Bijaya Adhikari

From: Joshua Clark <jclark@ntpc.com>
Sent: Monday, July 18, 2016 3:22 PM
To: accmanager@northwestel.net
Subject: Former Plant Site Remediation Project in Akalavik
Attachments: Aklavik Cemetery Remediation Report (2).pdf

Hi Tanya,

It was nice talking with you today. I just wanted to follow up on the conversation we had this afternoon regarding the remediation project at the former plant site. To address the concern of impacts in the graveyard I've attached a remediation report from 2004. The report summarizes the remediation activities conducted at the graveyard site next to the former plant site. The report states that all soil impacts were removed from the graveyard during the remediation project.

Unfortunately due to availability myself and the Project Manager from Matrix Solutions (the consulting company contracted to conduct the remediation project at the former plant site) will not be able to travel to Aklavik until mid-August. We would be more than happy to have a meeting with any interested parties to discuss the project then.

If there are any concerns or questions that someone would like answered before August maybe we can set up a meeting via telephone or Skype?

Thanks and talk with you soon.

Joshua Clark
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SITE REMEDIATION

Anglican Cemetery
Aklavik, Northwest Territories

Final Report
(Y/Ref.: 107306) (O/Ref.: NT4025)

NORTHWEST TERRITORIES POWER CORPORATION

January 2005

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Biogenie

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Anglican Cemetery
Aklavik, Northwest Territories

Final Report
(Y/Ref.: 107306) (O/Ref.: NT4025)

NORTHWEST TERRITORIES POWER CORPORATION

January 2005

Presented to: Mr. Eddie Smith
Environmental Analyst

Written by:
Eric Thomassin-Lacroix, Microbiol., M.Sc.
Project Manager

Verified by:
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Team Leader

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1 INTRODUCTION

Biogenie S.R.D.C. Inc. (hereinafter called "Biogenie") was retained by the Northwest Territories Power Corporation (hereinafter called "NTPC") in June 2004 to complete the remediation of hydrocarbon-contaminated soil at the Anglican cemetery in Aklavik, Northwest Territories. The location of Aklavik is shown in Figure 1.

1.1 AUTHORIZATION

A written authorization to proceed with the site remediation activities was provided to Biogenie in a service agreement dated June 16, 2004,by Mr. Robert Schmidt, Manager, Corporate Health, Safety & Environment, NTPC.

1.2 SCOPE OF WORK

The specific objectives of the remediation work were as follows:

- complete soil remediation activities in the Anglican cemetery by excavating hydrocarbon-impacted soil with concentrations above the *Canada-Wide Standards for Petroleum Hydrocarbons in Soil* (Canadian Council of Ministers of the Environment (CCME), 2001) for petroleum hydrocarbons (PHCs), residential land use;
- place the excavated soil into 0.6 m^3 bags and store it on NTPC's property;
- conduct confirmatory sampling on the floors and walls of the excavations by carrying out chemical analyses for benzene, toluene, ethylbenzene and xylenes (BTEX) and PHCs fraction 1 through fraction 4 (F1 through F4);
- backfill the excavations with material similar to the original soil and seed the area;
- collect soil samples from the 1999 soil stockpile located on NTPC's property; and
- produce a report describing the details and results of the site remediation activities.

The range of the report and limitations of responsibilities can be found in Appendix A of the present report.

Figure 1
SITE LOCATION
AKLAVIK, NORTHWEST TERRITORIES

2 SITE DESCRIPTION

The Aklavik Anglican cemetery is legally described as Lot 27A. The site is enclosed with a chain link fence to the north and a wooden fence to the south of the property.

2.1 SURROUNDING LAND USE

The surrounding land use is comprised of residential, commercial, and undeveloped land. The NTPC power plant is located to the north of the cemetery, while several residential homes and some Hamlet buildings are located to the south. Adjacent to the west is a municipal road and several houses and, further west, low density commercial development.

2.2 BACKGROUND AND PREVIOUS STUDIES

On June 1, 2003, NTPC discovered a leaking joint on the heating oil tank pipe located on the western side of the NTPC power plant site office. It appears from the contaminated area that the tank may have been leaking for some time. The heating oil tank and the office are located immediately adjacent and north of the Anglican graveyard. Surface staining was noted from the ground beneath the tank to the northwest corner of the graveyard and extending south over a small area of the cemetery. The staining appeared to have originated from the tank at the back of the office.

Following the discovery of the spill, NTPC coordinated 2 meetings with the Hamlet and Resources, Wildlife and Economic Development (RWED). The objective of the first meeting was to determine the sequence of actions to be taken immediately after the impacted soil had been discovered. As a result of the meeting, it was decided that an investigation of the impacted area be carried out in order to determine the extent of the contamination. NTPC retained the services of Golder Associates to perform an investigation at their power generating station in Aklavik. The scope of work was to conduct a reconnaissance of the site and surrounding areas, to carry out interviews with NTPC and local people as well as to collect water and soil samples in the impacted areas in order to determine the nature of the impacts in the cemetery. Once the results from the investigation were finalized, NTPC, the Hamlet and RWED met again and developed an action plan for the remediation of the site (Biogenie, 2003).

Biogenie conducted site remediation activities at the Anglican cemetery in July 2003 (Biogenie, 2003). The work consisted of reviewing previous environmental reports and proceeding with the excavation of shallow impacted soil over the graveyard identified previously by Golder Associates (Golder Associates, 2003). Confirmatory sampling was also done in the excavations by carrying out chemical analyses for BTEX and PHC (F1 through F4). A total of 25 m^3 of hydrocarbon-impacted soil was hand-excavated from the cemetery, and the soil was stockpiled on NTPC's property for disposal. Following the remediation activities, PHC concentrations exceeding the applicable criteria were still present in the area located just south of NTPC's office, as well as in the northern portion of the excavated area in the cemetery (Biogenie, 2003). Approximately 5 m^3 of hydrocarbon-impacted soil remained from the July 2003 field work.

3 FIELD ACTIVITIES

Mr. Guy Caumartin, Senior Technician for Biogenie, visited the site from July 26 to 28, 2004. He was responsible for the excavation and containerization of hydrocarbon-impacted soil in the Anglican cemetery as well as the confirmatory sampling which followed the site remediation activities. Community representatives (Hamlet employment officer and Anglican pastor) were met with before starting the remediation work in order to receive their approval and agreement on the work methodology to be used. They both agreed on the use of a backhoe in order to excavate the hydrocarbon-impacted soil in the cemetery. Two labourers were hired from the community to provide support and assistance for the work to be performed at the cemetery.

Remediation activities took place using a backhoe provided by a local contractor. Hydrocarbon-impacted soil was excavated to a maximum depth of 1.3 m below grade in the cemetery just south of NTPC's office. Excavated soil was immediately placed into 0.6 m^3 bags which were then transferred and stored on NTPC's property. A plastic membrane was installed on the northern wall of the excavation (EX2) in order to prevent the migration of contaminants from the power plant site to the cemetery and to differentiate between the remediated area and the undisturbed one. The open excavation was backfilled using clean soil and the area was seeded to insure the growth of the indigenous vegetation. The soil stockpile present form the 1999 spill was also sampled to measure its PHC concentration.

Following the remediation work, a total of 24 bags, or approximately 14.4 m^3 of soil, were filled with the soil excavated from the Anglican cemetery. An additional 14 bags, or approximately 8.4 m^3 of soil, were filled with the remainder of hydrocarbon-impacted soil excavated from the cemetery in July 2003 and stored on NTPC's property.

3.1 SOIL STRATIGRAPHY

The soil in the cemetery consists of a 0.05 m organic layer composed of grass and roots, followed by gray to black, wet, clayey silt to silt material to the maximum depth of the excavation (1.3 m).

3.2 SAMPLING METHODOLOGY

Three composite samples, made of at least 5 sub-samples, were collected from the walls and floor of the excavation, as shown in Figure 2. One composite sample, also made of at least 5 sub-samples, was collected from the 1999 soil stockpile. The samples were placed in glass jars provided by the laboratory. A reserved fraction of each sample was immediately placed in jars to be analyzed for BTEX concentrations. For preservation purposes, the selected samples were transported in coolers and maintained at a temperature below 10°C.

4 RESULTS OF THE REMEDIATION ACTIVITIES

4.1 SELECTION OF APPROPRIATE CRITERIA

The site under investigation was evaluated according to the *Environmental Guideline for Contaminated Site Remediation* (GNWT, 2003) based on the *Canada-Wide Standards for Petroleum Hydrocarbons in Soil* (CCME, 2001). Generic criteria for BTEX in soil were selected according to the land use based on the *Canadian Environmental Quality Guidelines* (CCME, 2003).

Site-specific criteria for PHC, F1 through F4, impacts were selected based on the *Canada-Wide Standards for Petroleum Hydrocarbons in Soil* (CCME, 2001) according to 4 factors: land use, grain size, protection of groundwater for aquatic life, and protection of potable groundwater. Among the applicable criteria, the most stringent were selected. Since the site under investigation is a cemetery, criteria applicable for residential land use were selected.

Generic guidelines are available for 2 types of soil: coarse and fine-grained. These soil types are defined as having a median grain size (d_{50}) greater or less than 75 µm, respectively. The type of soil potentially controlling the migration of the constituents of concern at the cemetery is fine-grained.

Two exposure pathways were excluded from the site under investigation. The protection of groundwater for aquatic life must be considered if a surface water body is located less than 10 m from a petroleum hydrocarbon-impacted site (CCME, 2001). Based on previous reports and the site location, this pathway was excluded. Also, the protection for potable groundwater must be considered if a site is underlain by groundwater of potable quality in sufficient yield (hydraulic conductivity of 10^{-4} cm/s or greater). The presence of nearby potable water wells is also considered when evaluating this exposure pathway. Nevertheless, due to the absence of drinking water wells in the area under investigation and the presence of permafrost, the protection of potable groundwater has been excluded. The management criteria resulting from the site characteristics are presented in Table I. These criteria were used for the evaluation of the impacted areas in the cemetery.

Table I : Tier I Management Criteria for Fine-Grained Soil and Residential Land Use

Parameters	Surface Soil (0-1.5 m depth) (mg/kg)
Benzene	0.5
Toluene	0.8
Ethylbenzene	1.2
Xylenes	1.0
PHC (F1)	260
PHC (F2)	900
PHC (F3)	800
PHC (F4)	5,600

F1:C_6 to C_{10}, does not include BTEX fractions.
F2: $C_{>10}$ to C_{16}
F3: $C_{>16}$ to C_{34}
F4: $C_{>34}$ to C_{50+}

4.2 CHEMICAL ANALYSIS RESULTS

A total of 4 soil samples were submitted to the laboratory to analyze their content of PHCs (F1 through F4) and BTEX. The first 3 samples were collected from Excavation No. 2 (EX2). The fourth sample was collected from the 1999 soil stockpile located on NTPC's property. Figure 2 shows the area where the excavation took place as well as chemical analysis results for all soil samples. Chemical analysis results are presented in Table II, and the official certificate of analysis provided by the laboratory can be found in Appendix B.

Two samples showed either PHC and/or BTEX concentrations above the applicable criteria presented in Table I. The first one is sample (EX2-WALL1-A) which was collected from the northern wall of excavation No. 2. This sample presented a PHC concentration of 563 mg/kg in PHC (F1) concentrations, 2,100 mg/kg in PHC (F2) concentrations and 1,900 mg/kg in PHC (F3) concentrations. The same sample also had toluene, ethylbenzene and xylenes concentrations above the applicable criteria. This result is not surprising since at the time of sampling, visual field observations indicated the presence of contamination along the NTPC property limits (right on the fence line). Also, the Phase III ESA completed at the site in July 2003 showed PHC impacts along the property limits (Biogenie, 2004). The scope of work for this project was to remove hydrocarbon-impacted soil exclusively from the graveyard, which was done, and not from NTPC's property. The second sample showing impacts above the guidelines is Pile (1999), which was collected from the 1999 soil stockpile located on NTPC's property. This sample presented PHC (F2) concentrations of 1,200 mg/kg as well as PHC (F3) concentrations of 9,000 mg/kg.

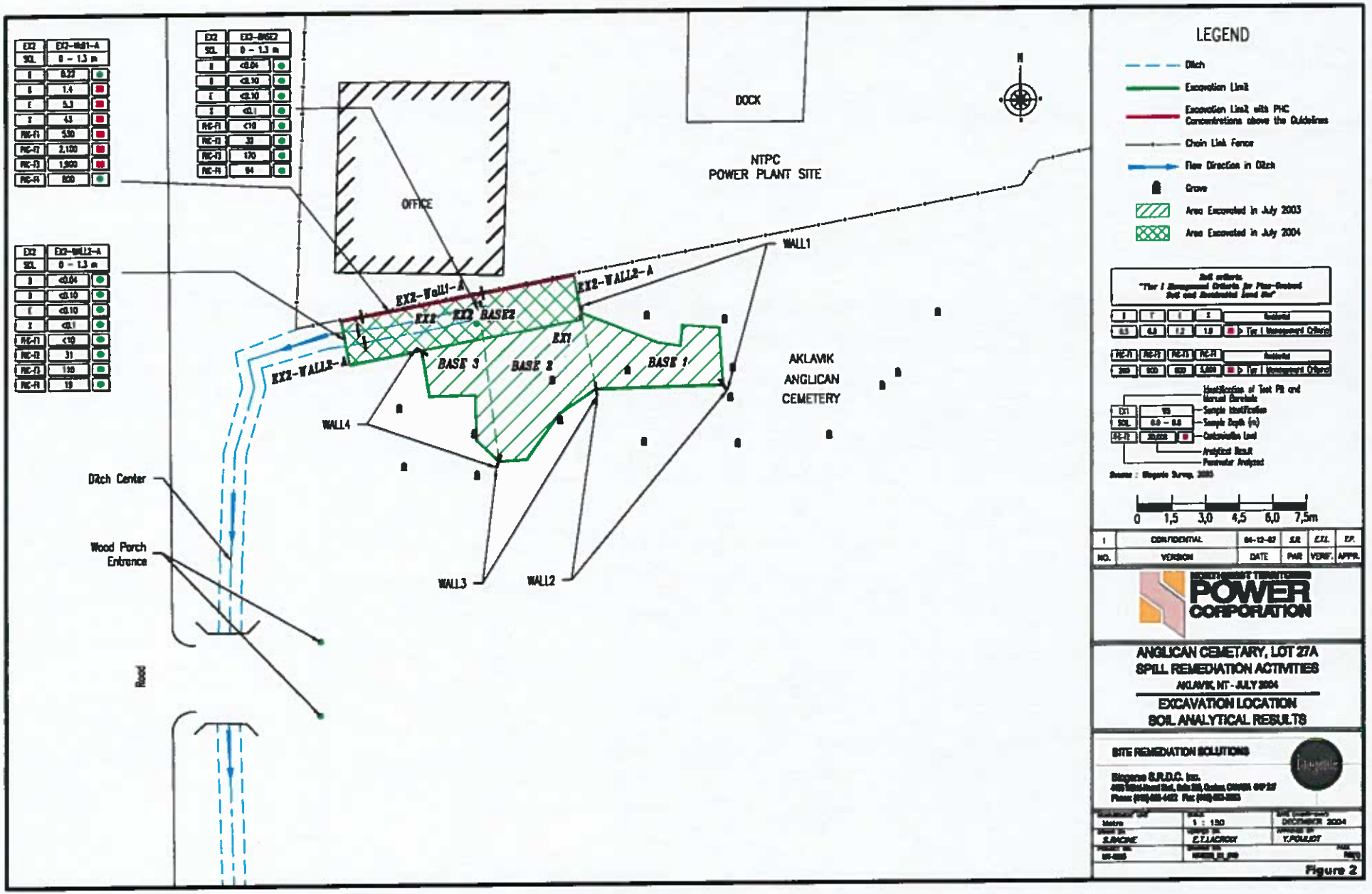
A photomontage showing each step of the site remediation activities is provided in Appendix C.

Table II : Soil Chemical Analysis Results - BTEX and PHCs (F1 through F4)

Sample ID	Philip ID	Sampling Date	Parameters							
			Benzene mg/kg	Toluene mg/kg	Ethylbenzene mg/kg	Xylenes mg/kg	PHC - F1 mg/kg	PHC - F2 mg/kg	PHC - F3 mg/kg	PHC - F4 mg/kg
EX2-WALL1-A	34030788	2004-07-27	0.22	[illegible]	[illegible]	[illegible]	530	2,100	1,900	800
EX2-WALL2-A	34030789	2004-07-27	<0,04	<0,10	<0,10	<0,1	<10	31	110	19
EX2-BASE2	34030790	2004-07-27	<0,04	<0,10	<0,10	<0,1	<10	32	170	94
Pile (1999)	34030791	2004-07-27	<0,04	<0,10	<0.10	0.2	15	1,200	9,000	1,300
Residential Land Use (CEQG, 2003)			0.5	0.8	1.2	1.0	-	-	-	-
Tier 1 CWS Levels for Surface Soil (Coarse-Grained)			-	-	-	-	260	900	800	5,600

PHC - F1: Petroleum hydrocarbons C_6 to C_{10}
PHC - F2: Petroleum hydrocarbons $C_{>10}$ to C_{16}
PHC - F3: Petroleum hydrocarbons $C_{>16}$ to C_{34}
PHC - F4: Petroleum hydrocarbons $C_{>34}$ to C_{50}.
1 mg/kg: 1 part per million (ppm)
Shaded area indicates sample exceeds the specific remediation guidelines (Residential Land Use)

S:/P/NT/4025/Results-July04-mod1



5 CONCLUSIONS

Site remediation activities carried out at the Aklavik Anglican cemetery successfully removed all hydrocarbon-contaminated soil present in the graveyard. An estimated volume of 14.4 m^3 of hydrocarbon-impacted soil was removed from the cemetery during the site remediation activities. The soil was placed in 0.6 m^3 bags and stored on NTPC's property for later disposal. An additional 14 bags, or approximately 8.4 m^3 of soil, were filled with the remainder of hydrocarbon-impacted soil excavated from the July 2003 visit.

Some PHC contamination was left beneath the fence, just south of the office building (north wall of excavation No. 2). It is recommended that the remainder of this soil be excavated and remediated when the power plant site is decommissioned.

6 REFERENCES

Biogenie (2003). *Site Remediation – Anglican Cemetery, Aklavik - Northwest Territories.* Presented to Northwest Territories Power Corporation in October 2003.

Biogenie (2004). *Phase III Environmental Site Assessment – NTPC Power Plant, Aklavik - Northwest Territories.* Presented to Northwest Territories Power Corporation in February 2004.

Canadian Council of Ministers of the Environment (2001). *Canada-Wide Standards for Petroleum Hydrocarbons in Soil.* Endorsed by the Canadian Council of Ministers of the Environment, April 30-May 1, 2001, Winnipeg.

Canadian Council of Ministers of the Environment (2003). *Canadian Environmental Quality Guidelines*- Summary Table (Update 2003).

Golder Associates Ltd. (2003). *Spill Investigation – Aklavik, NT.*

Government of the Northwest Territories (2003). *Environmental Guideline for Contaminated Site Remediation.* Environmental Protection Service. Department of Resources, Wildlife and Economic Development, November 2003.

APPENDIX A

Range of the Report and Limitation of Responsibilities

RANGE OF THE REPORT AND LIMITATION OF RESPONSIBILITIES

A – Recipient and Use

This report ("Report") was prepared by Biogenie S.R.D.C. Inc. ("Biogenie") at the request and for the sole benefit of Northwest Territories Power Corporation ("Client"), and is intended to be used exclusively by the Client.

B –Site Conditions

Any description of the target site ("Site"), soil and/or groundwater included in the Report is only provided as an indication to the Client, and unless otherwise specifically mentioned in the Report such description shall not at any time and under any circumstances be used for purposes other than to gain a better understanding of the Site and to fulfil the requirements of the mandate assigned to Biogenie by the Client ("Mandate").

All information, including but not limiting the comprehensiveness of the data, charts, descriptions, drawings, tables, analysis results, compilations, and any conclusion and recommendation included in the Report, shall arise from the direct observation of the Site during a specific period, namely the fulfilment of the Mandate, and from the interpretation of such information and data available during the same period.

The content of the Report shall not apply in any way or to any part of the Site or to any parameter, material or analysis excluded from the Mandate.

Biogenie shall not be held responsible for the presence of any substance or material of a different nature, or of a similar nature but with different concentrations, as those indicated in the Report, and this in any part or parts of the Site excluded from the Mandate.

The content of the Report, including its conclusions and recommendations, shall not apply to any period preceding or following the Mandate. The physiochemical conditions of the Site, and the type and degree of contamination identified on the Site, may vary within a given period depending on a number of factors, especially the current activities taking place on the Site and/or on lands adjacent to the Site.

A review of the Report and/or changes in the parameters, conclusions and/or recommendations may prove to be necessary in the event of a change in the Site conditions or the discovery of pertinent information subsequent to the production of the Report.

C - Legislation, Regulations, Guidelines and Policies

The interpretation of the data and observations concerning the Site, as well as the conclusions and recommendations resulting from these, shall take into account the laws, regulations, standards, policies and/or guidelines applicable to the Project and that are in effect at the time of the fulfilment of the Mandate. In the event no current law, regulation, policy, guideline or standard applies to the project, Biogenie shall take into account proven environmental and professional rules and practices when drawing up the Report.

Any change in the legislation, regulations, standards, policies and/or guidelines applicable to the project may result in the need to review the Report and/or modify its parameters, conclusions and/or recommendations.

D – Use of Report

The Report is intended for the exclusive use of the Client and shall only be used for the purpose it was meant for.

The content of the Report and its conclusions and recommendations only apply to the Site and may not, at any time and under any circumstances, apply to any land adjacent to the Site or to any other land located in the vicinity of the Site.

Any reproduction in any form whatsoever and any distribution or use of the Report, in whole or in part, by a person other that the Client, is strictly forbidden without the prior written consent of Biogenie. Biogenie makes no declaration and pledges no responsibility towards any person other than the Client with regard to the content of the Report and the conclusions and recommendations expressed therein.

Biogenie is in no way responsible for any loss, fine or penalty, or for any expense, damage or other prejudice of any type whatsoever, sustained by a person other than the Client as a result of the unauthorized use of the Report.

No provision of the Report shall be construed as or considered to be a legal opinion of Biogenie's.

APPENDIX B

Chemical Analysis Certificate and Chain of Custody

PSC

ANALYTICAL SERVICES

9619 42 Avenue
Edmonton, Alberta
Canada T6E 5R2
Tel 780 465 1212
Fax 780 450 4187

05-Aug-04

Certificate of Analysis

Reported To :

BIOGENIE Client Code BI

350 RUE FRANQUET
SAINTE FOY, QUEBEC
G1P 4P3

Attention : ERIC THOMASSIN-LACROIX
Phone : (418) 653-4422
FAX : (418) 653-3583

Project Information :

Project ID : NT 4025-001-101
Submitted By: GUY CAUMARTIN

Requisition Forms :

Form 42033918 shipped on 28-Jul-04 received on 29-Jul-04 logged on 29-Jul-04 completed on 4-Aug-04

Remarks :

+ All blank values are reported. Associated data are not blank corrected.
+ 'MDL' = Method Detection Limit, '<' = Less than MDL, '---' = Not analyzed
+ Solids results are based on dry weight except Biota Analyses & Special Waste Oil & Grease
+ Organic analyses are not corrected for extraction recovery standards except for Isotope Dilution methods, (i.e. CARB 429 PAH, all PCDD/F and DBD/DBF analyses)
+ All CCME results met required criteria unless otherwise stated in the report.
  All data on final reports are validated by technical personnel. Signature on file at laboratory.
  Deviations from Reference Method for the Canadian-wide Standard for Petroleum Hydrocarbons in Soil - Tier 1 Method:
  - F1 data reported using validated headspace instrumentation method
  - F2/F3/F4 data reported using validated cold solvent extraction instead of Soxhlet extraction
+ All Groundwater samples except BTEX/VOC's or Purgeable Hydrocarbons are decanted and/or filtered prior to analysis unless otherwise mandated by regulatory agency
+ This report shall not be reproduced except in full, without the written approval of the laboratory

Methods used by PSC are based upon those found in 'Standard Methods for the Examination of Water and Wastewater', 20th Edition, published by the American Public Health Association, or on US EPA protocols found in the 'Test Methods For Evaluating Solid Waste, Physical/Chemical Method, SW846', 3rd Edition. Other procedures are based on methodologies accepted by the appropriate regulatory agency. Methodology briefs are available by written request.

All work recorded herein has been done in accordance with normal professional standards using accepted testing methodologies, quality assurance and quality control procedures except where otherwise agreed to by the client and testing company in writing. Liability for any and all use of these test results shall be limited to the actual cost of the pertinent analysis done. There is no other warranty expressed or implied. Your samples will be retained at PSC for a period of 30 days from receipt of data or as per contract.

PSC Project Manager: Maureen Olinek

ANALYTICAL REPORT
Form 42033918

Client : BIOGENIE
Project : NT 4025-001-101

Sparcode	Parameter	Unit	MDL	Lab ID : 34030788 Client ID : EX2-WALL1-A	34030789 EX2-WALL2-A	34030790 EX2-BASE2	34030791 PILE (1999)
TEVRATIO	TEV RATIO	None		0.50	0.50	0.50	0.50
PHYSICAL							
00250760	Moisture	%(W/W)	0.3	27.1	31.0	27.2	10.9
HYDROCARBONS							
EX995149	PHC EXT F2 - 4	date		04/07/31	04/07/31	04/07/31	04/07/31
EX995170	Volat. Soil Extract.	date		04/07/29	04/07/29	04/07/29	04/07/29
PHC1PHCV	CCME PHC F1 C6-10	ug/g	10	530	< 10	< 10	15
HC1-CALC	CCME PHC F1-BTEX	ug/g		480	< 10	< 10	15
PHC2PHCS	CCME PHC F2 C10-16	ug/g	10	2100	31	32	1200
PHC3PHCS	CCME PHC F3 C16-34	ug/g	10	1900	110	170	9000
PHC4PHCS	CCME PHC F4 C34-50+	ug/g	10	800	19	94	1300
BASEPHCS	PHC F2-4 BASELINE 0	Y/N	Yes	Yes	Yes	Yes	Yes
VOLATILE ORGANICS							
B020PT12	Benzene	ug/g	0.04	0.22	< 0.04	< 0.04	< 0.04
T001PT12	Toluene	ug/g	0.10	1.4	< 0.10	< 0.10	< 0.10
B021PT12	Ethylbenzene	ug/g	0.10	5.3	< 0.10	< 0.10	< 0.10
X003PT12	m+p - Xylene	ug/g	0.10	27	< 0.10	< 0.10	0.19
X002PT12	o - Xylene	ug/g	0.10	16	< 0.10	< 0.10	< 0.10
X_882_10	Xylenes	ug/g	0.1	43	< 0.1	< 0.1	0.2
SURROGATE RECOVERY							
VS01PT12	Bromofluorobenzene	%	0	113	112	114	112
VS03PT12	d8-Toluene	%	0	111	109	110	110
Ed10PT12	Ethylbenzene-d10	%	60	102	94	97	102
				Matrix : Soil Sampled on: 04/07/27 12:00	Soil 04/07/27 12:00	Soil 04/07/27 12:00	Soil 04/07/27 14:00

SPIKE SUMMARY
Form 42033918

Parameter	Client ID	Lab ID	Sample Conc.	Sample & Spike Conc.	Spike Amount	Unit	Percent Recovery
CCME PHC F2 C10-16	Blank Spike. Batch :	45203382	< 10	560	492	ug/g	114
CCME PHC F3 C16-34	Blank Spike. Batch :	45203382	11	1600	1590	ug/g	101
CCME PHC F1 C6-10	Blank Spike. Batch :	45203341	< 10	300	291	ug/g	103
Benzene	Blank Spike. Batch :	45203374	< 0.04	2.1	2	ug/g	104
Toluene	Blank Spike. Batch :	45203374	< 0.10	2.3	2	ug/g	113
Ethylbenzene	Blank Spike. Batch :	45203374	< 0.10	2.1	2	ug/g	107
m+p - Xylene	Blank Spike. Batch :	45203374	< 0.10	4.4	4	ug/g	107
o - Xylene	Blank Spike. Batch :	45203374	< 0.10	2.2	2	ug/g	110

ANALYSIS DATES
Form 42033918

	Lab ID :	34030788	34030789	34030790	34030791
	Client ID:	EX2-WALL1-A	EX2-WALL2-A	EX2-BASE2	PILE (1999)
TEVRATIO	TEV RATIO	29-JUL-2004	29-JUL-2004	29-JUL-2004	29-JUL-2004
00250760	Moisture	30-JUL-2004	30-JUL-2004	30-JUL-2004	30-JUL-2004
PHC1PHCV	CCME PHC F1 C6-10	31-JUL-2004	31-JUL-2004	31-JUL-2004	31-JUL-2004
CCMEPHCS	CCMEPHCS	03-AUG-2004	03-AUG-2004	03-AUG-2004	03-AUG-2004
PKG-BT17	BTEX by P&T	30-JUL-2004	30-JUL-2004	30-JUL-2004	30-JUL-2004
	Matrix:	Soil	Soil	Soil	Soil
	Sampled on:	27-JUL-2004	27-JUL-2004	27-JUL-2004	27-JUL-2004

BATCH NUMBERS
Form 42033918

	Lab ID :	34030788	34030789	34030790	34030791
	Client ID:	EX2-WALL1-A	EX2-WALL2-A	EX2-BASE2	PILE (1999)
TEVRATIO	TEV RATIO	45104635	45104635	45104635	45104635
00250760	Moisture	45104638	45104638	45104638	45104638
PHC1PHCV	CCME PHC F1 C6-10	45203341	45203341	45203341	45203341
CCMEPHCS	CCMEPHCS	45203382	45203382	45203382	45203382
PKG-BT17	BTEX by P&T	45203374	45203374	45203374	45203374
	Matrix:	Soil	Soil	Soil	Soil
	Sampled on:	27-JUL-2004	27-JUL-2004	27-JUL-2004	27-JUL-2004

BLANK SUMMARY
Form 42033918

All method blanks were less than MDL, except the following:

Parameter	Batch	Sparcode	Blank Conc.	MDL	Unit
CCME PHC F3 C16-34	45203382	PHC3PHCS	11	10	ug/g

PSC ANALYTICAL SERVICES
9619 - 42nd Avenue
Edmonton, AB T6E 5R2
Phone: (780) 465-1212
Fax: (780) 450-4187
Toll Free: 1-877-465-8889

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

ANALYSIS REQUEST 42033918

COMPANY NAME: BIOGENIE	PH. #: 418 653-4422
COMPANY ADDRESS: 350, FRANQUET STE-FOY (QUEBEC) G1P 4P3	FAX #: 418 653-3583
SAMPLER NAME (PRINT): GUY CAUMARTIN	CLIENT PROJECT ID: (#) NT 4025-001-101
	PROJECT MANAGER: ERIC THOMASSIN-LACROIX

FIELD SAMPLE ID	PSC LAB # (Lab Use Only)	MATRIX: GROUND WATER	SURFACE WATER	SOIL	OTHER	# CONTAINERS	SAMPLING: DATE	TIME	HEADSPACE VAPOUR	CCME PHC(F1-F4)	BTEX
1 EX2-WALL1-A	30788			X		1	4-7-27	12:00		X	X
2 EX2-WALL2-A	30789			X		1	"	12:00		X	X
3 EX2-BASE 2	30790			X		1	"	12:00		X	X
4 PILE (1999)	30791			X		1	"	14:00		X	X
5											
6											
7											
8											
9											
10											
11											
12											

TAT (Turnaround Time)

5 DAY TAT MUST HAVE PRIOR APPROVAL

* some exceptions apply please contact lab

STANDARD 10 BUSINESS DAYS ☐
STANDARD 5 BUSINESS DAYS ☒
RUSH 2 BUSINESS DAYS ☐
URGENT 1 BUSINESS DAY ☐

OTHER BUSINESS DAYS _____

CUSTODY RECORD

P.O. NUMBER: EDM2004-07-19

SPECIAL DETECTION LIMITS / CONTAMINANT TYPE

☐ ALBERTA TIER 1 ☐ CCME level _____
☐ PST
☐ CDWG ☐ OTHER _____

ACCOUNTING CONTACT:

SPECIAL REPORTING OR BILLING INSTRUCTIONS

JARS USED

LAB USE ONLY mo Aug 3

ARRIVAL TEMPERATURE °C: 4 4 4

LAB INFORMATION: Aug 6/04

RELINQUISHED BY SAMPLER:	DATE 4-7-28	TIME 12:00	RECEIVED BY: CANADIAN NORTH CARGO
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
RELINQUISHED BY: CN	DATE 7/29	TIME 7:05	RECEIVED BY LABORATORY:

ORIGINAL - PSC YELLOW - PSC PINK - CLIENT

APPENDIX C

Photomontage

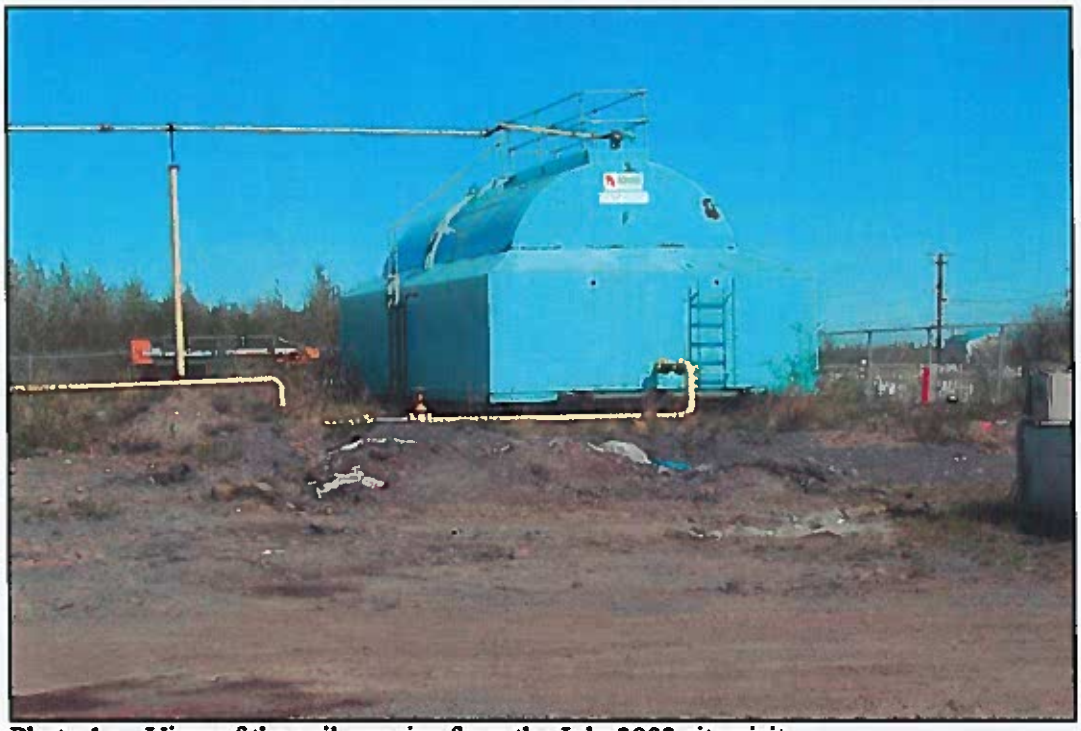


Photo 1 : View of the soil remains from the July 2003 site visit.

Photo 2 : View of the site before the start of the excavation work.

Photo 3 : Remediation work in progress in the Anglican cemetery.

Photo 4 : Installation of the membrane on NTPC's property limit.

Photo 5 : View of the membrane (west side) on the northern wall of EX2.

Photo 6 : Placing of the July 2003 hydrocarbon-impacted soil into bags.

Photo 7 : Final view of the site at the completion of the remediation work.

Photo 8 : Final view of the site at the completion of the work (cont'd).

Photo 9 : View of 38 bags of soil and the location of the former July 2003 soil stockpile.