Crown-Indigenous Relations and Northern Affairs Canada
Relations Couronne-Autochtones et Affaires du Nord Canada

JERICHO DIAMOND MINE SITE STABILIZATION PROJECT

NUNAVUT IMPACT REVIEW BOARD FILE #16UN058 2018 ANNUAL REPORT

June 11, 2019

Canada

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The Proponent shall submit a comprehensive annual report to the Nunavut Impact Review Board at the end of each year of permitted activities, and before December 31st of each year. It is expected that reporting requirements under NIRB File No. 16UN058 will be coordinated with existing reporting requirements associated with INAC's ongoing site management and monitoring functions related to the Jericho Diamond Mine Project (NIRB File No. 00MN059) as approved to proceed under Project Certificate No. 002. The Board expects to receive the first such report on or before December 31, 2017.

The annual report must contain, but not limited to, the following information:

a) A summary of activities undertaken for the year, including:

- **a map and associated details pertaining to remediation activities and site operations conducted to-date;**

The activities that took place during the year included:

- June 4th to 6th Site Visit
  - Mobilization via aircraft
  - Implementation of Year 1 of the Operation, Maintenance and Surveillance (OMS) Plan
  - Site Tour (CIRNAC Inspector, NIRB)
  - Demobilization via aircraft
- July 31st to August 5th Site Stabilization
  - Mobilization via aircraft
  - Repair the S-fold in the liner covering the PHC Containment Cell;
  - Complete follow-up items from Environment Canada
    - Aboveground Storage Tank (AST) decommissioning
    - Halocarbon decommissioning
  - Address issues identified during the June inspection
    - Excavate stained soils in former camp area
    - Collect and remove wires, tarp and other debris in the former camp and sump area
  - Complete Year 1 of the OMS Plan
  - Demobilization via aircraft
- August 27th to 28th Site Visit
  - Mobilization via aircraft;
  - Decommissioning of the Oil/Water Separator Berm
    - Pumping of water to the pit
    - Removal and storage of residual gravel/sludge and absorbent materials
    - Removal and storage of geomembrane and geotextile
  - Demobilization via aircraft

See Appendix A for maps of the site showing all work areas.

- **a map detailing the locations of all fuel storage areas illustrating all containment structures, accompanied with a description of all containment measures implemented;**

Current fuel storage is limited to drummed fuel located within the Truck Shop Building (see Appendix A, Figure 2). This building has an in-ground sump to contain any fuel spills.

- **a description of local hires and employee training initiatives;**

Due to the short duration of on-site activities there were no local hires or training initiatives.

- **details on transportation activities undertaken including:**
  1. **aircraft flight frequency, approximate flight routes, and altitudes;**

Transportation to and from the site was completed via flights from Yellowknife using Twin Otter and King Air aircraft. A total of eight flights into the site were completed in conjunction with the three site visits in 2018.

  2. **finalized winter road routing and vehicle traffic information (number of return trips, types of vehicles);**

Not applicable.

- **site photos illustrating site conditions and areas of remediation works;**

Site photos are provided in the following Appendices:

- Appendix B: *Rowe's Outcome Joint Venture (ROJV) Memorandum – Summer 2018 Work*
- Appendix C: *Jericho Mine Site – Operation, Maintenance and Surveillance Program – 2018 Report*
- Appendix D: Oil/Water Separator Sump Decommissioning Photos

- **a summary of wastes disposed on-site as well those transported for disposal offsite, including locations and any required mitigation during transportation;**

During the June 4-6 and August 27-28 site visits no wastes were disposed of on-site. All wastes were collected and back-hauled to Yellowknife for disposal.

During the July 31 to August 5 work the wastes that were disposed of on-site were:

- Sewage: pacto toilets were used and the bags were incinerated daily;

- Camp and other non-hazardous waste: was incinerated daily. Ash from the incinerator was packaged and transported off-site for disposal

Wastes collected prior to demobilization on August 5th were back-hauled to Yellowknife for disposal.

b) An updated work plan for the following year including an approximate work schedule;

The Jericho Diamond Mine Site Stabilization Project has been completed and all equipment and materials that were brought into the site have been removed.

The project is now in long-term Operation, Maintenance and Surveillance (OMS), 2018 was the first year and the current plan involves 3 years of monitoring the effectiveness of the site stabilization work. Further OMS will be defined by the results of the initial 3 year program.

c) A summary of community consultations undertaken throughout the year, providing copy of materials presented to community members, a description of issues and concerns raised, discussions with community members and advice offered to the Proponent, as well as any follow-up actions that were required or taken to resolve any concerns expressed about the project;

None.

d) A log of instances in which community residents occupied or transited through the project area for the purpose of traditional land use or harvesting. This log should include the location and number of people encountered, activity being undertaken (e.g., berry picking, fishing, hunting, camping, etc.), date and time; and any mitigation measures or adaptive management undertaken to prevent disturbance;

There were no instances where community residents occupied or transited through the project area during the 2018 field activities in June and August.

e) A brief summary of wildlife mitigation and monitoring results as well as any mitigation actions undertaken. In addition, the Proponent shall maintain a record of wildlife observations while operating within the project area and include it as part of the summary report. The summary report should include the following:

No wildlife was observed during the 2018 fieldwork.

- **Locations (i.e., latitude and longitude) and species of wildlife observed on-site including number of animals, a description of the animal activity, and a description of the gender and age of**

animals if possible; Prior to conducting project activities, the Proponent should map the location of any sensitive wildlife sites such as denning sites, calving areas, caribou crossing sites, and raptor nests in the project area, and identify the timing of critical life history events (i.e., calving, mating, denning and nesting);

No wildlife was observed during the 2018 fieldwork.

- **The Proponent should indicate potential impacts from the project, and ensure that operational activities are managed and modified to avoid impacts on wildlife and sensitive sites;**

Given the short duration of on-site activities in 2018 (11 days over 3 months) there were minimal impacts to wildlife.

- **A summary of the effectiveness of mitigation measures for wildlife impacts; and**

A member of the field team was equipped with a firearm in case of a wildlife encounter. This measure has proved effective when used in the past.

- **If mitigation measures are observed to be ineffective or not achieving the expected outcomes, a discussion of issues interfering with the mitigation and alternative plans to reduce impacts to the wildlife in the vicinity of the project;**

Not applicable.

f) A summary of any heritage sites encountered during the exploration activities, any follow-up action or reporting required as a result, and how project activities were modified to mitigate impacts on the heritage sites;

No heritage sites were encountered during the site activities.

g) A summary of its knowledge of Inuit land use in/near the project area and how project activities were modified to mitigate impacts on Inuit land use; and

Inuit land use in/near the project area is limited and mostly consists of winter access (via snowmobile) to Contwoyto Lake. There was no need to alter project activities to mitigate impacts on Inuit land use due to the fact that:

- the main area of use, Contwoyto Lake, is over 3 kilometres from the main part of the Jericho site; and
- project activities took place between June and August, when snowmobile access is not possible

h) A summary of how the Proponent has complied with conditions contained within the Screening Decision Report, and all conditions as required by other authorizations associated with the project proposal.

The Proponent complied with the Screening Decision Report and all other Permits, Licences and Authorizations throughout the completion of the site stabilization work. Compliance was achieved by:

- discussing all regulatory requirements during the pre-construction and all other project meetings;
- copies of all regulatory documents were provided to the contractor;
- copies of all regulatory documents were posted at the work site as required;
- the contractor's Site Superintendent responsibilities included ensuring regulatory compliance;
- the Crown employed Departmental Representatives and had them on-site during all activities to ensure compliance with the contract and regulatory authorizations; and
- Inspectors were given access to the site in order to complete compliance inspections.

Supplemental Questions

The Nunavut Impact Review Board issued Board Recommendations with the *2016-2017 Annual Monitoring Report for the Jericho Diamond Mine Project* on November 27, 2017. Below are the recommendations and responses:

By way of a motion carried during its regular meeting held in November 2017, Board via Recommendation #5 requests that Indigenous and Northern Affairs Canada (INAC) requests that Indigenous and Northern Affairs Canada provide the NIRB with a detailed report of the stabilization works undertaken at the Jericho site under NIRB File No. 16UN058. The report should include details related to all activities conducted, results of the work, expected short and long-term management requirements, community consultation conducted or to be conducted, and an outline of the expected monitoring and management program. The Board requests that the report include, but not be limited to, the following information in addition to what is required by the Screening Decision Report for 16UN058. This report should be provided as part of the annual report to be submitted to the NIRB on or before December 31st of each year:

a) Details related to water monitoring, sampling, treatment, and discharge activities conducted during the reporting year;

Details on the water monitoring, sampling, treatment and discharge activities that took place in 2018 can be found in the *Rowe's Outcome Joint Venture (ROJV) Memorandum – Summer 2018 Work* in Appendix B and also in the *Jericho Mine*

Site – Operation, Maintenance and Surveillance Program – 2018 Report in Appendix C.

Water used for camp operations is discussed on Page 4 *Rowe's Outcome Joint Venture (ROJV) Memorandum – Summer 2018 Work* in Appendix B.

A summary of water sampling activities and associated laboratory analyses can be found in Appendix A of the *Jericho Mine Site – Operation, Maintenance and Surveillance Program – 2018 Report* in Appendix C.

b) Details related to earthworks conducted during the reporting year including modifications to water management structures, berms, dykes, and pads;

Earthworks completed in 2018 included the following:

- Phase 1 Petroleum Hydrocarbon (PHC) Contaminated Soils Cell Cover, the cover material was temporarily removed to expose the liner so it could be flattened and repaired. Cover material was then replaced. Further details can be found in the *Rowe's Outcome Joint Venture (ROJV) Memorandum – Summer 2018 Work* in Appendix B.

c) Details related to stabilization activities in the open pit area;

No stabilization activities took place in the open pit area in 2018. The OMS activities completed in the open pit area are detailed in the *Jericho Mine Site – Operation, Maintenance and Surveillance Program – 2018 Report* in Appendix C.

d) Details related to the covering of the Processed Kimberlite Containment Area;

The covering of the Processed Kimberlite Containment Area (PKCA) was completed in 2017. The OMS activities completed on the PKCA are detailed in the *Jericho Mine Site – Operation, Maintenance and Surveillance Program – 2018 Report* in Appendix C.

e) Details related to the collection and disposal of hazardous wastes;

No hazardous waste was collected for disposal in 2018. All know hazardous wastes were previously addressed.

f) Details related to the collection, treatment/disposal of contaminated soils;

The small volume (0.5 x 1.0 x 18 metres = 9 cubic metres) of hydrocarbon contaminated soils excavated in 2018 was added to the PHC Containment Cell when the liner was removed to repair the S-bend. Further details can be found

on Pages 2-3 of the *Rowe's Outcome Joint Venture (ROJV) Memorandum – Summer 2018 Work* in Appendix B.

g) Plans to manage deteriorating structures on-site;

A long-term Operation, Maintenance and Surveillance (OMS) Plan has been drafted for the site. Implementation of the OMS Plan began in 2018 and included surveillance activities to ensure the stabilization actions completed (e.g. West Dam Breach, PKCA Cover) are meeting their design intent.

With respect to the buildings, tanks, and camp, all hazardous materials have been removed and disposed of off-site. There are currently no plans to manage these structures as their deterioration is considered a low risk to human and environmental health.

h) Details related to any other remediation activities undertaken and any additional hazards identified;

All remedial activities that took place in 2018 are detailed in previous sections and within the *Rowe's Outcome Joint Venture (ROJV) Memorandum – Summer 2018 Work* in Appendix B.

No additional hazards were identified during the site activities.

i) Community consultation summaries; and

No community consultations were conducted this year.

j) Monitoring and management plans to ensure the environmental stability of the site and to ensure the effectiveness of the stabilization activities undertaken.

A long-term Operation, Maintenance and Surveillance (OMS) Plan has been drafted for the site and was provided with the *2017 Supplemental Annual Report*. Year 1 of OMS activities were completed in 2018, the results of these activities are provided in the *Jericho Mine Site – Operation, Maintenance and Surveillance Program – 2018 Report* in Appendix C. These results will be used to inform and plan OMS activities going forward.

APPENDIX A:
JERICHO DIAMOND MINE
SITE MAPS

Figure 1: Site Overview

Figure 2: South End of Site – Showing 2018 Work Areas

APPENDIX B:
ROWE'S OUTCOME JOINT VENTURE (ROJV) MEMORANDUM
SUMMER 2018 WORK

Memorandum

Date: October 11, 2018

To: Michael Bernardin, PSPC
Henry Wong, DXB Projects

From: Jonathan Markiewicz, Outcome Consultants Inc,

CC: Jack Rowe, Rowe's Construction
Michael Billowits, Outcome

Re: Summer 2018 Work
PSPC Contract EW699-171068/001/NCS ("Contract")

1.0 Purpose

The purpose of this memo is to provide a summary of works completed at the Jericho Mine Site to carry out the necessary liner repairs to the Phase 1 Tank Farm PHC Containment Cell, and to close out several inspection items required by Rowe's Outcome JV ("ROJV") during the Contract.

2.0 Scope of Work

Based on the current status of the site and the information requested by various Authorities Having Jurisdiction (AHJ) ROJV understands that the current scope of work includes the following:

1- Establish a safe and secure Camp utilizing the existing Airstrip Camp, Crown equipment and a ROJV Satellite phone (phone #: 1- 403-799-5302).
2- Excavate the soils associated with the 11 stained spots, place the impacted soils in the Phase 1 Tank Farm PHC Containment Cell, sample the open excavation for Petroleum Hydrocarbons (PHCs F1-F4) and compare the analyses against the Abandoned Military Site Remediation Protocol (AMSRP)to substantiate that the area has been remediated, and finally backfill/grade the area.
3- Uncover the LLDPE liner used to cover the PHC Containment Cell located in the Phase 1 Tank Farm such that the S-fold can be cut out and that the liner can be repaired providing a flat top surface. The liner to be recovered with the removed aggregates.
4- Collect, containerize and remove off-site any wastes (wires, tarps, etc.) associated with the Camp operations. Take before and after photographs of the remaining wastes to be managed.

5- Observe and record the current state of the 22 ASTs and update any records, labels or signage associated with their decommissioning. Take photographs of any existing or newly affixed labels/signs.

6- Observe and record the current state of the Halocarbon equipment and update any records, labels or signage associated with their decommissioning. Take photographs of any existing or newly affixed labels/signs.

3.0 Means and Methods

ROJV travelled to the Jericho Mine Site on July 31, 2018 and carried out the following activities:

1- **11 Stained Spots** – On August 1, 2018 and using the crown owned CAT 320 ROJV excavated a single trench will be excavated to a depth of 50-cm and a width of 1-m, the entire length of the 11 stained spots, approximated at 18 metres in length, with a 5-m northern section. This trench excavated all 11-spots and the potentially impacted soils beneath them.

The excavated soils were be transported from the work area to the Phase 1 containment cell using the crown owned CAT 950. The soils were temporarily stored on a poly liner until the Phase 1 LLDPE liner was cleared and opened.

Jonathan Markiewicz, P.Geo. collected soil grab samples every 2-3 m along each side wall and along the excavation floor; twenty-one (21) in total. Using a RKI combustible carbon gas detector (CCGD) and photo-ionization device (PID) screened each soil grab sample to identify the best location for sampling. Mr. Markiewicz then returned to the soil grab sample locations with the highest CCGD/PID readings and collected confirmatory samples from the trench consisting of 6 side wall and 2 floor samples. The sample density is consistent with the 9m2 sample grid density described in section 6.1.2 of the AMSRP as well as Protocol 3 – Soil Sampling Procedures at Contaminated Sites Environment Yukon (March 2011) section 3.0 which requires confirmatory samples collected from “each excavation face, one sample should be taken for each 10 metres running length”. In total, 9 samples were collected, including a duplicate sample (FL SGS 3 duplicate of FL SGS 2), and were submitted to Maxxam Analytics in Edmonton, Alberta for laboratory analyses of PHCs F1 to F4. The analytical results, included as Attachment #1, indicate that each was less than the method detection limit and confirms that no impacted soils remain in the vicinity of the 11-spotted stains.

The excavated trench was then back filled with coarse PK aggregates to reinstate the surface to a useable road/parking surface.

Photographs of the excavation and final state of the site have been included in Attachment #2.

2- **Liner Repair -** ROJV used the CAT 320 excavator to carefully uncover the LLDPE liner located above the PHC contaminated soils in the Phase 1 Tank Farm. ROJV retrofitted the flat clean-out blade of the excavator bucket with a 20-cm wide, 2-cm thick dense rubber track. This

enabled ROJV to gently uncover the coarse PK cover. ROJV also used hand shovels and brooms to fully expose a 6-m wide section of the liner.

Once cleared of the surface cover A& A Technical Services carried-out the liner repairs and QA tests, as follows:

a. The liner was cut
b. Any excess aggregates cleared out of the way to prepare a flat surface, free of sharp protrusions with positive drainage to match the rest of the Phase 1 containment cell.
c. The liner was then overlapped and any excess or damaged materials were cut away and discarded.
d. A&A then cleaned the liner using water and cotton cloth.
e. A&A carried out quality control tests of the welding equipment to establish the required temperature and seaming rates. A&A then tested the qualification welds so they are exceeding minimum International Association of Geosythetic installers (IAGI) peel and shear tests for 30mil LLDPE.
f. A&A then wedge welded the two liner pieces together. A&A then took a destruct sample of the in place weld
g. Large damaged areas, including the tear created during the 2017 installation were covered with a LLDPE patch and sealed with extrusion welding. Similarly A&A qualified the extrusion welds prior to carrying out the repairs
h. After the welds were completed A&A conducted vacuum tests along the entire seam length and each of the patch seams.

The liner was then photographed and inspected by the PSPC Departmental Representative. Attachment #2 includes photographs taken throughout the repair activities and Attachment #3 includes the quality reports provided by A&A following their repairs.

After field approval of the liner repairs, ROJV then covered the LLDPE liner with 0.5m of coarse PK aggregate and graded the top surface to uniformly match the remainder of the containment cell. Any excess coarse PK aggregates were placed and graded along the western side of the containment cell.

3- **Waste Management –** ROJV collected the remaining buried and partially buried electrical and data lines associated with the temporary camp that could not be removed in 2017 due to frozen soil conditions. The lines were transported off-site for either re-use (extension cords in good condition) or disposal.

The tarp associated with the greywater sumps was rolled and also removed from site and transported to Hay River, NT for re-use.

Before and after photographs are provided in Attachment #2

4- **AST Decommissioning –** On August 3, 2018 ROJV observed 20 of the 22 ASTs to confirm their state of decommissioning, the final 2 ASTs were observed on August 5, 2018.

ROJV noted the Tank ID #, serial numbers, original and final locations. The Tank IDs were then confirmed with the DR and included as AST Decommissioning Summary Table in Attachment #4.

The attached AST Decommissioning Summary Table was reconciled, in order of precedence, using on-site serial number and mine tank ID verifications (including photographic records), database information from INAC's FIRSTs registration, and All-Peace's decommissioning reports. The information provided in Attachment #4 is an accurate record of what was observed on each AST Manufacturer's Plate (serial number, capacity, etc.).

Using a RKI Eagle II combustible gas meter, ROJV collected ambient air readings from inside each of the ASTs and these value, all 0% LEL, were recorded in the summary table. Only AST # T5 (GEM-6-052-1) was unable to get a reading due to the fact that all AST openings were inaccessible.

ROJV placed new labels on all 22 ASTs stating the date of decommissioning and that they have been removed from service.

ROJV took before and after photographs, which are provided in Attachment #2.

5- **Halocarbon Decommissioning –** On August 2, 2018 ROJV observed the equipment that were decommissioned during the 2017 field program. In total, 18 units were observed and confirmed to have been decommissioned, new labels were affixed to each unit.

ROJV took photographs of the decommissioned units after the labels were affixed.

6- **Camp Closure –** Through-out the Summer 2018 works ROJV consumed Diesel and propane that was stored in the Hazardous Materials Storage area. Any diesel that was not used during operations was used to refill operational ASTs (Airstrip Camp Generator Tank, Garage Generator Tank and Incinerator Tank). All emptied drums were deheaded, cleaned and stacked sideways with the drums cleaned in 2017. Washwater was removed from site and disposed of at KBL Environmental. Unused propane was vented from the tanks and the vessels, once emptied, were stored on the stable platform with the other propane tanks northeast of the Hazardous Materials area. ROJV secured 2 propane bottles to the airstrip camp for future use and at the DRs request left a single 30-L Jerry can of gasoline in the seacan near the airstrip camp.

All camp waste was incinerated using the existing Mine Site incinerator, except for the final garbage which was brought off-site for disposal. All greywater was transferred to the Open Pit.

All waterlines were bled dry and valves left partially open. All P-traps in the sinks and shower were filled with RV antifreeze.

All crown used equipment was parked inside the Maintenance garage with the exception of a light tower, the ambulance truck and white van. They were all confirmed to be

operational and left with fuel in the tanks. Master switches in the engine compartments were turned off, or the battery leads disconnected.

ROJV demobilized from the site in the late afternoon on August 5, 2018.

4.0 Closure

ROJV trusts that this summary report adequately describes the work completed in the Summer of 2018 and assists PSPC/INAC in closing off several regulatory and construction items at the former Jericho Mine site.

If you require any further information or clarification, please do not hesitate to contact the writer.

Regards,

Jonathan Markiewicz, P.Geo.
Senior Project Manager

Attachment 1 – Laboratory Certificates of Analysis
Attachment 2 – Photographs
Attachment 3- Liner Repair QA/QC Report
Attachment 4 – AST Inventory

Attachment 1 – Laboratory Certificates of Analysis

Your Project #: P2017-01
Your C.O.C. #: A058394

Attention: JONATHAN MARKIEWICZ

OUTCOME CONSULTANTS INC.
151 HOLLAND AVENUE
SUITE 200
OTTAWA, ON
CANADA K1Y 0Y2

Report Date: 2018/08/04
Report #: R2599895
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B865009
Received: 2018/08/02, 10:50

Sample Matrix: Soil
Samples Received: 9

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
BTEX/F1 by HS GC/MS/FID (MeOH extract) (1)	9	N/A	2018/08/03	AB SOP-00039	CCME CWS/EPA 8260d m
F1-BTEX	9	N/A	2018/08/04	AB SOP-00039	Auto Calc
CCME Hydrocarbons (F2-F4 in soil) (2)	9	2018/08/03	2018/08/03	AB SOP-00036 / AB SOP-00040	CCME PHC-CWS m
Moisture	9	N/A	2018/08/03	AB SOP-00002	CCME PHC-CWS m

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected.

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Maxxam, unless otherwise agreed in writing.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested.

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

Your Project #: P2017-01
Your C.O.C. #: A058394

Attention: JONATHAN MARKIEWICZ

OUTCOME CONSULTANTS INC.
151 HOLLAND AVENUE
SUITE 200
OTTAWA, ON
CANADA K1Y 0Y2

Report Date: 2018/08/04
Report #: R2599895
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B865009
Received: 2018/08/02, 10:50

Encryption Key

Linsay Sunderman
Senior Project Manager
04 Aug 2018 17:19:58

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Cynny Hagen, Project Manager
Email: CHagen@maxxam.ca
Phone# (403)735-2273

==========

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Analytics International Corporation o/a Maxxam Analytics Edmonton: 9331 - 48th Street T6B 2R4 Telephone (780)577-7100 Fax (780)450-4187

Maxxam Job #: B865009
Report Date: 2018/08/04

OUTCOME CONSULTANTS INC.
Client Project #: P2017-01

AT1 BTEX AND F1-F4 IN SOIL (VIALS)

Maxxam ID		TZ8559	TZ8560	TZ8561	TZ8562	TZ8563		
Sampling Date		2018/08/01 16:30	2018/08/01 16:05	2018/08/01 16:21	2018/08/01 16:27	2018/08/01 16:16		
COC Number		A058394	A058394	A058394	A058394	A058394		
	UNITS	NW SGS 1@0.1	SW SGS 1@0.1	EW SGS 1@0.1	EW SGS 2@0.1	WW SGS 1@0.1	RDL	QC Batch
Ext. Pet. Hydrocarbon								
F2 (C10-C16 Hydrocarbons)	mg/kg	<10	<10	<10	<10	<10	10	9087475
F3 (C16-C34 Hydrocarbons)	mg/kg	<50	<50	<50	<50	<50	50	9087475
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	<50	<50	<50	<50	50	9087475
Reached Baseline at C50	mg/kg	Yes	Yes	Yes	Yes	Yes		9087475
Physical Properties								
Moisture	%	3.7	3.9	2.6	6.6	3.8	0.30	9090661
Volatiles								
Xylenes (Total)	mg/kg	<0.045	<0.045	<0.045	<0.045	<0.045	0.045	9090071
F1 (C6-C10) - BTEX	mg/kg	<10	<10	<10	<10	<10	10	9090071
Field Preserved Volatiles								
Benzene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	9090627
Toluene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	9090627
Ethylbenzene	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9090627
m & p-Xylene	mg/kg	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	9090627
o-Xylene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	9090627
F1 (C6-C10)	mg/kg	<10	<10	<10	<10	<10	10	9090627
Surrogate Recovery (%)								
1,4-Difluorobenzene (sur.)	%	102	101	102	102	105		9090627
4-Bromofluorobenzene (sur.)	%	94	92	92	94	93		9090627
D10-o-Xylene (sur.)	%	95	91	99	102	96		9090627
D4-1,2-Dichloroethane (sur.)	%	84	84	84	84	86		9090627
O-TERPHENYL (sur.)	%	90	90	88	88	87		9087475

RDL = Reportable Detection Limit

Maxxam Analytics International Corporation o/a Maxxam Analytics Edmonton: 9331 - 48th Street T6B 2R4 Telephone (780)577-7100 Fax (780)450-4187

Maxxam Job #: B865009
Report Date: 2018/08/04

OUTCOME CONSULTANTS INC.
Client Project #: P2017-01

AT1 BTEX AND F1-F4 IN SOIL (VIALS)

Maxxam ID		TZ8564	TZ8565	TZ8566		TZ8567		
Sampling Date		2018/08/01 16:24	2018/08/01 16:11	2018/08/01 16:35		2018/08/01 16:37		
COC Number		A058394	A058394	A058394		A058394		
	UNITS	WW SGS 2@0.1	FL SGS 1 @ 0.3	FL SGS 2 @ 0.3	QC Batch	FL SGS 3 @ 0.3	RDL	QC Batch
Ext. Pet. Hydrocarbon								
F2 (C10-C16 Hydrocarbons)	mg/kg	<10	<10	<10	9087475	<10	10	9077664
F3 (C16-C34 Hydrocarbons)	mg/kg	<50	<50	<50	9087475	<50	50	9077664
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	<50	<50	9087475	<50	50	9077664
Reached Baseline at C50	mg/kg	Yes	Yes	Yes	9087475	Yes		9077664
Physical Properties								
Moisture	%	3.7	4.5	3.4	9090661	3.4	0.30	9090661
Volatiles								
Xylenes (Total)	mg/kg	<0.045	<0.045	<0.045	9090071	<0.045	0.045	9090071
F1 (C6-C10) - BTEX	mg/kg	<10	<10	<10	9090071	<10	10	9090071
Field Preserved Volatiles								
Benzene	mg/kg	<0.0050	<0.0050	<0.0050	9090627	<0.0050	0.0050	9090627
Toluene	mg/kg	<0.020	<0.020	<0.020	9090627	<0.020	0.020	9090627
Ethylbenzene	mg/kg	<0.010	<0.010	<0.010	9090627	<0.010	0.010	9090627
m & p-Xylene	mg/kg	<0.040	<0.040	<0.040	9090627	<0.040	0.040	9090627
o-Xylene	mg/kg	<0.020	<0.020	<0.020	9090627	<0.020	0.020	9090627
F1 (C6-C10)	mg/kg	<10	<10	<10	9090627	<10	10	9090627
Surrogate Recovery (%)								
1,4-Difluorobenzene (sur.)	%	102	101	101	9090627	101		9090627
4-Bromofluorobenzene (sur.)	%	92	91	92	9090627	92		9090627
D10-o-Xylene (sur.)	%	104	92	96	9090627	95		9090627
D4-1,2-Dichloroethane (sur.)	%	83	84	84	9090627	84		9090627
O-TERPHENYL (sur.)	%	88	87	92	9087475	85		9077664

RDL = Reportable Detection Limit

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Maxxam Job #: B865009
Report Date: 2018/08/04

OUTCOME CONSULTANTS INC.
Client Project #: P2017-01

GENERAL COMMENTS

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

Package 1	3.3°C

Results relate only to the items tested.

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Report Date: 2018/08/04

OUTCOME CONSULTANTS INC.
Client Project #: P2017-01

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
9077664	JR1	Matrix Spike	O-TERPHENYL (sur.)	2018/07/28		90	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/07/28		91	%	60 - 140
			F3 (C16-C34 Hydrocarbons)	2018/07/28		94	%	60 - 140
			F4 (C34-C50 Hydrocarbons)	2018/07/28		97	%	60 - 140
9077664	JR1	Spiked Blank	O-TERPHENYL (sur.)	2018/07/28		91	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/07/28		91	%	60 - 140
			F3 (C16-C34 Hydrocarbons)	2018/07/28		90	%	60 - 140
			F4 (C34-C50 Hydrocarbons)	2018/07/28		88	%	60 - 140
9077664	JR1	Method Blank	O-TERPHENYL (sur.)	2018/07/28		105	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/07/28	<10		mg/kg	
			F3 (C16-C34 Hydrocarbons)	2018/07/28	<50		mg/kg	
			F4 (C34-C50 Hydrocarbons)	2018/07/28	<50		mg/kg	
9077664	JR1	RPD	F2 (C10-C16 Hydrocarbons)	2018/07/28	NC		%	40
			F3 (C16-C34 Hydrocarbons)	2018/07/28	NC		%	40
			F4 (C34-C50 Hydrocarbons)	2018/07/28	NC		%	40
9087475	JR1	Matrix Spike	O-TERPHENYL (sur.)	2018/08/03		95	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/08/03		101	%	60 - 140
			F3 (C16-C34 Hydrocarbons)	2018/08/03		93	%	60 - 140
			F4 (C34-C50 Hydrocarbons)	2018/08/03		90	%	60 - 140
9087475	JR1	Spiked Blank	O-TERPHENYL (sur.)	2018/08/03		91	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/08/03		96	%	60 - 140
			F3 (C16-C34 Hydrocarbons)	2018/08/03		90	%	60 - 140
			F4 (C34-C50 Hydrocarbons)	2018/08/03		84	%	60 - 140
9087475	JR1	Method Blank	O-TERPHENYL (sur.)	2018/08/03		103	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/08/03	<10		mg/kg	
			F3 (C16-C34 Hydrocarbons)	2018/08/03	<50		mg/kg	
			F4 (C34-C50 Hydrocarbons)	2018/08/03	<50		mg/kg	
9087475	JR1	RPD	F2 (C10-C16 Hydrocarbons)	2018/08/03	NC		%	40
			F3 (C16-C34 Hydrocarbons)	2018/08/03	NC		%	40
			F4 (C34-C50 Hydrocarbons)	2018/08/03	NC		%	40
9090627	AMJ	Matrix Spike [TZ8560-02]	1,4-Difluorobenzene (sur.)	2018/08/03		98	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/08/03		94	%	50 - 140
			D10-o-Xylene (sur.)	2018/08/03		100	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/08/03		80	%	50 - 140
			Benzene	2018/08/03		97	%	50 - 140
			Toluene	2018/08/03		92	%	50 - 140
			Ethylbenzene	2018/08/03		100	%	50 - 140
			m & p-Xylene	2018/08/03		102	%	50 - 140
			o-Xylene	2018/08/03		99	%	50 - 140
			F1 (C6-C10)	2018/08/03		74	%	60 - 140
9090627	AMJ	Spiked Blank	1,4-Difluorobenzene (sur.)	2018/08/03		101	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/08/03		95	%	50 - 140
			D10-o-Xylene (sur.)	2018/08/03		96	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/08/03		83	%	50 - 140
			Benzene	2018/08/03		100	%	60 - 130
			Toluene	2018/08/03		101	%	60 - 130
			Ethylbenzene	2018/08/03		102	%	60 - 130
			m & p-Xylene	2018/08/03		106	%	60 - 130
			o-Xylene	2018/08/03		100	%	60 - 130
			F1 (C6-C10)	2018/08/03		109	%	60 - 140
9090627	AMJ	Method Blank	1,4-Difluorobenzene (sur.)	2018/08/03		103	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/08/03		92	%	50 - 140
			D10-o-Xylene (sur.)	2018/08/03		95	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/08/03		83	%	50 - 140
			Benzene	2018/08/03	<0.0050		mg/kg	

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OUTCOME CONSULTANTS INC.
Client Project #: P2017-01

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Toluene	2018/08/03	<0.020		mg/kg	
			Ethylbenzene	2018/08/03	<0.010		mg/kg	
			m & p-Xylene	2018/08/03	<0.040		mg/kg	
			o-Xylene	2018/08/03	<0.020		mg/kg	
			F1 (C6-C10)	2018/08/03	<10		mg/kg	
9090627	AMJ	RPD [TZ8560-02]	Benzene	2018/08/03	NC		%	50
			Toluene	2018/08/03	NC		%	50
			Ethylbenzene	2018/08/03	NC		%	50
			m & p-Xylene	2018/08/03	NC		%	50
			o-Xylene	2018/08/03	NC		%	50
			F1 (C6-C10)	2018/08/03	NC		%	30
9090661	HKG	Method Blank	Moisture	2018/08/03	<0.30		%	
9090661	HKG	RPD	Moisture	2018/08/03	2.1		%	20

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

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

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

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

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

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

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OUTCOME CONSULTANTS INC.
Client Project #: P2017-01

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Daniel Reslan, cCT, QP, Organics Manager

Pamela Kimmerly, Chem. Tech., Team Lead

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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Maxxam

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www.maxxamanalytics.com

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Chain of Custody A053884

Page: 1 of 1

	Invoice To: C/O Report Address ☐	Report To: Same as Invoice ☐
Company:	OUTCOME CONSULTANTS	
Contact:	J MARKIEWICZ	
Address:	151 HOLLAND AV	
	Prov: OTTAWA ON K1Y0Y2	Prov: PC:
Contact #s:	Ph: 514-984-6605 Cell:	Ph: Cell:

Report Distribution (E-Mail):
jmarkiewicz@outcomeinc.ca
jmauchan@outcomeinc.ca

REGULATORY GUIDELINES:
☐ AT1
☒ CCME
☐ Regulated Drinking Water
☒ Other:

All samples are held for 60 calendar days after sample receipt, unless specified otherwise.

PO #:	
Project # / Name:	P2017-01
Site Location:	
Quote #:	
Sampled By:	

SERVICE REQUESTED:
☒ RUSH (Contact lab to reserve) Date Required: 24 TAT
☐ REGULAR (5 to 7 Days)

See reverse for package specifics

	Sample ID	Depth (unit)	Matrix GW / SW Soil	Date/Time Sampled YY/MM/DD 24:00	SOIL: BTEX F1-F4	Sieve (75 micron)	Regulated Metals (CCME / AT1)	Salinity 4	Assessment ICP Metals	Basic Class II Landfill	WATER: ☐VOCs ☐BTEX F1 ☐BTEX F1-F2	☐BTEX F1-F4 ☐Routine Water ☐Turb ☐F	☐TOC ☐DOC	Regulated Metals (CCME / AT1) Total	Dissolved	Mercury	☐Total ☐Dissolved	Other Analysis	HOLD - Do not Analyze	# of Containers Submitted
1	NW SGS1	0.1	Soil	18/08/01 16h30	X															3
2	SW SGS1	0.1		16h05																3
3	EW SGS1	0.1		16h21																3
4	EW SGS2	0.1		16h27																2
5	WW SGS1	0.1		16h16																3
6	WW SGS2	0.1		16h24																3
7	FL SGS1	0.3		16h11																3
8	FL SGS2	0.3		16h35																3
9	FL SGS3	0.3	~	~16h37	~															3
10																				
11																				
12																				F/P

RECEIVED IN YELLOWKNIFE
By: [signature] Jeffreys
2018-08-02
ice-yes
sealed-yes
10:50am
Temp: 11.3, 3

Please indicate Filtered, Preserved or Both (F, P, F/P)

Relinquished By (Signature/Print): [signature] JMARKIEWICZ	Date (YY/MM/DD): 18/08/01	Time (24:00): 16h48
Relinquished By (Signature/Print):	Date (YY/MM/DD):	Time (24:00):

Special Instructions:

# of Jars Used & Not Submitted

LAB USE ONLY

Received By:	Date:	Time:
DanielleBorsien	20180803	0715

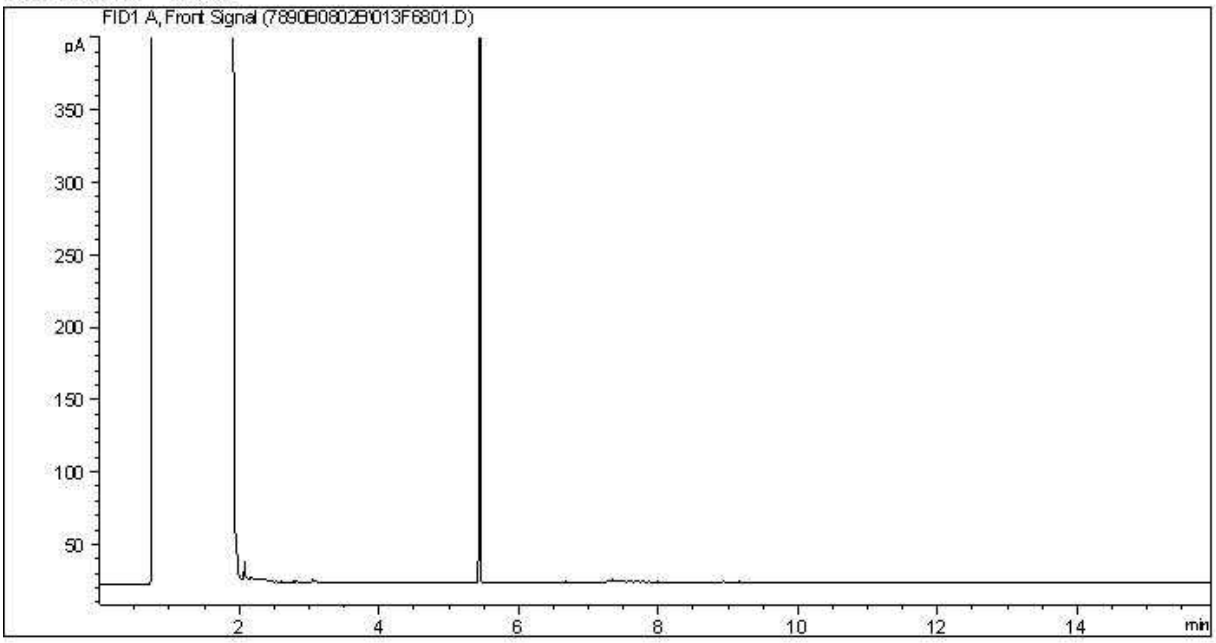
Lab Comments:

Maxxam Job #: B865009

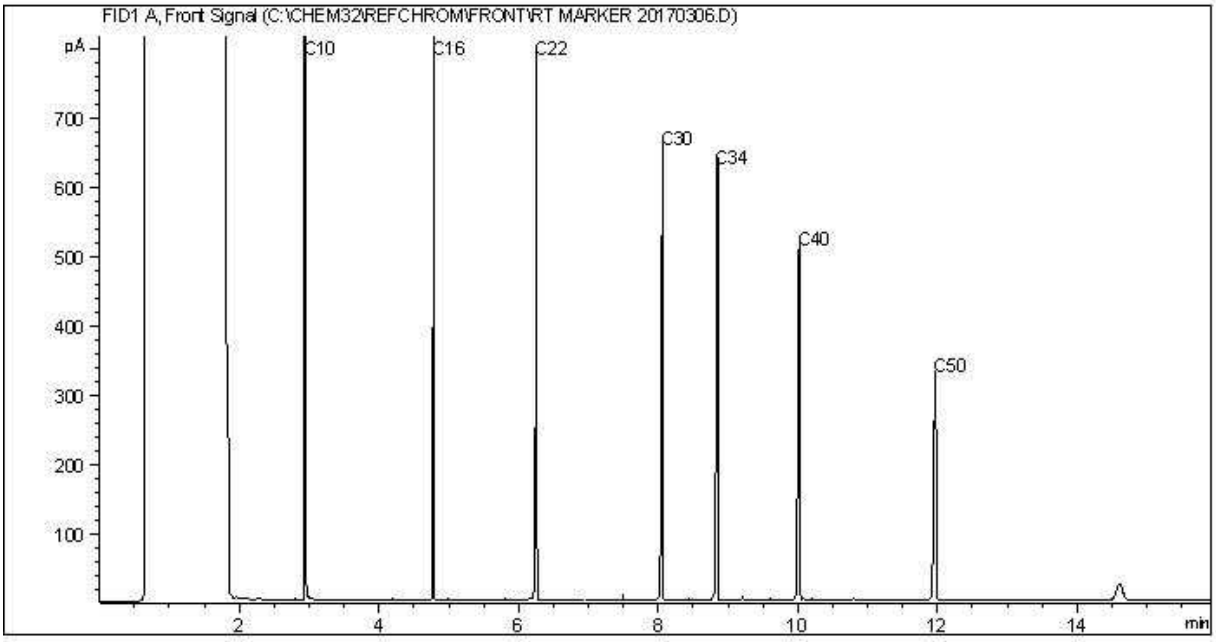
Custody Seal	Temperature	Ice
Y	10,6,13	Y

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890B



Carbon Range Distribution - Reference Chromatogram



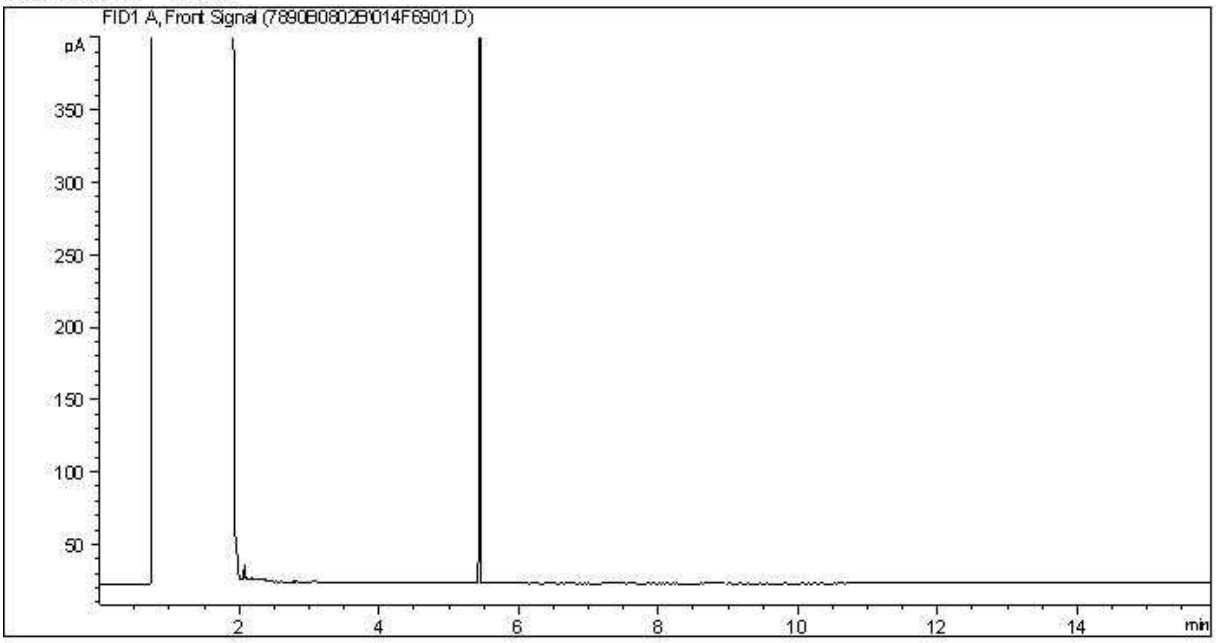
TYPICAL PRODUCT CARBON NUMBER RANGES

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

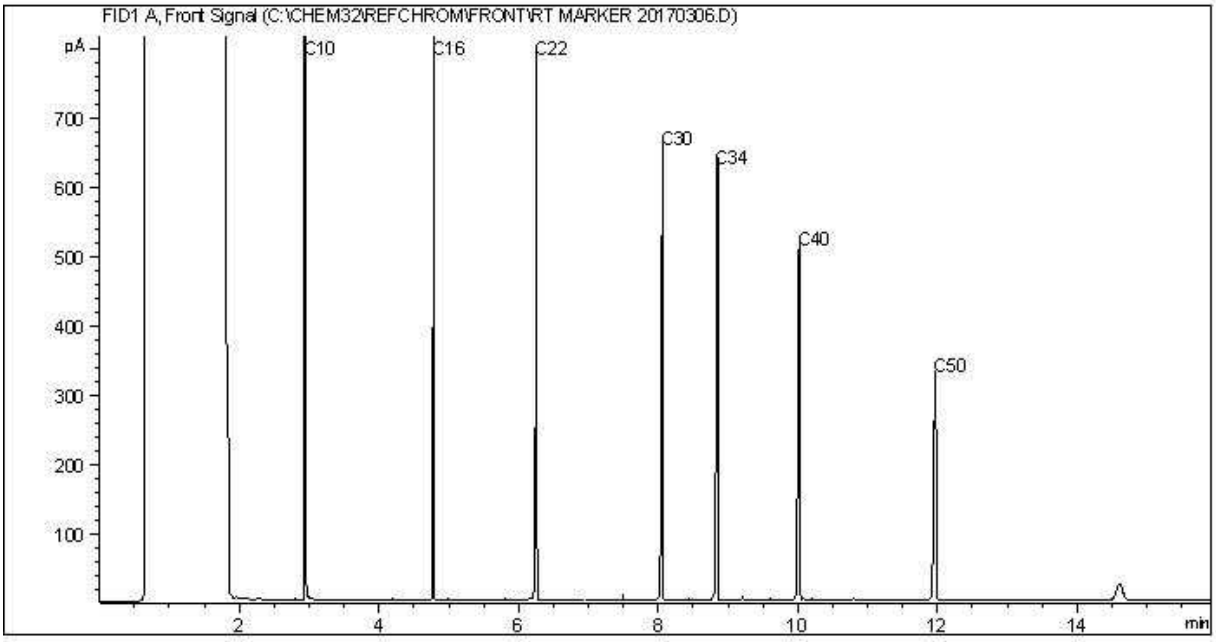
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890B



Carbon Range Distribution - Reference Chromatogram



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CCME Hydrocarbons (F2-F4 in soil) Chromatogram

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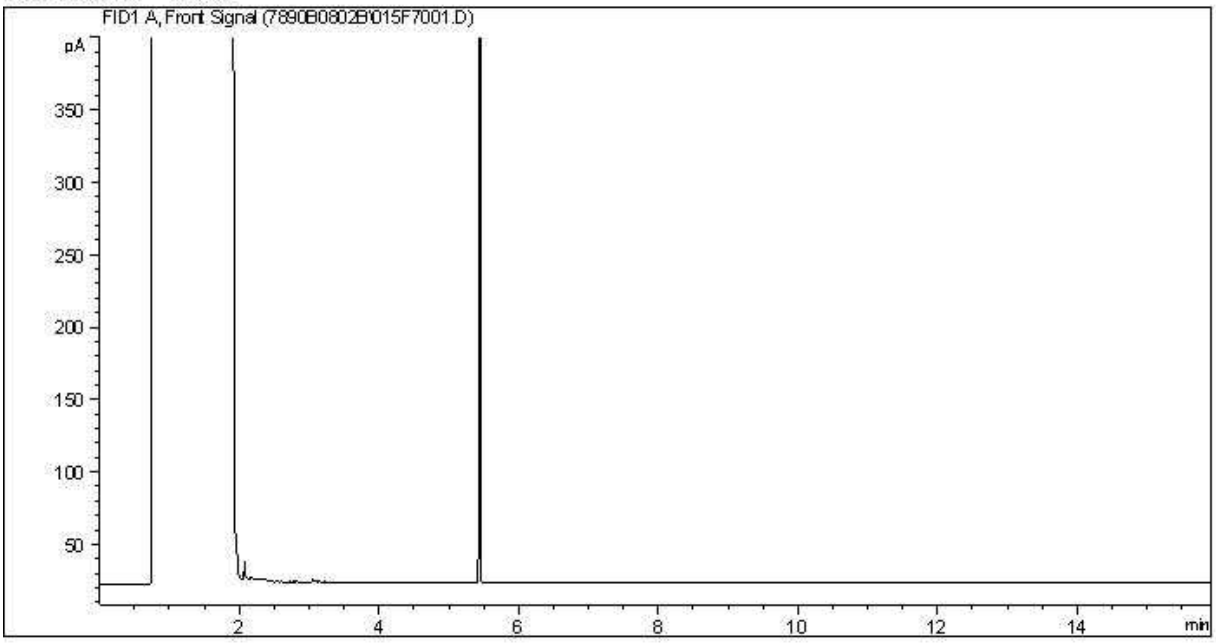
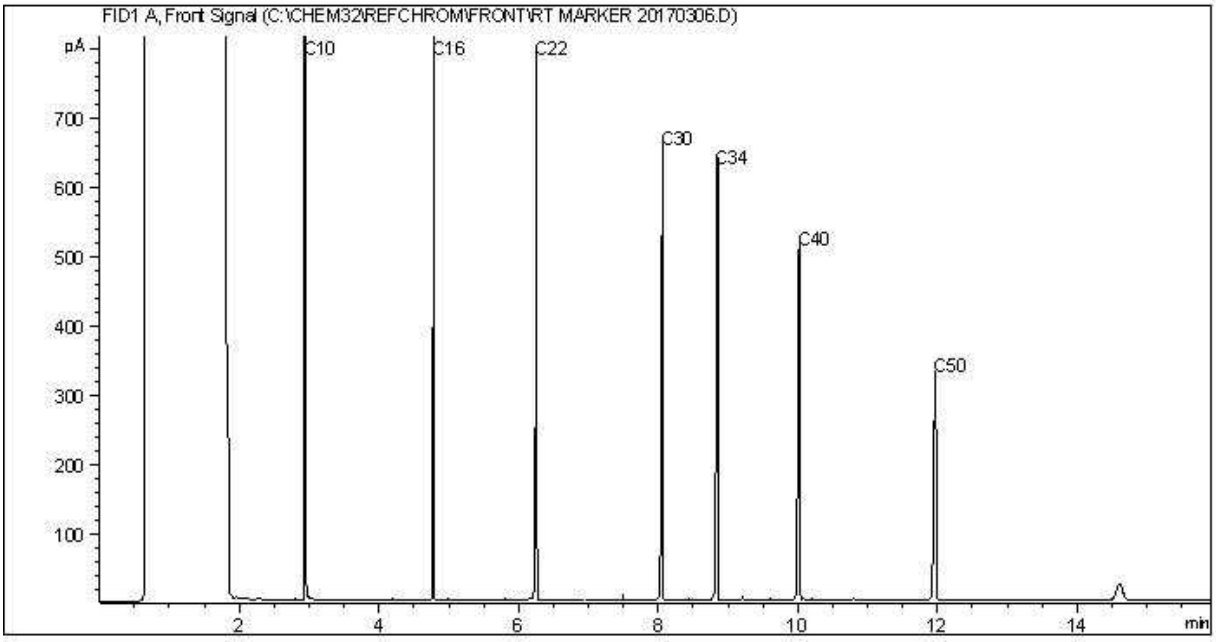


Carbon Range Distribution - Reference Chromatogram



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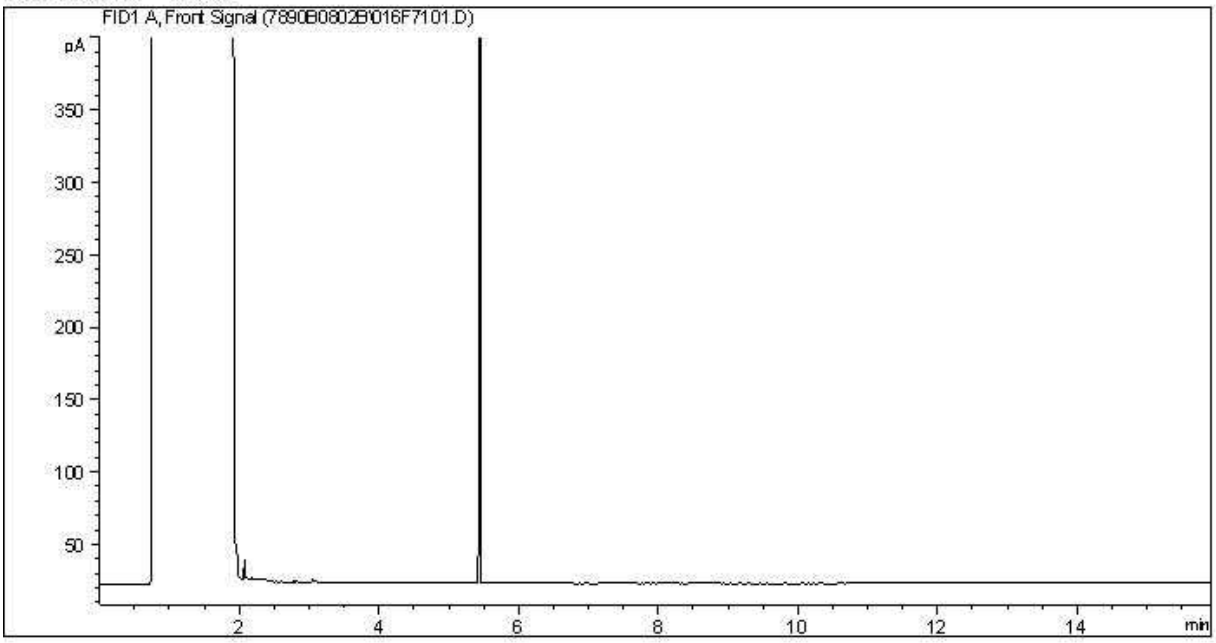
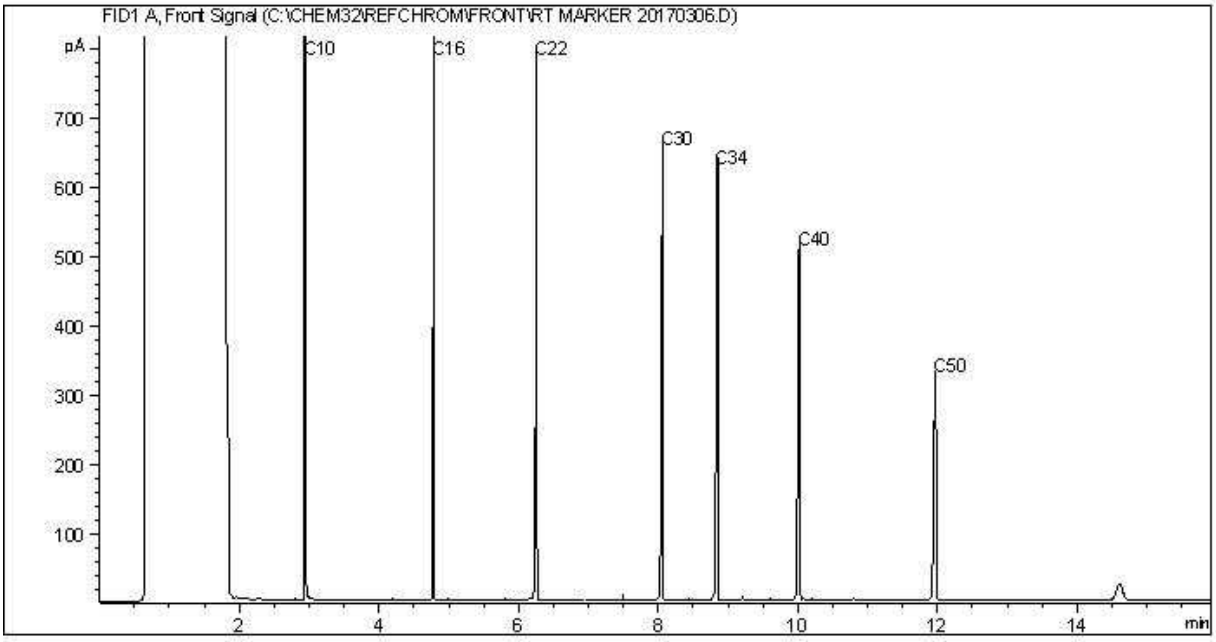
CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890B



Carbon Range Distribution - Reference Chromatogram



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CCME Hydrocarbons (F2-F4 in soil) Chromatogram

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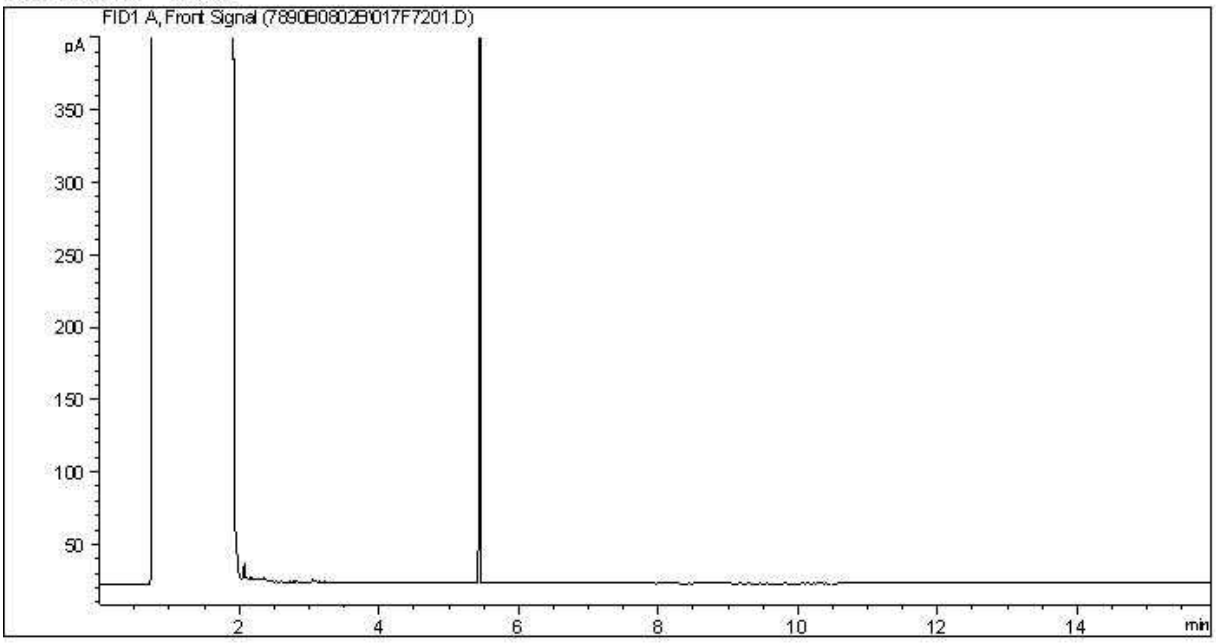
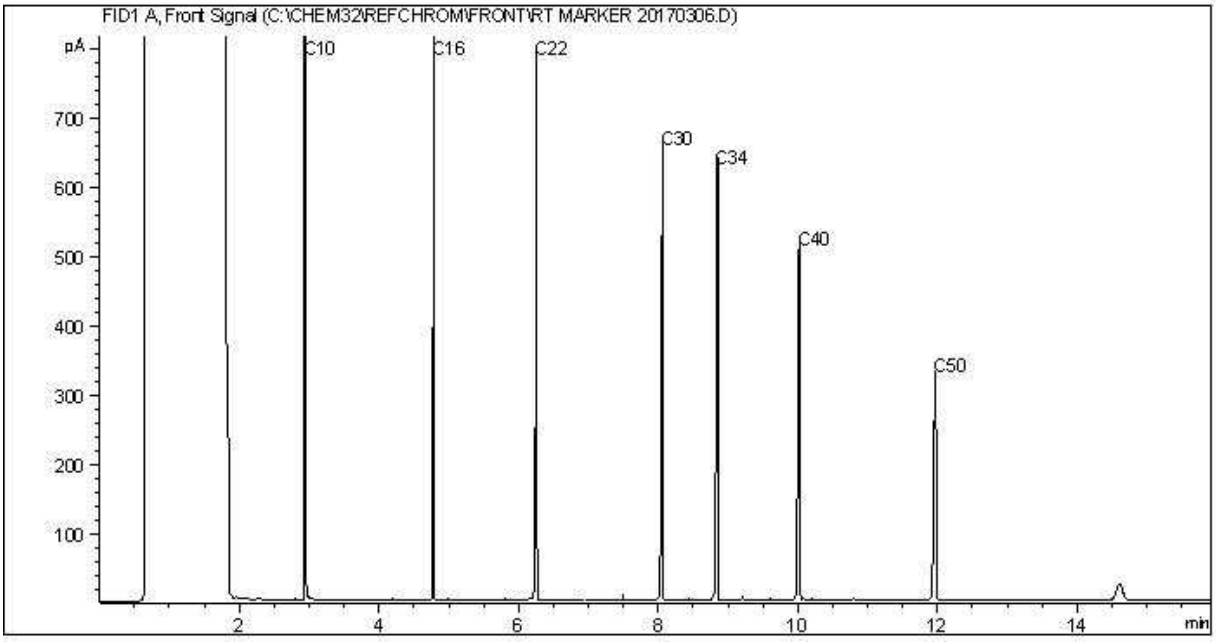


Carbon Range Distribution - Reference Chromatogram



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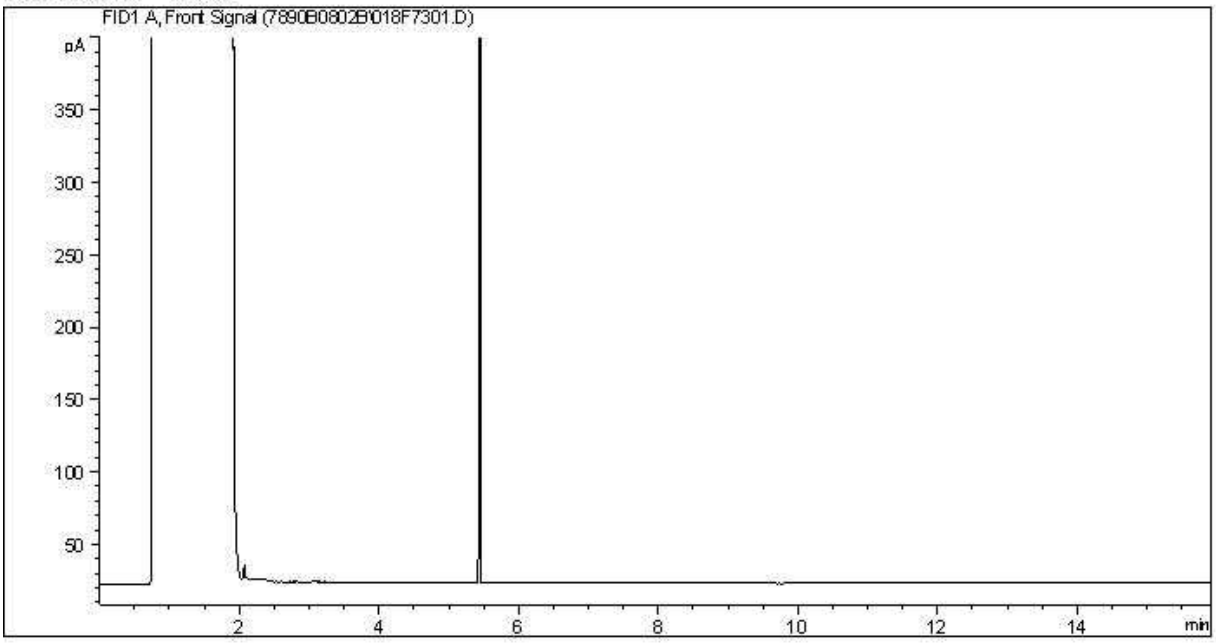
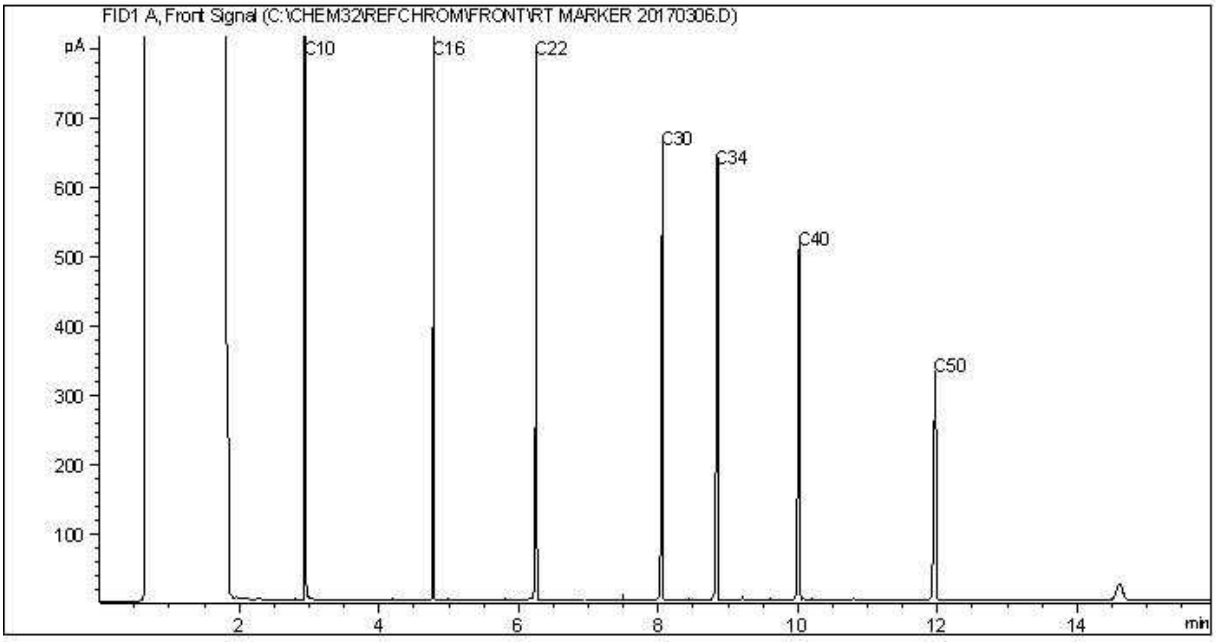
CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890B



Carbon Range Distribution - Reference Chromatogram



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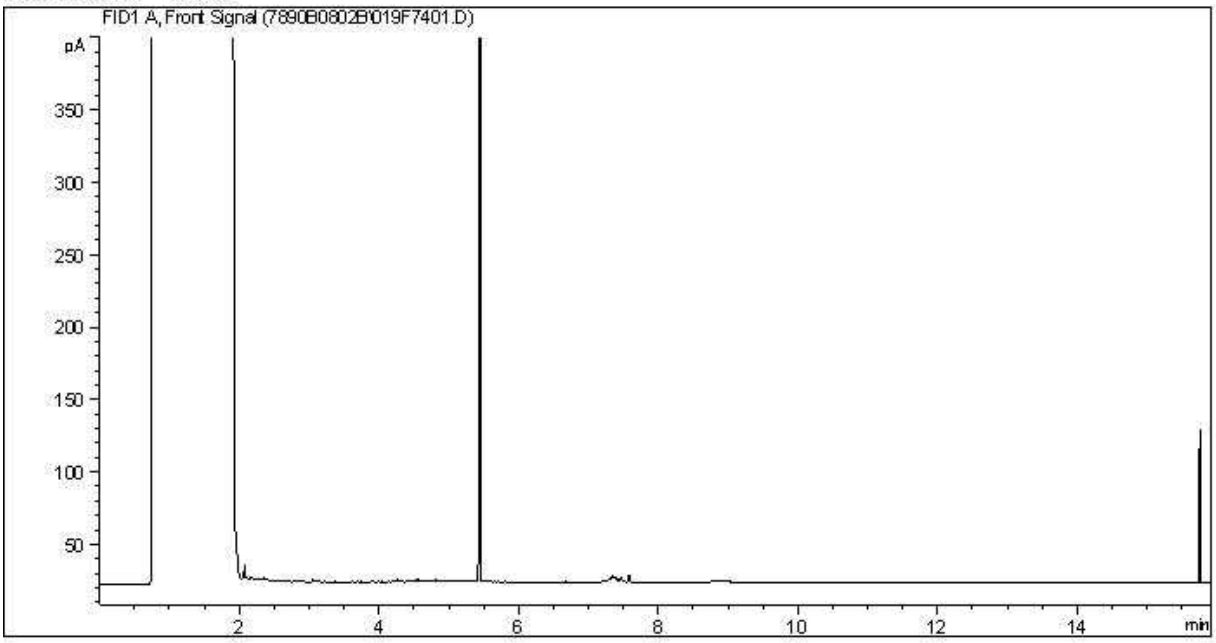
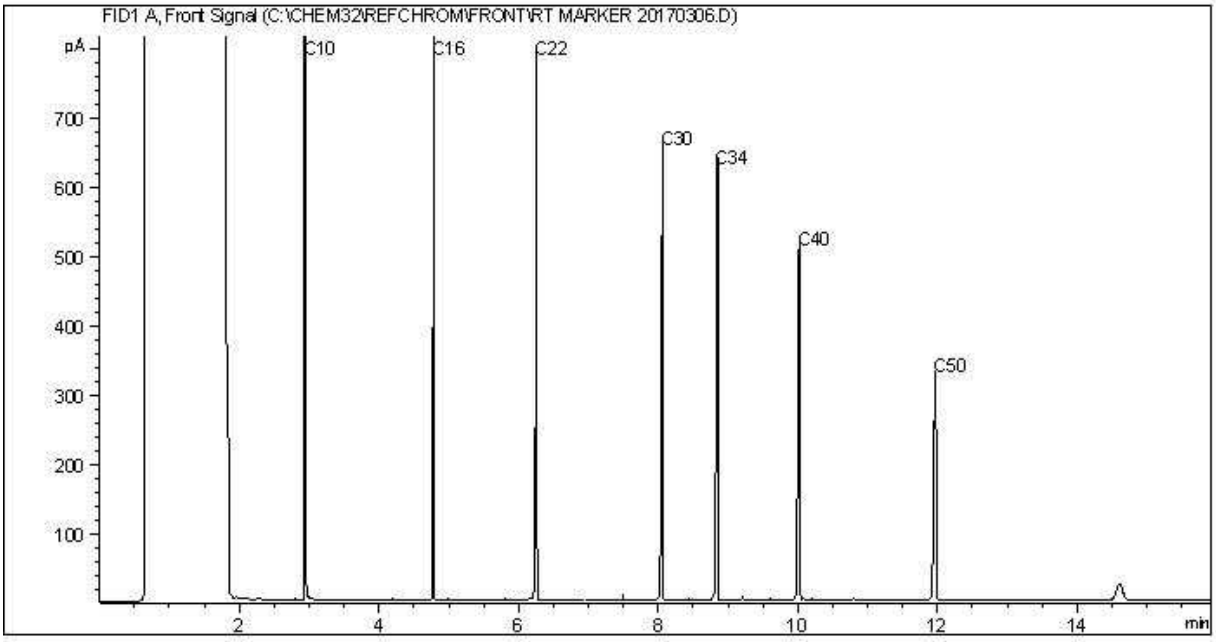
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890B



Carbon Range Distribution - Reference Chromatogram



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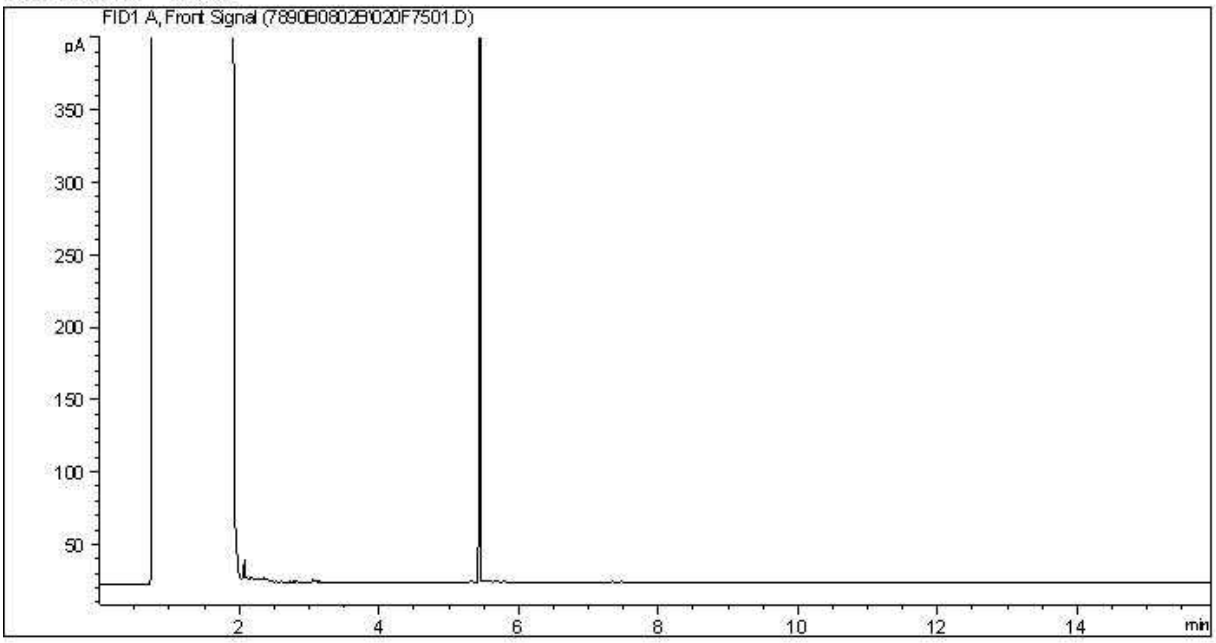
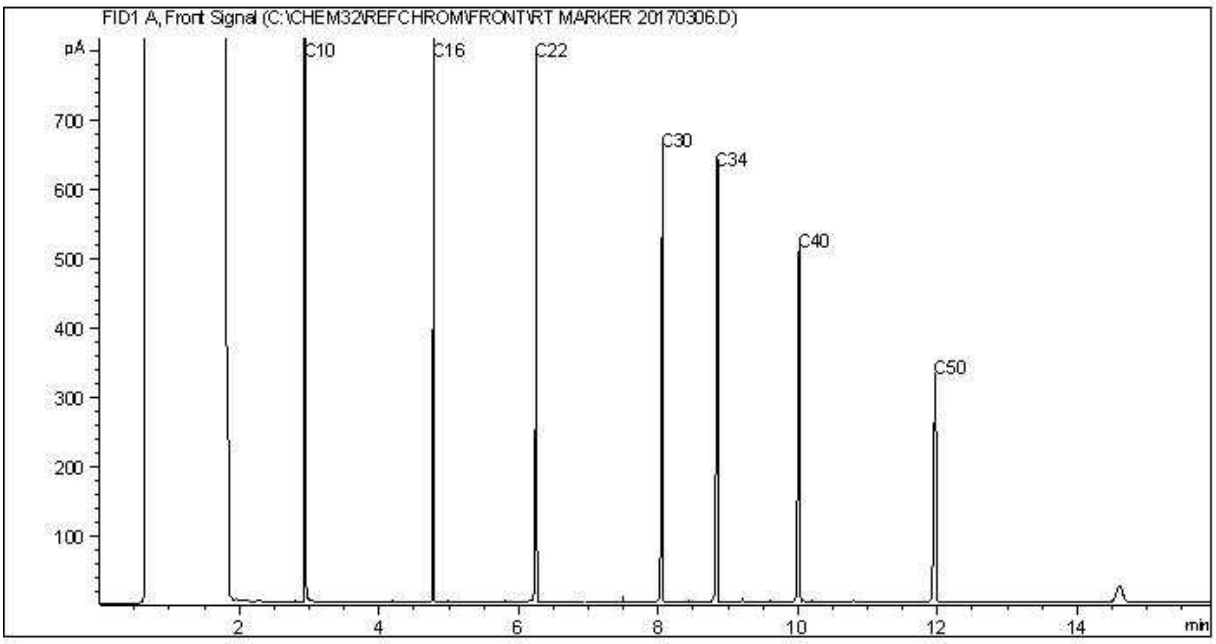
CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890B



Carbon Range Distribution - Reference Chromatogram



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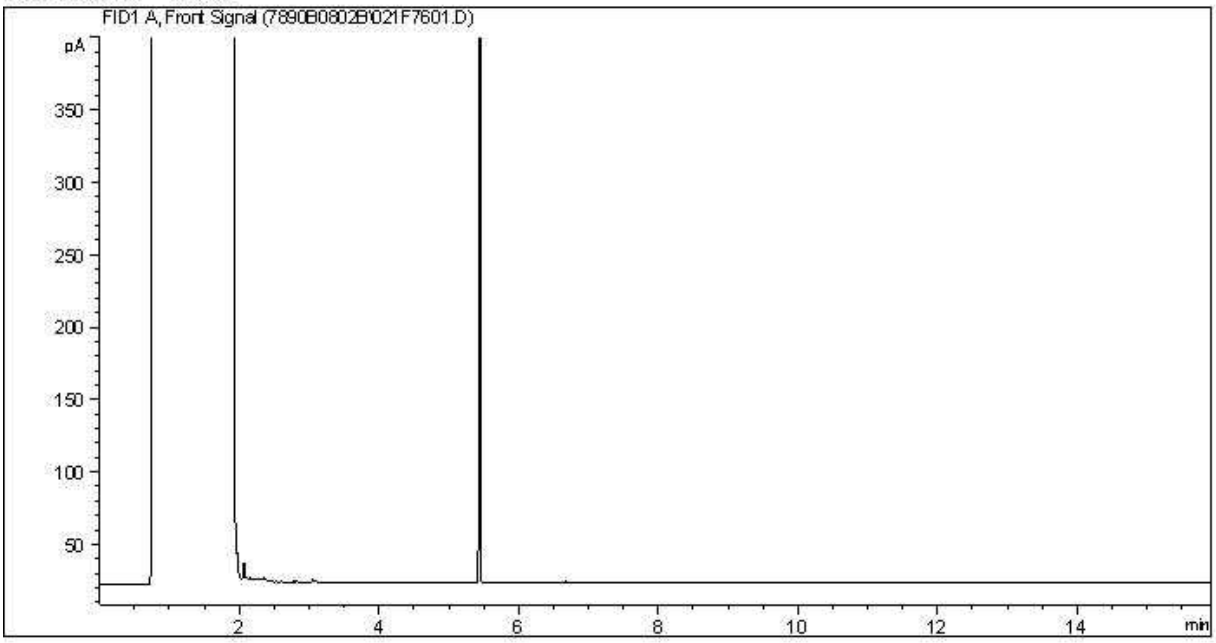
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

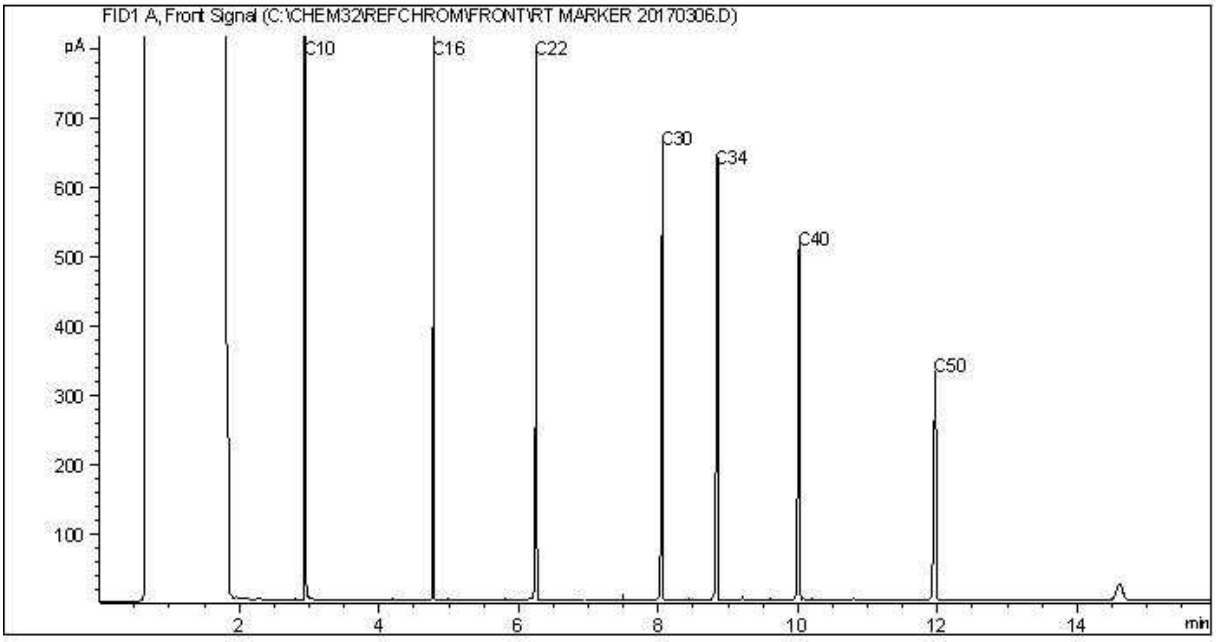
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890B



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

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

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

Attachment 2 – Photographs

Photo Log

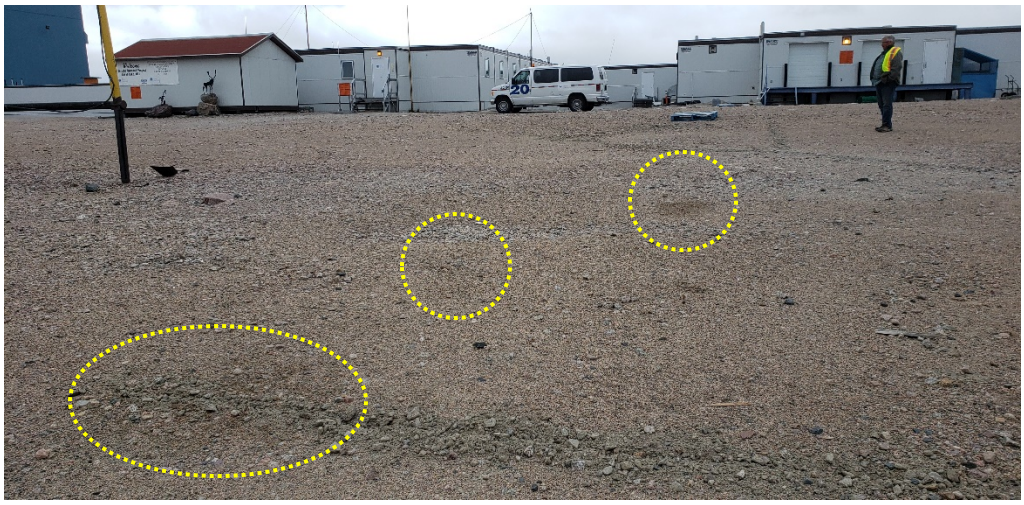


Photo 1

Date
August 1, 2018

Description

Surface staining observed in Spring 2018 near Main Camp.

Viewing Direction
SE

Photo 2

Date
August 1, 2018

Description
Excavation of the stained area near the Main Camp.

Viewing Direction SE

Photo 3

Date
August 4, 2018

Description
Final backfilled Excavation of the stained area near the Main Camp.

Viewing Direction
SE

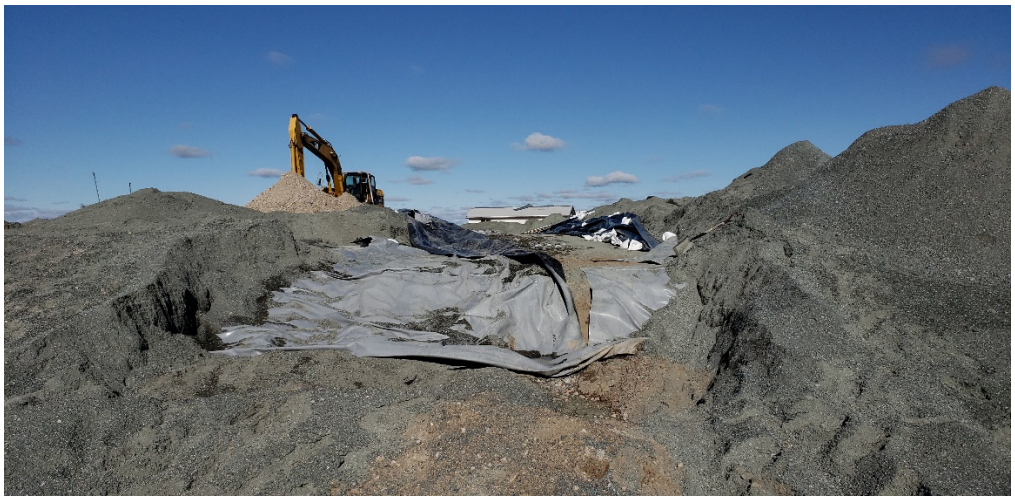


Photo 4

Date
August 4, 2018

Description
Uncovered Phase 1 Liner.

Viewing Direction
W

Photo 5

Date
August 4, 2018

Description
Liner pulled back to place the stained soils.

Viewing Direction
W

Photo 6

Date
August 4, 2018

Description
Liner cut and cleaned in preparation of seam seals..

Viewing Direction
NE

Photo 7

Date
August 4, 2018

Description
Seam Sealing completed by A&A Technical Services.

Viewing Direction
SE

Photo 8

Date
August 5, 2018

Description
Extrusion seams on patches covering small tears

Viewing Direction
N

Photo 9

Date
August 5, 2018

Description
Vaccum testing the seams

Viewing Direction
SE

Photo 10

Date
August 5, 2018

Description
Final sealed liner.

Viewing Direction
W

Photo 11

Date
August 5, 2018

Description
Final Coarse PK cover replaced and graded

Viewing Direction
SE

Photo 12

Date
August 1, 2018

Description
Camp Waste (wires and greywater liner) staged for off-site removal.

Viewing Direction
N

Photo 13

Date
August 4, 2018

Description
2017 Camp area cleared of wires.

Viewing Direction
W

Photo 14

Date
August 1, 2018

Description
Greywater Sump area cleared of liner.

Viewing Direction
W

Photo 15

Date
August 3, 2018

Description
AST T5 – GEM-6-052-1

Viewing Direction
E

Photo 16

Date
August 3, 2018

Description
Label on AST T5 – GEM-6-052-1

Viewing Direction
E

Photo 17

Date
August 3, 2018

Description
AST T7 – GEM-6-052-2

Viewing Direction
W

Photo 18

Date
August 3, 2018

Description
Label on AST T7 – GEM-6-052-2

Viewing Direction
W

Photo 19

Date
August 3, 2018

Description
AST T3 – GEM-6-052-3

Viewing Direction
E

Photo 20

Date
August 3, 2018

Description
Label on AST T3 – GEM-6-052-3 (bottom right corner)

Viewing Direction
W

Photo 21

Date
August 3, 2018

Description
AST T2 – GEM-6-052-4

Viewing Direction
NE

Photo 22

Date
August 3, 2018

Description
Label on AST T2 – GEM-6-052-4

Viewing Direction
NE

Photo 23

Date
August 3, 2018

Description
AST T1 – GEM-6-052-5

Viewing Direction
E

Photo 24

Date
August 3, 2018

Description
Label on AST T1 – GEM-6-052-5

Viewing Direction
E

Photo 25

Date
August 3, 2018

Description
AST T6 – GEM-6-052-6

Viewing Direction
SE

Photo 26

Date
August 3, 2018

Description
Label on AST T6 – GEM-6-052-6

Viewing Direction
SE

Photo 27

Date
August 3, 2018

Description
AST T4 – GEM-6-052-7

Viewing Direction
NW

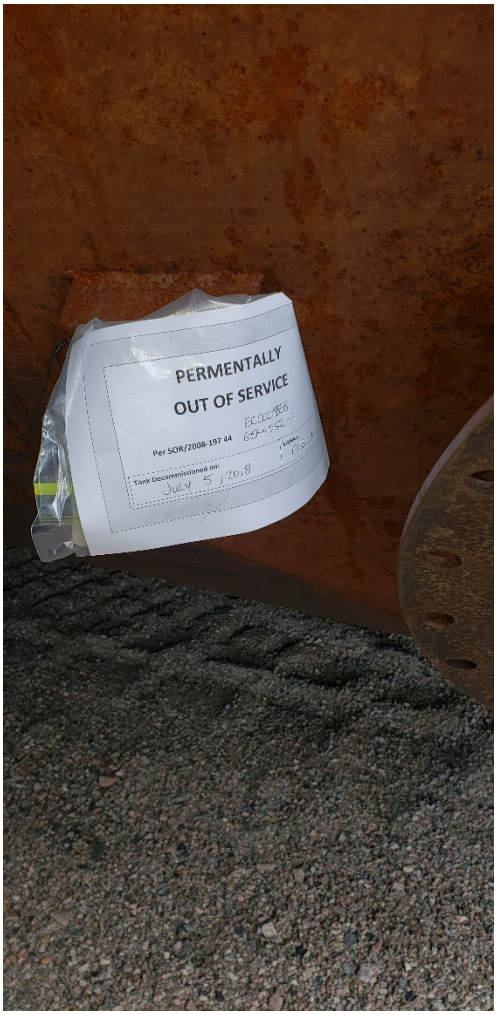


Photo 28

Date
August 3, 2018

Description
Label on AST T4 – GEM-6-052-7

Viewing Direction
E

Photo 29

Date
August 3, 2018

Description
AST T8 – GEM-6-052-8

Viewing Direction
N

Photo 30

Date
August 3, 2018

Description
Label on AST T8 – GEM-6-052-8

Viewing Direction
E

Photo 31

Date
August 3, 2018

Description
AST T10 – GEM-6-005-1

Viewing Direction
NE

Photo 32

Date
August 3, 2018

Description
Label on AST T10 – GEM-6-005-1

Viewing Direction
NE

Photo 33

Date
August 13, 2018

Description
AST T9 – GEM-6-005-2

Viewing Direction
SW

Photo 34

Date
August 3, 2018

Description
Label on AST T9 – GEM-6-005-2

Viewing Direction
S

Photo 35

Date
August 3, 2018

Description
AST T11 – GEM-6-005-3

Viewing Direction
SW

Photo 36

Date
August 3, 2018

Description
Label on AST T11 – GEM-6-005-3

Viewing Direction
E

Photo 37

Date
August 3, 2018

Description
AST T12 – GEM-6-005-4

Viewing Direction
SW

Photo 38

Date
August 3, 2018

Description
Label on AST T12 – GEM-6-005-4

Viewing Direction
N

Photo 39

Date
August 3, 2018

Description
AST T18 – D8778-S12

Viewing Direction
N

Photo 40

Date
August 3, 2018

Description
Label on AST T18 – D8778-S12

Viewing Direction
N

Photo 41

Date
August 3, 2018

Description
AST T15 – D8778-S14

Viewing Direction
N

Photo 42

Date
August 11, 2017

Description
Label on AST T15 – D8778-S14

Viewing Direction
N

Photo 43

Date
August 3, 2018

Description
AST T14 – C244056

Viewing Direction
W

Photo 44

Date
August 3, 2018

Description
label on AST T14 – C244056

Viewing Direction
S

Photo 45

Date
August 5, 2018

Description
AST T21 – D8778-S13

Viewing Direction
N

Photo 46

Date
August 5, 2018

Description

Label on AST T21 – D8778-S13

Viewing Direction
N

Photo 47

Date
August 5, 2018

Description
AST T20 – D8778-S15

Viewing Direction
N

Photo 48

Date
August 5, 2018

Description
Label onAST T20 – D8778-S15

Viewing Direction
N

Photo 49

Date
August 11, 2017

Description
AST T19 – D8778-S19

Viewing Direction
W

Photo 50

Date
August 3, 2018

Description
Label on AST T19 – D8778-S19

Viewing Direction
W

Photo 51

Date
August 3, 2018

Description
AST T22 – D8778-5

Viewing Direction
N

Photo 52

Date
August 3, 2018

Description
Label on AST T22 – D8778-5

Viewing Direction
N

Photo 53

Date
August 3, 2018

Description
AST T17 – D8778-11

Viewing Direction
W

Photo 54

Date
August 3, 2018

Description
Label on AST T17 – D8778-11

Viewing Direction
W

Photo 55

Date
August 3, 2018

Description
AST T23 – D8778-6

Viewing Direction
W

Photo 56

Date
August 3, 2018

Description
AST T23 – D8778-6

Viewing Direction
W

Photo 57

Date
August 3, 2018

Description
AST T16 – D8778-8

Viewing Direction
W

Photo 58

Date
August 3, 2018

Description
Label on AST T16 – D8778-8

Viewing Direction
W

Photo 59 / 60

Date
August 2, 2018

Description
Salad Bar

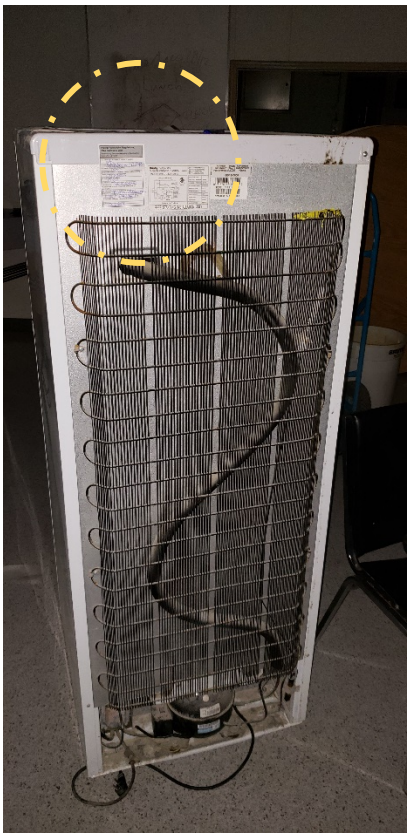


Photo 61 / 62

Date
August 2, 2018

Description
White Fridge #1

Photo 63 / 64

Date
August 2, 2018

Description
Ice Maker

Photo 65 / 66

Date
August 2, 2018

Description
Coke Fridge

Photo 67 / 68

Date
August 2, 2018

Description
Water Cooler #1

Photo 69 / 70

Date
August 2, 2018

Description
Slushie Machine

Photo 71 / 72

Date
August 2, 2018

Description
Milk Cooler

Photo 73 / 74

Date
August 2, 2018

Description
Pop Machine

Photo 75 / 76

Date
August 2, 2018

Description
Glass Door Fridge #1

Photo 77 / 78

Date
August 2, 2018

Description
Glass Door Fridge #2

Photo 79 / 80

Date
August 2, 2018

Description
Sample Freezer

Photo 81 / 82

Date
August 2, 2018

Description
Walk In Fridge #1

Photo 83 / 84

Date
August 2, 2018

Description
Walk In Fridge #2

Photo 85 / 86

Date
August 2, 2018

Description
White Fridge # 2

Photo 87 / 88

Date
August 2, 2018

Description
Portable AC Unit #1

Photo 89 /90

Date
August 2, 2018

Description
Portable AC Unit #2

Photo 91 / 92

Date
August 2, 2018

Description
White Fridge #3

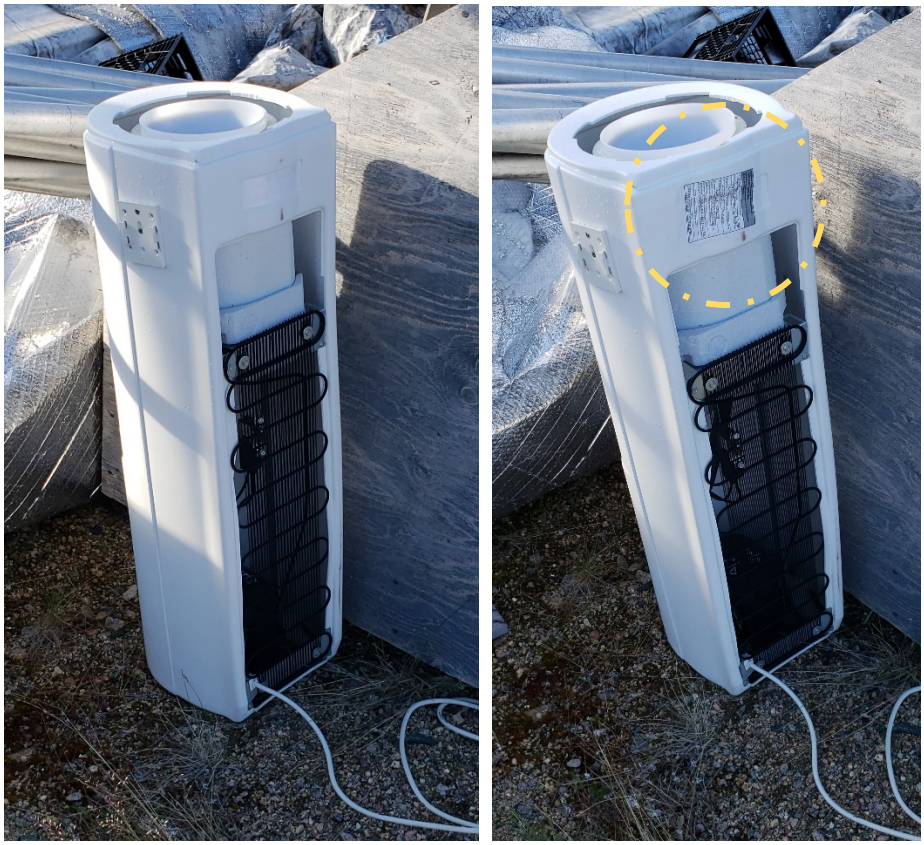


Photo 93 / 94

Date
August 2, 2018

Description
Water Cooler #2

Photo 95

Date
August 5, 2018

Description
Crown Equipment Stored in Maintena
Garage

Viewing Direction
S

Photo 96

Date
August 5, 2018

Description
Crown Equipment Stored
at Airstrip

Viewing Direction
W

Attachment 3- Liner Repair QA/QC Report

A&A Technical Services

327B Old Airport Rd. PO Box 2922

Yellowknife NT X1A 2R2

August 16, 2018

Rowes/Outcome JV

Jericho 30mil LLDPE liner repair August 3-5, 2018

August3, 2018

Arrived at site, contractor was exposing the LLDPE liner using an excavator with smooth bucket with rubber lip to pull the fill material from the liner. Some damage occurred as the bucket had snagged the excess fold in the liner. The fill material directly over the liner was still frozen and the bulk of it had to be broken up and removed manually.

August 4, 2018

Liner and fold is completely exposed. The liner was cut along the fold and pulled back to expose the fill underneath. Ice buildup under the liner, likely from snow when it was installed, was removed and the under lying fill was raked smooth. The liner was the folded back over the smooth fill and laid flat. The excess overlap on the liner was trimmed, cleaned and wedge welded. All damage that could not be wedge welded was patched and extrusion welded.

August 5, 2018

Continued extrusion welding remaining patches and extrusion beaded dimples and any small holes that could be found. A destruct sample of the wedge weld was taken and tested (see attached). All extrusion weld patches and extrusion beads were vacuum box tested with soapy water as witnessed by Henry Wong (DR). Three very small pinholes were detected and repaired. Liner repair was approved and then backfilled with processed kimberlite using an excavator and front end loader.

Crew demobilized from site aprox. 6pm

TECHNICAL SERVICES

Jericho Mine Site Nunavut - 30 mil LLDPE liner repair August 3-5, 2018

Welder pre-qualification tests

Wedge welder	Temp. set C	Speed	Date: Aug. 4, 2018
Pro-wedge #2	350	5.5m/min	
Peel test #	Inside weld ppi*	Outside weld ppi	**IAGI minimum ppi
1	52	51	38
2	49	52	38
3	52	53	38
4	54	52	38
Shear Test			IAGI minimum ppi
1	52		45
2	54		45
3	52		45
4	50		45
Extrusion welder	Extrudite temp. C	Hot air temp. C	Date: Aug. 4, 2018
Pro-X #1	250	190	IAGI minimum ppi
Peel test #			
1	50		34
2	51		34
3	52		34
4	52		34
Shear test			
1	52		45
2	54		45
3	51		45
4	52		45

Destruct sample from in place wedge weld Date August 5, 2018

Peel test #	Inside weld ppi*	Outside weld ppi	**IAGI minimum ppi
1	49	51	38
2	52	50	38
3	51	54	38
4	54	52	38
Shear			IAGI minimum ppi
1	50		45
2	50		45
3	53		45
4	52		45

*ppi = pounds per inch

** International Association of Geosynthetic Installers PE Installation guidelines.

Signed: Alan Harman Aug. 16/18

Alan Harman

A&A Technical Services - Yellowknife NT

Attachment 4 – AST Inventory

AST Inventory						
EC Tank#	**Serial #**	**Mine #**	**Location**	**Vapours**	**Decom**	**capacity (L)**
EC00015828	GEM-052-1	T5	Phase 1 Tank Farm	*	July 2, 2017	500000
EC00015828	GEM-052-2	T7	Phase 1 Tank Farm	0% LEL	July 3, 2017	500000
EC00015828	GEM-052-3	T3	Phase 1 Tank Farm	0% LEL	July 3, 2017	500000
EC00015828	GEM-052-4	T2	Phase 1 Tank Farm	0% LEL	July 4, 2017	500000
EC00015828	GEM-052-5	T1	Phase 1 Tank Farm	0% LEL	July 4, 2017	500000
EC00015828	GEM-052-6	T6	Phase 1 Tank Farm	0% LEL	July 5, 2017	500000
EC00015828	GEM-052-7	T4	Phase 1 Tank Farm	0% LEL	July 5, 2017	500000
EC00015828	GEM-052-8	T8	Phase 1 Tank Farm	0% LEL	July 6, 2017	500000
EC00015828	GEM-6-005-1	T10	Phase 2 Tank Farm	0% LEL	October 1, 2017	1500000
EC00015828	GEM-6-005-2	T9	Phase 2 Tank Farm	0% LEL	June 30, 2017	1500000
EC00015828	GEM-6-005-3	T11	Phase 2 Tank Farm	0% LEL	July 1, 2017	1500000
EC00015828	GEM-6-005-4	T12	Phase 2 Tank Farm	0% LEL	July 2, 2017	1500000
EC00015828	D8778-S14	T15	Phase 1 Tank Farm	0% LEL	October 2, 2017	63595
EC00015828	D8778-S12	T18	Next to Generators	0% LEL	October 2, 2017	63595
EC00016023	C-244056	T14	Truck Shop	0% LEL	October 2, 2017	15000
EC00016028	D8778-S13	T21	Airstrip	0% LEL	October 2, 2017	63595
EC00016029	D8778-S15	T20	Airstrip	0% LEL	October 3, 2017	63595
EC00016030	D8778-S19	T19	HazMat Area	0% LEL	October 5, 2017	63595
EC00016031	D-8778-5	T22	HazMat Area	0% LEL	October 5, 2017	63595
EC00016032	D8778-S11	T17	HazMat Area	0% LEL	October 4, 2017	63595
EC00016033	D-8778-6	T23	HazMat Area	0% LEL	October 3, 2017	63595
EC00016034	D-8778-8	T16	HazMat Area	0% LEL	October 4, 2017	63595

Notes: * No accessible port, vent or opening to collect combustible gas reading

APPENDIX C:
JERICHO MINE SITE
OPERATION, MAINTENANCE AND SURVEILLANCE PROGRAM
2018 REPORT – FINAL

JERICHO MINE SITE – OPERATION, MAINTENANCE AND SURVEILLANCE PROGRAM
2018 REPORT – FINAL

Prepared for:

Public Services and Procurement Canada

By:

DXB Projects

January 2019

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Date January 2019

TABLE OF CONTENTS

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Date January 2019

LIST OF PHOTOGRAPHS ..... END OF TEXT

Date January 2019

ABBREVIATIONS

CCME	Canadian Council of Ministers of the Environment
CIRNAC	Crown-Indigenous Relations and Northern Affairs Canada
OMS	Operation, Maintenance and Surveillance
PHC	Petroleum Hydrocarbon
PKCA	Processed Kimberlite Containment Area
PSPC	Public Service and Procurement Canada

Date	January 2019

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Date January 2019

1.0 INTRODUCTION

A site stabilization construction program was completed for the Jericho Mine site during the 2017 season, with minor deficiencies rectified in 2018. The project was designed to stabilize the site, which had been abandoned and under the official custodial stewardship of Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC) since 2014.

An Operation, Maintenance and Surveillance (OMS) Plan (Arcadis, 2018) was prepared for the Jericho Mine site following completion of the main stabilization work in 2017. The outcome of the Plan, with respect to its implementation, included the following:

- A list of residual risks following stabilization of the site;
- No planned operational activities;
- No planned preventative maintenance; however, reactive-based maintenance if stabilization components fail their specific design intent;
- Surveillance activities focused on mitigating the residual risks;
    - In general, to have the site remain in a physical and environmentally stable condition, and
- Outline of OMS parameters and triggers, for actions and closure.

In June 2018, the first site inspection was under taken. The scope of work for the inspection was based on the outcomes of the OMS Plan. Late winter site conditions, including snow cover and only partial site access, limited the effectiveness of the inspection.

In August of 2018, a small Contractor's work force was mobilized to the site to correct deficiencies noted from 2017 Site Stabilization Contract. In addition to quality control oversight for the deficiency work, the opportunity was also used to complete additional inspections and water quality testing for the OMS program.

This report is a presentation of the 2018 OMS work. A summary of June Inspection and OMS activities carried out in August 2018 are presented in Section 2. Findings from the surveillance are in Section 3 and discussion of the OMS parameters and triggers in Section 4.

2.0 2018 OMS PROGRAM

The 2018 OMS program was year 1 following the stabilization of the Jericho Mine site. The site activities focused on surveillance of the identified post-stabilization residual risks, including visual inspection for the stability of physical features and water quality monitoring of uranium in the Open Pit.

The residual risks and risk levels were described in the OMS Plan, as presented below in Table 2-1.

Table 2-1: Post- Stabilization Residual Risks

Risk ID	Residual Risk	Level
1	Sediment release and instability of side slopes could result in poor performance of the West Dam breach.	Low
2	Potholes in the PKCA cover were observed near the end of the 2017 field season. Further erosion could result in localized failure of the tailings cover and release windblown tailings.	Moderate
3	The Open Pit could result in injury to third party, as there are no access restrictions. *	Moderately high
4	Due to design inconsistencies, the road adjacent to the Open Pit could hold water and eventually wash out, resulting in a sediment release to Carat Lake.	Low
5	Hydrocarbon contaminated soils have been placed into a lined containment cell. The liner could be compromised resulting in water contacting soil and contaminated water release to the environment.	Low
6	The water in the pit contains uranium concentrations above CCME guidelines for the protection of aquatic life. Eventually the pit lake will overflow into Carat Lake	Low
7	Building condition will deteriorate over time, resulting in loss of asset value	Low

* Note: an existing berm around the Open Pit and warning signage were in place prior to the start of the 2017 site stabilization. Vehicle access to the pit area was cut-off following the 2017 work.

The list of physical features or installed 'human made' engineering controls at the site that require visual inspections are:

- West Dam breach;
- Divider Dyke A breach;
- Petroleum Hydrocarbon (PHC) Containment Cell;

- Processed Kimberlite Containment Area (PKCA);
- C1 Channel;
- Pit Outflow Channel;
- Open Pit water level & uranium level; and
- Roads.

A June 2018 Site Inspection was planned with CIRNAC and Public Service and Procurement Canada (PSPC) forming part of the field team. The site trip was intended as the start to the OMS program, and for a review of site conditions following the 2017 project shut down; with consideration that corrective work would still be completed later in 2018 to close-out the Site Stabilization Contract.

2.1 JUNE 2018 SITE INSPECTION

A three (3) day site trip was undertaken June 4th to June 6th, 2018. The program was designed to carry out the 2018 OMS program for the stabilized Jericho Mine site, including inspection of the stabilized mine components and water quality testing of the Open Pit lake.

The site, however, was covered in snow and all water fully iced over during that period. The Crown's annual environmental protection program was typically carried out in early June, and this year's site condition appears to be abnormal and reflected a very heavy snowfall year and late winter.

Some limited inspection of the site was carried out, including some drone visual footage; however, most areas were snow covered and road access not available to the West Dam Breach.

2.2 AUGUST 2018 WORK PROGRAM

The Jericho Mine Site Stabilization Contractor mobilized to site on July 31, 2018 to undertake a work program to correct deficient work from 2017 and complete some regulatory and project administrative close-out. OMS activities were carried out in parallel with work oversight.

The following is a timeline of site activities:

August 1st, 2018

- mobilized to site
- camp clean-up

August 2nd, 2018

- ROJV exposing PHC cover liner
- Survey confirmation that Pit Outflow is low point of perimeter road
- Inspection of C1 Channel

August 3rd, 2018

- Tank inspection
- CIRNAC Lands inspector on-site
- Inspection of West Dam

August 4th, 2018

- Start of PHC Containment Cell – cover liner repair
- Survey for Pit Water level
- Open Pit inspection
- Decommissioned halocarbon equipment inspection
- Drone inspection

August 5th, 2018

- PHC Containment Cell cover re-construction inspection
- Demobilize from site

3.0 SURVEILLANCE

The OMS Plan outlined decision criteria for three parameters/ categories to be monitored, established triggers that would be assessed and contingency actions for activated triggers. The parameters consist of:

- Visual Inspection of stability for the listed physical features/ long-term Infrastructure;
- Long-term Monitoring; and
- Frequency of surveillance activities.

3.1 INSPECTION OF PHYSICAL FEATURES/ LONG-TERM INFRASTRUCTURE

A summary of findings from the inspection are presented in Table 3-1.

Table 3-1: Findings from Long-Term Infrastructure Inspection

Feature ID	Physical Feature	2018 Inspections	Photos
1	West Dam Breach	Drone visual inspection in June and walking inspection August. Minor erosion crack on South Bank and a minor erosion gully in North Bank.	1 – 6
2	PHC Containment Cell	PHC Containment Cell cover re-constructed August 5, 2018. On-site for deficiency repair.	7 – 11
3	PKCA	Walking inspections June and August. Some surface melt channels formed during thaw, deeper erosion at ponded area before Divider Dike A. Nominal increase in depth of previously identified pot holes.	12 – 22

Date January 2019

Feature ID	Physical Feature	2018 Inspections	Photos
4	C1 Channel	Visual Inspection in June and walking inspection in August. Some notable erosion at the outlet of C1 Channel into the Open Pit. Water has been observed over the past 2 years flowing under the surface of the channel – some significant erosion event likely during the 2018 freshet (between June and August) indicative of heavy snow load year and late winter conditions.	23 – 27
5	Pit Outflow Channel	Walking inspection in August. Rod and level check of Pit Outflow inlet; confirmed low point of perimeter road.	28 – 30
6	Open Pit	Walking inspection in August. The water level was observed to have risen half a bench level following the 2018 freshet (between June and August); Photo 31 illustrates the change in water level. An estimated water volume increase was calculated based on the following: • Approximate water surface area of 88,000 m^2 (interpolated from digital file); • 1.5 m to 2 m water rise (based on visual estimate); and • therefore 132, 000 m^3 to 176,000 m^3. Surveyed water level at 449.5 masl. **note inconsistencies were identified with the front loop-survey data set, thus the back loop was used to determine the survey elevation.*	31 – 34

Feature ID	Physical Feature	2018 Inspections	Photos
7	Roads	Some significant erosion gullies were observed at an isolated section of the main road, east of the HWTA (towards the former mine site). The gullies were observed during the August 2018 Inspection, following the earlier June Inspection and therefore 2018 winter melt. Since heavy equipment work was underway during the 2018 inspection, the eroded section was backfilled with coarse processed kimberlite material to maintain the integrity of the road.	

3.2 MONITORING

The monitoring aspect of the OMS Plan includes continued analysis for total uranium in the Open Pit water. A summary of the Uranium concentrations (in Open Pit water) – to date is shown in Table 3-2.

Lab certificates for the recent 2017 and 2018 samples have been included in Appendix A.

Table 3-2: Uranium Concentrations in Open Pit Water

Project Phase	Sample Date	Open Pit Water Uranium (mg/L)
CCME PFAL Guideline		0.015
Mining	Jun. 27, 2007	0.0508
Mining	Jul. 22, 2007	0.0184
Mining	Aug. 25, 2007	0.12
Mining	Oct. 9, 2008	0.234
2014 Assessment Work	Aug. 29, 2014	0.117
2017 Stabilization Work	Jun. 19, 2017	0.035
	Sep. 22, 2017	0.094
2018 Surveillance	Aug. 5, 2018	0.075
2018 Project Close-out	Aug. 28, 2018	0.069

The drop in 2014 uranium concentrations from 2008 were discussed in the Jericho Diamond Mine – Options Analysis (EBA, 2015). The June 19, 2017 result, following three years of minimal site activity, was near the expected- final extrapolated uranium concentration for the Pit water. However, after implementation of the 2017 Jericho Stabilization works, including direct pumping of water from Cell A into the Open Pit and re-work the site's permanent surface water drainage pathway, the Uranium concentration in the Pit rose at the end of the 2017 work program.

The 2018 water results show a drop in the Pit water's uranium concentration from the end of 2017; marking the start of a new trendline following the site's stabilization. A continued decrease in the Pit water's uranium concentration is expected as the pit continues to fill. The OMS Plan monitoring triggers will continued to be assess as the program continues.

3.3 FREQUENCY ASSESSMENT

The frequency parameter for the decision criteria is meant to assess the site's overall stability and determine appropriate frequencies for continued OMS events. The Plans outlines annual inspections in years 1 (2018), 2 (2019) and 3 (2020) prior to a specific evaluation of the site's overall condition.

As described in the visual inspection above, some notable site condition changes are in process following the first winter cycle post- 2017 work; and should continued to be monitored until they stabilized.

4.0 DISCUSSION

The OMS Plan outlined decision criteria for the parameters to be monitored. The decisions are meant to trigger contingency actions once the trigger criteria are applicable.

Table 4-1 presents the monitored parameters from the 2018 Jericho OMS program.

Table 4-1: OMS Decision Criteria.

Parameter	Activity	Trigger
Monitoring	The uranium concentration was measured for the Open Pit water in August 2018 - results from 2017 and 2018 are summarized in Table 3-1.	No trigger for action based the uranium water results.
Visual Inspection	Inspection for the development of potholes, and changes to the stability of the long-term infrastructure components (i.e., roads, tailings cover, PHC containment cell, west dam breach, C1 channel)	Some minor erosion at the West Dam breach and PKCA cover; however, no significant failing of design intent. Notable erosion of the C1 Channel outflow; however, no design failing at this point. No significant development of additional pot holes. Continue monitoring of potholes. No specific triggers for contingency plans.
Frequency	Site visit requirements	No trigger for reduced monitoring frequency.

5.0 CONTINGENCY ACTIONS

Based on the findings of the surveillance activities, there is no requirement for contingency action.

6.0 SUMMARY AND RECOMMENDATIONS

Following the 2018 OMS program the following table presents an update of the residual risks and new proposed actions, if applicable.

Residual Risk	OMS Plan Proposed Action	Post-2018 Update
Sediment release and instability of side slopes could result in poor performance of the West Dam breach.	Surveillance of the West Dam breach. Erosion and slow failure not expected to pose a risk.	Continue surveillance of the breach.
Potholes in the PKCA cover were observed near the end of the 2017 field season. Further erosion could result in localized failure of the tailings cover and release windblown tailings.	Potholes will be filled in 2018 field season and monitoring of the PKCA cover.	Review change state of potholes and fill, if appropriate.
The Open Pit could result in injury to third party, as there are no access restrictions.	The Open Pit is being converted to a pit lake which is expected to take 11 to 15 years. Signage has been posted near the pit, at the airstrip and at the southwest end of site.	No change in proposed action.
Due to design inconsistencies, the road adjacent to the Open Pit could hold water and eventually wash out, resulting in a sediment release to Carat Lake.	Survey the existing conditions and take corrective actions as appropriate.	A survey of the outflow confirmed the channel inlet to be the low point of the pit perimeter road. No further action and recommendation to reduce or remove the risk related in the OMS Plan.

Date January 2019

Residual Risk	OMS Plan Proposed Action	Post-2018 Update
Hydrocarbon contaminated soils have been placed into a lined containment cell. The liner could be compromised resulting in water contacting soil and contaminated water release to the environment.	Surveillance of the PHC containment cell.	No change in proposed action.
The water in the pit contains uranium concentrations above CCME guidelines for the protection of aquatic life. Eventually the pit lake will overflow into Carat Lake.	Long term monitoring of the pit lake water, to determine if there is a risk prior to overflow.	No change in proposed action.
Building condition will deteriorate over time, resulting in loss of asset value.	No action. Building asset value to progress towards $0.	No change in proposed action.
Washout erosion from the underside of the C1 Channel, at the outlet into the Open Pit. Noted following the first winter cycle after construction.	New residual risk noted for 2018. The risk level is assessed to be 'low', since physical access to the area is restricted and immediate environmental impact mitigated by flow directly into the open pit. Erosion and slow failure not expected to pose a risk.	New surveillance of C1 Channel.

The 2018 monitoring period marked the 1st year of the Jericho OMS program. Stabilized mine components were observed for the first time following the 2017 construction, first winter season and initial freeze/ thaw cycle. Work was also completed in 2018 to correct the PHC Soil Containment cover.

The notable change in conditions for 2018 was the erosion of the underside of the C1 channel. A new residual risk is recommended to be added to the registry above.

The risk identified for the road adjacent the Open Pit (perimeter road); concerning the elevation of the outflow not being the lowest-point of the road and potential for the road to hold back water before flowing out the outflow channel, was addressed. The invert of the outflow was surveyed to be the lowest point in the road and the tracking of the residual risk is recommended to be removed.

Following the 2018 program, it is recommended that all physical features continue to be monitored in years 2 and 3, as per the initial OMS stage. The surveillance should establish a baseline of post-construction site conditions.

7.0 REFERENCES

Arcadis. 2018. Operation, Maintenance and Surveillance (OMS Plan) – Jericho Diamond Mine Site.

TetraTech. 2015. Options Analysis Rev 02 – Jericho Diamond Mine, Nunavut.

Date January 2019

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Photo 2: June 6, 2018 West Dam Breach – Looking East (upstream).
Photo 3: June 6, 2018 West Dam Breach – South Bank.
Photo 4: August 3, 2018 West Dam Breach – Minor Erosion in South Bank.
Photo 5: August 3, 2018 West Dam Breach – North Bank Erosion Gully.
Photo 6: August 4, 2018 West Dam Breach – North Bank.
Photo 7: June 6, 2018 PHC Containment Cell Cover – Pre-Deficiency Repair (mound in middle).
Photo 8: June 6, 2018 PHC Containment Cell Cover – Pre-Deficiency Repair.
Photo 9: August 5, 2018 PHC Containment Cell Cover – Post-Deficiency Repair.
Photo 10: August 5, 2018 PHC Containment Cell Cover – Looking North, Re-Instated Cover.
Photo 11: August 5, 2018 PHC Containment Cell Cover – Looking North, Re-Instated Cover.
Photo 12: June 5, 2018 PKCA Cover, North PKCA – Looking North.
Photo 13: June 5, 2018 PKCA Cover, North PKCA – Looking South, Surface Melt Channels.
Photo 14: June 5, 2018 PKCA Cover, North PKCA – New Pot Hole.
Photo 15: June 5, 2018 PKCA Cover, Southeast PKCA – Previously Identified Pot Hole.
Photo 16: June 6, 2018 PKCA Cover, North PKCA – Looking West (downstream).
Photo 17: June 6, 2018 PKCA Cover, North+ South PKCA – Looking West (downstream).
Photo 18: June 6, 2018 PKCA Cover/ Divider Dike A – Looking West (downstream).
Photo 19: June 6, 2018 PKCA Cover, Southeast PKCA – Previously Identified Pot Holes.
Photo 20: August 3, 2018 PKCA Cover, North PKCA – Outlet of Erosion Channel near ponded water adjacent Divider Dike A.
Photo 21: August 4, 2018 PKCA Cover, North PKCA – Summer Surface Water Channels.
Photo 22: August 4, 2018 PKCA Cover, North+ South PKCA – Looking Northwest.
Photo 23: June 5, 2018 C1 Channel – Looking North, Channel snow covered.
Photo 24: June 6, 2018 C1 Channel – Looking West, Channel snow covered.
Photo 25: August 2, 2018 C1 Channel – Looking South, Erosion at Outlet into Open Pit.
Photo 26: August 4, 2018 C1 Channel – Looking West, Erosion at Outlet into Open Pit.
Photo 27: August 4, 2018 C1 Channel – Looking West, Upstream Catchment.
Photo 28: August 2, 2018 Pit Perimeter Road – Survey of Out Flow.
Photo 29: August 4, 2018 Pit Perimeter Road – Looking North, Outflow at Low Grade Point.
Photo 30: August 4, 2018 Pit Perimeter Road – Looking South.
Photo 31: June 5, 2018 Open Pit – Looking Southeast, Open Pit Water Level.
Photo 32: June 6, 2018 Open Pit – Looking East.
Photo 33: August 4, 2018 Open Pit – Looking South, Open Pit Water Level.
Photo 34: August 4, 2018 Open Pit – Water Level Survey.

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Date	January 2019

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Date January 2019

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Date	January 2019

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Date	January 2019

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Date	January 2019

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Date	January 2019

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Date	January 2019

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Date	January 2019

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Date	January 2019

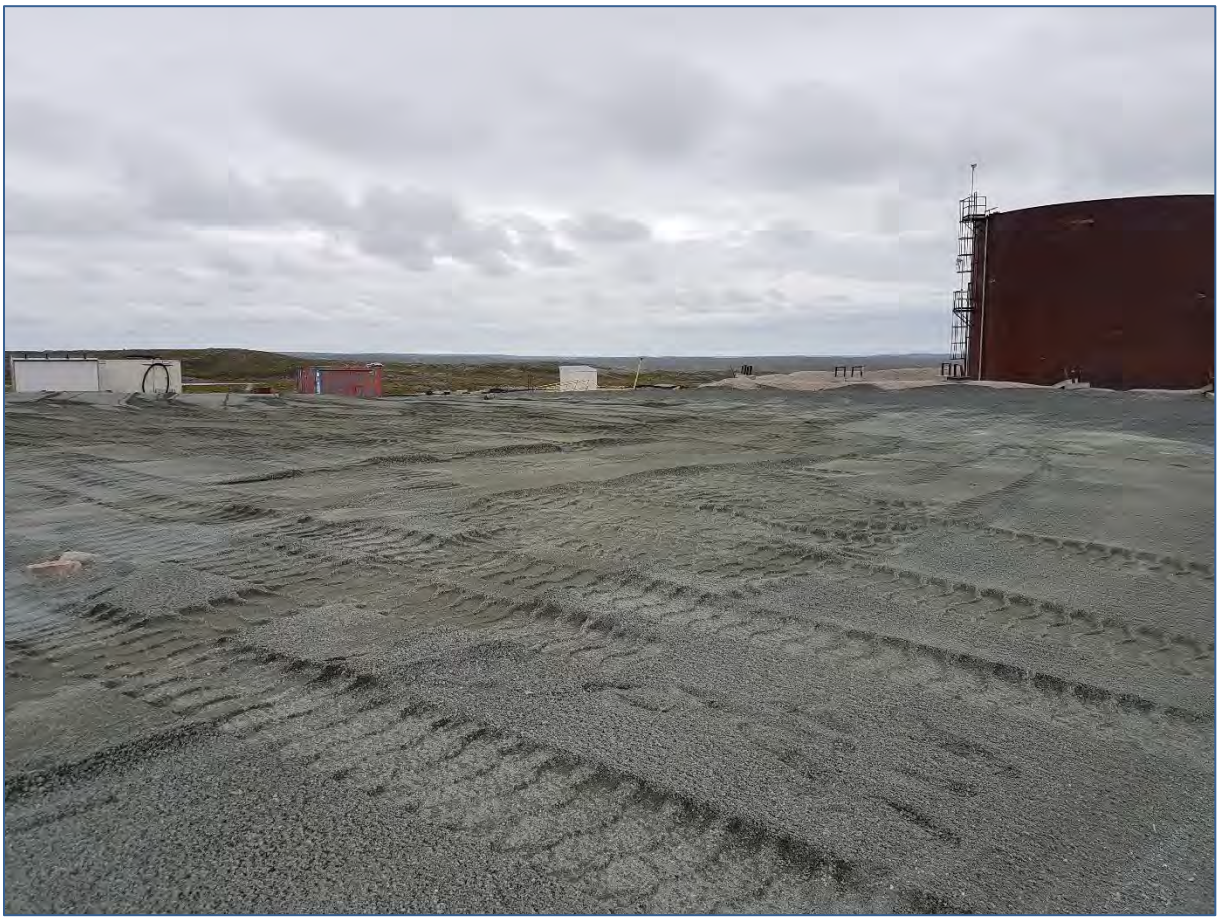

Photo 10: August 5, 2018 PHC Containment Cell Cover – Looking North, Re-Instated Cover.

Date	January 2019

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Date January 2019

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Date	January 2019

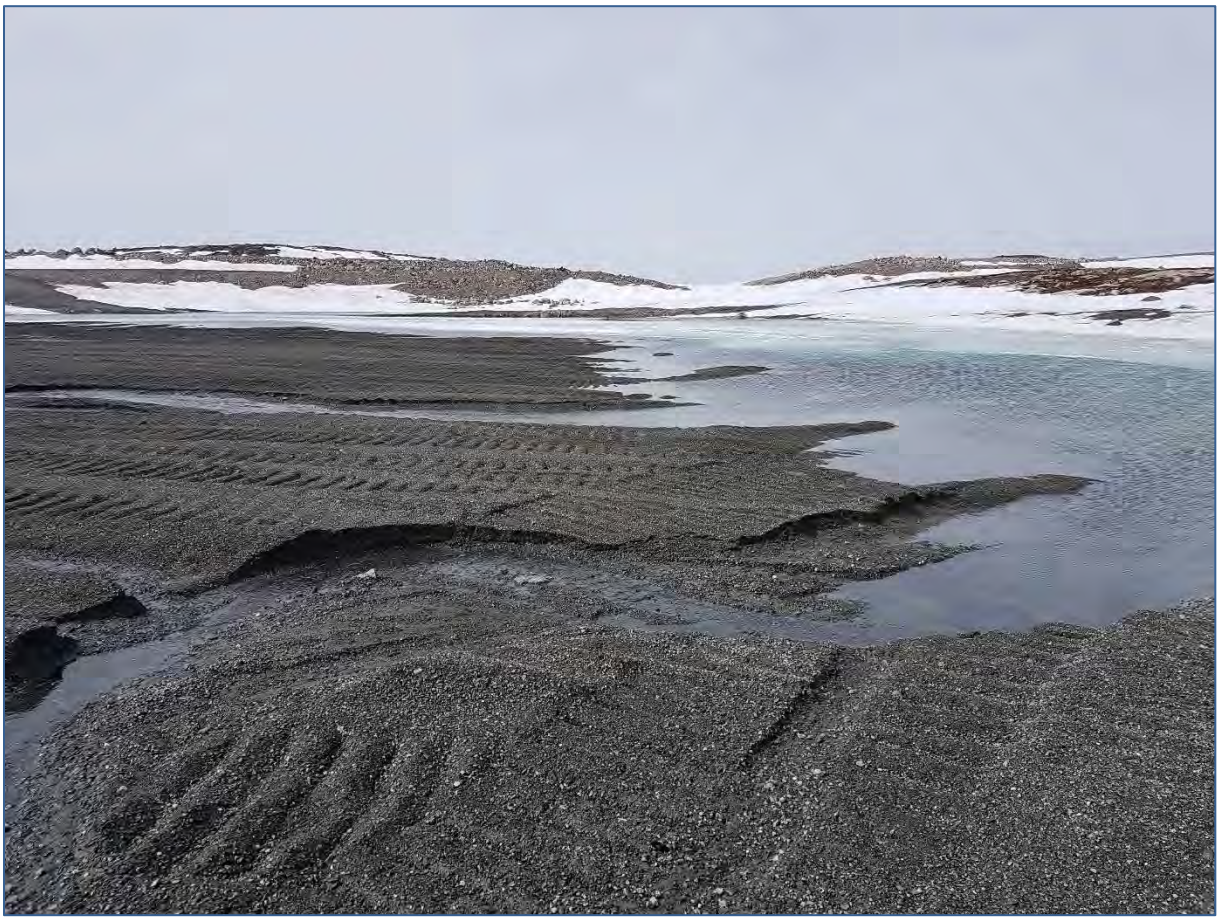

Photo 13: June 5, 2018 PKCA Cover, North PKCA – Looking South, Surface Melt Channels.

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Photo 14: June 5, 2018 PKCA Cover, North PKCA – New Pot Hole.

Date January 2019

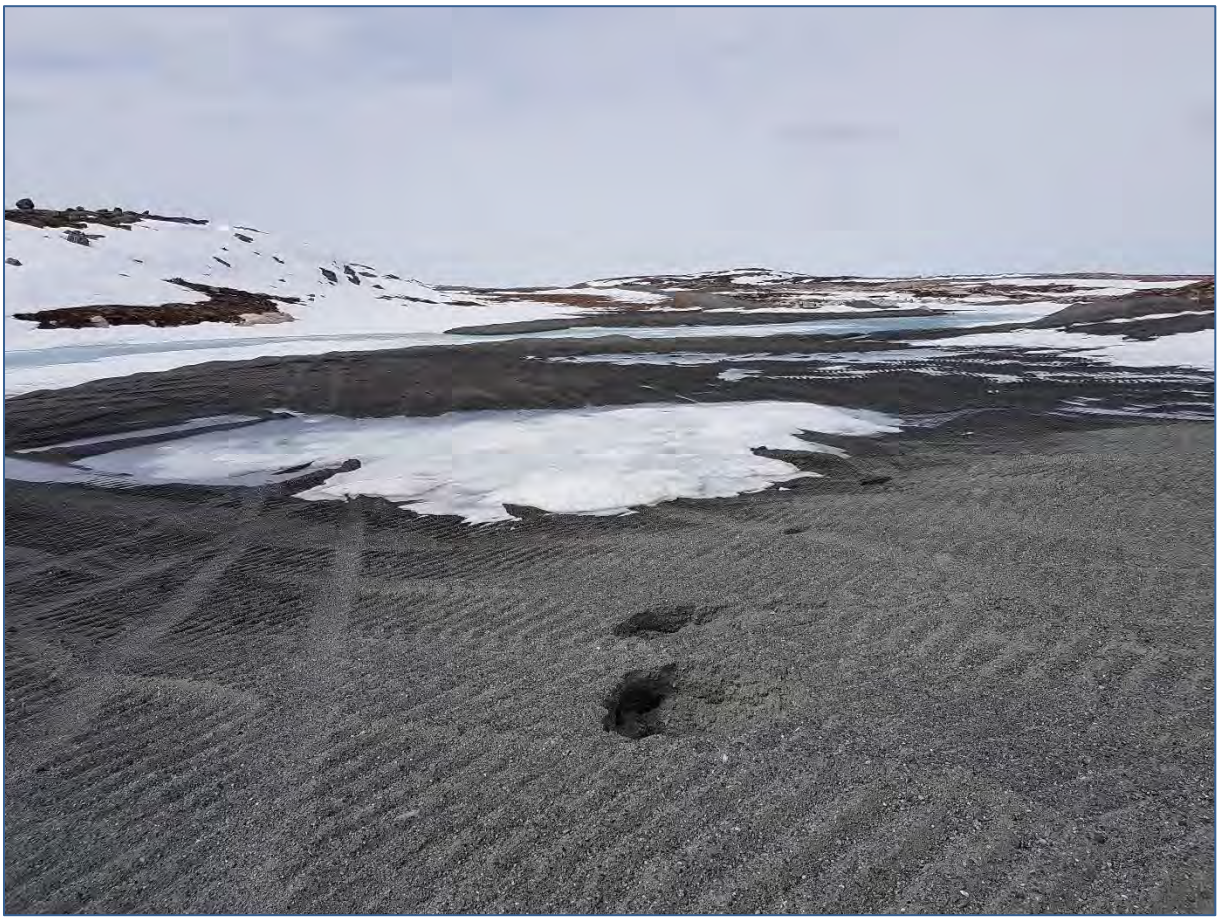
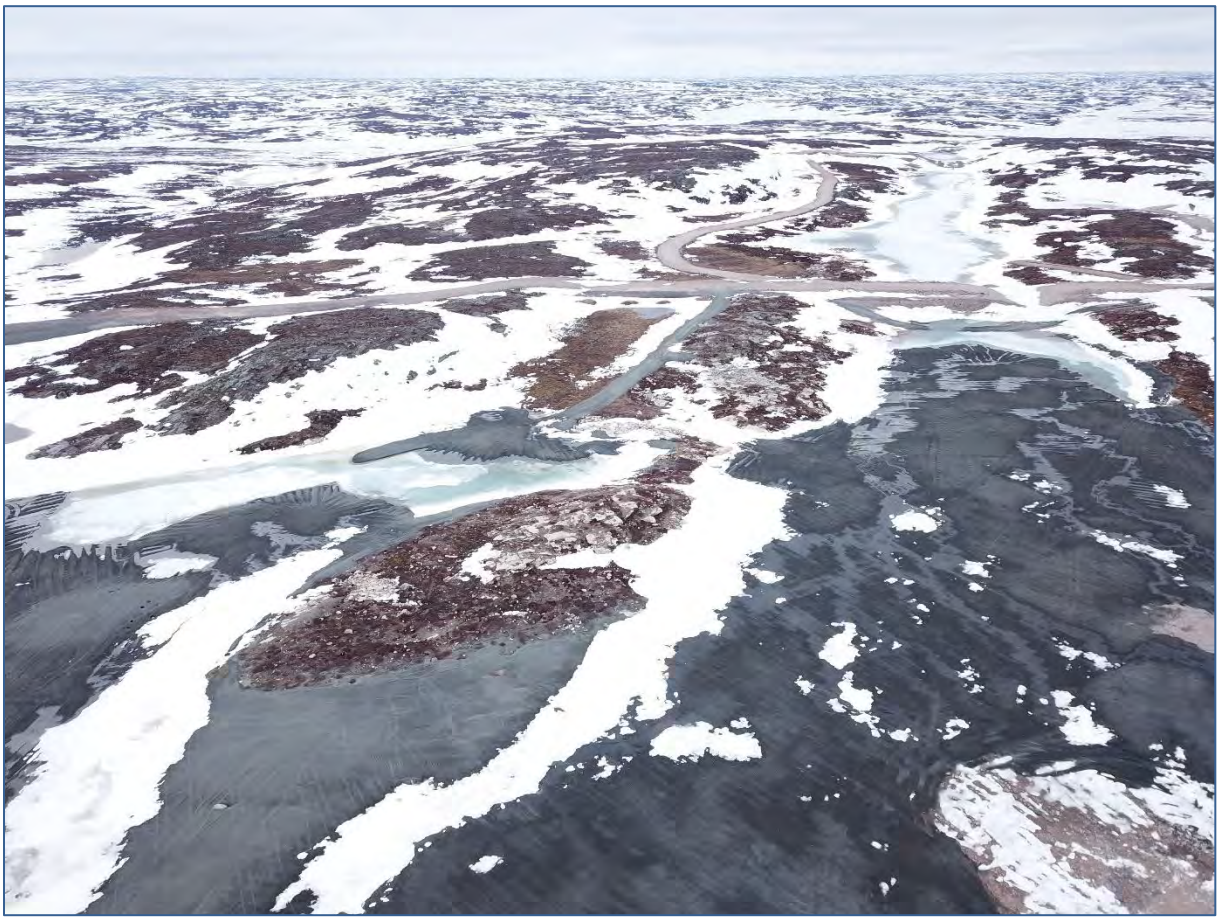


Photo 15: June 5, 2018 PKCA Cover, Southeast PKCA – Previously Identified Pot Hole.

Date	January 2019

Photo 16: June 6, 2018 PKCA Cover, North PKCA – Looking West (downstream).

Date	January 2019



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Date	January 2019

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Date	January 2019

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Date	January 2019

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Date	January 2019

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Date	January 2019

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Date	January 2019

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Date	January 2019

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Date	January 2019

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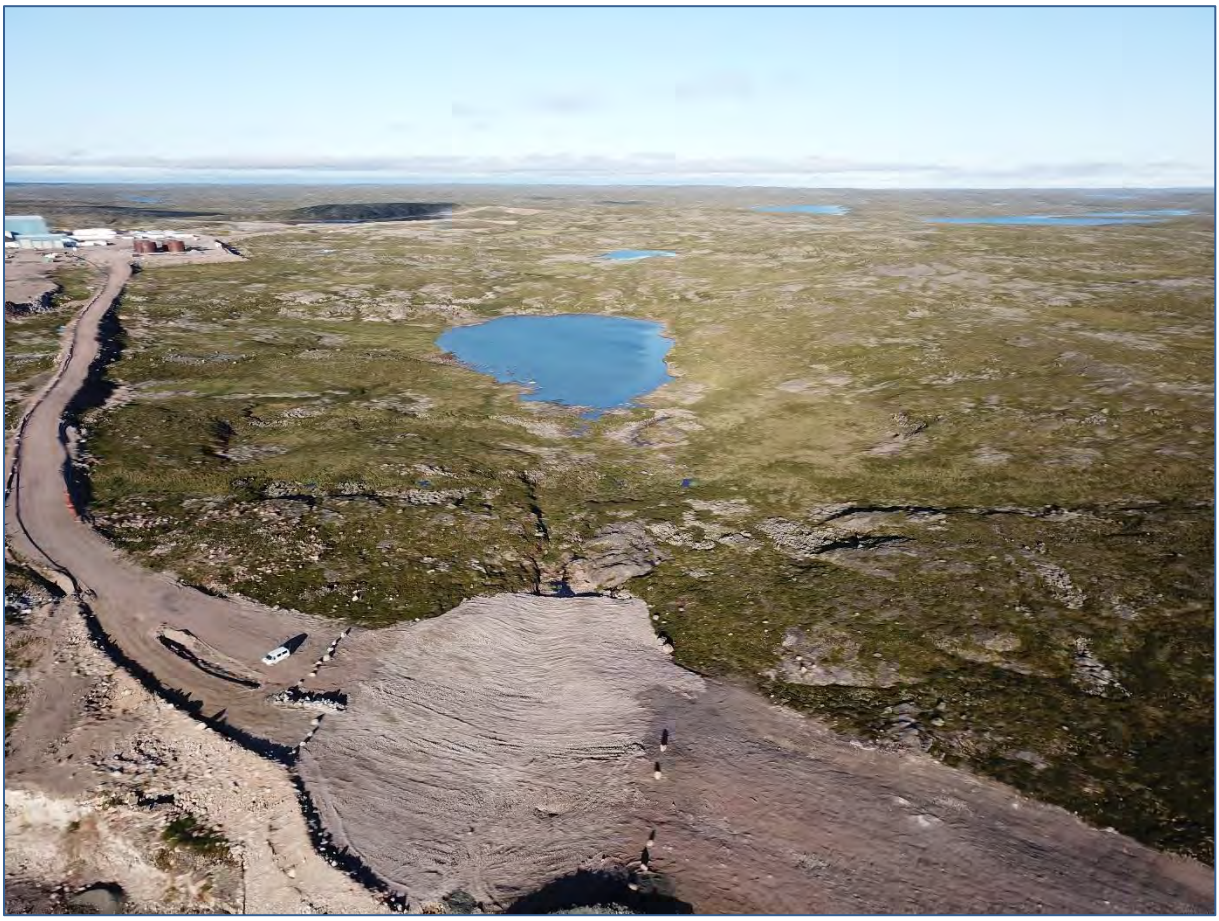
Date	January 2019



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Date January 2019

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Date	January 2019

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Date	January 2019

Photo 33: August 4, 2018 Open Pit – Looking South, Open Pit Water Level.

Date	January 2019

Photo 34: August 4, 2018 Open Pit – Water Level Survey.

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APPENDIX A

Water Quality Monitoring Laboratory Certificate of Analyses

Date	January 2019

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Cash Clients
ATTN: Henry Wong
DXB Projects
Toronto ON L4N3Y3

Date Received: 09-JUN-17
Report Date: 26-JUN-17 15:57 (MT)
Version: FINAL

Client Phone: 416-575-8064

Certificate of Analysis

Lab Work Order #: L1939807
Project P.O. #: NOT SUBMITTED
Job Reference:
C of C Numbers:
Legal Site Desc:

Comments:

.

Rick Zolkiewski
General Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1939807-1	L1939807-2	L1939807-3	L1939807-4	L1939807-5
Description	Water	Water	Water	Water	Water
Sampled Date	08-JUN-17	08-JUN-17	09-JUN-17	09-JUN-17	09-JUN-17
Sampled Time	17:30	23:00	10:00	11:00	11:30
Client ID	CONTWOYTO	PIT	WEST DAM	PHASE 1	DYKE A
Grouping / **Analyte**					
WATER					
Physical Tests pH (pH)	6.01	7.47	7.48	7.36	7.85
Total Suspended Solids (mg/L)	<3.0	<3.0	<3.0	<3.0	6.9
Total Dissolved Solids (mg/L)	<10	68	82	44	129
Anions and Nutrients Ammonia, Total (as N) (mg/L)	0.111	<0.050	<0.050	0.059	<0.050
Chloride (Cl) (mg/L)	<0.50	0.82	2.58	<0.50	2.45
Nitrate (as N) (mg/L)	<0.020	1.11	0.071	<0.020	1.19
Bacteriological Tests MPN-Fecal Coliform (MPN/100mL)	<1 HTA	<1 HTA	<1	<1	<1
Total Metals Aluminum (Al)-Total (mg/L)	0.0095	0.185	0.0144	0.0224	0.0584
Antimony (Sb)-Total (mg/L)	0.00021	0.00013	<0.00010	<0.00010	0.00012
Arsenic (As)-Total (mg/L)	0.00010	0.00078	0.00023	0.00132	0.00020
Barium (Ba)-Total (mg/L)	0.000967	0.0290	0.0170	0.00232	0.0582
Beryllium (Be)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Bismuth (Bi)-Total (mg/L)	0.000063	<0.000050	<0.000050	<0.000050	<0.000050
Boron (B)-Total (mg/L)	<0.010	0.014	0.015	<0.010	0.020
Cadmium (Cd)-Total (mg/L)	<0.0000050	<0.0000050	<0.0000050	0.0000730	<0.0000050
Calcium (Ca)-Total (mg/L)	0.389	12.4	9.72	3.62	11.0
Cesium (Cs)-Total (mg/L)	<0.000010	0.000074	0.000028	<0.000010	0.000070
Chromium (Cr)-Total (mg/L)	<0.0013 DLB	0.00044	0.00019	0.00021	0.00183
Cobalt (Co)-Total (mg/L)	<0.00010	0.00015	<0.00010	0.00042	0.00043
Copper (Cu)-Total (mg/L)	<0.00050	0.00974	0.00139	0.0126	0.00107
Iron (Fe)-Total (mg/L)	<0.010	0.189	0.056	0.169	0.157
Lead (Pb)-Total (mg/L)	<0.000050	0.000504	<0.000050	0.000239	0.000081
Lithium (Li)-Total (mg/L)	<0.0010	0.0021	<0.0010	<0.0010	<0.0010
Magnesium (Mg)-Total (mg/L)	0.185	6.10	6.96	1.49	14.6
Manganese (Mn)-Total (mg/L)	0.00070	0.00573	0.0317	0.129	0.00629
Molybdenum (Mo)-Total (mg/L)	<0.000050	0.00226	0.00122	0.000256	0.00653
Nickel (Ni)-Total (mg/L)	<0.00050	0.00146	0.00108	0.00377	0.0135
Phosphorus (P)-Total (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Total (mg/L)	0.134	2.13	4.07	0.914	7.39
Rubidium (Rb)-Total (mg/L)	0.00037	0.00230	0.00797	0.00205	0.0191
Selenium (Se)-Total (mg/L)	<0.000050	0.000285	0.000056	0.000067	0.000325
Silicon (Si)-Total (mg/L)	<0.10	2.95	0.41	1.61	1.70
Silver (Ag)-Total (mg/L)	<0.000010	<0.000010	<0.000010	0.000021	<0.000010
Sodium (Na)-Total (mg/L)	0.211	1.73	4.67	0.659	7.75
Strontium (Sr)-Total (mg/L)	0.00208	0.0624	0.159	0.0169	0.257
Sulfur (S)-Total (mg/L)	<0.50	1.42	3.31	<0.50	8.94

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1939807-1	L1939807-2	L1939807-3	L1939807-4	L1939807-5
Description	Water	Water	Water	Water	Water
Sampled Date	08-JUN-17	08-JUN-17	09-JUN-17	09-JUN-17	09-JUN-17
Sampled Time	17:30	23:00	10:00	11:00	11:30
Client ID	CONTWOYTO	PIT	WEST DAM	PHASE 1	DYKE A
Grouping / **Analyte**					
WATER					
Total Metals Tellurium (Te)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Thallium (Tl)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	0.000016
Thorium (Th)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Tin (Sn)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium (Ti)-Total (mg/L)	<0.00030	0.00599	<0.00030	0.00057	0.00314
Tungsten (W)-Total (mg/L)	<0.00010	0.00014	<0.00010	<0.00010	0.00118
Uranium (U)-Total (mg/L)	0.000011	0.0349	0.00253	0.000189	0.000965
Vanadium (V)-Total (mg/L)	<0.00050	0.00297	<0.00050	<0.00050	<0.00050
Zinc (Zn)-Total (mg/L)	<0.0030	<0.0030	<0.0030	0.0067	<0.0030
Zirconium (Zr)-Total (mg/L)	<0.000060	0.000275	<0.000060	0.000145	0.000061
Dissolved Metals Dissolved Metals Filtration Location	FIELD	FIELD	FIELD	LAB	FIELD
Aluminum (Al)-Dissolved (mg/L)	0.0077	0.0228	0.0058	0.0158	0.0037
Aggregate Organics Biochemical Oxygen Demand (mg/L)	<2.0	<2.0	<2.0	3.0	<2.0
Oil and Grease (mg/L)	<1.0	<1.0	<1.0	2.9	<1.0
Volatile Organic Compounds Benzene (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
EthylBenzene (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Toluene (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
o-Xylene (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
m+p-Xylene (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Xylenes (mg/L)	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071
F1(C6-C10) (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
F1-BTEX (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
Surrogate: 4-Bromofluorobenzene (SS) (%)	92.4	88.2	89.2	89.8	91.0
Surrogate: 3,4-Dichlorotoluene (SS) (%)	97.0	97.1	97.1	99.9	99.3
Surrogate: 1,4-Difluorobenzene (SS) (%)	95.5	96.6	96.2	95.6	95.3
Hydrocarbons F2 (>C10-C16) (mg/L)	<0.10	<0.10	<0.10	0.27	<0.10
F3 (C16-C34) (mg/L)	<0.25	<0.25	<0.25	1.15	<0.25
F4 (C34-C50) (mg/L)	<0.25	<0.25	<0.25	<0.25	<0.25
TPH (C6-C50) (mg/L)	<0.38	<0.38	<0.38	1.42	<0.38
Surrogate: 2-Bromobenzotrifluoride (%)	96.6	92.5	92.2	94.2	88.0

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

Qualifiers for Individual Samples Listed:

Sample Number	Client Sample ID	Qualifier	Description
L1939807-1	CONTWOYTO	EHR	Exceeded Recommended Holding Time prior to receipt at the lab. - BOD and Fecal coliforms
L1939807-2	PIT	EHR	Exceeded Recommended Holding Time prior to receipt at the lab. - BOD and Fecal coliforms

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Matrix Spike	Chloride (Cl)	MS-B	L1939807-1, -2, -3, -4, -5
Matrix Spike	Barium (Ba)-Total	MS-B	L1939807-2, -3, -4, -5
Matrix Spike	Calcium (Ca)-Total	MS-B	L1939807-1
Matrix Spike	Calcium (Ca)-Total	MS-B	L1939807-2, -3, -4, -5
Matrix Spike	Magnesium (Mg)-Total	MS-B	L1939807-1
Matrix Spike	Magnesium (Mg)-Total	MS-B	L1939807-2, -3, -4, -5
Matrix Spike	Manganese (Mn)-Total	MS-B	L1939807-1
Matrix Spike	Potassium (K)-Total	MS-B	L1939807-2, -3, -4, -5
Matrix Spike	Sodium (Na)-Total	MS-B	L1939807-1
Matrix Spike	Sodium (Na)-Total	MS-B	L1939807-2, -3, -4, -5
Matrix Spike	Strontium (Sr)-Total	MS-B	L1939807-1
Matrix Spike	Strontium (Sr)-Total	MS-B	L1939807-2, -3, -4, -5
Matrix Spike	Sulfur (S)-Total	MS-B	L1939807-2, -3, -4, -5
Matrix Spike	Uranium (U)-Total	MS-B	L1939807-2, -3, -4, -5

Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLB	Detection Limit Raised. Analyte detected at comparable level in Method Blank.
HTA	Analytical holding time was exceeded.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
BOD5-TG	Water	Biochemical Oxygen Demand- 5 day (TAIGA)	SM5210B
BTXS,F1-ED	Water	BTEX, Styrene and F1 (C6-C10)	EPA 5021/8015&8260 GC-MS & FID
CL-IC-N-ED	Water	Chloride in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

F2,F3,F4-ED	Water	F2, F3, F4	EPA 3510/CCME PHC CWS-GC-FID

Water samples are spiked with 2-BBTF surrogate, and extracted by reciprocal action shaker for 30 minutes using a single micro-extraction with 2 mL hexane. After extraction, hexane extracts are dispensed into GC vials for GC-FID analysis.

FCOLI-MPN-YL	Water	Thermotolerant (Fecal) Coliforms	APHA 9223B, 2004 Enzyme Substrate Method

Analysis is carried out using procedures adapted from APHA 9223 "Enzyme Substrate Coliform Test". Fecal Coliform (Thermotolerant) bacteria are determined by mixing sample with a mixture of hydrolyzable substrates and then sealing in a multi-well packet. The packet is incubated for 18-24 hours and the number of wells exhibiting a positive response are counted. The final result is obtained by comparing the positive responses to a probability table.

MET-D-CCMS-ED	Water	Dissolved Metals in Water by CRC ICPMS	APHA 3030B/6020A (mod)

Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

MET-T-CCMS-ED	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)

Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

NH3-COL-ED	Water	Ammonia in Water by Colour	APHA 4500 NH3-NITROGEN (AMMONIA)

This analysis is carried out using procedures adapted from APHA Method 4500 NH3 "NITROGEN (AMMONIA)". Ammonia is determined using the automated phenate colourimetric method.

NO3-IC-N-ED	Water	Nitrate in Water by IC	EPA 300.1 (mod)

Reference Information

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

OGG-LLE-GRAV-ED	Water	O&G by Hex/MTBE extraction, gravimetric	APHA 5520 B HEXANE MTBE EXT. GRAVIME

This technique employs a hexane/methyl-tert-butyl ether extraction of water, followed by filtration of the solvent into an evaporation container. The solvent is evaporated in a pre-weighed dish and the oil and grease content is calculated from the weight of material remaining.

PH-ED	Water	pH	APHA 4500 H-Electrode

All samples analyzed by this method for pH will have exceeded the 15 minute recommended hold time from time of sampling (field analysis is recommended for pH where highly accurate results are needed)

SOLIDS-TDS-ED	Water	Total Dissolved Solids	APHA 2540 C

Gravimetric determination of solids in waters by filtration and evaporating filtrate to dryness at 180 degrees Celsius.

SOLIDS-TOTSUS-ED	Water	Total Suspended Solids	APHA 2540 D-Gravimetric

Gravimetric determination of solids in waters by filtration and drying filter at 104 degrees Celsius.

TPH(C6-C50)-CALC-ED	Water	Total Petroleum Hydrocarbons (C6-C50)	CCME CWS-PHC, Pub #1310, Dec 2001

TPH (C6-C50) is determined as the sum of CCME F1, F2, F3 and F4. The CCME F2-F4 test includes an in-situ silica gel cleanup to remove polar organic constituents that are not representative of petroleum hydrocarbons. Even after silica gel cleanup, some non-petroleum source hydrocarbons may be detected by this test.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
ED	ALS ENVIRONMENTAL - EDMONTON, ALBERTA, CANADA
TG	TAIGA ENVIRONMENTAL LABORATORY (INAC)
YL	ALS ENVIRONMENTAL -YELLOWKNIFE, NORTHWEST TERRITORIES CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg - milligrams per kilogram based on dry weight of sample.
mg/kg wwt - milligrams per kilogram based on wet weight of sample.
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L - milligrams per litre.
< - Less than.
D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Quality Control Report

Workorder: L1939807 Report Date: 26-JUN-17

Client: Cash Clients
DXB Projects
Toronto ON L4N3Y3

Contact: Henry Wong

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
BTXS,F1-ED	**Water**							
Batch R3746784								
WG2546440-2 LCS								
Benzene			104.6		%		70-130	15-JUN-17
Toluene			98.9		%		70-130	15-JUN-17
EthylBenzene			99.96		%		70-130	15-JUN-17
m+p-Xylene			94.2		%		70-130	15-JUN-17
o-Xylene			105.6		%		70-130	15-JUN-17
WG2546440-3 LCS								
F1(C6-C10)			78.7		%		70-130	15-JUN-17
WG2546440-1 MB								
Benzene			<0.00050		mg/L		0.0005	15-JUN-17
Toluene			<0.00050		mg/L		0.0005	15-JUN-17
EthylBenzene			<0.00050		mg/L		0.0005	15-JUN-17
m+p-Xylene			<0.00050		mg/L		0.0005	15-JUN-17
o-Xylene			<0.00050		mg/L		0.0005	15-JUN-17
F1(C6-C10)			<0.10		mg/L		0.1	15-JUN-17
Surrogate: 1,4-Difluorobenzene (SS)			95.5		%		70-130	15-JUN-17
Surrogate: 4-Bromofluorobenzene (SS)			90.9		%		70-130	15-JUN-17
Surrogate: 3,4-Dichlorotoluene (SS)			101.9		%		70-130	15-JUN-17
CL-IC-N-ED	**Water**							
Batch R3744347								
WG2545901-2 LCS								
Chloride (Cl)			98.5		%		90-110	10-JUN-17
WG2545901-1 MB								
Chloride (Cl)			<0.50		mg/L		0.5	10-JUN-17
F2,F3,F4-ED	**Water**							
Batch R3746791								
WG2546279-2 LCS		**DIESEL / MOTOR OIL**						
F2 (>C10-C16)			92.9		%		70-130	12-JUN-17
F3 (C16-C34)			97.5		%		70-130	12-JUN-17
F4 (C34-C50)			94.5		%		70-130	12-JUN-17
WG2546279-1 MB								
F2 (>C10-C16)			<0.10		mg/L		0.1	12-JUN-17
F3 (C16-C34)			<0.25		mg/L		0.25	12-JUN-17
F4 (C34-C50)			<0.25		mg/L		0.25	12-JUN-17
Surrogate: 2-Bromobenzotrifluoride			94.7		%		60-140	12-JUN-17
FCOLI-MPN-YL	**Water**							

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
FCOLI-MPN-YL	**Water**							
Batch R3746369								
WG2547296-2 DUP		**L1939807-4**						
MPN-Fecal Coliform		<1	<1	RPD-NA	MPN/100mL	N/A	65	10-JUN-17
WG2547296-1 MB								
MPN-Fecal Coliform			<1		MPN/100mL		1	10-JUN-17
MET-D-CCMS-ED	**Water**							
Batch R3749520								
WG2549373-10 LCS								
Aluminum (Al)-Dissolved			111.3		%		80-120	17-JUN-17
WG2549373-9 MB								
Aluminum (Al)-Dissolved			<0.0010		mg/L		0.001	17-JUN-17
Batch R3754859								
WG2553949-2 LCS								
Aluminum (Al)-Dissolved			107.4		%		80-120	22-JUN-17
WG2553949-1 MB								
Aluminum (Al)-Dissolved			<0.0010		mg/L		0.001	22-JUN-17
Batch R3755236								
WG2555669-2 LCS								
Aluminum (Al)-Dissolved			105.6		%		80-120	23-JUN-17
WG2555669-1 MB								
Aluminum (Al)-Dissolved			<0.0010		mg/L		0.001	23-JUN-17
Batch R3756412								
WG2553949-2 LCS								
Aluminum (Al)-Dissolved			106.9		%		80-120	26-JUN-17
WG2553949-1 MB								
Aluminum (Al)-Dissolved			<0.0010		mg/L		0.001	26-JUN-17
MET-T-CCMS-ED	**Water**							
Batch R3745771								
WG2546056-2 LCS		**HB WATER**						
Aluminum (Al)-Total			113.3		%		80-120	12-JUN-17
Antimony (Sb)-Total			104.7		%		80-120	12-JUN-17
Arsenic (As)-Total			105.9		%		80-120	12-JUN-17
Barium (Ba)-Total			105.7		%		80-120	12-JUN-17
Beryllium (Be)-Total			108.9		%		80-120	12-JUN-17
Bismuth (Bi)-Total			102.5		%		80-120	12-JUN-17
Boron (B)-Total			103.0		%		80-120	12-JUN-17
Cadmium (Cd)-Total			104.9		%		80-120	12-JUN-17
Calcium (Ca)-Total			104.0		%		80-120	12-JUN-17

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-ED	**Water**							
Batch R3745771								
WG2546056-2 LCS		**HB WATER**						
Cesium (Cs)-Total			101.3		%		80-120	12-JUN-17
Chromium (Cr)-Total			105.2		%		80-120	12-JUN-17
Cobalt (Co)-Total			102.9		%		80-120	12-JUN-17
Copper (Cu)-Total			102.3		%		80-120	12-JUN-17
Iron (Fe)-Total			100.7		%		80-120	12-JUN-17
Lead (Pb)-Total			103.9		%		80-120	12-JUN-17
Lithium (Li)-Total			107.1		%		80-120	12-JUN-17
Magnesium (Mg)-Total			108.0		%		80-120	12-JUN-17
Manganese (Mn)-Total			104.4		%		80-120	12-JUN-17
Molybdenum (Mo)-Total			103.1		%		80-120	12-JUN-17
Nickel (Ni)-Total			103.8		%		80-120	12-JUN-17
Phosphorus (P)-Total			96.1		%		70-130	12-JUN-17
Potassium (K)-Total			107.2		%		80-120	12-JUN-17
Rubidium (Rb)-Total			103.9		%		80-120	12-JUN-17
Selenium (Se)-Total			103.0		%		80-120	12-JUN-17
Silicon (Si)-Total			114.7		%		60-140	12-JUN-17
Silver (Ag)-Total			103.2		%		80-120	12-JUN-17
Sodium (Na)-Total			108.5		%		80-120	12-JUN-17
Strontium (Sr)-Total			111.3		%		80-120	12-JUN-17
Sulfur (S)-Total			105.7		%		80-120	12-JUN-17
Tellurium (Te)-Total			100.4		%		80-120	12-JUN-17
Thallium (Tl)-Total			101.1		%		80-120	12-JUN-17
Thorium (Th)-Total			102.1		%		80-120	12-JUN-17
Tin (Sn)-Total			101.2		%		80-120	12-JUN-17
Titanium (Ti)-Total			102.1		%		80-120	12-JUN-17
Tungsten (W)-Total			104.6		%		80-120	12-JUN-17
Uranium (U)-Total			105.4		%		80-120	12-JUN-17
Vanadium (V)-Total			106.7		%		80-120	12-JUN-17
Zinc (Zn)-Total			100.4		%		80-120	12-JUN-17
Zirconium (Zr)-Total			99.97		%		80-120	12-JUN-17
WG2546056-1 MB								
Aluminum (Al)-Total			<0.0030		mg/L		0.003	12-JUN-17
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	13-JUN-17
Arsenic (As)-Total			<0.00010		mg/L		0.0001	12-JUN-17

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-ED	**Water**							
Batch R3745771								
WG2546056-1 MB								
Barium (Ba)-Total			<0.000050		mg/L		0.00005	12-JUN-17
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	12-JUN-17
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	12-JUN-17
Boron (B)-Total			<0.010		mg/L		0.01	12-JUN-17
Cadmium (Cd)-Total			<0.0000050		mg/L		0.000005	12-JUN-17
Calcium (Ca)-Total			<0.050		mg/L		0.05	12-JUN-17
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	12-JUN-17
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	12-JUN-17
Copper (Cu)-Total			<0.00050		mg/L		0.0005	12-JUN-17
Iron (Fe)-Total			<0.010		mg/L		0.01	12-JUN-17
Lead (Pb)-Total			<0.000050		mg/L		0.00005	12-JUN-17
Lithium (Li)-Total			<0.0010		mg/L		0.001	12-JUN-17
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	12-JUN-17
Manganese (Mn)-Total			<0.00010		mg/L		0.0001	12-JUN-17
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	12-JUN-17
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	12-JUN-17
Phosphorus (P)-Total			<0.050		mg/L		0.05	12-JUN-17
Potassium (K)-Total			<0.050		mg/L		0.05	12-JUN-17
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	12-JUN-17
Selenium (Se)-Total			<0.000050		mg/L		0.00005	12-JUN-17
Silicon (Si)-Total			<0.10		mg/L		0.1	12-JUN-17
Silver (Ag)-Total			<0.000010		mg/L		0.00001	12-JUN-17
Sodium (Na)-Total			<0.050		mg/L		0.05	12-JUN-17
Strontium (Sr)-Total			<0.00020		mg/L		0.0002	12-JUN-17
Sulfur (S)-Total			<0.50		mg/L		0.5	12-JUN-17
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	12-JUN-17
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	12-JUN-17
Thorium (Th)-Total			<0.00010		mg/L		0.0001	12-JUN-17
Tin (Sn)-Total			<0.00010		mg/L		0.0001	12-JUN-17
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	12-JUN-17
Tungsten (W)-Total			<0.00010		mg/L		0.0001	12-JUN-17
Uranium (U)-Total			<0.000010		mg/L		0.00001	12-JUN-17
Vanadium (V)-Total			<0.00050		mg/L		0.0005	12-JUN-17
Zinc (Zn)-Total			<0.0030		mg/L		0.003	12-JUN-17

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-ED	**Water**							
Batch R3745771								
WG2546056-1 MB								
Zirconium (Zr)-Total			<0.000060		mg/L		0.00006	12-JUN-17
Batch R3746672								
WG2546679-2 LCS		**HB WATER**						
Aluminum (Al)-Total			108.7		%		80-120	13-JUN-17
Antimony (Sb)-Total			99.8		%		80-120	13-JUN-17
Arsenic (As)-Total			102.6		%		80-120	13-JUN-17
Barium (Ba)-Total			104.0		%		80-120	13-JUN-17
Beryllium (Be)-Total			97.7		%		80-120	13-JUN-17
Bismuth (Bi)-Total			95.8		%		80-120	13-JUN-17
Boron (B)-Total			96.0		%		80-120	13-JUN-17
Cadmium (Cd)-Total			97.1		%		80-120	13-JUN-17
Calcium (Ca)-Total			95.8		%		80-120	13-JUN-17
Cesium (Cs)-Total			97.4		%		80-120	13-JUN-17
Chromium (Cr)-Total			98.5		%		80-120	13-JUN-17
Cobalt (Co)-Total			99.1		%		80-120	13-JUN-17
Copper (Cu)-Total			99.7		%		80-120	13-JUN-17
Iron (Fe)-Total			100.1		%		80-120	13-JUN-17
Lead (Pb)-Total			98.6		%		80-120	13-JUN-17
Lithium (Li)-Total			97.2		%		80-120	13-JUN-17
Magnesium (Mg)-Total			102.5		%		80-120	13-JUN-17
Manganese (Mn)-Total			103.0		%		80-120	13-JUN-17
Molybdenum (Mo)-Total			96.6		%		80-120	13-JUN-17
Nickel (Ni)-Total			99.1		%		80-120	13-JUN-17
Phosphorus (P)-Total			128.4		%		70-130	13-JUN-17
Potassium (K)-Total			103.3		%		80-120	13-JUN-17
Rubidium (Rb)-Total			98.8		%		80-120	13-JUN-17
Selenium (Se)-Total			98.7		%		80-120	13-JUN-17
Silicon (Si)-Total			108.2		%		60-140	13-JUN-17
Silver (Ag)-Total			101.5		%		80-120	13-JUN-17
Sodium (Na)-Total			103.3		%		80-120	13-JUN-17
Strontium (Sr)-Total			105.8		%		80-120	13-JUN-17
Sulfur (S)-Total			100.2		%		80-120	13-JUN-17
Tellurium (Te)-Total			99.7		%		80-120	13-JUN-17

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-ED	**Water**							
Batch R3746672								
WG2546679-2 LCS		**HB WATER**						
Thallium (Tl)-Total			97.3		%		80-120	13-JUN-17
Thorium (Th)-Total			95.0		%		80-120	13-JUN-17
Tin (Sn)-Total			98.8		%		80-120	13-JUN-17
Titanium (Ti)-Total			99.4		%		80-120	13-JUN-17
Tungsten (W)-Total			98.3		%		80-120	13-JUN-17
Uranium (U)-Total			98.9		%		80-120	13-JUN-17
Vanadium (V)-Total			100.1		%		80-120	13-JUN-17
Zinc (Zn)-Total			96.2		%		80-120	13-JUN-17
Zirconium (Zr)-Total			94.7		%		80-120	13-JUN-17
WG2546679-1 MB								
Aluminum (Al)-Total			<0.0030		mg/L		0.003	13-JUN-17
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	13-JUN-17
Arsenic (As)-Total			<0.00010		mg/L		0.0001	13-JUN-17
Barium (Ba)-Total			<0.000050		mg/L		0.00005	13-JUN-17
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	13-JUN-17
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	13-JUN-17
Boron (B)-Total			<0.010		mg/L		0.01	13-JUN-17
Cadmium (Cd)-Total			<0.0000050		mg/L		0.000005	13-JUN-17
Calcium (Ca)-Total			<0.050		mg/L		0.05	13-JUN-17
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	13-JUN-17
Chromium (Cr)-Total			<0.00010		mg/L		0.0001	13-JUN-17
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	13-JUN-17
Copper (Cu)-Total			<0.00050		mg/L		0.0005	13-JUN-17
Iron (Fe)-Total			<0.010		mg/L		0.01	13-JUN-17
Lead (Pb)-Total			<0.000050		mg/L		0.00005	13-JUN-17
Lithium (Li)-Total			<0.0010		mg/L		0.001	13-JUN-17
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	13-JUN-17
Manganese (Mn)-Total			<0.00010		mg/L		0.0001	13-JUN-17
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	13-JUN-17
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	13-JUN-17
Phosphorus (P)-Total			<0.050		mg/L		0.05	13-JUN-17
Potassium (K)-Total			<0.050		mg/L		0.05	13-JUN-17
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	13-JUN-17
Selenium (Se)-Total			<0.000050		mg/L		0.00005	13-JUN-17

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-ED	**Water**							
Batch R3746672								
WG2546679-1 MB								
Silicon (Si)-Total			<0.10		mg/L		0.1	13-JUN-17
Silver (Ag)-Total			<0.000010		mg/L		0.00001	13-JUN-17
Sodium (Na)-Total			<0.050		mg/L		0.05	13-JUN-17
Strontium (Sr)-Total			<0.00020		mg/L		0.0002	13-JUN-17
Sulfur (S)-Total			<0.50		mg/L		0.5	13-JUN-17
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	13-JUN-17
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	13-JUN-17
Thorium (Th)-Total			<0.00010		mg/L		0.0001	13-JUN-17
Tin (Sn)-Total			<0.00010		mg/L		0.0001	13-JUN-17
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	13-JUN-17
Tungsten (W)-Total			<0.00010		mg/L		0.0001	13-JUN-17
Uranium (U)-Total			<0.000010		mg/L		0.00001	13-JUN-17
Vanadium (V)-Total			<0.00050		mg/L		0.0005	13-JUN-17
Zinc (Zn)-Total			<0.0030		mg/L		0.003	13-JUN-17
Zirconium (Zr)-Total			<0.000060		mg/L		0.00006	13-JUN-17
NH3-COL-ED	**Water**							
Batch R3748499								
WG2549426-12 LCS								
Ammonia, Total (as N)			108.2		%		85-115	15-JUN-17
WG2549426-14 LCS								
Ammonia, Total (as N)			104.6		%		85-115	15-JUN-17
WG2549426-2 LCS								
Ammonia, Total (as N)			99.4		%		85-115	15-JUN-17
WG2549426-20 LCS								
Ammonia, Total (as N)			105.7		%		85-115	15-JUN-17
WG2549426-1 MB								
Ammonia, Total (as N)			<0.050		mg/L		0.05	15-JUN-17
WG2549426-11 MB								
Ammonia, Total (as N)			<0.050		mg/L		0.05	15-JUN-17
WG2549426-13 MB								
Ammonia, Total (as N)			<0.050		mg/L		0.05	15-JUN-17
WG2549426-19 MB								
Ammonia, Total (as N)			<0.050		mg/L		0.05	15-JUN-17

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
NH3-COL-ED	**Water**							
Batch R3752404								
WG2553726-12 LCS								
Ammonia, Total (as N)			102.9		%		85-115	21-JUN-17
WG2553726-14 LCS								
Ammonia, Total (as N)			104.4		%		85-115	21-JUN-17
WG2553726-16 LCS								
Ammonia, Total (as N)			104.0		%		85-115	21-JUN-17
WG2553726-2 LCS								
Ammonia, Total (as N)			100.9		%		85-115	21-JUN-17
WG2553726-1 MB								
Ammonia, Total (as N)			<0.050		mg/L		0.05	21-JUN-17
WG2553726-11 MB								
Ammonia, Total (as N)			<0.050		mg/L		0.05	21-JUN-17
WG2553726-13 MB								
Ammonia, Total (as N)			<0.050		mg/L		0.05	21-JUN-17
WG2553726-15 MB								
Ammonia, Total (as N)			<0.050		mg/L		0.05	21-JUN-17
NO3-IC-N-ED	**Water**							
Batch R3744347								
WG2545901-2 LCS								
Nitrate (as N)			95.5		%		90-110	10-JUN-17
WG2545901-1 MB								
Nitrate (as N)			<0.020		mg/L		0.02	10-JUN-17
OGG-LLE-GRAV-ED	**Water**							
Batch R3745556								
WG2546113-2 LCS								
Oil and Grease			91.0		%		70-130	12-JUN-17
WG2546113-1 MB								
Oil and Grease			<1.0		mg/L		1	12-JUN-17
PH-ED	**Water**							
Batch R3744410								
WG2546037-7 DUP		**L1939807-4**						
pH		7.36	7.28	J	pH	0.08	0.3	11-JUN-17
WG2546037-10 LCS		**ED-PH6**						
pH			6.00		pH		5.8-6.2	11-JUN-17
WG2546037-3 LCS		**ED-PH6**						
pH			6.02		pH		5.8-6.2	11-JUN-17
SOLIDS-TDS-ED	**Water**							

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
SOLIDS-TDS-ED	**Water**							
Batch R3746490								
WG2546196-2 LCS								
Total Dissolved Solids			102.7		%		85-115	12-JUN-17
WG2546196-1 MB								
Total Dissolved Solids			<10		mg/L		10	12-JUN-17
SOLIDS-TOTSUS-ED	**Water**							
Batch R3746204								
WG2546439-2 LCS								
Total Suspended Solids			98.0		%		85-115	12-JUN-17
WG2546439-1 MB								
Total Suspended Solids			<3.0		mg/L		3	12-JUN-17

Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
J	Duplicate results and limits are expressed in terms of absolute difference.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
Physical Tests							
pH							
	1	08-JUN-17 17:30	11-JUN-17 00:00	0.25	54	hours	EHTR-FM
	2	08-JUN-17 23:00	11-JUN-17 00:00	0.25	49	hours	EHTR-FM
	3	09-JUN-17 10:00	11-JUN-17 00:00	0.25	38	hours	EHTR-FM
	4	09-JUN-17 11:00	11-JUN-17 00:00	0.25	37	hours	EHTR-FM
	5	09-JUN-17 11:30	11-JUN-17 00:00	0.25	36	hours	EHTR-FM
Bacteriological Tests							
Thermotolerant (Fecal) Coliforms							
	1	08-JUN-17 17:30	10-JUN-17 12:45	30	43	hours	EHTL
	2	08-JUN-17 23:00	10-JUN-17 12:45	30	38	hours	EHTL

Legend & Qualifier Definitions:

EHTR-FM:	Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended.
EHTR:	Exceeded ALS recommended hold time prior to sample receipt.
EHTL:	Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry.
EHT:	Exceeded ALS recommended hold time prior to analysis.
Rec. HT:	ALS recommended hold time (see units).

Notes*:
Where actual sampling date is not provided to ALS, the date (& time) of receipt is used for calculation purposes.
Where actual sampling time is not provided to ALS, the earlier of 12 noon on the sampling date or the time (& date) of receipt is used for calculation purposes. Samples for L1939807 were received on 09-JUN-17 16:00.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

Taiga Environmental Laboratory
4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9
Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.: 170352

- FINAL REPORT -

Prepared For: ALS Environmental

Address: 314 Old Airport Road
Unit 116
Yellowknife,NT
X1A 2R1

Attn: **Rick Zolkiewski** **Facsimile:**

Final report has been reviewed and approved by:

Judy Mah
Client Service Officer

NOTES:

- Test methods and data are validated by the laboratory's Quality Assurance Program. Taiga Environmental Laboratory is accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) to ISO/IEC 17025 as a testing laboratory for specific tests registered with CALA.
- Routine methods are based on recognized procedures from sources such as
  - Standard Methods for the Examination of Water and Wastewater APHA AWWA WEF;
  - Environment Canada
  - USEPA
- Samples shall be kept for thirty (30) days after the final report is issued. All microbiological samples shall be disposed of immediately upon completion of analysis to minimize biohazardous risks to laboratory personnel. Please contact the laboratory if you have any special requirements.
- Final results are based on the specific tests at the time of analysis and do not represent the conditions during sampling.

ReportDate: Tuesday, June 20, 2017
Print Date: *Tuesday, June 20, 2017*

Taiga Environmental Laboratory
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Taiga Batch No.: 170352

- CERTIFICATE OF ANALYSIS -

Client Sample ID: L1939807-1 CONTWOYTO **Taiga Sample ID:** 001

Client Project:
Sample Type: Water
Received Date: 09-Jun-17
Sampling Date: 08-Jun-17
Sampling Time:
Location:
Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Inorganics - Nutrients						
Biochemical Oxygen Demand	< 2	2	mg/L	10-Jun-17	SM5210:B	

ReportDate: Tuesday, June 20, 2017
Print Date: *Tuesday, June 20, 2017*

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Taiga Batch No.: 170352

- CERTIFICATE OF ANALYSIS -

Client Sample ID: L1939807-2 PIT **Taiga Sample ID:** 002

Client Project:
Sample Type: Water
Received Date: 09-Jun-17
Sampling Date: 08-Jun-17
Sampling Time:
Location:
Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Inorganics - Nutrients						
Biochemical Oxygen Demand	< 2	2	mg/L	10-Jun-17	SM5210:B	

ReportDate: Tuesday, June 20, 2017
Print Date: *Tuesday, June 20, 2017*

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Taiga Batch No.: 170352

- CERTIFICATE OF ANALYSIS -

Client Sample ID: L1939807-3 WEST DAM **Taiga Sample ID:** 003

Client Project:
Sample Type: Water
Received Date: 09-Jun-17
Sampling Date: 09-Jun-17
Sampling Time:
Location:
Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Inorganics - Nutrients						
Biochemical Oxygen Demand	< 2	2	mg/L	10-Jun-17	SM5210:B	

ReportDate: Tuesday, June 20, 2017
Print Date: *Tuesday, June 20, 2017*

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Taiga Batch No.: 170352

- CERTIFICATE OF ANALYSIS -

Client Sample ID: L1939807-4 PHASE 1 **Taiga Sample ID:** 004

Client Project:
Sample Type: Water
Received Date: 09-Jun-17
Sampling Date: 09-Jun-17
Sampling Time:
Location:
Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Inorganics - Nutrients						
Biochemical Oxygen Demand	3	2	mg/L	10-Jun-17	SM5210:B	

ReportDate: Tuesday, June 20, 2017
Print Date: *Tuesday, June 20, 2017*

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Taiga Batch No.: 170352

- CERTIFICATE OF ANALYSIS -

Client Sample ID: L1939807-5 DYKE A **Taiga Sample ID:** 005

Client Project:
Sample Type: Water
Received Date: 09-Jun-17
Sampling Date: 09-Jun-17
Sampling Time:
Location:
Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Inorganics - Nutrients						
Biochemical Oxygen Demand	< 2	2	mg/L	10-Jun-17	SM5210:B	

ReportDate: Tuesday, June 20, 2017
Print Date: *Tuesday, June 20, 2017*

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Taiga Batch No.: 170352

- CERTIFICATE OF ANALYSIS -

Client Sample ID: L1939807-5 DYKE A **Taiga Sample ID:** 005

*** Taiga analytical methods are based on the following standard analytical methods**

SM - Standard Methods for the Examination of Water and Wastewater

EPA - United States Environmental Protection Agency

ReportDate: Tuesday, June 20, 2017

Print Date: *Tuesday, June 20, 2017*

APPENDIX D:
OIL/WATER SEPARATOR SUMP DECOMMISSIONING PHOTOS

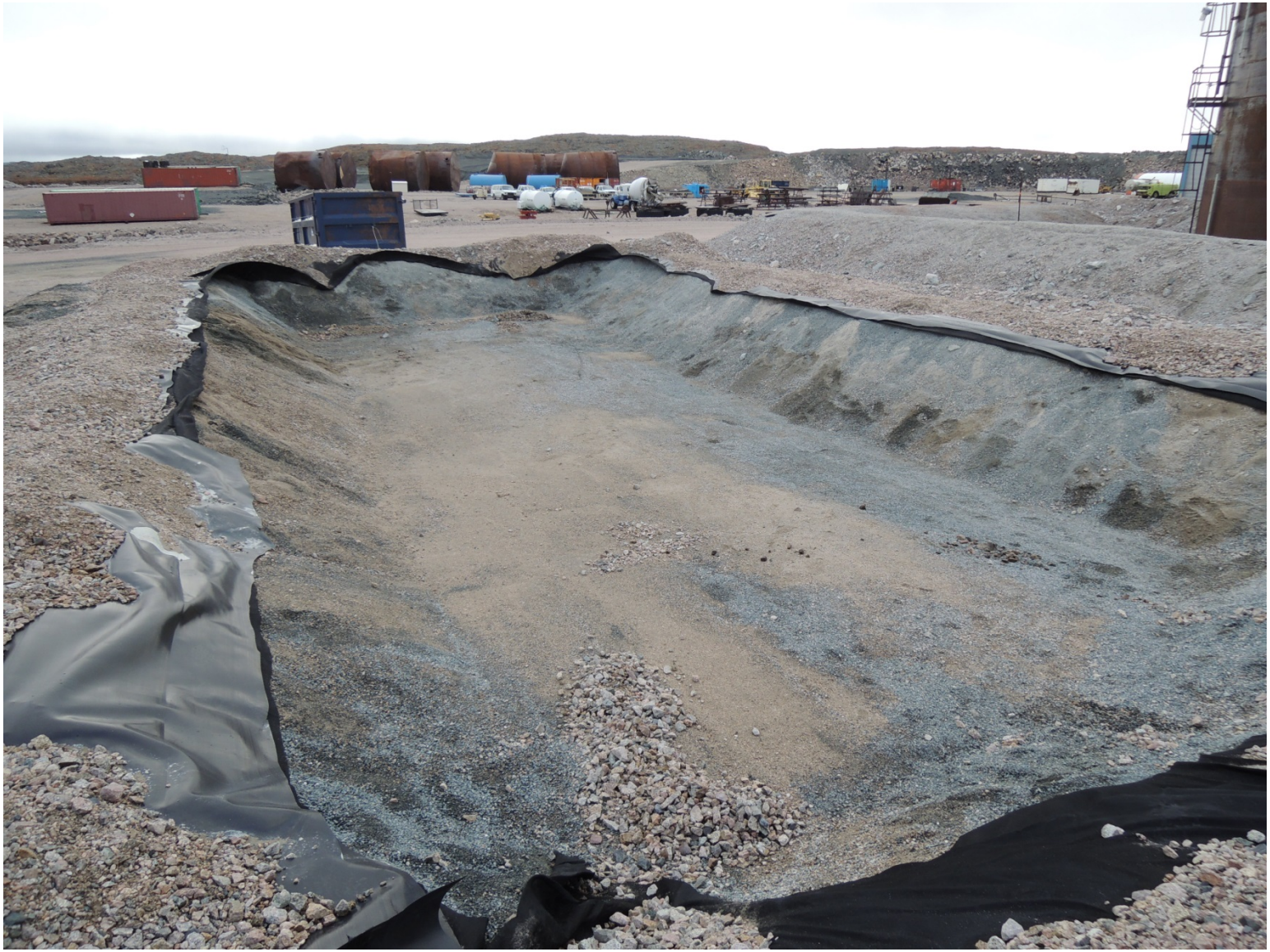
Picture #1 – Pump Setup

Picture #2 – Majority of Water Pumped

Picture #3 – Peeling Back Geomembrane to Consolidate Water/Gravel/Sludge

Picture #4 – Removal of Soil & Sludge by Shovel

Picture #5 – Both Geomembrane and Geotextile Removed



Picture #6 – Final Condition of Bermed Area