Qikiqtaaluk environmental

PHASE II ENVIRONMENTAL SITE ASSESSMENT

IQALUIT LANDFARM MAINTENANCE, IQALUIT AIRPORT, NUNAVUT

Privileged and confidential document presented to

Transports Canada Transport Canada

Mr. Michael Molinski, EP
Environmental Officer
Environmental Affairs, Programs
Prairie and Northern Region
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P.O. Box 8550
Winnipeg, Manitoba, R3C 0P6

FINAL REPORT

November 11, 2013

O/Ref.: RQ13-110-2

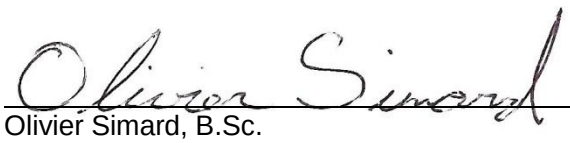
PHASE II ENVIRONMENTAL SITE ASSESSMENT

IQALUIT LANDFARM MAINTENANCE, IQALUIT AIRPORT, NUNAVUT

Privileged and confidential document presented to

TRANSPORT CANADA

Prepared and verified by:



Olivier Simard, B.Sc.
Project Manager – Site Remediation

Approved by:

Philippe Simon, P. Eng., Ph.D.
Project Director – Site Remediation

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LIST OF ABBREVIATIONS

BTEX:	Benzene, Toluene, Ethylbenzene, Xylene
ESA:	Environmental Site Assessment
LTU :	Landfarm Treatment Unit
PAH:	Polycyclic aromatic hydrocarbons
PHC ($_{F1-F4}$):	Petroleum hydrocarbons (F_1 to F_4)
QA/QC:	Quality Assurance/Quality Control
VOC:	Volatile organic compounds

1. INTRODUCTION

Qikiqtaaluk Environmental Inc. (QE) was mandated in May, 2013 by Transport Canada (Contract No. T6018-120061), to conduct the mechanical tilling of two LTUs to achieve a Phase II ESA on the units located within the Iqaluit Airport boundary by collecting 20 soil samples. In addition, nutrients had to be spread on the surface of both LTUs, and tilling had to be done again at least two weeks after the nutrients addition.

Finally, the footprint of a former LTU, and a soil stockpile also had to be characterized and following the results, the stockpiled soils had to be hauled to the former LTU footprint and landscaped to match surrounding terrain.

The present document provides a brief description of the Site, describes the methodology followed during the assessment of the soil at the Site and presents the results of this work.

The information provided in this report is subject to the General Conditions and Limitations of the Study provided in Appendix A.

1.1 Site Location and Description

The LTUs, soil stockpile, and former landfarm footprint are located inside the airport boundary between the tarmac and the airstrip

The approximate geographical coordinates of the center of the Site (in decimal degrees) are:

- Longitude: -68.7574;
- Latitude: 63.5509.

The Site is relatively flat with a small slope towards the east.

Figure 1 of Appendix B shows the location of the units within the Iqaluit airport boundary.

1.2 Context

This work and study was carried out in compliance with a Water License that Transport Canada was granted by the Nunavut Water Board and as a response to a Request for Proposal (T6018-120061).

1.3 Objectives

The objectives of the current mandate were the following:

- Review of previous environmental studies;
- Till both active LTUs on their entire surface to a depth of about 1 meter, apply nutrients, and till again;
- Evaluate summarily the environmental quality of the soils at quadrants with predefined number of soil samples per area;
- Compare the analytical soil sample results to the criteria of the Canadian Counsil of Ministers of the Environment (CCME) Guidelines;
- Prepare a Phase II ESA report.

2. PREVIOUS ENVIRONMENTAL SITE ASSESSMENTS

One report[1] was made available and was consulted before completing the present study.

This report concluded that the footprint of the decommissioned facility was still contaminated with PHC ($_{F1-F4}$).

1 "*Landfarm Treatment Unit Decommissioning, Iqaluit Airport, Iqaluit, Nunavut*" Biogénie, February 2012

3. WORK CONDUCTED AND METHODOLOGY

This section summarizes the work completed and the methodology used by QE during the Landfarm maintenance activities and the Phase II ESA. The fieldwork was carried out according to the *Environmental Guideline for Site Remediation, Department of Nunavut, revised March 2009* and also to meet the client's objectives. A photographic report, presented in Appendix C, shows certain steps of the work. The first tilling event on both LTUs was conducted between the 17th and the 19th of July, 2013. Nutrients, a mix of 2230 kg of CAN 27-0-0 and 330 kg of DAP was then added on the surfaces of both LTUs using a nutrient spreader pulled by an ATV.

3.1 QE Personnel and Subcontractors

Fieldwork activities were completed by Mr. Jean Tremblay and Mr. Martin Lemay, Environmental Technicians, under the supervision of Mr. Olivier Simard, Project Manager, and Mr. Greg Johnson, Director at QE. A review and approval of the report was performed by Mr. Philippe Simon.

The tasks related to preparing the work, elaborating the work plan, global compilation of data and results and the production of the present report were performed by the Project Manager under the supervision of the Director.

In order to fulfill its mandate, QE called upon a select group of competent, experimented and accredited companies, in the pertinent required fields, to complete field work and laboratory analysis, as shown in Table 1 below.

TABLE 1: Description Fieldwork and Laboratory Analysis

Work Performed	Machinery	Subcontractor / Company	Date
Tilling	Caterpillar 320C	Qikiqtaaluk Logistics	July 17 to 19, 2013
Second Tilling	Komatsu PC300	Kudlik	August 31 to September 2
Test pits Stockpile hauling and landscaping	Loader Cat 980	Qikiqtaaluk Logistics	September 2 to 4, 2013
Laboratory analysis	-	Agat	August 2013

3.2 Preparatory Activities

Before carrying out the fieldwork, an authorization was obtained by the client.

To ensure maximum safety and rigour in the planning and execution of the proposed work program, the following tasks were performed prior to starting fieldwork:

- Consultation of all available documentation (location plan, former studies, etc.) to verify, among other things, the presence of underground infrastructures and preferred contamination pathways in sensitive areas;
- Determination of the general geological and hydrogeological conditions at the Site;
- Start-up team meeting to elaborate the techniques and methodology to be used during the course of the fieldwork, planning of the work program and general coordination of the tasks, materials, equipment, work team, subcontractors and coordination of the work plan with the client;
- Site reconnaissance; validation of gathered data, access to sampling points and validation of the sampling points with Mr. Molinski from Transport Canada as well as the selection of the proper equipment and materials. At this step, groundwater monitoring was removed from the sampling program due to the poor state of the monitoring wells already in place.

3.3 Sampling Plan Strategy

The sampling strategy was planned to respond to the statement of work.

3.4 Soil Sampling Method

In total 44 soil samples, including 8 field duplicates were collected from the test pits. 12 soil samples with 2 field duplicates were collected from quadrants at the first LTU of 92 m by 37 m. A total of 8 soil samples with 2 field duplicates were collected from quadrants at the second Landfarm treatment of 42 m by 36 m. In addition, 8 soil samples and 2 field duplicates were collected from both the former landfarm footprint and the stockpile.

The collection of soil samples was completed by a QE Technician on August 1, 2013. All soil samples analyzed were collected in a timely manner, taking into account the investigation methods and potential contaminants present. Samples were collected manually using different sampling methods in quadrants on thicknesses generally inferior or equal to 0.6 m per sample.

Sampling point locations are presented in Figure 1 of Appendix B.

3.5 Groundwater Characterization

Due to the poor state of the existing monitoring wells present on-site, Transport Canada decided to remove groundwater monitoring from QE's mandate.

3.6 Transportation and Preservation of Samples

From the moment they were collected to their delivery to the laboratory, all samples were kept in laboratory-supplied insulated containers (coolers) and kept, using regular ice or ice packs, at a temperature of approximately 4°C (39.2°F) and away from any light source.

Samples were shipped to the laboratory, under a chain of custody, within 24 hours.

Unanalyzed samples will be preserved by the laboratory until the end of the mandate after which, barring prior notification from an authorized person, the laboratory will dispose of them.

3.7 Cleaning of Sampling Equipment and Instruments

During the course of the mandate all sampling equipment and instruments were cleaned between samplings in order to prevent direct and cross-contamination. The manufacturer's specifications were also respected when using the equipment.

This cleaning followed a 2-step process. The first step consisted in rinsing the instruments with fresh water (to remove larger particles), cleaning the surfaces with a brush, water and a phosphate-free detergent (to remove smaller particles), rinsing 3 times under fresh water to remove the detergent then rinsing twice with demineralized water.

3.8 Analytical Program

3.8.1 VOC Measurements

VOC screening was carried out for all samples collected during the sampling campaign on August 1, 2013. Screening consisted of the following steps:

- A field duplicate, similar to the original sample, was collected for VOC analysis;
- Field duplicates were placed in glass containers provided by the laboratory. These containers were partially filled (to leave airspace), then covered with aluminium foil before being sealed;
- Samples were kept at room temperature for a period of 30 minutes;
- The containers were shaken before taking the measurement.

VOC measurements were taken using a MiniRAE device by removing the cover of the sampling container and rapidly inserting the analyzer tube of the device through the aluminium foil for several seconds. The maximum reading was noted for each sample.

These readings allowed to assess the degree of VOC contamination.

3.8.2 Analytical Parameter Selection

The analytical program set for the Phase II ESA was as per the requirements of the Request for Proposal T6018-120061.

As previously mentioned, 44 soil samples (including 8 field duplicates) were collected at the Site. All 44 samples were submitted for analysis.

All of the soil samples submitted for analysis were analysed for the followings parameters: PAHs, BTEX, PHC ($_{F1-F4}$), metals (boron, barium, beryllium, cadmium, chromium, cobalt, copper, lead, molybdenum, nickel, silver, thallium, uranium, vanadium and zinc).

The details concerning the analytical methods and the detection limits for different parameters are available in the laboratory Certificates of Analysis provided in Appendix D.

3.8.3 Quality Assurance/Quality Control Program

All projects conducted by QE follow a strict QA/QC Program used to confirm the reliability, precision, repeatability and reproducibility of the data.

On-Site

The best practices have been set for on-site work in order to prevent any cross-contamination following the use of equipment or instruments and to ensure efficient and representative sampling operations. The safe practices followed during sampling, transport, identification and conservation of all collected samples included, among others:

- Following procedures and instructions set as a mean to standardize all work, in particular, by supporting a continuous training program for the field personnel regarding the various standardized methods of sampling and sample management protocols;
- Constant supervision of on-site personnel by the Project Manager;
- Calibration of each instrument in conformity with the manufacturer's specifications before and during fieldwork;
- Proper cleaning of all equipment, containers and instruments used before each sampling event;
- Careful handling and adequate care of sample containers and equipment used during the sampling, transport and preservation of the samples;
- Clear identification of all samples on chain of custody forms sent to the laboratory;
- Shipment of all samples in less than 24 hours;
- Conservation of all samples according to CCME standards.

A minimum of 20% of the soil sample field duplicates were submitted to the laboratory as part of the QA/QC program. Field duplicates were analyzed for the same parameters as the parent samples.

At the Laboratory

In order to present results with the highest possible reliability, the laboratory follows a QA/QC program that meets the CCME standards and requirements.

This program includes, among others:

- Laboratory blanks;
- Laboratory duplicates;
- Control/reference samples;
- Certified reference material;
- Sample spiking;
- Surrogates (organics).

A summary of the internal QA/QC program followed by the laboratory is available upon request.

3.8.4 Analytical Laboratory

Soil and groundwater analyses were conducted by AGAT Laboratories Ltd (AGAT), a certified laboratory located in the City of Mississauga. AGAT's have set an internal QA/QC program that meets CCME*'s* requirements.

4. FIELDWORK RESULTS

4.1 Soil Assessment Results

Soil analytical results are presented in Tables I and II, respectively (Appendix E). The laboratory's Certificates of Analysis are presented in Appendix D.

4.1.1 Applicable Soil Quality Criteria

Due to the industrial zoning of the Site and that no change of use is foreseen, analytical soil results were compared to the coarse-grained soil CCME's criteria applicable to commercial and industrial uses.

4.1.2 Soil Quality Results

During this study, 44 soil samples, including 8 duplicates were analyzed for various parameters of interest.

All samples showed concentrations below the CCME's criteria for PAHs, BTEX and metals. The 14 samples from the LTU 1 including the 2 field duplicates showed results above the criteria for the F2 fraction for PHC ($_{F1-F4}$). Out of the 8 samples from the LTU 2, 4 results showed concentrations above the criteria for the F2 fraction for PHC ($_{F1-F4}$). Otherwise, all soil samples from both the former landfarm footprint and the soil stockpile met the CCME criteria.

4.1.3 Fieldwork

Analytical results from the field duplicates collected are presented in Table I of Appendix E. The field duplicates were analyzed for the same parameters as its parent sample.

Results are generally within the accepted confidence interval (between 0 and 30%). These results confirm that the reproducibility and the homogeneity of samples are acceptable.

4.1.4 In the Laboratory

Internal laboratory quality control validates that the results are within the acceptable range.

Other QA/QC procedures, such as laboratory blanks and analog standard recovery, were followed by the laboratory in accordance with its internal quality control program. The results of these internal controls indicate that the analytical results are within acceptable deviations.

5. DISCUSSION OF RESULTS

5.1 Soils

Once the results were obtained, the second tilling event was coordinated and completed between August 31 and September 2nd. As per the requirements of the project, once QE learned that both the soil stockpile and the former landfarm footprint met all soil quality criteria, the soil stockpile was transported to the footprint area and landscaped. The last activity was conducted between the 2nd and the 4th of September, 2013.

6. CONCLUSIONS

QE was mandated by Transport Canada to conduct landfarm maintenance activities and to complete Phase II ESA to characterize the soils from 4 areas within the Iqaluit Airport premises. Initially 2 active LTUs were tilled to about 1 m in depth, and then nutrients were added on the surface. A total of 24 soil samples including 4 duplicates were taken from quadrants from both sites. The LTUs were tilled again at least two weeks after the nutrients were spread. In addition, 20 soil samples including 4 field duplicates were collected from a former landfarm footprint and from a soil stockpile located nearby. All soil samples were analysed for BTEX, PAHs and PHCs. Once it was found that both the soil stockpile and the former landfarm footprint met all CCMEs criteria for soil quality, the soil stockpile was hauled to the former landfarm location and landscaped to match the surrounding terrain.

Otherwise, the results showed that the LTU 1 does not meet the soil quality guidelines for the F2 fraction for PHCs. Similarly, half the volume of the LTU 2 also does not meet the soil quality guidelines for the F2 fraction for PHCs and therefore still need treatment.

APPENDIX A

GENERAL CONDITIONS AND LIMITATIONS OF THE STUDY

GENERAL CONDITIONS AND LIMITATIONS OF THE STUDY (PHASES II AND III AND REHABILITATION)

This report has been prepared for the exclusive use of the person to whom it is addressed. Possession of this report does not confer the right to publish, use or rely on the information, conclusions or recommendations contained in the report to anyone other than the person to whom it is addressed. The contents of the report constitute an assessment of the conditions of certain areas of the subject property and cannot be applied to any other property or location. This report must be as a whole, as sections taken individually and out of context may be erroneously interpreted. In addition, the addressee of the report may only rely on the text of the final version; any other text, opinion, draft or preliminary version provided by QE cannot be used.

The results, comments, interpretations, conclusions and recommendations contained in this report are valid only at the time when the information on which they are based was collected. They have been formulated, in accordance with the scope of the review and the specific limitations of the study, as well as in the light of our knowledge of the current and/or planned use(s) of the site, its general location and the applicable environmental laws, regulations standards and criteria.

This report is based on the verbal and/or written information obtained during the assessment, the accuracy of which has not been verified. QE has relied upon the written information provided and information provided by persons interviewed during the execution of this mandate as has assumed this information to be valid, accurate and provided in good faith. This information is considered to have been obtained in accordance with known and accepted rules of conduct and professional practices.

QE cannot be held responsible for any costs, claims, damages or harm which is a direct or indirect consequence of a false, incorrect or deceitful declaration or information provided, or the non-disclosure, dissimulation or concealment of pertinent information by the persons.

QE cannot be held responsible for damages resulting from unforeseeable events or changes in the conditions on the site after the date that information has been collected. In addition, QE cannot be held responsible for damages resulting from any modifications to applicable environmental laws, regulations, standards or criteria after delivery of this report, from the use of this report by a third party and/or for purposes other than those for which it has been written, or for any real or perceived loss of property value, or failure of a transaction because of the factual information, interpretations, conclusions and recommendations contained in this.

The report does not guarantee that the site is free of contaminants or hazardous or potentially hazardous material or conditions or that latent or undiscovered conditions will not become evident in the future.

Unless otherwise indicated in the report, drilling, taking measurements, sampling or detailed listing of the wastes, products, soil, water or other material on the study site or its immediate surroundings were not part of the present assessment.

All opinions expressed and references made to environmental laws, regulations, standards or criteria are provided for the client's information only and should not, under any circumstances, be considered as legal advice or a legal opinion.

…2

- ***Soil and Bedrock Conditions***

The descriptions of soils and, in some cases, bedrock, are presented herein with the intention to provide a general overview of subsurface conditions. This information must not, under any circumstances, be used as geotechnical data on which to base construction design or development, unless that intention has been specifically indicated in the text of the report.

The descriptions and characteristics of the soils and bedrock have been developed from data obtained during drilling and/or excavation at a given time period. The points of contact between the different geological units identified must be considered approximate, given the limits of the equipment and the method(s) used, the frequency of sampling, and the intrinsic variability of the units encountered.

The data from drilling and/or excavation has been extrapolated between sampling points and may therefore actually differ in the unverified areas.

- ***Groundwater and Surface Water Conditions***

The precision and presentation of groundwater and surface water conditions must be interpreted as a function of the type of instrumentation used, the survey period and the number of observations recorded. Conditions may vary as a result of seasonal effects, precipitation levels, surface water levels and tidal patterns, as well as following work or other activities on the site or in surrounding areas.

- ***Level of Contamination***

The selection of the analytical parameters, the number and location of sampling stations, the sampling frequency and selection the samples to be analysed in the laboratory depends on the requirements of regulatory authorities at the time of the study, the scope and extent of the mandate, the available budget and the environmental conditions in and around the subject site. Note, however, that virtually no scope of work no matter how exhaustive can identify all contaminants or conditions above and below ground. Also, the fact that a substance has not been analysed for does not exclude the possibility that it is present on the site.

The concentrations of chemical compounds presented herein are determined based on the results of chemical analyses performed by accredited laboratories and correspond to the concentrations detected at the location of the sampling. QE does not warrant the accuracy of the results provided by the accredited laboratory. Contamination levels are established by comparing the concentrations obtained to the standards and/or criteria in force at the time the sampling was done. The nature and degree of the contamination identified may, however, vary between sampling stations as well as being a function of time and following work conducted on the site or in surrounding areas.

The assessment of the degree and extent of contamination and the estimates of volumes of contaminated soils, residual wastes, contaminated groundwater, surface water or other media provided herein are estimated and are not valid for areas other than the locations of the sampling stations, at the depths attained at those stations.

Hence, the quantities of contaminated media to be managed are provided for the information purposes only and may vary, either up or down, if other pertinent information becomes available.

APPENDIX B

FIGURES

Légende

Environmental Classification of Soil Quality

The analytical parameter and result presented, which determine the concentration code, are the highest of the parameters measured, with respect to individual criteria and limit values. See the table of analytical results for other parameter values.

Concentration Codes

LTU3-8	Concentrations below the Canadian Environmental Quality Guidelines of CCME
LTU1-1	Concentrations exceeding the Canadian Environmental Quality Guidelines of CCME

CCME: Canadian Council of Ministers of the Environment

PRELIMINARY

Source :
- *Google earth; 2013.*

0 10 20 30 40 50m

CONFIDENTIAL

Figure 1

Site Plan and Sampling Point Locations

PHASE II ENVIRONMENTAL SITE ASSESSMENT

Presented to:

Gouvernement du Canada / Government of Canada
Transport Canada

Property located ct:

Iqaluit Airport

Scale: Comme indiqué	Conception date: 2013-09-24		Revision date 2013-10-31
Drawn by: J. Bergeron	Verified by: O. Simard		Approved by: P. Simon
Project no. RQ13-110-2	Drawing no.: RQ13-110-2-01	Layout: A	Geodetic reference: Aucune / Aucune

Qikiqtaaluk environmental

APPENDIX C

PHOTOGRAPHIC REPORT

Photo 1

Tilling of soil at the landfarm treatment unit for aeration.

Photo 2

View from the north of the landfarm being tilled.

Photo 3

Reshaping the landfarm surface after tilling event.

Photo 4

View of the area between both landfarms after the treated stockpiles were removed.

Photo 5

View of landscape after treated stockpiles were transported.

APPENDIX D

CERTIFICATES OF ANALYSIS

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

CLIENT NAME: QIKIQTAALUK ENVIRONNEMENT
9935 CATANIA AVE ENTRANCE 1 SUITE 200
BROSSARD, QC J4Z3V4
(514) 940-3332

ATTENTION TO: Oliver Simard

PROJECT NO: RQ13-110

AGAT WORK ORDER: 13Z745074

SOIL ANALYSIS REVIEWED BY: Anthony Dapaah, PhD (Chem), Inorganic Lab Manager

TRACE ORGANICS REVIEWED BY: Manpreet Sarao, Senior Analyst

DATE REPORTED: Aug 20, 2013

PAGES (INCLUDING COVER): 23

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

NOTES

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

AGAT Laboratories

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Certificate of Analysis

AGAT WORK ORDER: 13Z745074

PROJECT NO: RQ13-110

CLIENT NAME: QIKIQTAALUK ENVIRONNEMENT

ATTENTION TO: Oliver Simard

O. Reg. 153(511) - Metals (Abbrev) (Soil)

DATE RECEIVED: 2013-08-08

DATE REPORTED: 2013-08-20

		SAMPLE DESCRIPTION:		LTU 1-1	LTU 1-2	LTU 1-3	LTU 1-4	LTU 1-5	LTU 1-6	LTU 1-7	LTU 1-8
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		8/1/2013	8/1/2013	8/1/2013	8/1/2013	8/1/2013	8/1/2013	8/1/2013	8/1/2013
Parameter	Unit	G / S	RDL	4633198	4633200	4633203	4633208	4633211	4633214	4633222	4633225
Boron	µg/g		5	<5	<5	<5	<5	<5	<5	<5	<5
Barium	µg/g		2	34	32	31	29	30	35	34	37
Beryllium	µg/g		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cadmium	µg/g		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chromium	µg/g		2	20	20	19	20	19	21	20	19
Cobalt	µg/g		0.5	5.1	5.1	5.0	4.9	4.9	5.2	5.2	5.6
Copper	µg/g		1	13	13	13	13	12	13	14	14
Lead	µg/g		1	17	14	15	18	12	23	21	17
Molybdenum	µg/g		0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	1.1
Nickel	µg/g		1	8	8	8	8	7	8	8	8
Silver	µg/g		0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Thallium	µg/g		0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Uranium	µg/g		0.5	<0.5	<0.5	<0.5	0.6	<0.5	<0.5	<0.5	<0.5
Vanadium	µg/g		1	37	38	37	43	37	38	40	43
Zinc	µg/g		5	41	41	42	44	40	46	46	42

Certified By: Tony Tpash

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ATTENTION TO: Oliver Simard

O. Reg. 153(511) - Metals (Abbrev) (Soil)

DATE RECEIVED: 2013-08-08 **DATE REPORTED: 2013-08-20**

		SAMPLE DESCRIPTION:		LTU 1-9	LTU 1-10	LTU 1-11	LTU 1-12	LTU 1-D5	LTU 1-D10	LTU 2-1	LTU 2-2
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		8/1/2013	8/1/2013	8/1/2013	8/1/2013	8/1/2013	8/1/2013	8/1/2013	8/1/2013
Parameter	Unit	G / S	RDL	4633228	4633231	4633234	4633237	4633240	4633243	4633246	4633249
Boron	µg/g		5	<5	<5	<5	<5	<5	<5	<5	<5
Barium	µg/g		2	34	38	42	46	33	37	36	37
Beryllium	µg/g		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cadmium	µg/g		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chromium	µg/g		2	20	17	19	20	17	19	18	18
Cobalt	µg/g		0.5	5.7	5.5	5.8	6.2	5.2	5.3	4.9	5.4
Copper	µg/g		1	14	13	15	15	13	14	11	13
Lead	µg/g		1	17	23	24	19	16	21	15	20
Molybdenum	µg/g		0.5	0.7	0.7	0.8	0.8	0.8	0.7	0.6	0.7
Nickel	µg/g		1	8	8	8	9	8	7	7	9
Silver	µg/g		0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Thallium	µg/g		0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Uranium	µg/g		0.5	0.7	<0.5	0.5	0.5	<0.5	0.5	<0.5	<0.5
Vanadium	µg/g		1	45	39	40	44	38	40	37	39
Zinc	µg/g		5	42	45	48	48	41	42	36	43

Certified By: Tony Iacobucci

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DATE RECEIVED: 2013-08-08

DATE REPORTED: 2013-08-20

		SAMPLE DESCRIPTION:		LTU 2-3	LTU 2-4	LTU 2-5	LTU 2-6	LTU 2-7	LTU 2-8	LTU 2-D1	LTU 2-D3
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		8/1/2013	8/1/2013	8/1/2013	8/1/2013	8/1/2013	8/1/2013	8/1/2013	8/1/2013
Parameter	Unit	G / S	RDL	4633252	4633255	4633258	4633261	4633285	4633288	4633291	4633294
Boron	µg/g		5	<5	<5	<5	<5	<5	<5	<5	<5
Barium	µg/g		2	35	38	34	36	41	43	39	36
Beryllium	µg/g		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cadmium	µg/g		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chromium	µg/g		2	17	17	16	18	19	19	17	18
Cobalt	µg/g		0.5	5.5	5.4	5.0	6.0	5.7	6.6	5.3	5.1
Copper	µg/g		1	13	13	12	15	15	17	11	12
Lead	µg/g		1	18	18	10	12	14	14	16	17
Molybdenum	µg/g		0.5	0.7	0.7	0.6	0.8	0.8	0.9	0.6	0.6
Nickel	µg/g		1	8	9	7	9	8	9	7	8
Silver	µg/g		0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Thallium	µg/g		0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Uranium	µg/g		0.5	0.6	0.6	<0.5	0.7	0.5	0.5	<0.5	<0.5
Vanadium	µg/g		1	36	41	36	43	43	46	37	35
Zinc	µg/g		5	42	45	36	46	46	46	38	40

Certified By: Tony Tpach

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AGAT WORK ORDER: 13Z745074

PROJECT NO: RQ13-110

CLIENT NAME: QIKIQTAALUK ENVIRONNEMENT

ATTENTION TO: Oliver Simard

O. Reg. 153(511) - Metals (Abbrev) (Soil)

DATE RECEIVED: 2013-08-08

DATE REPORTED: 2013-08-20

		SAMPLE DESCRIPTION:		LTU 3-1	LTU 3-2	LTU 3-3	LTU 3-4	LTU 3-5	LTU 3-6	LTU 3-7	LTU 3-8
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		8/1/2013	8/1/2013	8/1/2013	8/1/2013	8/1/2013	8/1/2013	8/1/2013	8/1/2013
Parameter	Unit	G / S	RDL	4633297	4633300	4633303	4633306	4633309	4633312	4633314	4633317
Boron	µg/g		5	<5	<5	<5	<5	<5	<5	<5	<5
Barium	µg/g		2	28	47	71	66	65	38	28	46
Beryllium	µg/g		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cadmium	µg/g		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chromium	µg/g		2	17	17	27	24	23	17	15	20
Cobalt	µg/g		0.5	6.2	6.3	7.7	7.6	7.4	7.2	5.2	7.3
Copper	µg/g		1	18	19	17	15	15	20	13	18
Lead	µg/g		1	9	9	5	4	5	5	4	6
Molybdenum	µg/g		0.5	0.9	0.7	0.9	1.1	1.0	0.8	0.6	0.8
Nickel	µg/g		1	8	9	12	12	12	10	7	10
Silver	µg/g		0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Thallium	µg/g		0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Uranium	µg/g		0.5	<0.5	<0.5	0.6	0.6	0.7	<0.5	<0.5	0.5
Vanadium	µg/g		1	41	35	54	48	45	38	34	41
Zinc	µg/g		5	39	42	52	48	48	40	32	43

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AGAT WORK ORDER: 13Z745074

PROJECT NO: RQ13-110

CLIENT NAME: QIKIQTAALUK ENVIRONNEMENT

ATTENTION TO: Oliver Simard

O. Reg. 153(511) - Metals (Abbrev) (Soil)

DATE RECEIVED: 2013-08-08

DATE REPORTED: 2013-08-20

		SAMPLE DESCRIPTION:		LTU 3-D1	LTU 3-D3	STP-1	STP-2	STP-3	STP-4	STP-5	STP-6
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		8/1/2013	8/1/2013	8/1/2013	8/1/2013	8/1/2013	8/1/2013	8/1/2013	8/1/2013
Parameter	Unit	G / S	RDL	4633320	4633323	4633326	4633329	4633332	4633335	4633338	4633341
Boron	µg/g		5	<5	<5	<5	<5	<5	<5	<5	<5
Barium	µg/g		2	25	66	34	35	35	37	33	35
Beryllium	µg/g		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cadmium	µg/g		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chromium	µg/g		2	15	25	17	16	16	16	17	16
Cobalt	µg/g		0.5	5.0	8.0	5.2	5.3	5.1	5.2	5.8	5.7
Copper	µg/g		1	15	18	11	12	12	17	16	15
Lead	µg/g		1	5	5	14	15	15	15	50	21
Molybdenum	µg/g		0.5	0.7	0.7	0.7	0.7	0.6	0.7	0.8	0.8
Nickel	µg/g		1	7	12	7	8	7	8	9	8
Silver	µg/g		0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Thallium	µg/g		0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Uranium	µg/g		0.5	0.5	0.6	<0.5	<0.5	0.5	<0.5	<0.5	<0.5
Vanadium	µg/g		1	35	51	34	33	35	36	38	34
Zinc	µg/g		5	32	54	39	40	39	40	50	49

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AGAT WORK ORDER: 13Z745074

PROJECT NO: RQ13-110

CLIENT NAME: QIKIQTAALUK ENVIRONNEMENT

ATTENTION TO: Oliver Simard

O. Reg. 153(511) - Metals (Abbrev) (Soil)

DATE RECEIVED: 2013-08-08

DATE REPORTED: 2013-08-20

		SAMPLE DESCRIPTION:		STP-7	STP-8	STP-D4	STP-D6
		SAMPLE TYPE:		Soil	Soil	Soil	Soil
		DATE SAMPLED:		8/1/2013	8/1/2013	8/1/2013	8/1/2013
Parameter	Unit	G / S	RDL	4633344	4633347	4633350	4633353
Boron	µg/g		5	<5	<5	<5	<5
Barium	µg/g		2	29	33	36	32
Beryllium	µg/g		0.5	<0.5	<0.5	<0.5	<0.5
Cadmium	µg/g		0.5	<0.5	<0.5	<0.5	<0.5
Chromium	µg/g		2	15	16	16	15
Cobalt	µg/g		0.5	5.0	5.5	5.2	5.3
Copper	µg/g		1	13	13	12	14
Lead	µg/g		1	13	14	18	20
Molybdenum	µg/g		0.5	0.7	0.7	0.6	0.7
Nickel	µg/g		1	8	10	8	8
Silver	µg/g		0.2	<0.2	<0.2	<0.2	<0.2
Thallium	µg/g		0.4	<0.4	<0.4	<0.4	<0.4
Uranium	µg/g		0.5	<0.5	<0.5	<0.5	<0.5
Vanadium	µg/g		1	35	33	34	32
Zinc	µg/g		5	43	44	40	52

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to T1(All)

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AGAT WORK ORDER: 13Z745074

PROJECT NO: RQ13-110

CLIENT NAME: QIKIQTAALUK ENVIRONNEMENT

ATTENTION TO: Oliver Simard

O. Reg. 153(511) - PAHs (Soil)

DATE RECEIVED: 2013-08-08 **DATE REPORTED: 2013-08-20**

		SAMPLE DESCRIPTION:		LTU 1-1	LTU 1-2	LTU 1-3	LTU 1-4	LTU 1-5	LTU 1-6	LTU 1-7	LTU 1-8
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		8/1/2013	8/1/2013	8/1/2013	8/1/2013	8/1/2013	8/1/2013	8/1/2013	8/1/2013
Parameter	Unit	G / S	RDL	4633198	4633200	4633203	4633208	4633211	4633214	4633222	4633225
Naphthalene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Acenaphthylene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Acenaphthene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Fluorene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Phenanthrene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Anthracene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Fluoranthene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.10	<0.05
Pyrene	µg/g		0.05	<0.05	0.43	0.44	0.88	0.70	0.36	0.51	0.06
Benz(a)anthracene	µg/g		0.05	<0.05	0.13	0.14	0.20	0.21	0.06	0.10	<0.05
Chrysene	µg/g		0.05	<0.05	0.15	0.15	0.32	0.27	0.06	0.12	<0.05
Benzo(b)fluoranthene	µg/g		0.05	<0.05	0.08	0.10	0.15	0.11	0.13	0.13	<0.05
Benzo(k)fluoranthene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene	µg/g		0.05	<0.05	0.12	0.14	0.25	0.21	<0.05	0.10	<0.05
Indeno(1,2,3-cd)pyrene	µg/g		0.05	<0.05	0.05	0.06	0.09	0.08	0.05	<0.05	<0.05
Dibenz(a,h)anthracene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(g,h,i)perylene	µg/g		0.05	<0.05	0.12	0.13	0.23	0.19	0.12	0.09	<0.05
2-and 1-methyl Naphthalene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Moisture Content	%		0.1	7.3	7.7	7.1	5.9	7.2	6.0	7.5	6.9
Surrogate	**Unit**	**Acceptable Limits**									
Chrysene-d12	%	50-140		110	93	84	76	92	99	111	113

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AGAT WORK ORDER: 13Z745074

PROJECT NO: RQ13-110

CLIENT NAME: QIKIQTAALUK ENVIRONNEMENT

ATTENTION TO: Oliver Simard

O. Reg. 153(511) - PAHs (Soil)

DATE RECEIVED: 2013-08-08 **DATE REPORTED: 2013-08-20**

		SAMPLE DESCRIPTION:		LTU 1-9	LTU 1-10	LTU 1-11	LTU 1-12	LTU 1-D5	LTU 1-D10	LTU 2-1	LTU 2-2
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		8/1/2013	8/1/2013	8/1/2013	8/1/2013	8/1/2013	8/1/2013	8/1/2013	8/1/2013
Parameter	**Unit**	**G / S**	**RDL**	**4633228**	**4633231**	**4633234**	**4633237**	**4633240**	**4633243**	**4633246**	**4633249**
Naphthalene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Acenaphthylene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Acenaphthene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Fluorene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Phenanthrene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Anthracene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Fluoranthene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Pyrene	µg/g		0.05	0.07	0.14	0.30	0.07	0.61	0.15	0.07	0.11
Benz(a)anthracene	µg/g		0.05	<0.05	0.05	0.09	<0.05	0.18	0.05	<0.05	<0.05
Chrysene	µg/g		0.05	<0.05	0.05	0.10	<0.05	0.20	0.05	<0.05	<0.05
Benzo(b)fluoranthene	µg/g		0.05	0.05	0.08	0.09	<0.05	0.11	0.09	<0.05	0.05
Benzo(k)fluoranthene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene	µg/g		0.05	<0.05	0.05	0.10	<0.05	0.18	0.06	<0.05	<0.05
Indeno(1,2,3-cd)pyrene	µg/g		0.05	<0.05	<0.05	0.06	<0.05	0.07	<0.05	<0.05	<0.05
Dibenz(a,h)anthracene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(g,h,i)perylene	µg/g		0.05	<0.05	0.05	0.10	<0.05	0.17	0.05	<0.05	<0.05
2-and 1-methyl Naphthalene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Moisture Content	%		0.1	7.3	8.0	7.0	7.3	7.5	9.4	7.5	7.6
Surrogate	**Unit**	**Acceptable Limits**									
Chrysene-d12	%	50-140		106	111	121	101	89	99	94	76

Certified By: Manpreet Saroo

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AGAT WORK ORDER: 13Z745074

PROJECT NO: RQ13-110

CLIENT NAME: QIKIQTAALUK ENVIRONNEMENT

ATTENTION TO: Oliver Simard

O. Reg. 153(511) - PAHs (Soil)

DATE RECEIVED: 2013-08-08 **DATE REPORTED: 2013-08-20**

		SAMPLE DESCRIPTION:		LTU 2-3	LTU 2-4	LTU 2-5	LTU 2-6	LTU 2-7	LTU 2-8	LTU 2-D1	LTU 2-D3
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		8/1/2013	8/1/2013	8/1/2013	8/1/2013	8/1/2013	8/1/2013	8/1/2013	8/1/2013
Parameter	**Unit**	**G / S**	**RDL**	**4633252**	**4633255**	**4633258**	**4633261**	**4633285**	**4633288**	**4633291**	**4633294**
Naphthalene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Acenaphthylene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Acenaphthene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Fluorene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Phenanthrene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Anthracene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Fluoranthene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Pyrene	µg/g		0.05	0.08	0.06	<0.05	<0.05	0.06	0.05	0.07	0.07
Benz(a)anthracene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Chrysene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	0.07	0.06	<0.05	<0.05
Benzo(b)fluoranthene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(k)fluoranthene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-cd)pyrene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dibenz(a,h)anthracene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(g,h,i)perylene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
2-and 1-methyl Naphthalene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Moisture Content	%		0.1	8.4	8.0	5.7	5.8	4.5	6.0	8.0	9.0
Surrogate	**Unit**	**Acceptable Limits**									
Chrysene-d12	%	50-140		82	87	88	92	126	113	97	105

Certified By: Manpreet Sarao

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AGAT WORK ORDER: 13Z745074

PROJECT NO: RQ13-110

CLIENT NAME: QIKIQTAALUK ENVIRONNEMENT

ATTENTION TO: Oliver Simard

O. Reg. 153(511) - PAHs (Soil)

DATE RECEIVED: 2013-08-08 **DATE REPORTED: 2013-08-20**

		SAMPLE DESCRIPTION:		LTU 3-1	LTU 3-2	LTU 3-3	LTU 3-4	LTU 3-5	LTU 3-6	LTU 3-7	LTU 3-8
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		8/1/2013	8/1/2013	8/1/2013	8/1/2013	8/1/2013	8/1/2013	8/1/2013	8/1/2013
Parameter	Unit	G / S	RDL	4633297	4633300	4633303	4633306	4633309	4633312	4633314	4633317
Naphthalene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Acenaphthylene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Acenaphthene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Fluorene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Phenanthrene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Anthracene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Fluoranthene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Pyrene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benz(a)anthracene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Chrysene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(b)fluoranthene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(k)fluoranthene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-cd)pyrene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dibenz(a,h)anthracene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(g,h,i)perylene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
2-and 1-methyl Naphthalene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Moisture Content	%		0.1	5.5	8.5	11.8	14.5	13.6	4.4	8.5	8.4
Surrogate	**Unit**	**Acceptable Limits**									
Chrysene-d12	%	50-140		81	98	92	93	71	87	115	102

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AGAT WORK ORDER: 13Z745074

PROJECT NO: RQ13-110

CLIENT NAME: QIKIQTAALUK ENVIRONNEMENT

ATTENTION TO: Oliver Simard

O. Reg. 153(511) - PAHs (Soil)

DATE RECEIVED: 2013-08-08 **DATE REPORTED: 2013-08-20**

		SAMPLE DESCRIPTION:		LTU 3-D1	LTU 3-D3	STP-1	STP-2	STP-3	STP-4	STP-5	STP-6
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		8/1/2013	8/1/2013	8/1/2013	8/1/2013	8/1/2013	8/1/2013	8/1/2013	8/1/2013
Parameter	**Unit**	**G / S**	**RDL**	**4633320**	**4633323**	**4633326**	**4633329**	**4633332**	**4633335**	**4633338**	**4633341**
Naphthalene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Acenaphthylene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Acenaphthene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Fluorene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Phenanthrene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Anthracene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Fluoranthene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	0.06
Pyrene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	0.08	0.16
Benz(a)anthracene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.05
Chrysene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.05
Benzo(b)fluoranthene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.09	0.13
Benzo(k)fluoranthene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.05
Benzo(a)pyrene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-cd)pyrene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	0.05
Dibenz(a,h)anthracene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(g,h,i)perylene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.06	0.06
2-and 1-methyl Naphthalene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Moisture Content	%		0.1	8.0	11.6	5.1	6.0	7.3	6.8	4.0	4.2
Surrogate	**Unit**	**Acceptable Limits**									
Chrysene-d12	%	50-140		100	89	95	95	109	107	97	97

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AGAT WORK ORDER: 13Z745074

PROJECT NO: RQ13-110

CLIENT NAME: QIKIQTAALUK ENVIRONNEMENT

ATTENTION TO: Oliver Simard

O. Reg. 153(511) - PAHs (Soil)

DATE RECEIVED: 2013-08-08 **DATE REPORTED: 2013-08-20**

		SAMPLE DESCRIPTION:		STP-7	STP-8	STP-D4	STP-D6
		SAMPLE TYPE:		Soil	Soil	Soil	Soil
		DATE SAMPLED:		8/1/2013	8/1/2013	8/1/2013	8/1/2013
Parameter	Unit	G / S	RDL	4633344	4633347	4633350	4633353
Naphthalene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05
Acenaphthylene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05
Acenaphthene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05
Fluorene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05
Phenanthrene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05
Anthracene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05
Fluoranthene	µg/g		0.05	0.05	0.05	<0.05	0.08
Pyrene	µg/g		0.05	0.10	0.08	0.05	0.17
Benz(a)anthracene	µg/g		0.05	<0.05	<0.05	<0.05	0.06
Chrysene	µg/g		0.05	<0.05	<0.05	<0.05	0.06
Benzo(b)fluoranthene	µg/g		0.05	0.11	0.08	<0.05	0.13
Benzo(k)fluoranthene	µg/g		0.05	<0.05	<0.05	<0.05	0.05
Benzo(a)pyrene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-cd)pyrene	µg/g		0.05	0.05	<0.05	<0.05	0.05
Dibenz(a,h)anthracene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05
Benzo(g,h,i)perylene	µg/g		0.05	0.06	<0.05	<0.05	0.06
2-and 1-methyl Naphthalene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05
Moisture Content	%		0.1	5.1	4.5	8.0	4.7
Surrogate	**Unit**	**Acceptable Limits**					
Chrysene-d12	%	50-140		101	85	98	90

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

4633198-4633353 Results are based on the dry weight of the soil.

Note: The result for Benzo(b)Fluoranthene is the total of the Benzo(b)&(j)Fluoranthene isomers because the isomers co-elute on the GC column.

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AGAT WORK ORDER: 13Z745074

PROJECT NO: RQ13-110

CLIENT NAME: QIKIQTAALUK ENVIRONNEMENT

ATTENTION TO: Oliver Simard

O. Reg. 153(511) - PHCs F1 - F4 (with PAHs) (Soil)

DATE RECEIVED: 2013-08-08

DATE REPORTED: 2013-08-20

		SAMPLE DESCRIPTION:		LTU 1-1	LTU 1-2	LTU 1-3	LTU 1-4	LTU 1-5	LTU 1-6	LTU 1-7	LTU 1-8
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		8/1/2013	8/1/2013	8/1/2013	8/1/2013	8/1/2013	8/1/2013	8/1/2013	8/1/2013
Parameter	**Unit**	**G / S**	**RDL**	**4633198**	**4633200**	**4633203**	**4633208**	**4633211**	**4633214**	**4633222**	**4633225**
Benzene	µg/g		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Toluene	µg/g		0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
Ethylbenzene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Xylene Mixture	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
F1 (C6 to C10)	µg/g		5	26	56	78	57	66	28	91	21
F1 (C6 to C10) minus BTEX	µg/g		5	26	56	78	57	66	28	91	21
F2 (C10 to C16)	µg/g		10	440	1100	1300	1500	1500	660	1100	270
F2 (C10 to C16) minus Naphthalene	µg/g		10	440	1100	1300	1500	1500	660	1100	270
F3 (C16 to C34)	µg/g		50	740	890	690	970	810	1100	1000	500
F3 (C16 to C34) minus PAHs	µg/g		50	740	890	690	970	810	1100	1000	500
F4 (C34 to C50)	µg/g		50	420	390	250	400	390	450	420	240
Gravimetric Heavy Hydrocarbons	µg/g		50	NA	NA	NA	NA	NA	NA	NA	NA
Moisture Content	%		0.1	7.3	7.7	7.1	5.9	7.2	6.0	7.5	6.9
Surrogate	**Unit**	**Acceptable Limits**									
Terphenyl	%	60-140		87	110	100	110	100	90	85	87

Certified By: Manpreet Sarao

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AGAT WORK ORDER: 13Z745074

PROJECT NO: RQ13-110

CLIENT NAME: QIKIQTAALUK ENVIRONNEMENT

ATTENTION TO: Oliver Simard

O. Reg. 153(511) - PHCs F1 - F4 (with PAHs) (Soil)

DATE RECEIVED: 2013-08-08 **DATE REPORTED: 2013-08-20**

		SAMPLE DESCRIPTION:		LTU 1-9	LTU 1-10	LTU 1-11	LTU 1-12	LTU 1-D5	LTU 1-D10	LTU 2-1	LTU 2-2
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		8/1/2013	8/1/2013	8/1/2013	8/1/2013	8/1/2013	8/1/2013	8/1/2013	8/1/2013
Parameter	**Unit**	**G / S**	**RDL**	**4633228**	**4633231**	**4633234**	**4633237**	**4633240**	**4633243**	**4633246**	**4633249**
Benzene	µg/g		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Toluene	µg/g		0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
Ethylbenzene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Xylene Mixture	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
F1 (C6 to C10)	µg/g		5	15	130	70	28	56	100	63	75
F1 (C6 to C10) minus BTEX	µg/g		5	15	130	70	28	56	100	63	75
F2 (C10 to C16)	µg/g		10	300	1000	620	380	1400	1100	990	1200
F2 (C10 to C16) minus Naphthalene	µg/g		10	300	1000	620	380	1400	1100	990	1200
F3 (C16 to C34)	µg/g		50	460	970	740	710	750	1100	1100	1400
F3 (C16 to C34) minus PAHs	µg/g		50	460	970	740	710	750	1100	1100	1400
F4 (C34 to C50)	µg/g		50	240	330	260	420	280	380	620	540
Gravimetric Heavy Hydrocarbons	µg/g		50	NA	NA	NA	NA	NA	NA	NA	NA
Moisture Content	%		0.1	7.3	8.0	7.0	7.3	7.5	9.4	7.5	7.6
Surrogate	**Unit**	**Acceptable Limits**									
Terphenyl	%	60-140		100	83	90	110	85	97	120	120

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AGAT WORK ORDER: 13Z745074

PROJECT NO: RQ13-110

CLIENT NAME: QIKIQTAALUK ENVIRONNEMENT

ATTENTION TO: Oliver Simard

O. Reg. 153(511) - PHCs F1 - F4 (with PAHs) (Soil)

DATE RECEIVED: 2013-08-08 **DATE REPORTED: 2013-08-20**

		SAMPLE DESCRIPTION:		LTU 2-3	LTU 2-4	LTU 2-5	LTU 2-6	LTU 2-7	LTU 2-8	LTU 2-D1	LTU 2-D3
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		8/1/2013	8/1/2013	8/1/2013	8/1/2013	8/1/2013	8/1/2013	8/1/2013	8/1/2013
Parameter	**Unit**	**G / S**	**RDL**	**4633252**	**4633255**	**4633258**	**4633261**	**4633285**	**4633288**	**4633291**	**4633294**
Benzene	µg/g		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Toluene	µg/g		0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
Ethylbenzene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Xylene Mixture	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
F1 (C6 to C10)	µg/g		5	51	34	10	14	<5	<5	76	58
F1 (C6 to C10) minus BTEX	µg/g		5	51	34	10	14	<5	<5	76	58
F2 (C10 to C16)	µg/g		10	1000	450	140	200	36	100	820	770
F2 (C10 to C16) minus Naphthalene	µg/g		10	1000	450	140	200	36	100	820	770
F3 (C16 to C34)	µg/g		50	1300	700	330	440	470	540	1300	1400
F3 (C16 to C34) minus PAHs	µg/g		50	1300	700	330	440	470	540	1300	1400
F4 (C34 to C50)	µg/g		50	600	380	150	130	140	140	500	540
Gravimetric Heavy Hydrocarbons	µg/g		50	NA	NA	NA	NA	NA	NA	NA	NA
Moisture Content	%		0.1	8.4	8.0	5.7	5.8	4.5	6.0	8.0	9.0
Surrogate	**Unit**	**Acceptable Limits**									
Terphenyl	%	60-140		110	110	80	90	82	90	110	78

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AGAT WORK ORDER: 13Z745074

PROJECT NO: RQ13-110

CLIENT NAME: QIKIQTAALUK ENVIRONNEMENT

ATTENTION TO: Oliver Simard

O. Reg. 153(511) - PHCs F1 - F4 (with PAHs) (Soil)

DATE RECEIVED: 2013-08-08

DATE REPORTED: 2013-08-20

		SAMPLE DESCRIPTION:		LTU 3-1	LTU 3-2	LTU 3-3	LTU 3-4	LTU 3-5	LTU 3-6	LTU 3-7	LTU 3-8
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		8/1/2013	8/1/2013	8/1/2013	8/1/2013	8/1/2013	8/1/2013	8/1/2013	8/1/2013
Parameter	**Unit**	**G / S**	**RDL**	**4633297**	**4633300**	**4633303**	**4633306**	**4633309**	**4633312**	**4633314**	**4633317**
Benzene	µg/g		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Toluene	µg/g		0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
Ethylbenzene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Xylene Mixture	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
F1 (C6 to C10)	µg/g		5	22	<5	5	<5	<5	<5	<5	<5
F1 (C6 to C10) minus BTEX	µg/g		5	22	<5	5	<5	<5	<5	<5	<5
F2 (C10 to C16)	µg/g		10	170	22	110	<10	<10	<10	<10	37
F2 (C10 to C16) minus Naphthalene	µg/g		10	170	22	110	<10	<10	<10	<10	37
F3 (C16 to C34)	µg/g		50	140	96	160	<50	170	<50	<50	69
F3 (C16 to C34) minus PAHs	µg/g		50	140	96	160	<50	170	<50	<50	69
F4 (C34 to C50)	µg/g		50	<50	<50	<50	<50	<50	<50	<50	<50
Gravimetric Heavy Hydrocarbons	µg/g		50	NA	NA	NA	NA	NA	NA	NA	NA
Moisture Content	%		0.1	5.5	8.5	11.8	14.5	13.6	4.4	8.5	8.4
Surrogate	**Unit**	**Acceptable Limits**									
Terphenyl	%	60-140		76	78	77	68	120	77	74	95

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AGAT WORK ORDER: 13Z745074

PROJECT NO: RQ13-110

CLIENT NAME: QIKIQTAALUK ENVIRONNEMENT

ATTENTION TO: Oliver Simard

O. Reg. 153(511) - PHCs F1 - F4 (with PAHs) (Soil)

DATE RECEIVED: 2013-08-08 **DATE REPORTED: 2013-08-20**

		SAMPLE DESCRIPTION:		LTU 3-D1	LTU 3-D3	STP-1	STP-2	STP-3	STP-4	STP-5	STP-6
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		8/1/2013	8/1/2013	8/1/2013	8/1/2013	8/1/2013	8/1/2013	8/1/2013	8/1/2013
Parameter	**Unit**	**G / S**	**RDL**	**4633320**	**4633323**	**4633326**	**4633329**	**4633332**	**4633335**	**4633338**	**4633341**
Benzene	µg/g		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Toluene	µg/g		0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
Ethylbenzene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Xylene Mixture	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
F1 (C6 to C10)	µg/g		5	24	15	<5	<5	<5	<5	<5	<5
F1 (C6 to C10) minus BTEX	µg/g		5	24	15	<5	<5	<5	<5	<5	<5
F2 (C10 to C16)	µg/g		10	220	130	20	<10	45	180	60	90
F2 (C10 to C16) minus Naphthalene	µg/g		10	220	130	20	<10	45	180	60	90
F3 (C16 to C34)	µg/g		50	170	210	130	170	320	660	340	420
F3 (C16 to C34) minus PAHs	µg/g		50	170	210	130	170	320	660	340	420
F4 (C34 to C50)	µg/g		50	<50	<50	60	110	160	340	190	250
Gravimetric Heavy Hydrocarbons	µg/g		50	NA	NA	NA	NA	NA	NA	NA	NA
Moisture Content	%		0.1	8.0	11.6	5.1	6.0	7.3	6.8	4.0	4.2
Surrogate	**Unit**	**Acceptable Limits**									
Terphenyl	%	60-140		100	89	60	78	92	120	99	94

Certified By: Manpreet Sarao

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Certificate of Analysis

AGAT WORK ORDER: 13Z745074

PROJECT NO: RQ13-110

CLIENT NAME: QIKIQTAALUK ENVIRONNEMENT

ATTENTION TO: Oliver Simard

O. Reg. 153(511) - PHCs F1 - F4 (with PAHs) (Soil)

DATE RECEIVED: 2013-08-08

DATE REPORTED: 2013-08-20

		SAMPLE DESCRIPTION:		STP-7	STP-8	STP-D4	STP-D6
		SAMPLE TYPE:		Soil	Soil	Soil	Soil
		DATE SAMPLED:		8/1/2013	8/1/2013	8/1/2013	8/1/2013
Parameter	Unit	G / S	RDL	4633344	4633347	4633350	4633353
Benzene	µg/g		0.02	<0.02	<0.02	<0.02	<0.02
Toluene	µg/g		0.08	<0.08	<0.08	<0.08	<0.08
Ethylbenzene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05
Xylene Mixture	µg/g		0.05	<0.05	0.06	<0.05	<0.05
F1 (C6 to C10)	µg/g		5	<5	<5	<5	<5
F1 (C6 to C10) minus BTEX	µg/g		5	<5	<5	<5	<5
F2 (C10 to C16)	µg/g		10	52	37	250	87
F2 (C10 to C16) minus Naphthalene	µg/g		10	52	37	250	87
F3 (C16 to C34)	µg/g		50	310	290	840	370
F3 (C16 to C34) minus PAHs	µg/g		50	310	290	840	370
F4 (C34 to C50)	µg/g		50	180	180	350	270
Gravimetric Heavy Hydrocarbons	µg/g		50	NA	NA	NA	NA
Moisture Content	%		0.1	5.1	4.5	8.0	4.7
Surrogate	**Unit**	**Acceptable Limits**					
Terphenyl	%	60-140		120	78	97	100

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

4633198-4633353 Results are based on sample dry weight.
The C6-C10 fraction is calculated using toluene response factor.
The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and n-C34.
Gravimetric Heavy Hydrocarbons are not included in the Total C16-C50 and are only determined if the chromatogram of the C34 - C50 hydrocarbons indicates that hydrocarbons >C50 are present.
Total C6 - C50 results are corrected for BTEX and PAH contributions.
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC6 and nC10 response factors are within 30% of Toluene response factor.
nC10, nC16 and nC34 response factors are within 10% of their average.
C50 response factor is within 70% of nC10 + nC16 + nC34 average.
Linearity is within 15%.
Extraction and holding times were met for this sample.

Certified By: Manpreet Sareo

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Quality Assurance

CLIENT NAME: QIKIQTAALUK ENVIRONNEMENT

AGAT WORK ORDER: 13Z745074

PROJECT NO: RQ13-110

ATTENTION TO: Oliver Simard

Soil Analysis

RPT Date: Aug 20, 2013			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - Metals (Abbrev) (Soil)															
Boron	1	4633198	< 5	< 5	0.0%	< 5	85%	70%	130%	111%	80%	120%	101%	70%	130%
Barium	1	4633198	34	34	0.0%	< 2	100%	70%	130%	102%	80%	120%	97%	70%	130%
Beryllium	1	4633198	< 0.5	< 0.5	0.0%	< 0.5	115%	70%	130%	111%	80%	120%	106%	70%	130%
Cadmium	1	4633198	< 0.5	< 0.5	0.0%	< 0.5	100%	70%	130%	96%	80%	120%	99%	70%	130%
Chromium	1	4633198	20	20	0.0%	< 2	100%	70%	130%	107%	80%	120%	106%	70%	130%
Cobalt	1	4633198	5.1	5.5	7.5%	< 0.5	99%	70%	130%	100%	80%	120%	94%	70%	130%
Copper	1	4633198	13	13	0.0%	< 1	105%	70%	130%	104%	80%	120%	98%	70%	130%
Lead	1	4633198	17	21	21.1%	< 1	100%	70%	130%	98%	80%	120%	93%	70%	130%
Molybdenum	1	4633198	0.6	0.6	0.0%	< 0.5	101%	70%	130%	96%	80%	120%	101%	70%	130%
Nickel	1	4633198	8	8	0.0%	< 1	94%	70%	130%	104%	80%	120%	94%	70%	130%
Silver	1	4633198	< 0.2	< 0.2	0.0%	< 0.2	97%	70%	130%	110%	80%	120%	104%	70%	130%
Thallium	1	4633198	< 0.4	< 0.4	0.0%	< 0.4	95%	70%	130%	106%	80%	120%	98%	70%	130%
Uranium	1	4633198	< 0.5	< 0.5	0.0%	< 0.5	99%	70%	130%	96%	80%	120%	97%	70%	130%
Vanadium	1	4633198	37	39	5.3%	< 1	101%	70%	130%	99%	80%	120%	101%	70%	130%
Zinc	1	4633198	41	44	7.1%	< 5	104%	70%	130%	117%	80%	120%	111%	70%	130%
O. Reg. 153(511) - Metals (Abbrev) (Soil)															
Boron	1	4633225	< 5	< 5	0.0%	< 5	107%	70%	130%	81%	80%	120%	85%	70%	130%
Barium	1	4633225	37	38	2.7%	< 2	112%	70%	130%	108%	80%	120%	119%	70%	130%
Beryllium	1	4633225	< 0.5	< 0.5	0.0%	< 0.5	89%	70%	130%	90%	80%	120%	95%	70%	130%
Cadmium	1	4633225	< 0.5	< 0.5	0.0%	< 0.5	103%	70%	130%	111%	80%	120%	117%	70%	130%
Chromium	1	4633225	19	20	5.1%	< 2	90%	70%	130%	91%	80%	120%	105%	70%	130%
Cobalt	1	4633225	5.6	5.8	3.5%	< 0.5	97%	70%	130%	99%	80%	120%	104%	70%	130%
Copper	1	4633225	14	14	0.0%	< 1	101%	70%	130%	100%	80%	120%	114%	70%	130%
Lead	1	4633225	17	17	0.0%	< 1	101%	70%	130%	99%	80%	120%	105%	70%	130%
Molybdenum	1	4633225	1.1	0.8	NA	< 0.5	112%	70%	130%	101%	80%	120%	115%	70%	130%
Nickel	1	4633225	8	9	11.8%	< 1	98%	70%	130%	97%	80%	120%	105%	70%	130%
Silver	1	4633225	< 0.2	< 0.2	0.0%	< 0.2	100%	70%	130%	113%	80%	120%	127%	70%	130%
Thallium	1	4633225	< 0.4	< 0.4	0.0%	< 0.4	98%	70%	130%	107%	80%	120%	108%	70%	130%
Uranium	1	4633225	0.5	0.5	0.0%	< 0.5	103%	70%	130%	96%	80%	120%	104%	70%	130%
Vanadium	1	4633225	43	41	4.8%	< 1	101%	70%	130%	91%	80%	120%	109%	70%	130%
Zinc	1	4633225	42	42	0.0%	< 5	102%	70%	130%	108%	80%	120%	122%	70%	130%

Certified By: Tony Tpach

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Quality Assurance

CLIENT NAME: QIKIQTAALUK ENVIRONNEMENT

PROJECT NO: RQ13-110

AGAT WORK ORDER: 13Z745074

ATTENTION TO: Oliver Simard

Trace Organics Analysis

RPT Date: Aug 20, 2013

PARAMETER	Batch	Sample Id	DUPLICATE			Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
			Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - PHCs F1 - F4 (with PAHs) (Soil)															
Benzene	1	4633261	< 0.02	< 0.02	0.0%	< 0.02	117%	50%	140%	99%	60%	130%	113%	50%	140%
Toluene	1	4633261	< 0.08	< 0.08	0.0%	< 0.08	119%	50%	140%	99%	60%	130%	122%	50%	140%
Ethylbenzene	1	4633261	< 0.05	< 0.05	0.0%	< 0.05	120%	50%	140%	93%	60%	130%	114%	50%	140%
Xylene Mixture	1	4633261	< 0.05	< 0.05	0.0%	< 0.05	115%	50%	140%	96%	60%	130%	113%	50%	140%
F1 (C6 to C10)	1	4633261	14	12	15.4%	< 5	108%	60%	140%	98%	80%	120%	116%	60%	140%
F2 (C10 to C16)	1	4633246	990	1200	19.2%	< 10	105%	60%	140%	85%	80%	120%	103%	60%	140%
F3 (C16 to C34)	1	4633246	1100	1300	16.7%	< 50	111%	60%	140%	91%	80%	120%	102%	60%	140%
F4 (C34 to C50)	1	4633246	620	720	14.9%	< 50	98%	60%	140%	110%	80%	120%	105%	60%	140%
O. Reg. 153(511) - PHCs F1 - F4 (with PAHs) (Soil)															
Benzene	1	4633341	< 0.02	< 0.02	0.0%	< 0.02	128%	50%	140%	120%	60%	130%	103%	50%	140%
Toluene	1	4633341	< 0.08	< 0.08	0.0%	< 0.08	126%	50%	140%	125%	60%	130%	106%	50%	140%
Ethylbenzene	1	4633341	< 0.05	< 0.05	0.0%	< 0.05	128%	50%	140%	128%	60%	130%	106%	50%	140%
Xylene Mixture	1	4633341	< 0.05	< 0.05	0.0%	< 0.05	120%	50%	140%	125%	60%	130%	111%	50%	140%
F1 (C6 to C10)	1	4633341	< 5	< 5	0.0%	< 5	121%	60%	140%	118%	80%	120%	116%	60%	140%
F2 (C10 to C16)	1	4633312	< 10	< 10	0.0%	< 10	99%	60%	140%	106%	80%	120%	97%	60%	140%
F3 (C16 to C34)	1	4633312	< 50	< 50	0.0%	< 50	110%	60%	140%	108%	80%	120%	99%	60%	140%
F4 (C34 to C50)	1	4633312	< 50	< 50	0.0%	< 50	109%	60%	140%	99%	80%	120%	114%	60%	140%
O. Reg. 153(511) - PAHs (Soil)															
Naphthalene	1	4633246	< 0.05	< 0.05	0.0%	< 0.05	68%	50%	140%	89%	50%	140%	72%	50%	140%
Acenaphthylene	1	4633246	< 0.05	< 0.05	0.0%	< 0.05	78%	50%	140%	94%	50%	140%	87%	50%	140%
Acenaphthene	1	4633246	< 0.05	< 0.05	0.0%	< 0.05	76%	50%	140%	92%	50%	140%	87%	50%	140%
Fluorene	1	4633246	< 0.05	< 0.05	0.0%	< 0.05	80%	50%	140%	99%	50%	140%	91%	50%	140%
Phenanthrene	1	4633246	< 0.05	< 0.05	0.0%	< 0.05	81%	50%	140%	104%	50%	140%	98%	50%	140%
Anthracene	1	4633246	< 0.05	< 0.05	0.0%	< 0.05	81%	50%	140%	107%	50%	140%	91%	50%	140%
Fluoranthene	1	4633246	< 0.05	< 0.05	0.0%	< 0.05	80%	50%	140%	109%	50%	140%	109%	50%	140%
Pyrene	1	4633246	0.07	0.07	0.0%	< 0.05	82%	50%	140%	110%	50%	140%	122%	50%	140%
Benz(a)anthracene	1	4633246	< 0.05	< 0.05	0.0%	< 0.05	90%	50%	140%	132%	50%	140%	110%	50%	140%
Chrysene	1	4633246	< 0.05	< 0.05	0.0%	< 0.05	100%	50%	140%	138%	50%	140%	114%	50%	140%
Benzo(b)fluoranthene	1	4633246	< 0.05	< 0.05	0.0%	< 0.05	91%	50%	140%	110%	50%	140%	105%	50%	140%
Benzo(k)fluoranthene	1	4633246	< 0.05	< 0.05	0.0%	< 0.05	101%	50%	140%	97%	50%	140%	106%	50%	140%
Benzo(a)pyrene	1	4633246	< 0.05	< 0.05	0.0%	< 0.05	96%	50%	140%	106%	50%	140%	102%	50%	140%
Indeno(1,2,3-cd)pyrene	1	4633246	< 0.05	< 0.05	0.0%	< 0.05	89%	50%	140%	97%	50%	140%	86%	50%	140%
Dibenz(a,h)anthracene	1	4633246	< 0.05	< 0.05	0.0%	< 0.05	98%	50%	140%	89%	50%	140%	82%	50%	140%
Benzo(g,h,i)perylene	1	4633246	< 0.05	< 0.05	0.0%	< 0.05	76%	50%	140%	104%	50%	140%	84%	50%	140%
2-and 1-methyl Naphthalene	1	4633246	< 0.05	< 0.05	0.0%	< 0.05	67%	50%	140%	87%	50%	140%	74%	50%	140%
O. Reg. 153(511) - PAHs (Soil)															
Naphthalene	1	463312	< 0.05	< 0.05	0.0%	< 0.05	68%	50%	140%	89%	50%	140%	72%	50%	140%
Acenaphthylene	1	463312	< 0.05	< 0.05	0.0%	< 0.05	78%	50%	140%	94%	50%	140%	87%	50%	140%

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Quality Assurance

CLIENT NAME: QIKIQTAALUK ENVIRONNEMENT

AGAT WORK ORDER: 13Z745074

PROJECT NO: RQ13-110

ATTENTION TO: Oliver Simard

Trace Organics Analysis (Continued)

RPT Date: Aug 20, 2013			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Acenaphthene	1	463312	< 0.05	< 0.05	0.0%	< 0.05	76%	50%	140%	92%	50%	140%	87%	50%	140%
Fluorene	1	463312	< 0.05	< 0.05	0.0%	< 0.05	80%	50%	140%	99%	50%	140%	91%	50%	140%
Phenanthrene	1	463312	< 0.05	< 0.05	0.0%	< 0.05	81%	50%	140%	104%	50%	140%	98%	50%	140%
Anthracene	1	463312	< 0.05	< 0.05	0.0%	< 0.05	81%	50%	140%	107%	50%	140%	91%	50%	140%
Fluoranthene	1	463312	< 0.05	< 0.05	0.0%	< 0.05	80%	50%	140%	109%	50%	140%	109%	50%	140%
Pyrene	1	463312	< 0.05	< 0.05	0.0%	< 0.05	82%	50%	140%	110%	50%	140%	122%	50%	140%
Benz(a)anthracene	1	463312	< 0.05	< 0.05	0.0%	< 0.05	90%	50%	140%	132%	50%	140%	110%	50%	140%
Chrysene	1	463312	< 0.05	< 0.05	0.0%	< 0.05	100%	50%	140%	138%	50%	140%	114%	50%	140%
Benzo(b)fluoranthene	1	463312	< 0.05	< 0.05	0.0%	< 0.05	91%	50%	140%	110%	50%	140%	105%	50%	140%
Benzo(k)fluoranthene	1	463312	< 0.05	< 0.05	0.0%	< 0.05	101%	50%	140%	97%	50%	140%	106%	50%	140%
Benzo(a)pyrene	1	463312	< 0.05	< 0.05	0.0%	< 0.05	96%	50%	140%	106%	50%	140%	102%	50%	140%
Indeno(1,2,3-cd)pyrene	1	463312	< 0.05	< 0.05	0.0%	< 0.05	89%	50%	140%	97%	50%	140%	86%	50%	140%
Dibenz(a,h)anthracene	1	463312	< 0.05	< 0.05	0.0%	< 0.05	98%	50%	140%	89%	50%	140%	82%	50%	140%
Benzo(g,h,i)perylene	1	463312	< 0.05	< 0.05	0.0%	< 0.05	76%	50%	140%	104%	50%	140%	84%	50%	140%
2-and 1-methyl Naphthalene	1	463312	< 0.05	< 0.05	0.0%	< 0.05	67%	50%	140%	87%	50%	140%	74%	50%	140%
O. Reg. 153(511) - PAHs (Soil)															
Naphthalene	1	4633314	< 0.05	< 0.05	0.0%	< 0.05	68%	50%	140%	89%	50%	140%	72%	50%	140%
Acenaphthylene	1	4633314	< 0.05	< 0.05	0.0%	< 0.05	78%	50%	140%	94%	50%	140%	87%	50%	140%
Acenaphthene	1	4633314	< 0.05	< 0.05	0.0%	< 0.05	76%	50%	140%	92%	50%	140%	87%	50%	140%
Fluorene	1	4633314	< 0.05	< 0.05	0.0%	< 0.05	80%	50%	140%	99%	50%	140%	91%	50%	140%
Phenanthrene	1	4633314	< 0.05	< 0.05	0.0%	< 0.05	81%	50%	140%	104%	50%	140%	98%	50%	140%
Anthracene	1	4633314	< 0.05	< 0.05	0.0%	< 0.05	81%	50%	140%	107%	50%	140%	91%	50%	140%
Fluoranthene	1	4633314	< 0.05	< 0.05	0.0%	< 0.05	80%	50%	140%	109%	50%	140%	109%	50%	140%
Pyrene	1	4633314	< 0.05	< 0.05	0.0%	< 0.05	82%	50%	140%	110%	50%	140%	122%	50%	140%
Benz(a)anthracene	1	4633314	< 0.05	< 0.05	0.0%	< 0.05	90%	50%	140%	132%	50%	140%	110%	50%	140%
Chrysene	1	4633314	< 0.05	< 0.05	0.0%	< 0.05	100%	50%	140%	138%	50%	140%	114%	50%	140%
Benzo(b)fluoranthene	1	4633314	< 0.05	< 0.05	0.0%	< 0.05	91%	50%	140%	110%	50%	140%	105%	50%	140%
Benzo(k)fluoranthene	1	4633314	< 0.05	< 0.05	0.0%	< 0.05	101%	50%	140%	97%	50%	140%	106%	50%	140%
Benzo(a)pyrene	1	4633314	< 0.05	< 0.05	0.0%	< 0.05	96%	50%	140%	106%	50%	140%	102%	50%	140%
Indeno(1,2,3-cd)pyrene	1	4633314	< 0.05	< 0.05	0.0%	< 0.05	89%	50%	140%	97%	50%	140%	86%	50%	140%
Dibenz(a,h)anthracene	1	4633314	< 0.05	< 0.05	0.0%	< 0.05	98%	50%	140%	89%	50%	140%	82%	50%	140%
Benzo(g,h,i)perylene	1	4633314	< 0.05	< 0.05	0.0%	< 0.05	76%	50%	140%	104%	50%	140%	84%	50%	140%
2-and 1-methyl Naphthalene	1	4633314	< 0.05	< 0.05	0.0%	< 0.05	67%	50%	140%	87%	50%	140%	74%	50%	140%

Certified By: Manpreet Saleo

APPENDIX E

TABLES

TABLE I : Soils Analytical Results

Sample identification		LTU 1-1	LTU 1-2	LTU 1-3	LTU 1-4	LTU 1-5	LTU 1-6	LTU 1-7	LTU 1-8	LTU 1-9	LTU 1-10	LTU 1-11	LTU 1-12	LTU 1-D5	LTU 1-D10	LTU 2-1	LTU 2-2	LTU 2-3	LTU 2-4	LTU 2-5	LTU 2-6	LTU 2-7	LTU 2-8
Sampling date (yyyy-mm-dd)		2013-08-01	2013-08-01	2013-08-01	2013-08-01	2013-08-01	2013-08-01	2013-08-01	2013-08-01	2013-08-01	2013-08-01	2013-08-01	2013-08-01	2013-08-01	2013-08-01	2013-08-01	2013-08-01	2013-08-01	2013-08-01	2013-08-01	2013-08-01	2013-08-01	2013-08-01
Certificate of analysis		4633198	4633200	4633203	4633208	4633211	4633214	4633222	4633225	4633228	4633231	4633234	4633237	4633240	4633243	4633246	4633249	4633252	4633255	4633258	4633261	4633285	4633288
Parameter	**CCME**																						
Metals																							
Boron	*	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Barium	2000	34	32	31	29	30	35	34	37	34	38	42	46	33	37	36	37	35	38	34	36	41	43
Beryllium	8	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Cadmium	22	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Chromium	87	20	20	19	20	19	21	20	19	20	17	19	20	17	19	18	18	17	17	16	18	19	19
Cobalt	300	5.1	5.1	5	4.9	4.9	5.2	5.2	5.6	5.7	5.5	5.8	6.2	5.2	5.3	4.9	5.4	5.5	5.4	5	6	5.7	6.6
Copper	91	13	13	13	13	12	13	14	14	14	13	15	15	13	14	11	13	13	13	12	15	15	17
Lead	600	17	14	15	18	12	23	21	17	17	23	24	19	16	21	15	20	18	18	10	12	14	14
Molybdenum	40	0.6	0.6	0.6	0.6	0.6	0.6	0.6	1.1	0.7	0.7	0.8	0.8	0.8	0.7	0.6	0.7	0.7	0.7	0.6	0.8	0.8	0.9
Nickel	50	8	8	8	8	7	8	8	8	8	8	8	9	8	7	7	9	8	9	7	9	8	9
Silver	40	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Thallium	1	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
Uranium	300	< 0.5	< 0.5	< 0.5	0.6	< 0.5	< 0.5	< 0.5	< 0.5	0.7	< 0.5	0.5	0.5	< 0.5	0.5	< 0.5	< 0.5	0.6	0.6	< 0.5	0.7	0.5	0.5
Vanadium	130	37	38	37	43	37	38	40	43	45	39	40	44	38	40	37	39	36	41	36	43	43	46
Zinc	360	41	41	42	44	40	46	46	42	42	45	48	48	41	42	36	43	42	45	36	46	46	46
Polycyclic aromatic hydrocarbons (PAHs)																							
Naphtalene	22	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	*	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	*	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	*	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	50	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Anthracene	*	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	*	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Pyrene	100	< 0.05	0.43	0.44	0.88	0.7	0.36	0.51	0.06	0.07	0.14	0.3	0.07	0.61	0.15	0.07	0.11	0.08	0.06	< 0.05	< 0.05	0.06	0.05
Benzo(a)anthracene	10	< 0.05	0.13	0.14	0.2	0.21	0.06	0.1	< 0.05	< 0.05	0.05	0.09	< 0.05	0.18	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Chrysene	*	< 0.05	0.15	0.15	0.32	0.27	0.06	0.12	< 0.05	< 0.05	0.05	0.1	< 0.05	0.2	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.07	0.06
Benzo(b)fluoranthene	10	< 0.05	0.08	0.1	0.15	0.11	0.13	0.13	< 0.05	0.05	0.08	0.09	< 0.05	0.11	0.09	< 0.05	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(k)fluoranthene	10	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	0.7	< 0.05	0.12	0.14	0.25	0.21	< 0.05	0.1	< 0.05	< 0.05	0.05	0.1	< 0.05	0.18	0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	10	< 0.05	0.05	0.06	0.09	0.08	0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.06	< 0.05	0.07	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibenzo(a,h)anthracene	*	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(g,h,i)perylene	*	< 0.05	0.12	0.13	0.23	0.19	0.12	0.09	< 0.05	< 0.05	0.05	0.1	< 0.05	0.17	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-and 1-methyl naphthalene	*	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Moisture content	*	7.3	7.7	7.1	5.9	7.2	6	7.5	6.9	7.3	8	7	7.3	7.5	9.4	7.5	7.6	8.4	8	5.7	5.8	4.5	6
Chrysene-d12	*	110	93	84	76	92	99	111	113	106	111	121	101	89	99	94	76	82	87	88	92	126	113
Petroleum hydrocarbons (PHCs)																							
Benzene	0.03	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Toluene	0.37	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08
Ethylbenzene	0.082	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Xylene Mixture	11	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
F1 (C_6 to C_{10})	320	26	56	78	57	66	28	91	21	15	130	70	28	56	100	63	75	51	34	10	14	< 5	< 5
F1 (C_6 to C_{10}) minus BTEX	320	26	56	78	57	66	28	91	21	15	130	70	28	56	100	63	75	51	34	10	14	< 5	< 5
F2 (C_{10} to C_{16})	260	440	1100	1300	1500	1500	660	1100	270	300	1000	620	380	1400	1100	990	1200	1000	450	140	200	36	100
F2 (C_{10} to C_{16}) minus Naphthalene	260	440	1100	1300	1500	1500	660	1100	270	300	1000	620	380	1400	1100	990	1200	1000	450	140	200	36	100
F3 (C_{16} to C_{34})	1700	740	890	690	970	810	1100	1000	500	460	970	740	710	750	1100	1100	1400	1300	700	330	440	470	540
F3 (C_{16} to C_{34}) minus PAHs	1700	740	890	690	970	810	1100	1000	500	460	970	740	710	750	1100	1100	1400	1300	700	330	440	470	540
F4 (C_{34} to C_{50})	3300	420	390	250	400	390	450	420	240	240	330	260	420	280	380	620	540	600	380	150	130	140	140
Gravimetric Heavy Hydrocarbons	*	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Moisture content	*	7.3	7.7	7.1	5.9	7.2	6	7.5	6.9	7.3	8	7	7.3	7.5	9.4	7.5	7.6	8.4	8	5.7	5.8	4.5	6
Terphenyl	*	87	110	100	110	100	90	85	87	100	83	90	110	85	97	120	120	110	110	80	90	82	90

Analytical result exceeding the applicable value.

* : No value for this parameter was determined by the CCME.
BTEX : Benzene, toluene, ethylbenzene and xylene
CCME : Canadian Council of Ministers of the Environment
NA : Not analysed

Qikiqtaaluk environmental

TABLE I : Soils Analytical Results

Sample identification		LTU 2-D1	LTU 2-D3	LTU 3-1	LTU 3-2	LTU 3-3	LTU 3-4	LTU 3-5	LTU 3-6	LTU 3-7	LTU 3-8	LTU 3-D1	LTU 3-D3	STP-1	STP-2	STP-3	STP-4	STP-5	STP-6	STP-7	STP-8	STP-D4	STP-D6
Sampling date (yyyy-mm-dd)		2013-08-01	2013-08-01	2013-08-01	2013-08-01	2013-08-01	2013-08-01	2013-08-01	2013-08-01	2013-08-01	2013-08-01	2013-08-01	2013-08-01	2013-08-01	2013-08-01	2013-08-01	2013-08-01	2013-08-01	2013-08-01	2013-08-01	2013-08-01	2013-08-01	2013-08-01
Certificate of analysis		4633291	4633294	4633297	4633300	4633303	4633306	4633309	4633312	4633314	4633317	4633320	4633323	4633326	4633329	4633332	4633335	4633338	4633341	4633344	4633347	4633350	4633353
Parameter	**CCME**																						
Metals																							
Boron	*	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Barium	2000	39	36	28	47	71	66	65	38	28	46	25	66	34	35	35	37	33	35	29	33	36	32
Beryllium	8	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Cadmium	22	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Chromium	87	17	18	17	17	27	24	23	17	15	20	15	25	17	16	16	16	17	16	15	16	16	15
Cobalt	300	5.3	5.1	6.2	6.3	7.7	7.6	7.4	7.2	5.2	7.3	5	8	5.2	5.3	5.1	5.2	5.8	5.7	5	5.5	5.2	5.3
Copper	91	11	12	18	19	17	15	15	20	13	18	15	18	11	12	12	17	16	15	13	13	12	14
Lead	600	16	17	9	9	5	4	5	5	4	6	5	5	14	15	15	15	50	21	13	14	18	20
Molybdenum	40	0.6	0.6	0.9	0.7	0.9	1.1	1	0.8	0.6	0.8	0.7	0.7	0.7	0.7	0.6	0.7	0.8	0.8	0.7	0.7	0.6	0.7
Nickel	50	7	8	8	9	12	12	12	10	7	10	7	12	7	8	7	8	9	8	8	10	8	8
Silver	40	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Thallium	1	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
Uranium	300	< 0.5	< 0.5	< 0.5	< 0.5	0.6	0.6	0.7	< 0.5	< 0.5	0.5	0.5	0.6	< 0.5	< 0.5	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Vanadium	130	37	35	41	35	54	48	45	38	34	41	35	51	34	33	35	36	38	34	35	33	34	32
Zinc	360	38	40	39	42	52	48	48	40	32	43	32	54	39	40	39	40	50	49	43	44	40	52
Polycyclic aromatic hydrocarbons (PAHs)																							
Naphtalene	22	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	*	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	*	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	*	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	50	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Anthracene	*	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	*	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.05	0.06	0.05	0.05	< 0.05	0.08
Pyrene	100	0.07	0.07	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.05	0.08	0.16	0.1	0.08	0.05	0.17
Benzo(a)anthracene	10	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.05	< 0.05	< 0.05	< 0.05	0.06
Chrysene	*	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.05	< 0.05	< 0.05	< 0.05	0.06
Benzo(b)fluoranthene	10	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.09	0.13	0.11	0.08	< 0.05	0.13
Benzo(k)fluoranthene	10	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.05	< 0.05	< 0.05	< 0.05	0.05
Benzo(a)pyrene	0.7	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	10	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.05	0.05	0.05	< 0.05	< 0.05	0.05
Dibenzo(a,h)anthracene	*	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(g,h,i)perylene	*	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.06	0.06	0.06	< 0.05	< 0.05	0.06
2-and 1-methyl naphthalene	*	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Moisture content	*	8	9	5.5	8.5	11.8	14.5	13.6	4.4	8.5	8.4	8	11.6	5.1	6	7.3	6.8	4	4.2	5.1	4.5	8	4.7
Chrysene-d12	*	97	105	81	98	92	93	71	87	115	102	100	89	95	95	109	107	97	97	101	85	98	90
Petroleum hydrocarbons (PHCs)																							
Benzene	0.03	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Toluene	0.37	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08
Ethylbenzene	0.082	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Xylene Mixture	11	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.06	< 0.05	< 0.05
F1 (C_6 to C_{10})	320	76	58	22	< 5	5	< 5	< 5	< 5	< 5	< 5	24	15	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
F1 (C_6 to C_{10}) minus BTEX	320	76	58	22	< 5	5	< 5	< 5	< 5	< 5	< 5	24	15	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
F2 (C_{10} to C_{16})	260	820	770	170	22	110	< 10	< 10	< 10	< 10	37	220	130	20	< 10	45	180	60	90	52	37	250	87
F2 (C_{10} to C_{16}) minus Naphthalene	260	820	770	170	22	110	< 10	< 10	< 10	< 10	37	220	130	20	< 10	45	180	60	90	52	37	250	87
F3 (C_{16} to C_{34})	1700	1300	1400	140	96	160	< 50	170	< 50	< 50	69	170	210	130	170	320	660	340	420	310	290	840	370
F3 (C_{16} to C_{34}) minus PAHs	1700	1300	1400	140	96	160	< 50	170	< 50	< 50	69	170	210	130	170	320	660	340	420	310	290	840	370
F4 (C_{34} to C_{50})	3300	500	540	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	60	110	160	340	190	250	180	180	350	270
Gravimetric Heavy Hydrocarbons	*	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Moisture content	*	8	9	5.5	8.5	11.8	14.5	13.6	4.4	8.5	8.4	8	11.6	5.1	6	7.3	6.8	4	4.2	5.1	4.5	8	4.7
Terphenyl	*	110	78	76	78	77	68	120	77	74	95	100	89	60	78	92	120	99	94	120	78	97	100

Analytical result exceeding the applicable value.

* : No value for this parameter was determined by the CCME.
BTEX : Benzene, toluene, ethylbenzene and xylene
CCME : Canadian Council of Ministers of the Environment
NA : Not analysed

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TABLE II: PID Field Readings

Landfarm treatment Unit 1 (92 m x 37 m)		Landfarm treatment Unit 2 (42 m x 36 m)		Former Landfarm footprint (110 m x 38m)		Soil stockplie	
Sample identification	VOC Concentration	Sample identification	VOC Concentration	Sample identification	VOC Concentration	Sample identification	VOC Concentration
LTU1-1	160	LTU2-1	230	LTU3-1	105	STP-1	6,5
LTU1-2	176	LTU2-2	206	LTU3-2	16,5	STP-1	6,6
LTU1-3	246	LTU2-3	262	LTU3-3	45,2	STP-1	13,8
LTU1-4	185	LTU2-4	129	LTU3-4	12,4	STP-1	47,2
LTU1-5	322	LTU2-5	61,9	LTU3-5	17	STP-1	13,2
LTU1-6	146	LTU2-6	137	LTU3-6	16,3	STP-1	23,1
LTU1-7	290	LTU2-7	22,7	LTU3-7	9,5	STP-1	14,6
LTU1-8	95,4	LTU2-8	33,4	LTU3-8	36,4	STP-1	13,8
LTU1-9	84,3						
LTU1-10	496						
LTU1-11	235						
LTU1-12	123						