Phase III Environmental Site Assessment

Former Fire Training Area (APEC #2)
Inuvik (Mike Zubko) Airport
Inuvik, NWT

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PGL

Executive Summary

Pottinger Gaherty Environmental Consultants Ltd. (PGL) conducted a Phase III Environmental Site Assessment (ESA) of the former fire training area (FFTA, APEC 2), located at the Inuvik (Mike Zubko) Airport in Inuvik, Northwest Territories. The work is being managed by Public Works and Government Services Canada (PWGSC) under the supply agreement EO211-054107.

The Phase III ESA consisted of a data gap analysis based on the review of a previous investigation report, interviews with airport staff, site reconnaissance, access road assessment, and field investigations

The FFTA previously had been referred to as APEC 2. Two distinct areas of environmental concern (AECs) containing hydrocarbon contamination were identified within APEC 2:

- AEC 2A – Northwest of the Former Aboveground Storage Tanks;
- AEC 2B – Former Mock-up Area

The most probable volume of contaminated soil is:

- AEC 2A – 140m^3 (range 100–200m^3);
- AEC 2B – 5060m^3 (range 4,100–7,900m^3)

As part of our assessment, the access roads to the site were assessed during our field program in September 2009. Based on conditions at that time, the access roads were considered suitable for heavy equipment and trucks that may be required during remediation. However, the suitability of the roads immediately after the spring thaw has not been assessed and may impact the suitability of the access roads for heavy equipment traffic.

A hazardous materials reconnaissance of APEC 2 identified three drums marked as containing “lead paint and stripper” and an unlabelled drum (suspected of containing waste oil contaminated with glycols) onsite. These materials may impact human health or the environment if they were spilled or released. We recommend that these drums be removed. Non-hazardous materials identified onsite included runway towers, land treatment unit construction material, and fill stockpiles.

Based on data collected at the site, PGL calculated a National Classification System for Contaminated Sites (NCSCS) score. The NCSCS score for the Site is 56.5, indicating that the Site is “Class 2 – Medium Priority for Action.”

Possible remedial options for the hydrocarbon-contaminated soil identified in APEC 2 have been assessed and is presented under separate cover in PGL’s Remedial Action Plan.

Table of Contents

FIGURES

TABLES

In text

Appended

APPENDICES

List of Acronyms

AFFF	-	aqueous film-forming foam
APEC	-	area of potential environmental concern
ASTs	-	above ground storage tanks
bgs	-	below ground surface
BTEX	-	benzene, toluene, ethyl benzene, xylene
CCME	-	Canadian Council of Ministers of the Environment
CL	-	commercial land use
CWS	-	Canadian-Wide Standards
EGCSR	-	Environmental Guideline for Contaminated Site Remediation
ESA	-	environmental site assessment
FFTA	-	fire fighting training area
Franz	-	Franz Environmental Inc.
GNWT	-	Government of the Northwest Territories
IL	-	industrial land use
LTUs	-	Land Treatment Units
MAH	-	monocyclic aromatic hydrocarbon
MSDS	-	material safety data sheet
NCSCS	-	National Classification System for Contaminated Sites
NWT	-	Northwest Territories
PAH	-	polycyclic aromatic hydrocarbon
PCOCs	-	potential contaminants of concern
PGL	-	Pottinger Gaherty Environmental Consultants Ltd.
PHC	-	Petroleum Hydrocarbons
PWGSC	-	Public Works Government Services Canada
QA/QC	-	quality assurance and quality control
RFP	-	Request for Proposal
RPD	-	relative percent difference
TP##	-	test pit

1.0 INTRODUCTION

Pottinger Gaherty Environmental Consultants Ltd. (PGL) conducted a Phase III Environmental Site Assessment (ESA) of the former fire training area (FFTA, APEC 2), located at the Inuvik (Mike Zubko) Airport in Inuvik, Northwest Territories (the Site, Figure 1). The Terms of Reference for this ESA was presented in Public Works and Government Services Canada (PWGSC) Request for Proposal (RFP), project number EW699-101725. The work is being managed by PWGSC under the supply agreement EO211-054107. Modifications to the work plan were developed with the approval of Ms. Laurie Washington, PWGSC project manager, based on a data gap analysis of a previous consultant's report and field observations as the work progressed.

1.1 Background

1.1.1 Site History

Inuvik is the largest Canadian community north of the Arctic Circle. Inuvik is about 200km north of the Arctic Circle and 100km from the Beaufort Sea. Inuvik Airport was originally constructed in 1956–1958 and serves as a regional hub for delivery of services to smaller northwestern communities such as Tuktoyaktuk, Aklavik, Paulatuk, Fort McPherson, Arctic Red River, and Sachs Harbour. The airport is 10km southeast of Inuvik on the south side of the Dempster Highway (Figure 1). The airport includes an east-west oriented 1,950m runway.

We understand that in the 1990s the airport was transferred to the Government of Northwest Territories (GNWT) from the Government of Canada. Under an Airport Transfer Agreement (1995) between Transport Canada and the GNWT, Transport Canada is required to address any environmental regulatory deficiencies at the airport.

Based on our review of the available previous investigations, a number of areas of potential environmental concern (APECs) have been assessed. The purpose of this investigation is to further assess the former fire training area (FFTA), identified as APEC 2.

1.1.2 Site Description

The FFTA (APEC 2, the Site) is about 1km west of the airport terminal and is accessed via Airport Lake Road (Figure 1). Dolomite Lake (Airport Lake) is 500m south of the Site. The Site is about 6,000m^2 and is used for the storage of runway approach towers, land treatment unit, construction materials, etc. (Figure 2).

1.2 Investigation Objectives

The objectives of the investigation, as identified in the RFP are as follows:

1. Obtain information regarding past and present land use of the FFTA (APEC 2); with respect to potential contamination.
2. Identify, characterize and quantify all hazardous and non-hazardous materials at the Site.
3. Identify and delineate contaminated areas at the Site.
4. Conduct water sampling using existing monitoring groundwater wells or through installation of new groundwater wells to determine if groundwater flow is still restricted and/or to obtain and analyze water samples from the Site.

5. Evaluate the condition of Site access roads to ensure equipment for the remediation phase can access the Site.
6. Document all information in written reports for the Site.

2.0 SCOPE OF WORK

The Phase III ESA for the FFTA (APEC 2) was conducted in September 2009. As part of our investigation, PGL conducted a data gap analysis by reviewing a previous investigation report. Based on our review, a field sampling program and analytical plan was designed. PGL prepared a Site-specific health and safety plan for fieldwork activities, including provisions for emergency response and environmental protection. For safety, additional measures for working in remote locations were reviewed and implemented.

The field program consisted of interviews with the airport manager (Karen King) and staff (Randy McRae), a reconnaissance of the FFTA (APEC 2) and access roads, a test pit program, and assessment of existing groundwater-monitoring wells. PGL personnel were responsible for the collection of soil samples, water level measurements, field observations, and a photographic log of Site activities and findings.

3.0 REGULATORY CONTEXT

Contaminated site remediation in the Northwest Territories (NWT) is regulated by the GNWT's Environmental Guideline for Contaminated Site Remediation (EGCSR). In 2003, GNWT adopted the revised EGCSR containing petroleum hydrocarbon (PHC) Canada-Wide Standards (CWS) in soil as remediation criteria (Appendix 3 of the EGCSR). The CWS criteria apply to a variety of generalized land uses (e.g., industrial, commercial, residential, agriculture) that vary with depth (i.e., surface (<1.5m), subsurface (>1.5m) and grain size of soil (fine (<75µm), coarse (>75µm)), as well as, specific environmental and human receptors and pathways (e.g., ingestion, inhalation, etc.). Tier 1 criteria are applied to surface samples (up to 1.5m below ground surface (bgs)) and generic criteria are applied to subsurface samples (>1.5m bgs).

The GNWT has also adopted the Canadian Council of Ministers of the Environment (CCME) Canadian Environmental Quality Guidelines for soil and these remediation criteria are provided in Appendix 5 of the EGCSR. These remediation criteria are for specific petroleum hydrocarbon compounds (e.g., monocyclic aromatic hydrocarbons (MAHs), polycyclic aromatic hydrocarbons (PAHs)) and a variety of other parameters (e.g., metals, chlorinated hydrocarbons, etc.) that have been established for broad land use categories (e.g., industrial, commercial, residential, agriculture).

Land use at airports is not specifically designated in the EGCSR, but is generally considered a commercial land use (CL). However, some areas of the airport maybe considered as industrial land use (IL). A review of the EGCSR indicates that the CL and IL criteria are identical in most cases. Where a difference in the criteria is observed, PGL applied the more stringent of the two. The GNWT and CWS criteria for CL are used for numerical comparison to the laboratory analytical results, and are presented in Table 1 and Table 2 (attached).

As part of this assessment, PGL was to classify materials as hazardous or non-hazardous. Based on our review of the GNWT regulations and federal guidelines, "hazardous" materials are not defined; therefore our assessment has been based on professional judgement and experience in other jurisdictions.

4.0 SUMMARY OF THE PREVIOUS INVESTIGATION

Franz Environmental Inc. (Franz) conducted a Phase II and III ESA of the entire airport in February, 2007 and identified soil contamination in the FFTA. The FFTA was identified as area of potential environmental concern #2 (APEC 2).

APEC 2 consisted of a former mock-up area (e.g., fire staging area) and associated auxiliary equipment (e.g., aboveground storage tanks (ASTs)). Franz's investigation involved the excavation of 18 test pits. Based on this investigation, hydrocarbon contamination was identified in seven test pits in two areas (mock-up and north of former ASTs). Table A below summarizes the exceedences of applicable criteria in each of the areas.

Table A: Summary of Exceedences Identified in Franz's Phase II and III ESA (2007)

Test Pit	Location	Parameter (depth)	Exceedence of Applicable Criteria
02-TP06-03	Mock-up Area	F3 (0.1–0.3m)	GNWT Soil CL/IL CWS Soil CL/IL
02-TP06-07	Mock-up Area	Toluene (0.3–0.5m) (0.9–1.1m)	GNWT Soil CL/IL
		Xylene (0.3m–0.5m)	GNWT Soil CL/IL
		F1 (0.3–0.5m)	GNWT Soil CL/IL CWS Soil CL/IL
		F2 (0.3–0.5m)	GNWT Soil CL/IL CWS Soil CL/IL
		F3 (0.3–0.5m)	GNWT Soil CL/IL CWS Soil CL/IL
02-TP06-08	Mock-up Area	Toluene (1.7–1.9m) (2.3–2.5m)	GNWT Soil CL/IL
		Xylene (0.5–0.7m) (1.7–1.9m)	GNWT Soil CL/IL
		F1 (0.5–0.7m) (1.7–1.9m)	GNWT Soil CL/IL CWS Soil CL/IL
		F2 (0.5–0.7m)	GNWT Soil CL/IL CWS Soil CL/IL
02-TP06-09	Mock-up Area	F1 (0.1–0.3m)	GNWT Soil CL/IL CWS Soil CL/IL
		F2 (0.1–0.3m)	GNWT Soil CL/IL CWS Soil CL/IL

Test Pit	Location	Parameter (depth)	Exceedence of Applicable Criteria
		F3 (0.1–0.3m)	GNWT Soil CL/IL CWS Soil CL/IL
		F4 (0.1–0.3m)	GNWT Soil CL/IL CWS Soil CL/IL
02-TP06-10	Mock-up Area	F3 (0.6–0.8m)	GNWT Soil CL/IL CWS Soil CL/IL
02-TP06-16	North of Former ASTs	F3 (0–0.1)	GNWT Soil CL/IL CWS Soil CL/IL
		F4 (0–0.1)	GNWT Soil CL/IL CWS Soil CL/IL
02-TP06-17	North of Former ASTs	F3 (0–0.15m)	GNWT Soil CL/IL CWS Soil CL/IL
		F4 (0–0.15m)	GNWT Soil CL/IL CWS Soil CL/IL

Petroleum hydrocarbon (PHC) F1 through F4, toluene, and xylene concentrations were detected above the applicable criteria (as summarized in Table A) in select samples collected from test pits 02-TP06-07, 02-TP06-08, 02-TP06-09, and 02-TP06-10 (Figure 2) within the mock-up area. Contamination extended to a maximum depth of 2.5m bgs. PHC chromatograms indicate the presence of diesel fuel and in some cases, lubricating oil range products. A test pit (02-TP06-3) immediately west of the mock-up area was excavated where surficial staining was noted. PHC F3 contamination exceeding the GNWT and CWS standard was encountered at this location at a depth of 0.3m bgs.

Staining was noted on the ground north of the former ASTs. Soil samples collected and submitted for analysis from two test pits (02-TP06-16 and 02-TP06-17) in this area, exceeded the GNWT and CWS standards for PHC F3 and F4. PHC chromatograms indicate the presence of a lubricating oil range product. Contamination depth appeared to be limited to surface soils (maximum depth 0.15m bgs).

Franz observed minor groundwater seepage and saturated horizons in some investigation locations (02-MW06-1, 02-TP06-1, 02-TP06-02, 02-TP06-03, 02-TP06-04, 02-TP06-05, 02-TP06-07, 02-TP06-09 and 02-TP06-14) assessed; however, no significant groundwater was encountered.

The volume of contaminated soil estimated by Franz in APEC 2 was 1,730m^3 to 3,920m^3.

5.0 PHASE III ESA

PGL's assessment involved data gap analysis, interviews, access road and site reconnaissance. A summary of each of these tasks completed as part of the assessment is provided below.

5.1 Data Gap Analysis

Data gaps identified prior to PGL's field investigation were principally related to incomplete delineation aggravated by a change in the applicable standards since Franz's work and additional PCOCs identified in interviews.

Changes in the CWS criteria results in the following areas being reclassified as contaminated:

- 02-TP06-02, 1.6–1.8m, benzene, toluene, ethylbenzene and xylene (CWS CL);
- 02-TP06-07, 0.3–0.5m, benzene and ethylbenzene (CWS CL);
- 02-TP06-07, 0.9–1.1m, benzene (CWS CL);
- 02-TP06-08, 0.5–0.7m, benzene, toluene and ethylbenzene (CWS CL);
- 02-TP06-08, 1.7–1.9m, benzene and ethylbenzene (CWS CL);
- 02-TP06-08, 2.3–2.5m, benzene, ethylbenzene and xylene (CWS CL);
- 02-TP06-09, 0.1–0.3m, benzene, toluene, ethylbenzene and xylene (CWS CL);
- 02-TP06-09, 2.0–2.2m, benzene, toluene, ethylbenzene and xylene (CWS CL);
- 02-TP06-09, 2.6–2.8m, benzene, toluene and ethylbenzene (CWS CL);
- 02-TP06-10, 0.6–0.8, benzene, toluene, ethylbenzene and PHC F1 (CWS CL);
- 02-TP06-12, 0.1–0.3m, PHC F2 (CWS CL);
- 02-TP06-16, 0–0.1m, PHC F2 (CWS CL); and
- 02-TP06-17 0.0–0.15m, PHC F2 (CWS CL).

The additional PCOCs identified were associated with shotgun flares used to ignite the fires; aqueous film-forming foam (AFFF), water and Purple-K dry chemical used to extinguish the fires. The available data (i.e., particularly metals) from the previous report and the material safety data sheets (MSDS) for these products were reviewed. The parameters identified in the MSDS were either analyzed by Franz (e.g., metals) and detected below the applicable criteria or are not regulated; therefore they were not assessed further.

5.2 Site Interviews

PGL interviewed Karen King (Inuvik Airport Manager) and Randy McRae (long-term airport maintenance employee) regarding past and present uses of the FFTA (APEC 2). The anecdotal background information gathered is summarized below.

The Site was used as a fire fighting training area between the years 1978 and 1993 by Transport Canada Airport Firefighters. Training was conducted on a year-round basis, although burn frequency is unknown. We understand that shotgun flares were often used to ignite the fires, while diesel, aviation gas, used oil, jet-b fuel, and gasoline were used to fuel the fires. AFFF, water and Purple-K dry chemical were used to extinguish the fires.

We understand that drum storage historically took place in APEC 2. The contents of the drums stored onsite reportedly included asphalt primer, waste oil, waste antifreeze, glycols, and contaminated fuels. There is no documentation regarding spills on the Site.

5.3 Access Road Reconnaissance

Access to the FFTA (APEC 2) is via a series of well maintained, all-weather gravel roads. From the Dempster Highway, approximately 1km west of the airport, Airport Lake Road leads to the Site (Figure 1, Appendix 1, Photo 1.1). The road is in generally good condition, approximately 10m wide, and graded with drainage ditches on either side in most places. Some low areas have standing water, resulting in large puddles several centimetres deep (Photo 1.2). One kilometre south of the Dempster Highway turnoff, there is an area about 200m long that has significant potholes (Photo 1.3 and 1.4). Adjacent to the gravel quarry, a second gravel road forks to the east (Photo 1.5). This gated road leads to the FFTA (APEC 2), and eventually, airport tarmac. The gravel road is also in relatively good condition, is 10–11m wide, and showed no significant signs of flooding or weak areas (Photo 1.6). To the east and west of the FFTA (APEC 2) there are smaller gravel access roads that head south to the lakeshore. These roads are also in fairly good condition. At this time, the potential impact of the spring thaw on the accessibility of the Site via these roads is unknown.

5.4 FFTA (APEC 2) Site Reconnaissance

PGL conducted a Site reconnaissance of the FFTA (APEC 2) to identify hazardous and non-hazardous materials onsite. The FFTA (APEC 2) is 600m west of the airport runway, encompasses an area of about 60m by 100m (Figure 2), and is generally flat (Appendix 1, Photo 2.1). The land slopes downward to the north, east and west of the Site and topography indicates the area was most likely built up with fill material. To the north of the Site is the runway approach area lined with runway towers. A gravel road bounds the Site to the south, beyond which are two land treatment units (LTUs) for contaminated soil (Figure 2).

The Site consists of a former mock-up area where fires were staged for fire fighting training exercises. Surface staining was noted in the northeast corner of the Site (Photo 2.2). Staining was also noted in the general vicinity of the mock-up area (Photo 2.3).

Storage of various materials was noted onsite during the assessment and included:

- Old runway approach towers (metal towers, cables and light fixtures), stacked along the northwest edge of the Site (Photo 2.4);
- A pile of gravel fill material located along the north boundary of the Site (Photo 2.5);
- Remnants of what appears to be LTU construction material stockpiled at the north end of the Site. The material includes several rolls of geotextile fabric, four rolls of plastic liner and a roll of black canvas material (Photos 2.6 and 2.7);
- East of the LTU material, three drums are stored on a pallet. The drums are labelled as containing “lead paint and stripper” (Photo 2.8);
- Various pallets, empty metal buckets and old sections of metal piping are scattered throughout the Site (Photo 2.9 and 2.10); and
- A fourth drum, unlabelled and slightly bulging, located at the southeast corner of the Site. Due to the stressed condition of the drum, a sample was not collected. Airport staff indicated that the contents are unknown, but likely contain used oil, contaminated with glycols (Photo 2.11).

The above listed materials are mapped on Figure 2 and included in the Photographic Record (Appendix 1).

5.5 Field Program

The test pit program conducted by PGL for APEC 2 was carried out on September 22 and 23, 2009 using a rubber-tired backhoe provided by Northwind Industries of Inuvik, NWT. The size of the excavator was consistent with the maximum that would be allowed to operate within the flight path, and so is representative of the machinery that would be used during remediation.

Eighteen test pits were excavated during our assessment, many to refusal on either bedrock or permafrost. The selection of test pit, sample locations, and PCOCs were based on our gap analysis and risks assessed.

The FFTA previously had been referred to as APEC 2. Given that two distinct areas of hydrocarbon contamination have been identified within APEC 2, we have further defined each area as follow (see Figure 3):

- AEC 2A – northwest of former ASTs;
- AEC 2B – former mock-up area.

Prior to the excavation of test pits, underground utility location information was gathered from the Inuvik Airport personnel and previous investigation locations were surveyed and staked by Coreman Technical Services.

Soil stratigraphy was logged for each test pit and soil samples collected at selected intervals (Appendix 2). Visual and olfactory observations, including screening of samples with a Gastech, were also recorded on each of the test pit logs.

Samples were collected in accordance with the applicable GNWT EGCSR guidelines and PGL field sampling methodology (Appendix 3). In total, 56 soil samples were collected from the test pit program within APEC 2 and submitted to the Maxxam Analytics in Edmonton, AB. Soil samples were analyzed for benzene, toluene, ethylbenzene, xylenes (BTEX), and PHC F1-F4.

The depth to groundwater was monitored in the four existing monitoring wells installed onsite. Groundwater was not detected in any of the monitoring wells; therefore no samples were collected.

Photographs taken during the investigation are presented in Appendix 1.

5.6 Quality Assurance/Quality Control

PGL assessed chemical data quality assurance/quality control (QA/QC) through duplicate sample analyses and reliance on the Canadian Association of Environmental Analytical Laboratories certified laboratory's internal QA/QC procedures. The laboratory's QA/QC procedures include surrogate recovery and instrument calibration verification. Sample results are not released unless all internal QA/QC data are acceptable. Maxxam's QA/QC results are included with the laboratory reports in Appendix 4.

Selected soil samples were collected in duplicate (i.e., duplicate pair) and submitted for PHC F1-F4 and BTEX analysis. Of the six duplicate pairs analyzed, three samples have relative percent difference (RPD) values for the parameters analyzed above the acceptable reproducibility (e.g., 40%), refer to Appendix 5 for calculations.

The RPD exceedences of these duplicate pairs may be due to the nature of the material (e.g., crushed rock), and variations in the distribution of hydrocarbons. Based on our review of the data, the classification of the samples for these parameters does not change the classification of this material as contaminated.

6.0 INVESTIGATION RESULTS

6.1 Geology/Hydrogeology

The observed stratigraphy consisted of crushed rock (fill) placed over native material. The native material was generally identified by a thin peat horizon visible in most test pits (Appendix 2). Below the peat, a layer of sandy silt of varying thickness was encountered above the bedrock/permafrost (Appendix 1, Photo 3.2). Bedrock/permafrost (Photo 3.3) was encountered between 0.7m and 3.0m bgs. No test pit was advanced below 3.0m. Bedrock/permafrost was not always encountered.

In addition to completing a chemical analysis of soil samples collected, selected samples were submitted for grain-size analysis. A summary of the results are provided in Table B. Based on field observations, the stratigraphic layers were defined across the Site. Therefore, PGL selected samples that were characteristic of each layer (gravel fill, silt layer, peat layer) observed for sieve analysis.

Table B: Summary of Grain Size Analysis

Sample	Sampling Date	General Description	Sieve - Pan	Sieve 200 (0.075mm)	Classification
TP10-3	9/22/2009	Brown SILT with organics	65	35	FINE
TP14-1	9/23/2009	Purple GRAVEL with sand (crushed shale fill)	13	87	COARSE
TP06-2	9/23/2009	Brown mottled with grey SILT	47	53	COARSE
TP18-2	9/23/2009	Dark brown PEAT	84	16	FINE

Based on the grain-size analysis for the selected samples, PGL applied the sieve analysis result classifications to similar samples across the Site, as indicated in Table 1, as both the EGCSR and CWS criteria for PHC fractions are grain-size dependent.

Hydrocarbon odours were noted in soil samples collected from test pits (TP05, TP10, TP11, TP12, TP13 and TP14) located around the former mock-up area (Figure 2). Soil headspace vapour concentrations in samples from this area exceeded 100% lower explosive limit (LEL) in several samples, and were generally elevated in the area.

During our assessment, minor groundwater seepage was noted in TP05. The volume of seepage observed was insufficient to sample or warrant installation of a monitoring well.

6.2 Soil Results

The investigation results for each of the areas identified are described in this section. Exceedence of the applicable standards for one or more of the following parameters was observed: PHC F1-F4, benzene, toluene, ethylbenzene and xylenes.

6.2.1 APEC 2A – Northwest of Former ASTs

Concentrations of PHC F2, F3 and F4 were detected above the CWS and/or GNWT standards. Results are summarized in Table C (below) and are presented on Figure 3 and in Table 1.

Table C: Summary of Exceedences within APEC 2A

Test Pit	Parameter (depth)	Exceedence of Applicable Standard(s)
TP01A	F2 (0.3–0.5m)	CWS CL
TP02B	F3 (0–0.1m, 0.4–0.6m)	CWS CL and GNWT CL
	F4 (0–0.1m)	CWS CL and GNWT CL

6.2.2 APEC 2B – Former Mock-up Area

Concentrations of PHC F1–F4, benzene, ethyl benzene, toluene, and xylene were detected above the applicable standards in the former mock-up area. Results are summarised in Table D (below) and are presented in Figures 3 and 4 and Tables 1 and 2.

Table D: Summary of Exceedences within APEC 2B

Test Pit	Parameter (depth)		Exceedence of Applicable Standard(s)
TP03	F3	(0.4–0.6m)	CWS CL and GNWT CL
TP04	Benzene	(0.6–0.8m)	CWS CL
TP05	F1	(1.3–1.5m)	CWS CL and GNWT CL
	F2	(0.1–0.3, 0.6–0.8m, 1.3–1.5m)	CWS CL and GNWT CL
	F3	(0.1–0.3, 0.6–0.8m, 1.3–1.5m)	CWS CL and GNWT CL
	Benzene	(0.6–0.8m, 1.3–1.5m)	CWS CL
	Ethylbenzene	(0.1–0.3m, 0.6–0.8m, 1.3–1.5m)	CWS CL
TP07	F2	(0.3–0.5m)	CWS CL
		(0.9–1.1m)	CWS CL and GNWT CL
	F3	(0.9–1.1m)	CWS CL and GNWT CL
	Benzene	(1.5–1.7m)	CWS CL
	Ethylbenzene	(1.5–1.7m)	CWS CL

Test Pit	Parameter (depth)		Exceedence of Applicable Standard(s)
TP10	F1	(0.5–0.7m)	CWS CL and GNWT CL
	F2	(0.5–0.7m)	CWS CL and GNWT CL
		(1.7–1.9m, 2.3–2.5m)	CWS CL
	F3	(0.5–0.7m)	CWS CL and GNWT CL
	Benzene	(0.5–0.7m, 1.7–1.9m, 2.3–2.5m, 2.9–3.0m)	CWS CL
	Toluene	(0.5–0.7m, 1.7–1.9m, 2.3–2.5m)	CWS CL and GNWT CL
		(2.9–3.0m)	CWS CL
	Ethylbenzene	(0.5–0.7m, 1.7–1.9m, 2.3–2.5m, 2.9–3.0m)	CWS CL
	Xylenes	(0.5–0.7m)	CWS CL and GNWT CL
		(1.7–1.9m, 2.3–2.5m)	CWS CL
TP11	F1	(0.5–0.7m)	CWS CL and GNWT CL
	F2	(0.5–0.7m)	CWS CL and GNWT CL
		(2.8–3.0m)	CWS CL
	F3	(0.5–0.7m)	CWS CL and GNWT CL
	Benzene	(0.5–0.7m, 1.7–1.9m, 2.3–2.5m, 2.8–3.0m)	CWS CL
	Toluene	(1.7–1.9m)	CWS CL
	Ethylbenzene	(0.5–0.7m, 1.7–1.9m, 2.3–2.5m, 2.8–3.0m)	CWS CL and GNWT CL
TP12	F1	(0.5–0.7m, 1.7–1.9m, 2.3–2.5m)	CWS CL and GNWT CL
	F2	(0.5–0.7M, 1.7–1.9M, 2.3–2.5m)	CWS CL and GNWT CL
	F3	(0.5–0.7M, 2.3–2.5m)	CWS CL and GNWT CL
		(1.7–1.9m)	CWS CL
	F4	(2.3–2.5m)	CWS CL
	Benzene	(0.5–0.7m, 2.3–2.5m)	CWS CL
		(1.7–1.9m)	CWS CL and GNWT CL
	Toluene	(1.7–1.9m, 2.3–2.5m)	CWS CL and GNWT CL
	Ethylbenzene	(0.5–0.7m, 2.3–2.5m)	CWS CL
		(1.7–1.9m)	CWS CL and GNWT CL
	Xylenes	(0.5–0.7m, 1.7–1.9m, 2.3–2.5m)	CWS CL and GNWT CL

Test Pit	Parameter (depth)		Exceedence of Applicable Standard(s)
TP13	F1	(1.3–1.5m)	CWS CL and GNWT CL
	F2	(0.6–0.8m)	CWS CL
		(1.3–1.5m)	CWS CL and GNWT CL
	F3	(0.6–0.8m)	CWS CL and GNWT CL
	Benzene	(1.3–1.5m)	CWS CL
	Toluene	(1.3–1.5m)	CWS CL and GNWT CL
	Ethylbenzene	(1.3–1.5m)	CWS CL
	Xylenes	(1.3–1.5m)	CWS CL and GNWT CL
TP14	F1	(0.8–1.0m, 1.6–1.9m)	CWS CL and GNWT CL
	F2	(0.8–1.0m)	CWS CL and GNWT CL
		(1.6–1.9m)	CWS CL
	F3	(0.8–1.0m)	CWS CL and GNWT CL
	F4	(0.8–1.0m)	CWS CL and GNWT CL
	Benzene	(0.8–1.0m)	CWS CL
		(1.6–1.9m)	CWS CL and GNWT CL
	Toluene	(1.6–1.9m)	CWS CL and GNWT CL
	Ethylbenzene	(0.8–1.0m)	CWS CL
		(1.6–1.9m)	CWS CL and GNWT CL
	Xylenes	(0.8–1.0m)	CWS CL
		(1.6–1.9m)	CWS CL and GNWT CL
TP16	F2	(1.7–1.9m)	CWS CL
TP18	Benzene	(1.7–1.9m, 2.1–2.2m)	CWS CL
TP08B	F3	(0.6–0.7m)	CWS CL and GNWT CL
TP09B	Benzene	(0.1–0.3m, 0.4–0.6m)	CWS CL
	Toluene	(0.1–0.3m, 0.4–0.6m)	CWS CL

Based on the investigation work completed by PGL, Figure 5 depicts the estimated areal extent of soil contamination, while in Figure 6 and Figure 7 extent of vertical contamination is shown in the cross section.

6.3 Groundwater Results

Existing groundwater-monitoring wells installed by Franz onsite were observed to be dry, and no significant groundwater was encountered during the test pit program. As a result, no groundwater samples were collected.

6.4 National Classification System for Contaminated Sites (NCSCS)

Based on data collected at the Site, PGL calculated a National Classification System for Contaminated Sites (NCSCS) score. The NCSCS score consist of completing a number of forms. In summary, the NCSCS score for the Site is 56.5, indicating that the Site is "Class 2 – Medium Priority for Action." NCSCS forms are included in Appendix 6.

Franz previously calculated a Federal Contaminated Sites Action Plan NCS score of 60.3 for the Site. Under this classification the Site was identified as a "Class 2 – Action Likely Required."

7.0 DISCUSSION

7.1 Access Road Assessment

Assessment of the access roads to the Site revealed that the current conditions of the road will be adequate for remediation activities. Namely, roads will be able to bear the weight and frequency of heavy machinery traffic. Upgrades required would be limited to filling potholes located north of the quarry area. However, the potential impact of spring thaw has not been assessed. If remediation was to proceed at the Site and spring thaw impacted on the use of the access roads, we would recommend that remediation activities be undertaken once the road became passable (e.g., dried) and/or weight restrictions are not in place.

7.2 Site Reconnaissance

Reconnaissance of the FFTA (APEC 2) for the presence or absence of hazardous and non-hazardous materials identified several items. Most items identified were non-hazardous (i.e., runway towers, LTU construction supplies). However, three drums of "lead paint and stripper" were noted onsite, although the drums were properly labelled and stored. One unidentified drum was noted, but not sampled due to poor condition of the drum (e.g., bulging lid). The drums located on the Site pose a potential hazard to both human health and the environment in the event of a spill/release and should be removed.

7.3 Extent of Contamination

The investigation of soil contamination within the two areas (AEC 2A, AEC 2B) identified in APEC 2 was undertaken.

7.3.1 AEC 2A – Northwest of Former ASTs

The investigation in the area northwest of the former ASTs identified shallow soil contamination to a depth of approximately 0.5m bgs from surface. The depth of contamination may extend beyond 0.6m bgs; however, bedrock or permafrost encountered inhibited further investigation, and would similarly prevent excavation during remediation given that the machine used to excavate the test pits is of the maximum size that would be allowed at this location in the flight path.

PGL is confident of delineation of contamination in all directions within the typical level of uncertainty for such estimates. The northernmost sample at TP01A just exceeded the standard and so can be used as the northern boundary. Contamination is to full depth, and maximum depth that could be excavated (high confidence based on test pits) is roughly 0.5m. PGL estimates the mostly likely volume of contaminated material to be 140m^3, with a range of 90–210m^3.

The contaminants of concern were predominantly F2 through F4 hydrocarbon fractions.

7.3.2 AEC 2B – Former Mock-up Area

Contamination in AEC 2B is predominantly F1 and BTEX, but does include some heavier fractions (predominantly F2 and F3). Many test pits were terminated at refusal, and most test pits showed hydrocarbon contamination for the full depth. Since the machine used to excavate the test pits was consistent with the maximum size that would be allowed at this location in the flight path, the test pit depth refusal can be considered appropriate for determining depth of excavation for remediation. Depth to refusal was typically 1.5–2.2m, with one location having refusal at 3m, and a shallower zone to the west where refusal was shallower than 1m.

Areal extend was incomplete in two locations: south of TP18, and southwest of 02-TP06-02. Further delineation to the south is not possible because of the location of the LTUs, which limit the ability to investigate and remediate in these areas. Examining the results from TP18 indicates only benzene exceeds the CWS criterion (1,200ppb and 390ppb compared with a standard of 30ppb). Since toluene is the principal MAH contaminant, and the benzene standard is generally at the low end of the contaminated spectrum observed at the Site, we do not consider the limitation of excavation to the south to be significant to the quantity estimate. The sample at 02-TP06-02 narrowly exceeds the F2 CWS criterion (610ppm vs. 260ppm) and the benzene criterion (74ppb vs. 30ppb), and so can be reasonably be assumed to be very close to the boundary of contamination. We estimate, making appropriate allowance at both the less certain locations, that the most probable volume of contaminated material is 4,900m^3, with a range of 4,100m^3–7,900m^3. This level of uncertainty of this estimate is within typical bounds of a Detailed Site Investigation, and appropriate to carry forward to remediation.

7.3.3 Estimate Uncertainty Reduction

We considered whether additional investigation was merited to reduce the uncertainty in remedial estimates, for example by installing additional test pits. In general the uncertain locations are low enough that they can be used to reasonably bound contamination, and the resolution within the affected areas (typically 10m or less) would generally represent the upper bound of cost-effective pre-remedial investigation.

7.3.4 Summary of Site Contamination

Based on the investigations completed at each of the areas, the most probably volume estimate is 5,200m^3, with a range of 4200m^3 to 8100m^3. The difference between PGL's most probable and Franz's maximum (3,920m^3) is primarily due to a change to more stringent criteria for some parameters, resulting in a larger impacted area.

8.0 CONCLUSIONS AND RECOMMENDATIONS

PGL's Phase III ESA delineated the hydrocarbon contamination in the two areas (AEC 2A and AEC 2B) within APEC 2 to within acceptable DSI confidence levels. Based on the area and depths to refusal we estimate roughly 5,200m^3 (4,200–8,100m^3). While delineation was not strictly achieved in three locations, available results were sufficiently close to the standards in the context of other samples near edges of the affected area, and spacing was sufficiently close that further delineation is not recommended. Based on the information gathered during this investigation, PGL has assessed the possible remediation options for the hydrocarbon-contaminated soil in APEC 2. Discussions of the remedial options are provided under separate cover in the remedial action plan.

In addition to the remediation of hydrocarbon-contaminated soil, PGL recommends the four drums stored onsite be removed and disposed of appropriately.

9.0 STANDARD LIMITATIONS

PGL prepared this report for our client, PWGSC exclusively. PGL accepts no responsibility for any damages that may be suffered by third parties as a result of decisions or actions based on this report.

The report's purpose is to provide the client with an assessment of contamination on the subject property. The investigation consisted of a screening for potential contamination and, as is true for all environmental investigations, potential remains for the presence of unknown, unidentified, or unforeseen surface or subsurface contamination. More or different investigation may be required if other risks are identified. The data presented in this report is valid for the date of sampling, but Site conditions may change with time.

The findings and conclusions are Site-specific and were developed in a manner consistent with that level of care and skill normally exercised by environmental professionals currently practicing under similar conditions in the area. Changing assessment techniques, regulations, and Site conditions mean that environmental investigations and their conclusions can quickly become dated, so this report is for present use. The report should not be used after this time without PGL review or approval.

The project has been conducted according to our instructions and work program. Additional conditions and limitations on our liability are set forth in our work program and contract. This report is neither an endorsement nor a condemnation of the subject property. No warranty, expressed or implied, is made.

Respectfully submitted,

POTTINGER GAHERTY ENVIRONMENTAL CONSULTANTS LTD.
Per:

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MMZ/SNM/KHG/WDG/stm
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Figures

INUVIK

DEMPSTER HIGHWAY

FLOAT PLANE BASE

SHELL LAKE/
LONG LAKE

MacKENZIE RIVER

QUARRIES

AIRPORT LAKE ROAD

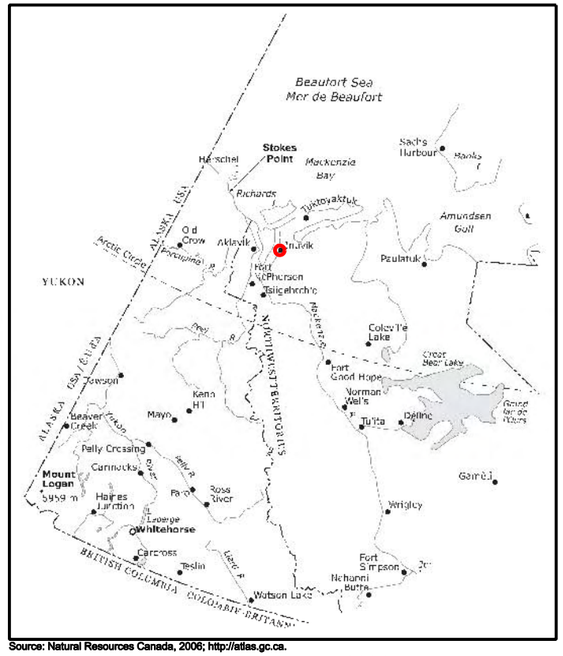
AIRPORT TERMINAL

APEC 2

DOLOMITE LAKE/
AIRPORT LAKE

Source: Google Earth, 2009, Imagery dates June 20-2004 - August 28, 2007.

0 4 km



Source: Natural Resources Canada, 2006; http://atlas.gc.ca.

0 200 km

SITE LOCATION

APEC 2 - Former Training Area, Inuvik Airport, Inuvik, NWT

PWGSC

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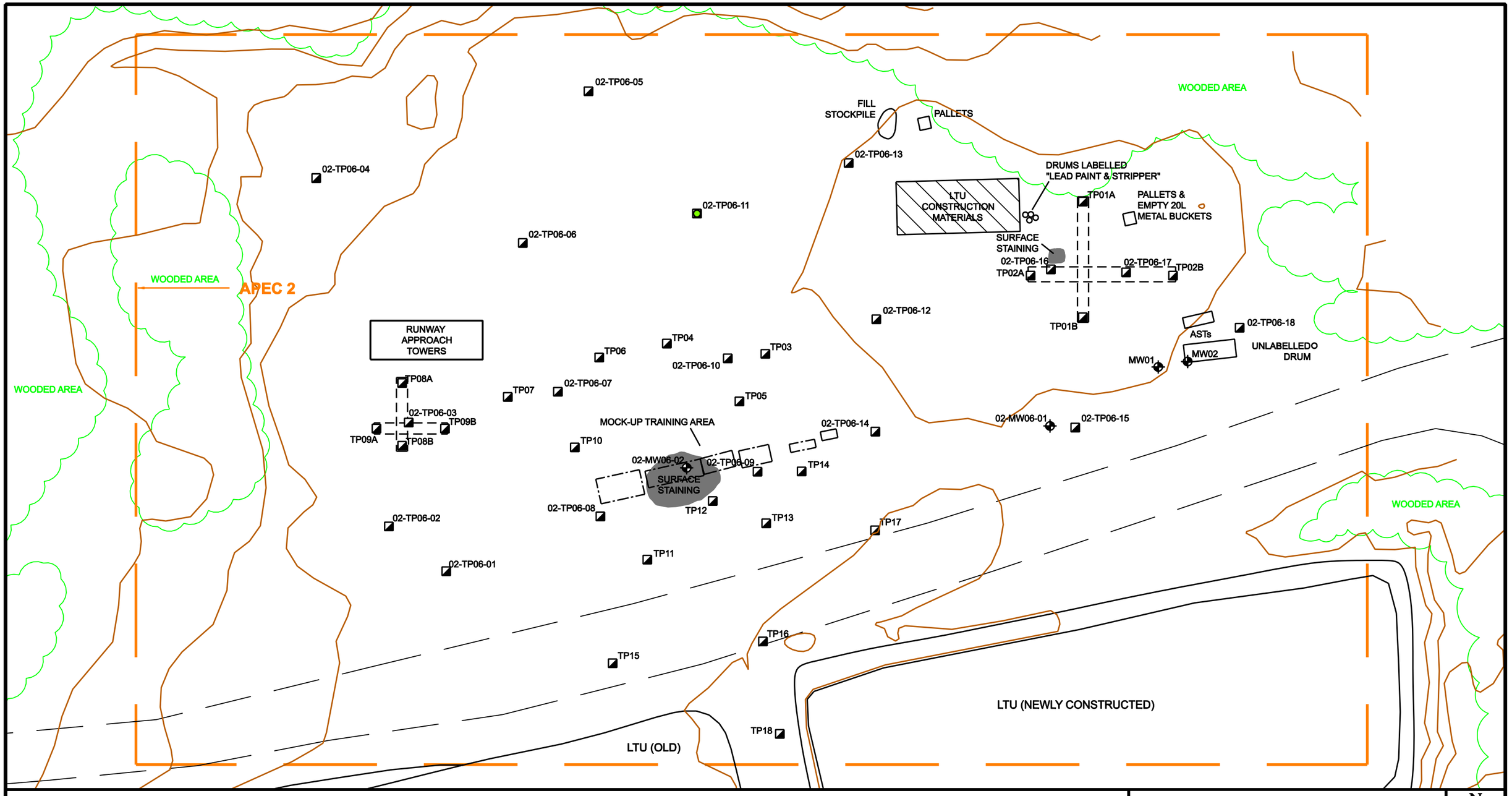
N

File No.: 125-78.01
Date: FEBRUARY 2010
Dwg No.: S1
Drawn by.: IRB

FIGURE 1

ORIGINAL IN COLOUR



MONITORING WELL LOCATION
TEST PIT LOCATION
TP06 PGL TEST PIT
PGL TEST TRENCH
02-TP06-03 FRANZ TEST PIT
MW FRANZ MONITORING WELL

APEC AREA OF ENVIRONMENTAL CONCERN
AST ABOVEGROUND STORAGE TANK

0 25m
Scale 1:500

SITE PLAN

APEC 2 - Former Training Area, Inuvik Airport, Inuvik, NWT

PWGSC

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File No.: 125-78.01
Date: FEBRUARY 2010
Dwg No.: S2
Drawn by.: IRB

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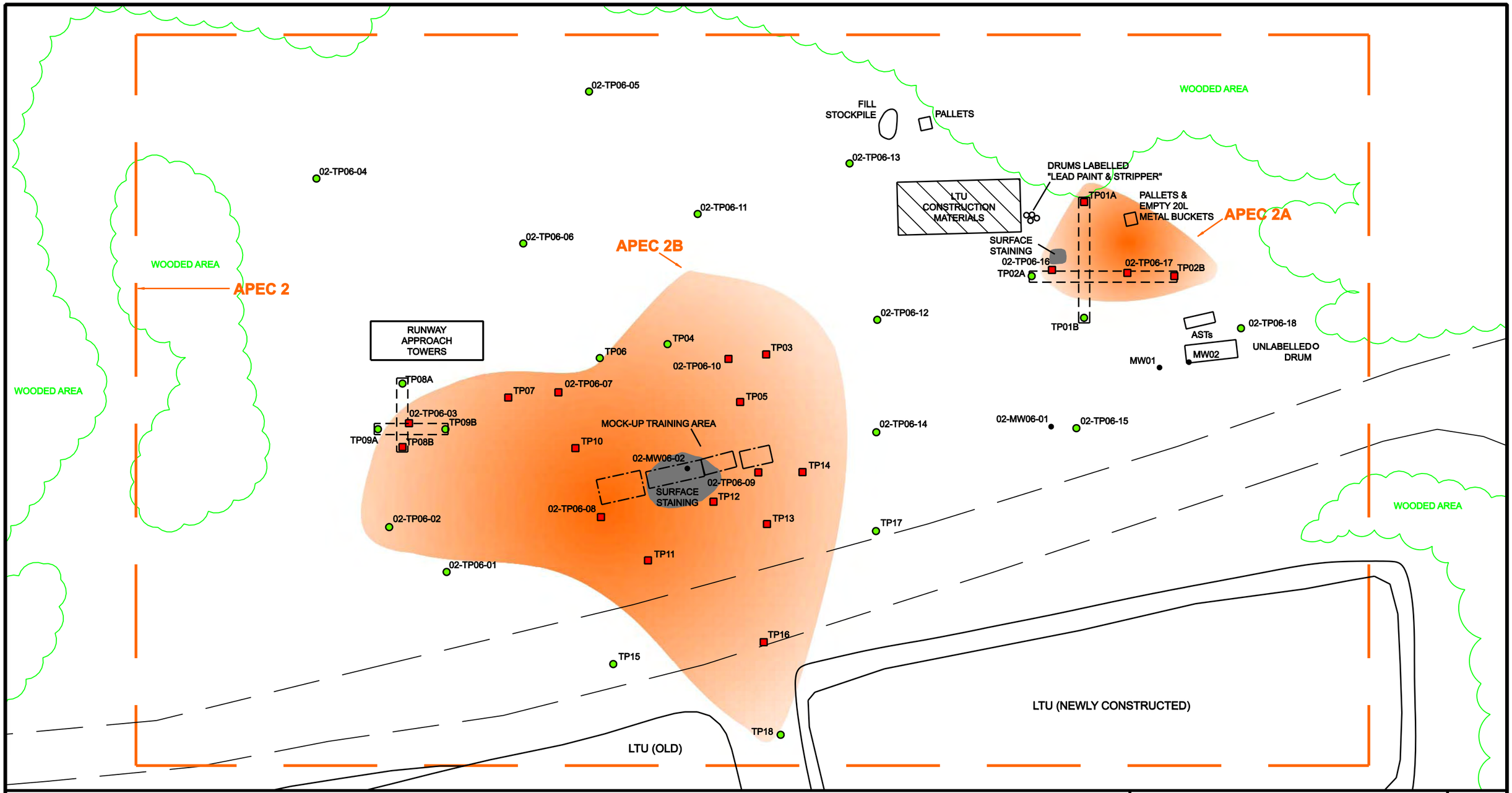
FIGURE 2

ORIGINAL IN COLOUR



TP10 PGL TEST PIT
MW01 FRANZ MONITORING WELL
02-TP06-07 FRANZ TEST PIT
PGL TEST TRENCH
SOIL SAMPLE GREATER THAN APPLICABLE STANDARD
SOIL SAMPLE LESS THAN APPLICABLE STANDARD
SOIL SAMPLE NOT ANALYZED

APEC AREA OF POTENTIAL ENVIRONMENTAL CONCERN
AST ABOVEGROUND STORAGE TANK

0 25m
Scale 1:500

ANALYTICAL RESULTS - PHC FRACTIONS F2-F4

APEC 2 - Former Training Area, Inuvik Airport, Inuvik, NWT

PWGSC

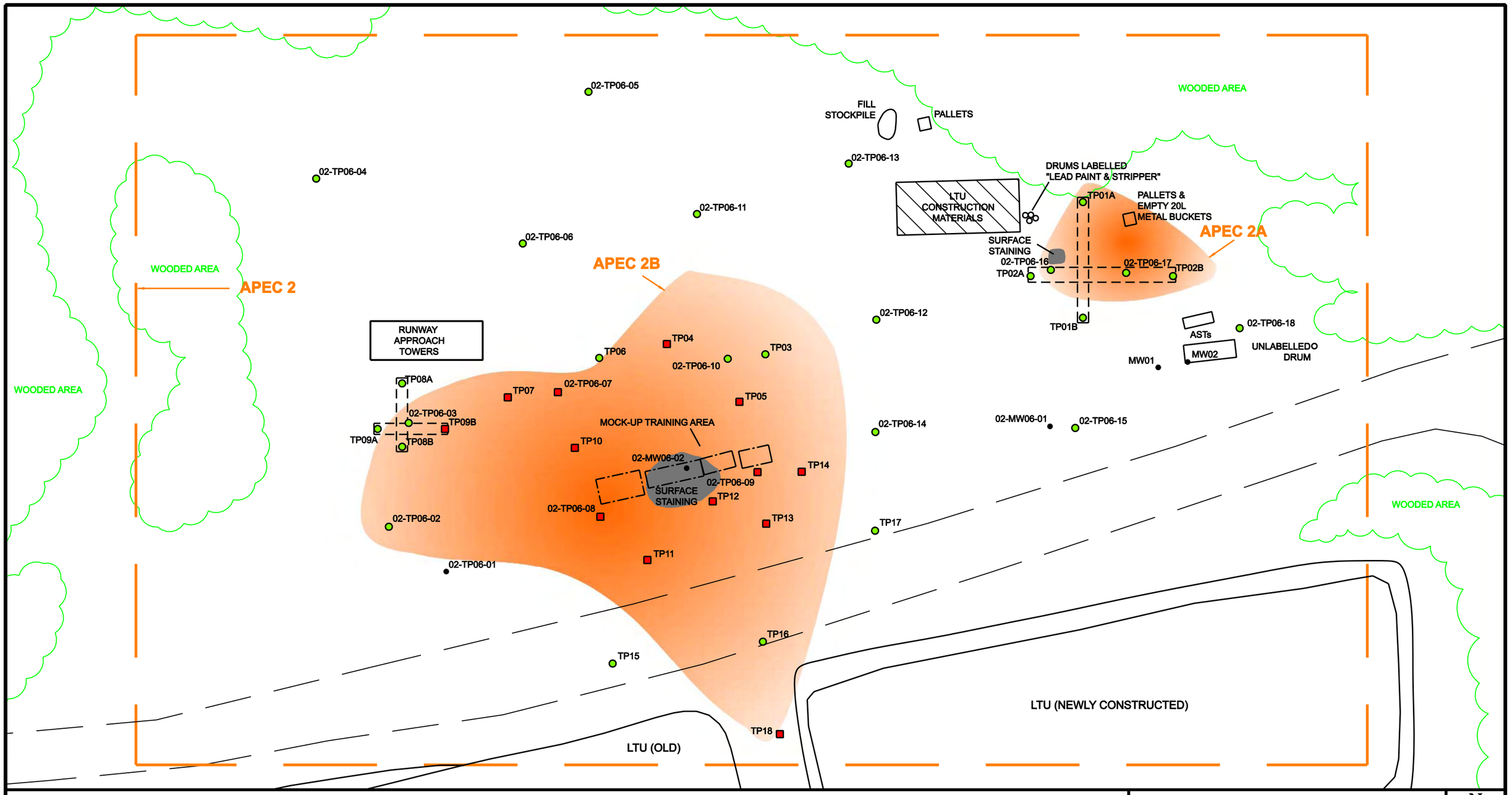
Pottinger Gaherty ENVIRONMENTAL CONSULTANTS

N

File No.: 125-78.01
Date: FEBRUARY 2010
Dwg No.: S3
Drawn by.: IRB

FIGURE 3

ORIGINAL IN COLOUR



TP10 PGL TEST PIT
MW01 FRANZ MONITORING WELL
02-TP06-07 FRANZ TEST PIT
PGL TEST TRENCH
SOIL SAMPLE GREATER THAN APPLICABLE STANDARD
SOIL SAMPLE LESS THAN APPLICABLE STANDARD
SOIL SAMPLE NOT ANALYZED

APEC AREA OF POTENTIAL ENVIRONMENTAL CONCERN
AST ABOVEGROUND STORAGE TANK

0 25m
Scale 1:500

ANALYTICAL RESULTS - BTEX, F1

APEC 2 - Former Training Area, Inuvik Airport, Inuvik, NWT

PWGSC

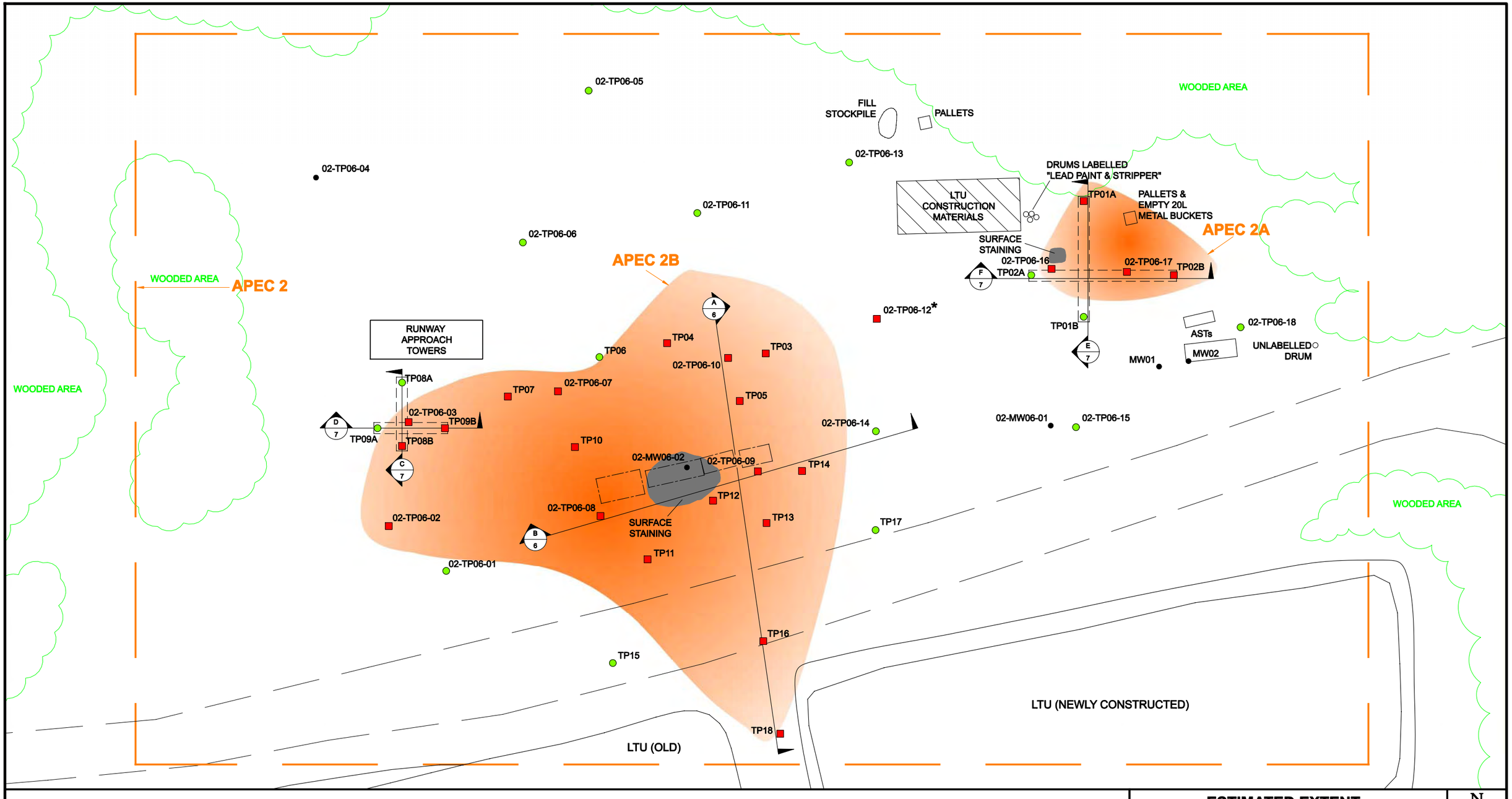
PGL Pottinger Gaherty ENVIRONMENTAL CONSULTANTS

N

File No.: 125-78.01
Date: DECEMBER 2009
Dwg No.: S4
Drawn by.: IRB

FIGURE 4

ORIGINAL IN COLOUR



TP10	PGL TEST PIT
MW01	FRANZ MONITORING WELL
02-TP06-07	FRANZ TEST PIT
	PGL TEST TRENCH
	SOIL SAMPLE GREATER THAN APPLICABLE STANDARD
	SOIL SAMPLE LESS THAN APPLICABLE STANDARD
	SOIL SAMPLE NOT ANALYZED

APEC	AREA OF POTENTIAL ENVIRONMENTAL CONCERN
AST	ABOVEGROUND STORAGE TANK
*	SURFICIAL IMPACTS ONLY

0 25m

Scale 1:500

ESTIMATED EXTENT OF SOIL CONTAMINATION

APEC 2 - Former Training Area, Inuvik Airport, Inuvik, NWT

PWGSC

N

File No.: 125-78.01

Date: FEBRUARY 2010

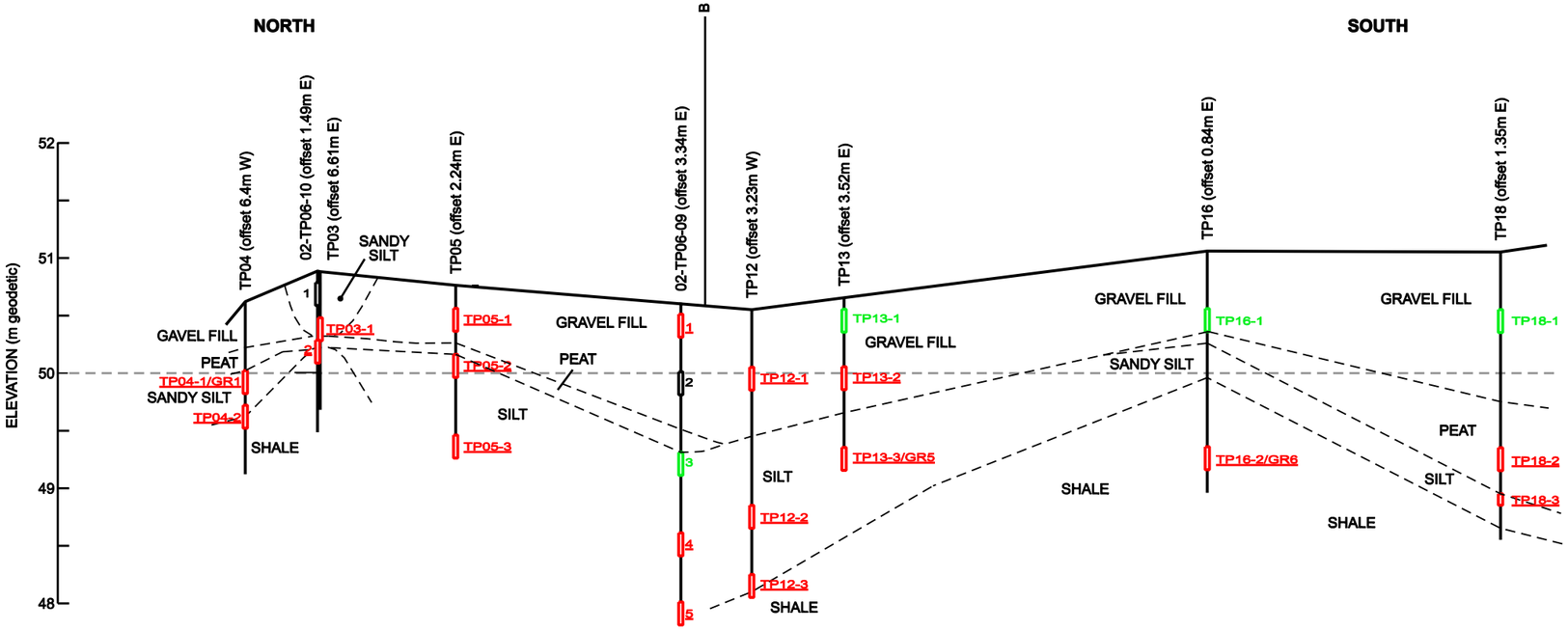
Dwg No.: S5

Drawn by.: IRB

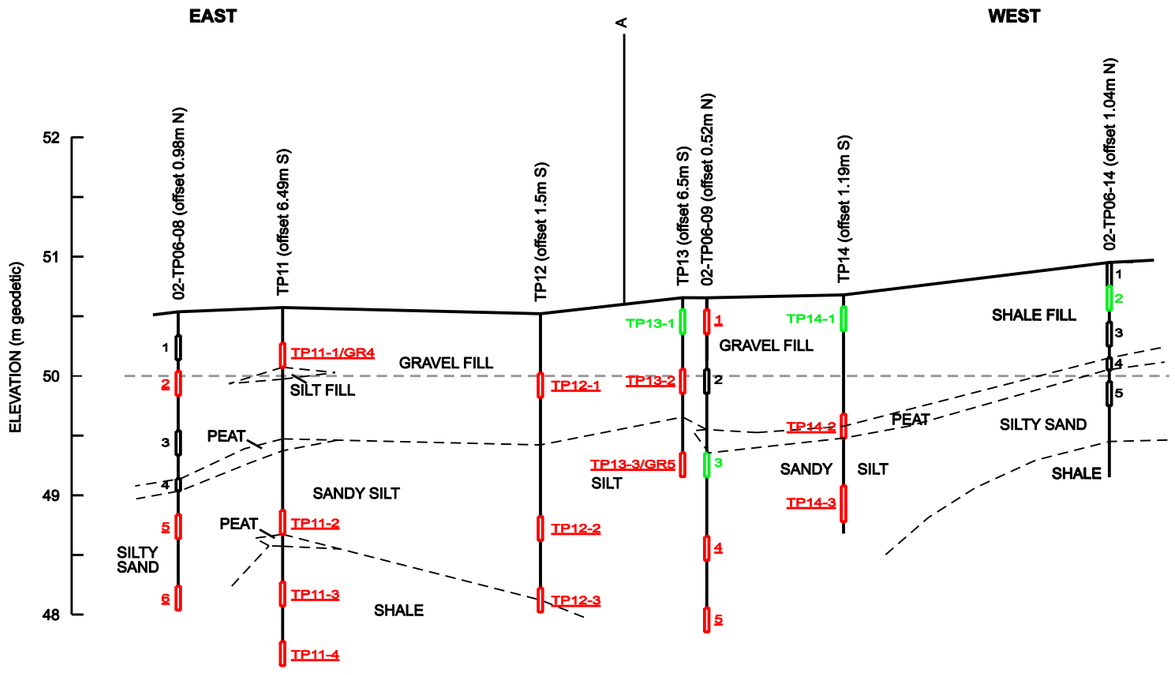
PGL Pottinger Gaherty ENVIRONMENTAL CONSULTANTS

FIGURE 5

ORIGINAL IN COLOUR



CROSS SECTION A - A'



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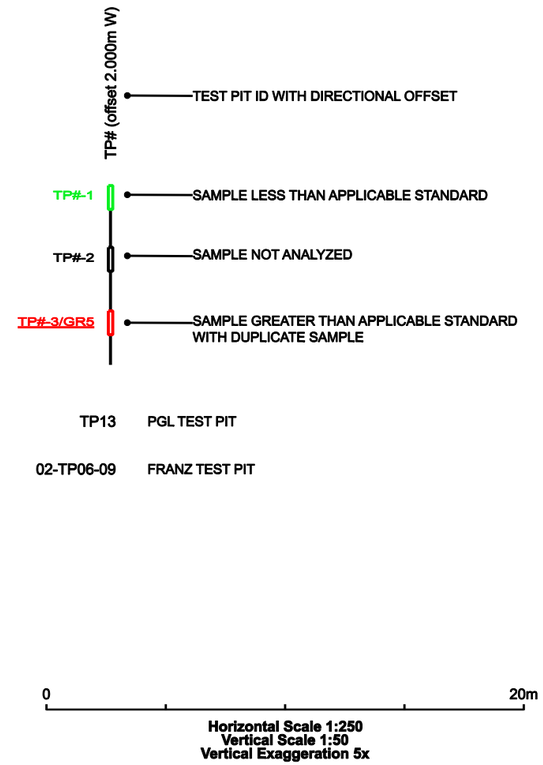

CROSS SECTIONS A AND B

APEC 2 - Former Training Area, Inuvik Airport, Inuvik, NWT

PWGSC

PGL Pottinger Gaherty ENVIRONMENTAL CONSULTANTS

N

File No.: 125-78.01
Date: FEBRUARY 2010
Dwg No.: XS1
Drawn by.: IRB

FIGURE 6

ORIGINAL IN COLOUR

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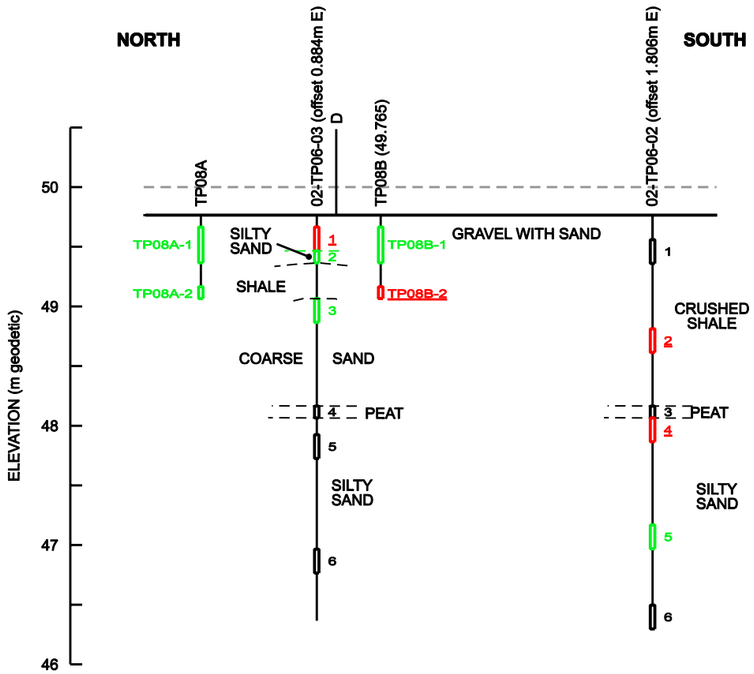

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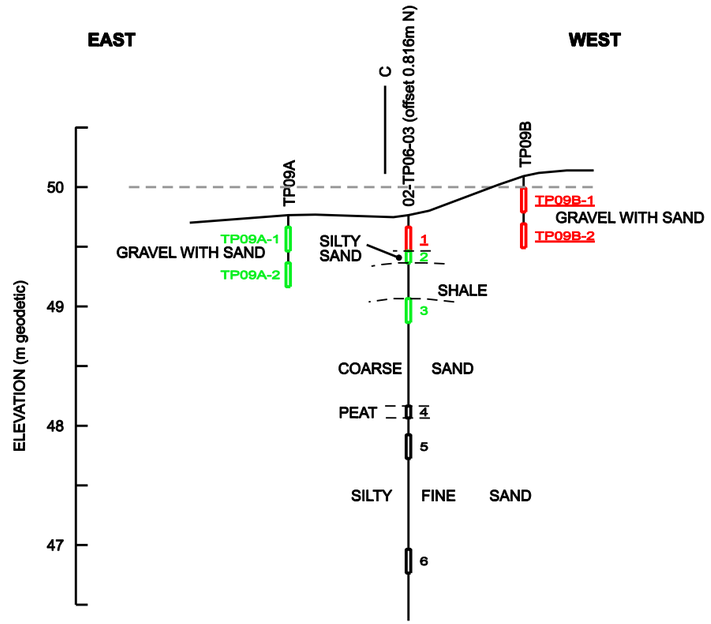
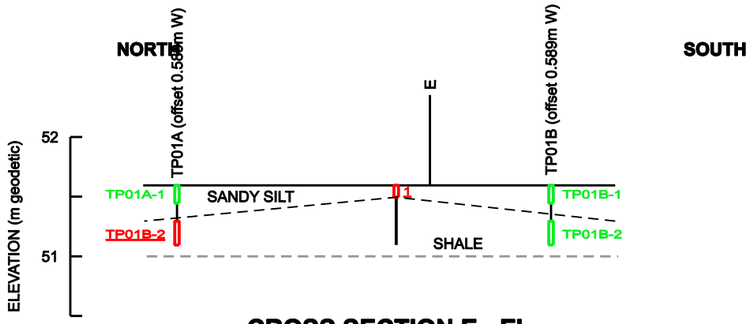
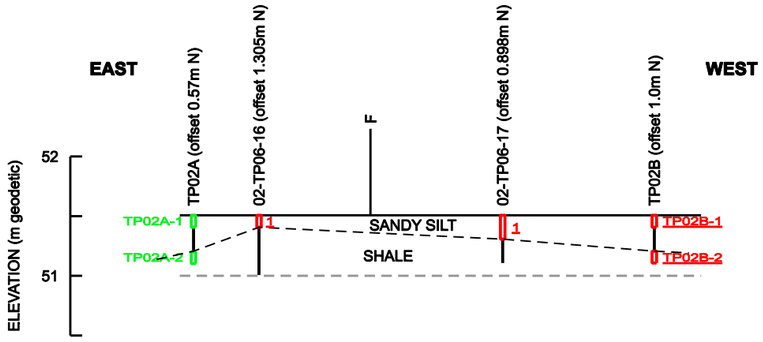


CROSS SECTION D - D'



CROSS SECTION E - E'



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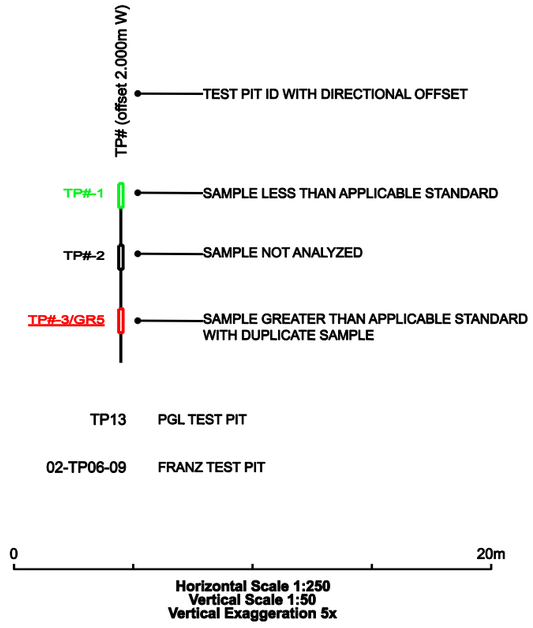

CROSS SECTIONS C, D, E AND F

APEC 2 - Former Training Area, Inuvik Airport, Inuvik, NWT

PWGSC

N

File No.: 125-78.01
Date: FEBRUARY 2010
Dwg No.: XS1
Drawn by.: IRB

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FIGURE **7**

ORIGINAL IN COLOUR

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Tables

TABLE 1
Soil Results - PETROLEUM HYDROCARBON FRACTIONS
Former Fire Training Area, Inuvik (Mike Zubko) Airport, Inuvik, NWT
PWGSC, PGL File: 0125-78.01

Sample		Parameter			
Location	**Depth (m)**	**PHC F2****	**PHC F3*****	**PHC F4**	**PHC F4SG**
TP01A-1[c]	0-0.15	140	330	150	-
TP01A-2[c]	0.3-0.5	**280**	340	180	-
TP01B-1[c]	0-0.15	<10	1100	350	1600
TP01B-2[c]	0.3-0.5	<10	850	830	2000
TP02A-1[c]	0-0.1	<10	320	240	500
TP02A-2[c]	0.4-0.6	<10	310	210	-
TP02B-1[c]	0-0.1	220	**7800**	**4200**	15000
TP02B-2[c]	0.4-0.6	180	**6400**	1900	9200
TP03-1[c]	0.4-0.6	110	**2800**	1200	3600
TP04-1[c]	0.6-0.8	<10	26	<10	-
GR1 (Dup of TP04-1)[c]	0.6-.8	<10	17	<10	-
TP04-2[c]	0.9-1.1	<10	24	<10	-
TP05-1[c]	0.1-0.3	**1700**	**6000**	1700	5600
TP05-2[c]	0.6-0.8	**3100**	**12000**	3000	15000
TP05-3[c]	1.3-1.5	**2400**	**2600**	330	1100
TP06-1[c]	0.3-0.5	120	1700	560	1900
TP06-2[c]	0.9-1.1	13	42	120	<500
TP06-3[c]	1.3-1.5	<10	37	71	-
TP07-1[c]	0.3-0.5	**400**	1000	290	930
TP07-2[c]	0.9-1.1	**1300**	**1900**	370	790
TP07-3[f]	1.5-1.7	23	33	69	-
GR2 (Dup of TP07-3)[f]	1.5-1.7	18	32	78	-
CWS CL Level (coarse)		**260**	**1700**	**3300**	**NG**
CWS CL Level (fine)		**260**	**2500**	**6600**	**NG**
CL - GNWT Tier 1 (coarse surface)		**760**	**1700**	**3300**	**NS**
CL - GNWT Tier 1 (fine surface)		**1500**	**2500**	**6600**	**NS**
CL - GNWT Tier 1 (coarse subsurface)		**2000**	**3500**	**10,000**	**NS**
CL - GNWT Tier 1 (fine subsurface)		**3000**	**5000**	**10,000**	**NS**

NOTES:

Sample results are presented as ug/g (ppm) on a dry weight basis.
CWS Levels are grain-size dependent.
Site soils are coarse/fine based on field observations and analytical results

PHC F2to F4	Petroleum Hydrocarbons, fraction 1 to fraction 4
TP	Test Pit
GR	Replicate/Duplicate Sample
c	sample is classified as coarse grained
f	sample is classified as fine grained
<	Less than the stated detection limit
-	Not analyzed
CWS	Canada-Wide Standards (2001)
GNWT	Government of Northwest Territories
CL	Commercial Land Use
#	Greater than applicable CWS Level
#	Greater than applicable CWS and GNWT Level

TABLE 1
Soil Results - PETROLEUM HYDROCARBON FRACTIONS
Former Fire Training Area, Inuvik (Mike Zubko) Airport, Inuvik, NWT
PWGSC, PGL File: 0125-78.01

Sample		Parameter			
Location	**Depth (m)**	**PHC F2****	**PHC F3*****	**PHC F4**	**PHC F4SG**
TP08A-1[c]	0.1-0.3	30	940	350	1100
TP08A-2[c]	0.6-0.7	82	1200	510	1300
TP08B-1[c]	0.1-0.3	23	470	280	750
TP08B-2[c]	0.6-0.7	110	**2200**	1200	3300
TP09A-1[c]	0.1-0.3	34	330	230	<500
TP09A-2[c]	0.4-0.6	35	640	260	600
TP09B-1[c]	0.1-0.3	43	900	510	1800
TP09B-2[c]	0.4-0.6	54	1200	520	1400
TP10-1[c]	0.5-0.7	**4300**	**4100**	1700	6100
TP10-2[f]	1.7-1.9	210	190	54	-
GR3 (Dup of 10-2)[f]	1.7-1.9	**360**	300	91	-
TP10-3[f]	2.3-2.5	**550**	470	140	-
TP10-4[f]	2.9-3.0	19	47	11	-
TP11-1[c]	0.5-0.7	**5700**	**2800**	1000	2900
GR4(Dup of TP11-1)[c]	0.5-0.7	**6800**	**3600**	1300	3100
TP11-2[f]	1.7-1.9	10	57	<10	-
TP11-3[c]	2.3-2.5	<10	63	13	-
TP11-4[c]	2.8-3.0	**1300**	1500	760	2900
TP12-1[c]	0.5-0.7	**3300**	**7500**	2800	10000
TP12-2[f]	1.7-1.9	**4800**	**3400**	830	2800
TP12-3[f]	2.3-2.5	**4100**	**8500**	**3600**	11000
TP13-1[c]	0.1-0.3	38	790	470	950
CWS CL Level (coarse)		**260**	**1700**	**3300**	**NG**
CWS CL Level (fine)		**260**	**2500**	**6600**	**NG**
CL - GNWT Tier 1 (coarse surface)		**760**	**1700**	**3300**	**NS**
CL - GNWT Tier 1 (fine surface)		**1500**	**2500**	**6600**	**NS**
CL - GNWT Tier 1 (coarse subsurface)		**2000**	**3500**	**10,000**	**NS**
CL - GNWT Tier 1 (fine subsurface)		**3000**	**5000**	**10,000**	**NS**

NOTES:

Sample results are presented as ug/g (ppm) on a dry weight basis.
CWS Levels are grain-size dependent.
Site soils are coarse/fine based on field observations and analytical results

PHC F2to F4	Petroleum Hydrocarbons, fraction 1 to fraction 4
TP	Test Pit
GR	Replicate/Duplicate Sample
c	sample is classified as coarse grained
f	sample is classified as fine grained
<	Less than the stated detection limit
-	Not analyzed
CWS	Canada-Wide Standards (2001)
GNWT	Government of Northwest Territories
CL	Commercial Land Use
#	Greater than applicable CWS Level
#	Greater than applicable CWS and GNWT Level

TABLE 1
Soil Results - PETROLEUM HYDROCARBON FRACTIONS
Former Fire Training Area, Inuvik (Mike Zubko) Airport, Inuvik, NWT
PWGSC, PGL File: 0125-78.01

Sample		Parameter			
Location	**Depth (m)**	**PHC F2****	**PHC F3*****	**PHC F4**	**PHC F4SG**
TP13-2[c]	0.6-0.8	**490**	**2200**	570	1500
TP13-3[c]	1.3-1.5	**5600**	1400	360	1700
GR5 (Dup of BH13-3)[c]	1.3-1.5	**4000**	1100	270	800
TP14-1[c]	0.1-0.3	90	1400	640	2300
TP14-2[c]	0.8-1.0	**3500**	**12000**	**3900**	15000
TP14-3[f]	1.6-1.9	**1600**	230	95	-
TP15-1[c]	0.5-0.7	11	74	32	-
TP15-2[c]	1.7-1.9	<10	30	<10	-
TP15-3[c]	2.3-2.5	<10	12	<10	-
TP16-1[c]	0.5-0.7	160	350	88	-
TP16-2[c]	1.7-1.9	**1700**	1200	35	-
GR6 (Dup of BH16M)[c]	1.7-1.9	**1800**	1400	18	-
TP17-1[c]	0.1-0.3	19	770	730	1600
TP17-2[c]	0.5-0.7	52	530	130	-
TP17-3[c]	1.7-1.9	12	49	17	-
TP18-1[c]	0.5-0.7	33	400	110	-
TP18-2[f]	1.7-1.9	<10	310	120	-
TP18-3[f]	2.1-2.2	<10	120	44	-
CWS CL Level (coarse)		**260**	**1700**	**3300**	**NG**
CWS CL Level (fine)		**260**	**2500**	**6600**	**NG**
CL - GNWT Tier 1 (coarse surface)		**760**	**1700**	**3300**	**NS**
CL - GNWT Tier 1 (fine surface)		**1500**	**2500**	**6600**	**NS**
CL - GNWT Tier 1 (coarse subsurface)		**2000**	**3500**	**10,000**	**NS**
CL - GNWT Tier 1 (fine subsurface)		**3000**	**5000**	**10,000**	**NS**

NOTES:

Sample results are presented as ug/g (ppm) on a dry weight basis.
CWS Levels are grain-size dependent.
Site soils are coarse/fine based on field observations and analytical results

PHC F2to F4	Petroleum Hydrocarbons, fraction 1 to fraction 4
TP	Test Pit
GR	Replicate/Duplicate Sample
c	sample is classified as coarse grained
f	sample is classified as fine grained
<	Less than the stated detection limit
-	Not analyzed
CWS	Canada-Wide Standards (2001)
GNWT	Government of Northwest Territories
CL	Commercial Land Use
#	Greater than applicable CWS Level
#	Greater than applicable CWS and GNWT Level

TABLE 2
Soil Results - MONOCYCLIC AROMATIC HYDROCARBONS
Former Fire Training Area, Inuvik (Mike Zubko) Airport, Inuvik, NWT
PWGSC, PGL File: 0125-78-01

Sample		Parameter						
Location	Depth (m)	benzene	toluene	ethylbenzene	xylenes (total)	m & p-xylene	o-xylene	PHC F1
TP01A-1[c]	0-0.15	<0.0050	<0.020	<0.010	<0.040	<0.040	<0.020	<12
TP01A-2[c]	0.3-0.5	<0.0050	<0.020	<0.010	<0.040	<0.040	<0.020	<12
TP01B-1[c]	0-0.15	<0.0050	<0.020	<0.010	<0.040	<0.040	<0.020	<12
TP01B-2[c]	0.3-0.5	<0.0050	<0.020	<0.010	<0.040	<0.040	<0.020	<12
TP02A-1[c]	0-0.1	<0.0050	<0.020	<0.010	<0.040	<0.040	<0.020	<12
TP02A-2[c]	0.4-0.6	<0.0050	<0.020	<0.010	<0.040	<0.040	<0.020	<12
TP02B-1[c]	0-0.1	<0.0050	<0.020	<0.010	<0.040	<0.040	<0.020	<12
TP02B-2[c]	0.4-0.6	<0.0050	<0.020	<0.010	<0.040	<0.040	<0.020	<12
TP03-1[c]	0.4-0.6	<0.0050	<0.020	<0.010	<0.040	<0.040	<0.020	<12
TP04-1[c]	0.6-0.8	**0.25**	0.042	<0.010	<0.040	<0.040	<0.020	17
GR1 (Dup of TP04-1)[c]	0.6-0.8	**0.27**	0.029	<0.010	<0.040	<0.040	<0.020	<12
TP04-2[c]	0.9-1.1	**0.58**	0.037	<0.010	<0.040	<0.040	<0.020	23
TP05-1[c]	0.1-0.3	0.025	0.15	**0.14**	1.8	1.5	0.38	260
TP05-2[c]	0.6-0.8	**0.036**	0.14	**0.09**	0.87	0.62	0.25	290
TP05-3[c]	1.3-1.5	**0.62**	0.12	**0.26**	0.67	0.47	0.2	**360**
TP06-1[c]	0.3-0.5	<0.0050	<0.020	<0.010	<0.040	<0.040	<0.020	<12
CL - CCME Guideline or CWS Level (coars		**0.030**	**0.37**	**0.082**	**11**	**NG**	**NG**	**320**
CL - CCME Guideline or CWS Level (fine)		**0.0068**	**0.08**	**0.018**	**2.4**	**NG**	**NG**	**320**
CL - GNWT Tier 1 (coarse surface)		**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**310**
CL - GNWT Tier 1 (fine surface)		**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**660**
CL - GNWT Tier 1 (coarse subsurface)		**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**700**
CL - GNWT Tier 1 (fine subsurface)		**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**1000**
CL - GNWT		**5**	**0.8**	**20**	**17**	**NS**	**NS**	**NS**

NOTES:

Sample results are presented as ug/g (ppm) on a dry weight basis.
Some CCME Guidelines and CWS Levels are grain-size dependent.
Site soils are coarse/fine based on field observations and analytical results

PHC F1	petroleum hydrocarbons, fraction 1 minus BTEX
TP	Test Pit
GR	Replicate/Duplicate Sample
c	sample is classified as coarse grained
f	sample is classified as fine grained
<	Less than the stated detection limit
CCME	Canadian Council of Ministers of the Environment (1999, and amendments)
CWS	Canada-Wide Standards (2001)
GNWT	Government of the Northwest Territories
CL	Commercial Land Use
NG	No Guideline exists
NS	No Standard exists
#	Greater than applicable CWS Level
#	Greater than applicable CWS and GNWT Level
#	Detection limit is great than applicable guideline

TABLE 2
Soil Results - MONOCYCLIC AROMATIC HYDROCARBONS
Former Fire Training Area, Inuvik (Mike Zubko) Airport, Inuvik, NWT
PWGSC, PGL File: 0125-78-01

Sample		Parameter						
Location	Depth (m)	benzene	toluene	ethylbenzene	xylenes (total)	m & p-xylene	o-xylene	PHC F1
TP06-2[c]	0.9-1.1	<0.0050	0.026	<0.010	<0.040	<0.040	<0.020	20
TP06-3[c]	1.3-1.5	<0.0050	<0.020	<0.010	<0.040	<0.040	<0.020	13
TP07-1[c]	0.3-0.5	<0.0050	<0.020	<0.010	<0.040	<0.040	<0.020	<12
TP07-2[c]	0.9-1.1	<0.0050	<0.020	<0.010	<0.040	<0.040	<0.020	39
TP07-3[f]	1.5-1.7	**0.033**	<0.020	<0.010	<0.040	<0.040	<0.020	<12
GR2 (Dup of TP07-3)[f]	1.5-1.7	<0.0050	<0.020	**0.031**	0.064	0.064	<0.020	<12
TP08A-1[c]	0.1-0.3	<0.0050	<0.020	<0.010	<0.040	<0.040	<0.020	<12
TP08A-2[c]	0.6-0.7	<0.0050	<0.020	<0.010	<0.040	<0.040	<0.020	<12
TP08B-1[c]	0.1-0.3	<0.0050	<0.020	<0.010	<0.040	<0.040	<0.020	<12
TP08B-2[c]	0.6-0.7	<0.0050	<0.020	<0.010	<0.040	<0.040	<0.020	<12
TP09A-1[c]	0.1-0.3	<0.0050	<0.020	<0.010	<0.040	<0.040	<0.020	<12
TP09A-2[c]	0.4-0.6	<0.0050	<0.020	<0.010	<0.040	<0.040	<0.020	<12
TP09B-1[c]	0.1-0.3	**0.041**	0.11	**0.087**	0.7	0.5	0.2	25
TP09B-2[c]	0.4-0.6	**0.048**	0.13	**0.087**	0.8	0.57	0.23	18
TP10-1[c]	0.5-0.7	**1.1**	**4.9**	**1.3**	**150**	110	39	**2200**
CL - CCME Guideline or CWS Level (coars		**0.030**	**0.37**	**0.082**	**11**	**NG**	**NG**	**320**
CL - CCME Guideline or CWS Level (fine)		**0.0068**	**0.08**	**0.018**	**2.4**	**NG**	**NG**	**320**
CL - GNWT Tier 1 (coarse surface)		**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**310**
CL - GNWT Tier 1 (fine surface)		**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**660**
CL - GNWT Tier 1 (coarse subsurface)		**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**700**
CL - GNWT Tier 1 (fine subsurface)		**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**1000**
CL - GNWT		**5**	**0.8**	**20**	**17**	**NS**	**NS**	**NS**

NOTES:

Sample results are presented as ug/g (ppm) on a dry weight basis.
Some CCME Guidelines and CWS Levels are grain-size dependent.
Site soils are coarse/fine based on field observations and analytical results

PHC F1	petroleum hydrocarbons, fraction 1 minus BTEX
TP	Test Pit
GR	Replicate/Duplicate Sample
c	sample is classified as coarse grained
f	sample is classified as fine grained
<	Less than the stated detection limit
CCME	Canadian Council of Ministers of the Environment (1999, and amendments)
CWS	Canada-Wide Standards (2001)
GNWT	Government of the Northwest Territories
CL	Commercial Land Use
NG	No Guideline exists
NS	No Standard exists
#	Greater than applicable CWS Level
#	Greater than applicable CWS and GNWT Level
#	Detection limit is great than applicable guideline

TABLE 2
Soil Results - MONOCYCLIC AROMATIC HYDROCARBONS
Former Fire Training Area, Inuvik (Mike Zubko) Airport, Inuvik, NWT
PWGSC, PGL File: 0125-78-01

Sample		Parameter						
Location	Depth (m)	benzene	toluene	ethylbenzene	xylenes (total)	m & p-xylene	o-xylene	PHC F1
TP10-2[f]	1.7-1.9	**0.49**	**1.4**	**0.68**	**8.7**	6.2	2.5	170
GR3 (Dup of 10-2)[f]	1.7-1.9	**0.76**	**2.9**	**1.5**	**13**	9.1	3.5	210
TP10-3[f]	2.3-2.5	**0.68**	**2.6**	**2**	**15**	11	4.3	240
TP10-4[f]	2.9-3.0	**0.058**	**0.11**	**0.055**	0.79	0.55	0.24	<12
TP11-1[c]	0.5-0.7	**0.66**	0.11	**6.5**	7.2	7	0.23	**800**
GR4(Dup of TP11-1)[c]	0.5-0.7	**0.55**	0.23	**5.5**	7.2	6.7	0.56	**450**
TP11-2[f]	1.7-1.9	**0.71**	**0.086**	**0.17**	0.13	0.13	<0.020	24
TP11-3[c]	2.3-2.5	**0.7**	0.14	**0.58**	0.14	0.099	0.039	44
TP11-4[c]	2.8-3.0	**0.23**	0.088	**1.4**	4.7	3.8	0.91	270
TP12-1[c]	0.5-0.7	**0.17**	0.3	**0.24**	**20**	15	5.4	**1500**
TP12-2[f]	1.7-1.9	**30**	**210**	**86**	**530**	400	130	**8700**
TP12-3[f]	2.3-2.5	**1.9**	**20**	**6.6**	**83**	61	22	**2100**
TP13-1[c]	0.1-0.3	0.025	0.11	0.066	0.6	0.42	0.18	<12
TP13-2[c]	0.6-0.8	0.028	0.11	0.066	0.62	0.42	0.21	16
TP13-3[c]	1.3-1.5	**0.24**	1.3	**7.4**	**22**	16	6.3	**2100**
CL - CCME Guideline or CWS Level (coars		**0.030**	**0.37**	**0.082**	**11**	**NG**	**NG**	**320**
CL - CCME Guideline or CWS Level (fine)		**0.0068**	**0.08**	**0.018**	**2.4**	**NG**	**NG**	**320**
CL - GNWT Tier 1 (coarse surface)		**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**310**
CL - GNWT Tier 1 (fine surface)		**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**660**
CL - GNWT Tier 1 (coarse subsurface)		**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**700**
CL - GNWT Tier 1 (fine subsurface)		**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**1000**
CL - GNWT		**5**	**0.8**	**20**	**17**	**NS**	**NS**	**NS**

NOTES:

Sample results are presented as ug/g (ppm) on a dry weight basis.
Some CCME Guidelines and CWS Levels are grain-size dependent.
Site soils are coarse/fine based on field observations and analytical results

PHC F1	petroleum hydrocarbons, fraction 1 minus BTEX
TP	Test Pit
GR	Replicate/Duplicate Sample
c	sample is classified as coarse grained
f	sample is classified as fine grained
<	Less than the stated detection limit
CCME	Canadian Council of Ministers of the Environment (1999, and amendments)
CWS	Canada-Wide Standards (2001)
GNWT	Government of the Northwest Territories
CL	Commercial Land Use
NG	No Guideline exists
NS	No Standard exists
#	Greater than applicable CWS Level
#	Greater than applicable CWS and GNWT Level
#	Detection limit is great than applicable guideline

TABLE 2
Soil Results - MONOCYCLIC AROMATIC HYDROCARBONS
Former Fire Training Area, Inuvik (Mike Zubko) Airport, Inuvik, NWT
PWGSC, PGL File: 0125-78-01

Sample		Parameter						
Location	Depth (m)	benzene	toluene	ethylbenzene	xylenes (total)	m & p-xylene	o-xylene	PHC F1
GR5 (Dup of BH13-3)[c]	1.3-1.5	**0.14**	**0.39**	**3.2**	6.8	5.1	1.7	**960**
TP14-1[c]	0.1-0.3	<0.0050	0.042	0.043	0.41	0.29	0.12	<12
TP14-2[c]	0.8-1.0	**0.79**	0.28	**0.84**	**12**	10	1.5	**1500**
TP14-3[f]	1.6-1.9	**42**	**240**	**58**	**310**	230	76	**5700**
TP15-1[c]	0.5-0.7	<0.0050	<0.020	<0.010	<0.040	<0.040	<0.020	<12
TP15-2[c]	1.7-1.9	<0.0050	<0.020	<0.010	<0.040	<0.040	<0.020	<12
TP15-3[c]	2.3-2.5	<0.0050	<0.020	<0.010	<0.040	<0.040	<0.020	<12
TP16-1[c]	0.5-0.7	<0.0050	<0.020	<0.010	<0.040	<0.040	<0.020	<12
TP16-2[c]	1.7-1.9	<0.0050	<0.020	<0.010	<0.040	<0.040	<0.020	180
GR6 (Dup of BH16M)[c]	1.7-1.9	<0.0050	<0.020	<0.010	<0.040	<0.040	<0.020	160
TP17-1[c]	0.1-0.3	<0.0050	<0.020	<0.010	<0.040	<0.040	<0.020	<12
TP17-2[c]	0.5-0.7	0.012	0.027	<0.010	<0.040	<0.040	<0.020	<12
TP17-3[c]	1.7-1.9	<0.0050	<0.020	<0.010	<0.040	<0.040	<0.020	<12
TP18-1[c]	0.5-0.7	<0.0050	<0.020	<0.010	<0.040	<0.040	<0.020	<12
TP18-2[f]	1.7-1.9	**1.2**	<0.042	**<0.021**	<0.085	<0.085	<0.042	<25
TP18-3[f]	2.1-2.2	**0.39**	<0.020	<0.010	<0.040	<0.040	<0.020	<12
CL - CCME Guideline or CWS Level (coars		**0.030**	**0.37**	**0.082**	**11**	**NG**	**NG**	**320**
CL - CCME Guideline or CWS Level (fine)		**0.0068**	**0.08**	**0.018**	**2.4**	**NG**	**NG**	**320**
CL - GNWT Tier 1 (coarse surface)		**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**310**
CL - GNWT Tier 1 (fine surface)		**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**660**
CL - GNWT Tier 1 (coarse subsurface)		**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**700**
CL - GNWT Tier 1 (fine subsurface)		**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**1000**
CL - GNWT		**5**	**0.8**	**20**	**17**	**NS**	**NS**	**NS**

NOTES:

Sample results are presented as ug/g (ppm) on a dry weight basis.
Some CCME Guidelines and CWS Levels are grain-size dependent.
Site soils are coarse/fine based on field observations and analytical results

PHC F1	petroleum hydrocarbons, fraction 1 minus BTEX
TP	Test Pit
GR	Replicate/Duplicate Sample
c	sample is classified as coarse grained
f	sample is classified as fine grained
<	Less than the stated detection limit
CCME	Canadian Council of Ministers of the Environment (1999, and amendments)
CWS	Canada-Wide Standards (2001)
GNWT	Government of the Northwest Territories
CL	Commercial Land Use
NG	No Guideline exists
NS	No Standard exists
#	Greater than applicable CWS Level
#	Greater than applicable CWS and GNWT Level
#	Detection limit is great than applicable guideline

Appendix 1

Photographic Record

Photographic Record

ROAD ASSESMENT

Photo 1.1: Access road to APEC 2 via Main Airport Lake Road, shortly after turnoff from Dempster Highway, looking south.

Photo 1.2: Example of low point with standing water.

Photo 1.3: Section with potholes, just north of quarry.

Photo 1.4: Close up of pot holes.

Photo 1.5: Turn off towards FFTA, just south of quarry. Looking east.

Photo 1.6: General condition of road access towards FFTA. Looking east.

APEC 2 ASSESMENT

Photo 2.1: Site photo of APEC 2 (FFTA) looking east.

Photo 2.2: Surficial staining noted adjacent to TP02.

Photo 2.3: Looking east towards mock up area. Surface staining visible (darker soils in centre of photo).

Photo 2.4: Runway towers stored at west end of FFTA.

Photo 2.5: Gravel stockpile, LTU construction material in background, looking east.

Photo 2.6: LTU construction material. Looking north.

Photo 2.7: Additional LTU construction material. Looking north.

Photo 2.8: Three drums labelled "lead paint and stripper".

Photo 2.9: Pallets and empty 5 gallon metal buckets.

Photo 2.10: Piping, possible used to transfer fuel from AST to mock up area.

Photo 2.11: Unlabelled drum, located at east edge of site. Lid is slightly bulged.

TEST PIT INVESTIGATION

Photo 3.1: Trenching in northeast corner (TP01).

Photo 3.2: Native peat and silt, overlain by crushed shale fill. Minor seepage noted in left corner (TP05).

Photo 3.4: TP11, exceedences of PHC fractions and BTEX at depths up to 3m bgs.

Photo 3.5: TP08, located at west edge of site.

Appendix 2

Borehole Logs

LOG OF TESTPIT TP01A

PWGSC
Inuvik (Mike Zubko) Airport
Inuvik, NT

PGL File: 0125-78.01

Installation Date	: September 22, 2008
Contractor	: Northwind Industries
Drill Type	: Rubber Tired Backhoe
Logged By	: Mary Zaleski
Well Installed	: No

Depth in Meters	USCS	GRAPHIC	DESCRIPTION	SAMPLES	SAMPLE NAME	VAPOURS	REMARKS
0	SM		Brown sandy SILT with rock fragments, moist, dense.		TP01A-1	0ppm	
	SH		Purple SHALE, fracutured, very hard.		TP01A-2	0ppm	
.5			End of testpit @ 0.5 meters.				
1							

LOG OF TESTPIT TP01B

PWGSC
Inuvik (Mike Zubko) Airport
Inuvik, NT

PGL File: 0125-78.01

Installation Date : September 22, 2008
Contractor : Northwind Industries
Drill Type : Rubber Tired Backhoe
Logged By : Mary Zaleski
Well Installed : No

Depth in Meters	USCS	GRAPHIC	DESCRIPTION	SAMPLES	SAMPLE NAME	VAPOURS	REMARKS
0	SM		Brown sandy SILT with rock fragments, moist, dense.		TP01B-1	0ppm	
	SH		Purple SHALE, fracutured, very hard.		TP01B-2	0ppm	
.5			End of testpit @ 0.5 meters.				
1							

LOG OF TESTPIT TP02A

PWGSC
Inuvik (Mike Zubko) Airport
Inuvik, NT

PGL File: 0125-78.01

Installation Date	: September 22, 2008
Contractor	: Northwind Industries
Drill Type	: Rubber Tired Backhoe
Logged By	: Mary Zaleski
Well Installed	: No

Depth in Meters	USCS	GRAPHIC	DESCRIPTION	SAMPLES	SAMPLE NAME	VAPOURS	REMARKS
0	SM		Brown sandy SILT with rock fragments, moist, dense.	X	TP02A-1	0ppm	
	SH		Purple SHALE, fractured, very hard.	X	TP02A-2	0ppm	
			End of testpit @ 0.4 meters.				
.5							
1							

LOG OF TESTPIT TP02B

PWGSC
Inuvik (Mike Zubko) Airport
Inuvik, NT

PGL File: 0125-78.01

Installation Date	: September 22, 2008
Contractor	: Northwind Industries
Drill Type	: Rubber Tired Backhoe
Logged By	: Mary Zaleski
Well Installed	: No

Depth in Meters	USCS	GRAPHIC	DESCRIPTION	SAMPLES	SAMPLE NAME	VAPOURS	REMARKS
0	SM		Brown sandy SILT with rock fragments, moist, dense.	X	TP02B-1	0ppm	
	SH		Purple SHALE, fractured, very hard.	X	TP02B-2	0ppm	
			End of testpit @ 0.4 meters.				
.5							
1							

LOG OF TESTPIT TP03

PWGSC
Inuvik (Mike Zubko) Airport
Inuvik, NT

PGL File: 0125-78.01

Installation Date	: September 23, 2008
Contractor	: Northwind Industries
Drill Type	: Rubber Tired Backhoe
Logged By	: Mary Zaleski
Well Installed	: No

Depth in Meters	USCS	GRAPHIC	DESCRIPTION	SAMPLES	SAMPLE NAME	VAPOURS	REMARKS
0	SM		Brown sandy SILT with rock fragments, moist, dense.	X	TP03-1	0ppm	
.5	SH		Purple SHALE, fractured, very hard, unable to sample.				
1			End of testpit @ 1.2 meters.				
1.5							
2							

LOG OF TESTPIT TP04

PWGSC
Inuvik (Mike Zubko) Airport
Inuvik, NT

PGL File: 0125-78.01

Installation Date	: September 23, 2008
Contractor	: Northwind Industries
Drill Type	: Rubber Tired Backhoe
Logged By	: Mary Zaleski
Well Installed	: No

Depth in Meters	USCS	GRAPHIC	DESCRIPTION	SAMPLES	SAMPLE NAME	VAPOURS	REMARKS
0	GW		FILL - Purplish grey GRAVEL with sand, damp, dense.				
.5	PT		Dark brown PEAT, some rootlets, moist, soft.				
	SM		Brown sandy SILT with rock fragments (purple shale), dense.	X	TP04-1/GR1	100ppm	
1			Permafrost(?) very hard.	X	TP04-2	75 ppm	
	SH		Grey and purple SHALE, fractured, hard.				
1.5			End of testpit @ 1.5 meters.				
2							

LOG OF TESTPIT TP05

PWGSC
Inuvik (Mike Zubko) Airport
Inuvik, NT

PGL File: 0125-78.01

Installation Date	: September 23, 2008
Contractor	: Northwind Industries
Drill Type	: Rubber Tired Backhoe
Logged By	: Mary Zaleski
Well Installed	: No

Depth in Meters	USCS	GRAPHIC	DESCRIPTION	SAMPLES	SAMPLE NAME	VAPOURS	REMARKS
0	GW		FILL - Purplish grey GRAVEL with sand and silt, moist, dense.		TP05-1	5% LEL	
.5	PT		Dark brown PEAT, some rootlets, moist, soft. Very minor water seepage in south east corner of TP.				
	ML		Light brown mottled with grey SILT, moist, dense, some gravels, slight odour.		TP05-2	450 ppm	
1			No odour		TP05-3	20% LEL	
1.5			End of testpit @ 1.5 meters.				
2							

LOG OF TESTPIT TP06

PWGSC
Inuvik (Mike Zubko) Airport
Inuvik, NT

PGL File: 0125-78.01

Installation Date	: September 23, 2008
Contractor	: Northwind Industries
Drill Type	: Rubber Tired Backhoe
Logged By	: Mary Zaleski
Well Installed	: No

Depth in Meters	USCS	GRAPHIC	DESCRIPTION	SAMPLES	SAMPLE NAME	VAPOURS	REMARKS
0	SM		FILL - Brown sandy SILT with gravel, moist, dense.				
	GW		FILL - Purple gravel with sand and silt, moist, dense.		TP06-1	25 ppm	
.5	PT		Dark brown PEAT, some organics, moist, soft.				
	ML		Brown mottled with grey SILT, moist, dense.		TP06-2	75 ppm	
1					TP06-3	150 ppm	
1.5			End of testpit @ 1.5 meters.				
2							

LOG OF TESTPIT TP07

PWGSC
Inuvik (Mike Zubko) Airport
Inuvik, NT

PGL File: 0125-78.01

Installation Date	: September 23, 2008
Contractor	: Northwind Industries
Drill Type	: Rubber Tired Backhoe
Logged By	: Mary Zaleski
Well Installed	: No

Depth in Meters	USCS	GRAPHIC	DESCRIPTION	SAMPLES	SAMPLE NAME	VAPOURS	REMARKS
0	GW		FILL - Purple grey GRAVEL with sand and silt, moist, dense.	☒	TP07-1	5 ppm	
.5	SH		Crushed SHALE, large fragments, some brown silt, damp, dense.	☒	TP07-2	5 ppm	
1	PT		Dark brown PEAT, rootlest, moist, soft.				
	SM		Brown sandy SILT, moist, dense.	☒	TP07-3/GR2	150 ppm	
1.5			End of testpit @ 1.8				
2							
2.5							

LOG OF TESTPIT TP08A

PWGSC
Inuvik (Mike Zubko) Airport
Inuvik, NT

PGL File: 0125-78.01

Installation Date	: September 23, 2008
Contractor	: Northwind Industries
Drill Type	: Rubber Tired Backhoe
Logged By	: Mary Zaleski
Well Installed	: No

Depth in Meters	USCS	GRAPHIC	DESCRIPTION	SAMPLES	SAMPLE NAME	VAPOURS	REMARKS
0	GW		Brown silty GRAVEL with sand, compact, damp.	☒	TP08A-1	0 ppm	
.5	SH		Grey SHALE, fractured, very hard.	☒	TP08A-2	0 ppm	
			End of testpit @ 0.7				
1							
1.5							
2							
2.5							

LOG OF TESTPIT TP08B

PWGSC
Inuvik (Mike Zubko) Airport
Inuvik, NT

PGL File: 0125-78.01

Installation Date	: September 23, 2008
Contractor	: Northwind Industries
Drill Type	: Rubber Tired Backhoe
Logged By	: Mary Zaleski
Well Installed	: No

Depth in Meters	USCS	GRAPHIC	DESCRIPTION	SAMPLES	SAMPLE NAME	VAPOURS	REMARKS
0	GW		Brown silty GRAVEL with sand, compact, damp.	☒	TP08B-1	0 ppm	
.5	SH		Grey SHALE, fractured, very hard.	☒	TP08B-2	0 ppm	
			End of testpit @ 0.7				
1							
1.5							
2							
2.5							

LOG OF TESTPIT TP09A

PWGSC
Inuvik (Mike Zubko) Airport
Inuvik, NT

PGL File: 0125-78.01

Installation Date	: September 23, 2008
Contractor	: Northwind Industries
Drill Type	: Rubber Tired Backhoe
Logged By	: Mary Zaleski
Well Installed	: No

Depth in Meters	USCS	GRAPHIC	DESCRIPTION	SAMPLES	SAMPLE NAME	VAPOURS	REMARKS
0	GW		Brown silty GRAVEL with sand, compact, damp.		TP09A-1	0 ppm	
.5					TP09A-2	0 ppm	
			End of testpit @ 0.6				
1							
1.5							
2							
2.5							

LOG OF TESTPIT TP09B

PWGSC
Inuvik (Mike Zubko) Airport
Inuvik, NT

PGL File: 0125-78.01

Installation Date	: September 23, 2008
Contractor	: Northwind Industries
Drill Type	: Rubber Tired Backhoe
Logged By	: Mary Zaleski
Well Installed	: No

Depth in Meters	USCS	GRAPHIC	DESCRIPTION	SAMPLES	SAMPLE NAME	VAPOURS	REMARKS
0	GW		Brown silty GRAVEL with sand, compact, damp.		TP09B-1	0 ppm	
.5					TP09B-2	0 ppm	
			End of testpit @ 0.6				
1							
1.5							
2							
2.5							

LOG OF TESTPIT TP10

PWGSC
Inuvik (Mike Zubko) Airport
Inuvik, NT

PGL File: 0125-78.01

Installation Date : September 22, 2008
Contractor : Northwind Industries
Drill Type : Rubber Tired Backhoe
Logged By : Mary Zaleski
Well Installed : No

Depth in Meters	USCS	GRAPHIC	DESCRIPTION	SAMPLES	SAMPLE NAME	VAPOURS	REMARKS
0	GW		FILL - Purple grey GRAVEL with sand and silt, damp, dense.				
.5			odourous	☒	TP10-1	30% LEL	
1							
1.5	PT		Dark brown PEAT, moist, soft.				
	ML		Brown SILT with organics				
2			slight odour	☒	TP10-2/GR3	>100% LEL	
2.5			slight odour	☒	TP10-3	>100% LEL	
3			no odour	☒	TP10-4	100 ppm	
			End of testpit @ 3.0				
3.5							

LOG OF TESTPIT TP11

PWGSC
Inuvik (Mike Zubko) Airport
Inuvik, NT

PGL File: 0125-78.01

Installation Date	: September 22, 2008
Contractor	: Northwind Industries
Drill Type	: Rubber Tired Backhoe
Logged By	: Mary Zaleski
Well Installed	: No

Depth in Meters	USCS	GRAPHIC	DESCRIPTION	SAMPLES	SAMPLE NAME	VAPOURS	REMARKS
0	GW		FILL - Purple brown GRAVEL with sand and silt, moist, dense, odourous				
.5	ML		FILL - Light brown SILT, moist, dense, odourous	☒	TP11-1/GR4	40% LEL	
	GW		FILL - Purple brown GRAVEL with sand and silt, moist, dense, odourous.				
1	PT		Dark brown PEAT, moist, soft.				
	SM		Brown sandy SILT, moist, dense, odourous.	☒	TP11-2	10% LEL	
1.5	PT		Dark brown PEAT, moist, soft.				
2	SH		Light brown SHALE, fractured, hard.	☒	TP11-3	5% LEL	
2.5			no odour	☒	TP11-4	20% LEL	
3			End of testpit @ 3.0 meters upon bedrock refusal.				
3.5							

LOG OF TESTPIT TP12

PWGSC
Inuvik (Mike Zubko) Airport
Inuvik, NT

PGL File: 0125-78.01

Installation Date	: September 22, 2008
Contractor	: Northwind Industries
Drill Type	: Rubber Tired Backhoe
Logged By	: Mary Zaleski
Well Installed	: No

Depth in Meters	USCS	GRAPHIC	DESCRIPTION	SAMPLES	SAMPLE NAME	VAPOURS	REMARKS
0							
.5	GW		FILL - Purple / brown GRAVEL with sand and silt, moist, dense, odourous	☒	TP12-1	30% LEL	
1							
1.5	ML		Dark brown / grey SILT, moist, dense.				
			odourous	☒	TP12-2	100% LEL	
2			odourous	☒	TP12-3	40% LEL	
2.5	SH		Purple SHALE, very hard.				
			End of testpit @ 2.5 meters upon bedrock refusal.				
3							

LOG OF TESTPIT TP13

PWGSC
Inuvik (Mike Zubko) Airport
Inuvik, NT

PGL File: 0125-78.01

Installation Date	: September 22, 2008
Contractor	: Northwind Industries
Drill Type	: Rubber Tired Backhoe
Logged By	: Mary Zaleski
Well Installed	: No

Depth in Meters	USCS	GRAPHIC	DESCRIPTION	SAMPLES	SAMPLE NAME	VAPOURS	REMARKS
0	GW		FILL - Purple GRAVEL with sand and silt, damp, dense.		TP13-1	0 ppm	
.5			slight odour		TP13-2	275 ppm	
1	ML		Dark brown/grey SILT, moist, dense, no odour		TP13-3/GR5	15% LEL	
1.5			End of testpit @ 1.5				
2							

LOG OF TESTPIT TP14

PWGSC
Inuvik (Mike Zubko) Airport
Inuvik, NT

PGL File: 0125-78.01

Installation Date	: September 23, 2008
Contractor	: Northwind Industries
Drill Type	: Rubber Tired Backhoe
Logged By	: Mary Zaleski
Well Installed	: No

Depth in Meters	USCS	GRAPHIC	DESCRIPTION	SAMPLES	SAMPLE NAME	VAPOURS	REMARKS
0	GW		FILL - Purple GRAVEL with sand and silt, damp, dense.	☒	TP14-1	100 ppm	
.5			no odour				
1			slight odour	☒	TP14-2	60% LEL	
	PT		Dark brown PEAT, moist, soft.				
1.5	SM		Brown sandy SILT, moist, dense.	☒	TP14-3	>100% LEL	
2			End of testpit @ 2.0				
2.5							

LOG OF TESTPIT TP15

PWGSC
Inuvik (Mike Zubko) Airport
Inuvik, NT

PGL File: 0125-78.01

Installation Date	: September 23, 2008
Contractor	: Northwind Industries
Drill Type	: Rubber Tired Backhoe
Logged By	: Mary Zaleski
Well Installed	: No

Depth in Meters	USCS	GRAPHIC	DESCRIPTION	SAMPLES	SAMPLE NAME	VAPOURS	REMARKS
0	GW		FILL- Purple GRAVEL (crushed shale), some silt and sand, damp, compact.				
.5				☒	TP15-1	0 ppm	
1	PT		Dark brown PEAT mottled with brown silt, some organics, moist, dense.				
1.5	SH		Purple SHALE (bedrock), very hard. some silt				
2				☒	TP15-2	75 ppm	
2.5			no odour, very coarse fracturing, wet. End of testpit @ 2.5m, upon bedrock refusal, some very minor seepage.	☒	TP15-3	0 ppm	
3							

LOG OF TESTPIT TP16

PWGSC
Inuvik (Mike Zubko) Airport
Inuvik, NT

PGL File: 0125-78.01

Installation Date	: September 23, 2008
Contractor	: Northwind Industries
Drill Type	: Rubber Tired Backhoe
Logged By	: Mary Zaleski
Well Installed	: No

Depth in Meters	USCS	GRAPHIC	DESCRIPTION	SAMPLES	SAMPLE NAME	VAPOURS	REMARKS
0	GW		FILL- Purple GRAVEL (crushed shale), very hard, damp.	☒	TP16-1	0 ppm	
.5	PT		Dark brown PEAT moist, soft.				
	SM		Brown sandy SILT, moist, stiff.				
1	SH		Purple SHALE (bedrock), very hard, course fracturing.				
1.5			odourous	☒	TP16-2/GR6	200 ppm	
2			End of testpit @ 2.1m, upon bedrock refusal.				
2.5							
3							

LOG OF TESTPIT TP17

PWGSC
Inuvik (Mike Zubko) Airport
Inuvik, NT

PGL File: 0125-78.01

Installation Date	: September 23, 2008
Contractor	: Northwind Industries
Drill Type	: Rubber Tired Backhoe
Logged By	: Mary Zaleski
Well Installed	: No

Depth in Meters	USCS	GRAPHIC	DESCRIPTION	SAMPLES	SAMPLE NAME	VAPOURS	REMARKS
0	GW		FILL- Purple GRAVEL (crushed shale), with silt and sand. no odour	☒	TP17-1	0 ppm	
.5				☒	TP17-2	0 ppm	
1	PT		Dark brown PEAT, organics, no odour				
1.5	SH		Purple SHALE (bedrock), very hard, no odour	☒	TP17-3	0 ppm	
2	SH		Blue/brown SHALE, very hard.				
2.5			End of testpit @ 2.3m.				
3							

LOG OF TESTPIT TP18

PWGSC
Inuvik (Mike Zubko) Airport
Inuvik, NT

PGL File: 0125-78.01

Installation Date	: September 23, 2008
Contractor	: Northwind Industries
Drill Type	: Rubber Tired Backhoe
Logged By	: Mary Zaleski
Well Installed	: No

Depth in Meters	USCS	GRAPHIC	DESCRIPTION	SAMPLES	SAMPLE NAME	VAPOURS	REMARKS
0	GW		FILL- Purple GRAVEL (crushed shale), with silt and sand.	☒	TP18-1	10 ppm	
.5							
1							
1.5	PT		Dark brown PEAT, moist.	☒	TP18-2	10 ppm	
2	ML		Grey SILT, some sand, moist, dense.	☒	TP18-3	50 ppm	
2.5	SH		Blue/brown SHALE, very hard, unable to sample.				
			End of testpit @ 2.5m.				
3							

Appendix 3

PGL's Soil and Groundwater Sampling Methodologies

PGL'S SOIL SAMPLING METHODOLOGY

A – INTRODUCTION

A standardized sampling protocol has not yet been established by the BC Ministry of Environment (formerly called BC Environment, BCE) as the Contaminated Site Regulations allows. PGL developed the following protocol with the aid of a variety of references including: the Canadian Council of Ministers of the Environment (CCME) document entitled *Guidance Manual on Sampling, Analysis, and Data Management for Contaminated Sites, Volume I: Main Report*, December 1993; BCE Guidance Document 1 – *Site Characterization and Confirmation Testing*; BCE Guidance Document 2 – *Statistical Criteria for Characterizing a Volume of Contaminated Material*; and BCE Guidance Document 12 – *Technical Guidance on Contaminated Sites Statistics for Contaminated Sites* (BCE Guidance Documents Updated 1999) and *British Columbia Field Sampling Manual*, January 2003.

PGL maintains a group of detailed field protocols that are geared to providing consistent field results. Protocols are reviewed formally at one- or two-year intervals for technical currency, consistency with regulatory guidance and consistency with actual field practices. This document summarizes those protocols in the following sections:

A. **Introduction** – Outlines the referenced material and contents of the following protocols.

B. **Protocol Objective** – Offers an objective to following recognized and acceptable sampling protocol.

C. **Sample Collection** – Provides soil collection protocols for sampling equipment, obtaining representative samples (procedures), transferring to appropriate containers, preservatives, and cleaning sampling equipment.

D. **Sample Labelling** – Includes our standard sample nomenclature used to identify key components (date, job number, unique ID, etc.) of the sample.

E. **Sample Recording** – Describes the information recording in field notes including labelling (ID), soil properties, and location.

F. **Sample Storage and Transport** – Describes sample preparation for transport.

G. **Chain of Custody** – Provides concise sample information for laboratory handling and analyses.

B – METHODOLOGY OBJECTIVE

The objective of the sampling methodology is to allow collection of samples which are consistent, representative, and repeatable, and to prevent cross-contamination.

C – SAMPLE COLLECTION

PGL's sample collection protocol comprises sample collection, handling, storage, labelling, and transport. During the sampling process, equipment and instrument cleaning is important to prevent cross-contamination. PGL personnel protect themselves from exposure to contaminants and cross-contamination by wearing new disposable latex or nitrile gloves during all sample collection. Half-face respirators, protective goggles, and chemical resistant clothing is selected based on site characteristics and risks.

When using a drill rig, PGL protocols call for pressure wash decontamination of downhole equipment to remove all visible residue, and full decontamination of sampling equipment (such as SPT) as described below. In general, more stringent protocols are applied where the risk of cross-contamination is considered significant.

The following describes the specific protocol for soil sampling. Following the soil protocol is a description of our sample labelling, recording, storage, and transport protocol applicable for soil.

C.1 – SOIL SAMPLE COLLECTION

Soil samples are collected with a variety of tools such as a stainless steel trowel, spoon, hand auger, or shovel. PGL personnel may also collect the sample using their hand always ensuring a new glove is worn for each sample. PGL does not use painted equipment. The equipment is cleaned prior to sample collection using detergent (alconox) and water to remove any visible dirt, followed by a thorough rinse with potable water or isopropanol.

Soil sample collection method depends on the sample type: *ex situ* or *in situ*. As our sampling standard protocol, PGL follows the sample collection protocol specified in BCE Guidance Document 1 – *Site Characterization and Confirmation Testing* (SC&CT) for the two sample types.

In Situ Samples

Collection of *in situ* or discrete samples (grab samples) is necessary to characterize worst case soils or hot spot areas. *In situ* samples are used to identify:

- Contaminant levels with minimal dilution effects.
- *In situ* contaminant distribution patterns (contaminant delineation).
- Heterogeneities in a soil profile.

For an excavation, PGL has established standard sampling protocols to collect two types of *in situ* samples: base samples and sidewall samples.

Base Samples (or surface)

1. Remove the disturbed soil from the top with a trowel (roughly 1cm to 5cm).
2. With a clean trowel or a gloved hand, remove the top 1cm from the top of the undisturbed soil to remove any residual contamination.
3. With a cleaned trowel, obtain a sample from the top of this soil.
4. Log the soil characteristics (see Section E).
5. Record sample depth and location.

Sidewall Samples

1. Scrape horizontally with a trowel any residual soils left from the excavator bucket from the sidewalls (roughly 5cm).
2. Obtain samples with a clean trowel or by hand (always wearing protective gloves for each sample).
3. Log the excavation face/stratigraphy and soil characteristics (see Section E).
4. Record sample depth and location.

Borehole Samples

Borehole samples are generally collected by either split spoon or sonic core barrel. Slough and material in contact with the sampler is generally discarded before sampling. Solid stem auger may be used where the auger can be twisted into the formation without churning to minimize the risk of dilution (typically depths less than 3m).

Ex Situ Samples

Ex situ samples are composite samples obtained to provide a representation of stockpiled soil. Our *ex situ* sampling protocol follows Part II of the SC&CT for aliquot sample sizes and composites for stockpiles with a suspected level of contamination (i.e., suspected to exceed residential or industrial criteria). Also, BCE's *Contaminated Site Statistical Application Guidance Document No. 14 – Stockpiling*, March 1995, is used as a guide in obtaining samples and for statistically applying the results to the criteria.

Generally, stockpiles are sampled with a composite of five discrete samples within a pile.

Cleaning of Soil Sampling Instruments

The sampling trowels are cleaned for each sample. They are wiped clean with a paper towel between metals sampling. For organic sampling, deionized water and paper towels are used to clean the trowels. If any oily or similar residue cannot be removed in this manner, isopropanol is used to clean the trowel instead of the water. If the sample is collected by hand, the sampler always wears a new glove for each sample collection. At any time, if the sampler's gloves become soiled or torn, new gloves are put on.

Field Volatile Screening

In addition to physical screening of samples, samples may also be field screened using a vapour analysis method (compound-specific gastech tubes, photoionization detector (PID), catalytic hydrocarbon sensor, etc.). Generally the procedure is as follows:

1. Fill a re-sealable plastic bag roughly one-third full.
2. Allow to equilibrate at ambient temperature or above 10ºC (whichever is higher) for at least 10 minutes.
3. Insert the probe into the headspace and record the concentration.

Field screening through the core sleeve when using sonic drilling methods is sometimes used as a coarse pre-screening.

Sample Containers

The sampled material is transferred into an appropriate sample container. In most cases this will be a laboratory-supplied jar/container or a recloseable polyethylene bag for inorganic analyses.

All samples for metals analyses are retained in laboratory-prepared plastic jars. All samples for organic analysis are placed in laboratory-prepared Teflon-lined glass jars. Headspace in the jars is minimized for samples requiring volatile organic analysis. See Section F for sample storage and transport details.

D – SAMPLE LABELLING

Soil samples are labelled before placement into the appropriate container. The containers are labelled with water-resistant ink on the lid and an adhesive label. The information included on the label is as follows:

- Date.
- Project number.
- Company name
- A sample descriptor (e.g., TP for Test Pit).
- A unique sample number.

E – SAMPLE RECORDING

The sample information recorded in the field notes includes the:

- Unique sample number (in notes and on the container).
- The depth below ground and the location (i.e., test pit number).
- Location on a drawing or sketch.
- Sampling method (i.e., sample from trowel, auger, or split spoon).
- Sampling type (i.e., whether sample is an aliquot, discrete, or composite).
- Physical, visual, and olfactory characteristics.

PGL records the above sample information in a field book or test pit/borehole/well log form. PGL also takes date-stamped photographs for visual documentation of sample characteristics and contaminant indicators. Sample location is recorded using measurements from permanent site features.

Recording of Sample Characteristics

Physical characteristics include a wide variety of contaminant indicators and soil characteristics. PGL records contaminant indicators such as staining, sheen, foreign substances (debris, metal, paint, grit, wood, etc.), and distinctive odours. PGL also records soil physical characteristics such as colour, grain size, density/consistency, moisture content, and soil structure. The following provides some details on these physical characteristics.

Soil Colour

Soil colour is determined using a freshly exposed or broken sample. Varying soil colour can indicate contamination, soil oxidation (weathering), or historical groundwater levels. Coloured spots or streaks are referred to in the soil description as “mottled.”

Soil Grain Size

Grain size includes particle sizes and qualitative descriptors of their relative proportions. From larger to smaller soil particles, particle size (diameter) identification includes:

- boulders (>300mm)
- cobbles (75 to 300mm)
- gravel (4.75 to 75mm)
- sand (0.075 to 4.75mm)
- silt (<0.075mm, fine powder, dries quickly, and loses consistency when wet and agitated)
- clay (plastic and cohesive)

Particle sizes for silts and clays are not visible. Silts can be felt as grainy, where clay cannot.

Qualitative proportions for secondary constituents (i.e., sands with an estimated weight percent of silt content) would be as follows:

- trace – less than 5% (e.g., SAND, with trace silt)
- some – 5% to 20% (e.g., SAND, with some silt)
- "Y" adjectives for lesser constituent – 20% to 35% (e.g., silty SAND)
- 35% to 50% (e.g., SAND and SILT).

Soil Density

Density and consistency is used to describe the stiffness of cohesive soils (clays) and density of incohesive sands and gravels. The consistency of clays can be described as:

CLAY

- Soft (thumb will penetrate soil).
- Stiff (thumb will dent soil).
- Hard (thumb will not indent).

SAND (incohesive soils)

- Loose (easily excavated with trowel).
- Compact (difficult to excavate with trowel).
- Dense (hard to loosen even with a pick).

Moisture Content

PGL records moisture content and seepage to estimate groundwater levels. Quantitative moisture levels include dry, moist, and wet (water seepage).

Soil Structure

Soil structure includes soil properties such as homogeneous to heterogeneous, stratification (layered), seams (thin laminations or lenses), pockets (varying and discontinuous thickness), fissures, and cemented particles.

F – SAMPLE STORAGE AND TRANSPORT

Samples are transported to the laboratory within 48 hours of collection. The samples are kept cool on ice (≤10°C) in an insulated cooler or container, and packed in a manner that prevents them from breakage during transport.

G – CHAIN OF CUSTODY

A Chain of Custody form accompanies the samples to the laboratory. The form includes information regarding the samples and the parameters to be analyzed. The form also includes information regarding the sequence of handling and transport of the samples to the laboratory.

PGL'S GROUNDWATER SAMPLING METHODOLOGY

A – INTRODUCTION

A standardized sampling protocol has not yet been established by the BC Ministry of Environment (formerly called BC Environment, BCE) as the Contaminated Site Regulations allows. PGL developed the following protocol with the aid of a variety of references including: the Canadian Council of Ministers of the Environment (CCME) document entitled *Guidance Manual on Sampling, Analysis, and Data Management for Contaminated Sites, Volume I: Main Report*, December 1993; BCE Guidance Document 1 – *Site Characterization and Confirmation Testing*; BCE Guidance Document 2 – *Statistical Criteria for Characterizing a Volume of Contaminated Material*; and BCE Guidance Document 12 – *Technical Guidance on Contaminated Sites Statistics for Contaminated Sites* (BCE Guidance Documents Updated 1999) and *British Columbia Field Sampling Manual*, January 2003.

PGL maintains a group of detailed field protocols that are geared to providing consistent field results. Protocols are reviewed formally at one- or two-year intervals for technical currency, consistency with regulatory guidance and consistency with actual field practices. This document summarizes those protocols in the following sections:

A. **Introduction** – Outlines the referenced material and contents of the following protocols.

B. **Protocol Objective** – Offers an objective to following recognized and acceptable sampling protocol.

C. **Groundwater Sample Collection** – Provides groundwater collection protocols for sampling equipment, obtaining representative samples (procedures), transferring to appropriate containers, preservatives, and cleaning sampling equipment.

D. **Sample Labelling** – Includes our standard sample nomenclature used to identify key components (date, job number, unique ID, etc.) of the sample.

E. **Sample Recording** – Describes the information recording in field notes including labelling (ID), water properties, and location.

F. **Sample Storage and Transport** – Describes sample preparation for transport.

G. **Chain of Custody** – Provides concise sample information for laboratory handling and analyses.

B – METHODOLOGY OBJECTIVE

The objective of the sampling methodology is to allow collection of samples that are consistent, representative, and repeatable, and to prevent cross-contamination.

C – SAMPLE COLLECTION

PGL's protocol for groundwater sample collection includes developing, purging and sampling steps. PGL's standard is to use well-dedicated Waterra inertial pump systems for development and peristaltic pumps for sampling all parameters. Well-dedicated polyethylene bailers may be used for slow recharge wells, and stainless steel bailers are sometimes used when high concentrations of solvents are expected. Management of development and purge water depends on site risks. Most often the water is drummed while other times it is disposed of onsite through treatment systems or the sanitary sewer.

Development

Wells are usually developed at the time they are installed or the next day. They are developed to reduce sediment content (to the extent possible) by surging (usually using surge blocks on a Waterra pump) and purging. We customarily use Waterra or electric centrifugal pumps for well development. PGL customarily removes at least three to five well volumes and may monitor purge water for:

Parameter	Objective
CONDUCTIVITY – mandatory	+/- 20µS/cm or +/- 3% whichever is higher
TEMPERATURE – optional	± 0.1°C
pH – mandatory	± 0.2 pH units
TURBIDITY – mandatory	< 10 NTUs

Purging and Sampling

After development, wells are left to geochemically and physically stabilize as long as practical, usually not less than 24 hours. Longer "relaxation" times are applied when project constraints allow or when non-aqueous phase liquid (NAPL) thickness is at issue. It is our experience that longer intervals result in more consistent (and so likely more representative) results, and shorter intervals lead to more false positives (high) results

The sampling tasks are:

- Measure the well headspace (where applicable) for volatile contaminants and methane;
- Measure the water level; and
- Check for NAPL using an optical interface probe, bailer, or reactive paste.

When testing the well headspace for volatile contaminants and methane, a combustible gas meter is used. For this test, all well openings are sealed for a minimum of 20 minutes to allow vapours to accumulate before measurements are performed.

PGL measures turbidity if sampling for sediment sensitive parameters (e.g., extractables such as PAH, EPH, phenols, etc.); turbidity target is <10 NTU.

If samples were collected using a peristaltic pump, each well was purged by the peristaltic pump at a low flow rate (0.2L/min to 0.5L/min) until stable chemistry objectives/targets, as outlined in development, were achieved. Following purging, samples were obtained with the peristaltic pump Samples were placed directly from these apparatus into the sample container except for metals samples, which are field filtered. PGL usually samples for sediment sensitive parameters first, and VOCs (which has low sediment sensitivity) last.

If samples were collected using Waterra, each well was purged a minimum of three well volumes. Following purging, samples were obtained with the Waterra. Samples were placed directly into the sample container except for metals samples, which are field filtered. PGL samples sediment sensitive parameters (such as extractable petroleum hydrocarbons, polycyclic aromatic hydrocarbons and phenols) with bailers after purging with Waterra and ensures that the turbidity target (<10 NTUs) has been achieved prior to sampling.

If samples were collected using bailers, each well was purged a minimum of three well volumes. Following purging, samples were obtained with the bailer. Samples were placed directly into the sample container except for metals samples, which are field filtered. PGL usually samples for sediment sensitive parameters first, and VOCs (which has low sediment sensitivity) last.

Wells that did not recover sufficiently for sampling requirements during a normal field day were sampled from standing water (no purging).

Stable chemistry objectives/targets are the same as outlined in development.

Following purging, samples are obtained with the peristaltic pump or bailer. Samples are placed directly from these apparatus into the sample container except for metals samples, which are field filtered. PGL usually samples for sediment sensitive parameters first, and VOCs (which has low sediment sensitivity) last.

Sample Containers

Samples are transferred to laboratory-supplied sample containers, preservatives added to the samples when applicable, and stored on ice or cold packs until transported to the laboratory.

Samples for volatile contaminants are collected in zero-headspace septum vials with minimum turbulence and must be initially bubble-free to be acceptable. Since zero-headspace septum vials are vulnerable to breakage during sample handling and transport, vials are collected in duplicate. Samples for dissolved metals analyses are filtered in the field using dedicated filtering equipment, then preserved using concentrated nitric acid.

D – SAMPLE LABELLING

Samples are labelled before placement into the appropriate container. The containers are labelled with water-resistant ink on the lid and an adhesive label. The information included on the label is as follows:

- Date;
- Project number;
- Initial of the site inspector collecting the sample;
- A sample descriptor (i.e., BH_M for monitoring well); and
- A unique sample number.

E – SAMPLE RECORDING

The sample information recorded in the field notes includes the:

- Unique sample number (in notes and on the container);
- The location (i.e., monitoring well number);
- Location on a drawing or sketch;
- Sampling method (i.e., bailer, or waterra with foot valve);
- Sampling type (i.e., whether sample is a filtered, or preserved); and
- Physical, visual, and olfactory characteristics.

PGL records the above sample information in a field book or monitoring well log form. PGL also takes date-stamped photographs for visual documentation of sample characteristics and contaminant indicators. Monitoring well locations are recorded in the field using measurements from permanent site features and/or a site survey is completed.

Recording of Sample Characteristics

PGL records such physical characteristics as colour, staining, sediment content, distinctive odours, sheen, and free product. These characteristics are important in the selection of different parameter analyses.

F – SAMPLE STORAGE AND TRANSPORT

Samples are transported to the laboratory within 48 hours of collection. The samples are kept cool on ice (≤10°C) in an insulated cooler or container, and packed in a manner that prevents them from breakage during transport.

G – CHAIN OF CUSTODY

A Chain of Custody form accompanies the samples to the laboratory. The form includes information regarding the samples and the parameters to be analyzed. The form also includes information regarding the sequence of handling and transport of the samples to the laboratory.

Appendix 4

Laboratory Reports

Your Project #: 0125-78.01
Site#: INUVIK, NW
Site: INUVIK AIRPORT - FTA
Your C.O.C. #: 82323, 98108, 78107

Attention: MARY ZALESKI
POTTINGER GAHERTY ENVIRONMENTAL CONS.
SUITE 1200
1185 WEST GEORGIA ST
VANCOUVER, BC
CANADA V6E 4E6

Report Date: 2009/10/05
This report supersedes all previous reports with the same Maxxam job number

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: A953332
Received: 2009/09/26, 9:30

Sample Matrix: Soil
Samples Received: 25

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
BTEX/F1 by HS GC/MS (MeOH extract)	5	2009/09/26	2009/09/28	EENVSOP-00005 EENVSOP-00002	EPA 8260C/CCME
BTEX/F1 by HS GC/MS (MeOH extract)	19	2009/09/26	2009/09/29	EENVSOP-00005 EENVSOP-00002	EPA 8260C/CCME
BTEX/F1 by HS GC/MS (MeOH extract)	1	2009/09/26	2009/09/30	EENVSOP-00005 EENVSOP-00002	EPA 8260C/CCME
CCME Hydrocarbons (F2-F4 in soil)	9	2009/09/26	2009/09/28	EENVSOP-00007 EENVSOP-00006	CCME PHC-CWS
CCME Hydrocarbons (F2-F4 in soil)	16	2009/09/26	2009/09/29	EENVSOP-00007 EENVSOP-00006	CCME PHC-CWS
CCME Hydrocarbons (F4G in soil)	18	2009/09/30	2009/09/30	EENVSOP-00121	CCME PHC-CWS
Moisture	25	N/A	2009/09/28	EENVSOP-00139	Carter SSMA 51.2
Particle Size by Sieve (75 micron)	2	N/A	2009/10/02	EENVSOP-00077	SSMA 47.4

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

JEREMY WAKARUK, B.Sc., Senior Project Manager
Email: jwakaruk@maxxamanalytics.com
Phone# (780) 577-7105 Ext:7105

==========

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. SCC and CALA have approved this reporting process and electronic report format.

Total cover pages: 1

Maxxam Job #: A953332
Report Date: 2009/10/05

POTTINGER GAHERTY ENVIRONMENTAL CONS.
Client Project #: 0125-78.01
Site Reference: INUVIK AIRPORT - FTA
Sampler Initials: MZ

AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		Q94082		Q94088	Q94089		
Sampling Date		2009/09/22		2009/09/22	2009/09/22		
COC Number		82323		82323	82323		
	Units	**TP10-1**	**RDL**	**TP10-2**	**TP10-3**	**RDL**	**QC Batch**
Physical Properties							
Moisture	%	6.2	0.3	12	13	0.3	3449799
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	mg/kg	4300	10	210	550	10	3448941
F3 (C16-C34 Hydrocarbons)	mg/kg	4100	10	190	470	10	3448941
F4 (C34-C50 Hydrocarbons)	mg/kg	1700	10	54	140	10	3448941
Reached Baseline at C50	mg/kg	No		Yes	Yes		3448941
Volatiles							
Benzene	mg/kg	1.1	0.0050	0.49	0.68	0.0050	3448966
Toluene	mg/kg	4.9	0.020	1.4	2.6	0.020	3448966
Ethylbenzene	mg/kg	1.3	0.010	0.68	2.0	0.010	3448966
Xylenes (Total)	mg/kg	150 (1)	4.0	8.7	15	0.040	3448966
m & p-Xylene	mg/kg	110 (1)	4.0	6.2	11	0.040	3448966
o-Xylene	mg/kg	39	0.020	2.5	4.3	0.020	3448966
F1 (C6-C10) - BTEX	mg/kg	2200	12	170	240	12	3448966
(C6-C10)	mg/kg	2400	12	180	260	12	3448966
Surrogate Recovery (%)							
4-BROMOFLUOROBENZENE (sur.)	%	127		96	108		3448966
D10-ETHYLBENZENE (sur.)	%	127		130	124		3448966
D4-1,2-DICHLOROETHANE (sur.)	%	99		99	108		3448966
D8-TOLUENE (sur.)	%	126		121	119		3448966
O-TERPHENYL (sur.)	%	87		86	89		3448941

RDL = Reportable Detection Limit
(1) Detection limit raised due to dilution to bring analyte within the calibrated range.

Maxxam Job #: A953332
Report Date: 2009/10/05

POTTINGER GAHERTY ENVIRONMENTAL CONS.
Client Project #: 0125-78.01
Site Reference: INUVIK AIRPORT - FTA
Sampler Initials: MZ

AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		Q94090		Q94091	Q94092		
Sampling Date		2009/09/22		2009/09/22	2009/09/22		
COC Number		82323		82323	82323		
	Units	**TP10-4**	**QC Batch**	**TP11-1**	**TP11-2**	**RDL**	**QC Batch**
Physical Properties							
Moisture	%	14	3449799	6.7	17	0.3	3449799
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	mg/kg	19	3448941	5700	10	10	3448941
F3 (C16-C34 Hydrocarbons)	mg/kg	47	3448941	2800	57	10	3448941
F4 (C34-C50 Hydrocarbons)	mg/kg	11	3448941	1000	<10	10	3448941
Reached Baseline at C50	mg/kg	Yes	3448941	No	Yes		3448941
Volatiles							
Benzene	mg/kg	0.058	3448966	0.66	0.71	0.0050	3448990
Toluene	mg/kg	0.11	3448966	0.11	0.086	0.020	3448990
Ethylbenzene	mg/kg	0.055	3448966	6.5	0.17	0.010	3448990
Xylenes (Total)	mg/kg	0.79	3448966	7.2	0.13	0.040	3448990
m & p-Xylene	mg/kg	0.55	3448966	7.0	0.13	0.040	3448990
o-Xylene	mg/kg	0.24	3448966	0.23	<0.020	0.020	3448990
F1 (C6-C10) - BTEX	mg/kg	<12	3448966	800	24	12	3448990
(C6-C10)	mg/kg	12	3448966	810	25	12	3448990
Surrogate Recovery (%)							
4-BROMOFLUOROBENZENE (sur.)	%	99	3448966	98	94		3448990
D10-ETHYLBENZENE (sur.)	%	130	3448966	124	121		3448990
D4-1,2-DICHLOROETHANE (sur.)	%	100	3448966	90	91		3448990
D8-TOLUENE (sur.)	%	121	3448966	110	103		3448990
O-TERPHENYL (sur.)	%	98	3448941	84	87		3448941

RDL = Reportable Detection Limit

Maxxam Job #: A953332
Report Date: 2009/10/05

POTTINGER GAHERTY ENVIRONMENTAL CONS.
Client Project #: 0125-78.01
Site Reference: INUVIK AIRPORT - FTA
Sampler Initials: MZ

AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		Q94093	Q94094	Q94095		
Sampling Date		2009/09/22	2009/09/22	2009/09/22		
COC Number		82323	82323	82323		
	Units	**TP11-3**	**TP11-4**	**TP12-1**	**RDL**	**QC Batch**
Physical Properties						
Moisture	%	18	12	5.2	0.3	3449799
Ext. Pet. Hydrocarbon						
F2 (C10-C16 Hydrocarbons)	mg/kg	<10	1300	3300	10	3448941
F3 (C16-C34 Hydrocarbons)	mg/kg	63	1500	7500	10	3448941
F4 (C34-C50 Hydrocarbons)	mg/kg	13	760	2800	10	3448941
Reached Baseline at C50	mg/kg	Yes	No	No		3448941
Volatiles						
Benzene	mg/kg	0.70	0.23	0.17	0.0050	3448990
Toluene	mg/kg	0.14	0.088	0.30	0.020	3448990
Ethylbenzene	mg/kg	0.58	1.4	0.24	0.010	3448990
Xylenes (Total)	mg/kg	0.14	4.7	20	0.040	3448990
m & p-Xylene	mg/kg	0.099	3.8	15	0.040	3448990
o-Xylene	mg/kg	0.039	0.91	5.4	0.020	3448990
F1 (C6-C10) - BTEX	mg/kg	44	270	1500	12	3448990
(C6-C10)	mg/kg	45	270	1600	12	3448990
Surrogate Recovery (%)						
4-BROMOFLUOROBENZENE (sur.)	%	93	104	88		3448990
D10-ETHYLBENZENE (sur.)	%	120	123	111		3448990
D4-1,2-DICHLOROETHANE (sur.)	%	88	94	93		3448990
D8-TOLUENE (sur.)	%	98	109	100		3448990
O-TERPHENYL (sur.)	%	93	88	102		3448941

RDL = Reportable Detection Limit

Maxxam Job #: A953332
Report Date: 2009/10/05

POTTINGER GAHERTY ENVIRONMENTAL CONS.
Client Project #: 0125-78.01
Site Reference: INUVIK AIRPORT - FTA
Sampler Initials: MZ

AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		Q94096		Q94097	Q94098		
Sampling Date		2009/09/22		2009/09/22	2009/09/22		
COC Number		82323		82323	82323		
	Units	**TP12-2**	**RDL**	**TP12-3**	**GR3**	**RDL**	**QC Batch**
Physical Properties							
Moisture	%	47	0.3	11	13	0.3	3449684
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	mg/kg	4800	10	4100	360	10	3448909
F3 (C16-C34 Hydrocarbons)	mg/kg	3400	10	8500	300	10	3448909
F4 (C34-C50 Hydrocarbons)	mg/kg	830	10	3600	91	10	3448909
Reached Baseline at C50	mg/kg	No		No	Yes		3448909
Volatiles							
Benzene	mg/kg	30	0.0050	1.9	0.76	0.0050	3448966
Toluene	mg/kg	210 (1)	0.20	20	2.9	0.020	3448966
Ethylbenzene	mg/kg	86	0.010	6.6	1.5	0.010	3448966
Xylenes (Total)	mg/kg	530	0.40	83	13	0.040	3448966
m & p-Xylene	mg/kg	400 (1)	0.40	61	9.1	0.040	3448966
o-Xylene	mg/kg	130 (1)	0.20	22	3.5	0.020	3448966
F1 (C6-C10) - BTEX	mg/kg	8700	12	2100	210	12	3448966
(C6-C10)	mg/kg	9500	12	2200	230	12	3448966
Surrogate Recovery (%)							
4-BROMOFLUOROBENZENE (sur.)	%	105		133	92		3448966
D10-ETHYLBENZENE (sur.)	%	121		115	130		3448966
D4-1,2-DICHLOROETHANE (sur.)	%	103		107	98		3448966
D8-TOLUENE (sur.)	%	105		122	129		3448966
O-TERPHENYL (sur.)	%	111		101	108		3448909

RDL = Reportable Detection Limit
(1) Detection limits raised due to dilution to bring analyte within the calibrated range(BTEX/F1).

Maxxam Job #: A953332
Report Date: 2009/10/05

POTTINGER GAHERTY ENVIRONMENTAL CONS.
Client Project #: 0125-78.01
Site Reference: INUVIK AIRPORT - FTA
Sampler Initials: MZ

AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		Q94099	Q94100	Q94123	Q94124		
Sampling Date		2009/09/22	2009/09/23	2009/09/23	2009/09/23		
COC Number		98108	78107	78107	78107		
	Units	**GR4**	**TP05-1**	**TP05-2**	**TP05-3**	**RDL**	**QC Batch**
Physical Properties							
Moisture	%	6.1	8.7	6.3	18	0.3	3449684
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	mg/kg	6800	1700	3100	2400	10	3448909
F3 (C16-C34 Hydrocarbons)	mg/kg	3600	6000	12000	2600	10	3448909
F4 (C34-C50 Hydrocarbons)	mg/kg	1300	1700	3000	330	10	3448909
Reached Baseline at C50	mg/kg	No	No	No	No		3448909
Volatiles							
Benzene	mg/kg	0.55	0.025	0.036	0.62	0.0050	3448966
Toluene	mg/kg	0.23	0.15	0.14	0.12	0.020	3448966
Ethylbenzene	mg/kg	5.5	0.14	0.090	0.26	0.010	3448966
Xylenes (Total)	mg/kg	7.2	1.8	0.87	0.67	0.040	3448966
m & p-Xylene	mg/kg	6.7	1.5	0.62	0.47	0.040	3448966
o-Xylene	mg/kg	0.56	0.38	0.25	0.20	0.020	3448966
F1 (C6-C10) - BTEX	mg/kg	450	260	290	360	12	3448966
(C6-C10)	mg/kg	470	260	300	360	12	3448966
Surrogate Recovery (%)							
4-BROMOFLUOROBENZENE (sur.)	%	132	109	126	115		3448966
D10-ETHYLBENZENE (sur.)	%	115	117	119	122		3448966
D4-1,2-DICHLOROETHANE (sur.)	%	102	105	101	98		3448966
D8-TOLUENE (sur.)	%	130	127	129	128		3448966
O-TERPHENYL (sur.)	%	114	117	112	118		3448909

RDL = Reportable Detection Limit

Maxxam Job #: A953332
Report Date: 2009/10/05

POTTINGER GAHERTY ENVIRONMENTAL CONS.
Client Project #: 0125-78.01
Site Reference: INUVIK AIRPORT - FTA
Sampler Initials: MZ

AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		Q94125	Q94126	Q94127	Q94128		
Sampling Date		2009/09/23	2009/09/23	2009/09/22	2009/09/22		
COC Number		78107	78107	78107	78107		
	Units	**TP09B-1**	**TP09B-2**	**TP13-1**	**TP13-2**	**RDL**	**QC Batch**
Physical Properties							
Moisture	%	8.5	9.3	8.8	7.5	0.3	3449684
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	mg/kg	43	54	38	490	10	3448909
F3 (C16-C34 Hydrocarbons)	mg/kg	900	1200	790	2200	10	3448909
F4 (C34-C50 Hydrocarbons)	mg/kg	510	520	470	570	10	3448909
Reached Baseline at C50	mg/kg	No	No	No	No		3448909
Volatiles							
Benzene	mg/kg	0.041	0.048	0.025	0.028	0.0050	3448966
Toluene	mg/kg	0.11	0.13	0.11	0.11	0.020	3448966
Ethylbenzene	mg/kg	0.087	0.087	0.066	0.066	0.010	3448966
Xylenes (Total)	mg/kg	0.70	0.80	0.60	0.62	0.040	3448966
m & p-Xylene	mg/kg	0.50	0.57	0.42	0.42	0.040	3448966
o-Xylene	mg/kg	0.20	0.23	0.18	0.21	0.020	3448966
F1 (C6-C10) - BTEX	mg/kg	25	18	<12	16	12	3448966
(C6-C10)	mg/kg	26	19	<12	16	12	3448966
Surrogate Recovery (%)							
4-BROMOFLUOROBENZENE (sur.)	%	119	86	85	93		3448966
D10-ETHYLBENZENE (sur.)	%	118	119	120	124		3448966
D4-1,2-DICHLOROETHANE (sur.)	%	136	102	101	98		3448966
D8-TOLUENE (sur.)	%	108	126	127	129		3448966
O-TERPHENYL (sur.)	%	123	116	108	114		3448909

RDL = Reportable Detection Limit

AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		Q94129	Q94130		Q94131		
Sampling Date		2009/09/23	2009/09/23		2009/09/23		
COC Number		78107	78107		78107		
	Units	**TP14-1**	**TP14-2**	**RDL**	**TP14-3**	**RDL**	**QC Batch**
Physical Properties							
Moisture	%	8.1	8.4	0.3	13	0.3	3449684
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	mg/kg	90	3500	10	1600	10	3448909
F3 (C16-C34 Hydrocarbons)	mg/kg	1400	12000	10	230	10	3448909
F4 (C34-C50 Hydrocarbons)	mg/kg	640	3900	10	95	10	3448909
Reached Baseline at C50	mg/kg	No	No		Yes		3448909
Volatiles							
Benzene	mg/kg	<0.0050	0.79	0.0050	42	0.0050	3448966
Toluene	mg/kg	0.042	0.28	0.020	240 (1)	0.20	3448966
Ethylbenzene	mg/kg	0.043	0.84	0.010	58 (1)	0.10	3448966
Xylenes (Total)	mg/kg	0.41	12	0.040	310	0.40	3448966
m & p-Xylene	mg/kg	0.29	10	0.040	230 (1)	0.40	3448966
o-Xylene	mg/kg	0.12	1.5	0.020	76 (1)	0.20	3448966
F1 (C6-C10) - BTEX	mg/kg	<12	1500	12	5700	12	3448966
(C6-C10)	mg/kg	12	1500	12	6300	12	3448966
Surrogate Recovery (%)							
4-BROMOFLUOROBENZENE (sur.)	%	93	125		106		3448966
D10-ETHYLBENZENE (sur.)	%	117	128		118		3448966
D4-1,2-DICHLOROETHANE (sur.)	%	100	101		106		3448966
D8-TOLUENE (sur.)	%	125	129		101		3448966
O-TERPHENYL (sur.)	%	118	107		110		3448909

RDL = Reportable Detection Limit
(1) Detection limits raised due to dilution to bring analyte within the calibrated range(BTEX/F1).

Maxxam Job #: A953332
Report Date: 2009/10/05

POTTINGER GAHERTY ENVIRONMENTAL CONS.
Client Project #: 0125-78.01
Site Reference: INUVIK AIRPORT - FTA
Sampler Initials: MZ

AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		Q94132	Q94133		
Sampling Date		2009/09/22	2009/09/22		
COC Number		78107	78107		
	Units	**TP13-3**	**GR5**	**RDL**	**QC Batch**
Physical Properties					
Moisture	%	25	15	0.3	3449684
Ext. Pet. Hydrocarbon					
F2 (C10-C16 Hydrocarbons)	mg/kg	5600	4000	10	3448909
F3 (C16-C34 Hydrocarbons)	mg/kg	1400	1100	10	3448909
F4 (C34-C50 Hydrocarbons)	mg/kg	360	270	10	3448909
Reached Baseline at C50	mg/kg	No	No		3448909
Volatiles					
Benzene	mg/kg	0.24	0.14	0.0050	3448966
Toluene	mg/kg	1.3	0.39	0.020	3448966
Ethylbenzene	mg/kg	7.4	3.2	0.010	3448966
Xylenes (Total)	mg/kg	22	6.8	0.040	3448966
m & p-Xylene	mg/kg	16	5.1	0.040	3448966
o-Xylene	mg/kg	6.3	1.7	0.020	3448966
F1 (C6-C10) - BTEX	mg/kg	2100	960	12	3448966
(C6-C10)	mg/kg	2100	970	12	3448966
Surrogate Recovery (%)					
4-BROMOFLUOROBENZENE (sur.)	%	128	132		3448966
D10-ETHYLBENZENE (sur.)	%	120	129		3448966
D4-1,2-DICHLOROETHANE (sur.)	%	100	100		3448966
D8-TOLUENE (sur.)	%	126	131		3448966
O-TERPHENYL (sur.)	%	113	112		3448909

RDL = Reportable Detection Limit

RESULTS OF CHEMICAL ANALYSES OF SOIL

Maxxam ID		Q94089	Q94129		
Sampling Date		2009/09/22	2009/09/23		
COC Number		82323	78107		
	Units	**TP10-3**	**TP14-1**	**RDL**	**QC Batch**
Physical Properties					
Sieve - Pan	%	65	13	0.2	3461527
Sieve - #200 (>0.075mm)	%	35	87	0.2	3461527
Grain Size	%	FINE	COARSE	0.2	3461527

RDL = Reportable Detection Limit

Maxxam Job #: A953332
Report Date: 2009/10/05

POTTINGER GAHERTY ENVIRONMENTAL CONS.
Client Project #: 0125-78.01
Site Reference: INUVIK AIRPORT - FTA
Sampler Initials: MZ

PETROLEUM HYDROCARBONS (CCME)

Maxxam ID		Q94082	Q94091	Q94094	Q94095		
Sampling Date		2009/09/22	2009/09/22	2009/09/22	2009/09/22		
COC Number		82323	82323	82323	82323		
	Units	**TP10-1**	**TP11-1**	**TP11-4**	**TP12-1**	**RDL**	**QC Batch**
OIL & GREASE							
F4SG (Heavy Hydrocarbons-Grav.)	mg/kg	6100	2900	2900	10000	500	3456872
RDL = Reportable Detection Limit							

Maxxam ID		Q94096	Q94097	Q94099	Q94100		
Sampling Date		2009/09/22	2009/09/22	2009/09/22	2009/09/23		
COC Number		82323	82323	98108	78107		
	Units	**TP12-2**	**TP12-3**	**GR4**	**TP05-1**	**RDL**	**QC Batch**
OIL & GREASE							
F4SG (Heavy Hydrocarbons-Grav.)	mg/kg	2800	11000	3100	5600	500	3456781
RDL = Reportable Detection Limit							

Maxxam ID		Q94123		Q94124		
Sampling Date		2009/09/23		2009/09/23		
COC Number		78107		78107		
	Units	**TP05-2**	**QC Batch**	**TP05-3**	**RDL**	**QC Batch**
OIL & GREASE						
F4SG (Heavy Hydrocarbons-Grav.)	mg/kg	15000	3456872	1100	500	3456781
RDL = Reportable Detection Limit						

Maxxam ID		Q94125		Q94126		
Sampling Date		2009/09/23		2009/09/23		
COC Number		78107		78107		
	Units	**TP09B-1**	**QC Batch**	**TP09B-2**	**RDL**	**QC Batch**
OIL & GREASE						
F4SG (Heavy Hydrocarbons-Grav.)	mg/kg	1800	3456872	1400	500	3456781
RDL = Reportable Detection Limit						

Maxxam Job #: A953332
Report Date: 2009/10/05

POTTINGER GAHERTY ENVIRONMENTAL CONS.
Client Project #: 0125-78.01
Site Reference: INUVIK AIRPORT - FTA
Sampler Initials: MZ

PETROLEUM HYDROCARBONS (CCME)

Maxxam ID		Q94127		Q94128		
Sampling Date		2009/09/22		2009/09/22		
COC Number		78107		78107		
	Units	**TP13-1**	**QC Batch**	**TP13-2**	**RDL**	**QC Batch**
OIL & GREASE						
F4SG (Heavy Hydrocarbons-Grav.)	mg/kg	950	3456872	1500	500	3456781
RDL = Reportable Detection Limit						

Maxxam ID		Q94129	Q94130	Q94132	Q94133		
Sampling Date		2009/09/23	2009/09/23	2009/09/22	2009/09/22		
COC Number		78107	78107	78107	78107		
	Units	**TP14-1**	**TP14-2**	**TP13-3**	**GR5**	**RDL**	**QC Batch**
OIL & GREASE							
F4SG (Heavy Hydrocarbons-Grav.)	mg/kg	2300	15000	1700	800	500	3456872
RDL = Reportable Detection Limit							

General Comments

Results relate only to the items tested.

POTTINGER GAHERTY ENVIRONMENTAL CONS.
Attention: MARY ZALESKI
Client Project #: 0125-78.01
P.O. #:
Site Reference: INUVIK AIRPORT - FTA

Quality Assurance Report

Maxxam Job Number: EA953332

QA/QC Batch Num	Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3448909	KO	Matrix Spike [Q94097-01]	O-TERPHENYL (sur.)	2009/09/29		112	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2009/09/29		NC	%	50 - 130
			F3 (C16-C34 Hydrocarbons)	2009/09/29		NC	%	50 - 130
			F4 (C34-C50 Hydrocarbons)	2009/09/29		NC	%	50 - 130
		Spiked Blank	O-TERPHENYL (sur.)	2009/09/29		95	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2009/09/29		95	%	80 - 120
			F3 (C16-C34 Hydrocarbons)	2009/09/29		98	%	80 - 120
			F4 (C34-C50 Hydrocarbons)	2009/09/29		97	%	80 - 120
		Method Blank	O-TERPHENYL (sur.)	2009/09/29		112	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2009/09/29	<10		mg/kg	
			F3 (C16-C34 Hydrocarbons)	2009/09/29	13, RDL=10		mg/kg	
			F4 (C34-C50 Hydrocarbons)	2009/09/29	19, RDL=10		mg/kg	
		RPD [Q94096-01]	F2 (C10-C16 Hydrocarbons)	2009/09/29	4.1		%	50
			F3 (C16-C34 Hydrocarbons)	2009/09/29	2.2		%	50
			F4 (C34-C50 Hydrocarbons)	2009/09/29	10.1		%	50
3448941	YT	Matrix Spike	O-TERPHENYL (sur.)	2009/09/28		90	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2009/09/28		97	%	50 - 130
			F3 (C16-C34 Hydrocarbons)	2009/09/28		84	%	50 - 130
			F4 (C34-C50 Hydrocarbons)	2009/09/28		89	%	50 - 130
		Spiked Blank	O-TERPHENYL (sur.)	2009/09/28		87	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2009/09/28		102	%	80 - 120
			F3 (C16-C34 Hydrocarbons)	2009/09/28		114	%	80 - 120
			F4 (C34-C50 Hydrocarbons)	2009/09/28		119	%	80 - 120
		Method Blank	O-TERPHENYL (sur.)	2009/09/28		129	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2009/09/28	<10		mg/kg	
			F3 (C16-C34 Hydrocarbons)	2009/09/28	13, RDL=10		mg/kg	
			F4 (C34-C50 Hydrocarbons)	2009/09/28	<10		mg/kg	
		RPD	F2 (C10-C16 Hydrocarbons)	2009/09/28	NC		%	50
			F3 (C16-C34 Hydrocarbons)	2009/09/28	27.2		%	50
			F4 (C34-C50 Hydrocarbons)	2009/09/28	NC		%	50
3448966	AN1	Matrix Spike [Q94097-01]	4-BROMOFLUOROBENZENE (sur.)	2009/09/29		127	%	60 - 140
			D10-ETHYLBENZENE (sur.)	2009/09/29		111	%	30 - 130
			D4-1,2-DICHLOROETHANE (sur.)	2009/09/29		94	%	60 - 140
			D8-TOLUENE (sur.)	2009/09/29		124	%	60 - 140
			Benzene	2009/09/29		NC	%	60 - 140
			Toluene	2009/09/29		NC	%	60 - 140
			Ethylbenzene	2009/09/29		NC	%	60 - 140
			m & p-Xylene	2009/09/29		NC	%	60 - 140
			o-Xylene	2009/09/29		NC	%	60 - 140
			(C6-C10)	2009/09/29		NC	%	60 - 140
		Spiked Blank	4-BROMOFLUOROBENZENE (sur.)	2009/09/29		98	%	60 - 140
			D10-ETHYLBENZENE (sur.)	2009/09/29		115	%	30 - 130
			D4-1,2-DICHLOROETHANE (sur.)	2009/09/29		96	%	60 - 140
			D8-TOLUENE (sur.)	2009/09/29		118	%	60 - 140
			Benzene	2009/09/29		102	%	60 - 140
			Toluene	2009/09/29		116	%	60 - 140
			Ethylbenzene	2009/09/29		103	%	60 - 140
			m & p-Xylene	2009/09/29		108	%	60 - 140
			o-Xylene	2009/09/29		101	%	60 - 140
			(C6-C10)	2009/09/29		95	%	80 - 120
		Method Blank	4-BROMOFLUOROBENZENE (sur.)	2009/09/29		95	%	60 - 140
			D10-ETHYLBENZENE (sur.)	2009/09/29		110	%	30 - 130
			D4-1,2-DICHLOROETHANE (sur.)	2009/09/29		104	%	60 - 140

POTTINGER GAHERTY ENVIRONMENTAL CONS.
Attention: MARY ZALESKI
Client Project #: 0125-78.01
P.O. #:
Site Reference: INUVIK AIRPORT - FTA

Quality Assurance Report (Continued)

Maxxam Job Number: EA953332

QA/QC Batch Num	Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3448966	AN1	Method Blank	D8-TOLUENE (sur.)	2009/09/29		101	%	60 - 140
			Benzene	2009/09/29	<0.0050		mg/kg	
			Toluene	2009/09/29	<0.020		mg/kg	
			Ethylbenzene	2009/09/29	<0.010		mg/kg	
			Xylenes (Total)	2009/09/29	<0.040		mg/kg	
			m & p-Xylene	2009/09/29	<0.040		mg/kg	
			o-Xylene	2009/09/29	<0.020		mg/kg	
			F1 (C6-C10) - BTEX	2009/09/29	<12		mg/kg	
			(C6-C10)	2009/09/29	<12		mg/kg	
		RPD [Q94096-01]	Benzene	2009/09/29	26.3		%	50
			Toluene	2009/09/29	20.3 (1)		%	50
			Ethylbenzene	2009/09/29	30.0		%	50
			Xylenes (Total)	2009/09/29	18.8		%	50
			m & p-Xylene	2009/09/29	19.2 (1)		%	50
			o-Xylene	2009/09/29	17.3 (1)		%	50
			F1 (C6-C10) - BTEX	2009/09/29	13.5		%	50
			(C6-C10)	2009/09/29	14.1		%	50
3448990	CL9	Matrix Spike	4-BROMOFLUOROBENZENE (sur.)	2009/09/28		85	%	60 - 140
			D10-ETHYLBENZENE (sur.)	2009/09/28		121	%	30 - 130
			D4-1,2-DICHLOROETHANE (sur.)	2009/09/28		91	%	60 - 140
			D8-TOLUENE (sur.)	2009/09/28		93	%	60 - 140
			Benzene	2009/09/28		103	%	60 - 140
			Toluene	2009/09/28		96	%	60 - 140
			Ethylbenzene	2009/09/28		107	%	60 - 140
			m & p-Xylene	2009/09/28		108	%	60 - 140
			o-Xylene	2009/09/28		102	%	60 - 140
			(C6-C10)	2009/09/28		120	%	60 - 140
		Spiked Blank	4-BROMOFLUOROBENZENE (sur.)	2009/09/28		96	%	60 - 140
			D10-ETHYLBENZENE (sur.)	2009/09/28		123	%	30 - 130
			D4-1,2-DICHLOROETHANE (sur.)	2009/09/28		90	%	60 - 140
			D8-TOLUENE (sur.)	2009/09/28		104	%	60 - 140
			Benzene	2009/09/28		103	%	60 - 140
			Toluene	2009/09/28		105	%	60 - 140
			Ethylbenzene	2009/09/28		105	%	60 - 140
			m & p-Xylene	2009/09/28		105	%	60 - 140
			o-Xylene	2009/09/28		102	%	60 - 140
			(C6-C10)	2009/09/28		113	%	80 - 120
		Method Blank	4-BROMOFLUOROBENZENE (sur.)	2009/09/28		96	%	60 - 140
			D10-ETHYLBENZENE (sur.)	2009/09/28		122	%	30 - 130
			D4-1,2-DICHLOROETHANE (sur.)	2009/09/28		88	%	60 - 140
			D8-TOLUENE (sur.)	2009/09/28		108	%	60 - 140
			Benzene	2009/09/28	<0.0050		mg/kg	
			Toluene	2009/09/28	<0.020		mg/kg	
			Ethylbenzene	2009/09/28	<0.010		mg/kg	
			Xylenes (Total)	2009/09/28	<0.040		mg/kg	
			m & p-Xylene	2009/09/28	<0.040		mg/kg	
			o-Xylene	2009/09/28	<0.020		mg/kg	
			F1 (C6-C10) - BTEX	2009/09/28	<12		mg/kg	
			(C6-C10)	2009/09/28	<12		mg/kg	
		RPD	Benzene	2009/09/28	NC		%	50
			Toluene	2009/09/28	NC		%	50
			Ethylbenzene	2009/09/28	NC		%	50
			Xylenes (Total)	2009/09/28	NC		%	50
			m & p-Xylene	2009/09/28	NC		%	50
			o-Xylene	2009/09/28	NC		%	50

POTTINGER GAHERTY ENVIRONMENTAL CONS.
Attention: MARY ZALESKI
Client Project #: 0125-78.01
P.O. #:
Site Reference: INUVIK AIRPORT - FTA

Quality Assurance Report (Continued)

Maxxam Job Number: EA953332

QA/QC Batch Num	Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3448990	CL9	RPD	F1 (C6-C10) - BTEX	2009/09/28	NC		%	50
			(C6-C10)	2009/09/28	NC		%	50
3449684	SR7	Method Blank	Moisture	2009/09/28	<0.3		%	
		RPD [Q94096-01]	Moisture	2009/09/28	3.4		%	20
3449799	SR7	Method Blank	Moisture	2009/09/28	<0.3		%	
		RPD	Moisture	2009/09/28	6.6		%	20
3456781	JHA	Matrix Spike	F4SG (Heavy Hydrocarbons-Grav.)	2009/09/30		108	%	65 - 130
		Spiked Blank	F4SG (Heavy Hydrocarbons-Grav.)	2009/09/30		96	%	70 - 130
		Method Blank	F4SG (Heavy Hydrocarbons-Grav.)	2009/09/30	<500		mg/kg	
		RPD	F4SG (Heavy Hydrocarbons-Grav.)	2009/09/30	NC		%	50
3456872	AR6	Spiked Blank	F4SG (Heavy Hydrocarbons-Grav.)	2009/09/30		120	%	70 - 130
		Method Blank	F4SG (Heavy Hydrocarbons-Grav.)	2009/09/30	<500		mg/kg	
3461527	ST6	Method Blank	Sieve - Pan	2009/10/02	<0.2		%	
			Sieve - #200 (>0.075mm)	2009/10/02	<0.2		%	
		RPD [Q94089-01]	Sieve - Pan	2009/10/02	1.2		%	35
			Sieve - #200 (>0.075mm)	2009/10/02	2.1		%	35

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 to which a known amount of the analyte has been added. Used to evaluate analyte recovery.
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 spiked amount was not sufficiently significant to permit a reliable recovery calculation.
NC (RPD): The RPD was not calculated. The level of analyte detected in the parent sample and its duplicate was not sufficiently significant to permit a reliable calculation.
(1) Detection limits raised due to dilution to bring analyte within the calibrated range(BTEX/F1).

Your Project #: 0125-78-01 INUVIK AIRPORT-FTA
Site: INUVIK NWT
Your C.O.C. #: 82324, 82343

Attention: MARY ZALESKI
POTTINGER GAHERTY ENVIRONMENTAL CONS.
SUITE 1200
1185 WEST GEORGIA ST
VANCOUVER, BC
CANADA V6E 4E6

Report Date: 2009/10/05
This report supersedes all previous reports with the same Maxxam job number

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: A953337
Received: 2009/09/26, 9:30

Sample Matrix: Soil
Samples Received: 13

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
BTEX/F1 by HS GC/MS (MeOH extract)	11	2009/09/26	2009/09/28	EENVSOP-00005 EENVSOP-00002	EPA 8260C/CCME
BTEX/F1 by HS GC/MS (MeOH extract)	2	2009/09/26	2009/09/29	EENVSOP-00005 EENVSOP-00002	EPA 8260C/CCME
CCME Hydrocarbons (F2-F4 in soil)	13	2009/09/28	2009/09/29	EENVSOP-00007 EENVSOP-00006	CCME PHC-CWS
CCME Hydrocarbons (F4G in soil)	10	2009/09/30	2009/09/30	EENVSOP-00121	CCME PHC-CWS
Moisture	13	N/A	2009/09/28	EENVSOP-00139	Carter SSMA 51.2
Particle Size by Sieve (75 micron)	1	N/A	2009/10/04	EENVSOP-00077	SSMA 47.4

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

JEREMY WAKARUK, B.Sc., Senior Project Manager
Email: jwakaruk@maxxamanalytics.com
Phone# (780) 577-7105 Ext:7105

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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. SCC and CALA have approved this reporting process and electronic report format.

Total cover pages: 1

Maxxam Job #: A953337
Report Date: 2009/10/05

POTTINGER GAHERTY ENVIRONMENTAL CONS.
Client Project #: 0125-78-01 INUVIK AIRPORT-FTA
Site Reference: INUVIK NWT
Sampler Initials: MMZ

AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		Q94135	Q94136		Q94137		
Sampling Date		2009/09/23	2009/09/23		2009/09/23		
COC Number		82324	82324		82324		
	Units	**TP06-1**	**TP06-2**	**QC Batch**	**TP06-3**	**RDL**	**QC Batch**
Physical Properties							
Moisture	%	7.5	14	3449631	13	0.3	3449631
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	mg/kg	120	13	3448938	<10	10	3448938
F3 (C16-C34 Hydrocarbons)	mg/kg	1700	42	3448938	37	10	3448938
F4 (C34-C50 Hydrocarbons)	mg/kg	560	120	3448938	71	10	3448938
Reached Baseline at C50	mg/kg	No	Yes	3448938	Yes		3448938
Volatiles							
Benzene	mg/kg	<0.0050	<0.0050	3449044	<0.0050	0.0050	3448868
Toluene	mg/kg	<0.020	0.026	3449044	<0.020	0.020	3448868
Ethylbenzene	mg/kg	<0.010	<0.010	3449044	<0.010	0.010	3448868
Xylenes (Total)	mg/kg	<0.040	<0.040	3449044	<0.040	0.040	3448868
m & p-Xylene	mg/kg	<0.040	<0.040	3449044	<0.040	0.040	3448868
o-Xylene	mg/kg	<0.020	<0.020	3449044	<0.020	0.020	3448868
F1 (C6-C10) - BTEX	mg/kg	<12	20	3449044	13	12	3448868
(C6-C10)	mg/kg	<12	20	3449044	12	12	3448868
Surrogate Recovery (%)							
4-BROMOFLUOROBENZENE (sur.)	%	91	91	3449044	90		3448868
D10-ETHYLBENZENE (sur.)	%	100	102	3449044	102		3448868
D4-1,2-DICHLOROETHANE (sur.)	%	77	77	3449044	74		3448868
D8-TOLUENE (sur.)	%	102	101	3449044	103		3448868
O-TERPHENYL (sur.)	%	109	111	3448938	101		3448938

RDL = Reportable Detection Limit

AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		Q94138		Q94139	Q94140		
Sampling Date		2009/09/23		2009/09/23	2009/09/23		
COC Number		82324		82324	82324		
	Units	**TP07-1**	**QC Batch**	**TP07-2**	**TP07-3**	**RDL**	**QC Batch**
Physical Properties							
Moisture	%	11	3449631	7.3	16	0.3	3449631
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	mg/kg	400	3448938	1300	23	10	3448938
F3 (C16-C34 Hydrocarbons)	mg/kg	1000	3448938	1900	33	10	3448938
F4 (C34-C50 Hydrocarbons)	mg/kg	290	3448938	370	69	10	3448938
Reached Baseline at C50	mg/kg	No	3448938	No	Yes		3448938
Volatiles							
Benzene	mg/kg	<0.0050	3448868	<0.0050	0.033	0.0050	3448356
Toluene	mg/kg	<0.020	3448868	<0.020	<0.020	0.020	3448356
Ethylbenzene	mg/kg	<0.010	3448868	<0.010	<0.010	0.010	3448356
Xylenes (Total)	mg/kg	<0.040	3448868	<0.040	<0.040	0.040	3448356
m & p-Xylene	mg/kg	<0.040	3448868	<0.040	<0.040	0.040	3448356
o-Xylene	mg/kg	<0.020	3448868	<0.020	<0.020	0.020	3448356
F1 (C6-C10) - BTEX	mg/kg	<12	3448868	39	<12	12	3448356
(C6-C10)	mg/kg	<12	3448868	39	<12	12	3448356
Surrogate Recovery (%)							
4-BROMOFLUOROBENZENE (sur.)	%	89	3448868	96	87		3448356
D10-ETHYLBENZENE (sur.)	%	98	3448868	109	114		3448356
D4-1,2-DICHLOROETHANE (sur.)	%	74	3448868	110	107		3448356
D8-TOLUENE (sur.)	%	102	3448868	100	100		3448356
O-TERPHENYL (sur.)	%	100	3448938	110	109		3448938

RDL = Reportable Detection Limit

Maxxam Job #: A953337
Report Date: 2009/10/05

POTTINGER GAHERTY ENVIRONMENTAL CONS.
Client Project #: 0125-78-01 INUVIK AIRPORT-FTA
Site Reference: INUVIK NWT
Sampler Initials: MMZ

AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		Q94141	Q94142	Q94143	Q94144		
Sampling Date		2009/09/23	2009/09/23	2009/09/23	2009/09/23		
COC Number		82324	82324	82324	82324		
	Units	**TP08A-1**	**TP08A-2**	**TP08B-1**	**TP08B-2**	**RDL**	**QC Batch**
Physical Properties							
Moisture	%	4.8	8.0	6.2	8.8	0.3	3449631
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	mg/kg	30	82	23	110	10	3448938
F3 (C16-C34 Hydrocarbons)	mg/kg	940	1200	470	2200	10	3448938
F4 (C34-C50 Hydrocarbons)	mg/kg	350	510	280	1200	10	3448938
Reached Baseline at C50	mg/kg	No	No	No	No		3448938
Volatiles							
Benzene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	3448356
Toluene	mg/kg	<0.020	<0.020	<0.020	<0.020	0.020	3448356
Ethylbenzene	mg/kg	<0.010	<0.010	<0.010	<0.010	0.010	3448356
Xylenes (Total)	mg/kg	<0.040	<0.040	<0.040	<0.040	0.040	3448356
m & p-Xylene	mg/kg	<0.040	<0.040	<0.040	<0.040	0.040	3448356
o-Xylene	mg/kg	<0.020	<0.020	<0.020	<0.020	0.020	3448356
F1 (C6-C10) - BTEX	mg/kg	<12	<12	<12	<12	12	3448356
(C6-C10)	mg/kg	<12	<12	<12	<12	12	3448356
Surrogate Recovery (%)							
4-BROMOFLUOROBENZENE (sur.)	%	98	99	99	100		3448356
D10-ETHYLBENZENE (sur.)	%	106	109	109	108		3448356
D4-1,2-DICHLOROETHANE (sur.)	%	105	102	104	106		3448356
D8-TOLUENE (sur.)	%	103	103	103	101		3448356
O-TERPHENYL (sur.)	%	104	94	85	83		3448938

RDL = Reportable Detection Limit

Maxxam Job #: A953337
Report Date: 2009/10/05

POTTINGER GAHERTY ENVIRONMENTAL CONS.
Client Project #: 0125-78-01 INUVIK AIRPORT-FTA
Site Reference: INUVIK NWT
Sampler Initials: MMZ

AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		Q94145	Q94146	Q94147		
Sampling Date		2009/09/23	2009/09/23	2009/09/23		
COC Number		82324	82324	82343		
	Units	**TP09A-1**	**TP09A-2**	**GR2**	**RDL**	**QC Batch**
Physical Properties						
Moisture	%	5.4	5.4	15	0.3	3449631
Ext. Pet. Hydrocarbon						
F2 (C10-C16 Hydrocarbons)	mg/kg	34	35	18	10	3448938
F3 (C16-C34 Hydrocarbons)	mg/kg	330	640	32	10	3448938
F4 (C34-C50 Hydrocarbons)	mg/kg	230	260	78	10	3448938
Reached Baseline at C50	mg/kg	No	No	Yes		3448938
Volatiles						
Benzene	mg/kg	<0.0050	<0.0050	<0.0050	0.0050	3448356
Toluene	mg/kg	<0.020	<0.020	<0.020	0.020	3448356
Ethylbenzene	mg/kg	<0.010	<0.010	0.031	0.010	3448356
Xylenes (Total)	mg/kg	<0.040	<0.040	0.064	0.040	3448356
m & p-Xylene	mg/kg	<0.040	<0.040	0.064	0.040	3448356
o-Xylene	mg/kg	<0.020	<0.020	<0.020	0.020	3448356
F1 (C6-C10) - BTEX	mg/kg	<12	<12	<12	12	3448356
(C6-C10)	mg/kg	<12	<12	<12	12	3448356
Surrogate Recovery (%)						
4-BROMOFLUOROBENZENE (sur.)	%	98	100	100		3448356
D10-ETHYLBENZENE (sur.)	%	109	107	104		3448356
D4-1,2-DICHLOROETHANE (sur.)	%	104	105	104		3448356
D8-TOLUENE (sur.)	%	102	102	103		3448356
O-TERPHENYL (sur.)	%	96	86	86		3448938

RDL = Reportable Detection Limit

Maxxam Job #: A953337
Report Date: 2009/10/05

POTTINGER GAHERTY ENVIRONMENTAL CONS.
Client Project #: 0125-78-01 INUVIK AIRPORT-FTA
Site Reference: INUVIK NWT
Sampler Initials: MMZ

RESULTS OF CHEMICAL ANALYSES OF SOIL

Maxxam ID		Q94136		
Sampling Date		2009/09/23		
COC Number		82324		
	Units	**TP06-2**	**RDL**	**QC Batch**
Physical Properties				
Sieve - Pan	%	47	0.2	3464672
Sieve - #200 (>0.075mm)	%	53	0.2	3464672
Grain Size	%	COARSE	0.2	3464672

RDL = Reportable Detection Limit

PETROLEUM HYDROCARBONS (CCME)

Maxxam ID		Q94135	Q94136	Q94138	Q94139		
Sampling Date		2009/09/23	2009/09/23	2009/09/23	2009/09/23		
COC Number		82324	82324	82324	82324		
	Units	**TP06-1**	**TP06-2**	**TP07-1**	**TP07-2**	**RDL**	**QC Batch**
OIL & GREASE							
F4SG (Heavy Hydrocarbons-Grav.)	mg/kg	1900	<500	930	790	500	3456781
RDL = Reportable Detection Limit							

Maxxam ID		Q94141	Q94142	Q94143	Q94144		
Sampling Date		2009/09/23	2009/09/23	2009/09/23	2009/09/23		
COC Number		82324	82324	82324	82324		
	Units	**TP08A-1**	**TP08A-2**	**TP08B-1**	**TP08B-2**	**RDL**	**QC Batch**
OIL & GREASE							
F4SG (Heavy Hydrocarbons-Grav.)	mg/kg	1100	1300	750	3300	500	3456781
RDL = Reportable Detection Limit							

Maxxam ID		Q94145	Q94146		
Sampling Date		2009/09/23	2009/09/23		
COC Number		82324	82324		
	Units	**TP09A-1**	**TP09A-2**	**RDL**	**QC Batch**
OIL & GREASE					
F4SG (Heavy Hydrocarbons-Grav.)	mg/kg	<500	600	500	3456781
RDL = Reportable Detection Limit					

General Comments

Results relate only to the items tested.

POTTINGER GAHERTY ENVIRONMENTAL CONS.
Attention: MARY ZALESKI
Client Project #: 0125-78-01 INUVIK AIRPORT-FTA
P.O. #:
Site Reference: INUVIK NWT

Quality Assurance Report

Maxxam Job Number: EA953337

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3448356 DR3	Matrix Spike	4-BROMOFLUOROBENZENE (sur.)	2009/09/29		104	%	60 - 140
		D10-ETHYLBENZENE (sur.)	2009/09/29		112	%	30 - 130
		D4-1,2-DICHLOROETHANE (sur.)	2009/09/29		106	%	60 - 140
		D8-TOLUENE (sur.)	2009/09/29		101	%	60 - 140
		Benzene	2009/09/29		98	%	60 - 140
		Toluene	2009/09/29		102	%	60 - 140
		Ethylbenzene	2009/09/29		105	%	60 - 140
		m & p-Xylene	2009/09/29		110	%	60 - 140
		o-Xylene	2009/09/29		105	%	60 - 140
		(C6-C10)	2009/09/29		113	%	60 - 140
	Spiked Blank	4-BROMOFLUOROBENZENE (sur.)	2009/09/29		100	%	60 - 140
		D10-ETHYLBENZENE (sur.)	2009/09/29		110	%	30 - 130
		D4-1,2-DICHLOROETHANE (sur.)	2009/09/29		99	%	60 - 140
		D8-TOLUENE (sur.)	2009/09/29		103	%	60 - 140
		Benzene	2009/09/29		97	%	60 - 140
		Toluene	2009/09/29		102	%	60 - 140
		Ethylbenzene	2009/09/29		104	%	60 - 140
		m & p-Xylene	2009/09/29		103	%	60 - 140
		o-Xylene	2009/09/29		100	%	60 - 140
		(C6-C10)	2009/09/29		100	%	80 - 120
	Method Blank	4-BROMOFLUOROBENZENE (sur.)	2009/09/29		98	%	60 - 140
		D10-ETHYLBENZENE (sur.)	2009/09/29		109	%	30 - 130
		D4-1,2-DICHLOROETHANE (sur.)	2009/09/29		105	%	60 - 140
		D8-TOLUENE (sur.)	2009/09/29		103	%	60 - 140
		Benzene	2009/09/29	<0.0050		mg/kg	
		Toluene	2009/09/29	<0.020		mg/kg	
		Ethylbenzene	2009/09/29	<0.010		mg/kg	
		Xylenes (Total)	2009/09/29	<0.040		mg/kg	
		m & p-Xylene	2009/09/29	<0.040		mg/kg	
		o-Xylene	2009/09/29	<0.020		mg/kg	
		F1 (C6-C10) - BTEX	2009/09/29	<12		mg/kg	
		(C6-C10)	2009/09/29	<12		mg/kg	
	RPD	Benzene	2009/09/29	NC		%	50
		Toluene	2009/09/29	NC		%	50
		Ethylbenzene	2009/09/29	NC		%	50
		Xylenes (Total)	2009/09/29	NC		%	50
		m & p-Xylene	2009/09/29	NC		%	50
		o-Xylene	2009/09/29	NC		%	50
		F1 (C6-C10) - BTEX	2009/09/29	NC		%	50
		(C6-C10)	2009/09/29	NC		%	50
3448868 CD1	Matrix Spike	4-BROMOFLUOROBENZENE (sur.)	2009/09/28		92	%	60 - 140
		D10-ETHYLBENZENE (sur.)	2009/09/28		99	%	30 - 130
		D4-1,2-DICHLOROETHANE (sur.)	2009/09/28		75	%	60 - 140
		D8-TOLUENE (sur.)	2009/09/28		101	%	60 - 140
		Benzene	2009/09/28		102	%	60 - 140
		Toluene	2009/09/28		96	%	60 - 140
		Ethylbenzene	2009/09/28		99	%	60 - 140
		m & p-Xylene	2009/09/28		96	%	60 - 140
		o-Xylene	2009/09/28		94	%	60 - 140
		(C6-C10)	2009/09/28		77	%	60 - 140
	Spiked Blank	4-BROMOFLUOROBENZENE (sur.)	2009/09/28		90	%	60 - 140
		D10-ETHYLBENZENE (sur.)	2009/09/28		93	%	30 - 130
		D4-1,2-DICHLOROETHANE (sur.)	2009/09/28		73	%	60 - 140
		D8-TOLUENE (sur.)	2009/09/28		103	%	60 - 140
		Benzene	2009/09/28		97	%	60 - 140

POTTINGER GAHERTY ENVIRONMENTAL CONS.
Attention: MARY ZALESKI
Client Project #: 0125-78-01 INUVIK AIRPORT-FTA
P.O. #:
Site Reference: INUVIK NWT

Quality Assurance Report (Continued)

Maxxam Job Number: EA953337

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3448868 CD1	Spiked Blank	Toluene	2009/09/28		96	%	60 - 140
		Ethylbenzene	2009/09/28		99	%	60 - 140
		m & p-Xylene	2009/09/28		96	%	60 - 140
		o-Xylene	2009/09/28		96	%	60 - 140
		(C6-C10)	2009/09/28		111	%	80 - 120
	Method Blank	4-BROMOFLUOROBENZENE (sur.)	2009/09/29		92	%	60 - 140
		D10-ETHYLBENZENE (sur.)	2009/09/29		99	%	30 - 130
		D4-1,2-DICHLOROETHANE (sur.)	2009/09/29		79	%	60 - 140
		D8-TOLUENE (sur.)	2009/09/29		100	%	60 - 140
		Benzene	2009/09/29	<0.0050		mg/kg	
		Toluene	2009/09/29	<0.020		mg/kg	
		Ethylbenzene	2009/09/29	<0.010		mg/kg	
		Xylenes (Total)	2009/09/29	<0.040		mg/kg	
		m & p-Xylene	2009/09/29	<0.040		mg/kg	
		o-Xylene	2009/09/29	<0.020		mg/kg	
		F1 (C6-C10) - BTEX	2009/09/29	<12		mg/kg	
		(C6-C10)	2009/09/29	<12		mg/kg	
	RPD	Benzene	2009/09/30	NC		%	50
		Toluene	2009/09/30	NC		%	50
		Ethylbenzene	2009/09/30	NC		%	50
		Xylenes (Total)	2009/09/30	NC		%	50
		m & p-Xylene	2009/09/30	NC		%	50
		o-Xylene	2009/09/30	NC		%	50
		F1 (C6-C10) - BTEX	2009/09/30	NC		%	50
		(C6-C10)	2009/09/30	NC		%	50
3448938 KO	Matrix Spike						
	[Q94136-01]	O-TERPHENYL (sur.)	2009/09/29		100	%	50 - 130
		F2 (C10-C16 Hydrocarbons)	2009/09/29		93	%	50 - 130
		F3 (C16-C34 Hydrocarbons)	2009/09/29		112	%	50 - 130
		F4 (C34-C50 Hydrocarbons)	2009/09/29		87	%	50 - 130
	Spiked Blank	O-TERPHENYL (sur.)	2009/09/29		80	%	50 - 130
		F2 (C10-C16 Hydrocarbons)	2009/09/29		104	%	80 - 120
		F3 (C16-C34 Hydrocarbons)	2009/09/29		118	%	80 - 120
		F4 (C34-C50 Hydrocarbons)	2009/09/29		104	%	80 - 120
	Method Blank	O-TERPHENYL (sur.)	2009/09/29		91	%	50 - 130
		F2 (C10-C16 Hydrocarbons)	2009/09/29	<10		mg/kg	
		F3 (C16-C34 Hydrocarbons)	2009/09/29	<10		mg/kg	
		F4 (C34-C50 Hydrocarbons)	2009/09/29	<10		mg/kg	
	RPD [Q94135-01]	F2 (C10-C16 Hydrocarbons)	2009/09/29	19.7		%	50
		F3 (C16-C34 Hydrocarbons)	2009/09/29	22.0		%	50
		F4 (C34-C50 Hydrocarbons)	2009/09/29	11.1		%	50
3449044 CD1	Matrix Spike						
	[Q94136-01]	4-BROMOFLUOROBENZENE (sur.)	2009/09/29		92	%	60 - 140
		D10-ETHYLBENZENE (sur.)	2009/09/29		103	%	30 - 130
		D4-1,2-DICHLOROETHANE (sur.)	2009/09/29		79	%	60 - 140
		D8-TOLUENE (sur.)	2009/09/29		102	%	60 - 140
		Benzene	2009/09/29		109	%	60 - 140
		Toluene	2009/09/29		100	%	60 - 140
		Ethylbenzene	2009/09/29		104	%	60 - 140
		m & p-Xylene	2009/09/29		98	%	60 - 140
		o-Xylene	2009/09/29		99	%	60 - 140
		(C6-C10)	2009/09/29		119	%	60 - 140
	Spiked Blank	4-BROMOFLUOROBENZENE (sur.)	2009/09/29		92	%	60 - 140
		D10-ETHYLBENZENE (sur.)	2009/09/29		112	%	30 - 130
		D4-1,2-DICHLOROETHANE (sur.)	2009/09/29		78	%	60 - 140

POTTINGER GAHERTY ENVIRONMENTAL CONS.
Attention: MARY ZALESKI
Client Project #: 0125-78-01 INUVIK AIRPORT-FTA
P.O. #:
Site Reference: INUVIK NWT

Quality Assurance Report (Continued)

Maxxam Job Number: EA953337

QA/QC Batch Num	Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3449044	CD1	Spiked Blank	D8-TOLUENE (sur.)	2009/09/29		100	%	60 - 140
			Benzene	2009/09/29		107	%	60 - 140
			Toluene	2009/09/29		100	%	60 - 140
			Ethylbenzene	2009/09/29		100	%	60 - 140
			m & p-Xylene	2009/09/29		96	%	60 - 140
			o-Xylene	2009/09/29		96	%	60 - 140
			(C6-C10)	2009/09/29		117	%	80 - 120
		Method Blank	4-BROMOFLUOROBENZENE (sur.)	2009/09/29		90	%	60 - 140
			D10-ETHYLBENZENE (sur.)	2009/09/29		101	%	30 - 130
			D4-1,2-DICHLOROETHANE (sur.)	2009/09/29		77	%	60 - 140
			D8-TOLUENE (sur.)	2009/09/29		101	%	60 - 140
			Benzene	2009/09/29	<0.0050		mg/kg	
			Toluene	2009/09/29	<0.020		mg/kg	
			Ethylbenzene	2009/09/29	<0.010		mg/kg	
			Xylenes (Total)	2009/09/29	<0.040		mg/kg	
			m & p-Xylene	2009/09/29	<0.040		mg/kg	
			o-Xylene	2009/09/29	<0.020		mg/kg	
			F1 (C6-C10) - BTEX	2009/09/29	<12		mg/kg	
			(C6-C10)	2009/09/29	<12		mg/kg	
		RPD [Q94135-01]	Benzene	2009/09/29	NC		%	50
			Toluene	2009/09/29	NC		%	50
			Ethylbenzene	2009/09/29	NC		%	50
			Xylenes (Total)	2009/09/29	NC		%	50
			m & p-Xylene	2009/09/29	NC		%	50
			o-Xylene	2009/09/29	NC		%	50
			F1 (C6-C10) - BTEX	2009/09/29	NC		%	50
			(C6-C10)	2009/09/29	NC		%	50
3449631	SR7	Method Blank	Moisture	2009/09/28	<0.3		%	
		RPD [Q94147-01]	Moisture	2009/09/28	7.8		%	20
3456781	JHA	Matrix Spike [Q94136-01]	F4SG (Heavy Hydrocarbons-Grav.)	2009/09/30		108	%	65 - 130
		Spiked Blank	F4SG (Heavy Hydrocarbons-Grav.)	2009/09/30		96	%	70 - 130
		Method Blank	F4SG (Heavy Hydrocarbons-Grav.)	2009/09/30	<500		mg/kg	
		RPD [Q94135-01]	F4SG (Heavy Hydrocarbons-Grav.)	2009/09/30	NC		%	50
3464672	JB9	Method Blank	Sieve - Pan	2009/10/04	<0.2		%	
			Sieve - #200 (>0.075mm)	2009/10/04	<0.2		%	

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 to which a known amount of the analyte has been added. Used to evaluate analyte recovery.
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 (RPD): The RPD was not calculated. The level of analyte detected in the parent sample and its duplicate was not sufficiently significant to permit a reliable calculation.

Your Project #: 0125-78-01 INUVIK AIRPORT-FTA
Site: INUVIK,NWT
Your C.O.C. #: 82321, 823222

Attention: MARY ZALESKI
POTTINGER GAHERTY ENVIRONMENTAL CONS.
SUITE 1200
1185 WEST GEORGIA ST
VANCOUVER, BC
CANADA V6E 4E6

Report Date: 2009/10/05
This report supersedes all previous reports with the same Maxxam job number

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: A953341
Received: 2009/09/26, 9:30

Sample Matrix: Soil
Samples Received: 24

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
BTEX/F1 by HS GC/MS (MeOH extract)	20	2009/09/26	2009/09/28	EENVSOP-00005 EENVSOP-00002	EPA 8260C/CCME
BTEX/F1 by HS GC/MS (MeOH extract)	4	2009/09/26	2009/09/29	EENVSOP-00005 EENVSOP-00002	EPA 8260C/CCME
CCME Hydrocarbons (F2-F4 in soil)	4	2009/09/26	2009/09/27	EENVSOP-00007 EENVSOP-00006	CCME PHC-CWS
CCME Hydrocarbons (F2-F4 in soil)	20	2009/09/26	2009/09/28	EENVSOP-00007 EENVSOP-00006	CCME PHC-CWS
CCME Hydrocarbons (F4G in soil)	5	2009/09/29	2009/09/29	EENVSOP-00121	CCME PHC-CWS
CCME Hydrocarbons (F4G in soil)	2	2009/09/30	2009/09/30	EENVSOP-00121	CCME PHC-CWS
Moisture	24	N/A	2009/09/28	EENVSOP-00139	Carter SSMA 51.2
Particle Size by Sieve (75 micron)	1	N/A	2009/10/04	EENVSOP-00077	SSMA 47.4

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

JEREMY WAKARUK, B.Sc., Senior Project Manager
Email: jwakaruk@maxxamanalytics.com
Phone# (780) 577-7105 Ext:7105

==========

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. SCC and CALA have approved this reporting process and electronic report format.

Total cover pages: 1

Maxxam Job #: A953341
Report Date: 2009/10/05

POTTINGER GAHERTY ENVIRONMENTAL CONS.
Client Project #: 0125-78-01 INUVIK AIRPORT-FTA
Site Reference: INUVIK,NWT
Sampler Initials: MMZ

AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		Q94162	Q94163	Q94164	Q94165		
Sampling Date		2009/09/23	2009/09/23	2009/09/23	2009/09/23		
COC Number		82321	82321	82321	82321		
	Units	**TP15-1**	**TP15-2**	**TP15-3**	**TP16-1**	**RDL**	**QC Batch**
Physical Properties							
Moisture	%	3.8	16	11	6.5	0.3	3449227
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	mg/kg	11	<10	<10	160	10	3448713
F3 (C16-C34 Hydrocarbons)	mg/kg	74	30	12	350	10	3448713
F4 (C34-C50 Hydrocarbons)	mg/kg	32	<10	<10	88	10	3448713
Reached Baseline at C50	mg/kg	Yes	Yes	Yes	Yes		3448713
Volatiles							
Benzene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	3448892
Toluene	mg/kg	<0.020	<0.020	<0.020	<0.020	0.020	3448892
Ethylbenzene	mg/kg	<0.010	<0.010	<0.010	<0.010	0.010	3448892
Xylenes (Total)	mg/kg	<0.040	<0.040	<0.040	<0.040	0.040	3448892
m & p-Xylene	mg/kg	<0.040	<0.040	<0.040	<0.040	0.040	3448892
o-Xylene	mg/kg	<0.020	<0.020	<0.020	<0.020	0.020	3448892
F1 (C6-C10) - BTEX	mg/kg	<12	<12	<12	<12	12	3448892
(C6-C10)	mg/kg	<12	<12	<12	<12	12	3448892
Surrogate Recovery (%)							
4-BROMOFLUOROBENZENE (sur.)	%	96	96	96	97		3448892
D10-ETHYLBENZENE (sur.)	%	111	113	113	112		3448892
D4-1,2-DICHLOROETHANE (sur.)	%	98	97	99	95		3448892
D8-TOLUENE (sur.)	%	102	102	101	102		3448892
O-TERPHENYL (sur.)	%	98	107	93	105		3448713

RDL = Reportable Detection Limit

Maxxam Job #: A953341
Report Date: 2009/10/05

POTTINGER GAHERTY ENVIRONMENTAL CONS.
Client Project #: 0125-78-01 INUVIK AIRPORT-FTA
Site Reference: INUVIK,NWT
Sampler Initials: MMZ

AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		Q94166	Q94167	Q94168	Q94169		
Sampling Date		2009/09/23	2009/09/23	2009/09/23	2009/09/23		
COC Number		82321	82321	82321	82321		
	Units	**TP16-2**	**TP17-1**	**TP17-2**	**TP17-3**	**RDL**	**QC Batch**
Physical Properties							
Moisture	%	9.2	9.6	6.0	19	0.3	3449227
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	mg/kg	1700	19	52	12	10	3448713
F3 (C16-C34 Hydrocarbons)	mg/kg	1200	770	530	49	10	3448713
F4 (C34-C50 Hydrocarbons)	mg/kg	35	730	130	17	10	3448713
Reached Baseline at C50	mg/kg	Yes	No	Yes	Yes		3448713
Volatiles							
Benzene	mg/kg	<0.0050	<0.0050	0.012	<0.0050	0.0050	3448892
Toluene	mg/kg	<0.020	<0.020	0.027	<0.020	0.020	3448892
Ethylbenzene	mg/kg	<0.010	<0.010	<0.010	<0.010	0.010	3448892
Xylenes (Total)	mg/kg	<0.040	<0.040	<0.040	<0.040	0.040	3448892
m & p-Xylene	mg/kg	<0.040	<0.040	<0.040	<0.040	0.040	3448892
o-Xylene	mg/kg	<0.020	<0.020	<0.020	<0.020	0.020	3448892
F1 (C6-C10) - BTEX	mg/kg	180	<12	<12	<12	12	3448892
(C6-C10)	mg/kg	180	<12	<12	<12	12	3448892
Surrogate Recovery (%)							
4-BROMOFLUOROBENZENE (sur.)	%	130	107	109	107		3448892
D10-ETHYLBENZENE (sur.)	%	118	110	113	114		3448892
D4-1,2-DICHLOROETHANE (sur.)	%	94	95	96	94		3448892
D8-TOLUENE (sur.)	%	105	106	106	105		3448892
O-TERPHENYL (sur.)	%	110	94	99	94		3448713

RDL = Reportable Detection Limit

Maxxam Job #: A953341
Report Date: 2009/10/05

POTTINGER GAHERTY ENVIRONMENTAL CONS.
Client Project #: 0125-78-01 INUVIK AIRPORT-FTA
Site Reference: INUVIK,NWT
Sampler Initials: MMZ

AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		Q94170			Q94171		
Sampling Date		2009/09/23			2009/09/23		
COC Number		82321			82321		
	Units	**TP18-1**	**RDL**	**QC Batch**	**TP18-2**	**RDL**	**QC Batch**
Physical Properties							
Moisture	%	8.9	0.3	3449227	53	0.3	3449227
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	mg/kg	33	10	3448713	<10	10	3448897
F3 (C16-C34 Hydrocarbons)	mg/kg	400	10	3448713	310	10	3448897
F4 (C34-C50 Hydrocarbons)	mg/kg	110	10	3448713	120	10	3448897
Reached Baseline at C50	mg/kg	Yes		3448713	Yes		3448897
Volatiles							
Benzene	mg/kg	<0.0050	0.0050	3448892	1.2	0.011	3448892
Toluene	mg/kg	<0.020	0.020	3448892	<0.042	0.042	3448892
Ethylbenzene	mg/kg	<0.010	0.010	3448892	<0.021	0.021	3448892
Xylenes (Total)	mg/kg	<0.040	0.040	3448892	<0.085	0.085	3448892
m & p-Xylene	mg/kg	<0.040	0.040	3448892	<0.085	0.085	3448892
o-Xylene	mg/kg	<0.020	0.020	3448892	<0.042	0.042	3448892
F1 (C6-C10) - BTEX	mg/kg	<12	12	3448892	<25	25	3448892
(C6-C10)	mg/kg	<12	12	3448892	<25	25	3448892
Surrogate Recovery (%)							
4-BROMOFLUOROBENZENE (sur.)	%	108		3448892	107		3448892
D10-ETHYLBENZENE (sur.)	%	117		3448892	114		3448892
D4-1,2-DICHLOROETHANE (sur.)	%	94		3448892	93		3448892
D8-TOLUENE (sur.)	%	106		3448892	105		3448892
O-TERPHENYL (sur.)	%	94		3448713	118		3448897

RDL = Reportable Detection Limit

Maxxam Job #: A953341
Report Date: 2009/10/05

POTTINGER GAHERTY ENVIRONMENTAL CONS.
Client Project #: 0125-78-01 INUVIK AIRPORT-FTA
Site Reference: INUVIK,NWT
Sampler Initials: MMZ

AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		Q94172	Q94173	Q94174	Q94175		
Sampling Date		2009/09/23	2009/09/23	2009/09/23	2009/09/23		
COC Number		82321	82321	823222	823222		
	Units	**TP18-3**	**GR6**	**TP01A-1**	**TP01A-2**	**RDL**	**QC Batch**
Physical Properties							
Moisture	%	29	8.8	9.6	7.1	0.3	3449227
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	mg/kg	<10	1800	140	280	10	3448897
F3 (C16-C34 Hydrocarbons)	mg/kg	120	1400	330	340	10	3448897
F4 (C34-C50 Hydrocarbons)	mg/kg	44	18	150	180	10	3448897
Reached Baseline at C50	mg/kg	Yes	Yes	Yes	Yes		3448897
Volatiles							
Benzene	mg/kg	0.39	<0.0050	<0.0050	<0.0050	0.0050	3448892
Toluene	mg/kg	<0.020	<0.020	<0.020	<0.020	0.020	3448892
Ethylbenzene	mg/kg	<0.010	<0.010	<0.010	<0.010	0.010	3448892
Xylenes (Total)	mg/kg	<0.040	<0.040	<0.040	<0.040	0.040	3448892
m & p-Xylene	mg/kg	<0.040	<0.040	<0.040	<0.040	0.040	3448892
o-Xylene	mg/kg	<0.020	<0.020	<0.020	<0.020	0.020	3448892
F1 (C6-C10) - BTEX	mg/kg	<12	160	<12	<12	12	3448892
(C6-C10)	mg/kg	<12	160	<12	<12	12	3448892
Surrogate Recovery (%)							
4-BROMOFLUOROBENZENE (sur.)	%	107	135	112	114		3448892
D10-ETHYLBENZENE (sur.)	%	116	120	117	115		3448892
D4-1,2-DICHLOROETHANE (sur.)	%	95	94	96	96		3448892
D8-TOLUENE (sur.)	%	104	105	107	108		3448892
O-TERPHENYL (sur.)	%	109	117	101	106		3448897

RDL = Reportable Detection Limit

Maxxam Job #: A953341
Report Date: 2009/10/05

POTTINGER GAHERTY ENVIRONMENTAL CONS.
Client Project #: 0125-78-01 INUVIK AIRPORT-FTA
Site Reference: INUVIK,NWT
Sampler Initials: MMZ

AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		Q94176	Q94177	Q94178	Q94179		
Sampling Date		2009/09/23	2009/09/23	2009/09/23	2009/09/23		
COC Number		823222	823222	823222	823222		
	Units	**TP01B-1**	**TP01B-2**	**TP02A-1**	**TP02A-2**	**RDL**	**QC Batch**
Physical Properties							
Moisture	%	9.5	10	11	8.5	0.3	3449227
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	mg/kg	<10	<10	<10	<10	10	3448897
F3 (C16-C34 Hydrocarbons)	mg/kg	1100	850	320	310	10	3448897
F4 (C34-C50 Hydrocarbons)	mg/kg	350	830	240	210	10	3448897
Reached Baseline at C50	mg/kg	No	No	No	Yes		3448897
Volatiles							
Benzene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	3448892
Toluene	mg/kg	<0.020	<0.020	<0.020	<0.020	0.020	3448892
Ethylbenzene	mg/kg	<0.010	<0.010	<0.010	<0.010	0.010	3448892
Xylenes (Total)	mg/kg	<0.040	<0.040	<0.040	<0.040	0.040	3448892
m & p-Xylene	mg/kg	<0.040	<0.040	<0.040	<0.040	0.040	3448892
o-Xylene	mg/kg	<0.020	<0.020	<0.020	<0.020	0.020	3448892
F1 (C6-C10) - BTEX	mg/kg	<12	<12	<12	<12	12	3448892
(C6-C10)	mg/kg	<12	<12	<12	<12	12	3448892
Surrogate Recovery (%)							
4-BROMOFLUOROBENZENE (sur.)	%	116	116	112	114		3448892
D10-ETHYLBENZENE (sur.)	%	119	116	119	117		3448892
D4-1,2-DICHLOROETHANE (sur.)	%	93	94	95	95		3448892
D8-TOLUENE (sur.)	%	108	108	107	107		3448892
O-TERPHENYL (sur.)	%	100	114	120	106		3448897

RDL = Reportable Detection Limit

AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		Q94180		Q94181		
Sampling Date		2009/09/23		2009/09/23		
COC Number		823222		823222		
	Units	**TP02B-1**	**QC Batch**	**TP02B-2**	**RDL**	**QC Batch**
Physical Properties						
Moisture	%	8.0	3449227	6.3	0.3	3449227
Ext. Pet. Hydrocarbon						
F2 (C10-C16 Hydrocarbons)	mg/kg	220	3448897	180	10	3448775
F3 (C16-C34 Hydrocarbons)	mg/kg	7800	3448897	6400	10	3448775
F4 (C34-C50 Hydrocarbons)	mg/kg	4200	3448897	1900	10	3448775
Reached Baseline at C50	mg/kg	No	3448897	No		3448775
Volatiles						
Benzene	mg/kg	<0.0050	3448892	<0.0050	0.0050	3448892
Toluene	mg/kg	<0.020	3448892	<0.020	0.020	3448892
Ethylbenzene	mg/kg	<0.010	3448892	<0.010	0.010	3448892
Xylenes (Total)	mg/kg	<0.040	3448892	<0.040	0.040	3448892
m & p-Xylene	mg/kg	<0.040	3448892	<0.040	0.040	3448892
o-Xylene	mg/kg	<0.020	3448892	<0.020	0.020	3448892
F1 (C6-C10) - BTEX	mg/kg	<12	3448892	<12	12	3448892
(C6-C10)	mg/kg	<12	3448892	<12	12	3448892
Surrogate Recovery (%)						
4-BROMOFLUOROBENZENE (sur.)	%	114	3448892	116		3448892
D10-ETHYLBENZENE (sur.)	%	113	3448892	115		3448892
D4-1,2-DICHLOROETHANE (sur.)	%	96	3448892	95		3448892
D8-TOLUENE (sur.)	%	106	3448892	109		3448892
O-TERPHENYL (sur.)	%	80	3448897	82		3448775

RDL = Reportable Detection Limit

Maxxam Job #: A953341
Report Date: 2009/10/05

POTTINGER GAHERTY ENVIRONMENTAL CONS.
Client Project #: 0125-78-01 INUVIK AIRPORT-FTA
Site Reference: INUVIK,NWT
Sampler Initials: MMZ

AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		Q94182	Q94183	Q94184	Q94185		
Sampling Date		2009/09/23	2009/09/23	2009/09/23	2009/09/23		
COC Number		823222	823222	823222	823222		
	Units	**TP03-1**	**TP04-1**	**TP04-2**	**GR1**	**RDL**	**QC Batch**
Physical Properties							
Moisture	%	17	13	11	11	0.3	3449631
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	mg/kg	110	<10	<10	<10	10	3448563
F3 (C16-C34 Hydrocarbons)	mg/kg	2800	26	24	17	10	3448563
F4 (C34-C50 Hydrocarbons)	mg/kg	1200	<10	<10	<10	10	3448563
Reached Baseline at C50	mg/kg	No	Yes	Yes	Yes		3448563
Volatiles							
Benzene	mg/kg	<0.0050	0.25	0.58	0.27	0.0050	3449044
Toluene	mg/kg	<0.020	0.042	0.037	0.029	0.020	3449044
Ethylbenzene	mg/kg	<0.010	<0.010	<0.010	<0.010	0.010	3449044
Xylenes (Total)	mg/kg	<0.040	<0.040	<0.040	<0.040	0.040	3449044
m & p-Xylene	mg/kg	<0.040	<0.040	<0.040	<0.040	0.040	3449044
o-Xylene	mg/kg	<0.020	<0.020	<0.020	<0.020	0.020	3449044
F1 (C6-C10) - BTEX	mg/kg	<12	17	23	<12	12	3449044
(C6-C10)	mg/kg	<12	18	23	<12	12	3449044
Surrogate Recovery (%)							
4-BROMOFLUOROBENZENE (sur.)	%	93	91	92	91		3449044
D10-ETHYLBENZENE (sur.)	%	103	102	101	99		3449044
D4-1,2-DICHLOROETHANE (sur.)	%	78	78	78	79		3449044
D8-TOLUENE (sur.)	%	101	101	100	98		3449044
O-TERPHENYL (sur.)	%	107	107	97	102		3448563

RDL = Reportable Detection Limit

Maxxam Job #: A953341
Report Date: 2009/10/05

POTTINGER GAHERTY ENVIRONMENTAL CONS.
Client Project #: 0125-78-01 INUVIK AIRPORT-FTA
Site Reference: INUVIK,NWT
Sampler Initials: MMZ

RESULTS OF CHEMICAL ANALYSES OF SOIL

Maxxam ID		Q94171		
Sampling Date		2009/09/23		
COC Number		82321		
	Units	**TP18-2**	**RDL**	**QC Batch**
Physical Properties				
Sieve - Pan	%	84	0.2	3464672
Sieve - #200 (>0.075mm)	%	16	0.2	3464672
Grain Size	%	FINE	0.2	3464672

RDL = Reportable Detection Limit

PETROLEUM HYDROCARBONS (CCME)

Maxxam ID		Q94167		Q94176		
Sampling Date		2009/09/23		2009/09/23		
COC Number		82321		823222		
	Units	**TP17-1**	**QC Batch**	**TP01B-1**	**RDL**	**QC Batch**
OIL & GREASE						
F4SG (Heavy Hydrocarbons-Grav.)	mg/kg	1600	3456781	1600	500	3452327
RDL = Reportable Detection Limit						

Maxxam ID		Q94177		Q94178	Q94180		
Sampling Date		2009/09/23		2009/09/23	2009/09/23		
COC Number		823222		823222	823222		
	Units	**TP01B-2**	**QC Batch**	**TP02A-1**	**TP02B-1**	**RDL**	**QC Batch**
OIL & GREASE							
F4SG (Heavy Hydrocarbons-Grav.)	mg/kg	2000	3456872	500	15000	500	3452327
RDL = Reportable Detection Limit							

Maxxam ID		Q94181	Q94182		
Sampling Date		2009/09/23	2009/09/23		
COC Number		823222	823222		
	Units	**TP02B-2**	**TP03-1**	**RDL**	**QC Batch**
OIL & GREASE					
F4SG (Heavy Hydrocarbons-Grav.)	mg/kg	9200	3600	500	3452327
RDL = Reportable Detection Limit					

General Comments

Sample Q94171-01: Detection limits raised due to high moisture content(btex/f1).

Results relate only to the items tested.

POTTINGER GAHERTY ENVIRONMENTAL CONS.
Attention: MARY ZALESKI
Client Project #: 0125-78-01 INUVIK AIRPORT-FTA
P.O. #:
Site Reference: INUVIK,NWT

Quality Assurance Report

Maxxam Job Number: EA953341

QA/QC Batch Num	Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3448563	YT	Matrix Spike	O-TERPHENYL (sur.)	2009/09/27		110	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2009/09/27		113	%	50 - 130
			F3 (C16-C34 Hydrocarbons)	2009/09/27		95	%	50 - 130
			F4 (C34-C50 Hydrocarbons)	2009/09/27		114	%	50 - 130
		Spiked Blank	O-TERPHENYL (sur.)	2009/09/27		120	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2009/09/27		110	%	80 - 120
			F3 (C16-C34 Hydrocarbons)	2009/09/27		92	%	80 - 120
			F4 (C34-C50 Hydrocarbons)	2009/09/27		110	%	80 - 120
		Method Blank	O-TERPHENYL (sur.)	2009/09/27		108	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2009/09/27	<10		mg/kg	
			F3 (C16-C34 Hydrocarbons)	2009/09/27	<10		mg/kg	
			F4 (C34-C50 Hydrocarbons)	2009/09/27	<10		mg/kg	
		RPD	F2 (C10-C16 Hydrocarbons)	2009/09/27	NC		%	50
			F3 (C16-C34 Hydrocarbons)	2009/09/27	28.3		%	50
			F4 (C34-C50 Hydrocarbons)	2009/09/27	27.4		%	50
3448713	KO	Matrix Spike	O-TERPHENYL (sur.)	2009/09/28		93	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2009/09/28		89	%	50 - 130
			F3 (C16-C34 Hydrocarbons)	2009/09/28		110	%	50 - 130
			F4 (C34-C50 Hydrocarbons)	2009/09/28		89	%	50 - 130
		Spiked Blank	O-TERPHENYL (sur.)	2009/09/28		97	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2009/09/28		93	%	80 - 120
			F3 (C16-C34 Hydrocarbons)	2009/09/28		115	%	80 - 120
			F4 (C34-C50 Hydrocarbons)	2009/09/28		95	%	80 - 120
		Method Blank	O-TERPHENYL (sur.)	2009/09/28		91	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2009/09/28	<10		mg/kg	
			F3 (C16-C34 Hydrocarbons)	2009/09/28	<10		mg/kg	
			F4 (C34-C50 Hydrocarbons)	2009/09/28	<10		mg/kg	
		RPD	F2 (C10-C16 Hydrocarbons)	2009/09/28	NC		%	50
			F3 (C16-C34 Hydrocarbons)	2009/09/28	NC		%	50
			F4 (C34-C50 Hydrocarbons)	2009/09/28	NC		%	50
3448775	LD2	Matrix Spike	O-TERPHENYL (sur.)	2009/09/28		91	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2009/09/28		114	%	50 - 130
			F3 (C16-C34 Hydrocarbons)	2009/09/28		122	%	50 - 130
			F4 (C34-C50 Hydrocarbons)	2009/09/28		116	%	50 - 130
		Spiked Blank	O-TERPHENYL (sur.)	2009/09/28		92	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2009/09/28		115	%	80 - 120
			F3 (C16-C34 Hydrocarbons)	2009/09/28		112	%	80 - 120
			F4 (C34-C50 Hydrocarbons)	2009/09/28		105	%	80 - 120
		Method Blank	O-TERPHENYL (sur.)	2009/09/28		121	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2009/09/28	<10		mg/kg	
			F3 (C16-C34 Hydrocarbons)	2009/09/28	12, RDL=10		mg/kg	
			F4 (C34-C50 Hydrocarbons)	2009/09/28	<10		mg/kg	
		RPD	F2 (C10-C16 Hydrocarbons)	2009/09/28	NC		%	50
			F3 (C16-C34 Hydrocarbons)	2009/09/28	NC		%	50
			F4 (C34-C50 Hydrocarbons)	2009/09/28	NC		%	50
3448892	AN1	Matrix Spike [Q94163-01]	4-BROMOFLUOROBENZENE (sur.)	2009/09/28		99	%	60 - 140
			D10-ETHYLBENZENE (sur.)	2009/09/28		113	%	30 - 130
			D4-1,2-DICHLOROETHANE (sur.)	2009/09/28		90	%	60 - 140
			D8-TOLUENE (sur.)	2009/09/28		103	%	60 - 140
			Benzene	2009/09/28		95	%	60 - 140
			Toluene	2009/09/28		97	%	60 - 140
			Ethylbenzene	2009/09/28		101	%	60 - 140
			m & p-Xylene	2009/09/28		103	%	60 - 140
			o-Xylene	2009/09/28		102	%	60 - 140

POTTINGER GAHERTY ENVIRONMENTAL CONS.
Attention: MARY ZALESKI
Client Project #: 0125-78-01 INUVIK AIRPORT-FTA
P.O. #:
Site Reference: INUVIK,NWT

Quality Assurance Report (Continued)

Maxxam Job Number: EA953341

QA/QC Batch Num	Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3448892	AN1	Matrix Spike						
		[Q94163-01]	(C6-C10)	2009/09/28		110	%	60 - 140
		Spiked Blank	4-BROMOFLUOROBENZENE (sur.)	2009/09/28		101	%	60 - 140
			D10-ETHYLBENZENE (sur.)	2009/09/28		103	%	30 - 130
			D4-1,2-DICHLOROETHANE (sur.)	2009/09/28		103	%	60 - 140
			D8-TOLUENE (sur.)	2009/09/28		101	%	60 - 140
			Benzene	2009/09/28		86	%	60 - 140
			Toluene	2009/09/28		82	%	60 - 140
			Ethylbenzene	2009/09/28		84	%	60 - 140
			m & p-Xylene	2009/09/28		86	%	60 - 140
			o-Xylene	2009/09/28		87	%	60 - 140
			(C6-C10)	2009/09/28		93	%	80 - 120
		Method Blank	4-BROMOFLUOROBENZENE (sur.)	2009/09/28		96	%	60 - 140
			D10-ETHYLBENZENE (sur.)	2009/09/28		112	%	30 - 130
			D4-1,2-DICHLOROETHANE (sur.)	2009/09/28		89	%	60 - 140
			D8-TOLUENE (sur.)	2009/09/28		104	%	60 - 140
			Benzene	2009/09/28	<0.0050		mg/kg	
			Toluene	2009/09/28	<0.020		mg/kg	
			Ethylbenzene	2009/09/28	<0.010		mg/kg	
			Xylenes (Total)	2009/09/28	<0.040		mg/kg	
			m & p-Xylene	2009/09/28	<0.040		mg/kg	
			o-Xylene	2009/09/28	<0.020		mg/kg	
			F1 (C6-C10) - BTEX	2009/09/28	<12		mg/kg	
			(C6-C10)	2009/09/28	<12		mg/kg	
		RPD [Q94162-01]	Benzene	2009/09/28	NC		%	50
			Toluene	2009/09/28	NC		%	50
			Ethylbenzene	2009/09/28	NC		%	50
			Xylenes (Total)	2009/09/28	NC		%	50
			m & p-Xylene	2009/09/28	NC		%	50
			o-Xylene	2009/09/28	NC		%	50
			F1 (C6-C10) - BTEX	2009/09/28	NC		%	50
			(C6-C10)	2009/09/28	NC		%	50
3448897	LD2	Matrix Spike	O-TERPHENYL (sur.)	2009/09/28		94	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2009/09/28		79	%	50 - 130
			F3 (C16-C34 Hydrocarbons)	2009/09/28		111	%	50 - 130
			F4 (C34-C50 Hydrocarbons)	2009/09/28		107	%	50 - 130
		Spiked Blank	O-TERPHENYL (sur.)	2009/09/28		85	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2009/09/28		105	%	80 - 120
			F3 (C16-C34 Hydrocarbons)	2009/09/28		107	%	80 - 120
			F4 (C34-C50 Hydrocarbons)	2009/09/28		105	%	80 - 120
		Method Blank	O-TERPHENYL (sur.)	2009/09/28		119	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2009/09/28	<10		mg/kg	
			F3 (C16-C34 Hydrocarbons)	2009/09/28	<10		mg/kg	
			F4 (C34-C50 Hydrocarbons)	2009/09/28	<10		mg/kg	
		RPD	F2 (C10-C16 Hydrocarbons)	2009/09/28	26.3		%	50
			F3 (C16-C34 Hydrocarbons)	2009/09/28	14.7		%	50
			F4 (C34-C50 Hydrocarbons)	2009/09/28	NC		%	50
3449044	CD1	Matrix Spike	4-BROMOFLUOROBENZENE (sur.)	2009/09/29		92	%	60 - 140
			D10-ETHYLBENZENE (sur.)	2009/09/29		103	%	30 - 130
			D4-1,2-DICHLOROETHANE (sur.)	2009/09/29		79	%	60 - 140
			D8-TOLUENE (sur.)	2009/09/29		102	%	60 - 140
			Benzene	2009/09/29		109	%	60 - 140
			Toluene	2009/09/29		100	%	60 - 140
			Ethylbenzene	2009/09/29		104	%	60 - 140
			m & p-Xylene	2009/09/29		98	%	60 - 140

POTTINGER GAHERTY ENVIRONMENTAL CONS.
Attention: MARY ZALESKI
Client Project #: 0125-78-01 INUVIK AIRPORT-FTA
P.O. #:
Site Reference: INUVIK,NWT

Quality Assurance Report (Continued)

Maxxam Job Number: EA953341

QA/QC Batch Num	Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3449044	CD1	Matrix Spike	o-Xylene	2009/09/29		99	%	60 - 140
			(C6-C10)	2009/09/29		119	%	60 - 140
		Spiked Blank	4-BROMOFLUOROBENZENE (sur.)	2009/09/29		92	%	60 - 140
			D10-ETHYLBENZENE (sur.)	2009/09/29		112	%	30 - 130
			D4-1,2-DICHLOROETHANE (sur.)	2009/09/29		78	%	60 - 140
			D8-TOLUENE (sur.)	2009/09/29		100	%	60 - 140
			Benzene	2009/09/29		107	%	60 - 140
			Toluene	2009/09/29		100	%	60 - 140
			Ethylbenzene	2009/09/29		100	%	60 - 140
			m & p-Xylene	2009/09/29		96	%	60 - 140
			o-Xylene	2009/09/29		96	%	60 - 140
			(C6-C10)	2009/09/29		117	%	80 - 120
		Method Blank	4-BROMOFLUOROBENZENE (sur.)	2009/09/29		90	%	60 - 140
			D10-ETHYLBENZENE (sur.)	2009/09/29		101	%	30 - 130
			D4-1,2-DICHLOROETHANE (sur.)	2009/09/29		77	%	60 - 140
			D8-TOLUENE (sur.)	2009/09/29		101	%	60 - 140
			Benzene	2009/09/29	<0.0050		mg/kg	
			Toluene	2009/09/29	<0.020		mg/kg	
			Ethylbenzene	2009/09/29	<0.010		mg/kg	
			Xylenes (Total)	2009/09/29	<0.040		mg/kg	
			m & p-Xylene	2009/09/29	<0.040		mg/kg	
			o-Xylene	2009/09/29	<0.020		mg/kg	
			F1 (C6-C10) - BTEX	2009/09/29	<12		mg/kg	
			(C6-C10)	2009/09/29	<12		mg/kg	
		RPD	Benzene	2009/09/29	NC		%	50
			Toluene	2009/09/29	NC		%	50
			Ethylbenzene	2009/09/29	NC		%	50
			Xylenes (Total)	2009/09/29	NC		%	50
			m & p-Xylene	2009/09/29	NC		%	50
			o-Xylene	2009/09/29	NC		%	50
			F1 (C6-C10) - BTEX	2009/09/29	NC		%	50
			(C6-C10)	2009/09/29	NC		%	50
3449227	SR7	Method Blank	Moisture	2009/09/28	<0.3		%	
		RPD [Q94162-01]	Moisture	2009/09/28	7.6		%	20
3449631	SR7	Method Blank	Moisture	2009/09/28	<0.3		%	
		RPD	Moisture	2009/09/28	7.8		%	20
3452327	JHA	Spiked Blank	F4SG (Heavy Hydrocarbons-Grav.)	2009/09/29		96	%	70 - 130
		Method Blank	F4SG (Heavy Hydrocarbons-Grav.)	2009/09/29	<500		mg/kg	
3456781	JHA	Matrix Spike	F4SG (Heavy Hydrocarbons-Grav.)	2009/09/30		108	%	65 - 130
		Spiked Blank	F4SG (Heavy Hydrocarbons-Grav.)	2009/09/30		96	%	70 - 130
		Method Blank	F4SG (Heavy Hydrocarbons-Grav.)	2009/09/30	<500		mg/kg	
		RPD	F4SG (Heavy Hydrocarbons-Grav.)	2009/09/30	NC		%	50
3456872	AR6	Spiked Blank	F4SG (Heavy Hydrocarbons-Grav.)	2009/09/30		120	%	70 - 130
		Method Blank	F4SG (Heavy Hydrocarbons-Grav.)	2009/09/30	<500		mg/kg	
3464672	JB9	Method Blank	Sieve - Pan	2009/10/04	<0.2		%	
			Sieve - #200 (>0.075mm)	2009/10/04	<0.2		%	

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 to which a known amount of the analyte has been added. Used to evaluate analyte recovery.
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 (RPD): The RPD was not calculated. The level of analyte detected in the parent sample and its duplicate was not sufficiently significant to permit a reliable calculation.

Appendix 5

Investigation QA/QC Data

TABLE 5-1
Soil Results - EXTRACTABLE PETROLEUM HYDROCARBONS RPD CALCULATIONS
Former Fire Training Area, Inuvik (Mike Zubko) Airport, Inuvik, NWT
PWGSC, PGL File: 0125-78-01

Sample		Parameter			
Location	**Depth (m)**	**PHC F2**	**PHC F3**	**PHC F4**	**PHC F4SG**
Detection Limit		**10**	**10**	**10**	**500**
5 x MDL		**50**	**50**	**50**	**2500**
Screening Criteria		**40%**	**40%**	**40%**	**40%**
TP04-1[c]	0.6-0.8	<10	26	<10	-
GR1 (Dup of TP04-1)[c]	0.6-.8	<10	17	<10	-
RPD		**NC**	**NC**	**NC**	**NC**
TP07-3[f]	1.5-1.7	23	33	69	-
GR2 (Dup of TP07-3)[f]	1.5-1.7	18	32	78	-
RPD		**NC**	**NC**	**12%**	**NC**
TP10-2[f]	1.7-1.9	210	190	54	-
GR3 (Dup of 10-2)[f]	1.7-1.9	360	300	91	-
RPD		**53%**	**45%**	**51%**	**NC**
TP11-1[c]	0.5-0.7	5700	2800	1000	2900
GR4(Dup of TP11-1)[c]	0.5-0.7	6800	3600	1300	3100
RPD		**18%**	**25%**	**26%**	**7%**
TP13-3c	1.3-1.5	5600	1400	360	1700
GR5 (Dup of BH13-3)c	1.3-1.5	4000	1100	270	800
RPD		**33%**	**24%**	**29%**	**NC**
TP16-2c	1.7-1.9	1700	1200	35	-
GR6 (Dup of BH16M)c	1.7-1.9	1800	1400	18	-
RPD		**6%**	**15%**	**NC**	**NC**

NOTES: Sample results are presented as ug/g (ppm) on a dry weight basis.

PHC F2to F4	Petroleum Hydrocarbons, fraction 2 to fraction 4
TP	Test Pit
GR	Replicate/Duplicate Sample
<	Less than the stated detection limit
RPD	Relative Percent Difference
NC	Not Calculated

TABLE 5-2
Soil Results - MONOCYCLIC AROMATIC HYDROCARBONS RPD CALCULATIONS
Former Fire Training Area, Inuvik (Mike Zubko) Airport, Inuvik, NWT
PWGSC, PGL File: 0125-78-01

Sample		Parameter						
Location	Depth (m)	benzene	toluene	ethylbenzene	xylenes (total)	m & p-xylene	o-xylene	PHC F1
Detection Limit		0.005	0.02	0.01	0.04	0.04	0.02	12
5 x MDL		**0.025**	**0.1**	**0.05**	**0.2**	**0.2**	**0.1**	**60**
Screening Criteria		**40%**	**40%**	**40%**	**40%**	**40%**	**40%**	**40%**
TP04-1c	0.6-0.8	0.25	0.042	<0.010	<0.040	<0.040	<0.020	17
GR1 (Dup of TP04-1)c	0.6-0.8	0.27	0.029	<0.010	<0.040	<0.040	<0.020	<12
RPD		**8%**	**NC**	**NC**	**NC**	**NC**	**NC**	**NC**
TP07-3f	1.5-1.7	0.033	<0.020	<0.010	<0.040	<0.040	<0.020	<12
GR2 (Dup of TP07-3)f	1.5-1.7	<0.0050	<0.020	0.031	0.064	0.064	<0.020	<12
RPD		**NC**	**NC**	**NC**	**NC**	**NC**	**NC**	**NC**
TP10-2f	1.7-1.9	0.49	1.4	0.68	8.7	6.2	2.5	170
GR3 (Dup of 10-2)f	1.7-1.9	0.76	2.9	1.5	13	9.1	3.5	210
RPD		**43%**	**70%**	**75%**	**40%**	**38%**	**33%**	**21%**
TP11-1c	0.5-0.7	0.66	0.11	6.5	7.2	7	0.23	800
GR4(Dup of TP11-1)c	0.5-0.7	0.55	0.23	5.5	7.2	6.7	0.56	450
RPD		**18%**	**71%**	**17%**	**NC**	**4%**	**84%**	**56%**
TP13-3c	1.3-1.5	0.24	1.3	7.4	22	16	6.3	2100
GR5 (Dup of BH13-3)c	1.3-1.5	0.14	0.39	3.2	6.8	5.1	1.7	960
RPD		**53%**	**108%**	**79%**	**106%**	**103%**	**115%**	**75%**
TP16-2c	1.7-1.9	<0.0050	<0.020	<0.010	<0.040	<0.040	<0.020	180
GR6 (Dup of BH16-2)c	1.7-1.9	<0.0050	<0.020	<0.010	<0.040	<0.040	<0.020	160
RPD		**NC**	**NC**	**NC**	**NC**	**NC**	**NC**	**12%**

NOTES: Sample results are presented as ug/g (ppm) on a dry weight basis.

PHC F2to F4	Petroleum Hydrocarbons, fraction 1
TP	Test Pit
GR	Replicate/Duplicate Sample
<	Less than the stated detection limit
MDL	Minimum Detection Limit
RPD	Relative Percent Difference
NC	Not Calculated

Appendix 6

NCSCS Forms

CCME National Classification System for Contaminated Sites (2008)
Pre-Screening Checklist
APEC 2 Former Fire Training Area

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)
Summary of Site Conditions
APEC 2 Former Fire Training Area
Inuvik (Mike Zubko) Airport, Inuvik, NT

Subject Site:	**APEC 2 Former Fire Training Area**	
Civic Address: *(or other description of location)*	Inuvik (Mike Zubko) Airport, Inuvik, NT	
Site Common Name : *(if applicable)*	Former Fire Training Area	
Site Owner or Custodian: *(Organization and Contact Person)*	Transport Canada/GNWT	
Legal description *or* metes and bounds:	Not available	
Approximate Site area:	6,000m²	
PID(s) : *(or Parcel Identification Numbers [PIN] if untitled Crown land)*	Not available	
Centre of site: *(provide latitude/longitude or UTM coordinates)*	Latitude: Longitude:	68° 18' 7.00" N 133° 31' 12.00" W
	UTM Coordinate:	
Site Land Use:	Current:	Storage
	Proposed:	No change
Site Plan	**Refer to Figure 2 of Report**	
Provide a brief description of the Site:	APEC 2 is located approximately 600m west of the airport runway, encompasses an area of about 60m by 100m (Figure 2), and is generally flat. The land slopes down to the north, east and west of the site, and topography indicates the area was most likely built up with fill material. To the north of the site is the runway approach area lined with runway towers. A gravel road bounds the site to the south, beyond which are two land treatment units (LTUs) (Figure 2). The site consists of a former mock-up area where fuel was periodically burned as part of firefighting training exercises. Surface staining was noted in the northeast corner of the site, and north west of the former ASTs. Staining was also noted in the general vicinity of where the mock-ups were located.	
Affected media and Contaminants of Potential Concern (COPC):	PHC F1-F4, benzene, toluene, ethylbenzene and xylenes	

Please fill in the "letter" that best describes the level of information available for the site being assessed

Site Letter Grade **C**

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:	**Pottinger Gaherty Environmental Consultants Ltd.**
Date Scoring Completed:	**November 13, 2009**

CCME National Classification System (2008)

(I) Contaminant Characteristics

APEC 2 Former Fire Training Area

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			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/cegg_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		Laboratory results indicate that several of the soil samples throughout APEC 2 exceeded the applicable standards for PHC F1-F4, benzene, toluene, ethylbenzene and xylenes.		
B. Groundwater	Do Not Know	Existing monitoring wells onsite were found to be dry during our field program, and no significant groundwater was encountered during the test pit program. As a result, no groundwater samples were collected.		
Yes No Do Not Know				
C. Surface water	No	There is no surface water or sediment in APEC 2.		
Yes No Do Not Know				
D. Sediment	No			
Yes No Do Not Know				
"Known" -score	2			
"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		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.
High Medium Low Do Not Know		Based on benzene		
"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")?	High (>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.
Mobile NAPL High (>100x) Medium (10x to 100x) Low (1x to 10x) Do Not Know				
"Known" -score	6			
"Potential" - score	---			
		Based on benzene		

CCME National Classification System (2008)

(I) Contaminant Characteristics

APEC 2 Former Fire Training Area

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	>10 hectare (ha) or 5000 m3	roughly 5,900m^3 to 8,000m^3 of PHC and MAH impacted soil identified at the site.	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	9			
"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	No		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	There are no utilities that could be damaged.		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	light extractable petroleum hydrocarbons, heavy extractable petroleum hydrocarbons, and aromatic hydrocarbons	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	2			
"Potential" - Score	---			

Contaminant Characteristic Total

Raw Total Scores- "Known"	27
Raw Total Scores- "Potential"	1
Raw Combined Total Scores	28
Total Score (Raw Combined / 40 * 33)	**23.1**

CCME National Classification System (2008)

(II) Migration Potential (Evaluation of contaminant migration pathways)

APEC 2 Former Fire Training Area

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	Low 1	Existing monitoring wells onsite were found to be dry during our field program, and no significant groundwater was encountered during the test pit program.	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		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 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 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 Bulletins (TABS) Number 19 –21.
c. Thickness of confining layer over aquifer of concern o 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	Intentionally left blank	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 Score	Do Not Know 0.5	Intentionally left blank	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 vertical migration of contaminants from the source location to the saturated water table aquifer, first hydrostratigraphic unit or other groundwater pathway.	

CCME National Classification System (2008)

(II) Migration Potential (Evaluation of contaminant migration pathways)

APEC 2 Former Fire Training Area

Definition	Score	Rationale for Score (document any assumptions, reports, or site-specific information; provide references)	Method Of Evaluation	Notes
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	None	Rainfall Annual Rainfall norm 1971 - 2000 is 117mm = 0.1 Permeability For infiltration assume: gravel (0) rainfall run off score = 0.1 * 0 = 0	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.	
Score	0			
f. Hydraulic conductivity of aquifer $>10^{-2}$ cm/s 10^{-2} to 10^{-4} cm/s $<10^{-4}$ cm/s Do Not Know	<10-4 cm/s	Shale	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).	
Score	0			
Potential groundwater pathway total	5			
Allowed Potential score	5	Note: If a "known" score is provided, the "potential" score is disallowed.		
Groundwater pathway total	**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).	12	Intentionally left blank	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 us 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 resource 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.
ii) Same as (i) except the information is not known but strongly suspected based on indirect observations.	8			
iii) Meets CWQG or absence of surface water exposure pathway (i.e., Distance to nearest surface water is > 5 km.)	0			
Score	Go to Potential ---			
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)				

CCME National Classification System (2008)

(II) Migration Potential (Evaluation of contaminant migration pathways)

APEC 2 Former Fire Training Area

Definition	Score	Rationale for Score (document any assumptions, reports, or site-specific information; provide references)	Method Of Evaluation	Notes
B. Potential for migration of COPCs in surface water				
a. Presence of containmen No containmen Partial containmen Full containmen Do Not Know		There is no engineered containment at the site.	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 betwe the site and nearby surface water. Full containment must include containment of all chemicals.	
	No containment			
Score	5			
b. Distance to Surface Water 0 to <100 m 100 - 300 m >300 m Do Not Know		Dolomite Lake (Airport Lake) is located approximately 500m south of the Site. There is a spring approximately 100m south of the Site.	Review available mapping and survey data to determine distance to nearest surface water bodies.	
	100 - 300 m			
Score	2			
c. Topography Contaminants above ground level and slope is ste Contaminants at or below ground level and slope is ste Contaminants above ground level and slope is intermedia Contaminants at or below ground level and slope is intermedia Contaminants above ground level and slope is fl Contaminants at or below ground level and slope is fl Do Not Know		APEC 2 is located approximately 600m west of the airport runway, encompasses an area of abou 60m by 100m, and is generally 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.).	
	At/below and fla			
Score	0			
d. Run-off potential High Moderate Low Very Low None Do Not Know		Rainfall Annual Rainfall norm 1971 - 2000 is 117mm = 0.1 Permeability For infiltration assume: gravel (0) rainfall run off score = 0.1 * 0 = 0	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)
	None			
Score	0			
e. Flood potentia 1 in 2 years 1 in 10 years 1 in 50 years Do Not Know		The site is not on a known flood plain.	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.	
	1 in 50 years			
Score	0.2			
Potential surface water pathway total	7.2			
Allowed Potential score	7.2	Note: If a "known" score is provided, the "potential" score is disallowed.		
Surface water pathway total	**7.2**			
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	Refer to Tables 1 and 2.	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			
	12			
Score	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 Vegetatec Landscaped Paved Do Not Know		Intentionally left blank	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 NC 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.
	Do Not Know			
Score	4			
b. For what proportion of the year does the site remain covered t snow? 0 to 10% of the yea 10 to 30% of the yea More than 30% of the yea Do Not Know		Intentionally left blank	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 wh ch are predominantly dry and not covered by snow (and therefore are more likely to generate dust).	
	Do Not Know			
Score	3			
Potential surface soil pathway total	7			
Allowed Potential score	---	**Note: If a "known" score is provided, the "potential" score is disallowed.**		
Soil pathway total	**12**			

CCME National Classification System (2008)

(II) Migration Potential (Evaluation of contaminant migration pathways)

APEC 2 Former Fire Training Area

Definition	Score	Rationale for Score (document any assumptions, reports, or site-specific information; provide references)	Method Of Evaluation	Notes
4. Vapour				
A. Demonstrated COPCs in vapour.				
Vapour has been measured (indoor or outdoor) in concentrations exceeding risk based concentrations. Strongly suspected (based on observations and/or modelling) Vapour has not been measured and volatile hydrocarbons have not been found in site soils or groundwater.	12 9 0	Volatile hydrocarbons are present at significant concentrations in soil.	Consult previous investigations, including human health risk assessments, for reports of vapours detected.	
	9			
Score	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) High (H' > 1.0E-1) Moderate (H' = 1.0E-1 to 1.0E-3 Low (H' < 1.0E-3) Not Volatile Do Not Know		Intentionally left blank	Reference: US EPA Soil Screening Guidance (Part 5 - Table 36) *Provided in Attached Reference Materials*	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 Potential for COPCs will be automatically assigned scores of zero and you can skip to section 5.
	Do Not Know			
Score	2.5			
b. What is the soil grain size? Fine Coarse Do Not Know		Intentionally left blank	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).	
	Do Not Know			
Score	3			
c. Is the depth to the source less than 10m? Yes No Do Not Know		Intentionally left blank	Review groundwater depths below grade for the site.	
	Do Not Know			
Score	1			
d. Are there any preferential pathways? Yes No Do Not Know		Intentionally left blank	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 becau 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.
	Do Not Know			
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**			

CCME National Classification System (2008)

(II) Migration Potential (Evaluation of contaminant migration pathways)

APEC 2 Former Fire Training Area

Definition	Score	Rationale for Score (document any assumptions, reports, or site-specific information; provide references)	Method Of Evaluation	Notes
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	The site is not a sedimentary deposition or erosional environment. There is no mechanism for the deposition or transport of sediment to or from the site regardless of the distance to an aquatic recieving environment.		
	0			
Score	0			
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				
a. Are the sediments having COPC exceedances capped with sediments having no exceedances ("clean sediments")?	Do Not Know		Review existing sediment assessments. If sediment coring has been completed, it may indicate th 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.	
Yes				
No				
Do Not Know	2			
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?	Do Not Know	Intentionally left blank	Review existing sediment assessments. If the sediments present at the site are in a river, select "no" for this question.	
Yes				
No				
Do Not Know	2			
c. For rivers, are the contaminated sediments in an area prone t sediment scouring?	Do Not Know		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 m	
Yes				
No				
Do Not Know	2			
Potential sediment pathway total	6			
Allowed Potential score	---	Note: If a "known" score is provided, the "potential" score is disallowed.		
Sediment pathway total	**0**			
6. Modifying Factors				
Are there subsurface utility conduits in the area affected b contamination?	No		Consult existing engineering reports. Subsurface utilities can act as conduits for contaminant migration.	
Yes				
No		There are no subsurface utility conduits in the area.		
Do Not Know				
Known	0			
Potentia	0			

Migration Potential Total		
Raw "known" total	21	
Raw "potential" total	12.2	
Raw combined total	33.2	Note: If "Known" and "Potential" scores are provided, the checklist defaults to known. Therefore,
Total (max 33)	**17.1**	the total "Potential" Score may not reflect the sum of the individual "Potential" scores.

(III) Exposure (Demonstrates the presence of an exposure pathway and receptors)

APEC 2 Former Fire Training Area

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*)	22	Intentionally left blank	*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 jurisdictio (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
Same as above, but "Strongly Suspected" based on observations or indirect evidence.	10			
No quantified or suspected exposures/impacts in humans.	0			
	Go to Potential			
Score	---			
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		Land use at airports is generally considered as commercial land use. Standards and guidelines for commercial land use are used for numerical comparison to the laboratory analytical results.	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).
	Commercial			
Score	1			
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		APEC 2 is not a public access area.	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 th has no cover, fence, natural barriers or buffer.	
	Mod. access, covered			
Score	1			
B. Potential for human exposure				
c) Potential for intake of contaminated soil, water, sediment or foods fo 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		soils are present exceeding their respective CCME guidelines, therefore dermal contact is assumed.	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.
	Yes			
Score	3			
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		there are no inhabitable buildings on the site within 30 m of soils with volatile contamination as determined in Worksheet II (Migration Potential).	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 conta 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 1332www.ccme.ca Golder, 2004. Soil Vapour Intrusion Guidance for Health Canada Screening Level Risk Assessment (SLRA) Submitted to Health Canada, Burnaby, BC
	No			
Score	0			
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 surfac soil is not contaminated, enter a score of zero. Fine Coarse Surface soil is not contaminated or absent (bedrock) Do Not Know Texture			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.	
	Coarse			
Score	1			
inhalation total	1			

CCME National Classification System (2008)

(III) Exposure (Demonstrates the presence of an exposure pathway and receptors)

APEC 2 Former Fire Training Area

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.			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.	**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: Choose a score based on the proximity to a drinking water supply, to indicate the potential for contamination (present or future).				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.
0 to 100 m 100 to 300 m 300 m to 1 km 1 to 5 km No drinking water present Do Not Know		Drinking water supply is from municipal sources	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.	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.
	No drinking water preser			
Score	0			
Is an alternative water supply readily available?				
Yes No Do Not Know	No	No alternative water supply known.		
Score	1			
Is human ingestion of contaminated soils possible?			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.	
Yes No Do Not Know	Yes	contaminated soils are located within the top 1.5 m, therefore it is assumed that ingestion of soils is an operable exposure pathway.		
Score	3			
Are food items consumed by people, such as plants, domestic animals or wildlife harvested from the contaminated land and its surroundings?			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.	
Yes No Do Not Know	No	The site is not a source of food.		
Score	0			
Ingestion total	4			
Human Health Total "Potential" Score	10	Note if a "Known" Human Health score is provided, the "Potential" score is disallowed.		
Allowed "Potential" Score	10			
2. Human Exposure Modifying Factors				
a) Strong reliance of local people on natural resources for survival (i.e., food, water, shelter, etc.)	No			
Yes No Do Not Know				
Known	0	The site is not inhabited.		
Potential	---			
Raw Human "known" total	0			
Raw Human "potential" total	10			
Raw Human Exposure Total Score	10			
Human Health Total (max 22)	**10.0**			
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 contaminate 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 s 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 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	Intentionally left blank	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)

APEC 2 Former Fire Training Area

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	Commercial	Land use at airports is generally considered as commercial land use. Standards and guidelines for commercial land use are used for numerical comparison to the laboratory analytical results.	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	1			
ii) Uptake potential Direct Contact - Are plants and/or soil invertebrates likely exposed t contaminated soils at the site? Yes No Do Not Know	Yes	contaminated soils are located within the top 1.5 m, therefore it is assumed that direct contact of soils with plants and soil invertebrates is an operable exposure pathway.	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 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	No	There is no surface water on the site and existing monitoring wells onsite wer found to be dry during our field program, and no significant groundwater was encountered during the test pit program.	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	0			
Are terrestrial animals likely to be ingesting contaminated soils at the site? Yes No Do Not Know	Yes	contaminated soils are located within the top 1.5 m, therefore it is assumed that terrestrial animals are likely to be ingesting contaminated soils at the site.	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	No	Petroluem hydrocarbons do not bioaccumulate.	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	0			
Distance to sensitive terrestrial ecological area 0 to 300 m 300 m to 1 km 1 to 5 km > 5 km Do Not Know	300 m to 1 km	Dolomite Lake (Airport Lake) is located approximately 500m south 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	2			
Raw Terrestrial Total Potential	5	Note if a "Known" Ecological Effects score is provided, the "Potential" score is disallowed.		
Allowed Terrestrial Total Potential	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	Not Applicable (no aquatic environn	There are no aquatic environments on the site.	"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	0			
ii) Uptake potential Does groundwater daylighting to an aquatic environment exceed th CCME water quality guidelines for the protection of aquatic life at th point of contact? Yes No (or Not Applicable) Do Not Know	No	Existing monitoring wells onsite were found to be dry during our field program and no significant groundwater was encountered during the test pit program.	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			
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	300 m to 1 km	Dolomite Lake (Airport Lake) is located approximately 500m south of the Site	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	2		Bioaccumulation of food items is possible if:	

CCME National Classification System (2008)

(III) Exposure (Demonstrates the presence of an exposure pathway and receptors)

APEC 2 Former Fire Training Area

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?		Petroluem hydrocarbons do not bioaccumulate.	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.	
Yes				
No				
Do Not Know	No			
Score	0			
Raw Aquatic Total Potential	2	Note if a "Known" Ecological Effects score is provided, the "Potential" score is disallowed.		
Allowed Aquatic Total Potential	2			
4. Ecological Exposure Modifying Factors				
a) Known occurrence of a species at risk.			Consult any ecological risk assessment reports. If information is not present, utilize on-line databas 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
Is there a potential for a species at risk to be present at the site?		intentionally left blank		
Yes				
No				
Do Not Know	Do Not Know			

Score	1			
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?	Do Not Know	intentionally left blank	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-m addresses. Evidence of changes must be documented, please attach copy of report containing relevant information.
Yes				
No	---			
Do Not Know	1			
Is there evidence of olfactory impact (i.e., unpleasant smell)?	Do Not Know		Examples of olfactory change can include the smell of a COPC or an increase in the rate of decay in an aquatic habitat.	
Yes		intentionally left blank		
No	---			
Do Not Know	1			
Is there evidence of increase in plant growth in the lake or water body?	Do Not Know		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.	
Yes		intentionally left blank		
No	---			
Do Not Know	1			
Is there evidence that fish or meat taken from or adjacent to the site smells or tastes different?	Do Not Know		Some contaminants can result in a distinctive change in the way food gathered from the site tastes smells.	
Yes	---	intentionally left blank		
No	1			
Do Not Know				
Ecological Modifying Factors Total - Knowr	**---**			
Ecological Modifying Factors Total - Potentia	**5**			
Raw Ecological Total - Known	0			
Raw Ecological Total - Potential	12			
Raw Ecological Total	12			
Ecological Total (Max 18)	**12.0**			
5. Other Potential Contaminant Receptors				
a) Exposure of permafrost (leading to erosion and structural concerns)				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.
Are there improvements (roads, buildings) at the site dependant upon the permafrost for structural integrity?	No	There are no improvements (roads, buildings) at the site dependant upon the permafrost for structural integrity.	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.	
Yes				
No	0			
Do Not Know	---			
Is there a physical pathway which can transport soils released by damaged permafrost to a nearby aquatic environment?	No		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.	
Yes		There is no physical pathway which can transport soils released by damaged permafrost to a nearby aquatic environment. There is no surface water on the site and the topography is generally flat.		
No	0			
Do Not Know	---			
Other Potential Receptors Total - Known	**0**			
Other Potential Receptors Total - Potential	**0**			

Exposure Total		
Raw Human Health + Ecological Total - Known	0	Only includes "Allowed potential" - if a "Known" score was supplied under a given category then the "Potential" score was not included.
Raw Human Health + Ecological Total - Potential	22	
Raw Total	22	
Exposure Total (max 34)	**16.3**	

CCME National Classification System (2008)
Score Summary
APEC 2 Former Fire Training Area

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	2	1
2. Chemical Hazard	8	---
3. Contaminant Exceedance Factor	6	---
4. Contaminant Quantity	9	---
5. Modifying Factors	2	---
Raw Total Score	27	1
Raw Total Score (Known + Potential)	28	
Adjusted Total Score (Raw Total / 40 *33)	**23.1**	(max 33)

II. Migration Potential	Known	Potential
1. Groundwater Movement	---	5
2. Surface Water Movement	---	7.2
3. Soil	12	---
4. Vapour	9	---
5. Sediment Movement	0	---
6. Modifying Factors	0	0
Raw Total Score	21	12.2
Raw Total Score (Known + Potential)	33.2	
Adjusted Total Score (Raw Total / 64 * 33)	**17.1**	(max 33)

III. Exposure	Known	Potential
1. Human Receptors		
A. Known Impact	---	
B Potential		
a. Land Use		1
b. Accessibility		1
c. Exposure Route		
i. Direct Contact		3
ii. Inhalation		1
iii. Ingestion		4
2. Human Receptors Modifying Factors	0	---
Raw Total Human Score	0	10
Raw Total Human Score (Known + Potential)	10	
Adjusted Total Human Score	10.0	(maximum 22)
3. Ecological Receptors		
A. Known Impact	---	
B. Potential		
a. Terrestrial		5
b. Aquatic		2
4. Ecological Receptors Modifying Factors	---	5
Raw Total Ecological Score	0	12
Raw Total Ecological Score (Known + Potential)	12	
Adjusted Total Ecological Score	12.0	(maximum 18)
5. Other Receptors	0	0
Total Other Receptors Score (Known + Potential)	0	
Total Exposure Score (Human + Ecological + Other)	**22.0**	
Adjusted Total Exposure Score (Total Exposure / 46 * 34)	**16.3**	(max 34)

Site Score

APEC 2 Former Fire Training Area

Site Letter Grade	**C**
Certainty Percentage	**69%**
% Responses that are "Do Not Know"	**14%**
Total NCSCS Score for site	**56.5**
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.