways, and potential receptors for this Site are described in Section 3.0.

Federal and provincial screening levels are numerical limits or statements which can be used for comparison with measured contaminant levels at a site in order to determine whether further investigation or actions are required (screening). It should be noted, however, that the definition of impact does not necessarily imply that there will be significant risks to human health and the environment. Natural attenuation mechanisms such as biodegradation and adsorption; the exposure pathways, the frequency and distances to potential receptors must be considered to determine specific risks and potential impacts. GEMTEC has conducted the screening for this Site in the context of both the federal and provincial frameworks, in consideration that our client is a federal organization, and under the understanding that the Province of Newfoundland is the current owner of the property. Both frameworks have been given equal weight in this assessment.

The Province of Newfoundland and Labrador has adopted the Atlantic Risk-Based Corrective Action (Atlantic RBCA) methodology for the assessment of contaminated sites and as such, the Atlantic Partnership in RBCA Implementation (Atlantic PIRI) risk-based screening levels (RBSLs) and ecological screening levels (ESLs) have been referenced for petroleum hydrocarbons. Atlantic PIRI does not currently provide guidelines for non-petroleum contaminants.

For federal screening, the primary source of screening levels are the Canadian Council of Ministers of the Environment (CCME) environmental quality guidelines. The CCME maintains an online database (http://st-ts.ccme.ca/en/index.html) that serves as a repository for the most up-to-date CCME guidelines available. This database was accessed in May 2018 in preparation of this report.

In the absence of provincial or federal screening levels, the following jurisdictions were referenced, in order of preference:

- Nova Scotia Environment (NSE). 2013. PRO 100: Notification of Contamination Protocol; and
- World Health Organization (WHO). 2006. Re-evaluation of Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds.

4.2 Comparison of Provincial and Federal Guidelines

Samples collected as part of this Step 3 Initial Testing Program were analyzed using the CCME Canada-Wide Standard (CWS) methodology. A comparison of the two methods is provided in Table 4.1 (adapted from Atlantic PIRI, 2012).

Table 4.1 Comparison of PHC Analytical Methods

Reporting	Atlantic Risk-Based Corrective Action (RBCA)	CCME CWS
Tier I Reporting	$C_{>6}$-C_{10} (aromatic + aliphatic, minus BTEX) $C_{>10}$-C_{16} (aromatic + aliphatic) $C_{>16}$-C_{21} (aromatic + aliphatic) $C_{>21}$-C_{32} (aromatic + aliphatic) modified TPH (equals all TPH less BTEX)	F1 = $C_{>6}$-C_{10} (aromatic + aliphatic) F2 = $C_{>10}$-C_{16} (aromatic + aliphatic) F3 = $C_{>16}$-C_{34} (aromatic + aliphatic) F4 = $C_{>34}$ (aromatic + aliphatic) (Note: BTEX is covered under other CCME methods)

For comparison of the laboratory results to the provincial guidelines (modified TPH, $C_{>6}$-C_{32})), GEMTEC has summed the detected concentrations of F1, F2, and F3 fractions (C_6-C_{34}). In the instance of no detections, the highest detection limit is used as the approximate value for modified TPH. This approximation is a slight over representation of the modified TPH concentration. It is noted that the CWS detection limits, in some instances, exceed the Atlantic RBCA guidelines.

4.3 Applicable Guidelines

The applicable provincial and federal soil criteria for the Site are summarized in Table 4.2.

Table 4.2 Applicable Soil Criteria

Parameter	Criteria	
	Ecological Health	Human Health
Federal		
Petroleum Hydrocarbons (PHCs)	<u>Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX compounds):</u> CCME SQG_E (2004, accessed online May 2018). Commercial and residential land use.	<u>BTEX compounds:</u> CCME SQG_{HH} (2004, accessed online May 2018). Commercial and residential land use, non-potable groundwater use. Incremental cancer risk: 10^{-5} (benzene)

Table 4.2 Applicable Soil Criteria

<table>
<tr><th rowspan="2">Parameter</th><th colspan="2">Criteria</th></tr>
<tr><th>Ecological Health</th><th>Human Health</th></tr>
<tr><td rowspan="2">Petroleum Hydrocarbons (PHCs)</td><td><u>PHC Fractions F1, F2, F3, and F4:</u>

Canada-Wide Standards (CWS) for coarse-grained surface soil (2008) - Ecological Health Standards. Commercial and residential land use. Most conservative exposure pathway.</td><td><u>PHC Fractions F1, F2, F3, and F4:</u>

CWS for coarse-grained surface soil (2008) - Human Health Standards. Commercial and residential land use. Most conservative exposure pathway.</td></tr>
<tr><td colspan="2">Where the chromatogram did not return to baseline, additional analysis (F4 Gravimetric (F4G) method) was conducted to quantify concentrations of $C_{>50}$ hydrocarbons. In these instances, the greater of the (preliminary) F4 ($C_{>34}$-C_{50}) and F4G ($C_{>50}$) are compared to the guideline for F4 ($C_{>34}$).</td></tr>
<tr><td rowspan="2">Polycyclic Aromatic Hydrocarbons (PAHs)</td><td rowspan="2">CCME SQG_E (1999 and various updates, accessed online May 2018). Commercial and residential land use.</td><td><u>Carcinogenic PAH compounds:</u>

CCME SQG_{HH} (2010) for Benzo(a)pyrene Total Potency Equivalent (B(a)P TPE)</td></tr>
<tr><td><u>Non-carcinogenic PAH compounds:</u>

No guidelines provided by CCME: however CCME recommends referencing other Canadian jurisdictions.

Thus:
Nova Scotia Environment (NSE) Tier 1 Environmental Quality Standards (EQS) for Commercial and residential, non-potable site (2013).</td></tr>
<tr><td rowspan="2">Metals</td><td>CCME SQG_E (1999, accessed online May 2018). Commercial and residential land use.</td><td>CCME SQG_{HH} (1999, accessed online May 2018). Commercial and residential land use.</td></tr>
<tr><td colspan="2">For some parameters (antimony, cobalt, tin), CCME does not provide separate SQG_E and SQG_{HH}. In these instances, the generic (or interim) guideline was referenced and is assumed to be protective of both ecological and human health receptors.</td></tr>
<tr><td>VOCs</td><td>CCME SQG_E (1999, accessed online May 2018). Commercial land use (no samples for VOCs analyzed in the residential portion of the Site).</td><td>CCME SQG_{HH} (1999, accessed online May 2018). Commercial land use (no samples for VOCs analyzed in the residential portion of the Site).</td></tr>
<tr><td>PCBs</td><td>CCME SQG_E (1999, accessed online May 2018). Commercial land use (no samples for PCBs analyzed in the residential portion of the Site).</td><td>CCME SQG_{HH} (1999, accessed online May 2018). Commercial land use. (no samples for PCBs analyzed in the residential portion of the Site).</td></tr>
</table>

Table 4.2 Applicable Soil Criteria

Parameter	Criteria	
	Ecological Health	**Human Health**
Furans and dioxin-like compounds	Interim CCME SQG_{HH} (2002, accessed online May 2018). All land uses (equivalent guideline). Guideline is for toxic equivalent. Toxic equivalent calculated using 2005 World Health Organization Toxic equivalency Factors (WHO, 2006). The generic guideline provided by CCME is assumed to be protective of both ecological and human health receptors.	
Provincial		
PHCs	Atlantic RBCA Tier I Ecological Screening Levels (ESLs) for the direct contact pathway for a property with coarse-grained soil. (2015). Commercial and residential land use.	Atlantic Risk-Based Corrective Action (RBCA) Tier I Soil Risk-Based Screening Levels (RBSLs) for non-potable groundwater use, coarse-grained soil and diesel impacts (closest resemblance to hydrocarbon composition reported by the laboratory, 2015). Commercial and residential land use.

The applicable provincial and federal sediment criteria for the Site are summarized in Table 4.3.

Table 4.3 Applicable Sediment Criteria

Parameter	Criteria	
	Ecological Health	**Human Health**
Federal		
PHCs VOCs	None available	Not applicable[1]
PAHs Metals PCBs	CCME Interim Sediment Quality Guidelines (ISQGs) for the Protection of Freshwater Aquatic Life Probable Effects Level (PELs) for the Protection of Freshwater Aquatic Life	Not applicable[1]
Provincial		
PHCs	Atlantic RBCA Tier I Ecological Screening Levels (ESLs) for typical sediment (2015).	Not applicable[1]
Notes: 1) It has been assumed that the surface water bodies are not used as a significant recreational water body (*e.g.*, Swimming), and as such, human receptors would not be in contact with sediment.		

The applicable provincial and federal surface water criteria for the Site are summarized in Table 4.4.

Table 4.4 Applicable Surface Water Criteria

Parameter	Criteria	
	Ecological Health	**Human Health[1,2]**
Federal		
PCBs	None available	Not applicable
PHCs PAHs General Chemistry Parameters Metals	CCME Water Quality Guidelines for the Protection of Aquatic Life - Freshwater	Not applicable
Provincial		
PHCs	Atlantic RBCA Tier I ESLs for the protection of freshwater and marine aquatic life. Diesel/lube oil (most conservative) petroleum type.	Not applicable

Notes:
1. Although the USAF used a surface water body for drinking water, for the purposes of this Initial Testing Program, it is presumed that residents of the seasonal community are not using surface water for drinking.
2. It has been assumed that the surface water bodies are not used as a significant recreational water body (*e.g.*, Swimming).

The applicable building material criteria for the Site are summarized in Table 4.5.

Table 4.5 Building Material Criteria

Parameter	Criteria	
	Ecological Health	**Human Health**
Federal		
Lead	Not available	As hazardous building materials are regulated by the Province, and disposal of the waste products will occur within the Province, the only Provincial guidelines are referenced.
Mercury	Not available	
Asbestos	Not applicable	
Pesticides in Paint	CCME (1999, with updates, accessed online May 2018) generic soil quality guidelines.	

Table 4.5 Building Material Criteria

Parameter	Criteria	
	Ecological Health	**Human Health**
Provincial		
Lead	Not applicable	In Newfoundland, handling of lead-based paint is regulated by the Provincial Occupational Health and Safety Regulations (Government of Newfoundland and Labrador, 2012). Paint with a concentration of lead below 5,000 mg/kg requires no special handling and may be disposed of in a municipal landfill (Government of Newfoundland and Labrador, 2016).
Mercury	Not applicable	No guideline available
Asbestos	Not applicable	Under Newfoundland and Labrador Regulation 111/98 (Asbestos Abatement Regulations, 1998 under the Occupational Health and Safety Act (O.C. 98-730)), Asbestos Containing Material is defined as having >1% asbestos fibres by weight.

5.0 SITE RECONNAISSANCE AND CHARACTERISTICS

GEMTEC personnel were on-site on September 14 and 15, 2017. The Site reconnaissance was conducted through a combination of aerial observations (from a helicopter) and Site walkover. The objective of the Site reconnaissance was to confirm the initial work plan (as prepared by GEMTEC, 2017) met the objectives of the project and to assess potential logistical/access considerations for collecting samples at the proposed locations. Site features and details from the Site visit are presented in the following subsections.

5.1 Aerial Observations

Spotted Island is the eastern most body off the mainland coast in the area, and is unprotected from neighboring islands. There are steep sharp bedrock cliffs along the northern portion of the island while the southern shores are flatter, shallower and have rocky beaches. The island is predominantly bedrock outcrop with some low-growing grass, mosses and shrubs in areas of shallow peaty soils. The island has several large steep bedrock outcrops and surface waterbodies.

Former site structures have been demolished and (presumably) buried with concrete slabs and foundations remaining. Foundations appear to be in good condition with some vegetation overgrowth. Site roads are bare, gravel covered and regularly travelled, presumably by the local seasonal community, located adjacent to the Lower Site. The former garbage dump (APEC #8) is still in use with recent waste and debris. A local resident of the seasonal community travelled to APEC #8 at the time of the Site visit and disposed of household garbage in this APEC.

The southern portion of the site is surrounded by a seasonal community (individual cottages). There appear to be several all-terrain vehicles (ATVs) which are likely used to travel the island. There are several heavily used tracks/trails out to waterbodies and the garbage dump (APEC #8).

A large cache of drums (quality could not be determined in the air) was observed over a bank to the east of (APEC #2, Helicopter Pad). There is significant moss and shrub overgrowth and the barrels are almost completed rusted away.

5.2 Site Inventory and Modifications to Preliminary APECs

The following is based on observations made during the site walkover. Site photos are presented in Appendix B.

5.2.1 APEC #1: AST (Upper Site)

APEC #1 consists of the area of the former 1,575,000 L diesel AST on the Upper Site. A 16 m diameter gravel pad (surrounded with concrete, approximately 0.3 m wide and of no appreciable height) is located at the center of the APEC, and is surrounded by a concrete berm (approximately 1.8 m high, 0.30 m wide and 80 m long, in good (few, if any cracks) condition) to the north and east. Bedrock outcrops surround the former AST to the west and south, forming a natural berm in these directions. The estimated volume of concrete at APEC #1 is approximately 50 cubic metres (m^3).

A hole in the northern berm wall appears to permit surface drainage to the north. The area and much of the former gravel pad are vegetated with grasses and forbs. No concrete cradles associated with former above ground piping were found at this APEC. Suspected petroleum staining was observed at SS_SP_09 and SS_SP_10, and PHC odours were apparent in soil samples SS_SP_11 and SS_SP_12.

Modifications to this APEC were not required based on the Site reconnaissance.

5.2.2 APEC #2: Helicopter Pad (Upper Site)

The gravel helicopter pad is present at APEC #2; however, much if of it has become vegetated with short grasses and forbs. The area of the pad is flat and is bordered to the west by bedrock outcropping. A path that appears to be traveled by ATVs is present to the north and a gravel access roadway, leading toward the former disaster shack, is present to the south. The helicopter pad is adjoined to the east by a steep slope. Neither PHC odours nor surface staining was observed at APEC #2.

Modifications to this APEC were not required based on the Site reconnaissance.

5.2.3 APEC #3: Disaster Shack (Upper Site)

The concrete slab of the former disaster shack (5.75 m by 12 m) is present at APEC #3 and is in good condition. The depth of the slab could not be confirmed, as it was below the ground surface. The depth of the slab is anticipated to be no deeper than bedrock in this area, which is approximately 0.30 m based on a hand-excavated test pit completed in the APEC. A small raised area of concrete, approximately 0.5 m by 1 m, was observed in the southeast corner of the slab. No penetrations (*e.g.,* pipes, conduits, *etc.*) were noted in the slab. The estimated volume of concrete is 21 m^3. Approximately 20 scattered pieces of suspected asbestos containing material (ACM) debris (each >0.05 m by >0.05 m) were identified at APEC #3. As such, asbestos was added as a COPC for this APEC. Neither PHC odours nor surface staining was observed at this APEC.

Modifications to this APEC were not required based on the Site reconnaissance.

5.2.4 APEC #4: Drum Cache (Upper Site)

The area to the west of the former main building and motor pool (APEC #5), that had been identified from aerial imagery as a potential drum cache, did not contain any drums. The structures visible in aerial imagery (assumed drums) were most likely the concrete supports of the former walkway/tunnel connecting the former main building to the former radome. There is no evidence of this area ever being used as a drum cache as there is no access road, no debris found, and limited space between the main building and a vertical cliff. As no environmental concerns were identified in this area, APEC #4 was moved to the east of APEC #2 (Helicopter Pad), where approximately 20 to 30 discarded 45 gallon metal drums were observed. It is presumed that these drums held fuel for helicopters (PHC), due to their proximity to APEC #2. The drums were observed in various states of oxidization ranging from mostly solid on the top surface, with rusted out bottoms (in contact with soil), to completely rusted away with the exception of rings and/or plastic caps. No contents was observed in any of the drums. Stamped information was visible on a few drums; however, due to their state of oxidization, the words were not legible. Dense, low lying vegetation (various mosses, alpine cranberry, Labrador Tea) covers much of the area, and has grown up / over many of the barrels. The drum cache area is approximately 20 square metres (m^2).

Neither PHC odours nor surface staining was observed at APEC #4; however, the area is a combination of bedrock outcrop and dense vegetation, thus surface staining was difficult to determine.

5.2.5 APEC #5: Main Building and Motor Pool (Upper Site)

APEC #5 is generally flat, with a gravel roadway around the east, south, and west of the former main building concrete slab. The former main building stepped concrete slab (13 m by 43 m) is still present on the Site. Based on the steps in the slab, three distinct former sections are inferred: the motor pool in the south with access ramps (13 m x 14 m); an assumed power generation area (13 m x 19 m); and a barracks in the north (13 m x 30 m). Each of the upper two “steps” in the slab were approximately 1 m higher than the previous slab. The lowermost slab was exposed approximately 0.3 m, and is anticipated to be no deeper than bedrock in this area (0.15 m, based on a hand-dug test pit in this APEC).

A concrete slab (2 m x 7 m) is located adjacent to the northwest wall of the main building, and presumably was part of the former access tunnel to the radome. The depth of this slab is anticipated to be approximately 0.3 m thick, similar to the lowest of the “step” in the main building. Six concrete supports (approximately 1.8 m x 1.8 m x 0.3 m) remain in the area of the former walkway / tunnel that connected the former main building to the former radome. The remains of the radome (octagonal gravel pad with concrete curbing) sits atop an approximately 6 m high cliff, immediately west of the former main building concrete slab; also on top of this cliff are two sets of three concrete pads (each 0.5 m x 0.5 m) associated with former tripillar communication antennae.

An estimated total of 730 m^3 of concrete remains at APEC #5.

Approximately 50 scattered pieces of cement board (suspected ACM; each >0.05 m by >0.05 m) were found in the area to the east of the former main building concrete slab. As a result, asbestos was added as a COPC for this APEC. Several metal fittings remain in the main building concrete slab and based on the approximate age of construction of the former buildings, they are suspected to be lead-based.

The original boundary of APEC #5, as provided in GEMTEC's final work plan, was adjusted to encompass the entire area around the former main building. Initially, it was interpreted that a crevasse was present in the central portion of APEC #5 and this area was designated as a separate APEC (originally APEC #6); however, this preliminary APEC was moved as discussed below in Section 5.2.6.

Neither PHC odours nor surface staining was observed at APEC #5.

5.2.6 APEC #6: 1987 Landfill/Bury Site #1 (assumed location, Upper Site)

Based on aerial imagery, it appeared as though there was a crevasse immediately west of the former main building. It was postulated that this area may have been used as a landfill during the 1987 Site demolition, due to the ease of access and potential for bulldozing materials off the cliff. However, during the Site reconnaissance, it was determined that the area was not a crevasse, but rather, a vertical cliff, upon which the former radome had been situated. No environmental concerns were identified (other than those covered under APEC #5), and as such, APEC #6 was relocated to the east of the former main building where evidence of fill, debris, and unnatural landscaping were noted in a natural depression, consistent with a dumping area. A local resident confirmed that burial of Site material had occurred in this area in the past.

A test pit completed in this area (to a maximum depth of 0.3 m), did not identify any debris below the surface. The debris that was observed was at surface (e.g., plastic, small metal objects and a buried drum). Digging by hand was difficult in this area. If waste is buried in this area, it is possible that it has a thick layer (e.g., 1 m) of soil on top of it.

Neither PHC odours nor surface staining was observed at APEC #6.

5.2.7 APEC #7: Aboveground Fuel Line (Upper Site and Lower Site)

APEC #7 is an approximately 3 km long gravel roadway connecting the Upper Site to the Lower Site. Historically, the former above ground fuel line was located alongside the current roadway; however, no evidence of concrete cradles that may have formerly been associated with the pipeline were observed.

Neither PHC odours nor surface staining was observed at APEC #7.

No modifications to this APEC, from that proposed in the GEMTEC work plan, were required based on the Site reconnaissance.

5.2.8 APEC #8 USAF Dump (assumed location, near Upper Site)

APEC #8 consists of a gravel roadway (overgrown with grasses and forbs) that veers off the main road to the east toward a steep cliff. There is waste scattered along the cliff face, primarily deposited at the base of the cliff. From the air, it was noted that there were two areas of dumping: the northernmost area appeared to be the primary dumping location, and a smaller, secondary dumping locations was located to the south. GEMTEC staff encountered a local seasonal resident who was in the area to dump their household waste; the resident indicated that the area has historically and is currently the primary waste disposal area for the island. The resident confirmed that USAF used this area to dispose of waste during their time on the island. The waste was not safely accessible; the abundant debris is located along the base of a steep cliff. Soil samples were collected where safely accessible (not within the footprint of debris, but at the top of the cliff). Debris visible from the aerial reconnaissance included metal drums, appliances, and household waste.

Neither PHC odours nor surface staining was observed at APEC #8, in the areas that could be accessed.

No modifications to this APEC were required based on the Site reconnaissance; however, it was noted that the easternmost portion of the APEC is not accessible as the steeps cliffs where garbage is tossed are not safely accessible on foot.

5.2.9 APEC #9 Pump House & Water Source (near Upper Site)

APEC #9 includes a freshwater lake, formerly used as a water source by the USAF, and the concrete foundation (5.25 m by 5 m) of a former water pump house. The thickness of the slab could not be determined as it was below the ground surface. Overburden in this area is estimated to be up to 1 m thick (per the referenced geology mapping), and as no outcropping was visible. Given the footprint of the building, it is anticipated that the slab would be on the order of 0.3 thick, which results in an estimated 53 m^3 of concrete at APEC #9. The freshwater lake at APEC #9 is approximately 78,000 m^2. At the time of the Site visit, the water was blue, and the bottom substrate (rock) was visible near the shore. The depth of the lake at its centre (anticipated deepest depth) was not determined as part of this mandate, as boat access would be required to do so. The depth of the water at the sampling point was approximately 0.3 m, and the base of the waterbody sloped down (water became deeper) with increasing distance from the shore. A 0.2 m diameter pipe was visible in the water and is assumed to be associated with former water intake equipment. A cleared area is present to the north of the former pump house (toward the former main building), is the apparent route of former above ground water lines. No evidence of former concrete cradles to support the water lines was visible.

Neither PHC odours nor surface staining was observed at APEC #9.

No modifications to this APEC, from that proposed in the GEMTEC work plan, were required based on the Site reconnaissance.

5.2.10 APEC #10: Dump Site (assumed location, near Upper Site)

A generally flat area consisting primarily of bedrock outcropping, APEC #10 appears to be a dumpsite. Debris was noted including construction and demolition waste, appliances, and metal drums (approximately 5, 45 gallon drums). Vinyl floor tiles (suspected ACMs) were also noted.

An estimated area of 20 m^2 of green streak pattern vinyl floor tile and an estimated area of 20 m^2 of beige (with grey streak pattern) vinyl floor tile were observed in the dump area. As a result, asbestos was added as a COPC to this APEC. As the waste was discarded on exposed bedrock, no soil samples could be collected.

Neither PHC odours nor surface staining was observed at APEC #10.

No modifications to this APEC, from that proposed in the GEMTEC work plan, were required based on the Site reconnaissance.

5.2.11 APEC #11: 1987 Landfill/Bury Site #2 (assumed location, Lower Site)

Although debris was noted in the areal imagery, it does not appear as though this area is currently being used or has historically been used as a landfill/bury site. The remains of a former unknown painted wooden structure (approximately 15 m x 6 m) are located at APEC #11. Asphalt shingles (total estimate of >50 m^2), tar paper, a table, a plastic tarp, metal, wood, and vinyl floor tiles (suspected ACMs) are present in this area. The total of volume of debris in this area is estimated to be, at most, 50 m^3. Mercury/lead based paint, asbestos, and pesticides in paint were added as COPCs to this APEC. Based on the materials present (vinyl floor tiles) it is unknown whether this building was associated with USAF Site activities.

Neither PHC odours nor surface staining was observed at APEC #11.

No modifications to this APEC, from that proposed in the GEMTEC work plan, were required based on the Site reconnaissance.

5.2.12 APEC #12: AST (Lower Site)

APEC #12 consists of the area of the former 1,625,000 L diesel AST. A 12 m diameter gravel pad, with concrete edging (or no appreciable thickness) is located at the Site. The concrete edging is in poor condition with disintegrating rebar exposed. A concrete berm, approximately 30 m wide, 30 m long and 1.8 m high, surrounds the former AST gravel pad; the berm is in good condition. This area appears to be frequented by local residents as there is graffiti on the concrete berm. A hole in the southern berm wall appears to permit surface drainage to the south. The estimated volume of concrete here is approximately 75 m^3 (berm and AST pad perimeter).

No concrete cradles associated with any former above ground piping were found at this APEC. No PHC odours or surface staining were observed outside the berm. Stressed vegetation and petroleum hydrocarbon odours were observed in areas inside the berm (SS_SP_50, SS_SP_51, SS_SP_52, SS_SP_53). Suspected petroleum staining was also identified in each of these four samples.

No modifications to this APEC, from that proposed in the GEMTEC work plan, were required based on the Site reconnaissance.

5.2.13 APEC #13: Waterbody (Lower Site)

The freshwater waterbody, neighbouring the former AST at the Lower Site (APEC #12) across the gravel roadway, was selected as an APEC due to its proximity to the AST and to investigate potential historical leaks from the AST, and/or dumping of burned/razed site structures into the waterbody.

The waterbody has an area of approximately 1,700 m^2. The north end of the waterbody has a gentle slope, and the water is very shallow at the shoreline. The sediment substrate was visible in the shallow water, and the black sediment was readily accessible for sampling. The southern end of the waterbody; however, had a rocky substrate and the water was very deep adjacent to the shoreline. Field staff attempted to estimate the depth using a shovel and an approximately 2 m long stick, however, the substrate was not encountered. As such, no sediment sample was collected from the southern end of this waterbody. A discarded 45 gallon metal drum was observed in the water in the southern portion of the waterbody.

Near the waterbody (between APEC #12 and APEC #13) is a recently-used local dump. Local residents dump their household waste, including appliances, furniture, building supplies, and ATVs in this area. Based on the modern nature of the debris, and that frequent local traffic to the dumping area was evident, it is assumed that this area is used by residents of the seasonal community. As the USAF used APEC #8 as a dumpsite, and as limited/no waste would be expected from the USAF Lower Site activities (AST and fuel pump house), this area is not anticipated to have been used by the USAF, and as such was not investigated as an APEC.

5.2.14 APEC #14 (Former Fuel Pump House, Lower Site)

During the Site reconnaissance, the remains of an additional structure were identified adjacent to the former AST at the Lower Site. Rusted, felled metals beams and debris were scattered over the former slab (approximately 5 m by 5 m). The slab is approximately 0.15 m above grade, and it is estimated that it could extend to the depth of bedrock, which in this area is estimated to be 0.15 m, based on manual test pitting. Two concrete blocks (each approximately 0.6 m by 0.6 m by 0.6 m) were located on the east and west sides of the former pump house; their former function is unknown. The total estimated volume of concrete at APEC #14 is 9 m^3.

Scattered pieces of cement board were noted. PHCs, PAHs, metals, and ACMs were added as COPCs in this additional APEC.

No PHC surface staining was observed. PHC odours were present in soil samples SS_SP_60 and SS_SP_61.

5.2.15 APEC #15 (Potential Bury Site)

Identified during the Site reconnaissance, an area north of APEC #11 was identified as a possible bury site. There are no structures in this area. The gravel-covered landscape was unnaturally flat, and inconsistent with the local topography. The edges of the area were pushed up, as is often seen in areas that have been bulldozed. Furans and dioxin-like compounds were added as COPCs in this additional APEC.

No PHC odours or surface staining were observed.

5.2.16 Additional Anthropogenic Site Features

In addition to the above-noted APECs, the following anthropogenic structures were observed:

- A possible rock pit/quarry (582618.51E, 5928504.40N, Zone 21U): an open area where historical gravel extraction is possible. There was no debris evident with the exception of a few small metal pieces (*e.g.,* metal cable).
- A possible former building (583202E, 5929875N, Zone 21U): a flat gravel area with remnants of a concrete block path.

No PHC odours or staining was observed, nor was substantive debris identified at the possible rock pit/quarry and possible former building. Based on the site observations, no environmental concern were apparent, and thus no samples were collected.

5.3 Test Pitting

A minimum of one test pit was completed at each APEC during the completion of the Step 3 Initial Testing Program. Details of the test pits are provided in Appendix C. Test pits were excavated to depths ranging from 0.15 to 0.30 metres in each area; bedrock was encountered in most test pits at depths ranging from 0.15 to 0.30 mbgs. In most areas, surficial soil was 0.15 m to 0.30 m thick and overlay hard, competent bedrock. Surficial soil was found to be mostly sand and gravel (with some silt) with the presence of organics in most areas. Permafrost was not encountered at any of the test pit locations, and based on the shallow soil conditions encountered, permafrost is not anticipated to present across the Site. On-site soil observations are presented in Section 6.3.

5.4 On-Site Habitat and Natural Environnent

The Site consists of four primary habitat types:

- <u>Surface water body (freshwater)</u>: many small surface water bodies are scattered throughout the Site/entire island, giving the island a “Spotted” look;
- <u>Gravel access roads</u>: approximately 3 km of gravel roadway connects the Upper and Lower Sites. A gravel road also connected the main building, Upper Site AST, disaster shack, and helicopter pad in the Upper Site area;
- <u>Exposed bedrock/concrete foundations</u>: much of the Site is devoid of, or supports limited vegetation due to the presence of bedrock outcropping and remains of former structure foundations;

- Vegetated: a mixture of grasses and forbs are present in scattered areas across the Site. No trees or woody vegetation were observed. This habitat is typical of the coastal island region of Labrador.

Species of gull and a loon were observed in the freshwater habitat. Evidence of small mammals (hare burrows) was observed during the Site visit; however no evidence of large mammals was observed.

6.0 INITIALTESTING PROGRAM RESULTS

6.1 Scope of Field Program

The APECs, and the scope of Initial Testing Program and NCSCS Classification are summarized in Table 6.1.

Table 6.1 Field Program

APEC		COPCs	Sample IDs			
#	**Description**		**Soil**	**Surface Water**	**Sediment**	**Building Materials**
1	AST (Upper Site)	PHCs, PAHs	SS_SP_09 SS_SP_10 SS_SP_11 SS_SP_12	-	-	-
2	Helicopter Pad (Upper Site)	PHCs, PAHs, metals	SS_SP_01 SS_SP_02 SS_SP_03 SS_SP_04	-	-	-
3	Disaster Shack (Upper Site)	PHCs, PAHs, metals	SS_SP_05 SS_SP_06 SS_SP_07 SS_SP_08	-	-	BS-SP-02B (cement board)
4	Drum cache (Upper Site)	PHCs	SS_SP_13 SS_SP_14 SS_SP_15 SS_SP_16	-	-	-
5	Main Building and Motor Pool (Upper Site)	PHCs, metals, PCBs, VOCs ACMs	SS_SP_17 SS_SP_18 SS_SP_19 SS_SP_20 SS_SP_21 SS_SP_22	-	-	BS_SP_02A (cement board)
6	1987 Landfill/Bury Site #1	PHCs, metals, PCBs	SS_SP_23 SS_SP_24 SS_SP_25 SS_SP_26	-	-	-
7	Aboveground Fuel Line	PHCs	SS_SP_27 SS_SP_29 SS_SP_38 SS_SP_39 SS_SP_44 SS_SP_49	-	-	-
8	USAF Dump	PHCs, PAHs, metals, PCBs	SS_SP_30 SS_SP_31 SS_SP_32 SS_SP_33	-	-	-
9	Pump House & Water Source	PHCs	SS_SP_34 SS_SP_35 SS_SP_36 SS_SP_37	SW_SP_02 SW_SP_03	SD_SP_02 SD_SP_03	-

Table 6.1 Field Program

APEC		COPCs	Sample IDs			
#	**Description**		**Soil**	**Surface Water**	**Sediment**	**Building Materials**
10	Dump Site (unknown origin)	PHCs, PAHs, metals, PCBs ACMs	SS_SP_40 SS_SP_41 SS_SP_42 SS_SP_43	-	-	BS_SP_08A (vinyl floor tile, green streak pattern) BS_SP_09A (vinyl floor tile, beige with grey streak pattern).
11	Former Unknown Structure	PHCs, PAHs, metals, PCBs ACMs lead/mercury -based paint, pesticides (in paint)	SS_SP_45 SS_SP_46 SS_SP_47 SS_SP_48	-	-	BS_SP_01A (asphalt shingle) BS_SP_05A (tar paper) BS_SP_06A (vinyl floor tile, grey streak pattern) BS_SP_07A (vinyl floor tile, beige streak pattern) PS_SP_01 (yellow paint on wood)
12	AST (Lower Site)	PHCs, PAHs	SS_SP_50 SS_SP_51 SS_SP_52 SS_SP_53	-	-	-
13	Waterbody (Lower Site)	PHCs, PAHs, heavy metals, PCBs, VOCs	-	SW_SP_04 SW_SP_05	SD_SP_04 SD_SP_05	-
14	Pump house associated with Lower Site AST (presumed)	PHCs, PAHs, metals, ACMs	SS_SP_60 SS_SP_61 SS_SP_62	-	-	BS_SP_04A (gasket) BS_SP_02C (cement board)

Table 6.1 Field Program

APEC		COPCs	Sample IDs			
#	Description		Soil	Surface Water	Sediment	Building Materials
15	Possible bury site	dioxins/ furans	SS_SP_63 SS_SP_64	-	-	-

COPCs = chemicals of potential concern
PHCs = petroleum hydrocarbons (PHCs) (or petroleum, oil, and lubricants (POL) (including Benzene, Toluene, Ethylbenzene and Xylene (BTEX)
PCB = polychlorinated biphenyls
PAH = polycyclic aromatic hydrocarbons
VOCs = volatile organic compounds
ACMs = asbestos-containing materials
n/a = not applicable

Soil samples were collected in general accordance with the proposed sampling locations included in the Work Plan (GEMTEC, 2017), or adjusted based on field observations to situate samples where COPC were expected to be present (*i.e.*, adjacent to historical structures, near apparent areas of former petroleum storage, in areas of stressed vegetation and/or in suspected landfill locations).

In addition to the sampling indicated above in Table 6.1, background samples were collected in areas that were anticipated to be outside of the areas influenced by historical Site activities. The intention of the background sampling was to determine the potential presence of naturally occurring parameters (*e.g.*, metals), that may be elevated compared to generic standards, but are not attributable to contamination, but rather characteristic of the geology of the region. Background samples that were collected as part of this program included:

- Soil located approximately 90 m northwest of APEC #1 (Upper Site AST), and approximately 150 m west of APEC #2 (helicopter pad). There was no indication of historical use of this area, and as such, impacts related to Site activities were not anticipated. This area is as far north of the AST as was reasonably accessible on foot, as further north of this location the topography drops sharply (approximately 30%) toward the Labrador Sea. Sample SS_SP_28BG was analyzed for PHCs, PAHs, PCBs, and metals;
- Surface water and sediment samples were collected in a waterbody located approximately 200 m south of the southernmost edge of the former water supply waterbody (APEC #9), and approximately 500 m south of the former pump house at APEC #9. This location was selected to its proximity to the water supply, as it is anticipated that the chemistry of the water will be similar to that of the water supply as the underlying bedrock and mineral composition is expected to be the same. The background waterbody is not connected to the former water supply water body, and as such, is not anticipated to have been influenced by the former USAF Site activities;

- The surface water sample (SW_SP_01BG) was analyzed for PHCs, PAHs, metals, and general chemistry parameters;
- The sediment sample (SD_SP_01BG) was analyzed for PHCs, PAHs, and metals.

6.2 Sampling Methods

Soil samples were collected using a hand trowel. Between sampling locations, the trowel was decontaminated. A wire brush was used to knock off loose particles, then the tool was spritzed with a solution of biodegradable detergent and water. A clean paper towel was used to wash the trowel, and then it was rinsed with deionized water. GEMTEC personnel wore disposable, nitrile gloves during sampling; the gloves were replaced prior to sampling the next location. Each surface soil sample was collected in a 120 millilitre (mL) glass jar supplied by the analytical laboratory. The 120 mL soil sample jar was completely filled to eliminate headspace losses of potential volatile contaminants in the sample. After sampling, each sample container was tightly capped, labelled and placed into an insulated cooler containing ice for transport to the analytical laboratory. All samples were maintained in temperature-controlled storage until delivered to the analytical laboratory.

Soil samples for potential PHC or VOC analysis were collected in 60 mL glass jars and 40 mL pre-weighed vials supplied by the analytical laboratory. The 40 mL vials contained 10 mL of methanol preservative, measured by the laboratory. Approximately five grams of soil was extracted using a dedicated sampling device supplied by the laboratory; the sample was placed into the 40 mL vial containing methanol per laboratory sampling requirements. The vial was then swirled to ensure the soil was fully dispersed in the methanol. The duplicate sample jar was only partially filled to allow for volatilization of contaminants for headspace analysis using a photoionization detector. The soil samples were maintained in ice-packed coolers until delivered to the analytical laboratory.

Surface water samples were collected in the appropriate laboratory-provided bottles containing all required preservatives. Samples were collected from the shore by skimming the water surface at each sampling location. Sample collection containers were completely filled to eliminate headspace losses of potential volatile contaminants in the sample. After sampling, each sample container was tightly capped, labelled and placed into insulated coolers containing ice.

Sediment samples were collected from the shore from the same sampling locations as the surface water samples, where possible. For the waterbody at APEC #13, the south embankment was too steep/the water was too deep for a sediment sample to be collected with the tools on hand (hand trowel and standard shovel). Sediment samples were collected using a hand trowel at depths of 0 to 0.05 metres below the sediment/water interface. Water was allowed to drain from the trowel prior to placing the sediment into the sample jars. The trowel was washed with a non-petroleum based cleaner and thoroughly wiped with a clean towel between each sampling location.

GEMTEC personnel wore disposable nitrile gloves during sampling; the gloves were replaced prior to collecting the next sample.

Sediment samples were collected in 120 mL glass jars and 40 mL pre-weighed vials (for PHC and VOC analysis) supplied by the analytical laboratory. The 40 mL vials contained 10 mL of methanol preservative, measured by the laboratory. Approximately 5 grams of sediment was extracted using a dedicated syringe supplied by the laboratory; the sample was placed into the 40 mL vial containing methanol per laboratory sampling requirements. The vial was then swirled to ensure the sediment was fully dispersed in the methanol. The 120 mL soil sample jar was completely filled to eliminate headspace losses of potential volatile contaminants in the sample. After sampling, each sample container was tightly capped, labelled and placed into insulated coolers containing ice.

Hazardous building material samples (suspected ACM, suspected lead-based paint) were collected from the scattered debris at the Site. Larger debris pieces were broken by hand to a size that would fit in a large zip-top plastic bag (approximately 0.25 m by 0.25 m). For painted surfaces, an estimated minimum sample weight of 100 grams (paint and substrate) was collected. One sample was collected to represent each hazardous material type at each APEC. For example, if many pieces of green vinyl floor tile were observed in an APEC, one representative green vinyl floor tile sample was collected for the APEC.

All samples were placed on ice in insulated coolers for transport back to GEMTEC's accommodations in Happy Valley - Goose Bay, Labrador. Additional packing materials (bubble wrap, etc.) were added to the coolers to ensure sample integrity during shipping. The samples were shipped to Maxxam Analytics in Bedford, Nova Scotia for analysis. Several parameters (CCME Hydrocarbons, furans and dioxin-like compounds) were analyzed at the Maxxam Analytics laboratory in Mississauga, Ontario.

In the analysis of PHCs, the laboratory provides a comment regarding whether the equipment (chromatogram) returned to baseline following the analysis of $C_{>34}$-C_{50} analysis. Where the chromatogram returns to baseline following the $C_{>34}$-C_{50} analysis, additional hydrocarbons in the $C_{>50}$ range are not expected, and the preliminary F4 ($C_{>34}$-C_{50}) analysis is deemed an appropriate approximation of CCME F4 ($C_{>34}$) hydrocarbons. Where the chromatogram did not return to baseline following the $C_{>34}$-C_{50} analysis (23 of the 70 samples submitted for PHC analysis), additional analysis (F4 Gravimetric method) was conducted to quantify hydrocarbons in the $C_{>50}$ range.

6.3 Field Observations

Samples and manual test pits were logged in the field during the September 2017 field program. Soil color, texture, odours, presence of debris, and headspace vapour readings were recorded.

In general, the soil conditions at the sampling locations across the Site consisted of brown sand with gravel or silt. Bedrock was generally encountered during the sampling, which was conducted using a hand trowel or shovel. Vegetation visible at the surface primarily consists of mosses and other small forbs which do not require much soil for rooting. Petroleum hydrocarbon odours were observed in samples SS_SP_11 and SS_SP_12 (APEC #1 - Upper Site AST), SS_SP_50, SS_SP_51, SS_SP_52, SS_SP_53 (APEC #12 – Lower Site AST), and SS_SP_60 and SS_SP_61 (APEC # 14 – pump house associated with Lower Site AST). In addition, suspected petroleum hydrocarbon staining was observed at SS_SP_09 and SS_SP_10 (APEC #1 - Upper Site AST), and SS_SP_50, SS_SP_51, SS_SP_52, SS_SP_53 (APEC #12 – Lower Site AST) upon disturbing the soil.

A summary of the soil sampling locations, test pits, and field observations are provided in Appendix C.

6.4 Geospatial Data Collection

Proposed sampling locations were determined using GPS coordinates. Site features were digitized from high-resolution aerial photos, and geospatial data for sampling locations were collected relative to readily identifiable features on aerial mapping, such as the remains of building foundations.

The DND Contaminated Sites Geo-Environmental Database was updated. The updated ESRI File Geodatabase was provided to DND/DCC.

6.5 Quality Assurance/Quality Control

The quality assurance/quality control (QA/QC) program consisted of the following:

- Collecting field duplicate samples (FD) of approximately 10% of the sampling program;
- Laboratory duplicates (LD), conducted at random by the laboratory;
- Laboratory in-house routine quality control checks including blanks and matrix spikes; and
- Sending a laboratory prepared trip blank (deionized water) in the coolers along with samples. This trip blank was analyzed for VOCs to assess the potential influence of vehicle emissions *(i.e.*, car, helicopter, and airplane) on the sample integrity.

Blind field duplicates were conducted when the number of samples for a given sampling matrix/analytical package combination (*e.g.* PHCs in soil) was greater than 10. Thus, the following packages were not duplicated in the field during this mandate:

- Soil: VOCs (2 samples), furans and dioxin-like compounds (1 sample),
- Sediment: PHCs (4 samples), PAHs (4 samples), metals (4 samples) PCBs (4 samples), VOCs (2 samples)
- Surface Water: PHCs (5 samples), general chemistry (5 samples), metals (5 samples), PCBs (4 samples) PAHs (2 samples)

Laboratory duplicates are conducted per laboratory protocols, based on each batch of samples analyzed which may include samples from other clients. The number of lab duplicates is out of the control of each client.

The results of the VOC analysis for the trip blank sample are provided in Table D20 (Appendix D). VOCs were not detected in the trip blank, indicating no background source of VOCs was present during the transport of the samples that could have influenced the other sample results.

Blind field duplicates and laboratory duplicates were analyzed to determine the extent to which they agree with the parent sample. General data quality targets for duplicate samples, per Health Canada (2008), are summarized in Table 6.2.

Table 6.2 Acceptable Relative Percent Difference

Duplicate Type	Soil	Water
Laboratory Duplicate	28-42%	21-28%
Field Duplicate[2]	57-85%	42-57%

Notes:
1) Relative Percent Difference is calculated as absolute value of the difference over the mean, times 100%
2) Elevated variability due to sampling and handling procedures, in addition to laboratory instrument variation

Elevated variation is often seen near the detection limit. Where the results are within five times the detection limit, the difference between the duplicate concentrations should be no more than two times the detection limit (Health Canada, 2008). Variation in the dataset is summarized in Table 6.3.

Table 6.3 Variation in the Dataset

Duplicate Type	Analytical Package	Duplicates within 5 x RDL[1]		Duplicates > 5 x RDL[1]		Percent within Acceptable Range
		Number of analytes	Absolute Difference[2]	Number of analytes	Range of RPD[3]	
Soil Samples						
Laboratory	PHC	38	0[4]	1	3%	100%
	PAH	30	0 - 249 x RDL	30	63 – 191%	54%
	Metals	0	-	27	6-38%	100%
	Furans and dioxin-like compounds	25	0 – 2.3 X EDL[5]	-	-	-
Field	PHC	47	0[4]	5	4 – 51%	100%
	PAH					
	Metals	35	0[4]	46	2-84%	100%
	PCB	16	0[4]	-	-	100%
Water Samples						
Laboratory	PHCs	6	0[4]	-	-	100%
	General Chemistry	3	0[4]	3	6-56%	83%
	PCBs	7	0[4]	-	-	100%

Notes:
EDL = Estimated detection limit
1) Reportable detection limit (RDL)
2) For values within 5 time the detection limit, duplicate concentrations should be no more than two times the reportable detection limit (RDL x 2, Health Canada, 2008)
3) Relative Percent Difference (RPD). Calculated as absolute value of the difference over the mean, times 100% for values >5 times the detection limit. Acceptable RPD range for laboratory duplicates is 28-42% for soil, and 21-28% for water. Acceptable RPD range for field duplicates is 57-85% for soil, and 42-57% for water (Health Canada, 2008)
4) All values in original and duplicate sample were below the RDL
5) The laboratory provides Estimated Detection Limits for the Furans and Dioxin-like compounds analysis that were different for the parent and lab duplicate sample. Multiples of the EDL are shown here based on the average EDL for the parent and duplicate

Elevated variability was found in the surface soil samples analyzed for PAHs (field and laboratory duplicates). Soil samples can vary widely as soil is very heterogeneous. Parameters such as PAHs tend to bind to the organic component of the soil matrix, which can vary from subsample to subsample. All parent/duplicate sample sets were classified the same, either above or below the referenced guideline. As such, the variability of PAHs in the collected soil samples does not have a significant impact on the overall interpretation of the dataset.

The RPD for the lab duplicate of orthophosphate (a general chemistry parameter) in surface water (56%) exceeded the generally acceptable standard for water (21-28%); however, as there are no guidelines referenced for this parameter for the protection of freshwater aquatic life, this variation does not have a significant impact on the overall interpretation of the dataset.

In-house quality checks performed by the lab are summarized in the laboratory certificates (Appendix E) and are generally within the acceptable ranges. The overall data quality is considered good.

6.6 Analytical Data Review

The sampling locations for the Step 3 Initial Testing Program are shown on Drawings 3 to 19 (Appendix A). Analytical data were compiled, compared to the screening levels identified in Section 4.1.3, and presented in tables in Appendix D. Laboratory certificates of analysis are provided in Appendix E.

6.6.1 Background Sampling Program

6.6.1.1 Background Soil Results

Soil results are summarized in Tables D1 to D6 (Appendix D).

PHCs were detected in the background soil sample (SS_SP_28_BG) in the F2, F3, and F4 ranges. Concentrations of PHCs in the background sample were below the federal and provincial screening levels.

Various metals parameters were detected in the background soil sample (SS_SP_28_BG), generally at concentrations below the referenced residential and commercial guidelines, with the exception of nickel (51 mg/kg) and selenium (2.2 mg/kg), which exceed the residential SQG_E (45 mg/kg and 1 mg/kg, respectively).

PAHs and PCBs were not detected in the background soil sample (SS_SP_28_BG).

6.6.1.2 Background Sediment Results

Sediment results are summarized in Tables D7-D9 (Appendix D).

PHCs and PAHs were not detected in the background sediment sample (SD_SP_01_BG).

Various metals parameters were detected in the background sediment sample (SD_SP_01_BG); however, all detected concentrations were below the ISQG and PEL (where applicable).

6.6.1.3 Background Surface Water Results

Surface water samples are summarized in Tables D10-D14 (Appendix D).

The background surface water sample was analyzed for PHCs using the CCME CWS method. For comparison of the laboratory results to the Provincial guidelines (modified TPH, $C_{>6}$-C_{32}), GEMTEC has summed the detected concentrations of F1, F2, and F3 fractions (C_6-C_{34}). In the instance of no detections, the highest detection limit is used as the approximate value for modified TPH. This approximation is a slight over representation of the modified TPH concentration. It is noted that the CWS detection limit exceeded the Atlantic RBCA guidelines. Nevertheless, petroleum hydrocarbon products (F1, F2, and F3) were not detected by the laboratory in the background surface water sample SP_SW_01_BG, or its laboratory duplicate.

PAHs were not detected in the background surface water sample (SW_SP_01_BG).

Metals and general chemistry parameters in the background surface water sample (SW_SP_01_BG), were either below the detection limits or the CCME FAL guidelines.

6.6.2 Soil

6.6.2.1 PHCs in Soil

Concentrations of PHCs in soil are presented in Tables D1-1 (for samples compared to residential guidelines) and D1-2 (for samples compared to commercial guidelines). Soil samples with concentrations exceeding the referenced screening levels are summarized in Table 6.4.

Table 6.4 Concentrations of PHCs in Soil above Referenced Screening Levels

Parameter	APEC	Sample Details			Screening Level (mg/kg)		Were Impacts Delineated?[1]
		ID	Depth (m)	Result (mg/kg)	HH	Eco	
PHCs							
Commercial Screening (Upper Site, and upper portions of APEC #7 (pipeline))							
F2	5	SS_SP_21	0-0.05	500	1000[3]	260[2,3]	**No**
F3	5	SS_SP_21	0-0.05	1900	3500[3]	1700[2,3]	**No**
F4	4	SS_SP_13	0-0.05	7700	10000[3]	3300[2,3]	**No**
		SS_SP_14	0-0.05	4000			**No**
		SS_SP_16	0-0.05	3800			**No**

Table 6.4 Concentrations of PHCs in Soil above Referenced Screening Levels

Parameter	APEC	Sample Details			Screening Level (mg/kg)		Were Impacts Delineated?[1]
		ID	Depth (m)	Result (mg/kg)	HH	Eco	
Residential Screening (Lower Site, and lower portions of APEC #7 (pipeline))							
F2	14	SS_SP_61	0-0.05	6500	150[3]	150[2,3]	**No**
F3	14	SS_SP_60	0-0.05	2400	2500[3]	300[2,3]	**No**
	14	SS_SP_61	0-0.05	4700			**No**
F4	14	SS_SP_60	0-0.05	7300	21000[3]	2800[2,3]	**No**

Notes:
HH = Human Health; Eco = Ecological
1.) Refers to horizontal delineation. Impacts are not expected to extend into bedrock, which was encountered in most sampling locations at depths of 0.15 m to 0.30 m.
2.) Atlantic RBCA Tier I RBSL (HH) and ESL (Eco)
3.) CCME Canada-Wide Standard for Petroleum Hydrocarbons in soil

6.6.2.2 PAHs in Soil

Concentrations of PAHs in soil are presented in Tables D2-1 (for samples compared to residential guidelines) and D2-2 (for samples compared to commercial guidelines). Soil samples with concentrations exceeding the referenced screening levels are summarized in Table 6.5.

Table 6.5 Concentrations of PAHs in Soil above Referenced Screening Levels

Parameter	APEC	Sample Details			Screening Level (mg/kg)		Were Impacts Delineated?[3]
		ID	Depth (m)	Result (mg/kg)	HH[1]	Eco[2]	
PAHs							
Commercial Screening (Upper Site, and upper portions of APEC #7 (pipeline))							
Phenanthrene	6	SS_SP_24	0-0.05	0.069	N/A	0.0046	**No**
Residential Screening (Lower Site, and lower portions of APEC #7 (pipeline))							
Fluorene	14	SS_SP_61	0-0.05	<0.053	2.2	0.013	Yes

Notes:
HH = Human Health; Eco = Ecological
1.) CCME SQG_{HH}
2.) CCME SQG_{Eco}
3.) Refers to horizontal delineation. Impacts are not expected to extend into bedrock, which was encountered in most sampling locations at depths of 0.15 m to 0.30 m.

The laboratory reports that the detection limits of several parameters (including naphthalene, indicated above in sample SS_SP_61) were elevated due to matrix/co-extractive interference. The elevated detection limits, and the detected concentrations for other parameters in sample SS_SP_61 were below their respective screening levels. A discussion of elevated detection limits is presented in Section 6.8.

6.6.2.3 Metals in Soil

Concentrations of metals in soil are presented in Tables D3-1 (for samples compared to residential guidelines) and D3-2 (for samples compared to commercial guidelines). Concentrations of nickel and selenium in the background sample (SS_SP_28_BG) exceeded the referenced screening levels for residential values. Soil samples with concentrations exceeding the referenced screening levels are summarized in Table 6.6.

Table 6.6 Concentrations of Metals in Soil above Referenced Screening Levels

Parameter	APEC	Sample Details			Screening Level (mg/kg)		Were Impacts Delineated?[3]
		ID	Depth (m)	Result (mg/kg)	HH[1]	Eco[2]	
Metals							
Commercial Screening (Upper Site, and upper portions of APEC #7 (pipeline))							
Copper	2	SS_SP_3	0.0-0.05	190	4000	91	**No**
	2	SS_SP_4	0.0-0.05	190			**No**
	3	SS_SP_06	0.0-0.05	230			**No**
	3	SS_SP_07	0.0-0.05	140			**No**
Copper	5	SS_SP_20	0.0-0.05	130			Yes[4]
	6	SS_SP_23	0.0-0.05	210			**No**
	6	SS_SP_23_FD	0.0-0.05	270			**No**
	6	SS_SP_25	0.0-0.05	270			**No**
	8	SS_SP_30	0.0-0.05	440			**No**
	8	SS_SP_33	0.0-0.05	800			**No**
Lead	6	SS_SP_23	0.0-0.05	2700	260	600	**No**
	6	SS_SP_23_FD	0.0-0.05	1100			**No**
	8	SS_SP_33	0.0-0.05	900			**No**
Zinc	8	SS_SP_33	0.0-0.05	1900	N/A	200	**No**
Residential Screening (Lower Site, and lower portions of APEC #7 (pipeline))							
Lead	14	SS_SP_62	0.0-0.05	210	140	300	**No**
Zinc	11	SS_SP_45	0.0-0.05	770	N/A	200	**No**

Notes:
HH = Human Health; Eco = Ecological
FD = Field Duplicate

1.) CCME SQG_{HH}
2.) CCME SQG_{Eco}
3.) Refers to horizontal delineation. Impacts are not expected to extend into bedrock, which was encountered in most sampling locations at depths of 0.15 m to 0.30 m.
4.) Surrounding samples (SS_SP_17, SS_SP_18, SS_SP_19, SS_SP_21, and SS_SP_ 22) were all analyzed for metals and concentrations of copper were below the referenced screening levels.

6.6.2.4 PCBs in Soil

Concentrations of PCBs in soil are presented in Tables D4-1 (for samples compared to residential guidelines) and D4-2 (for samples compared to commercial guidelines). PCBs were not detected in the analyzed soil samples, and the laboratory detection limits were below the human health and ecological guidelines for residential and commercial land use.

6.6.2.5 VOCs in Soil

Concentrations of VOCs in soil are presented in Table D5 for samples compared to commercial guidelines. No samples were collected for VOC analysis in the residential screening area of the Site. VOCs were not detected in the analyzed soil samples, and the laboratory detection limits were below the human health and ecological guidelines for commercial land use.

6.6.2.6 Furans and Dioxin-like compounds in Soil

Concentrations of furans and dioxin-like compounds in soil are presented in Table D6 for samples compared to commercial guidelines. No samples were collected for furans and dioxin-like compounds analysis in the residential screening area of the Site. A Toxic Equivalency Quotient (TEQ) was calculated for the analyzed sample by summing the concentration of each parameter, multiplied by its respective Toxic Equivalency Factor (TEF). The calculated TEQ (0.17 ng/kg for both SS_SP_64 and its lab duplicate SS_SP_64_LD) was 0.17 ng/kg, which is below the human health screening level of 1000 ng/kg, and below the ecological screening level of 4 ng/kg.

6.6.3 Sediment

6.6.3.1 PHCs in Sediment

Concentrations of PHCs in sediment are presented in Table D7. Sediment samples with concentrations exceeding the referenced screening levels are summarized in Table 6.7.

Table 6.7 Concentrations of PHCs in Sediment above Referenced Screening Levels

Parameter	APEC	Sample Details			Screening Level (mg/kg)	Were Impacts Delineated?[3]
		ID	Depth (m)	Concentration (mg/kg)		
PHCs						
Modified TPH	13	SD_SP_04	0-0.05	1682	15[2]	**No**

Notes:
1.) Horizontal delineation. Samples were collected at one depth only (0-0.05 m) thus, the vertical extent of impacts has not been determined.
2.) Atlantic RBCA Tier I ESL for “typical” sediment
3.) Horizontal delineation. Samples were collected at one depth only (0-0.05 m) thus, the vertical extent of impacts has not been determined.

6.6.3.2 PAHs in Sediment

Concentrations of PAHs in sediment are presented in Table D8. PAHs were not detected in the background sample (SD_SP_01_BG). Sediment samples with concentrations exceeding the referenced screening levels are summarized in Table 6.8.

Table 6.8 Concentrations of PAHs in Sediment above Referenced Screening Levels

Parameter	APEC	Sample Details			Screening Level (mg/kg)		Were Impacts Delineated?[3]
		ID	Depth (m)	Result (mg/kg)	ISQG[1]	PEL[2]	
PAHs							
2-Methylnaphthalene	13	SD_SP_04	0-0.05	0.17	0.0202	0.201	**No**
Acenaphthene				0.081	0.0671	0.0889	**No**
Acenaphthylene				0.039	0.00587	0.128	**No**
Anthracene				0.17	0.0469	0.245	**No**
Benz(a)anthracene				0.91	0.0317	0.385	**No**
Benzo(a)pyrene				0.73	0.0319	0.782	**No**
Chrysene/ Triphenylene				1.1	0.0571	0.862	**No**
Dibenz(a,h)anthracene				0.12	0.00622	0.135	**No**
Fluoranthene				3	0.111	2.355	**No**
Fluorene				0.14	0.0212	0.144	**No**
Naphthalene				0.1	0.0346	0.391	**No**
Phenanthrene				1.2	0.0419	0.515	**No**
Pyrene				2.4	0.053	0.875	**No**

Notes:
1.) Interim Sediment Quality Guideline (ISQG), represents tolerable effects level, which is the level below which adverse effects are expected to occur rarely (CCME, 1999).
2.) Probable Effects Level (PEL), level above which adverse effects are expected to occur frequently (CCME, 1999)
3.) Horizontal delineation. Samples were collected at one depth only (0-0.05 m) thus, the vertical extent of impacts has not been determined.

Concentrations of benz(a)anthracene, chrysene/triphenylene, fluoranthene, phenanthrene, and pyrene exceeded both the ISQG and PEL in sample SD_SP_04. Concentrations of the remaining PAHs were above the ISQG, but below the PEL.

6.6.3.3 Metals in Sediment

Concentrations of metals in sediment are presented in Table D9. Sediment Samples with concentrations exceeding the referenced screening levels are summarized in Table 6.9.

Table 6.9 Concentrations of Metals in Sediment above Referenced Screening Levels

Parameter	APEC	Sample Details			Screening Level (mg/kg)		Were Impacts Delineated?[3]
		ID	Depth (m)	Result (mg/kg)	ISQG[1]	PEL[2]	
Metals							
Arsenic	13	SD_SP_04	0-0.05	6.1	5.9	*17*	**No**
Cadmium				2.2	0.6	*3.5*	**No**
Copper				88	36	*197*	**No**
Lead				120	35	91.3	**No**
Zinc				970	123	315	**No**

Notes:
PELs in italic font were not exceeded
1.) Interim Sediment Quality Guideline (ISQG), represents tolerable effects level, which is the level below which adverse effects are expected to occur rarely (CCME, 1999).
2.) Probable Effects Level (PEL), level above which adverse effects are expected to occur frequently (CCME, 1999)
3.) Horizontal delineation. Samples were collected at one depth only (0-0.05 m) thus, the vertical extent of impacts has not been determined.

Concentrations of lead and zinc in SD_SP_04 exceeded both the ISGQ and the PEL.

6.6.3.4 PCBs in Sediment

Concentrations of PCBs in sediment are presented in Table D10. PCBs were not detected in the analyzed sediment samples; however the detection limit for (calculated) total PCBs exceeds the referenced screening level. Sediment samples with concentrations exceeding the referenced screening levels are summarized in Table 6.10.

Table 6.10 Concentrations of PCBs in Sediment above Referenced Screening Levels

Parameter	APEC	Sample Details			Screening Level (mg/kg)		Were Impacts Delineated?[3]
		ID	Depth (m)	Result (mg/kg)	ISQG[1]	PEL[2]	
PCBs							
Calculated Total PCB	9	SD_SP_02	0-0.05	<0.050	0.0341	0.277	**No**
		SD_SP_03	0-0.05	<0.050			**No**
	13	SD_SP_04	0-0.05	<0.050			**No**

Notes:
1.) Interim Sediment Quality Guideline (ISQG), represents tolerable effects level, which is the level below which adverse effects are expected to occur rarely (CCME, 1999).
2.) Probable Effects Level (PEL), level above which adverse effects are expected to occur frequently (CCME, 1999)
3.) Horizontal delineation. Samples were collected at one depth only (0-0.05 m) thus, the vertical extent of impacts has not been determined.

Although the calculated total PCB concentration exceeds the ISGQ, each individual PCB parameter was below the laboratory detection limits, and below their respective ISQG (where available). The calculated total PCB concentration is below the PEL.

See Section 7.2 for a discussion of elevated detection limits.

6.6.3.5 VOCs in Sediment

Concentrations of VOCs in sediment are presented in Table D11. VOCs were not detected in the analyzed sediment samples, and the detection limits were below the referenced screening levels.

6.6.4 Surface Water

6.6.4.1 PHCs in Surface Water

Concentrations of PHCs in surface water are presented in Table D12. Samples with concentrations exceeding the referenced screening levels are summarized in Table 6.11.

Table 6.11 Concentrations of PHCs in Surface Water above Referenced Screening Levels

Parameter	APEC	Sample Details			Ecological Screening Level (mg/L)
		ID	Depth (m)	Result (mg/L)	
PHCs					
Modified TPH	9	SW_SP_02	N/A	<0.2	0.1[1]
		SW_SP_03	N/A		
	13	SW_SP_04	N/A		
		SW_SP_05	N/A		
Notes: 1) Atlantic RBCA Tier I ESL for surface water BG = background N/A = not applicable					

Surface water samples were analyzed using the CCME CWS method. For comparison of the laboratory results to the Provincial guidelines (modified TPH, $C_{>6}$-C_{32}), GEMTEC has summed the detected concentrations of F1, F2, and F3 fractions (C_6-C_{34}). In the instance of no detections, the highest detection limit is used as the approximate value for modified TPH. This approximation is a slight over representation of the modified TPH concentration. It is noted that the CWS detection limits, in some instances, exceed the Atlantic RBCA guidelines. Nevertheless, petroleum hydrocarbon products (F1, F2, and F3) were not detected by the laboratory in the above-noted samples.

See Section 7.2 for a discussion of elevated detection limits.

6.6.4.2 PAHs in Surface Water

Concentrations of PAHs in surface water are presented in Table D13. PAHs were not detected in the analyzed surface water samples. Surface water samples with concentrations exceeding the referenced screening levels are summarized in Table 6.12.

Table 6.12 Concentrations of PAHs in Surface Water above Referenced Screening Levels

Parameter	APEC	Sample Details			Ecological Screening Level (mg/L)
		ID	Depth (m)	Result (mg/L)	
PAHs					
Anthracene	13	SW_SP_04	N/A	<0.014	0.012
No exceedances of ecological screening levels					

The laboratory detection limit for sample SW_SP_04 was elevated (and exceeded the screening level) due to limited sample in the sampling container. A discussion of elevated detection limits is presented in Section 7.2.

6.6.4.3 General Chemistry in Surface water

Concentrations of general chemistry parameters in surface water are presented in Table D14. Concentrations of general chemistry parameters in surface water were below the referenced ecological screening levels.

6.6.4.4 Metals in Surface water

Concentrations of metals in surface water are presented in Table D15. Surface water samples with concentrations exceeding the referenced screening levels are summarized in Table 6.13.

Table 6.13 Conc. of Metals in Surface Water above Referenced Screening Levels

Parameter	APEC	Sample Details			Ecological Screening Level (mg/kg)
		ID	Depth (m)	Result (mg/kg)	
Metals					
Aluminum[1]	9	SW_SP_02	N/A	130	100
		SW_SP_03	N/A	140	100
	13	SW_SP_04	N/A	340	100
		SW_SP_05	N/A	370	100
Copper[1]	13	SW_SP_04	N/A	3.7	2
		SW_SP_05	N/A	3.9	2
Iron	9	SW_SP_02	N/A	640	300
		SW_SP_03	N/A	630	
	13	SW_SP_04	N/A	1600	
		SW_SP_05	N/A	1700	
Lead[1]	13	SW_SP_05	N/A	1.2	1

Notes:
N/A = not applicable
1) Guidelines for aluminum, copper, and lead are dependent on pH and/or hardness. Sample-specific guidelines were calculated based on the pH and hardness measured by the lab and are presented here.

6.6.4.5 PCBs in Surface water

Concentrations of PCBs in surface water are presented in Table D16. PCBs were not detected in the analyzed surface water samples, and the laboratory detection limits were below the referenced guidelines.

6.6.5 Building Materials

Concentrations of asbestos, and concentrations of lead and mercury in paint are presented in Tables D17 and D18, respectively, and on Drawing 26. Building materials meeting the definition of "hazardous" (paint with a concentration of lead >5,000 mg/kg, or material having >1% asbestos fibres by weight) are summarized in Table 6.14.

Table 6.14 Hazardous Building Materials

Sample ID	APEC	Description	Result
Asbestos Containing Materials			
BS_SP_02A	5	Cement board	15% Crysotile
BS_SP_02B	3		20% Crysotile
BS_SP_02C	14		15% Crysotile
BS_SP_06A	11	Grey vinyl floor tile	2% Crysotile
BS_SP_07A		Beige vinyl floor tile	2% Crysotile
BS_SP_08A	10	Green vinyl floor tile	2% Crysotile
		Mastic on green vinyl floor tile	2% Crysotile
BS_SP_09A		Beige with green vinyl floor tile	2% Crysotile
		Mastic on beige with green vinyl floor tile	4% Crysotile

Concentrations of organochlorinated pesticides in the paint sample (pulverized paint and substrate) are provided in Table D19. Concentrations of the analyzed pesticides were generally below the laboratory detection limits, with the exception of p,p-DDT, a chemical breakdown product of Dichlorodiphenyltrichloroethane (DDT). This detection is also reflected in the calculated parameters provided by the lab for "DDT + metabolites" and "o,p-DDT + p,p-DDT".

CCME does not provide a guideline for pesticides in paint, but does provide a soil quality guideline for "DDT + metabolites". The concentration of DDT + metabolites in paint sample PS_SP_01 is below this soil quality guideline.

6.7 General

All parameters with detection limits above the guidelines have been included as "exceedances" for the remainder of this assessment.

7.0 DISCUSSION

7.1 Background Sampling

The location of the background soil sample (SS_SP_28_BG) was selected based on aerial imagery, and is located in an area that did not appear to have been part of the former USAF operations. No former structures were apparent, nor were there access roadways leading from the Site buildings to the background sampling area. No evidence of former structures was evident during the aerial reconnaissance or Site walkover. This area is as far north of the AST as was reasonably accessible on foot, as further north of this location the topography drops sharply (approximately 30%) toward the Labrador Sea. Detectable concentrations of petroleum hydrocarbons in the F2, F3, and F4 range were detected in the background sample (below the referenced screening levels). Similarly, petroleum hydrocarbons were detected on the same order of magnitude as the background samples (below the screening levels) in samples collected from APEC #1 (Upper Site AST), APEC #9 (water source), and APEC #14 (pumphouse associated with the AST at the Lower Site). Given the scattered nature of the detections, a background source cannot be ruled out at this time.

A total of 10 soil samples of the 37 soil samples analyzed for metals had elevated concentrations of copper exceeding the referenced ecological screening levels, ranging in concentration from 190 mg/kg to 800 mg/kg (compared to the commercial SQG_E of 91 mg/kg). Although copper can occur naturally in soil, the background sample (58 mg/kg) and other samples (ranging from 3.6 mg/kg to 84 mg/kg) are not elevated compared to the screening level, and the identified copper exceedances were limited to areas of USAF Site activities (APECs #2 (Helicopter Pad), APEC #3 (Disaster Shack), APEC #5 (Main Building and Motor Pool), APEC #6 (1987 Landfill/Bury Site), and APEC #8 (USAF Dump)). Therefore, it is expected that the observed copper exceedances in soil at the Site are related to historical Site use.

7.2 Detection Limits Exceeding Guidelines

There were several occurrences of laboratory detection limits exceeding the referenced screening levels as indicated below:

- Naphthalene in SS_SP_61 (APEC #14); reported concentration of <0.053 mg/kg compared to the SQG_E of 0.013 mg/kg (SQG_H of 2.2 mg/kg). The laboratory reported that the detection limits of several parameters (including naphthalene) in sample SS_SP_61 were elevated "due to matrix/co-extractive interference". Based on correspondence with the analytical laboratory, this interference is most likely a result of elevated organic matter in the sample that was not eliminated using the industry standard solid phase extraction column cleaning process that is used prior to analysis. The elevated organic carbon content was not anticipated during the field sampling, nor can it be controlled. Additional cleaning (*e.g.,* silica gel wash) should be considered at this location during future sampling programs.

- Anthracene in SW_SP_04 (APEC # 13); reported concentration of <0.014 mg/L compared to the CCME FAL guideline of 0.012 mg/L. The laboratory indicated this detection limit was elevated due to limited sample. Although the sample container was fully filled in the field, some leakage during transport must have occurred. Sometimes, grains of dirt can get entrained into the threads of sampling bottles, and while they appear to be tightly capped, may cause leakage if the bottles rest on their sides. Sample bottles were packed by GEMTEC staff right-side-up, however, handling of the coolers during shipment to the laboratory was outside of our control.
- Total PCBs in sediment (SD_SP_02, SD_SP_03, and SD_SP_04). Although the calculated total PCB concentration provided by the laboratory at the standard detection limit exceeds the ISGQ, each individual PCB parameter was below the laboratory detection limits, and below their respective ISQG (where available). The calculated total PCB concentration in these samples were below the PEL. Given that PCBs are not a concern at the adjacent land-based APECs, and no substantive source of PCBs is expected in the vicinity of the collected sediment samples, the detection limit for the Total PCB parameter above the ISQG does not represent a gap in the overall understanding of the Site conditions. No unacceptable risk associated with PCBs is anticipated.
- Modified TPH in surface water (SW_SP_02, SW_SP_03, SW_SP_04, and SW_SP_05): Surface water samples were analyzed using the CCME CWS method. For comparison of the laboratory results to the Provincial guidelines (modified TPH, $>C_6$-C_{32}), GEMTEC has summed the detected concentrations of F1, F2, and F3 fractions ($>C_6$-C_{34}). In the instance of no detections, the highest detection limit is used as the approximate value for modified TPH. This approximation is a slight over representation of the modified TPH concentration. It is noted that the CWS detection limits, in some instances, exceed the Atlantic RBCA guidelines. Nevertheless, petroleum hydrocarbon products (F1, F2, and F3) were not detected by the laboratory in the above-noted samples.

With the exception of PCBs in sediment the above-noted detection limits above the referenced screening levels represent uncertainties that can be resolved with future study:

- Duplicate analysis can be conducted for naphthalene (PAHs) in soil at SS_SP_61 (with additional cleaning procedures such as a silica gel wash requested) and anthracene (PAHs) in surface water at SW_SP_04; and
- For future surface water sampling for PHCs, if continued comparison to the Atlantic RBCA guidelines is anticipated, Atlantic MUST methodology analysis may be preferable to the CCME methodology analysis conducted as part of this mandate.

With the exception of PCBs in sediment, detection limits above the guidelines were included as “exceedances” warranting additional study in this assessment.

7.3 Conceptual Site Model

7.3.1 Human Receptors and Exposure Pathways

Human receptors identified at the Site include adults, children and toddlers. The complete exposure pathways by which human receptors could come into contact with impacts at the Site include: soil/dust dermal contact and ingestion; wind erosion and atmospheric dispersion; volatilization of organic contaminants and atmospheric dispersion, enclosed space accumulation; soil leaching to groundwater, and incidental ingestion and dermal contact with surface water and sediment.

7.3.2 Ecological Receptors and Exposure Pathways

Ecological receptors identified at the Site include mammals, birds, plants and invertebrates, freshwater aquatic life and potential species at risk. The complete exposure pathways by which ecological receptors could come into contact with impacts at the Site include: direct exposure and ingestion of surface soil; ingestion/plant uptake of groundwater; and direction exposure and/or ingestion with surface water and freshwater sediment.

7.3.3 Contaminants of Potential Concern

Based on the results of the analytical program the following COPC were identified as requiring further assessment, risk assessment and/or risk management:

- PHCs, PAHs and metals in soil;
- PHCs, PAHs, and metals in sediment; and
- Metals in surface water.

In addition, asbestos containing debris was confirmed to be present at various locations across the Site.

7.3.4 Confirmation/Refutation of APECs

A summary of the Step 3 Initial testing program is provided in Table 7.1. Based on the results, each area has either been confirmed as an APEC, or has been ruled out as no environmental concerns were identified. For areas with no environmental concerns, additional site assessment is not required.

Table7.1 Confirmation/Refutation of APECs

APEC		Assessment Results	Conclusion
Number	**Description**		
1	AST (Upper Site)	Four surface soil samples were analyzed for PHCs and PAHs. Concentrations were below guidelines.	No environmental concern.
2	Helicopter Pad (Upper Site)	Four surface soil samples were analyzed for PHCs and PAHs, and metals. Concentrations of PHCs and PAHs were below guidelines.	**Confirmed APEC (copper[1] in soil).**
3	Disaster Shack (Upper Site)	Four surface soil samples were analyzed for PHCs and PAHs, and metals. Concentrations of PHCs and PAHs were below guidelines.	**Confirmed APEC (copper[1] in soil). ACM debris confirmed.**
4	Drum cache (Upper Site)	Four surface soil samples were analyzed for PHCs. Three samples exceeded the F4 guidelines.	**Confirmed APEC (F4 in soil).**
5	Main Building and Motor Pool (Upper Site)	Six surface soil samples were collected for various analyses including of PHCs (6 samples), metals (6 samples), PAHs (4 samples), PCBs (4 samples), and VOCs (2 samples). SS_SP_20 exceeds the copper guideline, SS_SP_21 exceeds the F2 and F3 guidelines.	**Confirmed APEC (copper[1] (delineated), F2, and F3 in soil). ACM debris confirmed.**
6	1987 Landfill/Bury Site #1 (assumed location)	Four surface soil samples were analyzed for PHCs, PAHs, metals, and PCBS. Two samples exceed the copper guideline one sample exceeded the lead guideline, and one sample exceeded the phenanthrene guideline.	**Confirmed APEC (copper[1], lead, and phenanthrene in soil).**
7	Aboveground Fuel Line	Four samples were analyzed for PHCs. Measured concentrations were below the referenced guidelines.	No environmental concern.
8	USAF Dump	Four surface soil samples were analyzed for PHCs, PAHs, metals, and PCBS. Two samples exceed the copper guideline, and one sample exceeded the lead guideline	**Confirmed APEC (copper[1], and lead in soil).**

Table7.1 Confirmation/Refutation of APECs

APEC		Assessment Results	Conclusion
Number	Description		
9	Pump House & Water Source	Four surface soil samples were collected for analysis of PHC and PAH. Concentrations were below the referenced guidelines.	**Confirmed APEC (aluminum[2], iron[3], and Modified TPH[4] in surface water).**
		North shore of lake: one surface water sample was collected for analysis of PHC, general chemistry, metals, and PCBs and one sediment sample was collected for analysis of PHC, PAHs, metals, PCBs, and VOCs. Aluminum and iron in surface water exceeded the referenced guidelines. The detection limit for modified TPH in surface water exceeds the provincial guideline.	
		South shore of lake: one surface water sample was collected for analysis of PHC, general chemistry, metals, and PCBs and one sediment sample was collected for analysis of PHC, PAHs, Metals, and PCBs. Aluminum and iron in surface water exceeded the referenced guidelines. The detection limit for modified TPH in surface water exceeds the provincial guideline.	
10	Bury/Dump Site(assumed)	Four surface soil samples were analyzed for PHC, PAHs, metals, and PCBs. Measured concentrations were below the referenced guidelines.	No environmental concern in soil. **ACM debris confirmed.**
11	1987 Landfill/Bury Site #2 (assumed location)	Four surface soil samples were analyzed for PHC, PAHs, metals, and PCBs. The concentration of zinc in one sample exceeded the referenced SQG_E	**Confirmed APEC (zinc in soil). ACM debris confirmed.**
12	AST (Lower Site)	Four surface soil samples were analyzed for PHC, and two were also analyzed for PAHs. Measured concentrations were below the referenced guidelines.	No environmental concern.

Table7.1 Confirmation/Refutation of APECs

APEC		Assessment Results	Conclusion
Number	**Description**		
13	Waterbody (Lower Site)	North end of lake: One surface water sample was analyzed for PHC, PAH, general chemistry, metals, and PCBs, and one sediment sample was analyzed for PHC, PAHs, metals, PCBs, and VOCs. The detection limit for modified TPH in surface water exceeds the provincial guideline. Sediment concentrations of several PAH compounds, several metals, and modified TPH in sediment exceed the referenced guidelines	**Confirmed APEC (copper[1], aluminum[2], iron[3], and modified TPH[4], and anthacene[4] in surface water , and 2-methylnapthalene, acenapthalene, acenaphthylene, anthracene, benzo(a)anthracene, benzo(a)pyrene, chrysene, dibenzo(a,h,)anthracene, fluoranthene, fluorene, naphthalene[4], phenanthrene, pyrene, aluminum[2], arsenic, cadmium, copper[1], iron[3] , lead, and zinc in sediment).**
		South end of lake: on surface water sample was analyzed for PHC, general chemistry, metals, and PCBs. Concentrations of several metals parameters exceed the referenced guidelines	
14	Pump house associated with Lower Site AST (presumed)	Four surface soil samples were collected for analysis of PHCs. Additionally, 3 of the samples were analysed for PAHs and metals. PHCs in two samples, and iron in one sample exceed the referenced guideline.	**Confirmed APEC (iron, F2, F3, F4, and modified TPH in soil). ACM debris confirmed.**
15	Possible bury site	Two surface soil samples were collected for analysis of PHC, PAHs, metals, and PCBs. Additionally, one of the samples was analyzed for dioxins/furans. Measured concentrations were below the referenced screening levels.	No environmental concern.

Table7.1 Confirmation/Refutation of APECs

APEC		Assessment Results	Conclusion
Number	Description		
Notes: ACM = asbestos-containing materials 1) while copper can be found naturally occurring, data collected as part of this mandate suggests the copper is related to historical USAF activities (*i.e.,* copper in background soil sample was below screening levels, and no exceedances of copper in soil were found outside of the Upper Site / former USAF dump). 2) Aluminum is commonly found in freshwater surface water bodies. However, as elevated aluminum was not identified in the background surface water or sediment samples, former Site activities cannot be ruled out as the source of this aluminum. 3) Iron is commonly found in freshwater surface water bodies. However, as elevated aluminum was not identified in the background surface water or sediment samples, former Site activities cannot be ruled out as the source of this iron. 4) Parameter not detected, however the detection limit was greater than the screening level, and further assessment is recommended			

7.3.5 Estimated Area and Volume of Impacts

The aerial extent of contamination in generally estimated by either measuring the distance from an impacted sample to the next clean sample, or by halfway to the next clean sample. As the Initial Testing Program was limited in scope, and generally included only four to six samples per APEC; the next clean sample could be located hundreds of metres away within a separate APEC. Further, the Site is characterized by frequent bedrock outcropping, which may limit the spread of contaminants between samples. Supplemental data from Future Detailed Testing Program(s), if conducted, would help to refine these estimates. Often detailed testing programs involve "stepping out" beyond an impacted sample to delineate the aerial extent of the impacts. In the absence of an obstruction such as buildings, cliffs, *etc.*, this "stepping out" is generally done on an approximately 10 m scale. As such, for the purpose of calculating preliminary estimates of extent of impacts, GEMTEC has applied the following approach (in order of preference) to demarcate the estimated limits of impacts (whichever is the smaller distance):

- Distance to nearest outcrop/foundation remains;
- Halfway to the nearest clean sample within the same APEC;
- Distance to the edge of the APEC; or
- 10 m.

Depth of soil impacts has preliminarily been assumed to be equal to the depth of overburden in each APEC. The depth of overburden was estimated/inferred based on field observations (manual test pits) at each APEC. Although the depth of the waterbodies was not confirmed as part of this mandate (boat access would have been required to do so), for the purposes of these preliminary estimates, a 0.5 m depth has been assumed based on the Site observations at the sampling locations, which were generally shallow water along the waterbody's edge, with the exception of SW_SP_05, where the depth was confirmed to be at least 2 m (no impacts in this sample).

To determine volumes of asbestos, due to the small pieces of asbestos containing materials, it was conservatively assumed that 0.05 m of soil over a 10 m^2 area would be inadvertently removed with the asbestos during remediation, if completed. The area of impacts were identified based on field information. As such, the volume estimates for asbestos are identified as asbestos/soil mixtures.

A summary of the sample results that exceeded a human health and/or ecological guideline (provincial and/or federal) for one or more COPC are summarized in Table 7.2. Estimated impacted areas are shown on Drawings 20-24 (Appendix A).

Table 7.2 Preliminary Estimates of Impacted Areas

Sample ID	COPC	Matrix	Preliminary Estimates		
			Estimated Depth[1] (m)	Estimated Area[2] (m^2)	Estimated Volume[3,4] (m^3)
APEC #2 (Helicopter Pad)					
SS_SP_03	Copper	Soil	0.15	150	30
SS_SP_04	Copper	Soil	0.15	300	50
APEC #3 (Disaster Shack)					
BS_SP_02B	Crysotile Asbestos	Asbestos/Soil Mixture	0.05	800	40
SS_SP_06 SS_SP_07	Copper	Soil	0.30	300	90
APEC #4 (Drum Cache)					
SS_SP_13 SS_SP_1	F4	Soil	0.15	350	60
SS_SP_16	F4	Soil	0.15	200	30
APEC #5 (Main Building and Motor Pool)					
BS_SP_02A	Crysotile Asbestos	Asbestos/Soil Mixture	0.05	2100	110
SS_SP_20	Copper	Soil	0.15	150	30
SS_SP_21	F2, F3	Soil	0.15	150	30
APEC #6 (1987 Landfill/Bury Site #1)					
SS_SP_23, SS_SP_24, SS_SP_25	Copper, lead, phenanthrene	Soil	0.60	450	270

Table 7.2 Preliminary Estimates of Impacted Areas

Sample ID	COPC	Matrix	Preliminary Estimates		
			Estimated Depth[1] (m)	Estimated Area[2] (m^2)	Estimated Volume[3,4] (m^3)
APEC #8 (USAF Dump)					
SS_SP_30	Copper	Soil	0.30	250	80
SS_SP_33	Copper, lead,	Soil	0.30	100	30
APEC #9 (Pump House and Water Source)					
SW_SP_02	aluminum, iron	Surface water	1	150	150
SW_SP_03	aluminum, iron	Surface water	1	200	200
APEC #10 (Dump Site (assumed location, near Upper Site))					
BS_SP_08A BS_SP_09A	Crysotile Asbestos	Asbestos/Soil Mixture	0.05	400	20
APEC #11 (1987 Landfill/Bury Site #2 / Unknown Former Structure)					
BS_SP_06A BS_SP_07A	Crysotile Asbestos	Asbestos/Soil Mixture	0.05	1100	60
SS_SP_45	zinc	Soil	0.15	150	30
APEC #13 (Waterbody, Lower Site)					
SW_SP_04	copper, aluminum, iron, anthracene modified TPH	Surface Water	0.15	150	30
SD_SP_04	Several PAHs, aluminum, arsenic, cadmium, copper, iron, lead, zinc, and PCBs	Sediment	0.15	150	30
APEC #14 (Former Fuel Pump House, Lower Site)					
BS_SP_02C	Crysotile Asbestos	Asbestos/Soil Mixture	0.05	400	20
SS_SP_60, SS_SP_61, SS_SP_62	lead, modified TPH, F1, F2, F3	Soil	0.15	400	60
Total Estimated Volume of Impacted Soil at the Site					**790**
Total Estimated Volume of Asbestos/Soil Mixture					**250**
Total Estimated Volume of Impacted Sediment at the Site					**30**
Total Estimated Volume of Impacted Surface Water at the Site					**380**

Table 7.2 Preliminary Estimates of Impacted Areas

Sample ID	COPC	Matrix	Preliminary Estimates		
			Estimated Depth[1] (m)	Estimated Area[2] (m^2)	Estimated Volume[3,4] (m^3)

Notes:
m = metres; m^2 = square metres; and m^3 = cubic metres
1) Depth inferred on an APEC by APEC basis is based on observations made at the time of sampling; however, impacts were not delineated vertically during the Step 3 Initial Testing Program. These depths are estimates only.
2) Area estimates were determined on a number of factors that are detailed in Section 7.3.5 of the report.
3) Volume estimates are preliminary at this stage as delineation was not achieved during the Step 3 Initial Testing Program. As such, the presented volume estimates have been rounded up to the nearest 10 m^3.
4) All estimates presented herein should be revised following completion of a Step 5 Detailed Testing Program.

8.0 NCSCS CLASSIFICATION

The National Classification System for Contaminated Sites (NCSCS) process provides a uniform approach to evaluating need for further action at Sites to protect human health and the environment. The evaluation form was developed by the CCME in March 1992 (updated 2008, 2010 v1.2) and the process generally considers contaminant sources, exposure pathways, and potential human and environmental receptors, but is not intended to be used as a risk assessment tool. The scoring system reflects the concentrations and potential exposures of contaminants in relation to generic CCME remediation criteria. NCSCS Site Score categories are shown in Table 8.1.

Table 8.1 NCSCS Scoring Summary

Total Score	Class	Priority for Action
>70	Class 1	High
50-69.9	Class 2	Medium
37-49.9	Class 3	Low
<37	Class N	Not a priority
>15% of Responses are “Do not know”	Class INS	Insufficient Information

Based on the information gathered during the Initial Testing Program Investigation, a NCSCS score was calculated for the Site. The calculated NCSCS score is 67.9; a breakdown of the score is presented in Table 8.2. Based on this score, the Site is classified as Class 2, indicating a Medium priority for action. The detailed NCSCS evaluation form is presented in Appendix F.

Table 8.2 NCSCS Score Breakdown

Category	Score
Contaminant Characteristics	22.3
Migration Potential	23.5
Exposure	22.2
Certainty Percentage	75%
Total NCSCS Score[1]	**67.9**
Note: 1) As provided in the NCSCS output. The apparent discrepancy between this value and the sum of the category scores is based on intermediate rounding of category scores.	

9.0 SUMMARY

GEMTEC conducted an Initial Testing Program and NCSCS Classification at the former USAF manned Pinetree Line Radar Station located on Spotted Island, Labrador. The following is a summary of the results of the Initial Testing Program and NCSCS Classification:

APECs:

- Based on a document review, 13 preliminary Areas of Potential Environmental Concern (APEC)s were identified for field investigation; and
- Following a Site Reconnaissance, the locations and chemicals of potential concern (COPCs) were adjusted for some APECs, and an additional 2 APECs were identified: a presumed pump house associated with Lower Site AST (APEC #14), and a possible bury site (APEC #15).

Field Program/Testing Program:

- A total of 64 surface soil (0-0.05 m) samples, 5 sediment samples, 5 surface water samples, 1 paint sample, and 9 suspected ACM samples were collected from the Site in September, 2017; and
- Concentrations of COPCs were compared to the applicable provincial (PHCs only) and federal screening levels. The regulatory framework includes residential guidelines, for areas within 250 m of a seasonal community located near the Lower Site and commercial guidelines for areas greater than 250 m from the seasonal community (Upper Site, portions of the roadway, and APECs between the Upper and Lower Sites), non-potable groundwater use, and coarse-grained soil. Concentrations of COPCs were compared to the applicable ecological and human health guidelines.

Data Evaluation:

- Based on the results of the analytical program, the following were identified at concentrations exceeding the referenced human health and/or ecological screening levels:
  - Soil: PHCs, PAHs, and metals;
  - Sediment: PHCs, PAHs, metals, and PCBs; and
  - Surface water: metals
- Delineation of the impacts has generally not been achieved based on the Initial Testing Program
- Asbestos containing debris (cement board, vinyl floor tiles, and mastic) was confirmed at the Site at APECs #3 (Disaster Shack, Upper Site), #5 (Main Building and Motor Pool), #10 (Bury/Dump Site of unknown origin), #11 (Former Unknown Structure), and #14 (Pumphouse associated with the Lower Site AST).

NCSCS Scoring and Database:

- The calculated NCSCS score for the Site is 67.9. Based on this score, the Site is classified as Class 2, indicating a Medium priority for action; and
- The DND Environmental Geospatial Information System (GIS) Data Template was updated with all data collected as part of this mandate.

10.0 RECOMMENDATIONS

Based on the information gathered in the Initial Testing Program and NCSCS Classification, and taking into consideration the anticipated land use (vacant, adjacent to seasonal community (Lower Site)) with no municipal infrastructure, the following work plan is recommended to further delineate and characterize the APECs and to further refine and prioritize the contaminant risk:

The proposed scope of work for the Step 5 Detailed Testing Program and Step 6 Site Re-Classification using the CCME NSCSC is as follows:

- Complete interviews, if possible, with seasonal residents of Spotted Island to determine:
  - The source of drinking water in the area (groundwater, surface water, or off-island source). As the USAF used surface water for drinking, current use of surface water for potable purposes has not been ruled out; and
  - Whether the remains of a structure at APEC #11 (Unknown structure), and the unidentified potential former structure located at 583202E, 5929875N, Zone 21U are a result of USAF operations (or alternately obtain additional sources of information, if available, to determine this).
- Complete additional field data gathering including:
  - Supplemental background soil sampling to determine background conditions outside the influence of the former Site activities.
  - Collect surface and subsurface (where possible) soil samples, sediment samples, and surface water samples to delineate the extent of the identified COPC;
    - Atlantic RBCA hydrocarbon analytical methodology should be considered if future comparison to the Atlantic RBCA framework is anticipated;
  - Assessment of potential presence/absence of abandoned/sunken equipment or waste materials within the surface water body at APEC #13. This could be achieved using a small inflatable boat and underwater camera;
  - Pending a feasibility and safety assessment, access and collect soil samples at the base and/or face of the cliff at APEC #8 (USAF and current landfill); and
  - Complete geophysical surveys of the on-site landfills (suspected and confirmed) to determine the volume of debris, to aid in future remediation cost estimates.
- Complete data analysis and evaluation:
  - Analyse the degree of contamination on the Site (i.e., compare data to applicable pathway specific provincial and federal guidelines for human health and ecological health);
  - Update the DND Environmental GIS Data Template with all data collected as part of the mandate;
  - Refine/update the preliminary CSMs for human and ecological receptors, as required;
  - Re-Classify the Site using the NCSCS (Step 6);

- Determine the need for additional environmental site assessment and/or risk assessment work (if any); and
- Identifying any management actions that may be necessary.

- Complete the FACS Step 6 Site Re-Classification using the CCME NCSCS.

A cost estimate to complete the Step 5 Detailed Testing Program and Step 6 Site Re-Classification is provided under separate cover. Actual costs to complete additional phases of work at the Site will be dictated by Site conditions, the scope of the programs completed, and market values (for professional fees, analytical testing and transportation) at the time the work is completed.

11.0 CLOSURE

The information and conclusions presented represent the best technical judgment of GEMTEC Consulting Engineers and Scientists Limited based on current engineering and scientific practices and environmental standards at the time the work was performed. The conclusions are based on the site conditions encountered at the time the work was performed at the sampling locations, and can only be extrapolated to an undefined limited area around these locations. Soil and groundwater conditions including site history will dictate the extent of the limited area. In addition, analysis was only performed for a limited number of chemical parameters and media, and it should not be inferred that other chemical compounds are not present on the Site. Due to the nature of the investigation and to the limited data available, GEMTEC Consulting Engineers and Scientists Limited cannot warrant against undiscovered environmental liabilities.

Should additional information become available, GEMTEC Consulting Engineers and Scientists Limited requests that this information be brought to our attention so that we may re-assess the conclusions presented herein. This report was prepared by Melanie Langille, M.Env.Sc., and Shaun Pelkey, M.Sc.E., and was reviewed by Abigail Garnett, M.Sc.Eng., P.Eng. and Steve Livingstone, M.Sc., P.Geo. on behalf of GEMTEC Consulting Engineers and Scientists Limited.

Shaun Pelkey, M.Sc.E., P.Eng.
Senior Environmental Engineer

Melanie Langille, M.Env.Sc.
Environmental Scientist

Steve Livingstone, M.Sc., P.Geo.
Senior Environmental Geoscientist

Abigail Garnett, M.Sc.Eng., P.Eng
Senior Environmental Engineer /
Hydrogeologist

12.0 REFERENCES

AECOM. 2013. Hydrogeology of Labrador. Prepared for the Government of Newfoundland and Labrador, Department of Environment and Conservation – Water Resources Management Division. March, 2013.

Atlantic Partnership in RBCA (Risk-Based Corrective Action) Implementation (Atlantic PIRI). 2012 with 2015 updates. Atlantic RBCA (Risk-Based Correction Action) for Petroleum Impacted Sites in Atlantic Canada. Version 3. User Guidance.

Canadian Council of Ministers of the Environment (CCME). 2006. A Protocol for the Derivation of Environmental and Human Health Soil Quality Guidelines.

Canadian Council of Ministers of the Environment (CCME). 2008a. Canada-Wide Standard for Petroleum Hydrocarbons in Soil.

Canadian Council of Ministers of the Environment (CCME). 2008b. National Classification System for Contaminated Sites. Guidance Document.

Canadian Council of Ministers of the Environment (CCME). 1999 with updates obtained from the online database http://ceqg-rcqe.ccme.ca/en/index.html in September 2017. Soil Quality Guidelines (SQG) for the Protection of Environmental and Human Health.

Contaminated Sites Management Working Group. 1999. A Federal Approach to Contaminated Sites.

Defence Construction Canada. 2017. Statement of Work. Initial Testing Program and NCSCS Classification. Two Former Pinetree Line Radar Stations, One Former Weather Station, Labrador. DCC Project Number: NL17AS01. Dated June 2017.

Ecological Stratification Working Group (ESWG) 1996. Ecoregions of Labrador. Accessed from: http://www.heritage.nf.ca/environment/ecoregionas_lab.html#maplab.

Environment Canada. 2018. Canadian Climate Normals.
http://climate.weather.gc.ca/climate_normals/. Accessed online: May, 2018.

Fulton, R.J. 1986. Surficial geology, Cartwright, Labrador, Newfoundland, Geological Survey of Canada, Map 1620A, Scale 1:500,000.

GEMTEC Consulting Engineers and Scientist Limited (GEMTEC). 2017. Proposed Work Plan. Step 3 Initial Testing Program. Two Former Pinetree Line Radar Stations, One Former Weather Station, Labrador. DCC Project Number: NL17AS01. Dated August 22, 2017.

GHD Limited. 2016. Phase I Environmental Site Assessment. Former United States Military Site. Spotted Island, NL. Prepared for the Department of Environment and Conservation (Newfoundland and Labrador).

Gower, C.F. 1979. Geology east of Latitude 58º45', with contributions from D.G. Bailey and R.A. Doherty, especially in the areas of felsic volcanic rocks, geology of adlavik, islands by R.A. Doherty; geology of mainland west of latitude 58º45' by A. Lalonde.

Government of Canada. 2015. Federal Contaminated Sites Action Plan (FCSAP). Guidance Document of Federal Interim Groundwater Quality Guidelines for Federal Contaminated Sites.

Government of Newfoundland and Labrador, Department of Environment and Climate Change. 2016. Guidance Document: Municipal landfill bans, special wastes and diversion programs.

Government of Newfoundland and Labrador. 1998. Newfoundland and Labrador Regulation 111/98. *Asbestos Abatement Regulations,* 1998, under the *Occupational Health and Safety Act* (O.C. 98-730).

Government of Newfoundland and Labrador, Mineral Development Division, Department of Mines and Energy. 1986. Based on Geology by C.F. Gower, T. A. Nostrand, G. McRoberts, L. Crisby and S. Prevec, 1985.

Health Canada. 2008. Guidance Manual for Environmental Site Characterization in Support of Human Health Risk Assessment. Volume 1 Technical Guidance.

Health Canada. 2010. Federal Contaminated Site Risk Assessment in Canada. Part I: Guidance on Human Health Preliminary Quantitative Risk Assessment (PQRA), Version 2.0.Klassen, R.A., Paradis, S., Bolduc, A.M., and Thomas, R.D., 1992. Glacial Landforms and Deposits, Labrador, Newfoundland and eastern Quebec. Geological Survey of Canada, Map 1814A, scale 1:1,000,000.

Natural Resources Canada. 1995. The National Atlas of Canada, 5th Edition. Canada Permafrost.

Natural Resources Canada. 2017. The Atlas of Canada – Toporama. Accessed online, May 2018.

New Brunswick Department of Environment and Local Government. 2014. Disposal of Lead Paint & Lead Painted Materials Guideline.

Province of Newfoundland and Labrador. 2010. Environmental Standards for Construction and Demolition Waste Disposal Sites (GD-PPD-050.3).

Province of Newfoundland and Labrador. 2018. Fisheries and Land Resources. Species At Risk. Accessed online at https://www.flr.gov.nl.ca/wildlife/endangeredspecies/index.html in October, 2018.

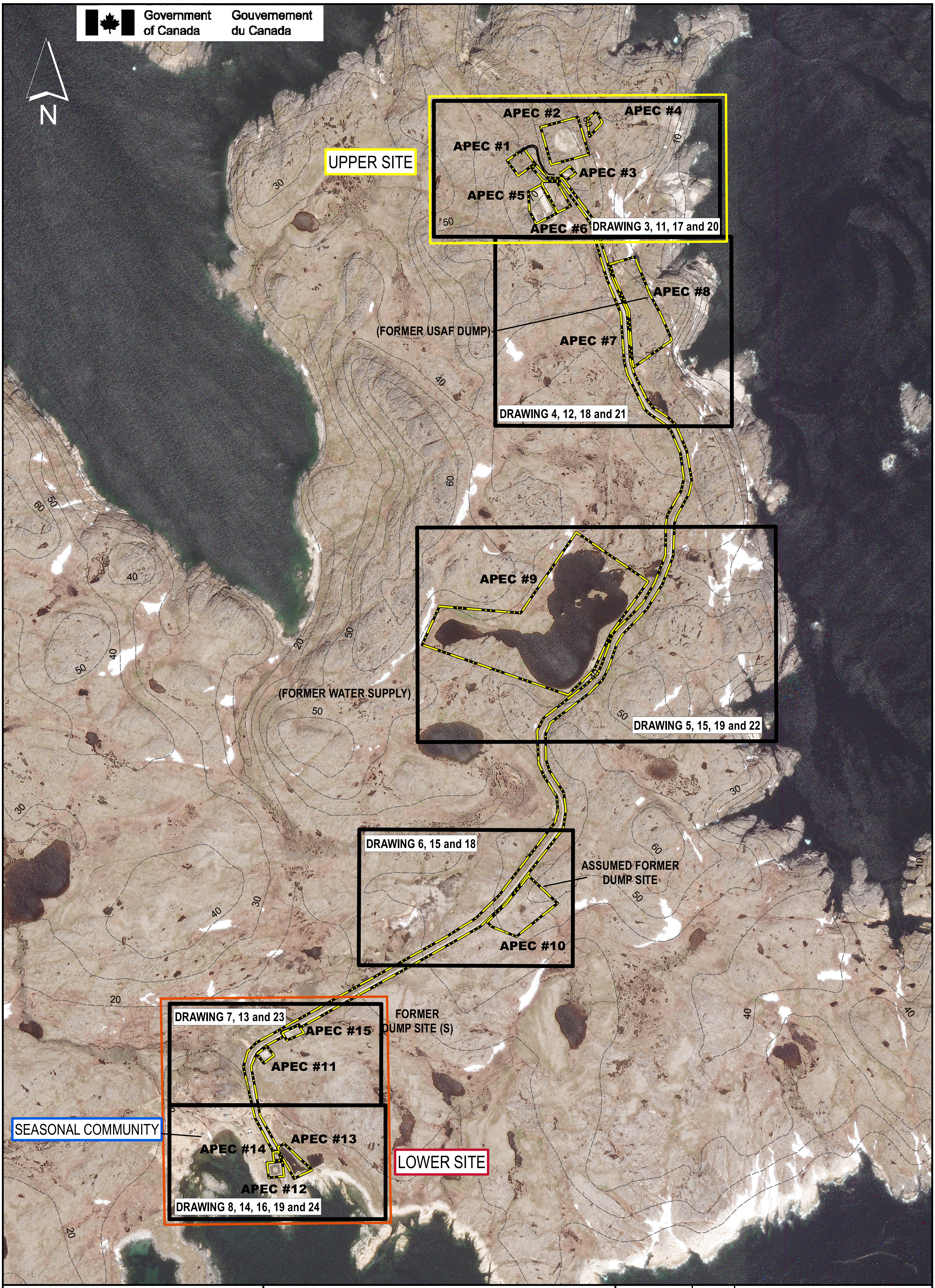
Province of Newfoundland and Labrador. 2012. Occupational Health and Safety Regulations, under the Occupational Health and Safety Act (O.C. 2012-005).

World Health Organization. 2006. The 2005 World Health Organization Re-evaluation of Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds.

APPENDIX A

Drawings

PROJECT: PROJET:	INITIAL TESTING PROGRAM AND NCSCS CLASSIFICATION FORMER PINE TREE LINE RADAR STATION SPOTTED ISLAND, LABRADOR, NL.	APPROVED: APPROUVÉ PAR:	MC ML
SUBJECT: SUJET:	SITE LOCATION PLAN	SCALE: ÉCHELLE:	1:100,000
		WBS NO.: NO. OTP:	NL17AS01
	GEMTEC Consulting Engineers and Scientists	PF NO.: NO. DP:	65745
DATE:	OCTOBER 2018	DWG NO.: NO. DESSIN:	10550.04.02 - Drawing 1

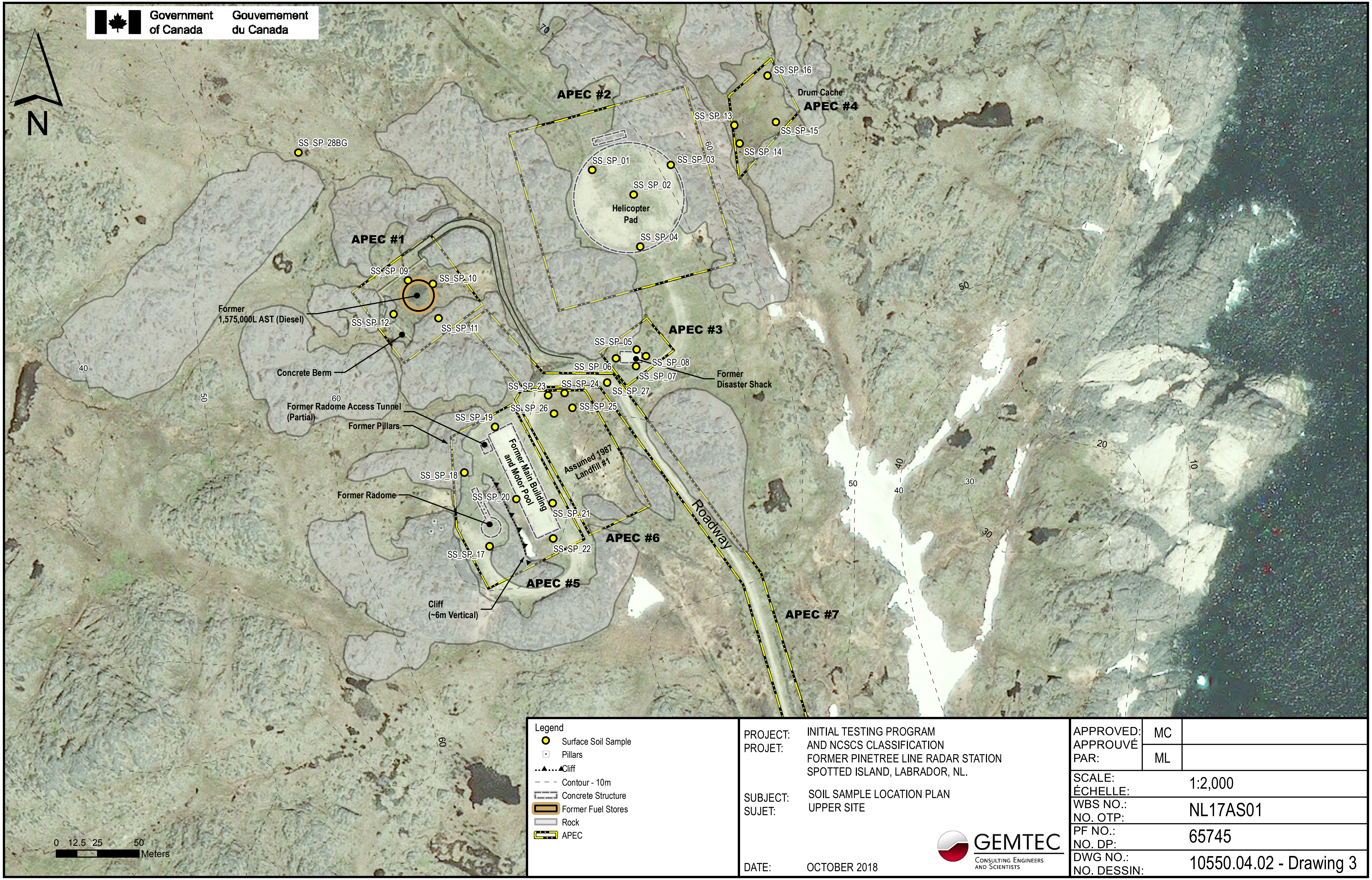


Notes
Coordinate System: NAD_1983_CSRS_UTM_Zone_21N
WKID: 2962 Authority: EPSG
Contour source: Data extrated from "Geospatial Data Extraction" of Natural Resources Canada, Goverment of Canada.
(http://maps.canada.ca/czs/index-en.html)

GEMTEC
CONSULTING ENGINEERS AND SCIENTISTS

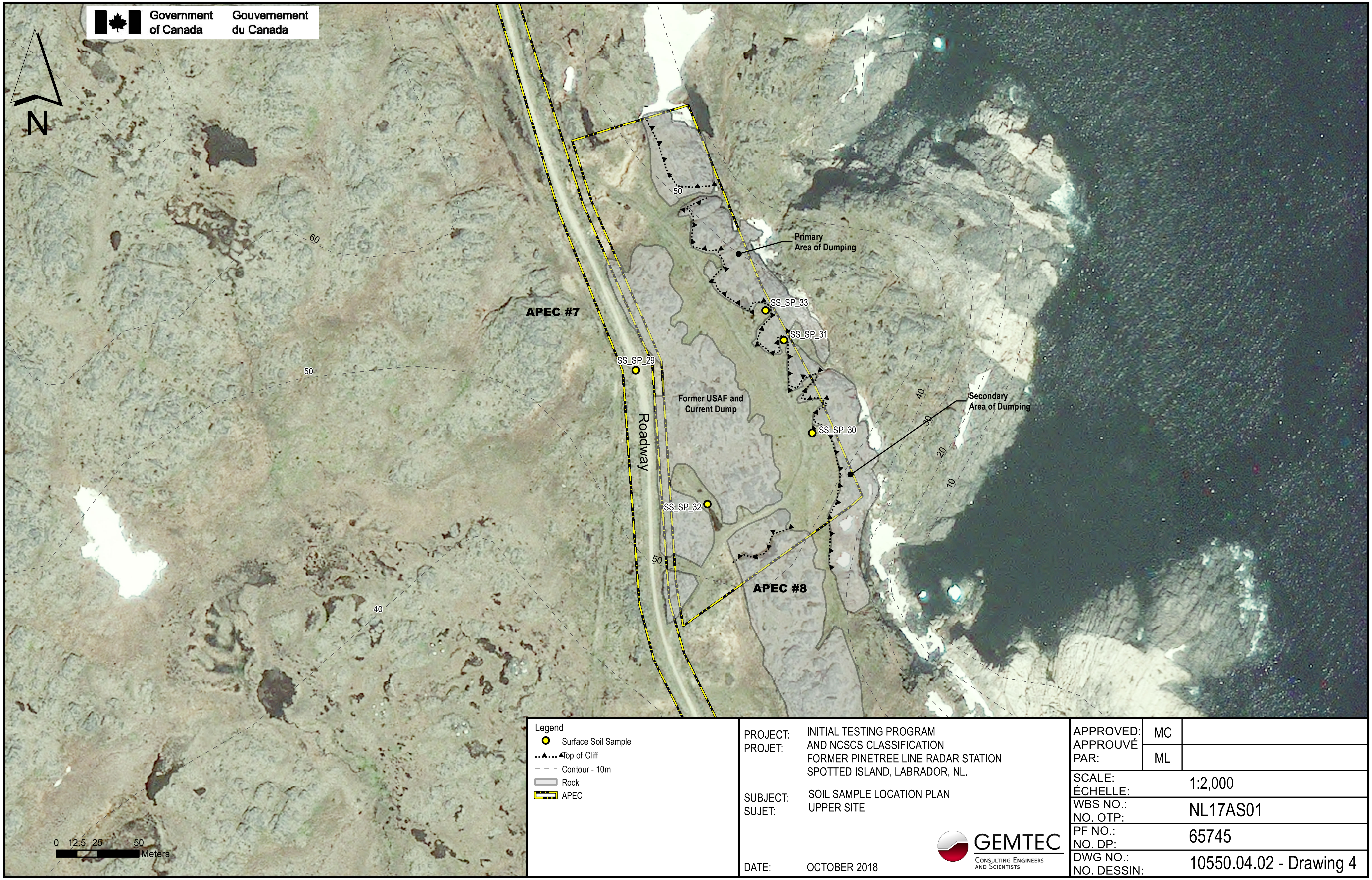
PROJECT: PROJET:	INITIAL TESTING PROGRAM AND NCSCS CLASSIFICATION FORMER PINETREE LINE RADAR STATION SPOTTED ISLAND, LABRADOR, NL.
SUBJECT: SUJET:	SITE OVERVIEW
DATE:	OCTOBER 2018

APPROVED: APPROUVÉ PAR:	MC / ML
SCALE: ÉCHELLE:	1:10,000
WBS NO.: NO. OTP:	NL17AS01
PF NO.: NO. DP:	65745
DWG NO.: NO. DESSIN:	10550.04.02 - Drawing 2



Legend
- Surface Soil Sample
- Pillars
- Cliff
- Contour - 10m
- Concrete Structure
- Former Fuel Stores
- Rock
- APEC

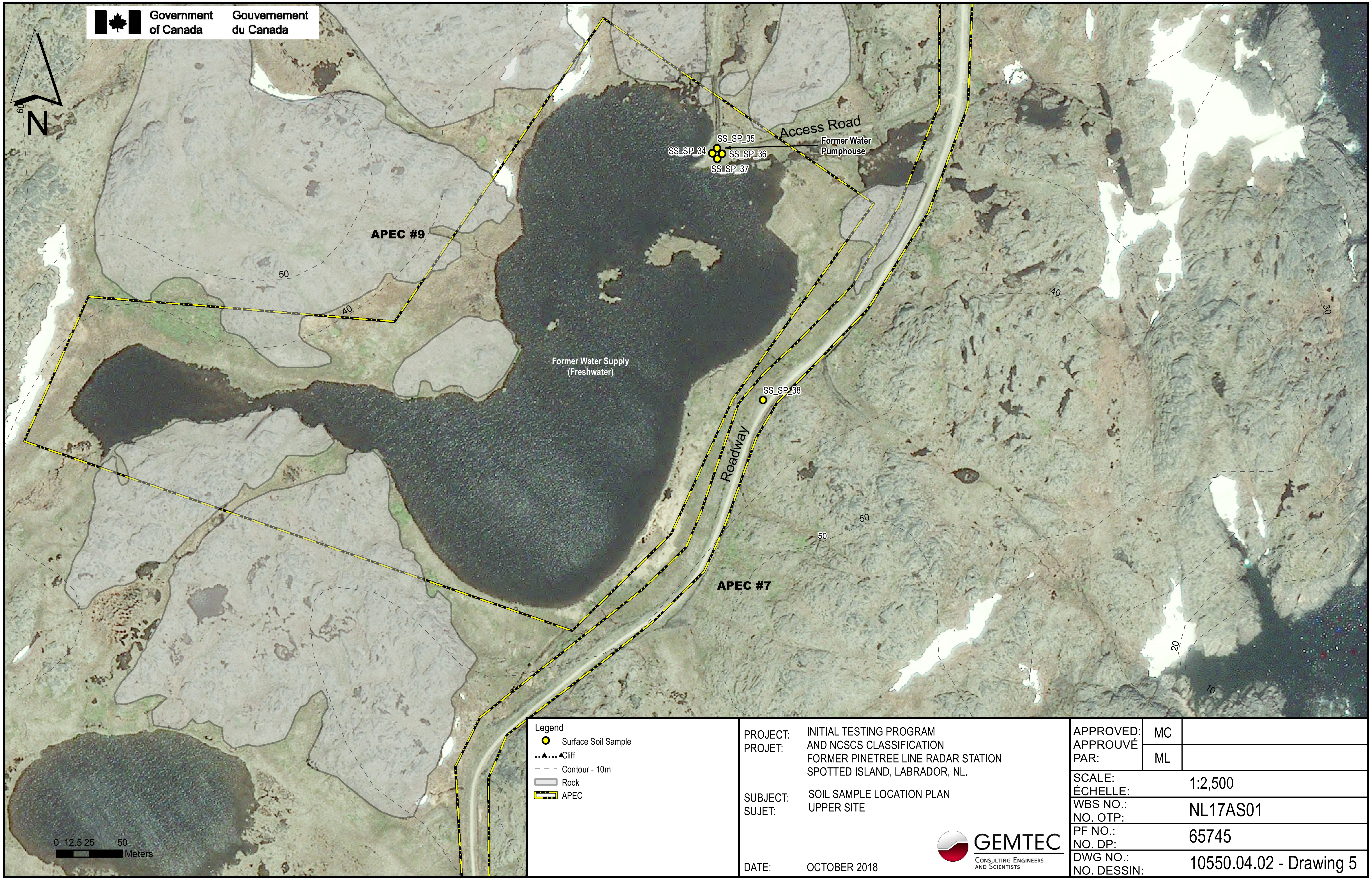
PROJECT: PROJET:	INITIAL TESTING PROGRAM AND NCSCS CLASSIFICATION FORMER PINETREE LINE RADAR STATION SPOTTED ISLAND, LABRADOR, NL.	APPROVED: APPROUVÉ PAR:	MC / ML
SUBJECT: SUJET:	SOIL SAMPLE LOCATION PLAN UPPER SITE	SCALE: ÉCHELLE:	1:2,000
		WBS NO.: NO. OTP:	NL17AS01
	GEMTEC Consulting Engineers and Scientists	PF NO.: NO. DP:	65745
DATE:	OCTOBER 2018	DWG NO.: NO. DESSIN:	10550.04.02 - Drawing 3



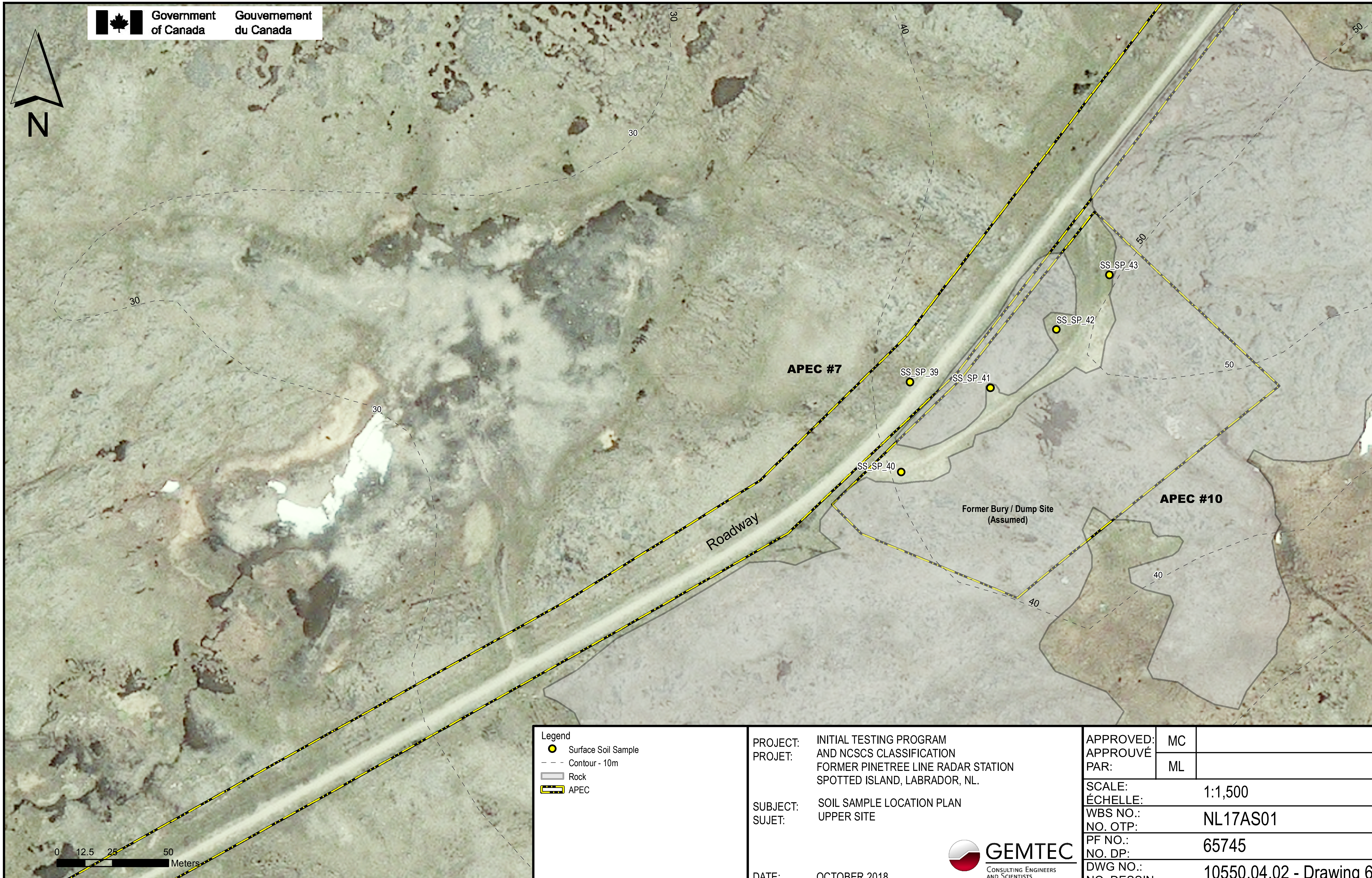
PROJECT: PROJET:	INITIAL TESTING PROGRAM AND NCSCS CLASSIFICATION FORMER PINETREE LINE RADAR STATION SPOTTED ISLAND, LABRADOR, NL.
SUBJECT: SUJET:	SOIL SAMPLE LOCATION PLAN UPPER SITE
DATE:	OCTOBER 2018

GEMTEC
Consulting Engineers and Scientists

APPROVED: APPROUVÉ PAR:	MC
	ML
SCALE: ÉCHELLE:	1:2,000
WBS NO.: NO. OTP:	NL17AS01
PF NO.: NO. DP:	65745
DWG NO.: NO. DESSIN:	10550.04.02 - Drawing 4



PROJECT: PROJET:	INITIAL TESTING PROGRAM AND NCSCS CLASSIFICATION FORMER PINETREE LINE RADAR STATION SPOTTED ISLAND, LABRADOR, NL.	APPROVED: APPROUVÉ PAR:	MC / ML
SUBJECT: SUJET:	SOIL SAMPLE LOCATION PLAN UPPER SITE	SCALE: ÉCHELLE:	1:2,500
		WBS NO.: NO. OTP:	NL17AS01
	GEMTEC Consulting Engineers and Scientists	PF NO.: NO. DP:	65745
DATE:	OCTOBER 2018	DWG NO.: NO. DESSIN:	10550.04.02 - Drawing 5



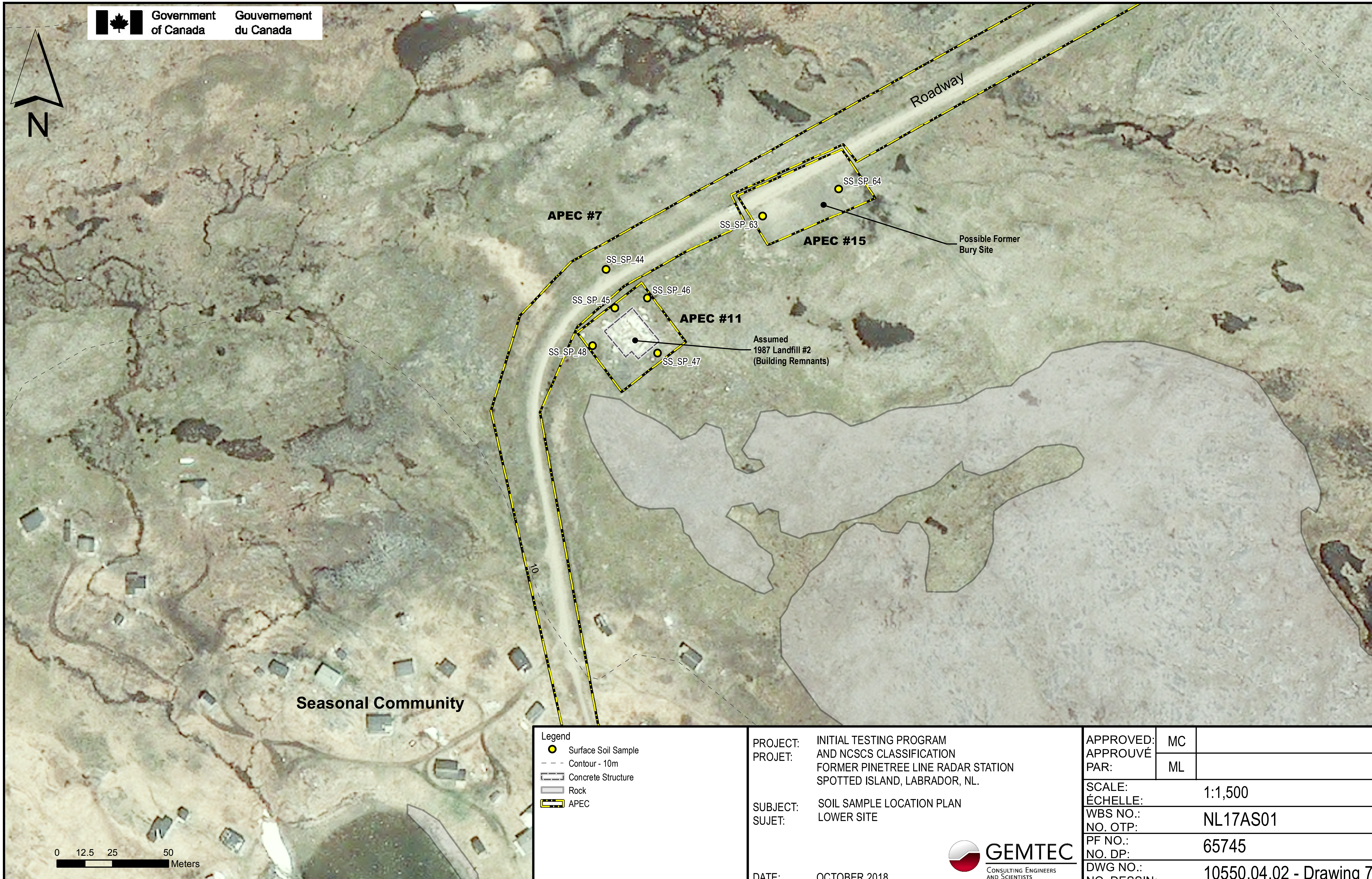
PROJECT:
PROJET: INITIAL TESTING PROGRAM
AND NCSCS CLASSIFICATION
FORMER PINETREE LINE RADAR STATION
SPOTTED ISLAND, LABRADOR, NL.

SUBJECT:
SUJET: SOIL SAMPLE LOCATION PLAN
UPPER SITE

DATE: OCTOBER 2018

GEMTEC
Consulting Engineers and Scientists

APPROVED: APPROUVÉ PAR:	MC
	ML
SCALE: ÉCHELLE:	1:1,500
WBS NO.: NO. OTP:	NL17AS01
PF NO.: NO. DP:	65745
DWG NO.: NO. DESSIN:	10550.04.02 - Drawing 6



Legend
- Surface Soil Sample
- Contour - 10m
- Concrete Structure
- Rock
- APEC

PROJECT: PROJET:	INITIAL TESTING PROGRAM AND NCSCS CLASSIFICATION FORMER PINETREE LINE RADAR STATION SPOTTED ISLAND, LABRADOR, NL.	APPROVED: APPROUVÉ PAR:	MC / ML
SUBJECT: SUJET:	SOIL SAMPLE LOCATION PLAN LOWER SITE	SCALE: ÉCHELLE:	1:1,500
		WBS NO.: NO. OTP:	NL17AS01
	GEMTEC Consulting Engineers and Scientists	PF NO.: NO. DP:	65745
DATE:	OCTOBER 2018	DWG NO.: NO. DESSIN:	10550.04.02 - Drawing 7

Legend
- Surface Soil Sample
- Cliff
- Contour - 10m
- Rock
- APEC

PROJECT: PROJET:	INITIAL TESTING PROGRAM AND NCSCS CLASSIFICATION FORMER PINETREE LINE RADAR STATION SPOTTED ISLAND, LABRADOR, NL.
SUBJECT: SUJET:	SOIL SAMPLE LOCATION PLAN LOWER SITE
DATE:	OCTOBER 2018

GEMTEC
CONSULTING ENGINEERS AND SCIENTISTS

APPROVED: APPROUVÉ PAR:	MC	
	ML	
SCALE: ÉCHELLE:	1:1,500	
WBS NO.: NO. OTP:	NL17AS01	
PF NO.: NO. DP:	65745	
DWG NO.: NO. DESSIN:	10550.04.02 - Drawing 8	

PROJECT:
PROJET: INITIAL TESTING PROGRAM AND NCSCS CLASSIFICATION FORMER PINETREE LINE RADAR STATION SPOTTED ISLAND, LABRADOR, NL.

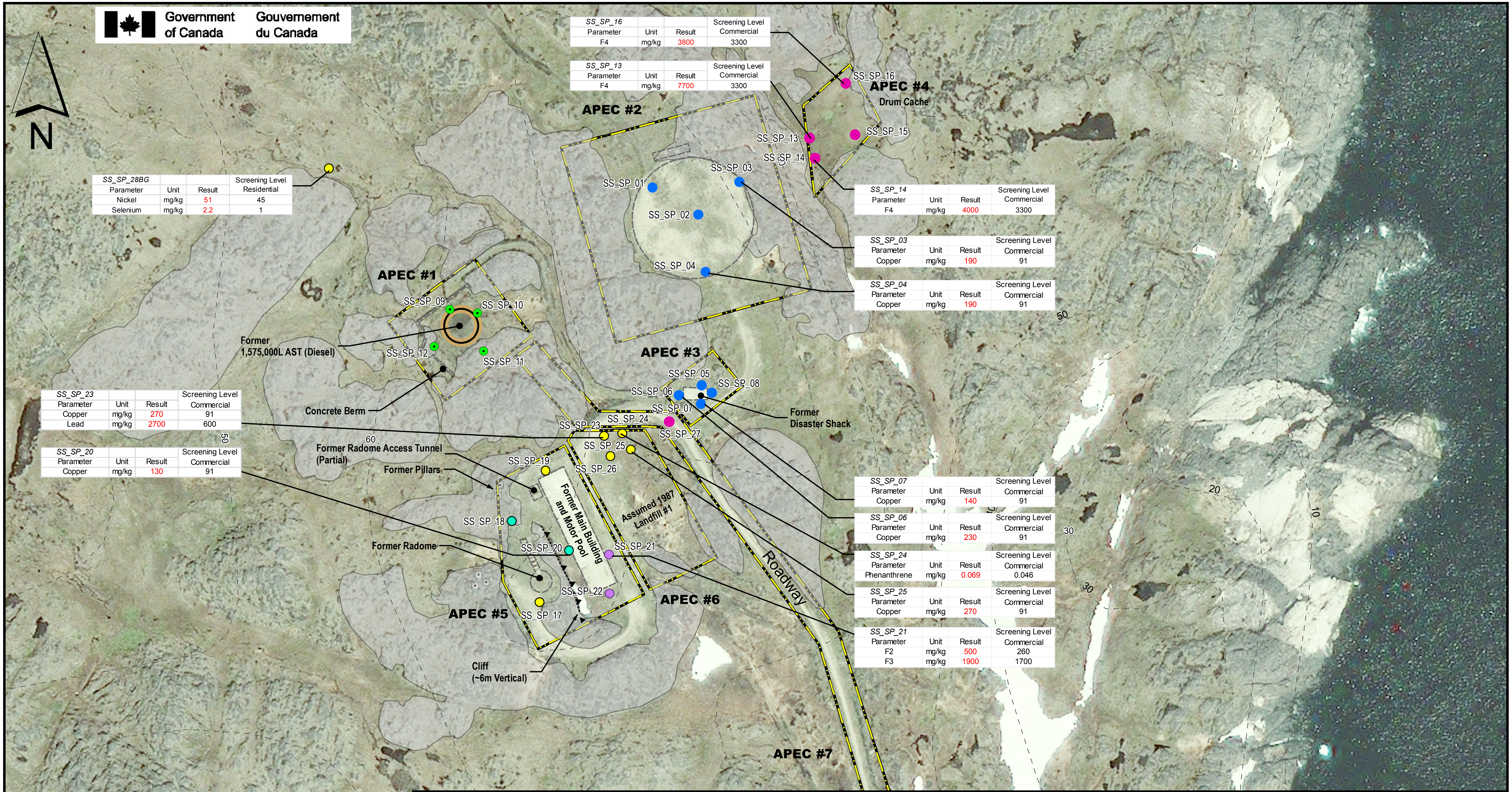
SUBJECT:
SUJET: SURFACE WATER AND SEDIMENT SAMPLE LOCATION PLAN

GEMTEC CONSULTING ENGINEERS AND SCIENTISTS

DATE: OCTOBER 2018

APPROVED: APPROUVÉ PAR:	MC / ML
SCALE: ÉCHELLE:	1:2,500
WBS NO.: NO. OTP:	NL17AS01
PF NO.: NO. DP:	65745
DWG NO.: NO. DESSIN:	10550.04.02 - Drawing 9

PROJECT: PROJET:	INITIAL TESTING PROGRAM AND NCSCS CLASSIFICATION FORMER PINETREE LINE RADAR STATION SPOTTED ISLAND, LABRADOR, NL.	APPROVED: APPROUVÉ PAR:	MC / ML
SUBJECT: SUJET:	SURFACE WATER AND SEDIMENT SAMPLE LOCATION PLAN LOWER SITE	SCALE: ÉCHELLE:	1:1,500
		WBS NO.: NO. OTP:	NL17AS01
	GEMTEC Consulting Engineers and Scientists	PF NO.: NO. DP:	65745
DATE:	OCTOBER 2018	DWG NO.: NO. DESSIN:	10550.04.02 - Drawing 10



Samples Analyzed For:

- PHC
- PHC, PAH
- PHC, Metals
- PHC, PAH, Metals
- PHC, PAH, Metals, PCBs
- PHC, PAH, Metals, PCBs, VOCs

Red Text = Exceedance

Legend

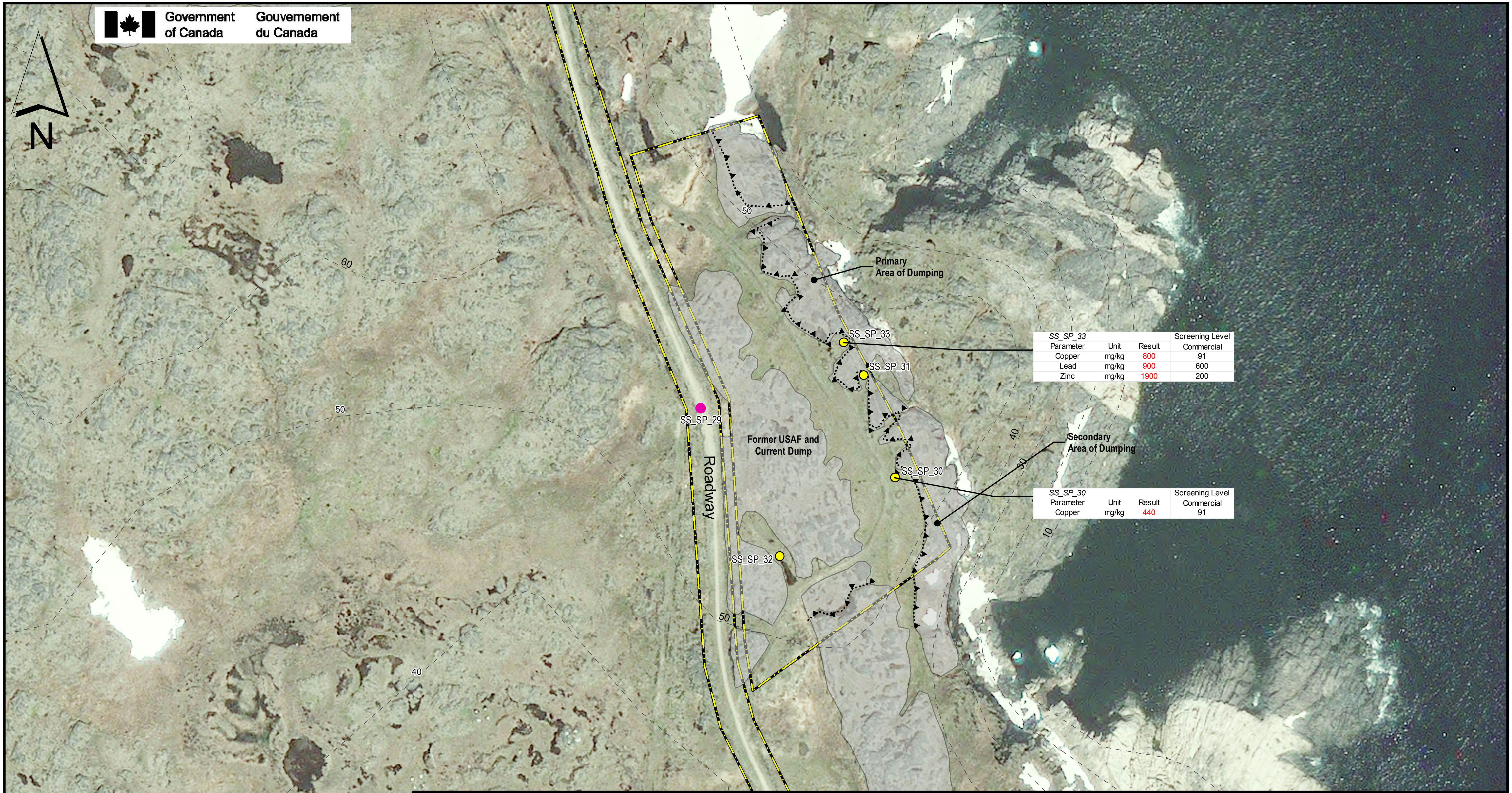
- Pillars
- Cliff
- Contour - 10m
- Concrete Structure
- Former Fuel Stores
- Former Barracks
- Bedrock
- APEC

*Residential guidelines have been applied to areas where human activity may be prevalent. Otherwise, commercial guidelines have been applied.
** If there was an exceedance of a sample or related field duplicate, the higher value was taken
*** Non-detects above guideline values were taken as an exceedance.
**** Samples taken at 0.0 - 0.05 m, unless otherwise indicated

PROJECT: PROJET:	INITIAL TESTING PROGRAM AND NCSCS CLASSIFICATION FORMER PINETREE LINE RADAR STATION SPOTTED ISLAND, LABRADOR, NL.
SUBJECT: SUJET:	SOIL SAMPLE EXCEEDANCE OF ECOLOGICAL SCREENING LEVELS UPPER SITE
DATE:	OCTOBER 2018

GEMTEC CONSULTING ENGINEERS AND SCIENTISTS

APPROVED: APPROUVÉ PAR:	MC
	ML
SCALE: ÉCHELLE:	1:2,000
WBS NO.: NO. OTP:	NL17AS01
PF NO.: NO. DP:	65745
DWG NO.: NO. DESSIN:	10550.04.02 - Drawing 11



SS_SP_33

Parameter	Unit	Result	Screening Level Commercial
Copper	mg/kg	800	91
Lead	mg/kg	900	600
Zinc	mg/kg	1900	200

SS_SP_30

Parameter	Unit	Result	Screening Level Commercial
Copper	mg/kg	440	91

Samples Analyzed For:
- PHC
- PHC, PAH, Metals, PCBs

Legend
- Top of Cliff
- Contour - 10m
- Bedrock
- APEC

Red Text = Exceedance

*Residential guidelines have been applied to areas where human activity may be prevalent. Otherwise, commercial guidelines have been applied.
** If there was an exceedance of a sample or related field duplicate, the higher value was taken
*** Non-detects above guideline values were taken as an exceedance.
**** Samples taken at 0.0 - 0.05 m, unless otherwise indicated

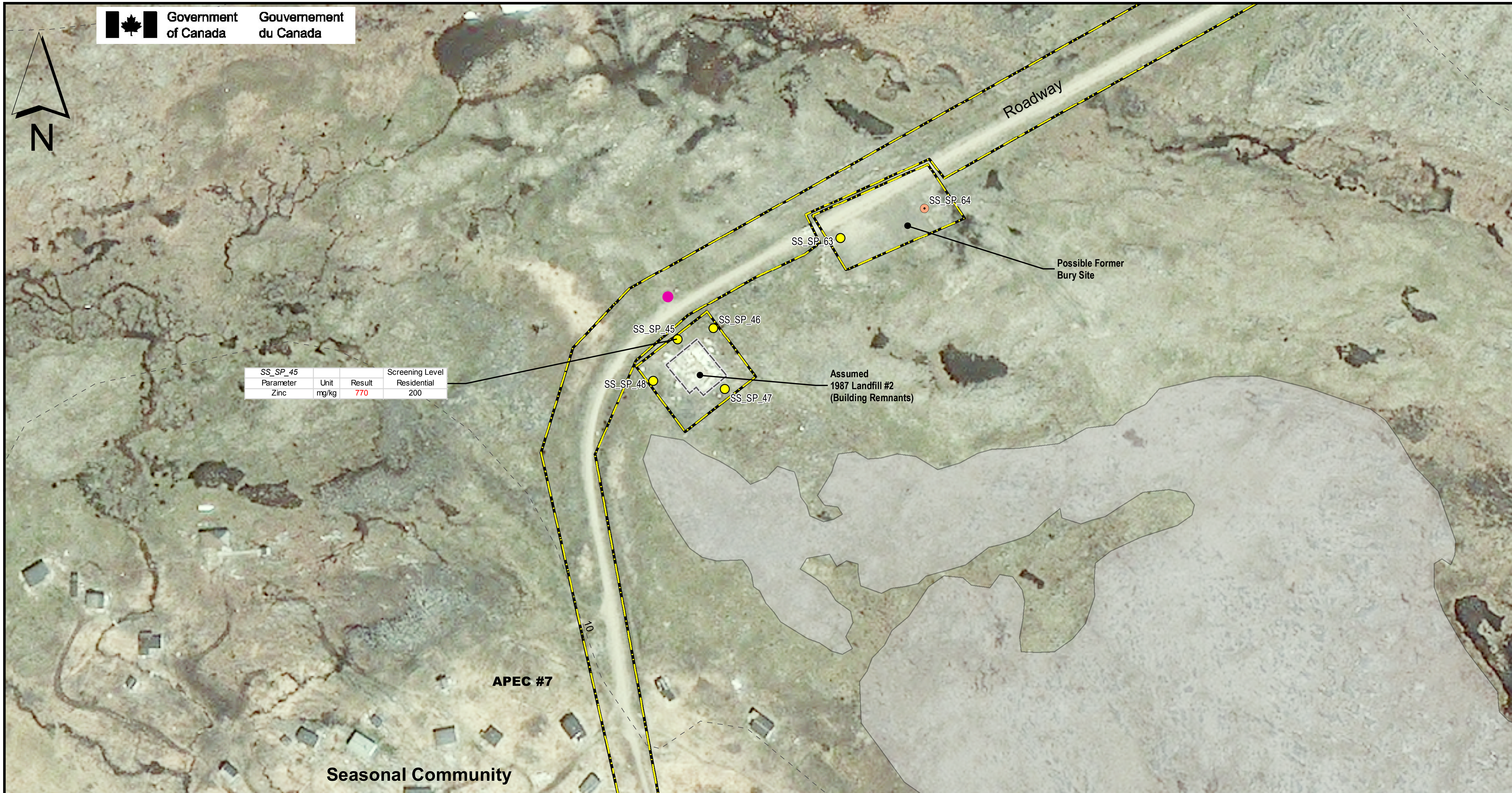
PROJECT: / PROJET: INITIAL TESTING PROGRAM AND NCSCS CLASSIFICATION FORMER PINETREE LINE RADAR STATION SPOTTED ISLAND, LABRADOR, NL.

SUBJECT: / SUJET: SOIL SAMPLE EXCEEDANCE OF ECOLOGICAL SCREENING LEVELS

DATE: OCTOBER 2018

GEMTEC
CONSULTING ENGINEERS AND SCIENTISTS

APPROVED: APPROUVÉ PAR:	MC / ML
SCALE: ÉCHELLE:	1:2,000
WBS NO.: NO. OTP:	NL17AS01
PF NO.: NO. DP:	65745
DWG NO.: NO. DESSIN:	10550.04.02 - Drawing 12



0 12.5 25 50
Meters

Samples Analyzed For:

- PHC
- PHC, PAH, Metals, PCBs
- PHC, PAH, Metals, PCB, Dioxins/Furans

Red Text = Exceedance

Legend

- Contour - 10m
- Concrete Structure
- Bedrock
- APEC

*Residential guidelines have been applied to areas where human activity may be prevalent. Otherwise, commercial guidelines have been applied.
** If there was an exceedance of a sample or related field duplicate, the higher value was taken
*** Non-detects above guideline values were taken as an exceedance.
**** Samples taken at 0.0 - 0.05 m, unless otherwise indicated

PROJECT: PROJET:	INITIAL TESTING PROGRAM AND NCSCS CLASSIFICATION FORMER PINETREE LINE RADAR STATION SPOTTED ISLAND, LABRADOR, NL.
SUBJECT: SUJET:	SOIL SAMPLE EXCEEDANCE OF ECOLOGICAL SCREENING LEVELS LOWER SITE
DATE:	OCTOBER 2018

GEMTEC
Consulting Engineers and Scientists

APPROVED: APPROUVÉ PAR:	MC	
	ML	
SCALE: ÉCHELLE:	1:1,500	
WBS NO.: NO. OTP:	NL17AS01	
PF NO.: NO. DP:	65745	
DWG NO.: NO. DESSIN:	10550.04.02 - Drawing 13	

SS_SP_60			Screening Level
Parameter	Unit	Result	Residential
F3	mg/kg	2400	300
F4	mg/kg	7300	2800

SS_SP_61			Screening Level
Parameter	Unit	Result	Residential
F2	mg/kg	6500	150
F3	mg/kg	4700	300
Naphthalene	mg/kg	< 0.053	0.013

Samples Analyzed For:
- PHC
- PHC, PAH
- PHC, PAH, Metals

Legend
- Contour - 10m
- Concrete Structure
- Former Fuel Stores
- Former Barracks
- Bedrock
- APEC

Red Text = Exceedance

*Residential guidelines have been applied to areas where human activity may be prevalent. Otherwise, commercial guidelines have been applied.
** If there was an exceedance of a sample or related field duplicate, the higher value was taken
*** Non-detects above guideline values were taken as an exceedance.
**** Samples taken at 0.0 - 0.05 m, unless otherwise indicated

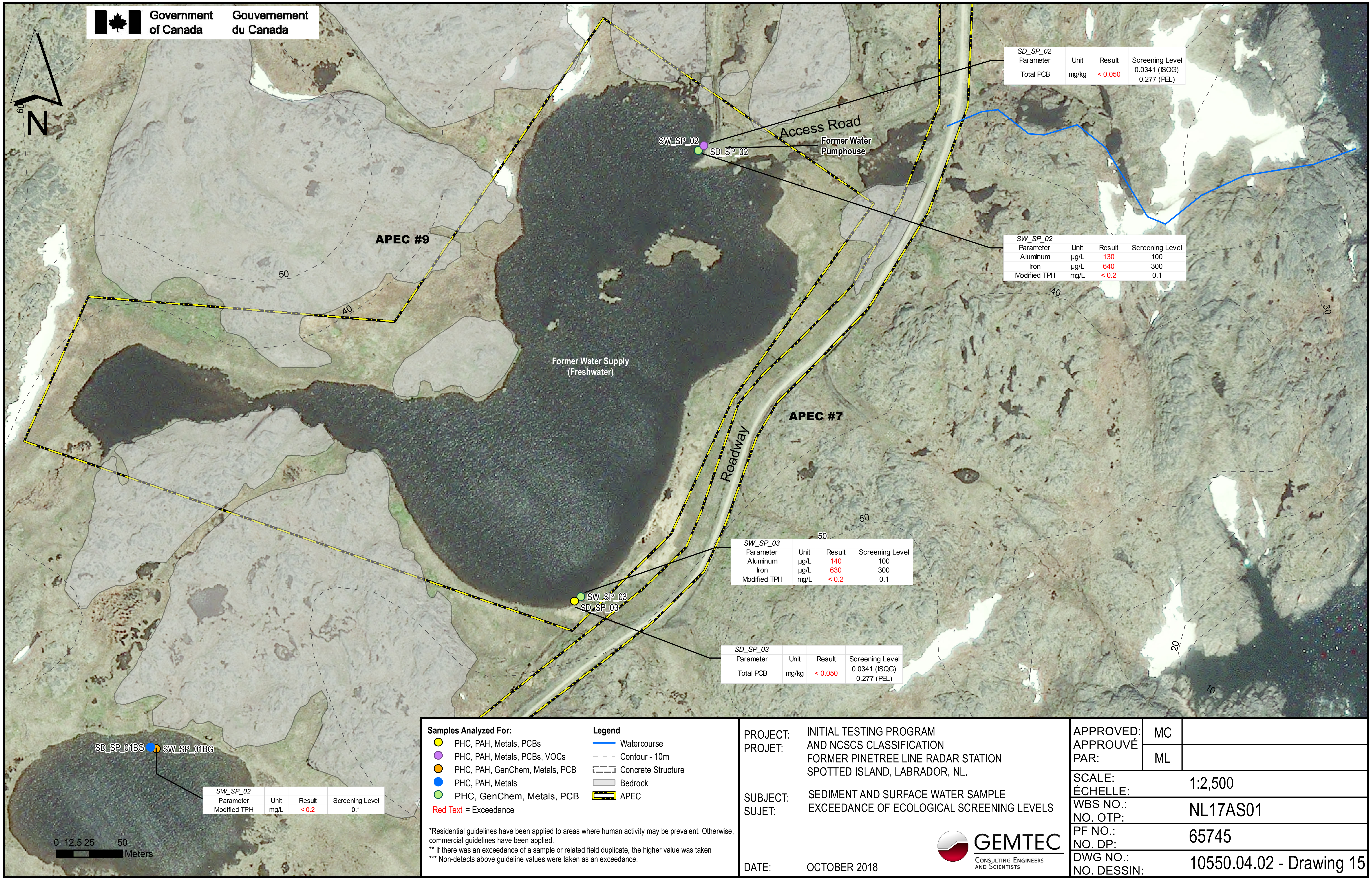
PROJECT:
PROJET: INITIAL TESTING PROGRAM AND NCSCS CLASSIFICATION FORMER PINETREE LINE RADAR STATION SPOTTED ISLAND, LABRADOR, NL.

SUBJECT:
SUJET: SOIL SAMPLE EXCEEDANCE OF ECOLOGICAL SCREENING LEVELS LOWER SITE

DATE: OCTOBER 2018

GEMTEC
CONSULTING ENGINEERS AND SCIENTISTS

APPROVED: APPROUVÉ PAR:	MC
	ML
SCALE: ÉCHELLE:	1:1,500
WBS NO.: NO. OTP:	NL17AS01
PF NO.: NO. DP:	65745
DWG NO.: NO. DESSIN:	10550.04.02 - Drawing 14



SD_SP_02			
Parameter	Unit	Result	Screening Level
Total PCB	mg/kg	< 0.050	0.0341 (ISQG) 0.277 (PEL)

SW_SP_02			
Parameter	Unit	Result	Screening Level
Aluminum	µg/L	130	100
Iron	µg/L	640	300
Modified TPH	mg/L	< 0.2	0.1

SW_SP_03			
Parameter	Unit	Result	Screening Level
Aluminum	µg/L	140	100
Iron	µg/L	630	300
Modified TPH	mg/L	< 0.2	0.1

SD_SP_03			
Parameter	Unit	Result	Screening Level
Total PCB	mg/kg	< 0.050	0.0341 (ISQG) 0.277 (PEL)

SW_SP_02			
Parameter	Unit	Result	Screening Level
Modified TPH	mg/L	< 0.2	0.1

Samples Analyzed For:

- PHC, PAH, Metals, PCBs
- PHC, PAH, Metals, PCBs, VOCs
- PHC, PAH, GenChem, Metals, PCB
- PHC, PAH, Metals
- PHC, GenChem, Metals, PCB

Red Text = Exceedance

Legend

- Watercourse
- Contour - 10m
- Concrete Structure
- Bedrock
- APEC

*Residential guidelines have been applied to areas where human activity may be prevalent. Otherwise, commercial guidelines have been applied.
** If there was an exceedance of a sample or related field duplicate, the higher value was taken
*** Non-detects above guideline values were taken as an exceedance.

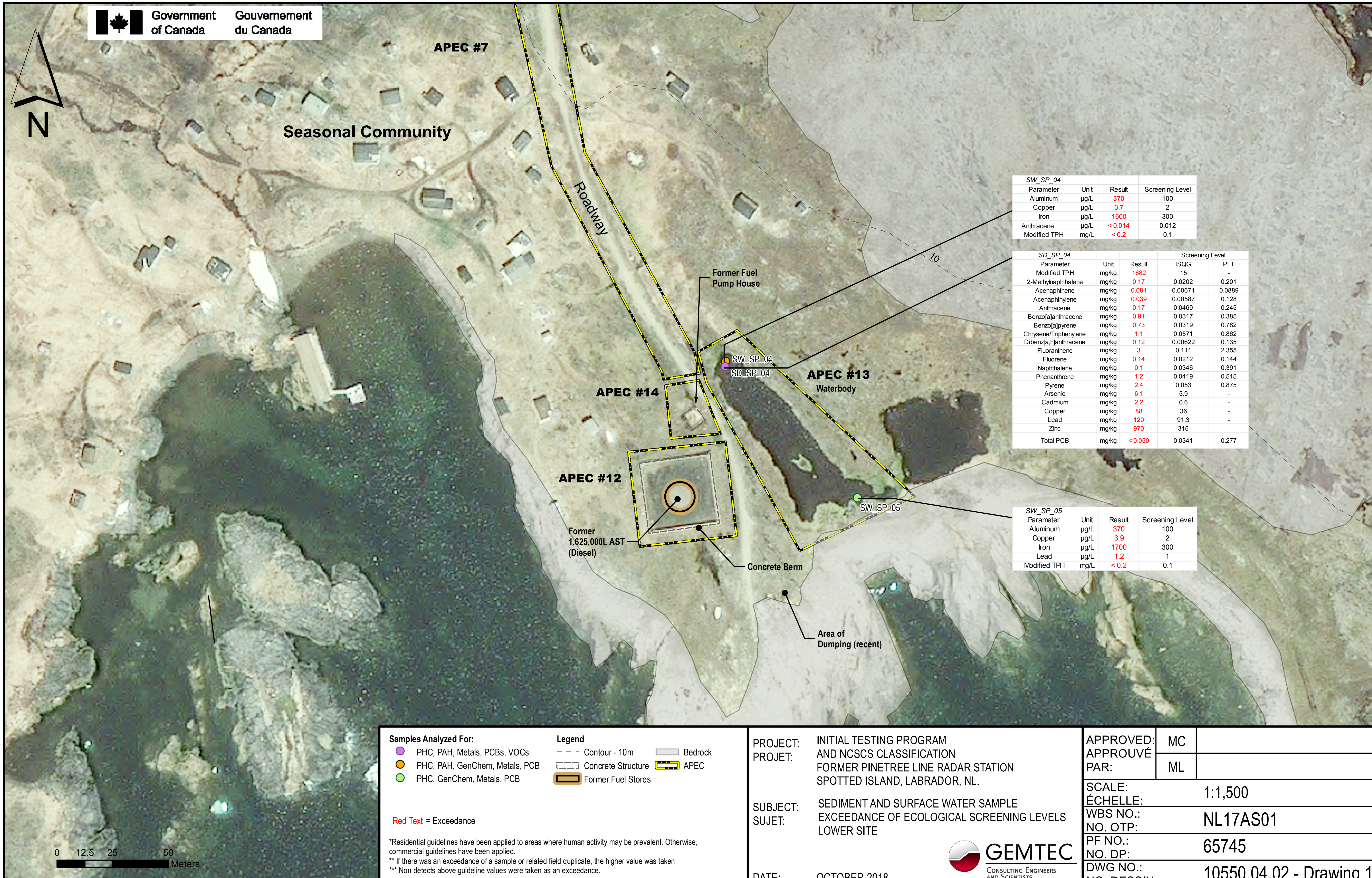
PROJECT: / PROJET: INITIAL TESTING PROGRAM AND NCSCS CLASSIFICATION FORMER PINETREE LINE RADAR STATION SPOTTED ISLAND, LABRADOR, NL.

SUBJECT: / SUJET: SEDIMENT AND SURFACE WATER SAMPLE EXCEEDANCE OF ECOLOGICAL SCREENING LEVELS

DATE: OCTOBER 2018

GEMTEC Consulting Engineers and Scientists

APPROVED: / APPROUVÉ PAR:	MC / ML
SCALE: / ÉCHELLE:	1:2,500
WBS NO.: / NO. OTP:	NL17AS01
PF NO.: / NO. DP:	65745
DWG NO.: / NO. DESSIN:	10550.04.02 - Drawing 15



SW_SP_04			
Parameter	Unit	Result	Screening Level
Aluminum	µg/L	370	100
Copper	µg/L	3.7	2
Iron	µg/L	1600	300
Anthracene	µg/L	< 0.014	0.012
Modified TPH	mg/L	< 0.2	0.1

SD_SP_04			Screening Level	
Parameter	Unit	Result	ISQG	PEL
Modified TPH	mg/kg	1682	15	-
2-Methylnaphthalene	mg/kg	0.17	0.0202	0.201
Acenaphthene	mg/kg	0.081	0.00671	0.0889
Acenaphthylene	mg/kg	0.039	0.00587	0.128
Anthracene	mg/kg	0.17	0.0469	0.245
Benzo[a]anthracene	mg/kg	0.91	0.0317	0.385
Benzo[a]pyrene	mg/kg	0.73	0.0319	0.782
Chrysene/Triphenylene	mg/kg	1.1	0.0571	0.862
Dibenz[a,h]anthracene	mg/kg	0.12	0.00622	0.135
Fluoranthene	mg/kg	3	0.111	2.355
Fluorene	mg/kg	0.14	0.0212	0.144
Naphthalene	mg/kg	0.1	0.0346	0.391
Phenanthrene	mg/kg	1.2	0.0419	0.515
Pyrene	mg/kg	2.4	0.053	0.875
Arsenic	mg/kg	6.1	5.9	-
Cadmium	mg/kg	2.2	0.6	-
Copper	mg/kg	88	36	-
Lead	mg/kg	120	91.3	-
Zinc	mg/kg	970	315	-
Total PCB	mg/kg	< 0.050	0.0341	0.277

SW_SP_05			
Parameter	Unit	Result	Screening Level
Aluminum	µg/L	370	100
Copper	µg/L	3.9	2
Iron	µg/L	1700	300
Lead	µg/L	1.2	1
Modified TPH	mg/L	< 0.2	0.1

Samples Analyzed For:
- PHC, PAH, Metals, PCBs, VOCs
- PHC, PAH, GenChem, Metals, PCB
- PHC, GenChem, Metals, PCB

Legend
- Contour - 10m
- Concrete Structure
- Former Fuel Stores
- Bedrock
- APEC

Red Text = Exceedance

*Residential guidelines have been applied to areas where human activity may be prevalent. Otherwise, commercial guidelines have been applied.
** If there was an exceedance of a sample or related field duplicate, the higher value was taken
*** Non-detects above guideline values were taken as an exceedance.

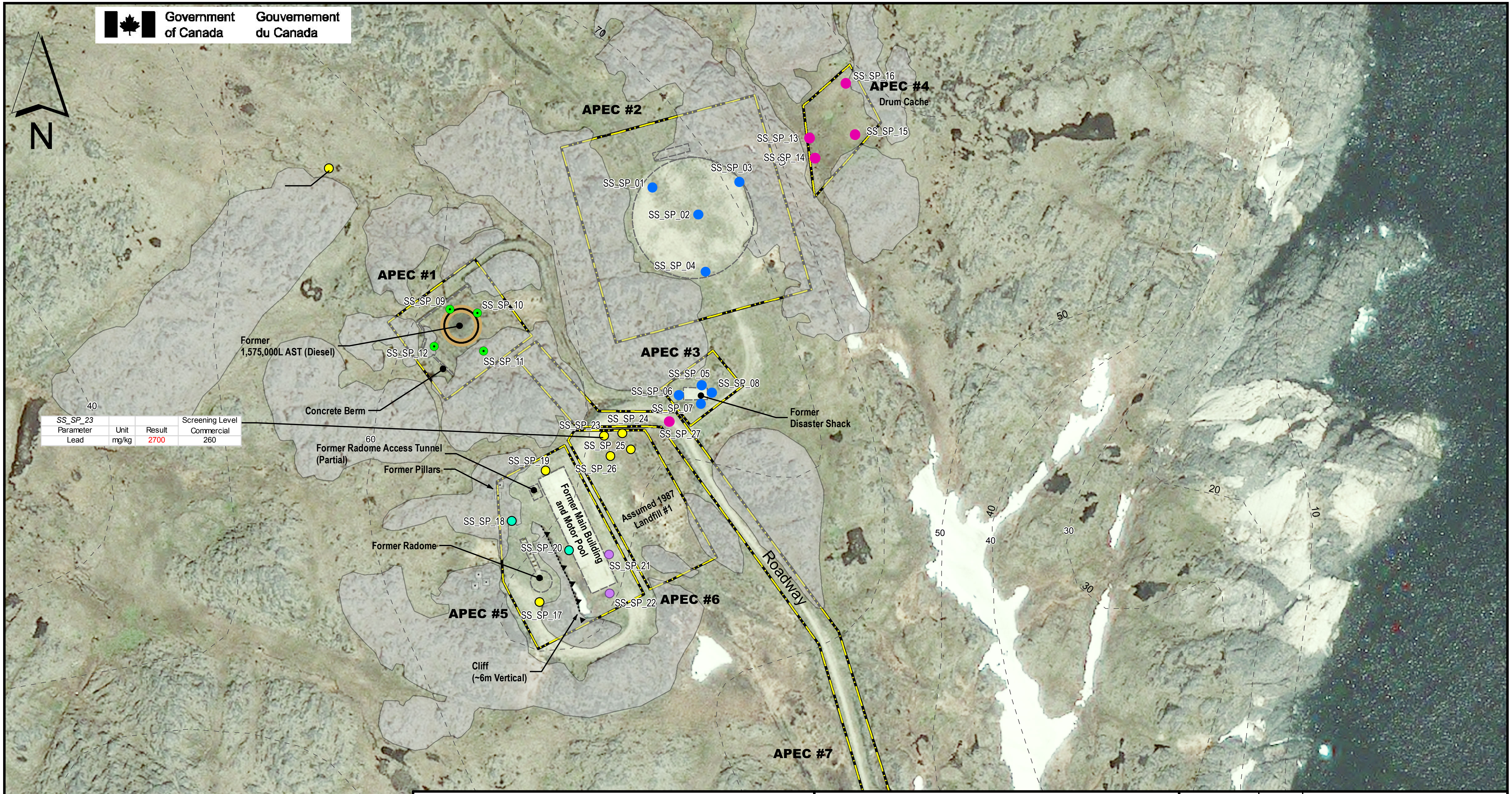
PROJECT: / PROJET: INITIAL TESTING PROGRAM AND NCSCS CLASSIFICATION FORMER PINETREE LINE RADAR STATION SPOTTED ISLAND, LABRADOR, NL.

SUBJECT: / SUJET: SEDIMENT AND SURFACE WATER SAMPLE EXCEEDANCE OF ECOLOGICAL SCREENING LEVELS LOWER SITE

DATE: OCTOBER 2018

GEMTEC Consulting Engineers and Scientists

APPROVED: APPROUVÉ PAR:	MC
	ML
SCALE: ÉCHELLE:	1:1,500
WBS NO.: NO. OTP:	NL17AS01
PF NO.: NO. DP:	65745
DWG NO.: NO. DESSIN:	10550.04.02 - Drawing 16



Samples Analyzed For:
- PHC
- PHC, PAH
- PHC, Metals
- PHC, PAH, Metals
- PHC, PAH, Metals, PCBs
- PHC, PAH, Metals, PCBs, VOCs

Red Text = Exceedance

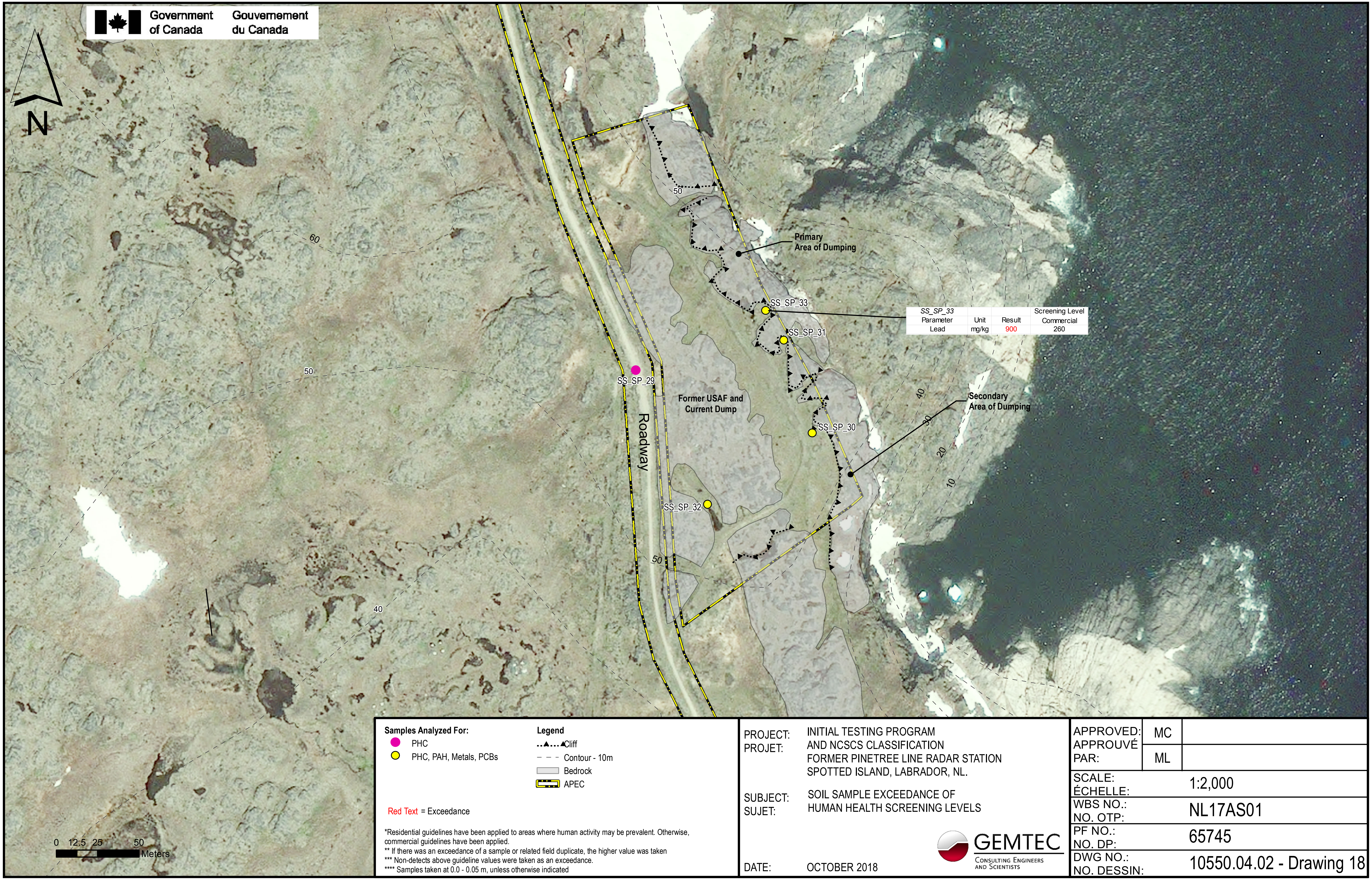
*Residential guidelines have been applied to areas where human activity may be prevalent. Otherwise, commercial guidelines have been applied.
** If there was an exceedance of a sample or related field duplicate, the higher value was taken
*** Non-detects above guideline values were taken as an exceedance.
**** Samples taken at 0.0 - 0.05 m, unless otherwise indicated

Legend
- Pillars
- Cliff
- Contour - 10m
- Concrete Structure
- Former Fuel Stores
- Former Barracks
- Bedrock
- APEC

PROJECT: PROJET:	INITIAL TESTING PROGRAM AND NCSCS CLASSIFICATION FORMER PINETREE LINE RADAR STATION SPOTTED ISLAND, LABRADOR, NL.
SUBJECT: SUJET:	SOIL SAMPLE EXCEEDANCE OF HUMAN HEALTH SCREENING LEVELS UPPER SITE
DATE:	OCTOBER 2018

GEMTEC
Consulting Engineers and Scientists

APPROVED: APPROUVÉ PAR:	MC
	ML
SCALE: ÉCHELLE:	1:2,000
WBS NO.: NO. OTP:	NL17AS01
PF NO.: NO. DP:	65745
DWG NO.: NO. DESSIN:	10550.04.02 - Drawing 17



SS_SP_33			Screening Level
Parameter	Unit	Result	Commercial
Lead	mg/kg	900	260

Samples Analyzed For:

- PHC
- PHC, PAH, Metals, PCBs

Legend

- Cliff
- Contour - 10m
- Bedrock
- APEC

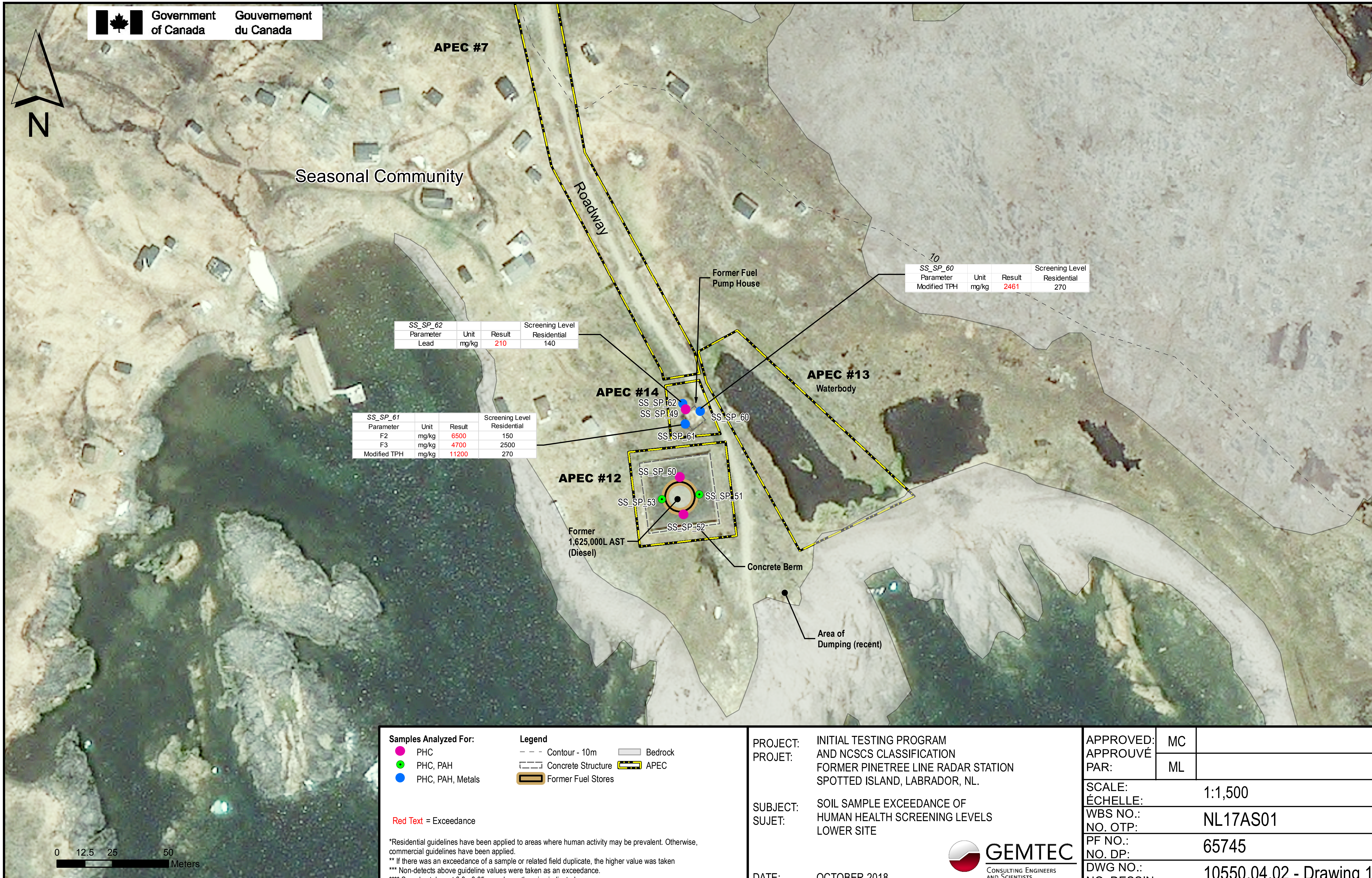
Red Text = Exceedance

*Residential guidelines have been applied to areas where human activity may be prevalent. Otherwise, commercial guidelines have been applied.
** If there was an exceedance of a sample or related field duplicate, the higher value was taken
*** Non-detects above guideline values were taken as an exceedance.
**** Samples taken at 0.0 - 0.05 m, unless otherwise indicated

PROJECT: PROJET:	INITIAL TESTING PROGRAM AND NCSCS CLASSIFICATION FORMER PINETREE LINE RADAR STATION SPOTTED ISLAND, LABRADOR, NL.
SUBJECT: SUJET:	SOIL SAMPLE EXCEEDANCE OF HUMAN HEALTH SCREENING LEVELS
DATE:	OCTOBER 2018

GEMTEC
CONSULTING ENGINEERS AND SCIENTISTS

APPROVED: APPROUVÉ PAR:	MC	
	ML	
SCALE: ÉCHELLE:	1:2,000	
WBS NO.: NO. OTP:	NL17AS01	
PF NO.: NO. DP:	65745	
DWG NO.: NO. DESSIN:	10550.04.02 - Drawing 18	



SS_SP_60			Screening Level
Parameter	Unit	Result	Residential
Modified TPH	mg/kg	2461	270

SS_SP_62			Screening Level
Parameter	Unit	Result	Residential
Lead	mg/kg	210	140

SS_SP_61			Screening Level
Parameter	Unit	Result	Residential
F2	mg/kg	6500	150
F3	mg/kg	4700	2500
Modified TPH	mg/kg	11200	270

Samples Analyzed For:
- PHC
- PHC, PAH
- PHC, PAH, Metals

Legend
- Contour - 10m
- Concrete Structure
- Former Fuel Stores
- Bedrock
- APEC

Red Text = Exceedance

*Residential guidelines have been applied to areas where human activity may be prevalent. Otherwise, commercial guidelines have been applied.
** If there was an exceedance of a sample or related field duplicate, the higher value was taken
*** Non-detects above guideline values were taken as an exceedance.
**** Samples taken at 0.0 - 0.05 m, unless otherwise indicated

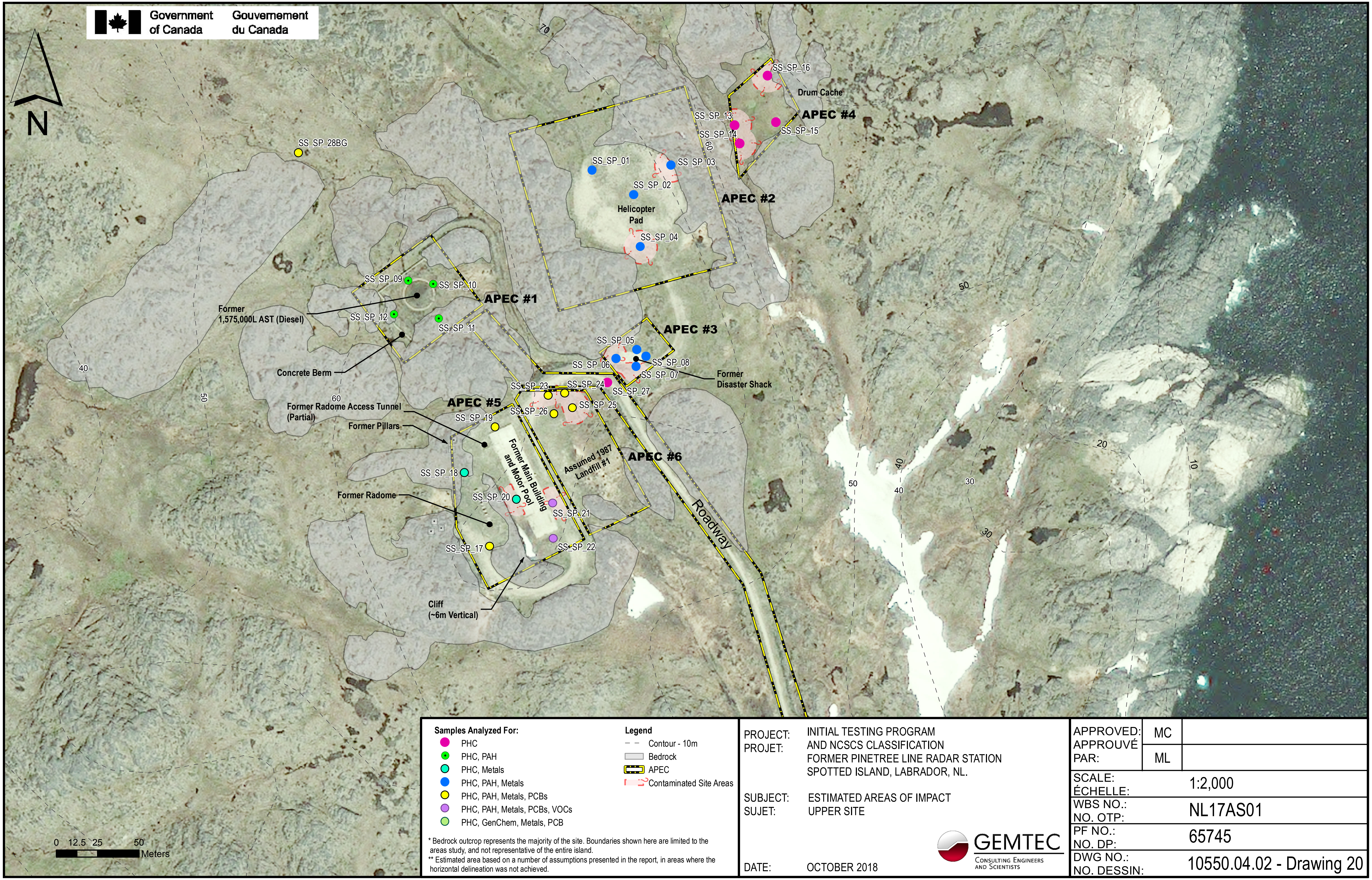
PROJECT: / PROJET: INITIAL TESTING PROGRAM AND NCSCS CLASSIFICATION FORMER PINETREE LINE RADAR STATION SPOTTED ISLAND, LABRADOR, NL.

SUBJECT: / SUJET: SOIL SAMPLE EXCEEDANCE OF HUMAN HEALTH SCREENING LEVELS LOWER SITE

DATE: OCTOBER 2018

GEMTEC Consulting Engineers and Scientists

APPROVED: / APPROUVÉ PAR:	MC ML
SCALE: / ÉCHELLE:	1:1,500
WBS NO.: / NO. OTP:	NL17AS01
PF NO.: / NO. DP:	65745
DWG NO.: / NO. DESSIN:	10550.04.02 - Drawing 19



Samples Analyzed For:

- PHC
- PHC, PAH
- PHC, Metals
- PHC, PAH, Metals
- PHC, PAH, Metals, PCBs
- PHC, PAH, Metals, PCBs, VOCs
- PHC, GenChem, Metals, PCB

Legend

- Contour - 10m
- Bedrock
- APEC
- Contaminated Site Areas

* Bedrock outcrop represents the majority of the site. Boundaries shown here are limited to the areas study, and not representative of the entire island.

** Estimated area based on a number of assumptions presented in the report, in areas where the horizontal delineation was not achieved.

PROJECT: PROJET:	INITIAL TESTING PROGRAM AND NCSCS CLASSIFICATION FORMER PINETREE LINE RADAR STATION SPOTTED ISLAND, LABRADOR, NL.
SUBJECT: SUJET:	ESTIMATED AREAS OF IMPACT UPPER SITE
DATE:	OCTOBER 2018

GEMTEC
Consulting Engineers and Scientists

APPROVED: APPROUVÉ PAR:	MC / ML
SCALE: ÉCHELLE:	1:2,000
WBS NO.: NO. OTP:	NL17AS01
PF NO.: NO. DP:	65745
DWG NO.: NO. DESSIN:	10550.04.02 - Drawing 20

Samples Analyzed For:

- PHC
- PHC, PAH, Metals, PCBs

Legend

- Contour - 10m
- Bedrock
- APEC
- Contaminated Site Areas

* Bedrock outcrop represents the majority of the site. Boundaries shown here are limited to the areas study, and not representative of the entire island.
** Estimated area based on a number of assumptions presented in the report, in areas where the horizontal delineation was not achieved.

PROJECT: PROJET:	INITIAL TESTING PROGRAM AND NCSCS CLASSIFICATION FORMER PINETREE LINE RADAR STATION SPOTTED ISLAND, LABRADOR, NL.
SUBJECT: SUJET:	ESTIMATED AREAS OF IMPACT
DATE:	OCTOBER 2018

GEMTEC
Consulting Engineers and Scientists

APPROVED: APPROUVÉ PAR:	MC ML
SCALE: ÉCHELLE:	1:2,000
WBS NO.: NO. OTP:	NL17AS01
PF NO.: NO. DP:	65745
DWG NO.: NO. DESSIN:	10550.04.02 - Drawing 21

Samples Analyzed For:
- PHC, PAH, Metals, PCBs
- PHC, PAH, Metals, PCBs, VOCs
- PHC, GenChem, Metals, PCB

Legend
- Contour - 10m
- Bedrock
- APEC
- Contaminated Site Areas

* Bedrock outcrop represents the majority of the site. Boundaries shown here are limited to the areas study, and not representative of the entire island.
** Estimated area based on a number of assumptions presented in the report, in areas where the horizontal delineation was not achieved.

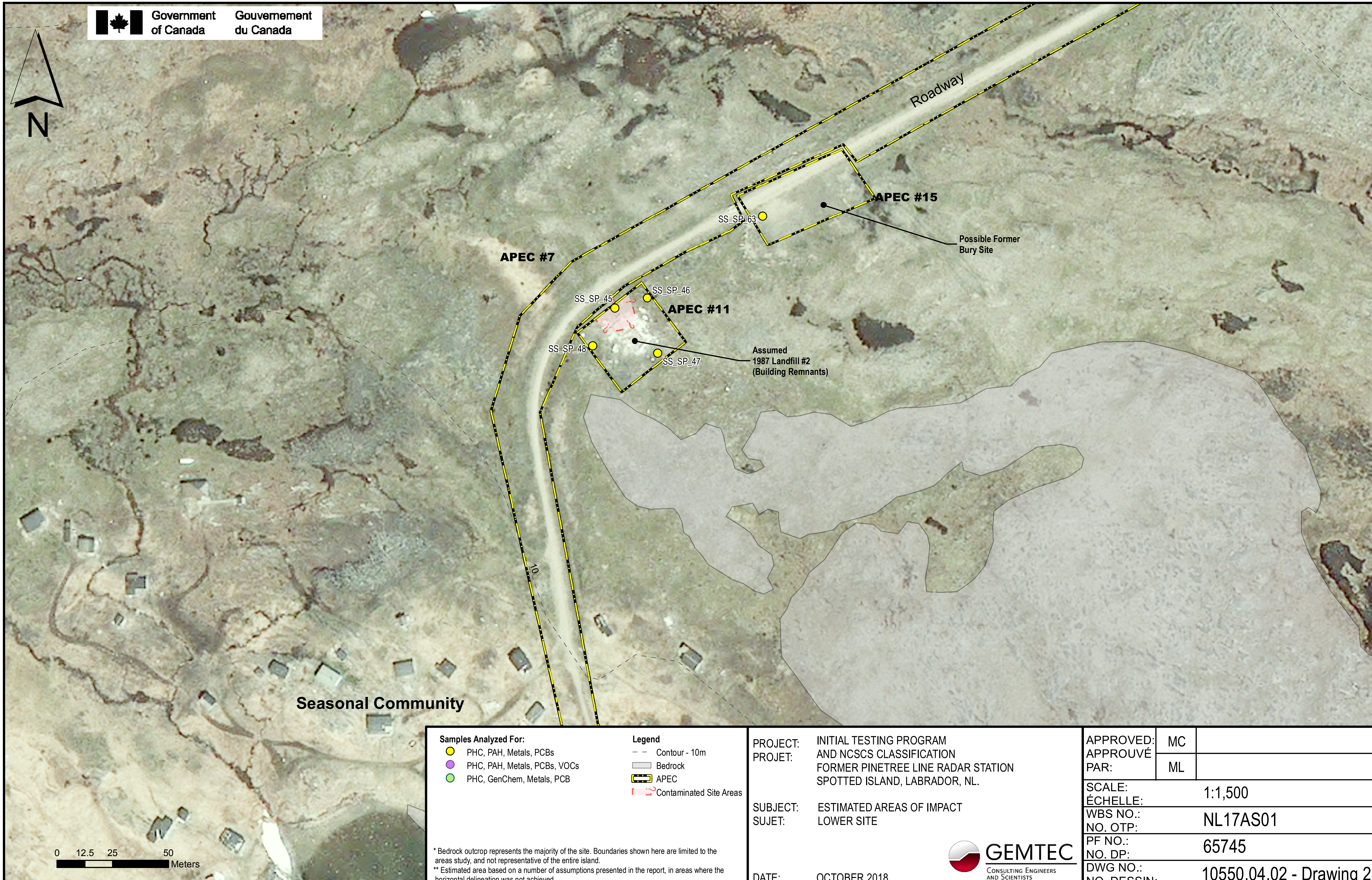
PROJECT: / PROJET: INITIAL TESTING PROGRAM AND NCSCS CLASSIFICATION FORMER PINETREE LINE RADAR STATION SPOTTED ISLAND, LABRADOR, NL.

SUBJECT: / SUJET: ESTIMATED AREAS OF IMPACT

DATE: OCTOBER 2018

GEMTEC
CONSULTING ENGINEERS AND SCIENTISTS

APPROVED: / APPROUVÉ PAR:	MC / ML
SCALE: / ÉCHELLE:	1:2,500
WBS NO.: / NO. OTP:	NL17AS01
PF NO.: / NO. DP:	65745
DWG NO.: / NO. DESSIN:	10550.04.02 - Drawing 22



Samples Analyzed For:
- PHC, PAH, Metals, PCBs
- PHC, PAH, Metals, PCBs, VOCs
- PHC, GenChem, Metals, PCB

Legend
- Contour - 10m
- Bedrock
- APEC
- Contaminated Site Areas

* Bedrock outcrop represents the majority of the site. Boundaries shown here are limited to the areas study, and not representative of the entire island.
** Estimated area based on a number of assumptions presented in the report, in areas where the horizontal delineation was not achieved.

PROJECT: PROJET:	INITIAL TESTING PROGRAM AND NCSCS CLASSIFICATION FORMER PINETREE LINE RADAR STATION SPOTTED ISLAND, LABRADOR, NL.
SUBJECT: SUJET:	ESTIMATED AREAS OF IMPACT LOWER SITE
DATE:	OCTOBER 2018

GEMTEC Consulting Engineers and Scientists

APPROVED: APPROUVÉ PAR:	MC
	ML
SCALE: ÉCHELLE:	1:1,500
WBS NO.: NO. OTP:	NL17AS01
PF NO.: NO. DP:	65745
DWG NO.: NO. DESSIN:	10550.04.02 - Drawing 23

Samples Analyzed For:

- PHC
- PHC, PAH
- PHC, PAH, Metals
- PHC, GenChem, Metals, PCB
- PHC, PAH, GenChem, Metals, PCB

Legend

- Contour - 10m
- Bedrock
- APEC
- Contaminated Site Areas

* Bedrock outcrop represents the majority of the site. Boundaries shown here are limited to the areas study, and not representative of the entire island.
** Estimated area based on a number of assumptions presented in the report, in areas where the horizontal delineation was not achieved.

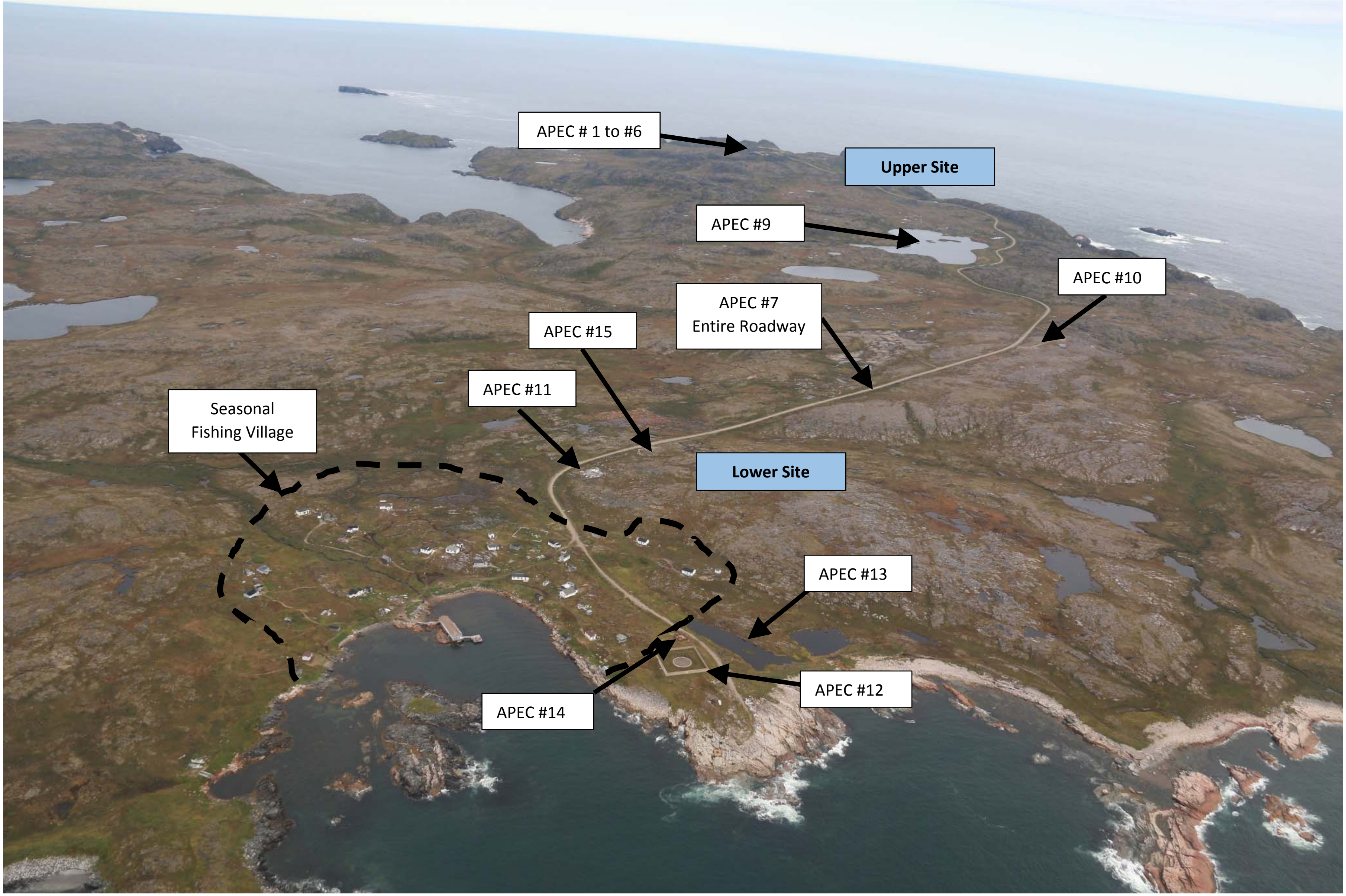
PROJECT: PROJET:	INITIAL TESTING PROGRAM AND NCSCS CLASSIFICATION FORMER PINETREE LINE RADAR STATION SPOTTED ISLAND, LABRADOR, NL.
SUBJECT: SUJET:	ESTIMATED AREAS OF IMPACT LOWER SITE
DATE:	OCTOBER 2018

GEMTEC
Consulting Engineers and Scientists

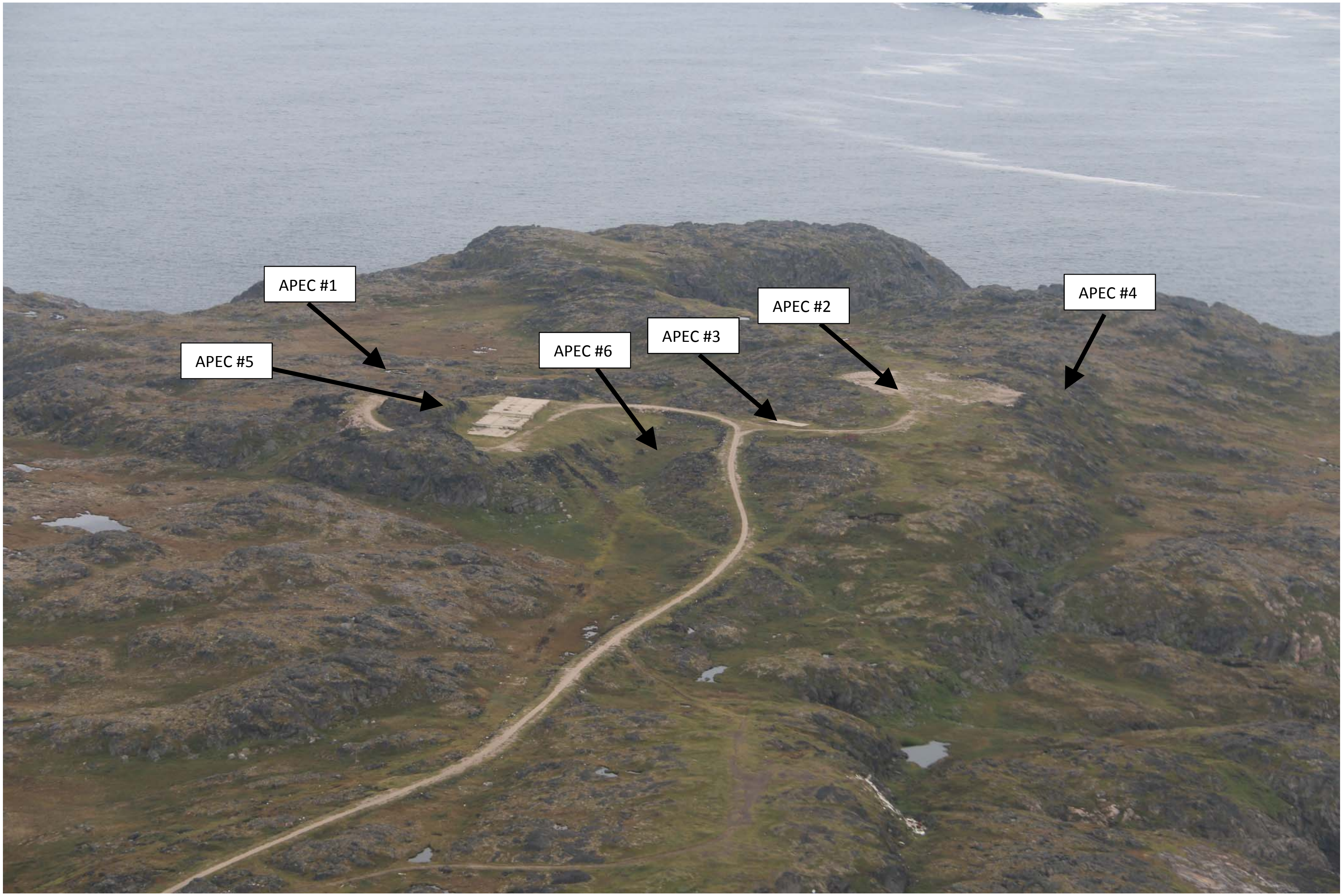
APPROVED: APPROUVÉ PAR:	MC
	ML
SCALE: ÉCHELLE:	1:1,500
WBS NO.: NO. OTP:	NL17AS01
PF NO.: NO. DP:	65745
DWG NO.: NO. DESSIN:	10550.04.02 - Drawing 24

APPENDIX B

Selected Site Photographs and Google Earth® Topography



APECs on Spotted Island; photograph taken during aerial flyover of the Site (September, 2017).



APECs on Spotted Island; photograph taken during aerial flyover of the Site (September, 2017).

PHOTO 1 - Aerial view of Spotted Island, approaching from the south (September, 2017).

PHOTO 2 - Aerial view of the Lower site showing former AST pad, adjacent seasonal village, and adjacent surface water body (September, 2017).

PHOTO 3 - Aerial view of gravel roadway (approximately 3 km) between the Lower site (left) and Upper site (out of view to the right) (September, 2017).

PHOTO 4 - Aerial view of surface water body historically used as a potable water source (September, 2017).

PHOTO 5 - Aerial view of the Upper site, approaching from the north. Helicopter pad, former AST pad, and remains of Main building foundation visible (September, 2017).

PHOTO 6 - Aerial view of Main building foundation, and, to the right, what appeared to be a drum cached based on satellite imagery (arrow) (September, 2017).

GEMTEC
CONSULTING ENGINEERS AND SCIENTISTS

PHOTO 7 - View of what appeared to be a drum cache (arrow). Structures are remains of supports for former tunnel between Main building and the Radom (September, 2017).

PHOTO 8 - APEC #1: View of the Upper site. (September, 2017)

PHOTO 9 - APEC #1: View of Former Helicopter Pad (arrow). (September, 2017)

PHOTO 10 - APEC #1: View of concrete perimeter wall. (September, 2017)

PHOTO 11 - APEC #1: Bedrock, forming a natural perimeter wall. (September, 2017)

PHOTO 12 - APEC #1: (Helicopter pad) facing west toward Main building.
(September, 2017)

PHOTO 13 - APEC #2: Helicopter pad, facing northeast. (September, 2017)

PHOTO 14 - APEC #2: View of rock outcrops to the side of the former Helicopter Pad. (September, 2017)

PHOTO 15 - APEC #3: Disaster shack showing intact concrete slab. (September, 2017)

PHOTO 16 - APEC #3: Concrete slab of former Disaster Shack. (September, 2017)

PHOTO 17 - APEC #4 (Preliminary): Presumed drum cache. No environmental concerns identified. (September, 2017).

PHOTO 18 - APEC #4: View of drums discarded over the embankment east of APEC #2, which became APEC #4 (adjusted): drum cache. (September, 2017)

PHOTO 19 - APEC #4 (adjusted): Approximately 20—30 discarded barrels were found. (September, 2017)

PHOTO 20 - APEC #4 (adjusted): Close up view of a discarded drum. Contents of barrel not confirmed, but presumed to be PHC, used for fueling helicopters. (September, 2017)

PHOTO 21 - APEC #4: View of drum buried under vegetation. (September, 2017)

PHOTO 22 - APEC #4: Another view of drums. (September, 2017)

PHOTO 23 - APEC #4: Remaining ring of a drum. (September, 2017)

PHOTO 24 - APEC #4: Another view of a degraded drum. (September, 2017)

PHOTO 25 - APEC #5: Main building showing step foundation. (September, 2017)

PHOTO 26 - APEC #5: View of penetrations through the slab of the Main building. Metal fittings presumed to be lead-containing. (September, 2017)

PHOTO 27 - APEC #5: View of concrete supports. (September, 2017)

PHOTO 28 - APEC #5: View of cliff face. (September, 2017)

PHOTO 29 - APEC #5: View of stepped concrete slab. (September, 2017)

PHOTO 30 - APEC #5: View of former main building concrete slab. (September, 2017)

PHOTO 31 - APEC #5: View of former main building concrete slab. (September, 2017)

PHOTO 32 - APEC #5: View of pipe in the former main building concrete slab. (September, 2017)

PHOTO 33 - APEC #5: View of holes in the former main building concrete slab. (September, 2017)

PHOTO 34 - APEC #5: View of former main building concrete slab. Slab is in good condition in most areas, but is degraded in other areas. (September, 2017)

PHOTO 35 - APEC #5: View of potential ACM debris. (September, 2017)

PHOTO 36 - APEC #5: View of pipes in former main building concrete slab.

(September, 2017)

PHOTO 37 - APEC #5: View of raised concrete blocks in former main building concrete slab. (September, 2017)

PHOTO 38 - APEC #5: Another view of former main building concrete slab, with raised concrete blocks to the left. (September, 2017)

PHOTO 39 - APEC #5: View of stepping in former main building concrete foundation. (September, 2017)

PHOTO 40 - APEC #5: View of stepping in former main building concrete foundation. Access road to the right. (September, 2017)

PHOTO 41 – APEC #6 (Preliminary): Rock face appeared in satellite imagery to be a crevasse where landfilling may have occurred. No environmental concerns identified. (September, 2017)

PHOTO 42 - APEC #6: Depression located adjacent to the former main building concrete foundation. (September, 2017)

PHOTO 43 – APEC #6: View of some debris (plastic, small metal objects, a buried, was observed in this area). (September, 2017)

PHOTO 44 - APEC #6: Test Pit completed in the depression area. (September, 2017)

PHOTO 45 – APEC #6: Area immediately east of APEC #5, where evidence of buried debris was noted. (September, 2017)

PHOTO 46 - APEC #6: Close up view of debris. (September, 2017)

PHOTO 47 – APEC #7: Gravel access road that connects the Upper Site to the lower Site, still in good condition. (September, 2017)

PHOTO 48 - APEC 7: Gravel access road that connects the Upper Site to the Lower Site, still in good condition. (September, 2017)

PHOTO 49 – APEC #7: Gravel access road that connects the Upper Site to the lower Site, still in good condition. (September, 2017)

PHOTO 50 - APEC #7: Gravel access road that connects the Upper Site to the Lower Site, still in good condition. (September, 2017)

PHOTO 51 – APEC #7: Gravel access road that connects the Upper Site to the lower Site, still in good condition. (September, 2017)

PHOTO 52 - APEC #7: Gravel access road that connects the Upper Site to the Lower Site, still in good condition. (September, 2017)

PHOTO 53 – APEC #7: Gravel access road that connects the Upper Site to the lower Site, still in good condition. (September, 2017)

PHOTO 54 - APEC #7: Gravel access road that connects the Upper Site to the Lower Site, still in good condition. (September, 2017)

PHOTO 55 – APEC #7: Gravel roadway between the Upper and Lower sites, Above ground fuel line was historically present adjacent to the roadway. (September, 2017)

PHOTO 56 - APEC #8: Areal view of USAF (and current) dump. (September, 2017)

PHOTO 57 – APEC #8: Debris located down a cliff. (September, 2017)

PHOTO 58 - APEC #8: View of waste down the cliff. (September, 2017)

PHOTO 59 – APEC #8: Second debris disposal area of off the cliff. (September, 2017)

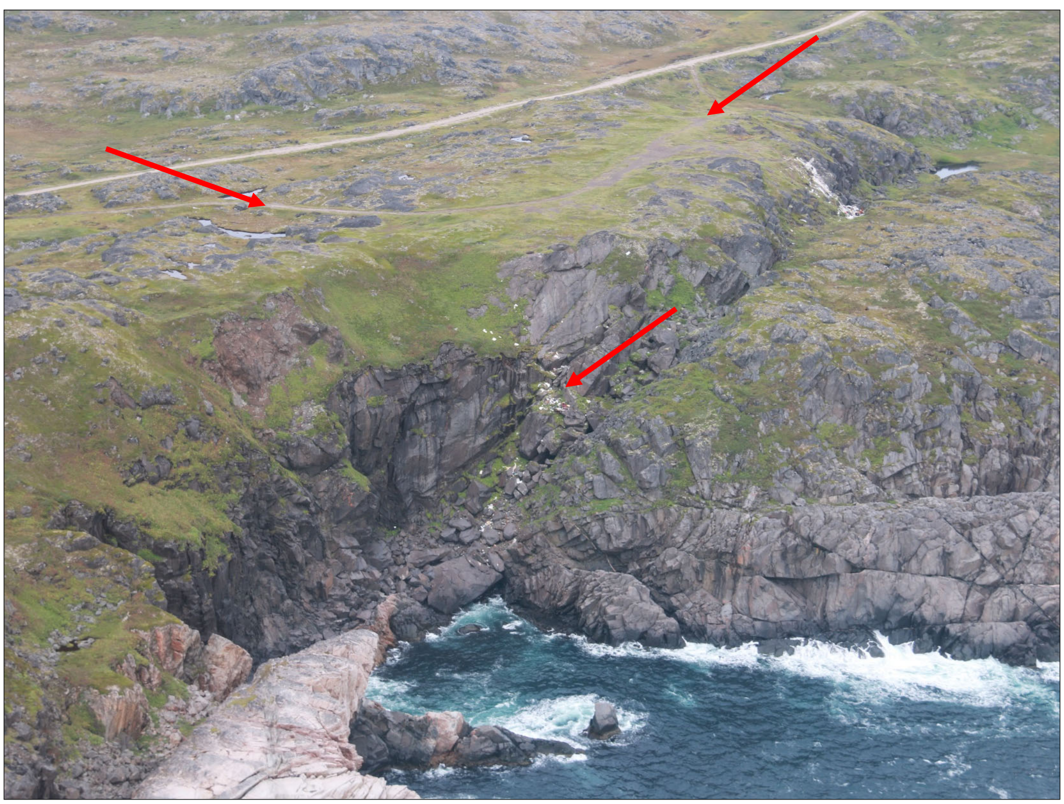


PHOTO 60 - APEC #8: Areal view of roadway leading into APEC #8, and dump areas (arrows). (September 2017)

PHOTO #61– APEC #8: Waste disposed at APEC #8 (includes modern domestic waste). (September, 2017)

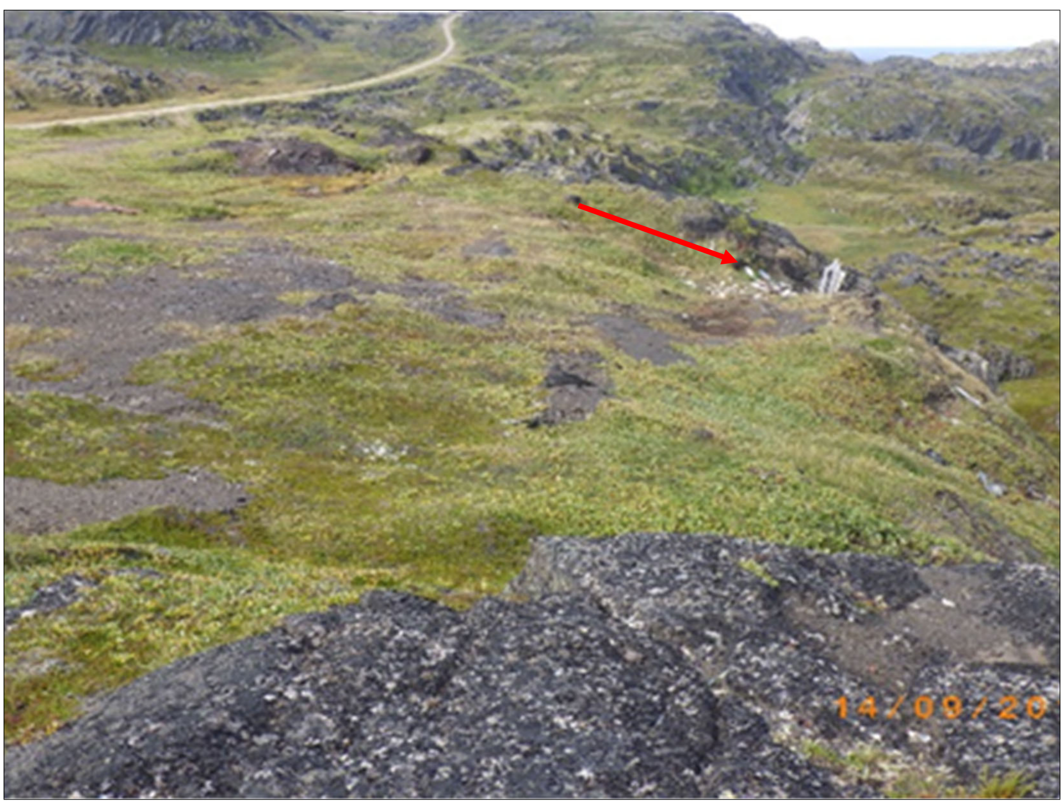


PHOTO 62 - APEC #8: View of cliff, where waste is deposited (arrow). (September 2017)

PHOTO 63– APEC #9: Former pump house concrete foundation. (September, 2017)

PHOTO 64 - APEC #9: Pump house and water source, showing remains of pump house foundation. (September 2017)

PHOTO 65– APEC #9: View of surface water body from the former pump house concrete foundation. ATV belongs to seasonal resident (September, 2017)

PHOTO 66 - APEC #9: View of substrate in the surface water body. (September 2017)

PHOTO 67– APEC #9: View of surface water body. (September, 2017)

PHOTO 68 - APEC #9: View of surface water body. (September 2017)

PHOTO 69– APEC #9: Remnants of water intake pipe (arrow). (September, 2017)

PHOTO 70 - APEC #9: View of former pump house concrete foundation and surface water body. (September 2017)

PHOTO 71– APEC #10: Bury / dump site. Debris is dumped directly on exposed bedrock thus no soil samples were collected. (September 2017)

PHOTO 72 - APEC #10: View of waste disposed on bedrock. (September 2017)

PHOTO 73– APEC #10: View of waste disposed on bedrock. (September 2017)

PHOTO 74 - APEC #10: View of waste disposed on bedrock. (September 2017)

PHOTO 75– APEC #10: View of floor tile waste disposed on bedrock. (September 2017)

PHOTO 76 - APEC #10: View of waste disposed on bedrock. (September 2017)

PHOTO 77– APEC #11: View of remains of a painted wooded structure and scattered building materials debris. (September, 2017)

PHOTO 78 - APEC #11: Close-up view of remains of a painted wooded structure, showing proximity to seasonal community to the south (background). (September 2017)

PHOTO 79– APEC #11: Remains of a painted wooded structure and scattered building material debris. Seasonal village observed in the background. (September, 2017)

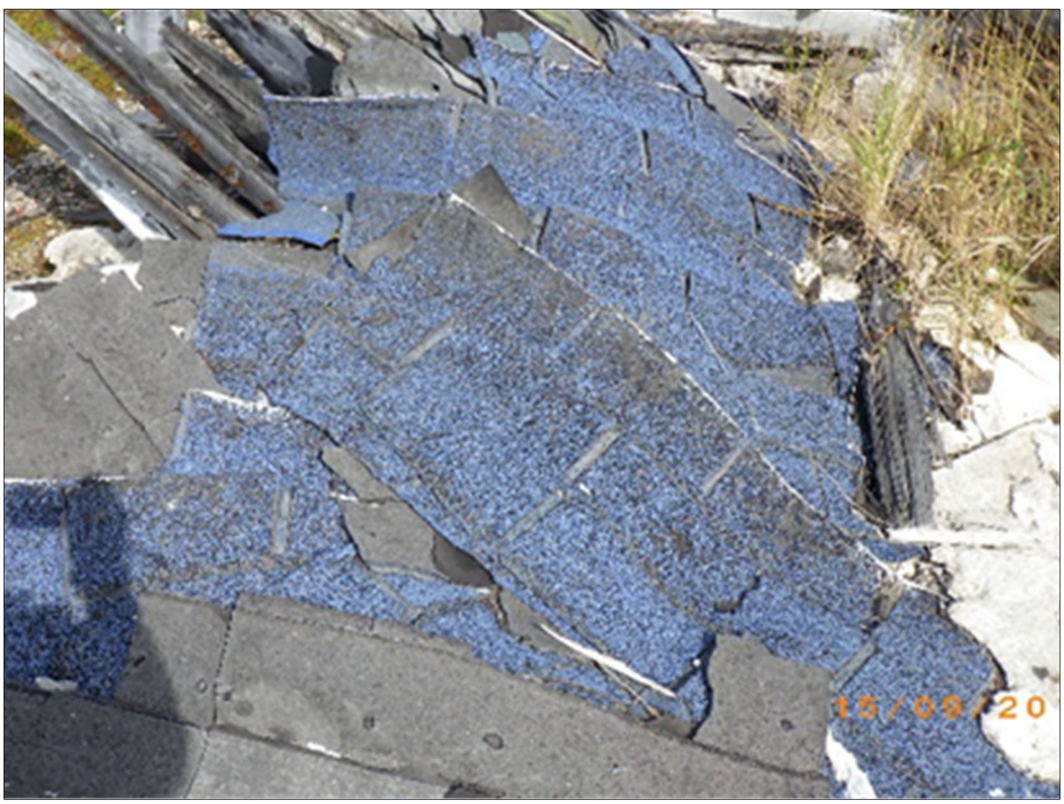


PHOTO 80 - APEC #11: View of asphalt shingles disposed of at APEC #11.

(September 2017)

PHOTO 81– APEC #11: View of waste disposed of at APEC #11. (September, 2017)

PHOTO 82 - APEC #11: View of remains of a painted wooded structured. Seasonal village observed in the background. (September 2017)

PHOTO 83– APEC #11: View of debris disposed of at APEC #11. (September, 2017)

PHOTO 84 - APEC #11: View of debris disposed of at APEC #11. (September, 2017)

PHOTO 85– APEC #12: Pad and berm surrounding former AST at the Lower Site. (September, 2017)

PHOTO 86— APEC #12: Concrete berm around former AST location at the Lower Site. (September 2017)

PHOTO 87– APEC #12: Concrete berm around former AST location at the Lower Site, with the gravel access road to the right. (September, 2017)

PHOTO 88— APEC #12: Surface water bodies present to the right of the grave roadway. (September 2017)

PHOTO 89– APEC #12: View of a boat on the shore near APEC #12 with the Labrador Sea located in the background. (September, 2017)

PHOTO 90— APEC #12: View of concrete berm at APEC #12 with a seasonal village seen in the background. (September 2017)

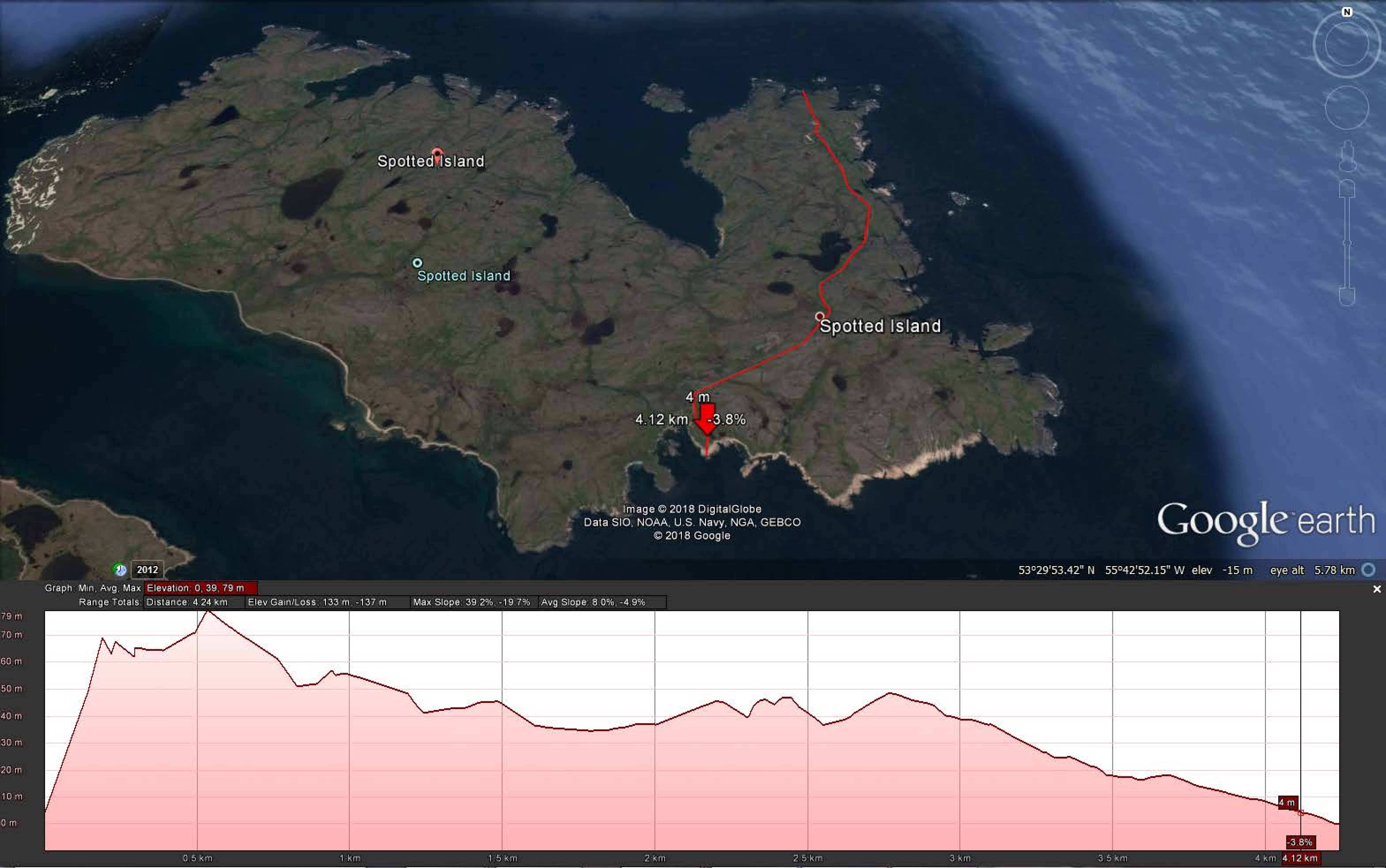
PHOTO 91– APEC #12: Modern dump where seasonal residents dispose of their waste. (September, 2017).

PHOTO 92— APEC #13: Waterbody at the Lower site. (September 2017)

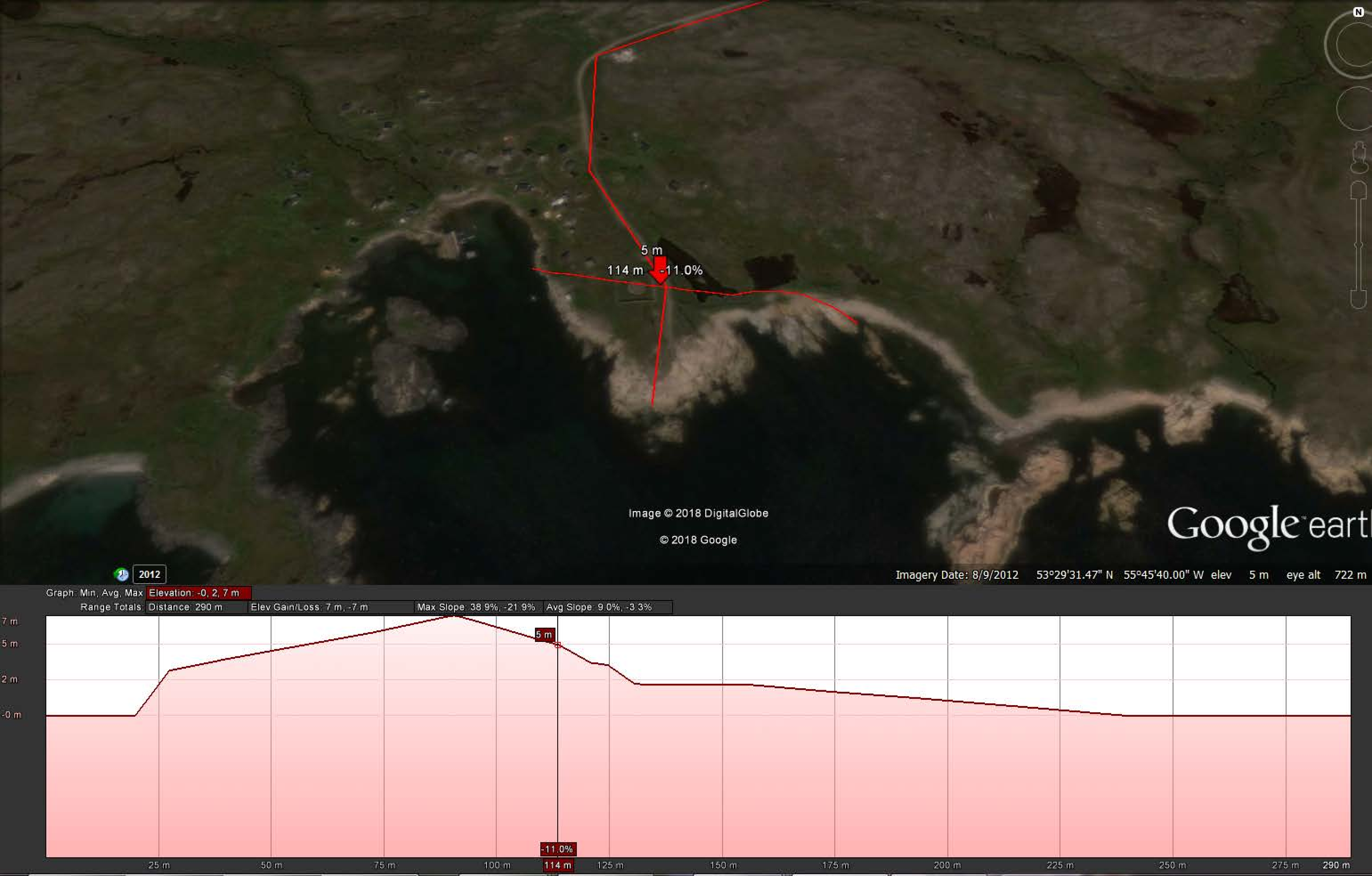
PHOTO 93- APEC #14: Presumed pump house associated with the Lower site AST. (September, 2017)

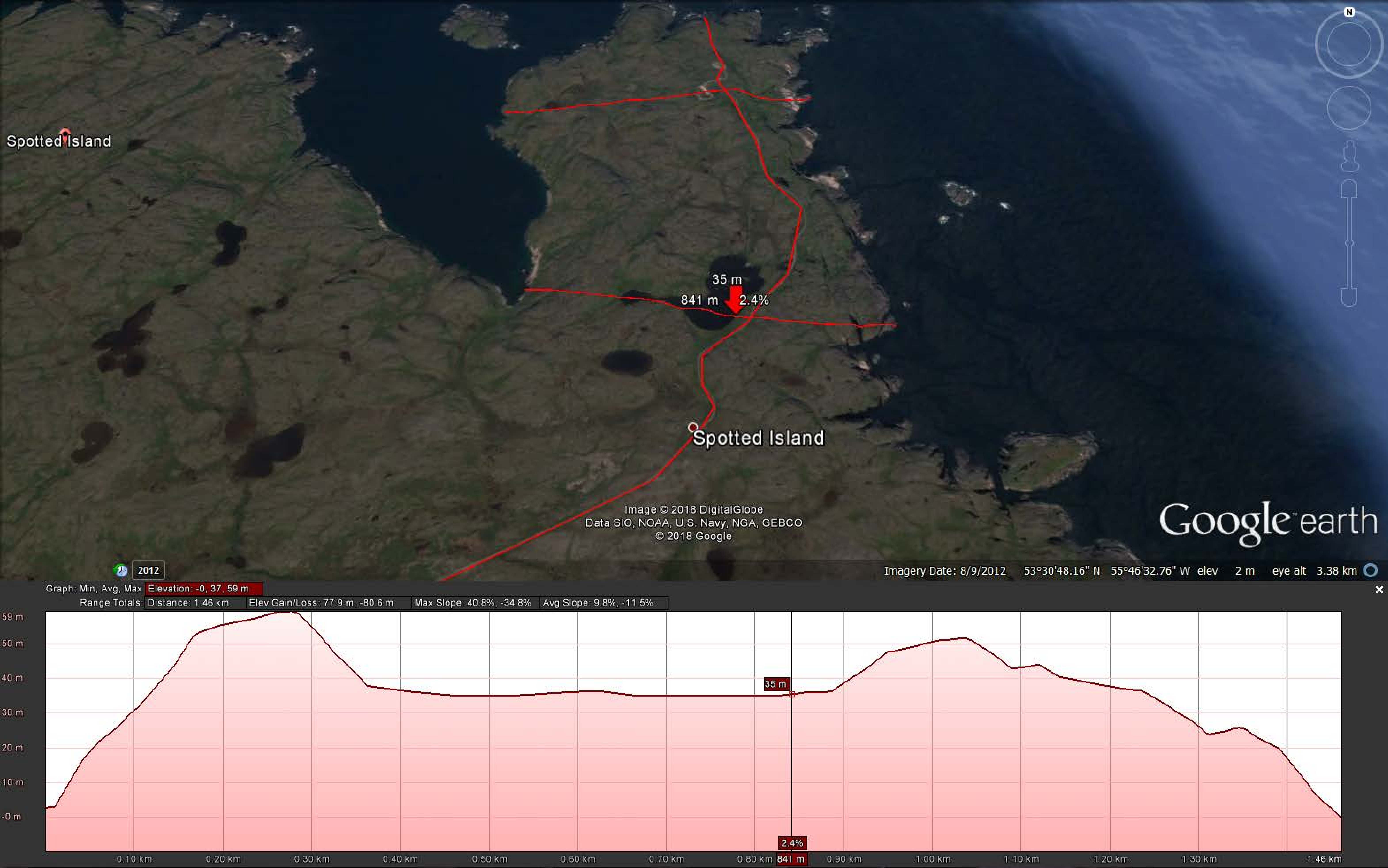
PHOTO 94 - APEC #15: Possible bury site suspected as landscaping is inconsistent with the rest of the Site. (September 2017)

PHOTO 95 - APEC #15: Possible rock pit / quarry identified in the Site reconnaissance. No environmental concerns were identified. (September, 2017)



Spotted Island
Spotted Island
Spotted Island
4 m
4.12 km
-3.8%
Image © 2018 DigitalGlobe
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
© 2018 Google
Google earth
2012
53°29'53.42" N 55°42'52.15" W elev -15 m eye alt 5.78 km
Graph: Min, Avg, Max Elevation: 0, 39, 79 m
Range Totals: Distance: 4.24 km Elev Gain/Loss: 133 m, -137 m Max Slope: 39.2%, -19.7% Avg Slope: 8.0%, -4.9%
79 m
70 m
60 m
50 m
40 m
30 m
20 m
10 m
0 m
0.5 km
1 km
1.5 km
2 km
2.5 km
3 km
3.5 km
4 km
4.12 km


5 m
114 m
-11.0%
Image © 2018 DigitalGlobe
© 2018 Google
Google earth
2012
Imagery Date: 8/9/2012
53°29'31.47" N
55°45'40.00" W
elev 5 m
eye alt 722 m
Graph: Min, Avg, Max
Elevation: -0, 2, 7 m
Range Totals:
Distance: 290 m
Elev Gain/Loss: 7 m, -7 m
Max Slope: 38.9%, -21.9%
Avg Slope: 9.0%, -3.3%
7 m
5 m
2 m
-0 m
25 m
50 m
75 m
100 m
125 m
150 m
175 m
200 m
225 m
250 m
275 m
290 m



Spotted Island
35 m
841 m
2.4%
Spotted Island
Image © 2018 DigitalGlobe
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
© 2018 Google
Google earth
2012
Imagery Date: 8/9/2012
53°30'48.16" N 55°46'32.76" W elev 2 m eye alt 3.38 km
Graph: Min, Avg, Max Elevation: -0, 37, 59 m
Range Totals Distance: 1.46 km Elev Gain/Loss: 77.9 m, -80.6 m Max Slope: 40.8%, -34.8% Avg Slope: 9.8%, -11.5%
59 m
50 m
40 m
30 m
20 m
10 m
-0 m
35 m
2.4%
0.10 km
0.20 km
0.30 km
0.40 km
0.50 km
0.60 km
0.70 km
0.80 km
841 m
0.90 km
1.00 km
1.10 km
1.20 km
1.30 km
1.46 km


67 m
989 m
2.5%
Image © 2018 DigitalGlobe
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
© 2018 Google
Google earth
2012
Imagery Date: 8/9/2012 53°30'59.90" N 55°44'52.69" W elev 67 m eye alt 1.98 km
Graph: Min, Avg, Max Elevation: -0, 36, 71 m
Range Totals: Distance: 1.40 km Elev Gain/Loss: 77.5 m, -83 m Max Slope: 31.7%, -40.9% Avg Slope: 10.3%, -12.3%
71 m
60 m
50 m
40 m
30 m
20 m
10 m
-0 m
0.10 km
0.20 km
0.30 km
0.40 km
0.50 km
0.60 km
0.70 km
0.80 km
0.90 km
1.10 km
1.20 km
1.30 km
1.40 km

APPENDIX C

Field Information

Table C1 - Soil Descriptions

Sample Location	Depth (mbgs)	Easting NAD83 (CSRS)	Northing NAD83 (CSRS)	Zone	Colour	Description	Fill Y/N	Stains Y/N	Petroleum Odours Y/N	VOC Reading (ppm)	Debris Type Present / Comment
SS_SP_01	0-0.05	582974.0408	5930655.925	21 N	Brown	Sand and gravel	N	N	N	0.0	
SS_SP_02	0-0.05	582998.95	5930641.128	21 N	Brown	Sand and gravel	N	N	N	0.0	
SS_SP_03	0-0.05	583021.6252	5930658.961	21 N	Brown	Sand and gravel	N	N	N	0.0	
SS_SP_04	0-0.05	583003.1059	5930609.673	21 N	Brown	Sand and gravel	N	N	N	0.0	
SS_SP_05	0-0.05	583000.8876	5930547.568	21 N	Brown	Sand, trace gravel	N	N	N	0.0	Organics
SS_SP_06	0-0.05	582988.3971	5930542.254	21 N	Brown	Sand and gravel	N	N	N	0.0	Organics
SS_SP_07	0-0.05	583000.5619	5930537.462	21 N	Brown	Sand and gravel	N	N	N	0.0	Organics
SS_SP_08	0-0.05	583006.416	5930543.581	21 N	Brown	Sand and gravel	N	N	N	0.0	Organics
SS_SP_09	0-0.05	582862.762	5930589.19	21 N	Black	Gravel	N	Y	N	0.0	Organics
SS_SP_10	0-0.05	582877.762	5930587.19	21 N	Brown	Gravel	N	Y	N	0.0	Organics
SS_SP_11	0-0.05	582881.239	5930566.443	21 N	Brown	Sand and gravel	N	N	Y	0.0	Organics
SS_SP_12	0-0.05	582853.999	5930568.856	21 N	Brown	Sand and gravel	N	N	Y	0.0	Organics
SS_SP_13	0-0.05	583060	5930683	21 N	Black	Sand, barrel cluster	N	N	N	0.0	Organics
SS_SP_14	0-0.05	583063	5930672	21 N	Black	Sand, barrel cluster	N	N	N	0.0	Organics
SS_SP_15	0-0.05	583085	5930685	21 N	Black	Sandy silt, heavy organics	N	N	N	0.0	Organics
SS_SP_16	0-0.05	583080	5930713	21 N	Black	Silty sand, organics	N	N	N	0.0	Organics
SS_SP_17	0-0.05	582912.0095	5930428.706	21 N	Brown	Sand and gravel	N	N	N	0.0	Organics
SS_SP_18	0-0.05	582896.7559	5930473.273	21 N	Brown	Sand and gravel	N	N	N	0.0	
SS_SP_19	0-0.05	582915.3672	5930500.915	21 N	Black	Sand and gravel	N	N	N	0.0	Organics
SS_SP_20	0-0.05	582928.1831	5930457.139	21 N	Brown	Sand and gravel	N	N	N	0.0	Organics
SS_SP_21	0-0.05	582950.1361	5930454.751	21 N	Brown	Sand and gravel	N	N	N	0.0	Organics
SS_SP_22	0-0.05	582950.4634	5930433.449	21 N	Brown	Sand, some gravel	N	N	N	0.0	Organics
SS_SP_23	0-0.05	582947.3921	5930519.841	21 N	Brown	Sand, silt, and gravel	Y	N	N	0.0	

Table C1 - Soil Descriptions

Sample Location	Depth (mbgs)	Easting NAD83 (CSRS)	Northing NAD83 (CSRS)	Zone	Colour	Description	Fill Y/N	Stains Y/N	Petroleum Odours Y/N	VOC Reading (ppm)	Debris Type Present / Comment
SS_SP_23_FD	0-0.06	582947.3921	5930519.841	22 N	Brown	Sand, silt, and gravel	Y	N	N	1.0	
SS_SP_24	0-0.05	582957.3178	5930521.128	21 N	Brown	Sand, silt, and gravel	Y	N	N	0.0	
SS_SP_25	0-0.05	582962.1152	5930512.31	21 N	Brown	Sand, silt, and gravel	Y	N	N	0.0	
SS_SP_26	0-0.05	582950.9025	5930508.775	21 N	Brown	Sand, silt, and gravel	Y	N	N	0.0	
SS_SP_27	0-0.05	582983.1568	5930527.614	21 N	Brown	Sand and gravel	N	N	N	0.0	Organics
SS_SP_28BG	0-0.05	582796.568	5930666.549	21 N	Brown	Sand and gravel	N	N	N	0.0	
SS_SP_29	0-0.05	583159.5939	5930149.889	21 N	Brown	0-0.02 m sand and gravel, 0.02-0.05 m sand and silt	N	N	N	0.0	Organics
SS_SP_30	0-0.05	583266	5930112	21 N	Brown	Brown silt, sand, and gravel	N	N	N	0.0	Organics
SS_SP_31	0-0.05	583249	5930168	21 N	Brown	Black sand and gravel	N	N	N	0.0	Organics
SS_SP_32	0-0.05	583202.9585	5930068.955	21 N	Brown	Sand, gravel, and silt	N	N	N	0.0	Organics
SS_SP_33	0-0.05	583238	5930186	21 N	Black	Sand and gravel	N	N	N	0.0	Organics
SS_SP_34	0-0.05	583107.6216	5929424.448	21 N	Brown	Sand and gravel	N	N	N	0.0	Organics
SS_SP_34_FD	0-0.05	583107.6216	5929424.448	21 N	Brown	Sand and gravel	N	N	N	0.0	Organics
SS_SP_35	0-0.05	583111.1981	5929428.226	21 N	Brown	Sand, silt, and gravel	N	N	N	0.0	Organics
SS_SP_36	0-0.05	583114.9048	5929424.019	21 N	Brown	Sand and gravel	N	N	N	0.0	Organics
SS_SP_37	0-0.05	583111.3207	5929420.257	21 N	Brown	Sand and gravel	N	N	N	0.0	Organics
SS_SP_38	0-0.05	583145.8423	5929238.039	21 N	Brown	Sand and silt	N	N	N	0.0	
SS_SP_39	0-0.05	582807.109	5928473.923	21 N	Brown	Sand and silt	N	N	N	0.0	
SS_SP_40	0-0.05	582803.1372	5928433.557	21 N	Brown	Sand and silt	N	N	N	0.0	
SS_SP_41	0-0.05	582843.0595	5928471.188	21 N	Brown	Sand and silt	N	N	N	0.0	
SS_SP_42	0-0.05	582872.6977	5928497.324	21 N	Brown	Sand and silt	N	N	N	0.0	
SS_SP_43	0-0.05	582896.3254	5928521.841	21 N	Brown	Sand and silt	N	N	N	0.0	
SS_SP_44	0-0.05	582130.9253	5928072.157	21 N	Brown	Sand and silt	N	N	N	0.0	

Table C1 - Soil Descriptions

Sample Location	Depth (mbgs)	Easting NAD83 (CSRS)	Northing NAD83 (CSRS)	Zone	Colour	Description	Fill Y/N	Stains Y/N	Petroleum Odours Y/N	VOC Reading (ppm)	Debris Type Present / Comment
SS_SP_45	0-0.05	582134.81	5928054.857	21 N	Brown	Sand and gravel	Y	N	N	0.0	Organics
SS_SP_46	0-0.05	582149.429	5928059.27	21 N	Brown	Sand and gravel	Y	N	N	0.0	Organics
SS_SP_47	0-0.05	582154.0537	5928034.655	21 N	Brown	Sand and gravel	Y	N	N	0.0	Organics
SS_SP_48	0-0.05	582124.904	5928037.888	21 N	Brown	Sand and gravel	Y	N	N	0.0	Organics
SS_SP_49	0-0.05	582172.3921	5927753.765	21 N	Brown	Sand and gravel	N	N	N	0.0	Organics
SS_SP_50	0-0.05	582169.7462	5927723.441	21 N	Black	Sand and gravel	N	Y	Y	0.0	Organics
SS_SP_51	0-0.05	582178.3473	5927715.657	21 N	Black	Sand and gravel	N	Y	Y	0.0	Organics
SS_SP_52	0-0.05	582171.3975	5927706.734	21 N	Black	Sand and gravel	N	Y	Y	0.0	Organics
SS_SP_53	0-0.05	582161.6266	5927713.527	21 N	Black	Sand and gravel	N	Y	Y	0.0	Organics
SS_SP_60	0-0.05	582178.836	5927752.916	21 N	Brown	Sand, some gravel	N	N	Y	0.0	Organics
SS_SP_61	0-0.05	582172.1779	5927747.176	21 N	Brown	Sand and gravel	N	N	Y	0.0	Organics
SS_SP_62	0-0.05	582171.1097	5927756.355	21 N	Brown	Sand and gravel	N	N	N	0.0	Organics
SS_SP_63	0-0.05	582201	5928096	21 N	Brown	Sand and gravel	N	N	N	0.0	Organics
SS_SP_64	0-0.05	582235	5928108	21 N	Brown	Sand and gravel	N	N	N	0.0	Organics

Notes:
FD = Field Duplicate
BG = background sample

Table C2 - Test Pit Logs

APEC	Sample Location	Depth (mbgs)	Easting NAD83 (CSRS)	Northing NAD83 (CSRS)	Zone	Colour	Description	Fill Y/N	Stains Y/N	Petroleum Odours Y/N	VOC Reading (ppm)	Debris Type Present / Comment
APEC #1	SS_SP_09	0-0.30	582862.762	5930589.19	21 N	Black	Sand and gravel	N	Y	N	0.0	Organics
		0.30					Bedrock encountered	N	N	N	N/A	
APEC #2	SS_SP_01	0-0.15	582974.0408	5930655.925	21 N	Brown	Sand and gravel	N	N	N	0.0	
		0.15					Bedrock encountered	N	N	N	N/A	
APEC #3	SS_SP_06	0-0.05	582988.3971	5930542.254	21 N	Brown	Sand and gravel	N	N	N	0.0	Organics
		0.30					Bedrock encountered	N	N	N	N/A	
APEC #4	SS_SP_16	0-0.05	583080	5930713	21 N	Black	Silty sand, organics	N	N	N	0.0	Organics
		0.15					Bedrock encountered	N	N	N	N/A	
APEC #5	SS_SP_17	0-0.05	582912.0095	5930428.706	21 N	Brown	Sand and gravel	N	N	N	0.0	Organics
		0.15					Bedrock encountered	N	N	N	N/A	
APEC #6	SS_SP_23	0-0.05	582947.3921	5930519.841	21 N	Brown	Sand, silt, and gravel	Y	N	N	0.0	
		0.60					Bedrock encountered	N	N	N	N/A	
APEC #7	SS_SP_29	0-0.02	583159.5939	5930149.889	21 N	Brown	0-0.02 m sand and gravel	N	N	N	0.0	Organics
		0.02-0.30					sand and silt	N	N	N	0.0	Organics
		0.30					Bedrock encountered	N	N	N	N/A	
APEC #8	SS_SP_32	0-0.3	583202.9585	5930068.955	21 N	Brown	Sand, gravel, and silt	N	N	N	0.0	Organics
		0.30					Bedrock encountered	N	N	N	N/A	
APEC #9	SS_SP_35	0-0.3	583111.1981	5929428.226	21 N	Brown	Sand, silt, and gravel	N	N	N	0.0	Organics
APEC #10	SS_SP_40	0-0.3	582803.1372	5928433.557	21 N	Brown	Sand and silt	N	N	N	0.0	
		0.30					Bedrock encountered	N	N	N	N/A	
APEC #11	SS_SP_45	0-0.15	582134.81	5928054.857	21 N	Brown	Sand and gravel	Y	N	N	0.0	Organics
		0.15					Bedrock encountered	N	N	N	N/A	
APEC #12	SS_SP_50	0-0.3	582169.7462	5927723.441	21 N	Black	Sand and gravel	N	Y	Y	0.0	Organics
		0.30					Bedrock encountered	N	N	N	N/A	
APEC #14	SS_SP_61	0-0.15	582172.1779	5927747.176	21 N	Brown	Sand and gravel	N	N	Y	0.0	Organics
		0.15					Bedrock encountered	N	N	N	N/A	
APEC #15	SS_SP_63	0-0.3	582201	5928096	21 N	Brown	Sand and gravel	N	N	N	0.0	Organics
		0.30					Bedrock encountered	N	N	N	N/A	

APPENDIX D

Analytical Tables

Table D1-1 Petroleum Hydrocarbons in Soil (mg/kg) (Residential)

Sample ID	Sample Depth (mbgs)	Sample Date	B	T	E	X	Total Petroleum Hydrocarbons						
							C_6-C_{10}	$C_{>10}$-C_{16}	$C_{>16}$-C_{34}	$C_{>34}$-C_{50}[4]	$C_{>50}$[5]	$C_{>34}$	Modified TPH (C_6-C_{32})[7]
							F1[3]	F2	F3	-	-	F4[6]	
Provincial Screening Levels[1]													
Human Health			**0.099**	**77**	**30**	**8.8**	**-**	**-**	**-**	**-**	**-**	**-**	**270**
Ecological			**31**	**75**	**55**	**95**	**210**	**150**	**300**	**2800**	**-**	**2800**	**-**
Federal Screening Levels[2]													
Human Health			**110**	**22000**	**10000**	**150000**	**30**	**150**	**2500**	**-**	**-**	**21000**	**-**
Ecological			**31**	**75**	**120**	**95**	**210**	**150**	**300**	**-**	**-**	**2800**	**-**
SS_SP_28_BG	0-0.05	14-Sep-17	<0.0060	<0.020	<0.010	<0.020	<10	11	130	140	200	200	141
SS_SP_44	0-0.05	15-Sep-17	<0.0060	<0.020	<0.010	<0.020	<10	<10	77	57	190	190	77
SS_SP_44_FD	0-0.05	15-Sep-17	<0.0060	<0.020	<0.010	<0.020	<10	<10	110	80	320	320	110
SS_SP_45	0-0.05	15-Sep-17	0.0099	<0.020	<0.010	<0.020	<10	<10	<50	<50	-	<50	<50
SS_SP_45_LD	0-0.05	15-Sep-17	0.0096	<0.020	<0.010	<0.020	<10	-	-	-	-	-	-
SS_SP_46	0-0.05	15-Sep-17	<0.0060	<0.020	<0.010	<0.020	<10	<20	250	200	480	480	250
SS_SP_47	0-0.05	15-Sep-17	<0.0060	<0.020	<0.010	<0.020	<10	<10	<50	<50	-	<50	<50
SS_SP_48	0-0.05	15-Sep-17	<0.0060	<0.020	<0.010	<0.020	<10	<10	<50	<50	-	<50	<50
SS_SP_49	0-0.05	15-Sep-17	<0.0060	<0.020	<0.010	<0.020	<10	<10	<50	<50	-	<50	<50
SS_SP_50	0-0.05	15-Sep-17	<0.0060	<0.020	<0.010	<0.020	<10	<10	150	120	170	170	150
SS_SP_51	0-0.05	15-Sep-17	<0.0060	<0.020	<0.010	<0.020	<10	<10	<50	<50	-	<50	<50
SS_SP_52	0-0.05	15-Sep-17	<0.0060	<0.020	<0.010	<0.020	<10	<10	<50	<50	-	<50	<50
SS_SP_53	0-0.05	15-Sep-17	<0.0060	<0.020	<0.010	<0.020	<10	<10	80	<50	-	<50	80
SS_SP_60	0-0.05	15-Sep-17	<0.0060	<0.020	<0.010	<0.020	<10	61	**2400**	1600	7300	**7300**	*2461*
SS_SP_61	0-0.05	15-Sep-17	<0.0060	<0.020	<0.010	<0.020	<10	**6500**	**4700**	100	-	100	*11200*

Table D1-1 Petroleum Hydrocarbons in Soil (mg/kg) (Residential)

Sample ID	Sample Depth (mbgs)	Sample Date	B	T	E	X	Total Petroleum Hydrocarbons						
							C_6-C_{10}	$C_{>10}$-C_{16}	$C_{>16}$-C_{34}	$C_{>34}$-C_{50}[4]	$C_{>50}$[5]	$C_{>34}$	Modified TPH (C_6-C_{32})[7]
							F1[3]	F2	F3	-	-	F4[6]	
Provincial Screening Levels [1]													
Human Health			**0.099**	**77**	**30**	**8.8**	**-**	**-**	**-**	**-**	**-**	**-**	**270**
Ecological			**31**	**75**	**55**	**95**	**210**	**150**	**300**	**2800**	**-**	**2800**	**-**
Federal Screening Levels [2]													
Human Health			**110**	**22000**	**10000**	**150000**	**30**	**150**	**2500**	**-**	**-**	**21000**	**-**
Ecological			**31**	**75**	**120**	**95**	**210**	**150**	**300**	**-**	**-**	**2800**	**-**
SS_SP_62	0-0.05	15-Sep-17	<0.0060	<0.020	<0.010	<0.020	<10	<10	<50	<50	-	<50	<50
SS_SP_63	0-0.05	15-Sep-17	<0.0060	<0.020	<0.010	<0.020	<10	<10	<50	<50	-	<50	<50
SS_SP_64	0-0.05	15-Sep-17	<0.0060	<0.020	<0.010	<0.020	<10	<10	<50	<50	-	<50	<50

Notes:

1. Tier I RBSLs and ESLs for a residential/parkland, non-potable site with coarse-grained soil, and diesel fuel impacts. Soil ESL for the Protection of Plants and Soil Invertebrates; Direct Soil Contact (mg/kg dry weight) (Atlantic PIRI, 2015).
2. CCME Canadian Soil Quality Guidelines for the Protection of Environmentaland Human Health and Canada Wide Standard (CWS) for Petroleum Hydrocarbons (PHC) in Soil (residential, coarse-grained surface soil, (cancer risk: 10-5 (benzene), (Management Limit and Eco Soil Contact (CWS))
3. Does not include BTEX RESpounds.
4. Where the chromatogram returns to baseline following the $C_{>34}$-C_{50} analysis, additional hydrocarbons in the $C_{>50}$ range are not expected, and the preliminary F4 ($C_{>34}$-C_{50}) analysis is deemed an appropriate approximation of CCME F4 ($C_{>34}$) hydrocarbons.
5. Where the chromatogram did not return to baseline following the $C>_{34}$-C_{50} analysis, additional analysis (F4 Gravimetric method) was conducted to quantify hydrocarbons in the $C_{>50}$ range.
6. CCME hydrocarbon range F4 presented here is the greater value of C_{34}-C_{50} and $C_{>50}$ (where analyzed. See notes 4 and 5).
7. Modified TPH calculated from the sum of the detected parameters of the CWS F1-F3 fractions. Though generally consistent with the Atlantic RBCA Guidelines for Laboratories (V3.1, 2016), the Atlantic RBCA modified TPH represents $C_{>6}$-C_{32}, while the CWS represents $C>_6$-C_{34}. Thus the calculated mTPH concentration presented here is a slight over estimate of mTPH in the Atlantic RBCA context.

Exceedances of the Federal Human Health Screening Levels or Detection Limits greater than the Federal Human Health Screening Levels are shaded red.

Exceedances of the Federal Ecological Screening Levels or Detection Limits greater than the Federal Ecological Screening Levels are **Bolded**.

Exceedances of Provincial Human Health Screening Levels are <u>underlined</u>.

Exceedances of the Provincial Ecological Screening Levels are *italicized* .

NA = not applicable

"-" = Not available/ Not analyzed.

Table D1-2 Petroleum Hydrocarbons in Soil (mg/kg) (Commercial)

Sample ID	Sample Depth (mbgs)	Sample Date	B	T	E	X	Total Petroleum Hydrocarbons						
							C_6-C_{10}	$C_{>10}$-C_{16}	$C_{>16}$-C_{34}	$C_{>34}$-C_{50}[4]	$C_{>50}$[5]	$C_{>34}$	Modified TPH (C_6-C_{32})[7]
							F1[3]	F2	F3	-	-	F4[6]	
Provincial Screening Levels [1]													
Human Health			**2.5**	**10000**	**10000**	**110**	**-**	**-**	**-**	**-**	**-**	**-**	**4000**
Ecological			**180**	**250**	**300**	**350**	**320**	**260**	**1700**	**3300**	**-**	**3300**	**-**
Federal Screening Levels [2]													
Human Health			**0.03**	**0.37**	**0.082**	**11**	**700**	**1000**	**3500**	**-**	**-**	**10000**	**-**
Ecological			**180**	**250**	**300**	**350**	**320**	**260**	**1700**	**-**	**-**	**3300**	**-**
SS_SP_01	0-0.05	14-Sep-17	<0.0060	<0.020	<0.010	<0.020	<10	<10	<50	<50	-	<50	<50
SS_SP_02	0-0.05	14-Sep-17	<0.0060	<0.020	<0.010	<0.020	<10	<10	52	<50	-	<50	52
SS_SP_03	0-0.05	14-Sep-17	<0.0060	<0.020	<0.010	<0.020	<10	<10	<50	<50	-	<50	<50
SS_SP_04	0-0.05	14-Sep-17	<0.0060	<0.020	<0.010	<0.020	<10	<10	<50	<50	-	<50	<50
SS_SP_05	0-0.05	14-Sep-17	<0.0060	<0.020	<0.010	<0.020	<10	<10	81	<50	-	<50	81
SS_SP_05_LD	0-0.05	14-Sep-17	<0.0060	<0.020	<0.010	<0.020	<10	-	-	-	-	-	-
SS_SP_06	0-0.05	14-Sep-17	<0.0060	<0.020	<0.010	<0.020	<10	<10	<50	<50	-	<50	<50
SS_SP_07	0-0.05	14-Sep-17	<0.0060	<0.020	<0.010	<0.020	<10	<10	120	<50	-	<50	120
SS_SP_08	0-0.05	14-Sep-17	<0.0060	<0.020	<0.010	<0.020	<10	<10	<50	<50	-	<50	<50
SS_SP_08_LD	0-0.05	14-Sep-17	-	-	-	-	-	<10	<50	<50	-	<50	-
SS_SP_08_FD	0-0.05	14-Sep-17	<0.0060	<0.020	<0.010	<0.020	<10	<10	<50	<50	-	<50	<50
SS_SP_09	0-0.05	14-Sep-17	<0.0060	<0.020	<0.010	<0.020	<10	<10	57	<50	-	<50	57
SS_SP_10	0-0.05	14-Sep-17	<0.0060	<0.020	<0.010	<0.020	<10	33	160	<50	-	<50	193
SS_SP_11	0-0.05	14-Sep-17	<0.0060	<0.020	<0.010	<0.020	<10	63	220	<50	-	<50	283
SS_SP_12	0-0.05	14-Sep-17	<0.0060	<0.020	<0.010	<0.020	<10	63	210	<50	-	<50	273
SS_SP_13	0-0.05	15-Sep-17	<0.012	<0.040	<0.020	<0.040	<20	<30	1200	930	7700	**7700**	1200
SS_SP_14	0-0.05	15-Sep-17	<0.012	<0.040	<0.020	<0.040	<20	<40	680	640	4000	**4000**	680
SS_SP_15	0-0.05	15-Sep-17	<0.018	<0.060	<0.030	<0.060	<30	<40	440	340	1200	1200	440
SS_SP_16	0-0.05	15-Sep-17	<0.012	<0.040	<0.020	<0.040	<20	<20	690	520	3800	**3800**	690

Table D1-2 Petroleum Hydrocarbons in Soil (mg/kg) (Commercial)

Sample ID	Sample Depth (mbgs)	Sample Date	B	T	E	X	Total Petroleum Hydrocarbons						
							C_6-C_{10}	$C_{>10}$-C_{16}	$C_{>16}$-C_{34}	$C_{>34}$-C_{50}[4]	$C_{>50}$[5]	$C_{>34}$	Modified TPH (C_6-C_{32})[7]
							F1[3]	F2	F3	-	-	F4[6]	
Provincial Screening Levels [1]													
Human Health			**2.5**	**10000**	**10000**	**110**	**-**	**-**	**-**	**-**	**-**	**-**	**4000**
Ecological			**180**	**250**	**300**	**350**	**320**	**260**	**1700**	**3300**	**-**	**3300**	**-**
Federal Screening Levels [2]													
Human Health			**0.03**	**0.37**	**0.082**	**11**	**700**	**1000**	**3500**	**-**	**-**	**10000**	**-**
Ecological			**180**	**250**	**300**	**350**	**320**	**260**	**1700**	**-**	**-**	**3300**	**-**
SS_SP_17	0-0.05	14-Sep-17	<0.0060	<0.020	<0.010	<0.020	<10	<10	<50	<50	-	<50	<50
SS_SP_18	0-0.05	14-Sep-17	<0.0060	<0.020	<0.010	<0.020	<10	<10	<50	<50	-	<50	<50
SS_SP_19	0-0.05	14-Sep-17	<0.0060	<0.020	<0.010	<0.020	<10	<10	62	55	280	280	62
SS_SP_20	0-0.05	14-Sep-17	<0.0060	<0.020	<0.010	<0.020	<10	<10	79	64	<100	64	79
SS_SP_20_LD	0-0.05	14-Sep-17	-	-	-	-	-	-	-	-	<100	0	-
SS_SP_21	0-0.05	14-Sep-17	<0.0060	<0.020	<0.010	<0.020	<10	**500**	**1900**	90	-	90	2400
SS_SP_21_LD	0-0.05	14-Sep-17	<0.0060	<0.020	<0.010	<0.020	<10	-	-	-	-	-	-
SS_SP_22	0-0.05	14-Sep-17	<0.0060	<0.020	<0.010	<0.020	<10	<10	<50	<50	-	<50	<50
SS_SP_22_LD	0-0.05	14-Sep-17	-	-	-	-	-	<10	<50	<50	-	<50	-
SS_SP_23	0-0.05	14-Sep-17	<0.0060	<0.020	<0.010	<0.020	<10	<10	<50	<50	-	<50	<50
SS_SP_23_FD	0-0.05	14-Sep-17	<0.0060	<0.020	<0.010	<0.020	<10	<10	<50	<50	-	<50	<50
SS_SP_24	0-0.05	14-Sep-17	<0.0060	<0.020	<0.010	<0.020	<10	<10	73	52	<100	52	73
SS_SP_25	0-0.05	14-Sep-17	<0.0060	<0.020	<0.010	<0.020	<10	<10	95	70	300	300	95
SS_SP_26	0-0.05	14-Sep-17	<0.0060	<0.020	<0.010	<0.020	<10	<10	<50	<50	-	<50	<50
SS_SP_26_FD	0-0.05	14-Sep-17	<0.0060	<0.020	<0.010	<0.020	<10	10	<50	<50	-	<50	10
SS_SP_27	0-0.05	14-Sep-17	<0.0060	<0.020	<0.010	<0.020	<10	<10	<50	<50	-	<50	<50
SS_SP_28_BG	0-0.05	14-Sep-17	<0.0060	<0.020	<0.010	<0.020	<10	11	130	140	200	200	141
SS_SP_29	0-0.05	14-Sep-17	<0.0060	<0.020	<0.010	<0.020	<10	<10	<50	<50	-	<50	<50
SS_SP_30	0-0.05	14-Sep-17	<0.0060	<0.020	<0.010	<0.020	<10	<10	<50	<50	-	<50	<50
SS_SP_31	0-0.05	14-Sep-17	<0.0060	<0.020	<0.010	<0.020	<10	25	1200	790	2400	2400	1225

Table D1-2 Petroleum Hydrocarbons in Soil (mg/kg) (Commercial)

Sample ID	Sample Depth (mbgs)	Sample Date	B	T	E	X	Total Petroleum Hydrocarbons C_6-C_{10}	$C_{>10}$-C_{16}	$C_{>16}$-C_{34}	$C_{>34}$-C_{50} [4]	$C_{>50}$ [5]	$C_{>34}$	Modified TPH (C_6-C_{32})[7]
							F1[3]	F2	F3	-	-	F4[6]	
Provincial Screening Levels [1]													
Human Health			**2.5**	**10000**	**10000**	**110**	**-**	**-**	**-**	**-**	**-**	**-**	**4000**
Ecological			**180**	**250**	**300**	**350**	**320**	**260**	**1700**	**3300**	**-**	**3300**	**-**
Federal Screening Levels [2]													
Human Health			**0.03**	**0.37**	**0.082**	**11**	**700**	**1000**	**3500**	**-**	**-**	**10000**	**-**
Ecological			**180**	**250**	**300**	**350**	**320**	**260**	**1700**	**-**	**-**	**3300**	**-**
SS_SP_32	0-0.05	14-Sep-17	<0.0060	<0.020	<0.010	<0.020	<10	<10	<50	<50	-	<50	<50
SS_SP_33	0-0.05	14-Sep-17	<0.0060	<0.020	<0.010	<0.020	<10	14	1000	520	1600	1600	1014
SS_SP_34	0-0.05	14-Sep-17	<0.0060	<0.020	<0.010	<0.020	<10	<10	<50	<50	-	<50	<50
SS_SP_34_FD	0-0.05	14-Sep-17	<0.0060	<0.020	<0.010	<0.020	<10	<10	60	52	<100	52	60
SS_SP_35	0-0.05	14-Sep-17	<0.0060	<0.020	<0.010	<0.020	<10	11	75	71	200	200	86
SS_SP_36	0-0.05	14-Sep-17	<0.0060	<0.020	<0.010	<0.020	<10	<10	100	85	360	360	100
SS_SP_37	0-0.05	14-Sep-17	<0.0060	<0.020	<0.010	<0.020	<10	<10	51	66	<100	66	51
SS_SP_38	0-0.05	14-Sep-17	<0.0060	<0.020	<0.010	<0.020	<10	<10	<50	<50	-	<50	<50
SS_SP_39	0-0.05	15-Sep-17	<0.0060	<0.020	<0.010	<0.020	<10	<10	<50	<50	-	<50	<50
SS_SP_40	0-0.05	15-Sep-17	<0.0060	<0.020	<0.010	<0.020	<10	<10	51	<50	-	<50	51
SS_SP_41	0-0.05	15-Sep-17	<0.0060	<0.020	<0.010	<0.020	<10	<10	140	91	<100	91	140
SS_SP_42	0-0.05	15-Sep-17	<0.0060	<0.020	<0.010	<0.020	<10	<10	<50	<50	-	<50	<50
SS_SP_42_LD	0-0.05	15-Sep-17	-	-	-	-	-	<10	<50	<50	-	<50	-
SS_SP_43	0-0.05	15-Sep-17	<0.0060	<0.020	<0.010	<0.020	<10	<10	<50	<50	-	<50	<50

Notes:

1. Tier 1 RBSLs and ESLs for a commercial, non-potable site with coarse-grained soil, and diesel impacts, Soil ESL for Protection of Plants and Soil Invertebrates, Direct Soil Contact (mg/kg dry weight) (Atlantic PIRI, 2015).
2. CCME Canadian Soil Quality Guidelines for the Protection of Environmentaland Human Health and Canada Wide Standard (CWS) for Petroleum Hydrocarbons (PHC) in Soil (commercial, coarse-grained surface soil, (cancer risk: 10-5 (benzene), (Management Limit and Eco Soil Contact (CWS))
3. Does not include BTEX compounds.
4. Where the chromatogram returns to baseline following the $C_{>34}$-C_{50} analysis, additional hydrocarbons in the $C_{>50}$ range are not expected, and the preliminary F4 ($C_{>34}$-C_{50}) analysis is deemed an appropriate approximation of CCME F4 ($C_{>34}$) hydrocarbons.

Table D1-2 Petroleum Hydrocarbons in Soil (mg/kg) (Commercial)

Sample ID	Sample Depth (mbgs)	Sample Date	B	T	E	X	Total Petroleum Hydrocarbons						
							C_6-C_{10}	$C_{>10}$-C_{16}	$C_{>16}$-C_{34}	$C_{>34}$-C_{50} [4]	$C_{>50}$ [5]	$C_{>34}$	Modified TPH (C_6-C_{32})[7]
							F1[3]	F2	F3	-	-	F4[6]	
Provincial Screening Levels [1]													
Human Health			2.5	10000	10000	110	-	-	-	-	-	-	4000
Ecological			180	250	300	350	320	260	1700	3300	-	3300	-
Federal Screening Levels [2]													
Human Health			0.03	0.37	0.082	11	700	1000	3500	-	-	10000	-
Ecological			180	250	300	350	320	260	1700	-	-	3300	-

5. Where the chromatogram did not return to baseline following the $C_{>34}$-C_{50} analysis, additional analysis (F4 Gravimetric method) was conducted to quantify hydrocarbons in the $C_{>50}$ range.

6. CCME hydrocarbon range F4 presented here is the greater value of C_{34}-C_{50} and $C_{>50}$ (where analyzed. See notes 4 and 5).

7. Modified TPH calculated from the sum of the detected parameters of the CWS F1-F3 fractions. Though generally consistent with the Atlantic RBCA Guidelines for Laboratories (V3.1, 2016), the Atlantic RBCA modified TPH represents $C_{>6}$-C_{32}, while the CWS represents $C_{>6}$-C_{34}. Thus the calculated mTPH concentration presented here is a slight over estimate of mTPH in the Atlantic RBCA context.

Exceedances of the Federal Human Health Screening Levels or Detection Limits greater than the Federal Human Health Screening Levels are shaded red.

Exceedances of the Federal Ecological Screening Levels or Detection Limits greater than the Federal Ecological Screening Levels are **Bolded**.

Exceedances of Provincial Human Health Screening Levels are <u>underlined</u>.

Exceedances of the Provincial Ecological Screening Levels are *italicized* .

NA = not applicable

"-" = Not available/ Not analyzed.

Table D2-1 PAHs in Soil (mg/kg) (Residential)

Parameter	Human Health		CCME Ecological Guideline	Concentration (mg/kg)				
				Sample Identification				
	NSE TIER 1 EQS (Residential)	B(a)P PEF		SS_SP_28_BG	SS_SP_45	SS_SP_46	SS_SP_47	SS_SP_48
Non-Carcinogenic PAHs								
Acenaphthene	3900	-	0.28	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Acenaphthylene	4.5	-	320	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Anthracene	24000	-	2.5	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Fluoranthene	3500	-	50	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Fluorene	2700	-	0.25	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Naphthalene	2.2	-	0.013	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Perylene	-	-	-	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Phenanthrene	-	-	0.046	<0.0050	<0.0050	0.0071	<0.0050	<0.0050
Pyrene	2100	-	10	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
1-Methylnaphthalene	72	-	-	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
2-Methylnaphthalene	72	-	-	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Carcinogenic PAHs								
Benzo[a]anthracene	-	0.1	1	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Benzo[a]pyrene	-	1	20	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Benzo[b]fluoranthene	-	0.1	1 [2]	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Benzo[ghi]perylene	-	0.01	-	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Benzo[j]fluoranthene	-	0.1	-	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Benzo[k]fluoranthene	-	0.1	1 [2]	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Chrysene	-	0.01	-	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dibenz[a,h]anthracene	-	1	1 [2]	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Indeno[1,2,3-cd]pyrene	-	0.1	1 [2]	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
B(a)P TPE	**-**	**-**	5.3	0.02 [1]	0.02 [1]	0.02 [1]	0.02 [1]	0.02 [1]
			Sample Depth (mbgs)	0-0.05	0-0.05	0-0.05	0-0.05	0-0.05
			Sample Date	14-Sep-17	14-Sep-17	14-Sep-17	14-Sep-17	14-Sep-17

Notes:

NSE TIER 1 EQS = Nova Scotia Environment Tier 1 Environmental Quality Standards (2013)

B(a)P PEF = Benzo(a)pyrene potency equivalency factor

[1] Uncertainty factor of 3 was used as the PAH source is expected to be creosote.

[2] Guideline is for the sum of Benzo [b+j+k]fluoranthene

Exceedances of the Federal Ecological Screening Levels or Detection Limits greater than the Federal Ecological Screening Levels are **Bolded**.

If the concentration was less than the detection limit, then 1/2 the detection limit was used in B(a)P TPE calculations.

" -" = no guideline available, not analysed

Table D2-1 PAHs in Soil (mg/kg) (Residential)

Parameter	Human Health		CCME Ecological Guideline	Concentration (mg/kg)				
				Sample Identification				
	NSE TIER 1 EQS (Residential)	B(a)P PEF		SS_SP_51	SS_SP_53	SD_SP_01_BG	SS_SP_60	SS_SP_61
Non-Carcinogenic PAHs								
Acenaphthene	3900	-	0.28	<0.0050	<0.0050	<0.0050	<0.0050	<0.050
Acenaphthylene	4.5	-	320	<0.0050	<0.0050	<0.0050	<0.0050	<0.12
Anthracene	24000	-	2.5	<0.0050	<0.0050	<0.0050	<0.0050	<0.020
Fluoranthene	3500	-	50	0.0088	0.059	<0.0050	0.0084	0.011
Fluorene	2700	-	0.25	<0.0050	<0.0050	<0.0050	<0.0050	<0.025
Naphthalene	2.2	-	0.013	<0.0050	<0.0050	<0.0050	<0.0050	**<0.053**
Perylene	-	-	-	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Phenanthrene	-	-	0.046	<0.0050	0.042	<0.0050	<0.0050	<0.027
Pyrene	2100	-	10	0.0077	0.051	<0.0050	0.0075	0.061
1-Methylnaphthalene	72	-	-	<0.0050	<0.0050	<0.0050	<0.0050	<0.062
2-Methylnaphthalene	72	-	-	<0.0050	<0.0050	<0.0050	<0.0050	<0.038
Carcinogenic PAHs								
Benzo[a]anthracene	-	0.1	1	<0.0050	0.016	<0.0050	<0.017	<0.0050
Benzo[a]pyrene	-	1	20	<0.0050	0.021	<0.0050	0.0077	<0.0050
Benzo[b]fluoranthene	-	0.1	1 [2]	<0.0050	0.02	<0.0050	0.011	0.0074
Benzo[ghi]perylene	-	0.01	-	<0.0050	0.018	<0.0050	0.02	0.0074
Benzo[j]fluoranthene	-	0.1	-	<0.0050	0.01	<0.0050	<0.0050	<0.0050
Benzo[k]fluoranthene	-	0.1	1 [2]	<0.0050	0.0096	<0.0050	<0.0050	<0.0050
Chrysene	-	0.01	-	<0.0050	0.022	<0.0050	<0.017	0.015
Dibenz[a,h]anthracene	-	1	1 [2]	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Indeno[1,2,3-cd]pyrene	-	0.1	1 [2]	<0.0050	0.014	<0.0050	0.0066	<0.0050
B(a)P TPE	**-**	**-**	5.3	0.02 [1]	0.09 [1]	0.02 [1]	0.04 [1]	0.02 [1]
			Sample Depth (mbgs)	0-0.05	0-0.05	0-0.05	0-0.05	0-0.05
			Sample Date	14-Sep-17	14-Sep-17	14-Sep-17	14-Sep-17	14-Sep-17

Notes:

NSE TIER 1 EQS = Nova Scotia Environment Tier 1 Environmental Quality Standards (2013)

B(a)P PEF = Benzo(a)pyrene potency equivalency factor

[1] Uncertainty factor of 3 was used as the PAH source is expected to be creosote.

[2] Guideline is for the sum of Benzo [b+j+k]fluoranthene

Exceedances of the Federal Ecological Screening Levels or Detection Limits greater than the Federal Ecological Screening Levels are **Bolded**.

If the concentration was less than the detection limit, then 1/2 the detection limit was used in B(a)P TPE calculations.

" -" = no guideline available, not analysed

Table D2-1 PAHs in Soil (mg/kg) (Residential)

Parameter	Human Health		CCME Ecological Guideline	Concentration (mg/kg)			
				Sample Identification			
	NSE TIER 1 EQS (Residential)	B(a)P PEF		SS_SP_62	SS_SP_63	SS_SP_63_LD	SS_SP_64
Non-Carcinogenic PAHs							
Acenaphthene	3900	-	0.28	<0.0050	<0.0050	<0.0050	<0.0050
Acenaphthylene	4.5	-	320	<0.0050	<0.0050	<0.0050	<0.0050
Anthracene	24000	-	2.5	<0.0050	<0.0050	<0.0050	<0.0050
Fluoranthene	3500	-	50	0.021	<0.0050	<0.0050	<0.0050
Fluorene	2700	-	0.25	<0.0050	<0.0050	<0.0050	<0.0050
Naphthalene	2.2	-	0.013	<0.0050	<0.0050	<0.0050	<0.0050
Perylene	-	-	-	<0.0050	<0.0050	<0.0050	<0.0050
Phenanthrene	-	-	0.046	0.013	<0.0050	<0.0050	<0.0050
Pyrene	2100	-	10	0.015	<0.0050	<0.0050	<0.0050
1-Methylnaphthalene	72	-	-	<0.0050	<0.0050	<0.0050	<0.0050
2-Methylnaphthalene	72	-	-	<0.0050	<0.0050	<0.0050	<0.0050
Carcinogenic PAHs							
Benzo[a]anthracene	-	0.1	1	<0.0050	<0.0050	<0.0050	<0.0050
Benzo[a]pyrene	-	1	20	0.007	<0.0050	<0.0050	<0.0050
Benzo[b]fluoranthene	-	0.1	1 [2]	0.0092	<0.0050	<0.0050	<0.0050
Benzo[ghi]perylene	-	0.01	-	0.007	<0.0050	<0.0050	<0.0050
Benzo[j]fluoranthene	-	0.1	-	<0.0050	<0.0050	<0.0050	<0.0050
Benzo[k]fluoranthene	-	0.1	1 [2]	<0.0050	<0.0050	<0.0050	<0.0050
Chrysene	-	0.01	-	0.012	<0.0050	<0.0050	<0.0050
Dibenz[a,h]anthracene	-	1	1 [2]	<0.0050	<0.0050	<0.0050	<0.0050
Indeno[1,2,3-cd]pyrene	-	0.1	1 [2]	<0.0050	<0.0050	<0.0050	<0.0050
B(a)P TPE	**-**	**-**	5.3	0.03 [1]	0.02 [1]	0.02 [1]	0.02 [1]
			Sample Depth (mbgs)	0-0.05	0-0.05	0-0.05	0-0.05
			Sample Date	14-Sep-17	14-Sep-17	14-Sep-17	14-Sep-17

Notes:

NSE TIER 1 EQS = Nova Scotia Environment Tier 1 Environmental Quality Standards (2013)

B(a)P PEF = Benzo(a)pyrene potency equivalency factor

[1] Uncertainty factor of 3 was used as the PAH source is expected to be creosote.

[2] Guideline is for the sum of Benzo [b+j+k]fluoranthene

Exceedances of the Federal Ecological Screening Levels or Detection Limits greater than the Federal Ecological Screening Levels are **Bolded**.

If the concentration was less than the detection limit, then 1/2 the detection limit was used in B(a)P TPE calculations.

" -" = no guideline available, not analysed

Table D2-2 PAHs in Soil (mg/kg) (Commercial)

Parameter	Human Health		CCME Ecological Guideline	Concentration (mg/kg)				
	NSE TIER 1 EQS (Commercial)	B(a)P PEF		Sample Identification				
				SS_SP_01	SS_SP_02	SS_SP_03	SS_SP_04	SS_SP_05
Non-Carcinogenic PAHs								
Acenaphthene	8000	-	0.28	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Acenaphthylene	66	-	320	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Anthracene	37000	-	32	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Fluoranthene	5300	-	180	<0.0050	<0.0050	<0.0050	<0.0050	0.029
Fluorene	4100	-	0.25	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Naphthalene	25	-	0.013	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Perylene	-	-	-	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Phenanthrene	-	-	0.046	<0.0050	<0.0050	<0.0050	<0.0050	0.011
Pyrene	3200	-	100	<0.0050	<0.0050	<0.0050	<0.0050	0.024
1-Methylnaphthalene	560	-	-	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
2-Methylnaphthalene	560	-	-	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Carcinogenic PAHs								
Benzo[a]anthracene	-	0.1	10	<0.0050	<0.0050	<0.0050	<0.0050	0.012
Benzo[a]pyrene	-	1	72	<0.0050	<0.0050	<0.0050	<0.0050	0.013
Benzo[b]fluoranthene	-	0.1	10 [2]	<0.0050	<0.0050	<0.0050	<0.0050	0.021
Benzo[ghi]perylene	-	0.01	-	<0.0050	<0.0050	<0.0050	<0.0050	0.011
Benzo[j]fluoranthene	-	0.1	-	<0.0050	<0.0050	<0.0050	<0.0050	0.0098
Benzo[k]fluoranthene	-	0.1	10 [2]	<0.0050	<0.0050	<0.0050	<0.0050	0.0099
Chrysene	-	0.01	-	<0.0050	<0.0050	<0.0050	<0.0050	0.019
Dibenz[a,h]anthracene	-	1	10 [2]	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Indeno[1,2,3-cd]pyrene	-	0.1	10 [2]	<0.0050	<0.0050	<0.0050	<0.0050	0.0099
B(a)P TPE	**-**	**-**	5.3	0.02 [1]	0.02 [1]	0.02 [1]	0.02 [1]	0.07 [1]
			Sample Depth (mbgs)	0-0.05	0-0.05	0-0.05	0-0.05	0-0.05
			Sample Date	14-Sep-17	14-Sep-17	14-Sep-17	14-Sep-17	14-Sep-17

Notes:

NSE TIER 1 EQS = Nova Scotia Environment Tier 1 Environmental Quality Standards (2013)

B(a)P PEF = Benzo(a)pyrene potency equivalency factor

[1] Uncertainty factor of 3 was used as the PAH source is expected to be creosote.

[2] Guideline is for the sum of Benzo [b+j+k]fluoranthene

Exceedances of the Federal Ecological Screening Levels or Detection Limits greater than the Federal Ecological Screening Levels are **Bolded**.

If the concentration was less than the detection limit, then 1/2 the detectionlimit was used in B(a)P TPE calculations.

" -" = no guideline available, not analysed

Table D2-2 PAHs in Soil (mg/kg) (Commercial)

Parameter	Concentration (mg/kg)							
	Human Health		CCME Ecological Guideline	Sample Identification				
	NSE TIER 1 EQS (Commercial)	B(a)P PEF		SS_SP_06	SS_SP_07	SS_SP_07_LD	SS_SP_08	SS_SP_08_FD
Non-Carcinogenic PAHs								
Acenaphthene	8000	-	0.28	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Acenaphthylene	66	-	320	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Anthracene	37000	-	32	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Fluoranthene	5300	-	180	<0.0050	<0.0050	0.0063	<0.0050	<0.0050
Fluorene	4100	-	0.25	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Naphthalene	25	-	0.013	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Perylene	-	-	-	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Phenanthrene	-	-	0.046	<0.0050	<0.0050	0.0063	<0.0050	<0.0050
Pyrene	3200	-	100	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
1-Methylnaphthalene	560	-	-	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
2-Methylnaphthalene	560	-	-	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Carcinogenic PAHs								
Benzo[a]anthracene	-	0.1	10	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Benzo[a]pyrene	-	1	72	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Benzo[b]fluoranthene	-	0.1	10 [2]	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Benzo[ghi]perylene	-	0.01	-	<0.0050	<0.0050	0.014	<0.0050	<0.0050
Benzo[j]fluoranthene	-	0.1	-	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Benzo[k]fluoranthene	-	0.1	10 [2]	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Chrysene	-	0.01	-	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dibenz[a,h]anthracene	-	1	10 [2]	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Indeno[1,2,3-cd]pyrene	-	0.1	10 [2]	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
B(a)P TPE	**-**	**-**	5.3	0.02 [1]	0.02 [1]	0.02 [1]	0.02 [1]	0.02 [1]
			Sample Depth (mbgs)	0-0.05	0-0.05	0-0.05	0-0.05	0-0.05
			Sample Date	14-Sep-17	14-Sep-17	14-Sep-17	14-Sep-17	14-Sep-17

Notes:

NSE TIER 1 EQS = Nova Scotia Environment Tier 1 Environmental Quality Standards (2013)

B(a)P PEF = Benzo(a)pyrene potency equivalency factor

[1] Uncertainty factor of 3 was used as the PAH source is expected to be creosote.

[2] Guideline is for the sum of Benzo [b+j+k]fluoranthene

Exceedances of the Federal Ecological Screening Levels or Detection Limits greater than the Federal Ecological Screening Levels are **Bolded**.

If the concentration was less than the detection limit, then 1/2 the detectionlimit was used in B(a)P TPE calculations.

" -" = no guideline available, not analysed

Table D2-2 PAHs in Soil (mg/kg) (Commercial)

Parameter	Concentration (mg/kg)							
	Human Health		CCME Ecological Guideline	Sample Identification				
	NSE TIER 1 EQS (Commercial)	B(a)P PEF		SS_SP_09	SS_SP_10	SS_SP_11	SS_SP_12	SS_SP_17
Non-Carcinogenic PAHs								
Acenaphthene	8000	-	0.28	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Acenaphthylene	66	-	320	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Anthracene	37000	-	32	<0.0050	<0.0050	<0.0076	<0.0050	<0.0050
Fluoranthene	5300	-	180	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Fluorene	4100	-	0.25	<0.0050	<0.0050	<0.0092	<0.0050	<0.0050
Naphthalene	25	-	0.013	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Perylene	-	-	-	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Phenanthrene	-	-	0.046	<0.0050	<0.0050	<0.012	<0.0050	<0.0050
Pyrene	3200	-	100	<0.0050	<0.0050	0.022	<0.0050	<0.0050
1-Methylnaphthalene	560	-	-	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
2-Methylnaphthalene	560	-	-	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Carcinogenic PAHs								
Benzo[a]anthracene	-	0.1	10	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Benzo[a]pyrene	-	1	72	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Benzo[b]fluoranthene	-	0.1	10 [2]	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Benzo[ghi]perylene	-	0.01	-	<0.0050	0.0087	<0.0050	<0.0050	<0.0050
Benzo[j]fluoranthene	-	0.1	-	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Benzo[k]fluoranthene	-	0.1	10 [2]	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Chrysene	-	0.01	-	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dibenz[a,h]anthracene	-	1	10 [2]	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Indeno[1,2,3-cd]pyrene	-	0.1	10 [2]	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
B(a)P TPE	**-**	**-**	5.3	0.02 [1]	0.02 [1]	0.02 [1]	0.02 [1]	0.02 [1]
			Sample Depth (mbgs)	0-0.05	0-0.05	0-0.05	0-0.05	0-0.05
			Sample Date	14-Sep-17	14-Sep-17	14-Sep-17	14-Sep-17	14-Sep-17

Notes:

NSE TIER 1 EQS = Nova Scotia Environment Tier 1 Environmental Quality Standards (2013)

B(a)P PEF = Benzo(a)pyrene potency equivalency factor

[1] Uncertainty factor of 3 was used as the PAH source is expected to be creosote.

[2] Guideline is for the sum of Benzo [b+j+k]fluoranthene

Exceedances of the Federal Ecological Screening Levels or Detection Limits greater than the Federal Ecological Screening Levels are **Bolded**.

If the concentration was less than the detection limit, then 1/2 the detectionlimit was used in B(a)P TPE calculations.

" -" = no guideline available, not analysed

Table D2-2 PAHs in Soil (mg/kg) (Commercial)

Parameter	NSE TIER 1 EQS (Commercial)	B(a)P PEF	CCME Ecological Guideline	SS_SP_19	SS_SP_21	SS_SP_22	SS_SP_23	SS_SP_23_FD
	Human Health			Concentration (mg/kg) Sample Identification				
Non-Carcinogenic PAHs								
Acenaphthene	8000	-	0.28	<0.0050	<0.0050	<0.0050	0.052	<0.0050
Acenaphthylene	66	-	320	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Anthracene	37000	-	32	<0.0050	<0.0050	<0.0050	0.21	<0.0050
Fluoranthene	5300	-	180	<0.0050	<0.0050	0.0150	1.9	0.071
Fluorene	4100	-	0.25	<0.0050	<0.0050	<0.0050	0.057	<0.0050
Naphthalene	25	-	0.013	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Perylene	-	-	-	<0.0050	<0.0050	<0.0050	0.17	0.0085
Phenanthrene	-	-	0.046	<0.0050	<0.0050	<0.0050	1.0	0.02
Pyrene	3200	-	100	<0.0050	<0.0050	0.014	1.3	0.055
1-Methylnaphthalene	560	-	-	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
2-Methylnaphthalene	560	-	-	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Carcinogenic PAHs								
Benzo[a]anthracene	-	0.1	10	<0.0050	<0.0050	0.009	0.68	0.034
Benzo[a]pyrene	-	1	72	<0.0050	<0.0050	0.01	0.64	0.034
Benzo[b]fluoranthene	-	0.1	10 [2]	<0.0050	<0.0050	0.0084	0.69	0.04
Benzo[ghi]perylene	-	0.01	-	<0.0050	<0.0050	0.0065	0.33	0.018
Benzo[j]fluoranthene	-	0.1	-	<0.0050	<0.0050	<0.0050	0.35	0.02
Benzo[k]fluoranthene	-	0.1	10 [2]	<0.0050	<0.0050	<0.0050	0.37	0.022
Chrysene	-	0.01	-	<0.0050	<0.0050	0.0099	0.7	0.046
Dibenz[a,h]anthracene	-	1	10 [2]	<0.0050	<0.0050	<0.0050	0.094	<0.0050
Indeno[1,2,3-cd]pyrene	-	0.1	10 [2]	<0.0050	<0.0050	0.006	0.31	0.017
B(a)P TPE	**-**	**-**	5.3	0.02 [1]	0.02 [1]	0.05 [1]	2.95 [1]	0.15 [1]
			Sample Depth (mbgs)	0-0.05	0-0.05	0-0.05	0-0.05	0-0.05
			Sample Date	14-Sep-17	14-Sep-17	14-Sep-17	14-Sep-17	14-Sep-17

Notes:

NSE TIER 1 EQS = Nova Scotia Environment Tier 1 Environmental Quality Standards (2013)

B(a)P PEF = Benzo(a)pyrene potency equivalency factor

[1] Uncertainty factor of 3 was used as the PAH source is expected to be creosote.

[2] Guideline is for the sum of Benzo [b+j+k]fluoranthene

Exceedances of the Federal Ecological Screening Levels or Detection Limits greater than the Federal Ecological Screening Levels are **Bolded**.

If the concentration was less than the detection limit, then 1/2 the detectionlimit was used in B(a)P TPE calculations.

" -" = no guideline available, not analysed

Table D2-2 PAHs in Soil (mg/kg) (Commercial)

Parameter	Concentration (mg/kg)							
	Human Health		CCME Ecological Guideline	Sample Identification				
	NSE TIER 1 EQS (Commercial)	B(a)P PEF		SS_SP_24	SS_SP_25	SS_SP_26	SS_SP_26_FD	SS_SP_28_BG
Non-Carcinogenic PAHs								
Acenaphthene	8000	-	0.28	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Acenaphthylene	66	-	320	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Anthracene	37000	-	32	0.0069	<0.0050	<0.0050	<0.0050	<0.0050
Fluoranthene	5300	-	180	0.25	<0.0050	0.0065	0.043	<0.0050
Fluorene	4100	-	0.25	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Naphthalene	25	-	0.013	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Perylene	-	-	-	0.026	<0.0050	<0.0050	<0.0050	<0.0050
Phenanthrene	-	-	0.046	**0.069**	<0.0050	<0.0050	0.014	<0.0050
Pyrene	3200	-	100	0.2	<0.0050	<0.0050	0.033	<0.0050
1-Methylnaphthalene	560	-	-	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
2-Methylnaphthalene	560	-	-	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Carcinogenic PAHs								
Benzo[a]anthracene	-	0.1	10	0.11	<0.0050	<0.0050	0.018	<0.0050
Benzo[a]pyrene	-	1	72	0.1	<0.0050	<0.0050	0.017	<0.0050
Benzo[b]fluoranthene	-	0.1	10 [2]	0.13	<0.0050	<0.0050	0.02	<0.0050
Benzo[ghi]perylene	-	0.01	-	0.063	<0.0050	<0.0050	0.01	<0.0050
Benzo[j]fluoranthene	-	0.1	-	0.064	<0.0050	<0.0050	0.01	<0.0050
Benzo[k]fluoranthene	-	0.1	10 [2]	0.067	<0.0050	<0.0050	0.01	<0.0050
Chrysene	-	0.01	-	0.13	<0.0050	<0.0050	0.022	<0.0050
Dibenz[a,h]anthracene	-	1	10 [2]	0.017	<0.0050	<0.0050	<0.0050	<0.0050
Indeno[1,2,3-cd]pyrene	-	0.1	10 [2]	0.061	<0.0050	<0.0050	0.0093	<0.0050
B(a)P TPE	**-**	**-**	5.3	0.49 [1]	0.02 [1]	0.02 [1]	0.08 [1]	0.02 [1]
			Sample Depth (mbgs)	0-0.05	0-0.05	0-0.05	0-0.05	0-0.05
			Sample Date	14-Sep-17	14-Sep-17	14-Sep-17	14-Sep-17	14-Sep-17

Notes:

NSE TIER 1 EQS = Nova Scotia Environment Tier 1 Environmental Quality Standards (2013)

B(a)P PEF = Benzo(a)pyrene potency equivalency factor

[1] Uncertainty factor of 3 was used as the PAH source is expected to be creosote.

[2] Guideline is for the sum of Benzo [b+j+k]fluoranthene

Exceedances of the Federal Ecological Screening Levels or Detection Limits greater than the Federal Ecological Screening Levels are **Bolded**.

If the concentration was less than the detection limit, then 1/2 the detectionlimit was used in B(a)P TPE calculations.

" -" = no guideline available, not analysed

Table D2-2 PAHs in Soil (mg/kg) (Commercial)

Parameter	Human Health		CCME Ecological Guideline	Concentration (mg/kg)				
				Sample Identification				
	NSE TIER 1 EQS (Commercial)	B(a)P PEF		SS_SP_30	SS_SP_31	SS_SP_32	SS_SP_33	SS_SP_34
Non-Carcinogenic PAHs								
Acenaphthene	8000	-	0.28	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Acenaphthylene	66	-	320	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Anthracene	37000	-	32	<0.0050	<0.0050	<0.0050	0.017	<0.0050
Fluoranthene	5300	-	180	<0.0050	<0.0050	<0.0050	0.0066	0.031
Fluorene	4100	-	0.25	<0.0050	<0.0050	<0.0050	0.0059	<0.0050
Naphthalene	25	-	0.013	<0.0050	<0.0050	<0.0050	0.0081	<0.0050
Perylene	-	-	-	<0.0050	<0.0050	<0.0050	<0.0050	0.0071
Phenanthrene	-	-	0.046	<0.0050	<0.0050	<0.0050	0.0089	0.0075
Pyrene	3200	-	100	<0.0050	<0.0050	<0.0050	0.014	0.03
1-Methylnaphthalene	560	-	-	<0.0050	<0.0050	<0.0050	0.0052	<0.0050
2-Methylnaphthalene	560	-	-	<0.0050	<0.0050	<0.0050	0.01	<0.0050
Carcinogenic PAHs								
Benzo[a]anthracene	-	0.1	10	<0.0050	<0.0050	<0.0050	<0.010	0.021
Benzo[a]pyrene	-	1	72	<0.0050	<0.0050	<0.0050	0.0072	0.029
Benzo[b]fluoranthene	-	0.1	10 [2]	<0.0050	<0.0050	<0.0050	0.011	0.038
Benzo[ghi]perylene	-	0.01	-	<0.0050	<0.0050	<0.0050	0.027	0.058
Benzo[j]fluoranthene	-	0.1	-	<0.0050	<0.0050	<0.0050	0.0067	0.016
Benzo[k]fluoranthene	-	0.1	10 [2]	<0.0050	<0.0050	<0.0050	<0.0050	0.014
Chrysene	-	0.01	-	<0.0050	<0.012	<0.0050	<0.034	0.032
Dibenz[a,h]anthracene	-	1	10 [2]	<0.0050	<0.0050	<0.0050	<0.0050	0.0064
Indeno[1,2,3-cd]pyrene	-	0.1	10 [2]	<0.0050	<0.0050	<0.0050	0.0096	0.02
B(a)P TPE	**-**	**-**	5.3	0.02 [1]	0.02 [1]	0.02 [1]	0.04 [1]	0.14 [1]
			Sample Depth (mbgs)	0-0.05	0-0.05	0-0.05	0-0.05	0-0.05
			Sample Date	14-Sep-17	14-Sep-17	14-Sep-17	14-Sep-17	14-Sep-17

Notes:

NSE TIER 1 EQS = Nova Scotia Environment Tier 1 Environmental Quality Standards (2013)

B(a)P PEF = Benzo(a)pyrene potency equivalency factor

[1] Uncertainty factor of 3 was used as the PAH source is expected to be creosote.

[2] Guideline is for the sum of Benzo [b+j+k]fluoranthene

Exceedances of the Federal Ecological Screening Levels or Detection Limits greater than the Federal Ecological Screening Levels are **Bolded**.

If the concentration was less than the detection limit, then 1/2 the detectionlimit was used in B(a)P TPE calculations.

" -" = no guideline available, not analysed

Table D2-2 PAHs in Soil (mg/kg) (Commercial)

Parameter	Human Health		CCME Ecological Guideline	Concentration (mg/kg)				
				Sample Identification				
	NSE TIER 1 EQS (Commercial)	B(a)P PEF		SS_SP_34_FD	SS_SP_34_FD_LD	SS_SP_35	SS_SP_36	SS_SP_37
Non-Carcinogenic PAHs								
Acenaphthene	8000	-	0.28	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Acenaphthylene	66	-	320	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Anthracene	37000	-	32	0.0066	<0.0050	<0.0050	<0.0050	0.0072
Fluoranthene	5300	-	180	0.11	0.029	0.019	<0.0050	0.09
Fluorene	4100	-	0.25	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Naphthalene	25	-	0.013	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Perylene	-	-	-	0.022	0.0081	<0.0050	<0.0050	0.011
Phenanthrene	-	-	0.046	0.017	<0.0050	<0.0050	<0.0050	0.013
Pyrene	3200	-	100	0.092	0.028	0.02	<0.0050	0.095
1-Methylnaphthalene	560	-	-	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
2-Methylnaphthalene	560	-	-	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Carcinogenic PAHs								
Benzo[a]anthracene	-	0.1	10	0.071	0.023	0.012	<0.0050	0.055
Benzo[a]pyrene	-	1	72	0.09	0.034	0.016	<0.0050	0.044
Benzo[b]fluoranthene	-	0.1	10 [2]	0.11	0.049	0.021	<0.0050	0.1
Benzo[ghi]perylene	-	0.01	-	0.071	0.037	0.03	<0.0050	0.028
Benzo[j]fluoranthene	-	0.1	-	0.052	0.021	0.0081	<0.0050	0.041
Benzo[k]fluoranthene	-	0.1	10 [2]	0.05	0.019	0.0077	<0.0050	0.043
Chrysene	-	0.01	-	0.081	0.035	0.023	<0.0050	0.086
Dibenz[a,h]anthracene	-	1	10 [2]	0.014	0.0063	<0.0050	<0.0050	0.0081
Indeno[1,2,3-cd]pyrene	-	0.1	10 [2]	0.049	0.021	0.01	<0.0050	0.027
B(a)P TPE	**-**	**-**	5.3	0.42 [1]	0.16 [1]	0.07 [1]	0.02 [1]	0.24 [1]
			Sample Depth (mbgs)	0-0.05	0-0.05	0-0.05	0-0.05	0-0.05
			Sample Date	14-Sep-17	14-Sep-17	14-Sep-17	14-Sep-17	14-Sep-17

Notes:

NSE TIER 1 EQS = Nova Scotia Environment Tier 1 Environmental Quality Standards (2013)

B(a)P PEF = Benzo(a)pyrene potency equivalency factor

[1] Uncertainty factor of 3 was used as the PAH source is expected to be creosote.

[2] Guideline is for the sum of Benzo [b+j+k]fluoranthene

Exceedances of the Federal Ecological Screening Levels or Detection Limits greater than the Federal Ecological Screening Levels are **Bolded**.

If the concentration was less than the detection limit, then 1/2 the detectionlimit was used in B(a)P TPE calculations.

" -" = no guideline available, not analysed

Table D2-2   PAHs in Soil (mg/kg) (Commercial)

Parameter	Human Health		CCME Ecological Guideline	Concentration (mg/kg)			
				Sample Identification			
	NSE TIER 1 EQS (Commercial)	B(a)P PEF		SS_SP_40	SS_SP_41	SS_SP_42	SS_SP_43
Non-Carcinogenic PAHs							
Acenaphthene	8000	-	0.28	<0.0050	<0.0050	<0.0050	<0.0050
Acenaphthylene	66	-	320	<0.0050	<0.0050	<0.0050	<0.0050
Anthracene	37000	-	32	<0.0050	<0.0050	<0.0050	<0.0050
Fluoranthene	5300	-	180	0.0063	0.008	<0.0050	<0.0050
Fluorene	4100	-	0.25	<0.0050	<0.0050	<0.0050	<0.0050
Naphthalene	25	-	0.013	<0.0050	<0.0050	<0.0050	<0.0050
Perylene	-	-	-	<0.0050	<0.0050	<0.0050	<0.0050
Phenanthrene	-	-	0.046	<0.0050	<0.0050	<0.0050	<0.0050
Pyrene	3200	-	100	0.0058	0.0087	<0.0050	<0.0050
1-Methylnaphthalene	560	-	-	<0.0050	<0.0050	<0.0050	<0.0050
2-Methylnaphthalene	560	-	-	<0.0050	<0.0050	<0.0050	<0.0050
Carcinogenic PAHs							
Benzo[a]anthracene	-	0.1	10	<0.0050	<0.0050	<0.0050	<0.0050
Benzo[a]pyrene	-	1	72	<0.0050	<0.0050	<0.0050	<0.0050
Benzo[b]fluoranthene	-	0.1	10 [2]	<0.0050	<0.0050	<0.0050	<0.0050
Benzo[ghi]perylene	-	0.01	-	<0.0050	<0.0050	<0.0050	<0.0050
Benzo[j]fluoranthene	-	0.1	-	<0.0050	<0.0050	<0.0050	<0.0050
Benzo[k]fluoranthene	-	0.1	10 [2]	<0.0050	<0.0050	<0.0050	<0.0050
Chrysene	-	0.01	-	<0.0050	0.0059	<0.0050	<0.0050
Dibenz[a,h]anthracene	-	1	10 [2]	<0.0050	<0.0050	<0.0050	<0.0050
Indeno[1,2,3-cd]pyrene	-	0.1	10 [2]	<0.0050	<0.0050	<0.0050	<0.0050
B(a)P TPE	**-**	**-**	5.3	0.02 [1]	0.02 [1]	0.02 [1]	0.02 [1]
			Sample Depth (mbgs)	0-0.05	0-0.05	0-0.05	0-0.05
			Sample Date	14-Sep-17	14-Sep-17	14-Sep-17	14-Sep-17

Notes:

NSE TIER 1 EQS = Nova Scotia Environment Tier 1 Environmental Quality Standards (2013)

B(a)P PEF = Benzo(a)pyrene potency equivalency factor

[1] Uncertainty factor of 3 was used as the PAH source is expected to be creosote.

[2] Guideline is for the sum of Benzo [b+j+k]fluoranthene

Exceedances of the Federal Ecological Screening Levels or Detection Limits greater than the Federal Ecological Screening Levels are **Bolded**.

If the concentration was less than the detection limit, then 1/2 the detectionlimit was used in B(a)P TPE calculations.

" -" = no guideline available, not analysed

Table D3-1 Metals in Soil (mg/kg) (Residential)

Parameter	CCME[1] Human Health	CCME[1] Ecological Health	CCME[1] Generic[2]	SS_SP_28_BG	SS_SP_45	SS_SP_46	SS_SP_47	SS_SP_48
Aluminum	-	-	-	17000	8900	3000	11000	11000
Antimony	-	-	20	<2.0	<2.0	<2.0	<2.0	<2.0
Arsenic	12	17	-	<2.0	3.6	<2.0	<2.0	<2.0
Barium	6800	500	-	70	130	28	99	110
Beryllium	75	4	-	<2.0	<2.0	<2.0	<2.0	<2.0
Bismuth	-	-	-	<2.0	<2.0	<2.0	<2.0	<2.0
Boron	-	-	-	<50	<50	<50	<50	<50
Cadmium	14	10	-	<0.30	<0.30	<0.30	<0.30	<0.30
Chromium	220	64	-	7.3	14	4.9	17	15
Cobalt	-	-	40	10	13	2	8.5	12
Copper	1100	63	-	58	28	3.6	21	28
Iron	-	-	-	26000	27000	9000	21000	20000
Lead	140	300	-	4.1	36	12	10	8
Lithium	-	-	-	14	16	5.3	17	21
Manganese	-	-	-	83	910	94	270	390
Mercury	6.6	12	-	<0.10	<0.10	<0.10	<0.10	<0.10
Molybdenum	-	-	-	<2.0	<2.0	<2.0	<2.0	<2.0
Nickel	200	45	-	**51**	21	3.5	18	21
Rubidium	-	-	-	13	18	9.4	15	17
Selenium	80	1	-	**2.2**	<1.0	<1.0	<1.0	<1.0
Silver	-	40	-	<0.50	<0.50	<0.50	<0.50	<0.50
Strontium	-	-	-	24	13	<5.0	12	13
Thallium	1	1.4	-	<0.10	<0.10	<0.10	<0.10	<0.10
Tin	-	-	50	<2.0	2.7	<2.0	<2.0	<2.0
Uranium	23	500	-	0.89	0.79	0.81	1	0.61
Vanadium	-	130	-	76	36	21	47	43
Zinc	-	200	-	20	**770**	14	51	61
			depth (m)	0-0.05	0-0.05	0-0.05	0-0.05	0-0.05
			Sample Date	14-Sep-17	15-Sep-17	15-Sep-17	15-Sep-17	15-Sep-17

1. Canadian Council of Ministers of the Environment Soil Quality Guidelines for the Protection of Environmental and Human Health (residential site)

2. Generic CCME guideline: no distinction regarding whether derivation is human health or ecologically based

Exceedances of the Federal Human Health Screening Levels or Detection Limits greater than the Federal Human Health Screening Levels are shaded red.

Exceedances of the Federal Ecological Screening Levels or Detection Limits greater than the Federal Ecological Screening Levels are **Bolded**.

- = no guideline, or parameter not analyzed

Table D3-1 Metals in Soil (mg/kg) (Residential)

Parameter	CCME[1] Human Health	CCME[1] Ecological Health	CCME[1] Generic[2]	SS_SP_60	SS_SP_61	SS_SP_62	SS_SP_63	SS_SP_64	SS_SP_64_LD
Aluminum	-	-	-	4900	5700	4100	9600	3500	4400
Antimony	-	-	20	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Arsenic	12	17	-	<2.0	<2.0	2.6	<2.0	<2.0	<2.0
Barium	6800	500	-	40	44	21	97	23	30
Beryllium	75	4	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Bismuth	-	-	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Boron	-	-	-	<50	<50	<50	<50	<50	<50
Cadmium	14	10	-	<0.30	0.49	3.7	<0.30	<0.30	<0.30
Chromium	220	64	-	8.3	10	17	13	3.5	3.9
Cobalt	-	-	40	3.2	4.3	4.9	9.5	2.8	3.9
Copper	1100	63	-	8.2	13	22	30	8.1	12
Iron	-	-	-	8800	11000	29000	20000	6200	7400
Lead	140	300	-	19	16	210	5.2	3.6	3.9
Lithium	-	-	-	7.6	9.5	6.4	24	6.5	9.2
Manganese	-	-	-	130	170	220	400	130	160
Mercury	6.6	12	-	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Molybdenum	-	-	-	<2.0	<2.0	2.3	<2.0	<2.0	<2.0
Nickel	200	45	-	7.6	8.7	16.0	17.0	4.5	5.9
Rubidium	-	-	-	3.8	6.6	3.7	16	4.3	5.5
Selenium	80	1	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Silver	-	40	-	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Strontium	-	-	-	7.6	7	5.8	8.5	<5.0	<5.0
Thallium	1	1.4	-	<0.10	<0.10	<0.10	0.1	<0.10	<0.10
Tin	-	-	50	<2.0	<2.0	2.6	<2.0	<2.0	<2.0
Uranium	23	500	-	0.51	0.77	0.44	0.88	0.79	0.74
Vanadium	-	130	-	14	20	14	36	12	13
Zinc	-	200	-	49	68	83	45	16	20
			depth (m)	0-0.05	0-0.05	0-0.05	0-0.05	0-0.05	0-0.05
			Sample Date	15-Sep-17	15-Sep-17	15-Sep-17	15-Sep-17	15-Sep-17	15-Sep-17

1. Canadian Council of Ministers of the Environment Soil Quality Guidelines for the Protection of Environmental and Human Health (residential site)

2. Generic CCME guideline: no distinction regarding whether derivation is human health or ecologically based

Exceedances of the Federal Human Health Screening Levels or Detection Limits greater than the Federal Human Health Screening Levels are shaded red.

Exceedances of the Federal Ecological Screening Levels or Detection Limits greater than the Federal Ecological Screening Levels are **Bolded**.

- = no guideline, or parameter not analyzed

Table D3-2 Metals in Soil (mg/kg) (Commercial)

	CCME[1]							
Parameter	Human Health	Ecological Health	Generic[2]	SS_SP_01	SS_SP_02	SS_SP_03	SS_SP_04	SS_SP_05
Aluminum	-	-	-	5300	4500	8300	9200	5100
Antimony	-	-	40	<2.0	<2.0	<2.0	<2.0	<2.0
Arsenic	12	26	-	<2.0	<2.0	<2.0	<2.0	<2.0
Barium	10000	2000	-	45	26	100	84	47
Beryllium	110	8	-	<2.0	<2.0	<2.0	<2.0	<2.0
Bismuth	-	-	-	<2.0	<2.0	<2.0	<2.0	<2.0
Boron	-	-	-	<50	<50	<50	<50	<50
Cadmium	49	22	-	<0.30	<0.30	<0.30	<0.30	<0.30
Chromium	630	87	-	6.9	4.7	4.3	4.5	5.9
Cobalt	-	-	300	4.8	3.3	19	21	6.3
Copper	4000	91	-	15	9.6	**190**	**190**	30
Iron	-	-	-	11000	8300	49000	48000	16000
Lead	260	600	-	3.3	2.3	1.9	2.2	19
Lithium	-	-	-	11	6.7	4.9	6.4	8.4
Manganese	-	-	-	190	120	310	380	200
Mercury	24	50	-	<0.10	<0.10	<0.10	<0.10	<0.10
Molybdenum	-	-	-	<2.0	<2.0	<2.0	<2.0	<2.0
Nickel	310	89	-	10	6.6	12	14	10
Rubidium	-	-	-	7.2	4.7	19	23	7.9
Selenium	125	2.9	-	<1.0	<1.0	<1.0	<1.0	<1.0
Silver	-	40	-	<0.50	<0.50	<0.50	<0.50	<0.50
Strontium	-	-	-	5.2	5.4	15	12	7.1
Thallium	1	3.6	-	<0.10	<0.10	<0.10	0.12	<0.10
Tin	-	-	300	<2.0	<2.0	<2.0	<2.0	<2.0
Uranium	33	2000	-	0.57	0.51	0.36	0.33	0.38
Vanadium	-	130	-	22	16	72	71	22
Zinc	-	200	-	24	17	57	62	44
			depth (m)	0-0.05	0-0.05	0-0.05	0-0.05	0-0.05
			Sample Date	14-Sep-17	14-Sep-17	14-Sep-17	14-Sep-17	14-Sep-17

1. Canadian Council of Ministers of the Environment Soil Quality Guidelines for the Protection of Environmental and Human Health (commercial site)

2. Generic CCME guideline: no distinction regarding whether derivation is human health or ecologically based

Exceedances of the Federal Human Health Screening Levels or Detection Limits greater than the Federal Human Health Screening Levels are shaded red.

Exceedances of the Federal Ecological Screening Levels or Detection Limits greater than the Federal Ecological Screening Levels are **Bolded**.

- = no guideline, or parameter not analyzed

Table D3-2 Metals in Soil (mg/kg) (Commercial)

Parameter	CCME[1] Human Health	CCME[1] Ecological Health	CCME[1] Generic[2]	SS_SP_06	SS_SP_07	SS_SP_08	SS_SP_08_FD	SS_SP_17
Aluminum	-	-	-	8100	9400	5600	5300	6900
Antimony	-	-	40	<2.0	<2.0	<2.0	<2.0	<2.0
Arsenic	12	26	-	<2.0	2.2	<2.0	<2.0	<2.0
Barium	10000	2000	-	26	65	37	38	63
Beryllium	110	8	-	<2.0	<2.0	<2.0	<2.0	<2.0
Bismuth	-	-	-	<2.0	<2.0	<2.0	<2.0	<2.0
Boron	-	-	-	<50	<50	<50	<50	<50
Cadmium	49	22	-	<0.30	0.3	<0.30	<0.30	<0.30
Chromium	630	87	-	8.1	9.4	8.8	7.5	9.5
Cobalt	-	-	300	34	21	4.6	4.5	6.8
Copper	4000	91	-	**230**	**140**	14	13	22
Iron	-	-	-	50000	44000	11000	9800	15000
Lead	260	600	-	4.3	19	5.5	5.1	17
Lithium	-	-	-	9.3	12	8.3	7.3	18
Manganese	-	-	-	560	420	160	140	330
Mercury	24	50	-	<0.10	<0.10	<0.10	<0.10	<0.10
Molybdenum	-	-	-	<2.0	<2.0	<2.0	<2.0	<2.0
Nickel	310	89	-	47	28	9	9.1	12
Rubidium	-	-	-	6.4	17	5.8	5.2	12
Selenium	125	2.9	-	<1.0	<1.0	<1.0	<1.0	<1.0
Silver	-	40	-	<0.50	<0.50	<0.50	<0.50	<0.50
Strontium	-	-	-	11	18	6.5	6.2	9.9
Thallium	1	3.6	-	<0.10	<0.10	<0.10	<0.10	<0.10
Tin	-	-	300	<2.0	<2.0	<2.0	<2.0	<2.0
Uranium	33	2000	-	0.31	0.45	0.65	0.51	0.74
Vanadium	-	130	-	58	71	20	19	26
Zinc	-	200	-	54	92	32	27	40
			depth (m)	0-0.05	0-0.05	0-0.05	0-0.05	0-0.05
			Sample Date	14-Sep-17	14-Sep-17	14-Sep-17	14-Sep-17	14-Sep-17

1. Canadian Council of Ministers of the Environment Soil Quality Guidelines for the Protection of Environmental and Human Health (commercial site)

2. Generic CCME guideline: no distinction regarding whether derivation is human health or ecologically based

Exceedances of the Federal Human Health Screening Levels or Detection Limits greater than the Federal Human Health Screening Levels are shaded red.

Exceedances of the Federal Ecological Screening Levels or Detection Limits greater than the Federal Ecological Screening Levels are **Bolded**.

- = no guideline, or parameter not analyzed

Table D3-2 Metals in Soil (mg/kg) (Commercial)

Parameter	CCME[1] Human Health	CCME[1] Ecological Health	CCME[1] Generic[2]	SS_SP_18	SS_SP_19	SS_SP_20	SS_SP_21	SS_SP_22
Aluminum	-	-	-	6100	6400	7300	6800	4900
Antimony	-	-	40	<2.0	<2.0	<2.0	<2.0	<2.0
Arsenic	12	26	-	<2.0	<2.0	<2.0	<2.0	<2.0
Barium	10000	2000	-	52	54	72	77	46
Beryllium	110	8	-	<2.0	<2.0	<2.0	<2.0	<2.0
Bismuth	-	-	-	<2.0	<2.0	<2.0	<2.0	<2.0
Boron	-	-	-	<50	<50	<50	<50	<50
Cadmium	49	22	-	<0.30	<0.30	<0.30	<0.30	<0.30
Chromium	630	87	-	11	11	4.3	15	6.8
Cobalt	-	-	300	8.3	5.1	17	7.1	4.2
Copper	4000	91	-	44	13	**130**	44	12
Iron	-	-	-	17000	12000	42000	20000	11000
Lead	260	600	-	5.9	140	2.5	37	5.1
Lithium	-	-	-	9.8	11	5.6	11	18
Manganese	-	-	-	220	170	310	200	250
Mercury	24	50	-	<0.10	<0.10	<0.10	<0.10	<0.10
Molybdenum	-	-	-	<2.0	<2.0	<2.0	<2.0	<2.0
Nickel	310	89	-	9.2	10	7.3	11	8.4
Rubidium	-	-	-	9.9	9.3	22	17	21.0
Selenium	125	2.9	-	<1.0	<1.0	<1.0	<1.0	<1.0
Silver	-	40	-	<0.50	<0.50	<0.50	<0.50	<0.50
Strontium	-	-	-	7.6	10	14	8.5	6.3
Thallium	1	3.6	-	<0.10	<0.10	0.1	<0.10	0.12
Tin	-	-	300	<2.0	<2.0	<2.0	<2.0	<2.0
Uranium	33	2000	-	0.5	0.9	0.33	0.6	1.2
Vanadium	-	130	-	28	25	78	35	18
Zinc	-	200	-	28	41	52	84	40
			depth (m)	0-0.05	0-0.05	0-0.05	0-0.05	0-0.05
			Sample Date	14-Sep-17	14-Sep-17	14-Sep-17	14-Sep-17	14-Sep-17

1. Canadian Council of Ministers of the Environment Soil Quality Guidelines for the Protection of Environmental and Human Health (commercial site)

2. Generic CCME guideline: no distinction regarding whether derivation is human health or ecologically based

Exceedances of the Federal Human Health Screening Levels or Detection Limits greater than the Federal Human Health Screening Levels are shaded red.

Exceedances of the Federal Ecological Screening Levels or Detection Limits greater than the Federal Ecological Screening Levels are **Bolded**.

- = no guideline, or parameter not analyzed

Table D3-2 Metals in Soil (mg/kg) (Commercial)

Parameter	CCME[1] Human Health	CCME[1] Ecological Health	CCME[1] Generic[2]	SS_SP_23	SS_SP_23_FD	SS_SP_24	SS_SP_25	SS_SP_26
Aluminum	-	-	-	8400	10000	6800	8200	8200
Antimony	-	-	40	<2.0	<2.0	<2.0	<2.0	<2.0
Arsenic	12	26	-	3.8	4	<2.0	<2.0	<2.0
Barium	10000	2000	-	76	98	46	56	80
Beryllium	110	8	-	<2.0	<2.0	<2.0	<2.0	<2.0
Bismuth	-	-	-	<2.0	<2.0	<2.0	<2.0	<2.0
Boron	-	-	-	<50	<50	<50	<50	<50
Cadmium	49	22	-	<0.30	<0.30	<0.30	<0.30	<0.30
Chromium	630	87	-	9.7	7	7.2	7.8	11
Cobalt	-	-	300	27	31	10	22	8.1
Copper	4000	91	-	**210**	**270**	84	**270**	25
Iron	-	-	-	53000	55000	20000	39000	17000
Lead	260	600	-	**2700**	**1100**	210	6	10
Lithium	-	-	-	6.9	7.8	9.2	6.1	18
Manganese	-	-	-	440	490	250	380	350
Mercury	24	50	-	<0.10	<0.10	<0.10	<0.10	<0.10
Molybdenum	-	-	-	<2.0	<2.0	<2.0	<2.0	<2.0
Nickel	310	89	-	21	21	14	25	14
Rubidium	-	-	-	17	22	9.1	15	15
Selenium	125	2.9	-	<1.0	<1.0	<1.0	<1.0	<1.0
Silver	-	40	-	<0.50	<0.50	<0.50	<0.50	<0.50
Strontium	-	-	-	13	14	11	12	8.9
Thallium	1	3.6	-	<0.10	0.12	<0.10	<0.10	<0.10
Tin	-	-	300	<2.0	<2.0	<2.0	<2.0	<2.0
Uranium	33	2000	-	0.31	0.44	0.51	0.36	0.81
Vanadium	-	130	-	130	96	37	74	31
Zinc	-	200	-	96	100	33	55	38
			depth (m)	0-0.05	0-0.05	0-0.05	0-0.05	0-0.05
			Sample Date	14-Sep-17	14-Sep-17	14-Sep-17	14-Sep-17	14-Sep-17

1. Canadian Council of Ministers of the Environment Soil Quality Guidelines for the Protection of Environmental and Human Health (commercial site)

2. Generic CCME guideline: no distinction regarding whether derivation is human health or ecologically based

Exceedances of the Federal Human Health Screening Levels or Detection Limits greater than the Federal Human Health Screening Levels are shaded red.

Exceedances of the Federal Ecological Screening Levels or Detection Limits greater than the Federal Ecological Screening Levels are **Bolded**.

- = no guideline, or parameter not analyzed

Table D3-2 Metals in Soil (mg/kg) (Commercial)

Parameter	CCME[1] Human Health	CCME[1] Ecological Health	CCME[1] Generic[2]	SS_SP_26_FD	SS_SP_28_BG	SS_SP_30	SS_SP_31	SS_SP_32
Aluminum	-	-	-	7400	17000	12000	5100	5200
Antimony	-	-	40	<2.0	<2.0	<2.0	<2.0	<2.0
Arsenic	12	26	-	<2.0	<2.0	<2.0	<2.0	<2.0
Barium	10000	2000	-	66	70	47	11	42
Beryllium	110	8	-	<2.0	<2.0	<2.0	<2.0	<2.0
Bismuth	-	-	-	<2.0	<2.0	<2.0	<2.0	<2.0
Boron	-	-	-	<50	<50	<50	<50	<50
Cadmium	49	22	-	<0.30	<0.30	<0.30	<0.30	<0.30
Chromium	630	87	-	9.7	7.3	11	12	7.7
Cobalt	-	-	300	7.4	10	43	9.6	9.1
Copper	4000	91	-	23	58	**440**	26	30
Iron	-	-	-	15000	26000	93000	35000	27000
Lead	260	600	-	11	4.1	2.5	1.9	9.7
Lithium	-	-	-	16	14	14	<2.0	8.2
Manganese	-	-	-	320	83	920	210	260
Mercury	24	50	-	<0.10	<0.10	<0.10	<0.10	<0.10
Molybdenum	-	-	-	<2.0	<2.0	<2.0	<2.0	<2.0
Nickel	310	89	-	12	51	42	18	15
Rubidium	-	-	-	13	13	16.0	2.6	9
Selenium	125	2.9	-	<1.0	2.2	1.5	<1.0	<1.0
Silver	-	40	-	<0.50	<0.50	<0.50	<0.50	<0.50
Strontium	-	-	-	7.6	24	13	7.8	9.8
Thallium	1	3.6	-	<0.10	<0.10	<0.10	<0.10	<0.10
Tin	-	-	300	<2.0	<2.0	<2.0	<2.0	<2.0
Uranium	33	2000	-	0.82	0.89	0.37	0.24	0.4
Vanadium	-	130	-	28	76	100	86	59
Zinc	-	200	-	35	20	88	15	34
			depth (m)	0-0.05	0-0.05	0-0.05	0-0.05	0-0.05
			Sample Date	14-Sep-17	14-Sep-17	14-Sep-17	14-Sep-17	14-Sep-17

1. Canadian Council of Ministers of the Environment Soil Quality Guidelines for the Protection of Environmental and Human Health (commercial site)

2. Generic CCME guideline: no distinction regarding whether derivation is human health or ecologically based

Exceedances of the Federal Human Health Screening Levels or Detection Limits greater than the Federal Human Health Screening Levels are shaded red.

Exceedances of the Federal Ecological Screening Levels or Detection Limits greater than the Federal Ecological Screening Levels are **Bolded**.

- = no guideline, or parameter not analyzed

Table D3-2 Metals in Soil (mg/kg) (Commercial)

	CCME[1]							
Parameter	Human Health	Ecological Health	Generic[2]	SS_SP_33	SS_SP_40	SS_SP_41	SS_SP_42	SS_SP_43
Aluminum	-	-	-	7800	5300	5000	6300	7000
Antimony	-	-	40	25	<2.0	<2.0	<2.0	<2.0
Arsenic	12	26	-	<2.0	<2.0	<2.0	<2.0	<2.0
Barium	10000	2000	-	110	31	34	39	66
Beryllium	110	8	-	<2.0	<2.0	<2.0	<2.0	<2.0
Bismuth	-	-	-	<2.0	<2.0	<2.0	<2.0	<2.0
Boron	-	-	-	<50	<50	<50	<50	<50
Cadmium	49	22	-	1.2	<0.30	<0.30	<0.30	<0.30
Chromium	630	87	-	52	5.6	6.3	7.9	8.8
Cobalt	-	-	300	24	3.7	3.7	5.5	4.6
Copper	4000	91	-	**800**	5.9	11	17	17
Iron	-	-	-	84000	13000	11000	13000	13000
Lead	260	600	-	**900**	4.8	7.2	6.4	3.9
Lithium	-	-	-	6.8	9.4	8.6	12	12
Manganese	-	-	-	530	180	140	180	170
Mercury	24	50	-	0.1	<0.10	<0.10	<0.10	<0.10
Molybdenum	-	-	-	4.2	<2.0	<2.0	<2.0	<2.0
Nickel	310	89	-	36	6.9	7.8	11	9.5
Rubidium	-	-	-	11	8.8	5.9	6.9	8.5
Selenium	125	2.9	-	<1.0	<1.0	<1.0	<1.0	<1.0
Silver	-	40	-	1.4	<0.50	<0.50	<0.50	<0.50
Strontium	-	-	-	17	8.3	6.8	7.9	7.4
Thallium	1	3.6	-	<0.10	<0.10	<0.10	<0.10	<0.10
Tin	-	-	300	100	<2.0	<2.0	<2.0	<2.0
Uranium	33	2000	-	0.24	0.59	0.58	0.55	0.55
Vanadium	-	130	-	120	26	23	25	26
Zinc	-	200	-	**1900**	24	22	27	27
			depth (m)	0-0.05	0-0.05	0-0.05	0-0.05	0-0.05
			Sample Date	14-Sep-17	15-Sep-17	15-Sep-17	15-Sep-17	15-Sep-17

1. Canadian Council of Ministers of the Environment Soil Quality Guidelines for the Protection of Environmental and Human Health (commercial site)

2. Generic CCME guideline: no distinction regarding whether derivation is human health or ecologically based

Exceedances of the Federal Human Health Screening Levels or Detection Limits greater than the Federal Human Health Screening Levels are shaded red.

Exceedances of the Federal Ecological Screening Levels or Detection Limits greater than the Federal Ecological Screening Levels are **Bolded**.

- = no guideline, or parameter not analyzed

Table D4-1 PCBs in Soil (mg/kg) (Residential)

	CCME [1]								
Parameter	**Human Health**	**Ecological Health**	**SS_SP_28_BG**	**SS_SP_45**	**SS_SP_46**	**SS_SP_47**	**SS_SP_48**	**SS_SP_63**	**SS_SP_64**
Aroclor 1016	-	-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Aroclor 1221	-	-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Aroclor 1232	-	-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Aroclor 1248	-	-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Aroclor 1242	-	-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Aroclor 1254	-	-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Aroclor 1260	-	-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Calculated Total PCB	5	1.3	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
		Sample Depth (mbgs)	0-0.05	0-0.05	0-0.05	0-0.05	0-0.05	0-0.05	0-0.05
		Sample Date	14-Sep-17	14-Sep-17	14-Sep-17	14-Sep-17	14-Sep-17	14-Sep-17	14-Sep-17

1. Canadian Council of Ministers of the Environment Soil Quality Guidelines for the Protection of Environmental and Human Health (residential site)

- = no guideline, or parameter not analyzed

Table D4-2 PCBs in Soil (mg/kg) (Commercial)

Parameter	CCME [1] Human Health	CCME [1] Ecological Health	SS_SP_17	SS_SP_19	SS_SP_21	SS_SP_22	SS_SP_23	SS_SP_23_FD
Aroclor 1016	-	-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Aroclor 1221	-	-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Aroclor 1232	-	-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Aroclor 1248	-	-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Aroclor 1242	-	-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Aroclor 1254	-	-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Aroclor 1260	-	-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Calculated Total PCB	50	1.3	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
		Sample Depth (mbgs)	0-0.05	0-0.05	0-0.05	0-0.05	0-0.05	0-0.05
		Sample Date	14-Sep-17	14-Sep-17	14-Sep-17	14-Sep-17	14-Sep-17	14-Sep-17

1. Canadian Council of Ministers of the Environment Soil Quality Guidelines for the Protection of Environmental and Human Health (commercial site)

- = no guideline, or parameter not analyzed

Table D4-2 PCBs in Soil (mg/kg) (Commercial)

	CCME [1]							
Parameter	**Human Health**	**Ecological Health**	**SS_SP_24**	**SS_SP_25**	**SS_SP_25_LD**	**SS_SP_26**	**SS_SP_26_FD**	**SS_SP_28_BG**
Aroclor 1016	-	-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Aroclor 1221	-	-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Aroclor 1232	-	-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Aroclor 1248	-	-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Aroclor 1242	-	-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Aroclor 1254	-	-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Aroclor 1260	-	-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Calculated Total PCB	50	1.3	<0.050	<0.050	-	<0.050	<0.050	<0.050
		Sample Depth (mbgs)	0-0.05	0-0.05	0-0.05	0-0.05	0-0.05	0-0.05
		Sample Date	14-Sep-17	14-Sep-17	14-Sep-17	14-Sep-17	14-Sep-17	14-Sep-17

1. Canadian Council of Ministers of the Environment Soil Quality Guidelines for the Protection of Environmental and Human Health (commercial site)

\- = no guideline, or parameter not analyzed

Table D4-2 PCBs in Soil (mg/kg) (Commercial)

Parameter	CCME [1] Human Health	CCME [1] Ecological Health	SS_SP_30	SS_SP_31	SS_SP_32	SS_SP_33	SS_SP_40	SS_SP_41
Aroclor 1016	-	-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Aroclor 1221	-	-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Aroclor 1232	-	-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Aroclor 1248	-	-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Aroclor 1242	-	-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Aroclor 1254	-	-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Aroclor 1260	-	-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Calculated Total PCB	50	1.3	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
		Sample Depth (mbgs)	0-0.05	0-0.05	0-0.05	0-0.05	0-0.05	0-0.05
		Sample Date	14-Sep-17	14-Sep-17	14-Sep-17	14-Sep-17	14-Sep-17	14-Sep-17

1. Canadian Council of Ministers of the Environment Soil Quality Guidelines for the Protection of Environmental and Human Health (commercial site)

- = no guideline, or parameter not analyzed

Table D4-2 PCBs in Soil (mg/kg) (Commercial)

Parameter	CCME [1] Human Health	CCME [1] Ecological Health	SS_SP_42	SS_SP_43
Aroclor 1016	-	-	<0.050	<0.050
Aroclor 1221	-	-	<0.050	<0.050
Aroclor 1232	-	-	<0.050	<0.050
Aroclor 1248	-	-	<0.050	<0.050
Aroclor 1242	-	-	<0.050	<0.050
Aroclor 1254	-	-	<0.050	<0.050
Aroclor 1260	-	-	<0.050	<0.050
Calculated Total PCB	50	1.3	<0.050	<0.050
		Sample Depth (mbgs)	0-0.05	0-0.05
		Sample Date	14-Sep-17	14-Sep-17

1. Canadian Council of Ministers of the Environment Soil Quality Guidelines for the Protection of Environmental and Human Health (commercial site)

- = no guideline, or parameter not analyzed

Table D5 Volatile Organic Compounds (Excluding BTEX) in Soil (µg/kg) (Commercial)

Parameter (other names for the same compound)	CCME [1] Human Health	Ecological Health	Generic[2]	SS_SP_21	SS_SP_22
1,1,1-Trichloroethane	-	-	50000	<25	<25
1,1,2,2-Tetrachlorethane	-	-	500	<25	<25
1,1,2-Trichloroethane	-	-	50000	<25	<25
1,1-Dichloroethane	-	-	50000	<25	<25
1,1-Dichloroethene (Dichloroethylene)	-	-	50000	<25	<25
1,2-Dichloroethane	-	-	50000	<25	<25
1,2-Dichloropropane	-	-	50000	<25	<25
1,3-Dichlorobenzene	-	-	10000	<25	<25
1,4-Dichlorobenzene	-	-	10000	<25	<25
Bromodichloromethane (Dichlorobromomethane)	-	-	-	<25	<25
Bromoform (Tribromomethane)	-	-	-	<25	<25
Bromomethane (Monobromomethane, Methyl Bromide)	-	-	-	<50	<50
Carbon Tetrachloride (Tetrachloromethane)	-	-	50000	<25	<25
Chlorobenzene (Monochlorobenzene)	-	-	10000	<25	<25
Chloroethane (Monochloroethane, Ethyl Chloride)	-	-	-	<200	<200
cis-1,2-Dichloroethene (1,2-Dichloroethylene)	-	-	50000	<25	<25
Dibromochloromethane	-	-	-	<25	<25
Methyl t-butyl ether (MTBE)	-	-	-	<25	71
Methylene Chloride (Dichloromethane)	-	-	50000	<50	<50
Styrene	-	-	50000	<25	<25
Tetrachloroethylene (1,1,2,2- Tetrachloroethene, PCE)	500	34000	-	<25	<25
trans-1,2-Dichloroethylene (1,2-Dichloroethylene)	-	-	-	<25	<25
trans-1,3-Dichloropropene	-	-	-	<25	<25
Trichloroethylene (1,1,2-Trichloroethene, TCE)	10	50	-	<10	<10
Trichlorofluoromethane (Freon 11)	-	-	-	<25	<25
Vinyl Chloride	-	-	-	<20	<20
			Sample Date	14-Sep-17	14-Sep-17
			Sample Depth (mbgs)	0-0.05	0-0.05

1. Canadian Council of Ministers of the Environment Soil Quality Guidelines for the Protection of Environmental and Human Health (commercial site)
2. Generic CCME guideline: no distinction regarding whether derivation is human health or ecologically based

NC = None calculated

- = no guideline, or parameter not analyzed

Table D6 Furans, and Dioxin-like Compounds in Soil (ng/kg)

Parameter	CCME[1] Human Health	CCME[1] Ecological Health	TEF[2]	SS_SP_64	SS_SP_64_LD
2,3,7,8-Tetra CDD *	-	-	1	<0.101	<0.105
1,2,3,7,8-Penta CDD *	-	-	1	<0.102	<0.0954
1,2,3,4,7,8-Hexa CDD *	-	-	0.1	<0.105	<0.112
1,2,3,6,7,8-Hexa CDD *	-	-	0.1	<0.102	<0.109
1,2,3,7,8,9-Hexa CDD *	-	-	0.1	<0.0927	<0.0992
1,2,3,4,6,7,8-Hepta CDD *	-	-	0.01	0.634	0.574
Octa CDD *	-	-	0.0003	8.14	7.91
Total Tetra CDD *	-	-	-	<0.127	<0.147
Total Penta CDD *	-	-	-	<0.118	<0.121
Total Hexa CDD *	-	-	-	0.538	0.375
Total Hepta CDD *	-	-	-	1.89	1.87
2,3,7,8-Tetra CDF **	-	-	0.1	<0.105	<0.102
1,2,3,7,8-Penta CDF **	-	-	0.03	<0.104	<0.102
2,3,4,7,8-Penta CDF **	-	-	0.3	<0.103	<0.102
1,2,3,4,7,8-Hexa CDF **	-	-	0.1	<0.100	<0.104
1,2,3,6,7,8-Hexa CDF **	-	-	0.1	<0.0958	<0.0991
2,3,4,6,7,8-Hexa CDF **	-	-	0.1	<0.101	<0.105
1,2,3,7,8,9-Hexa CDF **	-	-	0.1	<0.110	<0.113
1,2,3,4,6,7,8-Hepta CDF **	-	-	0.01	0.125	0.123
1,2,3,4,7,8,9-Hepta CDF **	-	-	0.01	<0.117	<0.127
Octa CDF **	-	-	0.0003	0.181	<0.125
Total Tetra CDF **	-	-	-	0.299	0.116
Total Penta CDF **	-	-	-	<0.104	<0.102
Total Hexa CDF **	-	-	-	<0.102	<0.105
Total Hepta CDF **	-	-	-	0.125	0.123
Toxic Equivalency Quotient (TEQ)	1000	4	-	0.17	0.17
			Sample Date	15-Sep-17	15-Sep-17
			Depth (m)	0-0.05	0-0.05

1. Canadian Council of Ministers of the Environment Soil Quality Guidelines for the Protection of Environmental and Human Health (residential site)

2. Toxic equivalency factors (Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds per World Health Organization, 2005)

* CDD = Chloro Dibenzo-p-Dioxin

** CDF = Chloro Dibenzo-p-Furan

- = no guideline, or parameter not analyzed

If the concentration was less than the detection limit, then 1/2 the detection limit was used in the TEQ calculation.

Table D7 Petroleum Hydrocarbons in Sediment (mg/kg)

Sample ID	Sample Depth (mbgs)	Sample Date	B	T	E	X	Total Petroleum Hydrocarbons						
							C_6-C_{10}	C_{10}-C_{16}	C_{16}-C_{34}	C_{34}-C_{50}[4]	$C_{>50}$[5]	$C_{>34}$	Modified TPH (C_6-C_{32})[7]
							F1[3]	F2	F3	-	-	F4[6]	
Provincial Screening Levels[1]			**1.2**	**1.4**	**1.2**	**1.3**	**-**	**-**	**-**	**-**	**-**	**-**	**15**
Federal Screening Levels[2]			**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
SD_SP_01_BG		15-Sep-17	<0.0060	<0.020	<0.010	<0.020	<10	<10	<50	<50	-	<50	<50
SD_SP_02		15-Sep-17	<0.0060	<0.020	<0.010	<0.020	<10	<10	<50	<50	-	<50	<50
SD_SP_03		15-Sep-17	<0.0060	<0.020	<0.010	<0.020	<10	<10	<50	<50	-	<50	<50
SD_SP_04		15-Sep-17	<0.018	<0.060	<0.030	<0.060	<30	82	1600	800	1700	2500	*1682*

Notes:

1. Tier I ESLs for "typical" sediment (Atlantic PIRI, 2015), gasoline fuel type (most conservative)
2. CCME does not provide Sediment Quality Guidelines for these parameters
3. Does not include BTEX compounds.
4. Where the chromatogram returns to baseline following the $C_{>34}$-C_{50} analysis, additional hydrocarbons in the $C_{>50}$ range are not expected, and the preliminary F4 ($C_{>34}$-C_{50}) analysis is deemed an appropriate approximation of CCME F4 ($C_{>34}$) hydrocarbons.
5. Where the chromatogram did not return to baseline following the $C_{>34}$-C_{50} analysis, additional anlysis (F4 Gravimetric method) was conducted to quantify hydrocarbons in the $C_{>50}$ range.
6. F4G concentration is the sum of the F4 and F4G analysis
7. Modified TPH calculated from the sum of the detected parameters of the CWS F1-F3 fractions. Though generally consistent with the Atlantic RBCA Guidelines for Laboratories (V3.1, 2016), the Atlantic RBCA modified TPH represents $C_{>6}$-C_{32}, while the CWS represents $C_{>6}$-C_{34}. Thus the calculated mTPH concentration presented here is a slight over estimate of mTPH in the Atlantic RBCA context.

Exceedances of the Provincial Ecological Screening Levels are italicized.

Where the concentration of a parameter exceeds both the Federal and Provincial screening level, the value is highlighted here in the context of the Federal framework only.

NA = not applicable

"-" = Not available/ Not analyzed.

Table D8 PAHs in Sediment (mg/kg)

Contaminant of Potential Concern	CCME		Sample ID			
	ISQG	**PEL**	**SD_SP_01_BG**	**SD_SP_02**	**SD_SP_03**	**SD_SP_04**
1-Methylnaphthalene	-	-	<0.0050	<0.0050	<0.0050	0.15
2-Methylnaphthalene	0.0202	0.201	<0.0050	<0.0050	<0.0050	**0.17**
Acenaphthene	0.00671	0.0889	<0.0050	<0.0050	<0.0050	**0.081**
Acenaphthylene	0.00587	0.128	<0.0050	<0.0050	<0.0050	**0.039**
Anthracene	0.0469	0.245	<0.0050	<0.0050	<0.0050	**0.17**
Benz(a)anthracene	0.0317	0.385	<0.0050	<0.0050	<0.0050	**0.91**
Benzo(a)pyrene	0.0319	0.782	<0.0050	<0.0050	<0.0050	**0.73**
Benzo(b)fluoranthene	-	-	<0.0050	<0.0050	<0.0050	0.75
Benzo(g,h,i)perylene	-	-	<0.0050	<0.0050	<0.0050	0.49
Benzo(j)fluoranthene	-	-	<0.0050	<0.0050	<0.0050	0.42
Benzo(k)fluoranthene	-	-	<0.0050	<0.0050	<0.0050	0.42
Chrysene/Triphenylene	0.0571	0.862	<0.0050	<0.0050	<0.0050	**1.1**
Dibenz(a,h)anthracene	0.00622	0.135	<0.0050	<0.0050	<0.0050	**0.12**
Fluoranthene	0.111	2.355	<0.0050	<0.0050	<0.0050	**3**
Fluorene	0.0212	0.144	<0.0050	<0.0050	<0.0050	**0.14**
Indeno(1,2,3-c,d)pyrene	-	-	<0.0050	<0.0050	<0.0050	0.44
Naphthalene	0.0346	0.391	<0.0050	<0.0050	<0.0050	**0.1**
Perylene	-	-	<0.0050	<0.0050	<0.0050	0.19
Phenanthrene	0.0419	0.515	<0.0050	<0.0050	<0.0050	**1.2**
Pyrene	0.053	0.875	<0.0050	<0.0050	<0.0050	**2.4**
		Sample Date				

Notes:
CCME = Canadian Council of Ministers of the Environment Sediment Quality Guidelines for the Protection of Aquatic Life - Freshwater (1998).
"-" = no guideline available or parameter not analyzed
ISQG = Interim Sediment Quality Guideline
PEL = Probable Effects Level
Exceedances of ISQG (Interim Sediment Quality Guidelines) are **Bolded**.
Exceedances of the PEL (Probable Effects Levels) are shaded red.

Table D9 Metals in Sediment (mg/kg)

Parameter	CCME ISQG[1]	CCME PEL[2]	SD_SP_01_BG	SD_SP_02	SD_SP_03	SD_SP_04
Aluminum	-	-	9400	4300	4200	12000
Antimony	-	-	<2.0	<2.0	<2.0	2
Arsenic	5.9	17	<2.0	<2.0	<2.0	**6.1**
Barium	-	-	46	30	28	120
Beryllium	-	-	<2.0	<2.0	<2.0	<2.0
Bismuth	-	-	<2.0	<2.0	<2.0	<2.0
Boron	-	-	<50	<50	<50	130
Cadmium	0.6	3.5	<0.30	<0.30	<0.30	**2.2**
Chromium	37.3	90	12	5.1	5.6	19
Cobalt	-	-	3.8	4.1	2.5	11
Copper	36	197	31	4.5	7.2	**88**
Iron	-	-	8500	12000	7600	36000
Lead	35	91.3	2.5	1.7	2	**120**
Lithium	-	-	8.7	16	4.7	16
Manganese	-	-	130	150	79	330
Mercury	0.17	0.486	<0.10	<0.10	<0.10	0.17
Molybdenum	-	-	<2.0	<2.0	<2.0	<2.0
Nickel	-	-	11.0	9.0	6.6	44.0
Rubidium	-	-	9.3	12	4.3	7.3
Selenium	-	-	<1.0	<1.0	<1.0	1.3
Silver	-	-	<0.50	<0.50	<0.50	<0.50
Strontium	-	-	12	7.8	8.9	18
Thallium	-	-	<0.10	<0.10	<0.10	<0.10
Tin	-	-	<2.0	<2.0	<2.0	27
Uranium	-	-	0.65	0.42	0.32	2.8
Vanadium	-	-	31	20	18	35
Zinc	123	315	21	23	11	**970**
		depth (m)	0-0.05	0-0.05	0-0.05	0-0.05
		Sample Date	15-Sep-17	15-Sep-17	15-Sep-17	15-Sep-17

1. Canadian Council of Ministers of the Environment Interim Sediment Quality Guidelines (ISQGs) for the Protection of Freshwater Aquatic Life

2. Canadian Council of Ministers Probable Effects Level (PELs) for the Protection of Freshwater Aquatic Life

Exceedances of the ISQG or Detection Limits greater than the ISQG are **Bolded**.

Exceedances of the PEL are shaded red

Where the concentration of a parameter exceeds both the ISQG and PEL, the value is highlighted here in the context of the PEL only.

- = no guideline, or parameter not analyzed

Table D10 PCBs in Sediment (mg/kg)

Parameter	CCME ISQG[1]	CCME PEL[2]	SD_SP_02	SD_SP_03	SD_SP_04
Aroclor 1016	-	-	<0.050	<0.050	<0.050
Aroclor 1221	-	-	<0.050	<0.050	<0.050
Aroclor 1232	-	-	<0.050	<0.050	<0.050
Aroclor 1248	-	-	<0.050	<0.050	<0.050
Aroclor 1242	-	-	<0.050	<0.050	<0.050
Aroclor 1254	0.06	0.34	<0.050	<0.050	<0.050
Aroclor 1260	-	-	<0.050	<0.050	<0.050
Calculated Total PCB	0.0341	0.277	**<0.050**	**<0.050**	**<0.050**
		Sample Date	14-Sep-17	14-Sep-17	14-Sep-17

1. Canadian Council of Ministers of the Environment Interim Sediment Quality Guidelines (ISQGs) for the Protection of Freshwater Aquat
2. Canadian Council of Ministers Probable Effects Level (PELs) for the Protection of Freshwater Aquatic Life
NC = None calculated
- = no guideline, or parameter not analyzed
Exceedances of the ISQG are **Bolded**.

Table D11 Volatile Organic Compounds (Excluding BTEX) in Sediment (µg/kg)

Parameter (other names for the same compound)	CCME ISQG[1]	CCME PEL[2]	SD_SP_02	SD_SP_04
1,1,1-Trichloroethane	-	-	<25	<25
1,1,2,2-Tetrachlorethane	-	-	<25	<25
1,1,2-Trichloroethane	-	-	<25	<25
1,1-Dichloroethane	-	-	<25	<25
1,1-Dichloroethene (Dichloroethylene)	-	-	<25	<25
1,2-Dichloroethane	-	-	<25	<25
1,2-Dichloropropane	-	-	<25	<25
1,3-Dichlorobenzene	-	-	<25	<25
1,4-Dichlorobenzene	-	-	<25	<25
Bromodichloromethane (Dichlorobromomethane)	-	-	<25	<25
Bromoform (Tribromomethane)	-	-	<25	<25
Bromomethane (Monobromomethane, Methyl Bromide)	-	-	<50	<50
Carbon Tetrachloride (Tetrachloromethane)	-	-	<25	<25
Chlorobenzene (Monochlorobenzene)	-	-	<25	<25
Chloroethane (Monochloroethane, Ethyl Chloride)	-	-	<200	<200
cis-1,2-Dichloroethene (1,2-Dichloroethylene)	-	-	<25	<25
Dibromochloromethane	-	-	<25	<25
Methyl t-butyl ether (MTBE)	-	-	<25	<25
Methylene Chloride (Dichloromethane)	-	-	<50	<50
Styrene	-	-	<25	<25
Tetrachloroethylene (1,1,2,2- Tetrachloroethene, PCE)	-	-	<25	<25
trans-1,2-Dichloroethylene (1,2-Dichloroethylene)	-	-	<25	<25
trans-1,3-Dichloropropene	-	-	<25	<25
Trichloroethylene (1,1,2-Trichloroethene, TCE)	-	-	<10	<10
Trichlorofluoromethane (Freon 11)	-	-	<25	<25
Vinyl Chloride	-	-	<20	<20
		Sample Date	15-Sep-17	15-Sep-17
		Sample Depth (mbgs)	0-0.05	0-0.05

1. Canadian Council of Ministers of the Environment Interim Sediment Quality Guidelines (ISQGs) for the Protection of Freshwater Aquatic Life

2. Canadian Council of Ministers Probable Effects Level (PELs) for the Protection of Freshwater Aquatic Life

CCME does not provide Sediment Quality Guidelines for these parameters

Table D12 Petroleum Hydrocarbons in Surface Water (mg/L)

Sample ID	Sample Date	B	T	E	X	Total Petroleum Hydrocarbons				
						C_6-C_{10}	C_{10}-C_{16}	C_{16}-C_{34}	C_{34}-C_{50}	Modfied TPH
						F1	F2	F3	F4	
Provincial Screening Levels [1]		2.1	0.77	0.32	0.33	-	-	-	-	0.10
Federal Screening Levels [2]		0.37	0.002	0.09	-	-	-	-	-	-
SW_SP_01_BG	15-Sep-17	<0.20	<0.20	<0.20	<0.40	<0.025	<0.10	<0.20	<0.20	**<0.20**
SW_SP_01_BG LD	15-Sep-17	<0.20	<0.20	<0.20	<0.40	<0.025	-	-	-	**<0.20**
SW_SP_02	15-Sep-17	<0.20	<0.20	<0.20	<0.40	<0.025	<0.10	<0.20	<0.20	**<0.20**
SW_SP_03	15-Sep-17	<0.20	<0.20	<0.20	<0.40	<0.025	<0.10	<0.20	<0.20	**<0.20**
SW_SP_04	15-Sep-17	<0.20	<0.20	<0.20	<0.40	<0.025	<0.10	<0.20	<0.20	**<0.20**
SW_SP_05	15-Sep-17	<0.20	<0.20	<0.20	<0.40	<0.025	<0.10	<0.20	<0.20	**<0.20**

Notes:

1. Tier I ESLs for Surface Water (Atlantic PIRI, 2015), diesel/lube oil type (most conservative)
2. CCME Water Quality Guidelines for the Protection of Aquatic Life

Exceedances of the Provincial Screening Levels / or Detection Limits Greater than the Provincial Guidelines are **Bolded**.

"-" = parameter not analyzed

Table D13 PAHs in Surface Water (µg/L)

Contaminant of Potential Concern	CCME FWAL [1]	SW_SP_01_BG	SW_SP_04
1-Methylnaphthalene	-	<0.050	<0.069
2-Methylnaphthalene	-	<0.050	<0.069
Acenaphthene	5.8	<0.010	<0.014
Acenaphthylene	-	<0.010	<0.014
Acridine	4.4	<0.050	<0.014
Anthracene	0.012	<0.010	<0.014
Benz(a)anthracene	0.018	<0.010	<0.014
Benzo(a)pyrene	0.015	<0.010	<0.014
Benzo(b)fluoranthene	-	<0.010	<0.014
Benzo(b/j)fluoranthene	-	<0.020	<0.028
Benzo(g,h,i)perylene	-	<0.010	<0.014
Benzo(j)fluoranthene	-	<0.010	<0.014
Benzo(k)fluoranthene	-	<0.010	<0.014
Chrysene/Triphenylene	-	<0.010	<0.014
Dibenz(a,h)anthracene	-	<0.010	<0.014
Fluoranthene	0.04	<0.010	<0.014
Fluorene	3	<0.010	<0.014
Indeno(1,2,3-c,d)pyrene	-	<0.010	<0.014
Naphthalene	1.1	<0.20	<0.28
Perylene	-	<0.010	<0.014
Phenanthrene	0.4	<0.010	<0.014
Pyrene	0.025	<0.010	<0.014
Quinoline	3.4	<0.050	<0.069
	Sample Date	15-Sep-17	15-Sep-17

Notes:

1. CCME = Canadian Council of Ministers of the Environment Water Quality Guidelines for the Protection of Aquatic Life - Freshwater

- = no guideline, or parameter not analyzed

Exceedances of the Federal Screening Levels are shaded red.

Table D14 General Chemistry Parameters in Surface Water

Parameter	Units	CCME FAL	SW_SP_01_BG	SW_SP_02	SW_SP_03	SW_SP_04	SW_SP_04_LD	SW_SP_05
Calculated Parameters								
Anion Sum	me/L	-	0.73	0.84	0.84	0.72	-	0.76
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	-	9.3	5.3	7.4	14	-	14
Calculated TDS	mg/L	-	41	49	48	43	-	45
Carb. Alkalinity (calc. as CaCO3)	mg/L	-	<1.0	<1.0	<1.0	<1.0	-	<1.0
Cation Sum	me/L	-	0.72	0.82	0.83	0.81	-	0.84
Hardness (CaCO3)	mg/L	-	11	9.3	9.5	11	-	11
Ion Balance (% Difference)	%	-	0.69	1.2	0.6	5.88	-	5
Langelier Index (@ 20C)	N/A	-	-3.51	-3.97	-3.77	-2.74	-	-2.89
Langelier Index (@ 4C)	N/A	-	-3.77	-4.22	-4.02	-3	-	-3.14
Nitrate (N)	mg/L	13	<0.050	0.32	<0.050	<0.050	-	<0.050
Saturation pH (@ 20C)	N/A	-	10.2	10.6	10.4	9.83	-	9.82
Saturation pH (@ 4C)	N/A	-	10.4	10.8	10.7	10.1	-	10.1
Inorganics								
Total Alkalinity (Total as CaCO3)	mg/L	-	9.3	5.3	7.4	14	-	14
Dissolved Chloride (Cl)	mg/L	120	19	23	23	15	16	17
Colour	TCU	-	37	89	68	180	-	180
Nitrate + Nitrite	mg/L	-	<0.050	0.32	<0.050	<0.050	<0.050	<0.050
Nitrite (N)	mg/L	0.06	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Nitrogen (Ammonia Nitrogen)	mg/L	0.5	<0.050	0.11	<0.050	<0.050	-	0.059
Total Organic Carbon (C)	mg/L	-	7.3	8.1	7.7	16	-	18
Orthophosphate (P)	mg/L	-	<0.010	<0.010	<0.010	0.013	0.023	0.023
pH	pH	6.5 to 9	6.66	6.6	6.66	7.08	-	6.93
Reactive Silica (SiO2)	mg/L	-	1.1	0.98	1	1.3	-	1.5
Dissolved Sulphate (SO4)	mg/L	-	<2.0	2.9	2.2	<2.0	<2.0	<2.0
Turbidity	NTU	-	5.6	1.1	1	1.7	1.8	1.5
Conductivity	uS/cm	-	83	96	93	83	-	83
		Sample Date	15-Sep-17	15-Sep-17	15-Sep-17	15-Sep-17	15-Sep-17	15-Sep-17

1. CCME FAL = Canadian Council of Ministers of the Environment Environmental Quality Guidelines for the Protection of Freshwater Aquatic Life.

\- = no guideline, or parameter not analyzed

Table D15 Metals in Surface Water (µg/L)

Contaminant of Potential Concern	CCME FWAL	SW_SP_01_BG	SW_SP_02	SW_SP_03	SW_SP_04	SW_SP_05
Aluminum[1]	5-100	71	130	140	340	370
Aluminum (Sample-Specific Guideline)		***100***	***100***	***100***	***100***	***100***
Antimony	-	<1.0	<1.0	<1.0	<1.0	<1.0
Arsenic	5	<1.0	<1.0	<1.0	<1.0	<1.0
Barium	-	3.7	3.2	3.4	8.3	8.7
Beryllium	-	<1.0	<1.0	<1.0	<1.0	<1.0
Bismuth	-	<2.0	<2.0	<2.0	<2.0	<2.0
Boron	1500	<50	<50	<50	<50	<50
Cadmium	0.04	<0.010	<0.010	<0.010	<0.010	0.013
Cadmium (Sample-Specific Guideline)		***0.04***	***0.04***	***0.04***	***0.04***	***0.04***
Calcium	-	1400	1000	1000	2100	2200
Chromium	8.9	<1.0	<1.0	<1.0	<1.0	<1.0
Cobalt	-	<0.40	<0.40	<0.40	<0.40	<0.40
Copper[1]	2	<2.0	<2.0	<2.0	3.7	3.9
Copper (Sample-Specific Guideline)		***2***	***2***	***2***	***2***	***2***
Iron	300	250	640	630	1600	1700
Lead[1]	1	<0.50	<0.50	<0.50	0.94	1.2
Lead (Sample-Specific Guideline)		***1***	***1***	***1***	***1***	***1***
Magnesium	-	1700	1600	1700	1500	1500
Manganese	-	11	3.6	3.7	30	36
Mercury	0.026	<0.013	<0.013	<0.013	<0.013	<0.013
Molybdenum	73	<2.0	<2.0	<2.0	<2.0	<2.0
Nickel[1]	25	<2.0	<2.0	<2.0	<2.0	<2.0
Nickel (Sample-Specific Guideline)	-	***25***	***25***	***25***	***25***	***25***
Phosphorus	-	<100	<100	<100	<100	100
Potassium	-	580	570	590	760	790
Selenium	1	<1.0	<1.0	<1.0	<1.0	<1.0
Silver	0.25	<0.10	<0.10	<0.10	<0.10	<0.10
Sodium	-	11000	14000	14000	12000	12000
Strontium	-	13	11	12	18	18
Thallium	0.8	<0.10	<0.10	<0.10	<0.10	<0.10
Tin	-	<2.0	<2.0	<2.0	<2.0	<2.0
Titanium	-	<2.0	2.9	2.3	4.5	5.3
Uranium	15	<0.10	<0.10	<0.10	0.11	0.12
Vanadium	-	<2.0	<2.0	<2.0	<2.0	<2.0
Zinc	30	<5.0	<5.0	<5.0	18	20
pH (Laboratory)	6.5-9	6.66	6.6	6.66	7.08	6.93
Hardness		11	9.3	9.5	11	11
	Sample Date	15-Sep-17	15-Sep-17	15-Sep-17	15-Sep-17	15-Sep-17

Notes:

1. Guidelines for aluminum, copper, lead, and nickel are dependent on pH and/or hardness. The most conservative values are provided for reference, while sample-specific guidelines were also calculated and presented based on the pH and hardness measured by the lab
CCME FAL = Canadian Council of Ministers of the Environment Environmental Quality Guidelines for the Protection of Freshwater Aquatic Life (Long-Term).

Exceedances of the Federal Screening Levels are shaded red (sample-specific, where applicable).

- = no guideline, or parameter not analyzed

Table D16   PCBs in Surface Water (μg/L)

Parameter	CCME FAL Guideline	SW_SP_02	SW_SP_02_LD	SW_SP_03	SW_SP_04	SW_SP_05
Aroclor 1016	-	<0.050	<0.050	<0.050	<0.050	<0.050
Aroclor 1221	-	<0.050	<0.050	<0.050	<0.050	<0.050
Aroclor 1232	-	<0.050	<0.050	<0.050	<0.050	<0.050
Aroclor 1248	-	<0.050	<0.050	<0.050	<0.050	<0.050
Aroclor 1242	-	<0.050	<0.050	<0.050	<0.050	<0.050
Aroclor 1254	-	<0.050	<0.050	<0.050	<0.050	<0.050
Aroclor 1260	-	<0.050	<0.050	<0.050	<0.050	<0.050
Calculated Total PCB	-	<0.050	-	<0.050	<0.050	<0.050
	Sample Date	15-Sep-17	15-Sep-17	15-Sep-17	15-Sep-17	15-Sep-17

1. CCME FAL = Canadian Council of Ministers of the Environment Environmental Quality Guidelines for the Protection of Freshwater Aquatic Life.

CCME does not provide surface water quality guidelines for these parameters

- = no guideline, or parameter not analyzed

Table D17 Asbestos Fibres in Building Materials (%)

Sample ID	Sample Date	Description	Color	Concentration	Asbestos Type
BS_SP_01A ASPHALT SHINGLE	15-Sep-17	SHINGLE	Black	<0.5	-
BS_SP_02A TRANSITE BOARD	14-Sep-17	TRANSITE	Grey	15	Chrysotile
BS_SP_02B TRANSITE BOARD	14-Sep-17	TRANSITE	Grey	20	Chrysotile
BS_SP_02C TRANSITE BOARD	15-Sep-17	TRANSITE	Grey	15	Chrysotile
BS_SP_03A BLACK CAULKING	15-Sep-17	CAULKING	Black	<0.5	-
BS_SP_04A GASKET	15-Sep-17	GASKET	Black	<0.5	-
BS_SP_05A TAR PAPER MATER	15-Sep-17	TAR	Black	<0.5	-
BS_SP_06A 9X9 TILE GREY STREAK	15-Sep-17	VFT	Grey	2	Chrysotile
BS_SP_07A 9X9 TILE BEIGE STREAK	15-Sep-17	VFT	Beige	2	Chrysotile
BS_SP_08A 9X9 TILE GREEN STREAK	15-Sep-17	VFT	Green	2	Chrysotile
		Mastic	Black	2	Chrysotile
BS_SP_09A 9X9 TILE BEIGE W. GREEN STREAK	15-Sep-17	VFT	Grey	2	Chrysotile
		Mastic	Black	4	Chrysotile

Under Newfoundland and Labrador Regulation 111/98 (Asbestos Abatement Regulations, 1998 under the Occupational Health and Safety Act (O.C. 98-730)), Abestos Containing Material is defined as having >1% asbestos fibres by weight.

VFT = vinyl floor tile

- not applicable. Not detected.

Asbestos Containing Materials are shaded red

Table D18 Lead and Mercury in Paint

				Metal Concentration (mg/kg)	
Sample ID	**Color**	**Substrate**	**Sample Date**	**Lead**	**Mercury**
PS_SP_01	Yellow	Wood	15-Sep-17	490	16
			Provincial Management Limit[1]	5,000	-
			Sample Date	15-Sep-17	15-Sep-17

Notes:

1. Concentrations below this limit are suitable for disposal in municipal landfills and are not considered Hazardous Waste

Table D19 Organochlorinated Pesticides in Paint (mg/kg)

	CCME [1] (SQG)	PS_SP_01 YELLOW ON WOOD
Calculated Parameters	-	
Aldrin + Dieldrin	-	<0.020
Chlordane (Total)	-	<0.020
DDT+ Metabolites	0.7	0.025
Heptachlor + Heptachlor epoxide	-	<0.020
o,p-DDD + p,p-DDD	-	<0.020
o,p-DDE + p,p-DDE	-	<0.020
o,p-DDT + p,p-DDT	-	0.025
Total Endosulfan	-	<0.020
Total PCB	1.3	<0.30
Pesticides & Herbicides		
Aroclor 1262	-	<0.1
Aroclor 1268	-	<0.1
Aldrin	-	<0.02
alpha-BHC	-	<0.02
beta-BHC	-	<0.02
delta-BHC	-	<0.02
a-Chlordane	-	<0.02
g-Chlordane	-	<0.02
o,p-DDD	-	<0.02
p,p-DDD	-	<0.02
o,p-DDE	-	<0.02
p,p-DDE	-	<0.02
o,p-DDT	-	<0.02
p,p-DDT	-	0.03
Dieldrin	-	<0.02
Endosulfan I (alpha)	-	<0.02
Endosulfan II (beta)	-	<0.02
Endosulfan sulfate	-	<0.02
Endrin	-	<0.02
Endrin aldehyde	-	<0.02
Endrin ketone	-	<0.02
Heptachlor	-	<0.02
Heptachlor epoxide	-	<0.02
Hexachlorobenzene	2	<0.02
Lindane	-	<0.02
Methoxychlor	-	<0.05
Mirex	-	<0.02
Octachlorostyrene	-	<0.02
Aroclor 1016	-	<0.2
Aroclor 1221	-	<0.3
Aroclor 1232	-	<0.2
Aroclor 1242	-	<0.2
Aroclor 1248	-	<0.2
Aroclor 1254	-	<0.2
Aroclor 1260	-	<0.2

1. Canadian Council of Ministers of the Environment Soil Quality Guidelines for the Protection of Environmental and Human Health (residential site)

Table D20 VOCs in Water - Quality Control Sample (µg/L)

Parameter	Trip Blank
1,2-Dichlorobenzene	<0.50
1,3-Dichlorobenzene	<1.0
1,4-Dichlorobenzene	<1.0
Chlorobenzene	<1.0
1,1,1-Trichloroethane	<1.0
1,1,2,2-Tetrachloroethane	<0.50
1,1,2-Trichloroethane	<1.0
1,1-Dichloroethane	<2.0
1,1-Dichloroethylene	<0.50
1,2-Dichloroethane	<1.0
1,2-Dichloropropane	<0.50
Benzene	<1.0
Bromodichloromethane	<1.0
Bromoform	<1.0
Bromomethane	<0.50
Carbon Tetrachloride	<0.50
Chloroethane	<8.0
Chloromethane	<8.0
cis-1,3-Dichloropropene	<0.50
Ethylene Dibromide	<0.20
Methyl t-butyl ether (MTBE)	<2.0
Methylene Chloride(Dichloromethane)	<3.0
o-Xylene	<1.0
p+m-Xylene	<2.0
Styrene	<1.0
Total Trihalomethanes	<1.0
Total Xylenes	<1.0
trans-1,2-Dichloroethylene	<0.50
trans-1,3-Dichloropropene	<0.50
Trichloroethylene	<1.0
Trichlorofluoromethane (FREON 11)	<8.0
Vinyl Chloride	<0.50

APPENDIX E

Laboratory Certificates of Analysis

Your Project #: 10550.04
Site Location: SPOTTED ISLAND

Attention:Abigail Garnett
GEMTEC LIMITED
191 Doak Rd
Fredericton, NB
Canada E3C 2E6

Your C.O.C. #: 627202-01-01, 627179-01-01, 627179-02-01, 627179-03-01, 627179-04-01, 627179-06-01, 627179-07-01

Report Date: 2017/11/08
Report #: R4837259
Version: 5 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B7K6270
Received: 2017/09/20, 10:26

Sample Matrix: Soil
Samples Received: 67

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Benzo(b/j)fluoranthene Sum (LL soil)	1	N/A	2017/10/03	N/A	Auto Calc.
Benzo(b/j)fluoranthene Sum (LL soil)	27	N/A	2017/10/04	N/A	Auto Calc.
Benzo(b/j)fluoranthene Sum (LL soil)	4	N/A	2017/10/06	N/A	Auto Calc.
Benzo(b/j)fluoranthene Sum (LL soil)	20	N/A	2017/10/10	N/A	Auto Calc.
Dioxins/Furans in Soil (EPS 1/RM/23) (1, 2)	1	2017/09/30	2017/10/08	BRL SOP-00410	EPS 1/RM/23 m
Petroleum Hydrocarbons F2-F4 in Soil (1, 3)	27	2017/09/27	2017/09/28	CAM SOP-00316	CCME CWS m
Petroleum Hydrocarbons F2-F4 in Soil (1, 3)	19	2017/09/27	2017/09/29	CAM SOP-00316	CCME CWS m
Petroleum Hydrocarbons F2-F4 in Soil (1, 3)	1	2017/09/27	2017/09/30	CAM SOP-00316	CCME CWS m
Petroleum Hydrocarbons F2-F4 in Soil (1, 3)	20	2017/09/27	2017/10/03	CAM SOP-00316	CCME CWS m
F4G (CCME Hydrocarbons Gravimetric) (1)	11	2017/10/06	2017/10/06	CAM SOP-00316	CCME PHC-CWS m
F4G (CCME Hydrocarbons Gravimetric) (1)	11	2017/10/16	2017/10/17	CAM SOP-00316	CCME PHC-CWS m
Metals Solids Acid Extr. ICPMS	12	2017/09/25	2017/09/25	ATL SOP 00058	EPA 6020A R1 m
Metals Solids Acid Extr. ICPMS	9	2017/09/29	2017/09/29	ATL SOP 00058	EPA 6020A R1 m
Metals Solids Acid Extr. ICPMS	14	2017/10/02	2017/10/02	ATL SOP 00058	EPA 6020A R1 m
Metals Solids Acid Extr. ICPMS	7	2017/10/02	2017/10/03	ATL SOP 00058	EPA 6020A R1 m
Metals Solids Acid Extr. ICPMS	1	2017/10/02	2017/10/04	ATL SOP 00058	EPA 6020A R1 m
Moisture	19	N/A	2017/09/22	ATL SOP 00001	OMOE Handbook 1983 m
Moisture	28	N/A	2017/09/27	ATL SOP 00001	OMOE Handbook 1983 m
Moisture	4	N/A	2017/09/28	ATL SOP 00001	OMOE Handbook 1983 m
Moisture	1	N/A	2017/09/29	ATL SOP 00001	OMOE Handbook 1983 m
Moisture (1)	15	N/A	2017/09/30	CAM SOP-00445	Carter 2nd ed 51.2 m
PAH in sediment by GC/MS (Low Level) (4)	1	2017/09/22	2017/10/04	ATL SOP 00102	EPA 8270D 2014 m
PAH in sediment by GC/MS (Low Level) (4)	1	2017/09/22	2017/10/06	ATL SOP 00102	EPA 8270D 2014 m
PAH in sediment by GC/MS (Low Level) (4)	7	2017/09/27	2017/10/03	ATL SOP 00102	EPA 8270D 2014 m
PAH in sediment by GC/MS (Low Level) (4)	12	2017/09/27	2017/10/04	ATL SOP 00102	EPA 8270D 2014 m
PAH in sediment by GC/MS (Low Level) (4)	3	2017/09/27	2017/10/06	ATL SOP 00102	EPA 8270D 2014 m
PAH in sediment by GC/MS (Low Level) (4)	1	2017/09/28	2017/10/03	ATL SOP 00102	EPA 8270D 2014 m

Maxxam Analytics International Corporation o/a Maxxam Analytics 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.maxxamanalytics.com

Your Project #: 10550.04
Site Location: SPOTTED ISLAND

Attention:Abigail Garnett
GEMTEC LIMITED
191 Doak Rd
Fredericton, NB
Canada E3C 2E6

Your C.O.C. #: 627202-01-01, 627179-01-01, 627179-02-01, 627179-03-01, 627179-04-01, 627179-06-01, 627179-07-01

Report Date: 2017/11/08
Report #: R4837259
Version: 5 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B7K6270
Received: 2017/09/20, 10:26

Sample Matrix: Soil
Samples Received: 67

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
PAH in sediment by GC/MS (Low Level) (4)	15	2017/09/28	2017/10/09	ATL SOP 00102	EPA 8270D 2014 m
PAH in sediment by GC/MS (Low Level) (4)	5	2017/09/28	2017/10/10	ATL SOP 00102	EPA 8270D 2014 m
PAH in sediment by GC/MS (Low Level) (4)	7	2017/09/29	2017/10/03	ATL SOP 00102	EPA 8270D 2014 m
PCBs in soil by GC/ECD (4)	7	2017/09/26	2017/09/28	ATL SOP 00106	EPA 8082A 2007 m
PCBs in soil by GC/ECD (4)	1	2017/09/27	2017/09/29	ATL SOP 00106	EPA 8082A 2007 m
PCBs in soil by GC/ECD (4)	19	2017/09/28	2017/09/29	ATL SOP 00106	EPA 8082A 2007 m
PCBs in soil by GC/ECD (4)	1	2017/09/29	2017/10/02	ATL SOP 00106	EPA 8082A 2007 m
PCB Aroclor sum (soil)	7	N/A	2017/09/28	N/A	Auto Calc.
PCB Aroclor sum (soil)	20	N/A	2017/09/29	N/A	Auto Calc.
PCB Aroclor sum (soil)	1	N/A	2017/10/02	N/A	Auto Calc.
Volatile Organic Compounds and F1 PHCs (1)	7	N/A	2017/09/27	CAM SOP-00230	EPA 8260 m
Volatile Organic Compounds and F1 PHCs (1)	24	N/A	2017/09/29	CAM SOP-00230	EPA 8260 m
Volatile Organic Compounds and F1 PHCs (1)	35	N/A	2017/09/30	CAM SOP-00230	EPA 8260 m
Volatile Organic Compounds and F1 PHCs (1)	1	N/A	2017/10/03	CAM SOP-00230	EPA 8260 m
VOCs in Soil - Field Preserved (5)	4	N/A	2017/09/25	ATL SOP 00133	EPA 8260C R3 m

Sample Matrix: Water
Samples Received: 6

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Carbonate, Bicarbonate and Hydroxide	5	N/A	2017/09/26	N/A	SM 22 4500-CO2 D
Alkalinity	4	N/A	2017/10/03	ATL SOP 00013	EPA 310.2 R1974 m
Alkalinity	1	N/A	2017/10/06	ATL SOP 00013	EPA 310.2 R1974 m
Benzo(b/j)fluoranthene Sum (water)	2	N/A	2017/09/28	N/A	Auto Calc.
Chloride	5	N/A	2017/10/03	ATL SOP 00014	SM 22 4500-Cl- E m
Colour	4	N/A	2017/10/04	ATL SOP 00020	SM 22 2120C m
Colour	1	N/A	2017/10/05	ATL SOP 00020	SM 22 2120C m

Your Project #: 10550.04
Site Location: SPOTTED ISLAND

Attention:Abigail Garnett

GEMTEC LIMITED
191 Doak Rd
Fredericton, NB
Canada E3C 2E6

Your C.O.C. #: 627202-01-01, 627179-01-01, 627179-02-01, 627179-03-01, 627179-04-01, 627179-06-01, 627179-07-01

Report Date: 2017/11/08
Report #: R4837259
Version: 5 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B7K6270
Received: 2017/09/20, 10:26

Sample Matrix: Water
Samples Received: 6

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Conductance - water	4	N/A	2017/09/25	ATL SOP 00004	SM 22 2510B m
Conductance - water	1	N/A	2017/09/26	ATL SOP 00004	SM 22 2510B m
Petroleum Hydro. CCME F1 & BTEX in Water (1)	5	N/A	2017/10/01	CAM SOP-00315	CCME PHC-CWS m
Petroleum Hydrocarbons F2-F4 in Water (1, 3)	2	2017/09/26	2017/10/02	CAM SOP-00316	CCME PHC-CWS m
Petroleum Hydrocarbons F2-F4 in Water (1, 3)	3	2017/09/28	2017/10/02	CAM SOP-00316	CCME PHC-CWS m
Hardness (calculated as CaCO3)	5	N/A	2017/09/28	ATL SOP 00048	SM 22 2340 B
Mercury - Total (CVAA,LL)	5	2017/10/02	2017/10/03	ATL SOP 00026	EPA 245.1 R3 m
Metals Water Total MS	5	2017/09/27	2017/09/28	ATL SOP 00058	EPA 6020A R1 m
Ion Balance (% Difference)	4	N/A	2017/10/04	N/A	Auto Calc.
Ion Balance (% Difference)	1	N/A	2017/10/06	N/A	Auto Calc.
Anion and Cation Sum	5	N/A	2017/10/03	N/A	Auto Calc.
Nitrogen Ammonia - water	5	N/A	2017/10/02	ATL SOP 00015	EPA 350.1 R2 m
Nitrogen - Nitrate + Nitrite	5	N/A	2017/10/03	ATL SOP 00016	USGS SOPINCF0452.2 m
Nitrogen - Nitrite	5	N/A	2017/10/03	ATL SOP 00017	SM 22 4500-NO2- B m
Nitrogen - Nitrate (as N)	5	N/A	2017/10/04	ATL SOP 00018	ASTM D3867-16
PAH (FWAL) in Water (A/Q) by GC/MS (SIM) (6)	2	2017/09/21	2017/09/28	ATL SOP 00103	EPA 8270D 2007 m
PCBs in water by GC/ECD	4	2017/09/22	2017/09/27	ATL SOP 00107	EPA 8082A m
PCB Aroclor sum (water)	4	N/A	2017/09/27	N/A	Auto Calc.
pH (7)	4	N/A	2017/09/25	ATL SOP 00003	SM 22 4500-H+ B m
pH (7)	1	N/A	2017/09/26	ATL SOP 00003	SM 22 4500-H+ B m
Phosphorus - ortho	5	N/A	2017/10/03	ATL SOP 00021	SM 22 4500-P E m
Sat. pH and Langelier Index (@ 20C)	4	N/A	2017/10/04	ATL SOP 00049	Auto Calc.
Sat. pH and Langelier Index (@ 20C)	1	N/A	2017/10/06	ATL SOP 00049	Auto Calc.
Sat. pH and Langelier Index (@ 4C)	4	N/A	2017/10/04	ATL SOP 00049	Auto Calc.
Sat. pH and Langelier Index (@ 4C)	1	N/A	2017/10/06	ATL SOP 00049	Auto Calc.
Reactive Silica	4	N/A	2017/10/03	ATL SOP 00022	EPA 366.0 m
Reactive Silica	1	N/A	2017/10/06	ATL SOP 00022	EPA 366.0 m

Maxxam Analytics International Corporation o/a Maxxam Analytics 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.maxxamanalytics.com

Your Project #: 10550.04
Site Location: SPOTTED ISLAND

Attention:Abigail Garnett

GEMTEC LIMITED
191 Doak Rd
Fredericton, NB
Canada E3C 2E6

Your C.O.C. #: 627202-01-01, 627179-01-01, 627179-02-01, 627179-03-01, 627179-04-01, 627179-06-01, 627179-07-01

Report Date: 2017/11/08
Report #: R4837259
Version: 5 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B7K6270
Received: 2017/09/20, 10:26

Sample Matrix: Water
Samples Received: 6

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Sulphate	5	N/A	2017/10/03	ATL SOP 00023	ASTM D516-16 m
Total Dissolved Solids (TDS calc)	4	N/A	2017/10/04	N/A	Auto Calc.
Total Dissolved Solids (TDS calc)	1	N/A	2017/10/06	N/A	Auto Calc.
Organic carbon - Total (TOC) (8)	5	N/A	2017/10/03	ATL SOP 00037	SM 22 5310C m
Turbidity	3	N/A	2017/09/25	ATL SOP 00011	EPA 180.1 R2 m
Turbidity	2	N/A	2017/10/02	ATL SOP 00011	EPA 180.1 R2 m
Volatile Organic Compounds in Water	1	N/A	2017/09/22	ATL SOP 00133	EPA 8260C R3 m

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam 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.

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam 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 Maxxam, unless otherwise agreed in writing.

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.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
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.

Maxxam Analytics International Corporation o/a Maxxam Analytics 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.maxxamanalytics.com

Your Project #: 10550.04
Site Location: SPOTTED ISLAND

Attention:Abigail Garnett

GEMTEC LIMITED
191 Doak Rd
Fredericton, NB
Canada E3C 2E6

Your C.O.C. #: 627202-01-01, 627179-01-01, 627179-02-01, 627179-03-01, 627179-04-01, 627179-06-01, 627179-07-01

Report Date: 2017/11/08
Report #: R4837259
Version: 5 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B7K6270
Received: 2017/09/20, 10:26

(1) This test was performed by Maxxam Analytics Mississauga
(2) Soils are reported on a dry weight basis unless otherwise specified.

Confirmatory runs for 2,3,7,8-TCDF are performed only if the primary result is greater than the RDL.
(3) All CCME PHC results met required criteria unless otherwise stated in the report. The CWS PHC methods employed by Maxxam 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.
(4) Soils are reported on a dry weight basis unless otherwise specified.
(5) No lab extraction date is given for C6-C10/BTEX and VOC samples that are field preserved with methanol. Extraction date is date sampled unless otherwise stated.
(6) Acridine and Quinoline parameters are not accredited.
(7) The APHA Standard Method require pH to be analyzed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the APHA Standard Method holding time.
(8) TOC / DOC present in the sample should be considered as non-purgeable TOC / DOC.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Heather Macumber, Senior Project Manager
Email: HMacumber@maxxam.ca
Phone# (902)420-0203 Ext:226
==
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

ATLANTIC RCAP-MS TOTAL METALS IN WATER (WATER)

Maxxam ID		FDZ369			FDZ370		FDZ371			
Sampling Date		2017/09/15			2017/09/15		2017/09/15			
COC Number		627202-01-01			627202-01-01		627202-01-01			
	UNITS	**SW_SP_01_BG**	**RDL**	**QC Batch**	**SW_SP_02**	**QC Batch**	**SW_SP_03**	**RDL**	**MDL**	**QC Batch**
Calculated Parameters										
Anion Sum	me/L	0.730	N/A	5175525	0.840	5175525	0.840	N/A	N/A	5175525
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	9.3	1.0	5175007	5.3	5175007	7.4	1.0	0.20	5175007
Calculated TDS	mg/L	41	1.0	5175527	49	5175527	48	1.0	0.20	5175527
Carb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	1.0	5175007	<1.0	5175007	<1.0	1.0	0.20	5175007
Cation Sum	me/L	0.720	N/A	5175525	0.820	5175525	0.830	N/A	N/A	5175525
Hardness (CaCO3)	mg/L	11	1.0	5175523	9.3	5175523	9.5	1.0	1.0	5175523
Ion Balance (% Difference)	%	0.690	N/A	5175524	1.20	5175524	0.600	N/A	N/A	5175524
Langelier Index (@ 20C)	N/A	-3.51		5175013	-3.97	5175013	-3.77			5175013
Langelier Index (@ 4C)	N/A	-3.77		5175014	-4.22	5175014	-4.02			5175014
Nitrate (N)	mg/L	<0.050	0.050	5175365	0.32	5175365	<0.050	0.050	N/A	5175365
Saturation pH (@ 20C)	N/A	10.2		5175013	10.6	5175013	10.4			5175013
Saturation pH (@ 4C)	N/A	10.4		5175014	10.8	5175014	10.7			5175014
Inorganics										
Total Alkalinity (Total as CaCO3)	mg/L	9.3	5.0	5192108	5.3	5192108	7.4	5.0	N/A	5192108
Dissolved Chloride (Cl)	mg/L	19	1.0	5192111	23	5192111	23	1.0	N/A	5192111
Colour	TCU	37	5.0	5192119	89 (1)	5192119	68 (1)	25	N/A	5192119
Nitrate + Nitrite (N)	mg/L	<0.050	0.050	5192122	0.32	5192122	<0.050	0.050	N/A	5192122
Nitrite (N)	mg/L	<0.010	0.010	5192124	<0.010	5192124	<0.010	0.010	N/A	5192124
Nitrogen (Ammonia Nitrogen)	mg/L	<0.050	0.050	5189674	0.11	5189674	<0.050	0.050	N/A	5189674
Total Organic Carbon (C)	mg/L	7.3	0.50	5193753	8.1	5193753	7.7	0.50	N/A	5193753
Orthophosphate (P)	mg/L	<0.010	0.010	5192120	<0.010	5192120	<0.010	0.010	N/A	5192120
pH	pH	6.66	N/A	5180804	6.60	5180804	6.66	N/A	N/A	5180804
Reactive Silica (SiO2)	mg/L	1.1	0.50	5192116	0.98	5192116	1.0	0.50	N/A	5192116
Dissolved Sulphate (SO4)	mg/L	<2.0	2.0	5192114	2.9	5192114	2.2	2.0	N/A	5192114
Turbidity	NTU	5.6	0.10	5192036	1.1	5180256	1.0	0.10	0.10	5180255
Conductivity	uS/cm	83	1.0	5180805	96	5180805	93	1.0	N/A	5180805
Metals										
Total Aluminum (Al)	ug/L	71	5.0	5184575	130	5184575	140	5.0	N/A	5184575
Total Antimony (Sb)	ug/L	<1.0	1.0	5184575	<1.0	5184575	<1.0	1.0	N/A	5184575
Total Arsenic (As)	ug/L	<1.0	1.0	5184575	<1.0	5184575	<1.0	1.0	N/A	5184575
Total Barium (Ba)	ug/L	3.7	1.0	5184575	3.2	5184575	3.4	1.0	N/A	5184575
Total Beryllium (Be)	ug/L	<1.0	1.0	5184575	<1.0	5184575	<1.0	1.0	N/A	5184575
Total Bismuth (Bi)	ug/L	<2.0	2.0	5184575	<2.0	5184575	<2.0	2.0	N/A	5184575
Total Boron (B)	ug/L	<50	50	5184575	<50	5184575	<50	50	N/A	5184575

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable
(1) Elevated reporting limit due to sample matrix.

Maxxam Analytics International Corporation o/a Maxxam Analytics 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.maxxamanalytics.com

Maxxam
A Bureau Veritas Group Company

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

ATLANTIC RCAP-MS TOTAL METALS IN WATER (WATER)

Maxxam ID		FDZ369			FDZ370		FDZ371			
Sampling Date		2017/09/15			2017/09/15		2017/09/15			
COC Number		627202-01-01			627202-01-01		627202-01-01			
	UNITS	**SW_SP_01_BG**	**RDL**	**QC Batch**	**SW_SP_02**	**QC Batch**	**SW_SP_03**	**RDL**	**MDL**	**QC Batch**
Total Cadmium (Cd)	ug/L	<0.010	0.010	5184575	<0.010	5184575	<0.010	0.010	N/A	5184575
Total Calcium (Ca)	ug/L	1400	100	5184575	1000	5184575	1000	100	N/A	5184575
Total Chromium (Cr)	ug/L	<1.0	1.0	5184575	<1.0	5184575	<1.0	1.0	N/A	5184575
Total Cobalt (Co)	ug/L	<0.40	0.40	5184575	<0.40	5184575	<0.40	0.40	N/A	5184575
Total Copper (Cu)	ug/L	<2.0	2.0	5184575	<2.0	5184575	<2.0	2.0	N/A	5184575
Total Iron (Fe)	ug/L	250	50	5184575	640	5184575	630	50	N/A	5184575
Total Lead (Pb)	ug/L	<0.50	0.50	5184575	<0.50	5184575	<0.50	0.50	N/A	5184575
Total Magnesium (Mg)	ug/L	1700	100	5184575	1600	5184575	1700	100	N/A	5184575
Total Manganese (Mn)	ug/L	11	2.0	5184575	3.6	5184575	3.7	2.0	N/A	5184575
Total Molybdenum (Mo)	ug/L	<2.0	2.0	5184575	<2.0	5184575	<2.0	2.0	N/A	5184575
Total Nickel (Ni)	ug/L	<2.0	2.0	5184575	<2.0	5184575	<2.0	2.0	N/A	5184575
Total Phosphorus (P)	ug/L	<100	100	5184575	<100	5184575	<100	100	N/A	5184575
Total Potassium (K)	ug/L	580	100	5184575	570	5184575	590	100	N/A	5184575
Total Selenium (Se)	ug/L	<1.0	1.0	5184575	<1.0	5184575	<1.0	1.0	N/A	5184575
Total Silver (Ag)	ug/L	<0.10	0.10	5184575	<0.10	5184575	<0.10	0.10	N/A	5184575
Total Sodium (Na)	ug/L	11000	100	5184575	14000	5184575	14000	100	N/A	5184575
Total Strontium (Sr)	ug/L	13	2.0	5184575	11	5184575	12	2.0	N/A	5184575
Total Thallium (Tl)	ug/L	<0.10	0.10	5184575	<0.10	5184575	<0.10	0.10	N/A	5184575
Total Tin (Sn)	ug/L	<2.0	2.0	5184575	<2.0	5184575	<2.0	2.0	N/A	5184575
Total Titanium (Ti)	ug/L	<2.0	2.0	5184575	2.9	5184575	2.3	2.0	N/A	5184575
Total Uranium (U)	ug/L	<0.10	0.10	5184575	<0.10	5184575	<0.10	0.10	N/A	5184575
Total Vanadium (V)	ug/L	<2.0	2.0	5184575	<2.0	5184575	<2.0	2.0	N/A	5184575
Total Zinc (Zn)	ug/L	<5.0	5.0	5184575	<5.0	5184575	<5.0	5.0	N/A	5184575

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam Analytics International Corporation o/a Maxxam Analytics 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.maxxamanalytics.com

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

ATLANTIC RCAP-MS TOTAL METALS IN WATER (WATER)

Maxxam ID		FDZ372	FDZ372			FDZ373			
Sampling Date		2017/09/15	2017/09/15			2017/09/15			
COC Number		627202-01-01	627202-01-01			627202-01-01			
	UNITS	SW_SP_04	SW_SP_04 Lab-Dup	RDL	QC Batch	SW_SP_05	RDL	MDL	QC Batch
Calculated Parameters									
Anion Sum	me/L	0.720		N/A	5175525	0.760	N/A	N/A	5175525
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	14		1.0	5175548	14	1.0	0.20	5175548
Calculated TDS	mg/L	43		1.0	5175527	45	1.0	0.20	5175527
Carb. Alkalinity (calc. as CaCO3)	mg/L	<1.0		1.0	5175548	<1.0	1.0	0.20	5175548
Cation Sum	me/L	0.810		N/A	5175525	0.840	N/A	N/A	5175525
Hardness (CaCO3)	mg/L	11		1.0	5175523	11	1.0	1.0	5175523
Ion Balance (% Difference)	%	5.88		N/A	5175524	5.00	N/A	N/A	5175524
Langelier Index (@ 20C)	N/A	-2.74			5175560	-2.89			5175560
Langelier Index (@ 4C)	N/A	-3.00			5175561	-3.14			5175561
Nitrate (N)	mg/L	<0.050		0.050	5175365	<0.050	0.050	N/A	5175365
Saturation pH (@ 20C)	N/A	9.83			5175560	9.82			5175560
Saturation pH (@ 4C)	N/A	10.1			5175561	10.1			5175561
Inorganics									
Total Alkalinity (Total as CaCO3)	mg/L	14		5.0	5198297	14	5.0	N/A	5192108
Dissolved Chloride (Cl)	mg/L	15	16	1.0	5192111	17	1.0	N/A	5192111
Colour	TCU	180		5.0	5198309	180 (1)	25	N/A	5192119
Nitrate + Nitrite (N)	mg/L	<0.050	<0.050	0.050	5192122	<0.050	0.050	N/A	5192122
Nitrite (N)	mg/L	<0.010	<0.010	0.010	5192124	<0.010	0.010	N/A	5192124
Nitrogen (Ammonia Nitrogen)	mg/L	<0.050		0.050	5189674	0.059	0.050	N/A	5189674
Total Organic Carbon (C)	mg/L	16 (1)		1.0	5193753	18 (1)	1.0	N/A	5193753
Orthophosphate (P)	mg/L	0.013	0.023	0.010	5192120	0.023	0.010	N/A	5192120
pH	pH	7.08		N/A	5180804	6.93	N/A	N/A	5181954
Reactive Silica (SiO2)	mg/L	1.3		0.50	5198307	1.5	0.50	N/A	5192116
Dissolved Sulphate (SO4)	mg/L	<2.0	<2.0	2.0	5192114	<2.0	2.0	N/A	5192114
Turbidity	NTU	1.7	1.8	0.10	5180258	1.5	0.10	0.10	5192047
Conductivity	uS/cm	83		1.0	5180805	83	1.0	N/A	5181955
Metals									
Total Aluminum (Al)	ug/L	340		5.0	5184575	370	5.0	N/A	5184575
Total Antimony (Sb)	ug/L	<1.0		1.0	5184575	<1.0	1.0	N/A	5184575
Total Arsenic (As)	ug/L	<1.0		1.0	5184575	<1.0	1.0	N/A	5184575
Total Barium (Ba)	ug/L	8.3		1.0	5184575	8.7	1.0	N/A	5184575
Total Beryllium (Be)	ug/L	<1.0		1.0	5184575	<1.0	1.0	N/A	5184575
Total Bismuth (Bi)	ug/L	<2.0		2.0	5184575	<2.0	2.0	N/A	5184575

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable
(1) Elevated reporting limit due to sample matrix.

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

ATLANTIC RCAP-MS TOTAL METALS IN WATER (WATER)

Maxxam ID		FDZ372	FDZ372			FDZ373			
Sampling Date		2017/09/15	2017/09/15			2017/09/15			
COC Number		627202-01-01	627202-01-01			627202-01-01			
	UNITS	SW_SP_04	SW_SP_04 Lab-Dup	RDL	QC Batch	SW_SP_05	RDL	MDL	QC Batch
Total Boron (B)	ug/L	<50		50	5184575	<50	50	N/A	5184575
Total Cadmium (Cd)	ug/L	<0.010		0.010	5184575	0.013	0.010	N/A	5184575
Total Calcium (Ca)	ug/L	2100		100	5184575	2200	100	N/A	5184575
Total Chromium (Cr)	ug/L	<1.0		1.0	5184575	<1.0	1.0	N/A	5184575
Total Cobalt (Co)	ug/L	<0.40		0.40	5184575	<0.40	0.40	N/A	5184575
Total Copper (Cu)	ug/L	3.7		2.0	5184575	3.9	2.0	N/A	5184575
Total Iron (Fe)	ug/L	1600		50	5184575	1700	50	N/A	5184575
Total Lead (Pb)	ug/L	0.94		0.50	5184575	1.2	0.50	N/A	5184575
Total Magnesium (Mg)	ug/L	1500		100	5184575	1500	100	N/A	5184575
Total Manganese (Mn)	ug/L	30		2.0	5184575	36	2.0	N/A	5184575
Total Molybdenum (Mo)	ug/L	<2.0		2.0	5184575	<2.0	2.0	N/A	5184575
Total Nickel (Ni)	ug/L	<2.0		2.0	5184575	<2.0	2.0	N/A	5184575
Total Phosphorus (P)	ug/L	<100		100	5184575	100	100	N/A	5184575
Total Potassium (K)	ug/L	760		100	5184575	790	100	N/A	5184575
Total Selenium (Se)	ug/L	<1.0		1.0	5184575	<1.0	1.0	N/A	5184575
Total Silver (Ag)	ug/L	<0.10		0.10	5184575	<0.10	0.10	N/A	5184575
Total Sodium (Na)	ug/L	12000		100	5184575	12000	100	N/A	5184575
Total Strontium (Sr)	ug/L	18		2.0	5184575	18	2.0	N/A	5184575
Total Thallium (Tl)	ug/L	<0.10		0.10	5184575	<0.10	0.10	N/A	5184575
Total Tin (Sn)	ug/L	<2.0		2.0	5184575	<2.0	2.0	N/A	5184575
Total Titanium (Ti)	ug/L	4.5		2.0	5184575	5.3	2.0	N/A	5184575
Total Uranium (U)	ug/L	0.11		0.10	5184575	0.12	0.10	N/A	5184575
Total Vanadium (V)	ug/L	<2.0		2.0	5184575	<2.0	2.0	N/A	5184575
Total Zinc (Zn)	ug/L	18		5.0	5184575	20	5.0	N/A	5184575

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

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

ATLANTIC VOC IN SOIL (FIELD PRES.)

Maxxam ID		FDZ421	FDZ422	FDZ514	FDZ520			
Sampling Date		2017/09/14	2017/09/14	2017/09/15	2017/09/15			
COC Number		627179-03-01	627179-03-01	627179-06-01	627179-07-01			
	UNITS	SS_SP_21	SS_SP_22	SD_SP_02	SD_SP_04	RDL	MDL	QC Batch
Volatile Organics								
1,1,1-Trichloroethane	ug/kg	<25	<25	<25	<25	25	0.00010	5177808
1,1,2,2-Tetrachloroethane	ug/kg	<25	<25	<25	<25	25	0.00040	5177808
1,1,2-Trichloroethane	ug/kg	<25	<25	<25	<25	25	0.00040	5177808
1,1-Dichloroethane	ug/kg	<25	<25	<25	<25	25	0.00010	5177808
1,1-Dichloroethylene	ug/kg	<25	<25	<25	<25	25	0.00010	5177808
1,2-Dichlorobenzene	ug/kg	<25	<25	<25	<25	25	0.00020	5177808
1,2-Dichloroethane	ug/kg	<25	<25	<25	<25	25	0.00010	5177808
1,2-Dichloropropane	ug/kg	<25	<25	<25	<25	25	0.00020	5177808
1,3-Dichlorobenzene	ug/kg	<25	<25	<25	<25	25	0.00020	5177808
1,4-Dichlorobenzene	ug/kg	<25	<25	<25	<25	25	0.00030	5177808
Benzene	ug/kg	<25	<25	<25	<25	25	0.00010	5177808
Bromodichloromethane	ug/kg	<25	<25	<25	<25	25	0.00020	5177808
Bromoform	ug/kg	<25	<25	<25	<25	25	0.00030	5177808
Bromomethane	ug/kg	<50	<50	<50	<50	50	0.00040	5177808
Carbon Tetrachloride	ug/kg	<25	<25	<25	<25	25	0.00010	5177808
Chlorobenzene	ug/kg	<25	<25	<25	<25	25	0.00010	5177808
Chloroethane	ug/kg	<200	<200	<200	<200	200	0.00030	5177808
Chloroform	ug/kg	<25	<25	<25	<25	25	0.00010	5177808
cis-1,2-Dichloroethylene	ug/kg	<25	<25	<25	<25	25	0.00010	5177808
cis-1,3-Dichloropropene	ug/kg	<25	<25	<25	<25	25	0.00020	5177808
Dibromochloromethane	ug/kg	<25	<25	<25	<25	25	0.00030	5177808
Ethylbenzene	ug/kg	<25	<25	<25	<25	25	0.00010	5177808
Ethylene Dibromide	ug/kg	<25	<25	<25	<25	25	0.00040	5177808
Methyl t-butyl ether (MTBE)	ug/kg	<25	71	<25	<25	25	0.00010	5177808
Methylene Chloride(Dichloromethane)	ug/kg	<50	<50	<50	<50	50	0.00040	5177808
o-Xylene	ug/kg	<25	<25	<25	<25	25	0.00010	5177808
p+m-Xylene	ug/kg	<25	<25	<25	<25	25	0.00010	5177808
Styrene	ug/kg	<25	<25	<25	<25	25	0.00020	5177808
Tetrachloroethylene	ug/kg	<25	<25	<25	<25	25	0.00030	5177808
Toluene	ug/kg	<25	<25	<25	<25	25	0.00010	5177808
Total Xylenes	ug/kg	<50	<50	<50	<50	50	N/A	5177808
trans-1,2-Dichloroethylene	ug/kg	<25	<25	<25	<25	25	0.00020	5177808
trans-1,3-Dichloropropene	ug/kg	<25	<25	<25	<25	25	0.00030	5177808
Trichloroethylene	ug/kg	<10	<10	<10	<10	10	0.00020	5177808

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

ATLANTIC VOC IN SOIL (FIELD PRES.)

Maxxam ID		FDZ421	FDZ422	FDZ514	FDZ520			
Sampling Date		2017/09/14	2017/09/14	2017/09/15	2017/09/15			
COC Number		627179-03-01	627179-03-01	627179-06-01	627179-07-01			
	UNITS	SS_SP_21	SS_SP_22	SD_SP_02	SD_SP_04	RDL	MDL	QC Batch
Trichlorofluoromethane (FREON 11)	ug/kg	<25	<25	<25	<25	25	0.00030	5177808
Vinyl Chloride	ug/kg	<20	<20	<20	<20	20	0.00020	5177808
Surrogate Recovery (%)								
4-Bromofluorobenzene	%	100	101	101	99			5177808
D10-o-Xylene	%	118	126 (1)	104 (1)	91			5177808
D4-1,2-Dichloroethane	%	96	94	94	95			5177808
D8-Toluene	%	100	101	101	99			5177808

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

(1) VOC samples were extracted using a flat-bed shaker instead of the accelerated mechanical shaker due to matrix incompatibility.

ATLANTIC VOC IN WATER (WATER)

Maxxam ID		FDZ526			
Sampling Date		2017/09/15			
COC Number		627179-07-01			
	UNITS	**TRIP BLANK**	**RDL**	**MDL**	**QC Batch**
Chlorobenzenes					
1,2-Dichlorobenzene	ug/L	<0.50	0.50	N/A	5175677
1,3-Dichlorobenzene	ug/L	<1.0	1.0	N/A	5175677
1,4-Dichlorobenzene	ug/L	<1.0	1.0	N/A	5175677
Chlorobenzene	ug/L	<1.0	1.0	N/A	5175677
Volatile Organics					
1,1,1-Trichloroethane	ug/L	<1.0	1.0	N/A	5175677
1,1,2,2-Tetrachloroethane	ug/L	<0.50	0.50	N/A	5175677
1,1,2-Trichloroethane	ug/L	<1.0	1.0	N/A	5175677
1,1-Dichloroethane	ug/L	<2.0	2.0	N/A	5175677
1,1-Dichloroethylene	ug/L	<0.50	0.50	1.0	5175677
1,2-Dichloroethane	ug/L	<1.0	1.0	N/A	5175677
1,2-Dichloropropane	ug/L	<0.50	0.50	N/A	5175677
Benzene	ug/L	<1.0	1.0	N/A	5175677
Bromodichloromethane	ug/L	<1.0	1.0	0.20	5175677
Bromoform	ug/L	<1.0	1.0	0.20	5175677
Bromomethane	ug/L	<0.50	0.50	N/A	5175677
Carbon Tetrachloride	ug/L	<0.50	0.50	N/A	5175677
Chloroethane	ug/L	<8.0	8.0	N/A	5175677
Chloroform	ug/L	<1.0	1.0	0.20	5175677
Chloromethane	ug/L	<8.0	8.0	N/A	5175677
cis-1,2-Dichloroethylene	ug/L	<0.50	0.50	N/A	5175677
cis-1,3-Dichloropropene	ug/L	<0.50	0.50	N/A	5175677
Dibromochloromethane	ug/L	<1.0	1.0	0.20	5175677
Ethylbenzene	ug/L	<1.0	1.0	N/A	5175677
Ethylene Dibromide	ug/L	<0.20	0.20	0.50	5175677
Methyl t-butyl ether (MTBE)	ug/L	<2.0	2.0	N/A	5175677
Methylene Chloride(Dichloromethane)	ug/L	<3.0	3.0	N/A	5175677
o-Xylene	ug/L	<1.0	1.0	N/A	5175677
p+m-Xylene	ug/L	<2.0	2.0	N/A	5175677
Styrene	ug/L	<1.0	1.0	N/A	5175677
Tetrachloroethylene	ug/L	<1.0	1.0	N/A	5175677
Toluene	ug/L	<1.0	1.0	N/A	5175677
Total Trihalomethanes	ug/L	<1.0	1.0	N/A	5175677
Total Xylenes	ug/L	<1.0	1.0	1.0	5175677

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

ATLANTIC VOC IN WATER (WATER)

Maxxam ID		FDZ526			
Sampling Date		2017/09/15			
COC Number		627179-07-01			
	UNITS	TRIP BLANK	RDL	MDL	QC Batch
trans-1,2-Dichloroethylene	ug/L	<0.50	0.50	N/A	5175677
trans-1,3-Dichloropropene	ug/L	<0.50	0.50	N/A	5175677
Trichloroethylene	ug/L	<1.0	1.0	N/A	5175677
Trichlorofluoromethane (FREON 11)	ug/L	<8.0	8.0	N/A	5175677
Vinyl Chloride	ug/L	<0.50	0.50	2.0	5175677
Surrogate Recovery (%)					
4-Bromofluorobenzene	%	99			5175677
D4-1,2-Dichloroethane	%	100			5175677
D8-Toluene	%	98			5175677

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

CCME PETROLEUM HYDROCARBONS SOIL (SOIL)

Maxxam ID		FDZ377	FDZ378	FDZ379	FDZ380	FDZ381			
Sampling Date		2017/09/14	2017/09/14	2017/09/14	2017/09/14	2017/09/14			
COC Number		627179-01-01	627179-01-01	627179-01-01	627179-01-01	627179-01-01			
	UNITS	**SS_SP_01**	**SS_SP_02**	**SS_SP_03**	**SS_SP_04**	**SS_SP_05**	**RDL**	**MDL**	**QC Batch**
Volatile Organics									
Benzene	ug/g	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	0.0060	0.0060	5180823
Ethylbenzene	ug/g	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	0.010	5180823
Toluene	ug/g	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	0.020	5180823
p+m-Xylene	ug/g	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	0.020	5180823
o-Xylene	ug/g	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	0.020	5180823
Total Xylenes	ug/g	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	0.020	5180823
F1 (C6-C10)	ug/g	<10	<10	<10	<10	<10	10	N/A	5180823
F1 (C6-C10) - BTEX	ug/g	<10	<10	<10	<10	<10	10	N/A	5180823
F2-F4 Hydrocarbons									
F2 (C10-C16 Hydrocarbons)	ug/g	<10	<10	<10	<10	<10	10	5.0	5184592
F3 (C16-C34 Hydrocarbons)	ug/g	<50	52	<50	<50	81	50	5.0	5184592
F4 (C34-C50 Hydrocarbons)	ug/g	<50	<50	<50	<50	<50	50	10	5184592
Reached Baseline at C50	ug/g	Yes	Yes	Yes	Yes	Yes			5184592
Surrogate Recovery (%)									
o-Terphenyl	%	85	87	86	89	85			5184592
4-Bromofluorobenzene	%	92	93	91	91	91			5180823
D10-o-Xylene	%	83	77	88	82	84			5180823
D4-1,2-Dichloroethane	%	102	104	98	102	97			5180823
D8-Toluene	%	91	91	90	91	91			5180823

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

CCME PETROLEUM HYDROCARBONS SOIL (SOIL)

Maxxam ID		FDZ381	FDZ382	FDZ383	FDZ384	FDZ384			
Sampling Date		2017/09/14	2017/09/14	2017/09/14	2017/09/14	2017/09/14			
COC Number		627179-01-01	627179-01-01	627179-01-01	627179-01-01	627179-01-01			
	UNITS	SS_SP_05 Lab-Dup	SS_SP_06	SS_SP_07	SS_SP_08	SS_SP_08 Lab-Dup	RDL	MDL	QC Batch
Volatile Organics									
Benzene	ug/g	<0.0060	<0.0060	<0.0060	<0.0060		0.0060	0.0060	5180823
Ethylbenzene	ug/g	<0.010	<0.010	<0.010	<0.010		0.010	0.010	5180823
Toluene	ug/g	<0.020	<0.020	<0.020	<0.020		0.020	0.020	5180823
p+m-Xylene	ug/g	<0.020	<0.020	<0.020	<0.020		0.020	0.020	5180823
o-Xylene	ug/g	<0.020	<0.020	<0.020	<0.020		0.020	0.020	5180823
Total Xylenes	ug/g	<0.020	<0.020	<0.020	<0.020		0.020	0.020	5180823
F1 (C6-C10)	ug/g	<10	<10	<10	<10		10	N/A	5180823
F1 (C6-C10) - BTEX	ug/g	<10	<10	<10	<10		10	N/A	5180823
F2-F4 Hydrocarbons									
F2 (C10-C16 Hydrocarbons)	ug/g		<10	<10	<10	<10	10	5.0	5184592
F3 (C16-C34 Hydrocarbons)	ug/g		<50	120	<50	<50	50	5.0	5184592
F4 (C34-C50 Hydrocarbons)	ug/g		<50	<50	<50	<50	50	10	5184592
Reached Baseline at C50	ug/g		Yes	Yes	Yes	Yes			5184592
Surrogate Recovery (%)									
o-Terphenyl	%		87	88	90	85			5184592
4-Bromofluorobenzene	%	91	93	93	91				5180823
D10-o-Xylene	%	82	79	80	91				5180823
D4-1,2-Dichloroethane	%	100	101	96	104				5180823
D8-Toluene	%	91	90	94	90				5180823

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

CCME PETROLEUM HYDROCARBONS SOIL (SOIL)

Maxxam ID		FDZ385	FDZ386	FDZ398	FDZ399	FDZ400			
Sampling Date		2017/09/14	2017/09/14	2017/09/14	2017/09/14	2017/09/14			
COC Number		627179-01-01	627179-01-01	627179-02-01	627179-02-01	627179-02-01			
	UNITS	SS_SP_08_FD	SS_SP_09	SS_SP_10	SS_SP_11	SS_SP_12	RDL	MDL	QC Batch
Volatile Organics									
Benzene	ug/g	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	0.0060	0.0060	5180823
Ethylbenzene	ug/g	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	0.010	5180823
Toluene	ug/g	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	0.020	5180823
p+m-Xylene	ug/g	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	0.020	5180823
o-Xylene	ug/g	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	0.020	5180823
Total Xylenes	ug/g	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	0.020	5180823
F1 (C6-C10)	ug/g	<10	<10	<10	<10	<10	10	N/A	5180823
F1 (C6-C10) - BTEX	ug/g	<10	<10	<10	<10	<10	10	N/A	5180823
F2-F4 Hydrocarbons									
F2 (C10-C16 Hydrocarbons)	ug/g	<10	<10	33	63	63	10	5.0	5184592
F3 (C16-C34 Hydrocarbons)	ug/g	<50	57	160	220	210	50	5.0	5184592
F4 (C34-C50 Hydrocarbons)	ug/g	<50	<50	<50	<50	<50	50	10	5184592
Reached Baseline at C50	ug/g	Yes	Yes	Yes	Yes	Yes			5184592
Surrogate Recovery (%)									
o-Terphenyl	%	86	84	89	91	92			5184592
4-Bromofluorobenzene	%	92	91	100	96	92			5180823
D10-o-Xylene	%	82	83	88	86	82			5180823
D4-1,2-Dichloroethane	%	102	95	101	99	94			5180823
D8-Toluene	%	91	90	89	96	91			5180823

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam Analytics International Corporation o/a Maxxam Analytics 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.maxxamanalytics.com

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

CCME PETROLEUM HYDROCARBONS SOIL (SOIL)

Maxxam ID		FDZ401			FDZ402			FDZ403			
Sampling Date		2017/09/15			2017/09/15			2017/09/15			
COC Number		627179-02-01			627179-02-01			627179-02-01			
	UNITS	**SS_SP_13**	**RDL**	**MDL**	**SS_SP_14**	**RDL**	**MDL**	**SS_SP_15**	**RDL**	**MDL**	**QC Batch**
Volatile Organics											
Benzene	ug/g	<0.012	0.012	0.012	<0.012	0.012	0.012	<0.018	0.018	0.018	5180823
Ethylbenzene	ug/g	<0.020	0.020	0.020	<0.020	0.020	0.020	<0.030	0.030	0.030	5180823
Toluene	ug/g	<0.040	0.040	0.040	<0.040	0.040	0.040	<0.060	0.060	0.060	5180823
p+m-Xylene	ug/g	<0.040	0.040	0.040	<0.040	0.040	0.040	<0.060	0.060	0.060	5180823
o-Xylene	ug/g	<0.040	0.040	0.040	<0.040	0.040	0.040	<0.060	0.060	0.060	5180823
Total Xylenes	ug/g	<0.040	0.040	0.040	<0.040	0.040	0.040	<0.060	0.060	0.060	5180823
F1 (C6-C10)	ug/g	<20	20	N/A	<20	20	N/A	<30	30	N/A	5180823
F1 (C6-C10) - BTEX	ug/g	<20	20	N/A	<20	20	N/A	<30	30	N/A	5180823
F2-F4 Hydrocarbons											
F2 (C10-C16 Hydrocarbons)	ug/g	<30	30	15	<40	40	20	<40	40	20	5184592
F3 (C16-C34 Hydrocarbons)	ug/g	1200	150	15	680	200	20	440	200	20	5184592
F4 (C34-C50 Hydrocarbons)	ug/g	930	150	30	640	200	40	340	200	40	5184592
Reached Baseline at C50	ug/g	No			No			No			5184592
Surrogate Recovery (%)											
o-Terphenyl	%	80			72			84			5184592
4-Bromofluorobenzene	%	95			92			95			5180823
D10-o-Xylene	%	68			64			76			5180823
D4-1,2-Dichloroethane	%	95			98			98			5180823
D8-Toluene	%	94			91			90			5180823

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

CCME PETROLEUM HYDROCARBONS SOIL (SOIL)

Maxxam ID		FDZ404			FDZ405	FDZ406	FDZ407			
Sampling Date		2017/09/15			2017/09/14	2017/09/14	2017/09/14			
COC Number		627179-02-01			627179-02-01	627179-02-01	627179-02-01			
	UNITS	SS_SP_16	RDL	MDL	SS_SP_17	SS_SP_18	SS_SP_19	RDL	MDL	QC Batch
Volatile Organics										
Benzene	ug/g	<0.012	0.012	0.012	<0.0060	<0.0060	<0.0060	0.0060	0.0060	5180823
Ethylbenzene	ug/g	<0.020	0.020	0.020	<0.010	<0.010	<0.010	0.010	0.010	5180823
Toluene	ug/g	<0.040	0.040	0.040	<0.020	<0.020	<0.020	0.020	0.020	5180823
p+m-Xylene	ug/g	<0.040	0.040	0.040	<0.020	<0.020	<0.020	0.020	0.020	5180823
o-Xylene	ug/g	<0.040	0.040	0.040	<0.020	<0.020	<0.020	0.020	0.020	5180823
Total Xylenes	ug/g	<0.040	0.040	0.040	<0.020	<0.020	<0.020	0.020	0.020	5180823
F1 (C6-C10)	ug/g	<20	20	N/A	<10	<10	<10	10	N/A	5180823
F1 (C6-C10) - BTEX	ug/g	<20	20	N/A	<10	<10	<10	10	N/A	5180823
F2-F4 Hydrocarbons										
F2 (C10-C16 Hydrocarbons)	ug/g	<20	20	10	<10	<10	<10	10	5.0	5184592
F3 (C16-C34 Hydrocarbons)	ug/g	690	100	10	<50	<50	62	50	5.0	5184592
F4 (C34-C50 Hydrocarbons)	ug/g	520	100	20	<50	<50	55	50	10	5184592
Reached Baseline at C50	ug/g	No			Yes	Yes	No			5184592
Surrogate Recovery (%)										
o-Terphenyl	%	81			80	86	83			5184592
4-Bromofluorobenzene	%	90			93	92	89			5180823
D10-o-Xylene	%	74			93	83	92			5180823
D4-1,2-Dichloroethane	%	97			98	96	97			5180823
D8-Toluene	%	91			86	91	92			5180823

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

CCME PETROLEUM HYDROCARBONS SOIL (SOIL)

Maxxam ID		FDZ420	FDZ421	FDZ421	FDZ422	FDZ422			
Sampling Date		2017/09/14	2017/09/14	2017/09/14	2017/09/14	2017/09/14			
COC Number		627179-03-01	627179-03-01	627179-03-01	627179-03-01	627179-03-01			
	UNITS	**SS_SP_20**	**SS_SP_21**	**SS_SP_21 Lab-Dup**	**SS_SP_22**	**SS_SP_22 Lab-Dup**	**RDL**	**MDL**	**QC Batch**
Volatile Organics									
Benzene	ug/g	<0.0060	<0.0060	<0.0060	<0.0060		0.0060	0.0060	5182564
Ethylbenzene	ug/g	<0.010	<0.010	<0.010	<0.010		0.010	0.010	5182564
Toluene	ug/g	<0.020	<0.020	<0.020	<0.020		0.020	0.020	5182564
p+m-Xylene	ug/g	<0.020	<0.020	<0.020	<0.020		0.020	0.020	5182564
o-Xylene	ug/g	<0.020	<0.020	<0.020	<0.020		0.020	0.020	5182564
Total Xylenes	ug/g	<0.020	<0.020	<0.020	<0.020		0.020	0.020	5182564
F1 (C6-C10)	ug/g	<10	<10	<10	<10		10	N/A	5182564
F1 (C6-C10) - BTEX	ug/g	<10	<10	<10	<10		10	N/A	5182564
F2-F4 Hydrocarbons									
F2 (C10-C16 Hydrocarbons)	ug/g	<10	500		<10	<10	10	5.0	5185233
F3 (C16-C34 Hydrocarbons)	ug/g	79	1900		<50	<50	50	5.0	5185233
F4 (C34-C50 Hydrocarbons)	ug/g	64	90		<50	<50	50	10	5185233
Reached Baseline at C50	ug/g	No	Yes		Yes	Yes			5185233
Surrogate Recovery (%)									
o-Terphenyl	%	90	110		81	86			5185233
4-Bromofluorobenzene	%	93	93	92	93				5182564
D10-o-Xylene	%	103	84	85	85				5182564
D4-1,2-Dichloroethane	%	100	101	100	101				5182564
D8-Toluene	%	98	98	99	99				5182564

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

CCME PETROLEUM HYDROCARBONS SOIL (SOIL)

Maxxam ID		FDZ423	FDZ424	FDZ425	FDZ426	FDZ427			
Sampling Date		2017/09/14	2017/09/14	2017/09/14	2017/09/14	2017/09/14			
COC Number		627179-03-01	627179-03-01	627179-03-01	627179-03-01	627179-03-01			
	UNITS	**SS_SP_23**	**SS_SP_23_FD**	**SS_SP_24**	**SS_SP_25**	**SS_SP_26**	**RDL**	**MDL**	**QC Batch**
Volatile Organics									
Benzene	ug/g	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	0.0060	0.0060	5182564
Ethylbenzene	ug/g	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	0.010	5182564
Toluene	ug/g	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	0.020	5182564
p+m-Xylene	ug/g	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	0.020	5182564
o-Xylene	ug/g	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	0.020	5182564
Total Xylenes	ug/g	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	0.020	5182564
F1 (C6-C10)	ug/g	<10	<10	<10	<10	<10	10	N/A	5182564
F1 (C6-C10) - BTEX	ug/g	<10	<10	<10	<10	<10	10	N/A	5182564
F2-F4 Hydrocarbons									
F2 (C10-C16 Hydrocarbons)	ug/g	<10	<10	<10	<10	<10	10	5.0	5185233
F3 (C16-C34 Hydrocarbons)	ug/g	<50	<50	73	95	<50	50	5.0	5185233
F4 (C34-C50 Hydrocarbons)	ug/g	<50	<50	52	70	<50	50	10	5185233
Reached Baseline at C50	ug/g	Yes	Yes	No	No	Yes			5185233
Surrogate Recovery (%)									
o-Terphenyl	%	86	88	94	94	92			5185233
4-Bromofluorobenzene	%	92	92	92	93	93			5182564
D10-o-Xylene	%	82	92	87	80	84			5182564
D4-1,2-Dichloroethane	%	100	100	101	101	100			5182564
D8-Toluene	%	100	99	99	99	99			5182564

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

CCME PETROLEUM HYDROCARBONS SOIL (SOIL)

Maxxam ID		FDZ428	FDZ429	FDZ439	FDZ440	FDZ441			
Sampling Date		2017/09/14	2017/09/14	2017/09/14	2017/09/14	2017/09/14			
COC Number		627179-03-01	627179-03-01	627179-04-01	627179-04-01	627179-04-01			
	UNITS	SS_SP_26_FD	SS_SP_27	SS_SP_28_BG	SS_SP_29	SS_SP_30	RDL	MDL	QC Batch
Volatile Organics									
Benzene	ug/g	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	0.0060	0.0060	5182564
Ethylbenzene	ug/g	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	0.010	5182564
Toluene	ug/g	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	0.020	5182564
p+m-Xylene	ug/g	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	0.020	5182564
o-Xylene	ug/g	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	0.020	5182564
Total Xylenes	ug/g	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	0.020	5182564
F1 (C6-C10)	ug/g	<10	<10	<10	<10	<10	10	N/A	5182564
F1 (C6-C10) - BTEX	ug/g	<10	<10	<10	<10	<10	10	N/A	5182564
F2-F4 Hydrocarbons									
F2 (C10-C16 Hydrocarbons)	ug/g	10	<10	11	<10	<10	10	5.0	5185233
F3 (C16-C34 Hydrocarbons)	ug/g	<50	<50	130	<50	<50	50	5.0	5185233
F4 (C34-C50 Hydrocarbons)	ug/g	<50	<50	140	<50	<50	50	10	5185233
Reached Baseline at C50	ug/g	Yes	Yes	No	Yes	Yes			5185233
Surrogate Recovery (%)									
o-Terphenyl	%	96	94	88	89	92			5185233
4-Bromofluorobenzene	%	91	91	92	91	91			5182564
D10-o-Xylene	%	99	82	81	86	85			5182564
D4-1,2-Dichloroethane	%	102	100	100	101	101			5182564
D8-Toluene	%	99	100	99	98	99			5182564

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

CCME PETROLEUM HYDROCARBONS SOIL (SOIL)

Maxxam ID		FDZ442	FDZ443	FDZ444	FDZ445	FDZ446			
Sampling Date		2017/09/14	2017/09/14	2017/09/14	2017/09/14	2017/09/14			
COC Number		627179-04-01	627179-04-01	627179-04-01	627179-04-01	627179-04-01			
	UNITS	**SS_SP_31**	**SS_SP_32**	**SS_SP_33**	**SS_SP_34**	**SS_SP_34_FD**	**RDL**	**MDL**	**QC Batch**
Volatile Organics									
Benzene	ug/g	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	0.0060	0.0060	5182564
Ethylbenzene	ug/g	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	0.010	5182564
Toluene	ug/g	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	0.020	5182564
p+m-Xylene	ug/g	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	0.020	5182564
o-Xylene	ug/g	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	0.020	5182564
Total Xylenes	ug/g	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	0.020	5182564
F1 (C6-C10)	ug/g	<10	<10	<10	<10	<10	10	N/A	5182564
F1 (C6-C10) - BTEX	ug/g	<10	<10	<10	<10	<10	10	N/A	5182564
F2-F4 Hydrocarbons									
F2 (C10-C16 Hydrocarbons)	ug/g	25	<10	14	<10	<10	10	5.0	5185233
F3 (C16-C34 Hydrocarbons)	ug/g	1200	<50	1000	<50	60	50	5.0	5185233
F4 (C34-C50 Hydrocarbons)	ug/g	790	<50	520	<50	52	50	10	5185233
Reached Baseline at C50	ug/g	No	Yes	No	Yes	No			5185233
Surrogate Recovery (%)									
o-Terphenyl	%	89	92	91	94	90			5185233
4-Bromofluorobenzene	%	92	92	93	92	91			5182564
D10-o-Xylene	%	84	79	76	75	80			5182564
D4-1,2-Dichloroethane	%	102	103	103	103	103			5182564
D8-Toluene	%	99	98	98	97	99			5182564

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

CCME PETROLEUM HYDROCARBONS SOIL (SOIL)

Maxxam ID		FDZ447	FDZ448		FDZ453	FDZ454	FDZ455			
Sampling Date		2017/09/14	2017/09/14		2017/09/14	2017/09/14	2017/09/15			
COC Number		627179-04-01	627179-04-01		627179-04-01	627179-04-01	627179-04-01			
	UNITS	SS_SP_35	SS_SP_36	QC Batch	SS_SP_37	SS_SP_38	SS_SP_39	RDL	MDL	QC Batch
Volatile Organics										
Benzene	ug/g	<0.0060	<0.0060	5182564	<0.0060	<0.0060	<0.0060	0.0060	0.0060	5182817
Ethylbenzene	ug/g	<0.010	<0.010	5182564	<0.010	<0.010	<0.010	0.010	0.010	5182817
Toluene	ug/g	<0.020	<0.020	5182564	<0.020	<0.020	<0.020	0.020	0.020	5182817
p+m-Xylene	ug/g	<0.020	<0.020	5182564	<0.020	<0.020	<0.020	0.020	0.020	5182817
o-Xylene	ug/g	<0.020	<0.020	5182564	<0.020	<0.020	<0.020	0.020	0.020	5182817
Total Xylenes	ug/g	<0.020	<0.020	5182564	<0.020	<0.020	<0.020	0.020	0.020	5182817
F1 (C6-C10)	ug/g	<10	<10	5182564	<10	<10	<10	10	N/A	5182817
F1 (C6-C10) - BTEX	ug/g	<10	<10	5182564	<10	<10	<10	10	N/A	5182817
F2-F4 Hydrocarbons										
F2 (C10-C16 Hydrocarbons)	ug/g	11	<10	5185233	<10	<10	<10	10	5.0	5185268
F3 (C16-C34 Hydrocarbons)	ug/g	75	100	5185233	51	<50	<50	50	5.0	5185268
F4 (C34-C50 Hydrocarbons)	ug/g	71	85	5185233	66	<50	<50	50	10	5185268
Reached Baseline at C50	ug/g	No	No	5185233	No	Yes	Yes			5185268
Surrogate Recovery (%)										
o-Terphenyl	%	91	93	5185233	97	101	91			5185268
4-Bromofluorobenzene	%	91	91	5182564	92	91	91			5182817
D10-o-Xylene	%	82	103	5182564	84	78	90			5182817
D4-1,2-Dichloroethane	%	103	103	5182564	107	107	103			5182817
D8-Toluene	%	98	99	5182564	95	95	97			5182817

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

CCME PETROLEUM HYDROCARBONS SOIL (SOIL)

Maxxam ID		FDZ456	FDZ457	FDZ458	FDZ458	FDZ459			
Sampling Date		2017/09/15	2017/09/15	2017/09/15	2017/09/15	2017/09/15			
COC Number		627179-04-01	627179-04-01	627179-04-01	627179-04-01	627179-04-01			
	UNITS	**SS_SP_40**	**SS_SP_41**	**SS_SP_42**	**SS_SP_42 Lab-Dup**	**SS_SP_43**	**RDL**	**MDL**	**QC Batch**
Volatile Organics									
Benzene	ug/g	<0.0060	<0.0060	<0.0060		<0.0060	0.0060	0.0060	5182817
Ethylbenzene	ug/g	<0.010	<0.010	<0.010		<0.010	0.010	0.010	5182817
Toluene	ug/g	<0.020	<0.020	<0.020		<0.020	0.020	0.020	5182817
p+m-Xylene	ug/g	<0.020	<0.020	<0.020		<0.020	0.020	0.020	5182817
o-Xylene	ug/g	<0.020	<0.020	<0.020		<0.020	0.020	0.020	5182817
Total Xylenes	ug/g	<0.020	<0.020	<0.020		<0.020	0.020	0.020	5182817
F1 (C6-C10)	ug/g	<10	<10	<10		<10	10	N/A	5182817
F1 (C6-C10) - BTEX	ug/g	<10	<10	<10		<10	10	N/A	5182817
F2-F4 Hydrocarbons									
F2 (C10-C16 Hydrocarbons)	ug/g	<10	<10	<10	<10	<10	10	5.0	5185268
F3 (C16-C34 Hydrocarbons)	ug/g	51	140	<50	<50	<50	50	5.0	5185268
F4 (C34-C50 Hydrocarbons)	ug/g	<50	91	<50	<50	<50	50	10	5185268
Reached Baseline at C50	ug/g	Yes	No	Yes	Yes	Yes			5185268
Surrogate Recovery (%)									
o-Terphenyl	%	100	97	98	93	93			5185268
4-Bromofluorobenzene	%	90	90	90		90			5182817
D10-o-Xylene	%	81	79	127		92			5182817
D4-1,2-Dichloroethane	%	105	105	106		106			5182817
D8-Toluene	%	97	96	96		97			5182817

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

Maxxam Analytics International Corporation o/a Maxxam Analytics 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.maxxamanalytics.com

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

CCME PETROLEUM HYDROCARBONS SOIL (SOIL)

Maxxam ID		FDZ460	FDZ461	FDZ462	FDZ462			
Sampling Date		2017/09/15	2017/09/15	2017/09/15	2017/09/15			
COC Number		627179-04-01	627179-04-01	627179-04-01	627179-04-01			
	UNITS	**SS_SP_44**	**SS_SP_44_FD**	**SS_SP_45**	**SS_SP_45 Lab-Dup**	**RDL**	**MDL**	**QC Batch**
Volatile Organics								
Benzene	ug/g	<0.0060	<0.0060	0.0099	0.0096	0.0060	0.0060	5182817
Ethylbenzene	ug/g	<0.010	<0.010	<0.010	<0.010	0.010	0.010	5182817
Toluene	ug/g	<0.020	<0.020	<0.020	<0.020	0.020	0.020	5182817
p+m-Xylene	ug/g	<0.020	<0.020	<0.020	<0.020	0.020	0.020	5182817
o-Xylene	ug/g	<0.020	<0.020	<0.020	<0.020	0.020	0.020	5182817
Total Xylenes	ug/g	<0.020	<0.020	<0.020	<0.020	0.020	0.020	5182817
F1 (C6-C10)	ug/g	<10	<10	<10	<10	10	N/A	5182817
F1 (C6-C10) - BTEX	ug/g	<10	<10	<10	<10	10	N/A	5182817
F2-F4 Hydrocarbons								
F2 (C10-C16 Hydrocarbons)	ug/g	<10	<10	<10		10	5.0	5185268
F3 (C16-C34 Hydrocarbons)	ug/g	77	110	<50		50	5.0	5185268
F4 (C34-C50 Hydrocarbons)	ug/g	57	80	<50		50	10	5185268
Reached Baseline at C50	ug/g	No	No	Yes				5185268
Surrogate Recovery (%)								
o-Terphenyl	%	96	97	97				5185268
4-Bromofluorobenzene	%	89	89	90	90			5182817
D10-o-Xylene	%	90	127	80	81			5182817
D4-1,2-Dichloroethane	%	105	103	106	107			5182817
D8-Toluene	%	97	98	96	96			5182817

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

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

CCME PETROLEUM HYDROCARBONS SOIL (SOIL)

Maxxam ID		FDZ505			FDZ506	FDZ507	FDZ508			
Sampling Date		2017/09/15			2017/09/15	2017/09/15	2017/09/15			
COC Number		627179-06-01			627179-06-01	627179-06-01	627179-06-01			
	UNITS	**SS_SP_46**	**RDL**	**MDL**	**SS_SP_47**	**SS_SP_48**	**SS_SP_49**	**RDL**	**MDL**	**QC Batch**
Volatile Organics										
Benzene	ug/g	<0.0060	0.0060	0.0060	<0.0060	<0.0060	<0.0060	0.0060	0.0060	5182817
Ethylbenzene	ug/g	<0.010	0.010	0.010	<0.010	<0.010	<0.010	0.010	0.010	5182817
Toluene	ug/g	<0.020	0.020	0.020	<0.020	<0.020	<0.020	0.020	0.020	5182817
p+m-Xylene	ug/g	<0.020	0.020	0.020	<0.020	<0.020	<0.020	0.020	0.020	5182817
o-Xylene	ug/g	<0.020	0.020	0.020	<0.020	<0.020	<0.020	0.020	0.020	5182817
Total Xylenes	ug/g	<0.020	0.020	0.020	<0.020	<0.020	<0.020	0.020	0.020	5182817
F1 (C6-C10)	ug/g	<10	10	N/A	<10	<10	<10	10	N/A	5182817
F1 (C6-C10) - BTEX	ug/g	<10	10	N/A	<10	<10	<10	10	N/A	5182817
F2-F4 Hydrocarbons										
F2 (C10-C16 Hydrocarbons)	ug/g	<20	20	10	<10	<10	<10	10	5.0	5185268
F3 (C16-C34 Hydrocarbons)	ug/g	250	100	10	<50	<50	<50	50	5.0	5185268
F4 (C34-C50 Hydrocarbons)	ug/g	200	100	20	<50	<50	<50	50	10	5185268
Reached Baseline at C50	ug/g	No			Yes	Yes	Yes			5185268
Surrogate Recovery (%)										
o-Terphenyl	%	98			95	88	99			5185268
4-Bromofluorobenzene	%	90			89	88	90			5182817
D10-o-Xylene	%	89			85	90	90			5182817
D4-1,2-Dichloroethane	%	105			105	105	108			5182817
D8-Toluene	%	97			97	98	96			5182817

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

CCME PETROLEUM HYDROCARBONS SOIL (SOIL)

Maxxam ID		FDZ509	FDZ510	FDZ511	FDZ512	FDZ513			
Sampling Date		2017/09/15	2017/09/15	2017/09/15	2017/09/15	2017/09/15			
COC Number		627179-06-01	627179-06-01	627179-06-01	627179-06-01	627179-06-01			
	UNITS	**SS_SP_50**	**SS_SP_51**	**SS_SP_52**	**SS_SP_53**	**SD_SP_01_BG**	**RDL**	**MDL**	**QC Batch**
Volatile Organics									
Benzene	ug/g	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	0.0060	0.0060	5182817
Ethylbenzene	ug/g	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	0.010	5182817
Toluene	ug/g	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	0.020	5182817
p+m-Xylene	ug/g	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	0.020	5182817
o-Xylene	ug/g	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	0.020	5182817
Total Xylenes	ug/g	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	0.020	5182817
F1 (C6-C10)	ug/g	<10	<10	<10	<10	<10	10	N/A	5182817
F1 (C6-C10) - BTEX	ug/g	<10	<10	<10	<10	<10	10	N/A	5182817
F2-F4 Hydrocarbons									
F2 (C10-C16 Hydrocarbons)	ug/g	<10	<10	<10	<10	<10	10	5.0	5185268
F3 (C16-C34 Hydrocarbons)	ug/g	150	<50	<50	80	<50	50	5.0	5185268
F4 (C34-C50 Hydrocarbons)	ug/g	120	<50	<50	<50	<50	50	10	5185268
Reached Baseline at C50	ug/g	No	Yes	Yes	Yes	Yes			5185268
Surrogate Recovery (%)									
o-Terphenyl	%	98	96	87	97	100			5185268
4-Bromofluorobenzene	%	91	89	91	89	89			5182817
D10-o-Xylene	%	81	118	138 (1)	83	75			5182817
D4-1,2-Dichloroethane	%	108	107	109	110	106			5182817
D8-Toluene	%	97	97	96	96	97			5182817

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable
(1) The recovery for the extraction surrogate compound was above the upper control limit. Visible loss of methanol was observed in this sample. This may represent a high bias in some results for this sample. For results that were not detected (ND), this potential bias has no impact.

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

CCME PETROLEUM HYDROCARBONS SOIL (SOIL)

Maxxam ID		FDZ514		FDZ519			FDZ520			
Sampling Date		2017/09/15		2017/09/15			2017/09/15			
COC Number		627179-06-01		627179-07-01			627179-07-01			
	UNITS	**SD_SP_02**	**QC Batch**	**SD_SP_03**	**RDL**	**MDL**	**SD_SP_04**	**RDL**	**MDL**	**QC Batch**
Volatile Organics										
Benzene	ug/g	<0.0060	5182817	<0.0060	0.0060	0.0060	<0.018	0.018	0.018	5182076
Ethylbenzene	ug/g	<0.010	5182817	<0.010	0.010	0.010	<0.030	0.030	0.030	5182076
Toluene	ug/g	<0.020	5182817	<0.020	0.020	0.020	<0.060	0.060	0.060	5182076
p+m-Xylene	ug/g	<0.020	5182817	<0.020	0.020	0.020	<0.060	0.060	0.060	5182076
o-Xylene	ug/g	<0.020	5182817	<0.020	0.020	0.020	<0.060	0.060	0.060	5182076
Total Xylenes	ug/g	<0.020	5182817	<0.020	0.020	0.020	<0.060	0.060	0.060	5182076
F1 (C6-C10)	ug/g	<10	5182817	<10	10	N/A	<30	30	N/A	5182076
F1 (C6-C10) - BTEX	ug/g	<10	5182817	<10	10	N/A	<30	30	N/A	5182076
F2-F4 Hydrocarbons										
F2 (C10-C16 Hydrocarbons)	ug/g	<10	5185268	<10	10	5.0	82	50	25	5184410
F3 (C16-C34 Hydrocarbons)	ug/g	<50	5185268	<50	50	5.0	1600	250	25	5184410
F4 (C34-C50 Hydrocarbons)	ug/g	<50	5185268	<50	50	10	800	250	50	5184410
Reached Baseline at C50	ug/g	Yes	5185268	Yes			No			5184410
Surrogate Recovery (%)										
o-Terphenyl	%	95	5185268	89			91			5184410
4-Bromofluorobenzene	%	89	5182817	91			91			5182076
D10-o-Xylene	%	77	5182817	85			63			5182076
D4-1,2-Dichloroethane	%	107	5182817	98			101			5182076
D8-Toluene	%	96	5182817	92			92			5182076

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam Analytics International Corporation o/a Maxxam Analytics 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.maxxamanalytics.com

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

CCME PETROLEUM HYDROCARBONS SOIL (SOIL)

Maxxam ID		FDZ521	FDZ522	FDZ523	FDZ524	FDZ525			
Sampling Date		2017/09/15	2017/09/15	2017/09/15	2017/09/15	2017/09/15			
COC Number		627179-07-01	627179-07-01	627179-07-01	627179-07-01	627179-07-01			
	UNITS	**SS_SP_60**	**SS_SP_61**	**SS_SP_62**	**SS_SP_63**	**SS_SP_64**	**RDL**	**MDL**	**QC Batch**
Volatile Organics									
Benzene	ug/g	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	0.0060	0.0060	5182076
Ethylbenzene	ug/g	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	0.010	5182076
Toluene	ug/g	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	0.020	5182076
p+m-Xylene	ug/g	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	0.020	5182076
o-Xylene	ug/g	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	0.020	5182076
Total Xylenes	ug/g	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	0.020	5182076
F1 (C6-C10)	ug/g	<10	<10	<10	<10	<10	10	N/A	5182076
F1 (C6-C10) - BTEX	ug/g	<10	<10	<10	<10	<10	10	N/A	5182076
F2-F4 Hydrocarbons									
F2 (C10-C16 Hydrocarbons)	ug/g	61	6500	<10	<10	<10	10	5.0	5184410
F3 (C16-C34 Hydrocarbons)	ug/g	2400	4700	<50	<50	<50	50	5.0	5184410
F4 (C34-C50 Hydrocarbons)	ug/g	1600	100	<50	<50	<50	50	10	5184410
Reached Baseline at C50	ug/g	No	Yes	Yes	Yes	Yes			5184410
Surrogate Recovery (%)									
o-Terphenyl	%	96	113	103	92	86			5184410
4-Bromofluorobenzene	%	88	98	91	91	91			5182076
D10-o-Xylene	%	92	82	97	84	113			5182076
D4-1,2-Dichloroethane	%	102	100	99	100	99			5182076
D8-Toluene	%	92	89	92	92	92			5182076

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam Analytics International Corporation o/a Maxxam Analytics 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.maxxamanalytics.com

RESULTS OF ANALYSES OF SOIL

Maxxam ID		FDZ377	FDZ378	FDZ379	FDZ380	FDZ381	FDZ382			
Sampling Date		2017/09/14	2017/09/14	2017/09/14	2017/09/14	2017/09/14	2017/09/14			
COC Number		627179-01-01	627179-01-01	627179-01-01	627179-01-01	627179-01-01	627179-01-01			
	UNITS	**SS_SP_01**	**SS_SP_02**	**SS_SP_03**	**SS_SP_04**	**SS_SP_05**	**SS_SP_06**	**RDL**	**MDL**	**QC Batch**
Inorganics										
Moisture	%	5.0	5.9	15	6.9	11	11	1.0	0.20	5177680

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		FDZ383	FDZ384	FDZ385	FDZ386	FDZ398			
Sampling Date		2017/09/14	2017/09/14	2017/09/14	2017/09/14	2017/09/14			
COC Number		627179-01-01	627179-01-01	627179-01-01	627179-01-01	627179-02-01			
	UNITS	**SS_SP_07**	**SS_SP_08**	**SS_SP_08_FD**	**SS_SP_09**	**SS_SP_10**	**RDL**	**MDL**	**QC Batch**
Inorganics									
Moisture	%	13	6.1	8.6	13	10	1.0	0.20	5177680

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		FDZ399		FDZ400	FDZ400	FDZ401	FDZ402			
Sampling Date		2017/09/14		2017/09/14	2017/09/14	2017/09/15	2017/09/15			
COC Number		627179-02-01		627179-02-01	627179-02-01	627179-02-01	627179-02-01			
	UNITS	**SS_SP_11**	**QC Batch**	**SS_SP_12**	**SS_SP_12 Lab-Dup**	**SS_SP_13**	**SS_SP_14**	**RDL**	**MDL**	**QC Batch**
Inorganics										
Moisture	%					73	78	1.0	0.50	5191424
Moisture	%	19	5184588	14	14			1.0	0.20	5177680

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

Maxxam ID		FDZ403	FDZ404	FDZ405	FDZ406	FDZ407	FDZ420			
Sampling Date		2017/09/15	2017/09/15	2017/09/14	2017/09/14	2017/09/14	2017/09/14			
COC Number		627179-02-01	627179-02-01	627179-02-01	627179-02-01	627179-02-01	627179-03-01			
	UNITS	**SS_SP_15**	**SS_SP_16**	**SS_SP_17**	**SS_SP_18**	**SS_SP_19**	**SS_SP_20**	**RDL**	**MDL**	**QC Batch**
Inorganics										
Moisture	%	77	59		6.7		31	1.0	0.50	5191424
Moisture	%			19		31		1.0	0.20	5177680

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

RESULTS OF ANALYSES OF SOIL

Maxxam ID		FDZ421	FDZ422	FDZ423	FDZ424	FDZ425			
Sampling Date		2017/09/14	2017/09/14	2017/09/14	2017/09/14	2017/09/14			
COC Number		627179-03-01	627179-03-01	627179-03-01	627179-03-01	627179-03-01			
	UNITS	**SS_SP_21**	**SS_SP_22**	**SS_SP_23**	**SS_SP_23_FD**	**SS_SP_24**	**RDL**	**MDL**	**QC Batch**
Inorganics									
Moisture	%	24	16	14	14	23	1.0	0.20	5177680

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		FDZ426	FDZ427	FDZ428	FDZ429	FDZ439	FDZ440			
Sampling Date		2017/09/14	2017/09/14	2017/09/14	2017/09/14	2017/09/14	2017/09/14			
COC Number		627179-03-01	627179-03-01	627179-03-01	627179-03-01	627179-04-01	627179-04-01			
	UNITS	**SS_SP_25**	**SS_SP_26**	**SS_SP_26_FD**	**SS_SP_27**	**SS_SP_28_BG**	**SS_SP_29**	**RDL**	**MDL**	**QC Batch**
Inorganics										
Moisture	%				5.1		18	1.0	0.50	5191424
Moisture	%	10	20	26		40		1.0	0.20	5184588

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		FDZ441	FDZ442	FDZ443	FDZ444		FDZ445			
Sampling Date		2017/09/14	2017/09/14	2017/09/14	2017/09/14		2017/09/14			
COC Number		627179-04-01	627179-04-01	627179-04-01	627179-04-01		627179-04-01			
	UNITS	**SS_SP_30**	**SS_SP_31**	**SS_SP_32**	**SS_SP_33**	**QC Batch**	**SS_SP_34**	**RDL**	**MDL**	**QC Batch**
Inorganics										
Moisture	%	17	39	17	23	5184588	11	1.0	0.20	5184797

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		FDZ445	FDZ446	FDZ447	FDZ448	FDZ453	FDZ454			
Sampling Date		2017/09/14	2017/09/14	2017/09/14	2017/09/14	2017/09/14	2017/09/14			
COC Number		627179-04-01	627179-04-01	627179-04-01	627179-04-01	627179-04-01	627179-04-01			
	UNITS	**SS_SP_34 Lab-Dup**	**SS_SP_34_FD**	**SS_SP_35**	**SS_SP_36**	**SS_SP_37**	**SS_SP_38**	**RDL**	**MDL**	**QC Batch**
Inorganics										
Moisture	%						19	1.0	0.50	5191424
Moisture	%	11	16	34	25	21		1.0	0.20	5184797

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

Maxxam Analytics International Corporation o/a Maxxam Analytics 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.maxxamanalytics.com

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

RESULTS OF ANALYSES OF SOIL

Maxxam ID		FDZ455	FDZ456	FDZ457	FDZ458	FDZ459	FDZ460			
Sampling Date		2017/09/15	2017/09/15	2017/09/15	2017/09/15	2017/09/15	2017/09/15			
COC Number		627179-04-01	627179-04-01	627179-04-01	627179-04-01	627179-04-01	627179-04-01			
	UNITS	**SS_SP_39**	**SS_SP_40**	**SS_SP_41**	**SS_SP_42**	**SS_SP_43**	**SS_SP_44**	**RDL**	**MDL**	**QC Batch**
Inorganics										
Moisture	%	13					29	1.0	0.50	5191424
Moisture	%		13	25	16	28		1.0	0.20	5184797

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		FDZ461		FDZ462		FDZ505	FDZ506			
Sampling Date		2017/09/15		2017/09/15		2017/09/15	2017/09/15			
COC Number		627179-04-01		627179-04-01		627179-06-01	627179-06-01			
	UNITS	**SS_SP_44_FD**	**QC Batch**	**SS_SP_45**	**QC Batch**	**SS_SP_46**	**SS_SP_47**	**RDL**	**MDL**	**QC Batch**
Inorganics										
Moisture	%	18	5191424		5191424			1.0	0.50	5191424
Moisture	%		5184797	14	5188941	44	23	1.0	0.20	5184797

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		FDZ507	FDZ508	FDZ509	FDZ510	FDZ511	FDZ512			
Sampling Date		2017/09/15	2017/09/15	2017/09/15	2017/09/15	2017/09/15	2017/09/15			
COC Number		627179-06-01	627179-06-01	627179-06-01	627179-06-01	627179-06-01	627179-06-01			
	UNITS	**SS_SP_48**	**SS_SP_49**	**SS_SP_50**	**SS_SP_51**	**SS_SP_52**	**SS_SP_53**	**RDL**	**MDL**	**QC Batch**
Inorganics										
Moisture	%		15	16		23		1.0	0.50	5191424
Moisture	%	19			20		15	1.0	0.20	5184797

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		FDZ513	FDZ514	FDZ519	FDZ520	FDZ521			
Sampling Date		2017/09/15	2017/09/15	2017/09/15	2017/09/15	2017/09/15			
COC Number		627179-06-01	627179-06-01	627179-07-01	627179-07-01	627179-07-01			
	UNITS	**SD_SP_01_BG**	**SD_SP_02**	**SD_SP_03**	**SD_SP_04**	**SS_SP_60**	**RDL**	**MDL**	**QC Batch**
Inorganics									
Moisture	%	15	16	17	81	22	1.0	0.20	5184797

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

RESULTS OF ANALYSES OF SOIL

Maxxam ID		FDZ522	FDZ522	FDZ523	FDZ524	FDZ525			
Sampling Date		2017/09/15	2017/09/15	2017/09/15	2017/09/15	2017/09/15			
COC Number		627179-07-01	627179-07-01	627179-07-01	627179-07-01	627179-07-01			
	UNITS	**SS_SP_61**	**SS_SP_61 Lab-Dup**	**SS_SP_62**	**SS_SP_63**	**SS_SP_64**	**RDL**	**MDL**	**QC Batch**
Inorganics									
Moisture	%	18	17	20	9.4	16	1.0	0.20	5184947

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		FDZ377	FDZ378	FDZ379	FDZ380	FDZ381			
Sampling Date		2017/09/14	2017/09/14	2017/09/14	2017/09/14	2017/09/14			
COC Number		627179-01-01	627179-01-01	627179-01-01	627179-01-01	627179-01-01			
	UNITS	SS_SP_01	SS_SP_02	SS_SP_03	SS_SP_04	SS_SP_05	RDL	MDL	QC Batch
Metals									
Acid Extractable Aluminum (Al)	mg/kg	5300	4500	8300	9200	5100	10	N/A	5180382
Acid Extractable Antimony (Sb)	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	N/A	5180382
Acid Extractable Arsenic (As)	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	N/A	5180382
Acid Extractable Barium (Ba)	mg/kg	45	26	100	84	47	5.0	N/A	5180382
Acid Extractable Beryllium (Be)	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	N/A	5180382
Acid Extractable Bismuth (Bi)	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	N/A	5180382
Acid Extractable Boron (B)	mg/kg	<50	<50	<50	<50	<50	50	N/A	5180382
Acid Extractable Cadmium (Cd)	mg/kg	<0.30	<0.30	<0.30	<0.30	<0.30	0.30	N/A	5180382
Acid Extractable Chromium (Cr)	mg/kg	6.9	4.7	4.3	4.5	5.9	2.0	N/A	5180382
Acid Extractable Cobalt (Co)	mg/kg	4.8	3.3	19	21	6.3	1.0	N/A	5180382
Acid Extractable Copper (Cu)	mg/kg	15	9.6	190	190	30	2.0	N/A	5180382
Acid Extractable Iron (Fe)	mg/kg	11000	8300	49000	48000	16000	50	N/A	5180382
Acid Extractable Lead (Pb)	mg/kg	3.3	2.3	1.9	2.2	19	0.50	N/A	5180382
Acid Extractable Lithium (Li)	mg/kg	11	6.7	4.9	6.4	8.4	2.0	N/A	5180382
Acid Extractable Manganese (Mn)	mg/kg	190	120	310	380	200	2.0	N/A	5180382
Acid Extractable Mercury (Hg)	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	N/A	5180382
Acid Extractable Molybdenum (Mo)	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	N/A	5180382
Acid Extractable Nickel (Ni)	mg/kg	10	6.6	12	14	10	2.0	N/A	5180382
Acid Extractable Rubidium (Rb)	mg/kg	7.2	4.7	19	23	7.9	2.0	N/A	5180382
Acid Extractable Selenium (Se)	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	N/A	5180382
Acid Extractable Silver (Ag)	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	N/A	5180382
Acid Extractable Strontium (Sr)	mg/kg	5.2	5.4	15	12	7.1	5.0	N/A	5180382
Acid Extractable Thallium (Tl)	mg/kg	<0.10	<0.10	<0.10	0.12	<0.10	0.10	N/A	5180382
Acid Extractable Tin (Sn)	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	N/A	5180382
Acid Extractable Uranium (U)	mg/kg	0.57	0.51	0.36	0.33	0.38	0.10	N/A	5180382
Acid Extractable Vanadium (V)	mg/kg	22	16	72	71	22	2.0	N/A	5180382
Acid Extractable Zinc (Zn)	mg/kg	24	17	57	62	44	5.0	N/A	5180382

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		FDZ382	FDZ383		FDZ384	FDZ385			
Sampling Date		2017/09/14	2017/09/14		2017/09/14	2017/09/14			
COC Number		627179-01-01	627179-01-01		627179-01-01	627179-01-01			
	UNITS	**SS_SP_06**	**SS_SP_07**	**QC Batch**	**SS_SP_08**	**SS_SP_08_FD**	**RDL**	**MDL**	**QC Batch**
Metals									
Acid Extractable Aluminum (Al)	mg/kg	8100	9400	5180382	5600	5300	10	N/A	5191858
Acid Extractable Antimony (Sb)	mg/kg	<2.0	<2.0	5180382	<2.0	<2.0	2.0	N/A	5191858
Acid Extractable Arsenic (As)	mg/kg	<2.0	2.2	5180382	<2.0	<2.0	2.0	N/A	5191858
Acid Extractable Barium (Ba)	mg/kg	26	65	5180382	37	38	5.0	N/A	5191858
Acid Extractable Beryllium (Be)	mg/kg	<2.0	<2.0	5180382	<2.0	<2.0	2.0	N/A	5191858
Acid Extractable Bismuth (Bi)	mg/kg	<2.0	<2.0	5180382	<2.0	<2.0	2.0	N/A	5191858
Acid Extractable Boron (B)	mg/kg	<50	<50	5180382	<50	<50	50	N/A	5191858
Acid Extractable Cadmium (Cd)	mg/kg	<0.30	0.30	5180382	<0.30	<0.30	0.30	N/A	5191858
Acid Extractable Chromium (Cr)	mg/kg	8.1	9.4	5180382	8.8	7.5	2.0	N/A	5191858
Acid Extractable Cobalt (Co)	mg/kg	34	21	5180382	4.6	4.5	1.0	N/A	5191858
Acid Extractable Copper (Cu)	mg/kg	230	140	5180382	14	13	2.0	N/A	5191858
Acid Extractable Iron (Fe)	mg/kg	50000	44000	5180382	11000	9800	50	N/A	5191858
Acid Extractable Lead (Pb)	mg/kg	4.3	19	5180382	5.5	5.1	0.50	N/A	5191858
Acid Extractable Lithium (Li)	mg/kg	9.3	12	5180382	8.3	7.3	2.0	N/A	5191858
Acid Extractable Manganese (Mn)	mg/kg	560	420	5180382	160	140	2.0	N/A	5191858
Acid Extractable Mercury (Hg)	mg/kg	<0.10	<0.10	5180382	<0.10	<0.10	0.10	N/A	5191858
Acid Extractable Molybdenum (Mo)	mg/kg	<2.0	<2.0	5180382	<2.0	<2.0	2.0	N/A	5191858
Acid Extractable Nickel (Ni)	mg/kg	47	28	5180382	9.0	9.1	2.0	N/A	5191858
Acid Extractable Rubidium (Rb)	mg/kg	6.4	17	5180382	5.8	5.2	2.0	N/A	5191858
Acid Extractable Selenium (Se)	mg/kg	<1.0	<1.0	5180382	<1.0	<1.0	1.0	N/A	5191858
Acid Extractable Silver (Ag)	mg/kg	<0.50	<0.50	5180382	<0.50	<0.50	0.50	N/A	5191858
Acid Extractable Strontium (Sr)	mg/kg	11	18	5180382	6.5	6.2	5.0	N/A	5191858
Acid Extractable Thallium (Tl)	mg/kg	<0.10	<0.10	5180382	<0.10	<0.10	0.10	N/A	5191858
Acid Extractable Tin (Sn)	mg/kg	<2.0	<2.0	5180382	<2.0	<2.0	2.0	N/A	5191858
Acid Extractable Uranium (U)	mg/kg	0.31	0.45	5180382	0.65	0.51	0.10	N/A	5191858
Acid Extractable Vanadium (V)	mg/kg	58	71	5180382	20	19	2.0	N/A	5191858
Acid Extractable Zinc (Zn)	mg/kg	54	92	5180382	32	27	5.0	N/A	5191858

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam Analytics International Corporation o/a Maxxam Analytics 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.maxxamanalytics.com

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		FDZ405	FDZ406	FDZ407	FDZ420			
Sampling Date		2017/09/14	2017/09/14	2017/09/14	2017/09/14			
COC Number		627179-02-01	627179-02-01	627179-02-01	627179-03-01			
	UNITS	**SS_SP_17**	**SS_SP_18**	**SS_SP_19**	**SS_SP_20**	**RDL**	**MDL**	**QC Batch**
Metals								
Acid Extractable Aluminum (Al)	mg/kg	6900	6100	6400	7300	10	N/A	5188792
Acid Extractable Antimony (Sb)	mg/kg	<2.0	<2.0	<2.0	<2.0	2.0	N/A	5188792
Acid Extractable Arsenic (As)	mg/kg	<2.0	<2.0	<2.0	<2.0	2.0	N/A	5188792
Acid Extractable Barium (Ba)	mg/kg	63	52	54	72	5.0	N/A	5188792
Acid Extractable Beryllium (Be)	mg/kg	<2.0	<2.0	<2.0	<2.0	2.0	N/A	5188792
Acid Extractable Bismuth (Bi)	mg/kg	<2.0	<2.0	<2.0	<2.0	2.0	N/A	5188792
Acid Extractable Boron (B)	mg/kg	<50	<50	<50	<50	50	N/A	5188792
Acid Extractable Cadmium (Cd)	mg/kg	<0.30	<0.30	<0.30	<0.30	0.30	N/A	5188792
Acid Extractable Chromium (Cr)	mg/kg	9.5	11	11	4.3	2.0	N/A	5188792
Acid Extractable Cobalt (Co)	mg/kg	6.8	8.3	5.1	17	1.0	N/A	5188792
Acid Extractable Copper (Cu)	mg/kg	22	44	13	130	2.0	N/A	5188792
Acid Extractable Iron (Fe)	mg/kg	15000	17000	12000	42000	50	N/A	5188792
Acid Extractable Lead (Pb)	mg/kg	17	5.9	140	2.5	0.50	N/A	5188792
Acid Extractable Lithium (Li)	mg/kg	18	9.8	11	5.6	2.0	N/A	5188792
Acid Extractable Manganese (Mn)	mg/kg	330	220	170	310	2.0	N/A	5188792
Acid Extractable Mercury (Hg)	mg/kg	<0.10	<0.10	<0.10	<0.10	0.10	N/A	5188792
Acid Extractable Molybdenum (Mo)	mg/kg	<2.0	<2.0	<2.0	<2.0	2.0	N/A	5188792
Acid Extractable Nickel (Ni)	mg/kg	12	9.2	10	7.3	2.0	N/A	5188792
Acid Extractable Rubidium (Rb)	mg/kg	12	9.9	9.3	22	2.0	N/A	5188792
Acid Extractable Selenium (Se)	mg/kg	<1.0	<1.0	<1.0	<1.0	1.0	N/A	5188792
Acid Extractable Silver (Ag)	mg/kg	<0.50	<0.50	<0.50	<0.50	0.50	N/A	5188792
Acid Extractable Strontium (Sr)	mg/kg	9.9	7.6	10	14	5.0	N/A	5188792
Acid Extractable Thallium (Tl)	mg/kg	<0.10	<0.10	<0.10	0.10	0.10	N/A	5188792
Acid Extractable Tin (Sn)	mg/kg	<2.0	<2.0	<2.0	<2.0	2.0	N/A	5188792
Acid Extractable Uranium (U)	mg/kg	0.74	0.50	0.90	0.33	0.10	N/A	5188792
Acid Extractable Vanadium (V)	mg/kg	26	28	25	78	2.0	N/A	5188792
Acid Extractable Zinc (Zn)	mg/kg	40	28	41	52	5.0	N/A	5188792

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		FDZ421	FDZ422	FDZ423	FDZ424	FDZ425			
Sampling Date		2017/09/14	2017/09/14	2017/09/14	2017/09/14	2017/09/14			
COC Number		627179-03-01	627179-03-01	627179-03-01	627179-03-01	627179-03-01			
	UNITS	SS_SP_21	SS_SP_22	SS_SP_23	SS_SP_23_FD	SS_SP_24	RDL	MDL	QC Batch
Metals									
Acid Extractable Aluminum (Al)	mg/kg	6800	4900	8400	10000	6800	10	N/A	5180382
Acid Extractable Antimony (Sb)	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	N/A	5180382
Acid Extractable Arsenic (As)	mg/kg	<2.0	<2.0	3.8	4.0	<2.0	2.0	N/A	5180382
Acid Extractable Barium (Ba)	mg/kg	77	46	76	98	46	5.0	N/A	5180382
Acid Extractable Beryllium (Be)	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	N/A	5180382
Acid Extractable Bismuth (Bi)	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	N/A	5180382
Acid Extractable Boron (B)	mg/kg	<50	<50	<50	<50	<50	50	N/A	5180382
Acid Extractable Cadmium (Cd)	mg/kg	<0.30	<0.30	<0.30	<0.30	<0.30	0.30	N/A	5180382
Acid Extractable Chromium (Cr)	mg/kg	15	6.8	9.7	7.0	7.2	2.0	N/A	5180382
Acid Extractable Cobalt (Co)	mg/kg	7.1	4.2	27	31	10	1.0	N/A	5180382
Acid Extractable Copper (Cu)	mg/kg	44	12	210	270	84	2.0	N/A	5180382
Acid Extractable Iron (Fe)	mg/kg	20000	11000	53000	55000	20000	50	N/A	5180382
Acid Extractable Lead (Pb)	mg/kg	37	5.1	2700	1100	210	0.50	N/A	5180382
Acid Extractable Lithium (Li)	mg/kg	11	18	6.9	7.8	9.2	2.0	N/A	5180382
Acid Extractable Manganese (Mn)	mg/kg	200	250	440	490	250	2.0	N/A	5180382
Acid Extractable Mercury (Hg)	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	N/A	5180382
Acid Extractable Molybdenum (Mo)	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	N/A	5180382
Acid Extractable Nickel (Ni)	mg/kg	11	8.4	21	21	14	2.0	N/A	5180382
Acid Extractable Rubidium (Rb)	mg/kg	17	21	17	22	9.1	2.0	N/A	5180382
Acid Extractable Selenium (Se)	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	N/A	5180382
Acid Extractable Silver (Ag)	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	N/A	5180382
Acid Extractable Strontium (Sr)	mg/kg	8.5	6.3	13	14	11	5.0	N/A	5180382
Acid Extractable Thallium (Tl)	mg/kg	<0.10	0.12	<0.10	0.12	<0.10	0.10	N/A	5180382
Acid Extractable Tin (Sn)	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	N/A	5180382
Acid Extractable Uranium (U)	mg/kg	0.60	1.2	0.31	0.44	0.51	0.10	N/A	5180382
Acid Extractable Vanadium (V)	mg/kg	35	18	130	96	37	2.0	N/A	5180382
Acid Extractable Zinc (Zn)	mg/kg	84	40	96	100	33	5.0	N/A	5180382

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam Analytics International Corporation o/a Maxxam Analytics 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.maxxamanalytics.com

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		FDZ426	FDZ427	FDZ428	FDZ439		FDZ441			
Sampling Date		2017/09/14	2017/09/14	2017/09/14	2017/09/14		2017/09/14			
COC Number		627179-03-01	627179-03-01	627179-03-01	627179-04-01		627179-04-01			
	UNITS	SS_SP_25	SS_SP_26	SS_SP_26_FD	SS_SP_28_BG	RDL	SS_SP_30	RDL	MDL	QC Batch
Metals										
Acid Extractable Aluminum (Al)	mg/kg	8200	8200	7400	17000	10	12000	10	N/A	5191858
Acid Extractable Antimony (Sb)	mg/kg	<2.0	<2.0	<2.0	<2.0	2.0	<2.0	2.0	N/A	5191858
Acid Extractable Arsenic (As)	mg/kg	<2.0	<2.0	<2.0	<2.0	2.0	<2.0	2.0	N/A	5191858
Acid Extractable Barium (Ba)	mg/kg	56	80	66	70	5.0	47	5.0	N/A	5191858
Acid Extractable Beryllium (Be)	mg/kg	<2.0	<2.0	<2.0	<2.0	2.0	<2.0	2.0	N/A	5191858
Acid Extractable Bismuth (Bi)	mg/kg	<2.0	<2.0	<2.0	<2.0	2.0	<2.0	2.0	N/A	5191858
Acid Extractable Boron (B)	mg/kg	<50	<50	<50	<50	50	<50	50	N/A	5191858
Acid Extractable Cadmium (Cd)	mg/kg	<0.30	<0.30	<0.30	<0.30	0.30	<0.30	0.30	N/A	5191858
Acid Extractable Chromium (Cr)	mg/kg	7.8	11	9.7	7.3	2.0	11	2.0	N/A	5191858
Acid Extractable Cobalt (Co)	mg/kg	22	8.1	7.4	10	1.0	43	1.0	N/A	5191858
Acid Extractable Copper (Cu)	mg/kg	270	25	23	58	2.0	440	2.0	N/A	5191858
Acid Extractable Iron (Fe)	mg/kg	39000	17000	15000	26000	50	93000	500	N/A	5191858
Acid Extractable Lead (Pb)	mg/kg	6.0	10	11	4.1	0.50	2.5	0.50	N/A	5191858
Acid Extractable Lithium (Li)	mg/kg	6.1	18	16	14	2.0	14	2.0	N/A	5191858
Acid Extractable Manganese (Mn)	mg/kg	380	350	320	83	2.0	920	2.0	N/A	5191858
Acid Extractable Mercury (Hg)	mg/kg	<0.10	<0.10	<0.10	<0.10	0.10	<0.10	0.10	N/A	5191858
Acid Extractable Molybdenum (Mo)	mg/kg	<2.0	<2.0	<2.0	<2.0	2.0	<2.0	2.0	N/A	5191858
Acid Extractable Nickel (Ni)	mg/kg	25	14	12	51	2.0	42	2.0	N/A	5191858
Acid Extractable Rubidium (Rb)	mg/kg	15	15	13	13	2.0	16	2.0	N/A	5191858
Acid Extractable Selenium (Se)	mg/kg	<1.0	<1.0	<1.0	2.2	1.0	1.5	1.0	N/A	5191858
Acid Extractable Silver (Ag)	mg/kg	<0.50	<0.50	<0.50	<0.50	0.50	<0.50	0.50	N/A	5191858
Acid Extractable Strontium (Sr)	mg/kg	12	8.9	7.6	24	5.0	13	5.0	N/A	5191858
Acid Extractable Thallium (Tl)	mg/kg	<0.10	<0.10	<0.10	<0.10	0.10	<0.10	0.10	N/A	5191858
Acid Extractable Tin (Sn)	mg/kg	<2.0	<2.0	<2.0	<2.0	2.0	<2.0	2.0	N/A	5191858
Acid Extractable Uranium (U)	mg/kg	0.36	0.81	0.82	0.89	0.10	0.37	0.10	N/A	5191858
Acid Extractable Vanadium (V)	mg/kg	74	31	28	76	2.0	100	2.0	N/A	5191858
Acid Extractable Zinc (Zn)	mg/kg	55	38	35	20	5.0	88	5.0	N/A	5191858

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam Analytics International Corporation o/a Maxxam Analytics 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.maxxamanalytics.com

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		FDZ442	FDZ443	FDZ444	FDZ456	FDZ457			
Sampling Date		2017/09/14	2017/09/14	2017/09/14	2017/09/15	2017/09/15			
COC Number		627179-04-01	627179-04-01	627179-04-01	627179-04-01	627179-04-01			
	UNITS	SS_SP_31	SS_SP_32	SS_SP_33	SS_SP_40	SS_SP_41	RDL	MDL	QC Batch
Metals									
Acid Extractable Aluminum (Al)	mg/kg	5100	5200	7800	5300	5000	10	N/A	5191787
Acid Extractable Antimony (Sb)	mg/kg	<2.0	<2.0	25	<2.0	<2.0	2.0	N/A	5191787
Acid Extractable Arsenic (As)	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	N/A	5191787
Acid Extractable Barium (Ba)	mg/kg	11	42	110	31	34	5.0	N/A	5191787
Acid Extractable Beryllium (Be)	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	N/A	5191787
Acid Extractable Bismuth (Bi)	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	N/A	5191787
Acid Extractable Boron (B)	mg/kg	<50	<50	<50	<50	<50	50	N/A	5191787
Acid Extractable Cadmium (Cd)	mg/kg	<0.30	<0.30	1.2	<0.30	<0.30	0.30	N/A	5191787
Acid Extractable Chromium (Cr)	mg/kg	12	7.7	52	5.6	6.3	2.0	N/A	5191787
Acid Extractable Cobalt (Co)	mg/kg	9.6	9.1	24	3.7	3.7	1.0	N/A	5191787
Acid Extractable Copper (Cu)	mg/kg	26	30	800	5.9	11	2.0	N/A	5191787
Acid Extractable Iron (Fe)	mg/kg	35000	27000	84000	13000	11000	50	N/A	5191787
Acid Extractable Lead (Pb)	mg/kg	1.9	9.7	900	4.8	7.2	0.50	N/A	5191787
Acid Extractable Lithium (Li)	mg/kg	<2.0	8.2	6.8	9.4	8.6	2.0	N/A	5191787
Acid Extractable Manganese (Mn)	mg/kg	210	260	530	180	140	2.0	N/A	5191787
Acid Extractable Mercury (Hg)	mg/kg	<0.10	<0.10	0.10	<0.10	<0.10	0.10	N/A	5191787
Acid Extractable Molybdenum (Mo)	mg/kg	<2.0	<2.0	4.2	<2.0	<2.0	2.0	N/A	5191787
Acid Extractable Nickel (Ni)	mg/kg	18	15	36	6.9	7.8	2.0	N/A	5191787
Acid Extractable Rubidium (Rb)	mg/kg	2.6	9.0	11	8.8	5.9	2.0	N/A	5191787
Acid Extractable Selenium (Se)	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	N/A	5191787
Acid Extractable Silver (Ag)	mg/kg	<0.50	<0.50	1.4	<0.50	<0.50	0.50	N/A	5191787
Acid Extractable Strontium (Sr)	mg/kg	7.8	9.8	17	8.3	6.8	5.0	N/A	5191787
Acid Extractable Thallium (Tl)	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	N/A	5191787
Acid Extractable Tin (Sn)	mg/kg	<2.0	<2.0	100	<2.0	<2.0	2.0	N/A	5191787
Acid Extractable Uranium (U)	mg/kg	0.24	0.40	0.24	0.59	0.58	0.10	N/A	5191787
Acid Extractable Vanadium (V)	mg/kg	86	59	120	26	23	2.0	N/A	5191787
Acid Extractable Zinc (Zn)	mg/kg	15	34	1900	24	22	5.0	N/A	5191787

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam Analytics International Corporation o/a Maxxam Analytics 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.maxxamanalytics.com

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		FDZ458	FDZ459		FDZ462		FDZ505			
Sampling Date		2017/09/15	2017/09/15		2017/09/15		2017/09/15			
COC Number		627179-04-01	627179-04-01		627179-04-01		627179-06-01			
	UNITS	**SS_SP_42**	**SS_SP_43**	**QC Batch**	**SS_SP_45**	**QC Batch**	**SS_SP_46**	**RDL**	**MDL**	**QC Batch**
Metals										
Acid Extractable Aluminum (Al)	mg/kg	6300	7000	5191787	8900	5191858	3000	10	N/A	5191787
Acid Extractable Antimony (Sb)	mg/kg	<2.0	<2.0	5191787	<2.0	5191858	<2.0	2.0	N/A	5191787
Acid Extractable Arsenic (As)	mg/kg	<2.0	<2.0	5191787	3.6	5191858	<2.0	2.0	N/A	5191787
Acid Extractable Barium (Ba)	mg/kg	39	66	5191787	130	5191858	28	5.0	N/A	5191787
Acid Extractable Beryllium (Be)	mg/kg	<2.0	<2.0	5191787	<2.0	5191858	<2.0	2.0	N/A	5191787
Acid Extractable Bismuth (Bi)	mg/kg	<2.0	<2.0	5191787	<2.0	5191858	<2.0	2.0	N/A	5191787
Acid Extractable Boron (B)	mg/kg	<50	<50	5191787	<50	5191858	<50	50	N/A	5191787
Acid Extractable Cadmium (Cd)	mg/kg	<0.30	<0.30	5191787	<0.30	5191858	<0.30	0.30	N/A	5191787
Acid Extractable Chromium (Cr)	mg/kg	7.9	8.8	5191787	14	5191858	4.9	2.0	N/A	5191787
Acid Extractable Cobalt (Co)	mg/kg	5.5	4.6	5191787	13	5191858	2.0	1.0	N/A	5191787
Acid Extractable Copper (Cu)	mg/kg	17	17	5191787	28	5191858	3.6	2.0	N/A	5191787
Acid Extractable Iron (Fe)	mg/kg	13000	13000	5191787	27000	5191858	9000	50	N/A	5191787
Acid Extractable Lead (Pb)	mg/kg	6.4	3.9	5191787	36	5191858	12	0.50	N/A	5191787
Acid Extractable Lithium (Li)	mg/kg	12	12	5191787	16	5191858	5.3	2.0	N/A	5191787
Acid Extractable Manganese (Mn)	mg/kg	180	170	5191787	910	5191858	94	2.0	N/A	5191787
Acid Extractable Mercury (Hg)	mg/kg	<0.10	<0.10	5191787	<0.10	5191858	<0.10	0.10	N/A	5191787
Acid Extractable Molybdenum (Mo)	mg/kg	<2.0	<2.0	5191787	<2.0	5191858	<2.0	2.0	N/A	5191787
Acid Extractable Nickel (Ni)	mg/kg	11	9.5	5191787	21	5191858	3.5	2.0	N/A	5191787
Acid Extractable Rubidium (Rb)	mg/kg	6.9	8.5	5191787	18	5191858	9.4	2.0	N/A	5191787
Acid Extractable Selenium (Se)	mg/kg	<1.0	<1.0	5191787	<1.0	5191858	<1.0	1.0	N/A	5191787
Acid Extractable Silver (Ag)	mg/kg	<0.50	<0.50	5191787	<0.50	5191858	<0.50	0.50	N/A	5191787
Acid Extractable Strontium (Sr)	mg/kg	7.9	7.4	5191787	13	5191858	<5.0	5.0	N/A	5191787
Acid Extractable Thallium (Tl)	mg/kg	<0.10	<0.10	5191787	<0.10	5191858	<0.10	0.10	N/A	5191787
Acid Extractable Tin (Sn)	mg/kg	<2.0	<2.0	5191787	2.7	5191858	<2.0	2.0	N/A	5191787
Acid Extractable Uranium (U)	mg/kg	0.55	0.55	5191787	0.79	5191858	0.81	0.10	N/A	5191787
Acid Extractable Vanadium (V)	mg/kg	25	26	5191787	36	5191858	21	2.0	N/A	5191787
Acid Extractable Zinc (Zn)	mg/kg	27	27	5191787	770	5191858	14	5.0	N/A	5191787

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		FDZ506	FDZ507		FDZ513	FDZ514			
Sampling Date		2017/09/15	2017/09/15		2017/09/15	2017/09/15			
COC Number		627179-06-01	627179-06-01		627179-06-01	627179-06-01			
	UNITS	**SS_SP_47**	**SS_SP_48**	**QC Batch**	**SD_SP_01_BG**	**SD_SP_02**	**RDL**	**MDL**	**QC Batch**
Metals									
Acid Extractable Aluminum (Al)	mg/kg	11000	11000	5191787	9400	4300	10	N/A	5188792
Acid Extractable Antimony (Sb)	mg/kg	<2.0	<2.0	5191787	<2.0	<2.0	2.0	N/A	5188792
Acid Extractable Arsenic (As)	mg/kg	<2.0	<2.0	5191787	<2.0	<2.0	2.0	N/A	5188792
Acid Extractable Barium (Ba)	mg/kg	99	110	5191787	46	30	5.0	N/A	5188792
Acid Extractable Beryllium (Be)	mg/kg	<2.0	<2.0	5191787	<2.0	<2.0	2.0	N/A	5188792
Acid Extractable Bismuth (Bi)	mg/kg	<2.0	<2.0	5191787	<2.0	<2.0	2.0	N/A	5188792
Acid Extractable Boron (B)	mg/kg	<50	<50	5191787	<50	<50	50	N/A	5188792
Acid Extractable Cadmium (Cd)	mg/kg	<0.30	<0.30	5191787	<0.30	<0.30	0.30	N/A	5188792
Acid Extractable Chromium (Cr)	mg/kg	17	15	5191787	12	5.1	2.0	N/A	5188792
Acid Extractable Cobalt (Co)	mg/kg	8.5	12	5191787	3.8	4.1	1.0	N/A	5188792
Acid Extractable Copper (Cu)	mg/kg	21	28	5191787	31	4.5	2.0	N/A	5188792
Acid Extractable Iron (Fe)	mg/kg	21000	20000	5191787	8500	12000	50	N/A	5188792
Acid Extractable Lead (Pb)	mg/kg	10	8.0	5191787	2.5	1.7	0.50	N/A	5188792
Acid Extractable Lithium (Li)	mg/kg	17	21	5191787	8.7	16	2.0	N/A	5188792
Acid Extractable Manganese (Mn)	mg/kg	270	390	5191787	130	150	2.0	N/A	5188792
Acid Extractable Mercury (Hg)	mg/kg	<0.10	<0.10	5191787	<0.10	<0.10	0.10	N/A	5188792
Acid Extractable Molybdenum (Mo)	mg/kg	<2.0	<2.0	5191787	<2.0	<2.0	2.0	N/A	5188792
Acid Extractable Nickel (Ni)	mg/kg	18	21	5191787	11	9.0	2.0	N/A	5188792
Acid Extractable Rubidium (Rb)	mg/kg	15	17	5191787	9.3	12	2.0	N/A	5188792
Acid Extractable Selenium (Se)	mg/kg	<1.0	<1.0	5191787	<1.0	<1.0	1.0	N/A	5188792
Acid Extractable Silver (Ag)	mg/kg	<0.50	<0.50	5191787	<0.50	<0.50	0.50	N/A	5188792
Acid Extractable Strontium (Sr)	mg/kg	12	13	5191787	12	7.8	5.0	N/A	5188792
Acid Extractable Thallium (Tl)	mg/kg	<0.10	<0.10	5191787	<0.10	<0.10	0.10	N/A	5188792
Acid Extractable Tin (Sn)	mg/kg	<2.0	<2.0	5191787	<2.0	<2.0	2.0	N/A	5188792
Acid Extractable Uranium (U)	mg/kg	1.0	0.61	5191787	0.65	0.42	0.10	N/A	5188792
Acid Extractable Vanadium (V)	mg/kg	47	43	5191787	31	20	2.0	N/A	5188792
Acid Extractable Zinc (Zn)	mg/kg	51	61	5191787	21	23	5.0	N/A	5188792

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		FDZ519	FDZ520	FDZ521		FDZ522			
Sampling Date		2017/09/15	2017/09/15	2017/09/15		2017/09/15			
COC Number		627179-07-01	627179-07-01	627179-07-01		627179-07-01			
	UNITS	SD_SP_03	SD_SP_04	SS_SP_60	QC Batch	SS_SP_61	RDL	MDL	QC Batch
Metals									
Acid Extractable Aluminum (Al)	mg/kg	4200	12000	4900	5188792	5700	10	N/A	5191787
Acid Extractable Antimony (Sb)	mg/kg	<2.0	2.0	<2.0	5188792	<2.0	2.0	N/A	5191787
Acid Extractable Arsenic (As)	mg/kg	<2.0	6.1	<2.0	5188792	<2.0	2.0	N/A	5191787
Acid Extractable Barium (Ba)	mg/kg	28	120	40	5188792	44	5.0	N/A	5191787
Acid Extractable Beryllium (Be)	mg/kg	<2.0	<2.0	<2.0	5188792	<2.0	2.0	N/A	5191787
Acid Extractable Bismuth (Bi)	mg/kg	<2.0	<2.0	<2.0	5188792	<2.0	2.0	N/A	5191787
Acid Extractable Boron (B)	mg/kg	<50	130	<50	5188792	<50	50	N/A	5191787
Acid Extractable Cadmium (Cd)	mg/kg	<0.30	2.2	<0.30	5188792	0.49	0.30	N/A	5191787
Acid Extractable Chromium (Cr)	mg/kg	5.6	19	8.3	5188792	10	2.0	N/A	5191787
Acid Extractable Cobalt (Co)	mg/kg	2.5	11	3.2	5188792	4.3	1.0	N/A	5191787
Acid Extractable Copper (Cu)	mg/kg	7.2	88	8.2	5188792	13	2.0	N/A	5191787
Acid Extractable Iron (Fe)	mg/kg	7600	36000	8800	5188792	11000	50	N/A	5191787
Acid Extractable Lead (Pb)	mg/kg	2.0	120	19	5188792	16	0.50	N/A	5191787
Acid Extractable Lithium (Li)	mg/kg	4.7	16	7.6	5188792	9.5	2.0	N/A	5191787
Acid Extractable Manganese (Mn)	mg/kg	79	330	130	5188792	170	2.0	N/A	5191787
Acid Extractable Mercury (Hg)	mg/kg	<0.10	0.17	<0.10	5188792	<0.10	0.10	N/A	5191787
Acid Extractable Molybdenum (Mo)	mg/kg	<2.0	<2.0	<2.0	5188792	<2.0	2.0	N/A	5191787
Acid Extractable Nickel (Ni)	mg/kg	6.6	44	7.6	5188792	8.7	2.0	N/A	5191787
Acid Extractable Rubidium (Rb)	mg/kg	4.3	7.3	3.8	5188792	6.6	2.0	N/A	5191787
Acid Extractable Selenium (Se)	mg/kg	<1.0	1.3	<1.0	5188792	<1.0	1.0	N/A	5191787
Acid Extractable Silver (Ag)	mg/kg	<0.50	<0.50	<0.50	5188792	<0.50	0.50	N/A	5191787
Acid Extractable Strontium (Sr)	mg/kg	8.9	18	7.6	5188792	7.0	5.0	N/A	5191787
Acid Extractable Thallium (Tl)	mg/kg	<0.10	<0.10	<0.10	5188792	<0.10	0.10	N/A	5191787
Acid Extractable Tin (Sn)	mg/kg	<2.0	27	<2.0	5188792	<2.0	2.0	N/A	5191787
Acid Extractable Uranium (U)	mg/kg	0.32	2.8	0.51	5188792	0.77	0.10	N/A	5191787
Acid Extractable Vanadium (V)	mg/kg	18	35	14	5188792	20	2.0	N/A	5191787
Acid Extractable Zinc (Zn)	mg/kg	11	970	49	5188792	68	5.0	N/A	5191787

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		FDZ523	FDZ524	FDZ525	FDZ525			
Sampling Date		2017/09/15	2017/09/15	2017/09/15	2017/09/15			
COC Number		627179-07-01	627179-07-01	627179-07-01	627179-07-01			
	UNITS	**SS_SP_62**	**SS_SP_63**	**SS_SP_64**	**SS_SP_64 Lab-Dup**	**RDL**	**MDL**	**QC Batch**
Metals								
Acid Extractable Aluminum (Al)	mg/kg	4100	9600	3500	4400	10	N/A	5191787
Acid Extractable Antimony (Sb)	mg/kg	<2.0	<2.0	<2.0	<2.0	2.0	N/A	5191787
Acid Extractable Arsenic (As)	mg/kg	2.6	<2.0	<2.0	<2.0	2.0	N/A	5191787
Acid Extractable Barium (Ba)	mg/kg	21	97	23	30	5.0	N/A	5191787
Acid Extractable Beryllium (Be)	mg/kg	<2.0	<2.0	<2.0	<2.0	2.0	N/A	5191787
Acid Extractable Bismuth (Bi)	mg/kg	<2.0	<2.0	<2.0	<2.0	2.0	N/A	5191787
Acid Extractable Boron (B)	mg/kg	<50	<50	<50	<50	50	N/A	5191787
Acid Extractable Cadmium (Cd)	mg/kg	3.7	<0.30	<0.30	<0.30	0.30	N/A	5191787
Acid Extractable Chromium (Cr)	mg/kg	17	13	3.5	3.9	2.0	N/A	5191787
Acid Extractable Cobalt (Co)	mg/kg	4.9	9.5	2.8	3.9	1.0	N/A	5191787
Acid Extractable Copper (Cu)	mg/kg	22	30	8.1	12	2.0	N/A	5191787
Acid Extractable Iron (Fe)	mg/kg	29000	20000	6200	7400	50	N/A	5191787
Acid Extractable Lead (Pb)	mg/kg	210	5.2	3.6	3.9	0.50	N/A	5191787
Acid Extractable Lithium (Li)	mg/kg	6.4	24	6.5	9.2	2.0	N/A	5191787
Acid Extractable Manganese (Mn)	mg/kg	220	400	130	160	2.0	N/A	5191787
Acid Extractable Mercury (Hg)	mg/kg	<0.10	<0.10	<0.10	<0.10	0.10	N/A	5191787
Acid Extractable Molybdenum (Mo)	mg/kg	2.3	<2.0	<2.0	<2.0	2.0	N/A	5191787
Acid Extractable Nickel (Ni)	mg/kg	16	17	4.5	5.9	2.0	N/A	5191787
Acid Extractable Rubidium (Rb)	mg/kg	3.7	16	4.3	5.5	2.0	N/A	5191787
Acid Extractable Selenium (Se)	mg/kg	<1.0	<1.0	<1.0	<1.0	1.0	N/A	5191787
Acid Extractable Silver (Ag)	mg/kg	<0.50	<0.50	<0.50	<0.50	0.50	N/A	5191787
Acid Extractable Strontium (Sr)	mg/kg	5.8	8.5	<5.0	<5.0	5.0	N/A	5191787
Acid Extractable Thallium (Tl)	mg/kg	<0.10	0.10	<0.10	<0.10	0.10	N/A	5191787
Acid Extractable Tin (Sn)	mg/kg	2.6	<2.0	<2.0	<2.0	2.0	N/A	5191787
Acid Extractable Uranium (U)	mg/kg	0.44	0.88	0.79	0.74	0.10	N/A	5191787
Acid Extractable Vanadium (V)	mg/kg	14	36	12	13	2.0	N/A	5191787
Acid Extractable Zinc (Zn)	mg/kg	83	45	16	20	5.0	N/A	5191787

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

Maxxam Analytics International Corporation o/a Maxxam Analytics 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.maxxamanalytics.com

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID		FDZ377	FDZ378	FDZ379	FDZ380		FDZ381			
Sampling Date		2017/09/14	2017/09/14	2017/09/14	2017/09/14		2017/09/14			
COC Number		627179-01-01	627179-01-01	627179-01-01	627179-01-01		627179-01-01			
	UNITS	**SS_SP_01**	**SS_SP_02**	**SS_SP_03**	**SS_SP_04**	**QC Batch**	**SS_SP_05**	**RDL**	**MDL**	**QC Batch**
Polyaromatic Hydrocarbons										
1-Methylnaphthalene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	5185061	<0.0050	0.0050	N/A	5185066
2-Methylnaphthalene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	5185061	<0.0050	0.0050	N/A	5185066
Acenaphthene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	5185061	<0.0050	0.0050	N/A	5185066
Acenaphthylene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	5185061	<0.0050	0.0050	N/A	5185066
Anthracene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	5185061	<0.0050	0.0050	N/A	5185066
Benzo(a)anthracene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	5185061	0.012	0.0050	N/A	5185066
Benzo(a)pyrene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	5185061	0.013	0.0050	N/A	5185066
Benzo(b)fluoranthene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	5185061	0.021	0.0050	N/A	5185066
Benzo(b/j)fluoranthene	mg/kg	<0.010	<0.010	<0.010	<0.010	5175549	0.031	0.010	N/A	5175549
Benzo(g,h,i)perylene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	5185061	0.011	0.0050	N/A	5185066
Benzo(j)fluoranthene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	5185061	0.0098	0.0050	N/A	5185066
Benzo(k)fluoranthene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	5185061	0.0099	0.0050	N/A	5185066
Chrysene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	5185061	0.019	0.0050	N/A	5185066
Dibenz(a,h)anthracene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	5185061	<0.0050	0.0050	N/A	5185066
Fluoranthene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	5185061	0.029	0.0050	N/A	5185066
Fluorene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	5185061	<0.0050	0.0050	N/A	5185066
Indeno(1,2,3-cd)pyrene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	5185061	0.0099	0.0050	N/A	5185066
Naphthalene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	5185061	<0.0050	0.0050	N/A	5185066
Perylene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	5185061	<0.0050	0.0050	N/A	5185066
Phenanthrene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	5185061	0.011	0.0050	N/A	5185066
Pyrene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	5185061	0.024	0.0050	N/A	5185066
Surrogate Recovery (%)										
D10-Anthracene	%	89	92	84	86	5185061	78			5185066
D14-Terphenyl	%	90	95	87	88	5185061	81			5185066
D8-Acenaphthylene	%	86	89	86	85	5185061	80			5185066

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID		FDZ382	FDZ383	FDZ383	FDZ384	FDZ385			
Sampling Date		2017/09/14	2017/09/14	2017/09/14	2017/09/14	2017/09/14			
COC Number		627179-01-01	627179-01-01	627179-01-01	627179-01-01	627179-01-01			
	UNITS	**SS_SP_06**	**SS_SP_07**	**SS_SP_07 Lab-Dup**	**SS_SP_08**	**SS_SP_08_FD**	**RDL**	**MDL**	**QC Batch**
Polyaromatic Hydrocarbons									
1-Methylnaphthalene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5185066
2-Methylnaphthalene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5185066
Acenaphthene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5185066
Acenaphthylene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5185066
Anthracene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5185066
Benzo(a)anthracene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5185066
Benzo(a)pyrene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5185066
Benzo(b)fluoranthene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5185066
Benzo(b/j)fluoranthene	mg/kg	<0.010	<0.010		<0.010	<0.010	0.010	N/A	5175549
Benzo(g,h,i)perylene	mg/kg	<0.0050	<0.0050	0.014	<0.0050	<0.0050	0.0050	N/A	5185066
Benzo(j)fluoranthene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5185066
Benzo(k)fluoranthene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5185066
Chrysene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5185066
Dibenz(a,h)anthracene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5185066
Fluoranthene	mg/kg	<0.0050	<0.0050	0.0063	<0.0050	<0.0050	0.0050	N/A	5185066
Fluorene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5185066
Indeno(1,2,3-cd)pyrene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5185066
Naphthalene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5185066
Perylene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5185066
Phenanthrene	mg/kg	<0.0050	<0.0050	0.0063	<0.0050	<0.0050	0.0050	N/A	5185066
Pyrene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5185066
Surrogate Recovery (%)									
D10-Anthracene	%	78	80	77	74	78			5185066
D14-Terphenyl	%	81	84	82	83	89			5185066
D8-Acenaphthylene	%	73	76	73	80	78			5185066

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

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID		FDZ386	FDZ398		FDZ399		FDZ400			
Sampling Date		2017/09/14	2017/09/14		2017/09/14		2017/09/14			
COC Number		627179-01-01	627179-02-01		627179-02-01		627179-02-01			
	UNITS	**SS_SP_09**	**SS_SP_10**	**RDL**	**SS_SP_11**	**RDL**	**SS_SP_12**	**RDL**	**MDL**	**QC Batch**
Polyaromatic Hydrocarbons										
1-Methylnaphthalene	mg/kg	<0.0050	<0.0050	0.0050	<0.0050	0.0050	<0.0050	0.0050	N/A	5185066
2-Methylnaphthalene	mg/kg	<0.0050	<0.0050	0.0050	<0.0050	0.0050	<0.0050	0.0050	N/A	5185066
Acenaphthene	mg/kg	<0.0050	<0.0050	0.0050	<0.0050	0.0050	<0.0050	0.0050	N/A	5185066
Acenaphthylene	mg/kg	<0.0050	<0.0050	0.0050	<0.0050	0.0050	<0.0050	0.0050	N/A	5185066
Anthracene	mg/kg	<0.0050	<0.0050	0.0050	<0.0076 (1)	0.0076	<0.0050	0.0050	N/A	5185066
Benzo(a)anthracene	mg/kg	<0.0050	<0.0050	0.0050	<0.0050	0.0050	<0.0050	0.0050	N/A	5185066
Benzo(a)pyrene	mg/kg	<0.0050	<0.0050	0.0050	<0.0050	0.0050	<0.0050	0.0050	N/A	5185066
Benzo(b)fluoranthene	mg/kg	<0.0050	<0.0050	0.0050	<0.0050	0.0050	<0.0050	0.0050	N/A	5185066
Benzo(b/j)fluoranthene	mg/kg	<0.010	<0.010	0.010	<0.010	0.010	<0.010	0.010	N/A	5175549
Benzo(g,h,i)perylene	mg/kg	<0.0050	0.0087	0.0050	<0.0050	0.0050	<0.0050	0.0050	N/A	5185066
Benzo(j)fluoranthene	mg/kg	<0.0050	<0.0050	0.0050	<0.0050	0.0050	<0.0050	0.0050	N/A	5185066
Benzo(k)fluoranthene	mg/kg	<0.0050	<0.0050	0.0050	<0.0050	0.0050	<0.0050	0.0050	N/A	5185066
Chrysene	mg/kg	<0.0050	<0.0050	0.0050	<0.0050	0.0050	<0.0050	0.0050	N/A	5185066
Dibenz(a,h)anthracene	mg/kg	<0.0050	<0.0050	0.0050	<0.0050	0.0050	<0.0050	0.0050	N/A	5185066
Fluoranthene	mg/kg	<0.0050	<0.0050	0.0050	<0.0050	0.0050	<0.0050	0.0050	N/A	5185066
Fluorene	mg/kg	<0.0050	<0.0050	0.0050	<0.0092 (1)	0.0092	<0.0050	0.0050	N/A	5185066
Indeno(1,2,3-cd)pyrene	mg/kg	<0.0050	<0.0050	0.0050	<0.0050	0.0050	<0.0050	0.0050	N/A	5185066
Naphthalene	mg/kg	<0.0050	<0.0050	0.0050	<0.0050	0.0050	<0.0050	0.0050	N/A	5185066
Perylene	mg/kg	<0.0050	<0.0050	0.0050	<0.0050	0.0050	<0.0050	0.0050	N/A	5185066
Phenanthrene	mg/kg	<0.0050	<0.0050	0.0050	<0.012 (1)	0.012	<0.0050	0.0050	N/A	5185066
Pyrene	mg/kg	<0.0050	<0.0050	0.0050	0.022	0.0050	<0.0050	0.0050	N/A	5185066
Surrogate Recovery (%)										
D10-Anthracene	%	98	82		80		87			5185066
D14-Terphenyl	%	101	83		70		85			5185066
D8-Acenaphthylene	%	84	80		75		75			5185066

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable
(1) Elevated PAH RDL(s) due to matrix / co-extractive interference.

Maxxam Analytics International Corporation o/a Maxxam Analytics 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.maxxamanalytics.com

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID		FDZ405	FDZ407	FDZ421	FDZ422	FDZ423			
Sampling Date		2017/09/14	2017/09/14	2017/09/14	2017/09/14	2017/09/14			
COC Number		627179-02-01	627179-02-01	627179-03-01	627179-03-01	627179-03-01			
	UNITS	**SS_SP_17**	**SS_SP_19**	**SS_SP_21**	**SS_SP_22**	**SS_SP_23**	**RDL**	**MDL**	**QC Batch**
Polyaromatic Hydrocarbons									
1-Methylnaphthalene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5185066
2-Methylnaphthalene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5185066
Acenaphthene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.052	0.0050	N/A	5185066
Acenaphthylene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5185066
Anthracene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.21	0.0050	N/A	5185066
Benzo(a)anthracene	mg/kg	<0.0050	<0.0050	<0.0050	0.0090	0.68	0.0050	N/A	5185066
Benzo(a)pyrene	mg/kg	<0.0050	<0.0050	<0.0050	0.010	0.64	0.0050	N/A	5185066
Benzo(b)fluoranthene	mg/kg	<0.0050	<0.0050	<0.0050	0.0084	0.69	0.0050	N/A	5185066
Benzo(b/j)fluoranthene	mg/kg	<0.010	<0.010	<0.010	<0.010	1.0	0.010	N/A	5175549
Benzo(g,h,i)perylene	mg/kg	<0.0050	<0.0050	<0.0050	0.0065	0.33	0.0050	N/A	5185066
Benzo(j)fluoranthene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.35	0.0050	N/A	5185066
Benzo(k)fluoranthene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.37	0.0050	N/A	5185066
Chrysene	mg/kg	<0.0050	<0.0050	<0.0050	0.0099	0.70	0.0050	N/A	5185066
Dibenz(a,h)anthracene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.094	0.0050	N/A	5185066
Fluoranthene	mg/kg	<0.0050	<0.0050	<0.0050	0.015	1.9	0.0050	N/A	5185066
Fluorene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.057	0.0050	N/A	5185066
Indeno(1,2,3-cd)pyrene	mg/kg	<0.0050	<0.0050	<0.0050	0.0060	0.31	0.0050	N/A	5185066
Naphthalene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5185066
Perylene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.17	0.0050	N/A	5185066
Phenanthrene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	1.0	0.0050	N/A	5185066
Pyrene	mg/kg	<0.0050	<0.0050	<0.0050	0.014	1.3	0.0050	N/A	5185066
Surrogate Recovery (%)									
D10-Anthracene	%	97	74	89	76	75			5185066
D14-Terphenyl	%	95	82	74	80	76			5185066
D8-Acenaphthylene	%	79	78	70	76	80			5185066

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID		FDZ424	FDZ425	FDZ426	FDZ427	FDZ428			
Sampling Date		2017/09/14	2017/09/14	2017/09/14	2017/09/14	2017/09/14			
COC Number		627179-03-01	627179-03-01	627179-03-01	627179-03-01	627179-03-01			
	UNITS	**SS_SP_23_FD**	**SS_SP_24**	**SS_SP_25**	**SS_SP_26**	**SS_SP_26_FD**	**RDL**	**MDL**	**QC Batch**
Polyaromatic Hydrocarbons									
1-Methylnaphthalene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5185066
2-Methylnaphthalene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5185066
Acenaphthene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5185066
Acenaphthylene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5185066
Anthracene	mg/kg	<0.0050	0.0069	<0.0050	<0.0050	<0.0050	0.0050	N/A	5185066
Benzo(a)anthracene	mg/kg	0.034	0.11	<0.0050	<0.0050	0.018	0.0050	N/A	5185066
Benzo(a)pyrene	mg/kg	0.034	0.10	<0.0050	<0.0050	0.017	0.0050	N/A	5185066
Benzo(b)fluoranthene	mg/kg	0.040	0.13	<0.0050	<0.0050	0.020	0.0050	N/A	5185066
Benzo(b/j)fluoranthene	mg/kg	0.060	0.19	<0.010	<0.010	0.030	0.010	N/A	5175549
Benzo(g,h,i)perylene	mg/kg	0.018	0.063	<0.0050	<0.0050	0.010	0.0050	N/A	5185066
Benzo(j)fluoranthene	mg/kg	0.020	0.064	<0.0050	<0.0050	0.010	0.0050	N/A	5185066
Benzo(k)fluoranthene	mg/kg	0.022	0.067	<0.0050	<0.0050	0.010	0.0050	N/A	5185066
Chrysene	mg/kg	0.046	0.13	<0.0050	<0.0050	0.022	0.0050	N/A	5185066
Dibenz(a,h)anthracene	mg/kg	<0.0050	0.017	<0.0050	<0.0050	<0.0050	0.0050	N/A	5185066
Fluoranthene	mg/kg	0.071	0.25	<0.0050	0.0065	0.043	0.0050	N/A	5185066
Fluorene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5185066
Indeno(1,2,3-cd)pyrene	mg/kg	0.017	0.061	<0.0050	<0.0050	0.0093	0.0050	N/A	5185066
Naphthalene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5185066
Perylene	mg/kg	0.0085	0.026	<0.0050	<0.0050	<0.0050	0.0050	N/A	5185066
Phenanthrene	mg/kg	0.020	0.069	<0.0050	<0.0050	0.014	0.0050	N/A	5185066
Pyrene	mg/kg	0.055	0.20	<0.0050	<0.0050	0.033	0.0050	N/A	5185066
Surrogate Recovery (%)									
D10-Anthracene	%	77	74	73	74	80			5185066
D14-Terphenyl	%	81	78	81	85	83			5185066
D8-Acenaphthylene	%	80	82	75	76	79			5185066

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID		FDZ439		FDZ441		FDZ442		FDZ443			
Sampling Date		2017/09/14		2017/09/14		2017/09/14		2017/09/14			
COC Number		627179-04-01		627179-04-01		627179-04-01		627179-04-01			
	UNITS	SS_SP_28_BG	QC Batch	SS_SP_30	RDL	SS_SP_31	RDL	SS_SP_32	RDL	MDL	QC Batch
Polyaromatic Hydrocarbons											
1-Methylnaphthalene	mg/kg	<0.0050	5185066	<0.0050	0.0050	<0.0050	0.0050	<0.0050	0.0050	N/A	5187223
2-Methylnaphthalene	mg/kg	<0.0050	5185066	<0.0050	0.0050	<0.0050	0.0050	<0.0050	0.0050	N/A	5187223
Acenaphthene	mg/kg	<0.0050	5185066	<0.0050	0.0050	<0.0050	0.0050	<0.0050	0.0050	N/A	5187223
Acenaphthylene	mg/kg	<0.0050	5185066	<0.0050	0.0050	<0.0050	0.0050	<0.0050	0.0050	N/A	5187223
Anthracene	mg/kg	<0.0050	5185066	<0.0050	0.0050	<0.0050	0.0050	<0.0050	0.0050	N/A	5187223
Benzo(a)anthracene	mg/kg	<0.0050	5185066	<0.0050	0.0050	<0.0050	0.0050	<0.0050	0.0050	N/A	5187223
Benzo(a)pyrene	mg/kg	<0.0050	5185066	<0.0050	0.0050	<0.0050	0.0050	<0.0050	0.0050	N/A	5187223
Benzo(b)fluoranthene	mg/kg	<0.0050	5185066	<0.0050	0.0050	<0.0050	0.0050	<0.0050	0.0050	N/A	5187223
Benzo(b/j)fluoranthene	mg/kg	<0.010	5175549	<0.010	0.010	<0.010	0.010	<0.010	0.010	N/A	5175549
Benzo(g,h,i)perylene	mg/kg	<0.0050	5185066	<0.0050	0.0050	<0.0050	0.0050	<0.0050	0.0050	N/A	5187223
Benzo(j)fluoranthene	mg/kg	<0.0050	5185066	<0.0050	0.0050	<0.0050	0.0050	<0.0050	0.0050	N/A	5187223
Benzo(k)fluoranthene	mg/kg	<0.0050	5185066	<0.0050	0.0050	<0.0050	0.0050	<0.0050	0.0050	N/A	5187223
Chrysene	mg/kg	<0.0050	5185066	<0.0050	0.0050	<0.012 (1)	0.012	<0.0050	0.0050	N/A	5187223
Dibenz(a,h)anthracene	mg/kg	<0.0050	5185066	<0.0050	0.0050	<0.0050	0.0050	<0.0050	0.0050	N/A	5187223
Fluoranthene	mg/kg	<0.0050	5185066	<0.0050	0.0050	<0.0050	0.0050	<0.0050	0.0050	N/A	5187223
Fluorene	mg/kg	<0.0050	5185066	<0.0050	0.0050	<0.0050	0.0050	<0.0050	0.0050	N/A	5187223
Indeno(1,2,3-cd)pyrene	mg/kg	<0.0050	5185066	<0.0050	0.0050	<0.0050	0.0050	<0.0050	0.0050	N/A	5187223
Naphthalene	mg/kg	<0.0050	5185066	<0.0050	0.0050	<0.0050	0.0050	<0.0050	0.0050	N/A	5187223
Perylene	mg/kg	<0.0050	5185066	<0.0050	0.0050	<0.0050	0.0050	<0.0050	0.0050	N/A	5187223
Phenanthrene	mg/kg	<0.0050	5185066	<0.0050	0.0050	<0.0050	0.0050	<0.0050	0.0050	N/A	5187223
Pyrene	mg/kg	<0.0050	5185066	<0.0050	0.0050	<0.0050	0.0050	<0.0050	0.0050	N/A	5187223
Surrogate Recovery (%)											
D10-Anthracene	%	73	5185066	83		78		91			5187223
D14-Terphenyl	%	85	5185066	80		79		84			5187223
D8-Acenaphthylene	%	78	5185066	88		80		94			5187223

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable
(1) Elevated PAH RDL(s) due to matrix / co-extractive interference.

Maxxam Analytics International Corporation o/a Maxxam Analytics 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.maxxamanalytics.com

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID		FDZ444		FDZ445	FDZ446	FDZ446	FDZ447			
Sampling Date		2017/09/14		2017/09/14	2017/09/14	2017/09/14	2017/09/14			
COC Number		627179-04-01		627179-04-01	627179-04-01	627179-04-01	627179-04-01			
	UNITS	**SS_SP_33**	**RDL**	**SS_SP_34**	**SS_SP_34_FD**	**SS_SP_34_FD Lab-Dup**	**SS_SP_35**	**RDL**	**MDL**	**QC Batch**
Polyaromatic Hydrocarbons										
1-Methylnaphthalene	mg/kg	0.0052	0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5187223
2-Methylnaphthalene	mg/kg	0.010	0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5187223
Acenaphthene	mg/kg	<0.0050	0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5187223
Acenaphthylene	mg/kg	<0.0050	0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5187223
Anthracene	mg/kg	0.017	0.0050	<0.0050	0.0066	<0.0050	<0.0050	0.0050	N/A	5187223
Benzo(a)anthracene	mg/kg	<0.010 (1)	0.010	0.021	0.071	0.023 (2)	0.012	0.0050	N/A	5187223
Benzo(a)pyrene	mg/kg	0.0072	0.0050	0.029	0.090	0.034 (2)	0.016	0.0050	N/A	5187223
Benzo(b)fluoranthene	mg/kg	0.011	0.0050	0.038	0.11	0.049 (2)	0.021	0.0050	N/A	5187223
Benzo(b/j)fluoranthene	mg/kg	0.017	0.010	0.054	0.17		0.029	0.010	N/A	5175549
Benzo(g,h,i)perylene	mg/kg	0.027	0.0050	0.058	0.071	0.037 (2)	0.030	0.0050	N/A	5187223
Benzo(j)fluoranthene	mg/kg	0.0067	0.0050	0.016	0.052	0.021 (2)	0.0081	0.0050	N/A	5187223
Benzo(k)fluoranthene	mg/kg	<0.0050	0.0050	0.014	0.050	0.019 (2)	0.0077	0.0050	N/A	5187223
Chrysene	mg/kg	<0.034 (1)	0.034	0.032	0.081	0.035 (2)	0.023	0.0050	N/A	5187223
Dibenz(a,h)anthracene	mg/kg	<0.0050	0.0050	0.0064	0.014	0.0063	<0.0050	0.0050	N/A	5187223
Fluoranthene	mg/kg	0.0066	0.0050	0.031	0.11	0.029 (2)	0.019	0.0050	N/A	5187223
Fluorene	mg/kg	0.0059	0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5187223
Indeno(1,2,3-cd)pyrene	mg/kg	0.0096	0.0050	0.020	0.049	0.021 (2)	0.010	0.0050	N/A	5187223
Naphthalene	mg/kg	0.0081	0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5187223
Perylene	mg/kg	<0.0050	0.0050	0.0071	0.022	0.0081 (2)	<0.0050	0.0050	N/A	5187223
Phenanthrene	mg/kg	0.0089	0.0050	0.0075	0.017	<0.0050 (2)	<0.0050	0.0050	N/A	5187223
Pyrene	mg/kg	0.014	0.0050	0.030	0.092	0.028 (2)	0.020	0.0050	N/A	5187223
Surrogate Recovery (%)										
D10-Anthracene	%	86		89	70	88	86			5187223
D14-Terphenyl	%	78		84	66	84	81			5187223
D8-Acenaphthylene	%	93		93	89	91	91			5187223

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable
(1) Elevated PAH RDL(s) due to matrix / co-extractive interference.
(2) Duplicate: results are outside acceptance limit due to possible sample in-homogeneity. Sample was past recommended hold time for repeat analysis.

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID		FDZ448	FDZ453	FDZ456	FDZ457	FDZ458			
Sampling Date		2017/09/14	2017/09/14	2017/09/15	2017/09/15	2017/09/15			
COC Number		627179-04-01	627179-04-01	627179-04-01	627179-04-01	627179-04-01			
	UNITS	**SS_SP_36**	**SS_SP_37**	**SS_SP_40**	**SS_SP_41**	**SS_SP_42**	**RDL**	**MDL**	**QC Batch**
Polyaromatic Hydrocarbons									
1-Methylnaphthalene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5187223
2-Methylnaphthalene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5187223
Acenaphthene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5187223
Acenaphthylene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5187223
Anthracene	mg/kg	<0.0050	0.0072	<0.0050	<0.0050	<0.0050	0.0050	N/A	5187223
Benzo(a)anthracene	mg/kg	<0.0050	0.055	<0.0050	<0.0050	<0.0050	0.0050	N/A	5187223
Benzo(a)pyrene	mg/kg	<0.0050	0.044	<0.0050	<0.0050	<0.0050	0.0050	N/A	5187223
Benzo(b)fluoranthene	mg/kg	<0.0050	0.10	<0.0050	<0.0050	<0.0050	0.0050	N/A	5187223
Benzo(b/j)fluoranthene	mg/kg	<0.010	0.14	<0.010	<0.010	<0.010	0.010	N/A	5175549
Benzo(g,h,i)perylene	mg/kg	<0.0050	0.028	<0.0050	<0.0050	<0.0050	0.0050	N/A	5187223
Benzo(j)fluoranthene	mg/kg	<0.0050	0.041	<0.0050	<0.0050	<0.0050	0.0050	N/A	5187223
Benzo(k)fluoranthene	mg/kg	<0.0050	0.043	<0.0050	<0.0050	<0.0050	0.0050	N/A	5187223
Chrysene	mg/kg	<0.0050	0.086	<0.0050	0.0059	<0.0050	0.0050	N/A	5187223
Dibenz(a,h)anthracene	mg/kg	<0.0050	0.0081	<0.0050	<0.0050	<0.0050	0.0050	N/A	5187223
Fluoranthene	mg/kg	<0.0050	0.090	0.0063	0.0080	<0.0050	0.0050	N/A	5187223
Fluorene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5187223
Indeno(1,2,3-cd)pyrene	mg/kg	<0.0050	0.027	<0.0050	<0.0050	<0.0050	0.0050	N/A	5187223
Naphthalene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5187223
Perylene	mg/kg	<0.0050	0.011	<0.0050	<0.0050	<0.0050	0.0050	N/A	5187223
Phenanthrene	mg/kg	<0.0050	0.013	<0.0050	<0.0050	<0.0050	0.0050	N/A	5187223
Pyrene	mg/kg	<0.0050	0.095	0.0058	0.0087	<0.0050	0.0050	N/A	5187223
Surrogate Recovery (%)									
D10-Anthracene	%	86	86	84	86	82			5187223
D14-Terphenyl	%	79	87	80	82	76			5187223
D8-Acenaphthylene	%	88	88	92	91	90			5187223

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID		FDZ459		FDZ462		FDZ505	FDZ506			
Sampling Date		2017/09/15		2017/09/15		2017/09/15	2017/09/15			
COC Number		627179-04-01		627179-04-01		627179-06-01	627179-06-01			
	UNITS	**SS_SP_43**	**QC Batch**	**SS_SP_45**	**QC Batch**	**SS_SP_46**	**SS_SP_47**	**RDL**	**MDL**	**QC Batch**
Polyaromatic Hydrocarbons										
1-Methylnaphthalene	mg/kg	<0.0050	5187223	<0.0050	5189095	<0.0050	<0.0050	0.0050	N/A	5187223
2-Methylnaphthalene	mg/kg	<0.0050	5187223	<0.0050	5189095	<0.0050	<0.0050	0.0050	N/A	5187223
Acenaphthene	mg/kg	<0.0050	5187223	<0.0050	5189095	<0.0050	<0.0050	0.0050	N/A	5187223
Acenaphthylene	mg/kg	<0.0050	5187223	<0.0050	5189095	<0.0050	<0.0050	0.0050	N/A	5187223
Anthracene	mg/kg	<0.0050	5187223	<0.0050	5189095	<0.0050	<0.0050	0.0050	N/A	5187223
Benzo(a)anthracene	mg/kg	<0.0050	5187223	<0.0050	5189095	<0.0050	<0.0050	0.0050	N/A	5187223
Benzo(a)pyrene	mg/kg	<0.0050	5187223	<0.0050	5189095	<0.0050	<0.0050	0.0050	N/A	5187223
Benzo(b)fluoranthene	mg/kg	<0.0050	5187223	<0.0050	5189095	<0.0050	<0.0050	0.0050	N/A	5187223
Benzo(b/j)fluoranthene	mg/kg	<0.010	5175549	<0.010	5175549	<0.010	<0.010	0.010	N/A	5175549
Benzo(g,h,i)perylene	mg/kg	<0.0050	5187223	<0.0050	5189095	<0.0050	<0.0050	0.0050	N/A	5187223
Benzo(j)fluoranthene	mg/kg	<0.0050	5187223	<0.0050	5189095	<0.0050	<0.0050	0.0050	N/A	5187223
Benzo(k)fluoranthene	mg/kg	<0.0050	5187223	<0.0050	5189095	<0.0050	<0.0050	0.0050	N/A	5187223
Chrysene	mg/kg	<0.0050	5187223	<0.0050	5189095	<0.0050	<0.0050	0.0050	N/A	5187223
Dibenz(a,h)anthracene	mg/kg	<0.0050	5187223	<0.0050	5189095	<0.0050	<0.0050	0.0050	N/A	5187223
Fluoranthene	mg/kg	<0.0050	5187223	<0.0050	5189095	<0.0050	<0.0050	0.0050	N/A	5187223
Fluorene	mg/kg	<0.0050	5187223	<0.0050	5189095	<0.0050	<0.0050	0.0050	N/A	5187223
Indeno(1,2,3-cd)pyrene	mg/kg	<0.0050	5187223	<0.0050	5189095	<0.0050	<0.0050	0.0050	N/A	5187223
Naphthalene	mg/kg	<0.0050	5187223	<0.0050	5189095	<0.0050	<0.0050	0.0050	N/A	5187223
Perylene	mg/kg	<0.0050	5187223	<0.0050	5189095	<0.0050	<0.0050	0.0050	N/A	5187223
Phenanthrene	mg/kg	<0.0050	5187223	<0.0050	5189095	0.0071	<0.0050	0.0050	N/A	5187223
Pyrene	mg/kg	<0.0050	5187223	<0.0050	5189095	<0.0050	<0.0050	0.0050	N/A	5187223
Surrogate Recovery (%)										
D10-Anthracene	%	85	5187223	98	5189095	87	88			5187223
D14-Terphenyl	%	89	5187223	101	5189095	79	81			5187223
D8-Acenaphthylene	%	86	5187223	94	5189095	85	88			5187223

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID		FDZ507	FDZ510	FDZ512	FDZ513	FDZ514			
Sampling Date		2017/09/15	2017/09/15	2017/09/15	2017/09/15	2017/09/15			
COC Number		627179-06-01	627179-06-01	627179-06-01	627179-06-01	627179-06-01			
	UNITS	**SS_SP_48**	**SS_SP_51**	**SS_SP_53**	**SD_SP_01_BG**	**SD_SP_02**	**RDL**	**MDL**	**QC Batch**
Polyaromatic Hydrocarbons									
1-Methylnaphthalene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5187223
2-Methylnaphthalene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5187223
Acenaphthene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5187223
Acenaphthylene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5187223
Anthracene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5187223
Benzo(a)anthracene	mg/kg	<0.0050	<0.0050	0.016	<0.0050	<0.0050	0.0050	N/A	5187223
Benzo(a)pyrene	mg/kg	<0.0050	<0.0050	0.021	<0.0050	<0.0050	0.0050	N/A	5187223
Benzo(b)fluoranthene	mg/kg	<0.0050	<0.0050	0.020	<0.0050	<0.0050	0.0050	N/A	5187223
Benzo(b/j)fluoranthene	mg/kg	<0.010	<0.010	0.030	<0.010	<0.010	0.010	N/A	5175550
Benzo(g,h,i)perylene	mg/kg	<0.0050	<0.0050	0.018	<0.0050	<0.0050	0.0050	N/A	5187223
Benzo(j)fluoranthene	mg/kg	<0.0050	<0.0050	0.010	<0.0050	<0.0050	0.0050	N/A	5187223
Benzo(k)fluoranthene	mg/kg	<0.0050	<0.0050	0.0096	<0.0050	<0.0050	0.0050	N/A	5187223
Chrysene	mg/kg	<0.0050	<0.0050	0.022	<0.0050	<0.0050	0.0050	N/A	5187223
Dibenz(a,h)anthracene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5187223
Fluoranthene	mg/kg	<0.0050	0.0088	0.059	<0.0050	<0.0050	0.0050	N/A	5187223
Fluorene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5187223
Indeno(1,2,3-cd)pyrene	mg/kg	<0.0050	<0.0050	0.014	<0.0050	<0.0050	0.0050	N/A	5187223
Naphthalene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5187223
Perylene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5187223
Phenanthrene	mg/kg	<0.0050	<0.0050	0.042	<0.0050	<0.0050	0.0050	N/A	5187223
Pyrene	mg/kg	<0.0050	0.0077	0.051	<0.0050	<0.0050	0.0050	N/A	5187223
Surrogate Recovery (%)									
D10-Anthracene	%	91	84	81	85	85			5187223
D14-Terphenyl	%	88	80	70	85	83			5187223
D8-Acenaphthylene	%	87	87	85	86	90			5187223

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam Analytics International Corporation o/a Maxxam Analytics 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.maxxamanalytics.com

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID		FDZ519	FDZ520		FDZ521		FDZ522			
Sampling Date		2017/09/15	2017/09/15		2017/09/15		2017/09/15			
COC Number		627179-07-01	627179-07-01		627179-07-01		627179-07-01			
	UNITS	**SD_SP_03**	**SD_SP_04**	**RDL**	**SS_SP_60**	**RDL**	**SS_SP_61**	**RDL**	**MDL**	**QC Batch**
Polyaromatic Hydrocarbons										
1-Methylnaphthalene	mg/kg	<0.0050	0.15	0.0050	<0.0050	0.0050	<0.062 (1)	0.062	N/A	5189095
2-Methylnaphthalene	mg/kg	<0.0050	0.17	0.0050	<0.0050	0.0050	<0.038 (1)	0.038	N/A	5189095
Acenaphthene	mg/kg	<0.0050	0.081	0.0050	<0.0050	0.0050	<0.050 (1)	0.050	N/A	5189095
Acenaphthylene	mg/kg	<0.0050	0.039	0.0050	<0.0050	0.0050	<0.12 (1)	0.12	N/A	5189095
Anthracene	mg/kg	<0.0050	0.17	0.0050	<0.0050	0.0050	<0.020 (1)	0.020	N/A	5189095
Benzo(a)anthracene	mg/kg	<0.0050	0.91	0.0050	<0.017 (1)	0.017	<0.0050	0.0050	N/A	5189095
Benzo(a)pyrene	mg/kg	<0.0050	0.73	0.0050	0.0077	0.0050	<0.0050	0.0050	N/A	5189095
Benzo(b)fluoranthene	mg/kg	<0.0050	0.75	0.0050	0.011	0.0050	0.0074	0.0050	N/A	5189095
Benzo(b/j)fluoranthene	mg/kg	<0.010	1.2	0.010	0.011	0.010	<0.010	0.010	N/A	5175550
Benzo(g,h,i)perylene	mg/kg	<0.0050	0.49	0.0050	0.020	0.0050	0.0074	0.0050	N/A	5189095
Benzo(j)fluoranthene	mg/kg	<0.0050	0.42	0.0050	<0.0050	0.0050	<0.0050	0.0050	N/A	5189095
Benzo(k)fluoranthene	mg/kg	<0.0050	0.42	0.0050	<0.0050	0.0050	<0.0050	0.0050	N/A	5189095
Chrysene	mg/kg	<0.0050	1.1	0.0050	<0.017 (1)	0.017	0.015	0.0050	N/A	5189095
Dibenz(a,h)anthracene	mg/kg	<0.0050	0.12	0.0050	<0.0050	0.0050	<0.0050	0.0050	N/A	5189095
Fluoranthene	mg/kg	<0.0050	3.0	0.0050	0.0084	0.0050	0.011	0.0050	N/A	5189095
Fluorene	mg/kg	<0.0050	0.14	0.0050	<0.0050	0.0050	<0.025 (1)	0.025	N/A	5189095
Indeno(1,2,3-cd)pyrene	mg/kg	<0.0050	0.44	0.0050	0.0066	0.0050	<0.0050	0.0050	N/A	5189095
Naphthalene	mg/kg	<0.0050	0.10	0.0050	<0.0050	0.0050	<0.053 (1)	0.053	N/A	5189095
Perylene	mg/kg	<0.0050	0.19	0.0050	<0.0050	0.0050	<0.0050	0.0050	N/A	5189095
Phenanthrene	mg/kg	<0.0050	1.2	0.0050	<0.0050	0.0050	<0.027 (1)	0.027	N/A	5189095
Pyrene	mg/kg	<0.0050	2.4	0.0050	0.0075	0.0050	0.061	0.0050	N/A	5189095
Surrogate Recovery (%)										
D10-Anthracene	%	98	108		118		102			5189095
D14-Terphenyl	%	100	146 (2)		100		110			5189095
D8-Acenaphthylene	%	100	102		109		117			5189095

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable
(1) Elevated PAH RDL(s) due to matrix / co-extractive interference.
(2) PAH surrogate(s) not within acceptance limits. Sample past recommended hold time for repeat analysis.

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID		FDZ523	FDZ524	FDZ524	FDZ525			
Sampling Date		2017/09/15	2017/09/15	2017/09/15	2017/09/15			
COC Number		627179-07-01	627179-07-01	627179-07-01	627179-07-01			
	UNITS	**SS_SP_62**	**SS_SP_63**	**SS_SP_63 Lab-Dup**	**SS_SP_64**	**RDL**	**MDL**	**QC Batch**
Polyaromatic Hydrocarbons								
1-Methylnaphthalene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5189095
2-Methylnaphthalene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5189095
Acenaphthene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5189095
Acenaphthylene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5189095
Anthracene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5189095
Benzo(a)anthracene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5189095
Benzo(a)pyrene	mg/kg	0.0070	<0.0050	<0.0050	<0.0050	0.0050	N/A	5189095
Benzo(b)fluoranthene	mg/kg	0.0092	<0.0050	<0.0050	<0.0050	0.0050	N/A	5189095
Benzo(b/j)fluoranthene	mg/kg	<0.010	<0.010		<0.010	0.010	N/A	5175550
Benzo(g,h,i)perylene	mg/kg	0.0070	<0.0050	<0.0050	<0.0050	0.0050	N/A	5189095
Benzo(j)fluoranthene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5189095
Benzo(k)fluoranthene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5189095
Chrysene	mg/kg	0.012	<0.0050	<0.0050	<0.0050	0.0050	N/A	5189095
Dibenz(a,h)anthracene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5189095
Fluoranthene	mg/kg	0.021	<0.0050	<0.0050	<0.0050	0.0050	N/A	5189095
Fluorene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5189095
Indeno(1,2,3-cd)pyrene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5189095
Naphthalene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5189095
Perylene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5189095
Phenanthrene	mg/kg	0.013	<0.0050	<0.0050	<0.0050	0.0050	N/A	5189095
Pyrene	mg/kg	0.015	<0.0050	<0.0050	<0.0050	0.0050	N/A	5189095
Surrogate Recovery (%)								
D10-Anthracene	%	115	115	109	101			5189095
D14-Terphenyl	%	124	116	109	107			5189095
D8-Acenaphthylene	%	104	103	104	95			5189095

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

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

PETROLEUM HYDROCARBONS (CCME)

Maxxam ID		FDZ401	FDZ402				FDZ403			
Sampling Date		2017/09/15	2017/09/15				2017/09/15			
COC Number		627179-02-01	627179-02-01				627179-02-01			
	UNITS	SS_SP_13	SS_SP_14	RDL	MDL	QC Batch	SS_SP_15	RDL	MDL	QC Batch
F2-F4 Hydrocarbons										
F4G-sg (Grav. Heavy Hydrocarbons)	ug/g	7700	4000	400	400	5214380	1200	450	450	5200254

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		FDZ404				FDZ407	FDZ420	FDZ420			
Sampling Date		2017/09/15				2017/09/14	2017/09/14	2017/09/14			
COC Number		627179-02-01				627179-02-01	627179-03-01	627179-03-01			
	UNITS	SS_SP_16	RDL	MDL	QC Batch	SS_SP_19	SS_SP_20	SS_SP_20 Lab-Dup	RDL	MDL	QC Batch
F2-F4 Hydrocarbons											
F4G-sg (Grav. Heavy Hydrocarbons)	ug/g	3800	200	200	5214380	280	<100	<100	100	100	5200254

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

Maxxam ID		FDZ425	FDZ426	FDZ439	FDZ442	FDZ444			
Sampling Date		2017/09/14	2017/09/14	2017/09/14	2017/09/14	2017/09/14			
COC Number		627179-03-01	627179-03-01	627179-04-01	627179-04-01	627179-04-01			
	UNITS	SS_SP_24	SS_SP_25	SS_SP_28_BG	SS_SP_31	SS_SP_33	RDL	MDL	QC Batch
F2-F4 Hydrocarbons									
F4G-sg (Grav. Heavy Hydrocarbons)	ug/g	<100	300	200	2400	1600	100	100	5200254

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		FDZ446	FDZ447	FDZ448		FDZ453			
Sampling Date		2017/09/14	2017/09/14	2017/09/14		2017/09/14			
COC Number		627179-04-01	627179-04-01	627179-04-01		627179-04-01			
	UNITS	SS_SP_34_FD	SS_SP_35	SS_SP_36	QC Batch	SS_SP_37	RDL	MDL	QC Batch
F2-F4 Hydrocarbons									
F4G-sg (Grav. Heavy Hydrocarbons)	ug/g	<100	200	360	5200254	<100	100	100	5214380

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Analytics International Corporation o/a Maxxam Analytics 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.maxxamanalytics.com

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

PETROLEUM HYDROCARBONS (CCME)

Maxxam ID		FDZ457	FDZ460	FDZ461			FDZ505			
Sampling Date		2017/09/15	2017/09/15	2017/09/15			2017/09/15			
COC Number		627179-04-01	627179-04-01	627179-04-01			627179-06-01			
	UNITS	SS_SP_41	SS_SP_44	SS_SP_44_FD	RDL	MDL	SS_SP_46	RDL	MDL	QC Batch
F2-F4 Hydrocarbons										
F4G-sg (Grav. Heavy Hydrocarbons)	ug/g	<100	190	320	100	100	480	200	200	5214380

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

PETROLEUM HYDROCARBONS (CCME)

Maxxam ID		FDZ509			FDZ520			FDZ521			
Sampling Date		2017/09/15			2017/09/15			2017/09/15			
COC Number		627179-06-01			627179-07-01			627179-07-01			
	UNITS	**SS_SP_50**	**RDL**	**MDL**	**SD_SP_04**	**RDL**	**MDL**	**SS_SP_60**	**RDL**	**MDL**	**QC Batch**
F2-F4 Hydrocarbons											
F4G-sg (Grav. Heavy Hydrocarbons)	ug/g	170	100	100	1700	500	500	7300	100	100	5214380

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID		FDZ405	FDZ407	FDZ421	FDZ422	FDZ423	FDZ424			
Sampling Date		2017/09/14	2017/09/14	2017/09/14	2017/09/14	2017/09/14	2017/09/14			
COC Number		627179-02-01	627179-02-01	627179-03-01	627179-03-01	627179-03-01	627179-03-01			
	UNITS	**SS_SP_17**	**SS_SP_19**	**SS_SP_21**	**SS_SP_22**	**SS_SP_23**	**SS_SP_23_FD**	**RDL**	**MDL**	**QC Batch**
PCBs										
Aroclor 1016	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	N/A	5182128
Aroclor 1221	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	N/A	5182128
Aroclor 1232	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	N/A	5182128
Aroclor 1248	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	N/A	5182128
Aroclor 1242	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	N/A	5182128
Aroclor 1254	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	N/A	5182128
Aroclor 1260	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	N/A	5182128
Calculated Total PCB	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	N/A	5175554
Surrogate Recovery (%)										
Decachlorobiphenyl	%	93	94	87	89	90	89			5182128

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam ID		FDZ425		FDZ426	FDZ426	FDZ427	FDZ428			
Sampling Date		2017/09/14		2017/09/14	2017/09/14	2017/09/14	2017/09/14			
COC Number		627179-03-01		627179-03-01	627179-03-01	627179-03-01	627179-03-01			
	UNITS	**SS_SP_24**	**QC Batch**	**SS_SP_25**	**SS_SP_25 Lab-Dup**	**SS_SP_26**	**SS_SP_26_FD**	**RDL**	**MDL**	**QC Batch**
PCBs										
Aroclor 1016	ug/g	<0.050	5182128	<0.050	<0.050	<0.050	<0.050	0.050	N/A	5186627
Aroclor 1221	ug/g	<0.050	5182128	<0.050	<0.050	<0.050	<0.050	0.050	N/A	5186627
Aroclor 1232	ug/g	<0.050	5182128	<0.050	<0.050	<0.050	<0.050	0.050	N/A	5186627
Aroclor 1248	ug/g	<0.050	5182128	<0.050	<0.050	<0.050	<0.050	0.050	N/A	5186627
Aroclor 1242	ug/g	<0.050	5182128	<0.050	<0.050	<0.050	<0.050	0.050	N/A	5186627
Aroclor 1254	ug/g	<0.050	5182128	<0.050	<0.050	<0.050	<0.050	0.050	N/A	5186627
Aroclor 1260	ug/g	<0.050	5182128	<0.050	<0.050	<0.050	<0.050	0.050	N/A	5186627
Calculated Total PCB	ug/g	<0.050	5175554	<0.050		<0.050	<0.050	0.050	N/A	5175554
Surrogate Recovery (%)										
Decachlorobiphenyl	%	94	5182128	93	90	86	83			5186627

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

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID		FDZ439	FDZ441	FDZ442	FDZ443	FDZ444	FDZ456			
Sampling Date		2017/09/14	2017/09/14	2017/09/14	2017/09/14	2017/09/14	2017/09/15			
COC Number		627179-04-01	627179-04-01	627179-04-01	627179-04-01	627179-04-01	627179-04-01			
	UNITS	**SS_SP_28_BG**	**SS_SP_30**	**SS_SP_31**	**SS_SP_32**	**SS_SP_33**	**SS_SP_40**	**RDL**	**MDL**	**QC Batch**
PCBs										
Aroclor 1016	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	N/A	5186627
Aroclor 1221	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	N/A	5186627
Aroclor 1232	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	N/A	5186627
Aroclor 1248	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	N/A	5186627
Aroclor 1242	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	N/A	5186627
Aroclor 1254	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	N/A	5186627
Aroclor 1260	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	N/A	5186627
Calculated Total PCB	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	N/A	5175554
Surrogate Recovery (%)										
Decachlorobiphenyl	%	87	84	83	86	69 (1)	77			5186627

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable
(1) PCB surrogate not within acceptance limits. Sample past recommended hold time for repeat analysis.

Maxxam ID		FDZ457	FDZ458	FDZ459		FDZ462			
Sampling Date		2017/09/15	2017/09/15	2017/09/15		2017/09/15			
COC Number		627179-04-01	627179-04-01	627179-04-01		627179-04-01			
	UNITS	**SS_SP_41**	**SS_SP_42**	**SS_SP_43**	**QC Batch**	**SS_SP_45**	**RDL**	**MDL**	**QC Batch**
PCBs									
Aroclor 1016	ug/g	<0.050	<0.050	<0.050	5186627	<0.050	0.050	N/A	5189670
Aroclor 1221	ug/g	<0.050	<0.050	<0.050	5186627	<0.050	0.050	N/A	5189670
Aroclor 1232	ug/g	<0.050	<0.050	<0.050	5186627	<0.050	0.050	N/A	5189670
Aroclor 1248	ug/g	<0.050	<0.050	<0.050	5186627	<0.050	0.050	N/A	5189670
Aroclor 1242	ug/g	<0.050	<0.050	<0.050	5186627	<0.050	0.050	N/A	5189670
Aroclor 1254	ug/g	<0.050	<0.050	<0.050	5186627	<0.050	0.050	N/A	5189670
Aroclor 1260	ug/g	<0.050	<0.050	<0.050	5186627	<0.050	0.050	N/A	5189670
Calculated Total PCB	ug/g	<0.050	<0.050	<0.050	5175554	<0.050	0.050	N/A	5175554
Surrogate Recovery (%)									
Decachlorobiphenyl	%	81	78	81	5186627	84			5189670

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID		FDZ505	FDZ506	FDZ507	FDZ514		FDZ519			
Sampling Date		2017/09/15	2017/09/15	2017/09/15	2017/09/15		2017/09/15			
COC Number		627179-06-01	627179-06-01	627179-06-01	627179-06-01		627179-07-01			
	UNITS	**SS_SP_46**	**SS_SP_47**	**SS_SP_48**	**SD_SP_02**	**QC Batch**	**SD_SP_03**	**RDL**	**MDL**	**QC Batch**
PCBs										
Aroclor 1016	ug/g	<0.050	<0.050	<0.050	<0.050	5186627	<0.050	0.050	N/A	5187218
Aroclor 1221	ug/g	<0.050	<0.050	<0.050	<0.050	5186627	<0.050	0.050	N/A	5187218
Aroclor 1232	ug/g	<0.050	<0.050	<0.050	<0.050	5186627	<0.050	0.050	N/A	5187218
Aroclor 1248	ug/g	<0.050	<0.050	<0.050	<0.050	5186627	<0.050	0.050	N/A	5187218
Aroclor 1242	ug/g	<0.050	<0.050	<0.050	<0.050	5186627	<0.050	0.050	N/A	5187218
Aroclor 1254	ug/g	<0.050	<0.050	<0.050	<0.050	5186627	<0.050	0.050	N/A	5187218
Aroclor 1260	ug/g	<0.050	<0.050	<0.050	<0.050	5186627	<0.050	0.050	N/A	5187218
Calculated Total PCB	ug/g	<0.050	<0.050	<0.050	<0.050	5175554	<0.050	0.050	N/A	5175554
Surrogate Recovery (%)										
Decachlorobiphenyl	%	86	92	88	83	5186627	93			5187218

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam ID		FDZ520	FDZ524	FDZ525			
Sampling Date		2017/09/15	2017/09/15	2017/09/15			
COC Number		627179-07-01	627179-07-01	627179-07-01			
	UNITS	**SD_SP_04**	**SS_SP_63**	**SS_SP_64**	**RDL**	**MDL**	**QC Batch**
PCBs							
Aroclor 1016	ug/g	<0.050	<0.050	<0.050	0.050	N/A	5187218
Aroclor 1221	ug/g	<0.050	<0.050	<0.050	0.050	N/A	5187218
Aroclor 1232	ug/g	<0.050	<0.050	<0.050	0.050	N/A	5187218
Aroclor 1248	ug/g	<0.050	<0.050	<0.050	0.050	N/A	5187218
Aroclor 1242	ug/g	<0.050	<0.050	<0.050	0.050	N/A	5187218
Aroclor 1254	ug/g	<0.050	<0.050	<0.050	0.050	N/A	5187218
Aroclor 1260	ug/g	<0.050	<0.050	<0.050	0.050	N/A	5187218
Calculated Total PCB	ug/g	<0.050	<0.050	<0.050	0.050	N/A	5175554
Surrogate Recovery (%)							
Decachlorobiphenyl	%	85	88	91			5187218

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam Analytics International Corporation o/a Maxxam Analytics 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.maxxamanalytics.com

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

DIOXINS AND FURANS BY HRMS (SOIL)

Maxxam ID		FDZ525							
Sampling Date		2017/09/15							
COC Number		627179-07-01				TOXIC EQUIVALENCY		# of	
	UNITS	SS_SP_64	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
Dioxins & Furans									
2,3,7,8-Tetra CDD *	pg/g	<0.101	0.101	0.999	N/A	1.00	0.101		5196177
1,2,3,7,8-Penta CDD *	pg/g	<0.102	0.102	0.999	N/A	1.00	0.102		5196177
1,2,3,4,7,8-Hexa CDD *	pg/g	<0.105	0.105	0.999	N/A	0.100	0.0105		5196177
1,2,3,6,7,8-Hexa CDD *	pg/g	<0.102	0.102	0.999	N/A	0.100	0.0102		5196177
1,2,3,7,8,9-Hexa CDD *	pg/g	<0.0927	0.0927	0.999	N/A	0.100	0.00927		5196177
1,2,3,4,6,7,8-Hepta CDD *	pg/g	0.634	0.102	0.999	N/A	0.0100	0.00634		5196177
Octa CDD *	pg/g	8.14	0.131	9.99	N/A	0.000300	0.00244		5196177
Total Tetra CDD *	pg/g	<0.127 (1)	0.127	0.999	N/A			0	5196177
Total Penta CDD *	pg/g	<0.118 (1)	0.118	0.999	N/A			0	5196177
Total Hexa CDD *	pg/g	0.538	0.0996	0.999	N/A			3	5196177
Total Hepta CDD *	pg/g	1.89	0.102	0.999	N/A			2	5196177
2,3,7,8-Tetra CDF **	pg/g	<0.105	0.105	0.999	N/A	0.100	0.0105		5196177
1,2,3,7,8-Penta CDF **	pg/g	<0.104	0.104	0.999	N/A	0.0300	0.00312		5196177
2,3,4,7,8-Penta CDF **	pg/g	<0.103	0.103	0.999	N/A	0.300	0.0309		5196177
1,2,3,4,7,8-Hexa CDF **	pg/g	<0.100	0.100	0.999	N/A	0.100	0.0100		5196177
1,2,3,6,7,8-Hexa CDF **	pg/g	<0.0958	0.0958	0.999	N/A	0.100	0.00958		5196177
2,3,4,6,7,8-Hexa CDF **	pg/g	<0.101	0.101	0.999	N/A	0.100	0.0101		5196177
1,2,3,7,8,9-Hexa CDF **	pg/g	<0.110	0.110	0.999	N/A	0.100	0.0110		5196177
1,2,3,4,6,7,8-Hepta CDF **	pg/g	0.125	0.0855	0.999	N/A	0.0100	0.00125		5196177
1,2,3,4,7,8,9-Hepta CDF **	pg/g	<0.117	0.117	0.999	N/A	0.0100	0.00117		5196177
Octa CDF **	pg/g	0.181	0.0980	9.99	N/A	0.000300	0.0000543		5196177
Total Tetra CDF **	pg/g	0.299	0.105	0.999	N/A			1	5196177
Total Penta CDF **	pg/g	<0.104	0.104	0.999	N/A			0	5196177
Total Hexa CDF **	pg/g	<0.102	0.102	0.999	N/A			0	5196177
Total Hepta CDF **	pg/g	0.125	0.0989	0.999	N/A			1	5196177
TOTAL TOXIC EQUIVALENCY	pg/g						0.329		

EDL = Estimated Detection Limit
RDL = Reportable Detection Limit
TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.
WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds
QC Batch = Quality Control Batch
* CDD = Chloro Dibenzo-p-Dioxin
N/A = Not Applicable
** CDF = Chloro Dibenzo-p-Furan
(1) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

DIOXINS AND FURANS BY HRMS (SOIL)

Maxxam ID		FDZ525							
Sampling Date		2017/09/15							
COC Number		627179-07-01				TOXIC EQUIVALENCY		# of	
	UNITS	SS_SP_64	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
Surrogate Recovery (%)									
C13-1234678 HeptaCDD *	%	80							5196177
C13-1234678 HeptaCDF **	%	71							5196177
C13-123678 HexaCDD *	%	79							5196177
C13-123678 HexaCDF **	%	63							5196177
C13-12378 PentaCDD *	%	74							5196177
C13-12378 PentaCDF **	%	67							5196177
C13-2378 TetraCDD *	%	76							5196177
C13-2378 TetraCDF **	%	67							5196177
C13-OCDD *	%	95							5196177

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

** CDF = Chloro Dibenzo-p-Furan

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

DIOXINS AND FURANS BY HRMS (SOIL)

Maxxam ID		FDZ525							
Sampling Date		2017/09/15							
COC Number		627179-07-01				TOXIC EQUIVALENCY		# of	
	UNITS	SS_SP_64 Lab-Dup	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
Dioxins & Furans									
2,3,7,8-Tetra CDD *	pg/g	<0.105	0.105	0.999	N/A	1.00	0.105		5196177
1,2,3,7,8-Penta CDD *	pg/g	<0.0954	0.0954	0.999	N/A	1.00	0.0954		5196177
1,2,3,4,7,8-Hexa CDD *	pg/g	<0.112	0.112	0.999	N/A	0.100	0.0112		5196177
1,2,3,6,7,8-Hexa CDD *	pg/g	<0.109	0.109	0.999	N/A	0.100	0.0109		5196177
1,2,3,7,8,9-Hexa CDD *	pg/g	<0.0992	0.0992	0.999	N/A	0.100	0.00992		5196177
1,2,3,4,6,7,8-Hepta CDD *	pg/g	0.574	0.108	0.999	N/A	0.0100	0.00574		5196177
Octa CDD *	pg/g	7.91	0.0873	9.99	N/A	0.000300	0.00237		5196177
Total Tetra CDD *	pg/g	<0.147 (1)	0.147	0.999	N/A			0	5196177
Total Penta CDD *	pg/g	<0.121 (1)	0.121	0.999	N/A			0	5196177
Total Hexa CDD *	pg/g	0.375	0.107	0.999	N/A			2	5196177
Total Hepta CDD *	pg/g	1.87	0.108	0.999	N/A			2	5196177
2,3,7,8-Tetra CDF **	pg/g	<0.102	0.102	0.999	N/A	0.100	0.0102		5196177
1,2,3,7,8-Penta CDF **	pg/g	<0.102	0.102	0.999	N/A	0.0300	0.00306		5196177
2,3,4,7,8-Penta CDF **	pg/g	<0.102	0.102	0.999	N/A	0.300	0.0306		5196177
1,2,3,4,7,8-Hexa CDF **	pg/g	<0.104	0.104	0.999	N/A	0.100	0.0104		5196177
1,2,3,6,7,8-Hexa CDF **	pg/g	<0.0991	0.0991	0.999	N/A	0.100	0.00991		5196177
2,3,4,6,7,8-Hexa CDF **	pg/g	<0.105	0.105	0.999	N/A	0.100	0.0105		5196177
1,2,3,7,8,9-Hexa CDF **	pg/g	<0.113	0.113	0.999	N/A	0.100	0.0113		5196177
1,2,3,4,6,7,8-Hepta CDF **	pg/g	0.123	0.0921	0.999	N/A	0.0100	0.00123		5196177
1,2,3,4,7,8,9-Hepta CDF **	pg/g	<0.127	0.127	0.999	N/A	0.0100	0.00127		5196177
Octa CDF **	pg/g	<0.125 (1)	0.125	9.99	N/A	0.000300	0.0000375		5196177
Total Tetra CDF **	pg/g	0.116	0.102	0.999	N/A			1	5196177
Total Penta CDF **	pg/g	<0.102	0.102	0.999	N/A			0	5196177
Total Hexa CDF **	pg/g	<0.105	0.105	0.999	N/A			0	5196177
Total Hepta CDF **	pg/g	0.123	0.107	0.999	N/A			1	5196177
TOTAL TOXIC EQUIVALENCY	pg/g						0.329		

EDL = Estimated Detection Limit
RDL = Reportable Detection Limit
TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.
WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
* CDD = Chloro Dibenzo-p-Dioxin
N/A = Not Applicable
** CDF = Chloro Dibenzo-p-Furan
(1) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

DIOXINS AND FURANS BY HRMS (SOIL)

Maxxam ID		FDZ525							
Sampling Date		2017/09/15							
COC Number		627179-07-01				TOXIC EQUIVALENCY		# of	
	UNITS	SS_SP_64 Lab-Dup	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
Surrogate Recovery (%)									
C13-1234678 HeptaCDD *	%	97							5196177
C13-1234678 HeptaCDF **	%	87							5196177
C13-123678 HexaCDD *	%	94							5196177
C13-123678 HexaCDF **	%	76							5196177
C13-12378 PentaCDD *	%	99							5196177
C13-12378 PentaCDF **	%	79							5196177
C13-2378 TetraCDD *	%	90							5196177
C13-2378 TetraCDF **	%	85							5196177
C13-OCDD *	%	116							5196177

EDL = Estimated Detection Limit
RDL = Reportable Detection Limit
TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.
WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
* CDD = Chloro Dibenzo-p-Dioxin
** CDF = Chloro Dibenzo-p-Furan

Maxxam Analytics International Corporation o/a Maxxam Analytics 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.maxxamanalytics.com

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

MERCURY BY COLD VAPOUR AA (WATER)

Maxxam ID		FDZ369	FDZ370	FDZ371	FDZ372	FDZ373			
Sampling Date		2017/09/15	2017/09/15	2017/09/15	2017/09/15	2017/09/15			
COC Number		627202-01-01	627202-01-01	627202-01-01	627202-01-01	627202-01-01			
	UNITS	**SW_SP_01_BG**	**SW_SP_02**	**SW_SP_03**	**SW_SP_04**	**SW_SP_05**	**RDL**	**MDL**	**QC Batch**
Metals									
Total Mercury (Hg)	ug/L	<0.013	<0.013	<0.013	<0.013	<0.013	0.013	N/A	5192366

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

SEMI-VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		FDZ369		FDZ372			
Sampling Date		2017/09/15		2017/09/15			
COC Number		627202-01-01		627202-01-01			
	UNITS	SW_SP_01_BG	RDL	SW_SP_04	RDL	MDL	QC Batch
Polyaromatic Hydrocarbons							
1-Methylnaphthalene	ug/L	<0.050	0.050	<0.069	0.069	N/A	5180356
2-Methylnaphthalene	ug/L	<0.050	0.050	<0.069	0.069	N/A	5180356
Acenaphthene	ug/L	<0.010	0.010	<0.014	0.014	N/A	5180356
Acenaphthylene	ug/L	<0.010	0.010	<0.014	0.014	N/A	5180356
Acridine	ug/L	<0.050	0.050	<0.014	0.014	N/A	5180356
Anthracene	ug/L	<0.010	0.010	<0.014	0.014	N/A	5180356
Benzo(a)anthracene	ug/L	<0.010	0.010	<0.014	0.014	N/A	5180356
Benzo(a)pyrene	ug/L	<0.010	0.010	<0.014	0.014	N/A	5180356
Benzo(b)fluoranthene	ug/L	<0.010	0.010	<0.014	0.014	N/A	5180356
Benzo(b/j)fluoranthene	ug/L	<0.020	0.020	<0.028	0.028	N/A	5175551
Benzo(g,h,i)perylene	ug/L	<0.010	0.010	<0.014	0.014	N/A	5180356
Benzo(j)fluoranthene	ug/L	<0.010	0.010	<0.014	0.014	N/A	5180356
Benzo(k)fluoranthene	ug/L	<0.010	0.010	<0.014	0.014	N/A	5180356
Chrysene	ug/L	<0.010	0.010	<0.014	0.014	N/A	5180356
Dibenz(a,h)anthracene	ug/L	<0.010	0.010	<0.014	0.014	N/A	5180356
Fluoranthene	ug/L	<0.010	0.010	<0.014	0.014	N/A	5180356
Fluorene	ug/L	<0.010	0.010	<0.014	0.014	N/A	5180356
Indeno(1,2,3-cd)pyrene	ug/L	<0.010	0.010	<0.014	0.014	N/A	5180356
Naphthalene	ug/L	<0.20	0.20	<0.28	0.28	N/A	5180356
Perylene	ug/L	<0.010	0.010	<0.014	0.014	N/A	5180356
Phenanthrene	ug/L	<0.010	0.010	<0.014	0.014	N/A	5180356
Pyrene	ug/L	<0.010	0.010	<0.014	0.014	N/A	5180356
Quinoline	ug/L	<0.050	0.050	<0.069	0.069	N/A	5180356
Surrogate Recovery (%)							
D10-Anthracene	%	70		83			5180356
D14-Terphenyl	%	72		83 (1)			5180356
D8-Acenaphthylene	%	70		85			5180356

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable
(1) Elevated PAH RDL(s) due to limited sample.

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

PETROLEUM HYDROCARBONS (CCME)

Maxxam ID		FDZ369	FDZ369	FDZ370	FDZ371	FDZ372			
Sampling Date		2017/09/15	2017/09/15	2017/09/15	2017/09/15	2017/09/15			
COC Number		627202-01-01	627202-01-01	627202-01-01	627202-01-01	627202-01-01			
	UNITS	**SW_SP_01_BG**	**SW_SP_01_BG Lab-Dup**	**SW_SP_02**	**SW_SP_03**	**SW_SP_04**	**RDL**	**MDL**	**QC Batch**
BTEX & F1 Hydrocarbons									
Benzene	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	0.000040	5190771
Toluene	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	0.000040	5190771
Ethylbenzene	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	0.000040	5190771
o-Xylene	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	0.000040	5190771
p+m-Xylene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	0.000080	5190771
Total Xylenes	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	0.000080	5190771
F1 (C6-C10)	mg/L	<0.025	<0.025	<0.025	<0.025	<0.025	0.025	0.020	5190771
F1 (C6-C10) - BTEX	mg/L	<0.025	<0.025	<0.025	<0.025	<0.025	0.025	0.020	5190771
F2-F4 Hydrocarbons									
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10		<0.10	<0.10	<0.10	0.10	0.050	5187573
F3 (C16-C34 Hydrocarbons)	mg/L	<0.20		<0.20	<0.20	<0.20	0.20	0.070	5187573
F4 (C34-C50 Hydrocarbons)	mg/L	<0.20		<0.20	<0.20	<0.20	0.20	0.050	5187573
Reached Baseline at C50	mg/L	Yes		Yes	Yes	Yes			5187573
Surrogate Recovery (%)									
1,4-Difluorobenzene	%	95	98	94	101	97			5190771
4-Bromofluorobenzene	%	97	98	97	97	98			5190771
D10-Ethylbenzene	%	99	98	100	99	98			5190771
D4-1,2-Dichloroethane	%	92	94	90	94	96			5190771
o-Terphenyl	%	94		93	94	91			5187573

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

Maxxam Analytics International Corporation o/a Maxxam Analytics 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.maxxamanalytics.com

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

PETROLEUM HYDROCARBONS (CCME)

Maxxam ID		FDZ373			
Sampling Date		2017/09/15			
COC Number		627202-01-01			
	UNITS	SW_SP_05	RDL	MDL	QC Batch
BTEX & F1 Hydrocarbons					
Benzene	mg/L	<0.00020	0.00020	0.000040	5190771
Toluene	mg/L	<0.00020	0.00020	0.000040	5190771
Ethylbenzene	mg/L	<0.00020	0.00020	0.000040	5190771
o-Xylene	mg/L	<0.00020	0.00020	0.000040	5190771
p+m-Xylene	mg/L	<0.00040	0.00040	0.000080	5190771
Total Xylenes	mg/L	<0.00040	0.00040	0.000080	5190771
F1 (C6-C10)	mg/L	<0.025	0.025	0.020	5190771
F1 (C6-C10) - BTEX	mg/L	<0.025	0.025	0.020	5190771
F2-F4 Hydrocarbons					
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	0.10	0.050	5187573
F3 (C16-C34 Hydrocarbons)	mg/L	<0.20	0.20	0.070	5187573
F4 (C34-C50 Hydrocarbons)	mg/L	<0.20	0.20	0.050	5187573
Reached Baseline at C50	mg/L	Yes			5187573
Surrogate Recovery (%)					
1,4-Difluorobenzene	%	109			5190771
4-Bromofluorobenzene	%	102			5190771
D10-Ethylbenzene	%	97			5190771
D4-1,2-Dichloroethane	%	106			5190771
o-Terphenyl	%	92			5187573

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

POLYCHLORINATED BIPHENYLS BY GC-ECD (WATER)

Maxxam ID		FDZ370	FDZ370	FDZ371	FDZ372	FDZ373			
Sampling Date		2017/09/15	2017/09/15	2017/09/15	2017/09/15	2017/09/15			
COC Number		627202-01-01	627202-01-01	627202-01-01	627202-01-01	627202-01-01			
	UNITS	SW_SP_02	SW_SP_02 Lab-Dup	SW_SP_03	SW_SP_04	SW_SP_05	RDL	MDL	QC Batch
PCBs									
Aroclor 1016	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	N/A	5177184
Aroclor 1221	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	N/A	5177184
Aroclor 1232	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	N/A	5177184
Aroclor 1248	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	N/A	5177184
Aroclor 1242	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	N/A	5177184
Aroclor 1254	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	N/A	5177184
Aroclor 1260	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	N/A	5177184
Calculated Total PCB	ug/L	<0.050		<0.050	<0.050	<0.050	0.050	N/A	5175555
Surrogate Recovery (%)									
Decachlorobiphenyl	%	83	77	74	51	57			5177184

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

Maxxam Analytics International Corporation o/a Maxxam Analytics 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.maxxamanalytics.com

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

TEST SUMMARY

Maxxam ID: FDZ369
Sample ID: SW_SP_01_BG
Matrix: Water

Collected: 2017/09/15
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Carbonate, Bicarbonate and Hydroxide	CALC	5175007	N/A	2017/09/26	Automated Statchk
Alkalinity	KONE	5192108	N/A	2017/10/03	Nancy Rogers
Benzo(b/j)fluoranthene Sum (water)	CALC	5175551	N/A	2017/09/28	Automated Statchk
Chloride	KONE	5192111	N/A	2017/10/03	Nancy Rogers
Colour	KONE	5192119	N/A	2017/10/04	Nancy Rogers
Conductance - water	AT	5180805	N/A	2017/09/25	Julia McGovern
Petroleum Hydro. CCME F1 & BTEX in Water	HSGC/MSFD	5190771	N/A	2017/10/01	Wenhui (Susie) Shi
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	5187573	2017/09/26	2017/10/02	(Kent) Maolin Li
Hardness (calculated as CaCO3)		5175523	N/A	2017/09/28	Automated Statchk
Mercury - Total (CVAA,LL)	CV/AA	5192366	2017/10/02	2017/10/03	Arlene Rossiter
Metals Water Total MS	CICP/MS	5184575	2017/09/27	2017/09/28	Bryon Angevine
Ion Balance (% Difference)	CALC	5175524	N/A	2017/10/04	Automated Statchk
Anion and Cation Sum	CALC	5175525	N/A	2017/10/03	Automated Statchk
Nitrogen Ammonia - water	KONE	5189674	N/A	2017/10/02	Nancy Rogers
Nitrogen - Nitrate + Nitrite	KONE	5192122	N/A	2017/10/03	Nancy Rogers
Nitrogen - Nitrite	KONE	5192124	N/A	2017/10/03	Nancy Rogers
Nitrogen - Nitrate (as N)	CALC	5175365	N/A	2017/10/04	Automated Statchk
PAH (FWAL) in Water (A/Q) by GC/MS (SIM)	GC/MS	5180356	2017/09/21	2017/09/28	Gina Thompson
pH	AT	5180804	N/A	2017/09/25	Julia McGovern
Phosphorus - ortho	KONE	5192120	N/A	2017/10/03	Nancy Rogers
Sat. pH and Langelier Index (@ 20C)	CALC	5175013	N/A	2017/10/04	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	5175014	N/A	2017/10/04	Automated Statchk
Reactive Silica	KONE	5192116	N/A	2017/10/03	Nancy Rogers
Sulphate	KONE	5192114	N/A	2017/10/03	Nancy Rogers
Total Dissolved Solids (TDS calc)	CALC	5175527	N/A	2017/10/04	Automated Statchk
Organic carbon - Total (TOC)	TECH	5193753	N/A	2017/10/03	Soraya Merchant - Inactive
Turbidity	TURB	5192036	N/A	2017/10/02	Steven Smith

Maxxam ID: FDZ369 Dup
Sample ID: SW_SP_01_BG
Matrix: Water

Collected: 2017/09/15
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Petroleum Hydro. CCME F1 & BTEX in Water	HSGC/MSFD	5190771	N/A	2017/10/01	Wenhui (Susie) Shi

Maxxam ID: FDZ370
Sample ID: SW_SP_02
Matrix: Water

Collected: 2017/09/15
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Carbonate, Bicarbonate and Hydroxide	CALC	5175007	N/A	2017/09/26	Automated Statchk
Alkalinity	KONE	5192108	N/A	2017/10/03	Nancy Rogers
Chloride	KONE	5192111	N/A	2017/10/03	Nancy Rogers
Colour	KONE	5192119	N/A	2017/10/04	Nancy Rogers
Conductance - water	AT	5180805	N/A	2017/09/25	Julia McGovern

TEST SUMMARY

Maxxam ID: FDZ370
Sample ID: SW_SP_02
Matrix: Water

Collected: 2017/09/15
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Petroleum Hydro. CCME F1 & BTEX in Water	HSGC/MSFD	5190771	N/A	2017/10/01	Wenhui (Susie) Shi
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	5187573	2017/09/26	2017/10/02	(Kent) Maolin Li
Hardness (calculated as CaCO3)		5175523	N/A	2017/09/28	Automated Statchk
Mercury - Total (CVAA,LL)	CV/AA	5192366	2017/10/02	2017/10/03	Arlene Rossiter
Metals Water Total MS	CICP/MS	5184575	2017/09/27	2017/09/28	Bryon Angevine
Ion Balance (% Difference)	CALC	5175524	N/A	2017/10/04	Automated Statchk
Anion and Cation Sum	CALC	5175525	N/A	2017/10/03	Automated Statchk
Nitrogen Ammonia - water	KONE	5189674	N/A	2017/10/02	Nancy Rogers
Nitrogen - Nitrate + Nitrite	KONE	5192122	N/A	2017/10/03	Nancy Rogers
Nitrogen - Nitrite	KONE	5192124	N/A	2017/10/03	Nancy Rogers
Nitrogen - Nitrate (as N)	CALC	5175365	N/A	2017/10/04	Automated Statchk
PCBs in water by GC/ECD	GC/ECD	5177184	2017/09/22	2017/09/27	Chloe Bramble
PCB Aroclor sum (water)	CALC	5175555	N/A	2017/09/27	Automated Statchk
pH	AT	5180804	N/A	2017/09/25	Julia McGovern
Phosphorus - ortho	KONE	5192120	N/A	2017/10/03	Nancy Rogers
Sat. pH and Langelier Index (@ 20C)	CALC	5175013	N/A	2017/10/04	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	5175014	N/A	2017/10/04	Automated Statchk
Reactive Silica	KONE	5192116	N/A	2017/10/03	Nancy Rogers
Sulphate	KONE	5192114	N/A	2017/10/03	Nancy Rogers
Total Dissolved Solids (TDS calc)	CALC	5175527	N/A	2017/10/04	Automated Statchk
Organic carbon - Total (TOC)	TECH	5193753	N/A	2017/10/03	Soraya Merchant - Inactive
Turbidity	TURB	5180256	N/A	2017/09/25	Julia McGovern

Maxxam ID: FDZ370 Dup
Sample ID: SW_SP_02
Matrix: Water

Collected: 2017/09/15
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
PCBs in water by GC/ECD	GC/ECD	5177184	2017/09/22	2017/09/27	Chloe Bramble

Maxxam ID: FDZ371
Sample ID: SW_SP_03
Matrix: Water

Collected: 2017/09/15
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Carbonate, Bicarbonate and Hydroxide	CALC	5175007	N/A	2017/09/26	Automated Statchk
Alkalinity	KONE	5192108	N/A	2017/10/03	Nancy Rogers
Chloride	KONE	5192111	N/A	2017/10/03	Nancy Rogers
Colour	KONE	5192119	N/A	2017/10/04	Nancy Rogers
Conductance - water	AT	5180805	N/A	2017/09/25	Julia McGovern
Petroleum Hydro. CCME F1 & BTEX in Water	HSGC/MSFD	5190771	N/A	2017/10/01	Wenhui (Susie) Shi
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	5187573	2017/09/28	2017/10/02	(Kent) Maolin Li
Hardness (calculated as CaCO3)		5175523	N/A	2017/09/28	Automated Statchk
Mercury - Total (CVAA,LL)	CV/AA	5192366	2017/10/02	2017/10/03	Arlene Rossiter
Metals Water Total MS	CICP/MS	5184575	2017/09/27	2017/09/28	Bryon Angevine

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

TEST SUMMARY

Maxxam ID: FDZ371
Sample ID: SW_SP_03
Matrix: Water

Collected: 2017/09/15
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Ion Balance (% Difference)	CALC	5175524	N/A	2017/10/04	Automated Statchk
Anion and Cation Sum	CALC	5175525	N/A	2017/10/03	Automated Statchk
Nitrogen Ammonia - water	KONE	5189674	N/A	2017/10/02	Nancy Rogers
Nitrogen - Nitrate + Nitrite	KONE	5192122	N/A	2017/10/03	Nancy Rogers
Nitrogen - Nitrite	KONE	5192124	N/A	2017/10/03	Nancy Rogers
Nitrogen - Nitrate (as N)	CALC	5175365	N/A	2017/10/04	Automated Statchk
PCBs in water by GC/ECD	GC/ECD	5177184	2017/09/22	2017/09/27	Chloe Bramble
PCB Aroclor sum (water)	CALC	5175555	N/A	2017/09/27	Automated Statchk
pH	AT	5180804	N/A	2017/09/25	Julia McGovern
Phosphorus - ortho	KONE	5192120	N/A	2017/10/03	Nancy Rogers
Sat. pH and Langelier Index (@ 20C)	CALC	5175013	N/A	2017/10/04	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	5175014	N/A	2017/10/04	Automated Statchk
Reactive Silica	KONE	5192116	N/A	2017/10/03	Nancy Rogers
Sulphate	KONE	5192114	N/A	2017/10/03	Nancy Rogers
Total Dissolved Solids (TDS calc)	CALC	5175527	N/A	2017/10/04	Automated Statchk
Organic carbon - Total (TOC)	TECH	5193753	N/A	2017/10/03	Soraya Merchant - Inactive
Turbidity	TURB	5180255	N/A	2017/09/25	Julia McGovern

Maxxam ID: FDZ372
Sample ID: SW_SP_04
Matrix: Water

Collected: 2017/09/15
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Carbonate, Bicarbonate and Hydroxide	CALC	5175548	N/A	2017/09/26	Automated Statchk
Alkalinity	KONE	5198297	N/A	2017/10/06	Cecilia (Kate) Barrett
Benzo(b/j)fluoranthene Sum (water)	CALC	5175551	N/A	2017/09/28	Automated Statchk
Chloride	KONE	5192111	N/A	2017/10/03	Nancy Rogers
Colour	KONE	5198309	N/A	2017/10/05	Cecilia (Kate) Barrett
Conductance - water	AT	5180805	N/A	2017/09/25	Julia McGovern
Petroleum Hydro. CCME F1 & BTEX in Water	HSGC/MSFD	5190771	N/A	2017/10/01	Wenhui (Susie) Shi
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	5187573	2017/09/28	2017/10/02	(Kent) Maolin Li
Hardness (calculated as CaCO3)		5175523	N/A	2017/09/28	Automated Statchk
Mercury - Total (CVAA,LL)	CV/AA	5192366	2017/10/02	2017/10/03	Arlene Rossiter
Metals Water Total MS	CICP/MS	5184575	2017/09/27	2017/09/28	Bryon Angevine
Ion Balance (% Difference)	CALC	5175524	N/A	2017/10/06	Automated Statchk
Anion and Cation Sum	CALC	5175525	N/A	2017/10/03	Automated Statchk
Nitrogen Ammonia - water	KONE	5189674	N/A	2017/10/02	Nancy Rogers
Nitrogen - Nitrate + Nitrite	KONE	5192122	N/A	2017/10/03	Nancy Rogers
Nitrogen - Nitrite	KONE	5192124	N/A	2017/10/03	Nancy Rogers
Nitrogen - Nitrate (as N)	CALC	5175365	N/A	2017/10/04	Automated Statchk
PAH (FWAL) in Water (A/Q) by GC/MS (SIM)	GC/MS	5180356	2017/09/21	2017/09/28	Gina Thompson
PCBs in water by GC/ECD	GC/ECD	5177184	2017/09/22	2017/09/27	Chloe Bramble
PCB Aroclor sum (water)	CALC	5175555	N/A	2017/09/27	Automated Statchk
pH	AT	5180804	N/A	2017/09/25	Julia McGovern
Phosphorus - ortho	KONE	5192120	N/A	2017/10/03	Nancy Rogers

Maxxam Analytics International Corporation o/a Maxxam Analytics 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.maxxamanalytics.com

TEST SUMMARY

Maxxam ID: FDZ372
Sample ID: SW_SP_04
Matrix: Water

Collected: 2017/09/15
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Sat. pH and Langelier Index (@ 20C)	CALC	5175560	N/A	2017/10/06	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	5175561	N/A	2017/10/06	Automated Statchk
Reactive Silica	KONE	5198307	N/A	2017/10/06	Cecilia (Kate) Barrett
Sulphate	KONE	5192114	N/A	2017/10/03	Nancy Rogers
Total Dissolved Solids (TDS calc)	CALC	5175527	N/A	2017/10/06	Automated Statchk
Organic carbon - Total (TOC)	TECH	5193753	N/A	2017/10/03	Soraya Merchant - Inactive
Turbidity	TURB	5180258	N/A	2017/09/25	Julia McGovern

Maxxam ID: FDZ372 Dup
Sample ID: SW_SP_04
Matrix: Water

Collected: 2017/09/15
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chloride	KONE	5192111	N/A	2017/10/03	Nancy Rogers
Nitrogen - Nitrate + Nitrite	KONE	5192122	N/A	2017/10/03	Nancy Rogers
Nitrogen - Nitrite	KONE	5192124	N/A	2017/10/03	Nancy Rogers
Phosphorus - ortho	KONE	5192120	N/A	2017/10/03	Nancy Rogers
Sulphate	KONE	5192114	N/A	2017/10/03	Nancy Rogers
Turbidity	TURB	5180258	N/A	2017/09/25	Julia McGovern

Maxxam ID: FDZ373
Sample ID: SW_SP_05
Matrix: Water

Collected: 2017/09/15
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Carbonate, Bicarbonate and Hydroxide	CALC	5175548	N/A	2017/09/26	Automated Statchk
Alkalinity	KONE	5192108	N/A	2017/10/03	Nancy Rogers
Chloride	KONE	5192111	N/A	2017/10/03	Nancy Rogers
Colour	KONE	5192119	N/A	2017/10/04	Nancy Rogers
Conductance - water	AT	5181955	N/A	2017/09/26	Julia McGovern
Petroleum Hydro. CCME F1 & BTEX in Water	HSGC/MSFD	5190771	N/A	2017/10/01	Wenhui (Susie) Shi
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	5187573	2017/09/28	2017/10/02	(Kent) Maolin Li
Hardness (calculated as CaCO3)		5175523	N/A	2017/09/28	Automated Statchk
Mercury - Total (CVAA,LL)	CV/AA	5192366	2017/10/02	2017/10/03	Arlene Rossiter
Metals Water Total MS	CICP/MS	5184575	2017/09/27	2017/09/28	Bryon Angevine
Ion Balance (% Difference)	CALC	5175524	N/A	2017/10/04	Automated Statchk
Anion and Cation Sum	CALC	5175525	N/A	2017/10/03	Automated Statchk
Nitrogen Ammonia - water	KONE	5189674	N/A	2017/10/02	Nancy Rogers
Nitrogen - Nitrate + Nitrite	KONE	5192122	N/A	2017/10/03	Nancy Rogers
Nitrogen - Nitrite	KONE	5192124	N/A	2017/10/03	Nancy Rogers
Nitrogen - Nitrate (as N)	CALC	5175365	N/A	2017/10/04	Automated Statchk
PCBs in water by GC/ECD	GC/ECD	5177184	2017/09/22	2017/09/27	Chloe Bramble
PCB Aroclor sum (water)	CALC	5175555	N/A	2017/09/27	Automated Statchk
pH	AT	5181954	N/A	2017/09/26	Julia McGovern
Phosphorus - ortho	KONE	5192120	N/A	2017/10/03	Nancy Rogers

TEST SUMMARY

Maxxam ID: FDZ373
Sample ID: SW_SP_05
Matrix: Water

Collected: 2017/09/15
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Sat. pH and Langelier Index (@ 20C)	CALC	5175560	N/A	2017/10/04	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	5175561	N/A	2017/10/04	Automated Statchk
Reactive Silica	KONE	5192116	N/A	2017/10/03	Nancy Rogers
Sulphate	KONE	5192114	N/A	2017/10/03	Nancy Rogers
Total Dissolved Solids (TDS calc)	CALC	5175527	N/A	2017/10/04	Automated Statchk
Organic carbon - Total (TOC)	TECH	5193753	N/A	2017/10/03	Soraya Merchant - Inactive
Turbidity	TURB	5192047	N/A	2017/10/02	Steven Smith

Maxxam ID: FDZ377
Sample ID: SS_SP_01
Matrix: Soil

Collected: 2017/09/14
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (LL soil)	CALC	5175549	N/A	2017/10/06	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5184592	2017/09/27	2017/10/03	(Kent) Maolin Li
Metals Solids Acid Extr. ICPMS	ICP/MS	5180382	2017/09/25	2017/09/25	Mike Leblanc
Moisture	BAL	5177680	N/A	2017/09/22	Jacob Henley
PAH in sediment by GC/MS (Low Level)	GC/MS	5185061	2017/09/22	2017/10/06	Robin Smith-Armstrong
Volatile Organic Compounds and F1 PHCs	GC/MS	5180823	N/A	2017/09/29	Yang (Philip) Yu

Maxxam ID: FDZ378
Sample ID: SS_SP_02
Matrix: Soil

Collected: 2017/09/14
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (LL soil)	CALC	5175549	N/A	2017/10/06	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5184592	2017/09/27	2017/10/03	(Kent) Maolin Li
Metals Solids Acid Extr. ICPMS	ICP/MS	5180382	2017/09/25	2017/09/25	Mike Leblanc
Moisture	BAL	5177680	N/A	2017/09/22	Jacob Henley
PAH in sediment by GC/MS (Low Level)	GC/MS	5185061	2017/09/27	2017/10/06	Robin Smith-Armstrong
Volatile Organic Compounds and F1 PHCs	GC/MS	5180823	N/A	2017/09/29	Yang (Philip) Yu

Maxxam ID: FDZ379
Sample ID: SS_SP_03
Matrix: Soil

Collected: 2017/09/14
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (LL soil)	CALC	5175549	N/A	2017/10/06	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5184592	2017/09/27	2017/10/03	(Kent) Maolin Li
Metals Solids Acid Extr. ICPMS	ICP/MS	5180382	2017/09/25	2017/09/25	Mike Leblanc
Moisture	BAL	5177680	N/A	2017/09/22	Jacob Henley
PAH in sediment by GC/MS (Low Level)	GC/MS	5185061	2017/09/27	2017/10/06	Robin Smith-Armstrong
Volatile Organic Compounds and F1 PHCs	GC/MS	5180823	N/A	2017/09/29	Yang (Philip) Yu

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

TEST SUMMARY

Maxxam ID: FDZ380
Sample ID: SS_SP_04
Matrix: Soil

Collected: 2017/09/14
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (LL soil)	CALC	5175549	N/A	2017/10/06	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5184592	2017/09/27	2017/10/03	(Kent) Maolin Li
Metals Solids Acid Extr. ICPMS	ICP/MS	5180382	2017/09/25	2017/09/25	Mike Leblanc
Moisture	BAL	5177680	N/A	2017/09/22	Jacob Henley
PAH in sediment by GC/MS (Low Level)	GC/MS	5185061	2017/09/27	2017/10/06	Robin Smith-Armstrong
Volatile Organic Compounds and F1 PHCs	GC/MS	5180823	N/A	2017/09/30	Yang (Philip) Yu

Maxxam ID: FDZ381
Sample ID: SS_SP_05
Matrix: Soil

Collected: 2017/09/14
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (LL soil)	CALC	5175549	N/A	2017/10/04	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5184592	2017/09/27	2017/10/03	(Kent) Maolin Li
Metals Solids Acid Extr. ICPMS	ICP/MS	5180382	2017/09/25	2017/09/25	Mike Leblanc
Moisture	BAL	5177680	N/A	2017/09/22	Jacob Henley
PAH in sediment by GC/MS (Low Level)	GC/MS	5185066	2017/09/27	2017/10/03	Gina Thompson
Volatile Organic Compounds and F1 PHCs	GC/MS	5180823	N/A	2017/09/29	Yang (Philip) Yu

Maxxam ID: FDZ381 Dup
Sample ID: SS_SP_05
Matrix: Soil

Collected: 2017/09/14
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Volatile Organic Compounds and F1 PHCs	GC/MS	5180823	N/A	2017/09/29	Yang (Philip) Yu

Maxxam ID: FDZ382
Sample ID: SS_SP_06
Matrix: Soil

Collected: 2017/09/14
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (LL soil)	CALC	5175549	N/A	2017/10/04	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5184592	2017/09/27	2017/10/03	(Kent) Maolin Li
Metals Solids Acid Extr. ICPMS	ICP/MS	5180382	2017/09/25	2017/09/25	Mike Leblanc
Moisture	BAL	5177680	N/A	2017/09/22	Jacob Henley
PAH in sediment by GC/MS (Low Level)	GC/MS	5185066	2017/09/27	2017/10/03	Gina Thompson
Volatile Organic Compounds and F1 PHCs	GC/MS	5180823	N/A	2017/09/30	Yang (Philip) Yu

Maxxam ID: FDZ383
Sample ID: SS_SP_07
Matrix: Soil

Collected: 2017/09/14
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (LL soil)	CALC	5175549	N/A	2017/10/04	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5184592	2017/09/27	2017/10/03	(Kent) Maolin Li
Metals Solids Acid Extr. ICPMS	ICP/MS	5180382	2017/09/25	2017/09/25	Mike Leblanc

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

TEST SUMMARY

Maxxam ID: FDZ383
Sample ID: SS_SP_07
Matrix: Soil

Collected: 2017/09/14
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	5177680	N/A	2017/09/22	Jacob Henley
PAH in sediment by GC/MS (Low Level)	GC/MS	5185066	2017/09/27	2017/10/03	Gina Thompson
Volatile Organic Compounds and F1 PHCs	GC/MS	5180823	N/A	2017/10/03	Yang (Philip) Yu

Maxxam ID: FDZ383 Dup
Sample ID: SS_SP_07
Matrix: Soil

Collected: 2017/09/14
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
PAH in sediment by GC/MS (Low Level)	GC/MS	5185066	2017/09/27	2017/10/03	Gina Thompson

Maxxam ID: FDZ384
Sample ID: SS_SP_08
Matrix: Soil

Collected: 2017/09/14
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (LL soil)	CALC	5175549	N/A	2017/10/04	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5184592	2017/09/27	2017/10/03	(Kent) Maolin Li
Metals Solids Acid Extr. ICPMS	ICP/MS	5191858	2017/10/02	2017/10/03	Bryon Angevine
Moisture	BAL	5177680	N/A	2017/09/22	Jacob Henley
PAH in sediment by GC/MS (Low Level)	GC/MS	5185066	2017/09/27	2017/10/03	Gina Thompson
Volatile Organic Compounds and F1 PHCs	GC/MS	5180823	N/A	2017/09/30	Yang (Philip) Yu

Maxxam ID: FDZ384 Dup
Sample ID: SS_SP_08
Matrix: Soil

Collected: 2017/09/14
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5184592	2017/09/27	2017/10/03	(Kent) Maolin Li

Maxxam ID: FDZ385
Sample ID: SS_SP_08_FD
Matrix: Soil

Collected: 2017/09/14
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (LL soil)	CALC	5175549	N/A	2017/10/04	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5184592	2017/09/27	2017/10/03	(Kent) Maolin Li
Metals Solids Acid Extr. ICPMS	ICP/MS	5191858	2017/10/02	2017/10/03	Bryon Angevine
Moisture	BAL	5177680	N/A	2017/09/22	Jacob Henley
PAH in sediment by GC/MS (Low Level)	GC/MS	5185066	2017/09/27	2017/10/03	Gina Thompson
Volatile Organic Compounds and F1 PHCs	GC/MS	5180823	N/A	2017/09/30	Yang (Philip) Yu

Maxxam Analytics International Corporation o/a Maxxam Analytics 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.maxxamanalytics.com

TEST SUMMARY

Maxxam ID: FDZ386
Sample ID: SS_SP_09
Matrix: Soil

Collected: 2017/09/14
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (LL soil)	CALC	5175549	N/A	2017/10/04	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5184592	2017/09/27	2017/10/03	(Kent) Maolin Li
Moisture	BAL	5177680	N/A	2017/09/22	Jacob Henley
PAH in sediment by GC/MS (Low Level)	GC/MS	5185066	2017/09/27	2017/10/03	Gina Thompson
Volatile Organic Compounds and F1 PHCs	GC/MS	5180823	N/A	2017/09/30	Yang (Philip) Yu

Maxxam ID: FDZ398
Sample ID: SS_SP_10
Matrix: Soil

Collected: 2017/09/14
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (LL soil)	CALC	5175549	N/A	2017/10/04	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5184592	2017/09/27	2017/10/03	(Kent) Maolin Li
Moisture	BAL	5177680	N/A	2017/09/22	Jacob Henley
PAH in sediment by GC/MS (Low Level)	GC/MS	5185066	2017/09/27	2017/10/03	Gina Thompson
Volatile Organic Compounds and F1 PHCs	GC/MS	5180823	N/A	2017/09/30	Yang (Philip) Yu

Maxxam ID: FDZ399
Sample ID: SS_SP_11
Matrix: Soil

Collected: 2017/09/14
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (LL soil)	CALC	5175549	N/A	2017/10/04	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5184592	2017/09/27	2017/10/03	(Kent) Maolin Li
Moisture	BAL	5184588	N/A	2017/09/27	David Balfour
PAH in sediment by GC/MS (Low Level)	GC/MS	5185066	2017/09/27	2017/10/04	Gina Thompson
Volatile Organic Compounds and F1 PHCs	GC/MS	5180823	N/A	2017/09/30	Yang (Philip) Yu

Maxxam ID: FDZ400
Sample ID: SS_SP_12
Matrix: Soil

Collected: 2017/09/14
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (LL soil)	CALC	5175549	N/A	2017/10/04	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5184592	2017/09/27	2017/10/03	(Kent) Maolin Li
Moisture	BAL	5177680	N/A	2017/09/22	Jacob Henley
PAH in sediment by GC/MS (Low Level)	GC/MS	5185066	2017/09/27	2017/10/04	Gina Thompson
Volatile Organic Compounds and F1 PHCs	GC/MS	5180823	N/A	2017/09/30	Yang (Philip) Yu

Maxxam ID: FDZ400 Dup
Sample ID: SS_SP_12
Matrix: Soil

Collected: 2017/09/14
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	5177680	N/A	2017/09/22	Jacob Henley

Maxxam Analytics International Corporation o/a Maxxam Analytics 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.maxxamanalytics.com

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

TEST SUMMARY

Maxxam ID: FDZ401
Sample ID: SS_SP_13
Matrix: Soil

Collected: 2017/09/15
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5184592	2017/09/27	2017/10/03	(Kent) Maolin Li
F4G (CCME Hydrocarbons Gravimetric)	BAL	5214380	2017/10/16	2017/10/17	Yeldho Mathai
Moisture	BAL	5191424	N/A	2017/09/30	Chun Yan
Volatile Organic Compounds and F1 PHCs	GC/MS	5180823	N/A	2017/09/30	Yang (Philip) Yu

Maxxam ID: FDZ402
Sample ID: SS_SP_14
Matrix: Soil

Collected: 2017/09/15
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5184592	2017/09/27	2017/10/03	(Kent) Maolin Li
F4G (CCME Hydrocarbons Gravimetric)	BAL	5214380	2017/10/16	2017/10/17	Yeldho Mathai
Moisture	BAL	5191424	N/A	2017/09/30	Chun Yan
Volatile Organic Compounds and F1 PHCs	GC/MS	5180823	N/A	2017/09/30	Yang (Philip) Yu

Maxxam ID: FDZ403
Sample ID: SS_SP_15
Matrix: Soil

Collected: 2017/09/15
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5184592	2017/09/27	2017/10/03	(Kent) Maolin Li
F4G (CCME Hydrocarbons Gravimetric)	BAL	5200254	2017/10/06	2017/10/06	Debra Deslandes
Moisture	BAL	5191424	N/A	2017/09/30	Chun Yan
Volatile Organic Compounds and F1 PHCs	GC/MS	5180823	N/A	2017/09/30	Yang (Philip) Yu

Maxxam ID: FDZ404
Sample ID: SS_SP_16
Matrix: Soil

Collected: 2017/09/15
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5184592	2017/09/27	2017/10/03	(Kent) Maolin Li
F4G (CCME Hydrocarbons Gravimetric)	BAL	5214380	2017/10/16	2017/10/17	Yeldho Mathai
Moisture	BAL	5191424	N/A	2017/09/30	Chun Yan
Volatile Organic Compounds and F1 PHCs	GC/MS	5180823	N/A	2017/09/30	Yang (Philip) Yu

Maxxam ID: FDZ405
Sample ID: SS_SP_17
Matrix: Soil

Collected: 2017/09/14
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (LL soil)	CALC	5175549	N/A	2017/10/04	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5184592	2017/09/27	2017/10/03	(Kent) Maolin Li
Metals Solids Acid Extr. ICPMS	ICP/MS	5188792	2017/09/29	2017/09/29	Bryon Angevine
Moisture	BAL	5177680	N/A	2017/09/22	Jacob Henley
PAH in sediment by GC/MS (Low Level)	GC/MS	5185066	2017/09/27	2017/10/04	Gina Thompson
PCBs in soil by GC/ECD	GC/ECD	5182128	2017/09/26	2017/09/28	Chloe Bramble

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

TEST SUMMARY

Maxxam ID: FDZ405
Sample ID: SS_SP_17
Matrix: Soil

Collected: 2017/09/14
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
PCB Aroclor sum (soil)	CALC	5175554	N/A	2017/09/28	Automated Statchk
Volatile Organic Compounds and F1 PHCs	GC/MS	5180823	N/A	2017/09/30	Yang (Philip) Yu

Maxxam ID: FDZ406
Sample ID: SS_SP_18
Matrix: Soil

Collected: 2017/09/14
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5184592	2017/09/27	2017/10/03	(Kent) Maolin Li
Metals Solids Acid Extr. ICPMS	ICP/MS	5188792	2017/09/29	2017/09/29	Bryon Angevine
Moisture	BAL	5191424	N/A	2017/09/30	Chun Yan
Volatile Organic Compounds and F1 PHCs	GC/MS	5180823	N/A	2017/09/30	Yang (Philip) Yu

Maxxam ID: FDZ407
Sample ID: SS_SP_19
Matrix: Soil

Collected: 2017/09/14
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (LL soil)	CALC	5175549	N/A	2017/10/04	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5184592	2017/09/27	2017/10/03	(Kent) Maolin Li
F4G (CCME Hydrocarbons Gravimetric)	BAL	5200254	2017/10/06	2017/10/06	Debra Deslandes
Metals Solids Acid Extr. ICPMS	ICP/MS	5188792	2017/09/29	2017/09/29	Bryon Angevine
Moisture	BAL	5177680	N/A	2017/09/22	Jacob Henley
PAH in sediment by GC/MS (Low Level)	GC/MS	5185066	2017/09/27	2017/10/04	Gina Thompson
PCBs in soil by GC/ECD	GC/ECD	5182128	2017/09/26	2017/09/28	Chloe Bramble
PCB Aroclor sum (soil)	CALC	5175554	N/A	2017/09/28	Automated Statchk
Volatile Organic Compounds and F1 PHCs	GC/MS	5180823	N/A	2017/09/30	Yang (Philip) Yu

Maxxam ID: FDZ420
Sample ID: SS_SP_20
Matrix: Soil

Collected: 2017/09/14
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5185233	2017/09/27	2017/09/29	(Kent) Maolin Li
F4G (CCME Hydrocarbons Gravimetric)	BAL	5200254	2017/10/06	2017/10/06	Debra Deslandes
Metals Solids Acid Extr. ICPMS	ICP/MS	5188792	2017/09/29	2017/09/29	Bryon Angevine
Moisture	BAL	5191424	N/A	2017/09/30	Chun Yan
Volatile Organic Compounds and F1 PHCs	GC/MS	5182564	N/A	2017/09/29	Karen Hughes

Maxxam ID: FDZ420 Dup
Sample ID: SS_SP_20
Matrix: Soil

Collected: 2017/09/14
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
F4G (CCME Hydrocarbons Gravimetric)	BAL	5200254	2017/10/06	2017/10/06	Debra Deslandes

Maxxam Analytics International Corporation o/a Maxxam Analytics 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.maxxamanalytics.com

TEST SUMMARY

Maxxam ID: FDZ421
Sample ID: SS_SP_21
Matrix: Soil

Collected: 2017/09/14
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (LL soil)	CALC	5175549	N/A	2017/10/04	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5185233	2017/09/27	2017/09/29	(Kent) Maolin Li
Metals Solids Acid Extr. ICPMS	ICP/MS	5180382	2017/09/25	2017/09/25	Mike Leblanc
Moisture	BAL	5177680	N/A	2017/09/22	Jacob Henley
PAH in sediment by GC/MS (Low Level)	GC/MS	5185066	2017/09/22	2017/10/04	Gina Thompson
PCBs in soil by GC/ECD	GC/ECD	5182128	2017/09/26	2017/09/28	Chloe Bramble
PCB Aroclor sum (soil)	CALC	5175554	N/A	2017/09/28	Automated Statchk
Volatile Organic Compounds and F1 PHCs	GC/MS	5182564	N/A	2017/09/29	Karen Hughes
VOCs in Soil - Field Preserved	HS/MS	5177808	N/A	2017/09/25	Amanda Swales

Maxxam ID: FDZ421 Dup
Sample ID: SS_SP_21
Matrix: Soil

Collected: 2017/09/14
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Volatile Organic Compounds and F1 PHCs	GC/MS	5182564	N/A	2017/09/29	Karen Hughes

Maxxam ID: FDZ422
Sample ID: SS_SP_22
Matrix: Soil

Collected: 2017/09/14
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (LL soil)	CALC	5175549	N/A	2017/10/04	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5185233	2017/09/27	2017/09/29	(Kent) Maolin Li
Metals Solids Acid Extr. ICPMS	ICP/MS	5180382	2017/09/25	2017/09/25	Mike Leblanc
Moisture	BAL	5177680	N/A	2017/09/22	Jacob Henley
PAH in sediment by GC/MS (Low Level)	GC/MS	5185066	2017/09/27	2017/10/04	Gina Thompson
PCBs in soil by GC/ECD	GC/ECD	5182128	2017/09/26	2017/09/28	Chloe Bramble
PCB Aroclor sum (soil)	CALC	5175554	N/A	2017/09/28	Automated Statchk
Volatile Organic Compounds and F1 PHCs	GC/MS	5182564	N/A	2017/09/29	Karen Hughes
VOCs in Soil - Field Preserved	HS/MS	5177808	N/A	2017/09/25	Amanda Swales

Maxxam ID: FDZ422 Dup
Sample ID: SS_SP_22
Matrix: Soil

Collected: 2017/09/14
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5185233	2017/09/27	2017/09/29	(Kent) Maolin Li

Maxxam ID: FDZ423
Sample ID: SS_SP_23
Matrix: Soil

Collected: 2017/09/14
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (LL soil)	CALC	5175549	N/A	2017/10/04	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5185233	2017/09/27	2017/09/29	(Kent) Maolin Li

Maxxam
A Bureau Veritas Group Company

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

TEST SUMMARY

Maxxam ID: FDZ423
Sample ID: SS_SP_23
Matrix: Soil

Collected: 2017/09/14
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	5180382	2017/09/25	2017/09/25	Mike Leblanc
Moisture	BAL	5177680	N/A	2017/09/22	Jacob Henley
PAH in sediment by GC/MS (Low Level)	GC/MS	5185066	2017/09/27	2017/10/04	Gina Thompson
PCBs in soil by GC/ECD	GC/ECD	5182128	2017/09/26	2017/09/28	Chloe Bramble
PCB Aroclor sum (soil)	CALC	5175554	N/A	2017/09/28	Automated Statchk
Volatile Organic Compounds and F1 PHCs	GC/MS	5182564	N/A	2017/09/29	Karen Hughes

Maxxam ID: FDZ424
Sample ID: SS_SP_23_FD
Matrix: Soil

Collected: 2017/09/14
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (LL soil)	CALC	5175549	N/A	2017/10/04	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5185233	2017/09/27	2017/09/29	(Kent) Maolin Li
Metals Solids Acid Extr. ICPMS	ICP/MS	5180382	2017/09/25	2017/09/25	Mike Leblanc
Moisture	BAL	5177680	N/A	2017/09/22	Jacob Henley
PAH in sediment by GC/MS (Low Level)	GC/MS	5185066	2017/09/27	2017/10/04	Gina Thompson
PCBs in soil by GC/ECD	GC/ECD	5182128	2017/09/26	2017/09/28	Chloe Bramble
PCB Aroclor sum (soil)	CALC	5175554	N/A	2017/09/28	Automated Statchk
Volatile Organic Compounds and F1 PHCs	GC/MS	5182564	N/A	2017/09/29	Karen Hughes

Maxxam ID: FDZ425
Sample ID: SS_SP_24
Matrix: Soil

Collected: 2017/09/14
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (LL soil)	CALC	5175549	N/A	2017/10/04	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5185233	2017/09/27	2017/09/29	(Kent) Maolin Li
F4G (CCME Hydrocarbons Gravimetric)	BAL	5200254	2017/10/06	2017/10/06	Debra Deslandes
Metals Solids Acid Extr. ICPMS	ICP/MS	5180382	2017/09/25	2017/09/25	Mike Leblanc
Moisture	BAL	5177680	N/A	2017/09/22	Jacob Henley
PAH in sediment by GC/MS (Low Level)	GC/MS	5185066	2017/09/27	2017/10/04	Gina Thompson
PCBs in soil by GC/ECD	GC/ECD	5182128	2017/09/26	2017/09/28	Chloe Bramble
PCB Aroclor sum (soil)	CALC	5175554	N/A	2017/09/28	Automated Statchk
Volatile Organic Compounds and F1 PHCs	GC/MS	5182564	N/A	2017/09/29	Karen Hughes

Maxxam ID: FDZ426
Sample ID: SS_SP_25
Matrix: Soil

Collected: 2017/09/14
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (LL soil)	CALC	5175549	N/A	2017/10/04	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5185233	2017/09/27	2017/09/29	(Kent) Maolin Li
F4G (CCME Hydrocarbons Gravimetric)	BAL	5200254	2017/10/06	2017/10/06	Debra Deslandes
Metals Solids Acid Extr. ICPMS	ICP/MS	5191858	2017/10/02	2017/10/03	Bryon Angevine

TEST SUMMARY

Maxxam ID: FDZ426
Sample ID: SS_SP_25
Matrix: Soil

Collected: 2017/09/14
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	5184588	N/A	2017/09/27	David Balfour
PAH in sediment by GC/MS (Low Level)	GC/MS	5185066	2017/09/27	2017/10/04	Gina Thompson
PCBs in soil by GC/ECD	GC/ECD	5186627	2017/09/27	2017/09/29	Chloe Bramble
PCB Aroclor sum (soil)	CALC	5175554	N/A	2017/09/29	Automated Statchk
Volatile Organic Compounds and F1 PHCs	GC/MS	5182564	N/A	2017/09/29	Karen Hughes

Maxxam ID: FDZ426 Dup
Sample ID: SS_SP_25
Matrix: Soil

Collected: 2017/09/14
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
PCBs in soil by GC/ECD	GC/ECD	5186627	2017/09/28	2017/09/29	Chloe Bramble

Maxxam ID: FDZ427
Sample ID: SS_SP_26
Matrix: Soil

Collected: 2017/09/14
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (LL soil)	CALC	5175549	N/A	2017/10/04	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5185233	2017/09/27	2017/09/29	(Kent) Maolin Li
Metals Solids Acid Extr. ICPMS	ICP/MS	5191858	2017/10/02	2017/10/03	Bryon Angevine
Moisture	BAL	5184588	N/A	2017/09/27	David Balfour
PAH in sediment by GC/MS (Low Level)	GC/MS	5185066	2017/09/27	2017/10/04	Gina Thompson
PCBs in soil by GC/ECD	GC/ECD	5186627	2017/09/28	2017/09/29	Chloe Bramble
PCB Aroclor sum (soil)	CALC	5175554	N/A	2017/09/29	Automated Statchk
Volatile Organic Compounds and F1 PHCs	GC/MS	5182564	N/A	2017/09/29	Karen Hughes

Maxxam ID: FDZ428
Sample ID: SS_SP_26_FD
Matrix: Soil

Collected: 2017/09/14
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (LL soil)	CALC	5175549	N/A	2017/10/04	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5185233	2017/09/27	2017/09/29	(Kent) Maolin Li
Metals Solids Acid Extr. ICPMS	ICP/MS	5191858	2017/10/02	2017/10/03	Bryon Angevine
Moisture	BAL	5184588	N/A	2017/09/27	David Balfour
PAH in sediment by GC/MS (Low Level)	GC/MS	5185066	2017/09/27	2017/10/04	Gina Thompson
PCBs in soil by GC/ECD	GC/ECD	5186627	2017/09/28	2017/09/29	Chloe Bramble
PCB Aroclor sum (soil)	CALC	5175554	N/A	2017/09/29	Automated Statchk
Volatile Organic Compounds and F1 PHCs	GC/MS	5182564	N/A	2017/09/29	Karen Hughes

Maxxam Analytics International Corporation o/a Maxxam Analytics 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.maxxamanalytics.com

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

TEST SUMMARY

Maxxam ID: FDZ429
Sample ID: SS_SP_27
Matrix: Soil

Collected: 2017/09/14
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5185233	2017/09/27	2017/09/29	(Kent) Maolin Li
Moisture	BAL	5191424	N/A	2017/09/30	Chun Yan
Volatile Organic Compounds and F1 PHCs	GC/MS	5182564	N/A	2017/09/29	Karen Hughes

Maxxam ID: FDZ439
Sample ID: SS_SP_28_BG
Matrix: Soil

Collected: 2017/09/14
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (LL soil)	CALC	5175549	N/A	2017/10/04	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5185233	2017/09/27	2017/09/29	(Kent) Maolin Li
F4G (CCME Hydrocarbons Gravimetric)	BAL	5200254	2017/10/06	2017/10/06	Debra Deslandes
Metals Solids Acid Extr. ICPMS	ICP/MS	5191858	2017/10/02	2017/10/03	Bryon Angevine
Moisture	BAL	5184588	N/A	2017/09/27	David Balfour
PAH in sediment by GC/MS (Low Level)	GC/MS	5185066	2017/09/27	2017/10/04	Gina Thompson
PCBs in soil by GC/ECD	GC/ECD	5186627	2017/09/28	2017/09/29	Chloe Bramble
PCB Aroclor sum (soil)	CALC	5175554	N/A	2017/09/29	Automated Statchk
Volatile Organic Compounds and F1 PHCs	GC/MS	5182564	N/A	2017/09/29	Karen Hughes

Maxxam ID: FDZ440
Sample ID: SS_SP_29
Matrix: Soil

Collected: 2017/09/14
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5185233	2017/09/27	2017/09/29	(Kent) Maolin Li
Moisture	BAL	5191424	N/A	2017/09/30	Chun Yan
Volatile Organic Compounds and F1 PHCs	GC/MS	5182564	N/A	2017/09/29	Karen Hughes

Maxxam ID: FDZ441
Sample ID: SS_SP_30
Matrix: Soil

Collected: 2017/09/14
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (LL soil)	CALC	5175549	N/A	2017/10/10	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5185233	2017/09/27	2017/09/29	(Kent) Maolin Li
Metals Solids Acid Extr. ICPMS	ICP/MS	5191858	2017/10/02	2017/10/04	Bryon Angevine
Moisture	BAL	5184588	N/A	2017/09/27	David Balfour
PAH in sediment by GC/MS (Low Level)	GC/MS	5187223	2017/09/28	2017/10/09	Lisa Gates
PCBs in soil by GC/ECD	GC/ECD	5186627	2017/09/28	2017/09/29	Chloe Bramble
PCB Aroclor sum (soil)	CALC	5175554	N/A	2017/09/29	Automated Statchk
Volatile Organic Compounds and F1 PHCs	GC/MS	5182564	N/A	2017/09/29	Karen Hughes

Maxxam Analytics International Corporation o/a Maxxam Analytics 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.maxxamanalytics.com

TEST SUMMARY

Maxxam ID: FDZ442
Sample ID: SS_SP_31
Matrix: Soil

Collected: 2017/09/14
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (LL soil)	CALC	5175549	N/A	2017/10/10	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5185233	2017/09/27	2017/09/29	(Kent) Maolin Li
F4G (CCME Hydrocarbons Gravimetric)	BAL	5200254	2017/10/06	2017/10/06	Debra Deslandes
Metals Solids Acid Extr. ICPMS	ICP/MS	5191787	2017/10/02	2017/10/02	Bryon Angevine
Moisture	BAL	5184588	N/A	2017/09/27	David Balfour
PAH in sediment by GC/MS (Low Level)	GC/MS	5187223	2017/09/28	2017/10/09	Lisa Gates
PCBs in soil by GC/ECD	GC/ECD	5186627	2017/09/28	2017/09/29	Chloe Bramble
PCB Aroclor sum (soil)	CALC	5175554	N/A	2017/09/29	Automated Statchk
Volatile Organic Compounds and F1 PHCs	GC/MS	5182564	N/A	2017/09/29	Karen Hughes

Maxxam ID: FDZ443
Sample ID: SS_SP_32
Matrix: Soil

Collected: 2017/09/14
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (LL soil)	CALC	5175549	N/A	2017/10/10	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5185233	2017/09/27	2017/09/29	(Kent) Maolin Li
Metals Solids Acid Extr. ICPMS	ICP/MS	5191787	2017/10/02	2017/10/02	Bryon Angevine
Moisture	BAL	5184588	N/A	2017/09/27	David Balfour
PAH in sediment by GC/MS (Low Level)	GC/MS	5187223	2017/09/28	2017/10/09	Lisa Gates
PCBs in soil by GC/ECD	GC/ECD	5186627	2017/09/28	2017/09/29	Chloe Bramble
PCB Aroclor sum (soil)	CALC	5175554	N/A	2017/09/29	Automated Statchk
Volatile Organic Compounds and F1 PHCs	GC/MS	5182564	N/A	2017/09/29	Karen Hughes

Maxxam ID: FDZ444
Sample ID: SS_SP_33
Matrix: Soil

Collected: 2017/09/14
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (LL soil)	CALC	5175549	N/A	2017/10/10	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5185233	2017/09/27	2017/09/29	(Kent) Maolin Li
F4G (CCME Hydrocarbons Gravimetric)	BAL	5200254	2017/10/06	2017/10/06	Debra Deslandes
Metals Solids Acid Extr. ICPMS	ICP/MS	5191787	2017/10/02	2017/10/02	Bryon Angevine
Moisture	BAL	5184588	N/A	2017/09/27	David Balfour
PAH in sediment by GC/MS (Low Level)	GC/MS	5187223	2017/09/28	2017/10/09	Lisa Gates
PCBs in soil by GC/ECD	GC/ECD	5186627	2017/09/28	2017/09/29	Chloe Bramble
PCB Aroclor sum (soil)	CALC	5175554	N/A	2017/09/29	Automated Statchk
Volatile Organic Compounds and F1 PHCs	GC/MS	5182564	N/A	2017/09/29	Karen Hughes

Maxxam ID: FDZ445
Sample ID: SS_SP_34
Matrix: Soil

Collected: 2017/09/14
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (LL soil)	CALC	5175549	N/A	2017/10/10	Automated Statchk

Maxxam
A Bureau Veritas Group Company

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

TEST SUMMARY

Maxxam ID: FDZ445
Sample ID: SS_SP_34
Matrix: Soil

Collected: 2017/09/14
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5185233	2017/09/27	2017/09/30	(Kent) Maolin Li
Moisture	BAL	5184797	N/A	2017/09/27	Jacob Henley
PAH in sediment by GC/MS (Low Level)	GC/MS	5187223	2017/09/28	2017/10/09	Lisa Gates
Volatile Organic Compounds and F1 PHCs	GC/MS	5182564	N/A	2017/09/29	Karen Hughes

Maxxam ID: FDZ445 Dup
Sample ID: SS_SP_34
Matrix: Soil

Collected: 2017/09/14
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	5184797	N/A	2017/09/27	Jacob Henley

Maxxam ID: FDZ446
Sample ID: SS_SP_34_FD
Matrix: Soil

Collected: 2017/09/14
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (LL soil)	CALC	5175549	N/A	2017/10/10	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5185233	2017/09/27	2017/09/29	(Kent) Maolin Li
F4G (CCME Hydrocarbons Gravimetric)	BAL	5200254	2017/10/06	2017/10/06	Debra Deslandes
Moisture	BAL	5184797	N/A	2017/09/27	Jacob Henley
PAH in sediment by GC/MS (Low Level)	GC/MS	5187223	2017/09/28	2017/10/09	Lisa Gates
Volatile Organic Compounds and F1 PHCs	GC/MS	5182564	N/A	2017/09/29	Karen Hughes

Maxxam ID: FDZ446 Dup
Sample ID: SS_SP_34_FD
Matrix: Soil

Collected: 2017/09/14
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
PAH in sediment by GC/MS (Low Level)	GC/MS	5187223	2017/09/28	2017/10/09	Lisa Gates

Maxxam ID: FDZ447
Sample ID: SS_SP_35
Matrix: Soil

Collected: 2017/09/14
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (LL soil)	CALC	5175549	N/A	2017/10/10	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5185233	2017/09/27	2017/09/29	(Kent) Maolin Li
F4G (CCME Hydrocarbons Gravimetric)	BAL	5200254	2017/10/06	2017/10/06	Debra Deslandes
Moisture	BAL	5184797	N/A	2017/09/27	Jacob Henley
PAH in sediment by GC/MS (Low Level)	GC/MS	5187223	2017/09/28	2017/10/09	Lisa Gates
Volatile Organic Compounds and F1 PHCs	GC/MS	5182564	N/A	2017/09/29	Karen Hughes

Maxxam Analytics International Corporation o/a Maxxam Analytics 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.maxxamanalytics.com

TEST SUMMARY

Maxxam ID: FDZ448
Sample ID: SS_SP_36
Matrix: Soil

Collected: 2017/09/14
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (LL soil)	CALC	5175549	N/A	2017/10/10	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5185233	2017/09/27	2017/09/29	(Kent) Maolin Li
F4G (CCME Hydrocarbons Gravimetric)	BAL	5200254	2017/10/06	2017/10/06	Debra Deslandes
Moisture	BAL	5184797	N/A	2017/09/27	Jacob Henley
PAH in sediment by GC/MS (Low Level)	GC/MS	5187223	2017/09/28	2017/10/09	Lisa Gates
Volatile Organic Compounds and F1 PHCs	GC/MS	5182564	N/A	2017/09/29	Karen Hughes

Maxxam ID: FDZ453
Sample ID: SS_SP_37
Matrix: Soil

Collected: 2017/09/14
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (LL soil)	CALC	5175549	N/A	2017/10/10	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5185268	2017/09/27	2017/09/28	Jeevaraj Jeevaratrnam
F4G (CCME Hydrocarbons Gravimetric)	BAL	5214380	2017/10/16	2017/10/17	Yeldho Mathai
Moisture	BAL	5184797	N/A	2017/09/27	Jacob Henley
PAH in sediment by GC/MS (Low Level)	GC/MS	5187223	2017/09/28	2017/10/09	Lisa Gates
Volatile Organic Compounds and F1 PHCs	GC/MS	5182817	N/A	2017/09/30	Xueming Jiang

Maxxam ID: FDZ454
Sample ID: SS_SP_38
Matrix: Soil

Collected: 2017/09/14
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5185268	2017/09/27	2017/09/28	Jeevaraj Jeevaratrnam
Moisture	BAL	5191424	N/A	2017/09/30	Chun Yan
Volatile Organic Compounds and F1 PHCs	GC/MS	5182817	N/A	2017/09/30	Xueming Jiang

Maxxam ID: FDZ455
Sample ID: SS_SP_39
Matrix: Soil

Collected: 2017/09/15
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5185268	2017/09/27	2017/09/28	Jeevaraj Jeevaratrnam
Moisture	BAL	5191424	N/A	2017/09/30	Chun Yan
Volatile Organic Compounds and F1 PHCs	GC/MS	5182817	N/A	2017/09/30	Xueming Jiang

Maxxam ID: FDZ456
Sample ID: SS_SP_40
Matrix: Soil

Collected: 2017/09/15
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (LL soil)	CALC	5175549	N/A	2017/10/10	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5185268	2017/09/27	2017/09/28	Jeevaraj Jeevaratrnam
Metals Solids Acid Extr. ICPMS	ICP/MS	5191787	2017/10/02	2017/10/02	Bryon Angevine
Moisture	BAL	5184797	N/A	2017/09/27	Jacob Henley

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

TEST SUMMARY

Maxxam ID: FDZ456
Sample ID: SS_SP_40
Matrix: Soil

Collected: 2017/09/15
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
PAH in sediment by GC/MS (Low Level)	GC/MS	5187223	2017/09/28	2017/10/09	Lisa Gates
PCBs in soil by GC/ECD	GC/ECD	5186627	2017/09/28	2017/09/29	Chloe Bramble
PCB Aroclor sum (soil)	CALC	5175554	N/A	2017/09/29	Automated Statchk
Volatile Organic Compounds and F1 PHCs	GC/MS	5182817	N/A	2017/09/30	Xueming Jiang

Maxxam ID: FDZ457
Sample ID: SS_SP_41
Matrix: Soil

Collected: 2017/09/15
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (LL soil)	CALC	5175549	N/A	2017/10/10	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5185268	2017/09/27	2017/09/28	Jeevaraj Jeevaratrnam
F4G (CCME Hydrocarbons Gravimetric)	BAL	5214380	2017/10/16	2017/10/17	Yeldho Mathai
Metals Solids Acid Extr. ICPMS	ICP/MS	5191787	2017/10/02	2017/10/02	Bryon Angevine
Moisture	BAL	5184797	N/A	2017/09/27	Jacob Henley
PAH in sediment by GC/MS (Low Level)	GC/MS	5187223	2017/09/28	2017/10/09	Lisa Gates
PCBs in soil by GC/ECD	GC/ECD	5186627	2017/09/28	2017/09/29	Chloe Bramble
PCB Aroclor sum (soil)	CALC	5175554	N/A	2017/09/29	Automated Statchk
Volatile Organic Compounds and F1 PHCs	GC/MS	5182817	N/A	2017/09/30	Xueming Jiang

Maxxam ID: FDZ458
Sample ID: SS_SP_42
Matrix: Soil

Collected: 2017/09/15
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (LL soil)	CALC	5175549	N/A	2017/10/10	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5185268	2017/09/27	2017/09/28	Jeevaraj Jeevaratrnam
Metals Solids Acid Extr. ICPMS	ICP/MS	5191787	2017/10/02	2017/10/02	Bryon Angevine
Moisture	BAL	5184797	N/A	2017/09/27	Jacob Henley
PAH in sediment by GC/MS (Low Level)	GC/MS	5187223	2017/09/28	2017/10/09	Lisa Gates
PCBs in soil by GC/ECD	GC/ECD	5186627	2017/09/28	2017/09/29	Chloe Bramble
PCB Aroclor sum (soil)	CALC	5175554	N/A	2017/09/29	Automated Statchk
Volatile Organic Compounds and F1 PHCs	GC/MS	5182817	N/A	2017/09/30	Xueming Jiang

Maxxam ID: FDZ458 Dup
Sample ID: SS_SP_42
Matrix: Soil

Collected: 2017/09/15
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5185268	2017/09/27	2017/09/28	Jeevaraj Jeevaratrnam

Maxxam Analytics International Corporation o/a Maxxam Analytics 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.maxxamanalytics.com

TEST SUMMARY

Maxxam ID: FDZ459
Sample ID: SS_SP_43
Matrix: Soil

Collected: 2017/09/15
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (LL soil)	CALC	5175549	N/A	2017/10/10	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5185268	2017/09/27	2017/09/28	Jeevaraj Jeevaratrnam
Metals Solids Acid Extr. ICPMS	ICP/MS	5191787	2017/10/02	2017/10/02	Bryon Angevine
Moisture	BAL	5184797	N/A	2017/09/27	Jacob Henley
PAH in sediment by GC/MS (Low Level)	GC/MS	5187223	2017/09/28	2017/10/09	Lisa Gates
PCBs in soil by GC/ECD	GC/ECD	5186627	2017/09/28	2017/09/29	Chloe Bramble
PCB Aroclor sum (soil)	CALC	5175554	N/A	2017/09/29	Automated Statchk
Volatile Organic Compounds and F1 PHCs	GC/MS	5182817	N/A	2017/09/30	Xueming Jiang

Maxxam ID: FDZ460
Sample ID: SS_SP_44
Matrix: Soil

Collected: 2017/09/15
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5185268	2017/09/27	2017/09/28	Jeevaraj Jeevaratrnam
F4G (CCME Hydrocarbons Gravimetric)	BAL	5214380	2017/10/16	2017/10/17	Yeldho Mathai
Moisture	BAL	5191424	N/A	2017/09/30	Chun Yan
Volatile Organic Compounds and F1 PHCs	GC/MS	5182817	N/A	2017/09/30	Xueming Jiang

Maxxam ID: FDZ461
Sample ID: SS_SP_44_FD
Matrix: Soil

Collected: 2017/09/15
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5185268	2017/09/27	2017/09/28	Jeevaraj Jeevaratrnam
F4G (CCME Hydrocarbons Gravimetric)	BAL	5214380	2017/10/16	2017/10/17	Yeldho Mathai
Moisture	BAL	5191424	N/A	2017/09/30	Chun Yan
Volatile Organic Compounds and F1 PHCs	GC/MS	5182817	N/A	2017/09/30	Xueming Jiang

Maxxam ID: FDZ462
Sample ID: SS_SP_45
Matrix: Soil

Collected: 2017/09/15
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (LL soil)	CALC	5175549	N/A	2017/10/04	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5185268	2017/09/27	2017/09/28	Jeevaraj Jeevaratrnam
Metals Solids Acid Extr. ICPMS	ICP/MS	5191858	2017/10/02	2017/10/03	Bryon Angevine
Moisture	BAL	5188941	N/A	2017/09/29	David Balfour
PAH in sediment by GC/MS (Low Level)	GC/MS	5189095	2017/09/28	2017/10/03	Gina Thompson
PCBs in soil by GC/ECD	GC/ECD	5189670	2017/09/29	2017/10/02	Lisa Gates
PCB Aroclor sum (soil)	CALC	5175554	N/A	2017/10/02	Automated Statchk
Volatile Organic Compounds and F1 PHCs	GC/MS	5182817	N/A	2017/09/30	Xueming Jiang

TEST SUMMARY

Maxxam ID: FDZ462 Dup
Sample ID: SS_SP_45
Matrix: Soil

Collected: 2017/09/15
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Volatile Organic Compounds and F1 PHCs	GC/MS	5182817	N/A	2017/09/30	Xueming Jiang

Maxxam ID: FDZ505
Sample ID: SS_SP_46
Matrix: Soil

Collected: 2017/09/15
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (LL soil)	CALC	5175549	N/A	2017/10/10	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5185268	2017/09/27	2017/09/28	Jeevaraj Jeevaratrnam
F4G (CCME Hydrocarbons Gravimetric)	BAL	5214380	2017/10/16	2017/10/17	Yeldho Mathai
Metals Solids Acid Extr. ICPMS	ICP/MS	5191787	2017/10/02	2017/10/02	Bryon Angevine
Moisture	BAL	5184797	N/A	2017/09/27	Jacob Henley
PAH in sediment by GC/MS (Low Level)	GC/MS	5187223	2017/09/28	2017/10/09	Lisa Gates
PCBs in soil by GC/ECD	GC/ECD	5186627	2017/09/28	2017/09/29	Chloe Bramble
PCB Aroclor sum (soil)	CALC	5175554	N/A	2017/09/29	Automated Statchk
Volatile Organic Compounds and F1 PHCs	GC/MS	5182817	N/A	2017/09/30	Xueming Jiang

Maxxam ID: FDZ506
Sample ID: SS_SP_47
Matrix: Soil

Collected: 2017/09/15
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (LL soil)	CALC	5175549	N/A	2017/10/10	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5185268	2017/09/27	2017/09/28	Jeevaraj Jeevaratrnam
Metals Solids Acid Extr. ICPMS	ICP/MS	5191787	2017/10/02	2017/10/02	Bryon Angevine
Moisture	BAL	5184797	N/A	2017/09/27	Jacob Henley
PAH in sediment by GC/MS (Low Level)	GC/MS	5187223	2017/09/28	2017/10/09	Lisa Gates
PCBs in soil by GC/ECD	GC/ECD	5186627	2017/09/28	2017/09/29	Chloe Bramble
PCB Aroclor sum (soil)	CALC	5175554	N/A	2017/09/29	Automated Statchk
Volatile Organic Compounds and F1 PHCs	GC/MS	5182817	N/A	2017/09/30	Xueming Jiang

Maxxam ID: FDZ507
Sample ID: SS_SP_48
Matrix: Soil

Collected: 2017/09/15
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (LL soil)	CALC	5175550	N/A	2017/10/10	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5185268	2017/09/27	2017/09/28	Jeevaraj Jeevaratrnam
Metals Solids Acid Extr. ICPMS	ICP/MS	5191787	2017/10/02	2017/10/02	Bryon Angevine
Moisture	BAL	5184797	N/A	2017/09/27	Jacob Henley
PAH in sediment by GC/MS (Low Level)	GC/MS	5187223	2017/09/28	2017/10/10	Lisa Gates
PCBs in soil by GC/ECD	GC/ECD	5186627	2017/09/28	2017/09/29	Chloe Bramble
PCB Aroclor sum (soil)	CALC	5175554	N/A	2017/09/29	Automated Statchk
Volatile Organic Compounds and F1 PHCs	GC/MS	5182817	N/A	2017/09/30	Xueming Jiang

Maxxam Analytics International Corporation o/a Maxxam Analytics 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.maxxamanalytics.com

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

TEST SUMMARY

Maxxam ID: FDZ508 **Collected:** 2017/09/15
Sample ID: SS_SP_49 **Shipped:**
Matrix: Soil **Received:** 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5185268	2017/09/27	2017/09/28	Jeevaraj Jeevaratrnam
Moisture	BAL	5191424	N/A	2017/09/30	Chun Yan
Volatile Organic Compounds and F1 PHCs	GC/MS	5182817	N/A	2017/09/30	Xueming Jiang

Maxxam ID: FDZ509 **Collected:** 2017/09/15
Sample ID: SS_SP_50 **Shipped:**
Matrix: Soil **Received:** 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5185268	2017/09/27	2017/09/28	Jeevaraj Jeevaratrnam
F4G (CCME Hydrocarbons Gravimetric)	BAL	5214380	2017/10/16	2017/10/17	Yeldho Mathai
Moisture	BAL	5191424	N/A	2017/09/30	Chun Yan
Volatile Organic Compounds and F1 PHCs	GC/MS	5182817	N/A	2017/09/30	Xueming Jiang

Maxxam ID: FDZ510 **Collected:** 2017/09/15
Sample ID: SS_SP_51 **Shipped:**
Matrix: Soil **Received:** 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (LL soil)	CALC	5175550	N/A	2017/10/10	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5185268	2017/09/27	2017/09/28	Jeevaraj Jeevaratrnam
Moisture	BAL	5184797	N/A	2017/09/27	Jacob Henley
PAH in sediment by GC/MS (Low Level)	GC/MS	5187223	2017/09/28	2017/10/10	Lisa Gates
Volatile Organic Compounds and F1 PHCs	GC/MS	5182817	N/A	2017/09/30	Xueming Jiang

Maxxam ID: FDZ511 **Collected:** 2017/09/15
Sample ID: SS_SP_52 **Shipped:**
Matrix: Soil **Received:** 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5185268	2017/09/27	2017/09/28	Jeevaraj Jeevaratrnam
Moisture	BAL	5191424	N/A	2017/09/30	Chun Yan
Volatile Organic Compounds and F1 PHCs	GC/MS	5182817	N/A	2017/09/30	Xueming Jiang

Maxxam ID: FDZ512 **Collected:** 2017/09/15
Sample ID: SS_SP_53 **Shipped:**
Matrix: Soil **Received:** 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (LL soil)	CALC	5175550	N/A	2017/10/10	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5185268	2017/09/27	2017/09/28	Jeevaraj Jeevaratrnam
Moisture	BAL	5184797	N/A	2017/09/27	Jacob Henley
PAH in sediment by GC/MS (Low Level)	GC/MS	5187223	2017/09/28	2017/10/10	Lisa Gates
Volatile Organic Compounds and F1 PHCs	GC/MS	5182817	N/A	2017/09/30	Xueming Jiang

Maxxam Analytics International Corporation o/a Maxxam Analytics 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.maxxamanalytics.com

TEST SUMMARY

Maxxam ID: FDZ513
Sample ID: SD_SP_01_BG
Matrix: Soil

Collected: 2017/09/15
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (LL soil)	CALC	5175550	N/A	2017/10/10	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5185268	2017/09/27	2017/09/28	Jeevaraj Jeevaratrnam
Metals Solids Acid Extr. ICPMS	ICP/MS	5188792	2017/09/29	2017/09/29	Bryon Angevine
Moisture	BAL	5184797	N/A	2017/09/27	Jacob Henley
PAH in sediment by GC/MS (Low Level)	GC/MS	5187223	2017/09/28	2017/10/10	Lisa Gates
Volatile Organic Compounds and F1 PHCs	GC/MS	5182817	N/A	2017/09/30	Xueming Jiang

Maxxam ID: FDZ514
Sample ID: SD_SP_02
Matrix: Soil

Collected: 2017/09/15
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (LL soil)	CALC	5175550	N/A	2017/10/10	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5185268	2017/09/27	2017/09/28	Jeevaraj Jeevaratrnam
Metals Solids Acid Extr. ICPMS	ICP/MS	5188792	2017/09/29	2017/09/29	Bryon Angevine
Moisture	BAL	5184797	N/A	2017/09/27	Jacob Henley
PAH in sediment by GC/MS (Low Level)	GC/MS	5187223	2017/09/28	2017/10/10	Lisa Gates
PCBs in soil by GC/ECD	GC/ECD	5186627	2017/09/28	2017/09/29	Chloe Bramble
PCB Aroclor sum (soil)	CALC	5175554	N/A	2017/09/29	Automated Statchk
Volatile Organic Compounds and F1 PHCs	GC/MS	5182817	N/A	2017/09/30	Xueming Jiang
VOCs in Soil - Field Preserved	HS/MS	5177808	N/A	2017/09/25	Amanda Swales

Maxxam ID: FDZ519
Sample ID: SD_SP_03
Matrix: Soil

Collected: 2017/09/15
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (LL soil)	CALC	5175550	N/A	2017/10/04	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5184410	2017/09/27	2017/09/28	Zhiyue (Frank) Zhu
Metals Solids Acid Extr. ICPMS	ICP/MS	5188792	2017/09/29	2017/09/29	Bryon Angevine
Moisture	BAL	5184797	N/A	2017/09/27	Jacob Henley
PAH in sediment by GC/MS (Low Level)	GC/MS	5189095	2017/09/29	2017/10/03	Gina Thompson
PCBs in soil by GC/ECD	GC/ECD	5187218	2017/09/28	2017/09/29	Chloe Bramble
PCB Aroclor sum (soil)	CALC	5175554	N/A	2017/09/29	Automated Statchk
Volatile Organic Compounds and F1 PHCs	GC/MS	5182076	N/A	2017/09/27	Yang (Philip) Yu

Maxxam ID: FDZ520
Sample ID: SD_SP_04
Matrix: Soil

Collected: 2017/09/15
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (LL soil)	CALC	5175550	N/A	2017/10/04	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5184410	2017/09/27	2017/09/28	Zhiyue (Frank) Zhu
F4G (CCME Hydrocarbons Gravimetric)	BAL	5214380	2017/10/16	2017/10/17	Yeldho Mathai
Metals Solids Acid Extr. ICPMS	ICP/MS	5188792	2017/09/29	2017/09/29	Bryon Angevine

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

TEST SUMMARY

Maxxam ID: FDZ520
Sample ID: SD_SP_04
Matrix: Soil

Collected: 2017/09/15
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	5184797	N/A	2017/09/27	Jacob Henley
PAH in sediment by GC/MS (Low Level)	GC/MS	5189095	2017/09/29	2017/10/03	Gina Thompson
PCBs in soil by GC/ECD	GC/ECD	5187218	2017/09/28	2017/09/29	Chloe Bramble
PCB Aroclor sum (soil)	CALC	5175554	N/A	2017/09/29	Automated Statchk
Volatile Organic Compounds and F1 PHCs	GC/MS	5182076	N/A	2017/09/27	Yang (Philip) Yu
VOCs in Soil - Field Preserved	HS/MS	5177808	N/A	2017/09/25	Amanda Swales

Maxxam ID: FDZ521
Sample ID: SS_SP_60
Matrix: Soil

Collected: 2017/09/15
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (LL soil)	CALC	5175550	N/A	2017/10/04	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5184410	2017/09/27	2017/09/28	Zhiyue (Frank) Zhu
F4G (CCME Hydrocarbons Gravimetric)	BAL	5214380	2017/10/16	2017/10/17	Yeldho Mathai
Metals Solids Acid Extr. ICPMS	ICP/MS	5188792	2017/09/29	2017/09/29	Bryon Angevine
Moisture	BAL	5184797	N/A	2017/09/27	Jacob Henley
PAH in sediment by GC/MS (Low Level)	GC/MS	5189095	2017/09/29	2017/10/03	Gina Thompson
Volatile Organic Compounds and F1 PHCs	GC/MS	5182076	N/A	2017/09/27	Yang (Philip) Yu

Maxxam ID: FDZ522
Sample ID: SS_SP_61
Matrix: Soil

Collected: 2017/09/15
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (LL soil)	CALC	5175550	N/A	2017/10/04	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5184410	2017/09/27	2017/09/28	Zhiyue (Frank) Zhu
Metals Solids Acid Extr. ICPMS	ICP/MS	5191787	2017/10/02	2017/10/02	Bryon Angevine
Moisture	BAL	5184947	N/A	2017/09/28	David Balfour
PAH in sediment by GC/MS (Low Level)	GC/MS	5189095	2017/09/29	2017/10/03	Gina Thompson
Volatile Organic Compounds and F1 PHCs	GC/MS	5182076	N/A	2017/09/27	Yang (Philip) Yu

Maxxam ID: FDZ522 Dup
Sample ID: SS_SP_61
Matrix: Soil

Collected: 2017/09/15
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	5184947	N/A	2017/09/28	David Balfour

Maxxam ID: FDZ523
Sample ID: SS_SP_62
Matrix: Soil

Collected: 2017/09/15
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (LL soil)	CALC	5175550	N/A	2017/10/04	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5184410	2017/09/27	2017/09/28	Zhiyue (Frank) Zhu

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

TEST SUMMARY

Maxxam ID: FDZ523
Sample ID: SS_SP_62
Matrix: Soil

Collected: 2017/09/15
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	5191787	2017/10/02	2017/10/02	Bryon Angevine
Moisture	BAL	5184947	N/A	2017/09/28	David Balfour
PAH in sediment by GC/MS (Low Level)	GC/MS	5189095	2017/09/29	2017/10/03	Gina Thompson
Volatile Organic Compounds and F1 PHCs	GC/MS	5182076	N/A	2017/09/27	Yang (Philip) Yu

Maxxam ID: FDZ524
Sample ID: SS_SP_63
Matrix: Soil

Collected: 2017/09/15
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (LL soil)	CALC	5175550	N/A	2017/10/03	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5184410	2017/09/27	2017/09/28	Zhiyue (Frank) Zhu
Metals Solids Acid Extr. ICPMS	ICP/MS	5191787	2017/10/02	2017/10/02	Bryon Angevine
Moisture	BAL	5184947	N/A	2017/09/28	David Balfour
PAH in sediment by GC/MS (Low Level)	GC/MS	5189095	2017/09/29	2017/10/03	Gina Thompson
PCBs in soil by GC/ECD	GC/ECD	5187218	2017/09/28	2017/09/29	Chloe Bramble
PCB Aroclor sum (soil)	CALC	5175554	N/A	2017/09/29	Automated Statchk
Volatile Organic Compounds and F1 PHCs	GC/MS	5182076	N/A	2017/09/27	Yang (Philip) Yu

Maxxam ID: FDZ524 Dup
Sample ID: SS_SP_63
Matrix: Soil

Collected: 2017/09/15
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
PAH in sediment by GC/MS (Low Level)	GC/MS	5189095	2017/09/29	2017/10/03	Gina Thompson

Maxxam ID: FDZ525
Sample ID: SS_SP_64
Matrix: Soil

Collected: 2017/09/15
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (LL soil)	CALC	5175550	N/A	2017/10/04	Automated Statchk
Dioxins/Furans in Soil (EPS 1/RM/23)	HRMS/MS	5196177	2017/09/30	2017/10/08	Owen Cosby
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5184410	2017/09/27	2017/09/28	Zhiyue (Frank) Zhu
Metals Solids Acid Extr. ICPMS	ICP/MS	5191787	2017/10/02	2017/10/02	Bryon Angevine
Moisture	BAL	5184947	N/A	2017/09/28	David Balfour
PAH in sediment by GC/MS (Low Level)	GC/MS	5189095	2017/09/29	2017/10/03	Gina Thompson
PCBs in soil by GC/ECD	GC/ECD	5187218	2017/09/28	2017/09/29	Chloe Bramble
PCB Aroclor sum (soil)	CALC	5175554	N/A	2017/09/29	Automated Statchk
Volatile Organic Compounds and F1 PHCs	GC/MS	5182076	N/A	2017/09/27	Yang (Philip) Yu

Maxxam Analytics International Corporation o/a Maxxam Analytics 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.maxxamanalytics.com

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

TEST SUMMARY

Maxxam ID: FDZ525 Dup
Sample ID: SS_SP_64
Matrix: Soil

Collected: 2017/09/15
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dioxins/Furans in Soil (EPS 1/RM/23)	HRMS/MS	5196177	2017/09/30	2017/10/08	Owen Cosby
Metals Solids Acid Extr. ICPMS	ICP/MS	5191787	2017/10/02	2017/10/02	Bryon Angevine

Maxxam ID: FDZ526
Sample ID: TRIP BLANK
Matrix: Water

Collected: 2017/09/15
Shipped:
Received: 2017/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Volatile Organic Compounds in Water	HS/MS	5175677	N/A	2017/09/22	Amanda Swales

GENERAL COMMENTS

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

Package 1	3.2°C

VOCF1 Analysis: The sample extracts were transferred from the soil before 14 days. Analysis was completed within the 40 day specified hold time.

F4G analysis added to FDZ403-01, FDZ407-03, FDZ420-02, FDZ425-02, FDZ426-03, FDZ439-03, FDZ442-03, FDZ444-03, FDZ446-02, FDZ447-02 and FDZ448-02 as per request from A. Garnett. SMS 2017/10/13

Revised Report: Below samples analyszed for F4G as per request from Abigail. HM Oct 13/17

SS_SP_60 – FDZ521
SS_SP_37 – FDZ453
SS_SP_41 – FDZ457
SS_SP_44 – FDZ460
SS_SP_44_FD – FDZ461
SS_SP_50 – FDZ509
SS_SP_14 – FDZ402
SD_SP_04 – FDZ520
SS_SP_46 – FDZ505
SS_SP_13 – FDZ401
SS_SP_16 – FDZ404

Revised Report - Changed units for CCME Hydrocarbon in water to mg/L as per request from Terri. HWS Nov 8/17

Sample FDZ372 [SW_SP_04] : RCAp Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample FDZ401 [SS_SP_13] : F2-F4 Analysis: Detection limits were adjusted for high moisture content.

VOC-F1 Analysis: Detection limits were raised due to high moisture content of soil provided.
F4GGRAV-S:Due to high moisture content in the sample matrix, the DL is adjusted accordingly due to lower dry weight.

Sample FDZ402 [SS_SP_14] : F2-F4 Analysis: Detection limits were adjusted for high moisture content.

VOC-F1 Analysis: Detection limits were raised due to high moisture content of soil provided.
F4GGRAV-S:Due to high moisture content in the sample matrix, the DL is adjusted accordingly due to lower dry weight.

Sample FDZ403 [SS_SP_15] : F2-F4 Analysis: Detection limits were adjusted for high moisture content.

VOC-F1 Analysis: Detection limits were raised due to high moisture content of soil provided.
F4G Analysis: Due to high moisture the detection limit was adjusted.

Sample FDZ404 [SS_SP_16] : F2-F4 Analysis: Detection limits were adjusted for high moisture content.

VOC-F1 Analysis: Detection limits were raised due to high moisture content of soil provided.
F4GGRAV-S:Due to high moisture content in the sample matrix, the DL is adjusted accordingly due to lower dry weight.

Sample FDZ441 [SS_SP_30] : VOCF1 Analysis: Greater than 10g of soil was submitted in the field preserved vial. This significantly exceeds the protocol specification of approximately 5g. Additional methanol was added to the vial to ensure extraction efficiency.

Sample FDZ443 [SS_SP_32] : VOCF1 Analysis: Greater than 10g of soil was submitted in the field preserved vial. This significantly exceeds the protocol specification of approximately 5g. Additional methanol was added to the vial to ensure extraction efficiency.

Sample FDZ444 [SS_SP_33] : VOCF1 Analysis: Greater than 10g of soil was submitted in the field preserved vial. This significantly exceeds the protocol specification of approximately 5g. Additional methanol was added to the vial to ensure extraction efficiency.

Sample FDZ445 [SS_SP_34] : VOCF1 Analysis: Greater than 10g of soil was submitted in the field preserved vial. This significantly exceeds the protocol specification of approximately 5g. Additional methanol was added to the vial to ensure extraction efficiency.

Sample FDZ447 [SS_SP_35] : VOCF1 Analysis: Greater than 10g of soil was submitted in the field preserved vial. This significantly exceeds the protocol specification of approximately 5g. Additional methanol was added to the vial to ensure extraction efficiency.

Sample FDZ455 [SS_SP_39] : VOCF1 Analysis: Greater than 10g of soil was submitted in the field preserved vial. This significantly exceeds the protocol specification of approximately 5g. Additional methanol was added to the vial to ensure extraction efficiency.

Sample FDZ505 [SS_SP_46] : F24FID-S Analysis: Detection limits were adjusted for high moisture content.
F4GGRAV-S:Due to high moisture content in the sample matrix, the DL is adjusted accordingly due to lower dry weight.

Sample FDZ513 [SD_SP_01_BG] : VOCF1 Analysis: Greater than 10g of soil was submitted in the field preserved vial. This significantly exceeds the protocol specification of approximately 5g. Additional methanol was added to the vial to ensure extraction efficiency.

Sample FDZ514 [SD_SP_02] : VOCF1 Analysis: Greater than 10g of soil was submitted in the field preserved vial. This significantly exceeds the protocol specification of approximately 5g. Additional methanol was added to the vial to ensure extraction efficiency.

Sample FDZ520 [SD_SP_04] : VOC-F1 Analysis: Detection limits were raised due to high moisture content.
F4GGRAV-S:Due to high moisture content in the sample matrix, the DL is adjusted accordingly due to lower dry weight.

Results relate only to the items tested.

Maxxam Analytics International Corporation o/a Maxxam Analytics 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.maxxamanalytics.com

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
5175677	ASL	Matrix Spike	1,2-Dichlorobenzene	2017/09/22		91	%	70 - 130
			1,3-Dichlorobenzene	2017/09/22		91	%	70 - 130
			1,4-Dichlorobenzene	2017/09/22		89	%	70 - 130
			Chlorobenzene	2017/09/22		96	%	70 - 130
			1,1,1-Trichloroethane	2017/09/22		104	%	70 - 130
			1,1,2,2-Tetrachloroethane	2017/09/22		101	%	70 - 130
			1,1,2-Trichloroethane	2017/09/22		102	%	70 - 130
			1,1-Dichloroethane	2017/09/22		106	%	70 - 130
			1,1-Dichloroethylene	2017/09/22		108	%	70 - 130
			1,2-Dichloroethane	2017/09/22		101	%	70 - 130
			1,2-Dichloropropane	2017/09/22		98	%	70 - 130
			4-Bromofluorobenzene	2017/09/22		100	%	70 - 130
			Benzene	2017/09/22		97	%	70 - 130
			Bromodichloromethane	2017/09/22		100	%	70 - 130
			Bromoform	2017/09/22		103	%	70 - 130
			Bromomethane	2017/09/22		100	%	60 - 140
			Carbon Tetrachloride	2017/09/22		101	%	70 - 130
			Chloroethane	2017/09/22		93	%	60 - 140
			Chloroform	2017/09/22		96	%	70 - 130
			Chloromethane	2017/09/22		78	%	60 - 140
			cis-1,2-Dichloroethylene	2017/09/22		104	%	70 - 130
			cis-1,3-Dichloropropene	2017/09/22		109	%	70 - 130
			D4-1,2-Dichloroethane	2017/09/22		101	%	70 - 130
			D8-Toluene	2017/09/22		98	%	70 - 130
			Dibromochloromethane	2017/09/22		103	%	70 - 130
			Ethylbenzene	2017/09/22		99	%	70 - 130
			Ethylene Dibromide	2017/09/22		101	%	70 - 130
			Methyl t-butyl ether (MTBE)	2017/09/22		111	%	70 - 130
			Methylene Chloride(Dichloromethane)	2017/09/22		105	%	70 - 130
			o-Xylene	2017/09/22		99	%	70 - 130
			p+m-Xylene	2017/09/22		99	%	70 - 130
			Styrene	2017/09/22		103	%	70 - 130
			Tetrachloroethylene	2017/09/22		101	%	70 - 130
			Toluene	2017/09/22		101	%	70 - 130
			trans-1,2-Dichloroethylene	2017/09/22		104	%	70 - 130
			trans-1,3-Dichloropropene	2017/09/22		100	%	70 - 130
			Trichloroethylene	2017/09/22		102	%	70 - 130
			Trichlorofluoromethane (FREON 11)	2017/09/22		95	%	60 - 140
			Vinyl Chloride	2017/09/22		101	%	60 - 140
5175677	ASL	Spiked Blank	1,2-Dichlorobenzene	2017/09/22		91	%	70 - 130
			1,3-Dichlorobenzene	2017/09/22		92	%	70 - 130
			1,4-Dichlorobenzene	2017/09/22		90	%	70 - 130
			Chlorobenzene	2017/09/22		96	%	70 - 130
			1,1,1-Trichloroethane	2017/09/22		104	%	70 - 130
			1,1,2,2-Tetrachloroethane	2017/09/22		99	%	70 - 130
			1,1,2-Trichloroethane	2017/09/22		100	%	70 - 130
			1,1-Dichloroethane	2017/09/22		107	%	70 - 130
			1,1-Dichloroethylene	2017/09/22		109	%	70 - 130
			1,2-Dichloroethane	2017/09/22		100	%	70 - 130
			1,2-Dichloropropane	2017/09/22		97	%	70 - 130
			4-Bromofluorobenzene	2017/09/22		100	%	70 - 130
			Benzene	2017/09/22		96	%	70 - 130
			Bromodichloromethane	2017/09/22		100	%	70 - 130

Maxxam
A Bureau Veritas Group Company

Success Through Science®

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			Bromoform	2017/09/22		102	%	70 - 130
			Bromomethane	2017/09/22		98	%	60 - 140
			Carbon Tetrachloride	2017/09/22		102	%	70 - 130
			Chloroethane	2017/09/22		94	%	60 - 140
			Chloroform	2017/09/22		97	%	70 - 130
			Chloromethane	2017/09/22		94	%	60 - 140
			cis-1,2-Dichloroethylene	2017/09/22		105	%	70 - 130
			cis-1,3-Dichloropropene	2017/09/22		106	%	70 - 130
			D4-1,2-Dichloroethane	2017/09/22		101	%	70 - 130
			D8-Toluene	2017/09/22		98	%	70 - 130
			Dibromochloromethane	2017/09/22		102	%	70 - 130
			Ethylbenzene	2017/09/22		100	%	70 - 130
			Ethylene Dibromide	2017/09/22		100	%	70 - 130
			Methyl t-butyl ether (MTBE)	2017/09/22		112	%	70 - 130
			Methylene Chloride(Dichloromethane)	2017/09/22		106	%	70 - 130
			o-Xylene	2017/09/22		99	%	70 - 130
			p+m-Xylene	2017/09/22		99	%	70 - 130
			Styrene	2017/09/22		104	%	70 - 130
			Tetrachloroethylene	2017/09/22		101	%	70 - 130
			Toluene	2017/09/22		101	%	70 - 130
			trans-1,2-Dichloroethylene	2017/09/22		106	%	70 - 130
			trans-1,3-Dichloropropene	2017/09/22		96	%	70 - 130
			Trichloroethylene	2017/09/22		101	%	70 - 130
			Trichlorofluoromethane (FREON 11)	2017/09/22		95	%	60 - 140
			Vinyl Chloride	2017/09/22		102	%	60 - 140
5175677	ASL	Method Blank	1,2-Dichlorobenzene	2017/09/22	<0.50		ug/L	
			1,3-Dichlorobenzene	2017/09/22	<1.0		ug/L	
			1,4-Dichlorobenzene	2017/09/22	<1.0		ug/L	
			Chlorobenzene	2017/09/22	<1.0		ug/L	
			1,1,1-Trichloroethane	2017/09/22	<1.0		ug/L	
			1,1,2,2-Tetrachloroethane	2017/09/22	<0.50		ug/L	
			1,1,2-Trichloroethane	2017/09/22	<1.0		ug/L	
			1,1-Dichloroethane	2017/09/22	<2.0		ug/L	
			1,1-Dichloroethylene	2017/09/22	<0.50		ug/L	
			1,2-Dichloroethane	2017/09/22	<1.0		ug/L	
			1,2-Dichloropropane	2017/09/22	<0.50		ug/L	
			4-Bromofluorobenzene	2017/09/22		100	%	70 - 130
			Benzene	2017/09/22	<1.0		ug/L	
			Bromodichloromethane	2017/09/22	<1.0		ug/L	
			Bromoform	2017/09/22	<1.0		ug/L	
			Bromomethane	2017/09/22	<0.50		ug/L	
			Carbon Tetrachloride	2017/09/22	<0.50		ug/L	
			Chloroethane	2017/09/22	<8.0		ug/L	
			Chloroform	2017/09/22	<1.0		ug/L	
			Chloromethane	2017/09/22	<8.0		ug/L	
			cis-1,2-Dichloroethylene	2017/09/22	<0.50		ug/L	
			cis-1,3-Dichloropropene	2017/09/22	<0.50		ug/L	
			D4-1,2-Dichloroethane	2017/09/22		97	%	70 - 130
			D8-Toluene	2017/09/22		99	%	70 - 130
			Dibromochloromethane	2017/09/22	<1.0		ug/L	
			Ethylbenzene	2017/09/22	<1.0		ug/L	
			Ethylene Dibromide	2017/09/22	<0.20		ug/L	
			Methyl t-butyl ether (MTBE)	2017/09/22	<2.0		ug/L	

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			Methylene Chloride(Dichloromethane)	2017/09/22	<3.0		ug/L	
			o-Xylene	2017/09/22	<1.0		ug/L	
			p+m-Xylene	2017/09/22	<2.0		ug/L	
			Styrene	2017/09/22	<1.0		ug/L	
			Tetrachloroethylene	2017/09/22	<1.0		ug/L	
			Toluene	2017/09/22	<1.0		ug/L	
			Total Trihalomethanes	2017/09/22	<1.0		ug/L	
			Total Xylenes	2017/09/22	<1.0		ug/L	
			trans-1,2-Dichloroethylene	2017/09/22	<0.50		ug/L	
			trans-1,3-Dichloropropene	2017/09/22	<0.50		ug/L	
			Trichloroethylene	2017/09/22	<1.0		ug/L	
			Trichlorofluoromethane (FREON 11)	2017/09/22	<8.0		ug/L	
			Vinyl Chloride	2017/09/22	<0.50		ug/L	
5175677	ASL	RPD - Sample/Sample Dup	1,2-Dichlorobenzene	2017/09/22	NC		%	40
			1,3-Dichlorobenzene	2017/09/22	NC		%	40
			1,4-Dichlorobenzene	2017/09/22	NC		%	40
			Chlorobenzene	2017/09/22	NC		%	40
			1,1,1-Trichloroethane	2017/09/22	NC		%	40
			1,1,2,2-Tetrachloroethane	2017/09/22	NC		%	40
			1,1,2-Trichloroethane	2017/09/22	NC		%	40
			1,1-Dichloroethane	2017/09/22	NC		%	40
			1,1-Dichloroethylene	2017/09/22	NC		%	40
			1,2-Dichloroethane	2017/09/22	NC		%	40
			1,2-Dichloropropane	2017/09/22	NC		%	40
			Benzene	2017/09/22	NC		%	40
			Bromodichloromethane	2017/09/22	NC		%	40
			Bromoform	2017/09/22	NC		%	40
			Bromomethane	2017/09/22	NC		%	40
			Carbon Tetrachloride	2017/09/22	NC		%	40
			Chloroethane	2017/09/22	NC		%	40
			Chloroform	2017/09/22	NC		%	40
			Chloromethane	2017/09/22	NC		%	40
			cis-1,2-Dichloroethylene	2017/09/22	NC		%	40
			cis-1,3-Dichloropropene	2017/09/22	NC		%	40
			Dibromochloromethane	2017/09/22	NC		%	40
			Ethylbenzene	2017/09/22	NC		%	40
			Ethylene Dibromide	2017/09/22	NC		%	40
			Methylene Chloride(Dichloromethane)	2017/09/22	NC		%	40
			o-Xylene	2017/09/22	NC		%	40
			p+m-Xylene	2017/09/22	NC		%	40
			Styrene	2017/09/22	NC		%	40
			Tetrachloroethylene	2017/09/22	NC		%	40
			Toluene	2017/09/22	NC		%	40
			trans-1,2-Dichloroethylene	2017/09/22	NC		%	40
			trans-1,3-Dichloropropene	2017/09/22	NC		%	40
			Trichloroethylene	2017/09/22	NC		%	40
			Trichlorofluoromethane (FREON 11)	2017/09/22	NC		%	40
			Vinyl Chloride	2017/09/22	NC		%	40
5177184	CBR	Matrix Spike(FDZ371)	Decachlorobiphenyl	2017/09/27		71	%	30 - 130
			Aroclor 1254	2017/09/27		84	%	30 - 130
5177184	CBR	Spiked Blank	Decachlorobiphenyl	2017/09/27		92	%	30 - 130
			Aroclor 1254	2017/09/27		111	%	30 - 130
5177184	CBR	Method Blank	Decachlorobiphenyl	2017/09/27		69	%	30 - 130

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			Aroclor 1016	2017/09/27	<0.050		ug/L	
			Aroclor 1221	2017/09/27	<0.050		ug/L	
			Aroclor 1232	2017/09/27	<0.050		ug/L	
			Aroclor 1248	2017/09/27	<0.050		ug/L	
			Aroclor 1242	2017/09/27	<0.050		ug/L	
			Aroclor 1254	2017/09/27	<0.050		ug/L	
			Aroclor 1260	2017/09/27	<0.050		ug/L	
5177184	CBR	RPD - Sample/Sample Dup	Aroclor 1016	2017/09/27	NC		%	40
			Aroclor 1221	2017/09/27	NC		%	40
			Aroclor 1232	2017/09/27	NC		%	40
			Aroclor 1248	2017/09/27	NC		%	40
			Aroclor 1242	2017/09/27	NC		%	40
			Aroclor 1254	2017/09/27	NC		%	40
			Aroclor 1260	2017/09/27	NC		%	40
5177680	JHY	RPD - Sample/Sample Dup	Moisture	2017/09/22	5.1		%	25
5177808	ASL	Matrix Spike	4-Bromofluorobenzene	2017/09/25		101	%	60 - 140
			D10-o-Xylene	2017/09/25		109 (1)	%	60 - 130
			D4-1,2-Dichloroethane	2017/09/25		99	%	60 - 140
			D8-Toluene	2017/09/25		99	%	60 - 140
			1,1,1-Trichloroethane	2017/09/25		119	%	60 - 140
			1,1,2,2-Tetrachloroethane	2017/09/25		104	%	60 - 140
			1,1,2-Trichloroethane	2017/09/25		108	%	60 - 140
			1,1-Dichloroethane	2017/09/25		119	%	60 - 140
			1,1-Dichloroethylene	2017/09/25		123	%	60 - 140
			1,2-Dichlorobenzene	2017/09/25		103	%	60 - 140
			1,2-Dichloroethane	2017/09/25		108	%	60 - 140
			1,2-Dichloropropane	2017/09/25		108	%	60 - 140
			1,3-Dichlorobenzene	2017/09/25		106	%	60 - 140
			1,4-Dichlorobenzene	2017/09/25		105	%	60 - 140
			Benzene	2017/09/25		111	%	60 - 140
			Bromodichloromethane	2017/09/25		111	%	60 - 140
			Bromoform	2017/09/25		108	%	60 - 140
			Bromomethane	2017/09/25		103	%	60 - 140
			Carbon Tetrachloride	2017/09/25		116	%	60 - 140
			Chlorobenzene	2017/09/25		111	%	60 - 140
			Chloroethane	2017/09/25		103	%	60 - 140
			Chloroform	2017/09/25		108	%	60 - 140
			cis-1,2-Dichloroethylene	2017/09/25		116	%	60 - 140
			cis-1,3-Dichloropropene	2017/09/25		111	%	60 - 140
			Dibromochloromethane	2017/09/25		110	%	60 - 140
			Ethylbenzene	2017/09/25		116	%	60 - 140
			Ethylene Dibromide	2017/09/25		107	%	60 - 140
			Methyl t-butyl ether (MTBE)	2017/09/25		122	%	60 - 140
			Methylene Chloride(Dichloromethane)	2017/09/25		115	%	60 - 140
			o-Xylene	2017/09/25		115	%	60 - 140
			p+m-Xylene	2017/09/25		116	%	60 - 140
			Styrene	2017/09/25		115	%	60 - 140
			Tetrachloroethylene	2017/09/25		119	%	60 - 140
			Toluene	2017/09/25		114	%	60 - 140
			trans-1,2-Dichloroethylene	2017/09/25		118	%	60 - 140
			trans-1,3-Dichloropropene	2017/09/25		97	%	60 - 140
			Trichloroethylene	2017/09/25		117	%	60 - 140
			Trichlorofluoromethane (FREON 11)	2017/09/25		107	%	60 - 140

Maxxam
A Bureau Veritas Group Company

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			Vinyl Chloride	2017/09/25		107	%	60 - 140
5177808	ASL	Spiked Blank	4-Bromofluorobenzene	2017/09/25		101	%	60 - 140
			D10-o-Xylene	2017/09/25		104	%	60 - 130
			D4-1,2-Dichloroethane	2017/09/25		96	%	60 - 140
			D8-Toluene	2017/09/25		101	%	60 - 140
			1,1,1-Trichloroethane	2017/09/25		113	%	60 - 130
			1,1,2,2-Tetrachloroethane	2017/09/25		96	%	60 - 130
			1,1,2-Trichloroethane	2017/09/25		100	%	60 - 130
			1,1-Dichloroethane	2017/09/25		113	%	60 - 130
			1,1-Dichloroethylene	2017/09/25		117	%	60 - 130
			1,2-Dichlorobenzene	2017/09/25		96	%	60 - 130
			1,2-Dichloroethane	2017/09/25		101	%	60 - 130
			1,2-Dichloropropane	2017/09/25		101	%	60 - 130
			1,3-Dichlorobenzene	2017/09/25		100	%	60 - 130
			1,4-Dichlorobenzene	2017/09/25		98	%	60 - 130
			Benzene	2017/09/25		104	%	60 - 130
			Bromodichloromethane	2017/09/25		103	%	60 - 130
			Bromoform	2017/09/25		100	%	60 - 130
			Bromomethane	2017/09/25		97	%	60 - 140
			Carbon Tetrachloride	2017/09/25		111	%	60 - 130
			Chlorobenzene	2017/09/25		105	%	60 - 130
			Chloroethane	2017/09/25		98	%	60 - 140
			Chloroform	2017/09/25		103	%	60 - 130
			cis-1,2-Dichloroethylene	2017/09/25		109	%	60 - 130
			cis-1,3-Dichloropropene	2017/09/25		104	%	60 - 130
			Dibromochloromethane	2017/09/25		102	%	60 - 130
			Ethylbenzene	2017/09/25		111	%	60 - 130
			Ethylene Dibromide	2017/09/25		98	%	60 - 130
			Methyl t-butyl ether (MTBE)	2017/09/25		115	%	60 - 130
			Methylene Chloride(Dichloromethane)	2017/09/25		110	%	60 - 130
			o-Xylene	2017/09/25		109	%	60 - 130
			p+m-Xylene	2017/09/25		111	%	60 - 130
			Styrene	2017/09/25		110	%	60 - 130
			Tetrachloroethylene	2017/09/25		113	%	60 - 130
			Toluene	2017/09/25		110	%	60 - 130
			trans-1,2-Dichloroethylene	2017/09/25		112	%	60 - 130
			trans-1,3-Dichloropropene	2017/09/25		90	%	60 - 130
			Trichloroethylene	2017/09/25		112	%	60 - 130
			Trichlorofluoromethane (FREON 11)	2017/09/25		103	%	60 - 140
			Vinyl Chloride	2017/09/25		103	%	60 - 140
5177808	ASL	Method Blank	4-Bromofluorobenzene	2017/09/25		102	%	60 - 140
			D10-o-Xylene	2017/09/25		108	%	60 - 130
			D4-1,2-Dichloroethane	2017/09/25		93	%	60 - 140
			D8-Toluene	2017/09/25		100	%	60 - 140
			1,1,1-Trichloroethane	2017/09/25	<25		ug/kg	
			1,1,2,2-Tetrachloroethane	2017/09/25	<25		ug/kg	
			1,1,2-Trichloroethane	2017/09/25	<25		ug/kg	
			1,1-Dichloroethane	2017/09/25	<25		ug/kg	
			1,1-Dichloroethylene	2017/09/25	<25		ug/kg	
			1,2-Dichlorobenzene	2017/09/25	<25		ug/kg	
			1,2-Dichloroethane	2017/09/25	<25		ug/kg	
			1,2-Dichloropropane	2017/09/25	<25		ug/kg	
			1,3-Dichlorobenzene	2017/09/25	<25		ug/kg	

Maxxam Analytics International Corporation o/a Maxxam Analytics 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.maxxamanalytics.com

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			1,4-Dichlorobenzene	2017/09/25	<25		ug/kg	
			Benzene	2017/09/25	<25		ug/kg	
			Bromodichloromethane	2017/09/25	<25		ug/kg	
			Bromoform	2017/09/25	<25		ug/kg	
			Bromomethane	2017/09/25	<50		ug/kg	
			Carbon Tetrachloride	2017/09/25	<25		ug/kg	
			Chlorobenzene	2017/09/25	<25		ug/kg	
			Chloroethane	2017/09/25	<200		ug/kg	
			Chloroform	2017/09/25	<25		ug/kg	
			cis-1,2-Dichloroethylene	2017/09/25	<25		ug/kg	
			cis-1,3-Dichloropropene	2017/09/25	<25		ug/kg	
			Dibromochloromethane	2017/09/25	<25		ug/kg	
			Ethylbenzene	2017/09/25	<25		ug/kg	
			Ethylene Dibromide	2017/09/25	<25		ug/kg	
			Methyl t-butyl ether (MTBE)	2017/09/25	<25		ug/kg	
			Methylene Chloride(Dichloromethane)	2017/09/25	<50		ug/kg	
			o-Xylene	2017/09/25	<25		ug/kg	
			p+m-Xylene	2017/09/25	<25		ug/kg	
			Styrene	2017/09/25	<25		ug/kg	
			Tetrachloroethylene	2017/09/25	<25		ug/kg	
			Toluene	2017/09/25	<25		ug/kg	
			Total Xylenes	2017/09/25	<50		ug/kg	
			trans-1,2-Dichloroethylene	2017/09/25	<25		ug/kg	
			trans-1,3-Dichloropropene	2017/09/25	<25		ug/kg	
			Trichloroethylene	2017/09/25	<10		ug/kg	
			Trichlorofluoromethane (FREON 11)	2017/09/25	<25		ug/kg	
			Vinyl Chloride	2017/09/25	<20		ug/kg	
5177808	ASL	RPD - Sample/Sample Dup	1,1,1-Trichloroethane	2017/09/25	NC		%	50
			1,1,2,2-Tetrachloroethane	2017/09/25	NC		%	50
			1,1,2-Trichloroethane	2017/09/25	NC		%	50
			1,1-Dichloroethane	2017/09/25	NC		%	50
			1,1-Dichloroethylene	2017/09/25	NC		%	50
			1,2-Dichlorobenzene	2017/09/25	NC		%	50
			1,2-Dichloroethane	2017/09/25	NC		%	50
			1,2-Dichloropropane	2017/09/25	NC		%	50
			1,3-Dichlorobenzene	2017/09/25	NC		%	50
			1,4-Dichlorobenzene	2017/09/25	NC		%	50
			Benzene	2017/09/25	NC		%	50
			Bromodichloromethane	2017/09/25	NC		%	50
			Bromoform	2017/09/25	NC		%	50
			Bromomethane	2017/09/25	NC		%	50
			Carbon Tetrachloride	2017/09/25	NC		%	50
			Chlorobenzene	2017/09/25	NC		%	50
			Chloroethane	2017/09/25	NC		%	50
			Chloroform	2017/09/25	NC		%	50
			cis-1,2-Dichloroethylene	2017/09/25	NC		%	50
			cis-1,3-Dichloropropene	2017/09/25	NC		%	50
			Dibromochloromethane	2017/09/25	NC		%	50
			Ethylbenzene	2017/09/25	NC		%	50
			Ethylene Dibromide	2017/09/25	NC		%	50
			Methylene Chloride(Dichloromethane)	2017/09/25	NC		%	50
			o-Xylene	2017/09/25	NC		%	50
			p+m-Xylene	2017/09/25	NC		%	50

Maxxam Analytics International Corporation o/a Maxxam Analytics 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.maxxamanalytics.com

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			Styrene	2017/09/25	NC		%	50
			Tetrachloroethylene	2017/09/25	NC		%	50
			Toluene	2017/09/25	NC		%	50
			Total Xylenes	2017/09/25	NC		%	50
			trans-1,2-Dichloroethylene	2017/09/25	NC		%	50
			trans-1,3-Dichloropropene	2017/09/25	NC		%	50
			Trichloroethylene	2017/09/25	NC		%	50
			Trichlorofluoromethane (FREON 11)	2017/09/25	NC		%	50
			Vinyl Chloride	2017/09/25	NC		%	50
5180255	JMV	QC Standard	Turbidity	2017/09/25		102	%	80 - 120
5180255	JMV	Spiked Blank	Turbidity	2017/09/25		92	%	80 - 120
5180255	JMV	Method Blank	Turbidity	2017/09/25	<0.10		NTU	
5180255	JMV	RPD - Sample/Sample Dup	Turbidity	2017/09/25	12		%	20
5180256	JMV	QC Standard	Turbidity	2017/09/25		103	%	80 - 120
5180256	JMV	Spiked Blank	Turbidity	2017/09/25		93	%	80 - 120
5180256	JMV	Method Blank	Turbidity	2017/09/25	<0.10		NTU	
5180256	JMV	RPD - Sample/Sample Dup	Turbidity	2017/09/25	NC		%	20
5180258	JMV	QC Standard	Turbidity	2017/09/25		103	%	80 - 120
5180258	JMV	Spiked Blank	Turbidity	2017/09/25		93	%	80 - 120
5180258	JMV	Method Blank	Turbidity	2017/09/25	<0.10		NTU	
5180258	JMV	RPD - Sample/Sample Dup	Turbidity	2017/09/25	7.5		%	20
5180356	GTH	Matrix Spike	Benzo(j)fluoranthene	2017/09/26		71	%	30 - 130
			D10-Anthracene	2017/09/26		81	%	50 - 130
			D14-Terphenyl	2017/09/26		74	%	50 - 130
			D8-Acenaphthylene	2017/09/26		70	%	50 - 130
			1-Methylnaphthalene	2017/09/26		63	%	30 - 130
			2-Methylnaphthalene	2017/09/26		66	%	30 - 130
			Acenaphthene	2017/09/26		63	%	30 - 130
			Acenaphthylene	2017/09/26		80	%	30 - 130
			Acridine	2017/09/26		94	%	30 - 130
			Anthracene	2017/09/26		83	%	30 - 130
			Benzo(a)anthracene	2017/09/26		86	%	30 - 130
			Benzo(a)pyrene	2017/09/26		68	%	30 - 130
			Benzo(b)fluoranthene	2017/09/26		64	%	30 - 130
			Benzo(g,h,i)perylene	2017/09/26		56	%	30 - 130
			Benzo(k)fluoranthene	2017/09/26		71	%	30 - 130
			Chrysene	2017/09/26		82	%	30 - 130
			Dibenz(a,h)anthracene	2017/09/26		51	%	30 - 130
			Fluoranthene	2017/09/26		85	%	30 - 130
			Fluorene	2017/09/26		71	%	30 - 130
			Indeno(1,2,3-cd)pyrene	2017/09/26		52	%	30 - 130
			Naphthalene	2017/09/26		59	%	30 - 130
			Perylene	2017/09/26		67	%	30 - 130
			Phenanthrene	2017/09/26		70	%	30 - 130
			Pyrene	2017/09/26		83	%	30 - 130
			Quinoline	2017/09/26		70	%	30 - 130
5180356	GTH	Spiked Blank	Benzo(j)fluoranthene	2017/09/26		78	%	30 - 130
			D10-Anthracene	2017/09/26		63	%	50 - 130
			D14-Terphenyl	2017/09/26		71	%	50 - 130
			D8-Acenaphthylene	2017/09/26		73	%	50 - 130
			1-Methylnaphthalene	2017/09/26		66	%	30 - 130
			2-Methylnaphthalene	2017/09/26		68	%	30 - 130
			Acenaphthene	2017/09/26		71	%	30 - 130

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			Acenaphthylene	2017/09/26		81	%	30 - 130
			Acridine	2017/09/26		92	%	30 - 130
			Anthracene	2017/09/26		79	%	30 - 130
			Benzo(a)anthracene	2017/09/26		81	%	30 - 130
			Benzo(a)pyrene	2017/09/26		75	%	30 - 130
			Benzo(b)fluoranthene	2017/09/26		67	%	30 - 130
			Benzo(g,h,i)perylene	2017/09/26		76	%	30 - 130
			Benzo(k)fluoranthene	2017/09/26		78	%	30 - 130
			Chrysene	2017/09/26		77	%	30 - 130
			Dibenz(a,h)anthracene	2017/09/26		76	%	30 - 130
			Fluoranthene	2017/09/26		80	%	30 - 130
			Fluorene	2017/09/26		77	%	30 - 130
			Indeno(1,2,3-cd)pyrene	2017/09/26		72	%	30 - 130
			Naphthalene	2017/09/26		64	%	30 - 130
			Perylene	2017/09/26		77	%	30 - 130
			Phenanthrene	2017/09/26		72	%	30 - 130
			Pyrene	2017/09/26		77	%	30 - 130
			Quinoline	2017/09/26		65	%	30 - 130
5180356	GTH	Method Blank	Benzo(j)fluoranthene	2017/09/26	<0.010		ug/L	
			D10-Anthracene	2017/09/26		88	%	50 - 130
			D14-Terphenyl	2017/09/26		89	%	50 - 130
			D8-Acenaphthylene	2017/09/26		79	%	50 - 130
			1-Methylnaphthalene	2017/09/26	<0.050		ug/L	
			2-Methylnaphthalene	2017/09/26	<0.050		ug/L	
			Acenaphthene	2017/09/26	<0.010		ug/L	
			Acenaphthylene	2017/09/26	<0.010		ug/L	
			Acridine	2017/09/26	<0.050		ug/L	
			Anthracene	2017/09/26	<0.010		ug/L	
			Benzo(a)anthracene	2017/09/26	<0.010		ug/L	
			Benzo(a)pyrene	2017/09/26	<0.010		ug/L	
			Benzo(b)fluoranthene	2017/09/26	<0.010		ug/L	
			Benzo(g,h,i)perylene	2017/09/26	<0.010		ug/L	
			Benzo(k)fluoranthene	2017/09/26	<0.010		ug/L	
			Chrysene	2017/09/26	<0.010		ug/L	
			Dibenz(a,h)anthracene	2017/09/26	<0.010		ug/L	
			Fluoranthene	2017/09/26	<0.010		ug/L	
			Fluorene	2017/09/26	<0.010		ug/L	
			Indeno(1,2,3-cd)pyrene	2017/09/26	<0.010		ug/L	
			Naphthalene	2017/09/26	<0.20		ug/L	
			Perylene	2017/09/26	<0.010		ug/L	
			Phenanthrene	2017/09/26	<0.010		ug/L	
			Pyrene	2017/09/26	<0.010		ug/L	
			Quinoline	2017/09/26	<0.050		ug/L	
5180356	GTH	RPD - Sample/Sample Dup	1-Methylnaphthalene	2017/09/26	7.3		%	40
			2-Methylnaphthalene	2017/09/26	NC		%	40
			Acenaphthene	2017/09/26	NC		%	40
			Acenaphthylene	2017/09/26	NC		%	40
			Acridine	2017/09/26	NC		%	40
			Anthracene	2017/09/26	NC		%	40
			Benzo(a)anthracene	2017/09/26	NC		%	40
			Benzo(a)pyrene	2017/09/26	NC		%	40
			Benzo(b)fluoranthene	2017/09/26	NC		%	40
			Benzo(g,h,i)perylene	2017/09/26	NC		%	40

Maxxam A Bureau Veritas Group Company

Success Through Science®

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			Benzo(k)fluoranthene	2017/09/26	NC		%	40
			Chrysene	2017/09/26	NC		%	40
			Dibenz(a,h)anthracene	2017/09/26	NC		%	40
			Fluoranthene	2017/09/26	NC		%	40
			Fluorene	2017/09/26	9.9		%	40
			Indeno(1,2,3-cd)pyrene	2017/09/26	NC		%	40
			Naphthalene	2017/09/26	NC		%	40
			Perylene	2017/09/26	NC		%	40
			Phenanthrene	2017/09/26	15		%	40
			Pyrene	2017/09/26	NC		%	40
			Quinoline	2017/09/26	NC		%	40
5180382	MLB	Matrix Spike	Acid Extractable Antimony (Sb)	2017/09/25		93	%	75 - 125
			Acid Extractable Arsenic (As)	2017/09/25		98	%	75 - 125
			Acid Extractable Barium (Ba)	2017/09/25		99	%	75 - 125
			Acid Extractable Beryllium (Be)	2017/09/25		100	%	75 - 125
			Acid Extractable Bismuth (Bi)	2017/09/25		102	%	75 - 125
			Acid Extractable Boron (B)	2017/09/25		97	%	75 - 125
			Acid Extractable Cadmium (Cd)	2017/09/25		100	%	75 - 125
			Acid Extractable Chromium (Cr)	2017/09/25		99	%	75 - 125
			Acid Extractable Cobalt (Co)	2017/09/25		99	%	75 - 125
			Acid Extractable Copper (Cu)	2017/09/25		98	%	75 - 125
			Acid Extractable Lead (Pb)	2017/09/25		95	%	75 - 125
			Acid Extractable Lithium (Li)	2017/09/25		109	%	75 - 125
			Acid Extractable Manganese (Mn)	2017/09/25		NC	%	75 - 125
			Acid Extractable Mercury (Hg)	2017/09/25		95	%	75 - 125
			Acid Extractable Molybdenum (Mo)	2017/09/25		97	%	75 - 125
			Acid Extractable Nickel (Ni)	2017/09/25		100	%	75 - 125
			Acid Extractable Rubidium (Rb)	2017/09/25		93	%	75 - 125
			Acid Extractable Selenium (Se)	2017/09/25		100	%	75 - 125
			Acid Extractable Silver (Ag)	2017/09/25		102	%	75 - 125
			Acid Extractable Strontium (Sr)	2017/09/25		101	%	75 - 125
			Acid Extractable Thallium (Tl)	2017/09/25		100	%	75 - 125
			Acid Extractable Tin (Sn)	2017/09/25		101	%	75 - 125
			Acid Extractable Uranium (U)	2017/09/25		96	%	75 - 125
			Acid Extractable Vanadium (V)	2017/09/25		96	%	75 - 125
			Acid Extractable Zinc (Zn)	2017/09/25		NC	%	75 - 125
5180382	MLB	Spiked Blank	Acid Extractable Antimony (Sb)	2017/09/25		99	%	75 - 125
			Acid Extractable Arsenic (As)	2017/09/25		100	%	75 - 125
			Acid Extractable Barium (Ba)	2017/09/25		97	%	75 - 125
			Acid Extractable Beryllium (Be)	2017/09/25		98	%	75 - 125
			Acid Extractable Bismuth (Bi)	2017/09/25		104	%	75 - 125
			Acid Extractable Boron (B)	2017/09/25		100	%	75 - 125
			Acid Extractable Cadmium (Cd)	2017/09/25		101	%	75 - 125
			Acid Extractable Chromium (Cr)	2017/09/25		97	%	75 - 125
			Acid Extractable Cobalt (Co)	2017/09/25		98	%	75 - 125
			Acid Extractable Copper (Cu)	2017/09/25		99	%	75 - 125
			Acid Extractable Lead (Pb)	2017/09/25		97	%	75 - 125
			Acid Extractable Lithium (Li)	2017/09/25		102	%	75 - 125
			Acid Extractable Manganese (Mn)	2017/09/25		101	%	75 - 125
			Acid Extractable Mercury (Hg)	2017/09/25		110	%	75 - 125
			Acid Extractable Molybdenum (Mo)	2017/09/25		99	%	75 - 125
			Acid Extractable Nickel (Ni)	2017/09/25		101	%	75 - 125
			Acid Extractable Rubidium (Rb)	2017/09/25		101	%	75 - 125

Maxxam Analytics International Corporation o/a Maxxam Analytics 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.maxxamanalytics.com

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			Acid Extractable Selenium (Se)	2017/09/25		101	%	75 - 125
			Acid Extractable Silver (Ag)	2017/09/25		101	%	75 - 125
			Acid Extractable Strontium (Sr)	2017/09/25		103	%	75 - 125
			Acid Extractable Thallium (Tl)	2017/09/25		102	%	75 - 125
			Acid Extractable Tin (Sn)	2017/09/25		107	%	75 - 125
			Acid Extractable Uranium (U)	2017/09/25		96	%	75 - 125
			Acid Extractable Vanadium (V)	2017/09/25		97	%	75 - 125
			Acid Extractable Zinc (Zn)	2017/09/25		102	%	75 - 125
5180382	MLB	Method Blank	Acid Extractable Aluminum (Al)	2017/09/25	<10		mg/kg	
			Acid Extractable Antimony (Sb)	2017/09/25	<2.0		mg/kg	
			Acid Extractable Arsenic (As)	2017/09/25	<2.0		mg/kg	
			Acid Extractable Barium (Ba)	2017/09/25	<5.0		mg/kg	
			Acid Extractable Beryllium (Be)	2017/09/25	<2.0		mg/kg	
			Acid Extractable Bismuth (Bi)	2017/09/25	<2.0		mg/kg	
			Acid Extractable Boron (B)	2017/09/25	<50		mg/kg	
			Acid Extractable Cadmium (Cd)	2017/09/25	<0.30		mg/kg	
			Acid Extractable Chromium (Cr)	2017/09/25	<2.0		mg/kg	
			Acid Extractable Cobalt (Co)	2017/09/25	<1.0		mg/kg	
			Acid Extractable Copper (Cu)	2017/09/25	<2.0		mg/kg	
			Acid Extractable Iron (Fe)	2017/09/25	<50		mg/kg	
			Acid Extractable Lead (Pb)	2017/09/25	<0.50		mg/kg	
			Acid Extractable Lithium (Li)	2017/09/25	<2.0		mg/kg	
			Acid Extractable Manganese (Mn)	2017/09/25	<2.0		mg/kg	
			Acid Extractable Mercury (Hg)	2017/09/25	<0.10		mg/kg	
			Acid Extractable Molybdenum (Mo)	2017/09/25	<2.0		mg/kg	
			Acid Extractable Nickel (Ni)	2017/09/25	<2.0		mg/kg	
			Acid Extractable Rubidium (Rb)	2017/09/25	<2.0		mg/kg	
			Acid Extractable Selenium (Se)	2017/09/25	<1.0		mg/kg	
			Acid Extractable Silver (Ag)	2017/09/25	<0.50		mg/kg	
			Acid Extractable Strontium (Sr)	2017/09/25	<5.0		mg/kg	
			Acid Extractable Thallium (Tl)	2017/09/25	<0.10		mg/kg	
			Acid Extractable Tin (Sn)	2017/09/25	<2.0		mg/kg	
			Acid Extractable Uranium (U)	2017/09/25	<0.10		mg/kg	
			Acid Extractable Vanadium (V)	2017/09/25	<2.0		mg/kg	
			Acid Extractable Zinc (Zn)	2017/09/25	<5.0		mg/kg	
5180382	MLB	RPD - Sample/Sample Dup	Acid Extractable Aluminum (Al)	2017/09/25	0.84		%	35
			Acid Extractable Antimony (Sb)	2017/09/25	NC		%	35
			Acid Extractable Arsenic (As)	2017/09/25	NC		%	35
			Acid Extractable Barium (Ba)	2017/09/25	0.33		%	35
			Acid Extractable Beryllium (Be)	2017/09/25	NC		%	35
			Acid Extractable Bismuth (Bi)	2017/09/25	NC		%	35
			Acid Extractable Boron (B)	2017/09/25	NC		%	35
			Acid Extractable Cadmium (Cd)	2017/09/25	NC		%	35
			Acid Extractable Chromium (Cr)	2017/09/25	NC		%	35
			Acid Extractable Cobalt (Co)	2017/09/25	NC		%	35
			Acid Extractable Copper (Cu)	2017/09/25	NC		%	35
			Acid Extractable Iron (Fe)	2017/09/25	1.7		%	35
			Acid Extractable Lead (Pb)	2017/09/25	27		%	35
			Acid Extractable Lithium (Li)	2017/09/25	9.6		%	35
			Acid Extractable Manganese (Mn)	2017/09/25	0.098		%	35
			Acid Extractable Mercury (Hg)	2017/09/25	NC		%	35
			Acid Extractable Molybdenum (Mo)	2017/09/25	NC		%	35
			Acid Extractable Nickel (Ni)	2017/09/25	NC		%	35

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			Acid Extractable Rubidium (Rb)	2017/09/25	4.1		%	35
			Acid Extractable Selenium (Se)	2017/09/25	NC		%	35
			Acid Extractable Silver (Ag)	2017/09/25	NC		%	35
			Acid Extractable Strontium (Sr)	2017/09/25	12		%	35
			Acid Extractable Thallium (Tl)	2017/09/25	2.9		%	35
			Acid Extractable Tin (Sn)	2017/09/25	NC		%	35
			Acid Extractable Uranium (U)	2017/09/25	NC		%	35
			Acid Extractable Vanadium (V)	2017/09/25	15		%	35
			Acid Extractable Zinc (Zn)	2017/09/25	1.3		%	35
5180804	JMV	QC Standard	pH	2017/09/25		101	%	97 - 103
5180804	JMV	RPD - Sample/Sample Dup	pH	2017/09/25	0.038		%	N/A
5180805	JMV	Spiked Blank	Conductivity	2017/09/25		102	%	80 - 120
5180805	JMV	Method Blank	Conductivity	2017/09/25	1.6, RDL=1.0		uS/cm	
5180805	JMV	RPD - Sample/Sample Dup	Conductivity	2017/09/25	2.1		%	25
5180823	YY	Matrix Spike(FDZ381)	4-Bromofluorobenzene	2017/09/29		100	%	60 - 140
			D10-o-Xylene	2017/09/29		96	%	60 - 130
			D4-1,2-Dichloroethane	2017/09/29		96	%	60 - 140
			D8-Toluene	2017/09/29		104	%	60 - 140
			Benzene	2017/09/29		108	%	60 - 140
			Ethylbenzene	2017/09/29		91	%	60 - 140
			Toluene	2017/09/29		102	%	60 - 140
			p+m-Xylene	2017/09/29		94	%	60 - 140
			o-Xylene	2017/09/29		92	%	60 - 140
			F1 (C6-C10)	2017/09/29		95	%	60 - 140
5180823	YY	Spiked Blank	4-Bromofluorobenzene	2017/09/29		102	%	60 - 140
			D10-o-Xylene	2017/09/29		88	%	60 - 130
			D4-1,2-Dichloroethane	2017/09/29		96	%	60 - 140
			D8-Toluene	2017/09/29		106	%	60 - 140
			Benzene	2017/09/29		105	%	60 - 130
			Ethylbenzene	2017/09/29		88	%	60 - 130
			Toluene	2017/09/29		99	%	60 - 130
			p+m-Xylene	2017/09/29		91	%	60 - 130
			o-Xylene	2017/09/29		91	%	60 - 130
			F1 (C6-C10)	2017/09/29		95	%	80 - 120
5180823	YY	Method Blank	4-Bromofluorobenzene	2017/09/29		90	%	60 - 140
			D10-o-Xylene	2017/09/29		77	%	60 - 130
			D4-1,2-Dichloroethane	2017/09/29		101	%	60 - 140
			D8-Toluene	2017/09/29		92	%	60 - 140
			Benzene	2017/09/29	<0.0060		ug/g	
			Ethylbenzene	2017/09/29	<0.010		ug/g	
			Toluene	2017/09/29	<0.020		ug/g	
			p+m-Xylene	2017/09/29	<0.020		ug/g	
			o-Xylene	2017/09/29	<0.020		ug/g	
			Total Xylenes	2017/09/29	<0.020		ug/g	
			F1 (C6-C10)	2017/09/29	<10		ug/g	
			F1 (C6-C10) - BTEX	2017/09/29	<10		ug/g	
5180823	YY	RPD - Sample/Sample Dup	Benzene	2017/09/29	NC		%	50
			Ethylbenzene	2017/09/29	NC		%	50
			Toluene	2017/09/29	NC		%	50
			p+m-Xylene	2017/09/29	NC		%	50
			o-Xylene	2017/09/29	NC		%	50
			Total Xylenes	2017/09/29	NC		%	50

Maxxam
A Bureau Veritas Group Company

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			F1 (C6-C10)	2017/09/29	NC		%	30
			F1 (C6-C10) - BTEX	2017/09/29	NC		%	30
5181954	JMV	QC Standard	pH	2017/09/26		100	%	97 - 103
5181954	JMV	RPD - Sample/Sample Dup	pH	2017/09/26	0.11		%	N/A
5181955	JMV	Spiked Blank	Conductivity	2017/09/26		103	%	80 - 120
5181955	JMV	Method Blank	Conductivity	2017/09/26	1.5, RDL=1.0		uS/cm	
5181955	JMV	RPD - Sample/Sample Dup	Conductivity	2017/09/26	0.70		%	25
5182076	YY	Matrix Spike	4-Bromofluorobenzene	2017/09/27		100	%	60 - 140
			D10-o-Xylene	2017/09/27		95	%	60 - 130
			D4-1,2-Dichloroethane	2017/09/27		92	%	60 - 140
			D8-Toluene	2017/09/27		105	%	60 - 140
			Benzene	2017/09/27		105	%	60 - 140
			Ethylbenzene	2017/09/27		95	%	60 - 140
			Toluene	2017/09/27		103	%	60 - 140
			p+m-Xylene	2017/09/27		100	%	60 - 140
			o-Xylene	2017/09/27		97	%	60 - 140
			F1 (C6-C10)	2017/09/27		108	%	60 - 140
5182076	YY	Spiked Blank	4-Bromofluorobenzene	2017/09/27		102	%	60 - 140
			D10-o-Xylene	2017/09/27		94	%	60 - 130
			D4-1,2-Dichloroethane	2017/09/27		97	%	60 - 140
			D8-Toluene	2017/09/27		104	%	60 - 140
			Benzene	2017/09/27		105	%	60 - 130
			Ethylbenzene	2017/09/27		91	%	60 - 130
			Toluene	2017/09/27		100	%	60 - 130
			p+m-Xylene	2017/09/27		95	%	60 - 130
			o-Xylene	2017/09/27		94	%	60 - 130
			F1 (C6-C10)	2017/09/27		96	%	80 - 120
5182076	YY	Method Blank	4-Bromofluorobenzene	2017/09/27		93	%	60 - 140
			D10-o-Xylene	2017/09/27		82	%	60 - 130
			D4-1,2-Dichloroethane	2017/09/27		97	%	60 - 140
			D8-Toluene	2017/09/27		93	%	60 - 140
			Benzene	2017/09/27	<0.0060		ug/g	
			Ethylbenzene	2017/09/27	<0.010		ug/g	
			Toluene	2017/09/27	<0.020		ug/g	
			p+m-Xylene	2017/09/27	<0.020		ug/g	
			o-Xylene	2017/09/27	<0.020		ug/g	
			Total Xylenes	2017/09/27	<0.020		ug/g	
			F1 (C6-C10)	2017/09/27	<10		ug/g	
			F1 (C6-C10) - BTEX	2017/09/27	<10		ug/g	
5182076	YY	RPD - Sample/Sample Dup	Benzene	2017/09/27	NC		%	50
			Ethylbenzene	2017/09/27	NC		%	50
			Toluene	2017/09/27	NC		%	50
			p+m-Xylene	2017/09/27	NC		%	50
			o-Xylene	2017/09/27	NC		%	50
			Total Xylenes	2017/09/27	NC		%	50
			F1 (C6-C10)	2017/09/27	NC		%	30
			F1 (C6-C10) - BTEX	2017/09/27	NC		%	30
5182128	CBR	Matrix Spike	Decachlorobiphenyl	2017/09/28		85	%	30 - 130
			Aroclor 1254	2017/09/28		97	%	30 - 130
5182128	CBR	Spiked Blank	Decachlorobiphenyl	2017/09/28		96	%	30 - 130
			Aroclor 1254	2017/09/28		100	%	30 - 130
5182128	CBR	Method Blank	Decachlorobiphenyl	2017/09/28		91	%	30 - 130

Maxxam
A Bureau Veritas Group Company

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			Aroclor 1016	2017/09/28	<0.050		ug/g	
			Aroclor 1221	2017/09/28	<0.050		ug/g	
			Aroclor 1232	2017/09/28	<0.050		ug/g	
			Aroclor 1248	2017/09/28	<0.050		ug/g	
			Aroclor 1242	2017/09/28	<0.050		ug/g	
			Aroclor 1254	2017/09/28	<0.050		ug/g	
			Aroclor 1260	2017/09/28	<0.050		ug/g	
5182128	CBR	RPD - Sample/Sample Dup	Aroclor 1016	2017/09/28	NC		%	50
			Aroclor 1221	2017/09/28	NC		%	50
			Aroclor 1232	2017/09/28	NC		%	50
			Aroclor 1248	2017/09/28	NC		%	50
			Aroclor 1242	2017/09/28	NC		%	50
			Aroclor 1254	2017/09/28	NC		%	50
			Aroclor 1260	2017/09/28	NC		%	50
5182564	KH2	Matrix Spike(FDZ421)	4-Bromofluorobenzene	2017/09/28		97	%	60 - 140
			D10-o-Xylene	2017/09/28		86	%	60 - 130
			D4-1,2-Dichloroethane	2017/09/28		100	%	60 - 140
			D8-Toluene	2017/09/28		101	%	60 - 140
			Benzene	2017/09/28		105	%	60 - 140
			Ethylbenzene	2017/09/28		95	%	60 - 140
			Toluene	2017/09/28		96	%	60 - 140
			p+m-Xylene	2017/09/28		92	%	60 - 140
			o-Xylene	2017/09/28		92	%	60 - 140
			F1 (C6-C10)	2017/09/28		87	%	60 - 140
5182564	KH2	Spiked Blank	4-Bromofluorobenzene	2017/09/28		97	%	60 - 140
			D10-o-Xylene	2017/09/28		93	%	60 - 130
			D4-1,2-Dichloroethane	2017/09/28		102	%	60 - 140
			D8-Toluene	2017/09/28		102	%	60 - 140
			Benzene	2017/09/28		105	%	60 - 130
			Ethylbenzene	2017/09/28		93	%	60 - 130
			Toluene	2017/09/28		96	%	60 - 130
			p+m-Xylene	2017/09/28		91	%	60 - 130
			o-Xylene	2017/09/28		92	%	60 - 130
			F1 (C6-C10)	2017/09/28		91	%	80 - 120
5182564	KH2	Method Blank	4-Bromofluorobenzene	2017/09/28		90	%	60 - 140
			D10-o-Xylene	2017/09/28		75	%	60 - 130
			D4-1,2-Dichloroethane	2017/09/28		104	%	60 - 140
			D8-Toluene	2017/09/28		99	%	60 - 140
			Benzene	2017/09/28	<0.0060		ug/g	
			Ethylbenzene	2017/09/28	<0.010		ug/g	
			Toluene	2017/09/28	<0.020		ug/g	
			p+m-Xylene	2017/09/28	<0.020		ug/g	
			o-Xylene	2017/09/28	<0.020		ug/g	
			Total Xylenes	2017/09/28	<0.020		ug/g	
			F1 (C6-C10)	2017/09/28	<10		ug/g	
			F1 (C6-C10) - BTEX	2017/09/28	<10		ug/g	
5182564	KH2	RPD - Sample/Sample Dup	Benzene	2017/09/29	NC		%	50
			Ethylbenzene	2017/09/29	NC		%	50
			Toluene	2017/09/29	NC		%	50
			p+m-Xylene	2017/09/29	NC		%	50
			o-Xylene	2017/09/29	NC		%	50
			Total Xylenes	2017/09/29	NC		%	50
			F1 (C6-C10)	2017/09/29	NC		%	30

Maxxam
A Bureau Veritas Group Company

Success Through Science®

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			F1 (C6-C10) - BTEX	2017/09/29	NC		%	30
5182817	XJI	Matrix Spike(FDZ462)	4-Bromofluorobenzene	2017/09/29		96	%	60 - 140
			D10-o-Xylene	2017/09/29		87	%	60 - 130
			D4-1,2-Dichloroethane	2017/09/29		104	%	60 - 140
			D8-Toluene	2017/09/29		102	%	60 - 140
			Benzene	2017/09/29		104	%	60 - 140
			Ethylbenzene	2017/09/29		91	%	60 - 140
			Toluene	2017/09/29		95	%	60 - 140
			p+m-Xylene	2017/09/29		88	%	60 - 140
			o-Xylene	2017/09/29		89	%	60 - 140
			F1 (C6-C10)	2017/09/29		94	%	60 - 140
5182817	XJI	Spiked Blank	4-Bromofluorobenzene	2017/09/29		96	%	60 - 140
			D10-o-Xylene	2017/09/29		87	%	60 - 130
			D4-1,2-Dichloroethane	2017/09/29		102	%	60 - 140
			D8-Toluene	2017/09/29		102	%	60 - 140
			Benzene	2017/09/29		109	%	60 - 130
			Ethylbenzene	2017/09/29		97	%	60 - 130
			Toluene	2017/09/29		100	%	60 - 130
			p+m-Xylene	2017/09/29		93	%	60 - 130
			o-Xylene	2017/09/29		94	%	60 - 130
			F1 (C6-C10)	2017/09/29		93	%	80 - 120
5182817	XJI	Method Blank	4-Bromofluorobenzene	2017/09/29		90	%	60 - 140
			D10-o-Xylene	2017/09/29		79	%	60 - 130
			D4-1,2-Dichloroethane	2017/09/29		105	%	60 - 140
			D8-Toluene	2017/09/29		98	%	60 - 140
			Benzene	2017/09/29	<0.0060		ug/g	
			Ethylbenzene	2017/09/29	<0.010		ug/g	
			Toluene	2017/09/29	<0.020		ug/g	
			p+m-Xylene	2017/09/29	<0.020		ug/g	
			o-Xylene	2017/09/29	<0.020		ug/g	
			Total Xylenes	2017/09/29	<0.020		ug/g	
			F1 (C6-C10)	2017/09/29	<10		ug/g	
			F1 (C6-C10) - BTEX	2017/09/29	<10		ug/g	
5182817	XJI	RPD - Sample/Sample Dup	Benzene	2017/09/30	2.4		%	50
			Ethylbenzene	2017/09/30	NC		%	50
			Toluene	2017/09/30	NC		%	50
			p+m-Xylene	2017/09/30	NC		%	50
			o-Xylene	2017/09/30	NC		%	50
			Total Xylenes	2017/09/30	NC		%	50
			F1 (C6-C10)	2017/09/30	NC		%	30
			F1 (C6-C10) - BTEX	2017/09/30	NC		%	30
5184410	ZZ	Matrix Spike	o-Terphenyl	2017/09/28		89	%	60 - 130
			F2 (C10-C16 Hydrocarbons)	2017/09/28		96	%	50 - 130
			F3 (C16-C34 Hydrocarbons)	2017/09/28		94	%	50 - 130
			F4 (C34-C50 Hydrocarbons)	2017/09/28		95	%	50 - 130
5184410	ZZ	Spiked Blank	o-Terphenyl	2017/09/28		90	%	60 - 130
			F2 (C10-C16 Hydrocarbons)	2017/09/28		97	%	80 - 120
			F3 (C16-C34 Hydrocarbons)	2017/09/28		94	%	80 - 120
			F4 (C34-C50 Hydrocarbons)	2017/09/28		95	%	80 - 120
5184410	ZZ	Method Blank	o-Terphenyl	2017/09/28		88	%	60 - 130
			F2 (C10-C16 Hydrocarbons)	2017/09/28	<10		ug/g	
			F3 (C16-C34 Hydrocarbons)	2017/09/28	<50		ug/g	
			F4 (C34-C50 Hydrocarbons)	2017/09/28	<50		ug/g	

Maxxam Analytics International Corporation o/a Maxxam Analytics 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.maxxamanalytics.com

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
5184410	ZZ	RPD - Sample/Sample Dup	F2 (C10-C16 Hydrocarbons)	2017/09/28	NC		%	30
			F3 (C16-C34 Hydrocarbons)	2017/09/28	NC		%	30
			F4 (C34-C50 Hydrocarbons)	2017/09/28	NC		%	30
5184575	BAN	Matrix Spike	Total Aluminum (Al)	2017/09/28		95	%	80 - 120
			Total Antimony (Sb)	2017/09/28		101	%	80 - 120
			Total Arsenic (As)	2017/09/28		93	%	80 - 120
			Total Barium (Ba)	2017/09/28		95	%	80 - 120
			Total Beryllium (Be)	2017/09/28		92	%	80 - 120
			Total Bismuth (Bi)	2017/09/28		100	%	80 - 120
			Total Boron (B)	2017/09/28		90	%	80 - 120
			Total Cadmium (Cd)	2017/09/28		97	%	80 - 120
			Total Calcium (Ca)	2017/09/28		100	%	80 - 120
			Total Chromium (Cr)	2017/09/28		94	%	80 - 120
			Total Cobalt (Co)	2017/09/28		96	%	80 - 120
			Total Copper (Cu)	2017/09/28		94	%	80 - 120
			Total Iron (Fe)	2017/09/28		99	%	80 - 120
			Total Lead (Pb)	2017/09/28		95	%	80 - 120
			Total Magnesium (Mg)	2017/09/28		98	%	80 - 120
			Total Manganese (Mn)	2017/09/28		95	%	80 - 120
			Total Molybdenum (Mo)	2017/09/28		101	%	80 - 120
			Total Nickel (Ni)	2017/09/28		95	%	80 - 120
			Total Phosphorus (P)	2017/09/28		100	%	80 - 120
			Total Potassium (K)	2017/09/28		99	%	80 - 120
			Total Selenium (Se)	2017/09/28		94	%	80 - 120
			Total Silver (Ag)	2017/09/28		96	%	80 - 120
			Total Sodium (Na)	2017/09/28		94	%	80 - 120
			Total Strontium (Sr)	2017/09/28		98	%	80 - 120
			Total Thallium (Tl)	2017/09/28		101	%	80 - 120
			Total Tin (Sn)	2017/09/28		105	%	80 - 120
			Total Titanium (Ti)	2017/09/28		94	%	80 - 120
			Total Uranium (U)	2017/09/28		105	%	80 - 120
			Total Vanadium (V)	2017/09/28		94	%	80 - 120
			Total Zinc (Zn)	2017/09/28		97	%	80 - 120
5184575	BAN	Spiked Blank	Total Aluminum (Al)	2017/09/28		96	%	80 - 120
			Total Antimony (Sb)	2017/09/28		103	%	80 - 120
			Total Arsenic (As)	2017/09/28		94	%	80 - 120
			Total Barium (Ba)	2017/09/28		95	%	80 - 120
			Total Beryllium (Be)	2017/09/28		94	%	80 - 120
			Total Bismuth (Bi)	2017/09/28		103	%	80 - 120
			Total Boron (B)	2017/09/28		93	%	80 - 120
			Total Cadmium (Cd)	2017/09/28		98	%	80 - 120
			Total Calcium (Ca)	2017/09/28		102	%	80 - 120
			Total Chromium (Cr)	2017/09/28		96	%	80 - 120
			Total Cobalt (Co)	2017/09/28		98	%	80 - 120
			Total Copper (Cu)	2017/09/28		95	%	80 - 120
			Total Iron (Fe)	2017/09/28		100	%	80 - 120
			Total Lead (Pb)	2017/09/28		97	%	80 - 120
			Total Magnesium (Mg)	2017/09/28		99	%	80 - 120
			Total Manganese (Mn)	2017/09/28		98	%	80 - 120
			Total Molybdenum (Mo)	2017/09/28		105	%	80 - 120
			Total Nickel (Ni)	2017/09/28		98	%	80 - 120
			Total Phosphorus (P)	2017/09/28		100	%	80 - 120
			Total Potassium (K)	2017/09/28		100	%	80 - 120

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			Total Selenium (Se)	2017/09/28		96	%	80 - 120
			Total Silver (Ag)	2017/09/28		101	%	80 - 120
			Total Sodium (Na)	2017/09/28		96	%	80 - 120
			Total Strontium (Sr)	2017/09/28		99	%	80 - 120
			Total Thallium (Tl)	2017/09/28		103	%	80 - 120
			Total Tin (Sn)	2017/09/28		106	%	80 - 120
			Total Titanium (Ti)	2017/09/28		98	%	80 - 120
			Total Uranium (U)	2017/09/28		106	%	80 - 120
			Total Vanadium (V)	2017/09/28		96	%	80 - 120
			Total Zinc (Zn)	2017/09/28		98	%	80 - 120
5184575	BAN	Method Blank	Total Aluminum (Al)	2017/09/28	<5.0		ug/L	
			Total Antimony (Sb)	2017/09/28	<1.0		ug/L	
			Total Arsenic (As)	2017/09/28	<1.0		ug/L	
			Total Barium (Ba)	2017/09/28	<1.0		ug/L	
			Total Beryllium (Be)	2017/09/28	<1.0		ug/L	
			Total Bismuth (Bi)	2017/09/28	<2.0		ug/L	
			Total Boron (B)	2017/09/28	<50		ug/L	
			Total Cadmium (Cd)	2017/09/28	<0.010		ug/L	
			Total Calcium (Ca)	2017/09/28	<100		ug/L	
			Total Chromium (Cr)	2017/09/28	<1.0		ug/L	
			Total Cobalt (Co)	2017/09/28	<0.40		ug/L	
			Total Copper (Cu)	2017/09/28	<2.0		ug/L	
			Total Iron (Fe)	2017/09/28	<50		ug/L	
			Total Lead (Pb)	2017/09/28	<0.50		ug/L	
			Total Magnesium (Mg)	2017/09/28	<100		ug/L	
			Total Manganese (Mn)	2017/09/28	<2.0		ug/L	
			Total Molybdenum (Mo)	2017/09/28	<2.0		ug/L	
			Total Nickel (Ni)	2017/09/28	<2.0		ug/L	
			Total Phosphorus (P)	2017/09/28	<100		ug/L	
			Total Potassium (K)	2017/09/28	<100		ug/L	
			Total Selenium (Se)	2017/09/28	<1.0		ug/L	
			Total Silver (Ag)	2017/09/28	<0.10		ug/L	
			Total Sodium (Na)	2017/09/28	<100		ug/L	
			Total Strontium (Sr)	2017/09/28	<2.0		ug/L	
			Total Thallium (Tl)	2017/09/28	<0.10		ug/L	
			Total Tin (Sn)	2017/09/28	<2.0		ug/L	
			Total Titanium (Ti)	2017/09/28	<2.0		ug/L	
			Total Uranium (U)	2017/09/28	<0.10		ug/L	
			Total Vanadium (V)	2017/09/28	<2.0		ug/L	
			Total Zinc (Zn)	2017/09/28	<5.0		ug/L	
5184575	BAN	RPD - Sample/Sample Dup	Total Aluminum (Al)	2017/09/28	NC		%	20
			Total Antimony (Sb)	2017/09/28	NC		%	20
			Total Arsenic (As)	2017/09/28	1.4		%	20
			Total Barium (Ba)	2017/09/28	1.2		%	20
			Total Beryllium (Be)	2017/09/28	NC		%	20
			Total Bismuth (Bi)	2017/09/28	NC		%	20
			Total Boron (B)	2017/09/28	0.94		%	20
			Total Cadmium (Cd)	2017/09/28	NC		%	20
			Total Calcium (Ca)	2017/09/28	0.98		%	20
			Total Chromium (Cr)	2017/09/28	NC		%	20
			Total Cobalt (Co)	2017/09/28	NC		%	20
			Total Copper (Cu)	2017/09/28	NC		%	20
			Total Iron (Fe)	2017/09/28	3.1		%	20

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			Total Lead (Pb)	2017/09/28	NC		%	20
			Total Magnesium (Mg)	2017/09/28	1.0		%	20
			Total Manganese (Mn)	2017/09/28	1.5		%	20
			Total Molybdenum (Mo)	2017/09/28	5.7		%	20
			Total Nickel (Ni)	2017/09/28	NC		%	20
			Total Phosphorus (P)	2017/09/28	NC		%	20
			Total Potassium (K)	2017/09/28	0.97		%	20
			Total Selenium (Se)	2017/09/28	NC		%	20
			Total Silver (Ag)	2017/09/28	NC		%	20
			Total Sodium (Na)	2017/09/28	1.2		%	20
			Total Strontium (Sr)	2017/09/28	1.4		%	20
			Total Thallium (Tl)	2017/09/28	NC		%	20
			Total Tin (Sn)	2017/09/28	NC		%	20
			Total Titanium (Ti)	2017/09/28	NC		%	20
			Total Uranium (U)	2017/09/28	1.4		%	20
			Total Vanadium (V)	2017/09/28	NC		%	20
			Total Zinc (Zn)	2017/09/28	NC		%	20
5184588	DBF	RPD - Sample/Sample Dup	Moisture	2017/09/27	7.7		%	25
5184592	KLI	Matrix Spike(FDZ384)	o-Terphenyl	2017/10/03		94	%	60 - 130
			F2 (C10-C16 Hydrocarbons)	2017/10/03		95	%	50 - 130
			F3 (C16-C34 Hydrocarbons)	2017/10/03		101	%	50 - 130
			F4 (C34-C50 Hydrocarbons)	2017/10/03		98	%	50 - 130
5184592	KLI	Spiked Blank	o-Terphenyl	2017/10/03		85	%	60 - 130
			F2 (C10-C16 Hydrocarbons)	2017/10/03		95	%	80 - 120
			F3 (C16-C34 Hydrocarbons)	2017/10/03		96	%	80 - 120
			F4 (C34-C50 Hydrocarbons)	2017/10/03		93	%	80 - 120
5184592	KLI	Method Blank	o-Terphenyl	2017/10/03		93	%	60 - 130
			F2 (C10-C16 Hydrocarbons)	2017/10/03	<10		ug/g	
			F3 (C16-C34 Hydrocarbons)	2017/10/03	<50		ug/g	
			F4 (C34-C50 Hydrocarbons)	2017/10/03	<50		ug/g	
5184592	KLI	RPD - Sample/Sample Dup	F2 (C10-C16 Hydrocarbons)	2017/10/03	NC		%	30
			F3 (C16-C34 Hydrocarbons)	2017/10/03	NC		%	30
			F4 (C34-C50 Hydrocarbons)	2017/10/03	NC		%	30
5184797	JHY	RPD - Sample/Sample Dup	Moisture	2017/09/27	2.8		%	25
5184947	DBF	RPD - Sample/Sample Dup	Moisture	2017/09/28	8.1		%	25
5185061	RST	Matrix Spike	D10-Anthracene	2017/10/06		73	%	50 - 130
			D14-Terphenyl	2017/10/06		71	%	50 - 130
			D8-Acenaphthylene	2017/10/06		72	%	50 - 130
			1-Methylnaphthalene	2017/10/06		66	%	30 - 130
			2-Methylnaphthalene	2017/10/06		69	%	30 - 130
			Acenaphthene	2017/10/06		69	%	30 - 130
			Acenaphthylene	2017/10/06		78	%	30 - 130
			Anthracene	2017/10/06		83	%	30 - 130
			Benzo(a)anthracene	2017/10/06		79	%	30 - 130
			Benzo(a)pyrene	2017/10/06		72	%	30 - 130
			Benzo(b)fluoranthene	2017/10/06		75	%	30 - 130
			Benzo(g,h,i)perylene	2017/10/06		73	%	30 - 130
			Benzo(j)fluoranthene	2017/10/06		75	%	30 - 130
			Benzo(k)fluoranthene	2017/10/06		77	%	30 - 130
			Chrysene	2017/10/06		73	%	30 - 130
			Dibenz(a,h)anthracene	2017/10/06		73	%	30 - 130
			Fluoranthene	2017/10/06		83	%	30 - 130
			Fluorene	2017/10/06		78	%	30 - 130

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			Indeno(1,2,3-cd)pyrene	2017/10/06		71	%	30 - 130
			Naphthalene	2017/10/06		68	%	30 - 130
			Perylene	2017/10/06		73	%	30 - 130
			Phenanthrene	2017/10/06		75	%	30 - 130
			Pyrene	2017/10/06		83	%	30 - 130
5185061	RST	Spiked Blank	D10-Anthracene	2017/10/05		85	%	50 - 130
			D14-Terphenyl	2017/10/05		88	%	50 - 130
			D8-Acenaphthylene	2017/10/05		86	%	50 - 130
			1-Methylnaphthalene	2017/10/05		84	%	30 - 130
			2-Methylnaphthalene	2017/10/05		91	%	30 - 130
			Acenaphthene	2017/10/05		92	%	30 - 130
			Acenaphthylene	2017/10/05		94	%	30 - 130
			Anthracene	2017/10/05		98	%	30 - 130
			Benzo(a)anthracene	2017/10/05		94	%	30 - 130
			Benzo(a)pyrene	2017/10/05		88	%	30 - 130
			Benzo(b)fluoranthene	2017/10/05		91	%	30 - 130
			Benzo(g,h,i)perylene	2017/10/05		86	%	30 - 130
			Benzo(j)fluoranthene	2017/10/05		90	%	30 - 130
			Benzo(k)fluoranthene	2017/10/05		95	%	30 - 130
			Chrysene	2017/10/05		90	%	30 - 130
			Dibenz(a,h)anthracene	2017/10/05		82	%	30 - 130
			Fluoranthene	2017/10/05		98	%	30 - 130
			Fluorene	2017/10/05		94	%	30 - 130
			Indeno(1,2,3-cd)pyrene	2017/10/05		83	%	30 - 130
			Naphthalene	2017/10/05		88	%	30 - 130
			Perylene	2017/10/05		89	%	30 - 130
			Phenanthrene	2017/10/05		88	%	30 - 130
			Pyrene	2017/10/05		98	%	30 - 130
5185061	RST	Method Blank	D10-Anthracene	2017/10/05		85	%	50 - 130
			D14-Terphenyl	2017/10/05		83	%	50 - 130
			D8-Acenaphthylene	2017/10/05		80	%	50 - 130
			1-Methylnaphthalene	2017/10/05	<0.0050		mg/kg	
			2-Methylnaphthalene	2017/10/05	<0.0050		mg/kg	
			Acenaphthene	2017/10/05	<0.0050		mg/kg	
			Acenaphthylene	2017/10/05	<0.0050		mg/kg	
			Anthracene	2017/10/05	<0.0050		mg/kg	
			Benzo(a)anthracene	2017/10/05	<0.0050		mg/kg	
			Benzo(a)pyrene	2017/10/05	<0.0050		mg/kg	
			Benzo(b)fluoranthene	2017/10/05	<0.0050		mg/kg	
			Benzo(g,h,i)perylene	2017/10/05	<0.0050		mg/kg	
			Benzo(j)fluoranthene	2017/10/05	<0.0050		mg/kg	
			Benzo(k)fluoranthene	2017/10/05	<0.0050		mg/kg	
			Chrysene	2017/10/05	<0.0050		mg/kg	
			Dibenz(a,h)anthracene	2017/10/05	<0.0050		mg/kg	
			Fluoranthene	2017/10/05	<0.0050		mg/kg	
			Fluorene	2017/10/05	<0.0050		mg/kg	
			Indeno(1,2,3-cd)pyrene	2017/10/05	<0.0050		mg/kg	
			Naphthalene	2017/10/05	<0.0050		mg/kg	
			Perylene	2017/10/05	<0.0050		mg/kg	
			Phenanthrene	2017/10/05	<0.0050		mg/kg	
			Pyrene	2017/10/05	<0.0050		mg/kg	
5185061	RST	RPD - Sample/Sample Dup	1-Methylnaphthalene	2017/10/06	NC		%	50
			2-Methylnaphthalene	2017/10/06	NC		%	50

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			Acenaphthene	2017/10/06	NC		%	50
			Acenaphthylene	2017/10/06	NC		%	50
			Anthracene	2017/10/06	NC		%	50
			Benzo(a)anthracene	2017/10/06	NC		%	50
			Benzo(a)pyrene	2017/10/06	NC		%	50
			Benzo(b)fluoranthene	2017/10/06	NC		%	50
			Benzo(g,h,i)perylene	2017/10/06	NC		%	50
			Benzo(j)fluoranthene	2017/10/06	NC		%	50
			Benzo(k)fluoranthene	2017/10/06	NC		%	50
			Chrysene	2017/10/06	NC		%	50
			Dibenz(a,h)anthracene	2017/10/06	NC		%	50
			Fluoranthene	2017/10/06	143 (2)		%	50
			Fluorene	2017/10/06	NC		%	50
			Indeno(1,2,3-cd)pyrene	2017/10/06	NC		%	50
			Naphthalene	2017/10/06	NC		%	50
			Perylene	2017/10/06	NC		%	50
			Phenanthrene	2017/10/06	148 (2)		%	50
			Pyrene	2017/10/06	122 (2)		%	50
5185066	GTH	Matrix Spike(FDZ383)	D10-Anthracene	2017/10/03		77	%	50 - 130
			D14-Terphenyl	2017/10/03		83	%	50 - 130
			D8-Acenaphthylene	2017/10/03		76	%	50 - 130
			1-Methylnaphthalene	2017/10/03		80	%	30 - 130
			2-Methylnaphthalene	2017/10/03		87	%	30 - 130
			Acenaphthene	2017/10/03		92	%	30 - 130
			Acenaphthylene	2017/10/03		83	%	30 - 130
			Anthracene	2017/10/03		88	%	30 - 130
			Benzo(a)anthracene	2017/10/03		89	%	30 - 130
			Benzo(a)pyrene	2017/10/03		86	%	30 - 130
			Benzo(b)fluoranthene	2017/10/03		93	%	30 - 130
			Benzo(g,h,i)perylene	2017/10/03		91	%	30 - 130
			Benzo(j)fluoranthene	2017/10/03		91	%	30 - 130
			Benzo(k)fluoranthene	2017/10/03		93	%	30 - 130
			Chrysene	2017/10/03		84	%	30 - 130
			Dibenz(a,h)anthracene	2017/10/03		88	%	30 - 130
			Fluoranthene	2017/10/03		94	%	30 - 130
			Fluorene	2017/10/03		89	%	30 - 130
			Indeno(1,2,3-cd)pyrene	2017/10/03		86	%	30 - 130
			Naphthalene	2017/10/03		84	%	30 - 130
			Perylene	2017/10/03		84	%	30 - 130
			Phenanthrene	2017/10/03		90	%	30 - 130
			Pyrene	2017/10/03		90	%	30 - 130
5185066	GTH	Spiked Blank	D10-Anthracene	2017/10/03		77	%	50 - 130
			D14-Terphenyl	2017/10/03		85	%	50 - 130
			D8-Acenaphthylene	2017/10/03		77	%	50 - 130
			1-Methylnaphthalene	2017/10/03		84	%	30 - 130
			2-Methylnaphthalene	2017/10/03		90	%	30 - 130
			Acenaphthene	2017/10/03		95	%	30 - 130
			Acenaphthylene	2017/10/03		84	%	30 - 130
			Anthracene	2017/10/03		90	%	30 - 130
			Benzo(a)anthracene	2017/10/03		91	%	30 - 130
			Benzo(a)pyrene	2017/10/03		90	%	30 - 130
			Benzo(b)fluoranthene	2017/10/03		96	%	30 - 130
			Benzo(g,h,i)perylene	2017/10/03		97	%	30 - 130

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			Benzo(j)fluoranthene	2017/10/03		94	%	30 - 130
			Benzo(k)fluoranthene	2017/10/03		93	%	30 - 130
			Chrysene	2017/10/03		87	%	30 - 130
			Dibenz(a,h)anthracene	2017/10/03		91	%	30 - 130
			Fluoranthene	2017/10/03		95	%	30 - 130
			Fluorene	2017/10/03		93	%	30 - 130
			Indeno(1,2,3-cd)pyrene	2017/10/03		90	%	30 - 130
			Naphthalene	2017/10/03		87	%	30 - 130
			Perylene	2017/10/03		89	%	30 - 130
			Phenanthrene	2017/10/03		93	%	30 - 130
			Pyrene	2017/10/03		91	%	30 - 130
5185066	GTH	Method Blank	D10-Anthracene	2017/10/03		85	%	50 - 130
			D14-Terphenyl	2017/10/03		82	%	50 - 130
			D8-Acenaphthylene	2017/10/03		79	%	50 - 130
			1-Methylnaphthalene	2017/10/03	<0.0050		mg/kg	
			2-Methylnaphthalene	2017/10/03	<0.0050		mg/kg	
			Acenaphthene	2017/10/03	<0.0050		mg/kg	
			Acenaphthylene	2017/10/03	<0.0050		mg/kg	
			Anthracene	2017/10/03	<0.0050		mg/kg	
			Benzo(a)anthracene	2017/10/03	<0.0050		mg/kg	
			Benzo(a)pyrene	2017/10/03	<0.0050		mg/kg	
			Benzo(b)fluoranthene	2017/10/03	<0.0050		mg/kg	
			Benzo(g,h,i)perylene	2017/10/03	<0.0050		mg/kg	
			Benzo(j)fluoranthene	2017/10/03	<0.0050		mg/kg	
			Benzo(k)fluoranthene	2017/10/03	<0.0050		mg/kg	
			Chrysene	2017/10/03	<0.0050		mg/kg	
			Dibenz(a,h)anthracene	2017/10/03	<0.0050		mg/kg	
			Fluoranthene	2017/10/03	<0.0050		mg/kg	
			Fluorene	2017/10/03	<0.0050		mg/kg	
			Indeno(1,2,3-cd)pyrene	2017/10/03	<0.0050		mg/kg	
			Naphthalene	2017/10/03	<0.0050		mg/kg	
			Perylene	2017/10/03	<0.0050		mg/kg	
			Phenanthrene	2017/10/03	<0.0050		mg/kg	
			Pyrene	2017/10/03	<0.0050		mg/kg	
5185066	GTH	RPD - Sample/Sample Dup	1-Methylnaphthalene	2017/10/03	NC		%	50
			2-Methylnaphthalene	2017/10/03	NC		%	50
			Acenaphthene	2017/10/03	NC		%	50
			Acenaphthylene	2017/10/03	NC		%	50
			Anthracene	2017/10/03	NC		%	50
			Benzo(a)anthracene	2017/10/03	NC		%	50
			Benzo(a)pyrene	2017/10/03	NC		%	50
			Benzo(b)fluoranthene	2017/10/03	NC		%	50
			Benzo(g,h,i)perylene	2017/10/03	NC		%	50
			Benzo(j)fluoranthene	2017/10/03	NC		%	50
			Benzo(k)fluoranthene	2017/10/03	NC		%	50
			Chrysene	2017/10/03	NC		%	50
			Dibenz(a,h)anthracene	2017/10/03	NC		%	50
			Fluoranthene	2017/10/03	23		%	50
			Fluorene	2017/10/03	NC		%	50
			Indeno(1,2,3-cd)pyrene	2017/10/03	NC		%	50
			Naphthalene	2017/10/03	NC		%	50
			Perylene	2017/10/03	NC		%	50
			Phenanthrene	2017/10/03	23		%	50

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			Pyrene	2017/10/03	NC		%	50
5185233	KLI	Matrix Spike(FDZ422)	o-Terphenyl	2017/09/29		85	%	60 - 130
			F2 (C10-C16 Hydrocarbons)	2017/09/29		89	%	50 - 130
			F3 (C16-C34 Hydrocarbons)	2017/09/29		93	%	50 - 130
			F4 (C34-C50 Hydrocarbons)	2017/09/29		90	%	50 - 130
5185233	KLI	Spiked Blank	o-Terphenyl	2017/09/29		81	%	60 - 130
			F2 (C10-C16 Hydrocarbons)	2017/09/29		85	%	80 - 120
			F3 (C16-C34 Hydrocarbons)	2017/09/29		88	%	80 - 120
			F4 (C34-C50 Hydrocarbons)	2017/09/29		85	%	80 - 120
5185233	KLI	Method Blank	o-Terphenyl	2017/09/29		91	%	60 - 130
			F2 (C10-C16 Hydrocarbons)	2017/09/29	<10		ug/g	
			F3 (C16-C34 Hydrocarbons)	2017/09/29	<50		ug/g	
			F4 (C34-C50 Hydrocarbons)	2017/09/29	<50		ug/g	
5185233	KLI	RPD - Sample/Sample Dup	F2 (C10-C16 Hydrocarbons)	2017/09/29	NC		%	30
			F3 (C16-C34 Hydrocarbons)	2017/09/29	NC		%	30
			F4 (C34-C50 Hydrocarbons)	2017/09/29	NC		%	30
5185268	JJE	Matrix Spike(FDZ458)	o-Terphenyl	2017/09/28		82	%	60 - 130
			F2 (C10-C16 Hydrocarbons)	2017/09/28		89	%	50 - 130
			F3 (C16-C34 Hydrocarbons)	2017/09/28		92	%	50 - 130
			F4 (C34-C50 Hydrocarbons)	2017/09/28		87	%	50 - 130
5185268	JJE	Spiked Blank	o-Terphenyl	2017/09/28		80	%	60 - 130
			F2 (C10-C16 Hydrocarbons)	2017/09/28		89	%	80 - 120
			F3 (C16-C34 Hydrocarbons)	2017/09/28		90	%	80 - 120
			F4 (C34-C50 Hydrocarbons)	2017/09/28		84	%	80 - 120
5185268	JJE	Method Blank	o-Terphenyl	2017/09/28		99	%	60 - 130
			F2 (C10-C16 Hydrocarbons)	2017/09/28	<10		ug/g	
			F3 (C16-C34 Hydrocarbons)	2017/09/28	<50		ug/g	
			F4 (C34-C50 Hydrocarbons)	2017/09/28	<50		ug/g	
5185268	JJE	RPD - Sample/Sample Dup	F2 (C10-C16 Hydrocarbons)	2017/09/28	NC		%	30
			F3 (C16-C34 Hydrocarbons)	2017/09/28	NC		%	30
			F4 (C34-C50 Hydrocarbons)	2017/09/28	NC		%	30
5186627	CBR	Matrix Spike(FDZ426)	Decachlorobiphenyl	2017/09/29		89	%	30 - 130
			Aroclor 1254	2017/09/29		103	%	30 - 130
5186627	CBR	Spiked Blank	Decachlorobiphenyl	2017/09/29		99	%	30 - 130
			Aroclor 1254	2017/09/29		106	%	30 - 130
5186627	CBR	Method Blank	Decachlorobiphenyl	2017/09/29		95	%	30 - 130
			Aroclor 1016	2017/09/29	<0.050		ug/g	
			Aroclor 1221	2017/09/29	<0.050		ug/g	
			Aroclor 1232	2017/09/29	<0.050		ug/g	
			Aroclor 1248	2017/09/29	<0.050		ug/g	
			Aroclor 1242	2017/09/29	<0.050		ug/g	
			Aroclor 1254	2017/09/29	<0.050		ug/g	
			Aroclor 1260	2017/09/29	<0.050		ug/g	
5186627	CBR	RPD - Sample/Sample Dup	Aroclor 1016	2017/09/29	NC		%	50
			Aroclor 1221	2017/09/29	NC		%	50
			Aroclor 1232	2017/09/29	NC		%	50
			Aroclor 1248	2017/09/29	NC		%	50
			Aroclor 1242	2017/09/29	NC		%	50
			Aroclor 1254	2017/09/29	NC		%	50
			Aroclor 1260	2017/09/29	NC		%	50
5187218	CBR	Matrix Spike	Decachlorobiphenyl	2017/09/29		68 (3)	%	30 - 130
			Aroclor 1254	2017/09/29		67 (4)	%	30 - 130
5187218	CBR	Spiked Blank	Decachlorobiphenyl	2017/09/29		94	%	30 - 130

Maxxam
A Bureau Veritas Group Company

Success Through Science®

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			Aroclor 1254	2017/09/29		85	%	30 - 130
5187218	CBR	Method Blank	Decachlorobiphenyl	2017/09/29		90	%	30 - 130
			Aroclor 1016	2017/09/29	<0.050		ug/g	
			Aroclor 1221	2017/09/29	<0.050		ug/g	
			Aroclor 1232	2017/09/29	<0.050		ug/g	
			Aroclor 1248	2017/09/29	<0.050		ug/g	
			Aroclor 1242	2017/09/29	<0.050		ug/g	
			Aroclor 1254	2017/09/29	<0.050		ug/g	
			Aroclor 1260	2017/09/29	<0.050		ug/g	
5187218	CBR	RPD - Sample/Sample Dup	Aroclor 1016	2017/09/29	NC		%	50
			Aroclor 1221	2017/09/29	NC		%	50
			Aroclor 1232	2017/09/29	NC		%	50
			Aroclor 1248	2017/09/29	NC		%	50
			Aroclor 1242	2017/09/29	NC		%	50
			Aroclor 1254	2017/09/29	NC		%	50
			Aroclor 1260	2017/09/29	NC		%	50
5187223	LGE	Matrix Spike(FDZ446)	D10-Anthracene	2017/10/09		90	%	50 - 130
			D14-Terphenyl	2017/10/09		89	%	50 - 130
			D8-Acenaphthylene	2017/10/09		94	%	50 - 130
			1-Methylnaphthalene	2017/10/09		87	%	30 - 130
			2-Methylnaphthalene	2017/10/09		92	%	30 - 130
			Acenaphthene	2017/10/09		98	%	30 - 130
			Acenaphthylene	2017/10/09		103	%	30 - 130
			Anthracene	2017/10/09		114	%	30 - 130
			Benzo(a)anthracene	2017/10/09		102	%	30 - 130
			Benzo(a)pyrene	2017/10/09		68	%	30 - 130
			Benzo(b)fluoranthene	2017/10/09		63	%	30 - 130
			Benzo(g,h,i)perylene	2017/10/09		83	%	30 - 130
			Benzo(j)fluoranthene	2017/10/09		75	%	30 - 130
			Benzo(k)fluoranthene	2017/10/09		75	%	30 - 130
			Chrysene	2017/10/09		86	%	30 - 130
			Dibenz(a,h)anthracene	2017/10/09		89	%	30 - 130
			Fluoranthene	2017/10/09		102	%	30 - 130
			Fluorene	2017/10/09		99	%	30 - 130
			Indeno(1,2,3-cd)pyrene	2017/10/09		81	%	30 - 130
			Naphthalene	2017/10/09		90	%	30 - 130
			Perylene	2017/10/09		86	%	30 - 130
			Phenanthrene	2017/10/09		118	%	30 - 130
			Pyrene	2017/10/09		97	%	30 - 130
5187223	LGE	Spiked Blank	D10-Anthracene	2017/10/09		87	%	50 - 130
			D14-Terphenyl	2017/10/09		80	%	50 - 130
			D8-Acenaphthylene	2017/10/09		94	%	50 - 130
			1-Methylnaphthalene	2017/10/09		85	%	30 - 130
			2-Methylnaphthalene	2017/10/09		92	%	30 - 130
			Acenaphthene	2017/10/09		97	%	30 - 130
			Acenaphthylene	2017/10/09		99	%	30 - 130
			Anthracene	2017/10/09		108	%	30 - 130
			Benzo(a)anthracene	2017/10/09		109	%	30 - 130
			Benzo(a)pyrene	2017/10/09		93	%	30 - 130
			Benzo(b)fluoranthene	2017/10/09		104	%	30 - 130
			Benzo(g,h,i)perylene	2017/10/09		90	%	30 - 130
			Benzo(j)fluoranthene	2017/10/09		92	%	30 - 130
			Benzo(k)fluoranthene	2017/10/09		92	%	30 - 130

Maxxam Analytics International Corporation o/a Maxxam Analytics 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.maxxamanalytics.com

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			Chrysene	2017/10/09		97	%	30 - 130
			Dibenz(a,h)anthracene	2017/10/09		82	%	30 - 130
			Fluoranthene	2017/10/09		104	%	30 - 130
			Fluorene	2017/10/09		107	%	30 - 130
			Indeno(1,2,3-cd)pyrene	2017/10/09		87	%	30 - 130
			Naphthalene	2017/10/09		94	%	30 - 130
			Perylene	2017/10/09		94	%	30 - 130
			Phenanthrene	2017/10/09		90	%	30 - 130
			Pyrene	2017/10/09		101	%	30 - 130
5187223	LGE	Method Blank	D10-Anthracene	2017/10/09		89	%	50 - 130
			D14-Terphenyl	2017/10/09		84	%	50 - 130
			D8-Acenaphthylene	2017/10/09		81	%	50 - 130
			1-Methylnaphthalene	2017/10/09	<0.0050		mg/kg	
			2-Methylnaphthalene	2017/10/09	<0.0050		mg/kg	
			Acenaphthene	2017/10/09	<0.0050		mg/kg	
			Acenaphthylene	2017/10/09	<0.0050		mg/kg	
			Anthracene	2017/10/09	<0.0050		mg/kg	
			Benzo(a)anthracene	2017/10/09	<0.0050		mg/kg	
			Benzo(a)pyrene	2017/10/09	<0.0050		mg/kg	
			Benzo(b)fluoranthene	2017/10/09	<0.0050		mg/kg	
			Benzo(g,h,i)perylene	2017/10/09	<0.0050		mg/kg	
			Benzo(j)fluoranthene	2017/10/09	<0.0050		mg/kg	
			Benzo(k)fluoranthene	2017/10/09	<0.0050		mg/kg	
			Chrysene	2017/10/09	<0.0050		mg/kg	
			Dibenz(a,h)anthracene	2017/10/09	<0.0050		mg/kg	
			Fluoranthene	2017/10/09	<0.0050		mg/kg	
			Fluorene	2017/10/09	<0.0050		mg/kg	
			Indeno(1,2,3-cd)pyrene	2017/10/09	<0.0050		mg/kg	
			Naphthalene	2017/10/09	<0.0050		mg/kg	
			Perylene	2017/10/09	<0.0050		mg/kg	
			Phenanthrene	2017/10/09	<0.0050		mg/kg	
			Pyrene	2017/10/09	<0.0050		mg/kg	
5187223	LGE	RPD - Sample/Sample Dup	1-Methylnaphthalene	2017/10/09	NC		%	50
			2-Methylnaphthalene	2017/10/09	NC		%	50
			Acenaphthene	2017/10/09	NC		%	50
			Acenaphthylene	2017/10/09	NC		%	50
			Anthracene	2017/10/09	28		%	50
			Benzo(a)anthracene	2017/10/09	103 (5)		%	50
			Benzo(a)pyrene	2017/10/09	91 (5)		%	50
			Benzo(b)fluoranthene	2017/10/09	79 (5)		%	50
			Benzo(g,h,i)perylene	2017/10/09	63 (5)		%	50
			Benzo(j)fluoranthene	2017/10/09	86 (5)		%	50
			Benzo(k)fluoranthene	2017/10/09	89 (5)		%	50
			Chrysene	2017/10/09	80 (5)		%	50
			Dibenz(a,h)anthracene	2017/10/09	NC		%	50
			Fluoranthene	2017/10/09	116 (5)		%	50
			Fluorene	2017/10/09	NC		%	50
			Indeno(1,2,3-cd)pyrene	2017/10/09	81 (5)		%	50
			Naphthalene	2017/10/09	NC		%	50
			Perylene	2017/10/09	92 (5)		%	50
			Phenanthrene	2017/10/09	108 (5)		%	50
			Pyrene	2017/10/09	107 (5)		%	50
5187573	KLI	Matrix Spike	o-Terphenyl	2017/10/02		97	%	60 - 130

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			F2 (C10-C16 Hydrocarbons)	2017/10/02		NC	%	50 - 130
			F3 (C16-C34 Hydrocarbons)	2017/10/02		98	%	50 - 130
			F4 (C34-C50 Hydrocarbons)	2017/10/02		97	%	50 - 130
5187573	KLI	Spiked Blank	o-Terphenyl	2017/10/02		96	%	60 - 130
			F2 (C10-C16 Hydrocarbons)	2017/10/02		88	%	60 - 130
			F3 (C16-C34 Hydrocarbons)	2017/10/02		93	%	60 - 130
			F4 (C34-C50 Hydrocarbons)	2017/10/02		92	%	60 - 130
5187573	KLI	Method Blank	o-Terphenyl	2017/10/02		95	%	60 - 130
			F2 (C10-C16 Hydrocarbons)	2017/10/02	<0.10		mg/L	
			F3 (C16-C34 Hydrocarbons)	2017/10/02	<0.20		mg/L	
			F4 (C34-C50 Hydrocarbons)	2017/10/02	<0.20		mg/L	
5187573	KLI	RPD - Sample/Sample Dup	F2 (C10-C16 Hydrocarbons)	2017/10/02	NC		%	30
			F3 (C16-C34 Hydrocarbons)	2017/10/02	NC		%	30
			F4 (C34-C50 Hydrocarbons)	2017/10/02	NC		%	30
5188792	BAN	Matrix Spike	Acid Extractable Antimony (Sb)	2017/09/29		84	%	75 - 125
			Acid Extractable Arsenic (As)	2017/09/29		110	%	75 - 125
			Acid Extractable Barium (Ba)	2017/09/29		NC	%	75 - 125
			Acid Extractable Beryllium (Be)	2017/09/29		102	%	75 - 125
			Acid Extractable Bismuth (Bi)	2017/09/29		103	%	75 - 125
			Acid Extractable Boron (B)	2017/09/29		93	%	75 - 125
			Acid Extractable Cadmium (Cd)	2017/09/29		100	%	75 - 125
			Acid Extractable Chromium (Cr)	2017/09/29		97	%	75 - 125
			Acid Extractable Cobalt (Co)	2017/09/29		104	%	75 - 125
			Acid Extractable Copper (Cu)	2017/09/29		NC	%	75 - 125
			Acid Extractable Lead (Pb)	2017/09/29		NC	%	75 - 125
			Acid Extractable Lithium (Li)	2017/09/29		107	%	75 - 125
			Acid Extractable Manganese (Mn)	2017/09/29		NC	%	75 - 125
			Acid Extractable Mercury (Hg)	2017/09/29		98	%	75 - 125
			Acid Extractable Molybdenum (Mo)	2017/09/29		NC	%	75 - 125
			Acid Extractable Nickel (Ni)	2017/09/29		104	%	75 - 125
			Acid Extractable Rubidium (Rb)	2017/09/29		101	%	75 - 125
			Acid Extractable Selenium (Se)	2017/09/29		101	%	75 - 125
			Acid Extractable Silver (Ag)	2017/09/29		100	%	75 - 125
			Acid Extractable Strontium (Sr)	2017/09/29		108	%	75 - 125
			Acid Extractable Thallium (Tl)	2017/09/29		102	%	75 - 125
			Acid Extractable Tin (Sn)	2017/09/29		NC	%	75 - 125
			Acid Extractable Uranium (U)	2017/09/29		99	%	75 - 125
			Acid Extractable Vanadium (V)	2017/09/29		99	%	75 - 125
			Acid Extractable Zinc (Zn)	2017/09/29		NC	%	75 - 125
5188792	BAN	Spiked Blank	Acid Extractable Antimony (Sb)	2017/09/29		99	%	75 - 125
			Acid Extractable Arsenic (As)	2017/09/29		99	%	75 - 125
			Acid Extractable Barium (Ba)	2017/09/29		95	%	75 - 125
			Acid Extractable Beryllium (Be)	2017/09/29		101	%	75 - 125
			Acid Extractable Bismuth (Bi)	2017/09/29		102	%	75 - 125
			Acid Extractable Boron (B)	2017/09/29		103	%	75 - 125
			Acid Extractable Cadmium (Cd)	2017/09/29		99	%	75 - 125
			Acid Extractable Chromium (Cr)	2017/09/29		98	%	75 - 125
			Acid Extractable Cobalt (Co)	2017/09/29		97	%	75 - 125
			Acid Extractable Copper (Cu)	2017/09/29		97	%	75 - 125
			Acid Extractable Lead (Pb)	2017/09/29		97	%	75 - 125
			Acid Extractable Lithium (Li)	2017/09/29		102	%	75 - 125
			Acid Extractable Manganese (Mn)	2017/09/29		101	%	75 - 125
			Acid Extractable Mercury (Hg)	2017/09/29		104	%	75 - 125

Maxxam
A Bureau Veritas Group Company

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			Acid Extractable Molybdenum (Mo)	2017/09/29		98	%	75 - 125
			Acid Extractable Nickel (Ni)	2017/09/29		99	%	75 - 125
			Acid Extractable Rubidium (Rb)	2017/09/29		99	%	75 - 125
			Acid Extractable Selenium (Se)	2017/09/29		101	%	75 - 125
			Acid Extractable Silver (Ag)	2017/09/29		100	%	75 - 125
			Acid Extractable Strontium (Sr)	2017/09/29		99	%	75 - 125
			Acid Extractable Thallium (Tl)	2017/09/29		100	%	75 - 125
			Acid Extractable Tin (Sn)	2017/09/29		103	%	75 - 125
			Acid Extractable Uranium (U)	2017/09/29		97	%	75 - 125
			Acid Extractable Vanadium (V)	2017/09/29		96	%	75 - 125
			Acid Extractable Zinc (Zn)	2017/09/29		98	%	75 - 125
5188792	BAN	Method Blank	Acid Extractable Aluminum (Al)	2017/09/29	<10		mg/kg	
			Acid Extractable Antimony (Sb)	2017/09/29	<2.0		mg/kg	
			Acid Extractable Arsenic (As)	2017/09/29	<2.0		mg/kg	
			Acid Extractable Barium (Ba)	2017/09/29	<5.0		mg/kg	
			Acid Extractable Beryllium (Be)	2017/09/29	<2.0		mg/kg	
			Acid Extractable Bismuth (Bi)	2017/09/29	<2.0		mg/kg	
			Acid Extractable Boron (B)	2017/09/29	<50		mg/kg	
			Acid Extractable Cadmium (Cd)	2017/09/29	<0.30		mg/kg	
			Acid Extractable Chromium (Cr)	2017/09/29	<2.0		mg/kg	
			Acid Extractable Cobalt (Co)	2017/09/29	<1.0		mg/kg	
			Acid Extractable Copper (Cu)	2017/09/29	<2.0		mg/kg	
			Acid Extractable Iron (Fe)	2017/09/29	<50		mg/kg	
			Acid Extractable Lead (Pb)	2017/09/29	<0.50		mg/kg	
			Acid Extractable Lithium (Li)	2017/09/29	<2.0		mg/kg	
			Acid Extractable Manganese (Mn)	2017/09/29	<2.0		mg/kg	
			Acid Extractable Mercury (Hg)	2017/09/29	<0.10		mg/kg	
			Acid Extractable Molybdenum (Mo)	2017/09/29	<2.0		mg/kg	
			Acid Extractable Nickel (Ni)	2017/09/29	<2.0		mg/kg	
			Acid Extractable Rubidium (Rb)	2017/09/29	<2.0		mg/kg	
			Acid Extractable Selenium (Se)	2017/09/29	<1.0		mg/kg	
			Acid Extractable Silver (Ag)	2017/09/29	<0.50		mg/kg	
			Acid Extractable Strontium (Sr)	2017/09/29	<5.0		mg/kg	
			Acid Extractable Thallium (Tl)	2017/09/29	<0.10		mg/kg	
			Acid Extractable Tin (Sn)	2017/09/29	<2.0		mg/kg	
			Acid Extractable Uranium (U)	2017/09/29	<0.10		mg/kg	
			Acid Extractable Vanadium (V)	2017/09/29	<2.0		mg/kg	
			Acid Extractable Zinc (Zn)	2017/09/29	<5.0		mg/kg	
5188792	BAN	RPD - Sample/Sample Dup	Acid Extractable Aluminum (Al)	2017/09/29	1.2		%	35
			Acid Extractable Antimony (Sb)	2017/09/29	NC		%	35
			Acid Extractable Arsenic (As)	2017/09/29	5.7		%	35
			Acid Extractable Barium (Ba)	2017/09/29	7.1		%	35
			Acid Extractable Beryllium (Be)	2017/09/29	NC		%	35
			Acid Extractable Bismuth (Bi)	2017/09/29	NC		%	35
			Acid Extractable Boron (B)	2017/09/29	NC		%	35
			Acid Extractable Cadmium (Cd)	2017/09/29	9.0		%	35
			Acid Extractable Chromium (Cr)	2017/09/29	8.6		%	35
			Acid Extractable Cobalt (Co)	2017/09/29	7.7		%	35
			Acid Extractable Copper (Cu)	2017/09/29	11		%	35
			Acid Extractable Iron (Fe)	2017/09/29	3.2		%	35
			Acid Extractable Lead (Pb)	2017/09/29	92 (6)		%	35
			Acid Extractable Lithium (Li)	2017/09/29	2.3		%	35
			Acid Extractable Manganese (Mn)	2017/09/29	0.34		%	35

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			Acid Extractable Mercury (Hg)	2017/09/29	1.2		%	35
			Acid Extractable Molybdenum (Mo)	2017/09/29	13		%	35
			Acid Extractable Nickel (Ni)	2017/09/29	8.4		%	35
			Acid Extractable Rubidium (Rb)	2017/09/29	6.8		%	35
			Acid Extractable Selenium (Se)	2017/09/29	NC		%	35
			Acid Extractable Silver (Ag)	2017/09/29	0.21		%	35
			Acid Extractable Strontium (Sr)	2017/09/29	15		%	35
			Acid Extractable Thallium (Tl)	2017/09/29	7.3		%	35
			Acid Extractable Tin (Sn)	2017/09/29	94 (6)		%	35
			Acid Extractable Uranium (U)	2017/09/29	0.097		%	35
			Acid Extractable Vanadium (V)	2017/09/29	3.0		%	35
			Acid Extractable Zinc (Zn)	2017/09/29	3.3		%	35
5188941	DBF	RPD - Sample/Sample Dup	Moisture	2017/09/29	4.5		%	25
5189095	GTH	Matrix Spike(FDZ524)	D10-Anthracene	2017/10/03		129	%	50 - 130
			D14-Terphenyl	2017/10/03		132 (7)	%	50 - 130
			D8-Acenaphthylene	2017/10/03		121	%	50 - 130
			1-Methylnaphthalene	2017/10/03		113	%	30 - 130
			2-Methylnaphthalene	2017/10/03		123	%	30 - 130
			Acenaphthene	2017/10/03		132 (8)	%	30 - 130
			Acenaphthylene	2017/10/03		118	%	30 - 130
			Anthracene	2017/10/03		147 (8)	%	30 - 130
			Benzo(a)anthracene	2017/10/03		145 (8)	%	30 - 130
			Benzo(a)pyrene	2017/10/03		147 (8)	%	30 - 130
			Benzo(b)fluoranthene	2017/10/03		151 (8)	%	30 - 130
			Benzo(g,h,i)perylene	2017/10/03		160 (8)	%	30 - 130
			Benzo(j)fluoranthene	2017/10/03		150 (8)	%	30 - 130
			Benzo(k)fluoranthene	2017/10/03		150 (8)	%	30 - 130
			Chrysene	2017/10/03		136 (8)	%	30 - 130
			Dibenz(a,h)anthracene	2017/10/03		154 (8)	%	30 - 130
			Fluoranthene	2017/10/03		145 (8)	%	30 - 130
			Fluorene	2017/10/03		125	%	30 - 130
			Indeno(1,2,3-cd)pyrene	2017/10/03		152 (8)	%	30 - 130
			Naphthalene	2017/10/03		119	%	30 - 130
			Perylene	2017/10/03		148 (8)	%	30 - 130
			Phenanthrene	2017/10/03		138 (8)	%	30 - 130
			Pyrene	2017/10/03		140 (8)	%	30 - 130
5189095	GTH	Spiked Blank	D10-Anthracene	2017/10/03		118	%	50 - 130
			D14-Terphenyl	2017/10/03		115	%	50 - 130
			D8-Acenaphthylene	2017/10/03		115	%	50 - 130
			1-Methylnaphthalene	2017/10/03		107	%	30 - 130
			2-Methylnaphthalene	2017/10/03		115	%	30 - 130
			Acenaphthene	2017/10/03		117	%	30 - 130
			Acenaphthylene	2017/10/03		111	%	30 - 130
			Anthracene	2017/10/03		122	%	30 - 130
			Benzo(a)anthracene	2017/10/03		122	%	30 - 130
			Benzo(a)pyrene	2017/10/03		121	%	30 - 130
			Benzo(b)fluoranthene	2017/10/03		127	%	30 - 130
			Benzo(g,h,i)perylene	2017/10/03		126	%	30 - 130
			Benzo(j)fluoranthene	2017/10/03		126	%	30 - 130
			Benzo(k)fluoranthene	2017/10/03		125	%	30 - 130
			Chrysene	2017/10/03		114	%	30 - 130
			Dibenz(a,h)anthracene	2017/10/03		118	%	30 - 130
			Fluoranthene	2017/10/03		129	%	30 - 130

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			Fluorene	2017/10/03		118	%	30 - 130
			Indeno(1,2,3-cd)pyrene	2017/10/03		116	%	30 - 130
			Naphthalene	2017/10/03		113	%	30 - 130
			Perylene	2017/10/03		122	%	30 - 130
			Phenanthrene	2017/10/03		123	%	30 - 130
			Pyrene	2017/10/03		124	%	30 - 130
5189095	GTH	Method Blank	D10-Anthracene	2017/10/03		106	%	50 - 130
			D14-Terphenyl	2017/10/03		116	%	50 - 130
			D8-Acenaphthylene	2017/10/03		104	%	50 - 130
			1-Methylnaphthalene	2017/10/03	<0.0050		mg/kg	
			2-Methylnaphthalene	2017/10/03	<0.0050		mg/kg	
			Acenaphthene	2017/10/03	<0.0050		mg/kg	
			Acenaphthylene	2017/10/03	<0.0050		mg/kg	
			Anthracene	2017/10/03	<0.0050		mg/kg	
			Benzo(a)anthracene	2017/10/03	<0.0050		mg/kg	
			Benzo(a)pyrene	2017/10/03	<0.0050		mg/kg	
			Benzo(b)fluoranthene	2017/10/03	<0.0050		mg/kg	
			Benzo(g,h,i)perylene	2017/10/03	<0.0050		mg/kg	
			Benzo(j)fluoranthene	2017/10/03	<0.0050		mg/kg	
			Benzo(k)fluoranthene	2017/10/03	<0.0050		mg/kg	
			Chrysene	2017/10/03	<0.0050		mg/kg	
			Dibenz(a,h)anthracene	2017/10/03	<0.0050		mg/kg	
			Fluoranthene	2017/10/03	<0.0050		mg/kg	
			Fluorene	2017/10/03	<0.0050		mg/kg	
			Indeno(1,2,3-cd)pyrene	2017/10/03	<0.0050		mg/kg	
			Naphthalene	2017/10/03	<0.0050		mg/kg	
			Perylene	2017/10/03	<0.0050		mg/kg	
			Phenanthrene	2017/10/03	<0.0050		mg/kg	
			Pyrene	2017/10/03	<0.0050		mg/kg	
5189095	GTH	RPD - Sample/Sample Dup	1-Methylnaphthalene	2017/10/03	NC		%	50
			2-Methylnaphthalene	2017/10/03	NC		%	50
			Acenaphthene	2017/10/03	NC		%	50
			Acenaphthylene	2017/10/03	NC		%	50
			Anthracene	2017/10/03	NC		%	50
			Benzo(a)anthracene	2017/10/03	NC		%	50
			Benzo(a)pyrene	2017/10/03	NC		%	50
			Benzo(b)fluoranthene	2017/10/03	NC		%	50
			Benzo(g,h,i)perylene	2017/10/03	NC		%	50
			Benzo(j)fluoranthene	2017/10/03	NC		%	50
			Benzo(k)fluoranthene	2017/10/03	NC		%	50
			Chrysene	2017/10/03	NC		%	50
			Dibenz(a,h)anthracene	2017/10/03	NC		%	50
			Fluoranthene	2017/10/03	NC		%	50
			Fluorene	2017/10/03	NC		%	50
			Indeno(1,2,3-cd)pyrene	2017/10/03	NC		%	50
			Naphthalene	2017/10/03	NC		%	50
			Perylene	2017/10/03	NC		%	50
			Phenanthrene	2017/10/03	NC		%	50
			Pyrene	2017/10/03	NC		%	50
5189670	LGE	Matrix Spike	Decachlorobiphenyl	2017/10/02		96	%	30 - 130
			Aroclor 1254	2017/10/02		72	%	30 - 130
5189670	LGE	Spiked Blank	Decachlorobiphenyl	2017/10/02		90	%	30 - 130
			Aroclor 1254	2017/10/02		102	%	30 - 130

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
5189670	LGE	Method Blank	Decachlorobiphenyl	2017/10/02		91	%	30 - 130
			Aroclor 1016	2017/10/02	<0.050		ug/g	
			Aroclor 1221	2017/10/02	<0.050		ug/g	
			Aroclor 1232	2017/10/02	<0.050		ug/g	
			Aroclor 1248	2017/10/02	<0.050		ug/g	
			Aroclor 1242	2017/10/02	<0.050		ug/g	
			Aroclor 1254	2017/10/02	<0.050		ug/g	
			Aroclor 1260	2017/10/02	<0.050		ug/g	
5189670	LGE	RPD - Sample/Sample Dup	Aroclor 1016	2017/10/02	NC		%	50
			Aroclor 1221	2017/10/02	NC		%	50
			Aroclor 1232	2017/10/02	NC		%	50
			Aroclor 1248	2017/10/02	NC		%	50
			Aroclor 1242	2017/10/02	NC		%	50
			Aroclor 1254	2017/10/02	NC		%	50
			Aroclor 1260	2017/10/02	NC		%	50
5189674	NRG	Matrix Spike	Nitrogen (Ammonia Nitrogen)	2017/10/02		101	%	80 - 120
5189674	NRG	Spiked Blank	Nitrogen (Ammonia Nitrogen)	2017/10/02		109	%	80 - 120
5189674	NRG	Method Blank	Nitrogen (Ammonia Nitrogen)	2017/10/02	<0.050		mg/L	
5189674	NRG	RPD - Sample/Sample Dup	Nitrogen (Ammonia Nitrogen)	2017/10/02	NC		%	20
5190771	WSS	Matrix Spike(FDZ369)	1,4-Difluorobenzene	2017/10/01		105	%	70 - 130
			4-Bromofluorobenzene	2017/10/01		99	%	70 - 130
			D10-Ethylbenzene	2017/10/01		104	%	70 - 130
			D4-1,2-Dichloroethane	2017/10/01		92	%	70 - 130
			Benzene	2017/10/01		108	%	70 - 130
			Toluene	2017/10/01		104	%	70 - 130
			Ethylbenzene	2017/10/01		102	%	70 - 130
			o-Xylene	2017/10/01		105	%	70 - 130
			p+m-Xylene	2017/10/01		100	%	70 - 130
			F1 (C6-C10)	2017/10/01		88	%	70 - 130
5190771	WSS	Spiked Blank	1,4-Difluorobenzene	2017/10/01		108	%	70 - 130
			4-Bromofluorobenzene	2017/10/01		98	%	70 - 130
			D10-Ethylbenzene	2017/10/01		101	%	70 - 130
			D4-1,2-Dichloroethane	2017/10/01		106	%	70 - 130
			Benzene	2017/10/01		109	%	70 - 130
			Toluene	2017/10/01		102	%	70 - 130
			Ethylbenzene	2017/10/01		99	%	70 - 130
			o-Xylene	2017/10/01		103	%	70 - 130
			p+m-Xylene	2017/10/01		97	%	70 - 130
			F1 (C6-C10)	2017/10/01		94	%	70 - 130
5190771	WSS	Method Blank	1,4-Difluorobenzene	2017/10/01		109	%	70 - 130
			4-Bromofluorobenzene	2017/10/01		98	%	70 - 130
			D10-Ethylbenzene	2017/10/01		98	%	70 - 130
			D4-1,2-Dichloroethane	2017/10/01		95	%	70 - 130
			Benzene	2017/10/01	<0.00020		mg/L	
			Toluene	2017/10/01	<0.00020		mg/L	
			Ethylbenzene	2017/10/01	<0.00020		mg/L	
			o-Xylene	2017/10/01	<0.00020		mg/L	
			p+m-Xylene	2017/10/01	<0.00040		mg/L	
			Total Xylenes	2017/10/01	<0.00040		mg/L	
			F1 (C6-C10)	2017/10/01	<0.025		mg/L	
			F1 (C6-C10) - BTEX	2017/10/01	<0.025		mg/L	
5190771	WSS	RPD - Sample/Sample Dup	Benzene	2017/10/01	NC		%	30
			Toluene	2017/10/01	NC		%	30

Maxxam
A Bureau Veritas Group Company

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			Ethylbenzene	2017/10/01	NC		%	30
			o-Xylene	2017/10/01	NC		%	30
			p+m-Xylene	2017/10/01	NC		%	30
			Total Xylenes	2017/10/01	NC		%	30
			F1 (C6-C10)	2017/10/01	NC		%	30
			F1 (C6-C10) - BTEX	2017/10/01	NC		%	30
5191424	CYN	RPD - Sample/Sample Dup	Moisture	2017/09/30	2.0		%	20
5191787	BAN	Matrix Spike(FDZ525)	Acid Extractable Antimony (Sb)	2017/10/02		98	%	75 - 125
			Acid Extractable Arsenic (As)	2017/10/02		102	%	75 - 125
			Acid Extractable Barium (Ba)	2017/10/02		115	%	75 - 125
			Acid Extractable Beryllium (Be)	2017/10/02		100	%	75 - 125
			Acid Extractable Bismuth (Bi)	2017/10/02		101	%	75 - 125
			Acid Extractable Boron (B)	2017/10/02		98	%	75 - 125
			Acid Extractable Cadmium (Cd)	2017/10/02		102	%	75 - 125
			Acid Extractable Chromium (Cr)	2017/10/02		105	%	75 - 125
			Acid Extractable Cobalt (Co)	2017/10/02		104	%	75 - 125
			Acid Extractable Copper (Cu)	2017/10/02		105	%	75 - 125
			Acid Extractable Lead (Pb)	2017/10/02		99	%	75 - 125
			Acid Extractable Lithium (Li)	2017/10/02		103	%	75 - 125
			Acid Extractable Manganese (Mn)	2017/10/02		NC	%	75 - 125
			Acid Extractable Mercury (Hg)	2017/10/02		97	%	75 - 125
			Acid Extractable Molybdenum (Mo)	2017/10/02		101	%	75 - 125
			Acid Extractable Nickel (Ni)	2017/10/02		103	%	75 - 125
			Acid Extractable Rubidium (Rb)	2017/10/02		101	%	75 - 125
			Acid Extractable Selenium (Se)	2017/10/02		102	%	75 - 125
			Acid Extractable Silver (Ag)	2017/10/02		101	%	75 - 125
			Acid Extractable Strontium (Sr)	2017/10/02		103	%	75 - 125
			Acid Extractable Thallium (Tl)	2017/10/02		102	%	75 - 125
			Acid Extractable Tin (Sn)	2017/10/02		100	%	75 - 125
			Acid Extractable Uranium (U)	2017/10/02		102	%	75 - 125
			Acid Extractable Vanadium (V)	2017/10/02		103	%	75 - 125
			Acid Extractable Zinc (Zn)	2017/10/02		105	%	75 - 125
5191787	BAN	Spiked Blank	Acid Extractable Antimony (Sb)	2017/10/02		97	%	75 - 125
			Acid Extractable Arsenic (As)	2017/10/02		102	%	75 - 125
			Acid Extractable Barium (Ba)	2017/10/02		99	%	75 - 125
			Acid Extractable Beryllium (Be)	2017/10/02		103	%	75 - 125
			Acid Extractable Bismuth (Bi)	2017/10/02		102	%	75 - 125
			Acid Extractable Boron (B)	2017/10/02		122	%	75 - 125
			Acid Extractable Cadmium (Cd)	2017/10/02		101	%	75 - 125
			Acid Extractable Chromium (Cr)	2017/10/02		101	%	75 - 125
			Acid Extractable Cobalt (Co)	2017/10/02		100	%	75 - 125
			Acid Extractable Copper (Cu)	2017/10/02		102	%	75 - 125
			Acid Extractable Lead (Pb)	2017/10/02		100	%	75 - 125
			Acid Extractable Lithium (Li)	2017/10/02		102	%	75 - 125
			Acid Extractable Manganese (Mn)	2017/10/02		102	%	75 - 125
			Acid Extractable Mercury (Hg)	2017/10/02		103	%	75 - 125
			Acid Extractable Molybdenum (Mo)	2017/10/02		100	%	75 - 125
			Acid Extractable Nickel (Ni)	2017/10/02		104	%	75 - 125
			Acid Extractable Rubidium (Rb)	2017/10/02		100	%	75 - 125
			Acid Extractable Selenium (Se)	2017/10/02		103	%	75 - 125
			Acid Extractable Silver (Ag)	2017/10/02		99	%	75 - 125
			Acid Extractable Strontium (Sr)	2017/10/02		101	%	75 - 125
			Acid Extractable Thallium (Tl)	2017/10/02		102	%	75 - 125

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			Acid Extractable Tin (Sn)	2017/10/02		109	%	75 - 125
			Acid Extractable Uranium (U)	2017/10/02		100	%	75 - 125
			Acid Extractable Vanadium (V)	2017/10/02		101	%	75 - 125
			Acid Extractable Zinc (Zn)	2017/10/02		104	%	75 - 125
5191787	BAN	Method Blank	Acid Extractable Aluminum (Al)	2017/10/02	<10		mg/kg	
			Acid Extractable Antimony (Sb)	2017/10/02	<2.0		mg/kg	
			Acid Extractable Arsenic (As)	2017/10/02	<2.0		mg/kg	
			Acid Extractable Barium (Ba)	2017/10/02	<5.0		mg/kg	
			Acid Extractable Beryllium (Be)	2017/10/02	<2.0		mg/kg	
			Acid Extractable Bismuth (Bi)	2017/10/02	<2.0		mg/kg	
			Acid Extractable Boron (B)	2017/10/02	<50		mg/kg	
			Acid Extractable Cadmium (Cd)	2017/10/02	<0.30		mg/kg	
			Acid Extractable Chromium (Cr)	2017/10/02	<2.0		mg/kg	
			Acid Extractable Cobalt (Co)	2017/10/02	<1.0		mg/kg	
			Acid Extractable Copper (Cu)	2017/10/02	<2.0		mg/kg	
			Acid Extractable Iron (Fe)	2017/10/02	<50		mg/kg	
			Acid Extractable Lead (Pb)	2017/10/02	<0.50		mg/kg	
			Acid Extractable Lithium (Li)	2017/10/02	<2.0		mg/kg	
			Acid Extractable Manganese (Mn)	2017/10/02	<2.0		mg/kg	
			Acid Extractable Mercury (Hg)	2017/10/02	<0.10		mg/kg	
			Acid Extractable Molybdenum (Mo)	2017/10/02	<2.0		mg/kg	
			Acid Extractable Nickel (Ni)	2017/10/02	<2.0		mg/kg	
			Acid Extractable Rubidium (Rb)	2017/10/02	<2.0		mg/kg	
			Acid Extractable Selenium (Se)	2017/10/02	<1.0		mg/kg	
			Acid Extractable Silver (Ag)	2017/10/02	<0.50		mg/kg	
			Acid Extractable Strontium (Sr)	2017/10/02	<5.0		mg/kg	
			Acid Extractable Thallium (Tl)	2017/10/02	<0.10		mg/kg	
			Acid Extractable Tin (Sn)	2017/10/02	<2.0		mg/kg	
			Acid Extractable Uranium (U)	2017/10/02	<0.10		mg/kg	
			Acid Extractable Vanadium (V)	2017/10/02	<2.0		mg/kg	
			Acid Extractable Zinc (Zn)	2017/10/02	<5.0		mg/kg	
5191787	BAN	RPD - Sample/Sample Dup	Acid Extractable Aluminum (Al)	2017/10/02	22		%	35
			Acid Extractable Antimony (Sb)	2017/10/02	NC		%	35
			Acid Extractable Arsenic (As)	2017/10/02	NC		%	35
			Acid Extractable Barium (Ba)	2017/10/02	27		%	35
			Acid Extractable Beryllium (Be)	2017/10/02	NC		%	35
			Acid Extractable Bismuth (Bi)	2017/10/02	NC		%	35
			Acid Extractable Boron (B)	2017/10/02	NC		%	35
			Acid Extractable Cadmium (Cd)	2017/10/02	NC		%	35
			Acid Extractable Chromium (Cr)	2017/10/02	10		%	35
			Acid Extractable Cobalt (Co)	2017/10/02	34		%	35
			Acid Extractable Copper (Cu)	2017/10/02	35		%	35
			Acid Extractable Iron (Fe)	2017/10/02	18		%	35
			Acid Extractable Lead (Pb)	2017/10/02	6.6		%	35
			Acid Extractable Lithium (Li)	2017/10/02	34		%	35
			Acid Extractable Manganese (Mn)	2017/10/02	17		%	35
			Acid Extractable Mercury (Hg)	2017/10/02	NC		%	35
			Acid Extractable Molybdenum (Mo)	2017/10/02	NC		%	35
			Acid Extractable Nickel (Ni)	2017/10/02	28		%	35
			Acid Extractable Rubidium (Rb)	2017/10/02	25		%	35
			Acid Extractable Selenium (Se)	2017/10/02	NC		%	35
			Acid Extractable Silver (Ag)	2017/10/02	NC		%	35
			Acid Extractable Strontium (Sr)	2017/10/02	NC		%	35

Maxxam
A Bureau Veritas Group Company

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			Acid Extractable Thallium (Tl)	2017/10/02	NC		%	35
			Acid Extractable Tin (Sn)	2017/10/02	NC		%	35
			Acid Extractable Uranium (U)	2017/10/02	6.8		%	35
			Acid Extractable Vanadium (V)	2017/10/02	6.4		%	35
			Acid Extractable Zinc (Zn)	2017/10/02	20		%	35
5191858	BAN	Matrix Spike	Acid Extractable Antimony (Sb)	2017/10/03		92	%	75 - 125
			Acid Extractable Arsenic (As)	2017/10/03		101	%	75 - 125
			Acid Extractable Barium (Ba)	2017/10/03		NC	%	75 - 125
			Acid Extractable Beryllium (Be)	2017/10/03		104	%	75 - 125
			Acid Extractable Bismuth (Bi)	2017/10/03		104	%	75 - 125
			Acid Extractable Boron (B)	2017/10/03		99	%	75 - 125
			Acid Extractable Cadmium (Cd)	2017/10/03		104	%	75 - 125
			Acid Extractable Chromium (Cr)	2017/10/03		105	%	75 - 125
			Acid Extractable Cobalt (Co)	2017/10/03		105	%	75 - 125
			Acid Extractable Copper (Cu)	2017/10/03		111	%	75 - 125
			Acid Extractable Lead (Pb)	2017/10/03		104	%	75 - 125
			Acid Extractable Lithium (Li)	2017/10/03		112	%	75 - 125
			Acid Extractable Manganese (Mn)	2017/10/03		NC	%	75 - 125
			Acid Extractable Mercury (Hg)	2017/10/03		100	%	75 - 125
			Acid Extractable Molybdenum (Mo)	2017/10/03		105	%	75 - 125
			Acid Extractable Nickel (Ni)	2017/10/03		108	%	75 - 125
			Acid Extractable Rubidium (Rb)	2017/10/03		100	%	75 - 125
			Acid Extractable Selenium (Se)	2017/10/03		105	%	75 - 125
			Acid Extractable Silver (Ag)	2017/10/03		103	%	75 - 125
			Acid Extractable Strontium (Sr)	2017/10/03		105	%	75 - 125
			Acid Extractable Thallium (Tl)	2017/10/03		105	%	75 - 125
			Acid Extractable Tin (Sn)	2017/10/03		111	%	75 - 125
			Acid Extractable Uranium (U)	2017/10/03		103	%	75 - 125
			Acid Extractable Vanadium (V)	2017/10/03		104	%	75 - 125
			Acid Extractable Zinc (Zn)	2017/10/03		NC	%	75 - 125
5191858	BAN	Spiked Blank	Acid Extractable Antimony (Sb)	2017/10/03		106	%	75 - 125
			Acid Extractable Arsenic (As)	2017/10/03		106	%	75 - 125
			Acid Extractable Barium (Ba)	2017/10/03		105	%	75 - 125
			Acid Extractable Beryllium (Be)	2017/10/03		103	%	75 - 125
			Acid Extractable Bismuth (Bi)	2017/10/03		107	%	75 - 125
			Acid Extractable Boron (B)	2017/10/03		121	%	75 - 125
			Acid Extractable Cadmium (Cd)	2017/10/03		104	%	75 - 125
			Acid Extractable Chromium (Cr)	2017/10/03		105	%	75 - 125
			Acid Extractable Cobalt (Co)	2017/10/03		105	%	75 - 125
			Acid Extractable Copper (Cu)	2017/10/03		106	%	75 - 125
			Acid Extractable Lead (Pb)	2017/10/03		104	%	75 - 125
			Acid Extractable Lithium (Li)	2017/10/03		101	%	75 - 125
			Acid Extractable Manganese (Mn)	2017/10/03		107	%	75 - 125
			Acid Extractable Mercury (Hg)	2017/10/03		105	%	75 - 125
			Acid Extractable Molybdenum (Mo)	2017/10/03		107	%	75 - 125
			Acid Extractable Nickel (Ni)	2017/10/03		107	%	75 - 125
			Acid Extractable Rubidium (Rb)	2017/10/03		106	%	75 - 125
			Acid Extractable Selenium (Se)	2017/10/03		105	%	75 - 125
			Acid Extractable Silver (Ag)	2017/10/03		104	%	75 - 125
			Acid Extractable Strontium (Sr)	2017/10/03		106	%	75 - 125
			Acid Extractable Thallium (Tl)	2017/10/03		108	%	75 - 125
			Acid Extractable Tin (Sn)	2017/10/03		105	%	75 - 125
			Acid Extractable Uranium (U)	2017/10/03		104	%	75 - 125

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			Acid Extractable Vanadium (V)	2017/10/03		105	%	75 - 125
			Acid Extractable Zinc (Zn)	2017/10/03		105	%	75 - 125
5191858	BAN	Method Blank	Acid Extractable Aluminum (Al)	2017/10/03	<10		mg/kg	
			Acid Extractable Antimony (Sb)	2017/10/03	<2.0		mg/kg	
			Acid Extractable Arsenic (As)	2017/10/03	<2.0		mg/kg	
			Acid Extractable Barium (Ba)	2017/10/03	<5.0		mg/kg	
			Acid Extractable Beryllium (Be)	2017/10/03	<2.0		mg/kg	
			Acid Extractable Bismuth (Bi)	2017/10/03	<2.0		mg/kg	
			Acid Extractable Boron (B)	2017/10/03	<50		mg/kg	
			Acid Extractable Cadmium (Cd)	2017/10/03	<0.30		mg/kg	
			Acid Extractable Chromium (Cr)	2017/10/03	<2.0		mg/kg	
			Acid Extractable Cobalt (Co)	2017/10/03	<1.0		mg/kg	
			Acid Extractable Copper (Cu)	2017/10/03	<2.0		mg/kg	
			Acid Extractable Iron (Fe)	2017/10/03	<50		mg/kg	
			Acid Extractable Lead (Pb)	2017/10/03	<0.50		mg/kg	
			Acid Extractable Lithium (Li)	2017/10/03	<2.0		mg/kg	
			Acid Extractable Manganese (Mn)	2017/10/03	<2.0		mg/kg	
			Acid Extractable Mercury (Hg)	2017/10/03	<0.10		mg/kg	
			Acid Extractable Molybdenum (Mo)	2017/10/03	<2.0		mg/kg	
			Acid Extractable Nickel (Ni)	2017/10/03	<2.0		mg/kg	
			Acid Extractable Rubidium (Rb)	2017/10/03	<2.0		mg/kg	
			Acid Extractable Selenium (Se)	2017/10/03	<1.0		mg/kg	
			Acid Extractable Silver (Ag)	2017/10/03	<0.50		mg/kg	
			Acid Extractable Strontium (Sr)	2017/10/03	<5.0		mg/kg	
			Acid Extractable Thallium (Tl)	2017/10/03	<0.10		mg/kg	
			Acid Extractable Tin (Sn)	2017/10/03	<2.0		mg/kg	
			Acid Extractable Uranium (U)	2017/10/03	<0.10		mg/kg	
			Acid Extractable Vanadium (V)	2017/10/03	<2.0		mg/kg	
			Acid Extractable Zinc (Zn)	2017/10/03	<5.0		mg/kg	
5191858	BAN	RPD - Sample/Sample Dup	Acid Extractable Aluminum (Al)	2017/10/03	3.8		%	35
			Acid Extractable Antimony (Sb)	2017/10/03	NC		%	35
			Acid Extractable Arsenic (As)	2017/10/03	27		%	35
			Acid Extractable Barium (Ba)	2017/10/03	6.1		%	35
			Acid Extractable Beryllium (Be)	2017/10/03	NC		%	35
			Acid Extractable Bismuth (Bi)	2017/10/03	NC		%	35
			Acid Extractable Boron (B)	2017/10/03	NC		%	35
			Acid Extractable Cadmium (Cd)	2017/10/03	NC		%	35
			Acid Extractable Chromium (Cr)	2017/10/03	0.057		%	35
			Acid Extractable Cobalt (Co)	2017/10/03	6.2		%	35
			Acid Extractable Copper (Cu)	2017/10/03	2.1		%	35
			Acid Extractable Iron (Fe)	2017/10/03	3.2		%	35
			Acid Extractable Lead (Pb)	2017/10/03	6.7		%	35
			Acid Extractable Lithium (Li)	2017/10/03	0.39		%	35
			Acid Extractable Manganese (Mn)	2017/10/03	27		%	35
			Acid Extractable Mercury (Hg)	2017/10/03	NC		%	35
			Acid Extractable Molybdenum (Mo)	2017/10/03	NC		%	35
			Acid Extractable Nickel (Ni)	2017/10/03	5.2		%	35
			Acid Extractable Rubidium (Rb)	2017/10/03	9.3		%	35
			Acid Extractable Selenium (Se)	2017/10/03	NC		%	35
			Acid Extractable Silver (Ag)	2017/10/03	NC		%	35
			Acid Extractable Strontium (Sr)	2017/10/03	7.6		%	35
			Acid Extractable Thallium (Tl)	2017/10/03	8.6		%	35
			Acid Extractable Tin (Sn)	2017/10/03	NC		%	35

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			Acid Extractable Uranium (U)	2017/10/03	6.8		%	35
			Acid Extractable Vanadium (V)	2017/10/03	1.6		%	35
			Acid Extractable Zinc (Zn)	2017/10/03	7.2		%	35
5192036	SSI	QC Standard	Turbidity	2017/10/02		106	%	80 - 120
5192036	SSI	Spiked Blank	Turbidity	2017/10/02		95	%	80 - 120
5192036	SSI	Method Blank	Turbidity	2017/10/02	<0.10		NTU	
5192036	SSI	RPD - Sample/Sample Dup	Turbidity	2017/10/02	NC		%	20
5192047	SSI	QC Standard	Turbidity	2017/10/02		106	%	80 - 120
5192047	SSI	Spiked Blank	Turbidity	2017/10/02		95	%	80 - 120
5192047	SSI	Method Blank	Turbidity	2017/10/02	<0.10		NTU	
5192047	SSI	RPD - Sample/Sample Dup	Turbidity	2017/10/02	NC		%	20
5192108	NRG	Matrix Spike(FDZ372)	Total Alkalinity (Total as CaCO3)	2017/10/03		108	%	80 - 120
5192108	NRG	Spiked Blank	Total Alkalinity (Total as CaCO3)	2017/10/03		105	%	80 - 120
5192108	NRG	Method Blank	Total Alkalinity (Total as CaCO3)	2017/10/03	<5.0		mg/L	
5192111	NRG	Matrix Spike(FDZ372)	Dissolved Chloride (Cl)	2017/10/03		96	%	80 - 120
5192111	NRG	QC Standard	Dissolved Chloride (Cl)	2017/10/03		107	%	80 - 120
5192111	NRG	Spiked Blank	Dissolved Chloride (Cl)	2017/10/03		103	%	80 - 120
5192111	NRG	Method Blank	Dissolved Chloride (Cl)	2017/10/03	<1.0		mg/L	
5192111	NRG	RPD - Sample/Sample Dup	Dissolved Chloride (Cl)	2017/10/03	7.5		%	25
5192114	NRG	Matrix Spike(FDZ372)	Dissolved Sulphate (SO4)	2017/10/03		103	%	80 - 120
5192114	NRG	Spiked Blank	Dissolved Sulphate (SO4)	2017/10/03		96	%	80 - 120
5192114	NRG	Method Blank	Dissolved Sulphate (SO4)	2017/10/03	<2.0		mg/L	
5192114	NRG	RPD - Sample/Sample Dup	Dissolved Sulphate (SO4)	2017/10/03	NC		%	25
5192116	NRG	Matrix Spike(FDZ372)	Reactive Silica (SiO2)	2017/10/03		90	%	N/A
5192116	NRG	Spiked Blank	Reactive Silica (SiO2)	2017/10/03		96	%	80 - 120
5192116	NRG	Method Blank	Reactive Silica (SiO2)	2017/10/03	<0.50		mg/L	
5192119	NRG	Spiked Blank	Colour	2017/10/04		93	%	80 - 120
5192119	NRG	Method Blank	Colour	2017/10/04	<5.0		TCU	
5192120	NRG	Matrix Spike(FDZ372)	Orthophosphate (P)	2017/10/03		91	%	80 - 120
5192120	NRG	Spiked Blank	Orthophosphate (P)	2017/10/03		100	%	80 - 120
5192120	NRG	Method Blank	Orthophosphate (P)	2017/10/03	<0.010		mg/L	
5192120	NRG	RPD - Sample/Sample Dup	Orthophosphate (P)	2017/10/03	NC		%	25
5192122	NRG	Matrix Spike(FDZ372)	Nitrate + Nitrite (N)	2017/10/03		103	%	80 - 120
5192122	NRG	Spiked Blank	Nitrate + Nitrite (N)	2017/10/03		105	%	80 - 120
5192122	NRG	Method Blank	Nitrate + Nitrite (N)	2017/10/03	<0.050		mg/L	
5192122	NRG	RPD - Sample/Sample Dup	Nitrate + Nitrite (N)	2017/10/03	NC		%	25
5192124	NRG	Matrix Spike(FDZ372)	Nitrite (N)	2017/10/03		96	%	80 - 120
5192124	NRG	Spiked Blank	Nitrite (N)	2017/10/03		101	%	80 - 120
5192124	NRG	Method Blank	Nitrite (N)	2017/10/03	<0.010		mg/L	
5192124	NRG	RPD - Sample/Sample Dup	Nitrite (N)	2017/10/03	NC		%	25
5192366	ARS	Matrix Spike	Total Mercury (Hg)	2017/10/03		106	%	80 - 120
5192366	ARS	Spiked Blank	Total Mercury (Hg)	2017/10/03		104	%	80 - 120
5192366	ARS	Method Blank	Total Mercury (Hg)	2017/10/03	<0.013		ug/L	
5192366	ARS	RPD - Sample/Sample Dup	Total Mercury (Hg)	2017/10/03	NC		%	20
5193753	SMT	Matrix Spike	Total Organic Carbon (C)	2017/10/03		99	%	80 - 120
5193753	SMT	Spiked Blank	Total Organic Carbon (C)	2017/10/03		95	%	80 - 120
5193753	SMT	Method Blank	Total Organic Carbon (C)	2017/10/03	<0.50		mg/L	
5193753	SMT	RPD - Sample/Sample Dup	Total Organic Carbon (C)	2017/10/03	9.8		%	20
5196177	OBC	Matrix Spike	C13-1234678 HeptaCDD	2017/10/09		92	%	30 - 130
			C13-1234678 HeptaCDF	2017/10/09		78	%	30 - 130
			C13-123678 HexaCDD	2017/10/09		87	%	30 - 130
			C13-123678 HexaCDF	2017/10/09		69	%	30 - 130
			C13-12378 PentaCDD	2017/10/09		95	%	30 - 130

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			C13-12378 PentaCDF	2017/10/09		75	%	30 - 130
			C13-2378 TetraCDD	2017/10/09		86	%	30 - 130
			C13-2378 TetraCDF	2017/10/09		79	%	30 - 130
			C13-OCDD	2017/10/09		107	%	30 - 130
			2,3,7,8-Tetra CDD	2017/10/09		97	%	80 - 140
			1,2,3,7,8-Penta CDD	2017/10/09		96	%	80 - 140
			1,2,3,4,7,8-Hexa CDD	2017/10/09		103	%	80 - 140
			1,2,3,6,7,8-Hexa CDD	2017/10/09		102	%	80 - 140
			1,2,3,7,8,9-Hexa CDD	2017/10/09		102	%	80 - 140
			1,2,3,4,6,7,8-Hepta CDD	2017/10/09		98	%	80 - 140
			Octa CDD	2017/10/09		97	%	80 - 140
			2,3,7,8-Tetra CDF	2017/10/09		101	%	80 - 140
			1,2,3,7,8-Penta CDF	2017/10/09		101	%	80 - 140
			2,3,4,7,8-Penta CDF	2017/10/09		109	%	80 - 140
			1,2,3,4,7,8-Hexa CDF	2017/10/09		107	%	80 - 140
			1,2,3,6,7,8-Hexa CDF	2017/10/09		114	%	80 - 140
			2,3,4,6,7,8-Hexa CDF	2017/10/09		109	%	80 - 140
			1,2,3,7,8,9-Hexa CDF	2017/10/09		110	%	80 - 140
			1,2,3,4,6,7,8-Hepta CDF	2017/10/09		94	%	80 - 140
			1,2,3,4,7,8,9-Hepta CDF	2017/10/09		110	%	80 - 140
			Octa CDF	2017/10/09		90	%	80 - 140
5196177	OBC	Spiked Blank	C13-1234678 HeptaCDD	2017/10/08		94	%	30 - 130
			C13-1234678 HeptaCDF	2017/10/08		80	%	30 - 130
			C13-123678 HexaCDD	2017/10/08		87	%	30 - 130
			C13-123678 HexaCDF	2017/10/08		71	%	30 - 130
			C13-12378 PentaCDD	2017/10/08		91	%	30 - 130
			C13-12378 PentaCDF	2017/10/08		81	%	30 - 130
			C13-2378 TetraCDD	2017/10/08		94	%	30 - 130
			C13-2378 TetraCDF	2017/10/08		80	%	30 - 130
			C13-OCDD	2017/10/08		110	%	30 - 130
			2,3,7,8-Tetra CDD	2017/10/08		92	%	80 - 140
			1,2,3,7,8-Penta CDD	2017/10/08		102	%	80 - 140
			1,2,3,4,7,8-Hexa CDD	2017/10/08		93	%	80 - 140
			1,2,3,6,7,8-Hexa CDD	2017/10/08		102	%	80 - 140
			1,2,3,7,8,9-Hexa CDD	2017/10/08		106	%	80 - 140
			1,2,3,4,6,7,8-Hepta CDD	2017/10/08		103	%	80 - 140
			Octa CDD	2017/10/08		99	%	80 - 140
			2,3,7,8-Tetra CDF	2017/10/08		100	%	80 - 140
			1,2,3,7,8-Penta CDF	2017/10/08		97	%	80 - 140
			2,3,4,7,8-Penta CDF	2017/10/08		99	%	80 - 140
			1,2,3,4,7,8-Hexa CDF	2017/10/08		99	%	80 - 140
			1,2,3,6,7,8-Hexa CDF	2017/10/08		107	%	80 - 140
			2,3,4,6,7,8-Hexa CDF	2017/10/08		104	%	80 - 140
			1,2,3,7,8,9-Hexa CDF	2017/10/08		105	%	80 - 140
			1,2,3,4,6,7,8-Hepta CDF	2017/10/08		97	%	80 - 140
			1,2,3,4,7,8,9-Hepta CDF	2017/10/08		108	%	80 - 140
			Octa CDF	2017/10/08		90	%	80 - 140
5196177	OBC	Spiked Blank DUP	C13-1234678 HeptaCDD	2017/10/08		95	%	30 - 130
			C13-1234678 HeptaCDF	2017/10/08		84	%	30 - 130
			C13-123678 HexaCDD	2017/10/08		96	%	30 - 130
			C13-123678 HexaCDF	2017/10/08		77	%	30 - 130
			C13-12378 PentaCDD	2017/10/08		99	%	30 - 130
			C13-12378 PentaCDF	2017/10/08		83	%	30 - 130

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			C13-2378 TetraCDD	2017/10/08		94	%	30 - 130
			C13-2378 TetraCDF	2017/10/08		86	%	30 - 130
			C13-OCDD	2017/10/08		119	%	30 - 130
			2,3,7,8-Tetra CDD	2017/10/08		96	%	80 - 140
			1,2,3,7,8-Penta CDD	2017/10/08		98	%	80 - 140
			1,2,3,4,7,8-Hexa CDD	2017/10/08		90	%	80 - 140
			1,2,3,6,7,8-Hexa CDD	2017/10/08		106	%	80 - 140
			1,2,3,7,8,9-Hexa CDD	2017/10/08		99	%	80 - 140
			1,2,3,4,6,7,8-Hepta CDD	2017/10/08		103	%	80 - 140
			Octa CDD	2017/10/08		97	%	80 - 140
			2,3,7,8-Tetra CDF	2017/10/08		98	%	80 - 140
			1,2,3,7,8-Penta CDF	2017/10/08		103	%	80 - 140
			2,3,4,7,8-Penta CDF	2017/10/08		116	%	80 - 140
			1,2,3,4,7,8-Hexa CDF	2017/10/08		100	%	80 - 140
			1,2,3,6,7,8-Hexa CDF	2017/10/08		108	%	80 - 140
			2,3,4,6,7,8-Hexa CDF	2017/10/08		107	%	80 - 140
			1,2,3,7,8,9-Hexa CDF	2017/10/08		110	%	80 - 140
			1,2,3,4,6,7,8-Hepta CDF	2017/10/08		95	%	80 - 140
			1,2,3,4,7,8,9-Hepta CDF	2017/10/08		118	%	80 - 140
			Octa CDF	2017/10/08		91	%	80 - 140
5196177	OBC	RPD	2,3,7,8-Tetra CDD	2017/10/08	4.3		%	25
			1,2,3,7,8-Penta CDD	2017/10/08	4.0		%	25
			1,2,3,4,7,8-Hexa CDD	2017/10/08	3.3		%	25
			1,2,3,6,7,8-Hexa CDD	2017/10/08	3.8		%	25
			1,2,3,7,8,9-Hexa CDD	2017/10/08	6.8		%	25
			1,2,3,4,6,7,8-Hepta CDD	2017/10/08	0		%	25
			Octa CDD	2017/10/08	2.0		%	25
			2,3,7,8-Tetra CDF	2017/10/08	2.0		%	25
			1,2,3,7,8-Penta CDF	2017/10/08	6.0		%	25
			2,3,4,7,8-Penta CDF	2017/10/08	16		%	25
			1,2,3,4,7,8-Hexa CDF	2017/10/08	1.0		%	25
			1,2,3,6,7,8-Hexa CDF	2017/10/08	0.93		%	25
			2,3,4,6,7,8-Hexa CDF	2017/10/08	2.8		%	25
			1,2,3,7,8,9-Hexa CDF	2017/10/08	4.7		%	25
			1,2,3,4,6,7,8-Hepta CDF	2017/10/08	2.1		%	25
			1,2,3,4,7,8,9-Hepta CDF	2017/10/08	8.8		%	25
			Octa CDF	2017/10/08	1.1		%	25
5196177	OBC	Method Blank	C13-1234678 HeptaCDD	2017/10/08		104	%	30 - 130
			C13-1234678 HeptaCDF	2017/10/08		79	%	30 - 130
			C13-123678 HexaCDD	2017/10/08		86	%	30 - 130
			C13-123678 HexaCDF	2017/10/08		71	%	30 - 130
			C13-12378 PentaCDD	2017/10/08		93	%	30 - 130
			C13-12378 PentaCDF	2017/10/08		82	%	30 - 130
			C13-2378 TetraCDD	2017/10/08		93	%	30 - 130
			C13-2378 TetraCDF	2017/10/08		86	%	30 - 130
			C13-OCDD	2017/10/08		102	%	30 - 130
			2,3,7,8-Tetra CDD	2017/10/08	<0.104, EDL=0.104		pg/g	
			1,2,3,7,8-Penta CDD	2017/10/08	<0.105, EDL=0.105		pg/g	
			1,2,3,4,7,8-Hexa CDD	2017/10/08	<0.0952, EDL=0.0952		pg/g	

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			1,2,3,6,7,8-Hexa CDD	2017/10/08	<0.0932, EDL=0.0932		pg/g	
			1,2,3,7,8,9-Hexa CDD	2017/10/08	<0.0845, EDL=0.0845		pg/g	
			1,2,3,4,6,7,8-Hepta CDD	2017/10/08	<0.109, EDL=0.109 (9)		pg/g	
			Octa CDD	2017/10/08	1.88, EDL=0.102		pg/g	
			Total Tetra CDD	2017/10/08	<0.176, EDL=0.176 (9)		pg/g	
			Total Penta CDD	2017/10/08	<0.118, EDL=0.118 (9)		pg/g	
			Total Hexa CDD	2017/10/08	<0.199, EDL=0.199 (9)		pg/g	
			Total Hepta CDD	2017/10/08	<0.109, EDL=0.109 (9)		pg/g	
			2,3,7,8-Tetra CDF	2017/10/08	<0.104, EDL=0.104		pg/g	
			1,2,3,7,8-Penta CDF	2017/10/08	<0.118, EDL=0.118		pg/g	
			2,3,4,7,8-Penta CDF	2017/10/08	<0.118, EDL=0.118		pg/g	
			1,2,3,4,7,8-Hexa CDF	2017/10/08	<0.102, EDL=0.102		pg/g	
			1,2,3,6,7,8-Hexa CDF	2017/10/08	<0.0969, EDL=0.0969		pg/g	
			2,3,4,6,7,8-Hexa CDF	2017/10/08	<0.103, EDL=0.103		pg/g	
			1,2,3,7,8,9-Hexa CDF	2017/10/08	<0.111, EDL=0.111		pg/g	
			1,2,3,4,6,7,8-Hepta CDF	2017/10/08	<0.102, EDL=0.102		pg/g	
			1,2,3,4,7,8,9-Hepta CDF	2017/10/08	<0.141, EDL=0.141		pg/g	
			Octa CDF	2017/10/08	<0.117, EDL=0.117		pg/g	
			Total Tetra CDF	2017/10/08	<0.104, EDL=0.104		pg/g	
			Total Penta CDF	2017/10/08	<0.118, EDL=0.118		pg/g	
			Total Hexa CDF	2017/10/08	<0.103, EDL=0.103		pg/g	
			Total Hepta CDF	2017/10/08	<0.119, EDL=0.119		pg/g	
5196177	OBC	RPD - Sample/Sample Dup	2,3,7,8-Tetra CDD	2017/10/08	NC		%	25
			1,2,3,7,8-Penta CDD	2017/10/08	NC		%	25
			1,2,3,4,7,8-Hexa CDD	2017/10/08	NC		%	25
			1,2,3,6,7,8-Hexa CDD	2017/10/08	NC		%	25
			1,2,3,7,8,9-Hexa CDD	2017/10/08	NC		%	25
			1,2,3,4,6,7,8-Hepta CDD	2017/10/08	NC		%	25
			Octa CDD	2017/10/08	NC		%	25
			Total Tetra CDD	2017/10/08	NC (9)		%	25
			Total Penta CDD	2017/10/08	NC (9)		%	25

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			Total Hexa CDD	2017/10/08	NC		%	25
			Total Hepta CDD	2017/10/08	1.1		%	25
			2,3,7,8-Tetra CDF	2017/10/08	NC		%	25
			1,2,3,7,8-Penta CDF	2017/10/08	NC		%	25
			2,3,4,7,8-Penta CDF	2017/10/08	NC		%	25
			1,2,3,4,7,8-Hexa CDF	2017/10/08	NC		%	25
			1,2,3,6,7,8-Hexa CDF	2017/10/08	NC		%	25
			2,3,4,6,7,8-Hexa CDF	2017/10/08	NC		%	25
			1,2,3,7,8,9-Hexa CDF	2017/10/08	NC		%	25
			1,2,3,4,6,7,8-Hepta CDF	2017/10/08	NC		%	25
			1,2,3,4,7,8,9-Hepta CDF	2017/10/08	NC		%	25
			Octa CDF	2017/10/08	NC (9)		%	25
			Total Tetra CDF	2017/10/08	NC		%	25
			Total Penta CDF	2017/10/08	NC		%	25
			Total Hexa CDF	2017/10/08	NC		%	25
			Total Hepta CDF	2017/10/08	NC		%	25
5198297	KBT	Matrix Spike	Total Alkalinity (Total as CaCO3)	2017/10/06		110	%	80 - 120
5198297	KBT	Spiked Blank	Total Alkalinity (Total as CaCO3)	2017/10/06		101	%	80 - 120
5198297	KBT	Method Blank	Total Alkalinity (Total as CaCO3)	2017/10/06	<5.0		mg/L	
5198297	KBT	RPD - Sample/Sample Dup	Total Alkalinity (Total as CaCO3)	2017/10/06	1.6		%	25
5198307	KBT	Matrix Spike	Reactive Silica (SiO2)	2017/10/06		94	%	80 - 120
5198307	KBT	Spiked Blank	Reactive Silica (SiO2)	2017/10/06		96	%	80 - 120
5198307	KBT	Method Blank	Reactive Silica (SiO2)	2017/10/06	<0.50		mg/L	
5198307	KBT	RPD - Sample/Sample Dup	Reactive Silica (SiO2)	2017/10/06	2.9		%	25
5198309	KBT	Spiked Blank	Colour	2017/10/05		106	%	80 - 120
5198309	KBT	Method Blank	Colour	2017/10/05	<5.0		TCU	
5198309	KBT	RPD - Sample/Sample Dup	Colour	2017/10/05	9.6		%	20
5200254	DDS	Matrix Spike(FDZ407)	F4G-sg (Grav. Heavy Hydrocarbons)	2017/10/06		107	%	65 - 135
5200254	DDS	Spiked Blank	F4G-sg (Grav. Heavy Hydrocarbons)	2017/10/06		101	%	65 - 135
5200254	DDS	Method Blank	F4G-sg (Grav. Heavy Hydrocarbons)	2017/10/06	<100		ug/g	
5200254	DDS	RPD - Sample/Sample Dup	F4G-sg (Grav. Heavy Hydrocarbons)	2017/10/06	NC		%	50
5214380	YMA	Matrix Spike	F4G-sg (Grav. Heavy Hydrocarbons)	2017/10/17		111	%	65 - 135
5214380	YMA	Spiked Blank	F4G-sg (Grav. Heavy Hydrocarbons)	2017/10/17		102	%	65 - 135
5214380	YMA	Method Blank	F4G-sg (Grav. Heavy Hydrocarbons)	2017/10/17	<100		ug/g	

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
5214380	YMA	RPD - Sample/Sample Dup	F4G-sg (Grav. Heavy Hydrocarbons)	2017/10/17	11		%	50

N/A = Not Applicable

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) VOC samples were extracted using a flat-bed shaker instead of the accelerated mechanical shaker due to matrix incompatibility.

(2) Duplicate: results are outside acceptance limit. Sample was past recommended hold time for repeat analysis.

(3) PCB surrogate not within acceptance limits. Analysis was repeated with similar results. PCB:Unidentified (possibly halogenated) compounds detected.

(4) Matrix Spike: results are outside acceptance limit. Analysis was repeated with similar results.

(5) Duplicate: results are outside acceptance limit due to possible sample in-homogeneity. Sample was past recommended hold time for repeat analysis.

(6) Poor RPD due to sample inhomogeneity. Results confirmed with repeat digestion and analysis.

(7) PAH surrogate(s) not within acceptance limits. Sample past recommended hold time for repeat analysis.

(8) Matrix Spike: results are outside acceptance limit. Analysis was not repeated, sample was past recommended hold time for repeat analysis.

(9) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.

Maxxam Job #: B7K6270
Report Date: 2017/11/08

GEMTEC LIMITED
Client Project #: 10550.04
Site Location: SPOTTED ISLAND

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Alan Stewart, Organics Manager, Bedford

Cristina Carriere, Scientific Service Specialist

Ewa Pranjic, M.Sc., C.Chem, Scientific Specialist

Mike MacGillivray, Scientific Specialist (Inorganics)

Owen Cosby, BSc.C.Chem, Supervisor, HRMS Services

Phil Deveau, Scientific Specialist (Organics)

Your Project #: 10550.04
Your C.O.C. #: 627210-01-01

Attention: Abigail Garnett

GEMTEC LIMITED
191 Doak Rd
Fredericton, NB
Canada E3C 2E6

Report Date: 2018/05/28
Report #: R5177850
Version: 5 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B7K8817
Received: 2017/09/20, 10:00

Sample Matrix: Paint
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Metals Bulk Acid Extr. ICPMS	1	2017/09/28	2017/09/29	ATL SOP 00058	EPA 6020A R1 m
OC Pesticides & PCBs in misc matrices (1, 2)	1	2017/11/16	2017/11/17	CAM SOP-00307	EPA 8081/8082 m
OC Pesticides Summed Parameters (1)	1	N/A	2017/11/21	CAM SOP-00307	EPA 8081/8082 m

Sample Matrix: Solid
Samples Received: 18

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
200 Point Count by PLM (1, 3)	18	N/A	2017/09/28	CAM SOP-00475	EPA/600/R-93/116

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam 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.

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam 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 Maxxam, unless otherwise agreed in writing.

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.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
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.

Maxxam Analytics International Corporation o/a Maxxam Analytics 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.maxxamanalytics.com

Your Project #: 10550.04
Your C.O.C. #: 627210-01-01

Attention: Abigail Garnett

GEMTEC LIMITED
191 Doak Rd
Fredericton, NB
Canada E3C 2E6

Report Date: 2018/05/28
Report #: R5177850
Version: 5 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B7K8817

Received: 2017/09/20, 10:00

(1) This test was performed by Maxxam Analytics Mississauga
(2) Chlordane (Total) = Alpha Chlordane + Gamma Chlordane

Sample(s) analyzed using methodologies that have not been subjected to Maxxam's standard validation process for the submitted matrix and is not an Accredited method. Analysis performed with client consent, however results should be viewed with discretion

(3) Maxxam Analytics' Asbestos Laboratory is accredited by NVLAP for bulk asbestos analysis by polarized light microscopy, NVLAP Code 600136-0.
This report may not be reproduced, except in full, without the written approval of Maxxam Analytics. This report may not be used by the client to claim product endorsement by NVLAP, NIST or any other agency of the U.S. Government.
Maxxam Analytics' scope of accreditation includes EPA-600/M4-82-020: "Interim Method for the Determination of Asbestos in Bulk Insulation Samples" and EPA-600/R-93/116: "Method for the Determination of Asbestos in Bulk Building Materials".

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Heather Macumber, Senior Project Manager
Email: HMacumber@maxxam.ca
Phone# (902)420-0203 Ext:226
==
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Job #: B7K8817
Report Date: 2018/05/28

GEMTEC LIMITED
Client Project #: 10550.04

ELEMENTS BY ATOMIC SPECTROSCOPY (PAINT)

Maxxam ID		FEK904	FEK904		
Sampling Date		2017/09/15	2017/09/15		
COC Number		627210-01-01	627210-01-01		
	UNITS	PS_SP_01 YELLOW ON WOOD	PS_SP_01 YELLOW ON WOOD Lab-Dup	RDL	QC Batch
Metals					
Acid Extractable Lead (Pb)	mg/kg	490	460	5.0	5186867
Acid Extractable Mercury (Hg)	mg/kg	16	16	1.0	5186867

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

Maxxam Job #: B7K8817
Report Date: 2018/05/28

GEMTEC LIMITED
Client Project #: 10550.04

ORGANOCHLORINATED PESTICIDES BY GC-ECD (PAINT)

Maxxam ID		FEK904		
Sampling Date		2017/09/15		
COC Number		627210-01-01		
	UNITS	**PS_SP_01 YELLOW ON WOOD**	**RDL**	**QC Batch**
Calculated Parameters				
Aldrin + Dieldrin	ug/g	<0.020	0.020	5259606
Chlordane (Total)	ug/g	<0.020	0.020	5259606
DDT+ Metabolites	ug/g	0.025	0.020	5259606
Heptachlor + Heptachlor epoxide	ug/g	<0.020	0.020	5259606
o,p-DDD + p,p-DDD	ug/g	<0.020	0.020	5259606
o,p-DDE + p,p-DDE	ug/g	<0.020	0.020	5259606
o,p-DDT + p,p-DDT	ug/g	0.025	0.020	5259606
Total Endosulfan	ug/g	<0.020	0.020	5259606
Total PCB	ug/g	<0.30	0.30	5259606
Pesticides & Herbicides				
Aroclor 1262	ug/g	<0.1	0.1	5269694
Aroclor 1268	ug/g	<0.1	0.1	5269694
Aldrin	ug/g	<0.02	0.02	5269694
alpha-BHC	ug/g	<0.02	0.02	5269694
beta-BHC	ug/g	<0.02	0.02	5269694
delta-BHC	ug/g	<0.02	0.02	5269694
a-Chlordane	ug/g	<0.02	0.02	5269694
g-Chlordane	ug/g	<0.02	0.02	5269694
o,p-DDD	ug/g	<0.02	0.02	5269694
p,p-DDD	ug/g	<0.02	0.02	5269694
o,p-DDE	ug/g	<0.02	0.02	5269694
p,p-DDE	ug/g	<0.02	0.02	5269694
o,p-DDT	ug/g	<0.02	0.02	5269694
p,p-DDT	ug/g	0.03	0.02	5269694
Dieldrin	ug/g	<0.02	0.02	5269694
Endosulfan I (alpha)	ug/g	<0.02	0.02	5269694
Endosulfan II (beta)	ug/g	<0.02	0.02	5269694
Endosulfan sulfate	ug/g	<0.02	0.02	5269694
Endrin	ug/g	<0.02	0.02	5269694
Endrin aldehyde	ug/g	<0.02	0.02	5269694
Endrin ketone	ug/g	<0.02	0.02	5269694
Heptachlor	ug/g	<0.02	0.02	5269694
Heptachlor epoxide	ug/g	<0.02	0.02	5269694
Hexachlorobenzene	ug/g	<0.02	0.02	5269694
Lindane	ug/g	<0.02	0.02	5269694

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Analytics International Corporation o/a Maxxam Analytics 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.maxxamanalytics.com

Maxxam Job #: B7K8817
Report Date: 2018/05/28

GEMTEC LIMITED
Client Project #: 10550.04

ORGANOCHLORINATED PESTICIDES BY GC-ECD (PAINT)

Maxxam ID		FEK904		
Sampling Date		2017/09/15		
COC Number		627210-01-01		
	UNITS	**PS_SP_01 YELLOW ON WOOD**	**RDL**	**QC Batch**
Methoxychlor	ug/g	<0.05	0.05	5269694
Mirex	ug/g	<0.02	0.02	5269694
Octachlorostyrene	ug/g	<0.02	0.02	5269694
Aroclor 1016	ug/g	<0.2	0.2	5269694
Aroclor 1221	ug/g	<0.3	0.3	5269694
Aroclor 1232	ug/g	<0.2	0.2	5269694
Aroclor 1242	ug/g	<0.2	0.2	5269694
Aroclor 1248	ug/g	<0.2	0.2	5269694
Aroclor 1254	ug/g	<0.2	0.2	5269694
Aroclor 1260	ug/g	<0.2	0.2	5269694
Surrogate Recovery (%)				
2,4,5,6-Tetrachloro-m-xylene	%	89		5269694
Decachlorobiphenyl	%	154 (1)		5269694

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

(1) Surrogate recovery was above the upper control limit due to matrix interference. This may represent a high bias in some results.

ASBESTOS (SOLID)

Maxxam ID		FEK886	FEK887			FEK888		
Sampling Date		2017/09/12	2017/09/12			2017/09/12		
COC Number		627210-01-01	627210-01-01			627210-01-01		
	UNITS	BS_CT_01A TRANSITE BOARD	BS_CT_02A BLACK CAULKING	RDL	QC Batch	BS_CT_02B BLACK CAULKING	RDL	QC Batch
Number of Layers	%	1.0	1.0		5186612	1.0		5186612
Layer 1 Homogenous?	%	Yes	Yes		5186612	Yes		5186612
Layer 1 Colour	%	GREY	BLACK		5186612	BLACK		5186612
Layer 1 Description	%	TRANSITE	CAULKING		5186612	CAULKING		5186612
Layer 1 Asbestos	%	DETECTED	DETECTED	0.5	5186612	<0.5	0.5	5186612
Layer 1 Chrysotile	%	15	6.0	0.5	5186612			
Layer 1 Cellulose	%					20	0.5	5186612
Layer 1 Non Fibrous Material	%	20	94	0.5	5186612	80	0.5	5186612

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		FEK889	FEK890	FEK891		
Sampling Date		2017/09/12	2017/09/12	2017/09/13		
COC Number		627210-01-01	627210-01-01	627210-01-01		
	UNITS	BS_CT_01B TRANSITE BOARD	BS_CT_01C TRANSITE BOARD	BS_CT_01D TRANSITE BOARD	RDL	QC Batch
Number of Layers	%	1.0	1.0	1.0		5186612
Layer 1 Homogenous?	%	Yes	Yes	Yes		5186612
Layer 1 Colour	%	GREY	GREY	GREY		5186612
Layer 1 Description	%	TRANSITE	TRANSITE	TRANSITE		5186612
Layer 1 Asbestos	%	DETECTED	DETECTED	DETECTED	0.5	5186612
Layer 1 Chrysotile	%	15	15	15	0.5	5186612
Layer 1 Non Fibrous Material	%	85	85	85	0.5	5186612

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B7K8817
Report Date: 2018/05/28

GEMTEC LIMITED
Client Project #: 10550.04

ASBESTOS (SOLID)

Maxxam ID		FEK892			FEK893		
Sampling Date		2017/09/12			2017/09/15		
COC Number		627210-01-01			627210-01-01		
	UNITS	BS_CT_03A ASPHALT SHEET ROOFING	RDL	QC Batch	BS_SP_01A ASPHALT SHINGLE	RDL	QC Batch
Number of Layers	%	1.0		5186612	1.0		5186612
Layer 1 Homogenous?	%	Yes		5186612	Yes		5186612
Layer 1 Colour	%	BLACK		5186612	BLACK		5186612
Layer 1 Description	%	ASPHALT		5186612	SHINGLE		5186612
Layer 1 Asbestos	%	<0.5	0.5	5186612	<0.5	0.5	5186612
Layer 1 Cellulose	%				15	0.5	5186612
Layer 1 Non Fibrous Material	%	100	0.5	5186612	85	0.5	5186612

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		FEK894	FEK895	FEK896		
Sampling Date		2017/09/14	2017/09/14	2017/09/15		
COC Number		627210-01-01	627210-01-01	627210-01-01		
	UNITS	BS_SP_02A TRANSITE BOARD	BS_SP_02B TRANSITE BOARD	BS_SP_02C TRANSITE BOARD	RDL	QC Batch
Number of Layers	%	1.0	1.0	1.0		5186612
Layer 1 Homogenous?	%	Yes	Yes	Yes		5186612
Layer 1 Colour	%	GREY	GREY	GREY		5186612
Layer 1 Description	%	TRANSITE	TRANSITE	TRANSITE		5186612
Layer 1 Asbestos	%	DETECTED	DETECTED	DETECTED	0.5	5186612
Layer 1 Chrysotile	%	15	20	15	0.5	5186612
Layer 1 Non Fibrous Material	%	85	85	85	0.5	5186612

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Analytics International Corporation o/a Maxxam Analytics 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.maxxamanalytics.com

ASBESTOS (SOLID)

Maxxam ID		FEK897			FEK898	FEK899		
Sampling Date		2017/09/15			2017/09/15	2017/09/15		
COC Number		627210-01-01			627210-01-01	627210-01-01		
	UNITS	BS_SP_03A BLACK CAULKING	RDL	QC Batch	BS_SP_04A GASKET	BS_SP_05A TAR PAPER MATER	RDL	QC Batch
Number of Layers	%	1.0		5186612	1.0	1.0		5186612
Layer 1 Homogenous?	%	Yes		5186612	Yes	Yes		5186612
Layer 1 Colour	%	BLACK		5186612	BLACK	BLACK		5186612
Layer 1 Description	%	CAULKING		5186612	GASKET	TAR		5186612
Layer 1 Asbestos	%	<0.5	0.5	5186612	<0.5	<0.5	0.5	5186612
Layer 1 Cellulose	%	20	0.5	5186612				
Layer 1 Non Fibrous Material	%	80	0.5	5186612	100	100	0.5	5186612

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		FEK900	FEK901			FEK902		
Sampling Date		2017/09/15	2017/09/15			2017/09/15		
COC Number		627210-01-01	627210-01-01			627210-01-01		
	UNITS	BS_SP_06A 9X9 TILE GREY STREAK	BS_SP_07A 9X9 TILE BEIGE STREAK	RDL	QC Batch	BS_SP_08A 9X9 TILE GREEN STREAK	RDL	QC Batch
Number of Layers	%	1.0	1.0		5186612	2.0		5186612
Layer 1 Homogenous?	%	Yes	Yes		5186612	Yes		5186612
Layer 1 Colour	%	GREY	BEIGE		5186612	GREEN		5186612
Layer 1 Description	%	VFT	VFT		5186612	VFT		5186612
Layer 1 Asbestos	%	DETECTED	DETECTED	0.5	5186612	DETECTED	0.5	5186612
Layer 1 Chrysotile	%	2.0	2.0	0.5	5186612	2.0	0.5	5186612
Layer 1 Non Fibrous Material	%	98	98	0.5	5186612	98	0.5	5186612
Layer 2 Homogenous?	%					Yes		5186612
Layer 2 Colour	%					BLACK		5186612
Layer 2 Description	%					MASTIC		5186612
Layer 2 Asbestos	%					DETECTED	0.5	5186612
Layer 2 Chrysotile	%					2.0	0.5	5186612
Layer 2 Non Fibrous Material	%					98	0.5	5186612

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam
A Bureau Veritas Group Company

Maxxam Job #: B7K8817
Report Date: 2018/05/28

GEMTEC LIMITED
Client Project #: 10550.04

ASBESTOS (SOLID)

Maxxam ID		FEK903		
Sampling Date		2017/09/15		
COC Number		627210-01-01		
	UNITS	BS_SP_09A 9X9 TILE BEIGE W. GREEN STREAK	RDL	QC Batch
Number of Layers	%	2.0		5186612
Layer 1 Homogenous?	%	Yes		5186612
Layer 1 Colour	%	GREY		5186612
Layer 1 Description	%	VFT		5186612
Layer 1 Asbestos	%	DETECTED	0.5	5186612
Layer 1 Chrysotile	%	2.0	0.5	5186612
Layer 1 Non Fibrous Material	%	98	0.5	5186612
Layer 2 Homogenous?	%	Yes		5186612
Layer 2 Colour	%	BLACK		5186612
Layer 2 Description	%	MASTIC		5186612
Layer 2 Asbestos	%	DETECTED	0.5	5186612
Layer 2 Chrysotile	%	4.0	0.5	5186612
Layer 2 Non Fibrous Material	%	96	0.5	5186612

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Analytics International Corporation o/a Maxxam Analytics 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.maxxamanalytics.com

GENERAL COMMENTS

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

Package 1	3.2°C

Revised report issued to add pesticide analysis on FEK904 (PS_SP_01 YELLOW ON WOOD). SMS 2017/11/22

Revised report: Issued report with only Lead and Mercury reported in the metals scan. HWS Oct 20/17

Revised report issued to provide a separate Certificate of Analysis for SP samples. 2017/09/29 SMS

Revised Report: Report reissued due to IT related issue. HWS May 28/18

ORGANOCHLORINATED PESTICIDES BY GC-ECD (PAINT)

OC Pesticides & PCBs in misc matrices: The recoveries were above the upper control limit. This may represent a high bias in some results for flagged analytes. For results that were not detected (ND), this potential bias has no impact.

ASBESTOS (SOLID)

200 Point Count by PLM: VFT = Vinyl Floor Tile

Results relate only to the items tested.

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
5186867	BAN	Matrix Spike [FEK904-01]	Acid Extractable Lead (Pb)	2017/09/29		NC	%	75 - 125
			Acid Extractable Mercury (Hg)	2017/09/29		NC	%	75 - 125
5186867	BAN	Spiked Blank	Acid Extractable Lead (Pb)	2017/09/29		99	%	75 - 125
			Acid Extractable Mercury (Hg)	2017/09/29		105	%	75 - 125
5186867	BAN	Method Blank	Acid Extractable Lead (Pb)	2017/09/29	<5.0		mg/kg	
			Acid Extractable Mercury (Hg)	2017/09/29	<1.0		mg/kg	
5186867	BAN	RPD [FEK904-01]	Acid Extractable Lead (Pb)	2017/09/29	5.9		%	35
			Acid Extractable Mercury (Hg)	2017/09/29	1.6		%	35
5269694	JZ	Matrix Spike [FEK904-01]	2,4,5,6-Tetrachloro-m-xylene	2017/11/17		86	%	30 - 130
			Decachlorobiphenyl	2017/11/17		146 (1)	%	30 - 130
			Aldrin	2017/11/17		84	%	50 - 130
			alpha-BHC	2017/11/17		120	%	30 - 130
			beta-BHC	2017/11/17		89	%	30 - 130
			delta-BHC	2017/11/17		98	%	30 - 130
			a-Chlordane	2017/11/17		108	%	50 - 130
			g-Chlordane	2017/11/17		105	%	50 - 130
			o,p-DDD	2017/11/17		121	%	50 - 130
			p,p-DDD	2017/11/17		127	%	50 - 130
			o,p-DDE	2017/11/17		83	%	50 - 130
			p,p-DDE	2017/11/17		108	%	50 - 130
			o,p-DDT	2017/11/17		86	%	50 - 130
			p,p-DDT	2017/11/17		113	%	50 - 130
			Dieldrin	2017/11/17		132 (2)	%	50 - 130
			Endosulfan I (alpha)	2017/11/17		126	%	50 - 130
			Endosulfan II (beta)	2017/11/17		110	%	50 - 130
			Endosulfan sulfate	2017/11/17		107	%	30 - 130
			Endrin	2017/11/17		104	%	50 - 130
			Endrin aldehyde	2017/11/17		443 (2)	%	30 - 130
			Endrin ketone	2017/11/17		119	%	30 - 130
			Heptachlor	2017/11/17		119	%	50 - 130
			Heptachlor epoxide	2017/11/17		107	%	50 - 130
			Hexachlorobenzene	2017/11/17		106	%	50 - 130
			Lindane	2017/11/17		96	%	50 - 130
			Methoxychlor	2017/11/17		126	%	50 - 130
			Mirex	2017/11/17		108	%	30 - 130
			Octachlorostyrene	2017/11/17		96	%	30 - 130
5269694	JZ	Spiked Blank	2,4,5,6-Tetrachloro-m-xylene	2017/11/17		90	%	30 - 130
			Decachlorobiphenyl	2017/11/17		108	%	30 - 130
			Aldrin	2017/11/17		85	%	50 - 130
			alpha-BHC	2017/11/17		102	%	30 - 130
			beta-BHC	2017/11/17		113	%	30 - 130
			delta-BHC	2017/11/17		120	%	30 - 130
			a-Chlordane	2017/11/17		114	%	50 - 130
			g-Chlordane	2017/11/17		112	%	50 - 130
			o,p-DDD	2017/11/17		127	%	50 - 130
			p,p-DDD	2017/11/17		126	%	50 - 130
			o,p-DDE	2017/11/17		83	%	50 - 130
			p,p-DDE	2017/11/17		100	%	50 - 130
			o,p-DDT	2017/11/17		85	%	50 - 130
			p,p-DDT	2017/11/17		90	%	50 - 130
			Dieldrin	2017/11/17		128	%	50 - 130
			Endosulfan I (alpha)	2017/11/17		143 (2)	%	50 - 130
			Endosulfan II (beta)	2017/11/17		123	%	50 - 130
			Endosulfan sulfate	2017/11/17		127	%	30 - 130
			Endrin	2017/11/17		112	%	50 - 130

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Endrin aldehyde	2017/11/17		116	%	30 - 130
			Endrin ketone	2017/11/17		120	%	30 - 130
			Heptachlor	2017/11/17		85	%	50 - 130
			Heptachlor epoxide	2017/11/17		112	%	50 - 130
			Hexachlorobenzene	2017/11/17		88	%	50 - 130
			Lindane	2017/11/17		91	%	50 - 130
			Methoxychlor	2017/11/17		121	%	50 - 130
			Mirex	2017/11/17		97	%	30 - 130
			Octachlorostyrene	2017/11/17		91	%	30 - 130
5269694	JZ	RPD	Aldrin	2017/11/17	2.3		%	50
			alpha-BHC	2017/11/17	5.2		%	50
			beta-BHC	2017/11/17	12		%	50
			delta-BHC	2017/11/17	7.1		%	50
			a-Chlordane	2017/11/17	5.6		%	50
			g-Chlordane	2017/11/17	7.0		%	50
			o,p-DDD	2017/11/17	6.0		%	50
			p,p-DDD	2017/11/17	4.1		%	50
			o,p-DDE	2017/11/17	1.7		%	50
			p,p-DDE	2017/11/17	1.1		%	50
			o,p-DDT	2017/11/17	1.2		%	50
			p,p-DDT	2017/11/17	2.8		%	50
			Dieldrin	2017/11/17	0.031		%	50
			Endosulfan I (alpha)	2017/11/17	7.2		%	50
			Endosulfan II (beta)	2017/11/17	4.0		%	50
			Endosulfan sulfate	2017/11/17	5.0		%	50
			Endrin	2017/11/17	6.7		%	50
			Endrin aldehyde	2017/11/17	0.53		%	50
			Endrin ketone	2017/11/17	6.2		%	50
			Heptachlor	2017/11/17	1.4		%	50
			Heptachlor epoxide	2017/11/17	7.5		%	50
			Hexachlorobenzene	2017/11/17	2.3		%	50
			Lindane	2017/11/17	6.9		%	50
			Methoxychlor	2017/11/17	6.9		%	50
			Mirex	2017/11/17	2.0		%	50
			Octachlorostyrene	2017/11/17	1.7		%	50
5269694	JZ	Method Blank	2,4,5,6-Tetrachloro-m-xylene	2017/11/17		91	%	30 - 130
			Aroclor 1262	2017/11/17	<0.2		ug/g	
			Aroclor 1268	2017/11/17	<0.2		ug/g	
			Decachlorobiphenyl	2017/11/17		114	%	30 - 130
			Aldrin	2017/11/17	<0.02		ug/g	
			alpha-BHC	2017/11/17	<0.02		ug/g	
			beta-BHC	2017/11/17	<0.02		ug/g	
			delta-BHC	2017/11/17	<0.02		ug/g	
			a-Chlordane	2017/11/17	<0.02		ug/g	
			g-Chlordane	2017/11/17	<0.02		ug/g	
			o,p-DDD	2017/11/17	<0.02		ug/g	
			p,p-DDD	2017/11/17	<0.02		ug/g	
			o,p-DDE	2017/11/17	<0.02		ug/g	
			p,p-DDE	2017/11/17	<0.02		ug/g	
			o,p-DDT	2017/11/17	<0.02		ug/g	
			p,p-DDT	2017/11/17	<0.02		ug/g	
			Dieldrin	2017/11/17	<0.02		ug/g	
			Endosulfan I (alpha)	2017/11/17	<0.02		ug/g	
			Endosulfan II (beta)	2017/11/17	<0.02		ug/g	
			Endosulfan sulfate	2017/11/17	<0.02		ug/g	

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Endrin	2017/11/17	<0.02		ug/g	
			Endrin aldehyde	2017/11/17	<0.02		ug/g	
			Endrin ketone	2017/11/17	<0.02		ug/g	
			Heptachlor	2017/11/17	<0.02		ug/g	
			Heptachlor epoxide	2017/11/17	<0.02		ug/g	
			Hexachlorobenzene	2017/11/17	<0.02		ug/g	
			Lindane	2017/11/17	<0.02		ug/g	
			Methoxychlor	2017/11/17	<0.05		ug/g	
			Mirex	2017/11/17	<0.02		ug/g	
			Octachlorostyrene	2017/11/17	<0.02		ug/g	
			Aroclor 1016	2017/11/17	<0.2		ug/g	
			Aroclor 1221	2017/11/17	<0.3		ug/g	
			Aroclor 1232	2017/11/17	<0.2		ug/g	
			Aroclor 1242	2017/11/17	<0.2		ug/g	
			Aroclor 1248	2017/11/17	<0.2		ug/g	
			Aroclor 1254	2017/11/17	<0.2		ug/g	
			Aroclor 1260	2017/11/17	<0.2		ug/g	

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.

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)

(1) Surrogate recovery was above the upper control limit due to matrix interference. This may represent a high bias in some results.

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

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Banu Gurgen-Keough, Supervisor

Cristina Carriere

Cristina Carriere, Scientific Service Specialist

Eric Dearman, Scientific Specialist

APPENDIX F

National Classification System for Contaminated Sites

CCME National Classification System for Contaminated Sites (2008, 2010 v 1.2)
Pre-Screening Checklist

Question	Response (yes / no)	Comment
1. Are **Radioactive material**, **Bacterial contamination** or **Biological hazards** likely to be present at the site?	No	If yes, do not proceed through the NCSCS. Contact applicable regulatory agency immediately.
2. Are there **no contamination exceedances** (known or suspected)? Determination of exceedances may be based on: 1) CCME environmental quality guidelines; 2) equivalent provincial guidelines/standards if no CCME guideline exists for a specific chemical in a relevant medium; or 3) toxicity benchmarks derived from the literature for chemicals not covered by CCME or provincial guidelines/standards.	No	If yes (i.e., there are no exceedances), do not proceed through the NCSCS.
3. Have **partial/incompleted or no environmental site investigations** been conducted for the Site?	No	If yes, do not proceed through the NCSCS.
4. Is there direct and signficant evidence of **impacts to humans** at the site, or off-site due to migration of contaminants from the site?	No	If yes, automatically rate the site as Class 1, a priority for remediation or risk management, regardless of the total score obtained should one be calculated (e.g., for comparison with other Class 1 sites).
5. Is there direct and significant evidence of **impacts to ecological receptors** at the site, or off-site due to migration of contaminants from the site?	No	Some low levels of impact to ecological receptors are considered acceptable, particularly on commercial and industrial land uses. However, if ecological effects are considered to be severe, the site may be categorized as Class 1, regardless of the numerical total NCSCS score. For the purpose of application of the NCSCS, effects that would be considered severe include observed effects on survival, growth or reproduction which could threaten the viability of a population of ecological receptors at the site. Other evidence that qualifies as severe adverse effects may be determined based on professional judgement and in consultation with the relevant jurisdiction.
6. Are there indicators of significant **adverse effects in the exposure zone** (i.e., the zone in which receptors may come into contact with contaminants)? Some examples are as follows: -Hydrocarbon sheen or NAPL in the exposure zone -Severely stressed biota or devoid of biota; -Presence of material at ground surface or sediment with suspected high concentration of contaminants such as ore tailings, sandblasting grit, slag, and coal tar.	No	If yes, automatically rate the site as Class 1, a priority for remediation or risk management, regardless of the total score obtained should one be calculated (e.g., for comparison with other Class 1 sites).
7. Do measured concentrations of volatiles or unexploded ordnances represent an **explosion hazard**?	No	If yes, automatically rate the site as Class 1, a priority for remediation or risk management, and do not continue until the safety risks have been addressed. Consult your jurisdiction's occupational health and safety guidance or legislation on exposive hazards and measurement of lower explosive limits.

If none of the above applies, proceed with the NCSCS scoring.

CCME National Classification System for Contaminated Sites (2008, 2010 v 1.2)
Summary of Site Conditions

Subject Site:	**Former USAF Radar Station, Spotted Island, Labrador**	
Civic Address: *(or other description of location)*	Former USAF Radar Station, Spotted Island, Labrador	
Site Common Name : *(if applicable)*	Spotted Island	
Site Owner or Custodian: *(Organization and Contact Person)*	Department of National Defence	
Legal description *or* metes and bounds:		
Approximate Site area:	594,807 m2	
PID(*s)* : *(or Parcel Identification Numbers [PIN] if untitled Crown land)*		
Centre of site: *(provide latitude/longitude or UTM coordinates)*	Latitude: Longitude:	___N53___ degrees ___30___ min ___55___ secs __W55____ degrees __45____ min ___20___ secs
	UTM Coordinate:	Northing ______________ Easting ______________
Site Land Use:	Current:	Former Commercial/Residential. Currently unoccupied
	Proposed:	Commercial / vacant. Seasonal community (residential) adjacent to portion of Site.
Site Plan	**To delineate the bounds of the Site a site plan MUST be attached. The plan must be drawn to scale indicating the boundaries in relation to well-defined reference points and/or legal descriptions. Delineation of the contamination should also be indicated on the site plan.**	
Provide a brief description of the Site:	The Site is a former manned US Air Force Radar Station (in operation from mid-1950's to early 1960's). The Site has an "Upper site" and a "Lower site" with approximately 3 km of gravel roadway separating the two sites. The Upper site consisted of several buidlings, a 1,500,000 litre aboveground storage tank (AST), radar and radio towers, power plant, and helipad. The Lower site consisted of a second 1,500,000 litre AST with a pumphouse. An above-ground fuel line connected the Lower and Upper site ASTs, which was located adjacent to the roadway. Drinking water was obtained from a freshwater lake located near the Upper site. Wastes produced during the operation of the Site were disposed in a local landfill, located near the Upper site. In 1987, the Site was decommissioned including the razing of on-site structures and the burning of materials, followed by the burying and covering of all building materials.The Site is now predominately covered in vegetation / gravel / exposed bedrock, and concrete from the former building foundations. A seasonal residential community is located adjacent to the Lower site. Access to the Site is not restricted.	

CCME National Classification System for Contaminated Sites (2008, 2010 v 1.2)
Summary of Site Conditions

Affected media and Contaminants of Potential Concern (COPC):	Soil, surface water, sediment, building materials and paint. PHC, metals, PCBs, PAHs, VOCs, dioxins, furans and dioxin-like compounds, asbestos, lead / mercury (paint)

Please fill in the "letter" that best describes the level of information available for the site being assessed

Site Letter Grade **D**

If letter grade is F, do not continue, you must have a minimum of a Phase I Environmental Site Assessment or equivalent.

Scoring Completed By:	GEMTEC Consulting Engineers and Scientists Limited
Date Scoring Completed:	Oct-18

CCME National Classification System (2008, 2010 v 1.2)
(I) Contaminant Characteristics
Former USAF Radar Station, Spotted Island, Labrador

Definition	Score	Rationale for Score (document any assumptions, reports, or site-specific information; provide references)	Method of Evaluation	Notes
1. Residency Media (replaces physical state)				
Which of the following residency media are known (or strongly suspected) to have one or more exceedances of the applicable CCME guidelines? **yes** = has an exceedance or strongly suspected to have an exceedance **no** = does not have an exceedance or strongly suspected not to have an exceedance		Exceedances of ecological guildelines petroleum hydrocarbons (PHCs), PAHs, and metals in soil (Copper, Lead and Zinc), PHCs, PAHs, metals in sediment, PHC, PAHs and metals (Copper, Iron and Lead) in surface water were confirmed (GEMTEC, 2018). Impacts to groundwater can not be discounted.	The overall score is calculated by adding the individual scores from each residency media (having one or more exceedance of the most conservative media specific and land-use appropriate CCME guideline). Summary tables of the Canadian Environmental Quality Guidelines for soil, water (aquatic life, non-potable groundwater environments, and agricultural water uses) and sediment are available on the CCME website at http://www.ccme.ca/publications/ceqg_rcqe.html?category_id=124 . For potable groundwater environments, guidelines for Canadian Drinking Water Quality (for comparison with groundwater monitoring data) are available on the Health Canada website at http://www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/doc_sup-appui/sum_guide-res_recom/index_e.html.	An increasing number of residency media containing chemical exceedances often equates to a greater potential risk due to an increase in the number of potential exposure pathways.
A. Soil	Yes			
Yes No Do Not Know				
B. Groundwater	Do Not Know			
Yes No Do Not Know				
C. Surface water	Yes			
Yes No Do Not Know				
D. Sediment	Yes			
Yes No Do Not Know				
"Known" -score	6			
"Potential" - score	1			
2. Chemical Hazard				
What is the relative degree of chemical hazard of the contaminant in the list of hazard rankings proposed by the Federal Contaminated Sites Action Plan (FCSAP)? High Medium Low Do Not Know	High	Lead is rated as "High" by FCSAP. Lead concentrations confirmed in soil at concentrations exceeding CCME guidelines (GEMTEC, 2018) - Initial Testing Program	The relative degree of chemical hazard should be selected based on the most hazardous contaminant known or suspected to be present at the site. The degree of hazard has been defined by the Federal Contaminated Sites Action Plan (FCSAP) and a list of substances with their associated hazard (Low, Medium and High) has been provided as a separate sheet in this file. *See Attached Reference Material for Contaminant Hazard Rankings.*	Hazard as defined in the revised NCS pertains to the physical properties of a chemical which can cause harm. Properties can include toxic potency, propensity to biomagnify, persistence in the environment, etc. Although there is some overlap between hazard and contaminant exceedance factor below, it will not be possible to derive contaminant exceedance factors for many substances which have a designated chemical hazard designation, but don't have a CCME guideline. The purpose of this category is to avoid missing a measure of toxic potential.
"Known" -score	8			
"Potential" - score	---			
3. Contaminant Exceedence Factor				
What is the ratio between the measured contaminant concentration and the applicable CCME guidelines (or other "standards")? Mobile NAPL High (>100x) Medium (10x to 100x) Low (1x to 10x) Do Not Know	High (>100x)	Maximum measured lead concentration of 2,700 mg/kg compared to CCME guideline of 260 mg/kg (GEMTEC, 2018) - Initial Testing Program. A few parameters exceeded >100x over , but the majority were 10x to 100x.	Ranking of contaminant "exceedance" is determined by comparing contaminant concentrations with the *most conservative media-specific and land-use appropriate CCME* environmental quality guidelines. **Ranking should be based on contaminant with greatest exceedance of CCME guidelines.** Ranking of contaminant hazard as high, medium and low is as follows: High = One or more measured contaminant concentration is greater than 100 X appropriate CCME guidelines Medium = One or more measured contaminant concentration is 10 - 99.99 X appropriate CCME guidelines Low = One or more measured contaminant concentration is 1 - 9.99 X appropriate CCME guidelines Mobile NAPL = Contaminant is a non-aqueous phase liquid (i.e., due to its low solubility, it does not dissolve in water, but remains as a separate liquid) and is present at a sufficiently high saturation (i.e., greater than residual NAPL saturation) such that there is significant potential for mobility either downwards or laterally. Other standards may include local background concentration or published toxicity benchmarks. Results of toxicity testing with site samples can be used as an alternative. This approach is only relevant for contaminants that do not biomagnify in the food web, since toxicity tests would not indicate potential effects at higher trophic levels. High = lethality observed. Medium = no lethality, but sub lethal effects observed. Low = neither lethal nor sub lethal effects observed.	In the event that elevated levels of a material with no associated CCME guidelines are present, check provincial and USEPA environmental criteria. Hazard Quotients (sometimes referred to as a screening quotient in risk assessments) refer to the ratio of measured concentration to the concentration believed to be the threshold for toxicity. A similar calculation is used here to determine the contaminant exceedance factor (CEF). Concentrations greater than one times the applicable CCME guideline (i.e., CEF=>1) indicate that risks are possible. Mobile NAPL has the highest associated score (8) because of its highly concentrated nature and potential for increase in the size of the impacted zone.
"Known" -score	6			
"Potential" - score	---			

CCME National Classification System (2008, 2010 v 1.2)

(I) Contaminant Characteristics

Former USAF Radar Station, Spotted Island, Labrador

Definition	Score	Rationale for Score (document any assumptions, reports, or site-specific information; provide references)	Method of Evaluation	Notes
4. Contaminant Quantity (known or strongly suspected)				
What is the known or strongly suspected quantity of all contaminants? >10 hectare (ha) or 5000 m^3 2 to 10 ha or 1000 to 5000 m^3 <2 ha or 1000 m^3 Do Not Know	<2 ha or 1000 m3	Initial Testing Report - approximately 1,000 m3 (preliminary estimate) (GEMTEC, 2018).	Measure or estimate the area or quantity of total contamination (i.e, all contaminants known or strongly suspected to be present on the site). The "Area of Contamination" is defined as the area or volume of contaminated media (soil, sediment, groundwater, surface water) exceeding appropriate environmental criteria.	A larger quantity of a potentially toxic substance can result in a larger frequency of exposure as well as a greater probability of migration, therefore, larger quantities of these substances earn a higher score.
"Known" -score	2			
"Potential" - score	---			
5. Modifying Factors				
Does the chemical fall in the class of persistent chemicals based on its behavior in the environment? Yes No Do Not Know	Yes	Lead does not degrade in the environment.	Persistent chemicals, e.g., PCBs, chlorinated pesticides etc. either do not degrade or take longer to degrade, and therefore may be available to cause effects for a longer period of time. Canadian Environmental Protection Act (CEPA) classifies a chemical as persistent when it has at least one of the following characteristics: (a) in air, (i) its half-life is equal to or greater than 2 days, or (ii) it is subject to atmospheric transport from its source to a remote area; (b) in water, its half-life is equal to or greater than 182 days; (c) in sediments, its half-life is equal to or greater than 365 days; or (d) in soil, its half-life is equal to or greater than 182 days. This list does not include metals or metalloids, which in their elemental form do not degrade. However metals and metalloids form chemical species in the environment, many of which are not readily bioavailable.	*Examples of Persistent Substances are provided in attached Reference Materials*
Are there contaminants present that could cause damage to utilities and infrastructure, either now or in the future, given their location? Yes No Do Not Know	No	No underground infrastructure currently present or foreseen (GEMTEC, 2018) - Initial Testing Program.		Some contaminants may react or absorb into underground utilities and infrastructure. For example, organic solvents may degrade some plastics, and salts could cause corrosion of metal.
How many different contaminant classes have representative CCME guideline exceedances? one two to four five or more Do Not Know	two to four	1. Inorganic substances (including metals) – Soil, Sediment and Surface Water 2. light extractable petroleum hydrocarbons (PHC F2) – Soil 3. heavy extractable petroleum hydrocarbons (PHC F3) - Soil 4. PAHs – Soil, Sediment (GEMTEC, 2018) - Initial Testing Program.	For the purposes of the revised NCS ranking system, the following chemicals represent distinct chemical "classes": inorganic substances (including metals), volatile petroleum hydrocarbons, light extractable petroleum hydrocarbons, heavy extractable petroleum hydrocarbons, PAHs, phenolic substances, chlorinated hydrocarbons, halogenated methanes, phthalate esters, pesticides.	*Refer to the Reference Material sheet for a list of example substances that fall under the various chemical classes.*
"Known" - Score	4			
"Potential" - Score	---			

Contaminant Characteristic Total

Raw Total Scores- "Known"	26
Raw Total Scores- "Potential"	1
Raw Combined Total Scores	27
Total Score (Raw Combined / 40 * 33)	**22.3**

(II) Migration Potential (Evaluation of contaminant migration pathways)

Former USAF Radar Station, Spotted Island, Labrador

Definition	Score	Rationale for Score (document any assumptions, reports, or site-specific information; provide references)	Method Of Evaluation	Notes
1. Groundwater Movement				
A. Known COPC exceedances and an operable groundwater pathway within and/or beyond the property boundary.				
i) For **potable groundwater environments**, 1) groundwater concentrations exceed background concentrations and 1X the Guideline for Canadian Drinking Water Quality (GCDWQ) or 2) there is known contact of contaminants with groundwater, based on physical evidence of groundwater contamination. For **non-potable environments** (typically urban environments with municipal services), 1) groundwater concentrations exceed 1X the applicable non potable guidelines or modified generic guidelines (which exclude ingestion of drinking water pathway) or 2) there is known contact of contaminants with groundwater, based on physical evidence of groundwater impacts. ii) Same as (i) except the information is not known but strongly suspected based on indirect observations. iii) Meets GCDWQ for **potable environments**; meets non-potable criteria or modified generic criteria (excludes ingestion of drinking water pathway) for **non-potable environments** **or** Absence of groundwater exposure pathway (i.e., there is no aquifer (see definition at right) at the site or there is an adequate isolating layer between the aquifer and the contamination, and within 5 km of the site there are no aquatic receiving environments and the groundwater does not daylight). Score	12 9 0 Go to Potential ---		Review chemical data and evaluate groundwater quality. The evaluation method concentrates on 1) a potable or non-potable groundwater environment; 2) the groundwater flow system and its potential to be an exposure pathway to known or potential receptors An aquifer is defined as a geologic unit that yields groundwater in usable quantities and drinking water quality. The aquifer can currently be used as a potable water supply or could have the potential for use in the future. Non-potable groundwater environments are defined as areas that are serviced with a reliable alternative water supply (most commonly provided in urban areas). The evaluation of a non-potable environment will be based on a site specific basis. Physical evidence includes significant sheens, liquid phase contamination, or contaminant saturated soils. Seeps and springs are considered part of the groundwater pathway. In Arctic environments, the potability and evaluation of the seasonal active layer (above the permafrost) as a groundwater exposure pathway will be considered on a site-specific basis.	The 1992 NCS rationale evaluated the off-site migration as a regulatory issue. The exposure assessment and classification of hazards should be evaluated regardless of the property boundaries. Someone experienced must provide a thorough description of the sources researched to determine the presence/absence of a groundwater supply source in the vicinity of the contaminated site. This information must be documented in the NCS Site Classification Worksheet including contact names, phone numbers, e-mail correspondence and/or reference maps/reports and other resources such as internet links. Note that for potable groundwater that also daylights into a nearby surface water body, the more stringent guidelines for both drinking water and protection of aquatic life should be considered. **Selected References** Potable Environments Guidelines for Canadian Drinking Water Quality:www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/doc_sup-appui/sum_guide-res_recom/index_e.html Non-Potable Environments Canadian Water Quality Guidelines for Protection of Aquatic Life. CCME. 1999 www.ccme.ca Compilation and Review of Canadian Remediation Guidelines, Standards and Regulations. Science Applications International Corporation (SAIC Canada), report to Environment Canada, January 4, 2002.
NOTE: If a score is assigned here for Known COPC Exceedances, then you can skip Part B (Potential for groundwater pathway) and go to Section 2 (Surface Water Pathway)				
B. Potential for groundwater pathway.				
a. Relative Mobility High Moderate Low Insignificant Do Not Know Score	Moderate 2	PHC and Metal impacts reported in soils -can leach to groundwater GEMTEC, 2018	Organics / Koc (L/kg) — Metals with higher mobility at acidic conditions — Metals with higher mobility at alkaline conditions Koc < 500 (i.e., log Koc < 2.7) — pH < 5 — pH > 8.5 Koc = 500 to 5000 (i.e., log Koc = 2.7 to 3.7) — pH = 5 to 6 — pH = 7.5 to 8.5 Koc = 5,000 to 100,000 (i.e., log Koc = 3.7 to 5) — pH > 6 — pH < 7.5 Koc > 100,000 (i.e., log Koc > 5)	Reference: US EPA Soil Screening Guidance (Part 5 - Table 39) If a score of zero is assigned for relative mobility, it is still recommended that the following sections on potential for groundwater pathway be evaluated and scored. Although the Koc of an individual contaminant may suggest that it will be relatively immobile, it is possible that, with complex mixtures, there could be enhanced mobility due to co-solvent effects. Therefore, the Koc cannot be relied on solely as a measure of mobility. An evaluation of other factors such as containment, thickness of confining layer, hydraulic conductivities and precipitation infiltration rate are still useful in predicting potential for groundwater migration, even if a contaminant is expected to have insignificant mobility based on its chemistry alone.
b. Presence of engineered sub-surface containment? No containment Partial containment Full containment Do Not Know Score	No containment 3	No engineered containment at the Site	Review the existing engineered systems or natural attenuation processes for the site and determine if full or partial containment is achieved. Full containment is defined as an engineered system or natural attenuation processes, monitored as being effective, which provide for full capture and/or treatment of contaminants. All chemicals of concern must be contained for "Full Containment" scoring. Natural attenuation must have sufficient data, and reports cited with monitoring data to support steady state conditions and the attenuation processes. If there is no containment or insufficient natural attenuation process, this category is evaluated as high. If there is less than full containment or if uncertain, then evaluate as medium. In Arctic environments, permafrost will be evaluated, as appropriate, based on detailed evaluations, effectiveness and reliability to contain/control contaminant migration.	Someone experienced must provide a thorough description of the sources researched to determine the containment of the source at the contaminated site. This information must be documented in the NCS Site Classification Worksheet including contact names, phone numbers, e-mail correspondence and/or reference maps, geotechnical reports or natural attenuation studies and other resources such as internet links. **Selected Resources:** United States Environmental Protection Agency (USEPA) 1998. Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Groundwater. EPA/600/R-98/128. Environment Canada – Ontario Region – Natural Attenuation Technical Assistance Bulletin (TABS) Number 19 –21.
c. Thickness of confining layer over aquifer of concern or groundwater exposure pathway 3 m or less including no confining layer or discontinuous confining layer 3 to 10 m > 10 m Do Not Know Score	Do Not Know 0.5	No deeper subsurface investigations have been completed at the Site	The term "confining layer" refers to geologic material with little or no permeability or hydraulic conductivity (such as unfractured clay); water does not pass through this layer or the rate of movement is extremely slow. Measure the thickness and extent of materials that will impede the migration of contaminants to the groundwater exposure pathway. The evaluation of this category is based on: 1) The presence and thickness of saturated subsurface materials that impede the vertical migration of contaminants to lower aquifer units which can or are used as drinking water sources or 2) The presence and thickness of unsaturated subsurface materials that impede the vertical migration of contaminants from the source location to the saturated zone (e.g., water table aquifer, first hydrostratigraphic unit or other groundwater pathway).	
d. Hydraulic conductivity of confining layer $>10^{-4}$ cm/s or no confining layer 10^{-4} to 10^{-6} cm/s $<10^{-6}$ cm/s Do Not Know		Discrete surface soil materials are coarse grained, but confining layer would be in the lower K bedrock. Lower hydraulic conductivities would apply	Determine the nature of geologic materials and estimate hydraulic conductivity from published material (or use "Range of Values of Hydraulic Conductivity and Permeability" figure in the Reference Material sheet). Unfractured clays should be scored low. Silts should be scored medium. Sand, gravel should be scored high. The evaluation of this category is based on: 1) The presence and hydraulic conductivity ("K") of saturated subsurface materials that impede the vertical migration of contaminants to lower aquifer units which can or are used as a drinking water source, groundwater exposure pathway or 2) The presence and permeability ("k") of unsaturated subsurface materials that impede the vertica	

(II) Migration Potential (Evaluation of contaminant migration pathways)

Former USAF Radar Station, Spotted Island, Labrador

Definition	Score	Rationale for Score (document any assumptions, reports, or site-specific information; provide references)	Method Of Evaluation	Notes
Score	<10-6 cm/s 0		2) The presence and permeability ("K") of unsaturated subsurface materials that impede the vertical migration of contaminants from the source location to the saturated water table aquifer, first hydrostratigraphic unit or other groundwater pathway.	
B. Potential for groundwater pathway.				
e. Precipitation infiltration rate (Annual precipitation factor x surface soil relative permeability factor) High Moderate Low Very Low None Do Not Know Score	High 1	Based on Canadian Climate Normals (1981-2010) for Cartwright (closest station to Cape Harrison, at similar elevation): Total annual precipitation = 1050.1 mm 1050.1 mm / 1000 = 1.1 1.1 * 0.6 (sand - as observed by GEMTEC 2018)	Precipitation Refer to Environment Canada precipitation records for relevant areas. Divide annual precipitation by 1000 and round to nearest tenth (e.g., 667 mm = 0.7 score). Permeability For surface soil relative permeability (i.e., infiltration) assume: gravel (1), sand (0.6), loam (0.3) and pavement or clay (0). Multiply the surface soil relative permeability factor with precipitation factor to obtain the score for precipitation infiltration rate.	
f. Hydraulic conductivity of aquifer $>10^{-2}$ cm/s 10^{-2} to 10^{-4} cm/s $<10^{-4}$ cm/s Do Not Know Score	<10-4 cm/s 0	Estimated based on unfractured grantic and granodioritic intrusive rocks	Determine the nature of geologic materials and estimate hydraulic conductivity of all aquifers of concern from published material (refer to "Range of Values of Hydraulic Conductivity and Permeability" in the Reference Material sheet).	
Potential groundwater pathway total	6.5			
Allowed Potential score	6.5	Note: If a "known" score is provided, the "potential" score is disallowed.		
Groundwater pathway total	**6.5**			
2. Surface Water Movement				
A. Demonstrated migration of COPC in surface water above background conditions				
Known concentrations of surface water: i) Concentrations exceed background concentrations and exceed CCME CWQG for protection of aquatic life, irrigation, livestock water, and/or recreation (whichever uses are applicable at the site) by >1 X; or There is known contact of contaminants with surface water based on site observations. or In the absence of CWQG, chemicals have been proven to be toxic based on site specific testing (e.g. toxicity testing; or other indicator testing of exposure). ii) Same as (i) except the information is not known but strongly suspected based on indirect observations. iii) Meets CWQG or absence of surface water exposure pathway (i.e., Distance to nearest surface water is > 5 km.) Score	12 8 0 12 12	Concentration of Anthracene (PAH) and Modifed TPH (PHC) exceeded for detection limits (Ecological values). Concentrations of aluminum, copper, iron, and lead above CCME Freshwater Aquatic Life guidelines confirmed (GEMTEC 2018). No exceedances of the guidelines in background surface water sample.	Collect all available information on quality of surface water near to site. Evaluate available data against Canadian Water Quality Guidelines (select appropriate guidelines based on local water use, e.g., recreation, irrigation, aquatic life, livestock watering, etc.). The evaluation method concentrates on the surface water flow system and its potential to be an exposure pathway. Contamination is present on the surface (above ground) and has the potential to impact surface water bodies. Surface water is defined as a water body that supports one of the following uses: recreation, irrigation, livestock watering, aquatic life.	General Notes: Someone experienced must provide a thorough description of the sources researched to classify the surface water body in the vicinity of the contaminated site. This information must be documented in the NCS Site Classification Worksheet including contact names, phone numbers, e-mail correspondence and/or reference maps/reports and other resources such as internet links. Selected References: CCME. 1999. Canadian Water Quality Guidelines for the Protection of Aquatic Life www.ccme.ca CCME. 1999. Canadian Water Quality Guidelines for the Protection of Agricultural Water Uses (Irrigation and Livestock Water) www.ccme.ca Health and Welfare Canada. 1992. Guidelines for Canadian Recreational Water Quality.
NOTE: If a score is assigned here for Demonstrated Migration in Surface Water, then you can skip Part B (Potential for migration of COPCs in surface water) and go to Section 3 (Surface Soils)				
B. Potential for migration of COPCs in surface water				
a. Presence of containment No containment Partial containment Full containment Do Not Know Score	Do Not Know 3		Review the existing engineered systems and relate these structures to site conditions and proximity to surface water and determine if full containment is achieved: score low if there is full containment such as capping, berms, dikes; score medium if there is partial containment such as natural barriers, trees, ditches, sedimentation ponds; score high if there are no intervening barriers between the site and nearby surface water. Full containment must include containment of all chemicals.	
b. Distance to Surface Water 0 to <100 m 100 - 300 m >300 m Do Not Know Score	Do Not Know 2		Review available mapping and survey data to determine distance to nearest surface water bodies.	
c. Topography Contaminants above ground level and slope is steep Contaminants at or below ground level and slope is steep Contaminants above ground level and slope is intermediate Contaminants at or below ground level and slope is intermediate Contaminants above ground level and slope is flat			Review engineering documents on the topography of the site and the slope of surrounding terrain. Steep slope = >50% Intermediate slope = between 5 and 50% Flat slope = < 5% Note: Type of fill placement (e.g., trench, above ground, etc.).	

Definition	Score	Rationale for Score (document any assumptions, reports, or site-specific information; provide references)	Method Of Evaluation	Notes
Contaminants at or below ground level and slope is flat Do Not Know Score	Do Not Know 1			
d. Run-off potential High (rainfall run-off score > 0.6) Moderate (0.4 < rainfall run-off score <0.6) Low (0.2 < rainfall run-off score <0.4) Very Low (0 < rainfall run-off score < 0.2) None (rainfall run-off score = 0) Do Not Know Score	Do Not Know 0.4		Rainfall Refer to Environment Canada precipitation records for relevant areas. Divide rainfall by 1000 and round to nearest tenth (e.g., 667 mm = 0.7 score). The former definition of "annual rainfall" did not include the precipitation as snow. This minor adjustment has been made. The second modification was the inclusion of permeability of surface materials as an evaluation factor. Permeability For infiltration assume: gravel (0), sand (0.3), loam (0.6) and pavement or clay (1). Multiply the infiltration factor with precipitation factor to obtain rainfall run off score.	Selected Sources: Environment Canada web page link:www.msc.ec.gc.ca Snow to rainfall conversion apply ratio of 15 (snow):1(water)
e. Flood potential 1 in 2 years 1 in 10 years 1 in 50 years Not in floodplain Do Not Know Score	Do Not Know 0.5		Review published data such as flood plain mapping or flood potential (e.g., spring or mountain run-off) and Conservation Authority records to evaluate flood potential of nearby water courses both up and down gradient. Rate zero if site not in flood plain.	
Potential surface water pathway total Allowed Potential score **Surface water pathway total**	6.9 --- **12**	Note: If a "known" score is provided, the "potential" score is disallowed.		
3. Surface Soils (potential for dust, dermal and ingestion exposure)				
A. Demonstrated concentrations of COPC in surface soils (top 1.5 m)				
COPCs measured in surface soils exceed the CCME soil quality guideline.	12	Exceedances of guidelines for petroleum hydrocarbons (PHCs), PAHs, and metals in soil (GEMTEC, 2018).	Collect all available information on quality of surface soils (i.e., top 1.5 metres) at the site. Evaluate available data against Canadian Soil Quality Guidelines. Select appropriate guidelines based on current (or proposed future) land use (i.e, agricultural, residential/parkland, commercial, or industrial), and soil texture if applicable (i.e., coarse or fine).	Selected References: CCME. 1999. Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health www.ccme.ca
Strongly suspected that soils exceed guidelines	9			
COPCs in surface soils does not exceed the CCME soil quality guideline or is not present (i.e., bedrock).	0			
Score	12 12			
NOTE: If a score is assigned here for Demonstrated Concentrations in Surface Soils, then you can skip Part B (Potential for a surface soils migration pathway) and go to Section 4 (Vapour)				
B. Potential for a surface soils (top 1.5 m) migration pathway				
a. Are the soils in question covered? Exposed Vegetated Landscaped Paved Do Not Know Score	Do Not Know 4		Consult engineering or risk assessment reports for the site. Alternatively, review photographs or perform a site visit. Landscaped surface soils must include a minimum of 0.5 m of topsoil.	The possibility of contaminants in blowing snow have not been included in the revised NCS as it is difficult to assess what constitutes an unacceptable concentration and secondly, spills to snow or ice are most efficiently mitigated while freezing conditions remain.
b. For what proportion of the year does the site remain covered by snow? 0 to 10% of the year 10 to 30% of the year More than 30% of the year Do Not Know Score	Do Not Know 3		Consult climatic information for the site. The increments represent the full span from soils which are always wet or covered with snow (and therefore less likely to generate dust) to those soils which are predominantly dry and not covered by snow (and therefore are more likely to generate dust).	
Potential surface soil pathway total Allowed Potential score **Soil pathway total**	7 --- **12**	**Note: If a "known" score is provided, the "potential" score is disallowed**		
4. Vapour				
A. Demonstrated COPCs in vapour.				
Vapour has been measured (indoor or outdoor) in concentrations exceeding risk based concentrations.	12	Exceedances of human health based guidelines for F2 hydrocarbons (GEMTEC, 2018). Outdoor air pathway would apply.	Consult previous investigations, including human health risk assessments, for reports of vapours detected.	
Strongly suspected (based on observations and/or modelling)	9			
Vapour has not been measured and volatile hydrocarbons have not been found in site soils or groundwater.	0			
Score	9 9			
NOTE: If a score is assigned here for Demonstrated COPCs in Vapour, then you can skip Part B (Potential for COPCs in vapour) and go to Section 5 (Sediment)				
B. Potential for COPCs in vapour				
a. Relative Volatility based on Henry's Law Constant, H' (dimensionless)				If the Henry's Law Constant for a substance indicates that it is not volatile, and a score of zero is assigned here for relative volatility, then the other three questions in this section on

Definition	Score	Rationale for Score (document any assumptions, reports, or site-specific information; provide references)	Method Of Evaluation	Notes
High (H' > 1.0E-1) Moderate (H' = 1.0E-1 to 1.0E-3) Low (H' < 1.0E-3) Not Volatile Do Not Know	Do Not Know		Reference: US EPA Soil Screening Guidance (Part 5 - Table 36) *Provided in Attached Reference Materials*	Potential for COPCs will be automatically assigned scores of zero and you can skip to section 5.
Score	2.5			
b. What is the soil grain size? Fine Coarse Do Not Know	Do Not Know		Review soil permeability data in engineering reports. The greater the permeability of soils, the greater the possible movement of vapours. Fine-grained soils are defined as those which contain greater than 50% by mass particles less than 75 µm mean diameter (D50 < 75 µm). Coarse-grained soils are defined as those which contain greater than 50% by mass particles greater than 75 µm mean diameter (D50 > 75 µm).	
Score	3			
c. Is the depth to the source less than 10m? Yes No Do Not Know	Do Not Know		Review groundwater depths below grade for the site.	
Score	1			
d. Are there any preferential pathways? Yes No Do Not Know	Do Not Know		Visit the site during dry summer conditions and/or review available photographs. Where bedrock is present, fractures would likely act as preferential pathyways.	Preferential pathways refer to areas where vapour migration is more likely to occur because there is lower resistance to flow than in the surrounding materials. For example, underground conduits such as sewer and utility lines, drains, or septic systems may serve as preferential pathways. Features of the building itself that may also be preferential pathways include earthen floors, expansion joints, wall cracks, or foundation perforations for subsurface features such as utility pipes, sumps, and drains.
Score	1			
Potential vapour pathway total	7.5			
Allowed Potential score	---	Note: If a "known" score is provided, the "potential" score is disallowed.		
Vapour pathway total	**9**			
5. Sediment Movement				
A. Demonstrated migration of sediments containing COPCs				
There is evidence to suggest that sediments originally deposited to the site (exceeding the CCME sediment quality guidelines) have migrated.	12		Review sediment assessment reports. Evidence of migration of contaminants in sediments must be reported by someone experienced in this area.	Usually not considered a significant concern in lakes/marine environments, but could be very important in rivers where transport downstream could be significant.
Strongly suspected (based on observations and/or modelling)	9			
Sediments have been contained and there is no indication that sediments will migrate in future. **or** Absence of sediment exposure pathway (i.e., within 5 km of the site there are no aquatic receiving environments, and therefore no sediments).	0			
	Go to Potential			
Score	---			
NOTE: If a score is assigned here for Demonstrated Migration of Sediments, then you can skip Part B (Potential for Sediment Migration) and go to Section 6 (Modifying Factors)				
B. Potential for sediment migration		Small lake (approximately 2000 m2) anticipated to be shallow depth (<3 m) based on Site observations (GEMTEC 2018)		
a. Are the sediments having COPC exceedances capped with sediments having no exceedances ("clean sediments")? Yes No Do Not Know	No 4		Review existing sediment assessments. If sediment coring has been completed, it may indicate that historically contaminated sediments have been covered over by newer "clean" sediments. This assessment will require that cores collected demonstrate a low concentration near the top and higher concentration with sediment depth.	
b. For lakes and marine habitats, are the contaminated sediments in shallow water and therefore likely to be affected by tidal action, wave action or propeller wash? Yes No Do Not Know	Do Not Know 2		Review existing sediment assessments. If the sediments present at the site are in a river, select "no" for this question.	
c. For rivers, are the contaminated sediments in an area prone to sediment scouring? Yes No Do Not Know	No 0		Review existing sediment assessments. It is important that the assessment is made under worst case flows (high yearly flows). Under high yearly flows, areas which are commonly depositional may	
Potential sediment pathway total	6			
Allowed Potential score	6	Note: If a "known" score is provided, the "potential" score is disallowed.		
Sediment pathway total	**6**			
6. Modifying Factors				
Are there subsurface utility conduits in the area affected by contamination? Yes No Do Not Know	No	No subsurface utility conduits known. Historical utilities were above ground (GEMTEC, 2018).	Consult existing engineering reports. Subsurface utilities can act as conduits for contaminant migration.	

(II) Migration Potential (Evaluation of contaminant migration pathways)

Former USAF Radar Station, Spotted Island, Labrador

Definition	Score	Rationale for Score (document any assumptions, reports, or site-specific information; provide references)	Method Of Evaluation	Notes
Known	0			
Potential	0			

Migration Potential Total

Raw "known" total	33	
Raw "potential" total	12.5	
Raw combined total	45.5	Note: If "Known" and "Potential" scores are provided, the checklist defaults to known. Therefore, the total "Potential" Score may not reflect the sum of the individual "Potential" scores.
Total (max 33)	**23.5**	

CCME National Classification System (2008, 2010 v 1.2)

(III) Exposure (Demonstrates the presence of an exposure pathway and receptors)

Former USAF Radar Station, Spotted Island, Labrador

Definition	Score	Rationale for Score (document any assumptions, reports, or site-specific information; provide references)	Method Of Evaluation	Notes
1. Human				
A. Known exposure				
Documented adverse impact or high quantified exposure which has or will result in an adverse effect, injury or harm or impairment of the safety to humans as a result of the contaminated site. (Class 1 Site*) Same as above, but "Strongly Suspected" based on observations or indirect evidence. No quantified or suspected exposures/impacts in humans. Score	22 10 0 Go to Potential ---	Lead (highly toxic) and hydrocarbon concentrations exceeding CCME guidelines.(GEMTEC, 2018)	*Where adverse effects on humans are documented, the site should be automatically designated as a Class 1 site (i.e., action required). There is no need to proceed through the NCS in this case. However, a scoring guideline (22) is provided in case a numerical score for the site is still desired (e.g., for comparison with other Class 1 sites). This category can be based on the outcomes of risk assessments and applies to studies which have reported Hazard Quotients >1 for noncarcinogenic chemicals and incremental cancer risks that exceed acceptable levels defined by the jurisdiction for carcinogenic chemicals (for most jurisdictions this is typically either $>10^{-5}$ or $>10^{-6}$). Known impacts can also be evaluated based on blood testing (e.g. blood lead >10 ug/dL) or other health based testing. This category can be based on the outcomes of risk assessments and applies to studies which have reported Hazard Quotients of less than 0.2 for non-carcinogenic chemicals and incremental lifetime cancer risks for carcinogenic chemicals that are within acceptable levels as defined by the jurisdiction (for most jurisdictions this is less than either 10^{-6} or 10^{-5}).	Known adverse impact includes domestic and traditional food sources. Adverse effects based on food chain transfer to humans and/or animals can be scored in this category. However, the weight of evidence must show a direct link of a contaminated food source/supply and subsequent ingestion/transfer to humans. Any associated adverse effects to the environment are scored separately later in this worksheet. Someone experienced must provide a thorough description of the sources researched to evaluate and determine the quantified exposure/impact (adverse effect) in the vicinity of the contaminated site. **Selected References:** Health Canada – Federal Contaminated Site Risk Assessment in Canada Parts 1 and 2 Guidance on Human Heath Screening Level Risk Assessments (www.hc-sc.gc.ca/ewh-semt/pubs/contamsite/index_e.html) United States Environmental Protection Agency, Integrated Risk Information System (IRIS) – http://toxnet.nml.nih.gov
NOTE: If a score is assigned here for Known Exposure, then you can skip Part B (Potential for Human Exposure) and go to Section 2 (Human Exposure Modifying Factors)				
B. Potential for human exposure				
a) Land use (provides an indication of potential human exposure scenarios) Agricultural Residential / Parkland Commercial Industrial Do Not Know Score	Res / Parkland 2	Because there is commercial and residential land use the most senstive was used (GEMTEC, 2018).	Review zoning and land use maps over the distances indicated. If the proposed future land use is more "sensitive" than the current land use, evaluate this factor assuming the proposed future use is in place. Agricultural land use is defined as uses of land where the activities are related to the productive capability of the land or facility (e.g., greenhouse) and are agricultural in nature, or activities related to the feeding and housing of animals as livestock. Residential/Parkland land uses are defined as uses of land on which dwelling on a permanent, temporary, or seasonal basis is the activity (residential), as well as uses on which the activities are recreational in nature and require the natural or human designed capability of the land to sustain that activity (parkland). Commercial/Industrial land uses are defined as land on which the activities are related to the buying, selling, or trading of merchandise or services (commercial), as well as land uses which are related to the production, manufacture, or storage of materials (industrial).	This is the main "receptor" factor used in site scoring. A higher score implies a greater exposure and/or exposure of more sensitive human receptors (e.g., children).
b. Indicate the level of accessibility to the contaminated portion of the site (e.g., the potential for coming in contact with contamination) Limited barriers to prevent site access; contamination not covered Moderate access or no intervening barriers, contaminants are covered. Remote locations in which contaminants not covered. Controlled access or remote location and contaminants are covered Do Not Know Score	Mod. access, covered 1	No barriers to accessing impacted surface soils, contaminants not covered	Review location and structures and contaminants at the site and determine if there are intervening barriers between the site and humans. A low rating should be assigned to a (covered) site surrounded by a fence or in a remote location, whereas a high score should be assigned to a site that has no cover, fence, natural barriers or buffer.	
B. Potential for human exposure				
c) Potential for intake of contaminated soil, water, sediment or foods for operable or potentially operable pathways, as identified in Worksheet II (Migration Potential). i) direct contact Is dermal contact with contaminated surface water, groundwater, sediments or soils anticipated? Yes No Do Not Know Score	Yes 3	As the impacted soils are near surface, direct contact and human exposure can occur.	If soils or potable groundwater are present exceeding their respective CCME guidelines, dermal contact is assumed. Exposure to surface water, non-potable groundwater or sediments exceeding their respective CCME guidelines will depend on the site. Select "Yes" if dermal exposure to surface water, non-potable groundwater or sediments is expected. For instance, dermal contact with sediments would not be expected in an active port. Only soils in the top 1.5 m are defined by CCME (2003) as surface soils. If contaminated soils are only located deeper than 1.5 m, direct contact with soils is not anticipated to be an operable contaminant exposure pathway.	Exposure via the skin is generally believed to be a minor exposure route. However for some organic contaminants, skin exposure can play a very important component of overall exposure. Dermal exposure can occur while swimming in contaminated waters, bathing with contaminated surface water/groundwater and digging in contaminated dirt, etc.
ii) inhalation (i.e., inhalation of dust, vapour) Vapour - Are there inhabitable buildings on the site within 30 m of soils or groundwater with volatile contamination as determined in Worksheet II (Migration Potential)? Yes No Do Not Know Score	Yes 3	No buildings on Site, however, seasonal community located within 30 m of the Site.	If inhabitable buildings are on the site within 30 m of soils or groundwater exceeding their respective guidelines for volatile chemicals, there is a potential of risk to human health (Health Canada, 2004). Review site investigations for location of soil samples (having exceedances of volatile substances) relative to buildings. Refer to (II) Migration Potential worksheet, 4B.a), *Potential for COPCs in Vapour* for a definition of volatility.	Exposure via the lungs (inhalation) can be a very important exposure pathway. Inhalation can be via both particulates (dust) and gas (vapours). Vapours can be a problem where buildings have been built on former industrial sites or where volatile contaminants have migrated below buildings resulting in the potential for vapour intrusion. Assesses the potential for humans to be exposed to vapours originating from site soils. The closer the receptor is to a source of volatile chemicals in soil, the greater the potential of exposure. Also, coarser-grained soil will convey vapour much more efficiently in the soil than finer grained material such as clays and silts. General Notes; Someone experienced must provide a thorough description of the sources researched to determine the presence/absence of a vapour migration and/or dust generation in the vicinity of the contaminated site. This information must be documented in the NCS Site Classification Worksheet including contact names, phone numbers, e-mail correspondence and/or reference maps/reports and other resource such as internet links. Selected References; Canadian Council of Ministers of the Environment (CCME). 2006. Protocol for the Derivation of Environmental and Human Health Soil Quality Guidelines. PN 1332. www.ccme.ca Golder, 2004. Soil Vapour Intrusion Guidance for Health Canada Screening Level Risk Assessment (SLRA) Submitted to Health Canada, Burnaby, BC
Dust - If there is contaminated surface soil (e.g. top 1.5 m) , indicate whether the soil is fine or coarse textured. If it is known that surface soil is not contaminated, enter a score of zero. Fine Coarse Surface soil is not contaminated or absent (bedrock) Do Not Know Texture Score	Coarse 1	Coarse texture- as per Initial Testing program (GEMTEC, 2018)	Consult grain size data for the site. If soils (containing exceedances of the CCME soil quality guidelines) predominantly consist of fine material (having a median grain size of 75 microns; as defined by CCME (2006)) then these soils are more likely to generate dusts.	
inhalation total	4			

(III) Exposure (Demonstrates the presence of an exposure pathway and receptors)

Former USAF Radar Station, Spotted Island, Labrador

Definition	Score	Rationale for Score (document any assumptions, reports, or site-specific information; provide references)	Method Of Evaluation	Notes
B. Potential for human exposure				
iii) Ingestion (i.e., ingestion of food items, water and soils [for children]), including traditional foods. Drinking Water: Choose a score based on the proximity to a drinking water supply, to indicate the potential for contamination (present or future). 0 to 100 m 100 to 300 m 300 m to 1 km 1 to 5 km No drinking water present Do Not Know	300 m to 1 km	There is uncertainty regarding the location of the drinking water supply for the adjacent seasonal community	Review available site data to determine if drinking water (groundwater, surface water, private, commercial or municipal supply) is known or suspected to be contaminated above Guidelines for Canadian Drinking Water Quality. If drinking water supply is known to be contaminated, some immediate action (e.g., provision of alternate drinking water supply) should be initiated to reduce or eliminate exposure. The evaluation of significant potential for exceedances of the water supply in the future may be based on the capture zones of the drinking water wells; contaminant travel times; computer modelling of flow and contaminant transport.	**Selected References:** Guidelines for Canadian Drinking Water Quality: www.hc-sc.gc.ca/hecs-sesc/water/publications/drinking_water_quality_guidelines/toc.htm Drinking water can be an extremely important exposure pathway to humans. If site groundwater or surface water is not used for drinking, then this pathway is considered to be inoperable. Consider both wild foods such as salmon, venison, caribou, as well as agricultural sources of food items if the contaminated site is on or adjacent to agricultural land uses.
Score	2			
Is an alternative water supply readily available? Yes No Do Not Know	No	No municipal water infrastructure in place or anticipated		
Score	1			
Is human ingestion of contaminated soils possible? Yes No Do Not Know	Yes	Contaminated soils are at surface	If contaminated soils are located within the top 1.5 m, it is assumed that ingestion of soils is an operable exposure pathway. Exposure to soils deeper than 1.5 m is possible, but less likely, and the duration is shorter. Refer to human health risk assessment reports for the site in question.	
Score	3			
Are food items consumed by people, such as plants, domestic animals or wildlife harvested from the contaminated land and its surroundings? Yes No Do Not Know	Yes	Assumed that wildlife harvesting and consumption of plants/berries could occur	Use human health risk assessment reports (or others) to determine if there is significant reliance on traditional food sources associated with the site. Is the food item in question going to spend a large proportion of its time at the site (e.g., large mammals may spend a very small amount of time at a small contaminated site)? Human health risk assessment reports for the site in question will also provide information on potential bioaccumulation of the COPC in question.	
Score	1			
Ingestion total	7			
Human Health Total "Potential" Score	17	Note if a "Known" Human Health score is provided, the "Potential" score is disallowed.		
Allowed "Potential" Score	17			
2. Human Exposure Modifying Factors				
a) Strong reliance of local people on natural resources for survival (i.e., food, water, shelter, etc.) Yes No Do Not Know	No	Based on field observations and converstation with local resident, people residing in the nearby community are primarily seasonal residents. The island is accessible by boat, and supplies appear to be brought in from the mainland, as evidenced by the types of garbage / debris in the local dump (GEMTEC, 2018)		
Known	0			
Potential	---			
Raw Human "known" total	0			
Raw Human "potential" total	17			
Raw Human Exposure Total Score	17			
Human Health Total (max 22)	**17.0**			
3. Ecological				
A. Known exposure				
Documented adverse impact or high quantified exposure which has or will result in an adverse effect, injury or harm or impairment of the safety to terrestrial or aquatic organisms as a result of the contaminated site.	18		Some low levels of impact to ecological receptors are considered acceptable, particularly on commercial and industrial land uses. However, if ecological effects are deemed to be severe, the site may be categorized as class one (i.e., a priority for remediation or risk management), regardless of the numerical total NCS score. For the purpose of application of the NCS, effects that would be considered severe include observed effects on survival, growth or reproduction which could threaten the viability of a population of ecological receptors at the site. Other evidence that qualifies as severe adverse effects may be determined based on professional judgement and in consultation with the relevant jurisdiction. If ecological effects are determined to be severe and an automatic Class 1 is assigned, there is no need to proceed through the NCS. However, a scoring guideline (18) is provided in case a numerical score for the site is still desired (e.g., for comparison with other Class 1 sites).	CCME, 1999: Canadian Water Quality Guidelines for the Protection of Aquatic Life. www.ccme.ca CCME, 1999: Canadian Water Quality Guidelines for the Protection of Agricultural Water Uses. www.ccme.ca Sensitive receptors- review: Canadian Council on Ecological Areas; www.ccea.org. Ecological effects should be evaluated at a population or community level, as opposed to at the level of individuals. For example, population-level effects could include reduced reproduction, growth or survival in a species. Community-level effects could include reduced species diversity or relative abundances. Further discussion of ecological assessment endpoints is provided in *A Framework for Ecological Risk Assessment: General Guidance* (CCME 1996). Notes: Someone experienced must provide a thorough description of the sources researched to classify the environmental receptors in the vicinity of the contaminated site. This information must be documented in the NCS Site Classification Worksheet including contact names, phone numbers, e-mail correspondence and/or reference maps/reports and other resource such as internet links.
Same as above, but "Strongly Suspected" based on observations or indirect evidence.	12		This category can be based on the outcomes of risk assessments and applies to studies which have reported Hazard Quotients >1. Alternatively, known impacts can also be evaluated based on a weight of evidence assessment involving a combination of site observations, tissue testing, toxicity testing and quantitative community assessments. Scoring of adverse effects on individual rare or endangered species will be completed on a case-by-case basis with full scientific justification.	
No quantified or suspected exposures/impacts in terrestrial or aquatic organisms	0		This category can be based on the outcomes of risk assessments and applies to studies which have reported Hazard Quotients of less than 1 and no other observable or measurable sign of impacts. Alternatively, it can be based on a combination of other lines of evidence showing no adverse effects, such as site observations, tissue testing, toxicity testing and quantitative community assessments.	
	Go to Potential			
Score	---			

NOTE: If a score is assigned here for Known Exposure, then you can skip Part B (Potential for Ecological Exposure) and go to Section 4 (Ecological Exposure Modifying Factors)

(III) Exposure (Demonstrates the presence of an exposure pathway and receptors)

Former USAF Radar Station, Spotted Island, Labrador

Definition	Score	Rationale for Score (document any assumptions, reports, or site-specific information; provide references)	Method Of Evaluation	Notes
B. Potential for ecological exposure (for the contaminated portion of the site)				
a) Terrestrial i) Land use Agricultural (or Wild lands) Residential/Parkland Commercial Industrial Do Not Know	Residential/Parkland	Because there is two land uses on Site the most senstive was selected (GEMTEC, 2018).	Review zoning and land use maps. If the proposed future land use is more "sensitive" than the current land use, evaluate this factor assuming the proposed future use is in place (indicate in the worksheet that future land use is the consideration). Agricultural land use is defined as uses of land where the activities are related to the productive capability of the land or facility (e.g., greenhouse) and are agricultural in nature, or activities related to the feeding and housing of animals as livestock. Wild lands are grouped with agricultural land due to the similarities in receptors that would be expected to occur there (e.g., herbivorous mammals and birds) and the similar need for a high level of protection to ensure ecological functioning. Residential/Parkland land uses are defined as uses of land on which dwelling on a permanent, temporary, or seasonal basis is the activity (residential), as well as uses on which the activities are recreational in nature and require the natural or human designed capability of the land to sustain that activity (parkland). Commercial/Industrial land uses are defined as land on which the activities are related to the buying, selling, or trading of merchandise or services (commercial), as well as land uses which are related to the production, manufacture, or storage of materials (industrial).	
Score	2			
ii) Uptake potential Direct Contact - Are plants and/or soil invertebrates likely exposed to contaminated soils at the site? Yes No Do Not Know	Yes	Plants community at the Site is generally healthy, and thus the invertebrate community is inferred to be intact (GEMTEC, 2018).	If contaminated soils are located within the top 1.5 m, it is assumed that direct contact of soils with plants and soil invertebrates is an operable exposure pathway. Exposure to soils deeper than 1.5 m is possible, but less likely.	
Score	1			
iii) Ingestion (i.e., wildlife or domestic animals ingesting contaminated food items, soils or water) Are terrestrial animals likely to be ingesting contaminated water at the site? Yes No Do Not Know	Yes	There are many on-site waterbodies and known exceedances have been measure to date at 2 surface water and 1 sediment location on the lake at the Lower Site (APEC 13) and 2 Surface Water exceedances at the lake adjacent to the former pump house (APEC 9) (GEMTEC, 2018).	Refer to an Ecological Risk Assessment for the site. If there is contaminated surface water at the site, assume that terrestrial organisms will ingest it.	
Score	1			
Are terrestrial animals likely to be ingesting contaminated soils at the site? Yes No Do Not Know	Yes	However, ingestion anticipated to be low due to low residence time of wildlife on Site (previously developed areas) as an abundance of suitable habitat (undeveloped / shrub/moss lands) surrounds the Site and the Site does not represent unique or special habitat (GEMTEC, 2018).	Refer to an Ecological Risk Assessment report. Most animals will co-ingest some soil while eating plant matter or soil invertebrates.	
Score	1			
Can the contamination identified bioaccumulate? Yes No Do Not Know	Yes	Several PAHs in surface water identified at concentrations exceeding the screening levels (GEMTEC, 2018). Based on the Reference Materials provided herein, Log(KOW) is generally above 4 for these parameters.	Bioaccumulation of contaminants within food items is considered possible if: 1) The Log(Kow) of the contaminant is greater than 4 (as per the chemical characteristics work sheet) and concentrations in soils exceed the most conservative CCME soil quality guideline for the intended land use, or 2) The contaminant in collected tissue samples exceeds the Canadian Tissue Residue Guidelines.	
Score	1			
Distance to sensitive terrestrial ecological area 0 to 300 m 300 m to 1 km 1 to 5 km > 5 km Do Not Know	> 5 km	A review of ecologically significant areas (CCEA, 2017), revealed no area of ecological significance within 5 km of the Site.	It is considered that within 300 m of a site, there is a concern for contamination. Therefore an environmental receptor located within this area of the site will be subject to further evaluations. It is also considered that any environmental receptor located greater than 5 km will not be a concern for evaluation. Review Conservation Authority mapping and literature including Canadian Council on Ecological Areas link: www.ccea.org.	Environmental receptors include: local, regional or provincial species of interest or significance; arctic environments (on a site specific basis); nature preserves, habitats for species at risk, sensitive forests, natural parks or forests.
Score	0.5			
Raw Terrestrial Total Potential	6.5	Note if a "Known" Ecological Effects score is provided, the "Potential" score is disallowed.		
Allowed Terrestrial Total Potential	6.5			
B. Potential for ecological exposure (for the contaminated portion of the site)				
b) Aquatic i) Classification of aquatic environment Sensitive Typical Not Applicable (no aquatic environment present) Do Not Know	Typical	The aquatic environment is considered typical for this area	"Sensitive aquatic environments" include those in or adjacent to shellfish or fish harvesting areas, marine parks, ecological reserves and fish migration paths. Also includes those areas deemed to have ecological significance such as for fish food resources, spawning areas or having rare or endangered species. "Typical aquatic environments" include those in areas other than those listed above.	
Score	1			
ii) Uptake potential Does groundwater daylighting to an aquatic environment exceed the CCME water quality guidelines for the protection of aquatic life at the point of contact? Yes No (or Not Applicable) Do Not Know	Do Not Know		Groundwater concentrations of contaminants at the point of contact with an aquatic receiving environment can be estimated in three ways: 1) by comparing collected nearshore groundwater concentrations to the CCME water quality guidelines (this will be a conservative comparison, as contaminant concentrations in groundwater often decrease between nearshore wells and the point of discharge). 2) by conducting groundwater modeling to estimate the concentration of groundwater immediately before discharge. 3) by installing water samplers, "peepers", in the sediments in the area of daylighting groundwater.	
Score	0.5			
Distance from the contaminated site to an important surface water resource 0 to 300 m 300 m to 1 km 1 to 5 km > 5 km Do Not Know	Do Not Know		It is considered that within 300 m of a site, there is a concern for contamination. Therefore an environmental receptor or important water resource located within this area of the site will be subject to further evaluation. It is also considered that any environmental receptor located greater than 5 km away will not be a concern for evaluation. Review Conservation Authority mapping and literature including Canadian Council on Ecological Areas link: www.ccea.org.	Environmental receptors include: local, regional or provincial species of interest or significance, sensitive wetlands and fens and other aquatic environments.
Score	1.5			
			Bioaccumulation of food items is possible if:	

(III) Exposure (Demonstrates the presence of an exposure pathway and receptors)

Former USAF Radar Station, Spotted Island, Labrador

Definition	Score	Rationale for Score (document any assumptions, reports, or site-specific information; provide references)	Method Of Evaluation	Notes
Are aquatic species (i.e., forage fish, invertebrates or plants) that are consumed by predatory fish or wildlife consumers, such as mammals and birds, likely to accumulate contaminants in their tissues? Yes No Do Not Know	Do Not Know		1) The Log(Kow) of the contaminant is greater than 4 (as per the chemical characteristics work sheet) and concentrations in sediments exceed the CCME ISQGs. 2) The contaminant in collected tissue samples exceeds the CCME tissue quality guidelines.	
Score	0.5			
Raw Aquatic Total Potential	3.5	Note if a "Known" Ecological Effects score is provided, the "Potential" score is disallowed.		
Allowed Aquatic Total Potential	3.5			
4. Ecological Exposure Modifying Factors				
a) Known occurrence of a species at risk. Is there a potential for a species at risk to be present at the site? Yes No Do Not Know	Yes 2	A review of ecologically significant areas (CCEA, 2017), revealed no area of ecological significance within 5 km of the Site. However, based on provincial resources (https://www.flr.gov.nl.ca/wildlife/endangeredspecies/index.html) the ranges of several species at risk, including polar bear and wolverine overlap the Site. The potential presence of species at risk at the Site has not been ruled out.	Consult any ecological risk assessment reports. If information is not present, utilize on-line databases such as Eco Explorer. Regional, Provincial (Environment Ministries), or Federal staff (Fisheries and Oceans or Environment Canada) should be able to provide some guidance.	Species at risk include those that are extirpated, endangered, threatened, or of special concern. For a list of species at risk, consult Schedule 1 of the federal Species at Risk Act (http://www.sararegistry.gc.ca/species/schedules_e.cfm?id=1). Many provincial governments may also provide regionally applicable lists of species at risk. For example, in British Columbia, consult: BCMWLAP. 2005. Endangered Species and Ecosystems in British Columbia. Provincial red and blue lists. Ministry of Sustainable Resource Management and Water, Land and Air Protection. http://srmwww.gov.bc.ca/atrisk/red-blue.htm
Score	---			
b) Potential impact of aesthetics (e.g., enrichment of a lake or tainting of food flavor). Is there evidence of aesthetic impact to receiving water bodies? Yes No Do Not Know	No 0 ---	None observed during the site investigation	Documentation may consist of environmental investigation reports, press articles, petitions or other records.	This Item will require some level of documentation by user, including contact names, addresses, phone numbers, e-mail addresses. Evidence of changes must be documented, please attach copy of report containing relevant information.
Is there evidence of olfactory impact (i.e., unpleasant smell)? Yes No Do Not Know	No 0 ---	None observed during the site investigation	Examples of olfactory change can include the smell of a COPC or an increase in the rate of decay in an aquatic habitat.	
Is there evidence of increase in plant growth in the lake or water body? Yes No Do Not Know	No 0 ---	None observed during the site investigation	A distinct increase of plant growth in an aquatic environment may suggest enrichment. Nutrients e.g., nitrogen or phosphorous releases to an aquatic body can act as a fertilizer.	
Is there evidence that fish or meat taken from or adjacent to the site smells or tastes different? Yes No Do Not Know	Do Not Know --- 1		Some contaminants can result in a distinctive change in the way food gathered from the site tastes or smells.	
Ecological Modifying Factors Total - Known	**2**			
Ecological Modifying Factors Total - Potential	**1**			
Raw Ecological Total - Known	2			
Raw Ecological Total - Potential	11			
Raw Ecological Total	13			
Ecological Total (Max 18)	**13.0**			
5. Other Potential Contaminant Receptors				
a) Exposure of permafrost (leading to erosion and structural concerns) Are there improvements (roads, buildings) at the site dependant upon the permafrost for structural integrity? Yes No Do Not Know	No 0 ---	Site is not located in a permafrost zone (GEMTEC, 2018).	Consult engineering reports, site plans or air photos of the site. When permafrost melts, the stability of the soil decreases, leading to erosion. Human structures, such as roads and/or buildings are often dependent on the stability that the permafrost provides.	Plants and lichens provide a natural insulating layer which will help prevent thawing of the permafrost during the summer. Plants and lichens may also absorb less solar radiation. Solar radiation is turned into heat which can also cause underlying permafrost to melt.
Is there a physical pathway which can transport soils released by damaged permafrost to a nearby aquatic environment? Yes No Do Not Know	No 0 ---		Melting permafrost leads to a decreased stability of underlying soils. Wind or surface run-off erosion can carry soils into nearby aquatic habitats. The increased soil loadings into a river can cause an increase in total dissolved solids and a resulting decrease in aquatic habitat quality. In addition, the erosion can bring contaminants from soils to aquatic environments.	
Other Potential Receptors Total - Known	**0**			
Other Potential Receptors Total - Potential	**0**			

Exposure Total		
Raw Human Health + Ecological Total - Known	2	
Raw Human Health + Ecological Total - Potential	28	Only includes "Allowed potential" - if a "Known" score was supplied under a given category then the "Potential" score was not included.
Raw Total	30	
Exposure Total (max 34)	**22.2**	

CCME National Classification System (2008, 2010 v 1.2)
Score Summary

Scores from individual worksheets are tallied in this worksheet.
Refer to this sheet after filling out the revised NCS completely.

I. Contaminant Characteristics

	Known	Potential
1. Residency Media	6	1
2. Chemical Hazard	8	---
3. Contaminant Exceedance Factor	6	---
4. Contaminant Quantity	2	---
5. Modifying Factors	4	---
Raw Total Score	26	1
Raw Total Score (Known + Potential)	27	
Adjusted Total Score (Raw Total / 40 *33)	**22.3**	(max 33)

II. Migration Potential

	Known	Potential
1. Groundwater Movement	---	6.5
2. Surface Water Movement	12	---
3. Soil	12	---
4. Vapour	9	---
5. Sediment Movement	---	6
6. Modifying Factors	0	0
Raw Total Score	33	12.5
Raw Total Score (Known + Potential)	45.5	
Adjusted Total Score (Raw Total / 64 * 33)	**23.5**	(max 33)

III. Exposure

	Known	Potential
1. Human Receptors		
A. Known Impact	---	
B Potential		
a. Land Use		2
b. Accessibility		1
c. Exposure Route		
i. Direct Contact		3
ii. Inhalation		4
iii. Ingestion		7
2. Human Receptors Modifying Factors	0	---
Raw Total Human Score	0	17
Raw Total Human Score (Known + Potential)	17	
Adjusted Total Human Score	17.0	(maximum 22)
3. Ecological Receptors		
A. Known Impact	---	
B. Potential		
a. Terrestrial		6.5
b. Aquatic		3.5
4. Ecological Receptors Modifying Factors	2	1
Raw Total Ecological Score	2	11
Raw Total Ecological Score (Known + Potential)	13	
Adjusted Total Ecological Score	13.0	(maximum 18)
5. Other Receptors	0	0
Total Other Receptors Score (Known + Potential)	0	
Total Exposure Score (Human + Ecological + Other)	**30.0**	
Adjusted Total Exposure Score (Total Exposure / 46 * 34)	**22.2**	(max 34)

Site Score

Former USAF Radar Station, Spotted Island, Labrador

Site Letter Grade	**D**
Certainty Percentage	**75%**
% Responses that are "Do Not Know"	**12%**
Total NCSCS Score for site	**67.9**
Site Classification Category	**2**

Site Classification Categories*:

Class 1 - High Priority for Action (Total NCS Score >70)
Class 2 - Medium Priority for Action (Total NCS Score 50 - 69.9)
Class 3 - Low Priority for Action (Total NCS Score 37 - 49.9)
Class N - Not a Priority for Action (Total NCS Score <37)
Class INS - Insufficient Information (>15% of responses are "Do Not Know")

* NOTE: The term "action" in the above categories does not necessarily refer to remediation, but could also include risk assessment, risk management or further site characterization and data collection.

Report to: **Defence Construction Canada**
GEMTEC Project: 10550.04.02 (Final) (November 23, 2018)

experience • knowledge • integrity

civil	civil
geotechnical	géotechnique
environmental	environnementale
field services	surveillance de chantier
materials testing	service de laboratoire des matériaux

expérience • connaissance • intégrité