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Subject:
2016 DEW Line Monitoring Program – CAM-1

ENVIRONMENT

Date:
March 24, 2017

Dear Ms. Sine:

Please find attached the Final CAM-1 2016 Monitoring Report.

Sincerely,

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ARCADIS Design & Consultancy for natural and built assets

Public Services and Procurement Canada

on behalf of

Department of National Defence

LONG TERM LANDFILL MONITORING AT THE FORMER CAM-1 DEW LINE SITE

Jenny Lind Island, Nunavut

March 24, 2017

DEW LINE MONITORING PROGRAM - CAM-1

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ACRONYMS AND ABBREVIATIONS

bgs	below ground surface
DEW	Distant Early Warning
DGPS	Differential Global Positioning System
DND	Department of National Defence
GPS	Global Positioning System
HDPE	High Density Polyethylene
m.a.s.l.	Metres Above Sea Level
MDL	Method Detection Limit
MW	Monitoring Well
NWS	North Warning System
PCB	Polychlorinated Biphenyl
PHC	Petroleum Hydrocarbon
PSPC	Public Services and Procurement Canada
QA/QC	Quality Assurance/Quality Control
RPD	Relative Percent Difference
SRR	Short Range Radar
TOR	Terms of Reference
TPH	Total Petroleum Hydrocarbons

EXECUTIVE SUMMARY

Public Services and Procurement Canada (PSPC) has been engaged by Department of National Defence (DND) to procure environmental services for the monitoring of Distant Early Warning (DEW) Line sites in Canada. PSPC has acquired the services of Arcadis Canada Inc. (Arcadis) to perform the environmental and geotechnical monitoring of select DND DEW Line Sites in the Kitikmeot Settlement Region, in the Nunavut settlement area for the years 2016 to 2020 (PIN-2 Cape Young, PIN-3 Lady Franklin Point, PIN-4 Byron Bay, CAM-M Cambridge Bay, CAM-1 Jenny Lind Island, CAM-2 Gladman Point, CAM-3 Shepherd Bay, and CAM-4 Pelly Bay). The present report documents the findings of the field program for the 2016 monitoring year conducted at the former DEW Line Site CAM-1, on Jenny Lind Island, Nunavut.

The 2016 monitoring program at CAM-1 took place between August 9 and 12, 2016. Ten landfills were monitored, comprising the Borrow Area North Landfill, Northeast Landfill, Station West Landfill, Non-Hazardous Waste Landfill, Tier II Disposal Facility, Southeast Landfill, Station East Landfill, Main Landfill, USAF Landfill, and East Landing Landfill.

The landfill monitoring program was intended to assess the performance of these landfills from an environmental and geotechnical perspective, and consisted of a visual inspection, soil sampling, groundwater sampling, and thermal monitoring (downloading data from thermistors installed in the Tier II Disposal Facility).

The main observations and required actions for future monitoring events are shown below:

Landfill	Main Observations and Conclusions	Required Action for Future Monitoring Events
Borrow Area North Landfill	Minor settlement, erosion, staining and vehicle rut features are present but are not affecting landfill stability. Landfill performance is acceptable.	Continued environmental and geotechnical monitoring as per monitoring schedule
Northeast Landfill	Minor settlement and erosion features and an uneven side slope area are present but are not affecting landfill stability. Landfill performance is acceptable.	Continued environmental and geotechnical monitoring as per monitoring schedule
Station West Landfill	Minor settlement, erosion and staining features and an uneven side slope area are present but are not affecting landfill stability. Cracks along three areas of landfill side slopes are decreasing in length through infilling. Landfill performance is acceptable.	Continued environmental and geotechnical monitoring as per monitoring schedule
Non-Hazardous Waste Landfill	Minor settlement and debris exposure features are present at the landfill but are not affecting landfill stability or the integrity of the landfill cover. Landfill performance is acceptable.	Continued environmental and geotechnical monitoring as per monitoring schedule

Landfill	Main Observations and Conclusions	Required Action for Future Monitoring Events
Tier II Disposal Facility	Minor settlement, erosion and staining features are present but are not affecting landfill stability. Landfill performance is acceptable.	Continued environmental and geotechnical monitoring as per monitoring schedule
Southeast Landfill	Minor settlement features and one area of vehicle ruts are present but are not affecting landfill stability. Landfill performance is acceptable.	Continued environmental and geotechnical monitoring as per monitoring schedule
Station East Landfill	Minor settlement and erosion features are present but are not affecting landfill stability. Landfill performance is acceptable.	Continued environmental and geotechnical monitoring as per monitoring schedule
Main Landfill	Minor settlement and erosion features are present but are not affecting landfill stability. One large area of staining is present but is likely caused by a different source of borrow material during construction. Landfill performance is acceptable.	Continued environmental and geotechnical monitoring as per monitoring schedule
USAF Landfill	One minor erosion feature is present and is not affecting landfill stability. Landfill performance is acceptable.	Continued environmental and geotechnical monitoring as per monitoring schedule
East Landing Landfill	Minor erosion, settlement and cracking features are present but are not affecting landfill stability. One long crack is present on the southeast corner of the landfill cover and has lengthened between 2014 and 2016, however no evidence was observed that this crack is affecting the stability of the landfill. Landfill performance is acceptable.	Continued environmental and geotechnical monitoring as per monitoring schedule

The results of the 2016 monitoring program indicate that the performance of all ten landfills at CAM-1 is acceptable. No remedial work or deviations from the current monitoring plan are required at this time.

1 BACKGROUND

1.1 Context and Mandate

Public Services and Procurement Canada (PSPC) has been engaged by Department of National Defence (DND) to procure environmental services for the monitoring of Distant Early Warning (DEW) Line sites in Canada. PSPC has acquired the services of Arcadis Canada Inc. (Arcadis) to perform the environmental and geotechnical monitoring of select DND DEW Line Sites in the Kitikmeot Settlement Region, in the Nunavut settlement area for the years 2016 to 2020 (PIN-2 Cape Young, PIN-3 Lady Franklin Point, PIN-4 Byron Bay, CAM-M Cambridge Bay, CAM-1 Jenny Lind Island, CAM-2 Gladman Point, CAM-3 Shepherd Bay, and CAM-4 Pelly Bay). The present report documents the findings of the field program for the 2016 monitoring year conducted at the former DEW Line Site CAM-1, on Jenny Lind Island, Nunavut.

1.2 Location, Background and Site Features

1.2.1 Site Location

The CAM-1 site is located on the east central side of Jenny Lind Island within the Queen Maud Gulf in Nunavut at 68^{o} 40' north latitude and 101^{o} 43' west longitude, approximately 76 m.a.s.l. The site is approximately 140 km southeast of the community of Ikaluktutiak (Cambridge Bay). The site location is shown on the inset Key Plan on Figure CAM-1.1.

CAM-1 is accessible by charter aircraft or helicopter. The current condition of the runway and site access roads is good and chartered aircraft was able to land with no issues. There are no on-site accommodation facilities at CAM-1 and onsite transportation is not available. The site is located about 1 km inland and exposed to oceanic influences from Queen Maud Gulf and Victoria Strait.

1.2.2 Background

The CAM-1 Jenny Lind Island site was constructed in the 1950s as part of the Distant Early Warning (DEW) Line and operated until the early 1990s. The DEW Line Station was eventually decommissioned and boarded up in the fall of 1992. CAM-1A, a remotely operated Short Range Radar (SRR) station operated by the North Warning System (NWS) was constructed approximately 12 km northwest of the site. The environmental cleanup and demolition of the former DEW line facilities included closure and remediation of eight landfills as well as the construction of one landfill for the disposal of non-hazardous waste generated from demolition and collection of site debris and the construction of a Tier II Disposal Facility for the placement of Tier II contaminated soils during site clean-up.

1.2.3 Site Description and Site Features

The site landscape is characterized by a surficial cover of glacial drift reworked by marine waters. It is marked by extensive raised beach and swale features.

Site features include a runway, a series of interconnected roadways and paths, a construction monument and the following ten landfills which are being monitored under the current scope of work:

- Borrow Area North Landfill
- Northeast Landfill
- Station West Landfill
- Non-Hazardous Waste Landfill
- Tier II Disposal Facility
- Southeast Landfill
- Station East landfill
- Main Landfill
- USAF Landfill
- East Landing Landfill

Figure CAM-1.1 shows the overall site plan and illustrates the landfill locations and other notable site features.

1.3 Study Objectives

The objectives of the DEW Line landfill monitoring programs are to collect sufficient information to assess the performance, integrity, and stability of the landfills from a geotechnical and environmental perspective for the protection of human health and the environment. In addition, the work program objective is to collect the monitoring data required as outlined below in Section 1.4 in an extremely thorough and consistent manner for each monitoring event.

PSPC has specified the requirements for the Landfill Monitoring Program in the document *Terms of Reference – Dew Line Landfill Monitoring Program – PIN-2 Cape Young, PIN-3 Lady Franklin Point, PIN-4 Byron Bay, CAM-M Cambridge Bay, CAM-1 Jenny Lind Island, CAM-2 Gladman Point, CAM-3 Shepherd Bay, and CAM-4 Pelly Bay – DEW Line Sites, Kitikmeot Region, Nunavut, DND Project # KITIK 16, November 2015.* Specifically, Section 3 of the Terms of Reference (TOR) outlined the study objectives in detail.

The following Table 1-1 is the proposed monitoring schedule for CAM-1.

Table 1-1: Monitoring Schedule – CAM-1 Jenny Lind Island

Monitoring Schedule – CAM-1 Jenny Lind Island		
No. of Years After Construction	Monitoring Event No.	Year of Monitoring Event
3	3	2012
4	4	2013
5	5	2014
7	6	2016

Monitoring Schedule – CAM-1 Jenny Lind Island		
No. of Years After Construction	Monitoring Event No.	Year of Monitoring Event
10	7	2019
15	8	2024
25	9	2034

1.4 Scope of Work

The scope of work for the Landfill Monitoring Program at CAM-1 is defined in the TOR (reference A) and in the accepted Arcadis proposal Number P-6298 (reference C) submitted to PSPC. The scope of work generally includes the following activities summarized in Table 1-2 and outlined in detail within Section 5 of the TOR.

Table 1-2: CAM-1 Jenny Lind Island Scope of Work

Landfill	Type	Visual Inspection (Y/N)	Soil Sampling (# of locations and depths)	Groundwater Sampling (# of MWs)	Thermal Monitoring (# of Thermistors)
Borrow Area North Landfill	Regraded	Y	5 X 2	-	-
Northeast Landfill	Regraded	Y	4 X 2	-	-
Station West Landfill	Regraded	Y	4 X 2	-	-
Non-Hazardous Waste Landfill	NHWL	Y	4 X 2	4	-
Tier II Disposal Facility	Tier II	Y	4X 2	4	4*
Southeast Landfill	Regraded	Y	5 X 2	-	-
Station East Landfill	Regraded	Y	4 X 2	-	-
Main Landfill	Regraded	Y	4 X 2	-	-
USAF Landfill	Regraded	Y	5 X 2	-	-
East Landing Landfill	Regraded	Y	5 x 2	-	-

*2019 (year 10) – Replace ULB15 and ULB1 batteries and reprogram dataloggers

1.5 Site Geology, Hydrogeology and Hydrology

Jenny Lind Island is located in the Arctic Platform geological province, with bedrock geology characterized by Cambrian-Silurian carbonate and siliciclastic rocks (Canada-Nunavut Geoscience Office, 2006). It is located in an area of continuous permafrost with medium to high ground ice content (Natural Resources Canada, 1995).

The island is generally low-lying with some parts of the island consisting of flat terrain, whereas other parts of the island consist of undulating terrain that is interspersed with sparsely vegetated rocky ridges. Other parts consist of numerous low-lying wetlands and sedge meadows. Shorelines are mostly sandy and/or consist of oceanic polished cobbles and boulders. The island's beach ridges and strand lines consist of a large lithologic variety of all sizes of material from clay particles to boulders, with sand and gravels predominating. Observations of the local surficial geologic conditions made during the monitoring program were similar to these general conditions.

Groundwater flow is seasonal, occurring mainly in the summer period of maximum active layer thaw. Groundwater is located at shallow depths and is highly affected by local permafrost conditions. Surface water in the vicinity of CAM-1 drains to the southeast towards Queen Maud Gulf.

1.6 Site Land-use Description

Jenny Lind Island is uninhabited; however it still has an active Short Range Radar (SRR) station operated as part of the North Warning System (CAM-1A), located approximately 12 km northwest of the landfill sites.

Jenny Lind Island is recognized as an Important Bird Area and a key migratory bird terrestrial habitat by the Canadian Wildlife Service.

The site is known to be a habitat for Lesser Snow Geese, Canada Geese, Ross's Geese, Muskoxen and Arctic Foxes (all observed during the site visit).

1.7 Field Program Staff and Field Schedule

The 2016 CAM-1 DEW Line monitoring event was conducted by Arcadis qualified personnel with extensive experience working in remote northern environments including other DEW line monitoring sites. The assignment team comprised the following individuals:

Arcadis Canada Field Team and Roles

- Stephen Borcsok, P.Eng. (SB) – Geotechnical Field Staff Lead
- Ryan Fletcher, C.Tech, EP (RF) – Environmental Field Staff Lead

Inuit Support Team and Roles (services provided by Kitnuna Corporation, IFR#0378)

- Wildlife Monitors (Darcy Evetalegak, Bert Maksagak)
- Environmental Field Staff Assistants (Brent Klengenberg)
- Camp Staff (Willy Lyall)

The following Arcadis Canada staff were not present on site but provided support to the field team during the field program:

- Charles Gravelle, P.Eng. (CG) – Project Director
- Troy Austrins, P.Eng. (TA) – Project Manager

The on-site field work for the 2016 monitoring event at CAM-1 took place between August 9 and 12, 2016.

1.8 Weather Conditions

An outline of historical recorded weather conditions encountered is presented on Table 1-3, as identified for the CAM-1 site. The 1961-1990 Climate Normals and averages (temperature and precipitation totals) prepared by Environment Canada for Jenny Lind Island are listed.

Note that Climate Normals for the 1971 to 2000 and 1981 to 2010 periods are not available. The closest location for which climate normal and averages for these periods are available is the community of Cambridge Bay, located approximately 140 km west-northwest.

Table 1-3: Summary of Historical Temperature and Precipitation Conditions (Jenny Lind Island)

Climate Normals (1961- 1990)	Jan	Feb	March	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Daily Maximum Temp. (°C)	NA	NA	-27	-18	-6	+3	+10	+8	+1	-8	-19	-25
Daily Average Temp. (°C)	'NA	NA	-30	-22	-9	+1	+5	+4	-1	-10	-22	-29
Daily Minimum Temp. (°C)	-38	-38	-35	-27	-13	-2	+2	+1	-3	-12	-28	-34
Precipitation (mm)	2	2	2.5	4	6	11	19	26	18	14	6	2.5

Note: as interpreted from Environment Canada graphing (Climate Normals)
NA – not available

An outline of weather conditions encountered during the 2016 field work conducted by Arcadis is provided in Section 2.1.

1.9 Project References

Project references include:

A Dew Line Landfill Monitoring Program – PIN-2 Cape Young, PIN-3 Lady Franklin Point, PIN-4 Byron Bay, CAM-M Cambridge Bay, CAM-1 Jenny Lind Island, CAM-2 Gladman Point, CAM-3 Shepherd Bay, and CAM-4 Pelly Bay – DEW Line Sites, Kitikmeot Region, Nunavut, DND Project # KITIK 16, November 2015. (Specifically Annex S and Annex D)

B Arcadis Canada Inc., Proposal for Kitik 16 DEW Line Sites Monitoring, Response to Solicitation No. W6837-151003/B, March 8, 2016

C Arcadis Canada Inc., Meeting Minutes, Kitikmeot DEW Line Sites Monitoring Kickoff Meeting, May 25, 2016.

D Environmental Sciences Group, CAM-1 Jenny Lind Island, Nunavut, First-Year Monitoring Program 2010, December 2010.

E Biogenie, The collection of Landfill Monitoring Data at the Former CAM-1 DEW Line Site, Jenny Lind Island, Nunavut, Final Report, 2011 Season, January 2012.

F Biogenie, The collection of Landfill Monitoring Data at the Former CAM-1 DEW Line Site, Jenny Lind Island, Nunavut, Draft Report, 2012 Season, Monitoring Event – 2, March 2013.

G Biogenie, The collection of Landfill Monitoring Data at the Former CAM-1 DEW Line Site, Jenny Lind Island, Nunavut, Final Report, 2013 Season, January 2014.

H Biogenie, The collection of Landfill Monitoring Data at the Former CAM-1 DEW Line Site, Jenny Lind Island, Nunavut, Final Report - 2014, June 2015.

I Canada-Nunavut Geoscience Office, Geology of Nunavut Map, 2006.

J Natural Resources Canada, Canada Permafrost Map, 1995.

1.10 Report Structure

This report describes the work completed in August 2016 at the CAM-1. The report has been organized such that the results for the Borrow Area North Landfill, Northeast Landfill, Station West Landfill, Non-Hazardous Waste Landfill, Tier II Disposal Facility, Southeast Landfill, Station East Landfill, Main Landfill, USAF Landfill, and East Landing Landfill are each presented in separate standalone sections. Each section contains all relevant information for the respective landfill as part of the 2016 Landfill Monitoring Program.

Each of the individual landfill sections include:

- A brief description of the landfill;
- Completed Visual Inspection Checklist;
- Preliminary Stability Assessment;
- A discussion of all the visual inspection issues assessed;
- The overall performance rating of the landfill;
- A photograph log;
- Annotated drawings of each landfill;
- Soil sample analytical data;
- Monitoring well sampling logs and analytical data (where applicable);
- A discussion and comparison of chemical data to background and previous years' monitoring events;
- Completed thermistor inspection forms (where applicable);
- Analysis of overall performance of the landfill; and
- Any recommendations for further action and conclusions.

For the photographic record, the printed copy of the report only includes an index of photos for the landfill, as well as photo sheets for key features. The original photos are included in electronic format (jpg) in the Addendum CD-ROM of the report. An electronic version of the report and its component tables, figures and data files is included in an Addendum CD-ROM, which is appended to this report.

Laboratory Certificates of Analysis, QA/QC results and discussion, copies of field notes, and graphed trends of soil and groundwater results are attached as appendices at the rear of this report.

2 APPROACH AND METHODOLOGY

2.1 Summary of Work

2.1.1 Health and Safety

Prior to mobilization to the site, a site specific health and safety plan was submitted and approved by DND. The plan outlined the general safety rules and procedures that were adhered to while working at the subject site. It also presented additional precautions and procedures in the event of an emergency situation. Prior to the commencement of field work, all project staff participating in the monitoring and assessment activities were required to familiarize themselves with the contents of the health and safety plan and sign the statement of compliance.

Field crews carried appropriate emergency gear and took every precaution to keep the crew out of danger. This included undertaking the following, where appropriate:

- Obtaining maps to assist in identifying/characterizing the dominant physical features in the vicinity of the site (e.g., topographic maps and aerial photographs);
- Carrying and knowing how to use emergency communication devices such as satellite phones, to be tested for functionality;
- A weather check to be conducted prior to transporting to the field;
- Compilation of a site specific emergency contact List providing numbers for emergency services, office contacts, and individual emergency contacts;
- Carrying a global positioning system (GPS) unit for navigation as well as for relaying accurate location coordinates in case of emergency;
- Use of hand-held radios (if within suitable range) for communication between field teams;
- Possession of a Level 1 first aid kit appropriate to the scope of work and number of personnel;
- Possession of an emergency field kit containing provisions necessary to survive (e.g. food, tarps, flares) should transport, or rescue services, not be available for a number of days; and
- Knowing how to use all emergency equipment and testing it prior to mobilization to the field.

The remoteness of the CAM-1 Jenny Lind Island required that a comprehensive emergency field kit be mobilized to the site for the duration of the field work.

Arcadis staff received all relevant health and safety training in preparation for undertaking the work activities on-site prior to mobilization to the sites. Arcadis ensured that all staff on site received a site safety orientation and field-specific training on contaminated sites issues on day one of the field program. The site safety orientation included specific details of the health and safety plan that were relevant for each job, and relevant training for each position.

2.1.2 Field Program

Arcadis staff mobilized to Cambridge Bay from Yellowknife via commercial aircraft (Canadian North). Travel to the site was via a Dornier 328 chartered aircraft, scheduled through Kitikmeot Air in Cambridge Bay, Nunavut. On-site transportation consisted of an ATV and foot. Accommodations while in Cambridge Bay were at the Arctic Lodge hotel and accommodations on site comprised tents (sleeping tents and one wall tent for cooking). Camp services were supplied by Kitnuna Corporation (IFR# IFR0378) of Cambridge Bay and ATV rental was sourced through Kalvik Enterprises (IFR# IFR0538) of Cambridge Bay. The following Table 2-1 outlines the field schedule for CAM-1.

Table 2-1: 2016 Field Schedule for CAM-1 Jenny Lind Island

August 2016					
Sunday	**Monday**	**Tuesday**	**Wednesday**	**Thursday**	**Friday**
7	8	9	10	11	12
Mobilized to Yellowknife	Mobilized to Cambridge Bay	Mobilized to CAM-1	CAM-1	CAM-1	Demobilized from CAM-1 to Cambridge Bay

Weather during the field inspection and monitoring event consisted of a mixture of sun and cloud, light to medium winds, with temperatures ranging between 5 to 15 degrees Celsius.

2.1.3 Visual Inspection

Visual inspection of each landfill was conducted by Mr. Stephen Borcsok, P.Eng. based on guidelines presented in section 5.2 of the TOR. A visual inspection checklist (provided in Annex J1 of the TOR and reproduced herein in each individual landfill chapter) was completed for each landfill site inspected. Inspection information including landfill designation, landfill type, date, monitoring event number, weather conditions, and the name of the inspector was recorded for each landfill. Observations of the landfill related to the following conditions was recorded:

- settlement;
- erosion;
- lateral movement;
- sloughing of slopes;
- cracks;
- frost action;
- animal burrows;
- vegetation re-establishment on surface;
- vegetation stress;

- staining;
- seepage points or ponded water;
- debris or liner exposure;
- condition of monitoring points; and
- other relevant observations.

The presence of the above conditions was recorded along with their location, dimensions, extent, and description. These observations were recorded electronically using a Trimble ProXRT DGPS unit and Trimble Nomad data logger (field computer).

Photographic records were taken to document the general condition of the landfill. All photographs were taken in order to substantiate recorded observations including where no concerns have been identified. All photographs were referenced to existing monuments when at all possible. Photographs have generally been taken with a 35 mm equivalent focal length of 24.0 mm.

Historical features and conditions have been noted from previous monitoring events. Existing features were compared to these features noted in previous monitoring reports and comparative analysis is included in each landfill-specific section of this report.

All monitoring equipment (monitoring wells and thermistors) was visually inspected, with any damage noted along with any other repair requirements. Photographic records were also collected of each monitoring station and are included in the individual landfill sections of this report.

2.1.4 Soil Sampling

Soil sampling at each landfill site was completed concurrently with the other monitoring requirements. A Soil Sampling Log (provided in Annex J2 of the TOR) was completed at each soil sampling location.

Two samples were collected at each sampling location: one sample from 0-15 cm depth, and one sample from 40-50 cm depth, where possible. Samples were collected from test pits manually excavated with hand tools (pick/shovel) which were decontaminated between locations using Alconox and distilled water. Each soil sample was collected in one laboratory supplied zip-top plastic bag and three 125 mL glass jars, which were filled with soil such that no headspace remained in the jars.

All soil sampling locations were backfilled after the collection of soil samples. All locations were photographed during sampling and after backfilling was completed, these photographs are included in the photographic records in each individual landfill section within this report.

Soil samples were collected at a number of locations as specified in the TOR. The number of locations at each landfill is shown below in Table 2-2:

Table 2-2: Summary of Soil Sampling Locations at CAM-1

DEW Line Site	Landfill	Proposed # of Soil Sampling Locations	Actual # of Soil Sampling Locations	Total # of Samples Submitted for Analysis
CAM-1 Jenny Lind Island	Borrow Area North Landfill	5X2	5X2	10
	Northeast Landfill	4X2	4X2	8
	Station West Landfill	4X2	4X2	8
	Non-Haz. Waste Landfill	4X2	4X2	7 (1)
	Tier II Disposal Facility	4X2	4X2	8
	Southeast Landfill	5X2	5X2	10
	Station East Landfill	4X2	4X2	8
	Main Landfill	4X2	4X2	6 (2)
	USAF Landfill	5X2	5X2	10
	East Landing Landfill	4X2	3X2	6 (3)
CAM-1 Total		**43**	**42**	**81**

(1) – refusal was reached at 0.2 metres below ground surface on boulders at soil sample location C1-MW02; therefore, no sample at depth was collected

(2) – refusal was reached at 0.2 metres below ground surface on cobbles/bedrock at soil sample locations C1-23 and C1-25; therefore, no sample at depth was collected

(3) – Soil sample location C1-34 consisted of washed gravel and cobbles – no soil was available for sampling

Soil samples were analyzed for the following parameters.

- Petroleum Hydrocarbons (PHCs): F1-F4 fractions. (F1-F3 fractions were summed to obtain an analogous total petroleum hydrocarbons (TPH) concentration);
- Inorganic elements: arsenic, cadmium, chromium, cobalt, copper, lead, nickel, zinc, mercury; and
- Polychlorinated Biphenyls (PCBs – Total Aroclors).

Soil analyses was carried out by Maxxam Analytics of Edmonton, Alberta (metals and PHCs) and Mississauga, Ontario (PCBs), an ISO 17025 certified laboratory. Full analytical results are presented in Appendix B.

QA/QC protocols were implemented for the soil sampling program. Blind duplicate samples and quality control and assurance measures were applied as appropriate. Blind duplicates were collected for approximately 10% of the soil samples collected. An additional 10% of soil samples were submitted to a second laboratory, ALS Laboratories of Edmonton, Alberta, an ISO 17025 certified laboratory, for inter-laboratory comparison of results. The specific locations where blind duplicates were collected were determined in the field and recorded in the field notes and are also presented in the analytical tables, as well as within the QA/QC section for each individual landfill.

2.1.5 Groundwater Sampling

Groundwater sampling at each landfill site was completed concurrently with the other monitoring requirements. A monitoring well sampling report (provided in Annex J3 of the TOR) was completed at each groundwater sampling location. These sampling reports note:

- Condition of the well;
- Any ponded water at the well location;
- Water elevation;
- Colour, odour, presence and thickness of free product if applicable;
- Depth to bottom of well;
- Height of well stick-up;
- Purge volume and purging equipment used; and
- PH, electrical conductivity and in-situ temperature after each purged volume and before sampling.

In order to ensure that the final groundwater analytical results are representative of actual in situ ground water quality, and to reduce the risk of false positives due to sediment entrainment in collected ground water samples, Arcadis employed low-flow sampling techniques using a peristaltic pump.

During purging, field parameters were measured and recorded in the groundwater monitoring logs. Parameters were obtained via a (calibrated) multi-meter unit with a flow through cell. Field parameters were collected on a five minute interval until stabilization was achieved. Stabilization was considered to be achieved when three consecutive stable readings for each parameter were documented. The following parameters were monitored in the field: pH, temperature, conductivity, oxidation-reduction potential (ORP), dissolved oxygen (DO), and total dissolved solids (TDS). The peristaltic pump was set to its lowest possible setting to still maintain flow in order to ensure the least chance of “drying out” the well.

After stabilization was achieved, the pump discharge line was disconnected from the flow- through cell so that samples could be collected. Wells were purged and sampled using dedicated sampling equipment consisting of ¼” high density polyethylene (HDPE) tubing. All tubing supplies were only used at one monitoring well location, and were removed following sampling to prevent damage due to freezing. Once collected, all samples were stored in a cooler packed with ice, until such time the samples could be delivered to the laboratory. Each sample was collected in the appropriate sample containers supplied by the testing laboratory and were pre-charged with the appropriate chemical preservatives ($NaHS0_4$ for F1/BTEX).

Other sampling equipment such as interface meters, pH meters, conductivity meters, and temperature meters were decontaminated between monitoring well locations using Alconox and distilled water. Groundwater samples were collected at a number of locations as specified in the TOR. The number of locations at each landfill is shown below in Table 2-3:

Table 2-3: Summary of Groundwater Sampling Locations at CAM-1

Monitoring Well ID	Observations	# of Groundwater Samples Collected
Non-Hazardous Waste Landfill		
MW01	Excellent condition - Dry	0
MW02	Excellent condition. Pumped dry, no recharge, limited water	0
MW03	Excellent condition	1
MW04	Excellent condition – limited water. Pumped dry – no recharge	0
Tier II Disposal Facility		
MW05	Excellent condition	1
MW06	Excellent condition, limited water, pumped dry – no recharge	0
MW07	Excellent condition – frozen (ice on probe)	0
MW08	Excellent condition - Dry	0

Groundwater samples were analyzed for the following parameters. Analyses was prioritized in the following order:

- Petroleum Hydrocarbons (PHCs): F1 fraction;
- Inorganic elements – total concentrations: arsenic, cadmium, chromium, cobalt, copper, lead, nickel, zinc, mercury. (Samples will not be filtered or preserved);
- Petroleum Hydrocarbons (PHCs): F2-F4 fractions. (F1-F3 fractions were summed to obtain an analogous total petroleum hydrocarbons (TPH) concentration); and
- Polychlorinated Biphenyls (PCBs – Total Aroclors).

Groundwater analyses was carried out by Maxxam Analytics (of Edmonton, Alberta for PHCs and Inorganics and Mississauga, Ontario for PCBs), an ISO 17025 certified laboratory. Full analytical results are presented in Appendix B.

QA/QC protocols were implemented for the groundwater sampling program. Blind duplicate samples and quality control and assurance measures were applied as appropriate. Blind duplicates were collected for approximately 10% of the groundwater samples collected. An additional 10% of groundwater samples were submitted to a second laboratory, ALS Laboratories of Edmonton, Alberta, an ISO 17025 certified laboratory, for inter-laboratory comparison of results. The specific locations where blind duplicates were collected were determined in the field and recorded in the field notes and are also presented in the analytical tables, as well as within the QA/QC section for each individual landfill. Travel blanks were also included as part of the sampling program.

2.1.6 Thermal Monitoring

Thermal monitoring at the Tier II Landfill site was completed concurrently with the other monitoring requirements. At each thermistor installation location, a thermistor annual maintenance report was completed (provided in Annex M of the TOR). Monitoring consisted of the following steps:

- Inspection of the condition of thermistor installations, noting their condition, damage if applicable, and any specific repair requirements;
- Retrieval of ground temperature data from the thermistor installations. A personal computer equipped with the appropriate software and datalogger programming files to retrieve the data was used.
- Collection of real-time manual readings of each individual thermistor bead using a digital readout provided by the datalogger software;
- Measurement of the distance of each thermistor cable above the ground; and
- Resetting datalogger memory to zero and restarting readings. The system was monitored using the personal computer to ensure that the dataloggers were functioning and temperatures were being recorded.

Thermal monitoring data was retrieved from a number of thermistor installations as specified in the TOR and shown below in Table 2-4.

Table 2-4: Summary of Thermal Monitoring CAM-1

DEW Line Site	Landfill	Thermistor ID	Observations
CAM-1 Jenny Lind Island	Tier II Disposal Facility	VT-1	No issues observed
		VT-2	No issues observed
		VT-3	No issues observed
		VT-4	No issues observed

2.2 Field Notes and Data Collection

2.2.1 Field Notes

Field notes were collected utilizing the field forms provided in the TOR, namely the soil sampling log and monitoring well sampling log (TOR annexes J2 and J3). In addition, field notes regarding thermistor inspections were recorded on the field form provided as Annex M – thermistor inspection template. A copy of the field notes is provided in Appendix C.

2.2.2 Data Collection

The visual inspection was conducted with the aid of a Trimble Pro XRT Differential Global Positioning System (DGPS) unit to locate features of note and to collect GIS information to be used in report preparation. The horizontal accuracy of the measurements taken with the DGPS unit ranged between 0.2 and 1.2 m, with most results between 0.2 and 0.5 m accuracy. A detailed data dictionary (Trimble file)

was created prior to the site visit to capture all required information as outlined in the long-term monitoring plan. An SSF file and the data dictionary (Trimble files) is included on the appended CD/DVD ROM to be used in future site investigations.

Placement of features of note on the Figures for each landfill was completed using the DGPS information, supplemented by visual observations. During the previous monitoring event in 2014, placement of features of note on Figures was done through visual observations only. Given the use of the DGPS unit, the locations of features reported in this 2016 monitoring report are considered to be more accurate than those reported using visual observations only in 2014. Small differences in feature locations are, unless otherwise noted, a result of the use of the more accurate DGPS data.

Thermistor data was downloaded onto a personal computer from dedicated dataloggers on the site. Raw thermistor data is provided in Excel format on the appended CD/DVD ROM.

2.3 Quality Assurance and Quality Control

Field personnel employed Arcadis' Quality Assurance/Quality Control (QA/QC) protocols, including appropriate techniques for soil sampling, sample storage, shipping and handling, as well as collection of duplicates.

2.3.1 Field

Soil samples collected for potential laboratory analysis were placed in polyethylene bags and laboratory prepared 125 mL glass jars fitted with screw-tight Teflon-lined lids. Groundwater samples were collected from monitoring wells and placed in a variety of appropriately sized and prepared laboratory vessels. Sample numbers were clearly marked on the containers. The soil jars and water bottles were filled to capacity with minimum headspace and stored in coolers with cold packs to moderate temperature fluctuations during transport to the laboratory. To prevent cross contamination, samples were collected with fresh nitrile gloves. Where soil samples were impossible to obtain by hand, a stainless steel trowel or shovel was used and decontaminated between samples. The samples were transported to the project laboratory accompanied by a Chain of Custody form.

Quality assurance and quality control (QA/QC) was carried out in accordance to the procedures outlined in Annex K of the TOR.

2.3.2 Laboratory

Field (i.e., blind) duplicate samples and quality control and assurance measures were applied as appropriate. Blind duplicates were collected at approximately 10% of the locations. An additional 10% blind duplicates were also collected and submitted to a secondary laboratory, ALS Laboratory Group, for inter-laboratory QA/QC comparison.

The specific locations where blind duplicates were collected was determined in the field, as it was dependent on the amount of water and/or soil available at each location. Travel blanks were also part of the sampling program. Laboratory prepared travel blanks were included in the sample bottle shipment and remained in the cooler with the collected groundwater samples throughout the duration of the project.

A discussion and analysis of QA/QC results is presented in Appendix D.

3 CAM-1: BORROW AREA NORTH LANDFILL

3.1 Landfill Description

The CAM-1 Borrow Area North Landfill is located along the road heading north of the station area, approximately 500 m north of the station infrastructure pad, as shown on Figure CAM-1.1. During the initial site investigations, geophysics identified five separate lobes of buried debris at this location.

The remediation of this landfill consisted of excavating Tier II contaminated soil from Lobe 3, and regrading with the placement of additional granular fill at all lobes.

The long term monitoring plan for the Borrow Area North Landfill consists of visual inspection, and the periodic collection of soil samples.

The landfill layout, visual observations and photographic locations are presented on Figure CAM-1.2A and soil analytical results are presented on Figure CAM-1.2B in the figures section.

3.2 Summary of Work Conducted

3.2.1 Visual Inspection

A visual inspection was completed on Lobes 1 through 5 of the Borrow Area North Landfill on August 9, 2016. The visual inspection of the landfill was completed with no deviations from the visual inspection work plan.

3.2.2 Soil Sampling

Soil sampling at the Borrow Area North Landfill was conducted on August 9, 2016 and consisted of the collection of ten soil samples from five soil sample stations (C1-1, C1-2, C1-3, C1-4, and C1-5). Depth limitations were encountered at soil sampling stations C1-1, C1-2, and C1-4 with each sample locations reaching a maximum depth of 0.4 m bgs.

The following Table 3-1 outlines the soil sampling activities conducted at the Borrow Area North Landfill.

Table 3-1: Summary of Work Conducted by Soil Sampling Location

Borrow Area North Landfill			
Sample Location	**Sample ID**	**Sample Depth (m bgs)**	**Notes**
C1-1	16-C1-1A	0 - 0.15	Refusal on cobbles
	16-C1-1B	0.3 -0.4	
C1-2	16-C1-2A	0 - 0.15	Refusal on cobbles
	16-C1-2B	0.3 – 0.4	
C1-3	16-C1-3A	0 - 0.15	
	16-C1-3B	0.4 – 0.5	

Borrow Area North Landfill			
Sample Location	**Sample ID**	**Sample Depth (m bgs)**	**Notes**
C1-4	16-C1-4A	0 - 0.15	Refusal on cobbles
	16-C1-4B	0.3 – 0.4	
C1-5	16-C1-5A	0 - 0.15	
	16-C1-5B	0.4 – 0.5	

3.2.3 Groundwater Sampling

No groundwater monitoring wells are present at the Borrow Area North Landfill.

3.2.4 Thermal Monitoring

No thermistors are present at the Borrow Area North Landfill.

3.3 Results of the Monitoring Program

The following Sections 3.3.1 through 3.3.4 summarize the results of the CAM-1 monitoring program and the Borrow Area North Landfill.

3.3.1 Visual Inspection

The visual inspection of the Borrow Area North Landfill was conducted on August 9, 2016. The visual inspection was conducted in compliance with Section 5.2 of the Terms of Reference and details are provided below in the following Sections 3.3.1.1 through 3.3.1.5. Figure CAM-1.2A presents the visual inspection findings and photographic locations.

3.3.1.1 Inspection Checklist

The visual inspection was completed as per the Terms of Reference and the visual inspection checklist is included as Table 3-2 of this report below.

Table 3-2: Visual Inspection Checklist – Borrow Area North Landfill

SITE NAME: **CAM-1 Jenny Lind Island**
DATE OF INSPECTION: August 9, 2016
WEATHER CONDITIONS: 10ºC, sunny
DATE OF PREVIOUS INSPECTION: August 28, 2014
INSPECTED BY: Stephen Borcsok
REPORT PREPARED BY: Stephen Borcsok and Ryan Fletcher
The preparer represents to the best of the preparer's knowledge, the following statements and observations are true and correct and to the best of the preparer's actual knowledge, no material facts have been suppressed or misstated.

Borrow Area North Landfill												
Checklist Item	**Present (Yes/No)**	**Feature Number**	**Feature Location**	**GPS Coordinates Easting/Northing/Zone**	**Length (m)**	**Width (m)**	**Depth (m)**	**Extent Relative to Landfill Surface**	**Description**	**Comparison with Historical Observations**	**Additional Comments/ Severity Rating**	**Photographic Records (photo reference, location, view point & direction, feature of note, scale)**
Settlement	Yes	A	Lobes 1 and 2 south side slope	389726.139 / 7621414.263	14	1	1	0.05	<1%	Minor depression on side slope	First observed in Year 3 (2012). No significant change between 2014 and 2016.	Severity Rating – Acceptable (feature is minor and not affecting landfill stability)	CAM-1 BAN 5, 6
Settlement	Yes	B	Lobe 3 northwest cover	389693.279 / 7621382.024 389694.015 / 7621380.077	14	0.4-4	0.2-1	0.1	<1%	two linear depressions	First observed in Year 2 (2011). No significant change between 2014 and 2016.	First noted as Feature A in 2011, changed to Feature B in 2012. Severity Rating – Acceptable ((features are minor and not affecting landfill stability)	CAM-1 BAN 14, 15, 16, 17
Settlement	Yes	G	Lobes 1 and 2 northwest side slope	389726.05 / 7621441.194 389724.902 / 7621439.695	14	0.6-1	0.4-0.6	0.1	<1%	two minor depressions on side slope	First observed in Year 5 (2014) as 3 depressions. Only 2 depressions observed in 2016.	Severity Rating – Acceptable (features are minor and not affecting landfill stability)	CAM-1 BAN 3, 4
Settlement	Yes	H	Lobe 3 north side slope	389704.538 / 7621388.613	14	1	0.2	0.1	<1%	Minor linear depression	First observed in Year 5 (2014). No significant change.	Severity Rating – Acceptable (feature is minor and not affecting landfill stability)	CAM-1 BAN 11, 12
Settlement	Yes	I	Lobes 4 and 5 east cover	389708.681 / 7621194.527	14	3	1	0.1	<1%	Minor linear depression	First observed in Year 5 (2014). No significant change between 2014 and 2016.	Severity Rating – Acceptable (feature is minor and not affecting landfill stability)	CAM-1 BAN 39, 40
Erosion	Yes	C	Lobes 4 and 5 southeast side slope	389711.134 / 7621183.851	14	4	0.5	0.05	<1%	Minor erosion, washing of fines on side slope	First observed in Year 2 (2011). Notable reduction in size since 2011. No significant change between 2014 and 2016.	First noted in 2011 as Feature B. Changed to Feature C in 2012. Severity Rating – Acceptable (feature is minor and not affecting landfill stability)	CAM-1 BAN 41, 42
Erosion	No	J	Lobe 3 east side slope	389736.349 / 7621329.35	14	N/A	N/A	N/A	<1%	Minor washing of fines on side slope	First observed in Year 5 (2014). Not observed in 2016.	Feature not observed.	CAM-1 BAN 20, 21, 22
Erosion	Yes	K	Lobe 3 southeast side slope	389719.113 / 7621270.162	14	5	0.5-1.0	0.05	<1%	Minor washing of fines on side slope	First observed in Year 5 (2014). No significant change between 2014 and 2016.	Severity Rating – Acceptable (feature is minor and not affecting landfill stability)	CAM-1 BAN 28, 29
Erosion	No	L	Lobes 4 and 5 southwest side slope	389657.694 / 7621188.51	14	4	0.1	0.02-0.05	<1%	Minor washing of fines on side slope	First observed in Year 5 (2014). Not observed in 2016.	Severity Rating – Acceptable (feature was not observed in 2016)	CAM-1 BAN 46, 47
Lateral Movement	No												
Frost Action	No												
Sloughing	No												
Cracking	No	F	Northeast corner of Lobes 4 and 5	N/A	N/A	10	0.02	0.002-0.003	<1%	Completely infilled tension crack	Feature first noted in Year 3 (2012). Feature was completely infilled and not observed in 2014 or 2016.	Severity Rating – Acceptable (feature was not observed in 2016)	N/A

Borrow Area North Landfill												
Checklist Item	**Present (Yes/No)**	**Feature Number**	**Feature Location**	**GPS Coordinates Easting/Northing/Zone**	**Length (m)**	**Width (m)**	**Depth (m)**	**Extent Relative to Landfill Surface**	**Description**	**Comparison with Historical Observations**	**Additional Comments/ Severity Rating**	**Photographic Records (photo reference, location, view point & direction, feature of note, scale)**
Animal Burrows	No											
Vegetation Establishment	No											
Staining	Yes	D	Beside Lobe 3 east toe	389741.107 / 7621312.356	14	10	5	0.05		Rust-coloured oxidation staining and ponded water east of Lobe 3	First observed in Year 1 (2010). No significant change noted between 2010-2013. Slight reduction in size between 2013 and 2014. Staining is associated with an area of ponding water so size of feature will change from year to year. Dimensions are approximate as feature is an irregular shape.	Result of seasonal ponding. Not in contact with landfill. Changes in size are due to annual hydrological differences and not related to landfill. Severity Rating – Acceptable (feature is not on landfill)	CAM-1 BAN 24, 25, 26
Staining	Yes	E	Lobes 4 and 5 north side cover	389698.065 / 7621225.65	14	5	1-3	N/A		Minor staining of cover material on side slope	First observed in Year 2 (2011). No significant change in feature since first noted in 2011.	Faint discolouration of side slope. Feature first noted as Feature C in Year 2 (2011). Changed to Feature E in 2012. Severity Rating – Acceptable (staining appears to be due to different borrow material)	CAM-1 BAN 33, 34
Vegetation Stress	No											
Seepage Points (or) Ponded Water	Yes	N/A	Northeast of Lobes 1 and 3	389737.443 / 7621402.262	14	63	70	0.3		Permanent water pond northeast of Lobes 1 and 3		Not identified as feature. Not within landfill. Depth was estimated from edge of pond. Severity Rating – Acceptable (ponded water is not on landfill and not affecting stability)	CAM-1 BAN 8, 19
Debris and/or Liner Exposed	No											
Presence & Condition of Monitoring Instruments	No											
Features of Note/Other Relevant Observations (e.g., signs of activity, ruts…)	Yes	M	Southeast corner of Lobes 1 and 2	389732.106 / 7621412.615 389733.527 / 7621414.757	14	4-5	0.3	0.1-0.2		Vehicle ruts	New observation in 2016.	Severity Rating – Acceptable (features are minor and not affecting landfill stability)	CAM-1 BAN 5, 6

3.3.1.2 Stability Assessment

The Preliminary Stability Assessment for the Borrow Area North Landfill was conducted on August 9, 2016 as per the Terms of Reference and the results are provided below in Table 3-3.

Table 3-3: Preliminary Stability Assessment – Borrow Area North Landfill

Borrow Area North Landfill		
Feature	**Severity Rating**	**Extent**
Settlement	Acceptable	Occasional
Erosion	Acceptable	Occasional
Lateral Movement	Not Observed	None
Frost Action	Not Observed	None
Sloughing	Not Observed	None
Cracking	Not Observed	None
Animal Burrows	Not Observed	None
Vegetation Establishment	Not Observed	None
Staining	Acceptable	Occasional
Vegetation Stress	Not Observed	None
Seepage / Ponded Water	Acceptable	Isolated
Debris and/or Liner Exposure	Not Observed	None
Other	Acceptable (Vehicle Ruts)	Isolated
Overall Landfill Performance	**Acceptable**	

Borrow Area North Landfill	
Performance / Severity Rating	**Description**
Acceptable	Noted features are of little consequence. The landfill is performing as designed. Minor deviations in environmental or physical performance may be observed, such as isolated areas of erosion, settlement.
Marginal	Physical/environmental performance appears to be deteriorating with time. Observations may include an increase in size or number of features of note,

Borrow Area North Landfill	
Performance / Severity Rating	**Description**
	such as differential settlement, erosion or cracking. No significant impact on landfill stability to date, but potential for failure is assessed as low or moderate.
Significant	Significant or potentially significant changes affecting landfill stability, such as significant changes in slope geometry, significant erosion or differential settlement; scarp development. The potential for failure is assessed as imminent.
Unacceptable	Stability of landfill is compromised to the extent that ability to contain waste materials is compromised. Examples may include: • Debris exposed in erosion channels or areas of differential settlement. • Liner exposed. • Slope failure.
Extent	**Description**
Isolated	Singular feature
Occasional	Features of note occurring at irregular intervals/locations
Numerous	Many features of note, impacted less than 50% of the surface area of the landfill
Extensive	Impacting greater than 50% of the surface area of the landfill

3.3.1.3 Photographic Records

The photographic record for the Borrow Area North Landfill has been completed as per Section 5.5 of the Terms of Reference and is included in the following page as Table 3-4. The Photographic Record only contains an index of photographs collected; full sized photographs are contained in the Appended CD/DVD-ROM. Figure CAM-1.2A presents the photograph locations and directions.

Table 3-4: Photographic Records – Borrow Area North Landfill

Borrow Area North Landfill						
Photo Identification	**Figure ID**	**View Direction**	**Photo Location and Direction**	**Feature Identification**	**Feature of Note**	**Other Comments**
Sample Station Photographs						
C1-1-1	S1	N/A	Sample station C1-1	C1-1	C1-1	Close up of test pit
C1-1-2	S1	West of southwest	Sample station C1-1	C1-1	C1-1	Test pit location
C1-1-3	S1	N/A	Sample station C1-1	C1-1	C1-1	C1-1 Backfilled

Borrow Area North Landfill						
Photo Identification	**Figure ID**	**View Direction**	**Photo Location and Direction**	**Feature Identification**	**Feature of Note**	**Other Comments**
C1-2-1	S2	N/A	Sample station C1-2	C1-2	C1-2	Close up of test pit
C1-2-2	S2	Southeast	Sample station C1-2	C1-2	C1-2	Test pit location
C1-2-3	S2	N/A	Sample station C1-2	C1-2	C1-2	C1-2 Backfilled
C1-3-1	S3	N/A	Sample station C1-3	C1-3	C1-3	Close up of test pit
C1-3-2	S3	East	Sample station C1-3	C1-3	C1-3	Test pit location
C1-3-3	S3	N/A	Sample station C1-3	C1-3	C1-3	C1-3 Backfilled
C1-4-1	S4	N/A	Sample station C1-4	C1-4	C1-4	Close up of test pit
C1-4-2	S4	East	Sample station C1-4	C1-4	C1-4	Test pit location
C1-4-3	S4	N/A	Sample station C1-4	C1-4	C1-4	C1-4 Backfilled
C1-5-1	S5	N/A	Sample station C1-5	C1-5	C1-5	Close up of test pit
C1-5-2	S5	Southeast	Sample station C1-5	C1-5	C1-5	Test pit location
C1-5-3	S5	N/A	Sample station C1-5	C1-5	C1-5	C1-5 Backfilled
Visual Inspection Photographs						
CAM-1 BAN 1	1	S	View of Lobes 1 and 2	N/A	N/A	
CAM-1 BAN 2	2	SW	View across Lobes 1 and 2	N/A	N/A	
CAM-1 BAN 3	3	S	Three small depressions on Lobes 1 and 2	Settlement	G	
CAM-1 BAN 4	4	N	Three small depressions on Lobes 1 and 2	Settlement	G	
CAM-1 BAN 5	5	N	Settlement and vehicle ruts on south end of Lobes 1 and 2	Settlement Vehicle Ruts	A M	
CAM-1 BAN 6	6	NE	Settlement and vehicle ruts on south end of Lobes 1 and 2	Settlement Vehicle Ruts	A M	
CAM-1 BAN 7	7	N	West toe of Lobes 1 and 2	N/A	N/A	

Borrow Area North Landfill						
Photo Identification	**Figure ID**	**View Direction**	**Photo Location and Direction**	**Feature Identification**	**Feature of Note**	**Other Comments**
CAM-1 BAN 8	8	SE	Ponded water along northeast toe of Lobe 3	N/A	N/A	
CAM-1 BAN 9	9	SW	North toe of Lobe 3	N/A	N/A	
CAM-1 BAN 10	10	S	View across Lobe 3	N/A	N/A	
CAM-1 BAN 11	11	S	Linear depression at north end of Lobe 3	Settlement	H	
CAM-1 BAN 12	12	E	Linear depression at north end of Lobe 3	Settlement	H	
CAM-1 BAN 13	13	E	North toe of Lobe 3	N/A	N/A	
CAM-1 BAN 14	14	S	Settlement along west toe of Lobe 3	Settlement	B	
CAM-1 BAN 15	15	N	Settlement on NW corner of Lobe 3	Settlement	B	
CAM-1 BAN 16	16	W	Settlement on NW corner of Lobe 3	Settlement	B	
CAM-1 BAN 17	17	N	Settlement along west toe of Lobe 3	Settlement	B	
CAM-1 BAN 18	18	S	West side slope of Lobe 3	N/A	N/A	
CAM-1 BAN 19	19	NE	Ponded water on NE corner of Lobe 3	N/A	N/A	
CAM-1 BAN 20	20	E	Area where minor erosion previously reported on Lobe 3 east side slope	Erosion	J	Feature not observed
CAM-1 BAN 21	21	W	Area where minor erosion previously reported on Lobe 3 east side slope	Erosion	J	Feature not observed
CAM-1 BAN 22	22	N	Area where minor erosion previously reported on Lobe 3 east side slope	Erosion	J	Feature not observed
CAM-1 BAN 23	23	N/A	No photo available	N/A	N/A	N/A
CAM-1 BAN 24	24	SE	Minor ponding and rust coloured	Staining	D	

Borrow Area North Landfill						
Photo Identification	**Figure ID**	**View Direction**	**Photo Location and Direction**	**Feature Identification**	**Feature of Note**	**Other Comments**
			staining east of Lobe 3			
CAM-1 BAN 25	25	NE	Minor ponding and rust coloured staining east of Lobe 3	Staining	D	
CAM-1 BAN 26	26	W	Minor ponding and rust coloured staining east of Lobe 3	Staining	D	
CAM-1 BAN 27	27	NW	View across Lobe 3 from SE corner	N/A	N/A	
CAM-1 BAN 28	28	SE	Minor erosion on Lobe 3 SE side slope	Erosion	K	
CAM-1 BAN 29	29	NW	Minor erosion on Lobe 3 SE side slope	Erosion	K	
CAM-1 BAN 30	30	N	View north along Lobe 3 east side slope	N/A	N/A	
CAM-1 BAN 31	31	SW	Lobe 3 SE side slope	N/A	N/A	
CAM-1 BAN 32	32	NE	Lobe 3 SE side slope	N/A	N/A	
CAM-1 BAN 33	33	SE	Minor staining on north side slope of Lobes 4 and 5	Staining	E	
CAM-1 BAN 34	34	SE	Minor staining on north side slope of Lobes 4 and 5	Staining	E	
CAM-1 BAN 35	35	SW	Northwest toe of Lobes 4 and 5	N/A	N/A	
CAM-1 BAN 36	36	NW	Location of infilled tension crack reported in 2014 report on Lobes 4 and 5	N/A	N/A	No evidence of tension crack
CAM-1 BAN 37	37	SE	Location of infilled tension crack reported in 2014	N/A	N/A	No evidence of tension crack

Borrow Area North Landfill						
Photo Identification	**Figure ID**	**View Direction**	**Photo Location and Direction**	**Feature Identification**	**Feature of Note**	**Other Comments**
			report on Lobes 4 and 5			
CAM-1 BAN 38	38	S	East side slope of Lobes 4 and 5	N/A	N/A	
CAM-1 BAN 39	39	N	Minor settlement on east side of Lobes 4 and 5	Settlement	I	
CAM-1 BAN 40	40	SE	Minor settlement on east side of Lobes 4 and 5	Settlement	I	
CAM-1 BAN 41	41	SW	Minor erosion on SE side slope of Lobes 4 and 5	Erosion	C	
CAM-1 BAN 42	42	NW	Minor erosion on SE side slope of Lobes 4 and 5	Erosion	C	
CAM-1 BAN 43	43	SE	View across Lobes 4 and 5	N/A	N/A	
CAM-1 BAN 44	44	N	View across Lobes 4 and 5	N/A	N/A	
CAM-1 BAN 45	45	NE	View across Lobes 4 and 5	N/A	N/A	
CAM-1 BAN 46	46	W	Area where minor erosion previously reported on Lobe 3 SE side slope	Erosion	L	Feature not observed
CAM-1 BAN 47	47	SE	Area where minor erosion previously reported on Lobe 3 SE side slope	Erosion	L	Feature not observed

Table 3-5: Selected Photographs – Borrow Area North Landfill

Borrow Area North Landfill
Photograph CAM-1 BAN 5: Settlement (Feature A) and vehicle ruts (Feature M) on south end of Lobes 1 and 2.
Photograph CAM-1 BAN 11: Linear depression at north end of Lobe 3.

Borrow Area North Landfill

Photograph CAM-1 BAN 25: Minor ponding and rust-coloured oxidation staining east of Lobe 3.

Photograph CAM-1 BAN 34: Minor staining on north side slope of Lobes 4 and 5.

Borrow Area North Landfill

Photograph CAM-1 BAN 39: Minor settlement on east side of Lobes 4 and 5

Photograph CAM-1 BAN 44: View of south side of Lobes 4 and 5, looking north towards Lobes 1, 2, and 3.

3.3.1.4 Trend Analysis

A trend analysis was conducted with regards to observations made during the visual inspection of the Borrow Area North Landfill. The following Table 3-6 outlines the results of the visual trend analysis.

Table 3-6: Visual Inspection Trends - Borrow Area North Landfill

Borrow Area North Landfill		
Checklist Item	**Feature Number**	**Comparison with Historical Observations**
Settlement	A	No significant change.
	B	No significant change.
	G	Three depressions were observed in 2014, only two depressions were observed in 2016.
	H	No significant change.
	I	No significant change.
Erosion	C	No significant change.
	J	Feature not observed.
	K	No significant change.
	L	Feature not observed.
Staining	D	No significant change.
	E	No significant change.
Vehicle Ruts	M	New observation in 2016.

3.3.1.5 Discussion of Results/Trends

A comparison of the visual inspection results of the 2014 and 2016 monitoring events at the Borrow Area North Landfill indicates that previously observed staining features, as well as most previously observed settlement and erosion features have not undergone any significant change. Two previously noted erosion features consisting of minor washing of fines on landfill side slopes were not observed, and one settlement feature was not observed. One new feature consisting of two vehicle ruts was observed in 2016.

3.3.2 Soil Sampling

Soil sampling of the Borrow Area North Landfill was conducted on August 9, 2016. The soil sampling was conducted in compliance with Section 5.3.1 and 5.3.2 of the Terms of Reference and details are provided below in the following Sections 3.3.2.1 through 3.3.2.3.

3.3.2.1 Laboratory Analytical Results

A total of ten soil samples were analysed from five soil sample locations at the Borrow Area North Landfill. Table 3-7 and 3-8 present the soil analytical results. Figure CAM-1.2B presents a summary of significant soil analytical results.

Table 3-7: Soil Chemical Analysis Results – Borrow Area North Landfill

Borrow Area North Landfill																	
Sample ID	**Sampling Station**	**Monitoring Year**	**Depth**	**Cu**	**Ni**	**Co**	**Cd**	**Pb**	**Zn**	**Cr**	**As**	**Hg**	**Total PCB**	**F1 C6-C10**	**F2 C10-C16**	**F3 C16-C34**	**Modified TPH Total C6-C34**
Comparison Values																	
Background				11	4.7	3.1	0.50	7	12	12	3.6	NS	0.042				NS
Baseline				**5.8**	**5.0**	**5.0**	**1.0**	**10**	**15**	**20**	**2.3**	**0.10**	**0.10**				**79**
Baseline +3 Standard Deviations				22	7.4	6.4	3.3	18	23	0.0	11	0.0	0.19				342
Upgradient																	
C1-1 Surface																	
10-16619	C1-1	2010	0-10	3.5	**9.8**	<5.0	<1.0	<10	<15	<20	**4.7**	<0.10	<0.0030	<10	11	140	**156**
C112-1A	C1-1	2012	0-15	<5.0	1.7	1.0	<0.10	3.3	<10	<1.0	**2.5**	<0.050	<0.010	<12	<10	27	38
C114-1A	C1-1	2014	0-15	3.8	1.5	0.6	0.04	<5.0	8.0	1.0	1.0	<0.01	<0.1	<10	<50	53	**83**
16-C1-1A	C1-1	2016	0-15	4.5	1.6	1	<0.005	6.1	<10	2.2	**2.3**	<0.05	<0.02*	<23*	<23*	<110*	78*
C1-1 Depth																	
10-16621	C1-1	2010	30-50	4.5	<5.0	<5.0	<1.0	<10	<15	<20	**2.6**	<0.10	<0.0030	<10	7.7	20	33
C112-1B	C1-1	2012	40-50	**8.0**	1.9	1.7	<0.10	8.0	<10	1.7	**4.6**	<0.050	<0.010	<12	<10	17	28
C114-1B	C1-1	2014	40-50	4.2	1.8	1.2	0.02	7.1	3.0	2.4	**2.8**	<0.01	<0.1	<10	<50	<50	55
16-C1-1B	C1-1	2016	30-40	4.8	1.5	1.4	<0.05	8.1	<10	2.3	**3.6**	0.1	<0.01	<12	<10	<50	36
Downgradient																	
C1-2 Surface																	
10-16611	C1-2	2010	0-10	<3.0	<5.0	<5.0	<1.0	<10	<15	<20	1.1	<0.10	0.0051	<10	7.2	41	53
C112-2A	C1-2	2012	0-15	<5.0	1.2	1.0	<0.10	3.0	<10	1.7	**2.6**	<0.050	<0.010	<12	<10	<10	16
C114-2A	C1-2	2014	0-15	2.7	1.1	1.0	0.02	<4.9	4.0	1.4	1.5	<0.01	<0.1	<10	<50	<50	55
16-C1-2A	C1-2	2016	0-15	1.5	<1.0	<0.5	<0.05	1.4	<10	<1.0	<1.0	<0.05	<0.01	<12	11	68	**85**
C1-2 Depth																	
10-16613	C1-2	2010	30-50	3.0	<5.0	<5.0	<1.0	<10	<15	<20	2.0	<0.10	0.0059	<10	5.9	19	30
C112-2B	C1-2	2012	40-50	**9.1**	3.8	2.3	<0.10	4.6	<10	4.8	**3.3**	<0.050	<0.010	<12	<10	<10	16
C114-2B	C1-2	2014	40-50	3.2	2.0	1.8	0.02	<5.0	5.0	2.9	2.1	<0.01	<0.1	<10	<50	<50	55
16-C1-2B	C1-2	2016	30-40	2.9	1.1	0.9	<0.05	2.2	<10	1.2	1.5	<0.05	<0.01	<12	<10	<50	36

Borrow Area North Landfill																	
Sample ID	Sampling Station	Monitoring Year	Depth	Cu	Ni	Co	Cd	Pb	Zn	Cr	As	Hg	Total PCB	F1 C6-C10	F2 C10-C16	F3 C16-C34	Modified TPH Total C6-C34
C1-3 Surface																	
10-16615	C1-3	2010	0-10	<3.0	<5.0	<5.0	<1.0	<10	<15	<20	2.3	<0.10	0.0066	<10	5.2	18	28
C112-3A	C1-3	2012	0-15	<5.0	2.8	2.1	<0.10	4.1	<10	3.8	3.5	<0.050	<0.010	<12	<10	16	27
C114-3A	C1-3	2014	0-15	3.5	1.9	1.8	0.03	<4.9	7.0	2.9	2.5	<0.01	<0.1	<10	<50	<50	55
16-C1-3A	C1-3	2016	0-15	4	2.8	1.8	<0.05	3.9	<10	3.6	2.6	<0.05	<0.01	<12	<10	<50	36
C1-3 Depth																	
10-16617/18	C1-3	2010	30-50	<3.0	<5.0	<5.0	<1.0	<10	<15	<20	1.4	<0.10	<0.0030	<10	4.2	9.6	19
C112-3B	C1-3	2012	40-50	<5.0	3.4	3.1	<0.10	6.2	<10	3.6	6.8	<0.050	<0.010	<12	<10	<10	16
C114-3B	C1-3	2014	40-50	2.9	1.4	1.5	0.01	<5.0	4.0	2.5	1.8	<0.01	<0.1	<10	<50	<50	55
16-C1-3B	C1-3	2016	40-50	6.5	2.2	2	<0.05	6	<10	3.0	5.1	<0.05	<0.01	<12	<10	<50	36
C1-4 Surface																	
10-16623	C1-4	2010	0-10	<3.0	<5.0	<5.0	<1.0	<10	<15	<20	1.4	<0.10	<0.0030	<10	7.0	43	55
C112-4A	C1-4	2012	0-15	<5.0	<1.0	<1.0	<0.10	1.3	<10	<1.0	<1.0	<0.050	<0.010	<12	<10	22	33
C114-4A	C1-4	2014	0-15	1.7	0.8	0.8	0.02	<4.9	10	1.2	0.8	<0.01	<0.1	<10	<50	<50	55
16-C1-4A	C1-4	2016	0-15	1.8	<1	0.65	<0.05	2	<10	1.3	1.0	<0.05	<0.01	<12	<10	<50	36
C1-4 Depth																	
10-16623	C1-4	2010	30-50	<3.0	<5.0	<5.0	<1.0	<10	<15	<20	1.3	<0.10	<0.0030	<10	6.6	14	26
C112-4A	C1-4	2012	40-50	<5.0	1.9	1.5	0.14	4.6	<10	2.7	1.8	<0.050	<0.010	<12	<10	<10	16
C114-4A	C1-4	2014	40-50	2.1	1.3	2.0	0.01	<4.9	5.0	2.2	1.6	<0.01	<0.1	<10	<50	<50	55
16-C1-4A	C1-4	2016	30-40	1.8	1.1	1	<0.05	2.4	<10	2.7	1.3	<0.05	<0.01	<12	<10	<50	36
C1-5 Surface																	
10-16627	C1-5	2010	0-10	<3.0	<5.0	<5.0	<1.0	<10	<15	<20	2.0	<0.10	0.022	<10	5.5	21	32
C112-5A	C1-5	2012	0-15	<5.0	<1.0	<1.0	<0.10	1.8	<10	<1.0	1.6	<0.050	<0.010	<12	<10	<10	16
C114-5A	C1-5	2014	0-15	1.6	0.7	0.9	0.02	<4.9	5.0	1.1	1.6	<0.01	<0.1	<10	<50	<50	55
16-C1-5A	C1-5	2016	0-15	1.7	<1	<0.5	<0.05	1.6	<10	<1.0	1.0	<0.05	<0.01	<12	<10	<50	36
C1-5 Depth																	
10-16629	C1-5	2010	30-50	<3.0	<5.0	<5.0	<1.0	<10	<15	<20	<1.0	<0.10	0.0206	<10	5.2	<9.0	15
C112-5B	C1-5	2012	40-50	<5.0	<1.0	<1.0	<0.10	1.2	<10	<1.0	<1.0	<0.050	<0.010	<12	<10	<10	16
C114-5B	C1-5	2014	40-50	1.6	0.6	0.7	0.01	<5.0	3.0	1.0	1.3	<0.01	<0.1	<10	<50	<50	55
16-C1-5B	C1-5	2016	40-50	1.5	<1.0	<0.5	<0.05	1.5	<10	<1.0	1.2	<0.05	<0.01	<12	<10	<50	36

Notes:

XX	sample exceeds background
XX	**sample exceeds baseline**
XX	*sample exceeds baseline +3 standard deviations*

**** All units in mg/kg**

***** Detection limits for PCBs and PHCs were raised in sample 16-C1-1A due to high moisture content.

Table 3-8: PHC F4 Soil Chemical Analysis Results – Borrow Area North Landfill

Sample Location	Sample ID	Sample Depth (m bgs)	PHC F4 (mg/kg)
C1-1	16-C1-1A	0 - 0.15	<110 (detection limit raised due to high moisture content)
	16-C1-1B	0.3 -0.4	<50
C1-2	16-C1-2A	0 - 0.15	<50
	16-C1-2B	0.3 – 0.4	<50
C1-3	16-C1-3A	0 - 0.15	<50
	16-C1-3B	0.4 – 0.5	<50
C1-4	16-C1-4A	0 - 0.15	<50
	16-C1-4B	0.3 – 0.4	<50
C1-5	16-C1-5A	0 - 0.15	<50
	16-C1-5B	0.4 – 0.5	<50

3.3.2.2 Discussion of Results – Comparison to Baseline/Background

Analytical results were compared against baseline data, and background concentrations. The following Table 3-9 summarizes the comparison of results.

Table 3-9: Evaluation of Results by Parameter – Borrow Area North Landfill

Borrow Area North Landfill	
Parameter	**Discussion of Results**
Copper (Cu)	Copper analysis reported concentrations below background and baseline, with the exception of sample 16-C1-3B, collected at soil sampling station C1-3 which reported a concentration of 6.5 mg/kg, which was above the baseline concentration of 5.8 mg/kg. All other soil samples reported Cu concentrations within similar ranges to previous monitoring events.
Nickel (Ni)	All soil samples reported either non-detect concentrations or were below both background and baseline concentrations for Ni.
Cobalt (Co)	All soil samples reported either non-detect concentrations or were below both background and baseline concentrations for Co.
Cadmium (Cd)	All soil samples reported either non-detect concentrations or were below both background and baseline concentrations for Cd.
Lead (Pb)	All soil samples reported either non-detect concentrations or were below both background and baseline concentrations for Pb, with the exception to soil sample 16-C1-1B which reported a concentration of 8.1 mg/kg exceeding the background concentration of 7 mg/kg.
Zinc (Zn)	All soil samples reported non-detect concentrations for Zn.
Chromium (Cr)	All soil samples reported either non-detect concentrations or were below both background and baseline concentrations for Cr.
Arsenic (As)	As was reported to exceed the baseline concentration of 2.3 mg/kg in four samples as follows; 16-C1-1A at 2.3 mg/kg, 16-C1-1B at 3.6 mg/kg, 16-C1-3A at 2.6 mg/kg, and 16-C1-

Borrow Area North Landfill	
Parameter	**Discussion of Results**
	3B at 5.1 mg/kg. Two of those samples (16-C1-1B and 16-C1-3B) were also reported at or above the background concentration of 3.6 mg/kg.
Mercury (Hg)	All soil samples reported either non-detect concentrations or were below both background and baseline concentrations for Hg.
PCBs (Total)	All soil samples reported non-detect concentrations for PCBs.
Modified TPH (C_6-C_{34})	All soil samples reported concentrations of modified TPH below baseline concentrations with the exception of sample 16-C1-2A, which reported a Modified TPH concentration of 85 mg/kg.

3.3.2.3 Soil Trend Analysis by Parameter & Discussion of Trends

A soil chemistry trend analysis was conducted based on the current and historical analytical results collected at the site. A series of graphs were generated including a visual comparison to background, baseline and historical concentrations using differentiating colours (See Appendix E1). The following Table 3-10 provides a summary of soil trend analysis findings and presents a discussion of the observed trends by parameter.

Table 3-10: Discussion of Trends – Borrow Area North Landfill

Borrow Area North Landfill	
Parameter	**Discussion of Trends**
Copper (Cu)	Based on current and historical results, it appears that Cu has no observable trend. Two anomalous elevated concentrations were reported in 2012 at sampling stations C1-1 and C1-2; however, subsequent monitoring events reported concentrations in line with one another. The current monitoring event reported one anomalous elevated Cu concentration at sample station C1-3; however, only two reported concentrations exist (along with two non-detect concentrations), which is insufficient to draw any conclusions for this sampling station.
Nickel (Ni)	Based on current and historical results, it appears that Ni has no observable trend.
Cobalt (Co)	Based on current and historical results, it appears that Co has no observable trend and/or may potentially be trending downward slightly.
Cadmium (Cd)	Based on mostly non-detect concentrations, Cd has no observable trend.
Lead (Pb)	Based on current and historical results, it appears that Pb has no observable trend; however, a slight downward may potentially be developing and additional data points are required to establish this observation.
Zinc (Zn)	Based on mostly non-detect concentrations, Zn has no observable trend.
Chromium (Cr)	Based on current and historical results, it appears that Cr has no observable trend.
Arsenic (As)	Based on current and historical results, As has no observable trend.
Mercury (Hg)	Based on mostly non-detect concentrations, Hg has no observable trend.
PCBs (Total)	Based on mostly non-detect concentrations, PCBs has no observable trend.
Modified TPH (C_6-C_{34})	Based on current and historical results, Modified TPH concentrations has no observable trend.

Trend analyses presented are based on the data available at the time of the investigation and any interpreted increasing or decreasing trends may be a result of natural variation in the data due to analytical methods. There is currently insufficient information to establish reliable trends; therefore, additional data points are required to be able to confidently determine if trends are present.

3.3.3 Groundwater Sampling

No groundwater monitoring wells are present at the Borrow Area North Landfill; therefore, no groundwater sampling or analysis was conducted.

3.3.4 Thermal Monitoring

No thermistors are present at the Borrow Area North Landfill; therefore, no thermal monitoring was conducted.

3.4 Conclusions and Overall Landfill Performance

Based on the results of the 2016 monitoring program, the overall performance of the Borrow Area North Landfill is acceptable.

3.5 Recommendations and Conclusions

Based on review and analysis of chemical data, it appears that the soil concentrations for the parameters tested appear to have no observable trend with no obvious soil concentration increases over time. Based on this review, it is recommended to continue the long term monitoring of soils as planned.

Based on the results of the visual inspection, the landfill performance is acceptable. No remedial work or deviations from the monitoring plan are recommended at this time.

4 CAM-1: NORTHEAST LANDFILL

4.1 Landfill Description

The CAM-1 Northeast Landfill is located in the Station Area, along the west side of the road heading north of the station. Geophysics identified three lobes of debris at this location. The remediation of this landfill consisted of the excavation of Tier II contaminated soil, and regrading of the surface with additional granular fill. Lobes 1 and 3 were regraded into one area, with Lobe 2 to the southwest.

The long term monitoring plan for the Northeast Landfill consists of visual inspection, and the periodic collection of soil samples.

The landfill layout, visual observations and photographic locations are presented on Figure CAM-1.3A and soil analytical results are presented on Figure CAM-1.3B in the figures section.

4.2 Summary of Work Conducted

4.2.1 Visual Inspection

A visual inspection was completed on Lobes 1, 2 and 3 of the Northeast Landfill on August 10, 2016. The visual inspection of the landfill was completed with no deviations from the visual inspection work plan.

4.2.2 Soil Sampling

Soil sampling at the Northeast Landfill was conducted on August 9, 2016 and consisted of the collection of eight soil samples from four soil sample stations (C1-6, C1-7, C1-8, and C1-9). Depth limitations were encountered at soil sampling stations C1-6, and C1-9 with the two sample locations reaching maximum depths of 0.35 and 0.45 m bgs respectively due to refusal on gravel and boulders.

The following Table 4-1 outlines the soil sampling activities conducted at the Northeast Landfill.

Table 4-1: Summary of Work Conducted by Soil Sampling Location

Northeast Landfill			
Sample Location	**Sample ID**	**Sample Depth (m bgs)**	**Notes**
C1-6	16-C1-6A	0 - 0.15	Refusal on boulder
	16-C1-6B	0.3 – 0.35	
C1-7	16-C1-2A	0 - 0.15	
	16-C1-2B	0.3 – 0.4	
C1-8	16-C1-3A	0 - 0.15	
	16-C1-3B	0.4 – 0.5	
C1-9	16-C1-4A	0 - 0.15	Refusal on heavy gravel
	16-C1-4B	0.35 – 0.45	

4.2.3 Groundwater Sampling

No groundwater monitoring wells are present at the Northeast Landfill.

4.2.4 Thermal Monitoring

No thermistors are present at the Northeast Landfill.

4.3 Results of the Monitoring Program

The following Sections 4.3.1 through 4.3.4 summarize the results of the CAM-1 monitoring program at the Northeast Landfill.

4.3.1 Visual Inspection

The visual inspection of the Northeast Landfill was conducted on August 10, 2016. The visual inspection was conducted in compliance with Section 5.2 of the Terms of Reference and details are provided below in the following Sections 4.3.1.1 through 4.3.1.5. Figure CAM-1.3A presents the visual inspection findings and photographic locations.

4.3.1.1 Inspection Checklist

The visual inspection was completed as per the Terms of Reference and the visual inspection checklist is included as Table 4-2 of this report below.

Table 4-2: Visual Inspection Checklist – Northeast Landfill

SITE NAME: **CAM-1 Jenny Lind Island**

LANDFILL DESIGNATION: Northeast Landfill
LANDFILL TYPE: Regraded
DATE OF INSPECTION: August 10, 2016
WEATHER CONDITIONS: 10ºC, sunny
DATE OF PREVIOUS INSPECTION: August 28, 2014
INSPECTED BY: Stephen Borcsok
REPORT PREPARED BY: Stephen Borcsok and Ryan Fletcher

The preparer represents to the best of the preparer's knowledge, the following statements and observations are true and correct and to the best of the preparer's actual knowledge, no material facts have been suppressed or misstated.

Northeast Landfill												
Checklist Item	**Present (Yes/No)**	**Feature Number**	**Feature Location**	**GPS Coordinates Easting/Northing/Zone**		**Length (m)**	**Width (m)**	**Depth (m)**	**Extent Relative to Landfill Surface**	**Description**	**Comparison with Historical Observations**	**Additional Comments/ Severity Rating**	**Photographic Records (photo reference, location, view point & direction, feature of note, scale)**
Settlement	Yes	A	Lobes 1 and 3 north side slope	389531.102 / 7621161.752 389536.391 / 7621157.057 389534.618 / 7621162.129	14 14 14	0.3-5	0.3-2	0.1-0.3	<1%	three depressions, two on inside corner slope and one on north side slope	First noted in Year 2 (2011). Marginal increases in magnitude or depth in 2013 and 2014. No significant change in features from 2014 to 2016.	Severity Rating – Acceptable (features are minor and not affecting landfill stability)	CAM-1 NE 25, 26, 27
Settlement	Yes	D	Lobe 2 east landfill cover	389544.257 / 7621114.25	14	13	0.2	0.05-0.1	<1%	Linear depression	First noted in Year 5 (2014). Length increased from 11 to 14 m, width from 0.1 to 0.2 m, depth from 0.02-0.04 to 0.05-0.1 m from 2014 to 2016.	Severity Rating – Acceptable (feature is minor and not affecting landfill stability)	CAM-1 NE 6, 7
Settlement	Yes	E	Lobes 1 and 3 northwest corner	389509.864 / 7621167.369	14	0.4	0.3	0.1	<1%	Pothole depression	First noted in Year 5 (2014). No significant change.	Severity Rating – Acceptable (feature is minor and not affecting landfill stability)	CAM-1 NE 20
Settlement	Yes	H	Lobe 2 west landfill cover	389519.845 / 7621102.066	14	7	0.3	0.05	<1%	Linear depression	New observation in 2016.	Severity Rating – Acceptable (feature is minor and not affecting landfill stability)	CAM-1 NE 34, 35
Erosion	Yes	C	Lobes 1 and 3 north side slope	389541.212 / 7621164.329	14	4	0.15	0.05	<1%	Minor erosion	First noted in Year 4 (2013). Length increased from 3 to 4 m from 2014 to 2016.	Severity Rating – Acceptable (feature is minor and not affecting landfill stability)	CAM-1 NE 30
Erosion	Yes	F	Lobes 1 and 3 northeast corner	389557.114 / 7621161.046	14	3	0.1	0.1	<1%	Minor erosion	First noted in Year 5 (2014). No significant change.	Severity Rating – Acceptable (feature is minor and not affecting landfill stability)	CAM-1 NE 31
Erosion	Yes	G	Lobes 1 and 3 west side slope	389500.762 / 7621158.123	14	7	0.5	0.1	<1%	Minor erosion	First noted in Year 5 (2014). Length increased from 4 to 7 m from 2014 to 2016.	Severity Rating – Acceptable (feature is minor and not affecting landfill stability)	CAM-1 NE, 18, 19
Lateral Movement	No												
Frost Action	No												
Sloughing	No												
Cracking	No												
Animal Burrows	No												
Vegetation Establishment	Yes	N/A	Lobes 1 and 3 side slopes						<1%	Occasional small plants on some landfill side slopes	New observation in 2016.	Severity Rating – Acceptable (vegetation establishment will be beneficial for landfill stability)	CAM-1 NE 12, 28, 31, 32
Staining	No												
Vegetation Stress	No												

Northeast Landfill												
Checklist Item	**Present (Yes/No)**	**Feature Number**	**Feature Location**	**GPS Coordinates Easting/Northing/Zone**	**Length (m)**	**Width (m)**	**Depth (m)**	**Extent Relative to Landfill Surface**	**Description**	**Comparison with Historical Observations**	**Additional Comments/ Severity Rating**	**Photographic Records (photo reference, location, view point & direction, feature of note, scale)**
Seepage Points (or) Ponded Water	No											
Debris and/or Liner Exposed	No											
Presence & Condition of Monitoring Instruments	No											
Features of Note/Other Relevant Observations (e.g., signs of activity, ruts…)	Yes	B	Lobes 1 and 3 north corner side slope	389508.988 / 7621175.067	14	4	4	N/A	1%	Uneven side slope	First noted in Year 1 (2010). No significant change.	Severity Rating – Acceptable (feature has undergone no significant change since 2010 and is not affecting landfill stability)	CAM-1 NE 20, 22, 24

4.3.1.2 Stability Assessment

The Preliminary Stability Assessment for the Northeast Landfill was conducted on August 9, 2016 as per the Terms of Reference and the results are provided below in Table 4-3.

Table 4-3: Preliminary Stability Assessment – Northeast Landfill

Northeast Landfill		
Feature	**Severity Rating**	**Extent**
Settlement	Acceptable	Occasional
Erosion	Acceptable	Occasional
Lateral Movement	Not Observed	None
Frost Action	Not Observed	None
Sloughing	Not Observed	None
Cracking	Not Observed	None
Animal Burrows	Not Observed	None
Vegetation Establishment	Acceptable	Isolated
Staining	Not Observed	None
Vegetation Stress	Not Observed	None
Seepage / Ponded Water	Not Observed	None
Debris and/or Liner Exposure	Not Observed	None
Other	Acceptable	Isolated
Overall Landfill Performance	**Acceptable**	

Northeast Landfill	
Performance / Severity Rating	**Description**
Acceptable	Noted features are of little consequence. The landfill is performing as designed. Minor deviations in environmental or physical performance may be observed, such as isolated areas of erosion, settlement.
Marginal	Physical/environmental performance appears to be deteriorating with time. Observations may include an increase in size or number of features of note,

Northeast Landfill	
Performance / Severity Rating	**Description**
	such as differential settlement, erosion or cracking. No significant impact on landfill stability to date, but potential for failure is assessed as low or moderate.
Significant	Significant or potentially significant changes affecting landfill stability, such as significant changes in slope geometry, significant erosion or differential settlement; scarp development. The potential for failure is assessed as imminent.
Unacceptable	Stability of landfill is compromised to the extent that ability to contain waste materials is compromised. Examples may include: • Debris exposed in erosion channels or areas of differential settlement. • Liner exposed. • Slope failure.
Extent	**Description**
Isolated	Singular feature
Occasional	Features of note occurring at irregular intervals/locations
Numerous	Many features of note, impacted less than 50% of the surface area of the landfill
Extensive	Impacting greater than 50% of the surface area of the landfill

4.3.1.3 Photographic Records

The photographic record for the Northeast Landfill has been completed as per Section 5.5 of the Terms of Reference and is included in the following page as Table 4-4. The Photographic Record only contains an index of photographs collected; full sized photographs are contained in the Appended CD/DVD-ROM. Selected photographs are shown in Table 4-5. Figure CAM-1.3A presents the photograph locations and directions.

Table 4-4: Photographic Records – Northeast Landfill

Northeast Landfill						
Photo Identification	**Figure ID**	**View Direction**	**Photo Location and Direction**	**Feature Identification**	**Feature of Note**	**Other Comments**
Sample Station Photographs						
C1-6-1	S6	N/A	Sample station C1-6	C1-6	C1-6	Close up of test pit
C1-6-2	S6	NW	Sample station C1-6	C1-6	C1-6	Test pit location

Northeast Landfill						
Photo Identification	**Figure ID**	**View Direction**	**Photo Location and Direction**	**Feature Identification**	**Feature of Note**	**Other Comments**
C1-6-3	S6	N/A	Sample station C1-6	C1-6	C1-6	C1-6 Backfilled
C1-7-1	S7	N/A	Sample station C1-7	C1-7	C1-7	Close up of test pit
C1-7-2	S7	SE	Sample station C1-7	C1-7	C1-7	Test pit location
C1-7-3	S7	N/A	Sample station C1-7	C1-7	C1-7	C1-7 Backfilled
C1-8-1	S8	N/A	Sample station C1-8	C1-8	C1-8	Soil Type
C1-8-2	S8	N/A	Sample station C1-8	C1-8	C1-8	Close up of test pit
C1-8-3	S8	S	Sample station C1-8	C1-8	C1-8	C1-8 location
C1-9-1	S9	N/A	Sample station C1-9	C1-9	C1-9	Close up of test pit
C1-9-2	S9	S of SW	Sample station C1-9	C1-9	C1-9	Test pit location
C1-9-3	S9	N/A	Sample station C1-9	C1-9	C1-9	C1-9 Backfilled
Visual Inspection Photographs						
CAM-1 NE 1	1	SW	View along centreline of Lobe 2	N/A	N/A	
CAM-1 NE 2	2	SW	View along west toe of Lobe 2	N/A	N/A	
CAM-1 NE 3	3	SW	View along east toe of Lobe 2	N/A	N/A	
CAM-1 NE 4	4	NE	View along centreline of Lobe 2	N/A	N/A	
CAM-1 NE 5	5	SW	View along centreline of Lobe 2	N/A	N/A	
CAM-1 NE 6	6	NE	Linear depression on east cover of Lobe 2	Settlement	D	
CAM-1 NE 7	7	SW	Linear depression on	Settlement	D	

Northeast Landfill						
Photo Identification	**Figure ID**	**View Direction**	**Photo Location and Direction**	**Feature Identification**	**Feature of Note**	**Other Comments**
			8east cover of Lobe 2			
CAM-1 NE 8	8	NE	View along centreline of Lobe 2	N/A	N/A	
CAM-1 NE 9	9	NE	View along west toe of Lobe 2	N/A	N/A	
CAM-1 NE 10	10	NE	View along east toe of Lobe 2	N/A	N/A	
CAM-1 NE 11	11	N	View of south side of Lobes 1 and 3	N/A	N/A	
CAM-1 NE 12	12	NE	East toe of Lobes 1 and 3 showing sparse vegetation	Vegetation	N/A	
CAM-1 NE 13	13	NE	View across Lobes 1 and 3 cover	N/A	N/A	
CAM-1 NE 14	14	NW	South toe of Lobes 1 and 3	N/A	N/A	
CAM-1 NE 15	15	NE	West toe of Lobes 1 and 3	N/A	N/A	
CAM-1 NE 16	16	SE	South toe of Lobes 1 and 3	N/A	N/A	
CAM-1 NE 17	17	E	View across south cover of Lobes 1 and 3	N/A	N/A	
CAM-1 NE 18	18	SSE	Minor erosion on west side slope of Lobes 1 and 3	Erosion	G	
CAM-1 NE 19	19	NW	Minor erosion on west side slope of Lobes 1 and 3	Erosion	G	
CAM-1 NE 20	20	SW	Uneven side slope and minor settlement on cover of Lobes 1 and 3	Uneven Side Slope Settlement	B E	

Northeast Landfill						
Photo Identification	**Figure ID**	**View Direction**	**Photo Location and Direction**	**Feature Identification**	**Feature of Note**	**Other Comments**
CAM-1 NE 21	21	SE	North side slope of Lobes 1 and 3	N/A	N/A	
CAM-1 NE 22	22	S	Uneven side slope on west side slope of Lobes 1 and 3	Uneven Side Slope	B	
CAM-1 NE 23	23	SE	View across landfill cover on Lobes 1 and 3	N/A	N/A	
CAM-1 NE 24	24	N	Uneven side slope on west side slope of Lobes 1 and 3	Uneven Side Slope	B	
CAM-1 NE 25	25	S	Minor depression on inside corner of north side slope on Lobes 1 and 3	Settlement	A	
CAM-1 NE 26	26	N	Minor settlement features on inside corner of north side slope on Lobes 1 and 3	Settlement	A	
CAM-1 NE 27	27	SE	Minor settlement features on inside corner of north side slope on Lobes 1 and 3	Settlement	A	
CAM-1 NE 28	28	NW	North side slope of Lobes 1 and 3 with sparse vegetation establishment	Vegetation	N/A	
CAM-1 NE 29	29	NE	View of northeast extension of Lobes 1 and 3	N/A	N/A	

Northeast Landfill						
Photo Identification	**Figure ID**	**View Direction**	**Photo Location and Direction**	**Feature Identification**	**Feature of Note**	**Other Comments**
CAM-1 NE 30	30	SE	Minor erosion on north side slope of Lobes 1 and 3	Erosion	C	
CAM-1 NE 31	31	NW	North side slope of Lobes 1 and 3, sparse vegetation establishment	Erosion Vegetation	F N/A	
CAM-1 NE 32	32	SW	Minor erosion on northeast corner of Lobes 1 and 3, sparse vegetation establishment	Erosion Vegetation	F N/A	
CAM-1 NE 33	33	S	View of north side of Lobes 1 and	N/A	N/A	
CAM-1 NE 34	34	NE	Linear depression on west cover of Lobe 2	Settlement	H	New feature
CAM-1 NE 35	35	SW	Linear depression on west cover of Lobe 2	Settlement	H	New feature

Table 4-5: Selected Photographs –Northeast Landfill

Northeast Landfill
Photograph CAM-1 NE 7: Linear depression (Feature D) on east cover of Lobe 2.
Photograph CAM-1 NE 12: East toe of Lobes 1 and 3 showing sparse vegetation establishment.

Northeast Landfill

Photograph CAM-1 NE 22: Uneven side slope (Feature B) on west side slope of Lobes 1 and 3.

Photograph CAM-1 NE 34: Linear depression (Feature H) on west cover of Lobe 2.

4.3.1.4 Trend Analysis

A trend analysis was conducted with regards to observations made during the visual inspection of the Northeast Landfill. The following Table 4-6 outlines the results of the visual trend analysis.

Table 4-6: Visual Inspection Trends - Northeast Landfill

Northeast Landfill		
Checklist Item	**Feature Number**	**Comparison with Historical Observations**
Settlement	A D E H	No significant change. Small increase in length, width and depth from 2014 to 2016. No significant change. New observation in 2016.
Erosion	C F G	Small increase in length from 2014 to 2016. No significant change. Increase in length from 4 to 7 m between 2014 and 2016.
Vegetation	N/A	Some sparse vegetation newly observed in 2016
Other Features	B (Uneven Side Slope)	No significant change from 2014 to 2016.

4.3.1.5 Discussion of Results/Trends

A comparison of the visual inspection results of the 2014 and 2016 monitoring events at the Northeast Landfill indicates that two existing settlement features, one existing erosion feature and one uneven slope feature have not undergone any significant change. One existing settlement feature exhibited small increases in length, width and depth from the 2014 to 2016 monitoring events. Two erosion features exhibited increases in length from 2014 to 2016. One new settlement feature was also observed. The observed new feature and the increases in size of three existing features are not affecting the stability of the landfill.

Some sparse vegetation has been observed on limited areas of the landfill side slopes. The presence of vegetation is expected to benefit the stability of the landfill.

4.3.2 Soil Sampling

Soil sampling of the Northeast Landfill was conducted on August 9, 2016. The soil sampling was conducted in compliance with Section 5.3.1 and 5.3.2 of the Terms of Reference and details are provided below in the following Sections 4.3.2.1 through 4.3.2.3.

4.3.2.1 Laboratory Analytical Results

A total of eight soil samples were analysed from four soil sample locations at the Northeast Landfill. The following Table 4-7 and 4-8 present the soil analytical results. Figure CAM-1.3B presents a summary of significant soil analytical results.

Table 4-7: Soil Chemical Analysis Results – Northeast Landfill

Northeast Landfill																	
Sample ID	**Sampling Station**	**Monitoring Year**	**Depth**	**Cu**	**Ni**	**Co**	**Cd**	**Pb**	**Zn**	**Cr**	**As**	**Hg**	**Total PCB**	**F1 C6-C10**	**F2 C10-C16**	**F3 C16-C34**	**Modified TPH Total C6-C34**
Comparison Values																	
Background				11	4.7	3.1	0.50	7	12	12	3.6	NS	0.042				NS
Baseline				**5.1**	**5.0**	**5.0**	**1.0**	**10**	**15**	**20**	**3.3**	**0.10**	**0.003**				**97**
Baseline +3 Standard Deviations				16	0.0	0.0	0.0	79	22	0.0	10	0.0	0.08				545
Upgradient																	
C1-6 Surface																	
10-16631	C1-6	2010	0-10	3.0	<5.0	<5.0	<1.0	**12**	<15	<20	**9.0**	<0.10	**0.017**	<10	5.3	20	30
C112-6A	C1-6	2012	0-15	**7.9**	2.5	1.7	<0.10	**15**	<10	2.2	**11**	<0.050	<0.010	<12	<10	12	23
C114-6A	C1-6	2014	0-15	3.6	1.2	1.7	0.04	**12**	4.0	2.2	**5.6**	<0.01	<0.1	<10	<50	<50	55
16-C1-6A	C1-6	2016	0-15	2.8	1.6	0.98	<0.050	**11**	<10	2.2	**6.9**	<0.050	<0.01	<12	<10	<50	36
C1-6 Depth																	
10-16633	C1-6	2010	10-25	4.3	<5.0	<5.0	<1.0	**15**	<15	<20	**7.9**	<0.10	**0.0046**	<10	4.8	27	37
C112-6B	C1-6	2012	40-50	**5.7**	3.3	2.4	<0.10	**27**	<10	2.7	**16**	<0.050	<0.010	<12	17	55	78
C114-6B	C1-6	2014	40-50	4.4	1.5	2.1	0.04	**19**	4	2.4	**8.5**	<0.01	<0.1	<10	<50	<50	55
16-C1-6B	C1-6	2016	30-35	4	2	1.6	<0.050	**17**	<10	1.9	**7.6**	<0.050	<0.01	<12	<10	<50	36
Downgradient																	
C1-7 Surface																	
10-16635/36	C1-7	2010	0-10	<3.0	<5.0	<5.0	<1.0	<10	<15	<20	2.5	<0.10	**0.0096**	<10	8.2	36	49
C112-7A	C1-7	2012	0-15	<5.0	1.6	1.1	<0.10	6.4	<10	2.3	**3.6**	<0.050	<0.010	<12	<10	<10	16
C114-7A	C1-7	2014	0-15	1.8	0.9	0.7	0.03	<5.0	9.0	1.5	2.1	<0.01	<0.1	<10	<50	<50	55
16-C1-7A	C1-7	2016	0-15	2	1.8	1.1	<0.050	6.5	<10	2.7	**3.6**	<0.050	<0.01	<12	<10	<50	36
C1-7 Depth																	
10-16637	C1-7	2010	30-50	<3.0	<5.0	<5.0	<1.0	<10	<15	<20	**4.1**	<0.10	**0.0067**	<10	7.6	19	32
C112-7B	C1-7	2012	40-50	**9.1**	1.6	1.1	<0.10	6.7	<10	2.3	**3.6**	<0.050	<0.010	<12	<10	<10	16
C114-7B	C1-7	2014	40-50	2.4	1.8	1.6	0.02	8.0	6.0	2.7	**3.7**	<0.01	<0.1	<10	<50	<50	55
16-C1-7B	C1-7	2016	40-50	3	1.5	1.2	<0.050	7	<10	2.4	**3.4**	<0.050	<0.01	<12	<10	<50	36
C1-8 Surface																	

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Northeast Landfill																	
Sample ID	Sampling Station	Monitoring Year	Depth	Cu	Ni	Co	Cd	Pb	Zn	Cr	As	Hg	Total PCB	F1 C6-C10	F2 C10-C16	F3 C16-C34	Modified TPH Total C6-C34
10-16639	C1-8	2010	0-10	<3.0	<5.0	<5.0	<1.0	<10	<15	<20	1.9	<0.10	**0.0045**	<10	<4.0	12	19
C112-8A	C1-8	2012	0-15	<5.0	1.1	<1.0	<0.10	2.9	<10	1.8	1.9	<0.050	<0.010	<12	<10	16	27
C114-8A	C1-8	2014	0-15	1.5	0.9	0.7	0.02	<4.9	6.0	1.8	1.5	<0.01	<0.1	<10	<50	<50	55
16-C1-8A	C1-8	2016	0-15	1.1	<1.0	0.55	<0.050	2.8	<10	1.4	2.1	<0.050	<0.01	<12	<10	<50	36
C1-8 Depth																	
10-16641	C1-8	2010	30-50	<3.0	<5.0	<5.0	<1.0	<10	<15	<20	**3.6**	<0.10	<0.0030	<10	<4.0	18	19
C112-8B	C1-8	2012	40-50	**8.0**	2.5	1.7	<0.10	**12**	<10	2.7	**10**	<0.050	<0.010	<12	<10	<10	27
C114-8B	C1-8	2014	40-50	2.6	1.8	2.2	0.02	**11**	7.0	2.5	**5.8**	<0.01	<0.1	<10	<50	<50	55
16-C1-8B	C1-8	2016	40-50	1.7	1.3	1	<0.050	6.2	<10	1.7	3.3	<0.050	<0.01	<12	<10	<50	36
C1-9 Surface																	
10-16643	C1-9	2010	0-10	<3.0	<5.0	<5.0	<1.0	<10	<15	<20	1.8	<0.10	<0.0030	<10	<4.0	13	20
C112-9A	C1-9	2012	0-15	**10**	2.7	<1.0	0.18	**110**	<10	**36**	2.6	<0.050	<0.010	<12	<10	22	33
C114-9A	C1-9	2014	0-15	**17**	4.6	1.5	0.12	7.9	7	4.3	**4.0**	0.02	<0.1	<10	<50	<50	55
16-C1-9A	C1-9	2016	0-15	**6.4**	2.4	1.3	0.075	7.3	<10	2.2	**5.0**	<0.050	<0.010	<12	<10	<50	36
C1-9 Depth																	
10-16645	C1-9	2010	30-40	<3.0	<5.0	<5.0	<1.0	<10	<15	<20	2.7	<0.10	<0.0030	<10	<4.0	12	19
C112-9B	C1-9	2012	40-50	**12**	3.3	2.2	0.14	**13**	<10	3.0	**7.8**	<0.050	<0.010	<12	<10	<10	16
C114-9B	C1-9	2014	40-50	**13**	4.6	3.5	0.10	**22**	15	3.6	**13**	<0.01	<0.1	<10	<50	<50	55
16-C1-9B	C1-9	2016	35-45	3.4	1.6	1	<0.050	6.4	<10	1.6	**3.8**	<0.050	<0.010	<12	<10	<50	36

Notes:

XX	sample exceeds background
XX	**sample exceeds baseline**
XX	*sample exceeds baseline +3 standard deviations*

**** All units in mg/kg**

Table 4-8: PHC F4 Soil Chemical Analysis Results – Northeast Landfill

Sample Location	Sample ID	Sample Depth (m bgs)	PHC F4 (mg/kg)
C1-6	16-C1-6A	0 - 0.15	<50
	16-C1-6B	0.3 – 0.35	<50
C1-7	16-C1-2A	0 - 0.15	<50
	16-C1-2B	0.3 – 0.4	<50
C1-8	16-C1-3A	0 - 0.15	<50
	16-C1-3B	0.4 – 0.5	<50
C1-9	16-C1-4A	0 - 0.15	<50
	16-C1-4B	0.35 – 0.45	<50

4.3.2.2 Discussion of Results – Comparison to Baseline/Background

Analytical results were compared against baseline data, and background concentrations. The following Table 4-9 summarizes the comparison of results.

Table 4-9: Evaluation of Results by Parameter – Northeast Landfill

Northeast Landfill	
Parameter	Discussion of Results
Copper (Cu)	Copper analysis reported concentrations below background and baseline, with the exception of sample 16-C1-9A, which reported a concentration of 6.4 mg/kg exceeding the baseline level of 5.1 mg/kg.
Nickel (Ni)	All soil samples reported either non-detect concentrations or were below both background and baseline concentrations for Ni.
Cobalt (Co)	All soil samples reported either non-detect concentrations or were below both background and baseline concentrations for Co.
Cadmium (Cd)	All soil samples reported either non-detect concentrations or were below both background and baseline concentrations for Cd.
Lead (Pb)	Pb exceeded the background and baseline concentrations of 7 mg/kg and 10 mg/kg in sample stations C1-6 surface (11 mg/kg) and C1-6 depth (17 mg/kg), both up-gradient sample locations. In addition, sample stations C1-7 depth and C1-9 surface both exceeded the background with concentrations of 7 mg/kg and 7.3 mg/kg respectively.
Zinc (Zn)	All soil samples reported non-detect concentrations for Zn.
Chromium (Cr)	All soil samples reported either non-detect concentrations or were below both background and baseline concentrations for Cr.
Arsenic (As)	As exceeded the background and baseline concentrations of 3.6 mg/kg and 3.3 mg/kg respectively in sample stations C1-6 surface (6.9 mg/kg) and depth (7.6 mg/kg), C1-9 surface (5.0 mg/kg), and C1-9 depth (3.8 mg/kg). C1- 7 surface and C1-7 depth both exceeded baseline at 3.6 and 3.4 mg/kg respectively.

Mercury (Hg)	All soil samples reported either non-detect concentrations or were below both background and baseline concentrations for Hg.
PCBs (Total)	All soil samples reported non-detect concentrations for PCBs.
Modified TPH (C_6-C_{34})	All soil samples reported concentrations of modified TPH below baseline concentrations.

4.3.2.3 Soil Trend Analysis by Parameter & Discussion of Trends

A soil chemistry trend analysis was conducted based on the current and historical analytical results collected at the site. A Series of graphs were generated including a visual comparison to background, baseline and historical concentrations using differentiating colours (See Appendix E2). The following Table 4-10 provides a summary of soil trend analysis findings and presents a discussion of the observed trends by parameter.

Table 4-10: Discussion of Trends – Northeast Landfill

Northeast Landfill	
Parameter	Discussion of Trends
Copper (Cu)	Based on current and historical results, it appears that Cu concentrations are trending downwards in all but one sample location (C1-7 surface), which reported a minor increase in concentration from 1.8 mg/kg in 2014 to 2 mg/kg. This increase is attributable to variations in laboratory analysis.
Nickel (Ni)	Based on current and historical results, Ni appears to have no observable trend. Only minor concentration fluctuations were noted over the monitoring years 2010 to 2016.
Cobalt (Co)	Based on current and historical results, it appears that Co has no observable trend; however, some samples have decreased in concentration from year to year.
Cadmium (Cd)	Based on mostly non-detect concentrations, Cd has no observable trend. Some of the samples indicate the possible development of a downward trend from low-level detections in previous monitoring rounds to non-detect concentrations in 2016; however, additional data is required to make this determination.
Lead (Pb)	Based on current and historical results, it appears that Pb is generally has no observable trend; however, downward trends were observed in sample stations C1-8 depth and C1-9 depth.
Zinc (Zn)	Based on mostly non-detect concentrations, Zn has no observable trend.
Chromium (Cr)	Based on current and historical results, it appears that Cr has no observable trend, with the exception of downward trends observed at sample stations C1-9 surface and C1-9 depth.
Arsenic (As)	Based on current and historical results, As has reported fluctuating concentrations throughout the monitoring years. Overall, there is a general trend downward.
Mercury (Hg)	Based on mostly non-detect concentrations, Hg has no observable trend.
PCBs (Total)	Based on all non-detect concentrations, PCBs has no observable trend.
Modified TPH (C_6-C_{34})	Based on current and historical results, Modified TPH concentrations have no observable trend.

Trend analyses presented are based on the data available at the time of the investigation and any interpreted increasing or decreasing trends may be a result of natural variation in the data due to

analytical methods. There is currently insufficient information to establish reliable trends; therefore, additional data points are required to be able to confidently determine if trends are present.

4.3.3 Groundwater Sampling

No groundwater monitoring wells are present at the Northeast Landfill; therefore, no groundwater sampling or analysis was conducted.

4.3.4 Thermal Monitoring

No thermistors are present at the Northeast Landfill; therefore, no thermal monitoring was conducted.

4.4 Conclusions and Overall Landfill Performance

Based on the results of the 2016 monitoring program, the overall performance of the Northeast Landfill is acceptable.

4.5 Recommendations and Conclusions

Based on review and analysis of chemical data, it appears that the soil concentrations for the parameters tested have no observable trend with no obvious soil parameter concentration increases over time. Based on this review, it is recommended to continue the long term monitoring of soils as planned.

Based on the results of the visual inspection, the landfill performance is acceptable. No remedial work or deviations from the monitoring plan are recommended at this time.

5 CAM-1: STATION WEST LANDFILL

5.1 Landfill Description

The CAM-1 Station West Landfill is located west of the intersection between the main access road between the Beach Area and Station Area and the access road heading northwest from the Station Area.

The remediation of the Station West Landfill included the excavation of Tier II contaminated soil, removal of debris from the pit area and landfill surface and regrading with the placement of additional granular fill.

The long term monitoring plan for the Station West Landfill consists of visual inspection, and the periodic collection of soil samples.

The landfill layout, visual observations and photographic locations are presented on Figure CAM-1.4A and soil analytical results are presented on Figure CAM-1.4B in the figures section.

5.2 Summary of Work Conducted

5.2.1 Visual Inspection

A visual inspection was conducted on the Station West Landfill on August 11, 2016. The visual inspection of the landfill was completed with no deviations from the visual inspection work plan.

5.2.2 Soil Sampling

Soil sampling at the Station West Landfill was conducted on August 10, 2016 and consisted of the collection of eight soil samples from four soil sample stations (C1-10, C1-11, C1-12, and C1-13). Depth limitations were encountered at soil sampling stations C1-10, and C1-13 with the two sample locations reaching maximum depths of 0.3 and 0.4 m bgs respectively.

The following Table 5-1 outlines the soil sampling activities conducted at the Station West Landfill.

Table 5-1: Summary of Work Conducted by Soil Sampling Location

Station West Landfill			
Sample Location	**Sample ID**	**Sample Depth (m bgs)**	**Notes**
C1-10	16-C1-10A	0 - 0.15	Refusal on boulders/cobbles
	16-C1-10B	0.25 – 0.3	
C1-11	16-C1-11A	0 - 0.15	
	16-C1-11B	0.4 – 0.5	
C1-12	16-C1-12A	0 - 0.15	
	16-C1-12B	0.4 – 0.5	

Station West Landfill			
Sample Location	**Sample ID**	**Sample Depth (m bgs)**	**Notes**
C1-13	16-C1-13A	0 - 0.15	Refusal due to sloughing material
	16-C1-13B	0.3 – 0.4	

5.2.3 Groundwater Sampling

No groundwater monitoring wells are present at the Station West Landfill.

5.2.4 Thermal Monitoring

No thermistors are present at the Station West Landfill.

5.3 Results of the Monitoring Program

The following Sections 5.3.1 through 5.3.4 summarize the results of the CAM-1 monitoring program at the Station West Landfill.

5.3.1 Visual Inspection

The visual inspection of the Station West Landfill was conducted on August 11, 2016. The visual inspection was conducted in compliance with Section 5.2 of the Terms of Reference and details are provided below in the following Sections 5.3.1.1 through 5.3.1.5. Figure CAM-1.4A presents the visual inspection findings and photographic locations.

5.3.1.1 Inspection checklist

The visual inspection was completed as per the Terms of Reference and the visual inspection checklist is included as Table 5-2 of this report below.

Table 5-2: Visual Inspection Checklist – Station West Landfill

SITE NAME: **CAM-1 Jenny Lind Island**

LANDFILL DESIGNATION: Station West Landfill
LANDFILL TYPE: Regraded
DATE OF INSPECTION: August 11, 2016
WEATHER CONDITIONS: 10ºC, sunny
DATE OF PREVIOUS INSPECTION: August 28, 2014
INSPECTED BY: Stephen Borcsok
REPORT PREPARED BY: Stephen Borcsok and Ryan Fletcher
The preparer represents to the best of the preparer's knowledge, the following statements and observations are true and correct and to the best of the preparer's actual knowledge, no material facts have been suppressed or misstated.

Station West Landfill												
Checklist Item	**Present (Yes/No)**	**Feature Number**	**Feature Location**	**GPS Coordinates Easting/Northing/Zone**	**Length (m)**	**Width (m)**	**Depth (m)**	**Extent Relative to Landfill Surface**	**Description**	**Comparison with Historical Observations**	**Additional Comments/ Severity Rating**	**Photographic Records (photo reference, location, view point & direction, feature of note, scale)**
Settlement	Yes	A	East side slope	389051.741 / 7620933.194 389048.023 / 7620936.951 389044.606 / 7620943.954 389039.198 / 7620948.991	14	0.2-2	0.1-0.2	0.05	<1%	Minor settlement at 4 locations	First noted in Year 2 (2011). No significant change from 2011 to 2016.	Severity Rating – Acceptable (features are minor and not affecting landfill stability)	CAM-1 SW 3, 5, 6, 9
Settlement	Yes	B	Northwest side slope and north cover	389029.736 / 7620954.773 389027.593 / 7620954.577 389013.164 / 7620946.19	14	0.7-1.5	0.2	0.05-0.1	<1%	Minor settlement at 3 locations	First noted in Year 2 (2011). No significant change from 2011 to 2016.	Severity Rating – Acceptable (features are minor and not affecting landfill stability)	CAM-1 SW 14, 29, 34
Settlement	Yes	E	Northeast corner	389041.821 / 7620956.566	14	6	4	0.1	<1%	Large area of minor settlement/erosion	First noted in Year 2 (2011). Marginal increase in size between years 4 and 5. No significant change between 2014 and 2016.		CAM-1 SW 10, 11, 12
Settlement	Yes	J	Southeast corner of cover	389050.621 / 7620911.303	14	0.4	0.2	0.05	<1%	Minor settlement	First noted in Year 5 (2014). No significant change between 2014 and 2016.		CAM-1 SW 17
Settlement	Yes	K	Southwest side slope	389017.437 / 7620909.000 389013.65 / 7620912.067	14	0.3	0.3	0.05	<1%	Minor settlement at 2 locations	First noted in Year 5 (2014). No significant change between 2014 and 2016.	Severity Rating – Acceptable (features are minor and not affecting landfill stability)	CAM-1 SW 23, 24
Settlement	Yes	L	Northeast side slope	389038.639 / 7620951.126	14	0.5	0.2	0.05	<1%	Minor settlement	New observation in 2016.		CAM-1 SW 10
Settlement	Yes	M	North cover	389027.362 / 7620951.939	14	0.5	0.2	0.05	<1%	Minor settlement	New observation in 2016.		CAM-1 SW 14, 34
Settlement	Yes	N	North cover	389019.501 / 7620950.014	14	0.5	0.2	0.05	<1%	Minor settlement	New observation in 2016.		CAM-1 SW 33
Erosion	Yes	D	East side slope	389047.698 / 7620934.384	14	3	0.1	0.05	<1%	Minor erosion, washing of fines	First noted in Year 2 (2011). Marginal increase in size between 2013 and 2014. Length of erosion shortened to 3 from 5 m between 2014 and 2016.	Severity Rating – Acceptable (features are minor and not affecting landfill stability)	CAM-1 SW 6, 7
Lateral Movement	No												
Frost Action	No												
Sloughing	No												
Cracking	Yes	G	South side slope	389032.912 / 7620901.755	14	10	0.02-0.04	N/A	<1%	Partially infilled tension cracks	First noted in Year 1 (2010). Notable increase in size in 2013. Crack is discontinuous and has become more infilled in 2016 compared to 2014.	Severity Rating – Acceptable (features are infilling and no evidence was observed to indicate feature is affecting landfill stability)	CAM-1 SW 19, 20, 21

Station West Landfill												
Checklist Item	**Present (Yes/No)**	**Feature Number**	**Feature Location**	**GPS Coordinates Easting/Northing/Zone**	**Length (m)**	**Width (m)**	**Depth (m)**	**Extent Relative to Landfill Surface**	**Description**	**Comparison with Historical Observations**	**Additional Comments/ Severity Rating**	**Photographic Records (photo reference, location, view point & direction, feature of note, scale)**
Cracking	Yes	H	Northeast side slope	389040.806 / 7620950.264	14	2	0.02-0.04	N/A	<1%	Partially infilled tension cracks	First noted in Year 3 (2012). Feature decreased in size in 2013 and was completely infilled in 2014. Discontinuous cracks were visible again in 2016.	Severity Rating – Acceptable (features are infilling and no evidence was observed to indicate feature is affecting landfill stability)	CAM-1 SW 9, 10
Cracking	Yes	I	East side slope	389049.694 / 7620934.523	14	2	0.02-0.04	N/A	<1%	Partially infilled tension cracks	First noted in Year 4 (2013). Crack shortened to 2 m from 6m between 2014 and 2016, has become more infilled.	Severity Rating – Acceptable (features are infilling and no evidence was observed to indicate feature is affecting landfill stability)	CAM-1 SW 3
Animal Burrows	No												
Vegetation Establishment	No												
Staining	Yes	F	South landfill cover	389042.266 / 7620918.313 389039.573 / 7620919.375 389035.984 / 7620921.641 389022.156 / 7620909.415 389013.802 / 7620921.763	14	2-4	0.2-0.4	N/A	<1%	Stained cover material at 5 locations	First noted in Year 1 (2010). Additional features noted in 2012, 2013 and 2014. No significant change from 2014 to 2016.	Severity Rating – Acceptable (features are minor and staining is believed to result from different borrow source material)	CAM-1 SW 15, 16, 18, 28
Vegetation Stress	No												
Seepage Points (or) Ponded Water	No												
Debris and/or Liner Exposed	No												
Presence & Condition of Monitoring Instruments	No												
Features of Note/Other Relevant Observations (e.g., signs of activity, ruts…)	Yes	C	Southwest corner of landfill	389004.149 / 7620921.737	14	5	5	0.05	<1%	Uneven side slope	First noted in Year 1 (2010). No significant change since 2010.	Severity Rating – Acceptable (feature is minor and is not affecting landfill stability)	CAM-1 SW 27

Station West Landfill												
Checklist Item	**Present (Yes/No)**	**Feature Number**	**Feature Location**	**GPS Coordinates Easting/Northing/Zone**	**Length (m)**	**Width (m)**	**Depth (m)**	**Extent Relative to Landfill Surface**	**Description**	**Comparison with Historical Observations**	**Additional Comments/ Severity Rating**	**Photographic Records (photo reference, location, view point & direction, feature of note, scale)**
Features of Note/Other Relevant Observations (e.g., signs of activity, ruts…)	Yes	O	West of landfill	388990.137 / 7620937.049	14	27	10	0.3	0%	Equipment tracks located west of landfill	First identified as Feature O in 2016. Tracks are outside landfill and do not affect landfill stability.	Feature is newly identified in 2016, however it is considered to have been created during the remedial work. Severity Rating - Acceptable	CAM-1 SW 32

5.3.1.2 Stability Assessment

The Preliminary Stability Assessment for the Station West Landfill was conducted on August 10, 2016 as per the Terms of Reference and the results are provided below in Table 5-3.

Table 5-3: Preliminary Stability Assessment – Station West Landfill

Station West Landfill		
Feature	**Severity Rating**	**Extent**
Settlement	Acceptable	Occasional
Erosion	Acceptable	Occasional
Lateral Movement	Not Observed	None
Frost Action	Not Observed	None
Sloughing	Not Observed	None
Cracking	Acceptable	Occasional
Animal Burrows	Not Observed	None
Vegetation Establishment	Not Observed	None
Staining	Acceptable	Occasional
Vegetation Stress	Not Observed	None
Seepage / Ponded Water	Not Observed	None
Debris and/or Liner Exposure	Not Observed	None
Other	Acceptable (Uneven Surface) Acceptable (Equipment Tracks outside Landfill)	Isolated Isolated
Overall Landfill Performance	**Acceptable**	

Station West Landfill	
Performance / Severity Rating	**Description**
Acceptable	Noted features are of little consequence. The landfill is performing as designed. Minor deviations in environmental or physical performance may be observed, such as isolated areas of erosion, settlement.

Station West Landfill	
Performance / Severity Rating	**Description**
Marginal	Physical/environmental performance appears to be deteriorating with time. Observations may include an increase in size or number of features of note, such as differential settlement, erosion or cracking. No significant impact on landfill stability to date, but potential for failure is assessed as low or moderate.
Significant	Significant or potentially significant changes affecting landfill stability, such as significant changes in slope geometry, significant erosion or differential settlement; scarp development. The potential for failure is assessed as imminent.
Unacceptable	Stability of landfill is compromised to the extent that ability to contain waste materials is compromised. Examples may include: • Debris exposed in erosion channels or areas of differential settlement. • Liner exposed. • Slope failure.
Extent	**Description**
Isolated	Singular feature
Occasional	Features of note occurring at irregular intervals/locations
Numerous	Many features of note, impacted less than 50% of the surface area of the landfill
Extensive	Impacting greater than 50% of the surface area of the landfill

5.3.1.3 Photographic Records

The photographic record for the Station West Landfill has been completed as per Section 5.5 of the Terms of Reference and is included in the following page as Table 5-4. The Photographic Record only contains an index of photographs collected; full sized photographs are contained in the Appended CD/DVD-ROM. Selected photographs are shown in Table 5-5. Figure CAM-1.4A presents the photograph locations and directions.

Table 5-4: Photographic Records – Station West Landfill

Station West Landfill						
Photo Identification	**Figure ID**	**View Direction**	**Photo Location and Direction**	**Feature Identification**	**Feature of Note**	**Other Comments**
Sample Station Photographs						
C1-10-1	S10	N/A	Sample station C1-10	C1-10	C1-10	Close up of test pit

Station West Landfill						
Photo Identification	**Figure ID**	**View Direction**	**Photo Location and Direction**	**Feature Identification**	**Feature of Note**	**Other Comments**
C1-10-2	S10	NW	Sample station C1-10	C1-10	C1-10	Test pit location
C1-10-3	S10	NW	Sample station C1-10	C1-10	C1-10	C1-10 Backfilled
C1-11-1	S11	N/A	Sample station C1-11	C1-11	C1-11	Close up of test pit
C1-11-2	S11	N/A	Sample station C1-11	C1-11	C1-11	Test pit location
C1-11-3	S11	N/A	Sample station C1-11	C1-11	C1-11	C1-11 Backfilled
C1-12-1	S12	N/A	Sample station C1-12	C1-12	C1-12	Soil Type
C1-12-2	S12	E of SE	Sample station C1-12	C1-12	C1-12	Close up of test pit
C1-12-3	S12	E of SE	Sample station C1-12	C1-12	C1-12	C1-12 location
C1-13-1	S13	N/A	Sample station C1-13	C1-13	C1-13	Close up of test pit
C1-13-2	S13	SW	Sample station C1-13	C1-13	C1-13	Test pit location
C1-13-3	S13	N/A	Sample station C1-13	C1-13	C1-13	C1-13 Backfilled
Visual Inspection Photographs						
CAM-1 SW 1	1	W	View across east side of landfill cover	N/A	N/A	
CAM-1 SW 2	2	NW	East side of landfill	N/A	N/A	
CAM-1 SW 3	3	NW	Mostly infilled crack on east side of landfill	Cracking	I	
CAM-1 SW 4	4	SW	No photo taken			
CAM-1 SW 5	5	SE	Minor erosion, settlement and mostly infilled crack on east side of landfill	Erosion Settlement Cracking	D A I	
CAM-1 SW 6	6	SW	Minor erosion and settlement	Erosion Settlement	D A	

Station West Landfill						
Photo Identification	Figure ID	View Direction	Photo Location and Direction	Feature Identification	Feature of Note	Other Comments
			on east side of landfill			
CAM-1 SW 7	7	NE	Minor erosion and mostly infilled crack on east side of landfill	Erosion Cracking	D I	
CAM-1 SW 8	8	SE	Minor settlement and erosion on east side of landfill	Erosion Settlement	D A	
CAM-1 SW 9	9	NE	Linear depression and mostly infilled crack on northeast side of landfill	Settlement Cracking	A H	
CAM-1 SW 10	10	SW	Wide area of settlement and linear depression on northeast side of landfill	Settlement	E L	New feature (Feature L)
CAM-1 SW 11	11	SW	Wide area of settlement on northeast side of landfill	Settlement	L	New feature
CAM-1 SW 12	12	SE	Wide area of settlement on northeast side of landfill	Settlement	L	New feature
CAM-1 SW 13	13	W	North side slope of landfill	N/A	N/A	
CAM-1 SW 14	14	N	Small depressions on north side of landfill	Settlement	B M	New feature (Feature M)
CAM-1 SW 15	15	S	Staining of cover material on landfill	Staining	F	
CAM-1 SW 16	16	ESE	Staining of cover material on landfill	Staining	F	

Station West Landfill						
Photo Identification	Figure ID	View Direction	Photo Location and Direction	Feature Identification	Feature of Note	Other Comments
CAM-1 SW 17	17	E	Small depression on southeast landfill crest	Settlement	J	
CAM-1 SW 18	18	S	Staining of cover material on landfill	Staining	F	
CAM-1 SW 19	19	W	Partially infilled cracks on south side slope	Cracking	G	
CAM-1 SW 20	20	E	Partially infilled cracks on south side slope	Cracking	G	
CAM-1 SW 21	21	N	Partially infilled cracks on south side slope	Cracking	G	
CAM-1 SW 22	22	N	View of south side of landfill	N/A	N/A	
CAM-1 SW 23	23	SE	Minor depression on south side slope of landfill	Settlement	K	
CAM-1 SW 24	24	SE	Minor depression on south side slope of landfill	Settlement	K	
CAM-1 SW 25	25	SE	South side of landfill	N/A	N/A	
CAM-1 SW 26	26	NE	West side of landfill, uneven surface at southwest corner	Uneven Surface	C	
CAM-1 SW 27	27	W	Uneven surface at southwest corner	Uneven Surface	C	
CAM-1 SW 28	28	E	Staining of cover material at southwest corner of landfill	Staining	F	
CAM-1 SW 29	29	E	Settlement on west landfill crest	Settlement	B	
CAM-1 SW 30	30	S	West side of landfill	N/A	N/A	

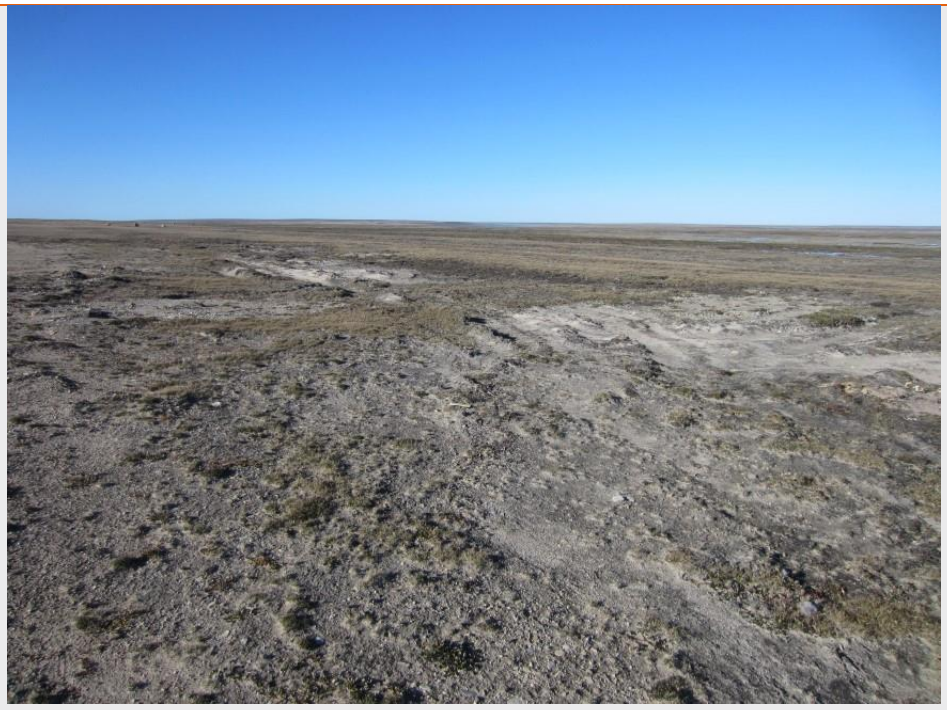
Station West Landfill						
Photo Identification	**Figure ID**	**View Direction**	**Photo Location and Direction**	**Feature Identification**	**Feature of Note**	**Other Comments**
CAM-1 SW 31	31	NE	North side of landfill	N/A	N/A	
CAM-1 SW 32	32	SW	Equipment tracks west of landfill	Equipment tracks	O	Previously identified, newly denoted as Feature O
CAM-1 SW 33	33	W	Minor settlement on northwest landfill cover	Settlement	N	New feature
CAM-1 SW 34	34	NW	Minor settlement on north landfill cover	Settlement	M	New feature
CAM-1 SW 35	35	W	View of entire landfill	N/A	N/A	

Table 5-5: Selected Photographs –Station West Landfill

Station West Landfill
Photograph CAM-1 SW 7: Minor erosion (Feature D) and mostly infilled crack (Feature I) on east side of landfill.
Photograph CAM-1 SW 11: Wide area of settlement (Feature L) on northeast side of landfill.

Station West Landfill

Photograph CAM-1 SW 20: Partially infilled cracks (Feature G) on south side slope.



Photograph CAM-1 SW 32: Equipment tracks west of landfill (Feature O).

Station West Landfill

Photograph CAM-1 SW 34: New minor settlement (Feature M) on north landfill cover.

Photograph CAM-1 SW 35: View of entire Station West Landfill from Tier II Disposal Facility.

5.3.1.4 Trend Analysis

A trend analysis was conducted with regards to observations made during the visual inspection of the Station West Landfill. The following Table 5-6 outlines the results of the visual trend analysis.

Table 5-6: Visual Inspection Trends - Station West Landfill

Station West Landfill		
Checklist Item	**Feature Number**	**Comparison with Historical Observations**
Settlement	A	No significant change.
	B	No significant change.
	E	No significant change.
	J	No significant change.
	K	No significant change.
	L	New observation in 2016.
	M	New observation in 2016.
	N	New observation in 2016.
Erosion	D	No significant change.
Cracking	G	Observed tension cracks have decreased in length due to infilling.
	H	Tension crack had completed infilled in 2014 but has reappeared in 2016.
	I	Observed tension cracks have decreased in length due to infilling.
Staining	F	No significant change.
Other Features	C (Uneven Side Slope)	No significant change.
	O (Equipment Tracks)	Newly identified in 2016, however it is likely this feature was created during the remedial works and has undergone little change since then.

5.3.1.5 Discussion of Results/Trends

A comparison of the visual inspection results of the 2014 and 2016 monitoring events at the Station West Landfill indicates that previously observed settlement, erosion and staining features have not undergone any significant change. An uneven side slope and equipment tracks observed outside of the landfill have also not undergone any significant change. Three new minor settlement features were observed in 2016. One tension crack feature which was previously reported to be completely infilled in 2014 has reappeared in 2016. Two other tension crack features have been partially infilled and have decreased in length between 2014 and 2016. These results and trends are not affecting the stability of the landfill at the present time.

5.3.2 Soil Sampling

Soil sampling of the Station West Landfill was conducted on August 10, 2016. The soil sampling was conducted in compliance with Section 5.3.1 and 5.3.2 of the Terms of Reference and details are provided below in the following Sections 5.3.2.1 through 5.3.2.3.

5.3.2.1 Laboratory Analytical Results

A total of eight soil samples were analysed from four soil sample locations at the Station West Landfill. Table 5-7 and 5-8 present the soil analytical results. Figure CAM-1.4B presents a summary of significant soil analytical results.

Table 5-7: Soil Chemical Analysis Results – Station West Landfill

Station West Landfill																	
Sample ID	**Sampling Station**	**Monitoring Year**	**Depth**	**Cu**	**Ni**	**Co**	**Cd**	**Pb**	**Zn**	**Cr**	**As**	**Hg**	**Total PCB**	**F1 C6-C10**	**F2 C10-C16**	**F3 C16-C34**	**Modified TPH Total C6-C34**
Comparison Values																	
Background				11	4.7	3.1	0.50	7	12	12	3.6	NS	0.042				NS
Baseline				**5.1**	**5.0**	**5.0**	**1.0**	**10**	**15**	**20**	**1.0**	**0.10**	**0.10**				**43**
Baseline +3 Standard Deviations				17	8.7	6.7	1.0	31	38	23	17	3.9	0.15				150
Upgradient																	
C1-10 Surface																	
10-16595	C1-10	2010	0-10	<3.0	<5.0	<5.0	<1.0	<10	<15	<20	**1.4**	<0.10	<0.0030	<10	5.7	81	**92**
C112-10A	C1-10	2012	0-15	<5.0	1.1	<1.0	<0.10	2.6	<10	1.4	**1.8**	<0.050	<0.010	<12	<10	11	22
C114-10A	C1-10	2014	0-15	1.8	1.1	0.5	0.02	<4.9	4.0	1.4	0.7	<0.01	<0.1	<10	<50	<50	**55**
16-C1-10A	C1-10	2016	0-15	1.4	<1.0	<0.50	<0.050	2	<10	1.4	<1.0	<0.050	<0.010	<12	<10	<50	36
C1-10 Depth																	
10-16597	C1-10	2010	30-50	3.4	<5.0	<5.0	<1.0	<10	<15	<20	**4.2**	<0.10	<0.0030	<10	5.8	21	32
C112-10B	C1-10	2012	40-50	<5.0	2.0	1.0	<0.10	5.9	<10	2.3	**4.7**	<0.050	<0.010	<12	<10	<10	16
C114-10B	C1-10	2014	40-50	**5.9**	2.9	2.6	0.03	**13**	5.0	4.2	**7.9**	<0.01	<0.1	<10	<50	<50	**55**
16-C1-10B	C1-10	2016	25-30	3.3	2.3	1.3	<0.050	9.6	<10	4.2	**4.6**	<0.050	<0.010	<12	<10	<50	36
Downgradient																	
C1-11 Surface																	
10-16599	C1-11	2010	0-10	<5.0	<5.0	<5.0	<1.0	<10	<15	<20	<1.0	<0.10	<0.0030	<10	5.6	29	40
C112-11A	C1-11	2012	0-15	<5.0	1.4	<1.0	<0.10	<1.0	<10	1.2	<1.0	<0.050	<0.010	<12	<10	<10	16
C114-11A	C1-11	2014	0-15	3.0	1.1	0.3	<0.01	<5.0	2.0	1.2	0.4	<0.01	<0.1	<10	<50	<50	**55**
16-C1-11A	C1-11	2016	0-15	1.2	1	<0.50	<0.050	0.71	<10	1.8	<1.0	<0.050	<0.01	<12	<10	<50	36
C1-11 Depth																	
10-16601	C1-11	2010	30-50	<3.0	<5.0	<5.0	<1.0	<10	<15	<20	<1.0	<0.10	<0.0030	<10	6.0	11	22
C112-11B	C1-11	2012	40-50	<5.0	1.9	<1.0	<0.10	1.4	<10	2.8	<1.0	<0.050	<0.010	<12	<10	<10	16
C114-11B	C1-11	2014	40-50	1.1	1.1	0.5	<0.01	<4.9	2.0	1.9	0.9	<0.01	<0.1	<10	<50	<50	**55**
16-C1-11B	C1-11	2016	40-50	<1.0	<1.0	<0.50	<0.050	0.86	<10	1.6	<1.0	<0.050	<0.01	<12	<10	<50	36
C1-12 Surface																	
10-16603	C1-12	2010	0-10	<3.0	<5.0	<5.0	<1.0	<10	<15	<20	<1.0	<0.10	<0.0030	<10	5.5	16	27

Station West Landfill																	
Sample ID	Sampling Station	Monitoring Year	Depth	Cu	Ni	Co	Cd	Pb	Zn	Cr	As	Hg	Total PCB	F1 C6-C10	F2 C10-C16	F3 C16-C34	Modified TPH Total C6-C34
C112-12A	C1-12	2012	0-15	<5.0	<1.0	<1.0	<0.10	1.4	<10	1.3	<1.0	<0.050	<0.010	<12	<10	<10	16
C114-12A	C1-12	2014	0-15	1.5	0.9	0.4	<0.01	<4.9	2.0	1.5	0.3	<0.01	<0.1	<10	<50	<50	**55**
16-C1-12A	C1-12	2016	0-15	1	<1.0	<0.50	<0.050	<0.50	<10	<1.0	<1.0	<0.050	<0.010	<12	<10	<50	36
C1-12 Depth																	
10-16605/06	C1-12	2010	30-50	<3.0	<5.0	<5.0	<1.0	<10	<15	<20	<1.0	<0.10	<0.0030	<10	5.7	16	27
C112-12B	C1-12	2012	40-50	<5.0	1.7	<1.0	<0.10	1.1	<10	2.6	<1.0	<0.050	<0.010	<12	<10	<10	16
C114-12B	C1-12	2014	40-50	1.3	1.4	0.8	<0.01	<5.0	3.0	2.2	0.6	<0.01	<0.1	<10	<50	<50	**55**
16-C1-12B	C1-12	2016	40-50	1.3	1.5	0.59	<0.050	1.2	<10	2.6	<1.0	<0.050	<0.010	<12	<10	<50	36
C1-13 Surface																	
10-16607	C1-13	2010	0-10	<3.0	<5.0	<5.0	<1.0	<10	<15	<20	<1.0	<0.10	<0.0030	<10	5.6	17	28
C112-13A	C1-13	2012	0-15	<5.0	1.1	<1.0	<0.10	1.4	<10	2.0	<1.0	<0.050	<0.010	<12	<10	<10	16
C114-13A	C1-13	2014	0-15	1.4	1.6	0.8	<0.01	<4.9	3.0	2.6	0.9	<0.01	<0.1	<10	<50	<50	**55**
16-C1-13A	C1-13	2016	0-15	1.2	1.3	0.62	<0.050	1.5	<10	2.2	<1.0	<0.050	<0.010	<12	<10	<50	36
C1-13 Depth																	
10-16609	C1-13	2010	30-50	<3.0	<5.0	<5.0	<1.0	<10	<15	<20	<1.0	<0.10	<0.0030	<10	4.5	12	22
C112-13B	C1-13	2012	40-50	<5.0	<1.0	<1.0	<0.10	1.4	<10	1.6	<1.0	<0.050	<0.010	<12	<10	<10	16
C114-13B	C1-13	2014	40-50	1.5	1.6	0.9	<0.01	<4.9	3.0	3.6	**1.1**	<0.01	<0.1	<10	<50	<50	**55**
16-C1-13B	C1-13	2016	30-40	1.2	1.1	0.6	<0.050	2.1	<10	1.8	**1.2**	<0.050	<0.010	<12	<10	<50	36

Notes:

XX	sample exceeds background
XX	**sample exceeds baseline**
XX	*sample exceeds baseline +3 standard deviations*

**** All units in mg/kg**

Table 5-8: PHC F4 Soil Chemical Analysis Results – Station West Landfill

Sample Location	Sample ID	Sample Depth (m bgs)	PHC F4 (mg/kg)
C1-10	16-C1-10A	0 - 0.15	<50
	16-C1-10B	0.25 – 0.3	<50
C1-11	16-C1-11A	0 - 0.15	<50
	16-C1-11B	0.4 – 0.5	<50
C1-12	16-C1-12A	0 - 0.15	<50
	16-C1-12B	0.4 – 0.5	<50
C1-13	16-C1-13A	0 - 0.15	<50
	16-C1-13B	0.3 – 0.4	<50

5.3.2.2 Discussion of Results – Comparison to Baseline/Background

Analytical results were compared against baseline data, and background concentrations. The following Table 5-9 summarizes the comparison of results.

Table 5-9: Evaluation of Results by Parameter – Station West Landfill

Station West Landill	
Parameter	Discussion of Results
Copper (Cu)	All soil samples reported either non-detect concentrations or were below both background and baseline concentrations for Cu.
Nickel (Ni)	All soil samples reported either non-detect concentrations or were below both background and baseline concentrations for Ni.
Cobalt (Co)	All soil samples reported either non-detect concentrations or were below both background and baseline concentrations for Co.
Cadmium (Cd)	All soil samples reported all non-detect concentrations.
Lead (Pb)	All soil samples reported either non-detect concentrations or were below both background and baseline concentrations for Pb, with the exception to sample station C1-10 depth which reported a concentration of 9.6. mg/kg exceeding the background concentration of 7 mg/kg.
Zinc (Zn)	All soil samples reported non-detect concentrations for Zn.
Chromium (Cr)	All soil samples reported either non-detect concentrations or were below both background and baseline concentrations for Cr.
Arsenic (As)	As exceeded the baseline concentration of 1.0 mg/kg at sample stations C1-10 depth and C1-13 depth with reported concentrations of 4.6 mg/kg and 1.2 mg/kg respectively. Sample station C1-10 depth also exceeded the background concentration of 3.6 mg/kg.
Mercury (Hg)	All soil samples reported non-detect concentrations for Hg.
PCBs (Total)	All soil samples reported non-detect concentrations for PCBs.
Modified TPH (C_6-C_{34})	All soil samples reported concentrations of modified TPH below baseline concentrations.

5.3.2.3 Soil Trend Analysis by Parameter & Discussion of Trends

A soil chemistry trend analysis was conducted based on the current and historical analytical results collected at the site. A Series of graphs were generated including a visual comparison to background, baseline and historical concentrations using differentiating colours (See Appendix E3). The following Table 5-10 provides a summary of soil trend analysis findings and presents a discussion of the observed trends by parameter.

Table 5-10: Discussion of Trends – Station West Landfill

Station West Landfill	
Parameter	**Discussion of Trends**
Copper (Cu)	Based on current and historical results, it appears that Cu concentrations are decreasing with time. All soil sampling stations reported decreases in Cu concentrations from previous monitoring events.
Nickel (Ni)	Based on current and historical results, it appears that Ni has no observable trend. Minor fluctuations in Ni concentrations with a trend towards decreasing concentrations were observed.
Cobalt (Co)	Based on current and historical results, it appears that Co has no observable trend and/or is trending downward in concentration across the landfill site.
Cadmium (Cd)	Based on all non-detect concentrations, Cd has no observable trend.
Lead (Pb)	Based on current and historical results, it appears that Pb has no observable trend, with fluctuations in concentrations noted across the site. Further monitoring data is required to establish a trend.
Zinc (Zn)	Based on either non-detect concentrations or concentrations below the comparison values, Zn has no observable trend.
Chromium (Cr)	Based on current and historical results, it appears that Cr has no observable trend, with only minor fluctuations in concentrations reported.
Arsenic (As)	Based on current and historical results, As has reported concentrations in the same range at each sampling station and has no observable trend.
Mercury (Hg)	Based on all non-detect concentrations, Hg has no observable trend.
PCBs (Total)	Based on all non-detect concentrations, PCBs has no observable trend.
Modified TPH (C_6-C_{34})	Based on current and historical results, Modified TPH concentrations had no observable trend.

Trend analyses presented are based on the data available at the time of the investigation and any interpreted increasing or decreasing trends may be a result of natural variation in the data due to analytical methods. There is currently insufficient information to establish reliable trends; therefore, additional data points are required to be able to confidently determine if trends are present.

5.3.3 Groundwater Sampling

No groundwater monitoring wells are present at the Station West Landfill; therefore, no groundwater sampling or analysis was conducted.

5.3.4 Thermal Monitoring

No thermistors are present at the Station West Landfill; therefore, no thermal monitoring was conducted.

5.4 Conclusions and Overall Landfill Performance

Based on the results of the 2016 monitoring program, the overall performance of the Station West Landfill is acceptable.

5.5 Recommendations and Conclusions

Based on review and analysis of chemical data, it appears that the soil concentrations for the parameters tested had no observable trend with no obvious soil concentration increases over time. Based on this review, it is recommended to continue the long term monitoring of soils as planned.

Based on the results of the visual inspection, the landfill performance is acceptable. No remedial work or deviations from the monitoring plan are recommended at this time.

6 CAM-1: NON-HAZARDOUS WASTE LANDFILL

6.1 Landfill Description

The CAM-1 Non-Hazardous Waste Landfill is located in the Station Area, immediately north of the intersection between the main access road between the Beach Area and Station area and the road heading northwest from the Station Area. The landfill was constructed to contain the non-hazardous waste generated from the demolition, from the removal of surface debris and the Tier I and Type A hydrocarbon (lubricating oil and greases) contaminated soil.

The design of this landfill includes compacted perimeter berms, and placement of a cover of compacted granular fill over the landfilled material. Groundwater monitoring wells were installed at the landfill perimeter.

The long term monitoring plan for the Non-Hazardous Waste Landfill consists of visual inspection, and the periodic collection of soil and groundwater samples.

The landfill layout, visual observations and photographic locations are presented on Figure CAM-1.5A and soil analytical results are presented on Figure CAM-1.5B in the figures section.

6.2 Summary of Work Conducted

6.2.1 Visual Inspection

A visual inspection was conducted on the Non-Hazardous Waste Landfill on August 10, 2016. The visual inspection of the landfill was completed with no deviations from the visual inspection work plan.

6.2.2 Soil Sampling

Soil sampling at the Non-Hazardous Waste Landfill was conducted on August 10, 2016 and consisted of the collection of seven soil samples from four soil sample stations (MW-1, MW-2, MW-3, and MW-4). Depth limitations were encountered at soil sampling stations MW-2 with refusal at 0.2 m bgs and MW-3 with refusal on cobbles at 0.35 m bgs. Due to shallow refusal, no depth sample was collected at sample station MW-2.

The following Table 6-1 outlines the soil sampling activities conducted at the Non-Hazardous Waste Landfill.

Table 6-1: Summary of Work Conducted by Soil Sampling Location

Non-Hazardous Waste Landfill			
Sample Location	**Sample ID**	**Sample Depth (m bgs)**	**Notes**
MW-1	16-C1-MW01A	0 - 0.15	Soil samples were collected approximately 3 m away from metal debris that is piled near the monitoring well.
	16-C1-MW01B	0.4 - 0.5	
MW-2	16-C1-MW02A	0 - 0.15	Refusal at 0.2 mbgs - boulders
	No Sample	No Sample	
MW-3	16-C1-MW03A	0 - 0.15	Refusal on cobbles
	16-C1-MW03B	0.3-0.35	
MW-4	16-C1-MW04A	0 - 0.15	
	16-C1-MW04B	0.4 – 0.5	

6.2.3 Groundwater Sampling

Groundwater monitoring at the Non-Hazardous Waste Landfill was conducted on August 10, 2016 and consisted of the inspection and groundwater monitoring of four monitoring wells (MW-1, MW-2, MW-3, and MW-4). One well, MW-1, was observed to be dry. Two wells, MW-2 and MW-4, contained water; however, once pumped dry did not recover and no samples were collected. Monitoring well MW-3 contained water and a groundwater sample was collected for analysis. Monitoring well sampling logs are presented in Section 0.

The following Table 6-2 outlines the groundwater sampling activities conducted at the Non-Hazardous Waste Landfill.

Table 6-2: Summary of Work Conducted by Monitoring Well

Non-Hazardous Waste Landfill		
Monitoring Well ID	**Observations**	**# of Groundwater Samples Collected**
MW-1	Excellent condition – Dry. A small amount of metal debris is piled on the rocks and ground approximately 2 m southeast of the well.	0
MW-2	Excellent condition. Pumped dry, no recharge, limited water	0
MW-3	Excellent condition	1
MW-4	Excellent condition – limited water. Pumped dry – no recharge	0

6.2.4 Thermal Monitoring

No thermistors are present at the Non-Hazardous Waste Landfill.

6.3 Results of the Monitoring Program

The following Sections 6.3.1 through 6.3.4 summarize the results of the CAM-1 monitoring program at the Non-Hazardous Waste Landfill.

6.3.1 Visual Inspection

The visual inspection of the Non-Hazardous Waste Landfill was conducted on August 10, 2016. The visual inspection was conducted in compliance with Section 5.2 of the Terms of Reference and details are provided below in the following Sections 6.3.1.1 through 6.3.1.5. Figure CAM-1.5A presents the visual inspection findings and photographic locations.

6.3.1.1 Inspection Checklist

The visual inspection was completed as per the Terms of Reference and the visual inspection checklist is included as Table 6-3 of this report below.

Table 6-3: Visual Inspection Checklist – Non-Hazardous Waste Landfill

SITE NAME: **CAM-1 Jenny Lind Island**

LANDFILL DESIGNATION: Non-Hazardous Waste Landfill
LANDFILL TYPE: Non-Hazardous Waste Landfill
DATE OF INSPECTION: August 10, 2016
WEATHER CONDITIONS: 10ºC, sunny
DATE OF PREVIOUS INSPECTION: August 27, 2014
INSPECTED BY: Stephen Borcsok
REPORT PREPARED BY: Stephen Borcsok and Ryan Fletcher

The preparer represents to the best of the preparer's knowledge, the following statements and observations are true and correct and to the best of the preparer's actual knowledge, no material facts have been suppressed or misstated.

Non-Hazardous Waste Landfill												
Checklist Item	**Present (Yes/No)**	**Feature Number**	**Feature Location**	**GPS Coordinates Easting/Northing/Zone**	**Length (m)**	**Width (m)**	**Depth (m)**	**Extent Relative to Landfill Surface**	**Description**	**Comparison with Historical Observations**	**Additional Comments/ Severity Rating**	**Photographic Records (photo reference, location, view point & direction, feature of note, scale)**
Settlement	Yes	A	Southwest cover	389262.85 / 7620918.739 389255.02 / 7620924.899	14	0.4-0.6	0.15-0.2	0.05	<1%	Linear depressions – two locations	First observed in Year 3 (2012). Cover appears stable. NSC.	Severity Rating – Acceptable (feature is minor and not affecting landfill stability)	CAM-1 NH 3, 4, 5
Settlement	Yes	C	North corner slope	389280.05 / 7620990.523	14	1	0.4	0.05	<1%	Linear depression	First observed in Year 5 (2014). Side slope appears stable. NSC.	Severity Rating - Acceptable (feature is minor and not affecting landfill stability)	CAM-1 NH 20, 21
Settlement	Yes	D	Northwest side slope	Coordinates not recorded.	14	1	0.2	0.1	<1%	Linear depression	First observed in Year 5 (2012). Side slope appears stable. NSC.	Severity Rating - Acceptable (feature is minor and not affecting landfill stability)	CAM-1 NH 25
Settlement	Yes	F	West side of cover	389265.71 / 7620919.062	14	0.3	0.2	0.1	<1%	Minor pothole depression	New observation in 2016.	Severity Rating - Acceptable (feature is minor and not affecting landfill stability)	CAM-1 NH 28, 29
Erosion	No												
Lateral Movement	No												
Frost Action	No												
Sloughing	No												
Cracking	No												
Animal Burrows	No												
Vegetation Establishment	No												
Staining	No												
Vegetation Stress	No												
Seepage Points (or) Ponded Water	No												
Debris and/or Liner Exposed	Yes	B	North, east, west side of cover	389245.90 / 7620934.927 389240.29 / 7620938.948 389257.01 / 7620944.271 389295.49 / 7620952.377 389318.49 / 7620937.639	14	0.1 – 0.3	0.1 – 0.2	N/A	<1%	Exposed geotextile material – five locations	First observed in Year 1 (2010). No significant change from 2014.	Severity Rating - Acceptable (features are minor and not affecting integrity of landfill cover)	CAM-1 NH 6, 7, 10, 11,12, 13, 14, 15
Debris and/or Liner Exposed	Yes	E	West side of cover	389265.586 / 620941.051	14	0.3	0.1	N/A	<1%	Exposed metal debris – one location	New observation in 2016.	Severity Rating – Acceptable (feature is minor and not affecting integrity of landfill cover)	CAM-1 NH 26, 27

Non-Hazardous Waste Landfill												
Checklist Item	**Present (Yes/No)**	**Feature Number**	**Feature Location**	**GPS Coordinates Easting/Northing/Zone**	**Length (m)**	**Width (m)**	**Depth (m)**	**Extent Relative to Landfill Surface**	**Description**	**Comparison with Historical Observations**	**Additional Comments/ Severity Rating**	**Photographic Records (photo reference, location, view point & direction, feature of note, scale)**
Presence & Condition of Monitoring Instruments	Yes	N/A	Outside landfill	N/A	N/A	N/A	N/A	N/A	MW-01, MW-02, MW-03, MW-04	Monitoring wells appear to be in good condition. Small amounts of metal debris are piled on boulders and the ground approximately 3 m southeast of MW-1 (also noted in 2013 and 2014).	Severity Rating - Acceptable	CAM-1 NH 1, 24
Features of Note/Other Relevant Observations (e.g., signs of activity, ruts…)	No											

6.3.1.2 Stability Assessment

The Preliminary Stability Assessment for the Non-Hazardous Waste Landfill was conducted on August 10, 2016 as per the Terms of Reference and the results are provided below in Table 6-4.

Table 6-4: Preliminary Stability Assessment – Non-Hazardous Waste Landfill

Non-Hazardous Waste Landfill		
Feature	**Severity Rating**	**Extent**
Settlement	Acceptable	Occasional
Erosion	Not Observed	None
Lateral Movement	Not Observed	None
Frost Action	Not Observed	None
Sloughing	Not Observed	None
Cracking	Not Observed	None
Animal Burrows	Not Observed	None
Vegetation Establishment	Not Observed	None
Staining	Not Observed	None
Vegetation Stress	Not Observed	None
Seepage / Ponded Water	Not Observed	None
Debris and/or Liner Exposure	Acceptable	Occasional
Other	Not Observed	None
Overall Landfill Performance	**Acceptable**	

Non-Hazardous Waste Landfill	
Performance / Severity Rating	**Description**
Acceptable	Noted features are of little consequence. The landfill is performing as designed. Minor deviations in environmental or physical performance may be observed, such as isolated areas of erosion, settlement.
Marginal	Physical/environmental performance appears to be deteriorating with time. Observations may include an increase in size or number of features of note,

Non-Hazardous Waste Landfill	
Performance / Severity Rating	**Description**
	such as differential settlement, erosion or cracking. No significant impact on landfill stability to date, but potential for failure is assessed as low or moderate.
Significant	Significant or potentially significant changes affecting landfill stability, such as significant changes in slope geometry, significant erosion or differential settlement; scarp development. The potential for failure is assessed as imminent.
Unacceptable	Stability of landfill is compromised to the extent that ability to contain waste materials is compromised. Examples may include: • Debris exposed in erosion channels or areas of differential settlement. • Liner exposed. • Slope failure.
Extent	**Description**
Isolated	Singular feature
Occasional	Features of note occurring at irregular intervals/locations
Numerous	Many features of note, impacted less than 50% of the surface area of the landfill
Extensive	Impacting greater than 50% of the surface area of the landfill

6.3.1.3 Photographic Records

The photographic record for the Non-Hazardous Waste Landfill has been completed as per Section 5.5 of the Terms of Reference and is included in the following page as Table 6-5. The Photographic Record only contains an index of photographs collected; full sized photographs are contained in the Appended CD/DVD-ROM. Selected photographs are shown in Table 6-6. Figure CAM-1.5A presents the photograph locations and directions.

Table 6-5: Photographic Records – Non-Hazardous Waste Landfill

Non-Hazardous Waste Landfill						
Photo Identification	**Figure ID**	**View Direction**	**Photo Location**	**Feature Identification**	**Feature of Note**	**Other Comments**
Sample Station Photographs						
C1-MW1-1	SM1	N/A	Sample station MW-1	MW-1 soil	MW-1	Close up of test pit
C1-MW1-2	SM1	N	Sample station MW-1	MW-1 soil	MW-1	Test pit location
C1-MW1-3	SM1	N	Sample station MW-1	MW-1 soil	MW-1	MW01 Backfilled

Non-Hazardous Waste Landfill						
Photo Identification	**Figure ID**	**View Direction**	**Photo Location**	**Feature Identification**	**Feature of Note**	**Other Comments**
C1-MW2-1	SM2	N/A	Sample station MW-2	MW-2 soil	MW-2	Close up of test pit
C1-MW2-2	SM2	SW	Sample station MW-2	MW-2 soil	MW-2	Test pit location
C1-MW2-3	SM2	N/A	Sample station MW-2	MW-2 soil	MW-2	MW02 Backfilled
C1-MW3-1	SM3	N/A	Sample station MW-3	MW-3 soil	MW-3	Close up of test pit
C1-MW3-2	SM3	N/A	Sample station MW-3	MW-3 soil	MW-3	MW03 Backfilled
C1-MW4-1	SM4	N/A	Sample station MW-4	MW-4 soil	MW-4	Close up of test pit
C1-MW4-2	SM4	SW	Sample station MW-4	MW-4 soil	MW-4	Test pit location
C1-MW4-3	SM4	N/A	Sample station MW-4	MW-4 soil	MW-4	MW04 Backfilled
Sampling Instruments						
MW1A	SM1	N	MW-1	MW-1	MW-1	Well casing
MW1B	SM1	N/A	MW-1	MW-1	MW-1	Inside well casing
MW2A	SM2	N	MW-2	MW-2	MW-2	Well casing
MW2B	SM2	SW	MW-2	MW-2	MW-2	Well location
MW2C	SM2	N/A	MW-2	MW-2	MW-2	Inside well casing
MW3A	SM3	N/A	MW-3	MW-3	MW-3	Well casing
MW3B	SM3	N/A	MW-3	MW-3	MW-3	Inside well casing
MW3C	SM3	SW	MW-3	MW-3	MW-3	Well location
MW4A	SM4	SE	MW-4	MW-4	MW-4	Well casing
MW4B	SM4	SE	MW-4	MW-4	MW-4	Well location
MW4C	SM4	N/A	MW-4	MW-4	MW-4	Inside well casing
Visual Inspection Photographs						
CAM-1 NH 1	1	N	Monitoring well MW-1 with metal debris piled nearby	N/A	N/A	
CAM-1 NH 2	2	N	View across landfill cover from south corner	N/A	N/A	
CAM-1 NH 3	3	NW	Linear depression on west landfill cover	Settlement	A	
CAM-1 NH 4	4	SE	Linear depression on west landfill cover	Settlement	A	
CAM-1 NH 5	5	NW	Linear depression on west landfill cover	Settlement	A	
CAM-1 NH 6	6	SE	Exposed geotextile debris on northwest cover	Debris Exposed	B	

Non-Hazardous Waste Landfill						
Photo Identification	**Figure ID**	**View Direction**	**Photo Location**	**Feature Identification**	**Feature of Note**	**Other Comments**
CAM-1 NH 7	7	NW	Exposed geotextile debris on northwest cover	Debris Exposed	B	
CAM-1 NH 8	8	E	View across landfill cover from west corner	N/A	N/A	
CAM-1 NH 9	9	NE	Northwest side slope of landfill	N/A	N/A	
CAM-1 NH 10	10	SW	Exposed geotextile debris on northwest cover	Debris Exposed	B	
CAM-1 NH 11	11	SE	Exposed geotextile debris on northwest cover	Debris Exposed	B	
CAM-1 NH 12	12	NW	Exposed geotextile debris on north cover	Debris Exposed	B	
CAM-1 NH 13	13	S	Exposed geotextile debris on north cover	Debris Exposed	B	
CAM-1 NH 14	14	NW	Exposed geotextile debris on northeast cover	Debris Exposed	B	
CAM-1 NH 15	15	SW	Exposed geotextile debris on northeast cover	Debris Exposed	B	
CAM-1 NH 16	16	W	View across landfill cover from east corner	N/A	N/A	
CAM-1 NH 17	17	NW	Northeast side slope of landfill	N/A	N/A	
CAM-1 NH 18	18	SW	Southeast side slope of landfill	N/A	N/A	
CAM-1 NH 19	19	S	View across landfill cover from north corner	N/A	N/A	
CAM-1 NH 20	20	S	Minor settlement on north landfill corner side slope	Settlement	C	
CAM-1 NH 21	21	N	Minor settlement on north landfill corner side slope	Settlement	C	

Non-Hazardous Waste Landfill						
Photo Identification	**Figure ID**	**View Direction**	**Photo Location**	**Feature Identification**	**Feature of Note**	**Other Comments**
CAM-1 NH 22	22	SW	Northwest side slope of landfill	N/A	N/A	
CAM-1 NH 23	23	SE	Northeast side slope of landfill	N/A	N/A	
CAM-1 NH 24	24	S	Monitoring well MW-4	N/A	N/A	
CAM-1 NH 25	25	SW	Linear depression below northwest landfill crest	Settlement	D	
CAM-1 NH 26	26	W	Exposed metal debris on central landfill cover	Debris Exposed	E	New feature
CAM-1 NH 27	27	S	Exposed metal debris on central landfill cover	Debris Exposed	E	New feature
CAM-1 NH 28	28	NW	Minor depression on south cover	Settlement	F	New feature
CAM-1 NH 29	29	S	Minor depression on south cover	Settlement	F	New feature

Table 6-6: Selected Photographs –Non-Hazardous Waste Landfill

Non-Hazardous Waste Landfill
Photograph CAM-1 NH 1: Monitoring well MW-1 with metal debris piled nearby.
Photograph CAM-1 NH 15: Exposed geotextile debris (Feature B) on northeast cover. Typical of multiple instances of exposed geotextile debris on landfill cover.

Non-Hazardous Waste Landfill

Photograph CAM-1 NH 26: New exposed metal debris (Feature E) on central landfill cover.

Photograph CAM-1 NH 29: New settlement feature (Feature F) on south landfill cover.

6.3.1.4 Trend Analysis

A trend analysis was conducted with regards to observations made during the visual inspection of the Non-Hazardous Waste Landfill. The following Table 6-7 outlines the results of the visual trend analysis.

Table 6-7: Visual Inspection Trends - Non-Hazardous Waste Landfill

Non-Hazardous Waste Landfill		
Checklist Item	**Feature Number**	**Comparison with Historical Observations**
Settlement	A	No significant change.
	C	No significant change.
	D	No significant change.
	F	New observation in 2016.
Debris Exposed	B	No significant change.
	E	New observation in 2016.

6.3.1.5 Discussion of Results/Trends

A comparison of the visual inspection results of the 2014 and 2016 monitoring events at the Non-Hazardous Waste Landfill indicates that previously observed minor settlement and exposed debris features have not undergone any significant change. One new minor settlement feature and one new minor exposed debris feature were observed in 2016. These minor features do not represent a concern to the stability of the landfill. The results of the visual inspection indicate the performance of the Non-Hazardous Waste Landfill is acceptable.

6.3.2 Soil Sampling

Soil sampling of the Non-Hazardous Waste Landfill was conducted on August 10, 2016. The soil sampling was conducted in compliance with Section 5.3.1 and 5.3.2 of the Terms of Reference and details are provided below in the following Sections 6.3.2.1 through 6.3.2.3.

6.3.2.1 Laboratory Analytical Results

A total of seven soil samples were analysed from four soil sample locations at the Non-Hazardous Waste Landfill. Table 6-8 and 6-9 present the soil analytical results. Figure CAM-1.5B presents a summary of significant soil analytical results.

Table 6-8: Soil Chemical Analysis Results – Non-Hazardous Waste Landfill

Non-Hazardous Waste Landfill																	
Sample ID	**Sampling Station**	**Monitoring Year**	**Depth**	**Cu**	**Ni**	**Co**	**Cd**	**Pb**	**Zn**	**Cr**	**As**	**Hg**	**Total PCB**	**F1 C6-C10**	**F2 C10-C16**	**F3 C16-C34**	**Modified TPH Total C6-C34**
Comparison Values																	
Background				11	4.7	3.1	0.50	7	12	12	3.6	NS	0.04				NS
Baseline				**5.7**	**5.0**	**5.0**	**1.00**	**18**	**15**	**20**	**7.2**	**0.10**	**0.10**				**34**
Baseline +3 Standard Deviations				15	5	5	1	76	34	20	31	0	2				123
BMW-1 Surface																	
10-16579/80	BMW-1	2010	0-10	3.0	<5.0	<5.0	<1.0	<10	<15	<20	1.0	<0.10	0.041	<10	6.7	50	**62**
C112-1WA	BMW-1	2012	0-15	<5.0	1.7	1.0	0.11	10	<10	2.9	3.9	<0.050	0.039	<12	<10	31	**42**
C114-1WA	BMW-1	2014	0-15	2.0	1.4	1.0	<0.01	<4.9	3.0	3.1	0.7	<0.01	<0.1	<10	<50	<50	**55**
16-C1-MW01A	BMW-1	2016	0-15	2.2	2	1	<0.050	3	<10	2.9	1.0	<0.050	<0.010	<12	<10	<50	**36**
BMW-1 Depth																	
10-16581/82	BMW-1	2010	30-50	4.3	<5.0	<5.0	<1.0	<10	<15	<20	2.1	<0.10	0.088	<10	7.5	76	**89**
C112-1WB	BMW-1	2012	40-50	<5.0	2.7	1.2	<0.10	10	<10	3.3	4.8	<0.050	0.025	<12	<10	28	**39**
C114-1WB	BMW-1	2014	40-50	1.8	1.4	0.9	<0.01	<5.0	3.0	2.3	0.8	<0.01	<0.1	<10	<50	<50	**55**
16-C1-MW01B	BMW-1	2016	40-50	3.1	2.2	1.1	0.082	**34**	**17**	3.6	1.7	<0.050	0.077	<12	<10	<50	**36**
Downgradient																	
MW-2 Surface																	
10-16583/84	MW-2	2010	0-10	<3.0	<5.0	<5.0	<1.0	17	<15	<20	3.1	<0.10	<0.0030	<10	<4.0	37	**44**
C112-WA	MW-2	2012	0-15	<5.0	1.6	<1.0	<0.10	11	1.6	2.3	4.0	<0.050	<0.010	<12	<10	<10	16
C114-2WA	MW-2	2014	0-15	3.2	1.3	1.6	0.05	**33**	3.0	2.4	**8.8**	<0.01	<0.1	<10	<50	<50	**55**
16-C1-MW02A	MW-2	2016	0-15	2.6	1.6	0.85	<0.050	**29**	<10	2.0	**11.0**	<0.050	<0.010	<12	<10	<50	**36**
MW-2 Depth																	
10-16585/86	MW-2	2010	30-50	3.1	<5.0	<5.0	<1.0	**23**	<15	<20	**7.7**	<0.10	<0.0030	<10	5.3	16	26
C112-2WB	MW-2	2012	40-50	<5.0	1.4	<1.0	<0.10	16	<10	1.8	5.4	<0.050	<0.010	<12	<10	<10	16
C114-2WB	MW-2	2014	40-50	**6.7**	3.2	2.8	0.08	**159**	3.0	6.3	***44***	<0.01	<0.1	<10	<50	<50	**55**
No sample. Refusal at 0.2m	MW-2	2016															
MW-3 Surface																	
10-16587/88	MW-3	2010	0-10	<3.0	<5.0	<5.0	<1.0	<10	<15	<20	1.4	<0.10	<0.0030	<10	5.4	20	30

Non-Hazardous Waste Landfill																	
Sample ID	**Sampling Station**	**Monitoring Year**	**Depth**	**Cu**	**Ni**	**Co**	**Cd**	**Pb**	**Zn**	**Cr**	**As**	**Hg**	**Total PCB**	**F1 C6-C10**	**F2 C10-C16**	**F3 C16-C34**	**Modified TPH Total C6-C34**
C112-3WA	MW-3	2012	0-15	<5.0	2.3	1.0	<0.10	2.5	<10	3.1	1.3	<0.050	<0.010	<12	<10	<10	16
C114-3WA	MW-3	2014	0-15	2.6	1.7	1.4	<0.01	<4.9	3.0	3.2	1.3	<0.01	<0.1	<10	<50	<50	**55**
16-C1-MW03A	MW-3	2016	0-15	5.4	2.2	1.1	<0.050	4.4	<10	3.3	2.1	<0.050	0.015	<12	<10	<50	**36**
MW-3 Depth																	
10-16589/90	MW-3	2010	30-50	4.1	<5.0	<5.0	<1.0	<10	<15	<20	2.7	<0.10	0.013	<10	5.6	56	**67**
C112-3WB	MW-3	2012	40-50	<5.0	2.0	1.2	<0.10	5.7	<10	3.0	2.7	<0.050	**0.12**	<12	<10	<10	16
C114-3WB	MW-3	2014	40-50	**6.2**	1.9	1.9	0.03	14	10	3.4	6.2	0.01	<0.1	<10	<50	<50	**55**
16-C1-MW03B	MW-3	2016	30-35	3.3	2.6	1.2	<0.050	5.6	<10	3.5	2.7	<0.050	0.02	<12	<10	<50	**36**
MW-4 Surface																	
10-16591/92	MW-4	2010	0-10	3.5	<5.0	<5.0	<1.0	<10	<15	<20	2.6	<0.10	0.017	<10	4.6	37	**47**
C112-4WA	MW-4	2012	0-15	<5.0	1.7	<1.0	<0.10	11	<10	3.0	4.2	<0.050	<0.010	<12	<10	<10	16
C114-4WA	MW-4	2014	0-15	**11**	1.1	1.2	0.11	15	**23**	3.4	4.1	0.02	<0.1	<10	<50	124	**154**
16-C1-MW04A	MW-4	2016	0-15	2.3	1.3	0.7	<0.050	6.4	<10	2.5	2.6	<0.050	0.012	<12	<10	<50	**36**
MW-4 Depth																	
10-16593/94	MW-4	2010	30-50	**11**	<5.0	<5.0	<1.0	**62**	<15	<20	**50**	<0.10	<0.0030	<10	<4.0	<9.0	12
C112-4WB	MW-4	2012	40-50	**6.2**	2.7	1.3	<0.10	**38**	<10	2.7	**21**	<0.050	<0.010	<12	<10	<10	16
C114-4WB	MW-4	2014	40-50	**11**	**7.1**	**6.6**	0.11	**126**	14	4.0	**90**	<0.01	<0.1	<10	<50	<50	**55**
16-C1-MW04B	MW-4	2016	40-50	**6.6**	3.9	1.9	<0.050	**52**	<10	3.2	**37.0**	<0.050	<0.010	<12	<10	<50	**36**

Notes:

XX	sample exceeds background
XX	**sample exceeds baseline**
XX	*sample exceeds baseline +3 standard deviations*

**** All units in mg/kg**

Table 6-9: PHC F4 Soil Chemical Analysis Results – Non-Hazardous Waste Landfill

Sample Location	Sample ID	Sample Depth (m bgs)	PHC F4 (mg/kg)
MW-1	16-C1-MW01A	0 - 0.15	<50
	16-C1-MW01B	0.4 - 0.5	<50
MW-2	16-C1-MW02A	0 - 0.15	<50
	No Sample	No Sample	-
MW-3	16-C1-MW03A	0 - 0.15	<50
	16-C1-MW03B	0.3-0.35	<50
MW-4	16-C1-MW04A	0 - 0.15	<50
	16-C1-MW04B	0.4 – 0.5	<50

6.3.2.2 Discussion of Results – Comparison to Baseline/Background

Analytical results were compared against baseline data, and background concentrations. The following Table 6-10 summarizes the comparison of results.

Table 6-10: Evaluation of Results by Parameter – Non-Hazardous Waste Landfill

Non-Hazardous Waste Landfill	
Parameter	**Discussion of Results**
Copper (Cu)	Most soil samples reported either non-detect concentrations or were below both background and baseline concentrations for Cu. One sample at MW-4 depth reported Cu concentrations above the baseline of 5.7 mg/kg with a concentration of 6.6 mg/kg.
Nickel (Ni)	All soil samples reported either non-detect concentrations or were below both background and baseline concentrations for Ni.
Cobalt (Co)	All soil samples reported either non-detect concentrations or were below both background and baseline concentrations for Co.
Cadmium (Cd)	All soil samples reported either non-detect concentrations or were below both background and baseline concentrations for Cd.
Lead (Pb)	Pb was above the background of 7 mg/kg and the baseline of 18 mg/kg in three sample locations with reported concentrations of 34 mg/kg at MW-1 depth, 29 mg/kg at MW-2 surface, and 52 mg/kg at MW-4 depth.
Zinc (Zn)	All soil samples reported either non-detect concentrations or were below both background and baseline concentrations for Zn with the exception of sample station MW-1 depth, which reported a concentration of 17 mg/kg above the background concentration of 12 mg/kg.
Chromium (Cr)	All soil samples reported either non-detect concentrations or were below both background and baseline concentrations for Cr.
Arsenic (As)	As was reported above the background concentration of 3.6 mg/kg and the baseline concentration of 7.2 mg/kg at sample station MW-2 surface with a reported concentration of 11 mg/kg. In addition, sample station MW-4 depth reported an As concentration of 37 mg/kg, which exceeds the baseline +3 standard deviations.
Mercury (Hg)	All soil samples reported non-detect concentrations for Hg.

Non-Hazardous Waste Landfill	
Parameter	**Discussion of Results**
PCBs (Total)	All soil samples reported either non-detect concentrations or were below both background and baseline concentrations for PCBs.
Modified TPH (C_6-C_{34})	All soil samples reported concentrations of modified TPH below the baseline concentrations.

6.3.2.3 Soil Trend Analysis by Parameter & Discussion of Trends

A soil chemistry trend analysis was conducted based on the current and historical analytical results collected at the site. A Series of graphs were generated including a visual comparison to background, baseline and historical concentrations using differentiating colours (See Appendix E4). The following Table 6-11 provides a summary of soil trend analysis findings and presents a discussion of the observed trends by parameter.

Table 6-11: Discussion of Trends – Non-Hazardous Waste Landfill

Non-Hazardous Waste Landfill	
Parameter	**Discussion of Trends**
Copper (Cu)	Based on current and historical results, Cu concentrations have undulated over the monitoring years 2010 to present. Cu has no observable trend with no obvious signs of increases or spikes in concentrations observed.
Nickel (Ni)	Based on current and historical results, it appears that Ni has no observable trend. Minor fluctuations in Ni concentrations were observed.
Cobalt (Co)	Based on current and historical results, it appears that Co has no observable trend.
Cadmium (Cd)	Based on current and historical results, it appears that Cd has no observable trend.
Lead (Pb)	Although elevated concentrations of Pb were reported, a general downward trend in concentrations was observed at the NHWL. One instance of a concentration increase was noted at MW-1 depth, where Pb went from non-detect up to 34 mg/kg over the monitoring years. This may be an anomalous result as it is only the one elevated value. Additional data points are required to determine if it is a trend or an anomaly.
Zinc (Zn)	Based on current and historical results, it appears that Zn has no observable trend, with only minor fluctuations in concentrations reported. In most instances, Zn appears to be decreasing in concentration with time with the exception to one sample station, MW-1 depth, which reported an increase in concentration. This increase may be an anomalous result.
Chromium (Cr)	Based on current and historical results, it appears that Cr has no observable trend, with only minor fluctuations in concentrations reported.
Arsenic (As)	Based on current and historical results, As has reported concentrations suggesting no observable trend across most of the landfill, with the exception to sampling station MW-2 where and increase in As has been reported at surface and at depth over the course of the monitoring. Although concentrations at MW-4 depth reported in exceedance of the baseline +3 standard deviations, the overall trend appears to be a decrease in As concentrations over time.
Mercury (Hg)	Based on all non-detect concentrations, Hg has no observable trend.

Non-Hazardous Waste Landfill	
Parameter	**Discussion of Trends**
PCBs (Total)	Based on mostly non-detect concentrations, PCBs has no observable trend.
Modified TPH (C_6-C_{34})	Based on current and historical results, Modified TPH has no observable trend.

Trend analyses presented are based on the data available at the time of the investigation and any interpreted increasing or decreasing trends may be a result of natural variation in the data due to analytical methods. There is currently insufficient information to establish reliable trends; therefore, additional data points are required to be able to confidently determine if trends are present.

6.3.3 Groundwater Sampling

Four groundwater monitoring wells (BMW-1, MW-2, MW-3, and MW-4) are present at the Non-Hazardous Waste Landfill. Groundwater sampling of the Non-Hazardous Waste Landfill was conducted on August 10, 2016. The groundwater sampling was conducted in compliance with Section 5.3.1 and 5.3.3 of the Terms of Reference and details are provided below in the following 6.3.3.1 to 6.3.3.5.

6.3.3.1 Monitoring Well Sampling/Inspection Logs

As per Section 5.3.3.2 of the TOR, groundwater monitoring logs were filled out for each monitoring well as provided on the following pages.

Table 6-12: CAM-1 Monitoring Well Log for MW-1

Monitoring Well Sampling Log

Site Name:	CAM-1	Landfill Name:	Non- Hazardous		
Monitoring Well ID:	MW-1	UTM Coordinates:		North	East
Sample Number(s) (include dups.):	None- Well Dry				
Bottles filled (by parameter type):	N/A				
Date of Sampling Event:	Aug 10/16			Time:	10:00
Weather:	Sun, windy, 10ºC				
Names of Samplers:	Ryan Fletcher				
Description of Well Condition and Surrounding ground conditions (note ponding of water):	Excellent Condition – small amounts of metal debris nearby				
Lock (condition, presence, model, manufacturer):	Cut and replaced as per TOR				

Pre-Measured Data (From Water Well Record Log)

*Depth of well installation (cm)=	440	Diameter of well (cm)=	3.8
*Depth to top of screen (cm)=	50	Length screened section (cm)=	300

*note: *depths are from ground surface*

Field Measurements

Measurement method (interface probe, tape, etc):	Interface probe
Well pipe height above ground (cm) (to top of pipe)=	50
Static water level (cm) from top of pipe =	N/A
Static water level (cm) (below ground surface) calculated =	N/A
Measured well refusal depth (cm) (measure after sampling)=	209.2

Thickness of water column (cm)=	N/A	Static volume of water in well (mL)=	N/A
Free product thickness (mm)=	No Free Product	Evidence of sludge or siltation:	No

Purging Information Summary*

Purging/sampling equipment, sampling technique and equipment calibration information:	N/A		
Well purged (Y/N):	N/A	Recharge Rate:	N/A
Volume Purged (L) (note multiple purging events if applicable):	N/A		

Parameter	Initial	Intermediate	Final	*Notes (if not stabilized)*
pH	N/A			
Conductivity (uS/cm)				
Turbidity (NTU)				
Temperature (degC)				

Visual/olfactory observations (incl. colour, odour, presence of free product/sheen/globules, siltation…): N/A

Decontamination of sampling equipment

Type of decontamination fluid (s):	N/A		
Number washes:	N/A	Number rinses:	N/A

Other Relevant Comments: N/A

Table 6-13: CAM-1 Monitoring Well Log for MW-2

Monitoring Well Sampling Log

Site Name:	CAM-1	Landfill Name:	Non- Hazardous		
Monitoring Well ID:	MW-2	UTM Coordinates:		North	East
Sample Number(s) (include dups.):	None- Well Dry				
Bottles filled (by parameter type):	N/A				
Date of Sampling Event:	Aug 10/16			Time:	15:15
Weather:	Sun, windy, 10-12°C				
Names of Samplers:	Ryan Fletcher				
Description of Well Condition and Surrounding ground conditions (note ponding of water):	Excellent Condition				
Lock (condition, presence, model, manufacturer):	Cut and replaced as per TOR				

Pre-Measured Data (From Water Well Record Log)

*Depth of well installation (cm)=	350	Diameter of well (cm)=	3.8
*Depth to top of screen (cm)=	50	Length screened section (cm)=	300

*note: *depths are from ground surface*

Field Measurements

Measurement method (interface probe, tape, etc):	Interface probe		
Well pipe height above ground (cm) (to top of pipe) =	34		
Static water level (cm) from top of pipe =	144.0		
Static water level (cm) (below ground surface) calculated =	110		
Measured well refusal depth (cm) (measure after sampling) =	187.6		
Thickness of water column (cm)=	43.6	Static volume of water in well (mL)=	N/A
Free product thickness (mm)=	No Free Product	Evidence of sludge or siltation:	No

Purging Information Summary*

Purging/sampling equipment, sampling technique and equipment calibration information:	Low flow peristaltic pump		
Well purged (Y/N):	Y	Recharge Rate:	N/A
Volume Purged (L) (note multiple purging events if applicable):	Dry- purged only 300mL- no recharge		

Parameter	Initial	Intermediate	Final	*Notes (if not stabilized)*
pH	Non – collected – no recharge			
Conductivity (uS/cm)				
Turbidity (NTU)				
Temperature (degC)				

Visual/olfactory observations (incl. colour, odour, presence of free product/sheen/globules, siltation…): Clear, no odour, no sheen

Decontamination of sampling equipment

Type of decontamination fluid (s):	N/A- dedicated sampling train		
Number washes:	N/A	Number rinses:	N/A

Other Relevant Comments: No recharge, pumped dry at 300mL, waited 20 mins (no recharge)

Table 6-14: CAM-1 Monitoring Well Log for MW-3

Monitoring Well Sampling Log

Site Name:	CAM-1	Landfill Name:	Non- Hazardous		
Monitoring Well ID:	MW-3	UTM Coordinates:		North	East
Sample Number(s) (include dups.):	C1-MW03/ALS Dup C1-MW03				
Bottles filled (by parameter type):	9 (4 PHC, 3 Metals, 2 PCB) – same for all				
Date of Sampling Event:	Aug 10/16		Time:	14:15	
Weather:	Sun, windy, 10-12°C				
Names of Samplers:	Ryan Fletcher				
Description of Well Condition and Surrounding ground conditions (note ponding of water):	Excellent Condition				
Lock (condition, presence, model, manufacturer):	Cut and replaced as per TOR				

Pre-Measured Data (From Water Well Record Log)

*Depth of well installation (cm)=	480	Diameter of well (cm)=	3.8
*Depth to top of screen (cm)=	50	Length screened section (cm)=	300

*note: *depths are from ground surface*

Field Measurements

Measurement method (interface probe, tape, etc):	Interface probe		
Well pipe height above ground (cm) (to top of pipe) =	34		
Static water level (cm) from top of pipe =	111.3		
Static water level (cm) (below ground surface) calculated =	77.3		
Measured well refusal depth (cm) (measure after sampling) =	208.1		
Thickness of water column (cm)=	96.8	Static volume of water in well (mL)=	N/A
Free product thickness (mm)=	No Free Product	Evidence of sludge or siltation:	No

Purging Information Summary*

Purging/sampling equipment, sampling technique and equipment calibration information:	Low flow peristaltic pump		
Well purged (Y/N):	Y	Recharge Rate:	N/A
Volume Purged (L) (note multiple purging events if applicable):	3.8		

Parameter	Initial	Intermediate	Final	*Notes (if not stabilized)*
pH	8.85	8.40	8.33	
Conductivity (uS/cm)	693	694	694	
Turbidity (NTU)				
Temperature (degC)	5.09	4.76	4.72	

Visual/olfactory observations (incl. colour, odour, presence of free product/sheen/globules, siltation…): Clear, no odour, no sheen

Decontamination of sampling equipment

Type of decontamination fluid (s):	N/A- dedicated sampling train		
Number washes:	N/A	Number rinses:	N/A

Other Relevant Comments: Clear purge water

Table 6-15: CAM-1 Monitoring Well Log for MW-4

Monitoring Well Sampling Log

Site Name:	CAM-1	Landfill Name:	Non- Hazardous		
Monitoring Well ID:	MW-4	UTM Coordinates:		North	East
Sample Number(s) (include dups.):	Limited water- no recharge				
Bottles filled (by parameter type):	No Sample				
Date of Sampling Event:	Aug 10/16			Time:	13:45
Weather:	Sun, windy, 10-12ºC				
Names of Samplers:	Ryan Fletcher				
Description of Well Condition and Surrounding ground conditions (note ponding of water):	Excellent Condition				
Lock (condition, presence, model, manufacturer):	Cut and replaced as per TOR				

Pre-Measured Data (From Water Well Record Log)

*Depth of well installation (cm)=	490	Diameter of well (cm)=	3.8
*Depth to top of screen (cm)=	50	Length screened section (cm)=	300

*note: *depths are from ground surface*

Field Measurements

Measurement method (interface probe, tape, etc):	Interface probe		
Well pipe height above ground (cm) (to top of pipe) =	41		
Static water level (cm) from top of pipe =	136.2		
Static water level (cm) (below ground surface) calculated =	95.2		
Measured well refusal depth (cm) (measure after sampling) =	210.0		
Thickness of water column (cm)=	73.8	Static volume of water in well (mL)=	N/A
Free product thickness (mm)=	No Free Product	Evidence of sludge or siltation:	No

Purging Information Summary*

Purging/sampling equipment, sampling technique and equipment calibration information:	Low flow peristaltic pump		
Well purged (Y/N):	Y	Recharge Rate:	N/A
Volume Purged (L) (note multiple purging events if applicable):	Dry, ~3 mins pumping with low- flow (400mL)		

Parameter	Initial	Intermediate	Final	*Notes (if not stabilized)*
pH	8.85	8.40	8.33	
Conductivity (uS/cm)	693	694	694	
Turbidity (NTU)				
Temperature (degC)	5.09	4.76	4.72	

Visual/olfactory observations (incl. colour, odour, presence of free product/sheen/globules, siltation…): Clear, no odour, no sheen

Decontamination of sampling equipment

Type of decontamination fluid (s):	N/A- dedicated sampling train		
Number washes:	N/A	Number rinses:	N/A

Other Relevant Comments: Clear purge water

Table 6-16: Summary of Groundwater Field Chemistry - NHWL

Non-Hazardous Waste Landfill						
	Time (min)	Temperature (°C)	Conductivity (uS/cm)	Dissolved Oxygen (mg/L)	pH	ORP (mV)
Upgradient- NHWL						
MW-1						
	5	5.67	1011	12.77	11.25	193.0
	10	Well Dry				
	15					
	20					
	25					
Downgradient- NHWL						
MW-3						
	5	5.09	693	13.00	8.85	179.8
	10	4.95	696	12.77	8.56	179.7
	15	4.76	694	12.97	8.40	182.1
	20	4.72	694	12.91	8.33	185.5
	25	Sampled				
MW-4						
	5	4.48	720	15.94	11.42	183.2
	10	Well dry at 3 minutes (~400mL) No recharge after 15-minute wait				
	15					
	20					
	25					

6.3.3.2 Water Levels/Groundwater Flow

Groundwater levels were collected and are presented below in Table 6-17.

Table 6-17: Summary of Groundwater Levels - Non-Hazardous Waste Landfill

Non-Hazardous Waste Landfill			
Monitoring Well ID	Water Level (TOC) (m)	Water Level (from ground surface) (m)	Comments
MW-1	2.092	1.592	Dry – no water
MW-2	1.440	1.100	Purged dry – no recharge
MW-3	1.113	0.773	Good recharge – sample collected
MW-4	1.362	0.952	Purged dry – no recharge

Insufficient information was available to ascertain a groundwater flow direction.

6.3.3.3 Groundwater Laboratory Analytical Results

One groundwater sample was analysed at the Non-Hazardous Waste Landfill. The following Table 6-18 presents the groundwater analytical results. Figure CAM-1.5C presents a summary of significant groundwater analytical results.

Table 6-18: Groundwater Chemical Analysis Results – Non-Hazardous Waste Landfill

Non-Hazardous Waste Landfill																
	Sampling Station	Monitoring Year	Cu	Ni	Co	Cd	Pb	Zn	Cr	As	Hg	Total PCB	F1 C6-C10	F2 C10-C16	F3 C16-C34	Modified TPH Total C6-C34
Comparison Values																
Baseline			**0.0092**	**0.036**	**0.0030**	**0.0010**	**0.0100**	**0.0092**	**0.089**	**0.0027**	**0.0004**	**0.00002**				**1**
Baseline +3 Standard Deviations			0.027	0.12	0.007	0.001	0.018	0.039	0.34	0.007	0.0004	0.00002				1
Upgradient																
MW-1																
not sampled - well frozen	BMW-1	2010	-	-	-	-	-	-	-	-	-	-	-	-	-	-
not sampled - well dry	BMW-1	2012	-	-	-	-	-	-	-	-	-	-	-	-	-	-
not sampled - well dry	BMW-1	2014	-	-	-	-	-	-	-	-	-	-	-	-	-	-
not sampled - well dry	BMW-1	2016	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Downgradient																
MW-2																
not sampled - well dry/frozen	MW-2	2010	-	-	-	-	-	-	-	-	-	-	-	-	-	-
not sampled - insufficient volume	MW-2	2012	-	-	-	-	-	-	-	-	-	-	-	-	-	-
not sampled - well dry	MW-2	2014	-	-	-	-	-	-	-	-	-	-	-	-	-	-
not sampled - no recharge	MW-2	2016	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW-3																
10-16560/61	MW-3	2010	0.0061	0.062	<0.0030	<0.0010	<0.010	<0.010	**0.17**	**0.0031**	<0.00040	<0.000020	<0.05	<0.5	<1.0	0.78
C112-3W	MW-3	2012	0.0040	0.014	0.00057	0.00003	0.0012	<0.0030	0.031	0.0026	<0.000002	<0.00010	<0.1	<0.1	<0.1	0.15
C112-BDW1 interlab (PHC fractions not analyzed)	MW-3	2012	0.0028	0.009	0.00038	0.00002	0.00085	<0.003	0.021	0.0019	<0.000002	<0.00005	-	-	-	0.2
C114-3W	MW-3	2014	**0.26**	0.64	**0.021**	0.00036	**0.02**	**0.064**	**2.0**	**0.064**	<0.000005	<0.0001	<0.2	<0.2	<0.1	0.25

Non-Hazardous Waste Landfill																
	Sampling Station	Monitoring Year	Cu	Ni	Co	Cd	Pb	Zn	Cr	As	Hg	Total PCB	F1 C6-C10	F2 C10-C16	F3 C16-C34	Modified TPH Total C6-C34
C1-MW03[1]	MW-3	2016	0.001	0.0020	<0.00030	<0.000020	<0.00020	<0.0030	<0.0010	0.00028	0.0000027	<0.00005	<0.1	<0.10	<0.20	0.200000
MW-4																
not sampled - insufficient volume	MW-4	2010	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C112-4W	MW-4	2012	**0.055**	0.27	0.00038	0.00014	**0.015**	**0.024**	**0.55**	**0.023**	0.000005	<0.000050	<0.1	<0.1	<0.1	0.15
C114-4W	MW-4	2014	**0.04**	0.16	**0.0058**	0.00039	**0.012**	**0.056**	**0.44**	**0.019**	<0.000005	<0.0001	<0.2	<0.2	<0.1	0.25
not sampled- no recharge	MW-4	2016	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

1 = Petroleum Hydrocarbons F4 reported a concentration of <0.20 mg/L for sample C1-MW03 in 2016.

XX	sample exceeds background
XX	**sample exceeds baseline**
Units=	**Mg/L**

6.3.3.4 Discussion of Groundwater Results by Parameter

Analytical results were compared against background and baseline data. The following Table 6-19 summarizes the comparison of results.

Table 6-19: Evaluation of Groundwater Analytical Results – Non-Hazardous Waste Landfill

Non-Hazardous Waste Landfill	
Parameter	**Discussion of Results**
Copper (Cu)	Cu was reported below the baseline concentrations in the single groundwater sample collected.
Nickel (Ni)	Ni was reported below the baseline concentrations in the single groundwater sample collected.
Cobalt (Co)	Co was reported at non-detect concentrations in the single groundwater sample collected.
Cadmium (Cd)	Cd was reported at non-detect concentrations in the single groundwater sample collected.
Lead (Pb)	Pb was reported at non-detect concentrations in the single groundwater sample collected.
Zinc (Zn)	Zn was reported at non-detect concentrations in the single groundwater sample collected.
Chromium (Cr)	Cr was reported at non-detect concentrations in the single groundwater sample collected.
Arsenic (As)	As was reported below the baseline concentrations in the single groundwater sample collected.
Mercury (Hg)	Hg was reported below the baseline concentrations in the single groundwater sample collected.
PCBs (Total)	PCBs were reported at non-detect concentrations in the single groundwater sample collected.
F1 (C_6-C_{10})	F1 was reported at non-detect concentrations in the single groundwater sample collected.
F2 (C_{10}-C_{16})	F2 was reported at non-detect concentrations in the single groundwater sample collected.
F3 (C_{16}-C_{34})	F3 was reported at non-detect concentrations in the single groundwater sample collected.
Modified TPH (C_6-C_{34})	Modified TPH was reported at non-detect concentrations in the single groundwater sample collected.

6.3.3.5 Groundwater Trend Analysis by Parameter and Discussion of Trends

Only one groundwater monitoring well, MW-3, produced sufficient water to compare against historical concentrations. A groundwater chemistry trend analysis was conducted based on the current and historical analytical results collected at the site. A Series of graphs were generated including a visual comparison to baseline and historical concentrations using differentiating colours (See Appendix F). The following Table 6-20 provides a summary of groundwater trend analysis findings and presents a discussion of the observed trends by parameter.

Table 6-20: Evaluation of Groundwater Chemistry Trends

Non-Hazardous Waste Landfill	
Parameter	**Discussion of Trends**
Copper (Cu)	Based on current and historical results, Cu concentrations have decreased over time.
Nickel (Ni)	Based on current and historical results, Ni concentrations have decreased over time.
Cobalt (Co)	Based on current and historical results, Co concentrations have decreased over time.
Cadmium (Cd)	Based on current and historical results, Cd concentrations have decreased over time.
Lead (Pb)	Based on current and historical results, Pb concentrations have decreased over time.
Zinc (Zn)	Based on current and historical results, Zn has no observable trend with an increase noted in 2014 and a decrease back to non-detect concentrations in 2016. An anomalous high concentration was reported in 2014.
Chromium (Cr)	Based on current and historical results, Cr has no observable trend with slight fluctuations and an increase noted in 2014 and a decrease back to non-detect concentrations in 2016. An anomalous high concentration was reported in 2014.
Arsenic (As)	Based on current and historical results, As has reported fluctuating concentrations with an overall trend to potentially decreasing concentrations; however, additional data points are required for this landfill to determine the trend. An anomalous high concentration was reported in 2014.
Mercury (Hg)	Based on mostly non-detect concentrations, Hg has no observable trend.
PCBs (Total)	Based on all non-detect concentrations, PCBs has no observable trend.
Modified TPH (C_6-C_{34})	Based on all non-detect concentrations, Modified TPH has no observable trend.

Trend analysis' presented are based on the data available at the time of the investigation and any interpreted increasing or decreasing trends may be a result of natural variation in the data due to analytical methods. There is currently insufficient information to establish reliable trends; therefore, additional data points are required to be able to confidently determine if trends are present.

6.3.4 Thermal Monitoring

No thermistors are present at the Non-Hazardous Waste Landfill; therefore, no thermal monitoring was conducted.

6.4 Conclusions and Overall Landfill Performance

Based on the results of the 2016 monitoring program, the overall performance of the Non-Hazardous Waste Landfill is acceptable.

6.5 Recommendations and Conclusions

Based on review and analysis of chemical data, it appears that the soil concentrations for the parameters tested had no observable trend with no obvious soil concentration increases over time. Arsenic (As) has reported concentrations suggesting no observable trend across most of the landfill, with the exception of

sampling station MW-2 where and increase in As has been reported at surface and at depth over the course of the site monitoring. More data points are required to determine a reliable trend.

In general, the groundwater concentrations in the monitoring well MW-3 appear to be decreasing with time; however, 2014 reported anomalously high concentrations for almost all analytes tested. This higher than average trend may have been the result of sampling techniques and entrained fines in the water samples.

Based on this review, it is recommended to continue the long term monitoring of soils and groundwater as planned.

Based on the results of the visual inspection, the landfill performance is acceptable. No remedial work or deviations from the monitoring plan are recommended at this time.

7 CAM-1: TIER II DISPOSAL FACILITY

7.1 Landfill Description

The CAM-1 Tier II Disposal Facility was constructed at the Jenny Lind Island site for the disposal of Tier II soil excavated during the cleanup. The location of the Tier II Soil Disposal Facility is southwest of the station, west of the access road between the airstrip and station areas.

The design of this landfill includes a double containment system consisting of a liner system and the construction of saturated, low-permeability berms, followed by the placement of sufficient surface fill to promote freezing of the landfill contents and containment berms. The liner was placed along the bottom of the landfill, along the berms and over the top of the landfill contents. Monitoring wells were installed along the landfill perimeter. Thermistors were installed within the berms and the main body of the landfill.

The long term monitoring plan for the Tier II Disposal Facility consists of visual inspection, the collection of soil and groundwater samples, and monitoring of subsurface ground temperatures in the berms and in the main body of the disposal facility through downloading thermistor data.

The landfill layout, visual observations and photographic locations are presented on Figure CAM-1.6A and soil analytical results are presented on Figure CAM-1.6B in the figures section.

7.2 Summary of Work Conducted

7.2.1 Visual Inspection

A visual inspection was conducted on the Tier II Disposal Facility on August 10, 2016. The visual inspection of the landfill was completed with no deviations from the visual inspection work plan.

7.2.2 Soil Sampling

Soil sampling at the Tier II Disposal Facility was conducted on August 10, 2016 and consisted of the collection of eight soil samples from four soil sample stations (MW-5, MW-6, MW-7, and MW-8). No depth restrictions were encountered.

The following Table 7-1 outlines the soil sampling activities conducted at the Tier II Disposal Facility.

Table 7-1: Summary of Work Conducted by Soil Sampling Location

Tier II Disposal Facility			
Sample Location	**Sample ID**	**Sample Depth (m bgs)**	**Notes**
MW-5	16-C1-MW05A	0 - 0.15	
	16-C1-MW05B	0.4 - 0.5	
MW-6	16-C1-MW06A	0 - 0.15	
	16-C1-MW06B	0.4 – 0.5	

Tier II Disposal Facility			
Sample Location	**Sample ID**	**Sample Depth (m bgs)**	**Notes**
MW-7	16-C1-MW07A	0 - 0.15	
	16-C1-MW07B	0.3-0.35	
MW-8	16-C1-MW08A	0 - 0.15	
	16-C1-MW08B	0.4 – 0.5	

7.2.3 Groundwater Sampling

Groundwater monitoring at the Tier II Disposal Facility was conducted on August 10, 2016 and consisted of the inspection and groundwater monitoring of four monitoring wells (MW-5, MW-6, MW-7, and MW-8). Monitoring well MW-5 contained water and a groundwater sample was collected for analysis. One well, MW-6, contained water; however, water quantity was limited and no sample could be collected for analysis. Two wells, MW-7 and MW-8, were observed to be dry. Monitoring well sampling logs are presented in Section 7.3.3.

The following Table 7-2 outlines the groundwater sampling activities conducted at the Tier II Disposal Facility.

Table 7-2: Summary of Work Conducted by Monitoring Well

Tier II Disposal Facility		
Monitoring Well ID	**Observations**	**# of Groundwater Samples Collected**
MW-5	Excellent condition	1
MW-6	Excellent condition. Insufficient water for sample.	0
MW-7	Excellent condition - Frozen	0
MW-8	Excellent condition – Dry	0

7.2.4 Thermal Monitoring

Four thermistors (VT-1, VT-2, VT-3, and VT-4) are present at the Tier II Disposal Facility. Each of the thermistor installations was inspected and data downloaded from the data loggers as per Section 5.4 of the Terms of Reference. Thermistor inspection reports were filled out for each of the installations and further details are provided in Section 7.3.4.1

7.3 Results of the Monitoring Program

The following Sections 7.3.1 through 7.3.4 summarize the results of the CAM-1 monitoring program at the Tier II Disposal Facility.

7.3.1 Visual Inspection

The visual inspection of the Tier II Disposal Facility was conducted on August 10, 2016. The visual inspection was conducted in compliance with Section 5.2 of the Terms of Reference and details are provided below in the following Sections 7.3.1.1 through 7.3.1.5. Figure CAM-1.6A presents the visual inspection findings and photographic locations.

7.3.1.1 Inspection checklist

The visual inspection was completed as per the Terms of Reference and the visual inspection checklist is included as Table 7-3 of this report below.

Table 7-3: Visual Inspection Checklist – Tier II Disposal Facility

SITE NAME: **CAM-1 Jenny Lind Island**

LANDFILL DESIGNATION: Tier II Disposal Facility
LANDFILL TYPE: Tier II
DATE OF INSPECTION: August 10, 2016
WEATHER CONDITIONS: 10ºC, sunny
DATE OF PREVIOUS INSPECTION: August 27, 2014
INSPECTED BY: Stephen Borcsok
REPORT PREPARED BY: Stephen Borcsok and Ryan Fletcher

The preparer represents to the best of the preparer's knowledge, the following statements and observations are true and correct and to the best of the preparer's actual knowledge, no material facts have been suppressed or misstated.

Tier II Disposal Facility												
Checklist Item	**Present (Yes/No)**	**Feature Number**	**Feature Location**	**GPS Coordinates Easting/Northing/Zone**		**Length (m)**	**Width (m)**	**Depth (m)**	**Extent Relative to Landfill Surface**	**Description**	**Comparison with Historical Observations**	**Additional Comments/ Severity Rating**	**Photographic Records (photo reference, location, view point & direction, feature of note, scale)**
Settlement	Yes	A	West side slope of landfill	389103.23 / 7620773.69	14	1.2	0.25	0.1	<1%	Linear depression	First observed in Year 3 (2012). Slope appears stable. No significant change.	Severity Rating – Acceptable (feature is minor and not affecting landfill stability)	CAM-1 TII 57
Settlement	Yes	C	South and east landfill cover	389123.088 / 7620729.663 389130.736 / 7620750.771 389117.019 / 7620724.928	14	7-12	0.3	0.1	<1%	Two linear depressions, one pothole depression	First observed in Year 5 (2014). Cover appears stable. No significant change.	Severity Rating – Acceptable (features are minor and not affecting landfill stability)	CAM-1 TII 10, 51, 52, 53, 54
Settlement	Yes	D	Northeast side slope of landfill	389125.669 / 7620781.387 389118.641 / 7620785.191	14	1.2	0.3	0.1	<1%	Linear depressions – two locations	First observed in Year 5 (2014). Slope appears stable. No significant change.	Severity Rating – Acceptable (features are minor and not affecting landfill stability)	CAM-1 TII 32, 33
Settlement	Yes	G	Centre of landfill cover	389112.238 / 7620759.912	14	1	0.2	0.1	<1%	Linear depression	New observation in 2016.	Severity Rating – Acceptable (feature is minor and not affecting landfill stability)	CAM-1 TII 60, 61
Erosion	Yes	B	Northwest corner and side slope of landfill	389105.166 / 7620780.091 389105.414 / 7620781.917 389104.962 / 7620787.978 389103.165 / 7620812.888	14	3-8	0.1-0.3	0.05	<1%	Shallow erosion channels – four locations	First observed in Year 2 (2011). Slope appears stable. Five erosion channels were observed in 2014, however only four were observed in 2016. Length changed from 2-12 to 3-8 from 2014 to 2016. Length of erosion channels may naturally increase over time as erosion continues, however differences in length may be due to differences in measurement technique.	Severity Rating – Acceptable (features are minor and not affecting landfill stability)	CAM-1 TII 26, 34, 35, 36, 37
Erosion	Yes	E	Northwest side slope of landfill	389095.973 / 7620758.894	14	6	0.2	0.05	<1%	Shallow erosion channel	First observed in Year 5 (2014). Slope appears stable. No significant change.	Severity Rating – Acceptable (feature is minor and not affecting landfill stability)	CAM-1 TII 55, 56
Lateral Movement	No												
Frost Action	No												
Sloughing	No												
Cracking	No												
Animal Burrows	No												
Vegetation Establishment	No												

Tier II Disposal Facility												
Checklist Item	**Present (Yes/No)**	**Feature Number**	**Feature Location**	**GPS Coordinates Easting/Northing/Zone**	**Length (m)**	**Width (m)**	**Depth (m)**	**Extent Relative to Landfill Surface**	**Description**	**Comparison with Historical Observations**	**Additional Comments/ Severity Rating**	**Photographic Records (photo reference, location, view point & direction, feature of note, scale)**
Staining	Yes	F	Centre of landfill cover	389118.016 / 7620756.731	14	0.3	0.3	N/A	Localized dark stain	First noted in Year 5 (2014). No significant change.	Severity Rating – Acceptable (feature is minor, staining is suspected to have come from outside source rather than from landfill)	CAM-1 TII 50
Vegetation Stress	No											
Seepage Points (or) Ponded Water	No											
Debris and/or Liner Exposed	No											
Presence & Condition of Monitoring Instruments	Yes	N/A	Four monitoring wells outside landfill, four thermistors on landfill cover		14				MW-5, MW-6, MW-7, MW-8, VT-1, VT-2, VT-3, VT-4	Locations were in good condition in 2014 and 2016.		CAM-1 TII 1, 11, 12, 13, 14, 16, 22, 38, 39, 40, 47, 48, 49
Features of Note/Other Relevant Observations (e.g., signs of activity, ruts…)	No											

7.3.1.2 Stability Assessment

The Preliminary Stability Assessment for the Tier II Disposal Facility was conducted on August 10, 2016 as per the Terms of Reference and the results are provided below in Table 7-4.

Table 7-4: Preliminary Stability Assessment – Tier II Disposal Facility

Tier II Disposal Facility		
Feature	**Severity Rating**	**Extent**
Settlement	Acceptable	Occasional
Erosion	Acceptable	Occasional
Lateral Movement	Not Observed	None
Frost Action	Not Observed	None
Sloughing	Not Observed	None
Cracking	Not Observed	None
Animal Burrows	Not Observed	None
Vegetation Establishment	Not Observed	None
Staining	Acceptable	Isolated
Vegetation Stress	Not Observed	None
Seepage / Ponded Water	Not Observed	None
Debris and/or Liner Exposure	Not Observed	None
Other	Not Observed	None
Overall Landfill Performance	**Acceptable**	

Tier II Disposal Facility	
Performance / Severity Rating	**Description**
Acceptable	Noted features are of little consequence. The landfill is performing as designed. Minor deviations in environmental or physical performance may be observed, such as isolated areas of erosion, settlement.
Marginal	Physical/environmental performance appears to be deteriorating with time. Observations may include an increase in size or number of features of note,

Tier II Disposal Facility	
Performance / Severity Rating	**Description**
	such as differential settlement, erosion or cracking. No significant impact on landfill stability to date, but potential for failure is assessed as low or moderate.
Significant	Significant or potentially significant changes affecting landfill stability, such as significant changes in slope geometry, significant erosion or differential settlement; scarp development. The potential for failure is assessed as imminent.
Unacceptable	Stability of landfill is compromised to the extent that ability to contain waste materials is compromised. Examples may include: • Debris exposed in erosion channels or areas of differential settlement. • Liner exposed. • Slope failure.
Extent	**Description**
Isolated	Singular feature
Occasional	Features of note occurring at irregular intervals/locations
Numerous	Many features of note, impacted less than 50% of the surface area of the landfill
Extensive	Impacting greater than 50% of the surface area of the landfill

7.3.1.3 Photographic Records

The photographic record for the Tier II Disposal Facility has been completed as per Section 5.5 of the Terms of Reference and is included in the following page as Table 7-5. The Photographic Record only contains an index of photographs collected; full sized photographs are contained in the Appended CD/DVD-ROM. Selected photographs are shown in Table 7-6. Figure CAM-1.6A presents the photograph locations and directions.

Table 7-5: Photographic Records – Tier II Disposal Facility

Tier II Disposal Facility						
Photo Identification	**Figure ID**	**View Direction**	**Photo Location**	**Feature Identification**	**Feature of Note**	**Other Comments**
Sample Station Photographs						
C1-MW5-1	SM5	N/A	Sample station MW-5	MW-5 soil	MW-5	Close up of test pit
C1-MW5-2	SM5	N	Sample station MW-5	MW-5 soil	MW-5	Test pit location

Tier II Disposal Facility						
Photo Identification	**Figure ID**	**View Direction**	**Photo Location**	**Feature Identification**	**Feature of Note**	**Other Comments**
C1-MW5-3	SM5	N	Sample station MW-5	MW-5 soil	MW-5	MW-5 Backfilled
C1-MW6-1	SM6	N/A	Sample station MW-6	MW-6 soil	MW-6	Close up of test pit
C1-MW6-2	SM6	SW	Sample station MW-6	MW-6 soil	MW-6	Test pit location
C1-MW6-3	SM6	N/A	Sample station MW-6	MW-6 soil	MW-6	MW-6 Backfilled
C1-MW7-1	SM7	N/A	Sample station MW-7	MW-7 soil	MW-7	Close up of test pit
C1-MW7-2	SM7	N/A	Sample station MW-7	MW-7 soil	MW-7	Test pit location
C1-MW7-3	SM7	N/A	Sample station MW-7	MW-7 soil	MW-7	MW-7 Backfilled
C1-MW8-1	SM8	N/A	Sample station MW-8	MW-8 soil	MW-8	Close up of test pit
C1-MW8-2	SM8	NES	Sample station MW-8	MW-8 soil	MW-8	Test pit location
C1-MW8-3	SM8	N/A	Sample station MW-8	MW-8 soil	MW-8	MW-8 Backfilled
Sampling Instruments						
MW5A	SM5	N/A	MW-5	MW-5	MW-5	Well casing
MW5B	SM5	N/A	MW-5	MW-5	MW-5	Inside well casing
MW5C	SM5	N/A	MW-5	MW-5	MW-5	Showing sampling equipment
MW6A	SM6	SW	MW-6	MW-6	MW-6	Well casing and location
MW6B	SM6	N/A	MW-6	MW-6	MW-6	Inside well casing
MW7A	SM7	SE	MW-7	MW-7	MW-7	Well casing
MW7B	SM7	SE	MW-7	MW-7	MW-7	Well Location
MW7C	SM7	N/A	MW-7	MW-7	MW-7	Inside well casing
MW8A	SM8	E	MW-8	MW-8	MW-8	Well casing
MW8B	SM8	N/A	MW-8	MW-8	MW-8	Inside well casing
	Visual Inspection Photographs					
CAM-1 TII 1	1	SW	Monitoring well MW-5	N/A	N/A	
CAM-1 TII 2	2	NW	View of east side of DF	N/A	N/A	

Tier II Disposal Facility						
Photo Identification	**Figure ID**	**View Direction**	**Photo Location**	**Feature Identification**	**Feature of Note**	**Other Comments**
CAM-1 TII 3	3	NE	Southeast toe of DF	N/A	N/A	
CAM-1 TII 4	4	NW	Southwest toe of DF	N/A	N/A	
CAM-1 TII 5	5	NE	Southeast side slope of DF	N/A	N/A	
CAM-1 TII 6	6	NW	Southwest side slope of DF	N/A	N/A	
CAM-1 TII 7	7	NE	Southeast crest of DF	N/A	N/A	
CAM-1 TII 8	8	NW	Southwest crest of DF			
CAM-1 TII 9	9	N	View across cover from southeast corner	N/A	N/A	
CAM-1 TII 10	10	N	Minor depression on southeast crest of DF	Settlement	C	
CAM-1 TII 11	11	NE	Vertical thermistor VT-4	N/A	N/A	
CAM-1 TII 12	12	W	Vertical thermistor VT-4	N/A	N/A	
CAM-1 TII 13	13	N	Vertical thermistor VT-3	N/A	N/A	
CAM-1 TII 14	14	E	Vertical thermistor VT-3	N/A	N/A	
CAM-1 TII 15	15	SW	Southeast crest of DF	N/A	N/A	
CAM-1 TII 16	16	NW	Northeast crest of DF, Vertical thermistor VT-3	N/A	N/A	

Tier II Disposal Facility						
Photo Identification	**Figure ID**	**View Direction**	**Photo Location**	**Feature Identification**	**Feature of Note**	**Other Comments**
CAM-1 TII 17	17	W	View across cover from northeast corner	N/A	N/A	
CAM-1 TII 18	18	SW	Southeast side slope of DF	N/A	N/A	
CAM-1 TII 19	19	NW	Northeast side slope of DF	N/A	N/A	
CAM-1 TII 20	20	SW	Southeast toe of DF	N/A	N/A	
CAM-1 TII 21	21	NW	Northeast toe of DF	N/A	N/A	
CAM-1 TII 22	22	SE	Monitoring well MW-6	N/A	N/A	
CAM-1 TII 23	23	SW	View of northeast side of DF	N/A	N/A	
CAM-1 TII 24	24	SE	Northeast toe of DF	N/A	N/A	
CAM-1 TII 25	25	SW	Northwest toe of DF	N/A	N/A	
CAM-1 TII 26	26	S	Minor erosion channel on north corner of DF	Erosion	B	
CAM-1 TII 27	27	SE	Northeast side slope of DF	N/A	N/A	
CAM-1 TII 28	28	SW	Northwest side slope of DF	N/A	N/A	
CAM-1 TII 29	29	SE	Northeast crest of DF	N/A	N/A	
CAM-1 TII 30	30	SW	Northwest crest of DF	N/A	N/A	
CAM-1 TII 31	31	SE	View across cover from	N/A	N/A	

Tier II Disposal Facility						
Photo Identification	**Figure ID**	**View Direction**	**Photo Location**	**Feature Identification**	**Feature of Note**	**Other Comments**
			northwest corner			
CAM-1 TII 32	32	NW	Minor depression on northeast crest of DF	Settlement	D	
CAM-1 TII 33	33	NW	Minor depression on northeast crest of DF	Settlement	D	
CAM-1 TII 34	34	NW	Minor erosion on northwest side slope of DF	Erosion	B	
CAM-1 TII 35	35	SE	Minor erosion on northwest side slope of DF	Erosion	B	
CAM-1 TII 36	36	SE	Minor erosion on northwest side slope of DF	Erosion	B	
CAM-1 TII 37	37	SE	Minor erosion on northwest side slope of DF	Erosion	B	
CAM-1 TII 38	38	E	Monitoring well MW-7	N/A	N/A	
CAM-1 TII 39	39	N	Northwest toe of DF, monitoring well MW-8	N/A	N/A	
CAM-1 TII 40	40	SE	Southwest toe of DF, monitoring well MW-8	N/A	N/A	

Tier II Disposal Facility						
Photo Identification	**Figure ID**	**View Direction**	**Photo Location**	**Feature Identification**	**Feature of Note**	**Other Comments**
CAM-1 TII 41	41	NE	Northwest side slope of DF	N/A	N/A	
CAM-1 TII 42	42	SE	Southwest side slope of DF	N/A	N/A	
CAM-1 TII 43	43	NE	Northwest crest of DF	N/A	N/A	
CAM-1 TII 44	44	SE	Southwest crest of DF	N/A	N/A	
CAM-1 TII 45	45	NE	View across cover from southwest corner	N/A	N/A	
CAM-1 TII 46	46	S	Vertical thermistor VT-1	N/A	N/A	
CAM-1 TII 47	47	NW	Vertical thermistor VT-1	N/A	N/A	
CAM-1 TII 48	48	NE	Vertical thermistor VT-2	N/A	N/A	
CAM-1 TII 49	49	S	Vertical thermistor VT-2	N/A	N/A	
CAM-1 TII 50	50	S	Small area of staining on central cover	Staining	F	
CAM-1 TII 51	51	NE	Linear depression on southeast cover	Settlement	C	
CAM-1 TII 52	52	SW	Linear depression on southeast cover	Settlement	C	
CAM-1 TII 53	53	NE	Linear depression on east cover	Settlement	C	

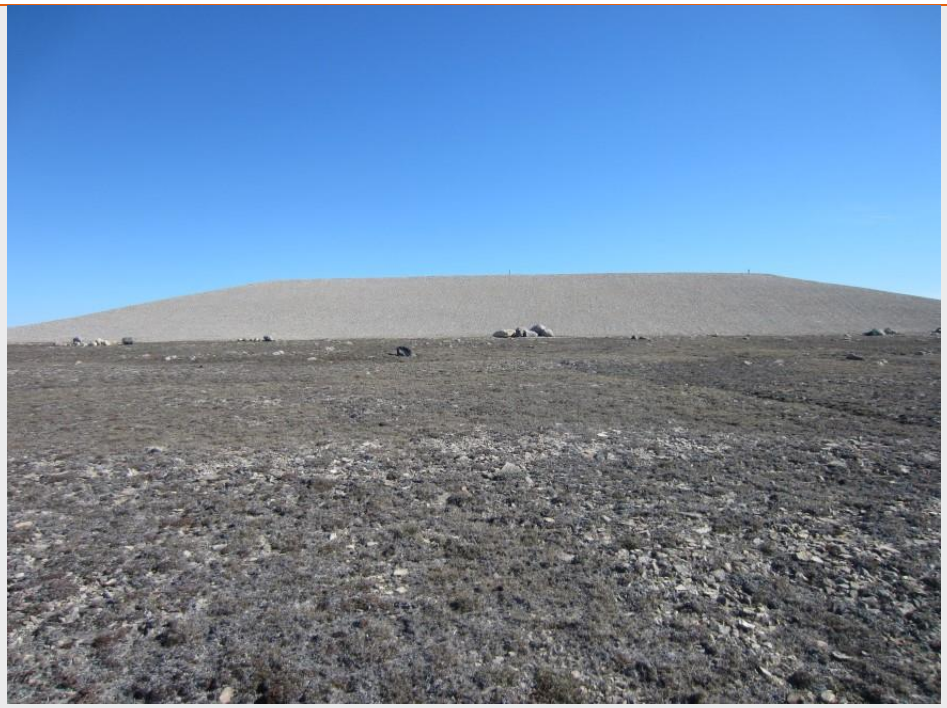
Tier II Disposal Facility						
Photo Identification	**Figure ID**	**View Direction**	**Photo Location**	**Feature Identification**	**Feature of Note**	**Other Comments**
CAM-1 TII 54	54	SW	Linear depression on east cover	Settlement	C	
CAM-1 TII 55	55	NW	Minor erosion on west side slope	Erosion	E	
CAM-1 TII 56	56	SE	Minor erosion on west side slope	Erosion	E	
CAM-1 TII 57	57	N	Minor depression below northwest crest	Settlement	A	
CAM-1 TII 58	58	NE	Southwest side of landfill	N/A	N/A	
CAM-1 TII 59	59	ESE	Northwest side of landfill	N/A	N/A	
CAM-1 TII 60	60	SE	Minor settlement on central cover	Settlement	G	New feature
CAM-1 TII 61	61	NW	Minor settlement on central cover	Settlement	G	New feature
CAM-1 TII 62	N/A	N/A	Aerial photograph of multiple landfills	N/A	N/A	

Table 7-6: Selected Photographs –Tier II Disposal Facility

Tier II Disposal Facility
Photograph CAM-1 TII 12: View across landfill cover including vertical thermistor VT-4.
Photograph CAM-1 TII 36: Minor erosion (Feature B) on northwest side slope of Disposal Facility.

Tier II Disposal Facility

Photograph CAM-1 TII 50: Small area of staining on central cover (Feature F).



Photograph CAM-1 TII 59: Northwest side of Tier II Disposal Facility.

Tier II Disposal Facility

Photograph CAM-1 TII 61: New minor settlement (Feature G) on central cover.

Photograph CAM-1 TII 62: Aerial photograph of CAM-1 showing landfills including Tier II Disposal Facility.

7.3.1.4 Trend Analysis

A trend analysis was conducted with regards to observations made during the visual inspection of the Tier II Disposal Facility. The following Table 7-7 outlines the results of the visual trend analysis.

Table 7-7: Visual Inspection Trends - Tier II Disposal Facility

Tier II Disposal Facility		
Checklist Item	**Feature Number**	**Comparison with Historical Observations**
Settlement	A	No significant change.
	C	No significant change.
	D	No significant change.
	G	New observation in 2016.
Erosion	B	No significant change.
	E	No significant change.
Staining	F	No significant change.

7.3.1.5 Discussion of Results/Trends

A comparison of the visual inspection results of the 2014 and 2016 monitoring events at Tier II Disposal Facility indicates that previously observed minor settlement, erosion and staining features have not undergone any significant change. One new minor settlement feature was observed in 2016.

7.3.2 Soil Sampling

Soil sampling of the Tier II Disposal Facility was conducted on August 10, 2016. The soil sampling was conducted in compliance with Section 5.3.1 and 5.3.2 of the Terms of Reference and details are provided below in the following Sections 7.3.2.1 through 7.3.2.3.

7.3.2.1 Laboratory Analytical Results

A total of eight soil samples were analysed from four soil sample locations at the Tier II Disposal Facility. Table 7-8 and 7-9 present the soil analytical results. Figure CAM-1.6B presents a summary of significant soil analytical results.

Table 7-8: Soil Chemical Analysis Results – Tier II Disposal Facility

Tier II Disposal Facility																	
Sample ID	**Sampling Station**	**Monitoring Year**	**Depth**	**Cu**	**Ni**	**Co**	**Cd**	**Pb**	**Zn**	**Cr**	**As**	**Hg**	**Total PCB**	**F1 C6-C10**	**F2 C10-C16**	**F3 C16-C34**	**Modified TPH Total C6-C34**
Comparison Values																	
Background				11	4.7	3.1	0.50	7	12	12	3.6	NS	0.042				NS
Baseline				**4.9**	**5.0**	**5.0**	**1**	**10**	**15**	**20**	**2.1**	**0.1**	**0.1**				**24**
Baseline +3 Standard Deviations				26	5.0	5.0	1.0	18	62	20	5.2	0.10	0.26				81
Upgradient																	
BMW5 Surface																	
10-16563	BMW-5	2010	0-10	<3.0	<5.0	<5.0	<1.0	<10	<15	<20	2.0	<0.10	<0.0030	<10	9.0	39	**53**
C111-5WA	BMW-5	2011	0-15	<5.0	2.0	1.0	<0.10	**10**	**49**	3.0	**3.0**	<0.050	0.070	<12	<10	<10	16
C112-5WA	BMW-5	2012	0-15	<5.0	1.5	<1.0	<0.10	4.2	<10	2.3	1.4	<0.050	0.067	<12	<10	<10	16
C113-5WA	BMW-5	2013	0-15	<5.0	1.7	<1.0	<0.10	**11**	14	2.5	**2.5**	<0.050	<0.010	<12	<10	51	**62**
C114-5WA	BMW-5	2014	0.-15	3.4	1.9	1.8	0.03	6.7	9.0	3.9	1.9	<0.01	<0.1	<10	<50	<50	**55**
16-C1-MW05A	BMW-5	2016	0-15	2.5	2.4	1.0	<0.050	5.1	<10	2.7	**2.6**	<0.050	0.021	<12	<10	57	**68**
BMW5 Depth																	
10-16565	BMW-5	2010	40	<3.0	<5.0	<5.0	<1.0	<10	<15	<20	1.1	<0.10	<0.0030	<10	4.1	15	24
C111-5WB	BMW-5	2011	40-50	**5.0**	3.0	1.0	<0.10	5.0	**21**	4.0	2.0	<0.050	<0.010	<12	<10	<10	16
C112-5WB	BMW-5	2012	40-50	<5.0	1.9	<1.0	<0.10	4.3	<10	3.2	1.4	<0.050	0.015	<12	<10	<10	16
C113-5WB	BMW-5	2013	40-50	<5.0	2.0	1.1	<0.10	3.8	<10	3.2	1.5	<0.050	<0.010	<12	<10	<50	**36**
C114-5WB	BMW-5	2014	40-50	1.7	1.5	1.4	0.01	<5.0	5.0	2.9	1.6	<0.01	<0.1	<10	<50	<50	**55**
16-C1-MW05B	BMW-5	2016	40-50	1.7	1.6	1.1	<0.050	3.2	<10	2.9	1.9	<0.050	<0.010	<12	<10	<50	**36**
Downgradient																	
MW6 Surface																	
10-16567	MW-6	2010	0-10	3.1	<5.0	<5.0	<1.0	<10	<15	<20	**2.3**	<0.10	<0.0030	<10	10	85	**100**
C111-6WA	MW-6	2011	0-15	<5.0	2.0	1.0	<0.10	6.0	<10	3.0	**3.0**	<0.050	<0.010	<12	<10	<10	16
C112-6WA	MW-6	2012	0-15	<5.0	2.1	<1.0	<0.10	2.6	<10	2.1	1.2	<0.050	<0.010	<12	<10	12	23
C113-6WA	MW-6	2013	0-15	<5.0	1.6	<1.0	<0.10	5.0	<10	2.8	1.8	<0.050	<0.010	<12	<10	<50	**36**
C113-6WA	MW-6	2013	0-15	2.7	2.6	1.4	0.040	<4.9	8.0	3.3	1.6	0.010	<0.10	<10	<50	<50	**55**
C114-6WA	MW-6	2014	0-15	3.0	2.7	1.1	0.02	<5.0	6.0	3.1	1.5	<0.01	<0.1	<10	<50	<50	**55**
16-C1-MW06A	MW-6	2016	0-15	2.2	1.9	1.2	<0.050	2.8	<10	3	1.8	<0.050	<0.010	<12	<10	<50	**36**

Tier II Disposal Facility																	
Sample ID	Sampling Station	Monitoring Year	Depth	Cu	Ni	Co	Cd	Pb	Zn	Cr	As	Hg	Total PCB	F1 C6-C10	F2 C10-C16	F3 C16-C34	Modified TPH Total C6-C34
MW6 Depth																	
10-16569	MW-6	2010	40	3.0	<5.0	<5.0	<1.0	<10	<15	<20	1.5	<0.10	<0.0030	<10	7.2	34	**46**
C111-6WB	MW-6	2011	40-50	<5.0	3.0	2.0	<0.10	4.0	<10	6.0	2.0	<0.050	<0.010	<12	<10	<10	16
C112-6WB	MW-6	2012	40-50	<5.0	2.4	1.3	<0.10	3.7	<10	3.1	**2.4**	<0.050	<0.010	<12	17	55	**78**
C113-6WB	MW-6	2013	40-50	<5.0	3.4	1.7	<0.10	4.8	<10	5.4	**7.4**	<0.050	<0.010	<12	<10	<50	**36**
C114-6WB	MW-6	2014	40-50	2.8	2.5	1.8	<0.01	<4.9	5.0	5.2	1.7	<0.01	<0.1	<10	<50	<50	**55**
16-C1-MW06B	MW-6	2016	40-50	2.1	2.1	1.4	<0.050	3.6	<10	3.6	1.6	<0.050	<0.010	<12	<10	<50	**36**
MW7 Surface																	
10-16571/72	MW-7	2010	0-10	<3.0	<5.0	<5.0	<1.0	<10	<15	<20	<1.0	<0.10	<0.0030	<10	12	150	**167**
C111-7WA	MW-7	2011	0-15	<5.0	2.0	<1.0	<0.10	3.0	<10	3.0	1.0	<0.050	<0.010	<12	<10	<10	16
C112-7WA	MW-7	2012	0-15	<5.0	1.3	<1.0	<0.10	3.1	<10	1.8	1.9	<0.050	<0.010	<12	<10	<10	16
C113-7WA	MW-7	2013	0-15	<5.0	3.8	2.3	<0.10	5.8	<10	6.5	**3.0**	<0.050	<0.010	<12	<10	<50	**36**
C114-7WA	MW-7	2014	0-15	1.3	0.8	0.6	<0.01	<5.0	6.0	1.3	0.7	<0.01	<0.1	<10	<50	<50	**55**
16-C1-MW07A	MW-7	2016	0-15	3.4	1.1	0.54	<0.050	3.9	<10	1.5	1.8	<0.050	<0.010	<12	<10	<50	**36**
MW7 Depth																	
10-16573	MW-7	2010	25-30	4.4	<5.0	<5.0	<1.0	<10	<15	<20	**2.9**	<0.10	<0.0030	<10	6.6	30	**42**
C111-7WB	MW-7	2011	40-50	<5.0	3.0	1.0	<0.10	3.0	<10	4.0	2.0	<0.050	<0.010	<12	<10	<10	16
C112-7WB	MW-7	2012	40-50	<5.0	1.9	1.1	<0.10	3.2	<10	2.8	1.9	<0.050	<0.010	<12	<10	<10	16
C113-7WB	MW-7	2013	40-50	<5.0	2.3	1.4	<0.10	3.4	<10	4.0	1.8	<0.050	<0.010	<12	<10	<50	**36**
C114-7WB	MW-7	2014	40-50	2.4	2.3	1.5	<0.01	<5.0	4.0	4.3	1.7	<0.01	<0.1	<10	<50	<50	**55**
16-C1-MW07B	MW-7	2016	40-50	4.3	2.5	1.6	<0.050	4.6	<10	4.2	**2.6**	<0.050	<0.010	<12	<10	<50	**36**
MW8 Surface																	
10-16575	MW-8	2010	0	<3.0	<5.0	<5.0	<1.0	<10	<15	<20	1.8	<0.10	<0.0030	<10	5.6	37	**48**
C111-8WA	MW-8	2011	0-15	<5.0	2.0	1.0	<0.10	3.0	<10	3.0	1.0	<0.050	<0.010	<12	<10	<10	16
C112-8WA	MW-8	2012	0-15	<5.0	1.1	<1.0	<0.10	1.9	<10	1.7	<1.0	<0.050	<0.010	<12	<10	<10	16
C113-8WA	MW-8	2013	0-15	<5.0	2.2	1.2	<0.10	3.9	<10	3.1	1.9	<0.050	<0.010	<12	<10	<50	**36**
C114-8WA	MW-8	2014	0-15	3.3	2.6	1.8	0.01	5.5	7	4.0	**2.4**	<0.01	<0.1	<10	<50	<50	**55**
16-C1-MW08A	MW-8	2016	0-15	**5.5**	2.9	1.4	0.051	7.1	<10	4	**3.9**	<0.050	<0.010	<12	<10	59	**70**
MW8 Depth																	
10-16577	MW-8	2010	40	<3.0	<5.0	<5.0	<1.0	<10	<15	<20	1.1	<0.10	<0.0030	<10	4.4	18	**27**

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Tier II Disposal Facility																	
Sample ID	Sampling Station	Monitoring Year	Depth	Cu	Ni	Co	Cd	Pb	Zn	Cr	As	Hg	Total PCB	F1 C6-C10	F2 C10-C16	F3 C16-C34	Modified TPH Total C6-C34
C111-8WB	MW-8	2011	40-50	<5.0	3.0	2.0	<0.10	5.0	<10	6.0	2.0	<0.050	<0.010	<12	<10	<10	16
C112-8WB	MW-8	2012	40-50	<5.0	3.2	1.5	<0.10	3.2	<10	4.3	1.8	<0.050	<0.010	<12	<10	<10	16
C113-8WB	MW-8	2013	40-50	<5.0	2.8	1.6	<0.10	3.8	<10	4.9	2.0	<0.050	<0.010	<12	<10	<50	**36**
C114-8WB	MW-8	2014	40-50	2.0	1.5	1.5	<0.01	<5.0	4.0	3.1	1.4	<0.01	<0.1	<10	<50	<50	**55**
16-C1-MW08B	MW-8	2016	40-50	2.3	2.2	1.2	<0.050	4	<10	3.7	2.0	<0.050	<0.010	<12	<10	<50	**36**

Notes:

XX	sample exceeds background
XX	**sample exceeds baseline**
XX	*sample exceeds baseline +3 standard deviations*

**** All units in mg/kg**

- The excel monitoring data table contains rounding formatting errors for Ni and Cr.

Table 7-9: PHC F4 Soil Chemical Analysis Results – Tier II Disposal Facility

Sample Location	Sample ID	Sample Depth (m bgs)	PHC F4 (mg/kg)
C1-14	16-C1-14A	0 - 0.15	<50
	16-C1-14B	0.4 – 0.5	<50
C1-15	16-C1-15A	0 - 0.15	<50
	16-C1-15B	0.4 – 0.5	<50
C1-16	16-C1-16A	0 - 0.15	<50
	16-C1-16B	0.4 – 0.5	<50
C1-17	16-C1-17A	0 - 0.15	<50
	16-C1-17B	0.3 – 0.35	<50
C1-18	16-C1-18A	0 – 0.15	<50
	16-C1-18B	0.4 – 0.5	<50

7.3.2.2 Discussion of Results – Comparison to Baseline/Background

Analytical results were compared against baseline data, and background concentrations. The following Table 7-10 summarizes the comparison of results.

Table 7-10: Evaluation of Results by Parameter – Tier II Disposal Facility

Tier II Disposal Facility	
Parameter	Discussion of Results
Copper (Cu)	All soil samples reported either non-detect concentrations or were below both background and baseline concentrations for Cu with the exception of sample MW8 surface which reported a concentration of 5.5 mg/kg which was above the baseline of 4.9 mg/kg.
Nickel (Ni)	All soil samples reported either non-detect concentrations or were below both background and baseline concentrations for Ni.
Cobalt (Co)	All soil samples reported either non-detect concentrations or were below both background and baseline concentrations for Co.
Cadmium (Cd)	All soil samples reported either non-detect concentrations or were below both background and baseline concentrations for Cd.
Lead (Pb)	All soil samples reported either non-detect concentrations or were below both background and baseline concentrations for Pb with the exception to sample MW8 surface which reported a concentration of 7.1 mg/kg which was slightly above the background concentration of 7 mg/kg.
Zinc (Zn)	All soil samples reported either non-detect concentrations or were below both background and baseline for Zn.
Chromium (Cr)	All soil samples reported concentrations below both background and baseline concentrations for Cr.
Arsenic (As)	As was reported above either the background concentration of 3.6 mg/kg and/or the baseline concentration of 2.1 mg/kg at sample stations MW-5 surface and MW-7 depth both with

	reported concentrations of 2.6 mg/kg. MW-8 surface was reported above both baseline and background with a concentration of 3.9 mg/kg.
Mercury (Hg)	All soil samples reported either non-detect concentrations or were below both background and baseline for Hg.
PCBs (Total)	All soil samples reported either non-detect concentrations or were below both background and baseline for PCBs.
Modified TPH (C_6-C_{34})	All soil samples reported TPH concentrations above the baseline and two samples also reported concentrations above the baseline +3 standard deviations (i.e., MW6 surface and MW7 surface, both in 2010). However, the comparison values were calculated from mostly non-detect laboratory detection limits and these exceedances do not represent a concern.

7.3.2.3 Soil Trend Analysis by Parameter & Discussion of Trends

A soil chemistry trend analysis was conducted based on the current and historical analytical results collected at the site. A Series of graphs were generated including a visual comparison to background, baseline and historical concentrations using differentiating colours (See Appendix E5). The following Table 7-11 provides a summary of soil trend analysis findings and presents a discussion of the observed trends by parameter.

Table 7-11: Discussion of Trends – Tier II Disposal Facility

Tier II Disposal Facility	
Parameter	**Discussion of Trends**
Copper (Cu)	Based on current and historical results, Cu concentrations have undulated over the monitoring years 2010 to present. Cu has no observable trend; however, evidence of a slight upward trend is present. Detection limits of 5 mg/kg were present in historical monitoring events and this may skew the general trend analysis slightly.
Nickel (Ni)	Based on current and historical results, it appears that Ni has no observable trend as concentrations have fluctuated up and down over the course of the monitoring history. There does appear to be a slight downward trend present.
Cobalt (Co)	Based on current and historical results, it appears that Co has no observable trend as most sample station report fluctuations of concentrations up and down. One sample station, MW-7 surface, shows a decrease in concentration.
Cadmium (Cd)	Based on current and historical results, it appears that Cd has no observable trend.
Lead (Pb)	Based on current and historical results, it appears that Pb has no observable trend as evidenced by fluctuations in concentrations over time at most of the sample locations. Sample station MW-6 surface reported a decrease in concentration over time, while sample station MW-7 depth reported an increase in concentrations over time.
Zinc (Zn)	Based on current and historical results, it appears that Zn has no observable trend. General fluctuations both up and down are noted at all sample station for Zn. No obvious trend is evident.
Chromium (Cr)	Based on current and historical results, it appears that Cr has no observable trend. General fluctuations both up and down are noted at all sample station for Cr. No obvious trend is evident.

Tier II Disposal Facility	
Parameter	**Discussion of Trends**
Arsenic (As)	Based on current and historical results, As has no observable trend across most of the landfill with fluctuations up and down over the monitoring years. Some exceptions were noted with sample station MW-5 depth reporting an increase in concentrations over time, MW-6 depth reporting a high spike in concentrations in 2013, and MW-8 surface reporting an increase in concentrations over time.
Mercury (Hg)	Based on all non-detect concentrations, Hg has no observable trend.
PCBs (Total)	Based on non-detect concentrations, PCBs has no observable trend.
Modified TPH (C_6-C_{34})	Based on current and historical results, Modified TPH concentrations has no observable trend.

Trend analyses presented are based on the data available at the time of the investigation and any interpreted increasing or decreasing trends may be a result of natural variation in the data due to analytical methods. There is currently insufficient information to establish reliable trends; therefore, additional data points are required to be able to confidently determine if trends are present.

7.3.3 Groundwater Sampling

Four groundwater monitoring wells (MW-5, MW-6, MW-7, and MW-8) are present at the Tier II Disposal Facility. Groundwater sampling of the Tier II Disposal Facility was conducted on August 10, 2016. The groundwater sampling was conducted in compliance with Section 5.3.1 and 5.3.3 of the Terms of Reference and details are provided below in the following 7.3.3.1 to 7.3.3.5.

7.3.3.1 Monitoring Well Sampling/Inspection Logs

As per Section 5.3.3.2 of the TOR, groundwater monitoring logs were filled out for each monitoring well as provided below.

Table 7-12: CAM-1 Monitoring Well Log for MW-5

Monitoring Well Sampling Log

Site Name:	CAM-1	Landfill Name:	Tier II		
Monitoring Well ID:	MW-5	UTM Coordinates:		North	East
Sample Number(s) (include dups.):	C1- MW05/ C1- Dup1 (Maxxam)				
Bottles filled (by parameter type):	PCB (2x500mL), Metals (7 plastic, 1 amber), PHC (2 vials, 2 amber), 1 general				
Date of Sampling Event:	Aug 10/16	Time:	11:00		
Weather:	Sun, windy, 10-12ºC				
Names of Samplers:	Ryan Fletcher				
Description of Well Condition and Surrounding ground conditions (note ponding of water):	Excellent Condition				
Lock (condition, presence, model, manufacturer):	Cut and replaced as per TOR				

Pre-Measured Data (From Water Well Record Log)

*Depth of well installation (cm)=	460	Diameter of well (cm)=	3.8
*Depth to top of screen (cm)=	50	Length screened section (cm)=	300

*note: *depths are from ground surface*

Field Measurements

Measurement method (interface probe, tape, etc):	Interface probe		
Well pipe height above ground (cm) (to top of pipe) =	30		
Static water level (cm) from top of pipe =	147.1		
Static water level (cm) (below ground surface) calculated =	117.1		
Measured well refusal depth (cm) (measure after sampling) =	140.8		
Thickness of water column (cm)=	23.7	Static volume of water in well (mL)=	N/A
Free product thickness (mm)=	No Free Product	Evidence of sludge or siltation:	No

Purging Information Summary*

Purging/sampling equipment, sampling technique and equipment calibration information:	Low flow peristaltic pump		
Well purged (Y/N):	Y	Recharge Rate:	N/A
Volume Purged (L) (note multiple purging events if applicable):	3.8L total, 15 minutes low-flow		

Parameter	Initial	Intermediate	Final	*Notes (if not stabilized)*
pH	7.74	7.64	7.69	
Conductivity (uS/cm)	887	827	801	
Turbidity (NTU)				
Temperature (degC)	2.23	1.83	1.43	

Visual/olfactory observations (incl. colour, odour, presence of free product/sheen/globules, siltation…): Clear, no odour, no sheen

Decontamination of sampling equipment

Type of decontamination fluid (s):	N/A- dedicated sampling train		
Number washes:	N/A	Number rinses:	N/A

Other Relevant Comments:

Table 7-13: CAM-1 Monitoring Well Log for MW-6

Monitoring Well Sampling Log

Site Name:	CAM-1	Landfill Name:	Tier II		
Monitoring Well ID:	MW-6	UTM Coordinates:		North	East
Sample Number(s) (include dups.):	N/A				
Bottles filled (by parameter type):	N/A- insufficient water				
Date of Sampling Event:	Aug 10/16	Time:			
Weather:	Sun, windy, 10-12°C				
Names of Samplers:	Ryan Fletcher				
Description of Well Condition and Surrounding ground conditions (note ponding of water):	Excellent Condition				
Lock (condition, presence, model, manufacturer):	Cut and replaced as per TOR				

Pre-Measured Data (From Water Well Record Log)

*Depth of well installation (cm)=	465	Diameter of well (cm)=	3.8
*Depth to top of screen (cm)=	50	Length screened section (cm)=	300

*note: *depths are from ground surface*

Field Measurements

Measurement method (interface probe, tape, etc):	Interface probe		
Well pipe height above ground (cm) (to top of pipe) =	60		
Static water level (cm) from top of pipe =	161.2		
Static water level (cm) (below ground surface) calculated =	101.2		
Measured well refusal depth (cm) (measure after sampling) =	162.7		
Thickness of water column (cm)=	1.5	Static volume of water in well (mL)=	N/A
Free product thickness (mm)=	No Free Product	Evidence of sludge or siltation:	No

Purging Information Summary*

Purging/sampling equipment, sampling technique and equipment calibration information:	N/A – insufficient water		
Well purged (Y/N):	N/A	Recharge Rate:	N/A
Volume Purged (L) (note multiple purging events if applicable):	N/A		

Parameter	Initial	Intermediate	Final	*Notes (if not stabilized)*
pH	N/A			
Conductivity (uS/cm)				
Turbidity (NTU)				
Temperature (degC)				

Visual/olfactory observations (incl. colour, odour, presence of free product/sheen/globules, siltation…): N/A

Decontamination of sampling equipment

Type of decontamination fluid (s):	N/A		
Number washes:	N/A	Number rinses:	N/A

Other Relevant Comments:

Table 7-14: CAM-1 Monitoring Well Log for MW-7

Monitoring Well Sampling Log

Site Name: CAM-1 Landfill Name: Tier II

Monitoring Well ID: MW-7 UTM Coordinates: North East

Sample Number(s) (include dups.): N/A

Bottles filled (by parameter type): N/A- frozen

Date of Sampling Event: Aug 10/16 Time: 11:30

Weather: Sun, windy, 10-12°C

Names of Samplers: Ryan Fletcher

Description of Well Condition and Surrounding ground conditions (note ponding of water): Excellent Condition

Lock (condition, presence, model, manufacturer): Cut and replaced as per TOR

Pre-Measured Data (From Water Well Record Log)

*Depth of well installation (cm)= 470 Diameter of well (cm)= 3.8

*Depth to top of screen (cm)= 50 Length screened section (cm)= 300

*note: *depths are from ground surface*

Field Measurements

Measurement method (interface probe, tape, etc): Interface probe

Well pipe height above ground (cm) (to top of pipe) = 50

Static water level (cm) from top of pipe = N/A

Static water level (cm) (below ground surface) calculated = N/A

Measured well refusal depth (cm) (measure after sampling) = 150.6 (frozen)

Thickness of water column (cm)= 0 Static volume of water in well (mL)= N/A

Free product thickness (mm)= None- Ice on probe Evidence of sludge or siltation: No

Purging Information Summary*

Purging/sampling equipment, sampling technique and equipment calibration information: N/A – insufficient water

Well purged (Y/N): N/A Recharge Rate: N/A

Volume Purged (L) (note multiple purging events if applicable): N/A

Parameter	Initial	Intermediate	Final	*Notes (if not stabilized)*
pH	N/A			
Conductivity (uS/cm)				
Turbidity (NTU)				
Temperature (degC)				

Visual/olfactory observations (incl. colour, odour, presence of free product/sheen/globules, siltation…): N/A

Decontamination of sampling equipment

Type of decontamination fluid (s): N/A

Number washes: N/A Number rinses: N/A

Other Relevant Comments:

Table 7-15: CAM-1 Monitoring Well Log for MW-8

Monitoring Well Sampling Log

Site Name: CAM-1 Landfill Name: Tier II

Monitoring Well ID: MW-8 UTM Coordinates: North East

Sample Number(s) (include dups.): N/A

Bottles filled (by parameter type): N/A

Date of Sampling Event: Aug 10/16 Time: 11:45

Weather: Sun, windy, 10-12°C

Names of Samplers: Ryan Fletcher

Description of Well Condition and Surrounding ground conditions (note ponding of water): Excellent Condition

Lock (condition, presence, model, manufacturer): Cut and replaced as per TOR

Pre-Measured Data (From Water Well Record Log)

*Depth of well installation (cm)= 480 Diameter of well (cm)= 3.8

*Depth to top of screen (cm)= 50 Length screened section (cm)= 300

*note: *depths are from ground surface*

Field Measurements

Measurement method (interface probe, tape, etc): Interface probe

Well pipe height above ground (cm) (to top of pipe) = 50

Static water level (cm) from top of pipe = N/A

Static water level (cm) (below ground surface) calculated = N/A

Measured well refusal depth (cm) (measure after sampling) = 163.1 (dry)

Thickness of water column (cm)= 0 Static volume of water in well (mL)= N/A

Free product thickness (mm)= None Evidence of sludge or siltation: No

Purging Information Summary*

Purging/sampling equipment, sampling technique and equipment calibration information: N/A – insufficient water

Well purged (Y/N): N/A Recharge Rate: N/A

Volume Purged (L) (note multiple purging events if applicable): N/A

Parameter	Initial	Intermediate	Final	*Notes (if not stabilized)*
pH	N/A			
Conductivity (uS/cm)				
Turbidity (NTU)				
Temperature (degC)				

Visual/olfactory observations (incl. colour, odour, presence of free product/sheen/globules, siltation…): N/A

Decontamination of sampling equipment

Type of decontamination fluid (s): N/A

Number washes: N/A Number rinses: N/A

Other Relevant Comments:

Table 7-16: Summary of Groundwater Field Chemistry – Tier II Disposal Facility

Tier II Disposal Facility						
	Time (min)	Temperature (°C)	Conductivity (uS/cm)	Dissolved Oxygen (mg/L)	pH	ORP (mV)
Downgradient- Tier II						
MW-5						
	0	2.15	862	15.23	7.64	172.4
	5	1.83	827	14.97	7.64	175.2
	10	1.54	807	14.67	7.66	177.4
	15	1.43	801	14.47	7.69	179.2
	20	Sampled at 20 minutes				
	25					

7.3.3.2 Water Levels/Groundwater Flow

Groundwater levels were collected and are presented below in Table 7-17.

Table 7-17: Summary of Groundwater Levels - Tier II Disposal Facility

Tier II Disposal Facility			
Monitoring Well ID	Water Level (TOC) (m)	Water Level (from ground surface) (m)	Comments
MW-5	1.471	1.171	Good recharge – sample collected
MW-6	1.627	1.027	Insufficient water
MW-7	1.506	1.006	Frozen - Dry
MW-8	1.631	1.131	Dry

Insufficient information was available to ascertain a groundwater flow direction.

7.3.3.3 Groundwater Laboratory Analytical Results

One groundwater sample was analysed at the Tier II Disposal Facility. No other groundwater data has been collected at the Tier II Disposal facility throughout the monitoring years.

The following Table 7-18 presents the groundwater analytical results. Figure CAM-1.6C presents a summary of significant groundwater analytical results.

Table 7-18: Groundwater Chemical Analysis Results – Tier II Disposal Facility

Tier II Disposal Facility																
	Sampling Station	Monitoring Year	Cu	Ni	Co	Cd	Pb	Zn	Cr	As	Hg	Total PCB	F1 C6-C10	F2 C10-C16	F3 C16-C34	Modified TPH Total C6-C34
Comparison Values																
Baseline			**0.012**	**0.020**	**0.0030**	**0.00100**	**0.0063**	**0.0052**	**0.030**	**0.0038**	**0.0040**	**0.000020**				**1**
Baseline +3 Standard Deviations			0.028	0.046	0.0030	0.0010	0.027	0.013	0.072	0.012	0.0040	0.00002				**1**
Upgradient																
MW-5																
not sampled - well dry	BMW-5	2010	-	-	-	-	-	-	-	-	-	-	-	-	-	-
not sampled - well dry	BMW-5	2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-
not sampled - well dry	BMW-5	2012	-	-	-	-	-	-	-	-	-	-	-	-	-	-
not sampled - well dry	BMW-5	2013	-	-	-	-	-	-	-	-	-	-	-	-	-	-
not sampled - well dry	BMW-5	2014	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16-BMW05[1]	BMW-5	2016	0.0034	0.0022	<0.00030	<0.000020	<0.0002	<0.0030	<0.0010	0.00099	0.0000031	<0.000050	<0.10	<0.10	<0.20	0.2

Notes:

1 = Petroleum Hydrocarbons F4 reported a concentration of <0.20 mg/L for sample 16-BMW05 in 2016.

Table 7-19: PHC F4 Groundwater Chemical Analysis Results – Tier II Disposal Facility

Monitoring Well ID	PHC F4 (mg/L)
MW-4	Not Sampled
MW-5	<0.20
MW-6	<0.20
MW-7	<0.20

No other groundwater data is available from the Tier II Disposal Facility.

7.3.3.4 Discussion of Groundwater Results by Parameter

Only one set of groundwater results have been collected from the Tier II Disposal Facility from MW-5 during this monitoring event; therefore, no baseline data is available for comparison purposes. More monitoring data is required for further analysis of results.

The results reported were non-detect for Co, Cd, Pb, Zn, Cr, Modified TPH, and PCBs. Low level concentrations were detected for As, Hg, Cu, and Ni.

7.3.3.5 Groundwater Trend Analysis by Parameter and Discussion of Trends

Only one groundwater monitoring well, MW-5, produced sufficient water to collect a sample and no historical data is available to conduct a trend analysis on the data set.

7.3.4 Thermal Monitoring

7.3.4.1 Thermistor Annual Maintenance Reports

As per Section 5.4.3 of the TOR, thermistor inspection logs were filled out for thermistors as provided in table 7-17.

Table 7-17: CAM-1 Thermistor Log for VT-1

ANNEX M: Thermistor Inspection Template

Inspector Name:	S. Borcsok				Inspection Date:	11-Aug-16			
Inspector Signature / Prepared By:	S. Borcsok								

Thermistor Information (*Some Information can be pre-populated from thermistor logs)

Site Name:	**CAM-1**		Landfill:	Tier II Disposal Facility					
Thermistor Number:	**VT-1**		Inclination:		Vertical				
Datalogger model no:	**RX-16**		Datalogger cable download model:					CCUSB	
*Install Date:	**28-Jul-09**		First Date Event		**13-Aug-11**	Last Date Event		**27-Aug-14**	
*Coordinates and Elevation		N	**7620734.0**		E	**389089.0**		Elev	**35.9**
Length of Cable (m)	**2.30 m**	Cable Lead Above Ground (m)				1.03 m			
Datalogger Serial #	**07060015**	Nodal Points	16						

Thermistor Inspection

	Good	Needs Maintenance	Description
Casing	X	☐	
Cover	X	☐	
Data Logger	X	☐	
Cable	X	☐	
Beads	X	☐	
Lock condition	X	☐	New Lock
Battery Installation Date	Expires 07/2019		
Battery Levels	Main 11.34 V		Aux 13.87 V

Manual Ground Temperature Readings

Bead	Volts	Degrees C	Bead	Volts	Degrees C
1	1.1295	6.1347	9	0.7503	-6.5878
2	1.0286	2.8342	10	0.7289	-7.3540
3	0.9592	0.5477	11	0.7102	-8.0350
4	0.9181	-0.8172	12	0.6948	-8.6002
5	0.881	-2.0647	13	0.6813	-9.0972
6	0.8333	-3.6871	14	0.6711	-9.4787
7	0.8029	-4.7356	15	0.66	-9.8947
8	0.7765	-5.6611	16	0.6532	-10.1517

Battery Information

Batteries changed ?	Yes		No	X	Monitoring Year:	7
Battery model number installed or model of battery in place:					UBL15, ULB1	
Expected remaining battery life (years):	3 - expires 07/2019					

Datalogger Programming (Describe programming completed; beads and frequency)

None

Observations and Proposed Maintenance

None required

Table 7-17: CAM-1 Thermistor Log for VT-2

ANNEX M: Thermistor Inspection Template

Inspector Name:	S. Borcsok				Inspection Date:	11-Aug-16			
Inspector Signature / Prepared By:	S. Borcsok								

Thermistor Information (*Some Information can be pre-populated from thermistor logs)

Site Name:	**CAM-1**		Landfill:	Tier II Disposal Facility					
Thermistor Number:	**VT-2**		Inclination:		Vertical				
Datalogger model no:	**RX-16**		Datalogger cable download model:					CCUSB	
*Install Date:	**29-Jul-09**		First Date Event		**13-Aug-11**	Last Date Event		**27-Aug-14**	
*Coordinates and Elevation		N	**7620759.0**		E	**389105.5**		Elev	**36.5**
Length of Cable (m)	**5.26 m**	Cable Lead Above Ground (m)				1.06 m			
Datalogger Serial #	**07050030**	Nodal Points	16						

Thermistor Inspection

	Good	Needs Maintenance	Description
Casing	X	☐	
Cover	X	☐	
Data Logger	X	☐	
Cable	X	☐	
Beads	X	☐	
Lock condition	X	☐	New Lock
Battery Installation Date	Expires 07/2019		
Battery Levels	Main 11.34 V		Aux 12.77 V

Manual Ground Temperature Readings

Bead	Volts	Degrees C	Bead	Volts	Degrees C
1	1.3063	11.9863	9	0.9592	0.5477
2	1.3021	11.8451	10	0.9188	-0.7968
3	1.3006	11.7938	11	0.8792	-2.1265
4	1.3161	12.3159	12	0.8444	-3.3083
5	1.3615	13.8599	13	0.798	-4.9081
6	1.2779	11.0264	14	0.7668	-6.0028
7	1.1299	6.1472	15	0.7425	-6.8659
8	1.0334	2.9918	16	0.7241	-7.5277

Battery Information

Batteries changed ?	Yes		No	X	Monitoring Year:	7
Battery model number installed or model of battery in place:					UBL15, ULB1	
Expected remaining battery life (years):	3 - expires 07/2019					

Datalogger Programming (Describe programming completed; beads and frequency)

None

Observations and Proposed Maintenance

None required

Table 7-17: CAM-1 Thermistor Log for VT-3

ANNEX M: Thermistor Inspection Template

Inspector Name:	S. Borcsok				Inspection Date:	11-Aug-16			
Inspector Signature / Prepared By:	S. Borcsok								

Thermistor Information (*Some Information can be pre-populated from thermistor logs)

Site Name:	**CAM-1**		Landfill:	Tier II Disposal Facility					
Thermistor Number:	**VT-3**		Inclination:		Vertical				
Datalogger model no:	**RX-16**		Datalogger cable download model:					CCUSB	
*Install Date:	**29-Aug-09**		First Date Event		**13-Aug-11**	Last Date Event		**27-Aug-14**	
*Coordinates and Elevation		N	**7620735.5**		E	**389140.5**		Elev	**36.4**
Length of Cable (m)	**2.35 m**	Cable Lead Above Ground (m)				1.03 m			
Datalogger Serial #		Nodal Points	16						

Thermistor Inspection

		Good	Needs Maintenance	Description
	Casing	X	☐	
	Cover	X	☐	
	Data Logger	X	☐	
	Cable	X	☐	
	Beads	X	☐	
	Lock condition	X	☐	New Lock
	Battery Installation Date	Expires 07/2019		
	Battery Levels	Main	11.34 V	Aux 13.75 V

Manual Ground Temperature Readings

Bead	Volts	Degrees C	Bead	Volts	Degrees C
1	1.1262	6.0074	9	0.7582	-6.3082
2	1.0343	3.0193	10	0.7365	-7.0821
3	0.9616	0.6285	11	0.7186	-7.7268
4	0.9236	-0.6363	12	0.7047	-8.2358
5	0.8858	-1.9026	13	0.6911	-8.7253
6	0.8375	-3.5933	14	0.679	-9.1852
7	0.8065	-4.6111	15	0.6687	-9.5674
8	0.7771	-5.6397	16	0.6656	-9.6899

Battery Information

Batteries changed ?	Yes		No	X	Monitoring Year:	7
Battery model number installed or model of battery in place:					UBL15, ULB1	
Expected remaining battery life (years):	3 - expires 07/2019					

Datalogger Programming (Describe programming completed; beads and frequency)

None

Observations and Proposed Maintenance

None required

Table 7-17: CAM-1 Thermistor Log for VT-4

ANNEX M: Thermistor Inspection Template

Inspector Name:	S. Borcsok				Inspection Date:	11-Aug-16			
Inspector Signature / Prepared By:	S. Borcsok								

Thermistor Information (*Some Information can be pre-populated from thermistor logs)

Site Name:	**CAM-1**		Landfill:	Tier II Disposal Facility					
Thermistor Number:	**VT-4**		Inclination:		Vertical				
Datalogger model no:	**RX-16**		Datalogger cable download model:					CCUSB	
*Install Date:	**29-Jul-09**		First Date Event		**13-Aug-11**	Last Date Event		**27-Aug-14**	
*Coordinates and Elevation		N	**7620749.0**		E	**389124.5**		Elev	**36.7**
Length of Cable (m)	**2.63 m**	Cable Lead Above Ground (m)				0.96 m			
Datalogger Serial #	**07060006**	Nodal Points	13						

Thermistor Inspection

	Good	Needs Maintenance	Description
Casing	X	☐	
Cover	X	☐	
Data Logger	X	☐	
Cable	X	☐	
Beads	X	☐	
Lock condition	X	☐	New Lock
Battery Installation Date	Expires 07/2019		
Battery Levels	Main 11.34 V		Aux 13.63 V

Manual Ground Temperature Readings

Bead	Volts	Degrees C	Bead	Volts	Degrees C
1	1.3625	13.8939	9	0.8419	-3.3918
2	1.3309	12.7986	10	0.7859	-5.3291
3	1.2002	8.4557	11	0.7546	-6.4357
4	1.0750	4.3531	12	0.7365	-7.0821
5	1.0006	1.9147	13	0.7175	-7.7683
6	0.9422	-0.0166	14	0.0000	381.0738
7	0.9114	-1.0442	15	0.0000	381.0738
8	0.8827	-2.0081	16	0.0000	381.0738

Battery Information

Batteries changed ?	Yes		No	X	Monitoring Year:	7
Battery model number installed or model of battery in place:					UBL15, ULB1	
Expected remaining battery life (years):	3 - expires 07/2019					

Datalogger Programming (Describe programming completed; beads and frequency)

None

Observations and Proposed Maintenance

None required

7.3.4.2 Summary of Findings from Annual DEW Line Thermal Reports

Findings from the DEW Line Thermal Reports are to be provided by DND. No analysed data was provided to Arcadis for inclusion into the 2016 monitoring report. Any further Summary of Findings for Thermal Reporting will be provided by Arcadis under a separate cover, once historical data has been obtained.

7.4 Conclusions and Overall Landfill Performance

Based on the results of the 2016 monitoring program, the overall performance of the Tier II Disposal Facility is acceptable.

7.5 Recommendations and Conclusions

Based on review and analysis of chemical data, it appears that the soil concentrations for the parameters tested has no observable trend. Copper does appear to have a slight upward trend across the site, while nickel reported the opposite with a slight downward trend. Most other parameters reported fluctuating concentrations over time indicating no observable trend.

Only one sample is available from the groundwater monitoring wells at the Tier II Disposal Facility throughout the monitoring years; therefore, more data is required for comparison purposes and to conduct a trend analysis.

Based on this review, it is recommended to continue the long term monitoring of soils and groundwater as planned.

Based on the results of the visual inspection, the Tier II Disposal Facility performance is acceptable. No remedial work or deviations from the monitoring plan are recommended at this time.

8 CAM-1: SOUTHEAST LANDFILL

8.1 Landfill Description

The CAM-1 Southeast Landfill is located in the southern portion of the Station Area, east of the Station POL access road. Geophysics identified two lobes of debris in the area.

The remediation of this landfill included the removal of surface debris and regrading with the placement of additional granular fill.

The long term monitoring plan for the Southeast Landfill consists of visual inspection, and the periodic collection of soil samples.

The landfill layout, visual observations and photographic locations are presented on Figure CAM-1.7A and soil analytical results are presented on Figure CAM-1.7B in the figures section.

8.2 Summary of Work Conducted

8.2.1 Visual Inspection

A visual inspection was conducted on the Southeast Landfill on August 10, 2016. The visual inspection of the landfill was completed with no deviations from the visual inspection work plan.

8.2.2 Soil Sampling

Soil sampling at the Southeast Landfill was conducted on August 10, 2016 and consisted of the collection of ten soil samples from five soil sample stations (C1-14, C1-15, C1-16, C1-17 and C1-18). Depth limitations were encountered at soil sampling station C1-17 where the maximum depth achieved was 0.35 m bgs.

The following Table 8-1 outlines the soil sampling activities conducted at the Southeast Landfill.

Table 8-1: Summary of Work Conducted by Soil Sampling Location

Southeast Landfill			
Sample Location	**Sample ID**	**Sample Depth (m bgs)**	**Notes**
C1-14	16-C1-14A	0 - 0.15	
	16-C1-14B	0.4 – 0.5	
C1-15	16-C1-15A	0 - 0.15	
	16-C1-15B	0.4 – 0.5	
C1-16	16-C1-16A	0 - 0.15	
	16-C1-16B	0.4 – 0.5	
C1-17	16-C1-17A	0 - 0.15	Refusal on Cobbles

Southeast Landfill			
Sample Location	**Sample ID**	**Sample Depth (m bgs)**	**Notes**
	16-C1-17B	0.3 – 0.35	
C1-18	16-C1-18A	0 – 0.15	
	16-C1-18B	0.4 – 0.5	

8.2.3 Groundwater Sampling

No groundwater monitoring wells are present at the Southeast Landfill.

8.2.4 Thermal Monitoring

No thermistors are present at the Southeast Landfill.

8.3 Results of the Monitoring Program

The following Sections 8.3.1 through 8.3.4 summarize the results of the CAM-1 monitoring program at the Southeast Landfill.

8.3.1 Visual Inspection

The visual inspection of the Southeast Landfill was conducted on August 10, 2016. The visual inspection was conducted in compliance with Section 5.2 of the Terms of Reference and details are provided below in the following Sections 8.3.1.1 through 8.3.1.5. Figure CAM-1.7A presents the visual inspection findings and photographic locations.

8.3.1.1 Inspection Checklist

The visual inspection was completed as per the Terms of Reference and the visual inspection checklist is included as Table 8-2 of this report below.

Table 8-2: Visual Inspection Checklist – Southeast Landfill

SITE NAME: **CAM-1 Jenny Lind Island**

LANDFILL DESIGNATION: Southeast Landfill
LANDFILL TYPE: Regraded
DATE OF INSPECTION: August 10, 2016
WEATHER CONDITIONS: 10ºC, sunny, light wind
DATE OF PREVIOUS INSPECTION: August 27, 2014
INSPECTED BY: Stephen Borcsok
REPORT PREPARED BY: Stephen Borcsok and Ryan Fletcher

The preparer represents to the best of the preparer's knowledge, the following statements and observations are true and correct and to the best of the preparer's actual knowledge, no material facts have been suppressed or misstated.

Southeast Landfill												
Checklist Item	**Present (Yes/No)**	**Feature Number**	**Feature Location**	**GPS Coordinates Easting/Northing/Zone**	**Length (m)**	**Width (m)**	**Depth (m)**	**Extent Relative to Landfill Surface**	**Description**	**Comparison with Historical Observations**	**Additional Comments**	**Photographic Records (photo reference, location, view point & direction, feature of note, scale)**
Settlement	Yes	A	North side slope, Lobe 2	389235.499 / 7620632.276	14	2.5	0.15	0.05	<1%	Linear depression	Feature first noted in Year 2 (2011). Side slope appears stable. NSC	Severity Rating – Acceptable (feature is minor and not affecting landfill stability)	CAM-1 SE 16, 17
Settlement	Yes	E	East side slope, Lobe 1	389262.877 / 7620585.886	14	6	0.2	0.1	<1%	Linear depression	New observation in 2016.	Severity Rating – Acceptable (feature is minor and not affecting landfill stability)	CAM-1 SE 23, 24
Settlement	No	B	Southeast crest, Lobe 1	N/A	N/A	0.5	0.15	0.03	<1%	Minor depression	Feature first noted in Year 3 (2012). Feature not observed in 2014 or 2016.	Severity Rating – Acceptable (feature was not observed in 2016)	N/A
Erosion	No	C	South cover/side slope, Lobe 1	N/A	N/A	N/A	N/A	N/A	<1%	Minor erosion, washing of fines	Feature first noted in Year 3 (2012). Feature not observed in 2016.	Severity Rating – Acceptable (feature was not observed in 2016)	CAM-1 SE 11, 12
Lateral Movement	No												
Frost Action	No												
Sloughing	No												
Cracking	No												
Animal Burrows	No												
Vegetation Establishment	Yes	N/A	Landfill side slopes	Various locations	14	N/A	N/A	N/A	<1%	Occasional very small plants present on landfill surface	Not observed previously.	Severity Rating – Acceptable (vegetation establishment will be beneficial for landfill stability)	CAM-1 SE 12
Staining	No												
Vegetation Stress	No												
Seepage Points (or) Ponded Water	No												
Debris and/or Liner Exposed	No												
Presence & Condition of Monitoring Instruments	No												

Southeast Landfill												
Checklist Item	**Present (Yes/No)**	**Feature Number**	**Feature Location**	**GPS Coordinates Easting/Northing/Zone**	**Length (m)**	**Width (m)**	**Depth (m)**	**Extent Relative to Landfill Surface**	**Description**	**Comparison with Historical Observations**	**Additional Comments**	**Photographic Records (photo reference, location, view point & direction, feature of note, scale)**
Features of Note/Other Relevant Observations (e.g., signs of activity, ruts…)	Yes	D	West side slope, Lobe 1	389210.134 / 7620563.753	14	3-5	0.15	0.05		Vehicle Ruts	Feature first noted in Year 2 (2011). Side slope appears stable. Length increased from 1-3 to 3-5 m between 2014 and 2016. Vehicle ruts are not expected to drastically increase in length from year to year so length increases may be a result of differences in measurement technique.	Severity Rating – Acceptable (features are minor and not affecting landfill stability)	CAM-1 SE 4, 5

8.3.1.2 Stability Assessment

The Preliminary Stability Assessment for the Southeast Landfill was conducted on August 10, 2016 as per the Terms of Reference and the results are provided below in Table 8-3.

Table 8-3: Preliminary Stability Assessment – Southeast Landfill

Southeast Landfill		
Feature	Severity Rating	Extent
Settlement	Acceptable	Occasional
Erosion	Not Observed	None
Lateral Movement	Not Observed	None
Frost Action	Not Observed	None
Sloughing	Not Observed	None
Cracking	Not Observed	None
Animal Burrows	Not Observed	None
Vegetation Establishment	Acceptable	Occasional
Staining	Not Observed	None
Vegetation Stress	Not Observed	None
Seepage / Ponded Water	Not Observed	None
Debris and/or Liner Exposure	Not Observed	None
Other	Acceptable (Tire Ruts)	Isolated
Overall Landfill Performance	**Acceptable**	

Southeast Landfill	
Performance / Severity Rating	Description
Acceptable	Noted features are of little consequence. The landfill is performing as designed. Minor deviations in environmental or physical performance may be observed, such as isolated areas of erosion, settlement.
Marginal	Physical/environmental performance appears to be deteriorating with time. Observations may include an increase in size or number of features of note,

Southeast Landfill	
Performance / Severity Rating	Description
	such as differential settlement, erosion or cracking. No significant impact on landfill stability to date, but potential for failure is assessed as low or moderate.
Significant	Significant or potentially significant changes affecting landfill stability, such as significant changes in slope geometry, significant erosion or differential settlement; scarp development. The potential for failure is assessed as imminent.
Unacceptable	Stability of landfill is compromised to the extent that ability to contain waste materials is compromised. Examples may include: • Debris exposed in erosion channels or areas of differential settlement. • Liner exposed. • Slope failure.
Extent	**Description**
Isolated	Singular feature
Occasional	Features of note occurring at irregular intervals/locations
Numerous	Many features of note, impacted less than 50% of the surface area of the landfill
Extensive	Impacting greater than 50% of the surface area of the landfill

8.3.1.3 Photographic Records

The photographic record for the Southeast Landfill has been completed as per Section 5.5 of the Terms of Reference and is included in the following page as Table 8-4. The Photographic Record only contains an index of photographs collected; full sized photographs are contained in the Appended CD/DVD-ROM. Selected photographs are shown in Table 8-5. Figure CAM-1.7A presents the photograph locations and directions.

Table 8-4: Photographic Records – Southeast Landfill

Southeast Landfill						
Photo Identification	**Figure ID**	**View Direction**	**Photo Location**	**Feature Identification**	**Feature of Note**	**Other Comments**
Sample Station Photographs						
C1-14-1	S14	N/A	Sample station C1-14	C1-14	C1-14	Close up of test pit
C1-14-2	S14	W of SW	Sample station C1-14	C1-14	C1-14	Test pit location

Southeast Landfill						
Photo Identification	**Figure ID**	**View Direction**	**Photo Location**	**Feature Identification**	**Feature of Note**	**Other Comments**
C1-14-3	S14	W of SW	Sample station C1-14	C1-14	C1-14	C1-14 Backfilled
C1-15-1	S15	N/A	Sample station C1-15	C1-15	C1-15	Close up of test pit
C1-15-2	S15	S	Sample station C1-15	C1-15	C1-15	Test pit location
C1-15-3	S15	S	Sample station C1-15	C1-15	C1-15	C1-15 Backfilled
C1-16-1	S16	N/A	Sample station C1-16	C1-16	C1-16	Close up of test pit
C1-16-2	S16	N of NW	Sample station C1-16	C1-16	C1-16	Test pit location
C1-16-3	S16	N/A	Sample station C1-16	C1-16	C1-16	C1-16 Backfilled
C1-17-1	S17	N/A	Sample station C1-17	C1-17	C1-17	Close up of test pit
C1-17-2	S17	N	Sample station C1-17	C1-17	C1-17	Test pit location
C1-17-3	S17	N	Sample station C1-17	C1-17	C1-17	C1-17 Backfilled
C1-18-1	S18	N/A	Sample station C1-18	C1-18	C1-18	Close up of test pit
C1-18-2	S18	N/A	Sample station C1-18	C1-18	C1-18	Test pit location
Visual Inspection Photographs						
CAM-1 SE 1	1	S	NW corner of Lobe 1	N/A	N/A	N/A
CAM-1 SE 2	2	SE	North toe of Lobe 1	N/A	N/A	N/A
CAM-1 SE 3	3	SW	Northwest toe of Lobe 1	N/A	N/A	N/A
CAM-1 SE 4	4	NW	West side slope Lobe 1	Vehicle ruts	D	N/A
CAM-1 SE 5	5	SE	West side slope Lobe 1	Vehicle ruts	D	N/A
CAM-1 SE 6	6	NE	Northwest toe of Lobe 1	N/A	N/A	N/A
CAM-1 SE 7	7	S	West toe of Lobe 1	N/A	N/A	N/A
CAM-1 SE 8	8	N	West toe of Lobe 1	N/A	N/A	N/A

Southeast Landfill						
Photo Identification	**Figure ID**	**View Direction**	**Photo Location**	**Feature Identification**	**Feature of Note**	**Other Comments**
CAM-1 SE 9	9	NE	Southeast toe of Lobe 1	N/A	N/A	N/A
CAM-1 SE 10	10	NE	View from SW corner of Lobe 1	N/A	N/A	N/A
CAM-1 SE 11	11	SE	Area where minor erosion on cover/side slope of Lobe 1 was previously reported	Erosion	C	Feature not observed
CAM-1 SE 12	12	NW	Area where minor erosion on cover/side slope of Lobe 1 was previously reported	Erosion Vegetation	C N/A	Feature C not observed
CAM-1 SE 13	13	S	Looking across Lobe 2	N/A	N/A	N/A
CAM-1 SE 14	14	SW	West toe of Lobe 2	N/A	N/A	N/A
CAM-1 SE 15	15	SE	Northeast toe of Lobe 2	N/A	N/A	N/A
CAM-1 SE 16	16	NW	Minor depression on northeast side slope of Lobe 2	Settlement	A	N/A
CAM-1 SE 17	17	SW	Minor depression on northeast side slope of Lobe 2	Settlement	A	N/A
CAM-1 SE 18	18	NW	Northeast toe of Lobe 2	N/A	N/A	N/A
CAM-1 SE 19	19	S	East toe of Lobe 2	N/A	N/A	N/A
CAM-1 SE 20	20	N	East toe of Lobe 2	N/A	N/A	N/A
CAM-1 SE 21	21	W	South toe of Lobe 2	N/A	N/A	N/A
CAM-1 SE 22	22	NW	Looking across Lobe 2	N/A	N/A	N/A
CAM-1 SE 23	23	S	Depression on north side slope of Lobe 1	Settlement	E	New Feature
CAM-1 SE 24	24	N	Depression on north side slope of Lobe 1	Settlement	E	New Feature

Table 8-5: Selected Photographs –Southeast Landfill

Southeast Landfill
Photograph CAM-1 SE 5: Vehicle ruts (Feature D) on west side slope of Lobe 1.
Photograph CAM-1 SE 12: Sparse vegetation observed on south side slope of Lobe 1.

Southeast Landfill

Photograph CAM-1 SE 17: Minor depression (Feature A) on northeast side slope of Lobe 2.

Photograph CAM-1 SE 23: Settlement (Feature E) on north side slope of Lobe 1.

8.3.1.4 Trend Analysis

A trend analysis was conducted with regards to observations made during the visual inspection of the Southeast Landfill. The following Table 8-6 outlines the results of the visual trend analysis.

Table 8-6: Visual Inspection Trends - Southeast Landfill

Southeast Landfill		
Checklist Item	Feature Number	Comparison with Historical Observations
Settlement	A E	No significant change from 2014 to 2016. New feature observed in 2016.
Erosion	C	Previously observed in 2014 but not observed in 2016.
Vegetation Establishment	N/A	No vegetation establishment observed in 2014. Establishment of occasional small plants on some landfill side slopes observed in 2016.
Other Features	D (Tire Ruts)	No significant change from 2014 to 2016.

8.3.1.5 Discussion of Results/Trends

A comparison of the visual inspection results of the 2014 and 2016 monitoring events at the Southeast Landfill indicates that observed features have not undergone any significant change. One new minor settlement feature was observed in 2016.

Some sparse vegetation has been observed on limited areas of the landfill side slopes. The presence of vegetation is expected to benefit the stability of the landfill.

8.3.2 Soil Sampling

Soil sampling of the Southeast Landfill was conducted on August 10, 2016. The soil sampling was conducted in compliance with Section 5.3.1 and 5.3.2 of the Terms of Reference and details are provided below in the following Sections 8.3.2.1 through 8.3.2.3.

8.3.2.1 Laboratory Analytical Results

A total of ten soil samples were analysed from five soil sample locations at the Southeast Landfill. Table 8-7 and 8-8 present the soil analytical results. Figure CAM-1.7B presents a summary of significant soil analytical results.

Table 8-7: Soil Chemical Analysis Results – Southeast Landfill

Southeast Landfill																	
Sample ID	**Sampling Station**	**Monitoring Year**	**Depth**	**Cu**	**Ni**	**Co**	**Cd**	**Pb**	**Zn**	**Cr**	**As**	**Hg**	**Total PCB**	**F1 C6-C10**	**F2 C10-C16**	**F3 C16-C34**	**Modified TPH Total C6-C34**
Comparison Values																	
Background				11	4.7	3.1	0.50	7	12	12	3.6	NS	0.042				NS
Baseline				**3.2**	**5.0**	**5.0**	**1.0**	**10**	**15**	**20**	**1.9**	**0.10**	**0.10**				**21**
Baseline +3 Standard Deviations				10	5.0	5.0	1.0	25	22	20	8.1	0.1	0.17				54
Upgradient																	
C1-14 Surface																	
10-16647	C1-14	2010	0-10	<3.0	<5.0	<5.0	<1.0	<10	<15	<20	**4.8**	<0.10	<0.0030	<10	<4.0	<9.0	12
C112-14A	C1-14	2012	0-15	<5.0	1.7	<1.0	<0.10	**18**	1.7	2.9	**3.0**	<0.050	<0.010	<12	<10	<10	16
C114-14A	C1-14	2014	0-15	1.7	1.2	0.9	<0.01	<5.0	3.0	2.2	1.8	<0.01	<0.1	<10	<50	<50	**55**
16-C1-14A	C1-14	2016	0-15	1.9	2.1	1.1	<0.050	7.6	<10	3.6	**3.5**	<0.050	<0.010	<12	<10	<50	**36**
C1-14 Depth																	
10-16649	C1-14	2010	30-50	<3.0	<5.0	<5.0	<1.0	<10	<15	<20	1.6	<0.10	<0.0030	<10	<4.0	<9.0	12
C112-14A	C1-14	2012	40-50	<5.0	3.3	<1.0	<0.10	2.9	<10	2.3	1.6	<0.050	<0.010	<12	<10	<10	16
C114-14B	C1-14	2014	40-50	1.5	3.6	1.5	<0.01	5.5	4.0	7.6	**2.2**	<0.01	<0.1	<10	<50	<50	**55**
16-C1-14B	C1-14	2016	40-50	1.3	1.6	0.77	<0.050	4.2	<10	2.5	**2.3**	<0.050	<0.010	<12	<10	<50	**36**
Downgradient																	
C1-15 Surface																	
10-16651	C1-15	2010	0-10	<3.0	<5.0	<5.0	<1.0	<10	<15	<20	1.6	<0.10	<0.0030	<10	<4.0	9.6	17
C112-15A	C1-15	2012	0-15	<5.0	1.3	<1.0	<0.10	4.5	<10	2.2	1.6	<0.050	<0.010	<12	<10	<10	16
C114-15A	C1-15	2014	0-15	2.4	1.3	1.0	<0.01	<5.0	4.0	2.5	1.9	<0.01	<0.1	<10	<50	<50	**55**
16-C1-15A	C1-15	2016	0-15	1.9	1.5	0.76	<0.050	3.3	<10	2.7	**2.2**	<0.050	<0.010	<12	<10	<50	**36**
C1-15 Depth																	
10-16653	C1-15	2010	30-50	**3.2**	<5.0	<5.0	<1.0	<10	<15	<20	1.8	<0.10	<0.0030	<10	4.0	12	21
C112-15B	C1-15	2012	40-50	<5.0	1.1	<1.0	<0.10	3.3	<10	1.5	1.5	<0.050	<0.010	<12	<10	<10	16
C114-15B	C1-15	2014	40-50	1.8	1.1	1.1	<0.01	<5.0	3.0	2.0	1.3	<0.01	<0.1	<10	<50	<50	**55**
16-C1-15B	C1-15	2016	40-50	1.9	1.4	0.76	<0.050	2.9	<10	2.9	**2.1**	<0.050	<0.010	<12	<10	<50	**36**
C1-16 Surface																	
10-16655	C1-16	2010	0-10	<3.0	<5.0	<5.0	<1.0	<10	<15	<20	<1.0	<0.10	<0.0030	<10	5.0	16	**26**

Southeast Landfill																	
Sample ID	Sampling Station	Monitoring Year	Depth	Cu	Ni	Co	Cd	Pb	Zn	Cr	As	Hg	Total PCB	F1 C6-C10	F2 C10-C16	F3 C16-C34	Modified TPH Total C6-C34
C112-16A	C1-16	2012	0-15	<5.0	<1.0	<1.0	<0.10	1.8	<10	1.6	<1.0	<0.050	<0.010	<12	<10	<10	16
C114-16A	C1-16	2014	0-15	<1.0	<0.5	0.4	0.02	<4.9	2.0	1.4	0.7	<0.01	<0.1	<10	<50	<50	55
16-C1-16A	C1-16	2016	0-15	<1.0	<1.0	<0.50	<0.050	2	<10	1.5	<1.0	<0.050	<0.010	<12	<10	<50	36
C1-16 Depth																	
10-16657	C1-16	2010	30-50	<3.0	<5.0	<5.0	<1.0	<10	<15	<20	1.2	<0.10	<0.0030	<10	4.3	<9.0	14
C112-16B	C1-16	2012	40-50	<5.0	<1.0	<1.0	<0.10	4.6	<10	1.3	1.4	<0.050	<0.010	<12	13	19	38
C114-16B	C1-16	2014	40-50	1.7	1.2	0.6	0.02	<4.9	2.0	1.8	1.2	<0.01	<0.1	<10	<50	<50	55
16-C1-16B	C1-16	2016	40-50	<1.0	<1.0	<0.50	<0.050	2.5	<10	1.5	<1.0	<0.050	<0.010	<12	<10	<50	36
C1-17 Surface																	
10-16659	C1-17	2010	0-10	<3.0	<5.0	<5.0	<1.0	<10	<15	<20	1.3	<0.10	<0.0030	<10	<4.0	<9.0	12
C112-17A	C1-17	2012	0-15	<5.0	1.2	<1.0	<0.10	2.2	<10	1.8	1.0	<0.050	<0.010	<12	<10	<10	16
C114-17A	C1-17	2014	0-15	1.4	0.8	0.6	0.01	<4.9	3.0	1.7	0.7	<0.01	<0.1	<10	<50	<50	55
16-C1-17A	C1-17	2016	0-15	1.3	<1.0	<0.50	<0.050	5.6	<10	1.8	2.3	<0.050	<0.010	<12	<10	<50	36
C1-17 Depth																	
10-16661	C1-17	2010	30-50	<3.0	<5.0	<5.0	<1.0	<10	<15	<20	2.2	<0.10	<0.0030	<10	5.6	<9.0	15
C112-17B	C1-17	2012	40-50	5.5	1.9	1.2	<0.10	41	<10	1.9	14	<0.050	<0.010	<12	<10	<10	16
C114-17B	C1-17	2014	40-50	2.4	1.9	0.9	0.04	8.7	3.0	2.9	2.7	<0.01	<0.1	<10	<50	<50	55
16-C1-17B	C1-17	2016	30-35	1.8	<1.0	0.62	<0.050	7.9	<10	1.7	2.4	<0.050	<0.010	<12	<10	<50	36
C1-18 Surface																	
10-16663	C1-18	2010	0-10	<3.0	<5.0	<5.0	<1.0	<10	<15	<20	<1.0	<0.10	<0.0030	<10	<4.0	<9.0	12
C112-18A	C1-18	2012	0-15	<5.0	1.7	<1.0	<0.10	1.4	<10	1.6	<1.0	<0.050	<0.010	<12	<10	<10	16
C114-18A	C1-18	2014	0-15	1.2	1.0	0.5	0.02	<5.0	3.0	1.5	0.6	<0.01	<0.1	<10	<50	<50	55
16-C1-18A	C1-18	2016	0-15	<1.0	<1.0	<0.50	<0.050	1.1	<10	1.6	<1.0	<0.050	<0.010	<12	<10	<50	36
C1-18 Depth																	
10-16665/66	C1-18	2010	30-50	<3.0	<5.0	<5.0	<1.0	<10	<15	<20	<1.0	<0.10	<0.0030	<10	4.0	9.0	18
C112-18B	C1-18	2012	40-50	<5.0	<1.0	<1.0	<0.10	<1.0	<10	1.0	<1.0	<0.050	<0.010	<12	<10	<10	16
C114-18B	C1-18	2014	40-50	<1.0	0.5	0.4	<0.01	<4.9	2.0	1.6	0.5	<0.01	<0.1	<10	<50	<50	55
16-C1-18B	C1-18	2016	40-50	<1.0	<1.0	<0.50	<0.050	1.1	<10	1.6	<1.0	<0.050	<0.010	<12	<10	<50	36

DEW LINE MONITORING PROGRAM - CAM-1

Notes: ** **All units in mg/kg**

XX	sample exceeds background
vXX	**sample exceeds baseline**
XX	*sample exceeds baseline +3 standard deviations*

Table 8-8: PHC F4 Soil Chemical Analysis Results – Southeast Landfill

Sample Location	Sample ID	Sample Depth (m bgs)	PHC F4 (mg/kg)
C1-14	16-C1-14A	0 - 0.15	<50
	16-C1-14B	0.4 – 0.5	<50
C1-15	16-C1-15A	0 - 0.15	<50
	16-C1-15B	0.4 – 0.5	<50
C1-16	16-C1-16A	0 - 0.15	<50
	16-C1-16B	0.4 – 0.5	<50
C1-17	16-C1-17A	0 - 0.15	<50
	16-C1-17B	0.3 – 0.35	<50
C1-18	16-C1-18A	0 – 0.15	<50
	16-C1-18B	0.4 – 0.5	<50

8.3.2.2 Discussion of Results – Comparison to Baseline/Background

Analytical results were compared against baseline data, and background concentrations. The following Table 8-9 summarizes the comparison of results.

Table 8-9: Evaluation of Results by Parameter – Southeast Landfill

Southeast Landfill	
Parameter	Discussion of Results
Copper (Cu)	All soil samples reported either non-detect concentrations or were below both background and baseline concentrations for Cu. Historical Cu concentrations were reported elevated above baseline at C1-17 depth (2012) and C1-15 depth (2010).
Nickel (Ni)	All soil samples reported either non-detect concentrations or were below both background and baseline concentrations for Ni.
Cobalt (Co)	All soil samples reported either non-detect concentrations or were below both background and baseline concentrations for Co.
Cadmium (Cd)	All soil samples reported non-detect concentrations.
Lead (Pb)	Pb was reported exceeding the background concentration of 7 mg/kg at sample stations C1-14 surface and C1-17 depth with concentrations of 7.6 mg/kg and 7.9 mg/kg respectively. All other sample station reported Pb concentrations below the background and baseline. Historical Pb concentrations were reported elevated above baseline at C1-14 surface (2012), as well as background and baseline at C1-17 depth (2012).
Zinc (Zn)	All soil samples reported non-detect concentrations for Zn.
Chromium (Cr)	All soil samples reported either non-detect concentrations or were below both background and baseline concentrations for Cr.
Arsenic (As)	As exceeded the baseline concentration of 1.9 mg/kg at sample stations C1-14 surface (3.5 mg/kg), C1-14 depth (2.3 mg/kg), C1-15 surface (2.2 mg/kg), C1-15 depth (2.1 mg/kg), C1-17

Southeast Landfill	
Parameter	Discussion of Results
	surface (2.3 mg/kg), and C1-17 depth (2.4 mg/kg). It should be noted that all samples were below the background concentrations for As.
Mercury (Hg)	All soil samples reported non-detect concentrations for Hg.
PCBs (Total)	All soil samples reported non-detect concentrations for PCBs.
Modified TPH (C_6-C_{34})	All soil samples reported concentrations of modified TPH above baseline concentrations; however, baseline values were calculated based on non-detect laboratory detection limits and these detections are not considered an issue.

8.3.2.3 Soil Trend Analysis by Parameter & Discussion of Trends

A soil chemistry trend analysis was conducted based on the current and historical analytical results collected at the site. A Series of graphs were generated including a visual comparison to background, baseline and historical concentrations using differentiating colours (See Appendix E6). The following Table 8-10 provides a summary of soil trend analysis findings and presents a discussion of the observed trends by parameter.

Table 8-10: Discussion of Trends – Southeast Landfill

Southeast Landfill	
Parameter	**Discussion of Trends**
Copper (Cu)	Based on current and historical results, it appears that Cu has no observable trend. Sample station C1-15 reported decreases at both surface and depth over time. The remaining sample stations reported slight fluctuations in Cu concentrations.
Nickel (Ni)	Based on current and historical results, it appears that Ni has no observable trend. Minor fluctuations in Ni concentrations with a trend towards decreasing concentrations were observed at most sample stations. Sample station C1-14 depth reported a concentration decrease over time.
Cobalt (Co)	Based on current and historical results, it appears that Co has no observable trend.
Cadmium (Cd)	Based on mostly non-detect concentrations, Cd has no observable trend.
Lead (Pb)	Based on current and historical results, Pb in generally noted to be decreasing in concentration over time across the landfill. One exception was noted at sample station C1-17 surface, where there was a slight increase in concentration over time.
Zinc (Zn)	Based on all non-detect concentrations, Zn has no observable trend.
Chromium (Cr)	Based on current and historical results, it appears that Cr has no observable trend with only minor fluctuations in concentrations reported.
Arsenic (As)	Based on current and historical results, As has no observable trend at sample stations C1-16 and C1-18 with minor concentration fluctuations reported. Sample stations C1-14, C1-15, and C1-17 reported an increase in concentrations over time indicating an upward trend.
Mercury (Hg)	Based on all non-detect concentrations, Hg has no observable trend.
PCBs (Total)	Based on all non-detect concentrations, PCBs has no observable trend.

Southeast Landfill	
Parameter	**Discussion of Trends**
Modified TPH (C_6-C_{34})	Based on current and historical results, Modified TPH concentrations has no observable trend.

Trend analyses presented are based on the data available at the time of the investigation and any interpreted increasing or decreasing trends may be a result of natural variation in the data due to analytical methods. There is currently insufficient information to establish reliable trends; therefore, additional data points are required to be able to confidently determine if trends are present.

8.3.3 Groundwater Sampling

No groundwater monitoring wells are present at the Southeast Landfill; therefore, no groundwater sampling or analysis was conducted.

8.3.4 Thermal Monitoring

No thermistors are present at the Southeast Landfill; therefore, no thermal monitoring was conducted.

8.4 Conclusions and Overall Landfill Performance

Based on the results of the 2016 monitoring program, the overall performance of the Southeast Landfill is acceptable.

8.5 Recommendations and Conclusions

Based on review and analysis of chemical data, it appears that the soil concentrations for the parameters tested had no observable trend with no obvious soil concentration increases over time. Based on this review, it is recommended to continue the long term monitoring of soils as planned.

Based on the results of the visual inspection, the landfill performance is acceptable. No remedial work or deviations from the monitoring plan are recommended at this time.

9 CAM-1: STATION EAST LANDFILL

9.1 Landfill Description

The CAM-1 Station East Landfill is located in the Station Area, east of the Station POL access road. Geophysics identified two lobes of debris in the area.

The remediation of this landfill included the removal of surface debris and regrading with the placement of additional granular fill.

The long term monitoring plan for the Station East Landfill consists of visual inspection, and the periodic collection of soil samples.

The landfill layout, visual observations and photographic locations are presented on Figure CAM-1.8A and soil analytical results are presented on Figure CAM-1.8B in the figures section

9.2 Summary of Work Conducted

9.2.1 Visual Inspection

A visual inspection was conducted on the Station East Landfill on August 11, 2016. The visual inspection of the landfill was completed with no deviations from the visual inspection work plan.

9.2.2 Soil Sampling

Soil sampling at the Station East Landfill was conducted on August 11, 2016 and consisted of the collection of eight soil samples from four soil sample stations (C1-19, C1-20, C1-21, and C1-22). Depth limitations were encountered at soil sampling stations C1-21 and C1-22 where the maximum depth achieved was 0.4 m bgs at both stations.

The following Table 9-1 outlines the soil sampling activities conducted at the Station East Landfill.

Table 9-1: Summary of Work Conducted by Soil Sampling Location

Station East Landfill			
Sample Location	**Sample ID**	**Sample Depth (m bgs)**	**Notes**
C1-19	16-C1-19A	0 - 0.15	
	16-C1-19B	0.4 – 0.5	
C1-20	16-C1-20A	0 - 0.15	
	16-C1-20B	0.4 – 0.5	
C1-21	16-C1-21A	0 - 0.15	Refusal on cobbles
	16-C1-21B	0.35 – 0.4	
C1-22	16-C1-22A	0 - 0.15	Refusal on boulders

Station East Landfill			
Sample Location	Sample ID	Sample Depth (m bgs)	Notes
	16-C1-22B	0.3 – 0.4	

9.2.3 Groundwater Sampling

No groundwater monitoring wells are present at the Station East Landfill.

9.2.4 Thermal Monitoring

No thermistors are present at the Station East Landfill.

9.3 Results of the Monitoring Program

The following Sections 9.3.1 through 9.3.4 summarize the results of the CAM-1 monitoring program at the Station East Landfill.

9.3.1 Visual Inspection

The visual inspection of the Station East Landfill was conducted on August 11, 2016. The visual inspection was conducted in compliance with Section 5.2 of the Terms of Reference and details are provided below in the following Sections 9.3.1.1 through 9.3.1.5. Figure CAM-1.8A presents the visual inspection findings and photographic locations.

9.3.1.1 Inspection Checklist

The visual inspection was completed as per the Terms of Reference and the visual inspection checklist is included as Table 9-2 of this report below.

Table 9-2: Visual Inspection Checklist – Station East Landfill

SITE NAME: **CAM-1 Jenny Lind Island**

LANDFILL DESIGNATION: Station East Landfill
LANDFILL TYPE: Regraded
DATE OF INSPECTION: August 11, 2016
WEATHER CONDITIONS: 10ºC, sunny
DATE OF PREVIOUS INSPECTION: August 28, 2014
INSPECTED BY: Stephen Borcsok
REPORT PREPARED BY: Stephen Borcsok and Ryan Fletcher

The preparer represents to the best of the preparer's knowledge, the following statements and observations are true and correct and to the best of the preparer's actual knowledge, no material facts have been suppressed or misstated.

Station East Landfill												
Checklist Item	**Present (Yes/No)**	**Feature Number**	**Feature Location**	**GPS Coordinates Easting/Northing/Zone**	**Length (m)**	**Width (m)**	**Depth (m)**	**Extent Relative to Landfill Surface**	**Description**	**Comparison with Historical Observations**	**Additional Comments/ Severity Rating**	**Photographic Records (photo reference, location, view point & direction, feature of note, scale)**
Settlement	Yes	A	Southwest landfill cover	389799.562 / 7620719.542 389779.461 / 7620729.783 389771.68 / 7620736.136	14	0.5-2	0.1-0.3	0.05	<1%	Three minor linear and pothole depressions	First noted in Year 3 (2012). No significant change from 2014 to 2016.	Severity Rating – Acceptable (features are minor and not affecting landfill stability)	CAM-1 STN E 36, 37, 39
Settlement	Yes	C	West cover and side slope	389757.568 / 7620751.218 389768.446 / 7620774.052 389769.224 / 7620766.913 389767.566 / 7620761.633 389765.495 / 7620751.75 389770.832 / 7620774.217	14	1-3	0.4-1	0.05-0.1	<1%	Six minor linear and pothole depressions	First noted in Year 5 (2014). One fewer feature observed in 2016 (6) than 2014 (7).	Features are minor and were difficult to differentiate from regular differences in landfill topography. Severity Rating – Acceptable (features are minor and not affecting landfill stability)	CAM-1 STN E 2, 3, 8, 9, 11
Settlement	Yes	D	Northeast cover	389810.212 / 7620795.808 389844.727 / 7620775.171 389818.028 / 7620793.47 389809.745 / 7620793.102 389812.848 / 7620797.265	14	0.4-8	0.15-0.4	0.05-0.1	<1%	Six minor linear and pothole depressions	First noted in Year 1 (2010). Notable increase in length of linear features in 2014. Two additional minor features observed in 2016. Minor decrease in length of longest feature from 10 to 8 m from 2014 to 2016, potentially due to difference in measurement technique.	Part of Feature A in 2014 and 2014. Severity Rating – Acceptable (features are minor and not affecting landfill stability)	CAM-1 STN E 15, 16, 20
Erosion	Yes	B	West side slope toe	389760.356 / 7620780.125	14	9	0.3-0.5	0.05	<1%	Minor erosion, washing of fines	First noted in Year 2 (2011). No significant change from 2014 to 2016.	Severity Rating – Acceptable (feature is minor and not affecting landfill stability)	CAM-1 STN E 4
Erosion	Yes	E	Northwest side slope	389761.558 / 7620784.499	14	4	0.2	0.05	<1%	Minor erosion, washing of fines	First noted in Year 5 (2014). No significant change from 2014 to 2016.	Severity Rating – Acceptable (feature is minor and not affecting landfill stability)	CAM-1 STN E 5, 6
Erosion	Yes	F	North side slope	389855.459 / 7620767.319	14	4-6	0.2	0.05	<1%	Three minor erosion channels	First noted in Year 5 (2014). No significant change from 2014 to 2016.	Severity Rating – Acceptable (feature is minor and not affecting landfill stability)	CAM-1 STN E 24, 25
Erosion	Yes	G	Southwest side slope	389777.683 / 7620727.522	14	5	0.1	0.05	<1%	Minor erosion, washing of fines	First noted in Year 5 (2014). No significant change from 2014 to 2016.	Severity Rating – Acceptable (feature is minor and not affecting landfill stability)	CAM-1 STN E 37, 38
Lateral Movement	No												
Frost Action	No												
Sloughing	No												
Cracking	No												
Animal Burrows	No												
Vegetation Establishment	No												

Station East Landfill												
Checklist Item	Present (Yes/No)	Feature Number	Feature Location	GPS Coordinates Easting/Northing/Zone	Length (m)	Width (m)	Depth (m)	Extent Relative to Landfill Surface	Description	Comparison with Historical Observations	Additional Comments/ Severity Rating	Photographic Records (photo reference, location, view point & direction, feature of note, scale)
Staining	No											
Vegetation Stress	No											
Seepage Points (or) Ponded Water	No											
Debris and/or Liner Exposed	No											
Presence & Condition of Monitoring Instruments	No											
Features of Note/Other Relevant Observations (e.g., signs of activity, ruts…)	No											

9.3.1.2 Stability Assessment

The Preliminary Stability Assessment for the Station East Landfill was conducted on August 11, 2016 as per the Terms of Reference and the results are provided below in Table 9-3.

Table 9-3: Preliminary Stability Assessment – Station East Landfill

Station East Landfill		
Feature	Severity Rating	Extent
Settlement	Acceptable	Occasional
Erosion	Acceptable	Occasional
Lateral Movement	Not Observed	None
Frost Action	Not Observed	None
Sloughing	Not Observed	None
Cracking	Not Observed	None
Animal Burrows	Not Observed	None
Vegetation Establishment	Not Observed	None
Staining	Not Observed	None
Vegetation Stress	Not Observed	None
Seepage / Ponded Water	Not Observed	None
Debris and/or Liner Exposure	Not Observed	None
Other	Not Observed	None
Overall Landfill Performance	**Acceptable**	

Station East Landfill	
Performance / Severity Rating	**Description**
Acceptable	Noted features are of little consequence. The landfill is performing as designed. Minor deviations in environmental or physical performance may be observed, such as isolated areas of erosion, settlement.
Marginal	Physical/environmental performance appears to be deteriorating with time. Observations may include an increase in size or number of features of note,

Station East Landfill	
Performance / Severity Rating	**Description**
	such as differential settlement, erosion or cracking. No significant impact on landfill stability to date, but potential for failure is assessed as low or moderate.
Significant	Significant or potentially significant changes affecting landfill stability, such as significant changes in slope geometry, significant erosion or differential settlement; scarp development. The potential for failure is assessed as imminent.
Unacceptable	Stability of landfill is compromised to the extent that ability to contain waste materials is compromised. Examples may include: • Debris exposed in erosion channels or areas of differential settlement. • Liner exposed. • Slope failure.
Extent	**Description**
Isolated	Singular feature
Occasional	Features of note occurring at irregular intervals/locations
Numerous	Many features of note, impacted less than 50% of the surface area of the landfill
Extensive	Impacting greater than 50% of the surface area of the landfill

9.3.1.3 Photographic Records

The photographic record for the Station East Landfill has been completed as per Section 5.5 of the Terms of Reference and is included in the following page as Table 9-4. The Photographic Record only contains an index of photographs collected; full sized photographs are contained in the Appended CD/DVD-ROM. Selected photographs are shown in Table 9-5. Figure CAM-1.8A presents the photograph locations and directions.

Table 9-4: Photographic Records – Station East Landfill

Station East Landfill						
Photo Identification	**Figure ID**	**View Direction**	**Photo Location and Direction**	**Feature Identification**	**Feature of Note**	**Other Comments**
Sample Station Photographs						
C1-19-1	S19	N/A	Sample station C1-19	C1-19	C1-19	Close up of test pit

Station East Landfill						
Photo Identification	**Figure ID**	**View Direction**	**Photo Location and Direction**	**Feature Identification**	**Feature of Note**	**Other Comments**
C1-19-2	S19	SE	Sample station C1-19	C1-19	C1-19	Test pit location
C1-19-3	S19	SE	Sample station C1-19	C1-19	C1-19	C1-19 Backfilled
C1-20-1	S20	N/A	Sample station C1-20	C1-20	C1-20	Close up of test pit
C1-20-2	S20	NW	Sample station C1-20	C1-20	C1-20	Test pit location
C1-20-3	S20	NW	Sample station C1-20	C1-20	C1-20	C1-20 Backfilled
C1-21-1	S21	N/A	Sample station C1-21	C1-21	C1-21	Close up of test pit
C1-21-2	S21	NW	Sample station C1-21	C1-21	C1-21	Test pit location
C1-21-3	S21	NW	Sample station C1-21	C1-21	C1-21	C1-21 Backfilled
C1-22-1	S22	N/A	Sample station C1-22	C1-22	C1-22	Close up of test pit
C1-22-2	S22	N	Sample station C1-22	C1-22	C1-22	Test pit location
C1-22-3	S22	N	Sample station C1-22	C1-22	C1-22	C1-22 Backfilled
Visual inspection Photographs						
CAM-1 STN E 1	1	NE	Northwest side slope of landfill	N/A	N/A	
CAM-1 STN E 2	2	SE	Southwest side slope toe of landfill	N/A	N/A	
CAM-1 STN E 3	3	NW	Minor depression at west toe of landfill	Settlement	C	
CAM-1 STN E 4	4	S	Minor erosion on west toe of landfill	Erosion	B	
CAM-1 STN E 5	5	W	Minor erosion on west side slope of landfill	Erosion	E	

Station East Landfill						
Photo Identification	**Figure ID**	**View Direction**	**Photo Location and Direction**	**Feature Identification**	**Feature of Note**	**Other Comments**
CAM-1 STN E 6	6	NE	Minor erosion on west side slope of landfill	Erosion	E	
CAM-1 STN E 7	7	NW	View down west side slope of landfill	N/A	N/A	
CAM-1 STN E 8	8	SE	Minor settlement on west landfill cover	Settlement	C	
CAM-1 STN E 9	9	SE	Minor settlement on west landfill cover	Settlement	C	
CAM-1 STN E 10	10	S	Minor settlement on west landfill cover	Settlement	C	
CAM-1 STN E 11	11	SW	Minor settlement on west landfill cover	Settlement	C	
CAM-1 STN E 12	12	E	Northwest toe of landfill	N/A	N/A	
CAM-1 STN E 13	13	SW	Northwest toe of landfill	N/A	N/A	
CAM-1 STN E 14	14	SE	Northeast toe of landfill	N/A	N/A	
CAM-1 STN E 15	15	E	Minor depressions on north landfill cover	Settlement	D	
CAM-1 STN E 16	16	NW	Minor depressions on north landfill cover	Settlement	D	
CAM-1 STN E 17	17	NE	Minor depressions on north landfill cover	Settlement	D	

Station East Landfill						
Photo Identification	**Figure ID**	**View Direction**	**Photo Location and Direction**	**Feature Identification**	**Feature of Note**	**Other Comments**
CAM-1 STN E 18	18	W	North toe of landfill	N/A	N/A	
CAM-1 STN E 19	19	S	Northeast toe of landfill	N/A	N/A	
CAM-1 STN E 20	20	S	Minor settlement on northeast landfill cover	Settlement	D	
CAM-1 STN E 21	21	NW	Northeast toe of landfill	N/A	N/A	
CAM-1 STN E 22	22	S	East toe of landfill	N/A	N/A	
CAM-1 STN E 23	23	SW	View across east landfill cover	N/A	N/A	
CAM-1 STN E 24	24	N	Three minor erosion channels on northeast side slope	Erosion	F	
CAM-1 STN E 25	25	SW	Three minor erosion channels on northeast side slope	Erosion	F	
CAM-1 STN E 26	26	SW	Southeast toe of landfill	N/A	N/A	
CAM-1 STN E 27	27	SW	Cover on southeast side of landfill, some loose material present	N/A	N/A	
CAM-1 STN E 28	28	NW	View across southeast side of landfill	N/A	N/A	
CAM-1 STN E 29	29	SW	Southeast toe of landfill	N/A	N/A	
CAM-1 STN E 30	30	NE	Southeast toe of landfill	N/A	N/A	

Station East Landfill						
Photo Identification	**Figure ID**	**View Direction**	**Photo Location and Direction**	**Feature Identification**	**Feature of Note**	**Other Comments**
CAM-1 STN E 31	31	W	South end of landfill	N/A	N/A	
CAM-1 STN E 32	32	NW	View across south landfill cover	N/A	N/A	
CAM-1 STN E 33	33	NE	Southwest toe of landfill	N/A	N/A	
CAM-1 STN E 34	34	S	Southwest toe of landfill	N/A	N/A	
CAM-1 STN E 35	35	NW	Southwest toe of landfill	N/A	N/A	
CAM-1 STN E 36	36	S	Minor settlement on southwest cover	Settlement	A	
CAM-1 STN E 37	37	SW	Minor settlement on landfill cover and minor erosion channel on side slope	Settlement Erosion	A G	
CAM-1 STN E 38	38	NE	Minor settlement on landfill cover and minor erosion channel on side slope	Settlement Erosion	A G	
CAM-1 STN E 39	39	NE	Minor settlement on landfill cover	Settlement	A	

Table 9-5: Selected Photographs –Station East Landfill

Station East Landfill
Photograph CAM-1 STN E 15: Minor depressions (Feature D) on north landfill cover.
Photograph CAM-1 STN E 25: Three minor erosion channels (Feature F) on northeast side slope.

Station East Landfill

Photograph CAM-1 STN E 36: Minor settlement (Feature A) on southwest landfill cover.

Photograph CAM-1 STN E 38: Minor settlement (Feature A) on landfill cover and minor erosion (Feature G) on landfill side slope.

9.3.1.4 Trend Analysis

A trend analysis was conducted with regards to observations made during the visual inspection of the Station East Landfill. The following Table 9-6 outlines the results of the visual trend analysis.

Table 9-6: Visual Inspection Trends - Station East Landfill

Station East Landfill		
Checklist Item	**Feature Number**	**Comparison with Historical Observations**
Settlement	A	No significant change.
	C	No significant change.
	D	No significant change.
Erosion	B	No significant change.
	E	No significant change.
	F	No significant change.
	G	No significant change.

9.3.1.5 Discussion of Results/Trends

A comparison of the visual inspection results of the 2014 and 2016 monitoring events at the Station East Landfill indicates that previously observed minor settlement and erosion features have not undergone any significant change.

9.3.2 Soil Sampling

Soil sampling of the Station East Landfill was conducted on August 11, 2016. The soil sampling was conducted in compliance with Section 5.3.1 and 5.3.2 of the Terms of Reference and details are provided below in the following Sections 9.3.2.1 through 9.3.2.3.

9.3.2.1 Laboratory Analytical Results

A total of eight soil samples were analysed from four soil sample locations at the Station East Landfill. Table 9-7 and 9-8 present the soil analytical results. Figure CAM-1.8B presents a summary of significant soil analytical results.

Table 9-7: Soil Chemical Analysis Results – Station East Landfill

Station East Landfill																	
Sample ID	**Sampling Station**	**Monitoring Year**	**Depth**	**Cu**	**Ni**	**Co**	**Cd**	**Pb**	**Zn**	**Cr**	**As**	**Hg**	**Total PCB**	**F1 C6-C10**	**F2 C10-C16**	**F3 C16-C34**	**Modified TPH Total C6-C34**
Comparison Values																	
Background				11	4.7	3.1	0.50	7	12	12	3.6	NS	0.042				NS
Baseline				**5.7**	**5.0**	**5.0**	**1.00**	**10**	**15**	**20**	**5.2**	**0.100**	**0.003**				**47**
Baseline +3 Standard Deviations				21	10	5	1	43	82	20	21	0	1				165
Upgradient																	
C1-19 Surface																	
10-16681	C1-19	2010	0-10	<3.0	<5.0	<5.0	<1.0	<10	<15	<20	4.2	<0.10	0.0038	<10	<4.0	<9.0	12
C112-19A	C1-19	2012	0-15	<5.0	1.9	<1.0	<0.10	7.2	<10	3.1	4.4	<0.050	<0.010	<12	<10	<10	16
C114-19A	C1-19	2014	0-15	**14**	3.7	2.2	0.03	**15**	**18**	5.7	2.6	<0.01	<0.1	<10	<50	<50	**55**
16-C1-19A	C1-19	2016	0-15	3.3	1.2	0.76	<0.050	8.5	<10	1.6	**6.8**	<0.050	<0.010	<12	<10	<50	36
C1-19 Depth																	
10-16683	C1-19	2010	30-50	<3.0	<5.0	<5.0	<1.0	<10	<15	<20	5.1	<0.10	0.0032	<10	<4.0	<9.0	12
C112-19B	C1-19	2012	40-50	<5.0	1.2	<1.0	<0.10	4.0	<10	2.8	1.7	<0.050	<0.010	<12	<10	<10	16
C114-19B	C1-19	2014	40-50	1.2	0.7	0.8	<0.01	<5.0	3.0	2.6	1.9	<0.01	<0.1	<10	<50	<50	**55**
16-C1-19B	C1-19	2016	40-50	5.2	3.8	<1.0	<0.1	9.9	<20	7.7	**6.8**	<0.1	<0.020	<12	<10	<50	36
Downgradient																	
C1-20 Surface																	
10-16685	C1-20	2010	0-10	3.0	<5.0	<5.0	<1.0	<10	<15	<20	**6.4**	<0.10	0.0090	<10	<4.0	<9.0	12
C112-20A	C1-20	2012	0-15	<5.0	2.0	<1.0	<0.10	9.9	<10	2.7	**7.6**	<0.050	<0.010	<12	<10	21	32
C114-20A	C1-20	2014	0-15	4.3	1.6	0.9	0.05	**11**	7	2.8	**7.9**	<0.01	<0.1	<10	<50	<50	**55**
16-C1-20A	C1-20	2016	0-15	5.4	2.5	1.1	0.052	**14**	10	3.9	**10**	<0.050	<0.01	<12	<10	<50	36
C1-20 Depth																	
10-16687	C1-20	2010	30-50	<3.0	<5.0	<5.0	<1.0	**10**	<15	<20	**6.4**	<0.10	0.0035	<10	4.0	<9.0	14
C112-20B	C1-20	2012	40-50	<5.0	2.2	1.1	<0.10	**26**	<10	2.7	**26**	<0.050	<0.010	<12	<10	<10	16
C-114-20B	C1-20	2014	40-50	2.8	1.2	0.8	0.03	**11**	5	2.9	**7.0**	<0.01	<0.1	<10	<50	<50	**55**
16-C1-20B	C1-20	2016	40-50	1.5	1.2	0.62	<0.050	4.6	<10	2.3	2.3	<0.050	<0.01	<12	<10	<50	36
C1-21 Surface																	
10-16689	C1-21	2010	0-10	<3.0	<5.0	<5.0	<1.0	**11**	<15	<20	**8.4**	<0.10	0.0033	<10	4.2	<9.0	14

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Station East Landfill																	
Sample ID	Sampling Station	Monitoring Year	Depth	Cu	Ni	Co	Cd	Pb	Zn	Cr	As	Hg	Total PCB	F1 C6-C10	F2 C10-C16	F3 C16-C34	Modified TPH Total C6-C34
C112-21A	C1-21	2012	0-15	<5.0	1.9	<1.0	<0.10	11	<10	2.8	8.4	<0.050	<0.010	<12	<10	<10	16
C114-21A	C1-21	2014	0-15	2.6	1.5	1.2	0.03	14	5	4.2	8.8	<0.01	<0.1	<10	<50	<50	55
16-C1-21A	C1-21	2016	0-15	3.6	2.3	0.84	<0.050	11	<10	3	8.5	<0.050	<0.010	<12	<10	<50	36
C1-21 Depth																	
10-16691	C1-21	2010	30-50	<3.0	<5.0	<5.0	<1.0	12	<15	<20	8.3	<0.10	<0.0030	<10	5.7	38	49
C112-21B	C1-21	2012	40-50	<5.0	2.0	<1.0	<0.10	12	<10	3.0	8.3	<0.050	<0.010	<12	13	<10	24
C114-21B	C1-21	2014	40-50	2.9	1.8	1.2	0.03	16	5	3.6	10	<0.01	<0.1	<10	<50	<50	55
16-C1-21B	C1-21	2016	35-40	2.5	2	0.87	<0.050	11	<10	2.7	8.2	<0.050	<0.010	<12	<10	<50	36
C1-22 Surface																	
10-16693/94	C1-22	2010	0-10	<3.0	<5.0	<5.0	<1.0	<10	<15	<20	5.4	<0.10	0.0033	<10	<4.0	15	22
C112-22A	C1-22	2012	0-15	9.0	1.9	<1.0	<0.10	9.2	<10	3.5	5.4	<0.050	<0.010	<12	<10	40	51
C114-22A	C1-22	2014	40-50	2.2	0.9	0.9	0.04	8.8	6.0	2.9	4.6	<0.01	<0.1	<10	<50	<50	55
16-C1-22A	C1-22	2016	0-15	1.9	1.4	0.7	<0.050	9.7	<10	3	5	<0.050	<0.010	<12	<10	<50	36
C1-22 Depth																	
10-16695	C1-22	2010	30-50	<3.0	<5.0	<5.0	<1.0	<10	<15	<20	4.8	<0.10	0.0030	<10	<4.0	<9.0	12
C112-22B	C1-22	2012	40-50	<5.0	1.1	<1.0	<0.10	7.0	<10	2.2	3.7	<0.050	<0.010	<12	<10	<10	16
C114-22B	C1-22	2014	40-50	1.4	0.7	0.8	0.01	9.4	3.0	3.1	4.1	<0.01	<0.1	<10	<50	<50	55
16-C1-22B	C1-22	2016	30-40	1.8	1.5	0.72	<0.050	8.9	<10	4	5.2	<0.050	<0.010	<12	<10	<50	36

Notes:

XX	sample exceeds background
XX	**sample exceeds baseline**
XX	*sample exceeds baseline +3 standard deviations*

**** All units in mg/kg**

Table 9-8: PHC F4 Soil Chemical Analysis Results – Station East Landfill

Sample Location	Sample ID	Sample Depth (m bgs)	PHC F4 (mg/kg)
C1-19	16-C1-19A	0 - 0.15	<50
	16-C1-19B	0.4 – 0.5	<50
C1-20	16-C1-20A	0 - 0.15	<50
	16-C1-20B	0.4 – 0.5	<50
C1-21	16-C1-21A	0 - 0.15	<50
	16-C1-21B	0.35 – 0.4	<50
C1-22	16-C1-22A	0 - 0.15	<50
	16-C1-22B	0.3 – 0.4	<50

9.3.2.2 Discussion of Results – Comparison to Baseline/Background

Analytical results were compared against baseline data, and background concentrations. The following Table 9-9 summarizes the comparison of results.

Table 9-9: Evaluation of Results by Parameter – Station East Landfill

Station East Landfill	
Parameter	**Discussion of Results**
Copper (Cu)	All soil samples reported either non-detect concentrations or were below both background and baseline concentrations for Cu. Historically Cu was reported elevated above background and baseline at C1-19, as well as baseline at C1-22.
Nickel (Ni)	All soil samples reported either non-detect concentrations or were below both background and baseline concentrations for Ni.
Cobalt (Co)	All soil samples reported either non-detect concentrations or were below both background and baseline concentrations for Co.
Cadmium (Cd)	All soil samples reported either non-detect concentrations or were below both background and baseline concentrations for Cd.
Lead (Pb)	Pb was reported exceeding either the background concentration of 7 mg/kg or the baseline concentration of 10 mg/kg at all samples collected at the Station East Landfill with the exception to one sample, C1-20 depth which was below both background and baseline. Historically Pb was elevated above baseline and background at C1-19, C1-23, C1-20, and C1-21.
Zinc (Zn)	All soil samples reported either non-detect concentrations or were below both background and baseline concentrations for Zn.
Chromium (Cr)	All soil samples reported either non-detect concentrations or were below both background and baseline concentrations for Cr.
Arsenic (As)	As was reported exceeding either the background concentration of 3.6 mg/kg or the baseline concentration of 5.2 mg/kg at all samples collected at the Station East Landfill with the exception to one sample, C1-20 depth which was below both background and baseline.
Mercury (Hg)	All soil samples reported non-detect concentrations for Hg.

Station East Landfill	
Parameter	**Discussion of Results**
PCBs (Total)	All soil samples reported either non-detect concentrations or below the background and baseline for PCBs.
Modified TPH (C_6-C_{34})	All soil samples reported concentrations of modified TPH below baseline concentrations in 2016.

9.3.2.3 Soil Trend Analysis by Parameter & Discussion of Trends

A soil chemistry trend analysis was conducted based on the current and historical analytical results collected at the site. A Series of graphs were generated including a visual comparison to background, baseline and historical concentrations using differentiating colours (See Appendix E7). The following Table 9-10 provides a summary of soil trend analysis findings and presents a discussion of the observed trends by parameter.

Table 9-10: Discussion of Trends – Station East Landfill

Station East Landfill	
Parameter	**Discussion of Trends**
Copper (Cu)	Based on current and historical results, it appears that Cu has no observable trend or is decreasing in concentration over time. Sample station C1-22 surface reported a significant decrease over time from 9 mg/kg in 2012 to 1.9 mg/kg in 2016. Similar decreases were also noted in C1-19 surface with a reported concentration of 14 mg/kg in 2014, down to 3.3 mg/kg in 2016. Additional data is required to confirm this observation.
Nickel (Ni)	Based on current and historical results, it appears that Ni has no observable trend. Only minor fluctuations in Ni concentrations were observed.
Cobalt (Co)	Based on current and historical results, it appears that Co is decreasing in concentration across the landfill site.
Cadmium (Cd)	Based on current and historical results, it appears that Cd has no observable trend. Only minor fluctuations in Cd concentrations were observed.
Lead (Pb)	Based on current and historical results, Pb was observed to fluctuate significantly across the site. Sample stations C1-19 depth and C1-20 surface both reported an increase in Pb concentrations over time, while sample stations C1-20 depth and C1-21 depth both reported decreases in concentrations over time. The remainder of the samples stations reported concentrations that fluctuate up and down over the monitoring years.
Zinc (Zn)	Based on current and historical results, it appears that Zn has no observable trend, with only minor fluctuations in concentrations reported.
Chromium (Cr)	Based on current and historical results, it appears that Cr has no observable trend, with only minor fluctuations in concentrations reported.
Arsenic (As)	Based on current and historical results, As has no observable trend; however, sample stations C1-19 surface, C1-19 depth, and C1-20 surface all reported increasing concentrations over time.
Mercury (Hg)	Based on all non-detect concentrations, Hg has no observable trend.

Station East Landfill	
Parameter	**Discussion of Trends**
PCBs (Total)	Based on mostly non-detect concentrations, PCBs has no observable trend. With the anomalous high detection limit removed, there is still no clear observable trend present. More data points are required to reliably determine a trend at this landfill.
Modified TPH (C_6-C_{34})	Based on current and historical results, Modified TPH concentrations have no observable trend.

Trend analyses presented are based on the data available at the time of the investigation and any interpreted increasing or decreasing trends may be a result of natural variation in the data due to analytical methods. There is currently insufficient information to establish reliable trends; therefore, additional data points are required to be able to confidently determine if trends are present.

9.3.3 Groundwater Sampling

No groundwater monitoring wells are present at the Station East Landfill; therefore, no groundwater sampling or analysis was conducted.

9.3.4 Thermal Monitoring

No thermistors are present at the Station East Landfill; therefore, no thermal monitoring was conducted.

9.4 Conclusions and Overall Landfill Performance

Based on the results of the 2016 monitoring program, the overall performance of the Station East Landfill is acceptable.

9.5 Recommendations and Conclusions

Based on review and analysis of chemical data, it appears that the soil concentrations for the parameters tested largely had no observable trend with no obvious soil concentration increases or decreases over time. Both arsenic and lead were detected in concentrations above the background and baseline across the site. Increases in concentrations were detected at sample stations C1-19 and C1-20. Sample station C1-19 is an upgradient sample location and any increases in reported concentrations are not considered to be contributed by the landfill. Based on this review, it is recommended to continue the long term monitoring of soils as planned.

Based on the results of the visual inspection, the landfill performance is acceptable. No remedial work or deviations from the monitoring plan are recommended at this time.

10 CAM-1: MAIN LANDFILL

10.1 Landfill Description

The CAM-1 Main Landfill is located at the terminus of a road heading east from the station infrastructure pad. The landfill consists of one main lobe and a smaller lobe located approximately 20 m away.

The remediation of this landfill included the removal of Tier II contaminated soil and surface debris, and regrading with the placement of additional granular fill.

The long term monitoring plan for the Main Landfill consists of visual inspection, and the periodic collection of soil samples.

The landfill layout, visual observations and photographic locations are presented on Figure CAM-1.8A and soil analytical results are presented on Figure CAM-1.8B in the figures section.

10.2 Summary of Work Conducted

10.2.1 Visual Inspection

A visual inspection was conducted on the Main Landfill on August 11, 2016. The visual inspection of the landfill was completed with no deviations from the visual inspection work plan.

10.2.2 Soil Sampling

Soil sampling at the Main Landfill was conducted on August 11, 2016 and consisted of the collection of six soil samples from four soil sample stations (C1-23, C1-24, C1-25, and C1-26). Depth limitations were encountered at soil sampling stations C1-23 and C1-25, where bedrock was encountered at 0.2 m bgs and no depth sample was collected due to limited test pit depth and presence of bedrock and rock substrate with limited soil available for sample collection. In addition, sample station C1-26 was limited to a depth of 0.35 m bgs.

The following Table 10-1 outlines the soil sampling activities conducted at the Main Landfill.

Table 10-1: Summary of Work Conducted by Soil Sampling Location

Main Landfill			
Sample Location	**Sample ID**	**Sample Depth (m bgs)**	**Notes**
C1-23	16-C1-23A	0 - 0.15	Refusal on bedrock at 0.2 m bgs – no depth sample collected here
	No depth sample		
C1-24	16-C1-24A	0 - 0.15	
	16-C1-24B	0.4 – 0.5	
C1-25	16-C1-25A	0 - 0.15	

Main Landfill			
Sample Location	**Sample ID**	**Sample Depth (m bgs)**	**Notes**
	No depth sample		Refusal on bedrock at 0.2 m bgs – no depth sample collected here
C1-26	16-C1-26A	0 - 0.15	Refusal on boulders and bedrock
	16-C1-26B	0.25 – 0.35	

10.2.3 Groundwater Sampling

No groundwater monitoring wells are present at the Main Landfill.

10.2.4 Thermal Monitoring

No thermistors are present at the Main Landfill.

10.3 Results of the Monitoring Program

The following Sections 10.3.1 through 10.3.4 summarize the results of the CAM-1 monitoring program at the Main Landfill.

10.3.1 Visual Inspection

The visual inspection of the Main Landfill was conducted on August 11, 2016. The visual inspection was conducted in compliance with Section 5.2 of the Terms of Reference and details are provided below in the following Sections 10.3.1.1 through 10.3.1.5. Figure CAM-1.8A presents the visual inspection findings and photographic locations.

10.3.1.1 Inspection Checklist

The visual inspection was completed as per the Terms of Reference and the visual inspection checklist is included as Table 10-2 of this report below.

Table 10-2: Visual Inspection Checklist – Main Landfill

SITE NAME: **CAM-1 Jenny Lind Island**
LANDFILL DESIGNATION: Main Landfill
LANDFILL TYPE: Regraded
DATE OF INSPECTION: August 11, 2016
WEATHER CONDITIONS: 10ºC, sunny
DATE OF PREVIOUS INSPECTION: August 28, 2014
INSPECTED BY: Stephen Borcsok
REPORT PREPARED BY: Stephen Borcsok and Ryan Fletcher
The preparer represents to the best of the preparer's knowledge, the following statements and observations are true and correct and to the best of the preparer's actual knowledge, no material facts have been suppressed or misstated.

Main Landfill												
Checklist Item	Present (Yes/No)	Feature Number	Feature Location	GPS Coordinates Easting/Northing/Zone	Length (m)	Width (m)	Depth (m)	Extent Relative to Landfill Surface	Description	Comparison with Historical Observations	Additional Comments/ Severity Rating	Photographic Records (photo reference, location, view point & direction, feature of note, scale)
Settlement	Yes	A	Northwest and north landfill cover	389649.306 / 7620705.477 389633.879 / 7620680.985 389643.619 / 7620711.237	14	0.4-1	0.2	0.05-0.1	<1%	Three minor depressions on landfill cover and side slope	First noted in Year 3 (2012). Formerly identified as Feature C in Years 2012 and 2013. No significant changes observed between 2014 and 2016.	Severity Rating – Acceptable (features are minor and not affecting landfill stability)	CAM-1 MAIN 3, 44, 45
Settlement	Yes	B	Southwest cover and side slope	389619.185 / 7620631.353 389651.424 / 7620632.975	14	0.5-1.2	0.3-0.4	0.05-0.1	<1%	Two minor depressions	First noted in Year 3 (2012). No significant changes from 2014 to 2016.	Formerly identified as part of Feature C in Years 2012 and 2013. One new depression noted in 2014. Severity Rating – Acceptable (features are minor and not affecting landfill stability)	CAM-1 MAIN 12, 47
Settlement	Yes	C	Southeast cover and side slope	389734.771 / 7620616.755 389739.183 / 7620610.975 389739.244 / 7620610.87	14	0.4-2	0.15-0.3	0.05-0.1	<1%	Three minor depressions	First noted in Year 5 (2014). No significant change from 2014 to 2016.	Severity Rating – Acceptable (features are minor and not affecting landfill stability)	CAM-1 MAIN 22, 23, 24, 31, 32, 33
Settlement	Yes	H	West cover	389620.117 / 7620634.114	14	0.3	0.3	0.05	<1%	One minor depression	New observation in 2016.	Severity Rating – Acceptable (feature is minor and not affecting landfill stability)	CAM-1 MAIN 46
Settlement	Yes	I	Southwest cover	389654.493 / 7620629.976	14	0.3	0.3	0.05	<1%	One minor depression	New observation in 2016.	Severity Rating – Acceptable (feature is minor and not affecting landfill stability)	CAM-1 MAIN 20
Settlement	Yes	J	South cover	389691.621 / 7620597.871 389692.507 / 7620599.392 389695.209 / 7620605.257	14	0.3-12	0.2-0.3	0.05-0.1	<1%	Three minor depressions, one linear depression	New observation in 2016.	Severity Rating – Acceptable (features are minor and not affecting landfill stability)	CAM-1 MAIN 48, 49
Erosion	Yes	D	Northwest side slope and corner	389637.502 / 7620702.947	14	27	0.4-0.5	0.05	<1%	One are of minor erosion along toe and side slopes	First noted in Year 2 (2011). Identified as 3 areas of erosion in 2014, was observed as one continuous area of erosion in 2016.	First noted in Year 2 (2011) as Feature A. Subsequently changed to Feature D in 2012-2014. One new area on northwest side slope noted in 2014.	CAM-1 MAIN 4, 5, 6, 7, 8
Erosion	Yes	E	Southwest toe and side slope	389651.954 / 7620625.921	14	24	0.05-0.5	0.05-0.15	<1%	One area of minor erosion along toe, two areas of minor erosion on side slopes	First noted in Year 2 (2011).	First noted in Year 2 (2011) as Feature B. Subsequently changed to Feature E in 2012-2014. Two areas on southwest side slope noted in Year 3. Marginal increase in depth of feature in 2014. Severity Rating – Acceptable Severity Rating – Acceptable (features are minor and not affecting landfill stability)	CAM-1 MAIN 16, 17, 19
Erosion	Yes	F	Northeast corner side slope, corner and toe	389712.364 / 7620699.59 389696.429 / 7620716.824 389689.603 / 7620727.249	14	3-30	0.02-0.15	0.05-0.1	<1%	Three areas of minor erosion on landfill corner, side slope and toe	First noted in Year 2 (2011). No significant change between 2011 and 2014. Erosion at toe has lengthened from 18 to 30 m between 2014 and 2016.	First noted as Feature C in 2011, then Feature F in 2012-2014. New area on corner noted in 2014. Severity Rating – Acceptable (features are	CAM-1 MAIN 38, 39, 40, 41, 42

Main Landfill												
Checklist Item	**Present (Yes/No)**	**Feature Number**	**Feature Location**	**GPS Coordinates Easting/Northing/Zone**	**Length (m)**	**Width (m)**	**Depth (m)**	**Extent Relative to Landfill Surface**	**Description**	**Comparison with Historical Observations**	**Additional Comments/ Severity Rating**	**Photographic Records (photo reference, location, view point & direction, feature of note, scale)**
											minor and not affecting landfill stability)	
Lateral Movement	No											
Frost Action	No											
Sloughing	No											
Cracking	No											
Animal Burrows	No											
Vegetation Establishment	Yes	N/A	Some landfill side slopes	N/A	N/A	N/A	N/A	<1%	Occasional small plants on landfill side slopes	New observation in 2016.	Severity Rating – Acceptable (vegetation establishment will be beneficial for landfill stability)	CAM-1 MAIN 3, 9, 15, 16, 18
Staining	Yes	G	Central cover of landfill	389684.436 / 7620657.175	14	30	25	N/A	2%	Slight discolouration of granular cover material	First noted in Year 3 (2012). No significant change since 2012.	Severity Rating – Acceptable (staining believed to be a result of different borrow source material)	CAM-1 MAIN 28, 29
Vegetation Stress	No											
Seepage Points (or) Ponded Water	No											
Debris and/or Liner Exposed	No											
Presence & Condition of Monitoring Instruments	No											
Features of Note/Other Relevant Observations (e.g., signs of activity, ruts…)	No											

10.3.1.2 Stability Assessment

The Preliminary Stability Assessment for the Main Landfill was conducted on August 11, 2016 as per the Terms of Reference and the results are provided below in Table 10-3.

Table 10-3: Preliminary Stability Assessment – Main Landfill

Main Landfill		
Feature	**Severity Rating**	**Extent**
Settlement	Acceptable	Occasional
Erosion	Acceptable	Occasional
Lateral Movement	Not Observed	None
Frost Action	Not Observed	None
Sloughing	Not Observed	None
Cracking	Not Observed	None
Animal Burrows	Not Observed	None
Vegetation Establishment	Acceptable	Occasional
Staining	Acceptable	Isolated
Vegetation Stress	Not Observed	None
Seepage / Ponded Water	Not Observed	None
Debris and/or Liner Exposure	Not Observed	None
Other	Not Observed	None
Overall Landfill Performance	**Acceptable**	

Main Landfill	
Performance / Severity Rating	**Description**
Acceptable	Noted features are of little consequence. The landfill is performing as designed. Minor deviations in environmental or physical performance may be observed, such as isolated areas of erosion, settlement.
Marginal	Physical/environmental performance appears to be deteriorating with time. Observations may include an increase in size or number of features of note,

Main Landfill	
Performance / Severity Rating	**Description**
	such as differential settlement, erosion or cracking. No significant impact on landfill stability to date, but potential for failure is assessed as low or moderate.
Significant	Significant or potentially significant changes affecting landfill stability, such as significant changes in slope geometry, significant erosion or differential settlement; scarp development. The potential for failure is assessed as imminent.
Unacceptable	Stability of landfill is compromised to the extent that ability to contain waste materials is compromised. Examples may include: • Debris exposed in erosion channels or areas of differential settlement. • Liner exposed. • Slope failure.
Extent	**Description**
Isolated	Singular feature
Occasional	Features of note occurring at irregular intervals/locations
Numerous	Many features of note, impacted less than 50% of the surface area of the landfill
Extensive	Impacting greater than 50% of the surface area of the landfill

10.3.1.3 Photographic Records

The photographic record for the Main Landfill has been completed as per Section 5.5 of the Terms of Reference and is included in the following page as Table 10-4. The Photographic Record only contains an index of photographs collected; full sized photographs are contained in the Appended CD/DVD-ROM. Selected photographs are shown in Table 10-5. Figure CAM-1.8A presents the photograph locations and directions.

Table 10-4: Photographic Records – Main Landfill

Main Landfill						
Photo Identification	**Figure ID**	**View Direction**	**Photo Location and Direction**	**Feature Identification**	**Feature of Note**	**Other Comments**
Sample Station Photographs						
C1-23-1	S23	N/A	Sample station C1-23	C1-23	C1-23	Close up of test pit

Main Landfill						
Photo Identification	**Figure ID**	**View Direction**	**Photo Location and Direction**	**Feature Identification**	**Feature of Note**	**Other Comments**
C1-23-2	S23	SE	Sample station C1-23	C1-23	C1-23	Test pit location
C1-23-3	S23	SE	Sample station C1-23	C1-23	C1-23	C1-23 Backfilled
C1-24-1	S24	N/A	Sample station C1-24	C1-24	C1-24	Close up of test pit
C1-24-2	S24	NW	Sample station C1-24	C1-24	C1-24	Test pit location
C1-24-3	S24	NW	Sample station C1-24	C1-24	C1-24	C1-24 Backfilled
C1-25-1	S25	N/A	Sample station C1-25	C1-25	C1-25	Close up of test pit
C1-25-2	S25	N	Sample station C1-25	C1-25	C1-25	Test pit location
C1-25-3	S25	N	Sample station C1-25	C1-25	C1-25	C1-25 Backfilled
C1-26-1	S26	N/A	Sample station C1-26	C1-26	C1-26	Close up of test pit
C1-26-2	S26	NE	Sample station C1-26	C1-26	C1-26	Test pit location
C1-26-3	S26	NE	Sample station C1-26	C1-26	C1-26	C1-26 Backfilled
Visual Inspection Photographs						
CAM-1 MAIN 1	1	NE	North side slope of landfill	N/A	N/A	
CAM-1 MAIN 2	2	SW	Northwest side slope of landfill	N/A	N/A	
CAM-1 MAIN 3	3	SE	Settlement on northwest side slope and sparse vegetation establishment	Settlement Vegetation	A N/A	
CAM-1 MAIN 4	4	SW	Northwest landfill side slope	Settlement	A	
CAM-1 MAIN 5	5	SW	Minor erosion on toe of	Erosion	D	

Main Landfill						
Photo Identification	**Figure ID**	**View Direction**	**Photo Location and Direction**	**Feature Identification**	**Feature of Note**	**Other Comments**
			northwest side slope			
CAM-1 MAIN 6	6	NE	Minor erosion on toe of northwest side slope	Erosion	D	
CAM-1 MAIN 7	7	S	West side slope of landfill	N/A	N/A	
CAM-1 MAIN 8	8	N	No photo collected	N/A	N/A	
CAM-1 MAIN 9	9	SE	View across landfill cover and sparse vegetation establishment	Vegetation	N/A	
CAM-1 MAIN 10	10	S	Linear depression on southwest corner of landfill	Settlement	B	
CAM-1 MAIN 11	11	SE	View across southwest corner of landfill	N/A	N/A	
CAM-1 MAIN 12	12	NE	West side slope of landfill	N/A	N/A	
CAM-1 MAIN 13	13	E	Southwest toe of landfill	N/A	N/A	
CAM-1 MAIN 14	14	NE	View across landfill cover	N/A	N/A	
CAM-1 MAIN 15	15	E	Minor erosion and sparse vegetation on southwest side slope of landfill	Erosion Vegetation	E N/A	
CAM-1 MAIN 16	16	NE	Minor erosion and sparse vegetation on	Erosion Vegetation	E N/A	

Main Landfill						
Photo Identification	**Figure ID**	**View Direction**	**Photo Location and Direction**	**Feature Identification**	**Feature of Note**	**Other Comments**
			southwest side slope of landfill			
CAM-1 MAIN 17	17	NW	Minor erosion on southwest side slope of landfill	Erosion	E	
CAM-1 MAIN 18	18	S	West side slope of landfill with sparse vegetation establishment	Vegetation	N/A	
CAM-1 MAIN 19	19	NE	Minor erosion on southwest side slope of landfill	Erosion	E	
CAM-1 MAIN 20	20	W	Settlement on west landfill cover	Settlement	I	New observation
CAM-1 MAIN 21	21	NE	View across south landfill cover	N/A	N/A	
CAM-1 MAIN 22	22	E	Linear depression on south side of landfill	Settlement	C	
CAM-1 MAIN 23	23	NW	Linear depression on south side of landfill	Settlement	C	
CAM-1 MAIN 24	24	NE	Linear depression on south side of landfill	Settlement	C	
CAM-1 MAIN 25	25	SW	South toe of landfill	N/A	N/A	
CAM-1 MAIN 26	26	SE	South toe of landfill	N/A	N/A	
CAM-1 MAIN 27	27	NW	View across landfill cover	Staining	G	

Main Landfill						
Photo Identification	**Figure ID**	**View Direction**	**Photo Location and Direction**	**Feature Identification**	**Feature of Note**	**Other Comments**
			towards area of discoloured cover material			
CAM-1 MAIN 28	28	NW	Discoloured cover material	Staining	G	
CAM-1 MAIN 29	29	S	Discoloured cover material	Staining	G	
CAM-1 MAIN 30	30	NW	View of southeast side of landfill	N/A	N/A	
CAM-1 MAIN 31	31	NW	Minor depression on southeast side slope	Settlement	C	
CAM-1 MAIN 32	32	SW	Minor depression on inside corner of east side of landfill	Settlement	C	
CAM-1 MAIN 33	33	E	Minor depression on inside corner of east side of landfill	Settlement	C	
CAM-1 MAIN 34	34	NW	East side slope of landfill	N/A	N/A	
CAM-1 MAIN 35	35	W	View across east side of landfill	N/A	N/A	
CAM-1 MAIN 36	36	SE	East side slope of landfill	N/A	N/A	
CAM-1 MAIN 37	37	NW	East side slope of landfill	N/A	N/A	
CAM-1 MAIN 38	38	NW	Minor erosion along east toe of landfill	Erosion	F	

Main Landfill						
Photo Identification	**Figure ID**	**View Direction**	**Photo Location and Direction**	**Feature Identification**	**Feature of Note**	**Other Comments**
CAM-1 MAIN 39	39	NE	Minor erosion along east toe of landfill	Erosion	F	
CAM-1 MAIN 40	40	SW	Minor erosion along east toe of landfill	Erosion	F	
CAM-1 MAIN 41	41	SE	Minor erosion along east toe of landfill	Erosion	F	
CAM-1 MAIN 42	42	S	Minor erosion on northeast corner of landfill	Erosion	F	
CAM-1 MAIN 43	43	NE	Exposed bedrock northeast of landfill	N/A	N/A	
CAM-1 MAIN 44	44	NE	Settlement on northwest landfill cover	Settlement	A	
CAM-1 MAIN 45	45	NW	Minor settlement on northwest landfill cover	Settlement	A	
CAM-1 MAIN 46	46	S	Minor settlement on southwest landfill cover	Settlement	H	New observation
CAM-1 MAIN 47	47	S	Minor settlement on south landfill cover	Settlement	B	
CAM-1 MAIN 48	48	S	Minor potholes and linear depression on south landfill cover	Settlement	J	New observation
CAM-1 MAIN 49	49	NE	Minor potholes and linear	Settlement	J	New observation

Main Landfill						
Photo Identification	**Figure ID**	**View Direction**	**Photo Location and Direction**	**Feature Identification**	**Feature of Note**	**Other Comments**
			depression on south landfill cover			

Table 10-5: Selected Photographs – Main Landfill

Main Landfill
Photograph CAM-1 MAIN 16: Minor erosion of fines (Feature E) on southwest side slope of landfill.

Main Landfill

Photograph CAM-1 MAIN 20: New minor settlement (Feature I) on west landfill cover.

Photograph CAM-1 MAIN 29: View across landfill cover at stained cover material (Feature G).

Main Landfill

Photograph CAM-1 MAIN 46: New minor settlement (Feature H) on southwest landfill cover.

Photograph CAM-1 MAIN 48: Minor potholes and linear depression (Feature J) on south landfill cover.

Main Landfill
Photograph CAM-1 MAIN 49: Minor potholes and linear depression (Feature J) on south landfill cover.

10.3.1.4 Trend Analysis

A trend analysis was conducted with regards to observations made during the visual inspection of the Main Landfill. The following Table 10-6 outlines the results of the visual trend analysis.

Table 10-6: Visual Inspection Trends - Main Landfill

Main Landfill		
Checklist Item	Feature Number	Comparison with Historical Observations
Settlement	A	No significant changes.
	B	No significant changes.
	C	No significant changes.
	H	New observation in 2016.
	I	New observation in 2016.
	J	New observation in 2016.
Erosion	D	Three identified areas of erosion in 2014 were observed to have combined to one area of erosion in 2016.

Main Landfill		
Checklist Item	Feature Number	Comparison with Historical Observations
	E F	Three identified areas of erosion in 2014 were observed to have combined to two area of erosion in 2016. Erosion at toe has increased in length slightly.
Vegetation Establishment	N/A	Some sparse vegetation newly observed in 2016.
Staining	G	No significant change.

10.3.1.5 Discussion of Results/Trends

A comparison of the visual inspection results of the 2014 and 2016 monitoring events at the Main Landfill indicates that previously observed minor settlement features and the large staining feature have not undergone any significant change. Three new minor settlement features were observed in 2016. Some sparse vegetation establishment was observed on the side slopes of the landfill. Three areas of erosion at the toes of landfill side slopes increased in size and at two features, discontinuous areas of erosion became continuous. These results do not affect the stability of the landfill at this time.

Some sparse vegetation has been observed on limited areas of the landfill side slopes. The presence of vegetation is expected to benefit the stability of the landfill.

10.3.2 Soil Sampling

Soil sampling of the Main Landfill was conducted on August 11, 2016. The soil sampling was conducted in compliance with Section 5.3.1 and 5.3.2 of the Terms of Reference and details are provided below in the following Sections 10.3.2.1 through 10.3.2.3.

10.3.2.1 Laboratory Analytical Results

A total of six soil samples were analysed from four soil sample locations at the Main Landfill. Table 10-7 and 10-8 present the soil analytical results. Figure CAM-1.8B presents a summary of significant soil analytical results.

Table 10-7: Soil Chemical Analysis Results – Main Landfill

Main Landfill																	
Sample ID	**Sampling Station**	**Monitoring Year**	**Depth**	**Cu**	**Ni**	**Co**	**Cd**	**Pb**	**Zn**	**Cr**	**As**	**Hg**	**Total PCB**	**F1 C6-C10**	**F2 C10-C16**	**F3 C16-C34**	**Modified TPH Total C6-C34**
Comparison Values																	
Background				11	4.7	3.1	0.50	7	12	12	3.6	NS	0.042				NS
Baseline				**5.7**	**5.0**	**5.0**	**1**	**10**	**15**	**20**	**5.2**	**0.1**	**0.003**				**47**
Baseline +3 Standard Deviations				21	10	5	1	43	82	20	21	0.1	1				165
Upgradient																	
C1-23 Surface																	
10-16667/68	C1-23	2010	0-10	4.0	<5.0	<5.0	<1.0	**42**	<15	<20	**35**	<0.10	0.0032	<10	4.2	<9.0	14
C112-23A	C1-23	2012	0-15	<5.0	2.6	1.4	<0.10	**42**	<10	1.9	**38**	<0.050	<0.010	<12	<10	<10	16
C114-23A	C1-23	2014	0-15	5.2	2.5	1.9	0.05	**67**	1	1.7	**39**	<0.01	<0.1	<10	<50	<50	**55**
16-C1-23A	C1-23	2016	0-15	2.4	1.6	1	<0.050	**56**	**32**	7.2	**19**	<0.050	<0.010	<12	<10	<50	36
C1-23 Depth																	
no depth sample collected due to bedrock	C1-23	2010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C112-23B	C1-23	2012	40-50	<5.0	2.0	1.2	<0.10	**42**	<10	1.6	**39**	<0.050	<0.010	<12	<10	12	23
C114-23B	C1-23	2014	40-50	4.1	1.8	1.3	0.03	**45**	1	1.6	**26**	<0.01	<0.1	<10	<50	<50	**55**
no depth sample collected due to bedrock	C1-23	2016	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Downgradient																	
C1-24 Surface																	
10-16669	C1-24	2010	0-10	<3.0	<5.0	<5.0	<1.0	<10	<15	<20	2.4	<0.10	0.0038	<10	7.2	9.0	21
C112-24A	C1-24	2012	0-15	<5.0	1.0	<1.0	<0.10	5.5	<10	2.3	2.9	<0.050	<0.010	<12	<10	<10	16
C114-24A	C1-24	2014	0-15	3.5	1.7	0.9	0.07	9.0	7.0	3.5	5.0	0.01	<0.1	<10	<50	<50	**55**
16-C1-24A	C1-24	2016	0-15	1.5	1.1	<0.50	<0.050	4.4	<10	5.6	2.1	<0.050	<0.010	<12	<10	<50	36
C1-24 Depth																	
10-16671	C1-24	2010	30-50	<3.0	<5.0	<5.0	<1.0	<10	<15	<20	3.3	<0.10	0.0035	<10	4.6	<9.0	14
C112-24B	C1-24	2012	40-50	<5.0	1.7	<1.0	<0.10	9.5	<10	2.7	**6.4**	<0.050	<0.010	<12	<10	<10	16
C114-24B	C1-24	2014	40-50	2.6	1.7	1.3	0.05	**14**	7.0	3.8	**7.4**	<0.01	<0.1	<10	<50	<50	**55**
16-C1-24B	C1-24	2016	40-50	1.6	1.2	0.57	<0.050	5.6	<10	2.2	2.9	<0.050	<0.010	<12	<10	<50	36

DEW LINE MONITORING PROGRAM - CAM-1

Main Landfill																	
Sample ID	Sampling Station	Monitoring Year	Depth	Cu	Ni	Co	Cd	Pb	Zn	Cr	As	Hg	Total PCB	F1 C6-C10	F2 C10-C16	F3 C16-C34	Modified TPH Total C6-C34
C1-25 Surface																	
10-16673	C1-25	2010	0-10	<3.0	<5.0	<5.0	<1.0	<10	<15	<20	1.5	<0.10	0.0031	<10	<4.0	<9.0	12
C112-25A	C1-25	2012	0-15	34	1.8	3.8	<0.10	3.1	<10	2.5	1.7	<0.050	<0.010	<12	<10	<10	16
C114-25A	C1-25	2014	0-15	2.3	1.4	0.7	0.03	<4.9	6.0	2.4	1.5	<0.01	<0.1	<10	<50	<50	55
16-C1-25A	C1-25	2016	0-15	3.5	1.2	0.52	0.055	5.5	<10	2.4	2.1	<0.050	<0.010	<12	<10	<50	36
C1-25 Depth																	
10-16675	C1-25	2010	30-50	<3.0	<5.0	<5.0	<1.0	<10	<15	<20	2.6	<0.10	<0.0030	<10	<4.0	<9.0	12
C112-25B	C1-25	2012	40-50	5.3	2.1	1.0	<0.10	4.6	<10	3.7	3.0	<0.050	<0.010	<12	13	<10	24
C114-25B	C1-25	2014	40-50	2.2	1.5	1.1	0.01	<4.9	3.0	3.2	2.8	<0.01	<0.1	<10	<50	<50	55
No sample taken due to bedrock refusal	C1-25	2016	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1-26 Surface																	
10-16677	C1-26	2010	0-10	<3.0	16	<5.0	<1.0	<10	<15	<20	1.1	<0.10	0.0033	<10	<4.0	<9.0	12
C112-26A	C1-26	2012	0-15	<5.0	1.6	<1.0	<0.10	3.9	<10	3.4	1.5	<0.050	<0.010	<12	<10	<10	16
C114-26A	C1-26	2014	0-15	1.4	0.7	1.2	0.03	5.6	7.0	4.2	1.7	<0.01	<0.1	<10	<50	<50	55
16-C1-26A	C1-26	2016	0-15	1.5	1.5	0.79	<0.050	4.5	<10	3.7	1.4	<0.050	<0.010	<12	<10	<50	36
C1-26 Depth																	
10-16679	C1-26	2010	30-50	<3.0	<5.0	<5.0	<1.0	<10	<15	<20	4.2	<0.10	<0.0030	<10	<4.0	<9.0	12
C112-26B	C1-26	2012	40-50	5.8	1.9	<1.0	<0.10	3.7	<10	3.4	2.2	<0.050	<0.010	<12	<10	<10	16
C114-26B	C1-26	2014	40-50	4.0	2.5	1.3	0.03	18	3.0	2.8	9.4	<0.01	<0.1	<10	<50	<50	55
16-C1-26B	C1-26	2016	25-35	1.9	1.8	0.83	<0.050	4.3	<10	3.7	2	<0.050	<0.010	<12	<10	<50	36

Notes:

XX	sample exceeds background
XX	**sample exceeds baseline**
XX	*sample exceeds baseline +3 standard deviations*

**** All units in mg/kg**

Table 10-8: PHC F4 Soil Chemical Analysis Results – Main Landfill

Sample Location	Sample ID	Sample Depth (m bgs)	PHC F4 (mg/kg)
C1-23	16-C1-23A	0 - 0.15	<50
	No depth sample		-
C1-24	16-C1-24A	0 - 0.15	<50
	16-C1-24B	0.4 – 0.5	<50
C1-25	16-C1-25A	0 - 0.15	<50
	No depth sample		-
C1-26	16-C1-26A	0 - 0.15	<50
	16-C1-26B	0.25 – 0.35	<50

10.3.2.2 Discussion of Results – Comparison to Baseline/Background

Analytical results were compared against baseline data, and background concentrations. The following Table 10-9 summarizes the comparison of results.

Table 10-9: Evaluation of Results by Parameter – Main Landfill

Main Landfill	
Parameter	Discussion of Results
Copper (Cu)	All soil samples reported either non-detect concentrations or were below both background and baseline concentrations for Cu.
Nickel (Ni)	All soil samples reported either non-detect concentrations or were below both background and baseline concentrations for Ni.
Cobalt (Co)	All soil samples reported either non-detect concentrations or were below both background and baseline concentrations for Co.
Cadmium (Cd)	All soil samples reported either non-detect concentrations or were below both background and baseline concentrations for Cd.
Lead (Pb)	Pb was reported exceeding the background concentration of 7 mg/kg or the baseline concentration of 10 mg/kg at sample station C1-23 surface, which is the up-gradient sample station with similar results historically. All other stations reported concentrations below the background and baseline. Historically Pb was reported elevated at C1-24 surface, C1-24 depth, and C1-26 depth.
Zinc (Zn)	All soil samples reported either non-detect concentrations or were below both background and baseline concentrations for Zn, with the exception to C1-23 surface which was above the background concentration of 12 mg/kg and the baseline concentration of 15 mg/kg with a reported concentration of 32 mg/kg.
Chromium (Cr)	All soil samples reported either non-detect concentrations or were below both background and baseline concentrations for Cr.
Arsenic (As)	As was reported below the background concentration of 3.6 mg/kg and the baseline concentration of 5.2 mg/kg at all samples collected at the Main Landfill with the exception to one sample, C1-23 surface which was above the baseline and background with a reported concentration of 19 mg/kg.

Mercury (Hg)	All soil samples reported non-detect concentrations for Hg.
PCBs (Total)	All soil samples reported non-detect concentrations for PCBs.
Modified TPH (C_6-C_{34})	All soil samples reported concentrations of modified TPH below baseline concentrations.

10.3.2.3 Soil Trend Analysis by Parameter & Discussion of Trends

A soil chemistry trend analysis was conducted based on the current and historical analytical results collected at the site. A series of graphs were generated including a visual comparison to background, baseline and historical concentrations using differentiating colours (See Appendix E7). The following Table 10-10 provides a summary of soil trend analysis findings and presents a discussion of the observed trends by parameter.

Table 10-10: Discussion of Trends – Main Landfill

Main Landfill	
Parameter	**Discussion of Trends**
Copper (Cu)	Based on current and historical results, it appears that Cu concentrations are decreasing across the site, indicating a downward trend.
Nickel (Ni)	Based on current and historical results, it appears that Ni concentrations are decreasing across the site, indicating a downward trend.
Cobalt (Co)	Based on current and historical results, it appears that Co concentrations are decreasing across the site, indicating a downward trend.
Cadmium (Cd)	Based on current and historical results, it appears that Cd has no observable trend.
Lead (Pb)	Based on current and historical results, Pb was observed to fluctuate significantly across the site. Overall, it appears that Pb has no observable trend. Samples collected in 2014 appear much higher in all sample stations than in previous sampling events and in comparison to the 2016 results; therefore, the 2014 results may be anomalous in nature. Further data points are required to adequately assess a trend at this landfill.
Zinc (Zn)	Based on current and historical results, it appears that Zn has no observable trend, with only minor fluctuations in concentrations reported. Soil sample C1-23 surface reported significantly elevated concentrations (32 mg/kg) over historic results (1 mg/kg in 2014 and non-detect prior).
Chromium (Cr)	Based on current and historical results, it appears that Cr has no observable trend, with only minor fluctuations in concentrations reported.
Arsenic (As)	Based on current and historical results, As concentrations were observed to be in a downward trend across the site, with the only sample station reporting concentrations above background and baseline being C1-23 surface, which is an upgradient sample station.
Mercury (Hg)	Based on all non-detect concentrations, Hg has no observable trend.
PCBs (Total)	Based on all non-detect concentrations, PCBs has no observable trend.
Modified TPH (C_6-C_{34})	Based on current and historical results, Modified TPH concentrations has no observable trend.

Trend analyses presented are based on the data available at the time of the investigation and any interpreted increasing or decreasing trends may be a result of natural variation in the data due to

analytical methods. There is currently insufficient information to establish reliable trends; therefore, additional data points are required to be able to confidently determine if trends are present.

10.3.3 Groundwater Sampling

No groundwater monitoring wells are present at the Main Landfill; therefore, no groundwater sampling or analysis was conducted.

10.3.4 Thermal Monitoring

No thermistors are present at the Main Landfill; therefore, no thermal monitoring was conducted.

10.4 Conclusions and Overall Landfill Performance

Based on the results of the 2016 monitoring program, the overall performance of the Main Landfill is acceptable.

10.5 Recommendations and Conclusions

Based on review and analysis of chemical data, it appears that the soil concentrations for the parameters tested largely had no observable trend with no obvious soil concentration increases over time.

Lead was detected in high concentrations (56 mg/kg) in the up gradient soil sample station C1-23 surface. All other Lead samples were below the baseline and background concentrations. Arsenic was also observed to be elevated in the upgradient sample; however, concentrations have decreased from previous sampling events from 39 mg/kg in 2014 19 mg/kg in 2016.

The instance of elevated metals concentrations in the up-gradient sample location suggest that some metal impacted soil may be present upgradient of the landfill; however, it is not anticipated that this is effecting the integrity of the landfill or influencing the downgradient sample stations.

Based on this review, it is recommended to continue the long term monitoring of soils as planned.

Based on the results of the visual inspection, the landfill performance is acceptable. No remedial work or deviations from the monitoring plan are recommended at this time.

11 CAM-1: USAF LANDFILL

11.1 Landfill Description

The CAM-1 USAF Landfill is located approximately 570 m north of the airstrip, on the east side of the main road connecting the Airstrip to the Station Area. Two lobes of debris were identified at this location.

The remediation of this landfill included the removal of surface debris and regrading with the placement of additional granular fill.

The long term monitoring plan for the USAF Landfill consists of visual inspection, and the periodic collection of soil samples.

The landfill layout, visual observations and photographic locations are presented on Figure CAM-1.9A and soil analytical results are presented on Figure CAM-1.9B in the figures section.

11.2 Summary of Work Conducted

11.2.1 Visual Inspection

A visual inspection was conducted on the USAF Landfill on August 11, 2016. The visual inspection of the landfill was completed with no deviations from the visual inspection work plan.

11.2.2 Soil Sampling

Soil sampling at the USAF Landfill was conducted on August 11, 2016 and consisted of the collection of ten soil samples from five soil sample stations (C1-27, C1-28, C1-29, C1-30 and C1-31).

The following Table 11-1 outlines the soil sampling activities conducted at the USAF Landfill.

Table 11-1: Summary of Work Conducted by Soil Sampling Location

USAF Landfill			
Sample Location	**Sample ID**	**Sample Depth (m bgs)**	**Notes**
C1-27	16-C1-27A	0 - 0.15	
	16-C1-27B	0.4 – 0.5	
C1-28	16-C1-28A	0 - 0.15	
	16-C1-28B	0.4 – 0.5	
C1-29	16-C1-29A	0 - 0.15	
	16-C1-29B	0.4 – 0.5	
C1-30	16-C1-30A	0 - 0.15	
	16-C1-30B	0.4 – 0.5	
C1-31	16-C1-31A	0 - 0.15	

USAF Landfill			
Sample Location	**Sample ID**	**Sample Depth (m bgs)**	**Notes**
	16-C1-31B	0.4 – 0.5	

11.2.3 Groundwater Sampling

No groundwater monitoring wells are present at the USAF Landfill.

11.2.4 Thermal Monitoring

No thermistors are present at the USAF Landfill.

11.3 Results of the Monitoring Program

The following Sections 11.3.1through 11.3.4 summarize the results of the CAM-1 monitoring program at the USAF Landfill.

11.3.1 Visual Inspection

The visual inspection of the USAF Landfill was conducted on August 11, 2016. The visual inspection was conducted in compliance with Section 5.2 of the Terms of Reference and details are provided below in the following Sections 11.3.1.1 through 11.3.1.5. Figure CAM-1.9A presents the visual inspection findings and photographic locations.

11.3.1.1 Inspection Checklist

The visual inspection was completed as per the Terms of Reference and the visual inspection checklist is included as Table 11-2 of this report below.

Table 11-2: Visual Inspection Checklist – USAF Landfill

SITE NAME: **CAM-1 Jenny Lind Island**
LANDFILL DESIGNATION: USAF Landfill
LANDFILL TYPE: Regraded
DATE OF INSPECTION: August 11, 2016
WEATHER CONDITIONS: 10ºC, sunny
DATE OF PREVIOUS INSPECTION: August 27, 2014
INSPECTED BY: Stephen Borcsok
REPORT PREPARED BY: Stephen Borcsok and Ryan Fletcher

The preparer represents to the best of the preparer's knowledge, the following statements and observations are true and correct and to the best of the preparer's actual knowledge, no material facts have been suppressed or misstated.

USAF Landfill												
Checklist Item	**Present (Yes/No)**	**Feature Number**	**Feature Location**	**GPS Coordinates Easting/Northing/Zone**	**Length (m)**	**Width (m)**	**Depth (m)**	**Extent Relative to Landfill Surface**	**Description**	**Comparison with Historical Observations**	**Additional Comments/ Severity Rating**	**Photographic Records (photo reference, location, view point & direction, feature of note, scale)**
Settlement	No											
Erosion	Yes	A	West side slope, Lobe 1	388453.566 / 7619272.42 14	5	0.1	0.01	<1%	Minor washing of fines	First noted in year 5 (2014). Decrease in length from 6 to 5 m from 2014 to 2016. Slope appears stable. NSC.	Severity Rating – Acceptable (feature is minor and not affecting landfill stability)	CAM-1 USAF 4, 5
Lateral Movement	No											
Frost Action	No											
Sloughing	No											
Cracking	No											
Animal Burrows	No											
Vegetation Establishment	No											
Staining	No											
Vegetation Stress	No											
Seepage Points (or) Ponded Water	No											
Debris and/or Liner Exposed	No											
Presence & Condition of Monitoring Instruments	No											
Features of Note/Other Relevant Observations (e.g., signs of activity, ruts…)	No											

11.3.1.2 Stability Assessment

The Preliminary Stability Assessment for the USAF Landfill was conducted on August 11, 2016 as per the Terms of Reference and the results are provided below in Table 11-3.

Table 11-3: Preliminary Stability Assessment – USAF Landfill

USAF Landfill		
Feature	Severity Rating	Extent
Settlement	Not Observed	None
Erosion	Acceptable	Isolated
Lateral Movement	Not Observed	None
Frost Action	Not Observed	None
Sloughing	Not Observed	None
Cracking	Not Observed	None
Animal Burrows	Not Observed	None
Vegetation Establishment	Not Observed	None
Staining	Not Observed	None
Vegetation Stress	Not Observed	None
Seepage / Ponded Water	Not Observed	None
Debris and/or Liner Exposure	Not Observed	None
Other	Not Observed	None
Overall Landfill Performance	**Acceptable**	

USAF Landfill	
Performance / Severity Rating	Description
Acceptable	Noted features are of little consequence. The landfill is performing as designed. Minor deviations in environmental or physical performance may be observed, such as isolated areas of erosion, settlement.
Marginal	Physical/environmental performance appears to be deteriorating with time. Observations may include an increase in size or number of features of note,

USAF Landfill	
Performance / Severity Rating	Description
	such as differential settlement, erosion or cracking. No significant impact on landfill stability to date, but potential for failure is assessed as low or moderate.
Significant	Significant or potentially significant changes affecting landfill stability, such as significant changes in slope geometry, significant erosion or differential settlement; scarp development. The potential for failure is assessed as imminent.
Unacceptable	Stability of landfill is compromised to the extent that ability to contain waste materials is compromised. Examples may include: • Debris exposed in erosion channels or areas of differential settlement. • Liner exposed. • Slope failure.
Extent	**Description**
Isolated	Singular feature
Occasional	Features of note occurring at irregular intervals/locations
Numerous	Many features of note, impacted less than 50% of the surface area of the landfill
Extensive	Impacting greater than 50% of the surface area of the landfill

11.3.1.3 Photographic Records

The photographic record for the USAF Landfill has been completed as per Section 5.5 of the Terms of Reference and is included in the following page as Table 11-4. The Photographic Record only contains an index of photographs collected; full sized photographs are contained in the Appended CD/DVD-ROM. Selected photographs are shown in Table 11-5. Figure CAM-1.9A presents the photograph locations and directions.

Table 11-4: Photographic Records – USAF Landfill

USAF Landfill						
Photo Identification	**Figure ID**	**View Direction**	**Photo Location and Direction**	**Feature Identification**	**Feature of Note**	**Other Comments**
Sample Station Photographs						
C1-27-1	S27	N/A	Sample station C1-27	C1-27	C1-27	Close up of test pit
C1-27-2	S27	N/A	Sample station C1-27	C1-27	C1-27	Test pit location
C1-27-3	S27	NW	Sample station C1-27	C1-27	C1-27	C1-27 Backfilled

USAF Landfill						
Photo Identification	**Figure ID**	**View Direction**	**Photo Location and Direction**	**Feature Identification**	**Feature of Note**	**Other Comments**
C1-28-1	S28	N/A	Sample station C1-28	C1-28	C1-28	Close up of test pit
C1-28-2	S28	SE	Sample station C1-28	C1-28	C1-28	Test pit location
C1-28-3	S28	SE	Sample station C1-28	C1-28	C1-28	C1-28 Backfilled
C1-29-1	S29	N/A	Sample station C1-28	C1-29	C1-29	Close up of test pit
C1-29-2	S29	SW	Sample station C1-29	C1-29	C1-29	Test pit location
C1-29-3	S29	SW	Sample station C1-29	C1-29	C1-29	C1-29 Backfilled
C1-30-1	S30	N/A	Sample station C1-29	C1-30	C1-30	Close up of test pit
C1-30-2	S30	S of SE	Sample station C1-30	C1-30	C1-30	Test pit location
C1-30-3	S30	S of SE	Sample station C1-30	C1-30	C1-30	C1-30 Backfilled
C1-31-1	S31	N/A	Sample station C1-31	C1-31	C1-31	Close up of test pit
C1-31-2	S31	SW	Sample station C1-31	C1-31	C1-31	Test pit location
C1-31-3	S31	SW	Sample station C1-31	C1-31	C1-31	C1-31 Backfilled
Visual Inspection Photographs						
CAM-1 USAF 1	1	SE	View from west of Lobes 1 and 2	N/A	N/A	
CAM-1 USAF 2	2	NE	West side slope of Lobe 1	N/A	N/A	
CAM-1 USAF 3	3	SW	West side slope of Lobe 1	N/A	N/A	
CAM-1 USAF 4	4	E	Minor erosion on west side slope of Lobe 1	Erosion	A	
CAM-1 USAF 5	5	W	Minor erosion on west side slope of Lobe 1	Erosion	A	
CAM-1 USAF 6	6	SE	Southwest side slope of Lobe 1	N/A	N/A	
CAM-1 USAF 7	7	NW	Southwest side slope of Lobe 1	N/A	N/A	
CAM-1 USAF 8	8	E	Southeast side slope of Lobe 1	N/A	N/A	
CAM-1 USAF 9	9	N	Corner marker post for USAF landfill located south of Lobe 1	N/A	N/A	

USAF Landfill						
Photo Identification	**Figure ID**	**View Direction**	**Photo Location and Direction**	**Feature Identification**	**Feature of Note**	**Other Comments**
CAM-1 USAF 10	10	SW	Southeast side slope of Lobe 1	N/A	N/A	
CAM-1 USAF 11	11	NW	East side slope of Lobe 1	N/A	N/A	
CAM-1 USAF 12	12	W	View across Lobe 1 from east side	N/A	N/A	
CAM-1 USAF 13	13	W	Corner marker post for USAF landfill located east of Lobe 1	N/A	N/A	
CAM-1 USAF 14	14	SE	East side slope of Lobe 1	N/A	N/A	
CAM-1 USAF 15	15	W	North side slope of Lobe 1	N/A	N/A	
CAM-1 USAF 16	16	S	View across Lobe 1 from north side	N/A	N/A	
CAM-1 USAF 17	17	NE	View across Lobe 2 from southwest corner	N/A	N/A	
CAM-1 USAF 18	18	E	South side slope of Lobe 2	N/A	N/A	
CAM-1 USAF 19	19	NW	West side slope of Lobe 2	N/A	N/A	
CAM-1 USAF 20	20	SW	South side slope of Lobe 2	N/A	N/A	
CAM-1 USAF 21	21	NW	East side slope of Lobe 2	N/A	N/A	
CAM-1 USAF 22	22	S	East side slope of Lobe 2	N/A	N/A	
CAM-1 USAF 23	23	W	North side slope of Lobe 2	N/A	N/A	
CAM-1 USAF 24	24	SW	View across Lobe 2 from northeast corner	N/A	N/A	
CAM-1 USAF 25	25	E	North side slope of Lobe 2	N/A	N/A	
CAM-1 USAF 26	26	S	West side slope of Lobe 2	N/A	N/A	

Table 11-5: Selected Photographs – USAF Landfill

USAF Landfill
Photograph CAM-1 USAF 4: Erosion (Feature A, minor washing of fines) on west side slope of Lobe 1.
Photograph CAM-1 USAF 5: Erosion (Feature A, minor washing of fines) on west side slope of Lobe 1.

USAF Landfill

Photograph CAM-1 USAF 16: View across Lobe 1 from north side.

Photograph CAM-1 USAF 24: View across Lobe 2 from northeast corner.

11.3.1.4 Trend Analysis

A trend analysis was conducted with regards to observations made during the visual inspection of the USAF Landfill. The following Table 11-6 outlines the results of the visual trend analysis.

Table 11-6: Visual Inspection Trends - USAF Landfill

USAF Landfill		
Checklist Item	**Feature Number**	**Comparison with Historical Observations**
Erosion	A	Decrease in length from 6 to 5 m between 2014 and 2016, no significant change.

11.3.1.5 Discussion of Results/Trends

A comparison of the visual inspection results of the 2014 and 2016 monitoring events at the USAF Landfill indicates that no new features of note are present at the landfill. The one minor erosion feature present at the landfill decreased slightly in length but has not undergone any significant change.

11.3.2 Soil Sampling

Soil sampling of the USAF Landfill was conducted on August 11, 2016. The soil sampling was conducted in compliance with Section 5.3.1 and 5.3.2 of the Terms of Reference and details are provided below in the following Sections 11.3.2.1 through 11.3.2.3

11.3.2.1 Laboratory Analytical Results

A total of ten soil samples were analysed from five soil sample locations at the USAF Landfill. Table 11-7 and 11-8 present the soil analytical results. Figure CAM-1.9B presents a summary of significant soil analytical results.

Table 11-7: Soil Chemical Analysis Results – USAF Landfill

USAF Landfill																	
Sample ID	**Sampling Station**	**Monitoring Year**	**Depth**	**Cu**	**Ni**	**Co**	**Cd**	**Pb**	**Zn**	**Cr**	**As**	**Hg**	**Total PCB**	**F1 C6-C10**	**F2 C10-C16**	**F3 C16-C34**	**Modified TPH Total C6-C34**
Comparison Values																	
Background				11	4.7	3.1	0.50	7	12	12	3.6	**NS**	0.04				**NS**
Baseline				**4.0**	**5.0**	**5.0**	**1.0**	**10**	**15**	**20**	**1.0**	**0.10**	**0.10**				**59**
Baseline +3 Standard Deviations				8.5	8.0	0.0	0.0	0.0	0.0	28	2.0	0.0	0.17				223
Upgradient																	
C1-27 Surface																	
10-16713	C1-27	2010	0-10	3.0	<5.0	<5.0	<1.0	<10	<15	<20	**5.4**	<0.10	<0.0030	<10	<4.0	<9.0	12
C112-27A	C1-27	2012	0-15	<5.0	2.0	<1.0	<0.10	4.9	<10	2.5	**1.3**	<0.050	<0.010	<12	<10	37	48
C114-27A	C1-27	2014	0-15	**9.6**	**5.7**	1.0	0.22	<5.0	4.0	3.6	**1.5**	0.0	<0.1	<10	<50	61	**91**
16-C1-27A	C1-27	2016	0-15	3.3	2.2	0.84	<0.050	2.1	<10	2.5	**1.1**	<0.050	<0.010	<12	<10	<50	36
C1-27 Depth																	
10-16715	C1-27	2010	30-50	**4.6**	**8.9**	<5.0	<1.0	<10	<15	<20	**1.4**	<0.10	<0.0030	<10	<4.0	10	17
C112-27B	C1-27	2012	40-50	<5.0	3.0	1.2	<0.10	2.6	<10	3.5	**1.6**	<0.050	<0.010	<12	<10	<10	16
C114-27B	C1-27	2014	40-50	2.3	1.9	0.9	0.01	<4.9	2.0	2.3	**1.1**	<0.01	<0.1	<10	<50	<50	55
16-C1-27B	C1-27	2016	40-50	1.7	1.7	0.85	<0.050	2	<10	2.9	**1.2**	<0.050	<0.010	<12	<10	<50	36
Downgradient																	
C1-28 Surface																	
10-16717	C1-28	2010	0-10	3.8	**5.6**	<5.0	<1.0	<10	<15	<20	**2.1**	<0.10	<0.0030	<10	<4.0	<9.0	12
C112-28A	C1-28	2012	0-15	**6.2**	**6.8**	2.7	<0.10	4.7	<10	9.1	**2.2**	<0.050	<0.010	<12	<10	<10	16
C114-28A	C1-28	2014	0-15	**4.8**	4.9	2.4	0.02	<5.0	7.0	7.1	**1.4**	<0.01	<0.1	<10	<50	<50	55
16-C1-28A	C1-28	2016	0-15	**5**	**6.1**	2.6	<0.050	4.3	<10	9.0	**2.0**	<0.050	<0.010	<12	<10	<50	36
C1-28 Depth																	
10-16719	C1-28	2010	30-50	3.1	<5.0	<5.0	<1.0	<10	<15	<20	**1.8**	<0.10	<0.0030	<10	<4.0	<9.0	12
C112-28B	C1-28	2012	40-50	**21**	**7.9**	2.9	<0.10	4.6	13	11	**2.3**	<0.050	<0.010	<12	<10	<10	16
C114-28B	C1-28	2014	40-50	1.9	1.9	1.2	<0.01	<5.0	4.0	3.6	0.8	<0.01	<0.1	<10	<50	<50	55
16-C1-28B	C1-28	2016	40-50	<1.0	<1.0	<0.50	<0.050	<0.50	<10	<1.0	<1.0	<0.050	<0.010	<12	<10	<50	36
C1-29 Surface																	

USAF Landfill																	
Sample ID	Sampling Station	Monitoring Year	Depth	Cu	Ni	Co	Cd	Pb	Zn	Cr	As	Hg	Total PCB	F1 C6-C10	F2 C10-C16	F3 C16-C34	Modified TPH Total C6-C34
10-16721	C1-29	2010	0-10	<3.0	<5.0	<5.0	<1.0	<10	<15	<20	1.5	<0.10	<0.0030	<10	<4.0	<9.0	12
C112-29A	C1-29	2012	0-15	<5.0	2.2	<1.0	<0.10	2.3	<10	3.2	1.4	<0.050	<0.010	<12	<10	<10	16
C114-29A	C1-29	2014	0-15	1.7	1.5	0.9	<0.01	<4.9	3.0	2.5	0.7	<0.01	<0.1	<10	<50	<50	55
16-C1-29A	C1-29	2016	0-15	2.4	1.6	0.62	<0.050	2	<10	3.8	<1.0	<0.050	<0.010	<12	<10	<50	36
C1-29 Depth																	
10-16723	C1-29	2010	25-30	<3.0	<5.0	<5.0	<1.0	<10	<15	<20	1.1	<0.10	<0.0030	<10	<4.0	<9.0	12
C112-29B	C1-29	2012	40-50	<5.0	3.5	1.1	<0.10	2.6	<10	5.6	1.3	<0.050	<0.010	<12	13	<10	24
C114-29B	C1-29	2014	40-50	2.8	3.4	1.3	<0.01	<5.0	3.0	4.0	1.0	<0.01	<0.1	<10	<50	<50	55
16-C1-29B	C1-29	2016	40-50	1.9	2.2	0.82	<0.050	2	<10	3.3	<1.0	<0.050	<0.010	<12	<10	<50	36
C1-30 Surface																	
10-16725	C1-30	2010	0-10	<3.0	<5.0	<5.0	<1.0	<10	<15	<20	<1.0	<0.10	<0.0030	<10	<4.0	22	29
C112-30A	C1-30	2012	0-15	6.0	2.2	<1.0	<0.10	1.8	<10	2.8	<1.0	<0.050	<0.010	<12	<10	<10	16
C114-30A	C1-30	2014	0-15	5.7	3.8	1.4	0.10	<4.9	9.0	4.0	1.0	0.0	<0.1	<10	<50	<50	55
16-C1-30A	C1-30	2016	0-15	1.6	1.5	0.83	<0.050	1.7	<10	2.6	<1.0	<0.050	<0.010	<12	<10	<50	36
C1-30 Depth																	
10-16727/28	C1-30	2010	30-50	<3.0	<5.0	<5.0	<1.0	<10	<15	<20	<1.0	<0.10	<0.0030	<10	<4.0	17	24
C112-30B	C1-30	2012	40-50	<5.0	2.0	<1.0	<0.10	1.6	<10	3.6	<1.0	<0.050	<0.010	<12	<10	<10	16
C114-30B	C1-30	2014	40-50	3.8	2.1	0.9	0.01	<5.0	2.0	3.0	0.6	<0.01	<0.1	<10	<50	<50	55
16-C1-30B	C1-30	2016	40-50	2.6	2.7	1.1	<0.050	1.7	<10	4.4	<1.0	<0.050	<0.010	<12	<10	<50	36
C1-31 Surface																	
10-16729/30	C1-31	2010	0-10	<3.0	<5.0	<5.0	<1.0	<10	<15	<20	<1.0	<0.10	<0.0030	<10	<4.0	<9.0	12
C112-31A	C1-31	2012	0-15	<5.0	1.4	<1.0	<0.10	1.4	<10	2.7	<1.0	<0.050	<0.010	<12	<10	<10	16
C114-31A	C1-31	2014	0-15	1.5	1.5	1.1	<0.01	<5.0	3.0	2.8	0.7	<0.01	<0.1	<10	<50	<50	55
16-C1-31A	C1-31	2016	0-15	1.6	4.1	0.81	<0.050	2	<10	9.1	<1.0	<0.050	<0.010	<12	<10	<50	36
C1-31 Depth																	
10-16731	C1-31	2010	30-50	<3.0	<5.0	<5.0	<1.0	<10	<15	<20	<1.0	<0.10	<0.0030	<10	<4.0	<9.0	12
C112-31B	C1-31	2012	40-50	<5.0	2.1	<1.0	<0.10	1.5	<10	3.4	<1.0	<0.050	<0.010	<12	<10	<10	16
C114-31B	C1-31	2014	40-50	2.0	2.0	0.9	<0.01	<5.0	3.0	4.0	0.8	<0.01	<0.1	<10	<50	<50	55
16-C1-31B	C1-31	2016	40-50	1.9	2.1	0.69	<0.050	1.7	<10	3.2	<1.0	<0.050	<0.010	<12	<10	<50	36

Notes:

XX	sample exceeds background
XX	**sample exceeds baseline**
XX	*sample exceeds baseline +3 standard deviations*

**** All units in mg/kg**

Table 11-8: PHC F4 Soil Chemical Analysis Results – USAF Landfill

Sample Location	Sample ID	Sample Depth (m bgs)	PHC F4 (mg/kg)
C1-27	16-C1-27A	0 - 0.15	<50
	16-C1-27B	0.4 – 0.5	<50
C1-28	16-C1-28A	0 - 0.15	<50
	16-C1-28B	0.4 – 0.5	<50
C1-29	16-C1-29A	0 - 0.15	<50
	16-C1-29B	0.4 – 0.5	<50
C1-30	16-C1-30A	0 - 0.15	<50
	16-C1-30B	0.4 – 0.5	<50
C1-31	16-C1-31A	0 - 0.15	<50
	16-C1-31B	0.4 – 0.5	<50

11.3.2.2 Discussion of Results – Comparison to Baseline/Background

Analytical results were compared against baseline data, and background concentrations. The following Table 11-9 summarizes the comparison of results.

Table 11-9: Evaluation of Results by Parameter – USAF Landfill

USAF Landfill	
Parameter	**Discussion of Results**
Copper (Cu)	All soil samples reported either non-detect concentrations or were below both background and baseline concentrations for Cu, with the exception to sample station C1-28 surface which reported a concentration of 5 mg/kg above the baseline concentration of 4 mg/kg.
Nickel (Ni)	All soil samples reported either non-detect concentrations or were below both background and baseline concentrations for Ni, with the exception to sample station C1-28 surface which reported a concentration of 6.1 mg/kg above both the baseline and background concentrations of 5.0 mg/kg and 4.7 mg/kg respectively.
Cobalt (Co)	All soil samples reported either non-detect concentrations or were below both background and baseline concentrations for Co.
Cadmium (Cd)	All soil samples were either non-detect concentrations or below the background and baseline for Cd.
Lead (Pb)	All soil samples reported either non-detect concentrations or were below both background and baseline concentrations for Pb.
Zinc (Zn)	All soil samples either non-detect concentrations or below the background and baseline for Zn. Historically, Zn was reported above background at C1-28 depth
Chromium (Cr)	All soil samples reported either non-detect concentrations or were below both background and baseline concentrations for Cr.
Arsenic (As)	As was reported above the baseline concentration of 1.0 mg/kg at soil sample stations C1-27 surface (1.1 mg/kg), C1-27 depth (1.2 mg/kg),a nd C1-28 surface (2.0 mg/kg). The remaining

USAF Landfill	
Parameter	**Discussion of Results**
	sample station all reported As concentrations below both the baseline and background concentrations.
Mercury (Hg)	All soil samples were either non-detect concentrations or below the background and baseline for Hg.
PCBs (Total)	All soil samples were either non-detect concentrations or below the background and baseline for PCBs.
Modified TPH (C_6-C_{34})	All soil samples reported concentrations of modified TPH below baseline concentrations.

11.3.2.3 Soil Trend Analysis by Parameter & Discussion of Trends

A soil chemistry trend analysis was conducted based on the current and historical analytical results collected at the site. A Series of graphs were generated including a visual comparison to background, baseline and historical concentrations using differentiating colours (See Appendix E8). The following Table 11-10 provides a summary of soil trend analysis findings and presents a discussion of the observed trends by parameter.

Table 11-10: Discussion of Trends – USAF Landfill

USAF Landfill	
Parameter	Discussion of Trends
Copper (Cu)	Based on current and historical results, it appears that Cu concentrations are decreasing across the site, indicating a general downward trend. Where downward trends were not observed (C1-29 surface and C1-28 surface), Cu has no observable trend.
Nickel (Ni)	Based on current and historical results, it appears that Ni has no observable trend with concentration fluctuations noted over the monitoring years. Decreases in concentrations were noted in C1-27 surface, C1-28 depth, C1-29 depth, and C1-30 surface. Concentration increases were noted in C1-30 depth and C1-31 surface.
Cobalt (Co)	Based on current and historical results, it appears that Co concentrations are decreasing across the site, indicating a downward trend. If no decrease was noted, then concentrations had no observable trend.
Cadmium (Cd)	Based on current and historical results, it appears that Cd has no observable trend.
Lead (Pb)	Based on current and historical results, Pb was observed to be generally declining in concentration over time. Where concentrations decreases were not noted, Pb has no observable trend.
Zinc (Zn)	Based on current and historical results, it appears that Zn has no observable trend.
Chromium (Cr)	Based on current and historical results, it appears that Cr has no observable trend, with only minor fluctuations in concentrations reported. One exception was noted in sample station C1-31 surface, where a concentration increase was noted from 2.8 mg/kg in 2014 to 9.1 mg/kg in 2016. These variations may be within natural variability and further data points are required to assess a trend.

USAF Landfill	
Parameter	Discussion of Trends
Arsenic (As)	Based on current and historical results, As had no observable trend at most of the sample stations. Decreases in concentrations over time were noted at sample stations C1-27 depth, C1-27 depth, C1-28 depth, and C1-29 surface; however, these slight decreases may be within natural variability and further data points are required to assess a trend.
Mercury (Hg)	Based on all non-detect concentrations, Hg has no observable trend.
PCBs (Total)	Based on all non-detect concentrations, PCBs has no observable trend.
Modified TPH (C_6-C_{34})	Based on current and historical results, Modified TPH concentrations have no observable trend.

Trend analyses presented are based on the data available at the time of the investigation and any interpreted increasing or decreasing trends may be a result of natural variation in the data due to analytical methods. There is currently insufficient information to establish reliable trends; therefore, additional data points are required to be able to confidently determine if trends are present.

11.3.3 Groundwater Sampling

No groundwater monitoring wells are present at the USAF Landfill; therefore, no groundwater sampling or analysis was conducted.

11.3.4 Thermal Monitoring

No thermistors are present at the USAF Landfill; therefore, no thermal monitoring was conducted.

11.4 Conclusions and Overall Landfill Performance

Based on the results of the 2016 monitoring program, the overall performance of the USAF Landfill is acceptable.

11.5 Recommendations and Conclusions

Based on review and analysis of chemical data, it appears that the soil concentrations for the parameters tested had no observable trend with no obvious soil concentration increases over time.

Based on this review, it is recommended to continue the long term monitoring of soils as planned.

Based on the results of the visual inspection, the landfill performance is acceptable. No remedial work or deviations from the monitoring plan are recommended at this time.

12 CAM-1: EAST LANDING LANDFILL

12.1 Landfill Description

The CAM-1 East Landing Landfill is located in the Beach Area, southeast of the end of the road connecting the Beach Area to the Station Area. The landfill initially consisted of five lobes of buried debris.

The remediation of this landfill included the excavation of Tier II contaminated soil, the removal of surface and partially embedded debris, complete excavation of two of the lobes and regrading of the remaining footprint with the placement of additional granular fill.

The landfill layout, visual observations and photographic locations are presented on Figure CAM-1.10A and soil analytical results are presented on Figure CAM-1.10B in the figures section

12.2 Summary of Work Conducted

12.2.1 Visual Inspection

A visual inspection was conducted on the East Landing Landfill on August 11, 2016. The visual inspection of the landfill was completed with no deviations from the visual inspection work plan.

12.2.2 Soil Sampling

Soil sampling at the East Landing Landfill was conducted on August 11, 2016 and consisted of the collection of six soil samples from four soil sample stations (C1-32, C1-33, C1-34, and C1-35). Depth limitations were encountered at soil sampling station C1-33, where the maximum depth achieved was 0.3 m bgs due to sloughing and saturated conditions. In addition, no sample was available at soil sampling station C1-34 as the sample station and surrounding areas consisted of only large gravel, cobbles, and boulders with no sand or fine material present for sampling.

The following Table 12-1 outlines the soil sampling activities conducted at the East Landing Landfill.

Table 12-1: Summary of Work Conducted by Soil Sampling Location

East Landing Landfill			
Sample Location	**Sample ID**	**Sample Depth (m bgs)**	**Notes**
C1-32	16-C1-32A	0 - 0.15	
	16-C1-32B	0.4 – 0.5	
C1-33	16-C1-33A	0 - 0.15	Refusal due to sloughing conditions
	16-C1-33B	0.2 – 0.3	
C1-34	No Sample Available		Sample station contained only rocks, large gravel, cobbles, and boulders. No soil or sand was present

East Landing Landfill			
Sample Location	**Sample ID**	**Sample Depth (m bgs)**	**Notes**
			in the area of the soil sample location or surrounding vicinity. This entire down-gradient area of the landfill is composed of washed and polished cobbles and very coarse gravel.
C1-35	16-C1-35A	0 - 0.15	Course sand was available, but very difficult to obtain a sample.
	16-C1-35B	0.4 – 0.5	

12.2.3 Groundwater Sampling

No groundwater monitoring wells are present at the East Landing Landfill.

12.2.4 Thermal Monitoring

No thermistors are present at the East Landing Landfill.

12.3 Results of the Monitoring Program

The following Sections 12.3.1through 12.3.4 summarize the results of the CAM-1 monitoring program at the East Landing Landfill.

12.3.1 Visual Inspection

The visual inspection of the East Landing Landfill was conducted on August 11, 2016. The visual inspection was conducted in compliance with Section 5.2 of the Terms of Reference and details are provided below in the following Sections 12.3.1.1 through 12.3.1.5. Figure CAM-1.10A presents the visual inspection findings and photographic locations.

12.3.1.1 Inspection Checklist

The visual inspection was completed as per the Terms of Reference and the visual inspection checklist is included as Table 12-2 of this report below.

Table 12-2: Visual Inspection Checklist – East Landing Landfill

SITE NAME: **CAM-1 Jenny Lind Island**
LANDFILL DESIGNATION: East Landfill Landfill
LANDFILL TYPE: Regraded
DATE OF INSPECTION: August 11, 2016
WEATHER CONDITIONS: 10ºC, sunny
DATE OF PREVIOUS INSPECTION: August 27, 2014
INSPECTED BY: Stephen Borcsok
REPORT PREPARED BY: Stephen Borcsok and Ryan Fletcher
The preparer represents to the best of the preparer's knowledge, the following statements and observations are true and correct and to the best of the preparer's actual knowledge, no material facts have been suppressed or misstated.

East Landing Landfill												
Checklist Item	**Present (Yes/No)**	**Feature Number**	**Feature Location**	**GPS Coordinates Easting/Northing/Zone**		**Length (m)**	**Width (m)**	**Depth (m)**	**Extent Relative to Landfill Surface**	**Description**	**Comparison with Historical Observations**	**Additional Comments/ Severity Rating**	**Photographic Records (photo reference, location, view point & direction, feature of note, scale)**
Settlement	Yes	A	Southwest side slope of landfill	388157.867 / 7618210.179 388158.277 / 7618210.382 388157.055 / 7618208.148	14	0.2-1.5	0.2-0.6	0.05-0.1	<1%	3 minor depressions	Single depression first noted in Year 3 (2012). Two additional depressions noted in 2014. Depressions appear unchanged from 2014. NSC	Severity Rating – Acceptable (features are minor and not affecting landfill stability)	CAM-1 EL 23, 24, 27
Settlement	Yes	F	SE side slope of landfill	388192.989 / 7618201.095	14	0.3	0.3	0.1	<1%	Minor depression	New observation in 2016.	Severity Rating – Acceptable (feature is minor and not affecting landfill stability)	CAM-1 EL 32
Settlement	Yes	G	S side slope of landfill	388170.126 / 7618208.965	14	5	0.3	0.1	<1%	Minor depression	New observation in 2016.	Severity Rating – Acceptable (feature is minor and not affecting landfill stability)	CAM-1 EL 33
Erosion	Yes	C	NW side slope of landfill	388156.241 / 7618238.159	14	4	0.2-1.0	0.02-0.03	<1%	Minor erosion	Feature first noted in Year 5 (2014). Side slope appears stable. NSC	Severity Rating – Acceptable (feature is minor and not affecting landfill stability)	CAM-1 EL 18, 19
Erosion	Yes	D	SW side slope of landfill	388158.035 / 7618208.422	14	6	0.3	0.05-0.1	<1%	Minor erosion	Feature first noted in Year 5 (2014). Side slope appears stable. Decrease in length from 6 to 5 m from 2014 to 2016.	Severity Rating – Acceptable (feature is minor and not affecting landfill stability)	CAM-1 EL 25, 26
Lateral Movement	No												
Frost Action	No												
Sloughing	No												
Cracking	Yes	B	SE corner of landfill cover	388186.378 / 7618210.061	14	39	0.03-0.05	0.1	<1%	Continuous tension crack	Feature first noted in Year 3 (2012). Crack has widened from 0.03 to 0.05 m in some sections and has lengthened from 28 to 39 m since 2014. The crack now runs off of the landfill to the east. Evidence of infilling of crack is present.	Severity Rating – Acceptable (feature has increased in length, however no evidence was observed to indicate feature is affecting landfill stability)	CAM-1 EL 28, 29, 30, 31
Cracking	Yes	E	NW side slope of landfill	388155.738 / 7618235.641	14	N/A	N/A	N/A	<1%	Completely infilled tension crack	Feature first noted in Year 5 (2014). Crack was completely infilled in 2016 and was not observed.	Severity Rating – Acceptable (feature was not observed in 2016)	CAM-1 EL 20, 21
Animal Burrows	No												
Vegetation Establishment	No												
Staining	No												
Vegetation Stress	No												
Seepage Points (or)	No												

East Landing Landfill											
Checklist Item	**Present (Yes/No)**	**Feature Number**	**Feature Location**	**GPS Coordinates Easting/Northing/Zone**	**Length (m)**	**Width (m)**	**Depth (m)**	**Extent Relative to Landfill Surface**	**Description**	**Comparison with Historical Observations**	**Additional Comments/ Severity Rating**	**Photographic Records (photo reference, location, view point & direction, feature of note, scale)**
Ponded Water												
Debris and/or Liner Exposed	No											
Presence & Condition of Monitoring Instruments	No											
Features of Note/Other Relevant Observations (e.g., signs of activity, ruts…)	No											

12.3.1.2 Stability Assessment

The Preliminary Stability Assessment for the East Landing Landfill was conducted on August 11, 2016 as per the Terms of Reference and the results are provided below in Table 12-3.

Table 12-3: Preliminary Stability Assessment – East Landing Landfill

East Landing Landfill		
Feature	**Severity Rating**	**Extent**
Settlement	Acceptable	Occasional
Erosion	Acceptable	Occasional
Lateral Movement	Not Observed	None
Frost Action	Not Observed	None
Sloughing	Not Observed	None
Cracking	Acceptable	Occasional
Animal Burrows	Not Observed	None
Vegetation Establishment	Not Observed	None
Staining	Not Observed	None
Vegetation Stress	Not Observed	None
Seepage / Ponded Water	Not Observed	None
Debris and/or Liner Exposure	Not Observed	None
Other	Not Observed	None
Overall Landfill Performance	**Acceptable**	

East Landing Landfill	
Performance / Severity Rating	**Description**
Acceptable	Noted features are of little consequence. The landfill is performing as designed. Minor deviations in environmental or physical performance may be observed, such as isolated areas of erosion, settlement.
Marginal	Physical/environmental performance appears to be deteriorating with time. Observations may include an increase in size or number of features of note,

East Landing Landfill	
Performance / Severity Rating	**Description**
	such as differential settlement, erosion or cracking. No significant impact on landfill stability to date, but potential for failure is assessed as low or moderate.
Significant	Significant or potentially significant changes affecting landfill stability, such as significant changes in slope geometry, significant erosion or differential settlement; scarp development. The potential for failure is assessed as imminent.
Unacceptable	Stability of landfill is compromised to the extent that ability to contain waste materials is compromised. Examples may include: • Debris exposed in erosion channels or areas of differential settlement. • Liner exposed. • Slope failure.
Extent	**Description**
Isolated	Singular feature
Occasional	Features of note occurring at irregular intervals/locations
Numerous	Many features of note, impacted less than 50% of the surface area of the landfill
Extensive	Impacting greater than 50% of the surface area of the landfill

12.3.1.3 Photographic Records

The photographic record for the East Landing Landfill has been completed as per Section 5.5 of the Terms of Reference and is included in the following page as Table 12-4. The Photographic Record only contains an index of photographs collected; full sized photographs are contained in the Appended CD/DVD-ROM. Selected photographs are shown in Table 12-5. Figure CAM-1.10A presents the photograph locations and directions.

Table 12-4: Photographic Records – East Landing Landfill

East Landing Landfill						
Photo Identification	**Figure ID**	**View Direction**	**Photo Location and Direction**	**Feature Identification**	**Feature of Note**	**Other Comments**
Sample Station Photographs						
C1-32-1	S32	S	Sample station C1-32	C1-32	C1-32	Test pit location

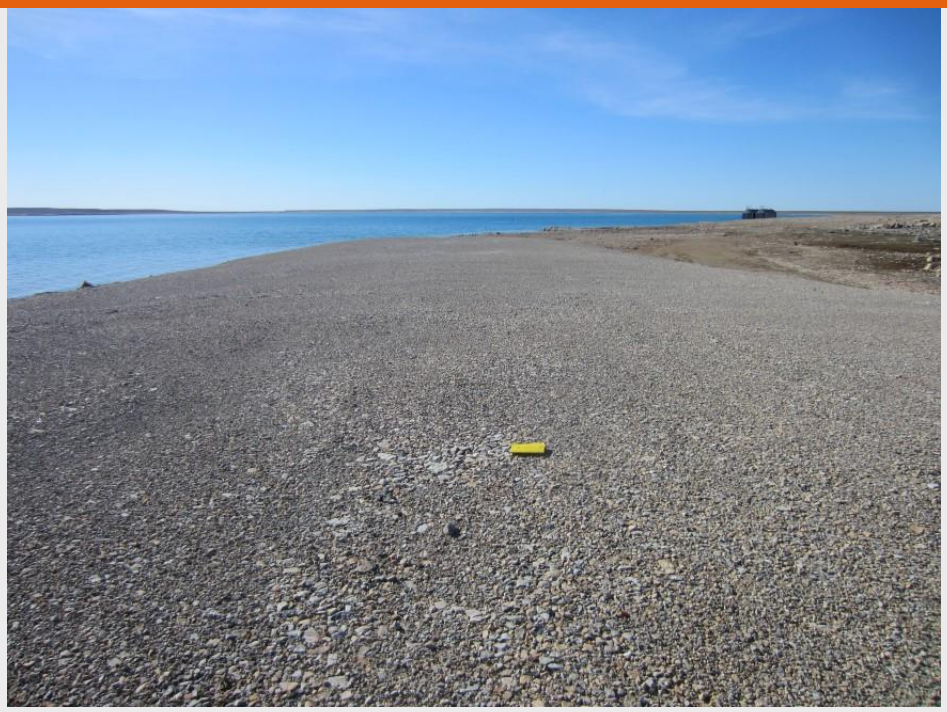
East Landing Landfill						
Photo Identification	**Figure ID**	**View Direction**	**Photo Location and Direction**	**Feature Identification**	**Feature of Note**	**Other Comments**
C1-32-2	S32	N/A	Sample station C1-32	C1-32	C1-32	Close up of test pit
C1-32-3	S32	N/A	Sample station C1-32	C1-32	C1-32	Close up of test pit
C1-33-1	S33	N	Sample station C1-33	C1-33	C1-33	Close up of test pit
C1-33-2	S33	N/A	Sample station C1-33	C1-33	C1-33	Test pit location
C1-33-3	S33	SE	Sample station C1-33	C1-33	C1-33	Backfilled
C1-34-1	S34	N/A	Sample station C1-34	C1-34	C1-34	Close up of test pit
C1-34-2	S34	N/A	Sample station C1-34	C1-34	C1-34	Soil type
C1-34-3	S34	NNE	Sample station C1-34	C1-34	C1-34	Backfilled
C1-35-1	S35	N/A	Sample station C1-35	C1-35	C1-35	Close up of test pit
C1-35-2	S35	S of SE	Sample station C1-35	C1-35	C1-35	Test pit location
C1-35-3	S35	S of SE	Sample station C1-35	C1-35	C1-35	Backfilled
Visual Inspection Photographs						
CAM-1 EL 1	1	SE	View from NW of landfill	N/A	N/A	
CAM-1 EL 2	2	SE	North toe of landfill	N/A	N/A	
CAM-1 EL 3	3	S	West toe of landfill	N/A	N/A	
CAM-1 EL 4	4	E	North side of landfill	N/A	N/A	
CAM-1 EL 5	5	S	West side of landfill	N/A	N/A	
CAM-1 EL 6	6	SE	South side of landfill	N/A	N/A	
CAM-1 EL 7	7	N	West side of landfill	N/A	N/A	

East Landing Landfill						
Photo Identification	**Figure ID**	**View Direction**	**Photo Location and Direction**	**Feature Identification**	**Feature of Note**	**Other Comments**
CAM-1 EL 8	8	SE	Southwest corner of landfill	N/A	N/A	
CAM-1 EL 9	9	E	View from southwest of landfill	N/A	N/A	
CAM-1 EL 10	10	SE	South toe of landfill	N/A	N/A	
CAM-1 EL 11	11	SE	South toe of landfill	N/A	N/A	
CAM-1 EL 12	12	NW	South toe of landfill	N/A	N/A	
CAM-1 EL 13	13	NE	East toe of landfill	N/A	N/A	
CAM-1 EL 14	14	NW	South side of landfill	N/A	N/A	
CAM-1 EL 15	15	W	North toe of landfill	N/A	N/A	
CAM-1 EL 16	16	SW	View across landfill from northeast corner	N/A	N/A	
CAM-1 EL 17	17	NW	View across centre of landfill	Erosion	C	
CAM-1 EL 18	18	N	Minor erosion on northwest side slope	Erosion	C	
CAM-1 EL 19	19	S	Minor erosion on northwest side slope	Erosion Cracking	C E	Feature E completely infilled and no longer present
CAM-1 EL 20	20	W	Infilled crack on northwest side slope	Cracking	E	Feature E completely infilled and no longer present
CAM-1 EL 21	21	E	Infilled crack on northwest side slope	Cracking	E	Feature completely infilled and no longer present
CAM-1 EL 22	22	S	West side slope of landfill	N/A	N/A	

East Landing Landfill						
Photo Identification	**Figure ID**	**View Direction**	**Photo Location and Direction**	**Feature Identification**	**Feature of Note**	**Other Comments**
CAM-1 EL 23	23	SE	Minor depressions on southwest side slope	Settlement	A	
CAM-1 EL 24	24	SW	Minor depressions on southwest side slope	Settlement	A	
CAM-1 EL 25	25	SW	Minor erosion on southwest side slope	Erosion	D	
CAM-1 EL 26	26	NE	Minor erosion on southwest side slope	Erosion	D	
CAM-1 EL 27	27	SE	Minor depression on southwest side slope	Settlement	A	
CAM-1 EL 28	28	SE	West side of tension crack on southeast landfill cover	Cracking	B	
CAM-1 EL 29	29	SE	Tension crack on southeast landfill cover	Cracking	B	
CAM-1 EL 30	30	NW	East side of tension crack on southeast landfill cover	Cracking	B	
CAM-1 EL 31	31	NW	Tension crack on southeast landfill cover	Cracking	B	
CAM-1 EL 32	32	SE	Minor depression on southeast side slope	Settlement	F	New feature in 2016
CAM-1 EL 33	33	E	Minor depression on southeast side slope	Settlement	G	New feature in 2016

East Landing Landfill						
Photo Identification	**Figure ID**	**View Direction**	**Photo Location and Direction**	**Feature Identification**	**Feature of Note**	**Other Comments**
CAM-1 EL 34	N/A	N/A	Aerial photograph of East Landing Landfll	N/A	N/A	

Table 12-5: Selected Photographs – East Landing Landfill

East Landing Landfill

Photograph CAM-1 EL 17: View across centre cover of landfill.
Photograph CAM-1 EL 19: Minor erosion (Feature C) and infilled crack (Feature E).

East Landing Landfill

Photograph CAM-1 EL 28: West side of tension crack (Feature B) on southeast landfill cover

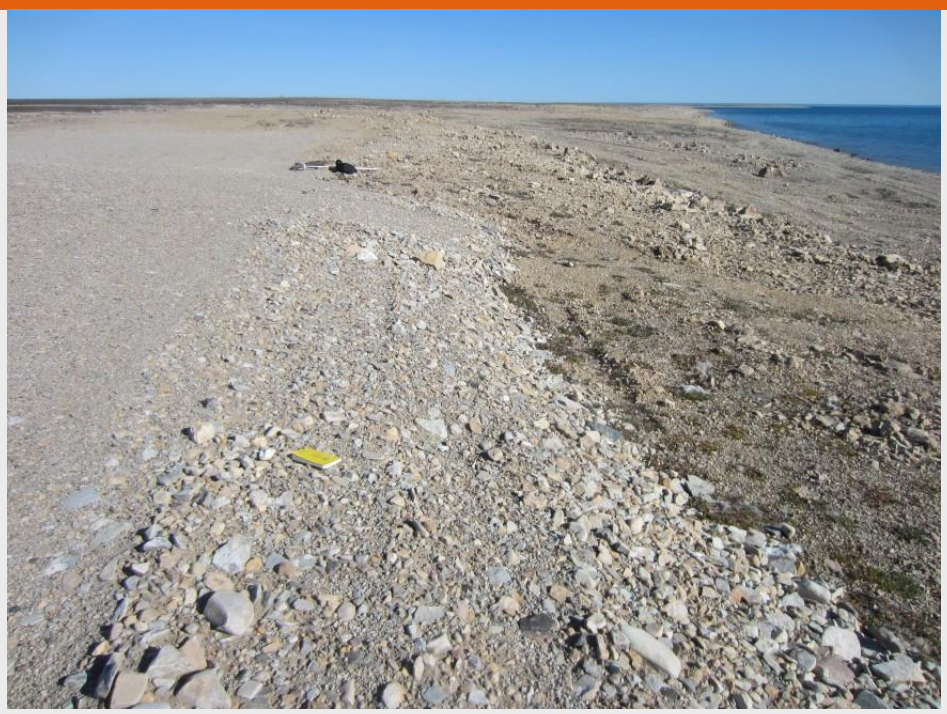
Photograph CAM-1 EL 29: Tension crack (Feature B) on southeast landfill cover

East Landing Landfill

Photograph CAM-1 EL 30: East side of tension crack (Feature B) on southeast landfill cover and continuing east of cover.

Photograph CAM-1 EL 31: Tension crack (Feature B) on southeast landfill cover.

East Landing Landfill



Photograph CAM-1 EL 32: New minor depression (Feature F) on southeast side slope.

Photograph CAM-1 EL 34: Aerial photograph showing East Landing Landfill

12.3.1.4 Trend Analysis

A trend analysis was conducted with regards to observations made during the visual inspection of the East Landing Landfill. The following Table 12-6 outlines the results of the visual trend analysis.

Table 12-6: Visual Inspection Trends - East Landing Landfill

East Landing Landfill		
Checklist Item	**Feature Number**	**Comparison with Historical Observations**
Settlement	A	No significant change
	F	New feature in 2016
	G	New feature in 2016
Erosion	C	No significant change
	D	No significant change
Cracking	B	Crack has widened and lengthened from previous monitoring event, is not as infilled as previously observed
	E	Completely infilled from 2014 to 2016

12.3.1.5 Discussion of Results/Trends

A comparison of the visual inspection results of the 2014 and 2016 monitoring events at the East Landing Landfill indicates that previously observed minor settlement and erosion features have not undergone any significant change. Two new minor settlement features was observed in 2016. One partially infilled crack observed in 2014 was observed in 2016 to be completely infilled. Feature B, a large crack along the southeast portion of the landfill cover has increased in length and width from 2014 to 2016. However, these increases in length and width are not affecting the stability of the landfill at this time.

12.3.2 Soil Sampling

Soil sampling of the East Landing Landfill was conducted on August 11, 2016. The soil sampling was conducted in compliance with Section 5.3.1 and 5.3.2 of the Terms of Reference and details are provided below in the following Sections 12.3.2.1 through 12.3.2.3

12.3.2.1 Laboratory Analytical Results

A total of six soil samples were analysed from four soil sample locations at the East Landing Landfill. Table 12-7 and 12-8 present the soil analytical results. Figure CAM-1.10B presents a summary of significant soil analytical results.

Table 12-7: Soil Chemical Analysis Results – East Landing Landfill

East Landing Landfill																	
Sample ID	**Sampling Station**	**Monitoring Year**	**Depth**	**Cu**	**Ni**	**Co**	**Cd**	**Pb**	**Zn**	**Cr**	**As**	**Hg**	**Total PCB**	**F1 C6-C10**	**F2 C10-C16**	**F3 C16-C34**	**Modified TPH Total C6-C34**
Comparison Values																	
Background				11	4.7	3.1	0.50	7	12	12	3.6	NS	0.042				NS
Baseline				**7.6**	**7.4**	**5.0**	**1.0**	**14**	**15**	**20**	**6.1**	**0.10**	**0.10**				**38**
Baseline +3 Standard Deviations				19	20	11	1.0	44	32	29	22	0.1	0.2				114
Upgradient																	
C1-32 Surface																	
10-16697	C1-32	2010	0-10	<3.0	<5.0	<5.0	<1.0	<10	<15	<20	1.8	<0.10	0.0038	<10	<4.0	<9.0	12
C112-32A	C1-32	2012	0-15	7.3	5.7	2.0	<0.10	4.3	<10	10	2.0	<0.050	<0.010	<12	<10	40	**51**
C114-32A	C1-32	2014	0-15	1.2	1.6	0.9	<0.01	<4.9	4.0	3.7	0.4	<0.01	<0.1	<10	<50	<50	**55**
16-C1-32A	C1-32	2016	0-15	2	6.6	0.87	<0.050	1.9	<10	13.0	2.0	<0.050	<0.010	<12	<10	<50	36
C1-32 Depth																	
10-16699	C1-32	2010	30-50	4.9	5.2	<5.0	<1.0	<10	<15	<20	2.7	<0.10	0.0031	<10	<4.0	<9.0	12
C112-32B	C1-32	2012	40-50	7.2	5.2	2.2	<0.10	5.1	5.2	7.2	2.2	<0.050	<0.010	<12	<10	33	**44**
C114-32B	C1-32	2014	40-50	2.3	2.2	0.9	0.01	<4.9	3.0	3.9	0.7	<0.01	<0.1	<10	<50	<50	**55**
16-C1-32B	C1-32	2016	40-50	2.7	5.8	1.4	<0.050	3.4	<10	11.0	2.0	<0.050	<0.010	<12	<10	83	**94**
Downgradient																	
C1-33 Surface																	
10-16701	C1-33	2010	0-10	**7.7**	7.0	<5.0	<1.0	**20**	<15	<20	**6.7**	<0.10	<0.0030	<10	<4.0	<9.0	12
C112-33A	C1-33	2012	0-15	<5.0	5.0	2.5	<0.10	**18**	<10	6.2	**6.4**	<0.050	<0.010	<12	<10	<10	16
C114-33A	C1-33	2014	0-15	7.6	**10**	**5.1**	0.02	**27**	9	8.8	**9.3**	<0.01	<0.1	<10	<50	<50	**55**
16-C1-33A	C1-33	2016	0-15	5.8	**8.5**	3.8	<0.050	**32**	<10	9.2	**11.0**	<0.050	<0.010	<12	<10	<50	36
C1-33 Depth																	
10-16703	C1-33	2010	30-50	4.5	5.8	<5.0	<1.0	**23**	<15	<20	**7.4**	<0.10	<0.0030	<10	8.0	18	31
C112-33B	C1-33	2012	40-50	**12**	7.1	3.1	<0.10	**23**	13	8.5	**7.0**	<0.050	<0.010	<12	<10	<10	16
C114-33B	C1-33	2014	40-50	7.6	**9.3**	4.7	0.02	**22**	7	9.5	**7.7**	<0.01	<0.1	<10	<50	<50	**55**
16-C1-33B	C1-33	2016	20-30	4.4	5.2	2.3	<0.050	14	<10	6.2	5.1	<0.050	<0.010	<12	<10	<50	36
C1-34 Surface																	

East Landing Landfill																	
Sample ID	Sampling Station	Monitoring Year	Depth	Cu	Ni	Co	Cd	Pb	Zn	Cr	As	Hg	Total PCB	F1 C6-C10	F2 C10-C16	F3 C16-C34	Modified TPH Total C6-C34
10-16705	C1-34	2010	0-10	6.7	7.4	<5.0	<1.0	39	17	<20	6.5	<0.10	<0.0030	<10	<4.0	<9.0	12
C112-34A	C1-34	2012	0-15	57	4.8	2.1	<0.10	22	19	5.9	4.7	<0.050	<0.010	<12	<10	<10	16
C114-34A	C1-34	2014	0-15	5.7	5.2	3.3	0.04	47	13	7.5	5.6	<0.01	<0.1	<10	<50	<50	55
No soil (rocks and pebbles)	C1-34	2016	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1-34 Depth																	
10-16707	C1-34	2010	30-50	4.7	5.9	<5.0	<1.0	140	<15	<20	5.0	<0.10	<0.0030	<10	5.4	21	31
C112-34B	C1-34	2012	40-50	19	7.3	2.8	<0.10	11	<10	11	4.0	<0.050	<0.010	<12	<10	<10	16
C114-34B	C1-34	2014	40-50	4.9	5.1	3.0	0.03	41	7.0	6.7	5.1	<0.01	<0.1	<10	<50	<50	55
No soil (rocks and pebbles)	C1-34	2016	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1-35 Surface																	
10-16709	C1-35	2010	0-10	4.9	6.6	<5.0	<1.0	16	<15	<20	7.9	<0.10	<0.0030	<10	<4.0	<9.0	12
C112-35A	C1-35	2012	0-15	6.9	5.6	2.4	<0.10	12	<10	7.9	5.4	<0.050	<0.010	<12	<10	<10	16
C114-35A	C1-35	2014	0-15	3.5	4.4	2.2	<0.01	13	7.0	7.4	4.0	<0.01	<0.1	<10	<50	<50	55
16-C1-35A	C1-35	2016	0-15	7.8	11	3	<0.050	15	<10	18.0	6.7	<0.050	<0.010	<12	<10	<50	36
C1-35 Depth																	
10-16711	C1-35	2010	30-50	<3.0	<5.0	<5.0	<1.0	<10	<15	<20	3.0	<0.10	<0.0030	<10	<4.0	<9.0	12
C112-35B	C1-35	2012	40-50	<5.0	2.5	1.2	<0.10	7.4	<10	4.0	2.3	<0.050	<0.010	<12	<10	<10	16
C114-35B	C1-35	2014	40-50	4.3	5.9	2.7	<0.01	7.5	8.0	7.4	2.9	<0.01	<0.1	<10	<50	<50	55
16-C1-35B	C1-35	2016	40-50	3	2.6	1.3	<0.050	7.6	<10	3.7	2.6	<0.050	<0.010	<12	<10	<50	36

Notes:

XX sample exceeds background

XX sample exceeds baseline

XX sample exceeds baseline +3 standard deviations

**** All units in mg/kg**

Table 12-8: PHC F4 Soil Chemical Analysis Results – USAF Landfill

Sample Location	Sample ID	Sample Depth (m bgs)	PHC F4 (mg/kg)
C1-32	16-C1-32A	0 - 0.15	<50
	16-C1-32B	0.4 – 0.5	<50
C1-33	16-C1-33A	0 - 0.15	<50
	16-C1-33B	0.2 – 0.3	<50
C1-34	No Sample Available		-
C1-35	16-C1-35A	0 - 0.15	<50
	16-C1-35B	0.4 – 0.5	<50

12.3.2.2 Discussion of Results – Comparison to Baseline/Background

Analytical results were compared against baseline data, and background concentrations. The following Table 12-9 summarizes the comparison of results.

Table 12-9: Evaluation of Results by Parameter – East Landing Landfill

East Landing Landfill	
Parameter	Discussion of Results
Copper (Cu)	All soil samples reported either non-detect concentrations or were below both background and baseline concentrations for Cu, with the exception to sample station C1-35 surface which reported a concentration of 7.8 mg/kg above the baseline concentration of 7.6 mg/kg.
Nickel (Ni)	Soil sample stations C1-35 surface and C1-33 surface reported concentrations of 11 mg/kg and 8.5 mg/kg respectively above both the baseline and background concentrations of 4.7 mg/kg and 7.4 mg/kg respectively. In addition, sample station C1-32 surface (6.6 mg/kg), C1-32 depth (5.8 mg/kg) and C1-33 depth (5.2 mg/kg) were both above the background concentrations
Cobalt (Co)	All soil samples reported either non-detect concentrations or were below both background and baseline concentrations for Co, with the exception to sample station C1-33 surface which reported a concentration of 3.8 mg/kg above the baseline concentration of 3.1 mg/kg.
Cadmium (Cd)	All soil samples were either non-detect concentrations or below the background and baseline for Cd.
Lead (Pb)	Pb was reported above the background concentration of 7 mg/kg at sample stations C1-33 depth and C1-35 depth. Concentrations were also above the baseline concentration of 14 mg/kg at sample stations C1-33 surface and C1-35 surface. However, concentrations were in similar ranges to previous monitoring events.
Zinc (Zn)	All soil samples were either non-detect concentrations or below the background and baseline for Zn.
Chromium (Cr)	Cr was reported above the background concentration of 12 mg/kg at sample stations C1-32 surface (13 mg/kg) and C1-35 surface (18 mg/kg). The remaining samples reported concentrations below both the baseline and background.
Arsenic (As)	As was reported above the background concentration of 3.6 mg/kg at soil sample station C1-33 depth (5.1 mg/kg). As was also reported above the baseline concentration of 6.1 mg/kg at sample stations C1-33 surface 911 mg/kg) and C1-35S (6.7 mg/kg). The remaining sample

East Landing Landfill	
Parameter	Discussion of Results
	station all reported As concentrations below both the baseline and background concentrations.
Mercury (Hg)	All soil samples were either non-detect concentrations or below the background and baseline for Hg.
PCBs (Total)	All soil samples were either non-detect concentrations or below the background and baseline for PCBs.
Modified TPH (C_6-C_{34})	All soil samples were either non-detect concentrations or below the baseline for TPH.

12.3.2.3 Soil Trend Analysis by Parameter & Discussion of Trends

A soil chemistry trend analysis was conducted based on the current and historical analytical results collected at the site. A Series of graphs were generated including a visual comparison to background, baseline and historical concentrations using differentiating colours (See Appendix E9). The following Table 12-10 provides a summary of soil trend analysis findings and presents a discussion of the observed trends by parameter.

Table 12-10: Discussion of Trends – East Landing Landfill

East Landing Landfill	
Parameter	Discussion of Trends
Copper (Cu)	Based on current and historical results, it appears that Cu has no observable trend or are decreasing slightly over time. One instance of a Cu concentration increase was noted at sample station C1-35 surface where concentrations of 3.5 mg/kg were reported in 2014 and 7.8 mg/kg in 2016.
Nickel (Ni)	Based on current and historical results, it appears that Ni has no observable trend with concentration fluctuations noted over the monitoring years. Some sample stations increased in concentration over time, while others decreased over time. More data is required to establish a reliable trend.
Cobalt (Co)	Based on current and historical results, it appears that Co has no observable trend with fluctuations in concentrations up and down throughout the monitoring years. The 2010 monitoring year had an elevated detection limit for Co, so cannot be compared to other years. More data points are required at this landfill to determine any trend.
Cadmium (Cd)	Based on current and historical results, it appears that Cd has no observable trend.
Lead (Pb)	In general, Pb concentrations appear to be fluctuating over time indicating no observable trend. One exception was noted at sample station C1-33 surface, where concentrations are increasing over time. One anomalous value was also observed at C1-34 in 2010 and further data points are required to determine a trend at this sample station.
Zinc (Zn)	Based on current and historical results, it appears that Zn has no observable trend.
Chromium (Cr)	Based on current and historical results, it appears that Cr has no observable trend, with fluctuations in concentrations reported over time. Soil sample stations C1-32 surface and depth, as well as C1-33 surface all reported increases in concentrations over time.

East Landing Landfill	
Parameter	Discussion of Trends
Arsenic (As)	Based on current and historical results, As has no observable trend at most of the sample stations with fluctuating concentrations noted throughout the monitoring years. An increase in concentrations over time were noted at sample station C1-33 surface from 6.4 mg/kg in 2012, 9.3 mg/kg in 2014, and 11 mg/kg in 2016.
Mercury (Hg)	Based on all non-detect concentrations, Hg has no observable trend.
PCBs (Total)	Based on all non-detect concentrations, PCBs has no observable trend.
Modified TPH (C_6-C_{34})	Based on current and historical results, Modified TPH concentrations has no observable trend.

Trend analyses presented are based on the data available at the time of the investigation and any interpreted increasing or decreasing trends may be a result of natural variation in the data due to analytical methods. There is currently insufficient information to establish reliable trends; therefore, additional data points are required to be able to confidently determine if trends are present.

12.3.3 Groundwater Sampling

No groundwater monitoring wells are present at the East Landing Landfill; therefore, no groundwater sampling or analysis was conducted.

12.3.4 Thermal Monitoring

No thermistors are present at the East Landing Landfill; therefore, no thermal monitoring was conducted.

12.4 Conclusions and Overall Landfill Performance

Based on the results of the 2016 monitoring program, the overall performance of the East Landing Landfill is acceptable. Feature B, a crack along the southeast cover of the landfill has increased in length and width from the previous monitoring event but is not affecting the overall landfill performance at this time.

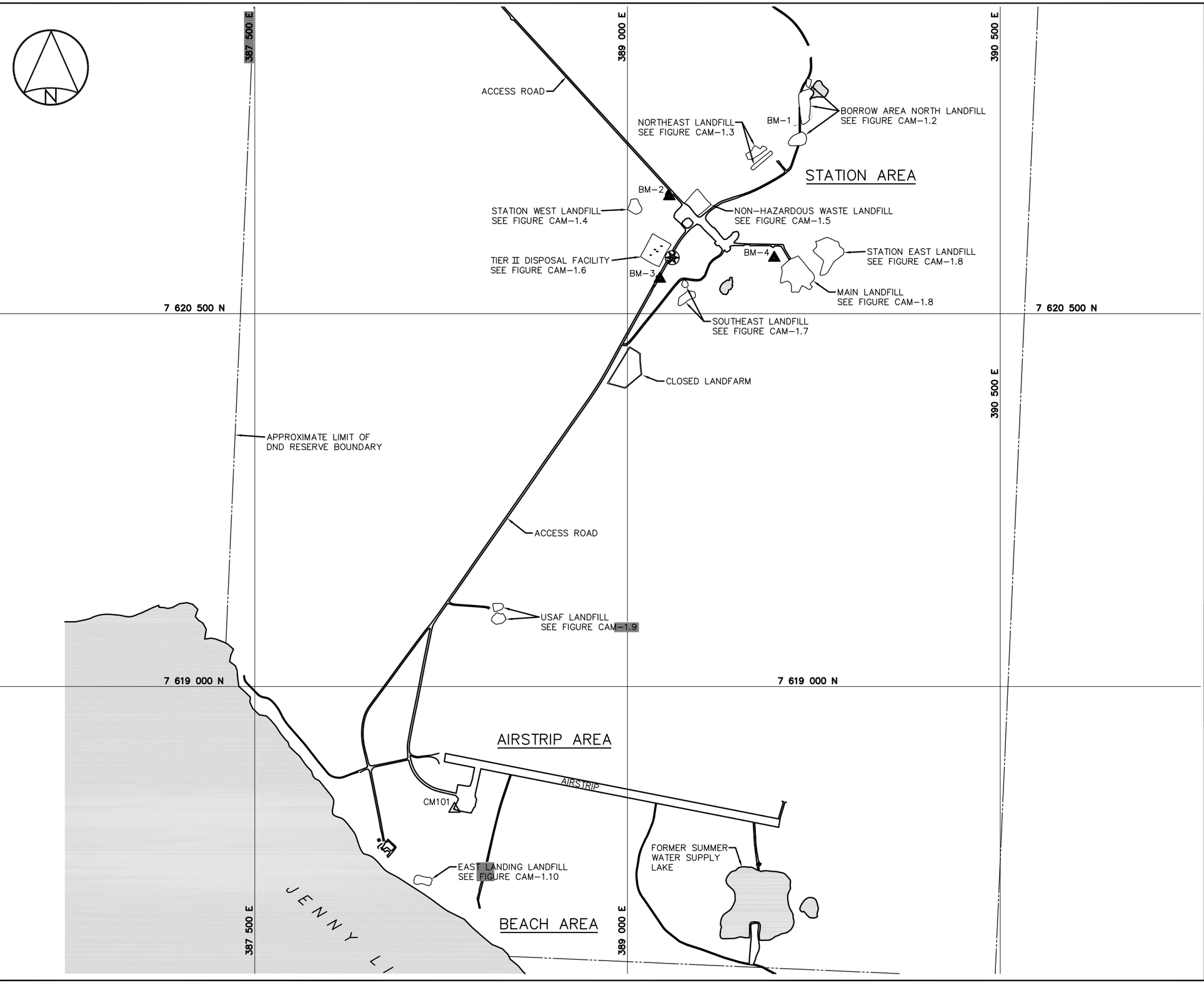
12.5 Recommendations and Conclusions

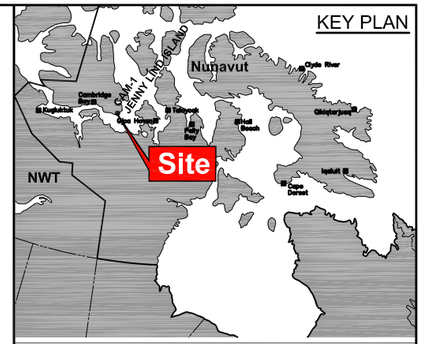
Based on review and analysis of chemical data, it appears that the soil concentrations for the parameters tested had no observable trend with no obvious soil concentration increases over time. Although a few instances of increase in chemical concentrations were noted, none of these indicate any potential issue with landfill integrity.

Based on this review, it is recommended to continue the long term monitoring of soils as planned.

Based on the results of the visual inspection, the landfill performance is acceptable. No remedial work or deviations from the monitoring plan are recommended at this time.

FIGURES





LEGEND:

- CM101 — SURVEY CONTROL MONUMENT
- BM-1 — PERMANENT BENCHMARK LOCATION (4)
- COMMEMORATIVE PLAQUE LOCATION
- APPROXIMATE LOCATION OF PROPERTY BOUNDARY
- BODY OF WATER

0 300 600 metres

SCALE 1:15,000

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DEPARTMENT OF NATIONAL DEFENCE

COLLECTION OF LANDFILL MONITORING DATA

CAM-1, JENNY LIND ISLAND, NUNAVUT

OVERALL SITE PLAN

Drawn By: I.S.Z.	Approved By: S.B.	Project No: 102012-1	
Date: FEB. 2017	Scale: AS SHOWN	Figure No: CAM-1.1	

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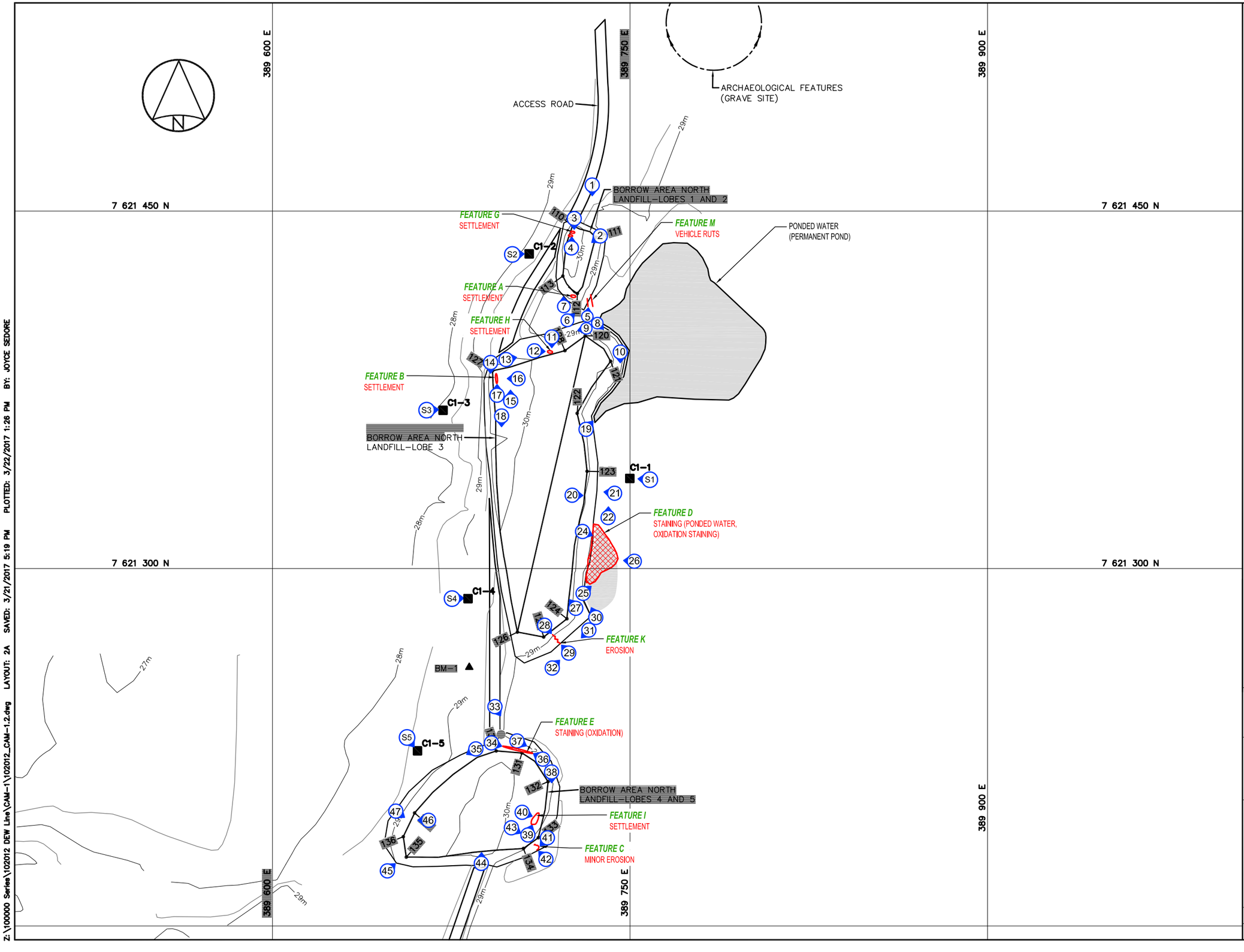

LEGEND:

- MONITORING SOIL SAMPLE LOCATION
- BM–1 PERMANENT BENCHMARK LOCATION
- 110 COORDINATE POINT
- 1 APPROX. PHOTOGRAPHIC VIEWPOINT
- BODY OF WATER
- SETTLEMENT
- STAINING
- EROSION

0 30 60 metres

SCALE 1:1500

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COLLECTION OF LANDFILL MONITORING DATA

CAM-1, JENNY LIND ISLAND, NUNAVUT

BORROW AREA NORTH LANDFILL
PLAN/MONITORING POINTS/
LANDFILL OBSERVATIONS

Drawn By: I.S.Z.	Approved By: S.B.	Project No: 102012-1	
Date: FEB. 2017	Scale: AS SHOWN	Figure No: CAM-1.2A	

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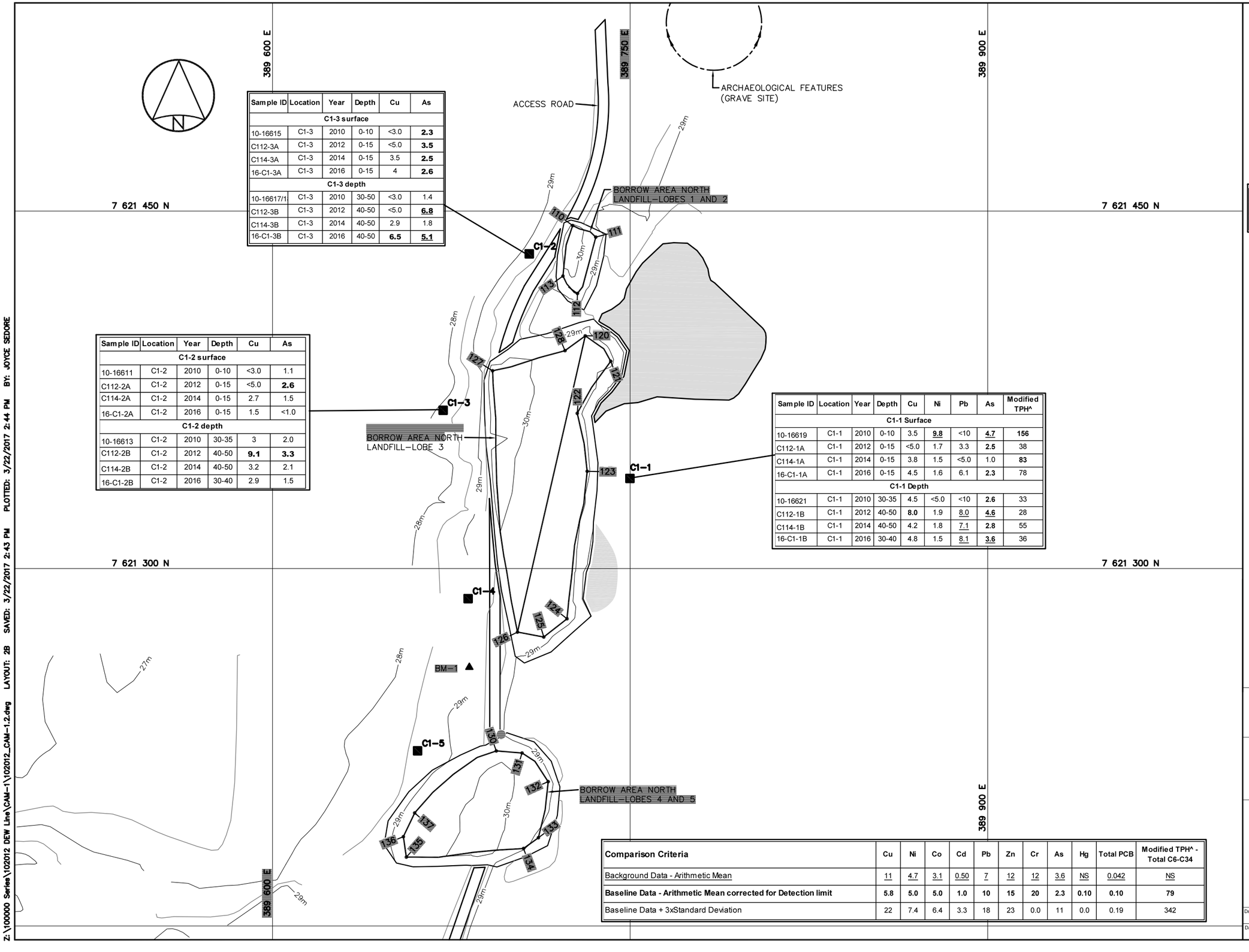

Sample ID	Location	Year	Depth	Cu	As
C1-3 surface					
10-16615	C1-3	2010	0-10	<3.0	**2.3**
C112-3A	C1-3	2012	0-15	<5.0	**3.5**
C114-3A	C1-3	2014	0-15	3.5	**2.5**
16-C1-3A	C1-3	2016	0-15	4	**2.6**
C1-3 depth					
10-16617/1	C1-3	2010	30-50	<3.0	1.4
C112-3B	C1-3	2012	40-50	<5.0	**6.8**
C114-3B	C1-3	2014	40-50	2.9	1.8
16-C1-3B	C1-3	2016	40-50	**6.5**	**5.1**

Sample ID	Location	Year	Depth	Cu	As
C1-2 surface					
10-16611	C1-2	2010	0-10	<3.0	1.1
C112-2A	C1-2	2012	0-15	<5.0	**2.6**
C114-2A	C1-2	2014	0-15	2.7	1.5
16-C1-2A	C1-2	2016	0-15	1.5	<1.0
C1-2 depth					
10-16613	C1-2	2010	30-35	3	2.0
C112-2B	C1-2	2012	40-50	**9.1**	**3.3**
C114-2B	C1-2	2014	40-50	3.2	2.1
16-C1-2B	C1-2	2016	30-40	2.9	1.5

Sample ID	Location	Year	Depth	Cu	Ni	Pb	As	Modified TPH^
C1-1 Surface								
10-16619	C1-1	2010	0-10	3.5	**9.8**	<10	**4.7**	**156**
C112-1A	C1-1	2012	0-15	<5.0	1.7	3.3	**2.5**	38
C114-1A	C1-1	2014	0-15	3.8	1.5	<5.0	1.0	**83**
16-C1-1A	C1-1	2016	0-15	4.5	1.6	6.1	**2.3**	78
C1-1 Depth								
10-16621	C1-1	2010	30-35	4.5	<5.0	<10	**2.6**	33
C112-1B	C1-1	2012	40-50	**8.0**	1.9	8.0	**4.6**	28
C114-1B	C1-1	2014	40-50	4.2	1.8	**7.1**	**2.8**	55
16-C1-1B	C1-1	2016	30-40	4.8	1.5	8.1	**3.6**	36

Comparison Criteria	Cu	Ni	Co	Cd	Pb	Zn	Cr	As	Hg	Total PCB	Modified TPH^ - Total C6-C34
Background Data - Arithmetic Mean	11	4.7	3.1	0.50	7	12	12	3.6	NS	0.042	NS
Baseline Data - Arithmetic Mean corrected for Detection limit	**5.8**	**5.0**	**5.0**	**1.0**	**10**	**15**	**20**	**2.3**	**0.10**	**0.10**	**79**
Baseline Data + 3xStandard Deviation	22	7.4	6.4	3.3	18	23	0.0	11	0.0	0.19	342

LEGEND:

- MONITORING SOIL SAMPLE LOCATION
- BM–1 PERMANENT BENCHMARK LOCATION
- 110 COORDINATE POINT
- BODY OF WATER

XX	sample exceeds background
XX	sample exceeds baseline
XX	*sample exceeds baseline + 3x Standard Deviation*

All units in mg/kg

^ Modifed TPH - Total C6-C34 is the sum of the F1, F2 and F3 fraction PHC concentrations

Note:
Where no table for exceedances are present, no samples at that location exceeded any of the evaluation parameters.

0 30 60 metres
SCALE 1:1500

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CAM-1, JENNY LIND ISLAND, NUNAVUT

BORROW AREA NORTH LANDFILL
SOIL CHEMISTRY

Drawn By: I.S.Z.	Approved By: S.B.	Project No: 102012-1	
Date: FEB. 2017	Scale: AS SHOWN	Figure No: CAM-1.2B	

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SAVED: 3/22/2017 2:43 PM
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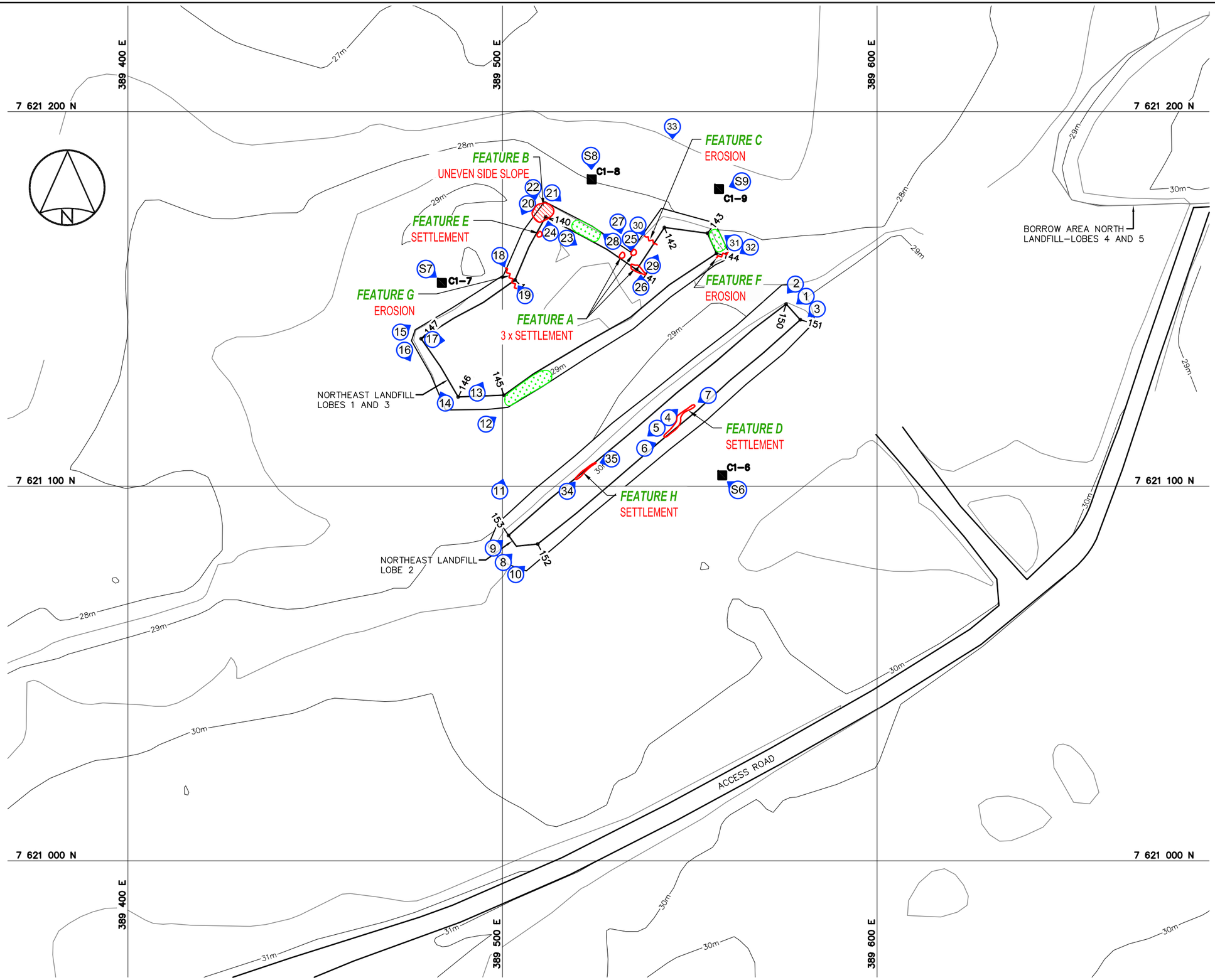

LEGEND:

- MONITORING SOIL SAMPLE LOCATION
- COORDINATE POINT
- APPROX. PHOTOGRAPHIC VIEWPOINT
- SETTLEMENT
- UNEVEN SIDE SLOPE
- EROSION
- VEGETATION

0 20 40 metres

SCALE 1:1000

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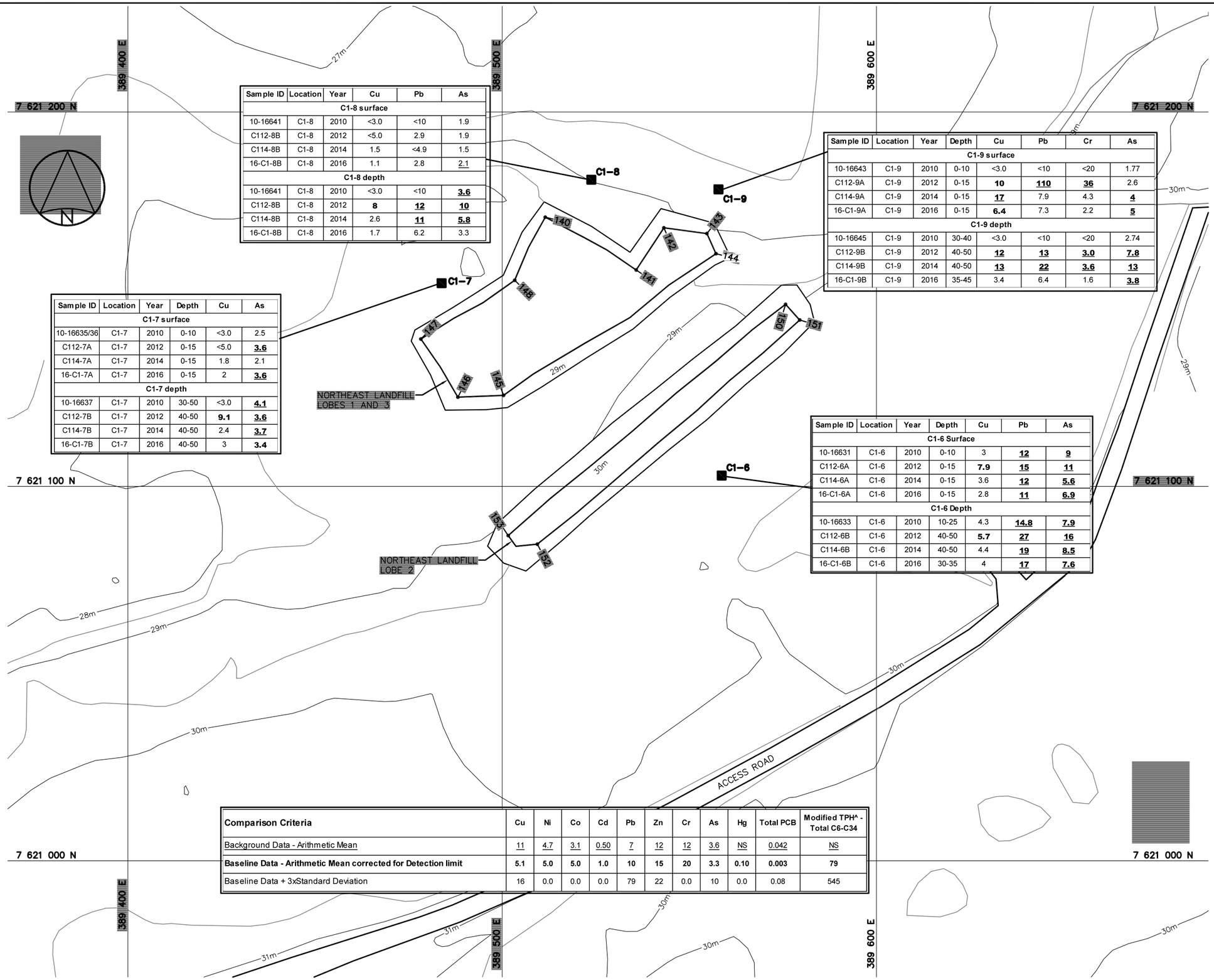
CAM-1, JENNY LIND ISLAND, NUNAVUT

NORTHEAST LANDFILL
PLAN/MONITORING POINTS/LANDFILL OBSERVATIONS

Drawn By: I.S.Z.	Approved By: S.B.	Project No: 102012-1	
Date: FEB. 2017	Scale: AS SHOWN	Figure No: CAM-1.3A	

Z:\100000 Series\102012 DEW Line\CAM-1\102012_CAM-1.3.dwg LAYOUT: 3A SAVED: 3/24/2017 1:05 PM PLOTTED: 3/24/2017 1:09 PM BY: IZABELA ZIBA



Sample ID	Location	Year	Cu	Pb	As
C1-8 surface					
10-16641	C1-8	2010	<3.0	<10	1.9
C112-8B	C1-8	2012	<5.0	2.9	1.9
C114-8B	C1-8	2014	1.5	<4.9	1.5
16-C1-8B	C1-8	2016	1.1	2.8	2.1
C1-8 depth					
10-16641	C1-8	2010	<3.0	<10	**3.6**
C112-8B	C1-8	2012	**8**	**12**	**10**
C114-8B	C1-8	2014	2.6	**11**	**5.8**
16-C1-8B	C1-8	2016	1.7	6.2	3.3

Sample ID	Location	Year	Depth	Cu	Pb	Cr	As
C1-9 surface							
10-16643	C1-9	2010	0-10	<3.0	<10	<20	1.77
C112-9A	C1-9	2012	0-15	**10**	**110**	**36**	2.6
C114-9A	C1-9	2014	0-15	**17**	7.9	4.3	**4**
16-C1-9A	C1-9	2016	0-15	**6.4**	7.3	2.2	**5**
C1-9 depth							
10-16645	C1-9	2010	30-40	<3.0	<10	<20	2.74
C112-9B	C1-9	2012	40-50	**12**	**13**	**3.0**	**7.8**
C114-9B	C1-9	2014	40-50	**13**	**22**	**3.6**	**13**
16-C1-9B	C1-9	2016	35-45	3.4	6.4	1.6	**3.8**

Sample ID	Location	Year	Depth	Cu	Pb	As
C1-7 surface						
10-16635/36	C1-7	2010	0-10	<3.0	2.5	
C112-7A	C1-7	2012	0-15	<5.0	**3.6**	
C114-7A	C1-7	2014	0-15	1.8	2.1	
16-C1-7A	C1-7	2016	0-15	2	**3.6**	
C1-7 depth						
10-16637	C1-7	2010	30-50	<3.0	**4.1**	
C112-7B	C1-7	2012	40-50	**9.1**	**3.6**	
C114-7B	C1-7	2014	40-50	2.4	**3.7**	
16-C1-7B	C1-7	2016	40-50	3	**3.4**	

Sample ID	Location	Year	Depth	Cu	Pb	As
C1-6 Surface						
10-16631	C1-6	2010	0-10	3	**12**	**9**
C112-6A	C1-6	2012	0-15	**7.9**	**15**	**11**
C114-6A	C1-6	2014	0-15	3.6	**12**	**5.6**
16-C1-6A	C1-6	2016	0-15	2.8	**11**	**6.9**
C1-6 Depth						
10-16633	C1-6	2010	10-25	4.3	**14.8**	**7.9**
C112-6B	C1-6	2012	40-50	**5.7**	**27**	**16**
C114-6B	C1-6	2014	40-50	4.4	**19**	**8.5**
16-C1-6B	C1-6	2016	30-35	4	**17**	**7.6**

Comparison Criteria	Cu	Ni	Co	Cd	Pb	Zn	Cr	As	Hg	Total PCB	Modified TPH^ - Total C6-C34
Background Data - Arithmetic Mean	11	4.7	3.1	0.50	7	12	12	3.6	NS	0.042	NS
Baseline Data - Arithmetic Mean corrected for Detection limit	**5.1**	**5.0**	**5.0**	**1.0**	**10**	**15**	**20**	**3.3**	**0.10**	**0.003**	**79**
Baseline Data + 3xStandard Deviation	16	0.0	0.0	0.0	79	22	0.0	10	0.0	0.08	545

LEGEND:

- MONITORING SOIL SAMPLE LOCATION
- 140 COORDINATE POINT

XX	sample exceeds background
XX	sample exceeds baseline
XX	*sample exceeds baseline + 3x Standard Deviation*

All units in mg/kg

^ Modifed TPH - Total C6-C34 is the sum of the F1, F2 and F3 fraction PHC concentrations

0 20 40 metres

SCALE 1:1000

ARCADIS

DEPARTMENT OF NATIONAL DEFENCE

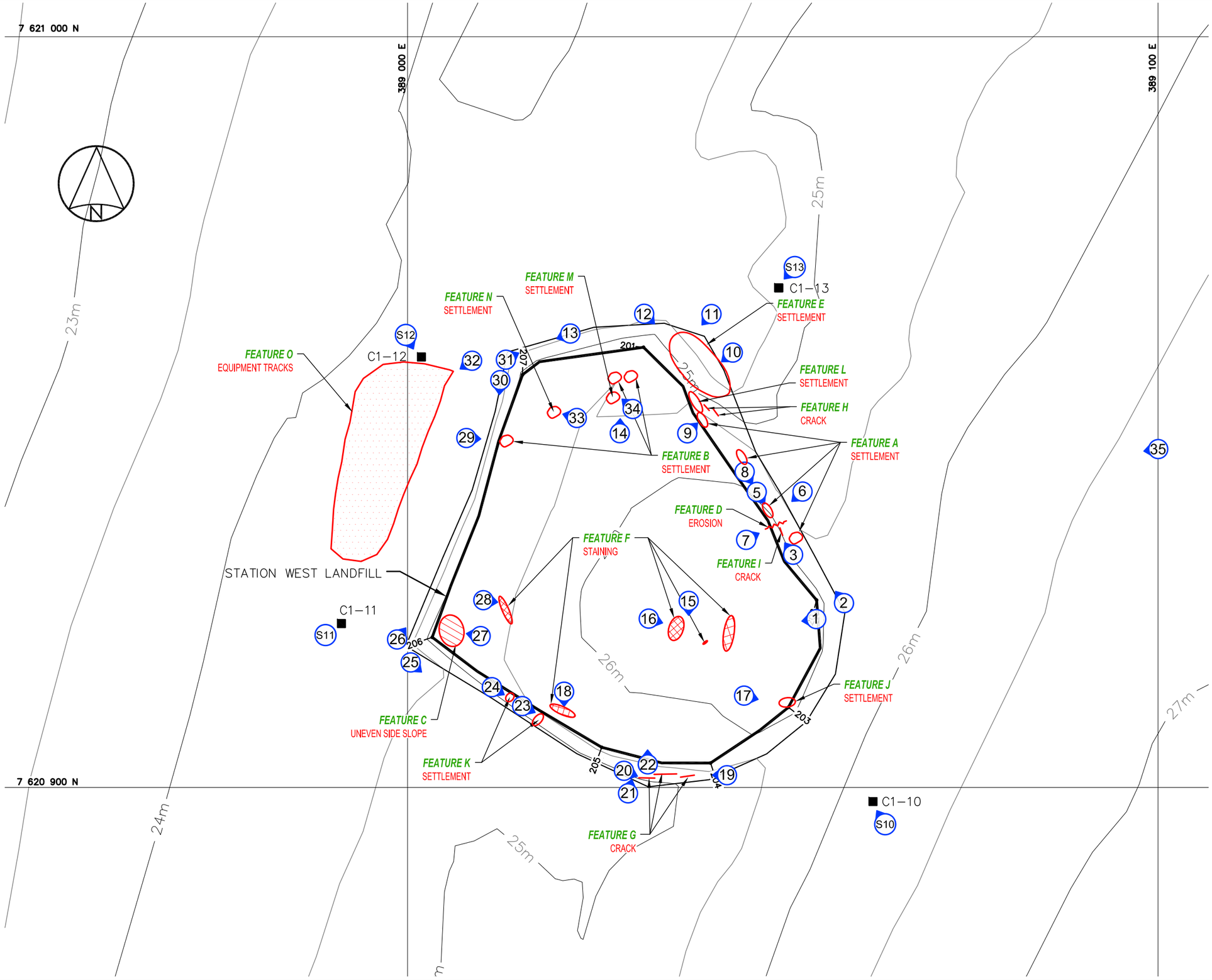
COLLECTION OF LANDFILL MONITORING DATA

CAM-1, JENNY LIND ISLAND, NUNAVUT

NORTHEAST LANDFILL
SOIL CHEMISTRY

Drawn By: I.S.Z.	Approved By: S.B.	Project No: 102012-1	
Date: FEB. 2017	Scale: AS SHOWN	Figure No: CAM-1.3B	

Z:\100000 Series\102012 DEW Line\CAM-1\102012_CAM-1.3.dwg LAYOUT: 3B SAVED: 3/22/2017 2:48 PM PLOTTED: 3/22/2017 2:48 PM BY: JOYCE SEDORE



LEGEND:

- MONITORING SOIL SAMPLE LOCATION
- 201 COORDINATE POINT
- 1 APPROX. PHOTOGRAPHIC VIEWPOINT
- SETTLEMENT
- STAINING
- EQUIPMENT TRACKS/RUTS
- UNEVEN SIDE SLOPE
- EROSION
- TENSION CRACK

0 10 20 metres

SCALE 1:500

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COLLECTION OF LANDFILL MONITORING DATA

CAM-1, JENNY LIND ISLAND, NUNAVUT

STATION WEST LANDFILL
PLAN/MONITORING POINTS/LANDFILL OBSERVATIONS

Drawn By: I.S.Z.	Approved By: S.B.	Project No: 102012-1	
Date: FEB. 2017	Scale: AS SHOWN	Figure No: CAM-1.4A	

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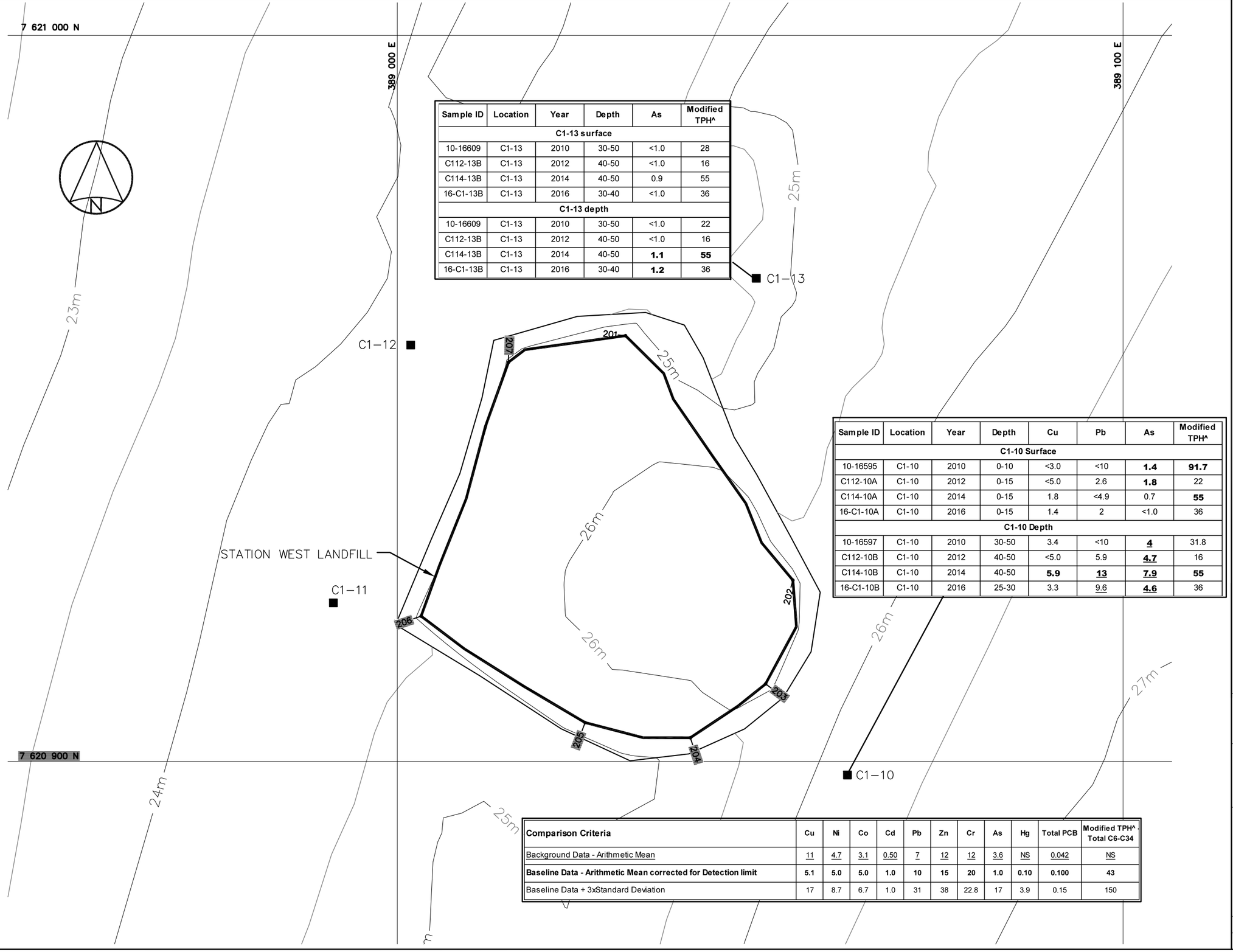

Sample ID	Location	Year	Depth	As	Modified TPH^
C1-13 surface					
10-16609	C1-13	2010	30-50	<1.0	28
C112-13B	C1-13	2012	40-50	<1.0	16
C114-13B	C1-13	2014	40-50	0.9	55
16-C1-13B	C1-13	2016	30-40	<1.0	36
C1-13 depth					
10-16609	C1-13	2010	30-50	<1.0	22
C112-13B	C1-13	2012	40-50	<1.0	16
C114-13B	C1-13	2014	40-50	**1.1**	**55**
16-C1-13B	C1-13	2016	30-40	**1.2**	36

Sample ID	Location	Year	Depth	Cu	Pb	As	Modified TPH^
C1-10 Surface							
10-16595	C1-10	2010	0-10	<3.0	<10	**1.4**	**91.7**
C112-10A	C1-10	2012	0-15	<5.0	2.6	**1.8**	22
C114-10A	C1-10	2014	0-15	1.8	<4.9	0.7	**55**
16-C1-10A	C1-10	2016	0-15	1.4	2	<1.0	36
C1-10 Depth							
10-16597	C1-10	2010	30-50	3.4	<10	**4**	31.8
C112-10B	C1-10	2012	40-50	<5.0	5.9	**4.7**	16
C114-10B	C1-10	2014	40-50	**5.9**	**13**	**7.9**	**55**
16-C1-10B	C1-10	2016	25-30	3.3	9.6	**4.6**	36

Comparison Criteria	Cu	Ni	Co	Cd	Pb	Zn	Cr	As	Hg	Total PCB	Modified TPH^ Total C6-C34
Background Data - Arithmetic Mean	11	4.7	3.1	0.50	7	12	12	3.6	NS	0.042	NS
Baseline Data - Arithmetic Mean corrected for Detection limit	**5.1**	**5.0**	**5.0**	**1.0**	**10**	**15**	**20**	**1.0**	**0.10**	**0.100**	**43**
Baseline Data + 3xStandard Deviation	17	8.7	6.7	1.0	31	38	22.8	17	3.9	0.15	150

LEGEND:

- ■ MONITORING SOIL SAMPLE LOCATION
- •201 COORDINATE POINT

XX	sample exceeds background
XX	sample exceeds baseline
XX	*sample exceeds baseline + 3x Standard Deviation*

All units in mg/kg

^ Modifed TPH - Total C6-C34 is the sum of the F1, F2 and F3 fraction PHC concentrations

Note:
Where no table for exceedances are present, no samples at that location exceeded any of the evaluation parameters.

0 10 20 metres
SCALE 1:500

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DEPARTMENT OF NATIONAL DEFENCE

COLLECTION OF LANDFILL MONITORING DATA

CAM-1, JENNY LIND ISLAND, NUNAVUT

STATION WEST LANDFILL
SOIL CHEMISTRY

Drawn By: I.S.Z.	Approved By: S.B.	Project No: 102012-1	
Date: FEB. 2017	Scale: AS SHOWN	Figure No: CAM-1.4B	

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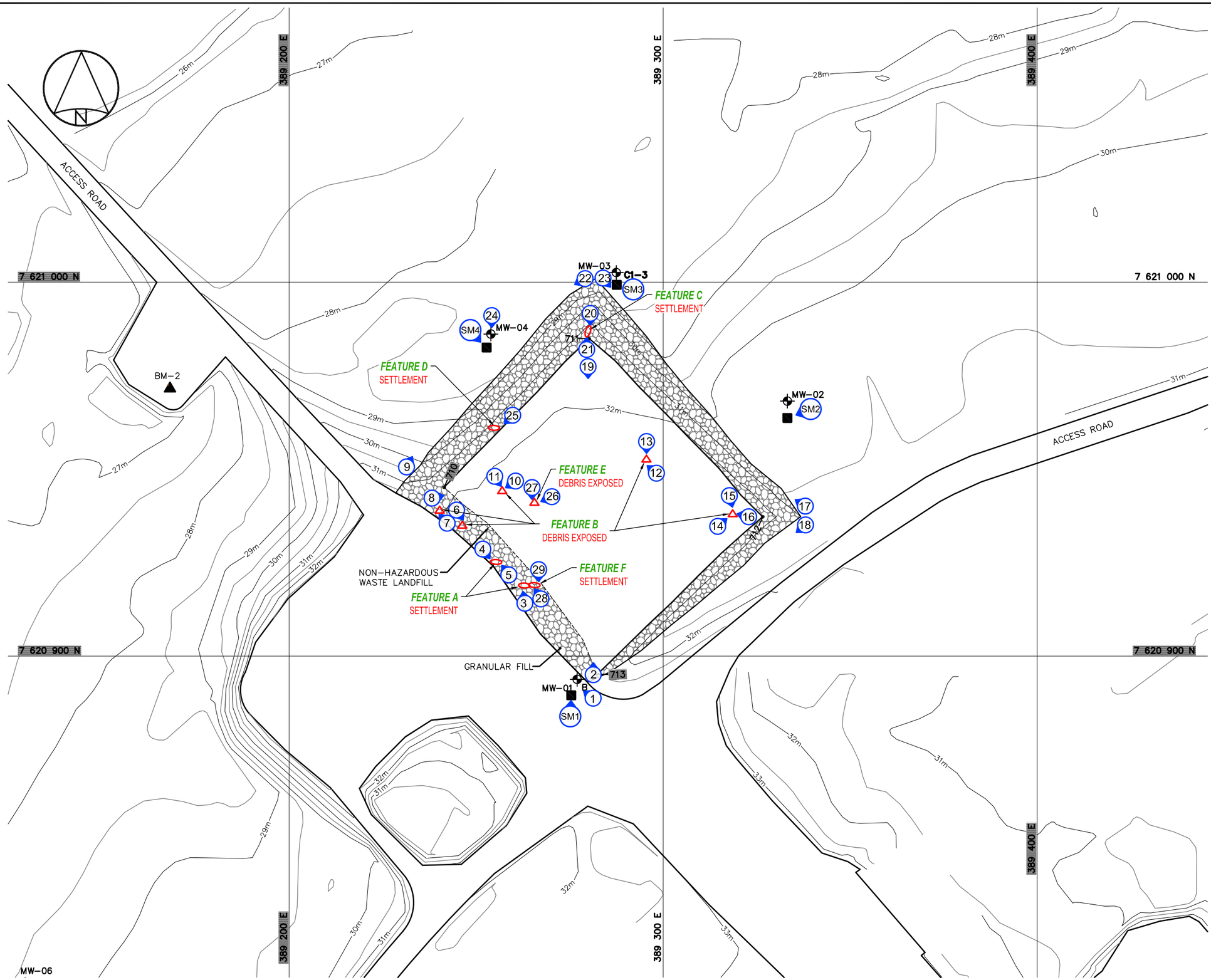

LEGEND:

- MONITORING SOIL SAMPLE LOCATION
- BM-2 PERMANENT BENCHMARK LOCATION
- 710 COORDINATE POINT
- MONITORING WELL LOCATION
- B BACKGROUND MONITORING WELL LOCATION
- 1 APPROX. PHOTOGRAPHIC VIEWPOINT
- SETTLEMENT
- DEBRIS EXPOSED

0 20 40 metres

SCALE 1:1000

ARCADIS

DEPARTMENT OF NATIONAL DEFENCE

COLLECTION OF LANDFILL MONITORING DATA

CAM-1, JENNY LIND ISLAND, NUNAVUT

NON-HAZARDOUS WASTE LANDFILL PLAN/MONITORING POINTS/LANDFILL OBSERVATIONS

Drawn By: I.S.Z.	Approved By: S.B.	Project No: 102012-1	
Date: FEB. 2017	Scale: AS SHOWN	Figure No: CAM-1.5A	

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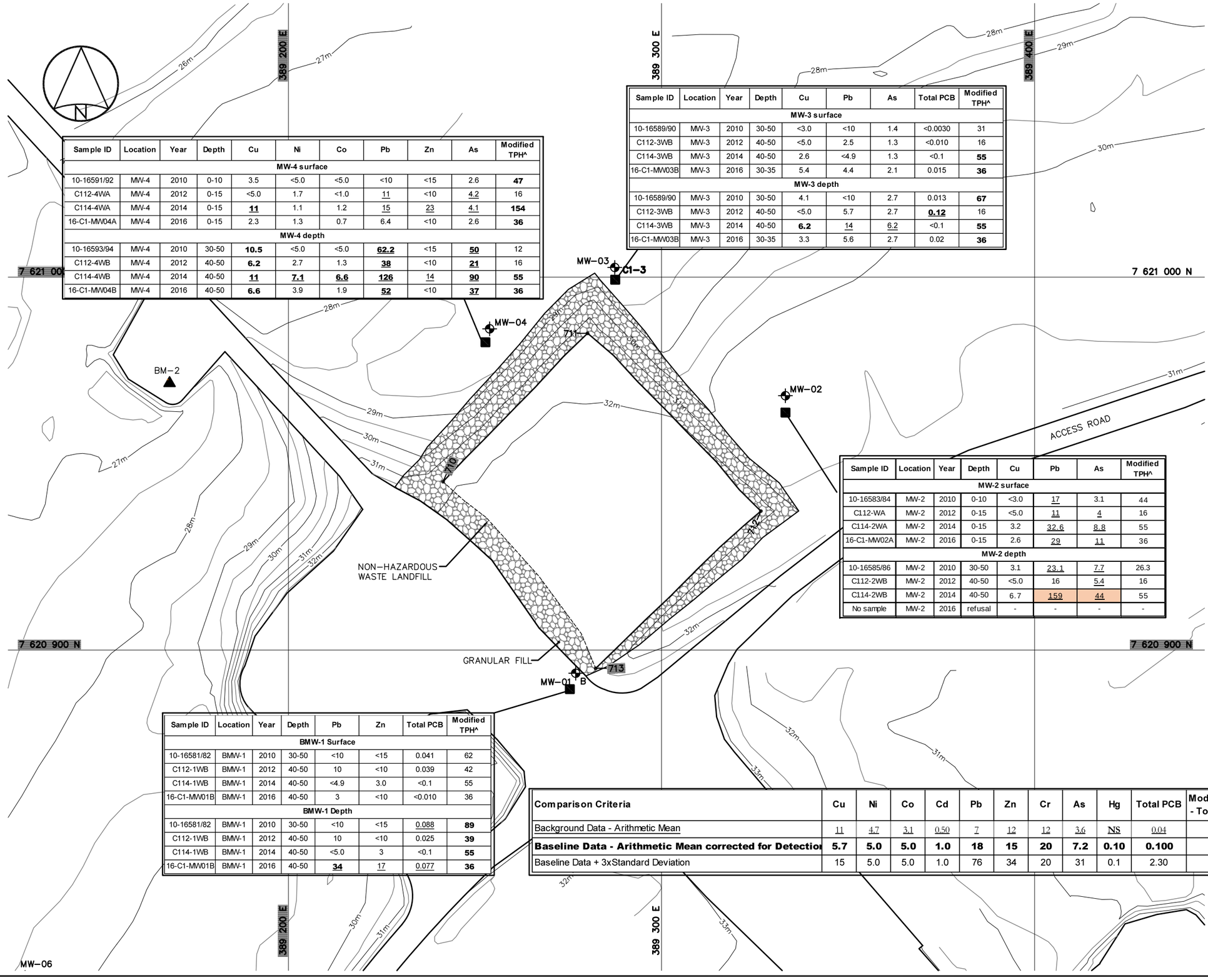

Sample ID	Location	Year	Depth	Cu	Ni	Co	Pb	Zn	As	Modified TPH^
MW-4 surface										
10-16591/92	MW-4	2010	0-10	3.5	<5.0	<5.0	<10	<15	2.6	**47**
C112-4WA	MW-4	2012	0-15	<5.0	1.7	<1.0	11	<10	4.2	16
C114-4WA	MW-4	2014	0-15	**11**	1.1	1.2	15	23	4.1	**154**
16-C1-MW04A	MW-4	2016	0-15	2.3	1.3	0.7	6.4	<10	2.6	**36**
MW-4 depth										
10-16593/94	MW-4	2010	30-50	**10.5**	<5.0	<5.0	**62.2**	<15	**50**	12
C112-4WB	MW-4	2012	40-50	**6.2**	2.7	1.3	**38**	<10	**21**	16
C114-4WB	MW-4	2014	40-50	**11**	**7.1**	**6.6**	**126**	14	**90**	**55**
16-C1-MW04B	MW-4	2016	40-50	**6.6**	3.9	1.9	**52**	<10	**37**	**36**

Sample ID	Location	Year	Depth	Cu	Pb	As	Total PCB	Modified TPH^
MW-3 surface								
10-16589/90	MW-3	2010	30-50	<3.0	<10	1.4	<0.0030	31
C112-3WB	MW-3	2012	40-50	<5.0	2.5	1.3	<0.010	16
C114-3WB	MW-3	2014	40-50	2.6	<4.9	1.3	<0.1	**55**
16-C1-MW03B	MW-3	2016	30-35	5.4	4.4	2.1	0.015	**36**
MW-3 depth								
10-16589/90	MW-3	2010	30-50	4.1	<10	2.7	0.013	**67**
C112-3WB	MW-3	2012	40-50	<5.0	5.7	2.7	**0.12**	16
C114-3WB	MW-3	2014	40-50	**6.2**	14	6.2	<0.1	**55**
16-C1-MW03B	MW-3	2016	30-35	3.3	5.6	2.7	0.02	**36**

Sample ID	Location	Year	Depth	Cu	Pb	As	Modified TPH^
MW-2 surface							
10-16583/84	MW-2	2010	0-10	<3.0	17	3.1	44
C112-WA	MW-2	2012	0-15	<5.0	11	4	16
C114-2WA	MW-2	2014	0-15	3.2	32.6	8.8	55
16-C1-MW02A	MW-2	2016	0-15	2.6	29	11	36
MW-2 depth							
10-16585/86	MW-2	2010	30-50	3.1	23.1	7.7	26.3
C112-2WB	MW-2	2012	40-50	<5.0	16	5.4	16
C114-2WB	MW-2	2014	40-50	6.7	159	44	55
No sample	MW-2	2016	refusal	-	-	-	-

Sample ID	Location	Year	Depth	Pb	Zn	Total PCB	Modified TPH^
BMW-1 Surface							
10-16581/82	BMW-1	2010	30-50	<10	<15	0.041	62
C112-1WB	BMW-1	2012	40-50	10	<10	0.039	42
C114-1WB	BMW-1	2014	40-50	<4.9	3.0	<0.1	55
16-C1-MW01B	BMW-1	2016	40-50	3	<10	<0.010	36
BMW-1 Depth							
10-16581/82	BMW-1	2010	30-50	<10	<15	0.088	**89**
C112-1WB	BMW-1	2012	40-50	10	<10	0.025	**39**
C114-1WB	BMW-1	2014	40-50	<5.0	3	<0.1	**55**
16-C1-MW01B	BMW-1	2016	40-50	**34**	17	0.077	**36**

Comparison Criteria	Cu	Ni	Co	Cd	Pb	Zn	Cr	As	Hg	Total PCB	Modified TPH^ - Total C6-C34
Background Data - Arithmetic Mean	11	4.7	3.1	0.50	7	12	12	3.6	NS	0.04	NS
Baseline Data - Arithmetic Mean corrected for Detection	**5.7**	**5.0**	**5.0**	**1.0**	**18**	**15**	**20**	**7.2**	**0.10**	**0.100**	**34**
Baseline Data + 3xStandard Deviation	15	5.0	5.0	1.0	76	34	20	31	0.1	2.30	123

LEGEND:

- MONITORING SOIL SAMPLE LOCATION
- BM–2 PERMANENT BENCHMARK LOCATION
- 710 COORDINATE POINT
- MONITORING WELL LOCATION
- B BACKGROUND MONITORING WELL LOCATION

XX	sample exceeds background
XX	sample exceeds baseline
XX	*sample exceeds baseline + 3x Standard Deviation*

All units in mg/kg

^ Modifed TPH - Total C6-C34 is the sum of the F1, F2 and F3 fraction PHC concentrations

0 20 40 metres

SCALE 1:1000

ARCADIS

DEPARTMENT OF NATIONAL DEFENCE

COLLECTION OF LANDFILL MONITORING DATA

CAM-1, JENNY LIND ISLAND, NUNAVUT

NON-HAZARDOUS WASTE LANDFILL
SOIL CHEMISTRY

Drawn By: I.S.Z.	Approved By: S.B.	Project No: 102012-1	
Date: FEB. 2017	Scale: AS SHOWN	Figure No: CAM-1.5B	

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Sample ID	Location	Year	Cu	Co	Pb	Zn	Cr	As
Downgradient - MW-4								
not sampled - insufficient volume	MW-4	2010	-	-	-	-	-	
C112-4W	MW-4	2012	**0.055**	0.00038	**0.015**	**0.024**	**0.55**	**0.023**
C114-4W	MW-4	2014	**0.04**	**0.0058**	**0.012**	**0.056**	**0.44**	**0.019**
not sampled- no recharge	MW-4	2016	-	-	-	-	-	

Sample ID	Location	Year	Cu	Co	Pb	Zn	Cr	As
Downgradient - MW-3								
10-16560/61	MW-3	2010	0.0061	<0.0030	<0.010	<0.010	**0.17**	**0.0031**
C112-3W	MW-3	2012	0.004	0.00057	0.0012	<0.0030	0.031	0.0026
C112-BDW1 interlab (PHC fractions not analyzed)	MW-3	2012	0.0028	0.00038	0.00085	<0.003	0.021	0.0019
C114-3W	MW-3	2014	**0.26**	**0.021**	**0.02**	**0.064**	**2**	**0.064**
C1-MW03	MW-3	2016	0.001	<0.00030	<0.00020	<0.0030	<0.0010	0.00028

Comparison Criteria	Cu	Ni	Co	Cd	Pb	Zn	Cr	As	Hg	Total PCB	Modified TPH^ - Total C6-C34
Baseline Data - Average	**0.0092**	**0.036**	**0.0030**	**0.0010**	**0.0100**	**0.0092**	**0.089**	**0.0027**	**0.0004**	**0.00002**	**1.0**
Baseline Data + 3xStandard Deviation	0.027	0.12	0.007	0.001	0.018	0.039	0.34	0.007	0.0004	0.00002	1.0

389 200 E
389 300 E
389 400 E
7 621 000 N
7 620 900 N
MW-03
C1-3
MW-04
Well did not recharge Aug. 10, 2016
MW-02
Well did not recharge Aug. 10, 2016
MW-01 B
Well was dry Aug. 10, 2016
MW-06
BM-2
ACCESS ROAD
NON-HAZARDOUS WASTE LANDFILL
GRANULAR FILL
710
711
712
713
26m
27m
28m
29m
30m
31m
32m
33m

LEGEND:

- MONITORING SOIL SAMPLE LOCATION
- BM-2 PERMANENT BENCHMARK LOCATION
- 710 COORDINATE POINT
- MONITORING WELL LOCATION
- B BACKGROUND MONITORING WELL LOCATION

XX	sample exceeds background
XX	sample exceeds baseline
XX	*sample exceeds baseline + 3x Standard Deviation*

All units in mg/L

0 20 40 metres
SCALE 1:1000

ARCADIS

DEPARTMENT OF NATIONAL DEFENCE

COLLECTION OF LANDFILL MONITORING DATA

CAM-1, JENNY LIND ISLAND, NUNAVUT

NON-HAZARDOUS WASTE LANDFILL GROUNDWATER CHEMISTRY

Drawn By: I.S.Z.	Approved By: S.B.	Project No: 102012-1	
Date: FEB. 2017	Scale: AS SHOWN	Figure No: CAM-1.5C	

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LEGEND:

- BM-3 — PERMANENT BENCHMARK LOCATION
- 810 — COORDINATE POINT
- COMMEMORATIVE PLAQUE LOCATION
- MONITORING WELL LOCATION
- B — BACKGROUND MONITORING WELL LOCATION
- VERTICAL THERMISTOR LOCATION
- MONITORING SOIL SAMPLE LOCATION
- 1 — APPROX. PHOTOGRAPHIC VIEWPOINT
- SETTLEMENT
- STAINING
- EROSION

0 20 40 metres

SCALE 1:1000

ARCADIS

DEPARTMENT OF NATIONAL DEFENCE

COLLECTION OF LANDFILL MONITORING DATA

CAM-1, JENNY LIND ISLAND, NUNAVUT

TIER II DISPOSAL FACILITY
PLAN/MONITORING POINTS/LANDFILL OBSERVATIONS

Drawn By: I.S.Z.	Approved By: S.B.	Project No: 102012-1	
Date: FEB. 2017	Scale: AS SHOWN	Figure No: CAM-1.6A	

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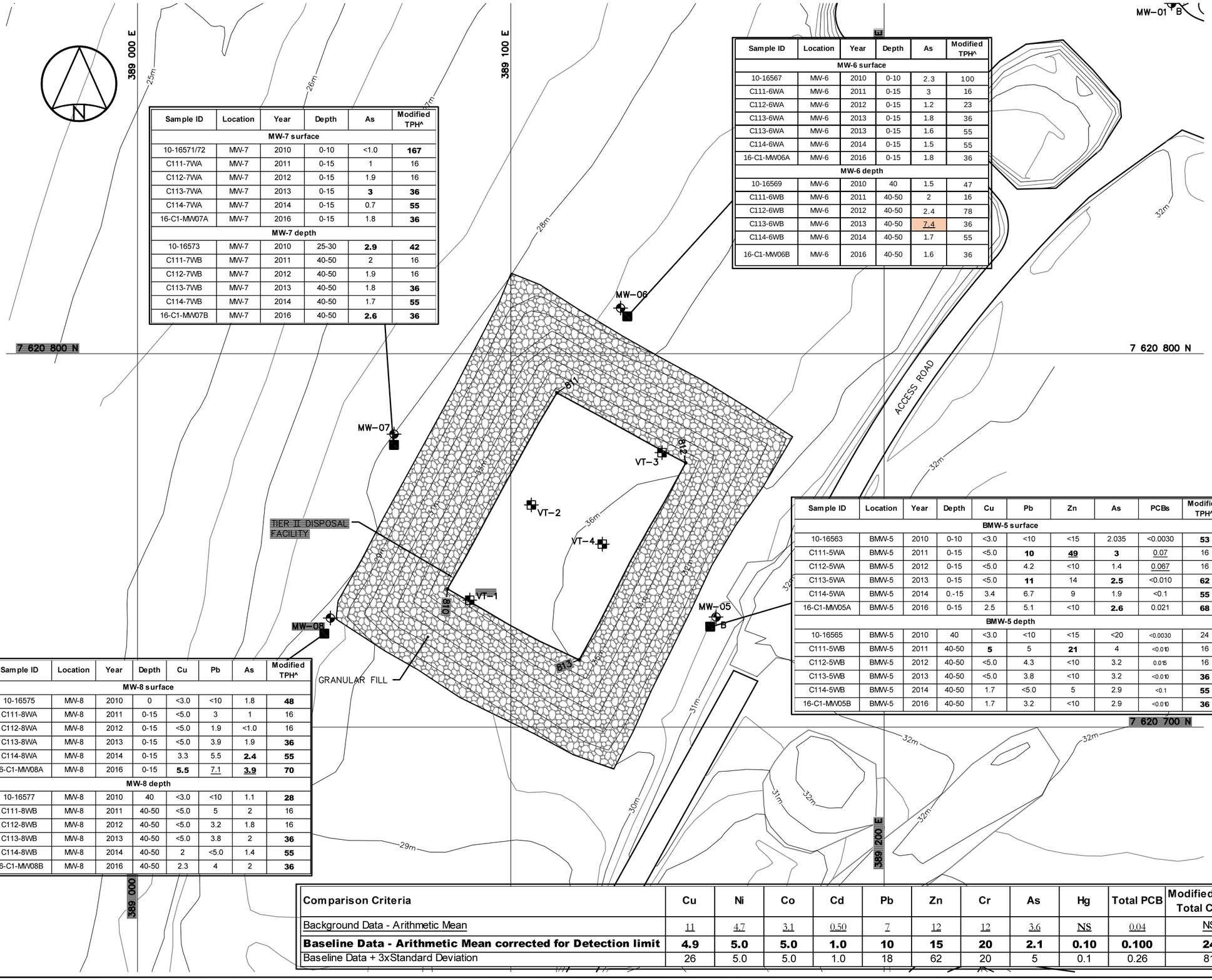


Sample ID	Location	Year	Depth	As	Modified TPH^
MW-6 surface					
10-16567	MW-6	2010	0-10	2.3	100
C111-6WA	MW-6	2011	0-15	3	16
C112-6WA	MW-6	2012	0-15	1.2	23
C113-6WA	MW-6	2013	0-15	1.8	36
C113-6WA	MW-6	2013	0-15	1.6	55
C114-6WA	MW-6	2014	0-15	1.5	55
16-C1-MW06A	MW-6	2016	0-15	1.8	36
MW-6 depth					
10-16569	MW-6	2010	40	1.5	47
C111-6WB	MW-6	2011	40-50	2	16
C112-6WB	MW-6	2012	40-50	2.4	78
C113-6WB	MW-6	2013	40-50	7.4	36
C114-6WB	MW-6	2014	40-50	1.7	55
16-C1-MW06B	MW-6	2016	40-50	1.6	36

Sample ID	Location	Year	Depth	As	Modified TPH^
MW-7 surface					
10-16571/72	MW-7	2010	0-10	<1.0	**167**
C111-7WA	MW-7	2011	0-15	1	16
C112-7WA	MW-7	2012	0-15	1.9	16
C113-7WA	MW-7	2013	0-15	**3**	**36**
C114-7WA	MW-7	2014	0-15	0.7	**55**
16-C1-MW07A	MW-7	2016	0-15	1.8	**36**
MW-7 depth					
10-16573	MW-7	2010	25-30	**2.9**	**42**
C111-7WB	MW-7	2011	40-50	2	16
C112-7WB	MW-7	2012	40-50	1.9	16
C113-7WB	MW-7	2013	40-50	1.8	**36**
C114-7WB	MW-7	2014	40-50	1.7	**55**
16-C1-MW07B	MW-7	2016	40-50	**2.6**	**36**

Sample ID	Location	Year	Depth	Cu	Pb	Zn	As	PCBs	Modified TPH^
BMW-5 surface									
10-16563	BMW-5	2010	0-10	<3.0	<10	<15	2.035	<0.0030	**53**
C111-5WA	BMW-5	2011	0-15	<5.0	**10**	**49**	**3**	0.07	16
C112-5WA	BMW-5	2012	0-15	<5.0	4.2	<10	1.4	0.067	16
C113-5WA	BMW-5	2013	0-15	<5.0	**11**	14	**2.5**	<0.010	**62**
C114-5WA	BMW-5	2014	0.-15	3.4	6.7	9	1.9	<0.1	**55**
16-C1-MW05A	BMW-5	2016	0-15	2.5	5.1	<10	**2.6**	0.021	**68**
BMW-5 depth									
10-16565	BMW-5	2010	40	<3.0	<10	<15	<20	<0.0030	24
C111-5WB	BMW-5	2011	40-50	**5**	5	**21**	4	<0.010	16
C112-5WB	BMW-5	2012	40-50	<5.0	4.3	<10	3.2	0.015	16
C113-5WB	BMW-5	2013	40-50	<5.0	3.8	<10	3.2	<0.010	**36**
C114-5WB	BMW-5	2014	40-50	1.7	<5.0	5	2.9	<0.1	**55**
16-C1-MW05B	BMW-5	2016	40-50	1.7	3.2	<10	2.9	<0.010	**36**

Sample ID	Location	Year	Depth	Cu	Pb	Zn	As	Modified TPH^
MW-8 surface								
10-16575	MW-8	2010	0	<3.0	<10	1.8	**48**	
C111-8WA	MW-8	2011	0-15	<5.0	3	1	16	
C112-8WA	MW-8	2012	0-15	<5.0	1.9	<1.0	16	
C113-8WA	MW-8	2013	0-15	<5.0	3.9	1.9	**36**	
C114-8WA	MW-8	2014	0-15	3.3	5.5	**2.4**	**55**	
16-C1-MW08A	MW-8	2016	0-15	**5.5**	7.1	**3.9**	**70**	
MW-8 depth								
10-16577	MW-8	2010	40	<3.0	<10	1.1	**28**	
C111-8WB	MW-8	2011	40-50	<5.0	5	2	16	
C112-8WB	MW-8	2012	40-50	<5.0	3.2	1.8	16	
C113-8WB	MW-8	2013	40-50	<5.0	3.8	2	**36**	
C114-8WB	MW-8	2014	40-50	2	<5.0	1.4	**55**	
16-C1-MW08B	MW-8	2016	40-50	2.3	4	2	**36**	

Comparison Criteria	Cu	Ni	Co	Cd	Pb	Zn	Cr	As	Hg	Total PCB	Modified TPH^ - Total C6-C34
Background Data - Arithmetic Mean	11	4.7	3.1	0.50	7	12	12	3.6	NS	0.04	NS
Baseline Data - Arithmetic Mean corrected for Detection limit	**4.9**	**5.0**	**5.0**	**1.0**	**10**	**15**	**20**	**2.1**	**0.10**	**0.100**	**24**
Baseline Data + 3xStandard Deviation	26	5.0	5.0	1.0	18	62	20	5	0.1	0.26	81

LEGEND:

- BM-3 — PERMANENT BENCHMARK LOCATION
- B10 — COORDINATE POINT
- COMMEMORATIVE PLAQUE LOCATION
- MONITORING WELL LOCATION
- B — BACKGROUND MONITORING WELL LOCATION
- VERTICAL THERMISTOR LOCATION
- MONITORING SOIL SAMPLE LOCATION

XX	sample exceeds background
XX	sample exceeds baseline
XX	*sample exceeds baseline + 3x Standard Deviation*

All units in mg/kg

^ Modifed TPH - Total C6-C34 is the sum of the F1, F2 and F3 fraction PHC concentrations

0 20 40 metres

SCALE 1:1000

ARCADIS

DEPARTMENT OF NATIONAL DEFENCE

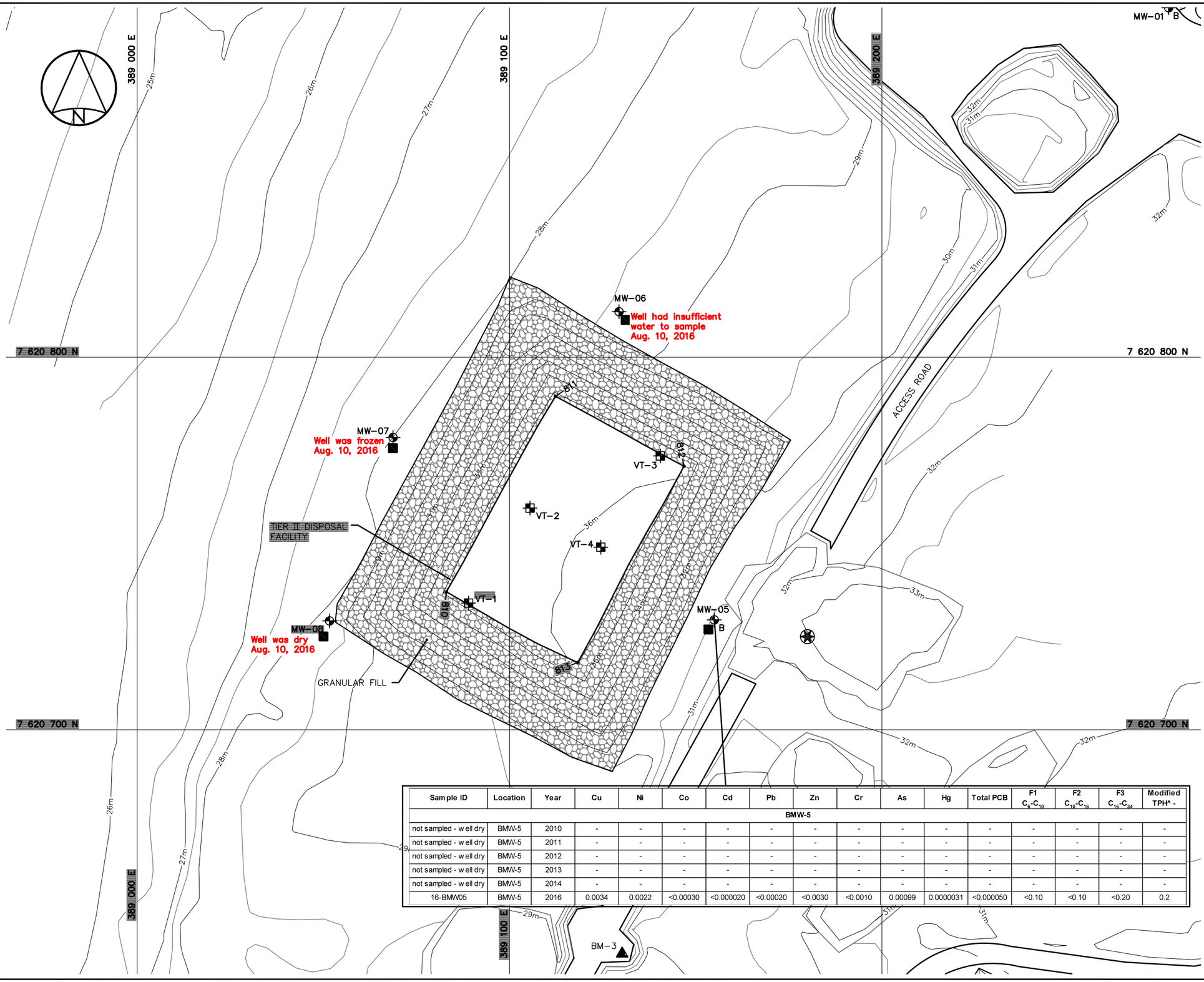
COLLECTION OF LANDFILL MONITORING DATA

CAM-1, JENNY LIND ISLAND, NUNAVUT

TIER II DISPOSAL FACILITY
SOIL CHEMISTRY

Drawn By: I.S.Z.	Approved By: S.B.	Project No: 102012-1	
Date: FEB. 2017	Scale: AS SHOWN	Figure No: CAM-1.6B	

Z:\100000 Series\102012 DEW Line\CAM-1\102012_CAM-1.6.dwg LAYOUT: 1.6B SAVED: 3/22/2017 3:02 PM PLOTTED: 3/22/2017 3:03 PM BY: JOYCE SEDORE



Sample ID	Location	Year	Cu	Ni	Co	Cd	Pb	Zn	Cr	As	Hg	Total PCB	F1 C_6-C_{10}	F2 C_{10}-C_{16}	F3 C_{16}-C_{34}	Modified TPH^ -
BMW-5																
not sampled - well dry	BMW-5	2010	-	-	-	-	-	-	-	-	-	-	-	-	-	-
not sampled - well dry	BMW-5	2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-
not sampled - well dry	BMW-5	2012	-	-	-	-	-	-	-	-	-	-	-	-	-	-
not sampled - well dry	BMW-5	2013	-	-	-	-	-	-	-	-	-	-	-	-	-	-
not sampled - well dry	BMW-5	2014	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16-BMW05	BMW-5	2016	0.0034	0.0022	<0.00030	<0.000020	<0.00020	<0.0030	<0.0010	0.00099	0.0000031	<0.000050	<0.10	<0.10	<0.20	0.2

LEGEND:

- BM-3 — PERMANENT BENCHMARK LOCATION
- B10 — COORDINATE POINT
- COMMEMORATIVE PLAQUE LOCATION
- MONITORING WELL LOCATION
- B — BACKGROUND MONITORING WELL LOCATION
- VERTICAL THERMISTOR LOCATION
- MONITORING SOIL SAMPLE LOCATION

XX	sample exceeds background
XX	sample exceeds baseline
XX	*sample exceeds baseline + 3x Standard Deviation*

All units in mg/L

^ Modifed TPH - Total C6-C34 is the sum of the F1, F2 and F3 fraction PHC concentrations

0 20 40 metres

SCALE 1:1000

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DEPARTMENT OF NATIONAL DEFENCE

COLLECTION OF LANDFILL MONITORING DATA

CAM-1, JENNY LIND ISLAND, NUNAVUT

TIER II DISPOSAL FACILITY
GROUNDWATER CHEMISTRY

Drawn By: I.S.Z.	Approved By: S.B.	Project No:	102012-1
Date: FEB. 2017	Scale: AS SHOWN	Figure No:	CAM-1.6C

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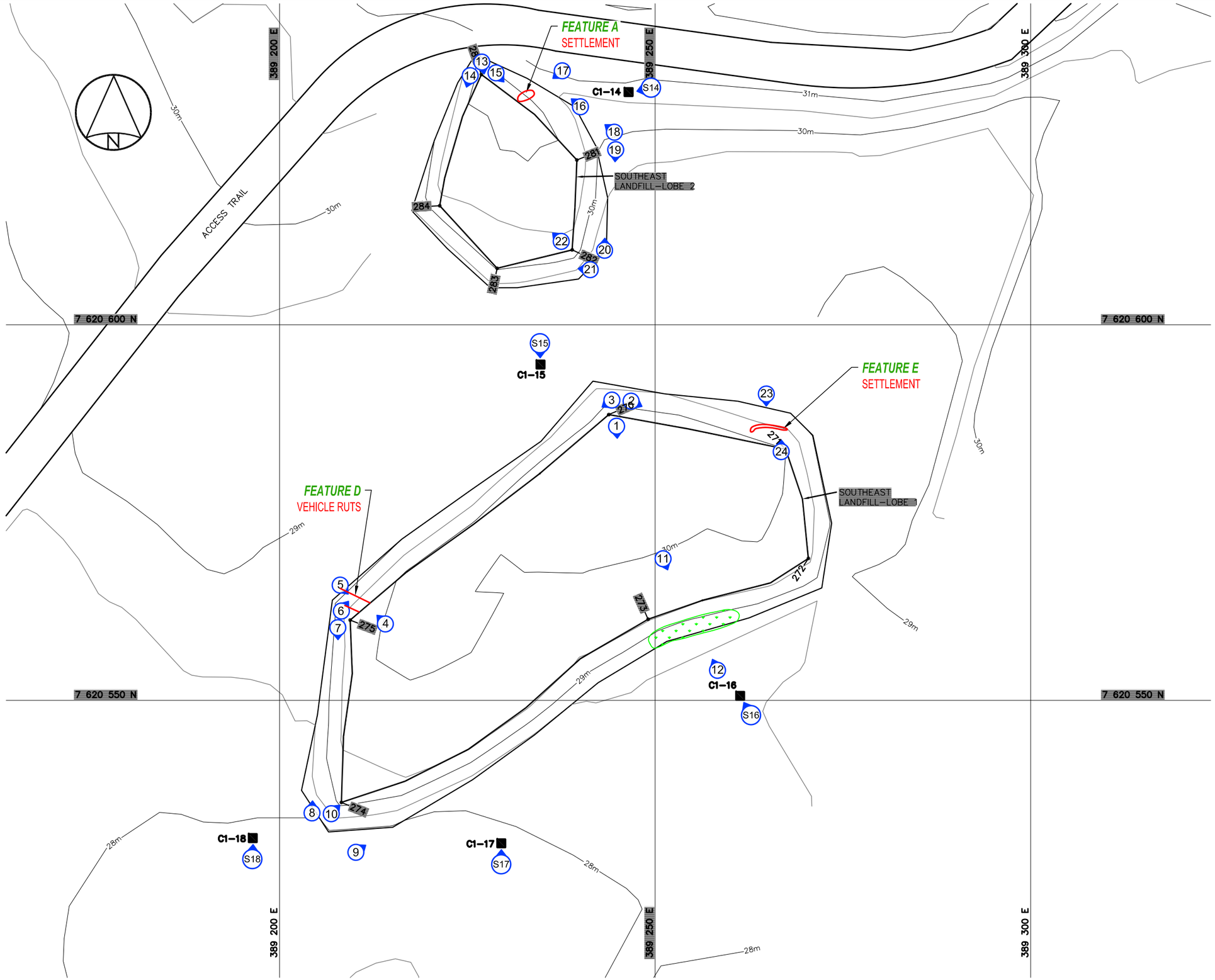

LEGEND:

- MONITORING SOIL SAMPLE LOCATION
- 270 COORDINATE POINT
- 1 APPROX. PHOTOGRAPHIC VIEWPOINT
- SETTLEMENT
- VEHICLE RUTS
- EROSION
- VEGETATION

0 10 20 metres

SCALE 1:500

ARCADIS

DEPARTMENT OF NATIONAL DEFENCE

COLLECTION OF LANDFILL MONITORING DATA

CAM-1, JENNY LIND ISLAND, NUNAVUT

SOUTHEAST LANDFILL
PLAN/MONITORING POINTS/LANDFILL OBSERVATIONS

Drawn By: I.S.Z.	Approved By: S.B.	Project No:	102012-1
Date: FEB. 2017	Scale: AS SHOWN	Figure No:	CAM-1.7A

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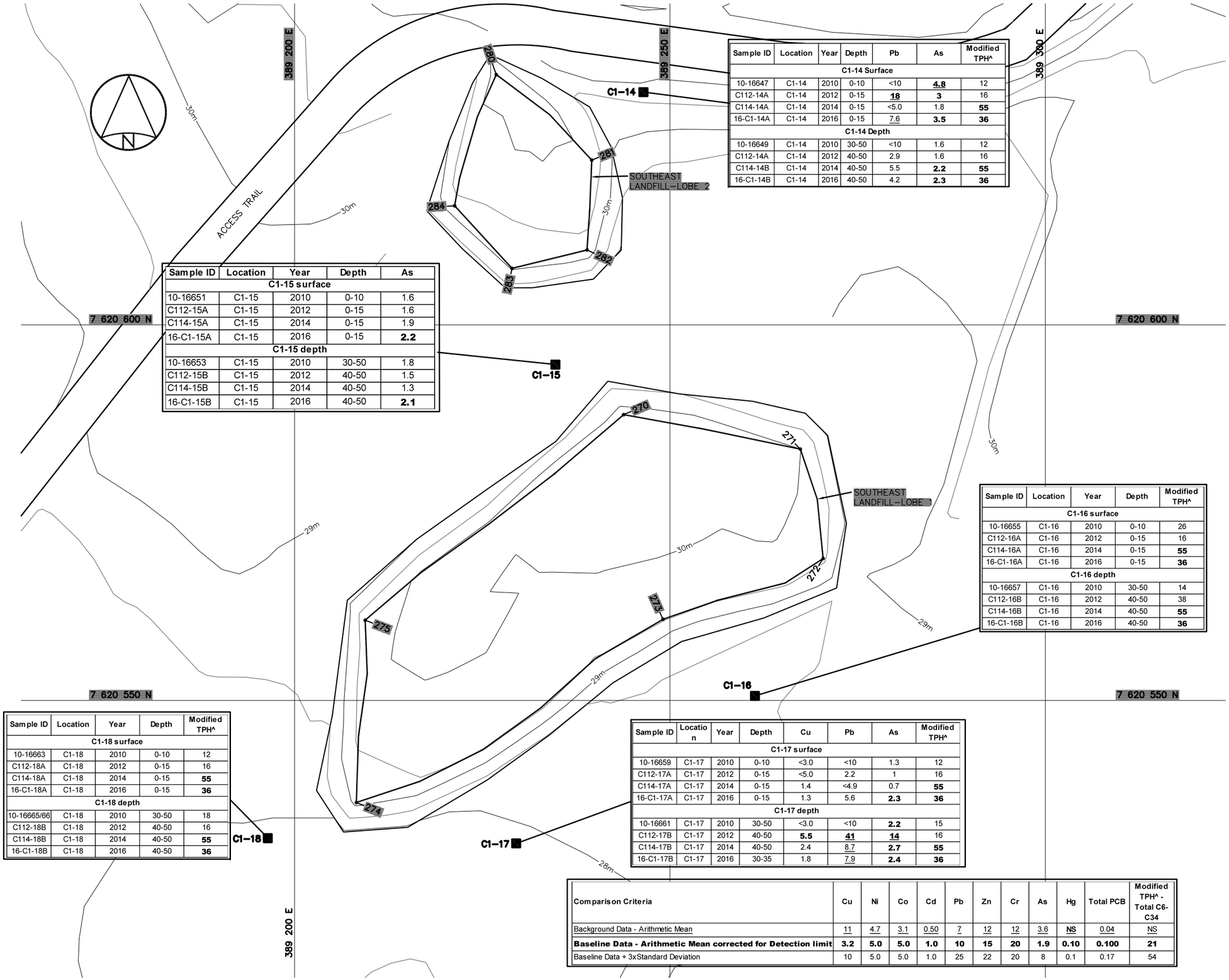

Sample ID	Location	Year	Depth	Pb	As	Modified TPH^
C1-14 Surface						
10-16647	C1-14	2010	0-10	<10	**4.8**	12
C112-14A	C1-14	2012	0-15	**18**	**3**	16
C114-14A	C1-14	2014	0-15	<5.0	1.8	**55**
16-C1-14A	C1-14	2016	0-15	7.6	**3.5**	**36**
C1-14 Depth						
10-16649	C1-14	2010	30-50	<10	1.6	12
C112-14A	C1-14	2012	40-50	2.9	1.6	16
C114-14B	C1-14	2014	40-50	5.5	**2.2**	**55**
16-C1-14B	C1-14	2016	40-50	4.2	**2.3**	**36**

Sample ID	Location	Year	Depth	As
C1-15 surface				
10-16651	C1-15	2010	0-10	1.6
C112-15A	C1-15	2012	0-15	1.6
C114-15A	C1-15	2014	0-15	1.9
16-C1-15A	C1-15	2016	0-15	**2.2**
C1-15 depth				
10-16653	C1-15	2010	30-50	1.8
C112-15B	C1-15	2012	40-50	1.5
C114-15B	C1-15	2014	40-50	1.3
16-C1-15B	C1-15	2016	40-50	**2.1**

Sample ID	Location	Year	Depth	Modified TPH^
C1-16 surface				
10-16655	C1-16	2010	0-10	26
C112-16A	C1-16	2012	0-15	16
C114-16A	C1-16	2014	0-15	**55**
16-C1-16A	C1-16	2016	0-15	**36**
C1-16 depth				
10-16657	C1-16	2010	30-50	14
C112-16B	C1-16	2012	40-50	38
C114-16B	C1-16	2014	40-50	**55**
16-C1-16B	C1-16	2016	40-50	**36**

Sample ID	Location	Year	Depth	Modified TPH^
C1-18 surface				
10-16663	C1-18	2010	0-10	12
C112-18A	C1-18	2012	0-15	16
C114-18A	C1-18	2014	0-15	**55**
16-C1-18A	C1-18	2016	0-15	**36**
C1-18 depth				
10-16665/66	C1-18	2010	30-50	18
C112-18B	C1-18	2012	40-50	16
C114-18B	C1-18	2014	40-50	**55**
16-C1-18B	C1-18	2016	40-50	**36**

Sample ID	Location	Year	Depth	Cu	Pb	As	Modified TPH^
C1-17 surface							
10-16659	C1-17	2010	0-10	<3.0	<10	1.3	12
C112-17A	C1-17	2012	0-15	<5.0	2.2	1	16
C114-17A	C1-17	2014	0-15	1.4	<4.9	0.7	**55**
16-C1-17A	C1-17	2016	0-15	1.3	5.6	**2.3**	**36**
C1-17 depth							
10-16661	C1-17	2010	30-50	<3.0	<10	**2.2**	15
C112-17B	C1-17	2012	40-50	**5.5**	**41**	**14**	16
C114-17B	C1-17	2014	40-50	2.4	8.7	**2.7**	**55**
16-C1-17B	C1-17	2016	30-35	1.8	7.9	**2.4**	**36**

Comparison Criteria	Cu	Ni	Co	Cd	Pb	Zn	Cr	As	Hg	Total PCB	Modified TPH^ - Total C6-C34
Background Data - Arithmetic Mean	11	4.7	3.1	0.50	7	12	12	3.6	**NS**	0.04	NS
Baseline Data - Arithmetic Mean corrected for Detection limit	**3.2**	**5.0**	**5.0**	**1.0**	**10**	**15**	**20**	**1.9**	**0.10**	**0.100**	**21**
Baseline Data + 3xStandard Deviation	10	5.0	5.0	1.0	25	22	20	8	0.1	0.17	54

LEGEND:

■ MONITORING SOIL SAMPLE LOCATION

270 COORDINATE POINT

XX	sample exceeds background
XX	sample exceeds baseline
XX	*sample exceeds baseline + 3x Standard Deviation*

All units in mg/kg

^ Modifed TPH - Total C6-C34 is the sum of the F1, F2 and F3 fraction PHC concentrations

0 10 20 metres

SCALE 1:500

ARCADIS

DEPARTMENT OF NATIONAL DEFENCE

COLLECTION OF LANDFILL MONITORING DATA

CAM-1, JENNY LIND ISLAND, NUNAVUT

SOUTHEAST LANDFILL
SOIL CHEMISTRY

Drawn By: I.S.Z.	Approved By: S.B.	Project No: 102012-1	
Date: FEB. 2017	Scale: AS SHOWN	Figure No: CAM-1.7B	

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389 600 E

389 750 E

389 900 E

7 620 700 N

7 620 550 N

ACCESS ROAD

MODULE TRAIN DEBRIS AREA LOBE 2

MAIN LANDFILL LOBES 1 AND 2

STATION EAST LANDFILL LOBES 1 AND 2

BM–4

C1–19

C1–20

C1–21

C1–22

C1–23

C1–24

C1–25

C1–26

FEATURE A SETTLEMENT

FEATURE B SETTLEMENT

FEATURE C SETTLEMENT

FEATURE D SETTLEMENT

FEATURE E EROSION

FEATURE F EROSION

FEATURE G STAINING

FEATURE H SETTLEMENT

FEATURE I SETTLEMENT

FEATURE J SETTLEMENT

LEGEND:

- MONITORING SOIL SAMPLE LOCATION
- BM–4 PERMANENT BENCHMARK LOCATION
- 310 COORDINATE POINT
- 1 APPROX. PHOTOGRAPHIC VIEWPOINT
- SETTLEMENT
- EROSION
- STAINING
- VEGETATION

0 25 50 metres

SCALE 1:1250

ARCADIS

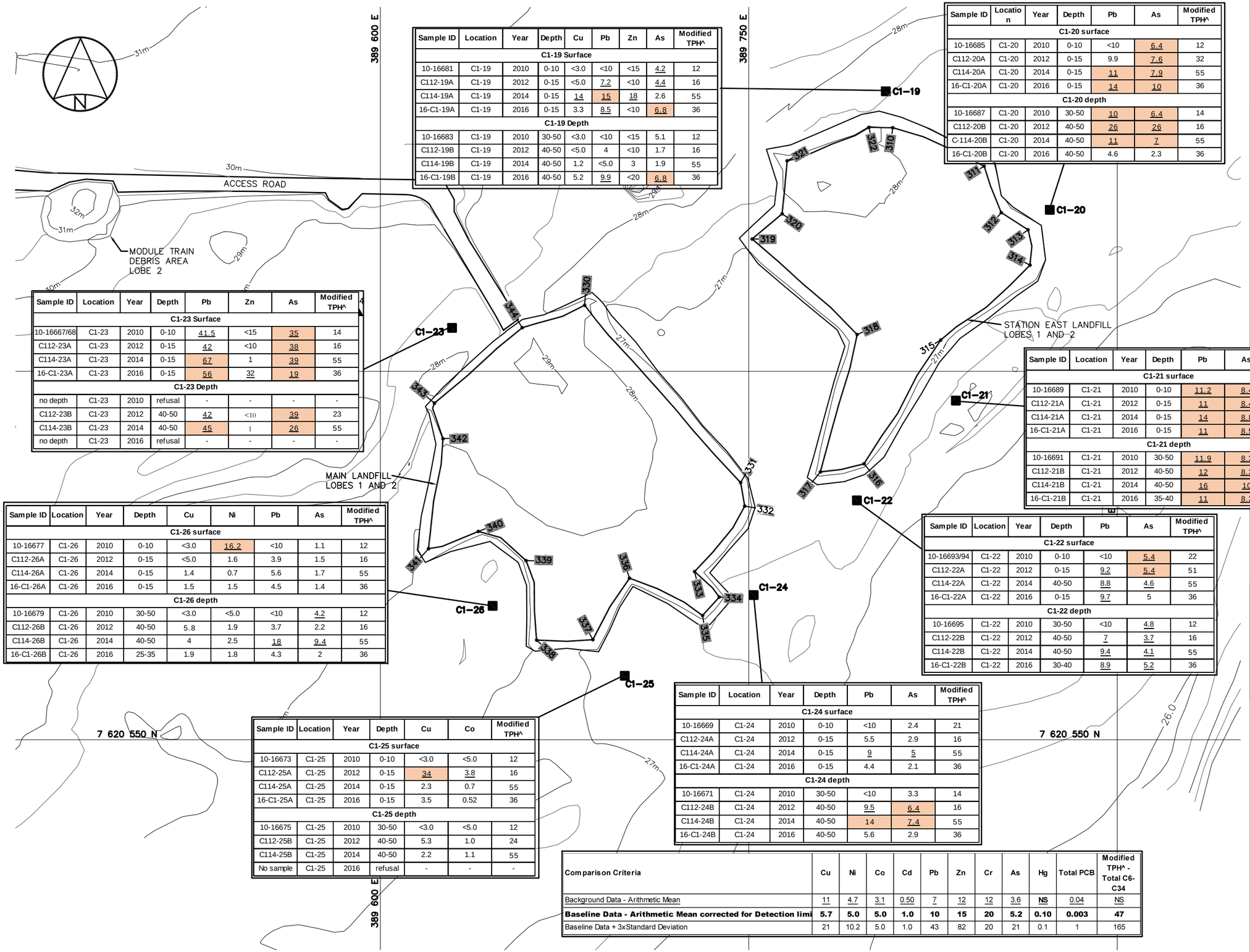
DEPARTMENT OF NATIONAL DEFENCE

COLLECTION OF LANDFILL MONITORING DATA

CAM-1, JENNY LIND ISLAND, NUNAVUT

STATION EAST AND MAIN LANDFILL PLAN/MONITORING POINTS/ LANDFILL OBSERVATIONS

Drawn By: I.S.Z.	Approved By: S.B.	Project No: 102012-1	
Date: FEB. 2017	Scale: AS SHOWN	Figure No: CAM-1.8A	



Sample ID	Location	Year	Depth	Cu	Pb	Zn	As	Modified TPH^
C1-19 Surface								
10-16681	C1-19	2010	0-10	<3.0	<10	<15	4.2	12
C112-19A	C1-19	2012	0-15	<5.0	7.2	<10	4.4	16
C114-19A	C1-19	2014	0-15	14	15	18	2.6	55
16-C1-19A	C1-19	2016	0-15	3.3	8.5	<10	6.8	36
C1-19 Depth								
10-16683	C1-19	2010	30-50	<3.0	<10	<15	5.1	12
C112-19B	C1-19	2012	40-50	<5.0	4	<10	1.7	16
C114-19B	C1-19	2014	40-50	1.2	<5.0	3	1.9	55
16-C1-19B	C1-19	2016	40-50	5.2	9.9	<20	6.8	36

Sample ID	Location	Year	Depth	Pb	As	Modified TPH^
C1-20 surface						
10-16685	C1-20	2010	0-10	<10	6.4	12
C112-20A	C1-20	2012	0-15	9.9	7.6	32
C114-20A	C1-20	2014	0-15	11	7.9	55
16-C1-20A	C1-20	2016	0-15	14	10	36
C1-20 depth						
10-16687	C1-20	2010	30-50	10	6.4	14
C112-20B	C1-20	2012	40-50	26	26	16
C-114-20B	C1-20	2014	40-50	11	7	55
16-C1-20B	C1-20	2016	40-50	4.6	2.3	36

Sample ID	Location	Year	Depth	Pb	Zn	As	Modified TPH^
C1-23 Surface							
10-16667/68	C1-23	2010	0-10	41.5	<15	35	14
C112-23A	C1-23	2012	0-15	42	<10	38	16
C114-23A	C1-23	2014	0-15	67	1	39	55
16-C1-23A	C1-23	2016	0-15	56	32	19	36
C1-23 Depth							
no depth	C1-23	2010	refusal	-	-	-	-
C112-23B	C1-23	2012	40-50	42	<10	39	23
C114-23B	C1-23	2014	40-50	45	1	26	55
no depth	C1-23	2016	refusal	-	-	-	-

Sample ID	Location	Year	Depth	Pb	As	Modified TPH^
C1-21 surface						
10-16689	C1-21	2010	0-10	11.2	8.4	14
C112-21A	C1-21	2012	0-15	11	8.4	16
C114-21A	C1-21	2014	0-15	14	8.8	55
16-C1-21A	C1-21	2016	0-15	11	8.5	36
C1-21 depth						
10-16691	C1-21	2010	30-50	11.9	8.3	49
C112-21B	C1-21	2012	40-50	12	8.3	24
C114-21B	C1-21	2014	40-50	16	10	55
16-C1-21B	C1-21	2016	35-40	11	8.2	36

Sample ID	Location	Year	Depth	Cu	Ni	Pb	As	Modified TPH^
C1-26 surface								
10-16677	C1-26	2010	0-10	<3.0	16.2	<10	1.1	12
C112-26A	C1-26	2012	0-15	<5.0	1.6	3.9	1.5	16
C114-26A	C1-26	2014	0-15	1.4	0.7	5.6	1.7	55
16-C1-26A	C1-26	2016	0-15	1.5	1.5	4.5	1.4	36
C1-26 depth								
10-16679	C1-26	2010	30-50	<3.0	<5.0	<10	4.2	12
C112-26B	C1-26	2012	40-50	5.8	1.9	3.7	2.2	16
C114-26B	C1-26	2014	40-50	4	2.5	18	9.4	55
16-C1-26B	C1-26	2016	25-35	1.9	1.8	4.3	2	36

Sample ID	Location	Year	Depth	Pb	As	Modified TPH^
C1-22 surface						
10-16693/94	C1-22	2010	0-10	<10	5.4	22
C112-22A	C1-22	2012	0-15	9.2	5.4	51
C114-22A	C1-22	2014	40-50	8.8	4.6	55
16-C1-22A	C1-22	2016	0-15	9.7	5	36
C1-22 depth						
10-16695	C1-22	2010	30-50	<10	4.8	12
C112-22B	C1-22	2012	40-50	7	3.7	16
C114-22B	C1-22	2014	40-50	9.4	4.1	55
16-C1-22B	C1-22	2016	30-40	8.9	5.2	36

Sample ID	Location	Year	Depth	Cu	Co	Modified TPH^
C1-25 surface						
10-16673	C1-25	2010	0-10	<3.0	<5.0	12
C112-25A	C1-25	2012	0-15	34	3.8	16
C114-25A	C1-25	2014	0-15	2.3	0.7	55
16-C1-25A	C1-25	2016	0-15	3.5	0.52	36
C1-25 depth						
10-16675	C1-25	2010	30-50	<3.0	<5.0	12
C112-25B	C1-25	2012	40-50	5.3	1.0	24
C114-25B	C1-25	2014	40-50	2.2	1.1	55
No sample	C1-25	2016	refusal	-	-	-

Sample ID	Location	Year	Depth	Pb	As	Modified TPH^
C1-24 surface						
10-16669	C1-24	2010	0-10	<10	2.4	21
C112-24A	C1-24	2012	0-15	5.5	2.9	16
C114-24A	C1-24	2014	0-15	9	5	55
16-C1-24A	C1-24	2016	0-15	4.4	2.1	36
C1-24 depth						
10-16671	C1-24	2010	30-50	<10	3.3	14
C112-24B	C1-24	2012	40-50	9.5	6.4	16
C114-24B	C1-24	2014	40-50	14	7.4	55
16-C1-24B	C1-24	2016	40-50	5.6	2.9	36

Comparison Criteria	Cu	Ni	Co	Cd	Pb	Zn	Cr	As	Hg	Total PCB	Modified TPH^ - Total C6-C34
Background Data - Arithmetic Mean	11	4.7	3.1	0.50	7	12	12	3.6	NS	0.04	NS
Baseline Data - Arithmetic Mean corrected for Detection limi	**5.7**	**5.0**	**5.0**	**1.0**	**10**	**15**	**20**	**5.2**	**0.10**	**0.003**	**47**
Baseline Data + 3xStandard Deviation	21	10.2	5.0	1.0	43	82	20	21	0.1	1	165

LEGEND:

- ■ MONITORING SOIL SAMPLE LOCATION
- BM-4 ▲ PERMANENT BENCHMARK LOCATION
- 310 COORDINATE POINT

XX	sample exceeds background
XX	sample exceeds baseline
XX	*sample exceeds baseline + 3x Standard Deviation*

All units in mg/kg

^ Modifed TPH - Total C6-C34 is the sum of the F1, F2 and F3 fraction PHC concentrations

0 30 60 metres

SCALE 1:1500

ARCADIS

DEPARTMENT OF NATIONAL DEFENCE

COLLECTION OF LANDFILL MONITORING DATA

CAM-1, JENNY LIND ISLAND, NUNAVUT

STATION EAST AND MAIN LANDFILL SOIL CHEMISTRY

Drawn By: I.S.Z.	Approved By: S.B.	Project No: 102012-1	
Date: FEB. 2017	Scale: AS SHOWN	Figure No: CAM-1.8B	

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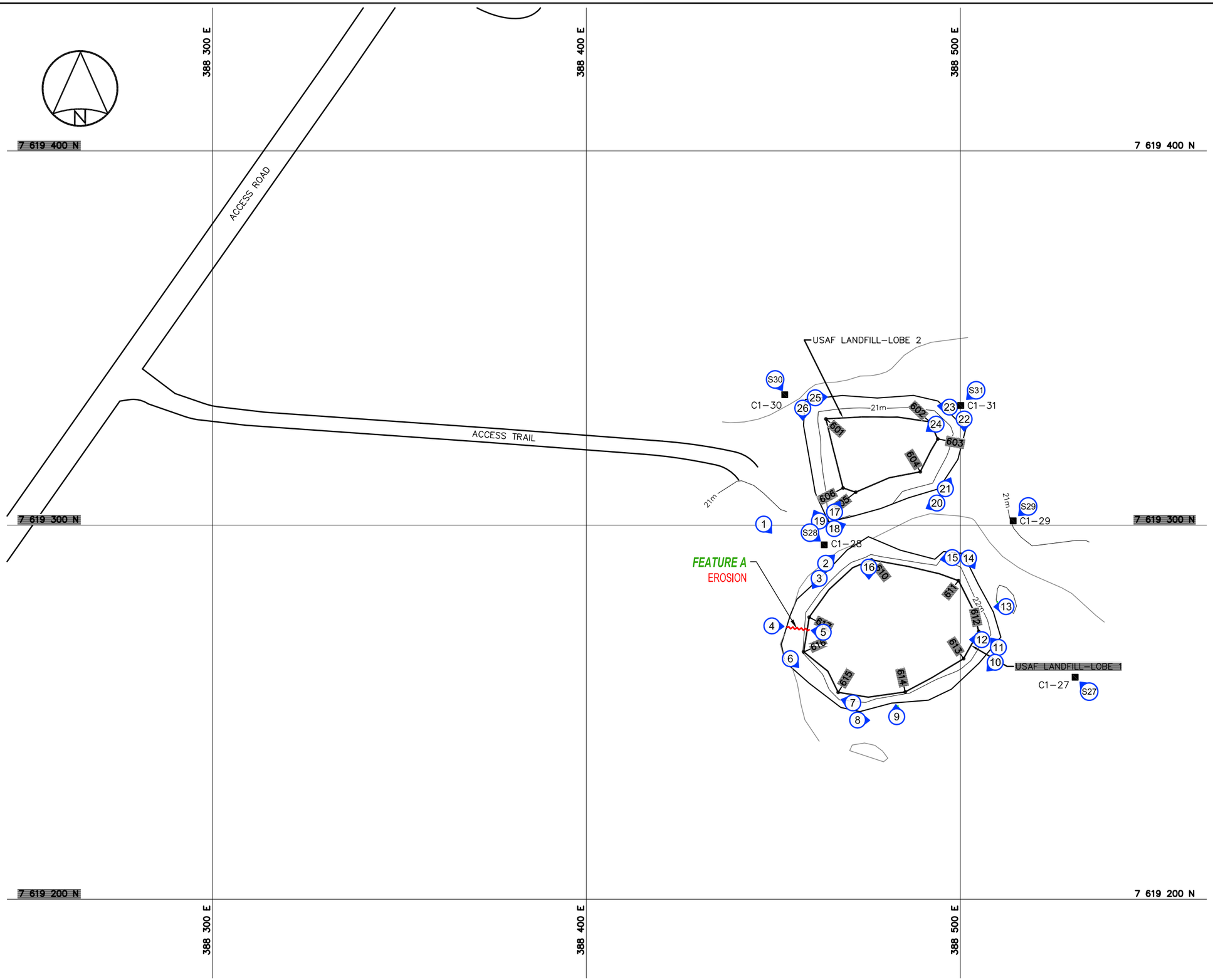


LEGEND:

- MONITORING SOIL SAMPLE LOCATION
- 601 COORDINATE POINT
- 1 APPROX. PHOTOGRAPHIC VIEWPOINT
- EROSION

0 20 40 metres

SCALE 1:1000

ARCADIS

DEPARTMENT OF NATIONAL DEFENCE

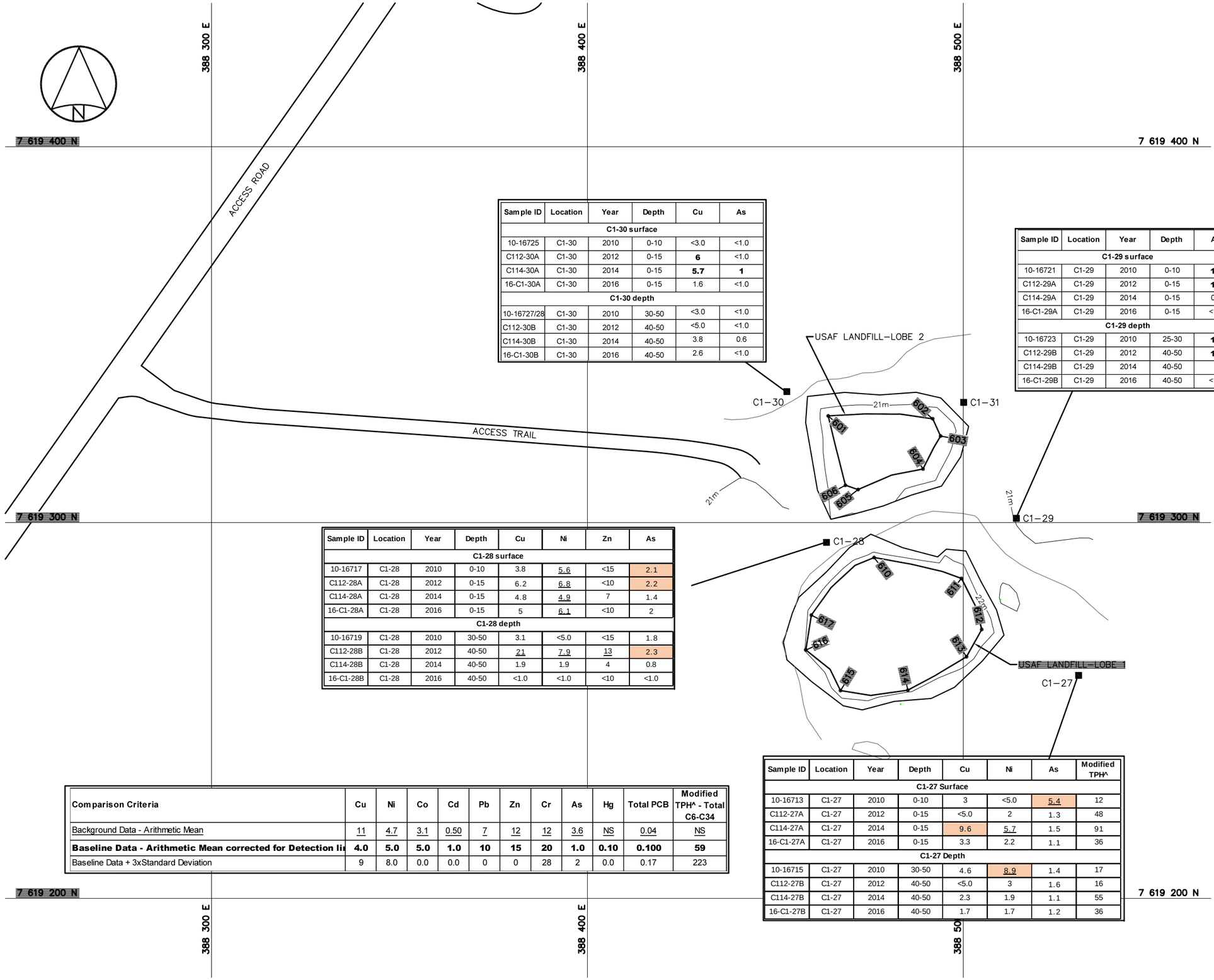
COLLECTION OF LANDFILL MONITORING DATA

CAM-1, JENNY LIND ISLAND, NUNAVUT

USAF LANDFILL
PLAN/MONITORING POINTS/LANDFILL OBSERVATIONS

Drawn By: I.S.Z.	Approved By: S.B.	Project No: 102012-1	
Date: FEB. 2017	Scale: AS SHOWN	Figure No: CAM-1.9A	

Z:\100000 Series\102012 DEW Line\CAM-1\102012_CAM-1.9.dwg LAYOUT: 1.9A SAVED: 3/21/2017 5:50 PM PLOTTED: 3/22/2017 1:32 PM BY: JOYCE SEDORE



Sample ID	Location	Year	Depth	Cu	As
C1-30 surface					
10-16725	C1-30	2010	0-10	<3.0	<1.0
C112-30A	C1-30	2012	0-15	**6**	<1.0
C114-30A	C1-30	2014	0-15	**5.7**	**1**
16-C1-30A	C1-30	2016	0-15	1.6	<1.0
C1-30 depth					
10-16727/28	C1-30	2010	30-50	<3.0	<1.0
C112-30B	C1-30	2012	40-50	<5.0	<1.0
C114-30B	C1-30	2014	40-50	3.8	0.6
16-C1-30B	C1-30	2016	40-50	2.6	<1.0

Sample ID	Location	Year	Depth	As
C1-29 surface				
10-16721	C1-29	2010	0-10	**1.5**
C112-29A	C1-29	2012	0-15	**1.4**
C114-29A	C1-29	2014	0-15	0.7
16-C1-29A	C1-29	2016	0-15	<1.0
C1-29 depth				
10-16723	C1-29	2010	25-30	**1.1**
C112-29B	C1-29	2012	40-50	**1.3**
C114-29B	C1-29	2014	40-50	1
16-C1-29B	C1-29	2016	40-50	<1.0

Sample ID	Location	Year	Depth	Cu	Ni	Zn	As
C1-28 surface							
10-16717	C1-28	2010	0-10	3.8	5.6	<15	2.1
C112-28A	C1-28	2012	0-15	6.2	6.8	<10	2.2
C114-28A	C1-28	2014	0-15	4.8	4.9	7	1.4
16-C1-28A	C1-28	2016	0-15	5	6.1	<10	2
C1-28 depth							
10-16719	C1-28	2010	30-50	3.1	<5.0	<15	1.8
C112-28B	C1-28	2012	40-50	21	7.9	13	2.3
C114-28B	C1-28	2014	40-50	1.9	1.9	4	0.8
16-C1-28B	C1-28	2016	40-50	<1.0	<1.0	<10	<1.0

Comparison Criteria	Cu	Ni	Co	Cd	Pb	Zn	Cr	As	Hg	Total PCB	Modified TPH^ - Total C6-C34
Background Data - Arithmetic Mean	11	4.7	3.1	0.50	7	12	12	3.6	NS	0.04	NS
Baseline Data - Arithmetic Mean corrected for Detection li	**4.0**	**5.0**	**5.0**	**1.0**	**10**	**15**	**20**	**1.0**	**0.10**	**0.100**	**59**
Baseline Data + 3xStandard Deviation	9	8.0	0.0	0.0	0	0	28	2	0.0	0.17	223

Sample ID	Location	Year	Depth	Cu	Ni	As	Modified TPH^
C1-27 Surface							
10-16713	C1-27	2010	0-10	3	<5.0	5.4	12
C112-27A	C1-27	2012	0-15	<5.0	2	1.3	48
C114-27A	C1-27	2014	0-15	9.6	5.7	1.5	91
16-C1-27A	C1-27	2016	0-15	3.3	2.2	1.1	36
C1-27 Depth							
10-16715	C1-27	2010	30-50	4.6	8.9	1.4	17
C112-27B	C1-27	2012	40-50	<5.0	3	1.6	16
C114-27B	C1-27	2014	40-50	2.3	1.9	1.1	55
16-C1-27B	C1-27	2016	40-50	1.7	1.7	1.2	36

LEGEND:

- ■ MONITORING SOIL SAMPLE LOCATION
- 601 COORDINATE POINT

XX	sample exceeds background
XX	sample exceeds baseline
XX	*sample exceeds baseline + 3x Standard Deviation*

All units in mg/kg

^ Modifed TPH - Total C6-C34 is the sum of the F1, F2 and F3 fraction PHC concentrations

Note:
Where no table for exceedances are present, no samples at that location exceeded any of the evaluation parameters.

0 20 40 metres

SCALE 1:1000

ARCADIS

DEPARTMENT OF NATIONAL DEFENCE

COLLECTION OF LANDFILL MONITORING DATA

CAM-1, JENNY LIND ISLAND, NUNAVUT

USAF LANDFILL
SOIL CHEMISTRY

Drawn By: I.S.Z.	Approved By: S.B.	Project No: 102012-1	
Date: FEB. 2017	Scale: AS SHOWN	Figure No: CAM-1.9B	

PLOTTED: 3/22/2017 3:18 PM BY: JOYCE SEDORE
SAVED: 3/22/2017 3:18 PM
LAYOUT: 1.9B
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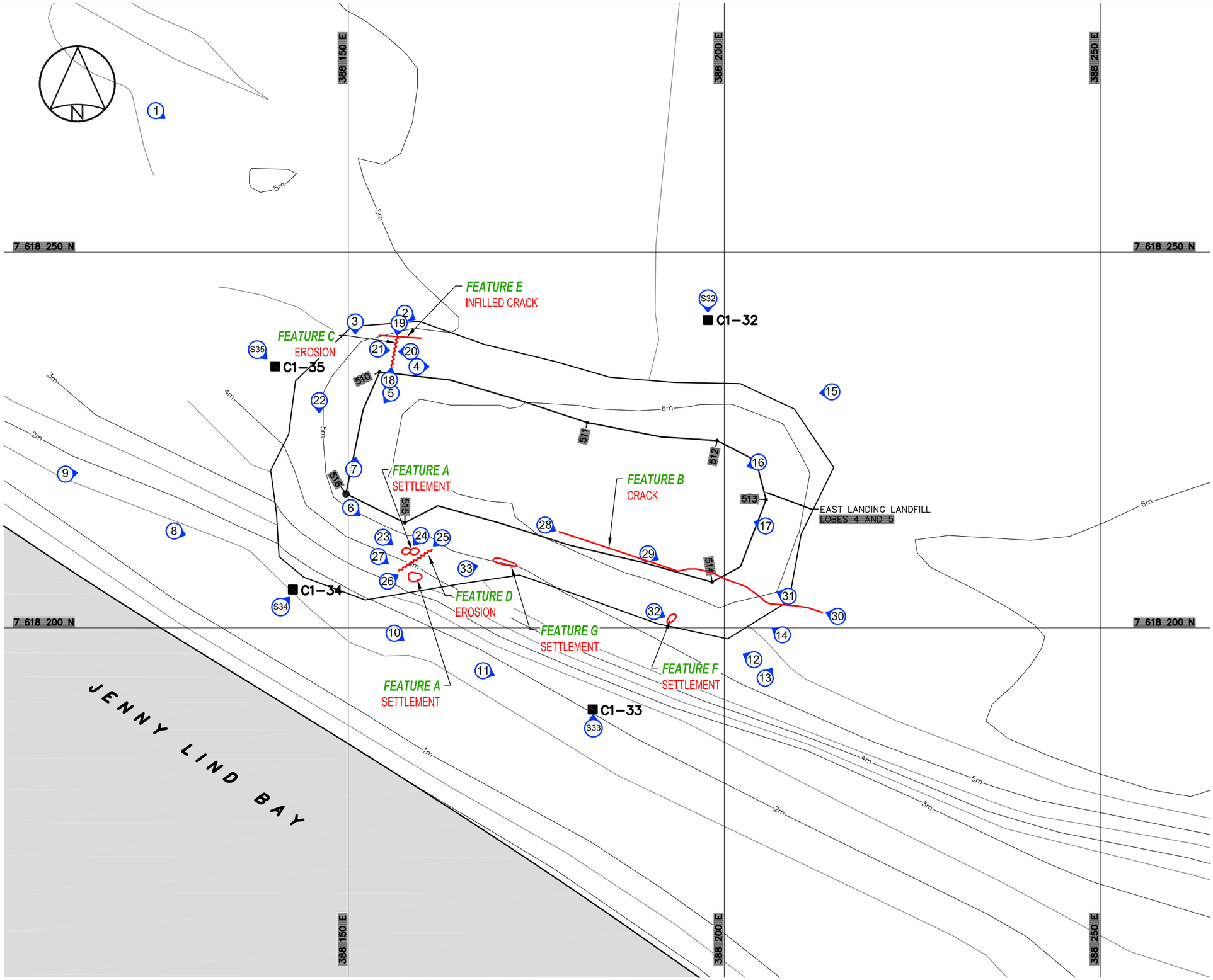


LEGEND:

- MONITORING SOIL SAMPLE LOCATION
- 510 COORDINATE POINT
- 1 APPROX. PHOTOGRAPHIC VIEWPOINT
- BODY OF WATER
- SETTLEMENT
- TENSION CRACK
- EROSION

0 10 20 metres

SCALE 1:500

ARCADIS

DEPARTMENT OF NATIONAL DEFENCE

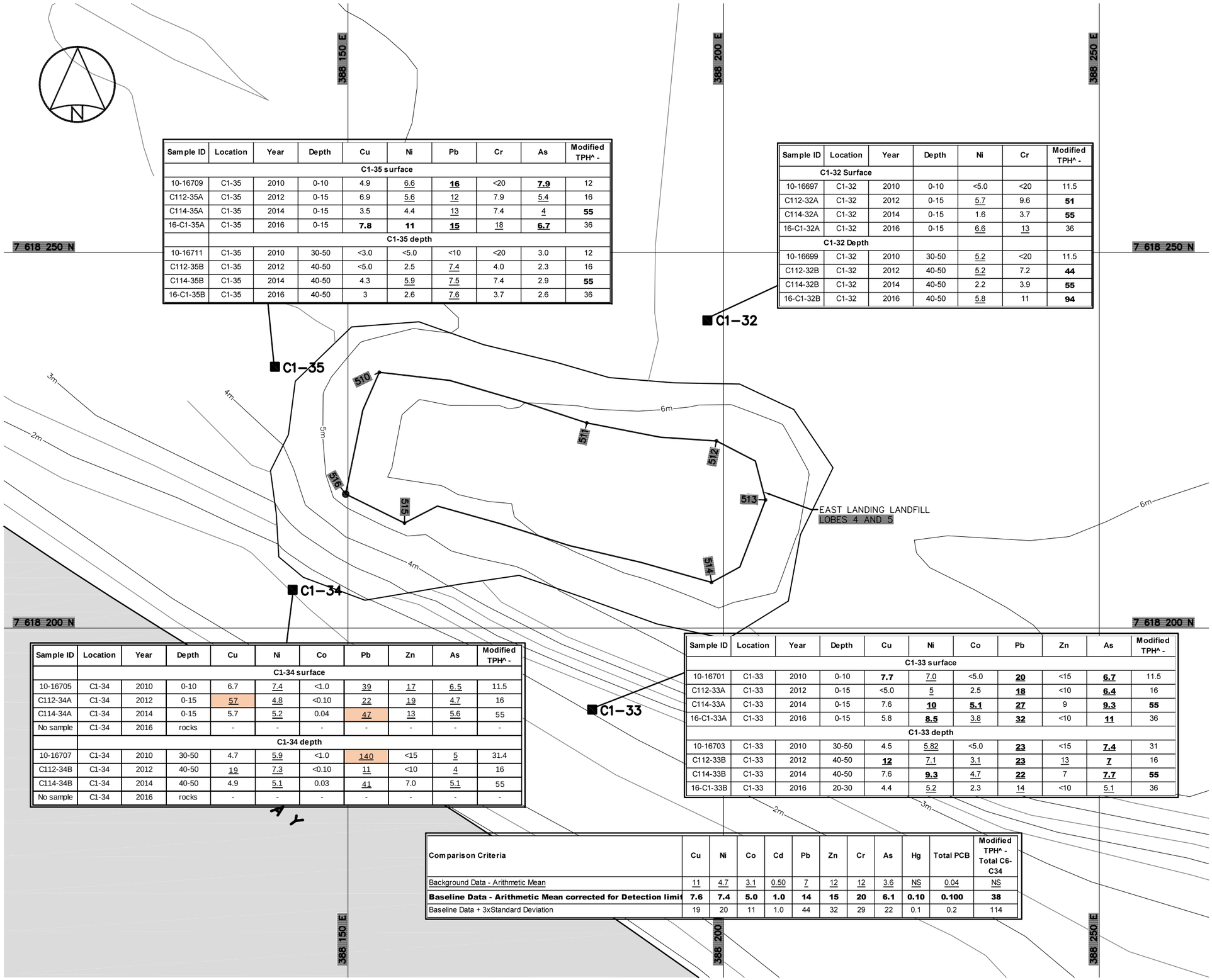
COLLECTION OF LANDFILL MONITORING DATA

CAM-1, JENNY LIND ISLAND, NUNAVUT

EAST LANDING LANDFILL
PLAN/MONITORING POINTS/LANDFILL OBSERVATIONS

Drawn By: I.S.Z.	Approved By: S.B.	Project No: 102012-1	
Date: FEB. 2017	Scale: AS SHOWN	Figure No: CAM-1.10A	

Z:\100000 Series\102012 DEW Line\CAM-1\102012_CAM-1.10.dwg LAYOUT: 1.10A SAVED: 3/21/2017 5:50 PM PLOTTED: 3/22/2017 1:25 PM BY: JOYCE SEDORE



Sample ID	Location	Year	Depth	Cu	Ni	Pb	Cr	As	Modified TPH^ -
C1-35 surface									
10-16709	C1-35	2010	0-10	4.9	6.6	**16**	<20	**7.9**	12
C112-35A	C1-35	2012	0-15	6.9	5.6	12	7.9	5.4	16
C114-35A	C1-35	2014	0-15	3.5	4.4	13	7.4	4	**55**
16-C1-35A	C1-35	2016	0-15	**7.8**	**11**	**15**	18	**6.7**	36
C1-35 depth									
10-16711	C1-35	2010	30-50	<3.0	<5.0	<10	<20	3.0	12
C112-35B	C1-35	2012	40-50	<5.0	2.5	7.4	4.0	2.3	16
C114-35B	C1-35	2014	40-50	4.3	5.9	7.5	7.4	2.9	**55**
16-C1-35B	C1-35	2016	40-50	3	2.6	7.6	3.7	2.6	36

Sample ID	Location	Year	Depth	Ni	Cr	Modified TPH^ -
C1-32 Surface						
10-16697	C1-32	2010	0-10	<5.0	<20	11.5
C112-32A	C1-32	2012	0-15	5.7	9.6	**51**
C114-32A	C1-32	2014	0-15	1.6	3.7	**55**
16-C1-32A	C1-32	2016	0-15	6.6	13	36
C1-32 Depth						
10-16699	C1-32	2010	30-50	5.2	<20	11.5
C112-32B	C1-32	2012	40-50	5.2	7.2	**44**
C114-32B	C1-32	2014	40-50	2.2	3.9	**55**
16-C1-32B	C1-32	2016	40-50	5.8	11	**94**

Sample ID	Location	Year	Depth	Cu	Ni	Co	Pb	Zn	As	Modified TPH^ -
C1-34 surface										
10-16705	C1-34	2010	0-10	6.7	7.4	<1.0	39	17	6.5	11.5
C112-34A	C1-34	2012	0-15	57	4.8	<0.10	22	19	4.7	16
C114-34A	C1-34	2014	0-15	5.7	5.2	0.04	47	13	5.6	55
No sample	C1-34	2016	rocks	-	-	-	-	-	-	-
C1-34 depth										
10-16707	C1-34	2010	30-50	4.7	5.9	<1.0	140	<15	5	31.4
C112-34B	C1-34	2012	40-50	19	7.3	<0.10	11	<10	4	16
C114-34B	C1-34	2014	40-50	4.9	5.1	0.03	41	7.0	5.1	55
No sample	C1-34	2016	rocks	-	-	-	-	-	-	-

Sample ID	Location	Year	Depth	Cu	Ni	Co	Pb	Zn	Cr	As	Modified TPH^ -
C1-33 surface											
10-16701	C1-33	2010	0-10	**7.7**	7.0	<5.0	**20**	<15	**6.7**		11.5
C112-33A	C1-33	2012	0-15	<5.0	5	2.5	**18**	<10	**6.4**		16
C114-33A	C1-33	2014	0-15	7.6	**10**	**5.1**	**27**	9	**9.3**		**55**
16-C1-33A	C1-33	2016	0-15	5.8	**8.5**	3.8	**32**	<10	**11**		36
C1-33 depth											
10-16703	C1-33	2010	30-50	4.5	5.82	<5.0	**23**	<15	**7.4**		31
C112-33B	C1-33	2012	40-50	**12**	7.1	3.1	**23**	13	**7**		16
C114-33B	C1-33	2014	40-50	7.6	**9.3**	4.7	**22**	7	**7.7**		**55**
16-C1-33B	C1-33	2016	20-30	4.4	5.2	2.3	14	<10	5.1		36

Comparison Criteria	Cu	Ni	Co	Cd	Pb	Zn	Cr	As	Hg	Total PCB	Modified TPH^ - Total C6-C34
Background Data - Arithmetic Mean	11	4.7	3.1	0.50	7	12	12	3.6	NS	0.04	NS
Baseline Data - Arithmetic Mean corrected for Detection limit	**7.6**	**7.4**	**5.0**	**1.0**	**14**	**15**	**20**	**6.1**	**0.10**	**0.100**	**38**
Baseline Data + 3xStandard Deviation	19	20	11	1.0	44	32	29	22	0.1	0.2	114

LEGEND:

- ■ MONITORING SOIL SAMPLE LOCATION
- 510 COORDINATE POINT

XX	sample exceeds background
XX	sample exceeds baseline
XX	*sample exceeds baseline + 3x Standard Deviation*

All units in mg/kg

^ Modifed TPH - Total C6-C34 is the sum of the F1, F2 and F3 fraction PHC concentrations

0 10 20 metres

SCALE 1:500

ARCADIS

DEPARTMENT OF NATIONAL DEFENCE

COLLECTION OF LANDFILL MONITORING DATA

CAM-1, JENNY LIND ISLAND, NUNAVUT

EAST LANDING LANDFILL
SOIL CHEMISTRY

Drawn By: I.S.Z.	Approved By: S.B.	Project No: 102012-1	
Date: FEB. 2017	Scale: AS SHOWN	Figure No: CAM-1.10B	

Z:\100000 Series\102012 DEW Line\CAM-1\102012_CAM-1.10.dwg LAYOUT: 1.10B SAVED: 3/21/2017 5:50 PM PLOTTED: 3/22/2017 1:24 PM BY: JOYCE SEDORE

APPENDIX A

Range of the Report and Limitations of Responsibilities

This report has been prepared exclusively for the Department of National Defence (DND) Canada. Any other person or entity may not rely upon the report without express written consent from Department of National Defence (DND) Canada.

Any use, which a third party makes of this report, or any reliance on decisions made based on it, is the responsibility of such third parties. Arcadis Canada Inc. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

Some of the information presented in this report was provided through existing documents. Although attempts were made, whenever possible, to obtain a minimum of two confirmatory sources of information, Arcadis Canada Inc., in certain instances, has been required to assume that the information provided is accurate.

The conclusions presented represent the best judgment of the assessors based on current environmental standards and on the site conditions observed on August 9, 10, and 11th, 2016. Due to the nature of the investigation and the limited data available, the assessors cannot warrant against undiscovered environmental liabilities.

Should additional information become available, Arcadis Canada Inc. requests that this information be brought to our attention so that we may re-assess the conclusions presented herein.

There is no warranty, expressed or implied that the work reported herein has uncovered all potential environmental liabilities, nor does the report preclude the possibility of contamination outside of the areas of investigation. The findings of this report were developed in a manner consistent with a level of care and skill normally exercised by members of the environmental science and engineering profession currently practicing under similar conditions in the area.

A potential remains for the presence of unknown, unidentified, or unforeseen surface and sub-surface contamination. Any evidence of such potential site contamination would require appropriate surface and sub-surface exploration and testing.

If new information is developed in future work (which may include excavations, borings, or other studies), Arcadis Canada Inc. should be requested to re-evaluate the conclusions of this report, and to provide amendments as required.

APPENDIX B

Laboratory QA/QC Reports and Certificates of Analysis

Your P.O. #: N/A
Your Project #: B668559
Your C.O.C. #: NA

Attention:Parminder Virk

Maxxam Analytics
2021 41st Ave NE
Calgary, AB
T2E 6P2

Report Date: 2016/08/24
Report #: R4130142
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B6H4359
Received: 2016/08/17, 10:31

Sample Matrix: Soil
Samples Received: 89

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Moisture	49	N/A	2016/08/19	CAM SOP-00445	Carter 2nd ed 51.2 m
Moisture	40	N/A	2016/08/20	CAM SOP-00445	Carter 2nd ed 51.2 m
Polychlorinated Biphenyl in Soil	1	2016/08/18	2016/08/18	CAM SOP-00309	EPA 8082A m
Polychlorinated Biphenyl in Soil	8	2016/08/18	2016/08/19	CAM SOP-00309	EPA 8082A m
Polychlorinated Biphenyl in Soil	40	2016/08/18	2016/08/20	CAM SOP-00309	EPA 8082A m
Polychlorinated Biphenyl in Soil	40	2016/08/18	2016/08/21	CAM SOP-00309	EPA 8082A m

Sample Matrix: Water
Samples Received: 3

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Polychlorinated Biphenyl in Water	1	2016/08/19	2016/08/20	CAM SOP-00309	EPA 8082A m
Polychlorinated Biphenyl in Water	2	2016/08/19	2016/08/21	CAM SOP-00309	EPA 8082A m

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.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Andrea Rieth, Project Manager
Email: ARieth@maxxam.ca
Phone# (905)817-5806
==========
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 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B6H4359
Report Date: 2016/08/24

Maxxam Analytics
Client Project #: B668559
Your P.O. #: N/A

RESULTS OF ANALYSES OF SOIL

Maxxam ID		CXC564		CXC565	CXC566	CXC567		
Sampling Date		2016/08/09 14:15		2016/08/09 14:15	2016/08/09 14:00	2016/08/09 14:00		
COC Number		NA		NA	NA	NA		
	UNITS	PG5955\16-C1-1A	QC Batch	PG5956\16-C1-1B	PG5957\16-C1-2A	PG5958\16-C1-2B	RDL	QC Batch
Inorganics								
Moisture	%	35	4627181	16	16	12	1.0	4628417

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		CXC568	CXC569		CXC570	CXC571		
Sampling Date		2016/08/09 13:30	2016/08/09 13:30		2016/08/09 13:15	2016/08/09 13:15		
COC Number		NA	NA		NA	NA		
	UNITS	PG5959\16-C1-3A	PG5960\16-C1-3B	QC Batch	PG5961\16-C1-4A	PG5962\16-C1-4B	RDL	QC Batch
Inorganics								
Moisture	%	3.6	2.7	4628417	12	5.8	1.0	4628439

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		CXC572		CXC573	CXC573		CXC574		
Sampling Date		2016/08/09 13:00		2016/08/09 13:00	2016/08/09 13:00		2016/08/09 16:30		
COC Number		NA		NA	NA		NA		
	UNITS	PG5963\16-C1-5A	QC Batch	PG5964\16-C1-5B	PG5964\16-C1-5B Lab-Dup	QC Batch	PG5973\16-C1-6A	RDL	QC Batch
Inorganics									
Moisture	%	4.2	4627181	5.8	5.9	4628417	11	1.0	4628400

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

Maxxam ID		CXC575		CXC576	CXC577	CXC578		
Sampling Date		2016/08/09 16:30		2016/08/09 15:00	2016/08/09 15:00	2016/08/09 15:30		
COC Number		NA		NA	NA	NA		
	UNITS	PG5974\16-C1-6B	QC Batch	PG5975\16-C1-7A	PG5976\16-C1-7B	PG5977\16-C1-8A	RDL	QC Batch
Inorganics								
Moisture	%	13	4628417	8.7	6.5	6.0	1.0	4628439

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B6H4359
Report Date: 2016/08/24

Maxxam Analytics
Client Project #: B668559
Your P.O. #: N/A

RESULTS OF ANALYSES OF SOIL

Maxxam ID		CXC579		CXC580		CXC581		
Sampling Date		2016/08/09 15:30		2016/08/09 16:00		2016/08/09 16:00		
COC Number		NA		NA		NA		
	UNITS	PG5978\16-C1-8B	QC Batch	PG5979\16-C1-9A	QC Batch	PG5980\16-C1-9B	RDL	QC Batch
Inorganics								
Moisture	%	6.3	4628439	15	4627181	10	1.0	4628417

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		CXC582	CXC583	CXC584	CXC585		
Sampling Date		2016/08/10 17:30	2016/08/10 17:30	2016/08/10 16:00	2016/08/10 16:00		
COC Number		NA	NA	NA	NA		
	UNITS	PG5981\16-C1-10A	PG5982\16-C1-10B	PG5986\16-C1-11A	PG5987\16-C1-11B	RDL	QC Batch
Inorganics							
Moisture	%	9.3	9.3	9.8	7.3	1.0	4628417

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		CXC586	CXC586		CXC587		
Sampling Date		2016/08/10 16:45	2016/08/10 16:45		2016/08/10 16:45		
COC Number		NA	NA		NA		
	UNITS	PG5988\16-C1-12A	PG5988\16-C1-12A Lab-Dup	QC Batch	PG5989\16-C1-12B	RDL	QC Batch
Inorganics							
Moisture	%	11	10	4628439	14	1.0	4628417

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

Maxxam ID		CXC588	CXC589		CXC590		
Sampling Date		2016/08/10 17:00	2016/08/10 17:00		2016/08/10 08:30		
COC Number		NA	NA		NA		
	UNITS	PG5990\16-C1-13A	PG5991\16-C1-13B	QC Batch	PG5992\16-C1-MW01A	RDL	QC Batch
Inorganics							
Moisture	%	12	13	4627181	5.0	1.0	4628417

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B6H4359
Report Date: 2016/08/24

Maxxam Analytics
Client Project #: B668559
Your P.O. #: N/A

RESULTS OF ANALYSES OF SOIL

Maxxam ID		CXC591		CXC592		CXC593		
Sampling Date		2016/08/10 08:30		2016/08/10 09:15		2016/08/10 09:00		
COC Number		NA		NA		NA		
	UNITS	PG5993\16-C1-MW01B	QC Batch	PG5994\16-C1-MW02A	QC Batch	PG5995\16-C1-MW03A	RDL	QC Batch
Inorganics								
Moisture	%	7.1	4628400	4.0	4628417	4.7	1.0	4628439

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		CXC594	CXC595		CXC596		
Sampling Date		2016/08/10 09:00	2016/08/10 08:45		2016/08/10 08:45		
COC Number		NA	NA		NA		
	UNITS	PG5997\16-C1-MW03B	PG5998\16-C1-MW04A	QC Batch	PG5999\16-C1-MW04B	RDL	QC Batch
Inorganics							
Moisture	%	6.0	9.9	4628417	9.7	1.0	4627181

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		CXC597		CXC598		CXC599		
Sampling Date		2016/08/10 10:30		2016/08/10 10:30		2016/08/10 09:45		
COC Number		NA		NA		NA		
	UNITS	PG6000\16-C1-MW05A	QC Batch	PG6001\16-C1-MW05B	QC Batch	PG6002\16-C1-MW06A	RDL	QC Batch
Inorganics								
Moisture	%	11	4627181	3.4	4628400	4.8	1.0	4628417

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		CXC600	CXC601	CXC602		
Sampling Date		2016/08/10 09:45	2016/08/10 10:00	2016/08/10 10:00		
COC Number		NA	NA	NA		
	UNITS	PG6003\16-C1-MW06B	PG6004\16-C1-MW07A	PG6005\16-C1-MW07B	RDL	QC Batch
Inorganics						
Moisture	%	4.5	16	5.7	1.0	4628439

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Client Project #: B668559
Your P.O. #: N/A

RESULTS OF ANALYSES OF SOIL

Maxxam ID		CXC603		CXC604		CXC605		
Sampling Date		2016/08/10 10:15		2016/08/10 10:15		2016/08/10 21:00		
COC Number		NA		NA		NA		
	UNITS	PG6008\16-C1-MW08A	QC Batch	PG6009\16-C1-MW08B	QC Batch	PG6010\16-C1-14A	RDL	QC Batch
Inorganics								
Moisture	%	7.9	4628439	5.2	4627181	1.8	1.0	4628417

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		CXC606		CXC607		CXC608		
Sampling Date		2016/08/10 21:00		2016/08/10 20:45		2016/08/10 20:45		
COC Number		NA		NA		NA		
	UNITS	PG6011\16-C1-14B	QC Batch	PG6012\16-C1-15A	QC Batch	PG6013\16-C1-15B	RDL	QC Batch
Inorganics								
Moisture	%	1.8	4628400	1.7	4628417	2.9	1.0	4628439

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		CXC609	CXC610	CXC611		CXC612		
Sampling Date		2016/08/10 20:20	2016/08/10 20:20	2016/08/10 20:15		2016/08/10 20:15		
COC Number		NA	NA	NA		NA		
	UNITS	PG6014\16-C1-16A	PG6015\16-C1-16B	PG6016\16-C1-17A	QC Batch	PG6017\16-C1-17B	RDL	QC Batch
Inorganics								
Moisture	%	2.0	3.2	3.4	4628439	3.0	1.0	4627181

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		CXC613	CXC613	CXC614	CXC615		
Sampling Date		2016/08/10 20:30	2016/08/10 20:30	2016/08/10 20:30	2016/08/11 08:15		
COC Number		NA	NA	NA	NA		
	UNITS	PG6018\16-C1-18A	PG6018\16-C1-18A Lab-Dup	PG6019\16-C1-18B	PG6020\16-C1-19A	RDL	QC Batch
Inorganics							
Moisture	%	6.1	6.2	5.9	12	1.0	4626854

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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RESULTS OF ANALYSES OF SOIL

Maxxam ID		CXC616	CXC617	CXC618		CXC619		
Sampling Date		2016/08/11 08:15	2016/08/11 09:00	2016/08/11 09:00		2016/08/11 08:45		
COC Number		NA	NA	NA		NA		
	UNITS	PG6021\16-C1-19B	PG6022\16-C1-20A	PG6023\16-C1-20B	QC Batch	PG6024\16-C1-21A	RDL	QC Batch
Inorganics								
Moisture	%	40	13	4.7	4626854	14	1.0	4626984

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		CXC620	CXC621	CXC622	CXC623		
Sampling Date		2016/08/11 08:45	2016/08/11 09:30	2016/08/11 09:30	2016/08/11 11:00		
COC Number		NA	NA	NA	NA		
	UNITS	PG6025\16-C1-21B	PG6026\16-C1-22A	PG6027\16-C1-22B	PG6032\16-C1-23A	RDL	QC Batch
Inorganics							
Moisture	%	11	12	7.3	9.4	1.0	4626854

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		CXC624	CXC625	CXC626		CXC627		
Sampling Date		2016/08/11 11:00	2016/08/11 10:00	2016/08/11 10:00		2016/08/11 10:30		
COC Number		NA	NA	NA		NA		
	UNITS	PG6033\16-C1-24A	PG6034\16-C1-24B	PG6035\16-C1-25A	QC Batch	PG6036\16-C1-26A	RDL	QC Batch
Inorganics								
Moisture	%	15	8.4	28	4626854	12	1.0	4626984

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		CXC628	CXC629	CXC630	CXC631		
Sampling Date		2016/08/11 10:30	2016/08/11 14:45	2016/08/11 14:45	2016/08/11 14:15		
COC Number		NA	NA	NA	NA		
	UNITS	PG6037\16-C1-26B	PG6038\16-C1-27A	PG6039\16-C1-27B	PG6040\16-C1-28A	RDL	QC Batch
Inorganics							
Moisture	%	7.3	9.2	5.0	4.4	1.0	4626854

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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RESULTS OF ANALYSES OF SOIL

Maxxam ID		CXC632	CXC633	CXC634		CXC635		
Sampling Date		2016/08/11 14:15	2016/08/11 14:30	2016/08/11 14:30		2016/08/11 14:00		
COC Number		NA	NA	NA		NA		
	UNITS	PG6041\16-C1-28B	PG6068\16-C1-29A	PG6069\16-C1-29B	QC Batch	PG6070\16-C1-30A	RDL	QC Batch
Inorganics								
Moisture	%	2.9	7.6	11	4626854	6.4	1.0	4626984

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		CXC636	CXC637	CXC638	CXC639		
Sampling Date		2016/08/11 14:00	2016/08/11 15:00	2016/08/11 15:00	2016/08/11 16:00		
COC Number		NA	NA	NA	NA		
	UNITS	PG6071\16-C1-30B	PG6072\16-C1-31A	PG6073\16-C1-31B	PG6074\16-C1-32A	RDL	QC Batch
Inorganics							
Moisture	%	5.9	3.7	4.6	22	1.0	4626984

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		CXC640	CXC641	CXC642	CXC643		
Sampling Date		2016/08/11 16:00	2016/08/11 16:30	2016/08/11 16:30	2016/08/11 16:15		
COC Number		NA	NA	NA	NA		
	UNITS	PG6075\16-C1-32B	PG6076\16-C1-33A	PG6077\16-C1-33B	PG6078\16-C1-35A	RDL	QC Batch
Inorganics							
Moisture	%	20	3.3	3.0	6.0	1.0	4626984

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		CXC644	CXC645	CXC645	CXC646	CXC647		
Sampling Date		2016/08/11 16:15	2016/08/09	2016/08/09	2016/08/09	2016/08/10		
COC Number		NA	NA	NA	NA	NA		
	UNITS	PG6079\16-C1-35B	PG6087\C1-DUP1	PG6087\C1-DUP1 Lab-Dup	PG6088\C1-DUP2	PG6089\C1-DUP3	RDL	QC Batch
Inorganics								
Moisture	%	4.5	3.9	4.3	6.2	9.4	1.0	4626984

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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RESULTS OF ANALYSES OF SOIL

Maxxam ID		CXC648	CXC649	CXC650	CXC651	CXC652		
Sampling Date		2016/08/10	2016/08/10	2016/08/11	2016/08/11	2016/08/11		
COC Number		NA	NA	NA	NA	NA		
	UNITS	**PG6090\C1-DUP4**	**PG6091\C1-DUP5**	**PG6092\C1-DUP6**	**PG6093\C1-DUP7**	**PG6094\C1-DUP8**	**RDL**	**QC Batch**
Inorganics								
Moisture	%	10	2.5	5.7	13	6.6	1.0	4626984

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID		CXC564			CXC565	CXC566	CXC567		
Sampling Date		2016/08/09 14:15			2016/08/09 14:15	2016/08/09 14:00	2016/08/09 14:00		
COC Number		NA			NA	NA	NA		
	UNITS	PG5955\16-C1-1A	RDL	QC Batch	PG5956\16-C1-1B	PG5957\16-C1-2A	PG5958\16-C1-2B	RDL	QC Batch
PCBs									
Aroclor 1016	ug/g	<0.020	0.020	4625667	<0.010	<0.010	<0.010	0.010	4625519
Aroclor 1221	ug/g	<0.020	0.020	4625667	<0.010	<0.010	<0.010	0.010	4625519
Aroclor 1232	ug/g	<0.020	0.020	4625667	<0.010	<0.010	<0.010	0.010	4625519
Aroclor 1242	ug/g	<0.020	0.020	4625667	<0.010	<0.010	<0.010	0.010	4625519
Aroclor 1248	ug/g	<0.020	0.020	4625667	<0.010	<0.010	<0.010	0.010	4625519
Aroclor 1254	ug/g	<0.020	0.020	4625667	<0.010	<0.010	<0.010	0.010	4625519
Aroclor 1260	ug/g	<0.020	0.020	4625667	<0.010	<0.010	<0.010	0.010	4625519
Aroclor 1262	ug/g	<0.020	0.020	4625667	<0.010	<0.010	<0.010	0.010	4625519
Aroclor 1268	ug/g	<0.020	0.020	4625667	<0.010	<0.010	<0.010	0.010	4625519
Total PCB	ug/g	<0.020	0.020	4625667	<0.010	<0.010	<0.010	0.010	4625519
Surrogate Recovery (%)									
Decachlorobiphenyl	%	83	N/A	4625667	89	90	78	N/A	4625519

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam ID		CXC568	CXC569		CXC570	CXC571		
Sampling Date		2016/08/09 13:30	2016/08/09 13:30		2016/08/09 13:15	2016/08/09 13:15		
COC Number		NA	NA		NA	NA		
	UNITS	PG5959\16-C1-3A	PG5960\16-C1-3B	QC Batch	PG5961\16-C1-4A	PG5962\16-C1-4B	RDL	QC Batch
PCBs								
Aroclor 1016	ug/g	<0.010	<0.010	4625519	<0.010	<0.010	0.010	4625414
Aroclor 1221	ug/g	<0.010	<0.010	4625519	<0.010	<0.010	0.010	4625414
Aroclor 1232	ug/g	<0.010	<0.010	4625519	<0.010	<0.010	0.010	4625414
Aroclor 1242	ug/g	<0.010	<0.010	4625519	<0.010	<0.010	0.010	4625414
Aroclor 1248	ug/g	<0.010	<0.010	4625519	<0.010	<0.010	0.010	4625414
Aroclor 1254	ug/g	<0.010	<0.010	4625519	<0.010	<0.010	0.010	4625414
Aroclor 1260	ug/g	<0.010	<0.010	4625519	<0.010	<0.010	0.010	4625414
Aroclor 1262	ug/g	<0.010	<0.010	4625519	<0.010	<0.010	0.010	4625414
Aroclor 1268	ug/g	<0.010	<0.010	4625519	<0.010	<0.010	0.010	4625414
Total PCB	ug/g	<0.010	<0.010	4625519	<0.010	<0.010	0.010	4625414
Surrogate Recovery (%)								
Decachlorobiphenyl	%	85	92	4625519	72	68	N/A	4625414

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

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POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID		CXC572		CXC573	CXC573	CXC574		
Sampling Date		2016/08/09 13:00		2016/08/09 13:00	2016/08/09 13:00	2016/08/09 16:30		
COC Number		NA		NA	NA	NA		
	UNITS	PG5963\16-C1-5A	QC Batch	PG5964\16-C1-5B	PG5964\16-C1-5B Lab-Dup	PG5973\16-C1-6A	RDL	QC Batch
PCBs								
Aroclor 1016	ug/g	<0.010	4625667	<0.010	<0.010	<0.010	0.010	4625519
Aroclor 1221	ug/g	<0.010	4625667	<0.010	<0.010	<0.010	0.010	4625519
Aroclor 1232	ug/g	<0.010	4625667	<0.010	<0.010	<0.010	0.010	4625519
Aroclor 1242	ug/g	<0.010	4625667	<0.010	<0.010	<0.010	0.010	4625519
Aroclor 1248	ug/g	<0.010	4625667	<0.010	<0.010	<0.010	0.010	4625519
Aroclor 1254	ug/g	<0.010	4625667	<0.010	<0.010	<0.010	0.010	4625519
Aroclor 1260	ug/g	<0.010	4625667	<0.010	<0.010	<0.010	0.010	4625519
Aroclor 1262	ug/g	<0.010	4625667	<0.010	<0.010	<0.010	0.010	4625519
Aroclor 1268	ug/g	<0.010	4625667	<0.010	<0.010	<0.010	0.010	4625519
Total PCB	ug/g	<0.010	4625667	<0.010	<0.010	<0.010	0.010	4625519
Surrogate Recovery (%)								
Decachlorobiphenyl	%	79	4625667	86	90	89	N/A	4625519

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

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POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID		CXC575	CXC576		CXC577	CXC578		
Sampling Date		2016/08/09 16:30	2016/08/09 15:00		2016/08/09 15:00	2016/08/09 15:30		
COC Number		NA	NA		NA	NA		
	UNITS	PG5974\16-C1-6B	PG5975\16-C1-7A	QC Batch	PG5976\16-C1-7B	PG5977\16-C1-8A	RDL	QC Batch
PCBs								
Aroclor 1016	ug/g	<0.010	<0.010	4625519	<0.010	<0.010	0.010	4625414
Aroclor 1221	ug/g	<0.010	<0.010	4625519	<0.010	<0.010	0.010	4625414
Aroclor 1232	ug/g	<0.010	<0.010	4625519	<0.010	<0.010	0.010	4625414
Aroclor 1242	ug/g	<0.010	<0.010	4625519	<0.010	<0.010	0.010	4625414
Aroclor 1248	ug/g	<0.010	<0.010	4625519	<0.010	<0.010	0.010	4625414
Aroclor 1254	ug/g	<0.010	<0.010	4625519	<0.010	<0.010	0.010	4625414
Aroclor 1260	ug/g	<0.010	<0.010	4625519	<0.010	<0.010	0.010	4625414
Aroclor 1262	ug/g	<0.010	<0.010	4625519	<0.010	<0.010	0.010	4625414
Aroclor 1268	ug/g	<0.010	<0.010	4625519	<0.010	<0.010	0.010	4625414
Total PCB	ug/g	<0.010	<0.010	4625519	<0.010	<0.010	0.010	4625414
Surrogate Recovery (%)								
Decachlorobiphenyl	%	83	89	4625519	81	81	N/A	4625414

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam ID		CXC579		CXC580		CXC581		
Sampling Date		2016/08/09 15:30		2016/08/09 16:00		2016/08/09 16:00		
COC Number		NA		NA		NA		
	UNITS	PG5978\16-C1-8B	QC Batch	PG5979\16-C1-9A	QC Batch	PG5980\16-C1-9B	RDL	QC Batch
PCBs								
Aroclor 1016	ug/g	<0.010	4625414	<0.010	4625667	<0.010	0.010	4625519
Aroclor 1221	ug/g	<0.010	4625414	<0.010	4625667	<0.010	0.010	4625519
Aroclor 1232	ug/g	<0.010	4625414	<0.010	4625667	<0.010	0.010	4625519
Aroclor 1242	ug/g	<0.010	4625414	<0.010	4625667	<0.010	0.010	4625519
Aroclor 1248	ug/g	<0.010	4625414	<0.010	4625667	<0.010	0.010	4625519
Aroclor 1254	ug/g	<0.010	4625414	<0.010	4625667	<0.010	0.010	4625519
Aroclor 1260	ug/g	<0.010	4625414	<0.010	4625667	<0.010	0.010	4625519
Aroclor 1262	ug/g	<0.010	4625414	<0.010	4625667	<0.010	0.010	4625519
Aroclor 1268	ug/g	<0.010	4625414	<0.010	4625667	<0.010	0.010	4625519
Total PCB	ug/g	<0.010	4625414	<0.010	4625667	<0.010	0.010	4625519
Surrogate Recovery (%)								
Decachlorobiphenyl	%	80	4625414	80	4625667	82	N/A	4625519

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam Job #: B6H4359
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Maxxam Analytics
Client Project #: B668559
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POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID		CXC582	CXC583		CXC584	CXC585		
Sampling Date		2016/08/10 17:30	2016/08/10 17:30		2016/08/10 16:00	2016/08/10 16:00		
COC Number		NA	NA		NA	NA		
	UNITS	PG5981\16-C1-10A	PG5982\16-C1-10B	QC Batch	PG5986\16-C1-11A	PG5987\16-C1-11B	RDL	QC Batch
PCBs								
Aroclor 1016	ug/g	<0.010	<0.010	4625519	<0.010	<0.010	0.010	4625414
Aroclor 1221	ug/g	<0.010	<0.010	4625519	<0.010	<0.010	0.010	4625414
Aroclor 1232	ug/g	<0.010	<0.010	4625519	<0.010	<0.010	0.010	4625414
Aroclor 1242	ug/g	<0.010	<0.010	4625519	<0.010	<0.010	0.010	4625414
Aroclor 1248	ug/g	<0.010	<0.010	4625519	<0.010	<0.010	0.010	4625414
Aroclor 1254	ug/g	<0.010	<0.010	4625519	<0.010	<0.010	0.010	4625414
Aroclor 1260	ug/g	<0.010	<0.010	4625519	<0.010	<0.010	0.010	4625414
Aroclor 1262	ug/g	<0.010	<0.010	4625519	<0.010	<0.010	0.010	4625414
Aroclor 1268	ug/g	<0.010	<0.010	4625519	<0.010	<0.010	0.010	4625414
Total PCB	ug/g	<0.010	<0.010	4625519	<0.010	<0.010	0.010	4625414
Surrogate Recovery (%)								
Decachlorobiphenyl	%	80	78	4625519	67	72	N/A	4625414

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam ID		CXC586	CXC587		CXC588	CXC589		
Sampling Date		2016/08/10 16:45	2016/08/10 16:45		2016/08/10 17:00	2016/08/10 17:00		
COC Number		NA	NA		NA	NA		
	UNITS	PG5988\16-C1-12A	PG5989\16-C1-12B	QC Batch	PG5990\16-C1-13A	PG5991\16-C1-13B	RDL	QC Batch
PCBs								
Aroclor 1016	ug/g	<0.010	<0.010	4625414	<0.010	<0.010	0.010	4625667
Aroclor 1221	ug/g	<0.010	<0.010	4625414	<0.010	<0.010	0.010	4625667
Aroclor 1232	ug/g	<0.010	<0.010	4625414	<0.010	<0.010	0.010	4625667
Aroclor 1242	ug/g	<0.010	<0.010	4625414	<0.010	<0.010	0.010	4625667
Aroclor 1248	ug/g	<0.010	<0.010	4625414	<0.010	<0.010	0.010	4625667
Aroclor 1254	ug/g	<0.010	<0.010	4625414	<0.010	<0.010	0.010	4625667
Aroclor 1260	ug/g	<0.010	<0.010	4625414	<0.010	<0.010	0.010	4625667
Aroclor 1262	ug/g	<0.010	<0.010	4625414	<0.010	<0.010	0.010	4625667
Aroclor 1268	ug/g	<0.010	<0.010	4625414	<0.010	<0.010	0.010	4625667
Total PCB	ug/g	<0.010	<0.010	4625414	<0.010	<0.010	0.010	4625667
Surrogate Recovery (%)								
Decachlorobiphenyl	%	77	82	4625414	80	89	N/A	4625667

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

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Maxxam Job #: B6H4359
Report Date: 2016/08/24

Maxxam Analytics
Client Project #: B668559
Your P.O. #: N/A

POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID		CXC590	CXC591		CXC592		
Sampling Date		2016/08/10 08:30	2016/08/10 08:30		2016/08/10 09:15		
COC Number		NA	NA		NA		
	UNITS	PG5992\16-C1-MW01A	PG5993\16-C1-MW01B	QC Batch	PG5994\16-C1-MW02A	RDL	QC Batch
PCBs							
Aroclor 1016	ug/g	<0.010	<0.010	4625519	<0.010	0.010	4625414
Aroclor 1221	ug/g	<0.010	<0.010	4625519	<0.010	0.010	4625414
Aroclor 1232	ug/g	<0.010	<0.010	4625519	<0.010	0.010	4625414
Aroclor 1242	ug/g	<0.010	0.031	4625519	<0.010	0.010	4625414
Aroclor 1248	ug/g	<0.010	<0.010	4625519	<0.010	0.010	4625414
Aroclor 1254	ug/g	<0.010	0.046	4625519	<0.010	0.010	4625414
Aroclor 1260	ug/g	<0.010	<0.010	4625519	<0.010	0.010	4625414
Aroclor 1262	ug/g	<0.010	<0.010	4625519	<0.010	0.010	4625414
Aroclor 1268	ug/g	<0.010	<0.010	4625519	<0.010	0.010	4625414
Total PCB	ug/g	<0.010	0.077	4625519	<0.010	0.010	4625414
Surrogate Recovery (%)							
Decachlorobiphenyl	%	78	76	4625519	84	N/A	4625414

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam ID		CXC593		CXC594		CXC595		
Sampling Date		2016/08/10 09:00		2016/08/10 09:00		2016/08/10 08:45		
COC Number		NA		NA		NA		
	UNITS	PG5995\16-C1-MW03A	QC Batch	PG5997\16-C1-MW03B	QC Batch	PG5998\16-C1-MW04A	RDL	QC Batch
PCBs								
Aroclor 1016	ug/g	<0.010	4625414	<0.010	4625519	<0.010	0.010	4625414
Aroclor 1221	ug/g	<0.010	4625414	<0.010	4625519	<0.010	0.010	4625414
Aroclor 1232	ug/g	<0.010	4625414	<0.010	4625519	<0.010	0.010	4625414
Aroclor 1242	ug/g	<0.010	4625414	<0.010	4625519	<0.010	0.010	4625414
Aroclor 1248	ug/g	<0.010	4625414	<0.010	4625519	<0.010	0.010	4625414
Aroclor 1254	ug/g	0.015	4625414	0.020	4625519	0.012	0.010	4625414
Aroclor 1260	ug/g	<0.010	4625414	<0.010	4625519	<0.010	0.010	4625414
Aroclor 1262	ug/g	<0.010	4625414	<0.010	4625519	<0.010	0.010	4625414
Aroclor 1268	ug/g	<0.010	4625414	<0.010	4625519	<0.010	0.010	4625414
Total PCB	ug/g	0.015	4625414	0.020	4625519	0.012	0.010	4625414
Surrogate Recovery (%)								
Decachlorobiphenyl	%	71	4625414	75	4625519	72	N/A	4625414

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam Job #: B6H4359
Report Date: 2016/08/24

Maxxam Analytics
Client Project #: B668559
Your P.O. #: N/A

POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID		CXC596	CXC596	CXC597		
Sampling Date		2016/08/10 08:45	2016/08/10 08:45	2016/08/10 10:30		
COC Number		NA	NA	NA		
	UNITS	PG5999\16-C1-MW04B	PG5999\16-C1-MW04B Lab-Dup	PG6000\16-C1-MW05A	RDL	QC Batch
PCBs						
Aroclor 1016	ug/g	<0.010	<0.010	<0.010	0.010	4625667
Aroclor 1221	ug/g	<0.010	<0.010	<0.010	0.010	4625667
Aroclor 1232	ug/g	<0.010	<0.010	<0.010	0.010	4625667
Aroclor 1242	ug/g	<0.010	<0.010	<0.010	0.010	4625667
Aroclor 1248	ug/g	<0.010	<0.010	<0.010	0.010	4625667
Aroclor 1254	ug/g	<0.010	<0.010	0.021	0.010	4625667
Aroclor 1260	ug/g	<0.010	<0.010	<0.010	0.010	4625667
Aroclor 1262	ug/g	<0.010	<0.010	<0.010	0.010	4625667
Aroclor 1268	ug/g	<0.010	<0.010	<0.010	0.010	4625667
Total PCB	ug/g	<0.010	<0.010	0.021	0.010	4625667
Surrogate Recovery (%)						
Decachlorobiphenyl	%	88	83	77	N/A	4625667

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

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POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID		CXC598	CXC599		CXC600		
Sampling Date		2016/08/10 10:30	2016/08/10 09:45		2016/08/10 09:45		
COC Number		NA	NA		NA		
	UNITS	PG6001\16-C1-MW05B	PG6002\16-C1-MW06A	QC Batch	PG6003\16-C1-MW06B	RDL	QC Batch
PCBs							
Aroclor 1016	ug/g	<0.010	<0.010	4625519	<0.010	0.010	4625414
Aroclor 1221	ug/g	<0.010	<0.010	4625519	<0.010	0.010	4625414
Aroclor 1232	ug/g	<0.010	<0.010	4625519	<0.010	0.010	4625414
Aroclor 1242	ug/g	<0.010	<0.010	4625519	<0.010	0.010	4625414
Aroclor 1248	ug/g	<0.010	<0.010	4625519	<0.010	0.010	4625414
Aroclor 1254	ug/g	<0.010	<0.010	4625519	<0.010	0.010	4625414
Aroclor 1260	ug/g	<0.010	<0.010	4625519	<0.010	0.010	4625414
Aroclor 1262	ug/g	<0.010	<0.010	4625519	<0.010	0.010	4625414
Aroclor 1268	ug/g	<0.010	<0.010	4625519	<0.010	0.010	4625414
Total PCB	ug/g	<0.010	<0.010	4625519	<0.010	0.010	4625414
Surrogate Recovery (%)							
Decachlorobiphenyl	%	82	86	4625519	72	N/A	4625414

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam ID		CXC601	CXC602	CXC603		
Sampling Date		2016/08/10 10:00	2016/08/10 10:00	2016/08/10 10:15		
COC Number		NA	NA	NA		
	UNITS	PG6004\16-C1-MW07A	PG6005\16-C1-MW07B	PG6008\16-C1-MW08A	RDL	QC Batch
PCBs						
Aroclor 1016	ug/g	<0.010	<0.010	<0.010	0.010	4625414
Aroclor 1221	ug/g	<0.010	<0.010	<0.010	0.010	4625414
Aroclor 1232	ug/g	<0.010	<0.010	<0.010	0.010	4625414
Aroclor 1242	ug/g	<0.010	<0.010	<0.010	0.010	4625414
Aroclor 1248	ug/g	<0.010	<0.010	<0.010	0.010	4625414
Aroclor 1254	ug/g	<0.010	<0.010	<0.010	0.010	4625414
Aroclor 1260	ug/g	<0.010	<0.010	<0.010	0.010	4625414
Aroclor 1262	ug/g	<0.010	<0.010	<0.010	0.010	4625414
Aroclor 1268	ug/g	<0.010	<0.010	<0.010	0.010	4625414
Total PCB	ug/g	<0.010	<0.010	<0.010	0.010	4625414
Surrogate Recovery (%)						
Decachlorobiphenyl	%	65	79	80	N/A	4625414

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

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Report Date: 2016/08/24

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POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID		CXC604		CXC605	CXC606		
Sampling Date		2016/08/10 10:15		2016/08/10 21:00	2016/08/10 21:00		
COC Number		NA		NA	NA		
	UNITS	PG6009\16-C1-MW08B	QC Batch	PG6010\16-C1-14A	PG6011\16-C1-14B	RDL	QC Batch
PCBs							
Aroclor 1016	ug/g	<0.010	4625667	<0.010	<0.010	0.010	4625519
Aroclor 1221	ug/g	<0.010	4625667	<0.010	<0.010	0.010	4625519
Aroclor 1232	ug/g	<0.010	4625667	<0.010	<0.010	0.010	4625519
Aroclor 1242	ug/g	<0.010	4625667	<0.010	<0.010	0.010	4625519
Aroclor 1248	ug/g	<0.010	4625667	<0.010	<0.010	0.010	4625519
Aroclor 1254	ug/g	<0.010	4625667	<0.010	<0.010	0.010	4625519
Aroclor 1260	ug/g	<0.010	4625667	<0.010	<0.010	0.010	4625519
Aroclor 1262	ug/g	<0.010	4625667	<0.010	<0.010	0.010	4625519
Aroclor 1268	ug/g	<0.010	4625667	<0.010	<0.010	0.010	4625519
Total PCB	ug/g	<0.010	4625667	<0.010	<0.010	0.010	4625519
Surrogate Recovery (%)							
Decachlorobiphenyl	%	77	4625667	87	88	N/A	4625519

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

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POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID		CXC607		CXC608	CXC609	CXC609		
Sampling Date		2016/08/10 20:45		2016/08/10 20:45	2016/08/10 20:20	2016/08/10 20:20		
COC Number		NA		NA	NA	NA		
	UNITS	PG6012\16-C1-15A	QC Batch	PG6013\16-C1-15B	PG6014\16-C1-16A	PG6014\16-C1-16A Lab-Dup	RDL	QC Batch
PCBs								
Aroclor 1016	ug/g	<0.010	4625519	<0.010	<0.010	<0.010	0.010	4625414
Aroclor 1221	ug/g	<0.010	4625519	<0.010	<0.010	<0.010	0.010	4625414
Aroclor 1232	ug/g	<0.010	4625519	<0.010	<0.010	<0.010	0.010	4625414
Aroclor 1242	ug/g	<0.010	4625519	<0.010	<0.010	<0.010	0.010	4625414
Aroclor 1248	ug/g	<0.010	4625519	<0.010	<0.010	<0.010	0.010	4625414
Aroclor 1254	ug/g	<0.010	4625519	<0.010	<0.010	<0.010	0.010	4625414
Aroclor 1260	ug/g	<0.010	4625519	<0.010	<0.010	<0.010	0.010	4625414
Aroclor 1262	ug/g	<0.010	4625519	<0.010	<0.010	<0.010	0.010	4625414
Aroclor 1268	ug/g	<0.010	4625519	<0.010	<0.010	<0.010	0.010	4625414
Total PCB	ug/g	<0.010	4625519	<0.010	<0.010	<0.010	0.010	4625414
Surrogate Recovery (%)								
Decachlorobiphenyl	%	83	4625519	80	70	69	N/A	4625414

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

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POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID		CXC610	CXC611		CXC612		
Sampling Date		2016/08/10 20:20	2016/08/10 20:15		2016/08/10 20:15		
COC Number		NA	NA		NA		
	UNITS	PG6015\16-C1-16B	PG6016\16-C1-17A	QC Batch	PG6017\16-C1-17B	RDL	QC Batch
PCBs							
Aroclor 1016	ug/g	<0.010	<0.010	4625414	<0.010	0.010	4625667
Aroclor 1221	ug/g	<0.010	<0.010	4625414	<0.010	0.010	4625667
Aroclor 1232	ug/g	<0.010	<0.010	4625414	<0.010	0.010	4625667
Aroclor 1242	ug/g	<0.010	<0.010	4625414	<0.010	0.010	4625667
Aroclor 1248	ug/g	<0.010	<0.010	4625414	<0.010	0.010	4625667
Aroclor 1254	ug/g	<0.010	<0.010	4625414	<0.010	0.010	4625667
Aroclor 1260	ug/g	<0.010	<0.010	4625414	<0.010	0.010	4625667
Aroclor 1262	ug/g	<0.010	<0.010	4625414	<0.010	0.010	4625667
Aroclor 1268	ug/g	<0.010	<0.010	4625414	<0.010	0.010	4625667
Total PCB	ug/g	<0.010	<0.010	4625414	<0.010	0.010	4625667
Surrogate Recovery (%)							
Decachlorobiphenyl	%	82	66	4625414	82	N/A	4625667

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam ID		CXC613	CXC614	CXC615		CXC616		
Sampling Date		2016/08/10 20:30	2016/08/10 20:30	2016/08/11 08:15		2016/08/11 08:15		
COC Number		NA	NA	NA		NA		
	UNITS	PG6018\16-C1-18A	PG6019\16-C1-18B	PG6020\16-C1-19A	RDL	PG6021\16-C1-19B	RDL	QC Batch
PCBs								
Aroclor 1016	ug/g	<0.010	<0.010	<0.010	0.010	<0.020	0.020	4625467
Aroclor 1221	ug/g	<0.010	<0.010	<0.010	0.010	<0.020	0.020	4625467
Aroclor 1232	ug/g	<0.010	<0.010	<0.010	0.010	<0.020	0.020	4625467
Aroclor 1242	ug/g	<0.010	<0.010	<0.010	0.010	<0.020	0.020	4625467
Aroclor 1248	ug/g	<0.010	<0.010	<0.010	0.010	<0.020	0.020	4625467
Aroclor 1254	ug/g	<0.010	<0.010	<0.010	0.010	<0.020	0.020	4625467
Aroclor 1260	ug/g	<0.010	<0.010	<0.010	0.010	<0.020	0.020	4625467
Aroclor 1262	ug/g	<0.010	<0.010	<0.010	0.010	<0.020	0.020	4625467
Aroclor 1268	ug/g	<0.010	<0.010	<0.010	0.010	<0.020	0.020	4625467
Total PCB	ug/g	<0.010	<0.010	<0.010	0.010	<0.020	0.020	4625467
Surrogate Recovery (%)								
Decachlorobiphenyl	%	64	74	68	N/A	75	N/A	4625467

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

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POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID		CXC617	CXC618		CXC619		
Sampling Date		2016/08/11 09:00	2016/08/11 09:00		2016/08/11 08:45		
COC Number		NA	NA		NA		
	UNITS	PG6022\16-C1-20A	PG6023\16-C1-20B	QC Batch	PG6024\16-C1-21A	RDL	QC Batch
PCBs							
Aroclor 1016	ug/g	<0.010	<0.010	4625467	<0.010	0.010	4625548
Aroclor 1221	ug/g	<0.010	<0.010	4625467	<0.010	0.010	4625548
Aroclor 1232	ug/g	<0.010	<0.010	4625467	<0.010	0.010	4625548
Aroclor 1242	ug/g	<0.010	<0.010	4625467	<0.010	0.010	4625548
Aroclor 1248	ug/g	<0.010	<0.010	4625467	<0.010	0.010	4625548
Aroclor 1254	ug/g	<0.010	<0.010	4625467	<0.010	0.010	4625548
Aroclor 1260	ug/g	<0.010	<0.010	4625467	<0.010	0.010	4625548
Aroclor 1262	ug/g	<0.010	<0.010	4625467	<0.010	0.010	4625548
Aroclor 1268	ug/g	<0.010	<0.010	4625467	<0.010	0.010	4625548
Total PCB	ug/g	<0.010	<0.010	4625467	<0.010	0.010	4625548
Surrogate Recovery (%)							
Decachlorobiphenyl	%	70	68	4625467	78	N/A	4625548

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam ID		CXC620	CXC621	CXC622	CXC623		
Sampling Date		2016/08/11 08:45	2016/08/11 09:30	2016/08/11 09:30	2016/08/11 11:00		
COC Number		NA	NA	NA	NA		
	UNITS	PG6025\16-C1-21B	PG6026\16-C1-22A	PG6027\16-C1-22B	PG6032\16-C1-23A	RDL	QC Batch
PCBs							
Aroclor 1016	ug/g	<0.010	<0.010	<0.010	<0.010	0.010	4625467
Aroclor 1221	ug/g	<0.010	<0.010	<0.010	<0.010	0.010	4625467
Aroclor 1232	ug/g	<0.010	<0.010	<0.010	<0.010	0.010	4625467
Aroclor 1242	ug/g	<0.010	<0.010	<0.010	<0.010	0.010	4625467
Aroclor 1248	ug/g	<0.010	<0.010	<0.010	<0.010	0.010	4625467
Aroclor 1254	ug/g	<0.010	<0.010	<0.010	<0.010	0.010	4625467
Aroclor 1260	ug/g	<0.010	<0.010	<0.010	<0.010	0.010	4625467
Aroclor 1262	ug/g	<0.010	<0.010	<0.010	<0.010	0.010	4625467
Aroclor 1268	ug/g	<0.010	<0.010	<0.010	<0.010	0.010	4625467
Total PCB	ug/g	<0.010	<0.010	<0.010	<0.010	0.010	4625467
Surrogate Recovery (%)							
Decachlorobiphenyl	%	63	74	68	76	N/A	4625467

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

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POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID		CXC624	CXC625	CXC626		CXC627		
Sampling Date		2016/08/11 11:00	2016/08/11 10:00	2016/08/11 10:00		2016/08/11 10:30		
COC Number		NA	NA	NA		NA		
	UNITS	PG6033\16-C1-24A	PG6034\16-C1-24B	PG6035\16-C1-25A	QC Batch	PG6036\16-C1-26A	RDL	QC Batch
PCBs								
Aroclor 1016	ug/g	<0.010	<0.010	<0.010	4625467	<0.010	0.010	4625548
Aroclor 1221	ug/g	<0.010	<0.010	<0.010	4625467	<0.010	0.010	4625548
Aroclor 1232	ug/g	<0.010	<0.010	<0.010	4625467	<0.010	0.010	4625548
Aroclor 1242	ug/g	<0.010	<0.010	<0.010	4625467	<0.010	0.010	4625548
Aroclor 1248	ug/g	<0.010	<0.010	<0.010	4625467	<0.010	0.010	4625548
Aroclor 1254	ug/g	<0.010	<0.010	<0.010	4625467	<0.010	0.010	4625548
Aroclor 1260	ug/g	<0.010	<0.010	<0.010	4625467	<0.010	0.010	4625548
Aroclor 1262	ug/g	<0.010	<0.010	<0.010	4625467	<0.010	0.010	4625548
Aroclor 1268	ug/g	<0.010	<0.010	<0.010	4625467	<0.010	0.010	4625548
Total PCB	ug/g	<0.010	<0.010	<0.010	4625467	<0.010	0.010	4625548
Surrogate Recovery (%)								
Decachlorobiphenyl	%	67	73	68	4625467	82	N/A	4625548

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam ID		CXC628	CXC629	CXC630	CXC631		
Sampling Date		2016/08/11 10:30	2016/08/11 14:45	2016/08/11 14:45	2016/08/11 14:15		
COC Number		NA	NA	NA	NA		
	UNITS	PG6037\16-C1-26B	PG6038\16-C1-27A	PG6039\16-C1-27B	PG6040\16-C1-28A	RDL	QC Batch
PCBs							
Aroclor 1016	ug/g	<0.010	<0.010	<0.010	<0.010	0.010	4625467
Aroclor 1221	ug/g	<0.010	<0.010	<0.010	<0.010	0.010	4625467
Aroclor 1232	ug/g	<0.010	<0.010	<0.010	<0.010	0.010	4625467
Aroclor 1242	ug/g	<0.010	<0.010	<0.010	<0.010	0.010	4625467
Aroclor 1248	ug/g	<0.010	<0.010	<0.010	<0.010	0.010	4625467
Aroclor 1254	ug/g	<0.010	<0.010	<0.010	<0.010	0.010	4625467
Aroclor 1260	ug/g	<0.010	<0.010	<0.010	<0.010	0.010	4625467
Aroclor 1262	ug/g	<0.010	<0.010	<0.010	<0.010	0.010	4625467
Aroclor 1268	ug/g	<0.010	<0.010	<0.010	<0.010	0.010	4625467
Total PCB	ug/g	<0.010	<0.010	<0.010	<0.010	0.010	4625467
Surrogate Recovery (%)							
Decachlorobiphenyl	%	69	65	69	68	N/A	4625467

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

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POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID		CXC631	CXC632	CXC633	CXC634		
Sampling Date		2016/08/11 14:15	2016/08/11 14:15	2016/08/11 14:30	2016/08/11 14:30		
COC Number		NA	NA	NA	NA		
	UNITS	PG6040\16-C1-28A Lab-Dup	PG6041\16-C1-28B	PG6068\16-C1-29A	PG6069\16-C1-29B	RDL	QC Batch
PCBs							
Aroclor 1016	ug/g	<0.010	<0.010	<0.010	<0.010	0.010	4625467
Aroclor 1221	ug/g	<0.010	<0.010	<0.010	<0.010	0.010	4625467
Aroclor 1232	ug/g	<0.010	<0.010	<0.010	<0.010	0.010	4625467
Aroclor 1242	ug/g	<0.010	<0.010	<0.010	<0.010	0.010	4625467
Aroclor 1248	ug/g	<0.010	<0.010	<0.010	<0.010	0.010	4625467
Aroclor 1254	ug/g	<0.010	<0.010	<0.010	<0.010	0.010	4625467
Aroclor 1260	ug/g	<0.010	<0.010	<0.010	<0.010	0.010	4625467
Aroclor 1262	ug/g	<0.010	<0.010	<0.010	<0.010	0.010	4625467
Aroclor 1268	ug/g	<0.010	<0.010	<0.010	<0.010	0.010	4625467
Total PCB	ug/g	<0.010	<0.010	<0.010	<0.010	0.010	4625467
Surrogate Recovery (%)							
Decachlorobiphenyl	%	70	67	73	70	N/A	4625467

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

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Maxxam Job #: B6H4359
Report Date: 2016/08/24

Maxxam Analytics
Client Project #: B668559
Your P.O. #: N/A

POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID		CXC635	CXC636	CXC636	CXC637		
Sampling Date		2016/08/11 14:00	2016/08/11 14:00	2016/08/11 14:00	2016/08/11 15:00		
COC Number		NA	NA	NA	NA		
	UNITS	PG6070\16-C1-30A	PG6071\16-C1-30B	PG6071\16-C1-30B Lab-Dup	PG6072\16-C1-31A	RDL	QC Batch
PCBs							
Aroclor 1016	ug/g	<0.010	<0.010	<0.010	<0.010	0.010	4625548
Aroclor 1221	ug/g	<0.010	<0.010	<0.010	<0.010	0.010	4625548
Aroclor 1232	ug/g	<0.010	<0.010	<0.010	<0.010	0.010	4625548
Aroclor 1242	ug/g	<0.010	<0.010	<0.010	<0.010	0.010	4625548
Aroclor 1248	ug/g	<0.010	<0.010	<0.010	<0.010	0.010	4625548
Aroclor 1254	ug/g	<0.010	<0.010	<0.010	<0.010	0.010	4625548
Aroclor 1260	ug/g	<0.010	<0.010	<0.010	<0.010	0.010	4625548
Aroclor 1262	ug/g	<0.010	<0.010	<0.010	<0.010	0.010	4625548
Aroclor 1268	ug/g	<0.010	<0.010	<0.010	<0.010	0.010	4625548
Total PCB	ug/g	<0.010	<0.010	<0.010	<0.010	0.010	4625548
Surrogate Recovery (%)							
Decachlorobiphenyl	%	73	69	67	74	N/A	4625548

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

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POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID		CXC638	CXC639	CXC640	CXC641		
Sampling Date		2016/08/11 15:00	2016/08/11 16:00	2016/08/11 16:00	2016/08/11 16:30		
COC Number		NA	NA	NA	NA		
	UNITS	PG6073\16-C1-31B	PG6074\16-C1-32A	PG6075\16-C1-32B	PG6076\16-C1-33A	RDL	QC Batch
PCBs							
Aroclor 1016	ug/g	<0.010	<0.010	<0.010	<0.010	0.010	4625548
Aroclor 1221	ug/g	<0.010	<0.010	<0.010	<0.010	0.010	4625548
Aroclor 1232	ug/g	<0.010	<0.010	<0.010	<0.010	0.010	4625548
Aroclor 1242	ug/g	<0.010	<0.010	<0.010	<0.010	0.010	4625548
Aroclor 1248	ug/g	<0.010	<0.010	<0.010	<0.010	0.010	4625548
Aroclor 1254	ug/g	<0.010	<0.010	<0.010	<0.010	0.010	4625548
Aroclor 1260	ug/g	<0.010	<0.010	<0.010	<0.010	0.010	4625548
Aroclor 1262	ug/g	<0.010	<0.010	<0.010	<0.010	0.010	4625548
Aroclor 1268	ug/g	<0.010	<0.010	<0.010	<0.010	0.010	4625548
Total PCB	ug/g	<0.010	<0.010	<0.010	<0.010	0.010	4625548
Surrogate Recovery (%)							
Decachlorobiphenyl	%	73	81	76	82	N/A	4625548

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam ID		CXC642	CXC643	CXC644	CXC645		
Sampling Date		2016/08/11 16:30	2016/08/11 16:15	2016/08/11 16:15	2016/08/09		
COC Number		NA	NA	NA	NA		
	UNITS	PG6077\16-C1-33B	PG6078\16-C1-35A	PG6079\16-C1-35B	PG6087\C1-DUP1	RDL	QC Batch
PCBs							
Aroclor 1016	ug/g	<0.010	<0.010	<0.010	<0.010	0.010	4625548
Aroclor 1221	ug/g	<0.010	<0.010	<0.010	<0.010	0.010	4625548
Aroclor 1232	ug/g	<0.010	<0.010	<0.010	<0.010	0.010	4625548
Aroclor 1242	ug/g	<0.010	<0.010	<0.010	<0.010	0.010	4625548
Aroclor 1248	ug/g	<0.010	<0.010	<0.010	<0.010	0.010	4625548
Aroclor 1254	ug/g	<0.010	<0.010	<0.010	<0.010	0.010	4625548
Aroclor 1260	ug/g	<0.010	<0.010	<0.010	<0.010	0.010	4625548
Aroclor 1262	ug/g	<0.010	<0.010	<0.010	<0.010	0.010	4625548
Aroclor 1268	ug/g	<0.010	<0.010	<0.010	<0.010	0.010	4625548
Total PCB	ug/g	<0.010	<0.010	<0.010	<0.010	0.010	4625548
Surrogate Recovery (%)							
Decachlorobiphenyl	%	82	78	85	80	N/A	4625548

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

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Maxxam Job #: B6H4359
Report Date: 2016/08/24

Maxxam Analytics
Client Project #: B668559
Your P.O. #: N/A

POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID		CXC646	CXC647	CXC648	CXC649	CXC650		
Sampling Date		2016/08/09	2016/08/10	2016/08/10	2016/08/10	2016/08/11		
COC Number		NA	NA	NA	NA	NA		
	UNITS	PG6088\C1-DUP2	PG6089\C1-DUP3	PG6090\C1-DUP4	PG6091\C1-DUP5	PG6092\C1-DUP6	RDL	QC Batch
PCBs								
Aroclor 1016	ug/g	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	4625548
Aroclor 1221	ug/g	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	4625548
Aroclor 1232	ug/g	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	4625548
Aroclor 1242	ug/g	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	4625548
Aroclor 1248	ug/g	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	4625548
Aroclor 1254	ug/g	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	4625548
Aroclor 1260	ug/g	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	4625548
Aroclor 1262	ug/g	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	4625548
Aroclor 1268	ug/g	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	4625548
Total PCB	ug/g	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	4625548
Surrogate Recovery (%)								
Decachlorobiphenyl	%	73	78	83	82	82	N/A	4625548

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam ID		CXC651	CXC652		
Sampling Date		2016/08/11	2016/08/11		
COC Number		NA	NA		
	UNITS	PG6093\C1-DUP7	PG6094\C1-DUP8	RDL	QC Batch
PCBs					
Aroclor 1016	ug/g	<0.010	<0.010	0.010	4625548
Aroclor 1221	ug/g	<0.010	<0.010	0.010	4625548
Aroclor 1232	ug/g	<0.010	<0.010	0.010	4625548
Aroclor 1242	ug/g	<0.010	<0.010	0.010	4625548
Aroclor 1248	ug/g	<0.010	<0.010	0.010	4625548
Aroclor 1254	ug/g	<0.010	<0.010	0.010	4625548
Aroclor 1260	ug/g	<0.010	<0.010	0.010	4625548
Aroclor 1262	ug/g	<0.010	<0.010	0.010	4625548
Aroclor 1268	ug/g	<0.010	<0.010	0.010	4625548
Total PCB	ug/g	<0.010	<0.010	0.010	4625548
Surrogate Recovery (%)					
Decachlorobiphenyl	%	81	73	N/A	4625548

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

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Maxxam Job #: B6H4359
Report Date: 2016/08/24

Maxxam Analytics
Client Project #: B668559
Your P.O. #: N/A

POLYCHLORINATED BIPHENYLS BY GC-ECD (WATER)

Maxxam ID		CXC653	CXC653	CXC654	CXC655		
Sampling Date		2016/08/10 11:00	2016/08/10 11:00	2016/08/10 14:15	2016/08/10		
COC Number		NA	NA	NA	NA		
	UNITS	PG6137\C1-MW05	PG6137\C1-MW05 Lab-Dup	PG6138\C1-MW03	PG6139\C1-DUP1	RDL	QC Batch
PCBs							
Aroclor 1016	ug/L	<0.05	<0.05	<0.05	<0.05	0.05	4627309
Aroclor 1221	ug/L	<0.05	<0.05	<0.05	<0.05	0.05	4627309
Aroclor 1232	ug/L	<0.05	<0.05	<0.05	<0.05	0.05	4627309
Aroclor 1242	ug/L	<0.05	<0.05	<0.05	<0.05	0.05	4627309
Aroclor 1248	ug/L	<0.05	<0.05	<0.05	<0.05	0.05	4627309
Aroclor 1254	ug/L	<0.05	<0.05	<0.05	<0.05	0.05	4627309
Aroclor 1260	ug/L	<0.05	<0.05	<0.05	<0.05	0.05	4627309
Aroclor 1262	ug/L	<0.05	<0.05	<0.05	<0.05	0.05	4627309
Aroclor 1268	ug/L	<0.05	<0.05	<0.05	<0.05	0.05	4627309
Total PCB	ug/L	<0.05	<0.05	<0.05	<0.05	0.05	4627309
Surrogate Recovery (%)							
Decachlorobiphenyl	%	55 (1)	54 (1)	59 (1)	52 (1)	N/A	4627309

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable
(1) Due to matrix interference, the Surrogate recovery was below the control limit as stipulated by Ontario Regulation 153, however, this recovery is still within Maxxam's performance based limits. Results reported with surrogate recoveries within this range are still valid but may have an associated low bias.

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TEST SUMMARY

Maxxam ID: CXC564 **Collected:** 2016/08/09
Sample ID: PG5955\16-C1-1A **Shipped:**
Matrix: Soil **Received:** 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4627181	N/A	2016/08/19	Shyanika Patel
Polychlorinated Biphenyl in Soil	GC/ECD	4625667	2016/08/18	2016/08/19	Dawn Alarie

Maxxam ID: CXC565 **Collected:** 2016/08/09
Sample ID: PG5956\16-C1-1B **Shipped:**
Matrix: Soil **Received:** 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4628417	N/A	2016/08/20	Shivani Desai
Polychlorinated Biphenyl in Soil	GC/ECD	4625519	2016/08/18	2016/08/20	Dawn Alarie

Maxxam ID: CXC566 **Collected:** 2016/08/09
Sample ID: PG5957\16-C1-2A **Shipped:**
Matrix: Soil **Received:** 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4628417	N/A	2016/08/20	Shivani Desai
Polychlorinated Biphenyl in Soil	GC/ECD	4625519	2016/08/18	2016/08/20	Dawn Alarie

Maxxam ID: CXC567 **Collected:** 2016/08/09
Sample ID: PG5958\16-C1-2B **Shipped:**
Matrix: Soil **Received:** 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4628417	N/A	2016/08/20	Shivani Desai
Polychlorinated Biphenyl in Soil	GC/ECD	4625519	2016/08/18	2016/08/20	Dawn Alarie

Maxxam ID: CXC568 **Collected:** 2016/08/09
Sample ID: PG5959\16-C1-3A **Shipped:**
Matrix: Soil **Received:** 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4628417	N/A	2016/08/20	Shivani Desai
Polychlorinated Biphenyl in Soil	GC/ECD	4625519	2016/08/18	2016/08/20	Dawn Alarie

Maxxam ID: CXC569 **Collected:** 2016/08/09
Sample ID: PG5960\16-C1-3B **Shipped:**
Matrix: Soil **Received:** 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4628417	N/A	2016/08/20	Shivani Desai
Polychlorinated Biphenyl in Soil	GC/ECD	4625519	2016/08/18	2016/08/20	Dawn Alarie

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TEST SUMMARY

Maxxam ID: CXC570 **Collected:** 2016/08/09
Sample ID: PG5961\16-C1-4A **Shipped:**
Matrix: Soil **Received:** 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4628439	N/A	2016/08/20	Valentina Kaftani
Polychlorinated Biphenyl in Soil	GC/ECD	4625414	2016/08/18	2016/08/21	Farahnaz Somwaru

Maxxam ID: CXC571 **Collected:** 2016/08/09
Sample ID: PG5962\16-C1-4B **Shipped:**
Matrix: Soil **Received:** 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4628439	N/A	2016/08/20	Valentina Kaftani
Polychlorinated Biphenyl in Soil	GC/ECD	4625414	2016/08/18	2016/08/21	Farahnaz Somwaru

Maxxam ID: CXC572 **Collected:** 2016/08/09
Sample ID: PG5963\16-C1-5A **Shipped:**
Matrix: Soil **Received:** 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4627181	N/A	2016/08/19	Shyanika Patel
Polychlorinated Biphenyl in Soil	GC/ECD	4625667	2016/08/18	2016/08/19	Dawn Alarie

Maxxam ID: CXC573 **Collected:** 2016/08/09
Sample ID: PG5964\16-C1-5B **Shipped:**
Matrix: Soil **Received:** 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4628417	N/A	2016/08/20	Shivani Desai
Polychlorinated Biphenyl in Soil	GC/ECD	4625519	2016/08/18	2016/08/20	Dawn Alarie

Maxxam ID: CXC573 Dup **Collected:** 2016/08/09
Sample ID: PG5964\16-C1-5B **Shipped:**
Matrix: Soil **Received:** 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4628417	N/A	2016/08/20	Shivani Desai
Polychlorinated Biphenyl in Soil	GC/ECD	4625519	2016/08/18	2016/08/20	Dawn Alarie

Maxxam ID: CXC574 **Collected:** 2016/08/09
Sample ID: PG5973\16-C1-6A **Shipped:**
Matrix: Soil **Received:** 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4628400	N/A	2016/08/20	Shivani Desai
Polychlorinated Biphenyl in Soil	GC/ECD	4625519	2016/08/18	2016/08/20	Dawn Alarie

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TEST SUMMARY

Maxxam ID: CXC575 **Collected:** 2016/08/09
Sample ID: PG5974\16-C1-6B **Shipped:**
Matrix: Soil **Received:** 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4628417	N/A	2016/08/20	Shivani Desai
Polychlorinated Biphenyl in Soil	GC/ECD	4625519	2016/08/18	2016/08/20	Dawn Alarie

Maxxam ID: CXC576 **Collected:** 2016/08/09
Sample ID: PG5975\16-C1-7A **Shipped:**
Matrix: Soil **Received:** 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4628439	N/A	2016/08/20	Valentina Kaftani
Polychlorinated Biphenyl in Soil	GC/ECD	4625519	2016/08/18	2016/08/20	Dawn Alarie

Maxxam ID: CXC577 **Collected:** 2016/08/09
Sample ID: PG5976\16-C1-7B **Shipped:**
Matrix: Soil **Received:** 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4628439	N/A	2016/08/20	Valentina Kaftani
Polychlorinated Biphenyl in Soil	GC/ECD	4625414	2016/08/18	2016/08/21	Farahnaz Somwaru

Maxxam ID: CXC578 **Collected:** 2016/08/09
Sample ID: PG5977\16-C1-8A **Shipped:**
Matrix: Soil **Received:** 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4628439	N/A	2016/08/20	Valentina Kaftani
Polychlorinated Biphenyl in Soil	GC/ECD	4625414	2016/08/18	2016/08/21	Farahnaz Somwaru

Maxxam ID: CXC579 **Collected:** 2016/08/09
Sample ID: PG5978\16-C1-8B **Shipped:**
Matrix: Soil **Received:** 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4628439	N/A	2016/08/20	Valentina Kaftani
Polychlorinated Biphenyl in Soil	GC/ECD	4625414	2016/08/18	2016/08/21	Farahnaz Somwaru

Maxxam ID: CXC580 **Collected:** 2016/08/09
Sample ID: PG5979\16-C1-9A **Shipped:**
Matrix: Soil **Received:** 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4627181	N/A	2016/08/19	Shyanika Patel
Polychlorinated Biphenyl in Soil	GC/ECD	4625667	2016/08/18	2016/08/19	Dawn Alarie

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TEST SUMMARY

Maxxam ID: CXC581 **Collected:** 2016/08/09
Sample ID: PG5980\16-C1-9B **Shipped:**
Matrix: Soil **Received:** 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4628417	N/A	2016/08/20	Shivani Desai
Polychlorinated Biphenyl in Soil	GC/ECD	4625519	2016/08/18	2016/08/20	Dawn Alarie

Maxxam ID: CXC582 **Collected:** 2016/08/10
Sample ID: PG5981\16-C1-10A **Shipped:**
Matrix: Soil **Received:** 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4628417	N/A	2016/08/20	Shivani Desai
Polychlorinated Biphenyl in Soil	GC/ECD	4625519	2016/08/18	2016/08/20	Dawn Alarie

Maxxam ID: CXC583 **Collected:** 2016/08/10
Sample ID: PG5982\16-C1-10B **Shipped:**
Matrix: Soil **Received:** 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4628417	N/A	2016/08/20	Shivani Desai
Polychlorinated Biphenyl in Soil	GC/ECD	4625519	2016/08/18	2016/08/20	Dawn Alarie

Maxxam ID: CXC584 **Collected:** 2016/08/10
Sample ID: PG5986\16-C1-11A **Shipped:**
Matrix: Soil **Received:** 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4628417	N/A	2016/08/20	Shivani Desai
Polychlorinated Biphenyl in Soil	GC/ECD	4625414	2016/08/18	2016/08/21	Farahnaz Somwaru

Maxxam ID: CXC585 **Collected:** 2016/08/10
Sample ID: PG5987\16-C1-11B **Shipped:**
Matrix: Soil **Received:** 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4628417	N/A	2016/08/20	Shivani Desai
Polychlorinated Biphenyl in Soil	GC/ECD	4625414	2016/08/18	2016/08/21	Farahnaz Somwaru

Maxxam ID: CXC586 **Collected:** 2016/08/10
Sample ID: PG5988\16-C1-12A **Shipped:**
Matrix: Soil **Received:** 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4628439	N/A	2016/08/20	Valentina Kaftani
Polychlorinated Biphenyl in Soil	GC/ECD	4625414	2016/08/18	2016/08/21	Farahnaz Somwaru

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TEST SUMMARY

Maxxam ID: CXC586 Dup
Sample ID: PG5988\16-C1-12A
Matrix: Soil
Collected: 2016/08/10
Shipped:
Received: 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4628439	N/A	2016/08/20	Valentina Kaftani

Maxxam ID: CXC587
Sample ID: PG5989\16-C1-12B
Matrix: Soil
Collected: 2016/08/10
Shipped:
Received: 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4628417	N/A	2016/08/20	Shivani Desai
Polychlorinated Biphenyl in Soil	GC/ECD	4625414	2016/08/18	2016/08/21	Farahnaz Somwaru

Maxxam ID: CXC588
Sample ID: PG5990\16-C1-13A
Matrix: Soil
Collected: 2016/08/10
Shipped:
Received: 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4627181	N/A	2016/08/19	Shyanika Patel
Polychlorinated Biphenyl in Soil	GC/ECD	4625667	2016/08/18	2016/08/19	Dawn Alarie

Maxxam ID: CXC589
Sample ID: PG5991\16-C1-13B
Matrix: Soil
Collected: 2016/08/10
Shipped:
Received: 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4627181	N/A	2016/08/19	Shyanika Patel
Polychlorinated Biphenyl in Soil	GC/ECD	4625667	2016/08/18	2016/08/19	Dawn Alarie

Maxxam ID: CXC590
Sample ID: PG5992\16-C1-MW01A
Matrix: Soil
Collected: 2016/08/10
Shipped:
Received: 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4628417	N/A	2016/08/20	Shivani Desai
Polychlorinated Biphenyl in Soil	GC/ECD	4625519	2016/08/18	2016/08/20	Dawn Alarie

Maxxam ID: CXC591
Sample ID: PG5993\16-C1-MW01B
Matrix: Soil
Collected: 2016/08/10
Shipped:
Received: 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4628400	N/A	2016/08/20	Shivani Desai
Polychlorinated Biphenyl in Soil	GC/ECD	4625519	2016/08/18	2016/08/20	Dawn Alarie

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TEST SUMMARY

Maxxam ID: CXC592 **Collected:** 2016/08/10
Sample ID: PG5994\16-C1-MW02A **Shipped:**
Matrix: Soil **Received:** 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4628417	N/A	2016/08/20	Shivani Desai
Polychlorinated Biphenyl in Soil	GC/ECD	4625414	2016/08/18	2016/08/21	Farahnaz Somwaru

Maxxam ID: CXC593 **Collected:** 2016/08/10
Sample ID: PG5995\16-C1-MW03A **Shipped:**
Matrix: Soil **Received:** 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4628439	N/A	2016/08/20	Valentina Kaftani
Polychlorinated Biphenyl in Soil	GC/ECD	4625414	2016/08/18	2016/08/21	Farahnaz Somwaru

Maxxam ID: CXC594 **Collected:** 2016/08/10
Sample ID: PG5997\16-C1-MW03B **Shipped:**
Matrix: Soil **Received:** 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4628417	N/A	2016/08/20	Shivani Desai
Polychlorinated Biphenyl in Soil	GC/ECD	4625519	2016/08/18	2016/08/20	Dawn Alarie

Maxxam ID: CXC595 **Collected:** 2016/08/10
Sample ID: PG5998\16-C1-MW04A **Shipped:**
Matrix: Soil **Received:** 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4628417	N/A	2016/08/20	Shivani Desai
Polychlorinated Biphenyl in Soil	GC/ECD	4625414	2016/08/18	2016/08/21	Farahnaz Somwaru

Maxxam ID: CXC596 **Collected:** 2016/08/10
Sample ID: PG5999\16-C1-MW04B **Shipped:**
Matrix: Soil **Received:** 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4627181	N/A	2016/08/19	Shyanika Patel
Polychlorinated Biphenyl in Soil	GC/ECD	4625667	2016/08/18	2016/08/18	Dawn Alarie

Maxxam ID: CXC596 Dup **Collected:** 2016/08/10
Sample ID: PG5999\16-C1-MW04B **Shipped:**
Matrix: Soil **Received:** 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Polychlorinated Biphenyl in Soil	GC/ECD	4625667	2016/08/18	2016/08/19	Dawn Alarie

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TEST SUMMARY

Maxxam ID: CXC597 **Collected:** 2016/08/10
Sample ID: PG6000\16-C1-MW05A **Shipped:**
Matrix: Soil **Received:** 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4627181	N/A	2016/08/19	Shyanika Patel
Polychlorinated Biphenyl in Soil	GC/ECD	4625667	2016/08/18	2016/08/19	Dawn Alarie

Maxxam ID: CXC598 **Collected:** 2016/08/10
Sample ID: PG6001\16-C1-MW05B **Shipped:**
Matrix: Soil **Received:** 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4628400	N/A	2016/08/20	Shivani Desai
Polychlorinated Biphenyl in Soil	GC/ECD	4625519	2016/08/18	2016/08/20	Dawn Alarie

Maxxam ID: CXC599 **Collected:** 2016/08/10
Sample ID: PG6002\16-C1-MW06A **Shipped:**
Matrix: Soil **Received:** 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4628417	N/A	2016/08/20	Shivani Desai
Polychlorinated Biphenyl in Soil	GC/ECD	4625519	2016/08/18	2016/08/20	Dawn Alarie

Maxxam ID: CXC600 **Collected:** 2016/08/10
Sample ID: PG6003\16-C1-MW06B **Shipped:**
Matrix: Soil **Received:** 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4628439	N/A	2016/08/20	Valentina Kaftani
Polychlorinated Biphenyl in Soil	GC/ECD	4625414	2016/08/18	2016/08/21	Farahnaz Somwaru

Maxxam ID: CXC601 **Collected:** 2016/08/10
Sample ID: PG6004\16-C1-MW07A **Shipped:**
Matrix: Soil **Received:** 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4628439	N/A	2016/08/20	Valentina Kaftani
Polychlorinated Biphenyl in Soil	GC/ECD	4625414	2016/08/18	2016/08/21	Farahnaz Somwaru

Maxxam ID: CXC602 **Collected:** 2016/08/10
Sample ID: PG6005\16-C1-MW07B **Shipped:**
Matrix: Soil **Received:** 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4628439	N/A	2016/08/20	Valentina Kaftani
Polychlorinated Biphenyl in Soil	GC/ECD	4625414	2016/08/18	2016/08/21	Farahnaz Somwaru

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TEST SUMMARY

Maxxam ID: CXC603 **Collected:** 2016/08/10
Sample ID: PG6008\16-C1-MW08A **Shipped:**
Matrix: Soil **Received:** 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4628439	N/A	2016/08/20	Valentina Kaftani
Polychlorinated Biphenyl in Soil	GC/ECD	4625414	2016/08/18	2016/08/21	Farahnaz Somwaru

Maxxam ID: CXC604 **Collected:** 2016/08/10
Sample ID: PG6009\16-C1-MW08B **Shipped:**
Matrix: Soil **Received:** 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4627181	N/A	2016/08/19	Shyanika Patel
Polychlorinated Biphenyl in Soil	GC/ECD	4625667	2016/08/18	2016/08/19	Dawn Alarie

Maxxam ID: CXC605 **Collected:** 2016/08/10
Sample ID: PG6010\16-C1-14A **Shipped:**
Matrix: Soil **Received:** 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4628417	N/A	2016/08/20	Shivani Desai
Polychlorinated Biphenyl in Soil	GC/ECD	4625519	2016/08/18	2016/08/20	Dawn Alarie

Maxxam ID: CXC606 **Collected:** 2016/08/10
Sample ID: PG6011\16-C1-14B **Shipped:**
Matrix: Soil **Received:** 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4628400	N/A	2016/08/20	Shivani Desai
Polychlorinated Biphenyl in Soil	GC/ECD	4625519	2016/08/18	2016/08/20	Dawn Alarie

Maxxam ID: CXC607 **Collected:** 2016/08/10
Sample ID: PG6012\16-C1-15A **Shipped:**
Matrix: Soil **Received:** 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4628417	N/A	2016/08/20	Shivani Desai
Polychlorinated Biphenyl in Soil	GC/ECD	4625519	2016/08/18	2016/08/20	Dawn Alarie

Maxxam ID: CXC608 **Collected:** 2016/08/10
Sample ID: PG6013\16-C1-15B **Shipped:**
Matrix: Soil **Received:** 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4628439	N/A	2016/08/20	Valentina Kaftani
Polychlorinated Biphenyl in Soil	GC/ECD	4625414	2016/08/18	2016/08/21	Farahnaz Somwaru

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TEST SUMMARY

Maxxam ID: CXC609 **Collected:** 2016/08/10
Sample ID: PG6014\16-C1-16A **Shipped:**
Matrix: Soil **Received:** 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4628439	N/A	2016/08/20	Valentina Kaftani
Polychlorinated Biphenyl in Soil	GC/ECD	4625414	2016/08/18	2016/08/21	Farahnaz Somwaru

Maxxam ID: CXC609 Dup **Collected:** 2016/08/10
Sample ID: PG6014\16-C1-16A **Shipped:**
Matrix: Soil **Received:** 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Polychlorinated Biphenyl in Soil	GC/ECD	4625414	2016/08/18	2016/08/21	Farahnaz Somwaru

Maxxam ID: CXC610 **Collected:** 2016/08/10
Sample ID: PG6015\16-C1-16B **Shipped:**
Matrix: Soil **Received:** 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4628439	N/A	2016/08/20	Valentina Kaftani
Polychlorinated Biphenyl in Soil	GC/ECD	4625414	2016/08/18	2016/08/21	Farahnaz Somwaru

Maxxam ID: CXC611 **Collected:** 2016/08/10
Sample ID: PG6016\16-C1-17A **Shipped:**
Matrix: Soil **Received:** 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4628439	N/A	2016/08/20	Valentina Kaftani
Polychlorinated Biphenyl in Soil	GC/ECD	4625414	2016/08/18	2016/08/21	Farahnaz Somwaru

Maxxam ID: CXC612 **Collected:** 2016/08/10
Sample ID: PG6017\16-C1-17B **Shipped:**
Matrix: Soil **Received:** 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4627181	N/A	2016/08/19	Shyanika Patel
Polychlorinated Biphenyl in Soil	GC/ECD	4625667	2016/08/18	2016/08/19	Dawn Alarie

Maxxam ID: CXC613 **Collected:** 2016/08/10
Sample ID: PG6018\16-C1-18A **Shipped:**
Matrix: Soil **Received:** 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4626854	N/A	2016/08/19	Nimarta Singh
Polychlorinated Biphenyl in Soil	GC/ECD	4625467	2016/08/18	2016/08/21	Farahnaz Somwaru

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TEST SUMMARY

Maxxam ID: CXC613 Dup
Sample ID: PG6018\16-C1-18A
Matrix: Soil
Collected: 2016/08/10
Shipped:
Received: 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4626854	N/A	2016/08/19	Nimarta Singh

Maxxam ID: CXC614
Sample ID: PG6019\16-C1-18B
Matrix: Soil
Collected: 2016/08/10
Shipped:
Received: 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4626854	N/A	2016/08/19	Nimarta Singh
Polychlorinated Biphenyl in Soil	GC/ECD	4625467	2016/08/18	2016/08/21	Farahnaz Somwaru

Maxxam ID: CXC615
Sample ID: PG6020\16-C1-19A
Matrix: Soil
Collected: 2016/08/11
Shipped:
Received: 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4626854	N/A	2016/08/19	Nimarta Singh
Polychlorinated Biphenyl in Soil	GC/ECD	4625467	2016/08/18	2016/08/21	Farahnaz Somwaru

Maxxam ID: CXC616
Sample ID: PG6021\16-C1-19B
Matrix: Soil
Collected: 2016/08/11
Shipped:
Received: 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4626854	N/A	2016/08/19	Nimarta Singh
Polychlorinated Biphenyl in Soil	GC/ECD	4625467	2016/08/18	2016/08/21	Farahnaz Somwaru

Maxxam ID: CXC617
Sample ID: PG6022\16-C1-20A
Matrix: Soil
Collected: 2016/08/11
Shipped:
Received: 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4626854	N/A	2016/08/19	Nimarta Singh
Polychlorinated Biphenyl in Soil	GC/ECD	4625467	2016/08/18	2016/08/21	Farahnaz Somwaru

Maxxam ID: CXC618
Sample ID: PG6023\16-C1-20B
Matrix: Soil
Collected: 2016/08/11
Shipped:
Received: 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4626854	N/A	2016/08/19	Nimarta Singh
Polychlorinated Biphenyl in Soil	GC/ECD	4625467	2016/08/18	2016/08/21	Farahnaz Somwaru

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TEST SUMMARY

Maxxam ID: CXC619 **Collected:** 2016/08/11
Sample ID: PG6024\16-C1-21A **Shipped:**
Matrix: Soil **Received:** 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4626984	N/A	2016/08/19	Nimarta Singh
Polychlorinated Biphenyl in Soil	GC/ECD	4625548	2016/08/18	2016/08/20	Dawn Alarie

Maxxam ID: CXC620 **Collected:** 2016/08/11
Sample ID: PG6025\16-C1-21B **Shipped:**
Matrix: Soil **Received:** 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4626854	N/A	2016/08/19	Nimarta Singh
Polychlorinated Biphenyl in Soil	GC/ECD	4625467	2016/08/18	2016/08/21	Farahnaz Somwaru

Maxxam ID: CXC621 **Collected:** 2016/08/11
Sample ID: PG6026\16-C1-22A **Shipped:**
Matrix: Soil **Received:** 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4626854	N/A	2016/08/19	Nimarta Singh
Polychlorinated Biphenyl in Soil	GC/ECD	4625467	2016/08/18	2016/08/21	Farahnaz Somwaru

Maxxam ID: CXC622 **Collected:** 2016/08/11
Sample ID: PG6027\16-C1-22B **Shipped:**
Matrix: Soil **Received:** 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4626854	N/A	2016/08/19	Nimarta Singh
Polychlorinated Biphenyl in Soil	GC/ECD	4625467	2016/08/18	2016/08/21	Farahnaz Somwaru

Maxxam ID: CXC623 **Collected:** 2016/08/11
Sample ID: PG6032\16-C1-23A **Shipped:**
Matrix: Soil **Received:** 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4626854	N/A	2016/08/19	Nimarta Singh
Polychlorinated Biphenyl in Soil	GC/ECD	4625467	2016/08/18	2016/08/21	Farahnaz Somwaru

Maxxam ID: CXC624 **Collected:** 2016/08/11
Sample ID: PG6033\16-C1-24A **Shipped:**
Matrix: Soil **Received:** 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4626854	N/A	2016/08/19	Nimarta Singh
Polychlorinated Biphenyl in Soil	GC/ECD	4625467	2016/08/18	2016/08/21	Farahnaz Somwaru

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TEST SUMMARY

Maxxam ID: CXC625 **Collected:** 2016/08/11
Sample ID: PG6034\16-C1-24B **Shipped:**
Matrix: Soil **Received:** 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4626854	N/A	2016/08/19	Nimarta Singh
Polychlorinated Biphenyl in Soil	GC/ECD	4625467	2016/08/18	2016/08/21	Farahnaz Somwaru

Maxxam ID: CXC626 **Collected:** 2016/08/11
Sample ID: PG6035\16-C1-25A **Shipped:**
Matrix: Soil **Received:** 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4626854	N/A	2016/08/19	Nimarta Singh
Polychlorinated Biphenyl in Soil	GC/ECD	4625467	2016/08/18	2016/08/21	Farahnaz Somwaru

Maxxam ID: CXC627 **Collected:** 2016/08/11
Sample ID: PG6036\16-C1-26A **Shipped:**
Matrix: Soil **Received:** 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4626984	N/A	2016/08/19	Nimarta Singh
Polychlorinated Biphenyl in Soil	GC/ECD	4625548	2016/08/18	2016/08/20	Dawn Alarie

Maxxam ID: CXC628 **Collected:** 2016/08/11
Sample ID: PG6037\16-C1-26B **Shipped:**
Matrix: Soil **Received:** 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4626854	N/A	2016/08/19	Nimarta Singh
Polychlorinated Biphenyl in Soil	GC/ECD	4625467	2016/08/18	2016/08/21	Farahnaz Somwaru

Maxxam ID: CXC629 **Collected:** 2016/08/11
Sample ID: PG6038\16-C1-27A **Shipped:**
Matrix: Soil **Received:** 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4626854	N/A	2016/08/19	Nimarta Singh
Polychlorinated Biphenyl in Soil	GC/ECD	4625467	2016/08/18	2016/08/21	Farahnaz Somwaru

Maxxam ID: CXC630 **Collected:** 2016/08/11
Sample ID: PG6039\16-C1-27B **Shipped:**
Matrix: Soil **Received:** 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4626854	N/A	2016/08/19	Nimarta Singh
Polychlorinated Biphenyl in Soil	GC/ECD	4625467	2016/08/18	2016/08/21	Farahnaz Somwaru

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TEST SUMMARY

Maxxam ID: CXC631 **Collected:** 2016/08/11
Sample ID: PG6040\16-C1-28A **Shipped:**
Matrix: Soil **Received:** 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4626854	N/A	2016/08/19	Nimarta Singh
Polychlorinated Biphenyl in Soil	GC/ECD	4625467	2016/08/18	2016/08/21	Farahnaz Somwaru

Maxxam ID: CXC631 Dup **Collected:** 2016/08/11
Sample ID: PG6040\16-C1-28A **Shipped:**
Matrix: Soil **Received:** 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Polychlorinated Biphenyl in Soil	GC/ECD	4625467	2016/08/18	2016/08/21	Farahnaz Somwaru

Maxxam ID: CXC632 **Collected:** 2016/08/11
Sample ID: PG6041\16-C1-28B **Shipped:**
Matrix: Soil **Received:** 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4626854	N/A	2016/08/19	Nimarta Singh
Polychlorinated Biphenyl in Soil	GC/ECD	4625467	2016/08/18	2016/08/21	Farahnaz Somwaru

Maxxam ID: CXC633 **Collected:** 2016/08/11
Sample ID: PG6068\16-C1-29A **Shipped:**
Matrix: Soil **Received:** 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4626854	N/A	2016/08/19	Nimarta Singh
Polychlorinated Biphenyl in Soil	GC/ECD	4625467	2016/08/18	2016/08/21	Farahnaz Somwaru

Maxxam ID: CXC634 **Collected:** 2016/08/11
Sample ID: PG6069\16-C1-29B **Shipped:**
Matrix: Soil **Received:** 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4626854	N/A	2016/08/19	Nimarta Singh
Polychlorinated Biphenyl in Soil	GC/ECD	4625467	2016/08/18	2016/08/21	Farahnaz Somwaru

Maxxam ID: CXC635 **Collected:** 2016/08/11
Sample ID: PG6070\16-C1-30A **Shipped:**
Matrix: Soil **Received:** 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4626984	N/A	2016/08/19	Nimarta Singh
Polychlorinated Biphenyl in Soil	GC/ECD	4625548	2016/08/18	2016/08/20	Dawn Alarie

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TEST SUMMARY

Maxxam ID: CXC636 **Collected:** 2016/08/11
Sample ID: PG6071\16-C1-30B **Shipped:**
Matrix: Soil **Received:** 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4626984	N/A	2016/08/19	Nimarta Singh
Polychlorinated Biphenyl in Soil	GC/ECD	4625548	2016/08/18	2016/08/20	Dawn Alarie

Maxxam ID: CXC636 Dup **Collected:** 2016/08/11
Sample ID: PG6071\16-C1-30B **Shipped:**
Matrix: Soil **Received:** 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Polychlorinated Biphenyl in Soil	GC/ECD	4625548	2016/08/18	2016/08/20	Dawn Alarie

Maxxam ID: CXC637 **Collected:** 2016/08/11
Sample ID: PG6072\16-C1-31A **Shipped:**
Matrix: Soil **Received:** 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4626984	N/A	2016/08/19	Nimarta Singh
Polychlorinated Biphenyl in Soil	GC/ECD	4625548	2016/08/18	2016/08/20	Dawn Alarie

Maxxam ID: CXC638 **Collected:** 2016/08/11
Sample ID: PG6073\16-C1-31B **Shipped:**
Matrix: Soil **Received:** 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4626984	N/A	2016/08/19	Nimarta Singh
Polychlorinated Biphenyl in Soil	GC/ECD	4625548	2016/08/18	2016/08/20	Dawn Alarie

Maxxam ID: CXC639 **Collected:** 2016/08/11
Sample ID: PG6074\16-C1-32A **Shipped:**
Matrix: Soil **Received:** 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4626984	N/A	2016/08/19	Nimarta Singh
Polychlorinated Biphenyl in Soil	GC/ECD	4625548	2016/08/18	2016/08/20	Dawn Alarie

Maxxam ID: CXC640 **Collected:** 2016/08/11
Sample ID: PG6075\16-C1-32B **Shipped:**
Matrix: Soil **Received:** 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4626984	N/A	2016/08/19	Nimarta Singh
Polychlorinated Biphenyl in Soil	GC/ECD	4625548	2016/08/18	2016/08/20	Dawn Alarie

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Maxxam Job #: B6H4359
Report Date: 2016/08/24

Maxxam Analytics
Client Project #: B668559
Your P.O. #: N/A

TEST SUMMARY

Maxxam ID: CXC641
Sample ID: PG6076\16-C1-33A
Matrix: Soil

Collected: 2016/08/11
Shipped:
Received: 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4626984	N/A	2016/08/19	Nimarta Singh
Polychlorinated Biphenyl in Soil	GC/ECD	4625548	2016/08/18	2016/08/20	Dawn Alarie

Maxxam ID: CXC642
Sample ID: PG6077\16-C1-33B
Matrix: Soil

Collected: 2016/08/11
Shipped:
Received: 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4626984	N/A	2016/08/19	Nimarta Singh
Polychlorinated Biphenyl in Soil	GC/ECD	4625548	2016/08/18	2016/08/20	Dawn Alarie

Maxxam ID: CXC643
Sample ID: PG6078\16-C1-35A
Matrix: Soil

Collected: 2016/08/11
Shipped:
Received: 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4626984	N/A	2016/08/19	Nimarta Singh
Polychlorinated Biphenyl in Soil	GC/ECD	4625548	2016/08/18	2016/08/20	Dawn Alarie

Maxxam ID: CXC644
Sample ID: PG6079\16-C1-35B
Matrix: Soil

Collected: 2016/08/11
Shipped:
Received: 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4626984	N/A	2016/08/19	Nimarta Singh
Polychlorinated Biphenyl in Soil	GC/ECD	4625548	2016/08/18	2016/08/20	Dawn Alarie

Maxxam ID: CXC645
Sample ID: PG6087\C1-DUP1
Matrix: Soil

Collected: 2016/08/09
Shipped:
Received: 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4626984	N/A	2016/08/19	Nimarta Singh
Polychlorinated Biphenyl in Soil	GC/ECD	4625548	2016/08/18	2016/08/20	Dawn Alarie

Maxxam ID: CXC645 Dup
Sample ID: PG6087\C1-DUP1
Matrix: Soil

Collected: 2016/08/09
Shipped:
Received: 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4626984	N/A	2016/08/19	Nimarta Singh

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TEST SUMMARY

Maxxam ID: CXC646 **Collected:** 2016/08/09
Sample ID: PG6088\C1-DUP2 **Shipped:**
Matrix: Soil **Received:** 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4626984	N/A	2016/08/19	Nimarta Singh
Polychlorinated Biphenyl in Soil	GC/ECD	4625548	2016/08/18	2016/08/20	Dawn Alarie

Maxxam ID: CXC647 **Collected:** 2016/08/10
Sample ID: PG6089\C1-DUP3 **Shipped:**
Matrix: Soil **Received:** 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4626984	N/A	2016/08/19	Nimarta Singh
Polychlorinated Biphenyl in Soil	GC/ECD	4625548	2016/08/18	2016/08/20	Dawn Alarie

Maxxam ID: CXC648 **Collected:** 2016/08/10
Sample ID: PG6090\C1-DUP4 **Shipped:**
Matrix: Soil **Received:** 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4626984	N/A	2016/08/19	Nimarta Singh
Polychlorinated Biphenyl in Soil	GC/ECD	4625548	2016/08/18	2016/08/20	Dawn Alarie

Maxxam ID: CXC649 **Collected:** 2016/08/10
Sample ID: PG6091\C1-DUP5 **Shipped:**
Matrix: Soil **Received:** 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4626984	N/A	2016/08/19	Nimarta Singh
Polychlorinated Biphenyl in Soil	GC/ECD	4625548	2016/08/18	2016/08/20	Dawn Alarie

Maxxam ID: CXC650 **Collected:** 2016/08/11
Sample ID: PG6092\C1-DUP6 **Shipped:**
Matrix: Soil **Received:** 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4626984	N/A	2016/08/19	Nimarta Singh
Polychlorinated Biphenyl in Soil	GC/ECD	4625548	2016/08/18	2016/08/20	Dawn Alarie

Maxxam ID: CXC651 **Collected:** 2016/08/11
Sample ID: PG6093\C1-DUP7 **Shipped:**
Matrix: Soil **Received:** 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4626984	N/A	2016/08/19	Nimarta Singh
Polychlorinated Biphenyl in Soil	GC/ECD	4625548	2016/08/18	2016/08/20	Dawn Alarie

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Maxxam Job #: B6H4359
Report Date: 2016/08/24

Maxxam Analytics
Client Project #: B668559
Your P.O. #: N/A

TEST SUMMARY

Maxxam ID: CXC652
Sample ID: PG6094\C1-DUP8
Matrix: Soil

Collected: 2016/08/11
Shipped:
Received: 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4626984	N/A	2016/08/19	Nimarta Singh
Polychlorinated Biphenyl in Soil	GC/ECD	4625548	2016/08/18	2016/08/20	Dawn Alarie

Maxxam ID: CXC653
Sample ID: PG6137\C1-MW05
Matrix: Water

Collected: 2016/08/10
Shipped:
Received: 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Polychlorinated Biphenyl in Water	GC/ECD	4627309	2016/08/19	2016/08/20	Dawn Alarie

Maxxam ID: CXC653 Dup
Sample ID: PG6137\C1-MW05
Matrix: Water

Collected: 2016/08/10
Shipped:
Received: 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Polychlorinated Biphenyl in Water	GC/ECD	4627309	2016/08/19	2016/08/20	Dawn Alarie

Maxxam ID: CXC654
Sample ID: PG6138\C1-MW03
Matrix: Water

Collected: 2016/08/10
Shipped:
Received: 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Polychlorinated Biphenyl in Water	GC/ECD	4627309	2016/08/19	2016/08/21	Dawn Alarie

Maxxam ID: CXC655
Sample ID: PG6139\C1-DUP1
Matrix: Water

Collected: 2016/08/10
Shipped:
Received: 2016/08/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Polychlorinated Biphenyl in Water	GC/ECD	4627309	2016/08/19	2016/08/21	Dawn Alarie

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GENERAL COMMENTS

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

Package 1	10.3°C
Package 2	12.7°C
Package 3	9.3°C

Sample CXC564-01 : PCB Analysis: Detection limits were adjusted for high moisture content.

Sample CXC616-01 : PCB Analysis: Detection limits were adjusted for high moisture content.

Results relate only to the items tested.

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Maxxam Job #: B6H4359
Report Date: 2016/08/24

Maxxam Analytics
Client Project #: B668559
Your P.O. #: N/A

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
4625414	FSO	Matrix Spike [CXC609-01]	Decachlorobiphenyl	2016/08/21		72	%	60 - 130
			Aroclor 1260	2016/08/21		81	%	60 - 130
			Total PCB	2016/08/21		81	%	60 - 130
4625414	FSO	Spiked Blank	Decachlorobiphenyl	2016/08/21		89	%	60 - 130
			Aroclor 1260	2016/08/21		99	%	60 - 130
			Total PCB	2016/08/21		99	%	60 - 130
4625414	FSO	Method Blank	Decachlorobiphenyl	2016/08/21		80	%	60 - 130
			Aroclor 1016	2016/08/21	<0.010		ug/g	
			Aroclor 1221	2016/08/21	<0.010		ug/g	
			Aroclor 1232	2016/08/21	<0.010		ug/g	
			Aroclor 1242	2016/08/21	<0.010		ug/g	
			Aroclor 1248	2016/08/21	<0.010		ug/g	
			Aroclor 1254	2016/08/21	<0.010		ug/g	
			Aroclor 1260	2016/08/21	<0.010		ug/g	
			Aroclor 1262	2016/08/21	<0.010		ug/g	
			Aroclor 1268	2016/08/21	<0.010		ug/g	
			Total PCB	2016/08/21	<0.010		ug/g	
4625414	FSO	RPD [CXC609-01]	Aroclor 1016	2016/08/21	NC		%	50
			Aroclor 1221	2016/08/21	NC		%	50
			Aroclor 1232	2016/08/21	NC		%	50
			Aroclor 1242	2016/08/21	NC		%	50
			Aroclor 1248	2016/08/21	NC		%	50
			Aroclor 1254	2016/08/21	NC		%	50
			Aroclor 1260	2016/08/21	NC		%	50
			Aroclor 1262	2016/08/21	NC		%	50
			Aroclor 1268	2016/08/21	NC		%	50
			Total PCB	2016/08/21	NC		%	50
4625467	FSO	Matrix Spike [CXC631-01]	Decachlorobiphenyl	2016/08/21		65	%	60 - 130
			Aroclor 1260	2016/08/21		74	%	60 - 130
			Total PCB	2016/08/21		74	%	60 - 130
4625467	FSO	Spiked Blank	Decachlorobiphenyl	2016/08/21		72	%	60 - 130
			Aroclor 1260	2016/08/21		95	%	60 - 130
			Total PCB	2016/08/21		95	%	60 - 130
4625467	FSO	Method Blank	Decachlorobiphenyl	2016/08/21		70	%	60 - 130
			Aroclor 1016	2016/08/21	<0.010		ug/g	
			Aroclor 1221	2016/08/21	<0.010		ug/g	
			Aroclor 1232	2016/08/21	<0.010		ug/g	
			Aroclor 1242	2016/08/21	<0.010		ug/g	
			Aroclor 1248	2016/08/21	<0.010		ug/g	
			Aroclor 1254	2016/08/21	<0.010		ug/g	
			Aroclor 1260	2016/08/21	<0.010		ug/g	
			Aroclor 1262	2016/08/21	<0.010		ug/g	
			Aroclor 1268	2016/08/21	<0.010		ug/g	
			Total PCB	2016/08/21	<0.010		ug/g	
4625467	FSO	RPD [CXC631-01]	Aroclor 1016	2016/08/21	NC		%	50
			Aroclor 1221	2016/08/21	NC		%	50
			Aroclor 1232	2016/08/21	NC		%	50
			Aroclor 1242	2016/08/21	NC		%	50
			Aroclor 1248	2016/08/21	NC		%	50
			Aroclor 1254	2016/08/21	NC		%	50
			Aroclor 1260	2016/08/21	NC		%	50
			Aroclor 1262	2016/08/21	NC		%	50
			Aroclor 1268	2016/08/21	NC		%	50

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total PCB	2016/08/21	NC		%	50
4625519	DH	Matrix Spike [CXC573-01]	Decachlorobiphenyl	2016/08/20		86	%	60 - 130
			Aroclor 1260	2016/08/20		94	%	60 - 130
			Total PCB	2016/08/20		94	%	60 - 130
4625519	DH	Spiked Blank	Decachlorobiphenyl	2016/08/20		98	%	60 - 130
			Aroclor 1260	2016/08/20		87	%	60 - 130
			Total PCB	2016/08/20		87	%	60 - 130
4625519	DH	Method Blank	Decachlorobiphenyl	2016/08/20		91	%	60 - 130
			Aroclor 1016	2016/08/20	<0.010		ug/g	
			Aroclor 1221	2016/08/20	<0.010		ug/g	
			Aroclor 1232	2016/08/20	<0.010		ug/g	
			Aroclor 1242	2016/08/20	<0.010		ug/g	
			Aroclor 1248	2016/08/20	<0.010		ug/g	
			Aroclor 1254	2016/08/20	<0.010		ug/g	
			Aroclor 1260	2016/08/20	<0.010		ug/g	
			Aroclor 1262	2016/08/20	<0.010		ug/g	
			Aroclor 1268	2016/08/20	<0.010		ug/g	
			Total PCB	2016/08/20	<0.010		ug/g	
4625519	DH	RPD [CXC573-01]	Aroclor 1016	2016/08/20	NC		%	50
			Aroclor 1221	2016/08/20	NC		%	50
			Aroclor 1232	2016/08/20	NC		%	50
			Aroclor 1242	2016/08/20	NC		%	50
			Aroclor 1248	2016/08/20	NC		%	50
			Aroclor 1254	2016/08/20	NC		%	50
			Aroclor 1260	2016/08/20	NC		%	50
			Aroclor 1262	2016/08/20	NC		%	50
			Aroclor 1268	2016/08/20	NC		%	50
			Total PCB	2016/08/20	NC		%	50
4625548	DH	Matrix Spike [CXC636-01]	Decachlorobiphenyl	2016/08/20		80	%	60 - 130
			Aroclor 1260	2016/08/20		78	%	60 - 130
			Total PCB	2016/08/20		78	%	60 - 130
4625548	DH	Spiked Blank	Decachlorobiphenyl	2016/08/20		69	%	60 - 130
			Aroclor 1260	2016/08/20		76	%	60 - 130
			Total PCB	2016/08/20		76	%	60 - 130
4625548	DH	Method Blank	Decachlorobiphenyl	2016/08/20		72	%	60 - 130
			Aroclor 1016	2016/08/20	<0.010		ug/g	
			Aroclor 1221	2016/08/20	<0.010		ug/g	
			Aroclor 1232	2016/08/20	<0.010		ug/g	
			Aroclor 1242	2016/08/20	<0.010		ug/g	
			Aroclor 1248	2016/08/20	<0.010		ug/g	
			Aroclor 1254	2016/08/20	<0.010		ug/g	
			Aroclor 1260	2016/08/20	<0.010		ug/g	
			Aroclor 1262	2016/08/20	<0.010		ug/g	
			Aroclor 1268	2016/08/20	<0.010		ug/g	
			Total PCB	2016/08/20	<0.010		ug/g	
4625548	DH	RPD [CXC636-01]	Aroclor 1016	2016/08/20	NC		%	50
			Aroclor 1221	2016/08/20	NC		%	50
			Aroclor 1232	2016/08/20	NC		%	50
			Aroclor 1242	2016/08/20	NC		%	50
			Aroclor 1248	2016/08/20	NC		%	50
			Aroclor 1254	2016/08/20	NC		%	50
			Aroclor 1260	2016/08/20	NC		%	50
			Aroclor 1262	2016/08/20	NC		%	50

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Aroclor 1268	2016/08/20	NC		%	50
			Total PCB	2016/08/20	NC		%	50
4625667	DH	Matrix Spike [CXC596-01]	Decachlorobiphenyl	2016/08/19		88	%	60 - 130
			Aroclor 1260	2016/08/19		85	%	60 - 130
			Total PCB	2016/08/19		85	%	60 - 130
4625667	DH	Spiked Blank	Decachlorobiphenyl	2016/08/18		84	%	60 - 130
			Aroclor 1260	2016/08/18		87	%	60 - 130
			Total PCB	2016/08/18		87	%	60 - 130
4625667	DH	Method Blank	Decachlorobiphenyl	2016/08/18		77	%	60 - 130
			Aroclor 1016	2016/08/18	<0.010		ug/g	
			Aroclor 1221	2016/08/18	<0.010		ug/g	
			Aroclor 1232	2016/08/18	<0.010		ug/g	
			Aroclor 1242	2016/08/18	<0.010		ug/g	
			Aroclor 1248	2016/08/18	<0.010		ug/g	
			Aroclor 1254	2016/08/18	<0.010		ug/g	
			Aroclor 1260	2016/08/18	<0.010		ug/g	
			Aroclor 1262	2016/08/18	<0.010		ug/g	
			Aroclor 1268	2016/08/18	<0.010		ug/g	
			Total PCB	2016/08/18	<0.010		ug/g	
4625667	DH	RPD [CXC596-01]	Aroclor 1016	2016/08/19	NC		%	50
			Aroclor 1221	2016/08/19	NC		%	50
			Aroclor 1232	2016/08/19	NC		%	50
			Aroclor 1242	2016/08/19	NC		%	50
			Aroclor 1248	2016/08/19	NC		%	50
			Aroclor 1254	2016/08/19	NC		%	50
			Aroclor 1260	2016/08/19	NC		%	50
			Aroclor 1262	2016/08/19	NC		%	50
			Aroclor 1268	2016/08/19	NC		%	50
			Total PCB	2016/08/19	NC		%	50
4626854	VGS	RPD [CXC613-01]	Moisture	2016/08/19	1.6		%	20
4626984	VGS	RPD [CXC645-01]	Moisture	2016/08/19	NC		%	20
4627181	GYA	RPD	Moisture	2016/08/19	0		%	20
4627309	DH	Matrix Spike	Decachlorobiphenyl	2016/08/21		54 (1)	%	60 - 130
			Aroclor 1260	2016/08/21		56 (2)	%	60 - 130
			Total PCB	2016/08/21		56 (3)	%	60 - 130
4627309	DH	Spiked Blank	Decachlorobiphenyl	2016/08/20		48 (1)	%	60 - 130
			Aroclor 1260	2016/08/20		53 (2)	%	60 - 130
			Total PCB	2016/08/20		53 (1)	%	60 - 130
4627309	DH	Method Blank	Decachlorobiphenyl	2016/08/20		50 (1)		60 - 130
			Aroclor 1016	2016/08/20	<0.05		ug/L	
			Aroclor 1221	2016/08/20	<0.05		ug/L	
			Aroclor 1232	2016/08/20	<0.05		ug/L	
			Aroclor 1242	2016/08/20	<0.05		ug/L	
			Aroclor 1248	2016/08/20	<0.05		ug/L	
			Aroclor 1254	2016/08/20	<0.05		ug/L	
			Aroclor 1260	2016/08/20	<0.05		ug/L	
			Aroclor 1262	2016/08/20	<0.05		ug/L	
			Aroclor 1268	2016/08/20	<0.05		ug/L	
			Total PCB	2016/08/20	<0.05		ug/L	
4627309	DH	RPD [CXC653-01]	Aroclor 1016	2016/08/20	NC		%	40
			Aroclor 1221	2016/08/20	NC		%	40
			Aroclor 1232	2016/08/20	NC		%	40
			Aroclor 1242	2016/08/20	NC		%	30

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Aroclor 1248	2016/08/20	NC		%	30
			Aroclor 1254	2016/08/20	NC		%	30
			Aroclor 1260	2016/08/20	NC		%	30
			Aroclor 1262	2016/08/20	NC		%	40
			Aroclor 1268	2016/08/20	NC		%	40
			Total PCB	2016/08/20	NC		%	40
4628400	GYA	RPD	Moisture	2016/08/20	2.3		%	20
4628417	GYA	RPD [CXC573-01]	Moisture	2016/08/20	1.7		%	20
4628439	NS3	RPD [CXC586-01]	Moisture	2016/08/20	3.9		%	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 (one or both samples < 5x RDL).

(1) Due to matrix interference, the Surrogate recovery was below the control limit as stipulated by Ontario Regulation 153, however, this recovery is still within Maxxam's performance based limits. Results reported with surrogate recoveries within this range are still valid but may have an associated low bias.

(2) The recovery for the flagged target analyte was below the control limit as stipulated by Ontario Regulation 153, however, this recovery is still within Maxxam's performance based limits. Results reported for this specific analyte with spike recoveries within this range are still valid but may have an associated low bias.

(3) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

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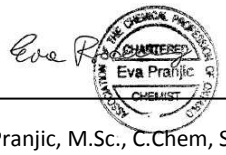
Maxxam Job #: B6H4359
Report Date: 2016/08/24

Maxxam Analytics
Client Project #: B668559
Your P.O. #: N/A

VALIDATION SIGNATURE PAGE

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



Ewa Pranjic, M.Sc., C.Chem, Scientific Specialist

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Your Project #: 102012-000, KITIKMEOT DEW LIN
Site#: CAM 1 Junny Lind Island

Attention:ANDREW HENDERSON

ARCADIS Canada
329 CHURCHILL AVE NORTH
SUITE 2000
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Your C.O.C. #: 501520-01-01, 501520-03-01, 501520-04-01, 501520-05-01, 501520-06-01, 501520-07-01, 501520-08-01, 501520-09-01, 501520-10-01, 501520-02-01, 501520-11-01

Report Date: 2016/09/20
Report #: R2264185
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B668559
Received: 2016/08/14, 10:40

Sample Matrix: Soil
Samples Received: 89

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
BTEX/F1 by HS GC/MS/FID (MeOH extract)	13	2016/08/16	2016/08/19	AB SOP-00039	CCME CWS/EPA 8260c m
BTEX/F1 by HS GC/MS/FID (MeOH extract)	2	2016/08/16	2016/08/20	AB SOP-00039	CCME CWS/EPA 8260c m
BTEX/F1 by HS GC/MS/FID (MeOH extract)	5	2016/08/16	2016/08/22	AB SOP-00039	CCME CWS/EPA 8260c m
BTEX/F1 by HS GC/MS/FID (MeOH extract)	2	2016/08/17	2016/08/20	AB SOP-00039	CCME CWS/EPA 8260c m
BTEX/F1 by HS GC/MS/FID (MeOH extract)	27	2016/08/17	2016/08/21	AB SOP-00039	CCME CWS/EPA 8260c m
BTEX/F1 by HS GC/MS/FID (MeOH extract)	9	2016/08/17	2016/08/22	AB SOP-00039	CCME CWS/EPA 8260c m
BTEX/F1 by HS GC/MS/FID (MeOH extract)	15	2016/08/18	2016/08/21	AB SOP-00039	CCME CWS/EPA 8260c m
BTEX/F1 by HS GC/MS/FID (MeOH extract)	13	2016/08/18	2016/08/22	AB SOP-00039	CCME CWS/EPA 8260c m
BTEX/F1 by HS GC/MS/FID (MeOH extract)	1	2016/08/20	2016/08/22	AB SOP-00039	CCME CWS/EPA 8260c m
BTEX/F1 by HS GC/MS/FID (MeOH extract)	1	2016/08/21	2016/08/21	AB SOP-00039	CCME CWS/EPA 8260c m
BTEX/F1 by HS GC/MS/FID (MeOH extract)	1	2016/08/21	2016/08/22	AB SOP-00039	CCME CWS/EPA 8260c m
CCME Hydrocarbons (F2-F4 in soil) (1)	5	2016/08/16	2016/08/19	AB SOP-00036 / AB SOP-00040	CCME PHC-CWS m
CCME Hydrocarbons (F2-F4 in soil) (1)	15	2016/08/16	2016/08/20	AB SOP-00036 / AB SOP-00040	CCME PHC-CWS m
CCME Hydrocarbons (F2-F4 in soil) (1)	30	2016/08/17	2016/08/21	AB SOP-00036 / AB SOP-00040	CCME PHC-CWS m
CCME Hydrocarbons (F2-F4 in soil) (1)	4	2016/08/17	2016/08/22	AB SOP-00036 / AB SOP-00040	CCME PHC-CWS m
CCME Hydrocarbons (F2-F4 in soil) (1)	28	2016/08/18	2016/08/21	AB SOP-00036 / AB SOP-00040	CCME PHC-CWS m
CCME Hydrocarbons (F2-F4 in soil) (1)	4	2016/08/18	2016/08/22	AB SOP-00036 / AB SOP-00040	CCME PHC-CWS m
CCME Hydrocarbons (F2-F4 in soil) (1)	1	2016/08/20	2016/08/21	AB SOP-00036 / AB SOP-00040	CCME PHC-CWS m
CCME Hydrocarbons (F2-F4 in soil) (1)	1	2016/08/21	2016/08/22	AB SOP-00036 / AB SOP-00040	CCME PHC-CWS m

Your Project #: 102012-000, KITIKMEOT DEW LIN
Site#: CAM 1 Junny Lind Island

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Your C.O.C. #: 501520-01-01, 501520-03-01, 501520-04-01, 501520-05-01, 501520-06-01, 501520-07-01, 501520-08-01, 501520-09-01, 501520-10-01, 501520-02-01, 501520-11-01

Report Date: 2016/09/20
Report #: R2264185
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B668559
Received: 2016/08/14, 10:40

Sample Matrix: Soil
Samples Received: 89

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
CCME Hydrocarbons (F2-F4 in soil) (1)	1	2016/08/22	2016/08/23	AB SOP-00036 / AB SOP-00040	CCME PHC-CWS m
Elements by ICPMS - Soils	17	2016/08/19	2016/08/21	AB SOP-00001 / AB SOP-00043	EPA 200.8 R5.4 m
Elements by ICPMS - Soils	36	2016/08/20	2016/08/21	AB SOP-00001 / AB SOP-00043	EPA 200.8 R5.4 m
Elements by ICPMS - Soils	36	2016/08/22	2016/08/22	AB SOP-00001 / AB SOP-00043	EPA 200.8 R5.4 m
Moisture	19	N/A	2016/08/17	AB SOP-00002	CCME PHC-CWS m
Moisture	34	N/A	2016/08/18	AB SOP-00002	CCME PHC-CWS m
Moisture	18	N/A	2016/08/19	AB SOP-00002	CCME PHC-CWS m
Moisture	15	N/A	2016/08/20	AB SOP-00002	CCME PHC-CWS m
Moisture	3	N/A	2016/08/22	AB SOP-00002	CCME PHC-CWS m

Sample Matrix: Water
Samples Received: 4

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
BTEX/F1 in Water by HS GC/MS/FID	4	N/A	2016/08/20	AB SOP-00039	CCME CWS/EPA 8260c m
Total Hexavalent Chromium	3	N/A	2016/08/18	AB SOP-00063	SM 22 3500-Cr B m
CCME Hydrocarbons (F2-F4 in water)	3	2016/08/20	2016/08/20	AB SOP-00037 / AB SOP-00040	CCME PHC-CWS m
Mercury - Low Level (Total)	3	2016/08/17	2016/08/17	EENVSOP-00031	EPA 1631E/245.1 R3 m
Elements by ICPMS - Total	3	2016/08/17	2016/08/17	AB SOP-00014 / AB SOP-00043	EPA 200.8 R5.4 m

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.

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

Your Project #: 102012-000, KITIKMEOT DEW LIN
Site#: CAM 1 Junny Lind Island

Attention:ANDREW HENDERSON

ARCADIS Canada
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SUITE 2000
OTTAWA, ON
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Your C.O.C. #: 501520-01-01, 501520-03-01, 501520-04-01, 501520-05-01, 501520-06-01, 501520-07-01, 501520-08-01, 501520-09-01, 501520-10-01, 501520-02-01, 501520-11-01

Report Date: 2016/09/20
Report #: R2264185
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B668559
Received: 2016/08/14, 10:40

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) 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.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Parminder Virk, Project Manager
Email: PVirk@maxxam.ca
Phone# (780) 577-7100

==========

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Maxxam Job #: B668559
Report Date: 2016/09/20

ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Sampler Initials: RF

AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		PG5955			PG5956		PG5957		
Sampling Date		2016/08/09 14:15			2016/08/09 14:15		2016/08/09 14:00		
COC Number		501520-01-01			501520-01-01		501520-01-01		
	UNITS	16-C1-1A	RDL	QC Batch	16-C1-1B	QC Batch	16-C1-2A	RDL	QC Batch
Physical Properties									
Moisture	%	56	0.30	8365131	14	8365131	18	0.30	8365131
Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/kg	<23 (1)	23	8367080	<10	8367087	11	10	8367328
F3 (C16-C34 Hydrocarbons)	mg/kg	<110 (1)	110	8367080	<50	8367087	68	50	8367328
F4 (C34-C50 Hydrocarbons)	mg/kg	<110 (1)	110	8367080	<50	8367087	<50	50	8367328
Reached Baseline at C50	mg/kg	Yes	N/A	8367080	Yes	8367087	Yes	N/A	8367328
Volatiles									
F1 (C6-C10) - BTEX	mg/kg	<23 (2)	23	8366762	<12	8366750	<12	12	8371136
F1 (C6-C10)	mg/kg	<23 (2)	23	8366762	<12	8366750	<12	12	8371136
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	101	N/A	8366762	102	8366750	101	N/A	8371136
4-Bromofluorobenzene (sur.)	%	96	N/A	8366762	99	8366750	94	N/A	8371136
D10-ETHYLBENZENE (sur.)	%	101	N/A	8366762	113	8366750	106	N/A	8371136
D4-1,2-Dichloroethane (sur.)	%	100	N/A	8366762	99	8366750	104	N/A	8371136
O-TERPHENYL (sur.)	%	95	N/A	8367080	101	8367087	99	N/A	8367328

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Detection limits raised due to high moisture content.
(2) Detection limits raised due to high moisture content, sample contains => 50% moisture.

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Maxxam Job #: B668559
Report Date: 2016/09/20

ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Sampler Initials: RF

AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		PG5958		PG5959		PG5960		PG5961		
Sampling Date		2016/08/09 14:00		2016/08/09 13:30		2016/08/09 13:30		2016/08/09 13:15		
COC Number		501520-01-01		501520-01-01		501520-01-01		501520-01-01		
	UNITS	16-C1-2B	QC Batch	16-C1-3A	QC Batch	16-C1-3B	QC Batch	16-C1-4A	RDL	QC Batch
Physical Properties										
Moisture	%	8.4	8365131	5.2	8365131	2.5	8365131	12	0.30	8365131
Ext. Pet. Hydrocarbon										
F2 (C10-C16 Hydrocarbons)	mg/kg	<10	8367080	<10	8367080	<10	8367328	<10	10	8367328
F3 (C16-C34 Hydrocarbons)	mg/kg	<50	8367080	<50	8367080	<50	8367328	<50	50	8367328
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	8367080	<50	8367080	<50	8367328	<50	50	8367328
Reached Baseline at C50	mg/kg	Yes	8367080	Yes	8367080	Yes	8367328	Yes	N/A	8367328
Volatiles										
F1 (C6-C10) - BTEX	mg/kg	<12	8366762	<12	8366598	<12	8371136	<12	12	8366769
F1 (C6-C10)	mg/kg	<12	8366762	<12	8366598	<12	8371136	<12	12	8366769
Surrogate Recovery (%)										
1,4-Difluorobenzene (sur.)	%	103	8366762	102	8366598	101	8371136	103	N/A	8366769
4-Bromofluorobenzene (sur.)	%	95	8366762	96	8366598	95	8371136	99	N/A	8366769
D10-ETHYLBENZENE (sur.)	%	129	8366762	101	8366598	97	8371136	110	N/A	8366769
D4-1,2-Dichloroethane (sur.)	%	106	8366762	100	8366598	101	8371136	98	N/A	8366769
O-TERPHENYL (sur.)	%	89	8367080	100	8367080	99	8367328	100	N/A	8367328

RDL = Reportable Detection Limit
N/A = Not Applicable

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Maxxam Job #: B668559
Report Date: 2016/09/20

ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Sampler Initials: RF

AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		PG5962		PG5963		PG5964		PG5973		
Sampling Date		2016/08/09 13:15		2016/08/09 13:00		2016/08/09 13:00		2016/08/09 16:30		
COC Number		501520-01-01		501520-01-01		501520-01-01		501520-03-01		
	UNITS	16-C1-4B	QC Batch	16-C1-5A	QC Batch	16-C1-5B	QC Batch	16-C1-6A	RDL	QC Batch
Physical Properties										
Moisture	%	6.4	8365131	4.1	8365131	7.7	8365131	12	0.30	8365131
Ext. Pet. Hydrocarbon										
F2 (C10-C16 Hydrocarbons)	mg/kg	<10	8367086	<10	8367080	<10	8367080	<10	10	8367086
F3 (C16-C34 Hydrocarbons)	mg/kg	<50	8367086	<50	8367080	<50	8367080	<50	50	8367086
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	8367086	<50	8367080	<50	8367080	<50	50	8367086
Reached Baseline at C50	mg/kg	Yes	8367086	Yes	8367080	Yes	8367080	Yes	N/A	8367086
Volatiles										
F1 (C6-C10) - BTEX	mg/kg	<12	8371136	<12	8371136	<12	8366598	<12	12	8366769
F1 (C6-C10)	mg/kg	<12	8371136	<12	8371136	<12	8366598	<12	12	8366769
Surrogate Recovery (%)										
1,4-Difluorobenzene (sur.)	%	101	8371136	100	8371136	101	8366598	99	N/A	8366769
4-Bromofluorobenzene (sur.)	%	95	8371136	94	8371136	94	8366598	99	N/A	8366769
D10-ETHYLBENZENE (sur.)	%	106	8371136	100	8371136	112	8366598	119	N/A	8366769
D4-1,2-Dichloroethane (sur.)	%	102	8371136	107	8371136	102	8366598	101	N/A	8366769
O-TERPHENYL (sur.)	%	124	8367086	100	8367080	92	8367080	96	N/A	8367086

RDL = Reportable Detection Limit
N/A = Not Applicable

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Maxxam Job #: B668559
Report Date: 2016/09/20

ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Sampler Initials: RF

AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		PG5974		PG5975		PG5976		PG5977		
Sampling Date		2016/08/09 16:30		2016/08/09 15:00		2016/08/09 15:00		2016/08/09 15:30		
COC Number		501520-03-01		501520-03-01		501520-03-01		501520-03-01		
	UNITS	16-C1-6B	QC Batch	16-C1-7A	QC Batch	16-C1-7B	QC Batch	16-C1-8A	RDL	QC Batch
Physical Properties										
Moisture	%	9.6	8365131	7.7	8365131	6.5	8365131	5.6	0.30	8365131
Ext. Pet. Hydrocarbon										
F2 (C10-C16 Hydrocarbons)	mg/kg	<10	8367086	<10	8367080	<10	8367086	<10	10	8367328
F3 (C16-C34 Hydrocarbons)	mg/kg	<50	8367086	<50	8367080	<50	8367086	<50	50	8367328
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	8367086	<50	8367080	<50	8367086	<50	50	8367328
Reached Baseline at C50	mg/kg	Yes	8367086	Yes	8367080	Yes	8367086	Yes	N/A	8367328
Volatiles										
F1 (C6-C10) - BTEX	mg/kg	<12	8371136	<12	8370818	<12	8366769	<12	12	8366750
F1 (C6-C10)	mg/kg	<12	8371136	<12	8370818	<12	8366769	<12	12	8366750
Surrogate Recovery (%)										
1,4-Difluorobenzene (sur.)	%	98	8371136	102	8370818	106	8366769	104	N/A	8366750
4-Bromofluorobenzene (sur.)	%	95	8371136	102	8370818	99	8366769	98	N/A	8366750
D10-ETHYLBENZENE (sur.)	%	96	8371136	104	8370818	112	8366769	121	N/A	8366750
D4-1,2-Dichloroethane (sur.)	%	110	8371136	107	8370818	97	8366769	96	N/A	8366750
O-TERPHENYL (sur.)	%	103	8367086	93	8367080	100	8367086	95	N/A	8367328

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Report Date: 2016/09/20

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AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		PG5978		PG5979		PG5980		PG5981		
Sampling Date		2016/08/09 15:30		2016/08/09 16:00		2016/08/09 16:00		2016/08/10 17:30		
COC Number		501520-03-01		501520-03-01		501520-03-01		501520-03-01		
	UNITS	16-C1-8B	QC Batch	16-C1-9A	QC Batch	16-C1-9B	QC Batch	16-C1-10A	RDL	QC Batch
Physical Properties										
Moisture	%	5.7	8365131	11	8371141	8.5	8365131	9.6	0.30	8366645
Ext. Pet. Hydrocarbon										
F2 (C10-C16 Hydrocarbons)	mg/kg	<10	8367080	<10	8367080	<10	8367086	<10	10	8370335
F3 (C16-C34 Hydrocarbons)	mg/kg	<50	8367080	<50	8367080	<50	8367086	<50	50	8370335
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	8367080	<50	8367080	<50	8367086	<50	50	8370335
Reached Baseline at C50	mg/kg	Yes	8367080	Yes	8367080	Yes	8367086	Yes	N/A	8370335
Volatiles										
F1 (C6-C10) - BTEX	mg/kg	<12	8366762	<12	8366598	<12	8366769	<12	12	8370794
F1 (C6-C10)	mg/kg	<12	8366762	<12	8366598	<12	8366769	<12	12	8370794
Surrogate Recovery (%)										
1,4-Difluorobenzene (sur.)	%	102	8366762	103	8366598	103	8366769	101	N/A	8370794
4-Bromofluorobenzene (sur.)	%	94	8366762	93	8366598	97	8366769	103	N/A	8370794
D10-ETHYLBENZENE (sur.)	%	117	8366762	108	8366598	115	8366769	103	N/A	8370794
D4-1,2-Dichloroethane (sur.)	%	106	8366762	102	8366598	100	8366769	121	N/A	8370794
O-TERPHENYL (sur.)	%	105	8367080	85	8367080	110	8367086	109	N/A	8370335

RDL = Reportable Detection Limit
N/A = Not Applicable

Maxxam Job #: B668559
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AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		PG5982	PG5986	PG5987	PG5988		PG5989		
Sampling Date		2016/08/10 17:30	2016/08/10 16:00	2016/08/10 16:00	2016/08/10 16:45		2016/08/10 16:45		
COC Number		501520-03-01	501520-04-01	501520-04-01	501520-04-01		501520-04-01		
	UNITS	16-C1-10B	16-C1-11A	16-C1-11B	16-C1-12A	QC Batch	16-C1-12B	RDL	QC Batch
Physical Properties									
Moisture	%	7.0	9.6	7.1	11	8366645	15	0.30	8367467
Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/kg	<10	<10	<10	<10	8370335	<10	10	8370335
F3 (C16-C34 Hydrocarbons)	mg/kg	<50	<50	<50	<50	8370335	<50	50	8370335
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	<50	<50	<50	8370335	<50	50	8370335
Reached Baseline at C50	mg/kg	Yes	Yes	Yes	Yes	8370335	Yes	N/A	8370335
Volatiles									
F1 (C6-C10) - BTEX	mg/kg	<12	<12	<12	<12	8370794	<12	12	8370818
F1 (C6-C10)	mg/kg	<12	<12	<12	<12	8370794	<12	12	8370818
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	101	99	102	102	8370794	103	N/A	8370818
4-Bromofluorobenzene (sur.)	%	103	104	102	102	8370794	102	N/A	8370818
D10-ETHYLBENZENE (sur.)	%	100	99	104	103	8370794	119	N/A	8370818
D4-1,2-Dichloroethane (sur.)	%	120	127	121	123	8370794	106	N/A	8370818
O-TERPHENYL (sur.)	%	111	121	122	124	8370335	116	N/A	8370335

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AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		PG5990		PG5991	PG5992		PG5993		
Sampling Date		2016/08/10 17:00		2016/08/10 17:00	2016/08/10 08:30		2016/08/10 08:30		
COC Number		501520-04-01		501520-04-01	501520-04-01		501520-04-01		
	UNITS	16-C1-13A	QC Batch	16-C1-13B	16-C1-MW01A	QC Batch	16-C1-MW01B	RDL	QC Batch
Physical Properties									
Moisture	%	14	8367467	14	3.5	8366645	5.7	0.30	8367467
Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/kg	<10	8370328	<10	<10	8370335	<10	10	8370335
F3 (C16-C34 Hydrocarbons)	mg/kg	<50	8370328	<50	<50	8370335	<50	50	8370335
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	8370328	<50	<50	8370335	<50	50	8370335
Reached Baseline at C50	mg/kg	Yes	8370328	Yes	Yes	8370335	Yes	N/A	8370335
Volatiles									
F1 (C6-C10) - BTEX	mg/kg	<12	8370818	<12	<12	8370794	<12	12	8370794
F1 (C6-C10)	mg/kg	<12	8370818	<12	<12	8370794	<12	12	8370794
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	102	8370818	105	101	8370794	101	N/A	8370794
4-Bromofluorobenzene (sur.)	%	100	8370818	103	101	8370794	102	N/A	8370794
D10-ETHYLBENZENE (sur.)	%	116	8370818	105	102	8370794	103	N/A	8370794
D4-1,2-Dichloroethane (sur.)	%	104	8370818	120	125	8370794	121	N/A	8370794
O-TERPHENYL (sur.)	%	123	8370328	123	119	8370335	119	N/A	8370335

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AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		PG5994		PG5995	PG5997		PG5998		
Sampling Date		2016/08/10 09:15		2016/08/10 09:00	2016/08/10 09:00		2016/08/10 08:45		
COC Number		501520-04-01		501520-04-01	501520-05-01		501520-05-01		
	UNITS	16-C1-MW02A	QC Batch	16-C1-MW03A	16-C1-MW03B	QC Batch	16-C1-MW04A	RDL	QC Batch
Physical Properties									
Moisture	%	3.7	8367467	4.4	6.0	8366645	8.2	0.30	8365897
Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/kg	<10	8370335	<10	<10	8370335	<10	10	8367081
F3 (C16-C34 Hydrocarbons)	mg/kg	<50	8370335	<50	<50	8370335	<50	50	8367081
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	8370335	<50	<50	8370335	<50	50	8367081
Reached Baseline at C50	mg/kg	Yes	8370335	Yes	Yes	8370335	Yes	N/A	8367081
Volatiles									
F1 (C6-C10) - BTEX	mg/kg	<12	8370798	<12	<12	8370794	<12	12	8370798
F1 (C6-C10)	mg/kg	<12	8370798	<12	<12	8370794	<12	12	8370798
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	99	8370798	103	101	8370794	103	N/A	8370798
4-Bromofluorobenzene (sur.)	%	103	8370798	103	102	8370794	101	N/A	8370798
D10-ETHYLBENZENE (sur.)	%	99	8370798	104	99	8370794	106	N/A	8370798
D4-1,2-Dichloroethane (sur.)	%	116	8370798	118	124	8370794	107	N/A	8370798
O-TERPHENYL (sur.)	%	115	8370335	115	116	8370335	108	N/A	8367081

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AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		PG5999		PG6000		PG6001	PG6002		
Sampling Date		2016/08/10 08:45		2016/08/10 10:30		2016/08/10 10:30	2016/08/10 09:45		
COC Number		501520-05-01		501520-05-01		501520-05-01	501520-05-01		
	UNITS	16-C1-MW04B	QC Batch	16-C1-MW05A	QC Batch	16-C1-MW05B	16-C1-MW06A	RDL	QC Batch
Physical Properties									
Moisture	%	9.3	8365897	7.5	8365897	3.4	4.0	0.30	8365897
Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/kg	<10	8367081	<10	8367081	<10	<10	10	8367081
F3 (C16-C34 Hydrocarbons)	mg/kg	<50	8367081	57	8367081	<50	<50	50	8367081
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	8367081	<50	8367081	<50	<50	50	8367081
Reached Baseline at C50	mg/kg	Yes	8367081	Yes	8367081	Yes	Yes	N/A	8367081
Volatiles									
F1 (C6-C10) - BTEX	mg/kg	<12	8370798	<12	8370794	<12	<12	12	8370798
F1 (C6-C10)	mg/kg	<12	8370798	<12	8370794	<12	<12	12	8370798
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	103	8370798	102	8370794	103	101	N/A	8370798
4-Bromofluorobenzene (sur.)	%	103	8370798	103	8370794	101	102	N/A	8370798
D10-ETHYLBENZENE (sur.)	%	107	8370798	101	8370794	106	98	N/A	8370798
D4-1,2-Dichloroethane (sur.)	%	109	8370798	124	8370794	114	114	N/A	8370798
O-TERPHENYL (sur.)	%	115	8367081	117	8367081	108	96	N/A	8367081

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N/A = Not Applicable

Maxxam Job #: B668559
Report Date: 2016/09/20

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AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		PG6003	PG6004	PG6005	PG6008	PG6009		
Sampling Date		2016/08/10 09:45	2016/08/10 10:00	2016/08/10 10:00	2016/08/10 10:15	2016/08/10 10:15		
COC Number		501520-05-01	501520-05-01	501520-05-01	501520-06-01	501520-06-01		
	UNITS	16-C1-MW06B	16-C1-MW07A	16-C1-MW07B	16-C1-MW08A	16-C1-MW08B	RDL	QC Batch
Physical Properties								
Moisture	%	3.9	7.3	4.6	14	4.5	0.30	8365897
Ext. Pet. Hydrocarbon								
F2 (C10-C16 Hydrocarbons)	mg/kg	<10	<10	<10	<10	<10	10	8367081
F3 (C16-C34 Hydrocarbons)	mg/kg	<50	<50	<50	59	<50	50	8367081
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	<50	<50	<50	<50	50	8367081
Reached Baseline at C50	mg/kg	Yes	Yes	Yes	Yes	Yes	N/A	8367081
Volatiles								
F1 (C6-C10) - BTEX	mg/kg	<12	<12	<12	<12	<12	12	8370798
F1 (C6-C10)	mg/kg	<12	<12	<12	<12	<12	12	8370798
Surrogate Recovery (%)								
1,4-Difluorobenzene (sur.)	%	100	102	102	103	105	N/A	8370798
4-Bromofluorobenzene (sur.)	%	100	101	104	102	102	N/A	8370798
D10-ETHYLBENZENE (sur.)	%	104	97	103	108	102	N/A	8370798
D4-1,2-Dichloroethane (sur.)	%	113	111	117	113	111	N/A	8370798
O-TERPHENYL (sur.)	%	111	111	106	108	111	N/A	8367081

RDL = Reportable Detection Limit
N/A = Not Applicable

Maxxam Job #: B668559
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AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		PG6010		PG6011	PG6012	PG6013	PG6014		
Sampling Date		2016/08/10 21:00		2016/08/10 21:00	2016/08/10 20:45	2016/08/10 20:45	2016/08/10 20:00		
COC Number		501520-06-01		501520-06-01	501520-06-01	501520-06-01	501520-06-01		
	UNITS	16-C1-14A	QC Batch	16-C1-14B	16-C1-15A	16-C1-15B	16-C1-16A	RDL	QC Batch
Physical Properties									
Moisture	%	1.9	8365897	1.7	1.5	1.8	2.5	0.30	8365897
Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/kg	<10	8367081	<10	<10	<10	<10	10	8367081
F3 (C16-C34 Hydrocarbons)	mg/kg	<50	8367081	<50	<50	<50	<50	50	8367081
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	8367081	<50	<50	<50	<50	50	8367081
Reached Baseline at C50	mg/kg	Yes	8367081	Yes	Yes	Yes	Yes	N/A	8367081
Volatiles									
F1 (C6-C10) - BTEX	mg/kg	<12	8370794	<12	<12	<12	<12	12	8370798
F1 (C6-C10)	mg/kg	<12	8370794	<12	<12	<12	<12	12	8370798
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	102	8370794	102	101	102	101	N/A	8370798
4-Bromofluorobenzene (sur.)	%	103	8370794	102	104	100	103	N/A	8370798
D10-ETHYLBENZENE (sur.)	%	101	8370794	104	109	104	96	N/A	8370798
D4-1,2-Dichloroethane (sur.)	%	123	8370794	115	119	113	118	N/A	8370798
O-TERPHENYL (sur.)	%	114	8367081	109	120	123	108	N/A	8367081

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AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		PG6015	PG6016	PG6017		PG6018	PG6019		
Sampling Date		2016/08/10 20:00	2016/08/10 20:15	2016/08/10 20:15		2016/08/10 20:30	2016/08/10 20:30		
COC Number		501520-06-01	501520-06-01	501520-06-01		501520-07-01	501520-07-01		
	UNITS	16-C1-16B	16-C1-17A	16-C1-17B	QC Batch	16-C1-18A	16-C1-18B	RDL	QC Batch
Physical Properties									
Moisture	%	3.8	3.1	3.1	8365897	6.7	3.6	0.30	8366645
Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/kg	<10	<10	<10	8367081	<10	<10	10	8367081
F3 (C16-C34 Hydrocarbons)	mg/kg	<50	<50	<50	8367081	<50	<50	50	8367081
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	<50	<50	8367081	<50	<50	50	8367081
Reached Baseline at C50	mg/kg	Yes	Yes	Yes	8367081	Yes	Yes	N/A	8367081
Volatiles									
F1 (C6-C10) - BTEX	mg/kg	<12	<12	<12	8370798	<12	<12	12	8370798
F1 (C6-C10)	mg/kg	<12	<12	<12	8370798	<12	<12	12	8370798
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	105	105	103	8370798	102	102	N/A	8370798
4-Bromofluorobenzene (sur.)	%	100	102	101	8370798	102	103	N/A	8370798
D10-ETHYLBENZENE (sur.)	%	103	109	107	8370798	103	101	N/A	8370798
D4-1,2-Dichloroethane (sur.)	%	110	112	115	8370798	115	118	N/A	8370798
O-TERPHENYL (sur.)	%	95	93	121	8367081	120	121	N/A	8367081

RDL = Reportable Detection Limit
N/A = Not Applicable

Maxxam Job #: B668559
Report Date: 2016/09/20

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AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		PG6020	PG6021	PG6022	PG6023	PG6024	PG6025		
Sampling Date		2016/08/11 08:15	2016/08/11 08:15	2016/08/11 09:00	2016/08/11 09:00	2016/08/11 08:45	2016/08/11 08:45		
COC Number		501520-07-01	501520-07-01	501520-07-01	501520-07-01	501520-07-01	501520-07-01		
	UNITS	**16-C1-19A**	**16-C1-19B**	**16-C1-20A**	**16-C1-20B**	**16-C1-21A**	**16-C1-21B**	**RDL**	**QC Batch**
Physical Properties									
Moisture	%	13	17	20	5.5	20	14	0.30	8368195
Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/kg	<10	<10	<10	<10	<10	<10	10	8370336
F3 (C16-C34 Hydrocarbons)	mg/kg	<50	<50	<50	<50	<50	<50	50	8370336
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	<50	<50	<50	<50	<50	50	8370336
Reached Baseline at C50	mg/kg	Yes	Yes	Yes	Yes	Yes	Yes	N/A	8370336
Volatiles									
F1 (C6-C10) - BTEX	mg/kg	<12	<12	<12	<12	<12	<12	12	8371137
F1 (C6-C10)	mg/kg	<12	<12	<12	<12	<12	<12	12	8371137
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	100	107	103	110	95	102	N/A	8371137
4-Bromofluorobenzene (sur.)	%	96	95	94	94	97	96	N/A	8371137
D10-ETHYLBENZENE (sur.)	%	98	108	102	113	94	102	N/A	8371137
D4-1,2-Dichloroethane (sur.)	%	99	96	96	94	108	99	N/A	8371137
O-TERPHENYL (sur.)	%	114	116	102	129	112	113	N/A	8370336

RDL = Reportable Detection Limit
N/A = Not Applicable

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ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Sampler Initials: RF

AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		PG6026	PG6027	PG6032	PG6033	PG6034		
Sampling Date		2016/08/11 09:30	2016/08/11 09:30	2016/08/11 11:00	2016/08/11 11:00	2016/08/11 10:00		
COC Number		501520-07-01	501520-07-01	501520-08-01	501520-08-01	501520-08-01		
	UNITS	16-C1-22A	16-C1-22B	16-C1-23A	16-C1-24A	16-C1-24B	RDL	QC Batch
Physical Properties								
Moisture	%	11	9.3	8.9	11	17	0.30	8368195
Ext. Pet. Hydrocarbon								
F2 (C10-C16 Hydrocarbons)	mg/kg	<10	<10	<10	<10	<10	10	8370336
F3 (C16-C34 Hydrocarbons)	mg/kg	<50	<50	<50	<50	<50	50	8370336
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	<50	<50	<50	<50	50	8370336
Reached Baseline at C50	mg/kg	Yes	Yes	Yes	Yes	Yes	N/A	8370336
Volatiles								
F1 (C6-C10) - BTEX	mg/kg	<12	<12	<12	<12	<12	12	8371137
F1 (C6-C10)	mg/kg	<12	<12	<12	<12	<12	12	8371137
Surrogate Recovery (%)								
1,4-Difluorobenzene (sur.)	%	102	101	100	101	100	N/A	8371137
4-Bromofluorobenzene (sur.)	%	95	101	94	95	94	N/A	8371137
D10-ETHYLBENZENE (sur.)	%	108	99	98	95	106	N/A	8371137
D4-1,2-Dichloroethane (sur.)	%	101	124	105	102	107	N/A	8371137
O-TERPHENYL (sur.)	%	125	111	116	114	111	N/A	8370336

RDL = Reportable Detection Limit
N/A = Not Applicable

Maxxam Job #: B668559
Report Date: 2016/09/20

ARCADIS Canada
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AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		PG6035		PG6036		PG6037		PG6038		
Sampling Date		2016/08/11 10:00		2016/08/11 10:30		2016/08/11 10:30		2016/08/11 14:45		
COC Number		501520-08-01		501520-08-01		501520-08-01		501520-08-01		
	UNITS	16-C1-25A	QC Batch	16-C1-26A	QC Batch	16-C1-26B	QC Batch	16-C1-27A	RDL	QC Batch
Physical Properties										
Moisture	%	25	8371141	12	8368195	8.0	8368195	7.8	0.30	8370721
Ext. Pet. Hydrocarbon										
F2 (C10-C16 Hydrocarbons)	mg/kg	<10	8371221	<10	8370336	<10	8370336	<10	10	8370991
F3 (C16-C34 Hydrocarbons)	mg/kg	<50	8371221	<50	8370336	<50	8370336	<50	50	8370991
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	8371221	<50	8370336	<50	8370336	<50	50	8370991
Reached Baseline at C50	mg/kg	Yes	8371221	Yes	8370336	Yes	8370336	Yes	N/A	8370991
Volatiles										
F1 (C6-C10) - BTEX	mg/kg	<12	8371256	<12	8371137	<12	8371115	<12	12	8370770
F1 (C6-C10)	mg/kg	<12	8371256	<12	8371137	<12	8371115	<12	12	8370770
Surrogate Recovery (%)										
1,4-Difluorobenzene (sur.)	%	99	8371256	101	8371137	101	8371115	102	N/A	8370770
4-Bromofluorobenzene (sur.)	%	95	8371256	95	8371137	102	8371115	100	N/A	8370770
D10-ETHYLBENZENE (sur.)	%	110	8371256	108	8371137	103	8371115	106	N/A	8370770
D4-1,2-Dichloroethane (sur.)	%	100	8371256	103	8371137	100	8371115	102	N/A	8370770
O-TERPHENYL (sur.)	%	93	8371221	112	8370336	109	8370336	114	N/A	8370991

RDL = Reportable Detection Limit
N/A = Not Applicable

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AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		PG6039		PG6040	PG6041		PG6068		
Sampling Date		2016/08/11 14:45		2016/08/11 14:15	2016/08/11 14:15		2016/08/11 14:30		
COC Number		501520-08-01		501520-08-01	501520-08-01		501520-09-01		
	UNITS	16-C1-27B	QC Batch	16-C1-28A	16-C1-28B	QC Batch	16-C1-29A	RDL	QC Batch
Physical Properties									
Moisture	%	4.2	8368195	4.1	3.5	8369563	6.8	0.30	8369563
Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/kg	<10	8370336	<10	<10	8370336	<10	10	8370328
F3 (C16-C34 Hydrocarbons)	mg/kg	<50	8370336	<50	<50	8370336	<50	50	8370328
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	8370336	<50	<50	8370336	<50	50	8370328
Reached Baseline at C50	mg/kg	Yes	8370336	Yes	Yes	8370336	Yes	N/A	8370328
Volatiles									
F1 (C6-C10) - BTEX	mg/kg	<12	8371115	<12	<12	8371115	<12	12	8371115
F1 (C6-C10)	mg/kg	<12	8371115	<12	<12	8371115	<12	12	8371115
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	102	8371115	99	98	8371115	99	N/A	8371115
4-Bromofluorobenzene (sur.)	%	100	8371115	102	101	8371115	100	N/A	8371115
D10-ETHYLBENZENE (sur.)	%	103	8371115	100	101	8371115	98	N/A	8371115
D4-1,2-Dichloroethane (sur.)	%	99	8371115	105	103	8371115	103	N/A	8371115
O-TERPHENYL (sur.)	%	113	8370336	116	111	8370336	136 (1)	N/A	8370328

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Surrogate recovery exceeds acceptance criteria (high recovery). As results are non-detect, there is no impact on data quality.

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AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		PG6069	PG6070	PG6071		PG6072		PG6073		
Sampling Date		2016/08/11 14:30	2016/08/11 14:00	2016/08/11 14:00		2016/08/11 15:00		2016/08/11 15:00		
COC Number		501520-09-01	501520-09-01	501520-09-01		501520-09-01		501520-09-01		
	UNITS	16-C1-29B	16-C1-30A	16-C1-30B	QC Batch	16-C1-31A	QC Batch	16-C1-31B	RDL	QC Batch
Physical Properties										
Moisture	%	12	6.7	6.4	8369563	4.5	8369563	4.6	0.30	8369563
Ext. Pet. Hydrocarbon										
F2 (C10-C16 Hydrocarbons)	mg/kg	<10	<10	<10	8370336	<10	8370336	<10	10	8370335
F3 (C16-C34 Hydrocarbons)	mg/kg	<50	<50	<50	8370336	<50	8370336	<50	50	8370335
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	<50	<50	8370336	<50	8370336	<50	50	8370335
Reached Baseline at C50	mg/kg	Yes	Yes	Yes	8370336	Yes	8370336	Yes	N/A	8370335
Volatiles										
F1 (C6-C10) - BTEX	mg/kg	<12	<12	<12	8371137	<12	8371115	<12	12	8371115
F1 (C6-C10)	mg/kg	<12	<12	<12	8371137	<12	8371115	<12	12	8371115
Surrogate Recovery (%)										
1,4-Difluorobenzene (sur.)	%	103	102	103	8371137	98	8371115	104	N/A	8371115
4-Bromofluorobenzene (sur.)	%	93	95	93	8371137	101	8371115	98	N/A	8371115
D10-ETHYLBENZENE (sur.)	%	109	98	125	8371137	103	8371115	109	N/A	8371115
D4-1,2-Dichloroethane (sur.)	%	102	103	104	8371137	102	8371115	94	N/A	8371115
O-TERPHENYL (sur.)	%	109	108	109	8370336	129	8370336	116	N/A	8370335

RDL = Reportable Detection Limit
N/A = Not Applicable

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AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		PG6074		PG6075	PG6076	PG6077	PG6078		
Sampling Date		2016/08/11 16:00		2016/08/11 16:00	2016/08/11 16:30	2016/08/11 16:30	2016/08/11 16:15		
COC Number		501520-09-01		501520-09-01	501520-09-01	501520-09-01	501520-10-01		
	UNITS	**16-C1-32A**	**QC Batch**	**16-C1-32B**	**16-C1-33A**	**16-C1-33B**	**16-C1-35A**	**RDL**	**QC Batch**
Physical Properties									
Moisture	%	20	8369563	17	3.5	3.1	6.8	0.30	8369563
Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/kg	<10	8370328	<10	<10	<10	<10	10	8370328
F3 (C16-C34 Hydrocarbons)	mg/kg	<50	8370328	83	<50	<50	<50	50	8370328
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	8370328	<50	<50	<50	<50	50	8370328
Reached Baseline at C50	mg/kg	Yes	8370328	Yes	Yes	Yes	Yes	N/A	8370328
Volatiles									
F1 (C6-C10) - BTEX	mg/kg	<12	8371115	<12	<12	<12	<12	12	8371137
F1 (C6-C10)	mg/kg	<12	8371115	<12	<12	<12	<12	12	8371137
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	99	8371115	99	100	100	101	N/A	8371137
4-Bromofluorobenzene (sur.)	%	100	8371115	96	94	94	94	N/A	8371137
D10-ETHYLBENZENE (sur.)	%	105	8371115	93	116	100	97	N/A	8371137
D4-1,2-Dichloroethane (sur.)	%	98	8371115	105	106	105	103	N/A	8371137
O-TERPHENYL (sur.)	%	120	8370328	123	88	124	125	N/A	8370328

RDL = Reportable Detection Limit
N/A = Not Applicable

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AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		PG6079		PG6087		PG6088		PG6089		
Sampling Date		2016/08/11 16:15		2016/08/09		2016/08/09		2016/08/10		
COC Number		501520-10-01		501520-02-01		501520-02-01		501520-02-01		
	UNITS	16-C1-35B	QC Batch	C1-DUP1	QC Batch	C1-DUP2	QC Batch	C1-DUP3	RDL	QC Batch
Physical Properties										
Moisture	%	4.6	8369563	4.2	8365131	6.3	8365131	7.8	0.30	8366645
Ext. Pet. Hydrocarbon										
F2 (C10-C16 Hydrocarbons)	mg/kg	<10	8370328	<10	8367080	<10	8367080	<10	10	8370335
F3 (C16-C34 Hydrocarbons)	mg/kg	<50	8370328	<50	8367080	<50	8367080	<50	50	8370335
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	8370328	<50	8367080	<50	8367080	<50	50	8370335
Reached Baseline at C50	mg/kg	Yes	8370328	Yes	8367080	Yes	8367080	Yes	N/A	8370335
Volatiles										
F1 (C6-C10) - BTEX	mg/kg	<12	8371115	<12	8366598	<12	8366769	<12	12	8370794
F1 (C6-C10)	mg/kg	<12	8371115	<12	8366598	<12	8366769	<12	12	8370794
Surrogate Recovery (%)										
1,4-Difluorobenzene (sur.)	%	100	8371115	102	8366598	103	8366769	103	N/A	8370794
4-Bromofluorobenzene (sur.)	%	99	8371115	94	8366598	98	8366769	101	N/A	8370794
D10-ETHYLBENZENE (sur.)	%	104	8371115	119	8366598	120	8366769	108	N/A	8370794
D4-1,2-Dichloroethane (sur.)	%	96	8371115	107	8366598	101	8366769	122	N/A	8370794
O-TERPHENYL (sur.)	%	117	8370328	106	8367080	92	8367080	117	N/A	8370335

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AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		PG6090		PG6091		PG6092		PG6093		
Sampling Date		2016/08/10		2016/08/10		2016/08/11		2016/08/11		
COC Number		501520-02-01		501520-02-01		501520-02-01		501520-02-01		
	UNITS	C1-DUP4	QC Batch	C1-DUP5	QC Batch	C1-DUP6	QC Batch	C1-DUP7	RDL	QC Batch
Physical Properties										
Moisture	%	10	8366645	3.0	8366645	5.5	8369563	11	0.30	8366645
Ext. Pet. Hydrocarbon										
F2 (C10-C16 Hydrocarbons)	mg/kg	<10	8370335	<10	8370335	<10	8370328	<10	10	8370335
F3 (C16-C34 Hydrocarbons)	mg/kg	<50	8370335	<50	8370335	<50	8370328	<50	50	8370335
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	8370335	<50	8370335	<50	8370328	<50	50	8370335
Reached Baseline at C50	mg/kg	Yes	8370335	Yes	8370335	Yes	8370328	Yes	N/A	8370335
Volatiles										
F1 (C6-C10) - BTEX	mg/kg	<12	8371113	<12	8370794	<12	8371137	<12	12	8370794
F1 (C6-C10)	mg/kg	<12	8371113	<12	8370794	<12	8371137	<12	12	8370794
Surrogate Recovery (%)										
1,4-Difluorobenzene (sur.)	%	106	8371113	101	8370794	100	8371137	102	N/A	8370794
4-Bromofluorobenzene (sur.)	%	102	8371113	103	8370794	95	8371137	103	N/A	8370794
D10-ETHYLBENZENE (sur.)	%	108	8371113	103	8370794	108	8371137	103	N/A	8370794
D4-1,2-Dichloroethane (sur.)	%	114	8371113	129	8370794	106	8371137	124	N/A	8370794
O-TERPHENYL (sur.)	%	113	8370335	118	8370335	122	8370328	118	N/A	8370335

RDL = Reportable Detection Limit
N/A = Not Applicable

Maxxam Job #: B668559
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AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		PG6094		
Sampling Date		2016/08/11		
COC Number		501520-02-01		
	UNITS	C1-DUP8	RDL	QC Batch
Physical Properties				
Moisture	%	7.2	0.30	8366645
Ext. Pet. Hydrocarbon				
F2 (C10-C16 Hydrocarbons)	mg/kg	<10	10	8370335
F3 (C16-C34 Hydrocarbons)	mg/kg	<50	50	8370335
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	50	8370335
Reached Baseline at C50	mg/kg	Yes	N/A	8370335
Volatiles				
F1 (C6-C10) - BTEX	mg/kg	<12	12	8370794
F1 (C6-C10)	mg/kg	<12	12	8370794
Surrogate Recovery (%)				
1,4-Difluorobenzene (sur.)	%	102	N/A	8370794
4-Bromofluorobenzene (sur.)	%	103	N/A	8370794
D10-ETHYLBENZENE (sur.)	%	102	N/A	8370794
D4-1,2-Dichloroethane (sur.)	%	122	N/A	8370794
O-TERPHENYL (sur.)	%	117	N/A	8370335

RDL = Reportable Detection Limit
N/A = Not Applicable

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AT1 BTEX AND F1-F4 IN WATER (WATER)

Maxxam ID		PG6137	PG6138	PG6139		
Sampling Date		2016/08/10 11:00	2016/08/10 14:15	2016/08/10		
COC Number		501520-11-01	501520-11-01	501520-11-01		
	UNITS	C1-MW05	C1-MW03	C1-DUP1	RDL	QC Batch
Ext. Pet. Hydrocarbon						
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	<0.10	<0.10	0.10	8370351
F3 (C16-C34 Hydrocarbons)	mg/L	<0.20	<0.20	<0.20	0.20	8370351
F4 (C34-C50 Hydrocarbons)	mg/L	<0.20	<0.20	<0.20	0.20	8370351
Reached Baseline at C50	mg/L	Yes	Yes	Yes	N/A	8370351
Volatiles						
Benzene	ug/L	<0.40	<0.40	<0.40	0.40	8370463
Toluene	ug/L	<0.40	<0.40	<0.40	0.40	8370463
Ethylbenzene	ug/L	<0.40	<0.40	<0.40	0.40	8370463
m & p-Xylene	ug/L	<0.80	<0.80	<0.80	0.80	8370463
o-Xylene	ug/L	<0.40	<0.40	<0.40	0.40	8370463
Xylenes (Total)	ug/L	<0.80	<0.80	<0.80	0.80	8370463
F1 (C6-C10) - BTEX	ug/L	<100	<100	<100	100	8370463
F1 (C6-C10)	ug/L	<100	<100	<100	100	8370463
Surrogate Recovery (%)						
1,4-Difluorobenzene (sur.)	%	102	100	99	N/A	8370463
4-Bromofluorobenzene (sur.)	%	96	96	97	N/A	8370463
D4-1,2-Dichloroethane (sur.)	%	96	99	97	N/A	8370463
O-TERPHENYL (sur.)	%	114	104	101	N/A	8370351

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ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		PG5955		PG5956	PG5957	PG5958	PG5959		
Sampling Date		2016/08/09 14:15		2016/08/09 14:15	2016/08/09 14:00	2016/08/09 14:00	2016/08/09 13:30		
COC Number		501520-01-01		501520-01-01	501520-01-01	501520-01-01	501520-01-01		
	UNITS	16-C1-1A	QC Batch	16-C1-1B	16-C1-2A	16-C1-2B	16-C1-3A	RDL	QC Batch
Elements									
Total Arsenic (As)	mg/kg	2.3	8369249	3.6	<1.0	1.5	2.6	1.0	8370397
Total Cadmium (Cd)	mg/kg	<0.050	8369249	<0.050	<0.050	<0.050	<0.050	0.050	8370397
Total Chromium (Cr)	mg/kg	2.2	8369249	2.3	<1.0	1.2	3.6	1.0	8370397
Total Cobalt (Co)	mg/kg	1.0	8369249	1.4	<0.50	0.90	1.8	0.50	8370397
Total Copper (Cu)	mg/kg	4.5	8369249	4.8	1.5	2.9	4.0	1.0	8370397
Total Lead (Pb)	mg/kg	6.1	8369249	8.1	1.4	2.2	3.9	0.50	8370397
Total Mercury (Hg)	mg/kg	<0.050	8369249	0.062	<0.050	<0.050	<0.050	0.050	8370397
Total Nickel (Ni)	mg/kg	1.6	8369249	1.5	<1.0	1.1	2.8	1.0	8370397
Total Zinc (Zn)	mg/kg	<10	8369249	<10	<10	<10	<10	10	8370397
RDL = Reportable Detection Limit									

Maxxam ID		PG5960		PG5961		PG5962	PG5963		
Sampling Date		2016/08/09 13:30		2016/08/09 13:15		2016/08/09 13:15	2016/08/09 13:00		
COC Number		501520-01-01		501520-01-01		501520-01-01	501520-01-01		
	UNITS	16-C1-3B	QC Batch	16-C1-4A	QC Batch	16-C1-4B	16-C1-5A	RDL	QC Batch
Elements									
Total Arsenic (As)	mg/kg	5.1	8370397	1.0	8371381	1.3	1.0	1.0	8370397
Total Cadmium (Cd)	mg/kg	<0.050	8370397	<0.050	8371381	<0.050	<0.050	0.050	8370397
Total Chromium (Cr)	mg/kg	3.0	8370397	1.3	8371381	2.7	<1.0	1.0	8370397
Total Cobalt (Co)	mg/kg	2.0	8370397	0.65	8371381	1.0	<0.50	0.50	8370397
Total Copper (Cu)	mg/kg	6.5	8370397	1.8	8371381	1.8	1.7	1.0	8370397
Total Lead (Pb)	mg/kg	6.0	8370397	2.0	8371381	2.4	1.6	0.50	8370397
Total Mercury (Hg)	mg/kg	<0.050	8370397	<0.050	8371381	<0.050	<0.050	0.050	8370397
Total Nickel (Ni)	mg/kg	2.2	8370397	<1.0	8371381	1.1	<1.0	1.0	8370397
Total Zinc (Zn)	mg/kg	<10	8370397	<10	8371381	<10	<10	10	8370397
RDL = Reportable Detection Limit									

Maxxam Job #: B668559
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ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		PG5964		PG5973	PG5974	PG5975		PG5976		
Sampling Date		2016/08/09 13:00		2016/08/09 16:30	2016/08/09 16:30	2016/08/09 15:00		2016/08/09 15:00		
COC Number		501520-01-01		501520-03-01	501520-03-01	501520-03-01		501520-03-01		
	UNITS	16-C1-5B	QC Batch	16-C1-6A	16-C1-6B	16-C1-7A	QC Batch	16-C1-7B	RDL	QC Batch
Elements										
Total Arsenic (As)	mg/kg	1.2	8371381	6.9	7.6	3.6	8370397	3.4	1.0	8369249
Total Cadmium (Cd)	mg/kg	<0.050	8371381	<0.050	<0.050	<0.050	8370397	<0.050	0.050	8369249
Total Chromium (Cr)	mg/kg	<1.0	8371381	2.2	1.9	2.7	8370397	2.4	1.0	8369249
Total Cobalt (Co)	mg/kg	<0.50	8371381	0.98	1.6	1.1	8370397	1.2	0.50	8369249
Total Copper (Cu)	mg/kg	1.5	8371381	2.8	4.0	2.0	8370397	3.0	1.0	8369249
Total Lead (Pb)	mg/kg	1.5	8371381	11	17	6.5	8370397	7.0	0.50	8369249
Total Mercury (Hg)	mg/kg	<0.050	8371381	<0.050	<0.050	<0.050	8370397	<0.050	0.050	8369249
Total Nickel (Ni)	mg/kg	<1.0	8371381	1.6	2.0	1.8	8370397	1.5	1.0	8369249
Total Zinc (Zn)	mg/kg	<10	8371381	<10	<10	<10	8370397	<10	10	8369249
RDL = Reportable Detection Limit										

Maxxam ID		PG5977	PG5978		PG5979	PG5980		PG5981		
Sampling Date		2016/08/09 15:30	2016/08/09 15:30		2016/08/09 16:00	2016/08/09 16:00		2016/08/10 17:30		
COC Number		501520-03-01	501520-03-01		501520-03-01	501520-03-01		501520-03-01		
	UNITS	16-C1-8A	16-C1-8B	QC Batch	16-C1-9A	16-C1-9B	QC Batch	16-C1-10A	RDL	QC Batch
Elements										
Total Arsenic (As)	mg/kg	2.1	3.3	8369249	5.0	3.8	8371381	<1.0	1.0	8369249
Total Cadmium (Cd)	mg/kg	<0.050	<0.050	8369249	0.075	<0.050	8371381	<0.050	0.050	8369249
Total Chromium (Cr)	mg/kg	1.4	1.7	8369249	2.2	1.6	8371381	1.4	1.0	8369249
Total Cobalt (Co)	mg/kg	0.55	1.0	8369249	1.3	1.0	8371381	<0.50	0.50	8369249
Total Copper (Cu)	mg/kg	1.1	1.7	8369249	6.4	3.4	8371381	1.4	1.0	8369249
Total Lead (Pb)	mg/kg	2.8	6.2	8369249	7.3	6.4	8371381	2.0	0.50	8369249
Total Mercury (Hg)	mg/kg	<0.050	<0.050	8369249	<0.050	<0.050	8371381	<0.050	0.050	8369249
Total Nickel (Ni)	mg/kg	<1.0	1.3	8369249	2.4	1.6	8371381	<1.0	1.0	8369249
Total Zinc (Zn)	mg/kg	<10	<10	8369249	<10	<10	8371381	<10	10	8369249
RDL = Reportable Detection Limit										

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ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Sampler Initials: RF

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		PG5982	PG5986	PG5987	PG5988	PG5989	PG5990		
Sampling Date		2016/08/10 17:30	2016/08/10 16:00	2016/08/10 16:00	2016/08/10 16:45	2016/08/10 16:45	2016/08/10 17:00		
COC Number		501520-03-01	501520-04-01	501520-04-01	501520-04-01	501520-04-01	501520-04-01		
	UNITS	16-C1-10B	16-C1-11A	16-C1-11B	16-C1-12A	16-C1-12B	16-C1-13A	RDL	QC Batch
Elements									
Total Arsenic (As)	mg/kg	4.6	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	8369249
Total Cadmium (Cd)	mg/kg	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	8369249
Total Chromium (Cr)	mg/kg	4.2	1.8	1.6	<1.0	2.6	2.2	1.0	8369249
Total Cobalt (Co)	mg/kg	1.3	<0.50	<0.50	<0.50	0.59	0.62	0.50	8369249
Total Copper (Cu)	mg/kg	3.3	1.2	<1.0	1.0	1.3	1.2	1.0	8369249
Total Lead (Pb)	mg/kg	9.6	0.71	0.86	<0.50	1.2	1.5	0.50	8369249
Total Mercury (Hg)	mg/kg	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	8369249
Total Nickel (Ni)	mg/kg	2.3	1.0	<1.0	<1.0	1.5	1.3	1.0	8369249
Total Zinc (Zn)	mg/kg	<10	<10	<10	<10	<10	<10	10	8369249
RDL = Reportable Detection Limit									

Maxxam ID		PG5991	PG5992		PG5993		PG5994		
Sampling Date		2016/08/10 17:00	2016/08/10 08:30		2016/08/10 08:30		2016/08/10 09:15		
COC Number		501520-04-01	501520-04-01		501520-04-01		501520-04-01		
	UNITS	16-C1-13B	16-C1-MW01A	QC Batch	16-C1-MW01B	QC Batch	16-C1-MW02A	RDL	QC Batch
Elements									
Total Arsenic (As)	mg/kg	1.2	1.0	8370393	1.7	8370397	11	1.0	8371381
Total Cadmium (Cd)	mg/kg	<0.050	<0.050	8370393	0.082	8370397	<0.050	0.050	8371381
Total Chromium (Cr)	mg/kg	1.8	2.9	8370393	3.6	8370397	2.0	1.0	8371381
Total Cobalt (Co)	mg/kg	0.60	1.0	8370393	1.1	8370397	0.85	0.50	8371381
Total Copper (Cu)	mg/kg	1.2	2.2	8370393	3.1	8370397	2.6	1.0	8371381
Total Lead (Pb)	mg/kg	2.1	3.0	8370393	34	8370397	29	0.50	8371381
Total Mercury (Hg)	mg/kg	<0.050	<0.050	8370393	<0.050	8370397	<0.050	0.050	8371381
Total Nickel (Ni)	mg/kg	1.1	2.0	8370393	2.2	8370397	1.6	1.0	8371381
Total Zinc (Zn)	mg/kg	<10	<10	8370393	17	8370397	<10	10	8371381
RDL = Reportable Detection Limit									

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Sampler Initials: RF

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		PG5995	PG5997		PG5998	PG5999		
Sampling Date		2016/08/10 09:00	2016/08/10 09:00		2016/08/10 08:45	2016/08/10 08:45		
COC Number		501520-04-01	501520-05-01		501520-05-01	501520-05-01		
	UNITS	16-C1-MW03A	16-C1-MW03B	QC Batch	16-C1-MW04A	16-C1-MW04B	RDL	QC Batch
Elements								
Total Arsenic (As)	mg/kg	2.1	2.7	8371381	2.6	37	1.0	8370393
Total Cadmium (Cd)	mg/kg	<0.050	<0.050	8371381	<0.050	<0.050	0.050	8370393
Total Chromium (Cr)	mg/kg	3.3	3.5	8371381	2.5	3.2	1.0	8370393
Total Cobalt (Co)	mg/kg	1.1	1.2	8371381	0.70	1.9	0.50	8370393
Total Copper (Cu)	mg/kg	5.4	3.3	8371381	2.3	6.6	1.0	8370393
Total Lead (Pb)	mg/kg	4.4	5.6	8371381	6.4	52	0.50	8370393
Total Mercury (Hg)	mg/kg	<0.050	<0.050	8371381	<0.050	<0.050	0.050	8370393
Total Nickel (Ni)	mg/kg	2.2	2.6	8371381	1.3	3.9	1.0	8370393
Total Zinc (Zn)	mg/kg	<10	<10	8371381	<10	<10	10	8370393
RDL = Reportable Detection Limit								

Maxxam ID		PG6000	PG6001	PG6002		PG6003	PG6004		
Sampling Date		2016/08/10 10:30	2016/08/10 10:30	2016/08/10 09:45		2016/08/10 09:45	2016/08/10 10:00		
COC Number		501520-05-01	501520-05-01	501520-05-01		501520-05-01	501520-05-01		
	UNITS	16-C1-MW05A	16-C1-MW05B	16-C1-MW06A	QC Batch	16-C1-MW06B	16-C1-MW07A	RDL	QC Batch
Elements									
Total Arsenic (As)	mg/kg	2.6	1.9	1.8	8371790	1.6	1.8	1.0	8370393
Total Cadmium (Cd)	mg/kg	<0.050	<0.050	<0.050	8371790	<0.050	<0.050	0.050	8370393
Total Chromium (Cr)	mg/kg	2.7	2.9	3.0	8371790	3.6	1.5	1.0	8370393
Total Cobalt (Co)	mg/kg	1.0	1.1	1.2	8371790	1.4	0.54	0.50	8370393
Total Copper (Cu)	mg/kg	2.5	1.7	2.2	8371790	2.1	3.4	1.0	8370393
Total Lead (Pb)	mg/kg	5.1	3.2	2.8	8371790	3.6	3.9	0.50	8370393
Total Mercury (Hg)	mg/kg	<0.050	<0.050	<0.050	8371790	<0.050	<0.050	0.050	8370393
Total Nickel (Ni)	mg/kg	2.4	1.6	1.9	8371790	2.1	1.1	1.0	8370393
Total Zinc (Zn)	mg/kg	<10	<10	<10	8371790	<10	<10	10	8370393
RDL = Reportable Detection Limit									

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ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		PG6005		PG6008		PG6009		PG6010		
Sampling Date		2016/08/10 10:00		2016/08/10 10:15		2016/08/10 10:15		2016/08/10 21:00		
COC Number		501520-05-01		501520-06-01		501520-06-01		501520-06-01		
	UNITS	16-C1-MW07B	QC Batch	16-C1-MW08A	QC Batch	16-C1-MW08B	QC Batch	16-C1-14A	RDL	QC Batch
Elements										
Total Arsenic (As)	mg/kg	2.6	8370393	3.9	8370397	2.0	8370393	3.5	1.0	8371381
Total Cadmium (Cd)	mg/kg	<0.050	8370393	0.051	8370397	<0.050	8370393	<0.050	0.050	8371381
Total Chromium (Cr)	mg/kg	4.2	8370393	4.0	8370397	3.7	8370393	3.6	1.0	8371381
Total Cobalt (Co)	mg/kg	1.6	8370393	1.4	8370397	1.2	8370393	1.1	0.50	8371381
Total Copper (Cu)	mg/kg	4.3	8370393	5.5	8370397	2.3	8370393	1.9	1.0	8371381
Total Lead (Pb)	mg/kg	4.6	8370393	7.1	8370397	4.0	8370393	7.6	0.50	8371381
Total Mercury (Hg)	mg/kg	<0.050	8370393	<0.050	8370397	<0.050	8370393	<0.050	0.050	8371381
Total Nickel (Ni)	mg/kg	2.5	8370393	2.9	8370397	2.2	8370393	2.1	1.0	8371381
Total Zinc (Zn)	mg/kg	<10	8370393	<10	8370397	<10	8370393	<10	10	8371381

RDL = Reportable Detection Limit

Maxxam ID		PG6011	PG6012		PG6013		PG6014	PG6015		
Sampling Date		2016/08/10 21:00	2016/08/10 20:45		2016/08/10 20:45		2016/08/10 20:00	2016/08/10 20:00		
COC Number		501520-06-01	501520-06-01		501520-06-01		501520-06-01	501520-06-01		
	UNITS	16-C1-14B	16-C1-15A	QC Batch	16-C1-15B	QC Batch	16-C1-16A	16-C1-16B	RDL	QC Batch
Elements										
Total Arsenic (As)	mg/kg	2.3	2.2	8371399	2.1	8371790	<1.0	<1.0	1.0	8370397
Total Cadmium (Cd)	mg/kg	<0.050	<0.050	8371399	<0.050	8371790	<0.050	<0.050	0.050	8370397
Total Chromium (Cr)	mg/kg	2.5	2.7	8371399	2.9	8371790	1.5	1.5	1.0	8370397
Total Cobalt (Co)	mg/kg	0.77	0.76	8371399	0.76	8371790	<0.50	<0.50	0.50	8370397
Total Copper (Cu)	mg/kg	1.3	1.9	8371399	1.9	8371790	<1.0	<1.0	1.0	8370397
Total Lead (Pb)	mg/kg	4.2	3.3	8371399	2.9	8371790	2.0	2.5	0.50	8370397
Total Mercury (Hg)	mg/kg	<0.050	<0.050	8371399	<0.050	8371790	<0.050	<0.050	0.050	8370397
Total Nickel (Ni)	mg/kg	1.6	1.5	8371399	1.4	8371790	<1.0	<1.0	1.0	8370397
Total Zinc (Zn)	mg/kg	<10	<10	8371399	<10	8371790	<10	<10	10	8370397

RDL = Reportable Detection Limit

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ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		PG6016		PG6017		PG6018	PG6019	PG6020		
Sampling Date		2016/08/10 20:15		2016/08/10 20:15		2016/08/10 20:30	2016/08/10 20:30	2016/08/11 08:15		
COC Number		501520-06-01		501520-06-01		501520-07-01	501520-07-01	501520-07-01		
	UNITS	16-C1-17A	QC Batch	16-C1-17B	QC Batch	16-C1-18A	16-C1-18B	16-C1-19A	RDL	QC Batch
Elements										
Total Arsenic (As)	mg/kg	2.3	8370397	2.4	8370393	<1.0	<1.0	6.8	1.0	8371790
Total Cadmium (Cd)	mg/kg	<0.050	8370397	<0.050	8370393	<0.050	<0.050	<0.050	0.050	8371790
Total Chromium (Cr)	mg/kg	1.8	8370397	1.7	8370393	1.6	1.6	1.6	1.0	8371790
Total Cobalt (Co)	mg/kg	<0.50	8370397	0.62	8370393	<0.50	<0.50	0.76	0.50	8371790
Total Copper (Cu)	mg/kg	1.3	8370397	1.8	8370393	<1.0	<1.0	3.3	1.0	8371790
Total Lead (Pb)	mg/kg	5.6	8370397	7.9	8370393	1.1	1.1	8.5	0.50	8371790
Total Mercury (Hg)	mg/kg	<0.050	8370397	<0.050	8370393	<0.050	<0.050	<0.050	0.050	8371790
Total Nickel (Ni)	mg/kg	<1.0	8370397	<1.0	8370393	<1.0	<1.0	1.2	1.0	8371790
Total Zinc (Zn)	mg/kg	<10	8370397	<10	8370393	<10	<10	<10	10	8371790
RDL = Reportable Detection Limit										

Maxxam ID		PG6021		PG6022	PG6023	PG6024	PG6025		
Sampling Date		2016/08/11 08:15		2016/08/11 09:00	2016/08/11 09:00	2016/08/11 08:45	2016/08/11 08:45		
COC Number		501520-07-01		501520-07-01	501520-07-01	501520-07-01	501520-07-01		
	UNITS	16-C1-19B	RDL	16-C1-20A	16-C1-20B	16-C1-21A	16-C1-21B	RDL	QC Batch
Elements									
Total Arsenic (As)	mg/kg	6.8	2.0	10	2.3	8.5	8.2	1.0	8371790
Total Cadmium (Cd)	mg/kg	<0.10	0.10	0.052	<0.050	<0.050	<0.050	0.050	8371790
Total Chromium (Cr)	mg/kg	7.7	2.0	3.9	2.3	3.0	2.7	1.0	8371790
Total Cobalt (Co)	mg/kg	<1.0	1.0	1.1	0.62	0.84	0.87	0.50	8371790
Total Copper (Cu)	mg/kg	5.2	2.0	5.4	1.5	3.6	2.5	1.0	8371790
Total Lead (Pb)	mg/kg	9.9	1.0	14	4.6	11	11	0.50	8371790
Total Mercury (Hg)	mg/kg	<0.10	0.10	<0.050	<0.050	<0.050	<0.050	0.050	8371790
Total Nickel (Ni)	mg/kg	3.8	2.0	2.5	1.2	2.3	2.0	1.0	8371790
Total Zinc (Zn)	mg/kg	<20	20	10	<10	<10	<10	10	8371790
RDL = Reportable Detection Limit									

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ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		PG6026	PG6027	PG6032	PG6033	PG6034		
Sampling Date		2016/08/11 09:30	2016/08/11 09:30	2016/08/11 11:00	2016/08/11 11:00	2016/08/11 10:00		
COC Number		501520-07-01	501520-07-01	501520-08-01	501520-08-01	501520-08-01		
	UNITS	16-C1-22A	16-C1-22B	16-C1-23A	16-C1-24A	16-C1-24B	RDL	QC Batch
Elements								
Total Arsenic (As)	mg/kg	5.0	5.2	19	2.1	2.9	1.0	8370393
Total Cadmium (Cd)	mg/kg	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	8370393
Total Chromium (Cr)	mg/kg	3.0	4.0	7.2	5.6	2.2	1.0	8370393
Total Cobalt (Co)	mg/kg	0.70	0.72	1.0	<0.50	0.57	0.50	8370393
Total Copper (Cu)	mg/kg	1.9	1.8	2.4	1.5	1.6	1.0	8370393
Total Lead (Pb)	mg/kg	9.7	8.9	56	4.4	5.6	0.50	8370393
Total Mercury (Hg)	mg/kg	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	8370393
Total Nickel (Ni)	mg/kg	1.4	1.5	1.6	1.1	1.2	1.0	8370393
Total Zinc (Zn)	mg/kg	<10	<10	32	<10	<10	10	8370393
RDL = Reportable Detection Limit								

Maxxam ID		PG6035		PG6036	PG6037		PG6038		
Sampling Date		2016/08/11 10:00		2016/08/11 10:30	2016/08/11 10:30		2016/08/11 14:45		
COC Number		501520-08-01		501520-08-01	501520-08-01		501520-08-01		
	UNITS	16-C1-25A	QC Batch	16-C1-26A	16-C1-26B	QC Batch	16-C1-27A	RDL	QC Batch
Elements									
Total Arsenic (As)	mg/kg	2.1	8371790	1.4	2.0	8370393	1.1	1.0	8369249
Total Cadmium (Cd)	mg/kg	0.055	8371790	<0.050	<0.050	8370393	<0.050	0.050	8369249
Total Chromium (Cr)	mg/kg	2.4	8371790	3.7	3.7	8370393	2.5	1.0	8369249
Total Cobalt (Co)	mg/kg	0.52	8371790	0.79	0.83	8370393	0.84	0.50	8369249
Total Copper (Cu)	mg/kg	3.5	8371790	1.5	1.9	8370393	3.3	1.0	8369249
Total Lead (Pb)	mg/kg	5.5	8371790	4.5	4.3	8370393	2.1	0.50	8369249
Total Mercury (Hg)	mg/kg	<0.050	8371790	<0.050	<0.050	8370393	<0.050	0.050	8369249
Total Nickel (Ni)	mg/kg	1.2	8371790	1.5	1.8	8370393	2.2	1.0	8369249
Total Zinc (Zn)	mg/kg	<10	8371790	<10	<10	8370393	<10	10	8369249
RDL = Reportable Detection Limit									

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ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		PG6039		PG6040	PG6041		PG6068		
Sampling Date		2016/08/11 14:45		2016/08/11 14:15	2016/08/11 14:15		2016/08/11 14:30		
COC Number		501520-08-01		501520-08-01	501520-08-01		501520-09-01		
	UNITS	16-C1-27B	QC Batch	16-C1-28A	16-C1-28B	QC Batch	16-C1-29A	RDL	QC Batch
Elements									
Total Arsenic (As)	mg/kg	1.2	8371399	2.0	<1.0	8371381	<1.0	1.0	8369249
Total Cadmium (Cd)	mg/kg	<0.050	8371399	<0.050	<0.050	8371381	<0.050	0.050	8369249
Total Chromium (Cr)	mg/kg	2.9	8371399	9.0	<1.0	8371381	3.8	1.0	8369249
Total Cobalt (Co)	mg/kg	0.85	8371399	2.6	<0.50	8371381	0.62	0.50	8369249
Total Copper (Cu)	mg/kg	1.7	8371399	5.0	<1.0	8371381	2.4	1.0	8369249
Total Lead (Pb)	mg/kg	2.0	8371399	4.3	<0.50	8371381	2.0	0.50	8369249
Total Mercury (Hg)	mg/kg	<0.050	8371399	<0.050	<0.050	8371381	<0.050	0.050	8369249
Total Nickel (Ni)	mg/kg	1.7	8371399	6.1	<1.0	8371381	1.6	1.0	8369249
Total Zinc (Zn)	mg/kg	<10	8371399	<10	<10	8371381	<10	10	8369249
RDL = Reportable Detection Limit									

Maxxam ID		PG6069		PG6070		PG6071		PG6072		
Sampling Date		2016/08/11 14:30		2016/08/11 14:00		2016/08/11 14:00		2016/08/11 15:00		
COC Number		501520-09-01		501520-09-01		501520-09-01		501520-09-01		
	UNITS	16-C1-29B	QC Batch	16-C1-30A	QC Batch	16-C1-30B	QC Batch	16-C1-31A	RDL	QC Batch
Elements										
Total Arsenic (As)	mg/kg	<1.0	8371381	<1.0	8370397	<1.0	8371381	<1.0	1.0	8370397
Total Cadmium (Cd)	mg/kg	<0.050	8371381	<0.050	8370397	<0.050	8371381	<0.050	0.050	8370397
Total Chromium (Cr)	mg/kg	3.3	8371381	2.6	8370397	4.4	8371381	9.1	1.0	8370397
Total Cobalt (Co)	mg/kg	0.82	8371381	0.83	8370397	1.1	8371381	0.81	0.50	8370397
Total Copper (Cu)	mg/kg	1.9	8371381	1.6	8370397	2.6	8371381	1.6	1.0	8370397
Total Lead (Pb)	mg/kg	2.0	8371381	1.7	8370397	1.7	8371381	2.0	0.50	8370397
Total Mercury (Hg)	mg/kg	<0.050	8371381	<0.050	8370397	<0.050	8371381	<0.050	0.050	8370397
Total Nickel (Ni)	mg/kg	2.2	8371381	1.5	8370397	2.7	8371381	4.1	1.0	8370397
Total Zinc (Zn)	mg/kg	<10	8371381	<10	8370397	<10	8371381	<10	10	8370397
RDL = Reportable Detection Limit										

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ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		PG6073	PG6074	PG6075		PG6076	PG6077		
Sampling Date		2016/08/11 15:00	2016/08/11 16:00	2016/08/11 16:00		2016/08/11 16:30	2016/08/11 16:30		
COC Number		501520-09-01	501520-09-01	501520-09-01		501520-09-01	501520-09-01		
	UNITS	**16-C1-31B**	**16-C1-32A**	**16-C1-32B**	**QC Batch**	**16-C1-33A**	**16-C1-33B**	**RDL**	**QC Batch**
Elements									
Total Arsenic (As)	mg/kg	<1.0	2.0	2.0	8370397	11	5.1	1.0	8371381
Total Cadmium (Cd)	mg/kg	<0.050	<0.050	<0.050	8370397	<0.050	<0.050	0.050	8371381
Total Chromium (Cr)	mg/kg	3.2	13	11	8370397	9.2	6.2	1.0	8371381
Total Cobalt (Co)	mg/kg	0.69	0.87	1.4	8370397	3.8	2.3	0.50	8371381
Total Copper (Cu)	mg/kg	1.9	2.0	2.7	8370397	5.8	4.4	1.0	8371381
Total Lead (Pb)	mg/kg	1.7	1.9	3.4	8370397	32	14	0.50	8371381
Total Mercury (Hg)	mg/kg	<0.050	<0.050	<0.050	8370397	<0.050	<0.050	0.050	8371381
Total Nickel (Ni)	mg/kg	2.1	6.6	5.8	8370397	8.5	5.2	1.0	8371381
Total Zinc (Zn)	mg/kg	<10	<10	<10	8370397	<10	<10	10	8371381
RDL = Reportable Detection Limit									

Maxxam ID		PG6078	PG6079		PG6087		PG6088	PG6089		
Sampling Date		2016/08/11 16:15	2016/08/11 16:15		2016/08/09		2016/08/09	2016/08/10		
COC Number		501520-10-01	501520-10-01		501520-02-01		501520-02-01	501520-02-01		
	UNITS	**16-C1-35A**	**16-C1-35B**	**QC Batch**	**C1-DUP1**	**QC Batch**	**C1-DUP2**	**C1-DUP3**	**RDL**	**QC Batch**
Elements										
Total Arsenic (As)	mg/kg	6.7	2.6	8371381	1.2	8369249	13	<1.0	1.0	8371381
Total Cadmium (Cd)	mg/kg	<0.050	<0.050	8371381	<0.050	8369249	<0.050	<0.050	0.050	8371381
Total Chromium (Cr)	mg/kg	18	3.7	8371381	1.2	8369249	2.4	1.3	1.0	8371381
Total Cobalt (Co)	mg/kg	3.0	1.3	8371381	<0.50	8369249	1.3	<0.50	0.50	8371381
Total Copper (Cu)	mg/kg	7.8	3.0	8371381	<1.0	8369249	3.3	1.0	1.0	8371381
Total Lead (Pb)	mg/kg	15	7.6	8371381	1.6	8369249	12	0.80	0.50	8371381
Total Mercury (Hg)	mg/kg	<0.050	<0.050	8371381	<0.050	8369249	<0.050	<0.050	0.050	8371381
Total Nickel (Ni)	mg/kg	11	2.6	8371381	<1.0	8369249	2.4	<1.0	1.0	8371381
Total Zinc (Zn)	mg/kg	<10	<10	8371381	<10	8369249	10	<10	10	8371381
RDL = Reportable Detection Limit										

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ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		PG6090	PG6091		PG6092	PG6093	PG6094		
Sampling Date		2016/08/10	2016/08/10		2016/08/11	2016/08/11	2016/08/11		
COC Number		501520-02-01	501520-02-01		501520-02-01	501520-02-01	501520-02-01		
	UNITS	C1-DUP4	C1-DUP5	QC Batch	C1-DUP6	C1-DUP7	C1-DUP8	RDL	QC Batch
Elements									
Total Arsenic (As)	mg/kg	<1.0	<1.0	8371381	2.0	1.2	1.0	1.0	8369249
Total Cadmium (Cd)	mg/kg	<0.050	<0.050	8371381	<0.050	<0.050	<0.050	0.050	8369249
Total Chromium (Cr)	mg/kg	1.2	1.9	8371381	2.1	3.4	2.7	1.0	8369249
Total Cobalt (Co)	mg/kg	<0.50	0.69	8371381	0.51	0.70	0.69	0.50	8369249
Total Copper (Cu)	mg/kg	1.8	<1.0	8371381	1.2	1.5	1.7	1.0	8369249
Total Lead (Pb)	mg/kg	0.53	1.8	8371381	5.0	4.5	2.3	0.50	8369249
Total Mercury (Hg)	mg/kg	<0.050	<0.050	8371381	<0.050	<0.050	<0.050	0.050	8369249
Total Nickel (Ni)	mg/kg	<1.0	1.0	8371381	<1.0	1.3	1.7	1.0	8369249
Total Zinc (Zn)	mg/kg	<10	<10	8371381	<10	<10	<10	10	8369249
RDL = Reportable Detection Limit									

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RESULTS OF CHEMICAL ANALYSES OF WATER

Maxxam ID		PG6137	PG6138	PG6139		
Sampling Date		2016/08/10 11:00	2016/08/10 14:15	2016/08/10		
COC Number		501520-11-01	501520-11-01	501520-11-01		
	UNITS	C1-MW05	C1-MW03	C1-DUP1	RDL	QC Batch
Metals						
Total Hex. Chromium (Cr 6+)	mg/L	<0.0010	<0.0010	<0.0010	0.0010	8367110
RDL = Reportable Detection Limit						

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ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		PG6137	PG6138	PG6139		
Sampling Date		2016/08/10 11:00	2016/08/10 14:15	2016/08/10		
COC Number		501520-11-01	501520-11-01	501520-11-01		
	UNITS	C1-MW05	C1-MW03	C1-DUP1	RDL	QC Batch
Elements						
Total Arsenic (As)	mg/L	0.00099	0.00028	0.0010	0.00020	8365801
Total Cadmium (Cd)	mg/L	<0.000020	<0.000020	<0.000020	0.000020	8365801
Total Chromium (Cr)	mg/L	<0.0010	<0.0010	<0.0010	0.0010	8365801
Total Cobalt (Co)	mg/L	<0.00030	<0.00030	<0.00030	0.00030	8365801
Total Copper (Cu)	mg/L	0.0034	0.0010	0.0034	0.00020	8365801
Total Lead (Pb)	mg/L	<0.00020	<0.00020	<0.00020	0.00020	8365801
Total Nickel (Ni)	mg/L	0.0022	0.0020	0.0021	0.00050	8365801
Total Zinc (Zn)	mg/L	<0.0030	<0.0030	<0.0030	0.0030	8365801
Low Level Elements						
Total Mercury (Hg)	ug/L	0.0031	0.0027	0.0036	0.0020	8365833
RDL = Reportable Detection Limit						

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VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		PG6140		
Sampling Date				
COC Number		501520-11-01		
	UNITS	TRIP BLANK	RDL	QC Batch
Volatiles				
Benzene	ug/L	<0.40	0.40	8370463
Toluene	ug/L	<0.40	0.40	8370463
Ethylbenzene	ug/L	<0.40	0.40	8370463
m & p-Xylene	ug/L	<0.80	0.80	8370463
o-Xylene	ug/L	<0.40	0.40	8370463
Xylenes (Total)	ug/L	<0.80	0.80	8370463
F1 (C6-C10) - BTEX	ug/L	<100	100	8370463
F1 (C6-C10)	ug/L	<100	100	8370463
Surrogate Recovery (%)				
1,4-Difluorobenzene (sur.)	%	100	N/A	8370463
4-Bromofluorobenzene (sur.)	%	97	N/A	8370463
D4-1,2-Dichloroethane (sur.)	%	96	N/A	8370463

RDL = Reportable Detection Limit
N/A = Not Applicable

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GENERAL COMMENTS

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

Package 1	3.3°C
Package 2	0.3°C
Package 3	5.3°C
Package 4	3.7°C
Package 5	4.7°C
Package 6	4.3°C
Package 7	5.3°C

PCB results file is attached to this job. The reference number from Maxxam Campobello is B6H4359.

Sample PG6021-01 : Detection limits raised due to sample matrix. Parameters affected are Al, Cr, Co, Cu, Pb, Sb, Mo, Ni, Se, Ag, As, Tl, Sn, Ti, U, V, Zn, Be, Cd.

Sample PG6035-01 : Sample extracted past 7 day hold time for BTEX/F1.

Sample PG6040-01 : Sample extracted past 7 day hold time for BTEX/F1.

Sample PG6137-01 : Sample was received unpreserved for Total Metals analysis by ICP.

Sample PG6138-01 : Sample was received unpreserved for Total Metals analysis by ICP.

Sample PG6139-01 : Sample was received unpreserved for Total Metals analysis by ICP.

Results relate only to the items tested.

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QUALITY ASSURANCE REPORT

ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
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			Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
8366598	1,4-Difluorobenzene (sur.)	2016/08/18	102	60 - 140	102	60 - 140	102	%				
8366598	4-Bromofluorobenzene (sur.)	2016/08/18	96	60 - 140	96	60 - 140	96	%				
8366598	D10-ETHYLBENZENE (sur.)	2016/08/18	108	60 - 130	108	60 - 130	130	%				
8366598	D4-1,2-Dichloroethane (sur.)	2016/08/18	105	60 - 140	104	60 - 140	109	%				
8366750	1,4-Difluorobenzene (sur.)	2016/08/19	102	60 - 140	103	60 - 140	103	%				
8366750	4-Bromofluorobenzene (sur.)	2016/08/19	100	60 - 140	99	60 - 140	99	%				
8366750	D10-ETHYLBENZENE (sur.)	2016/08/19	118	60 - 130	126	60 - 130	107	%				
8366750	D4-1,2-Dichloroethane (sur.)	2016/08/19	102	60 - 140	102	60 - 140	96	%				
8366762	1,4-Difluorobenzene (sur.)	2016/08/19	101	60 - 140	100	60 - 140	100	%				
8366762	4-Bromofluorobenzene (sur.)	2016/08/19	94	60 - 140	96	60 - 140	93	%				
8366762	D10-ETHYLBENZENE (sur.)	2016/08/19	103	60 - 130	118	60 - 130	106	%				
8366762	D4-1,2-Dichloroethane (sur.)	2016/08/19	102	60 - 140	105	60 - 140	104	%				
8366769	1,4-Difluorobenzene (sur.)	2016/08/19	100	60 - 140	102	60 - 140	106	%				
8366769	4-Bromofluorobenzene (sur.)	2016/08/19	97	60 - 140	107	60 - 140	102	%				
8366769	D10-ETHYLBENZENE (sur.)	2016/08/19	109	60 - 130	137 (1)	60 - 130	112	%				
8366769	D4-1,2-Dichloroethane (sur.)	2016/08/19	99	60 - 140	101	60 - 140	100	%				
8367080	O-TERPHENYL (sur.)	2016/08/20	96	50 - 130	107	50 - 130	123	%				
8367081	O-TERPHENYL (sur.)	2016/08/21	107	50 - 130	102	50 - 130	104	%				
8367086	O-TERPHENYL (sur.)	2016/08/21	109	50 - 130	97	50 - 130	126	%				
8367087	O-TERPHENYL (sur.)	2016/08/19	104	50 - 130	105	50 - 130	106	%				
8367328	O-TERPHENYL (sur.)	2016/08/19	93	50 - 130	100	50 - 130	106	%				
8370328	O-TERPHENYL (sur.)	2016/08/22	115	50 - 130	135 (1)	50 - 130	124	%				
8370335	O-TERPHENYL (sur.)	2016/08/21	116	50 - 130	114	50 - 130	130	%				
8370336	O-TERPHENYL (sur.)	2016/08/21	109	50 - 130	107	50 - 130	122	%				
8370351	O-TERPHENYL (sur.)	2016/08/22	104	50 - 130	102	50 - 130	95	%				
8370463	1,4-Difluorobenzene (sur.)	2016/08/20	96	70 - 130	98	70 - 130	100	%				
8370463	4-Bromofluorobenzene (sur.)	2016/08/20	97	70 - 130	97	70 - 130	99	%				
8370463	D4-1,2-Dichloroethane (sur.)	2016/08/20	96	70 - 130	98	70 - 130	96	%				
8370770	1,4-Difluorobenzene (sur.)	2016/08/20	105	60 - 140	102	60 - 140	102	%				
8370770	4-Bromofluorobenzene (sur.)	2016/08/20	102	60 - 140	102	60 - 140	102	%				
8370770	D10-ETHYLBENZENE (sur.)	2016/08/20	100	60 - 130	100	60 - 130	95	%				

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QUALITY ASSURANCE REPORT(CONT'D)

ARCADIS Canada
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Sampler Initials: RF

			Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
8370770	D4-1,2-Dichloroethane (sur.)	2016/08/20	111	60 - 140	111	60 - 140	105	%				
8370794	1,4-Difluorobenzene (sur.)	2016/08/21	101	60 - 140	99	60 - 140	102	%				
8370794	4-Bromofluorobenzene (sur.)	2016/08/21	104	60 - 140	103	60 - 140	103	%				
8370794	D10-ETHYLBENZENE (sur.)	2016/08/21	113	60 - 130	99	60 - 130	99	%				
8370794	D4-1,2-Dichloroethane (sur.)	2016/08/21	122	60 - 140	115	60 - 140	117	%				
8370798	1,4-Difluorobenzene (sur.)	2016/08/21	103	60 - 140	104	60 - 140	103	%				
8370798	4-Bromofluorobenzene (sur.)	2016/08/21	102	60 - 140	101	60 - 140	103	%				
8370798	D10-ETHYLBENZENE (sur.)	2016/08/21	106	60 - 130	108	60 - 130	104	%				
8370798	D4-1,2-Dichloroethane (sur.)	2016/08/21	107	60 - 140	105	60 - 140	110	%				
8370818	1,4-Difluorobenzene (sur.)	2016/08/20	101	60 - 140	100	60 - 140	102	%				
8370818	4-Bromofluorobenzene (sur.)	2016/08/20	102	60 - 140	103	60 - 140	103	%				
8370818	D10-ETHYLBENZENE (sur.)	2016/08/20	106	60 - 130	115	60 - 130	108	%				
8370818	D4-1,2-Dichloroethane (sur.)	2016/08/20	108	60 - 140	106	60 - 140	105	%				
8370991	O-TERPHENYL (sur.)	2016/08/21	107	50 - 130	109	50 - 130	119	%				
8371113	1,4-Difluorobenzene (sur.)	2016/08/22	101	60 - 140	101	60 - 140	106	%				
8371113	4-Bromofluorobenzene (sur.)	2016/08/22	104	60 - 140	104	60 - 140	102	%				
8371113	D10-ETHYLBENZENE (sur.)	2016/08/22	114	60 - 130	101	60 - 130	112	%				
8371113	D4-1,2-Dichloroethane (sur.)	2016/08/22	128	60 - 140	125	60 - 140	120	%				
8371115	1,4-Difluorobenzene (sur.)	2016/08/21	106	60 - 140	99	60 - 140	102	%				
8371115	4-Bromofluorobenzene (sur.)	2016/08/21	99	60 - 140	99	60 - 140	102	%				
8371115	D10-ETHYLBENZENE (sur.)	2016/08/21	112	60 - 130	108	60 - 130	103	%				
8371115	D4-1,2-Dichloroethane (sur.)	2016/08/21	94	60 - 140	97	60 - 140	101	%				
8371136	1,4-Difluorobenzene (sur.)	2016/08/22	102	60 - 140	98	60 - 140	104	%				
8371136	4-Bromofluorobenzene (sur.)	2016/08/22	94	60 - 140	100	60 - 140	95	%				
8371136	D10-ETHYLBENZENE (sur.)	2016/08/22	99	60 - 130	98	60 - 130	97	%				
8371136	D4-1,2-Dichloroethane (sur.)	2016/08/22	103	60 - 140	100	60 - 140	98	%				
8371137	1,4-Difluorobenzene (sur.)	2016/08/21	99	60 - 140	100	60 - 140	98	%				
8371137	4-Bromofluorobenzene (sur.)	2016/08/21	97	60 - 140	98	60 - 140	97	%				
8371137	D10-ETHYLBENZENE (sur.)	2016/08/21	99	60 - 130	102	60 - 130	104	%				
8371137	D4-1,2-Dichloroethane (sur.)	2016/08/21	100	60 - 140	100	60 - 140	101	%				
8371221	O-TERPHENYL (sur.)	2016/08/22	113	50 - 130	102	50 - 130	119	%				

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			Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
8371256	1,4-Difluorobenzene (sur.)	2016/08/22	102	60 - 140	101	60 - 140	101	%				
8371256	4-Bromofluorobenzene (sur.)	2016/08/22	98	60 - 140	94	60 - 140	95	%				
8371256	D10-ETHYLBENZENE (sur.)	2016/08/22	108	60 - 130	100	60 - 130	103	%				
8371256	D4-1,2-Dichloroethane (sur.)	2016/08/22	98	60 - 140	99	60 - 140	100	%				
8365131	Moisture	2016/08/17					<0.30	%	4.1	20		
8365801	Total Arsenic (As)	2016/08/17	106	80 - 120	103	80 - 120	<0.00020	mg/L	NC	20		
8365801	Total Cadmium (Cd)	2016/08/17	106	80 - 120	101	80 - 120	<0.000020	mg/L	NC	20		
8365801	Total Chromium (Cr)	2016/08/17	106	80 - 120	107	80 - 120	<0.0010	mg/L	NC	20		
8365801	Total Cobalt (Co)	2016/08/17	104	80 - 120	105	80 - 120	<0.00030	mg/L	NC	20		
8365801	Total Copper (Cu)	2016/08/17	102	80 - 120	104	80 - 120	<0.00020	mg/L	3.8	20		
8365801	Total Lead (Pb)	2016/08/17	103	80 - 120	104	80 - 120	<0.00020	mg/L				
8365801	Total Nickel (Ni)	2016/08/17	104	80 - 120	103	80 - 120	<0.00050	mg/L	NC	20		
8365801	Total Zinc (Zn)	2016/08/17	102	80 - 120	101	80 - 120	<0.0030	mg/L	NC	20		
8365833	Total Mercury (Hg)	2016/08/17	NC	85 - 115	99	85 - 115	<0.0020	ug/L	NC	20	105	85 - 115
8365897	Moisture	2016/08/18					<0.30	%	7.1	20		
8366598	F1 (C6-C10) - BTEX	2016/08/19					<12	mg/kg	NC	50		
8366598	F1 (C6-C10)	2016/08/19	94	60 - 140	100	60 - 140	<12	mg/kg	NC	50		
8366645	Moisture	2016/08/18					<0.30	%	0	20		
8366750	F1 (C6-C10) - BTEX	2016/08/18					<12	mg/kg	NC	50		
8366750	F1 (C6-C10)	2016/08/18	92	60 - 140	87	60 - 140	<12	mg/kg	NC	50		
8366762	F1 (C6-C10) - BTEX	2016/08/19					<12	mg/kg	NC	50		
8366762	F1 (C6-C10)	2016/08/19	96	60 - 140	86	60 - 140	<12	mg/kg	NC	50		
8366769	F1 (C6-C10) - BTEX	2016/08/19					<12	mg/kg	NC	50		
8366769	F1 (C6-C10)	2016/08/19	82	60 - 140	135	60 - 140	<12	mg/kg	NC	50		
8367080	F2 (C10-C16 Hydrocarbons)	2016/08/20	98	50 - 130	106	70 - 130	<10	mg/kg	NC	50		
8367080	F3 (C16-C34 Hydrocarbons)	2016/08/20	95	50 - 130	102	70 - 130	<50	mg/kg	NC	50		
8367080	F4 (C34-C50 Hydrocarbons)	2016/08/20	91	50 - 130	99	70 - 130	<50	mg/kg	NC	50		
8367081	F2 (C10-C16 Hydrocarbons)	2016/08/21	107	50 - 130	98	70 - 130	<10	mg/kg	NC	50		
8367081	F3 (C16-C34 Hydrocarbons)	2016/08/21	108	50 - 130	100	70 - 130	<50	mg/kg	NC	50		
8367081	F4 (C34-C50 Hydrocarbons)	2016/08/21	104	50 - 130	97	70 - 130	<50	mg/kg	NC	50		
8367086	F2 (C10-C16 Hydrocarbons)	2016/08/20	117	50 - 130	94	70 - 130	<10	mg/kg	NC	50		

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			Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
8367086	F3 (C16-C34 Hydrocarbons)	2016/08/20	NC	50 - 130	96	70 - 130	<50	mg/kg	14	50		
8367086	F4 (C34-C50 Hydrocarbons)	2016/08/20	NC	50 - 130	92	70 - 130	<50	mg/kg	13	50		
8367087	F2 (C10-C16 Hydrocarbons)	2016/08/19	101	50 - 130	101	70 - 130	<10	mg/kg	NC	50		
8367087	F3 (C16-C34 Hydrocarbons)	2016/08/19	100	50 - 130	101	70 - 130	<50	mg/kg	NC	50		
8367087	F4 (C34-C50 Hydrocarbons)	2016/08/19	99	50 - 130	98	70 - 130	<50	mg/kg	NC	50		
8367110	Total Hex. Chromium (Cr 6+)	2016/08/18	84	80 - 120	104	80 - 120	<0.0010	mg/L	NC	20		
8367328	F2 (C10-C16 Hydrocarbons)	2016/08/19	92	50 - 130	97	70 - 130	<10	mg/kg	NC	50		
8367328	F3 (C16-C34 Hydrocarbons)	2016/08/19	90	50 - 130	98	70 - 130	<50	mg/kg	NC	50		
8367328	F4 (C34-C50 Hydrocarbons)	2016/08/19	93	50 - 130	97	70 - 130	<50	mg/kg	NC	50		
8367467	Moisture	2016/08/19					<0.30	%	1.6	20		
8368195	Moisture	2016/08/19					<0.30	%	12	20		
8369249	Total Arsenic (As)	2016/08/21	95	75 - 125	98	75 - 125	<1.0	mg/kg	18	35	98	53 - 147
8369249	Total Cadmium (Cd)	2016/08/21	95	75 - 125	96	75 - 125	<0.050	mg/kg	NC	35		
8369249	Total Chromium (Cr)	2016/08/21	NC	75 - 125	98	75 - 125	<1.0	mg/kg	10	35	87	59 - 141
8369249	Total Cobalt (Co)	2016/08/21	93	75 - 125	98	75 - 125	<0.50	mg/kg	7.3	35	97	58 - 142
8369249	Total Copper (Cu)	2016/08/21	93	75 - 125	98	75 - 125	<1.0	mg/kg	0.55	35	103	83 - 117
8369249	Total Lead (Pb)	2016/08/21	92	75 - 125	103	75 - 125	<0.50	mg/kg	9.6	35	111	79 - 121
8369249	Total Mercury (Hg)	2016/08/21	99	75 - 125	101	75 - 125	<0.050	mg/kg	NC	35		
8369249	Total Nickel (Ni)	2016/08/21	NC	75 - 125	97	75 - 125	<1.0	mg/kg	3.7	35	104	79 - 121
8369249	Total Zinc (Zn)	2016/08/21	NC	75 - 125	95	75 - 125	<10	mg/kg	0.62	35	101	79 - 121
8369563	Moisture	2016/08/20					<0.30	%	4.5	20		
8370328	F2 (C10-C16 Hydrocarbons)	2016/08/21	107	50 - 130	127	70 - 130	<10	mg/kg	NC	50		
8370328	F3 (C16-C34 Hydrocarbons)	2016/08/21	106	50 - 130	126	70 - 130	<50	mg/kg	NC	50		
8370328	F4 (C34-C50 Hydrocarbons)	2016/08/21	104	50 - 130	124	70 - 130	<50	mg/kg	NC	50		
8370335	F2 (C10-C16 Hydrocarbons)	2016/08/21	107	50 - 130	100	70 - 130	<10	mg/kg	NC	50		
8370335	F3 (C16-C34 Hydrocarbons)	2016/08/21	105	50 - 130	101	70 - 130	<50	mg/kg	NC	50		
8370335	F4 (C34-C50 Hydrocarbons)	2016/08/21	106	50 - 130	101	70 - 130	<50	mg/kg	NC	50		
8370336	F2 (C10-C16 Hydrocarbons)	2016/08/21	101	50 - 130	99	70 - 130	<10	mg/kg	NC	50		
8370336	F3 (C16-C34 Hydrocarbons)	2016/08/21	100	50 - 130	98	70 - 130	<50	mg/kg	NC	50		
8370336	F4 (C34-C50 Hydrocarbons)	2016/08/21	105	50 - 130	100	70 - 130	<50	mg/kg	NC	50		
8370351	F2 (C10-C16 Hydrocarbons)	2016/08/20	110	50 - 130	117	70 - 130	<0.10	mg/L	120 (1)	40		

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			Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
8370351	F3 (C16-C34 Hydrocarbons)	2016/08/20	111	50 - 130	119	70 - 130	<0.20	mg/L	128 (1)	40		
8370351	F4 (C34-C50 Hydrocarbons)	2016/08/20	94	50 - 130	108	70 - 130	<0.20	mg/L	NC	40		
8370393	Total Arsenic (As)	2016/08/21	99	75 - 125	98	75 - 125	<1.0	mg/kg	NC	35	96	53 - 147
8370393	Total Cadmium (Cd)	2016/08/21	101	75 - 125	99	75 - 125	<0.050	mg/kg	NC	35		
8370393	Total Chromium (Cr)	2016/08/21	97	75 - 125	99	75 - 125	<1.0	mg/kg	NC	35	81	59 - 141
8370393	Total Cobalt (Co)	2016/08/21	99	75 - 125	98	75 - 125	<0.50	mg/kg	NC	35	92	58 - 142
8370393	Total Copper (Cu)	2016/08/21	96	75 - 125	98	75 - 125	<1.0	mg/kg	NC	35	100	83 - 117
8370393	Total Lead (Pb)	2016/08/21	96	75 - 125	103	75 - 125	<0.50	mg/kg	21	35	115	79 - 121
8370393	Total Mercury (Hg)	2016/08/21	103	75 - 125	108	75 - 125	<0.050	mg/kg	NC	35		
8370393	Total Nickel (Ni)	2016/08/21	99	75 - 125	97	75 - 125	<1.0	mg/kg	NC	35	104	79 - 121
8370393	Total Zinc (Zn)	2016/08/21	97	75 - 125	99	75 - 125	<10	mg/kg	NC	35	102	79 - 121
8370397	Total Arsenic (As)	2016/08/21	102	75 - 125	99	75 - 125	<1.0	mg/kg	NC	35	99	53 - 147
8370397	Total Cadmium (Cd)	2016/08/21	104	75 - 125	96	75 - 125	<0.050	mg/kg	NC	35		
8370397	Total Chromium (Cr)	2016/08/21	102	75 - 125	100	75 - 125	<1.0	mg/kg	NC	35	86	59 - 141
8370397	Total Cobalt (Co)	2016/08/21	100	75 - 125	100	75 - 125	<0.50	mg/kg	NC	35	95	58 - 142
8370397	Total Copper (Cu)	2016/08/21	98	75 - 125	99	75 - 125	<1.0	mg/kg	NC	35	101	83 - 117
8370397	Total Lead (Pb)	2016/08/21	104	75 - 125	104	75 - 125	<0.50	mg/kg	NC	35	111	79 - 121
8370397	Total Mercury (Hg)	2016/08/21	108	75 - 125	108	75 - 125	<0.050	mg/kg	NC	35		
8370397	Total Nickel (Ni)	2016/08/21	99	75 - 125	99	75 - 125	<1.0	mg/kg	NC	35	109	79 - 121
8370397	Total Zinc (Zn)	2016/08/21	97	75 - 125	96	75 - 125	<10	mg/kg	NC	35	101	79 - 121
8370463	Benzene	2016/08/20	101	70 - 130	87	70 - 130	<0.40	ug/L	NC	40		
8370463	Ethylbenzene	2016/08/20	104	70 - 130	90	70 - 130	<0.40	ug/L	NC	40		
8370463	F1 (C6-C10) - BTEX	2016/08/20					<100	ug/L	NC	40		
8370463	F1 (C6-C10)	2016/08/20	103	70 - 130	107	70 - 130	<100	ug/L	NC	40		
8370463	m & p-Xylene	2016/08/20	105	70 - 130	90	70 - 130	<0.80	ug/L	NC	40		
8370463	o-Xylene	2016/08/20	102	70 - 130	85	70 - 130	<0.40	ug/L	NC	40		
8370463	Toluene	2016/08/20	96	70 - 130	85	70 - 130	<0.40	ug/L	NC	40		
8370463	Xylenes (Total)	2016/08/20					<0.80	ug/L	NC	40		
8370721	Moisture	2016/08/22					<0.30	%	8.0	20		
8370770	F1 (C6-C10) - BTEX	2016/08/21					<12	mg/kg	NC	50		
8370770	F1 (C6-C10)	2016/08/21	91	60 - 140	91	60 - 140	<12	mg/kg	NC	50		

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			Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
8370794	F1 (C6-C10) - BTEX	2016/08/21					<12	mg/kg	NC	50		
8370794	F1 (C6-C10)	2016/08/21	101	60 - 140	102	60 - 140	<12	mg/kg	NC	50		
8370798	F1 (C6-C10) - BTEX	2016/08/21					<12	mg/kg	NC	50		
8370798	F1 (C6-C10)	2016/08/21	101	60 - 140	100	60 - 140	<12	mg/kg	NC	50		
8370818	F1 (C6-C10) - BTEX	2016/08/20					<12	mg/kg	NC	50		
8370818	F1 (C6-C10)	2016/08/20	85	60 - 140	93	60 - 140	<12	mg/kg	NC	50		
8370991	F2 (C10-C16 Hydrocarbons)	2016/08/21	100	50 - 130	103	70 - 130	<10	mg/kg	NC	50		
8370991	F3 (C16-C34 Hydrocarbons)	2016/08/21	96	50 - 130	103	70 - 130	<50	mg/kg	NC	50		
8370991	F4 (C34-C50 Hydrocarbons)	2016/08/21	99	50 - 130	102	70 - 130	<50	mg/kg	NC	50		
8371113	F1 (C6-C10) - BTEX	2016/08/22					<12	mg/kg	NC	50		
8371113	F1 (C6-C10)	2016/08/22	103	60 - 140	100	60 - 140	<12	mg/kg	NC	50		
8371115	F1 (C6-C10) - BTEX	2016/08/21					<12	mg/kg	NC	50		
8371115	F1 (C6-C10)	2016/08/21	113	60 - 140	109	60 - 140	<12	mg/kg	NC	50		
8371136	F1 (C6-C10) - BTEX	2016/08/22					<12	mg/kg	NC	50		
8371136	F1 (C6-C10)	2016/08/22	85	60 - 140	122	60 - 140	<12	mg/kg	NC	50		
8371137	F1 (C6-C10) - BTEX	2016/08/21					<12	mg/kg	NC	50		
8371137	F1 (C6-C10)	2016/08/21	94	60 - 140	112	60 - 140	<12	mg/kg	NC	50		
8371141	Moisture	2016/08/22					<0.30	%	1.1	20		
8371221	F2 (C10-C16 Hydrocarbons)	2016/08/22	111	50 - 130	99	70 - 130	<10	mg/kg	NC	50		
8371221	F3 (C16-C34 Hydrocarbons)	2016/08/22	111	50 - 130	100	70 - 130	<50	mg/kg	NC	50		
8371221	F4 (C34-C50 Hydrocarbons)	2016/08/22	105	50 - 130	95	70 - 130	<50	mg/kg	NC	50		
8371256	F1 (C6-C10) - BTEX	2016/08/22					<12	mg/kg	NC	50		
8371256	F1 (C6-C10)	2016/08/22	98	60 - 140	89	60 - 140	<12	mg/kg	NC	50		
8371381	Total Arsenic (As)	2016/08/22	98	75 - 125	100	75 - 125	<1.0	mg/kg	NC	35	114	53 - 147
8371381	Total Cadmium (Cd)	2016/08/22	101	75 - 125	100	75 - 125	<0.050	mg/kg	NC	35		
8371381	Total Chromium (Cr)	2016/08/22	98	75 - 125	101	75 - 125	<1.0	mg/kg	NC	35	100	59 - 141
8371381	Total Cobalt (Co)	2016/08/22	96	75 - 125	100	75 - 125	<0.50	mg/kg	NC	35	109	58 - 142
8371381	Total Copper (Cu)	2016/08/22	94	75 - 125	101	75 - 125	<1.0	mg/kg	NC	35	110	83 - 117
8371381	Total Lead (Pb)	2016/08/22	91	75 - 125	96	75 - 125	<0.50	mg/kg	NC	35	117	79 - 121
8371381	Total Mercury (Hg)	2016/08/22	98	75 - 125	103	75 - 125	<0.050	mg/kg	NC	35		
8371381	Total Nickel (Ni)	2016/08/22	95	75 - 125	101	75 - 125	<1.0	mg/kg	NC	35	113	79 - 121

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			Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
8371381	Total Zinc (Zn)	2016/08/22	95	75 - 125	101	75 - 125	<10	mg/kg	NC	35	119	79 - 121
8371399	Total Arsenic (As)	2016/08/22	96	75 - 125	98	75 - 125	<1.0	mg/kg	NC	35	101	53 - 147
8371399	Total Cadmium (Cd)	2016/08/22	98	75 - 125	96	75 - 125	<0.050	mg/kg	NC	35		
8371399	Total Chromium (Cr)	2016/08/22	100	75 - 125	98	75 - 125	<1.0	mg/kg	4.2	35	88	59 - 141
8371399	Total Cobalt (Co)	2016/08/22	95	75 - 125	97	75 - 125	<0.50	mg/kg	2.0	35	95	58 - 142
8371399	Total Copper (Cu)	2016/08/22	95	75 - 125	98	75 - 125	<1.0	mg/kg	1.4	35	101	83 - 117
8371399	Total Lead (Pb)	2016/08/22	100	75 - 125	97	75 - 125	<0.50	mg/kg	0.80	35	114	79 - 121
8371399	Total Mercury (Hg)	2016/08/22	104	75 - 125	102	75 - 125	0.054, RDL=0.050	mg/kg	9.3	35		
8371399	Total Nickel (Ni)	2016/08/22	95	75 - 125	97	75 - 125	<1.0	mg/kg	0.40	35	109	79 - 121
8371399	Total Zinc (Zn)	2016/08/22	NC	75 - 125	97	75 - 125	<10	mg/kg	NC	35	103	79 - 121
8371790	Total Arsenic (As)	2016/08/22	98	75 - 125	98	75 - 125	<1.0	mg/kg	NC	35	101	53 - 147
8371790	Total Cadmium (Cd)	2016/08/22	98	75 - 125	99	75 - 125	<0.050	mg/kg	NC	35		
8371790	Total Chromium (Cr)	2016/08/22	100	75 - 125	98	75 - 125	<1.0	mg/kg	3.4	35	83	59 - 141
8371790	Total Cobalt (Co)	2016/08/22	96	75 - 125	97	75 - 125	<0.50	mg/kg	0.64	35	96	58 - 142
8371790	Total Copper (Cu)	2016/08/22	96	75 - 125	97	75 - 125	<1.0	mg/kg	1.8	35	106	83 - 117
8371790	Total Lead (Pb)	2016/08/22	89	75 - 125	92	75 - 125	<0.50	mg/kg	1.5	35	101	79 - 121
8371790	Total Mercury (Hg)	2016/08/22	97	75 - 125	100	75 - 125	<0.050	mg/kg	NC	35		
8371790	Total Nickel (Ni)	2016/08/22	96	75 - 125	97	75 - 125	<1.0	mg/kg	2.2	35	106	79 - 121
8371790	Total Zinc (Zn)	2016/08/22	NC	75 - 125	97	75 - 125	<10	mg/kg	NC	35	103	79 - 121

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

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

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

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

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

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

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

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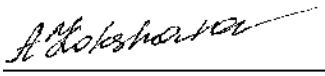
Maxxam Job #: B668559
Report Date: 2016/09/20

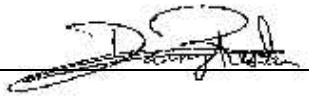
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Sampler Initials: RF

VALIDATION SIGNATURE PAGE

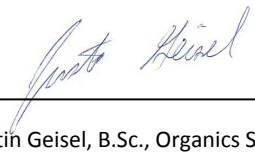
The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



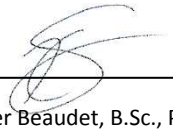
Anna Koksharova, M.Sc., Organics Senior Analyst



Daniel Reslan, cCT, QP, Organics Supervisor



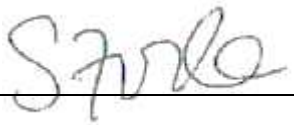
Justin Geisel, B.Sc., Organics Supervisor



Kristopher Beaudet, B.Sc., P.Chem., QP, Assistant General Manager

Maria Magdalena Florescu, Ph.D., P.Chem., QP, Inorganics Senior Analyst

Poonam Sharma, cCT, Organics Senior Analyst



Suwan Fock, B.Sc., QP, Inorganics Senior Analyst

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
A SUEZ WATER TECHNOLOGIES & SOLUTIONS Company

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666(12)

Chain Of Custody Record

1 / 11

Page 1 of 12

INVOICE TO:		Report Information		Project Information		Laboratory Use Only	
Company Name	#3269 ARCADIS Canada	Company Name	Same	Quotation #		Maxxam Job #	Bottle Order #:
Contact Name	ANDREW HENDERSON	Contact Name		P.O. #		B668559 D-T	501520
Address	329 CHURCHILL AVE NORTH SUITE 2000 OTTAWA ON K1Z 5B8	Address		Project #	102012-000, Kitikmeot DEW Lin	Chain Of Custody Record	Project Manager
Phone	(613) 721-0555 Fax (613) 721-0029	Phone	Fax	Project Name	CAM 1 Junny Lind Island	C#501520-01-01	Parminder Virk
Email	ahenderson@franzenvironmental.com, andrew.henders	Email	ryan.fletcher@arcadis.com	Site #			
				Sampled By	R. Fletcher		

Regulatory Criteria

Special Instructions

Note: For regulated drinking water samples - please use the Drinking Water Chain of Custody Form

Samples must be kept cool (< 10ºC) from time of sampling until delivery to maxxam

Analysis Requested

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Regulated Drinking Water ? (Y / N)	Metals Field Filtered ? (Y / N)	AT1 BTEX and F1-F4 in Soil	Polychlorinated Biphenyls	Elements by ICPMS - Soils	arsenic, cadmium, chromium, cobalt, copper, lead, mickel, zinc, and mercury	Total Hexavalent Chromium	Mercury - Low Level (Total)	AT1 BTEX and F1-F4 in Water	PCB WATER			# of Bottles	Comments
1		16-C1-1A	Aug 9/16	14:15	Soil			X	X		X							4	
2		16-C1-1B		14:15				X	X		X							4	Metals in bags
3		16-C1-2A		14:00				X	X		X							4	
4		16-C1-2B		14:00				X	X		X							4	
5		16-C1-3A		13:30				X	X		X							4	3 jars, 1 bag
6		16-C1-3B		13:30				X	X		X							4	
7		16-C1-4A		13:15				X	X		X							4	Lids NOT Labels
8		16-C1-4B		13:15				X	X		X							4	
9		16-C1-5A		13:00				X	X		X							4	
10		16-C1-5B		13:00				X	X		X							4	

RECEIVED IN YELLOWKNIFE
By: Michelle Mule 10:40
2016-08-15

Temp: 4-4-2 / 0-1-0 / 4-5-7 / 4-2-5 / 5-4-5 / 6-4-3 / 5-7-4

Turnaround Time (TAT) Required

Please provide advance notice for rush projects

Regular (Standard) TAT
(will be applied if Rush TAT is not specified)
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: Time Required:
Rush Confirmation Number (call lab for #)

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Lab Use Only: Time Sensitive	Temperature (ºC) on Receipt	Custody Seal Intact on Cooler?
Ryan Fletcher	Aug 12/16	15:00	DEJI WU	2016/08/15	12:30		☐	See ACTR	☐ Yes ☐ No

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

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666 (12)

Chain Of Custody Record

Page 2 of 11

INVOICE TO:		Report Information		Project Information		Laboratory Use Only	
Company Name	#3269 ARCADIS Canada	Company Name	Same	Quotation #		Maxxam Job #	Bottle Order #:
Contact Name	ANDREW HENDERSON	Contact Name		P.O. #		B668559 D-T	501520
Address	329 CHURCHILL AVE NORTH SUITE 2000	Address		Project #	102012-000, Kitikmeot DEW Lin	Chain Of Custody Record	Project Manager
	OTTAWA ON K1Z 5B8			Project Name		C#501520-03-01	Parminder Virk
Phone	(613) 721-0555 Fax: (613) 721-0029	Phone	Fax:	Site #	CAM 1 Junny Lind Island		
Email	ahenderson@franzenvironmental.com, andrew.henders	Email	ryan.fletcher@arcadis.com	Sampled By	R. Fletcher		

Regulatory Criteria

Special Instructions

Note: For regulated drinking water samples - please use the Drinking Water Chain of Custody Form

Samples must be kept cool (< 10°C) from time of sampling until delivery to maxxam

Analysis Requested

Turnaround Time (TAT) Required

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Date Required: Time Required:
Rush Confirmation Number (call lab for #)

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Regulated Drinking Water? (Y/N)	Metals Field Filtered? (Y/N)	AT1 BTEX and F1-F4 in Soil	Polychlorinated Biphenyls	Elements by ICPMS - Soils	arsenic, cadmium, chromium, cobalt, copper, lead, nickel, zinc, and mercury	Total Hexavalent Chromium	Mercury - Low Level (Total)	AT1 BTEX and F1-F4 in Water	PCB WATER	# of Bottles	Comments
1		16-C1-6A	Aug 9/16	16:30	Soil			X	X		X					4	
2		16-C1-6B		16:30				X	X		X					4	Metals in bags
3		16-C1-7A		15:00				X	X		X					4	
4		16-C1-7B		15:00				X	X		X					4	
5		16-C1-8A		15:30				X	X		X					4	1 bag
6		16-C1-8B		15:30				X	X		X					4	3 jars,
7		16-C1-9A		16:00				X	X		X					4	
8		16-C1-9B		16:00				X	X		X					4	
9		16-C1-10A	Aug 10/16	17:30				X	X		X					4	Lids are not labels
10		16-C1-10B	Aug 10/16	17:30				X	X		X					4	

RECEIVED IN YELLOWKNIFE
By: [illegible] Michelle Gwyle
2016-08-15 10:40
4-4-2
0-1-0
Temp: 4 / 5 / 7
4-2-5
5-4-5
6-4-3
5-3-4

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
Ryan Fletcher	Aug 17/16	15:00	Degan DEJI WU	2016/08/15	12:30	

Lab Use Only

Time Sensitive	Temperature (°C) on Receipt	Custody Seal Intact on Cooler?
	See ACTR	Yes / No

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

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Chain Of Custody Record

INVOICE TO:		Report Information		Project Information		Laboratory Use Only	
Company Name	#3269 ARCADIS Canada	Company Name	Same	Quotation #		Maxxam Job #	Bottle Order #:
Contact Name	ANDREW HENDERSON	Contact Name		P.O. #		B668559 D_T	501520
Address	329 CHURCHILL AVE NORTH SUITE 2000	Address		Project #	102012-000, Kitikmeot DEW Lin	Chain Of Custody Record	Project Manager
	OTTAWA ON K1Z 5B8			Project Name		C#501520-04-01	Parminder Virk
Phone	(613) 721-0555 Fax: (613) 721-0029	Phone	Fax:	Site #	CAM 1 Junny Lind Island		
Email	ahenderson@franzenvironmental.com, andrew.henders	Email	ryan.fletcher@arcadis.com	Sampled By	R. Fletcher		

Regulatory Criteria

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Job Specific Rush TAT (if applies to entire submission)
Date Required: Time Required:
Rush Confirmation Number (call lab for #)

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Regulated Drinking Water ? (Y / N)	Metals Field Filtered ? (Y / N)	AT1 BTEX and F1-F4 in Soil	Polychlorinated Biphenyls	Elements by ICPMS - Soils	arsenic, cadmium, chromium, cobalt, copper, lead, nickel, zinc, and mercury	Total Hexavalent Chromium	Mercury - Low Level (Total)	AT1 BTEX and F1-F4 in Water	PCB WATER			# of Bottles	Comments
1		16-CI-11A	Aug 10/16	16:00	Soil			X	X		X							4	
2		16-CI-11B		16:00				X	X		X							4	Metals in
3		16-CI-12A		16:45				X	X		X							4	
4		16-CI-12B		16:45				X	X		X							4	bags
5		16-CI-13A		17:00				X	X		X							4	1 bag
6		16-CI-13B		17:00				X	X		X							4	
7		16-CI-MW01A		8:30				X	X		X							4	3 jars,
8		16-CI-MW01B		8:30				X	X		X							4	
9		16-CI-MW02A		9:15				X	X		X							4	Lids are
10		16-CI-MW03A	↓	9:00	↓			X	X		X							4	not labels

RECEIVED IN YELLOWKNIFE
By: Michelle Gamble 10:40
2016-08-14
Temp: 4.4-2
0-1-0
4.5 A
4 2 5
6-4-3
5-4-5

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
Ryan Fletcher	Aug 17/16	15:00	DEJI WU	2016/08/15	12:30	

Lab Use Only		
Time Sensitive	Temperature (ºC) on Receipt	Custody Seal Intact on Cooler?
☐	See ACTR	☐ Yes ☐ No

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Chain Of Custody Record

Page 1 of 1

INVOICE TO:		Report Information		Project Information		Laboratory Use Only	
Company Name	#3269 ARCADIS Canada	Company Name		Quotation #		Maxxam Job #	Bottle Order #:
Contact Name	ANDREW HENDERSON	Contact Name	Samal	P.O. #		B668559 D_T	501520
Address	329 CHURCHILL AVE NORTH SUITE 2000 OTTAWA ON K1Z 5B8	Address		Project #	102012-000, Kitikmeot DEW Lin	Chain Of Custody Record	Project Manager
Phone	(613) 721-0555 Fax: (613) 721-0029	Phone	Fax:	Project Name		C#501520-05-01	Parminder Virk
Email	ahenderson@franzenvironmental.com, andrew.henders	Email	ryan.fletcher@arcadis.com	Site #	CAM 1 Junny Lind Island		
				Sampled By	R. Fletcher		

Regulatory Criteria

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Analysis Requested

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Regulated Drinking Water ? (Y / N)	Metals Field Filtered ? (Y / N)	AT1 BTEX and F1-F4 in Soil	Polychlorinated Biphenyls	Elements by ICPMS - Soils	arsenic, cadmium, chromium, cobalt, copper, lead, mickel, zinc, and mercury	Total Hexavalent Chromium	Mercury - Low Level (Total)	AT1 BTEX and F1-F4 in Water	PCB WATER	# of Bottles	Comments
1		16-CI-MW03B	Aug 10/16	9:00	Soil			X	X		X					4	
2		16-CI-MW04A		8:45				X	X		X					4	Metals in bags
3		16-CI-MW04B		8:45				X	X		X					4	
4		16-CI-MW05A		10:30				X	X		X					4	1 bag ea.
5		16-CI-MW05B						X	X		X					4	3 jars,
6		16-CI-MW05B		10:30				X	X		X					4	
7		16-CI-MW06A		9:45				X	X		X					4	
8		16-CI-MW06B		9:45				X	X		X					4	Lids are NOT labels
9		16-CI-MW07A		10:00				X	X		X					4	
10		16-CI-MW07B		10:00				X	X		X					4	

RECEIVED IN YELLOWKNIFE
By: Michelle Trudel 10:40
2016 -08- 14
Temp: 4-4-2 / 0-1-0 / 4 5 7 / 4 1 2 / 6 4 3 / 5 4 5

Turnaround Time (TAT) Required

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Regular (Standard) TAT (will be applied if Rush TAT is not specified) — X

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Job Specific Rush TAT (if applies to entire submission)
Date Required: _____ Time Required: _____
Rush Confirmation Number: _____ (call lab for #)

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
Ryan Fletcher	Aug 12/16	15:00	DEJI WU	2016/08/15	12:30	5
						7

Lab Use Only

Time Sensitive	Temperature (°C) on Receipt	Custody Seal Intact on Cooler?
☐	See ACTR	☐ Yes ☐ No

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Chain Of Custody Record

Page 5 of 11

INVOICE TO:		Report Information		Project Information		Laboratory Use Only	
Company Name	#3269 ARCADIS Canada	Company Name	Sam	Quotation #		Maxxam Job #	Bottle Order #:
Contact Name	ANDREW HENDERSON	Contact Name		P.O. #		B668559 D-T	501520
Address	329 CHURCHILL AVE NORTH SUITE 2000 OTTAWA ON K1Z 5B8	Address		Project #	102012-000, Kitikmeot DEW Lin	Chain Of Custody Record	Project Manager
Phone	(613) 721-0555 Fax: (613) 721-0029	Phone	Fax:	Project Name		C#501520-06-01	Parminder Virk
Email	ahenderson@franzenvironmental.com, andrew.henders	Email	ryan.fletcher@arcadis.com	Site #	CAM 1 Junny Lind Island		
				Sampled By	R. Fletcher		

Regulatory Criteria

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Date Required: Time Required:

Rush Confirmation Number (call lab for #)

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Regulated Drinking Water ? (Y / N)	Metals Field Filtered ? (Y / N)	AT1 BTEX and F1-F4 in Soil	Polychlorinated Biphenyls	Elements by ICPMS - Soils	arsenic, cadmium, chromium, cobalt, copper, lead, mickel, zinc, and mercury	Total Hexavalent Chromium	Mercury - Low Level (Total)	AT1 BTEX and F1-F4 in Water	PCB WATER	# of Bottles	Comments
1		16-Cl-MW08A	Aug 10/16	10:15	Soil			X	X		X					4	
2		16-Cl-MW08B		10:15				X	X		X					4	Metals in bags
3		16-Cl-14A		21:00				X	X		X					4	
4		16-Cl-14B		21:00				X	X		X					4	3 jars, 1 bag ea
5		16-Cl-15A		20:45				X	X		X					4	
6		16-Cl-15B		20:45				X	X		X					4	
7		16-Cl-16A		20:00				X	X		X					4	Lids are NOT
8		16-Cl-16B		20:00				X	X		X					4	labels
9		16-Cl-17A		20:15				X	X		X					4	
10		16-Cl-17B	↓	20:15	↓			X	X		X					4	

RECEIVED IN YELLOWKNIFE
By: Michelle Gute 10:40
2016-08-14
4-4-2
0-1-0
4 1 5 7
4 2 5
5 4 5
6-4-3
5 7 4
Temp:

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Lab Use Only: Time Sensitive	Temperature (°C) on Receipt	Custody Seal Intact on Cooler?
Ryan Fletcher	Aug 17/16	15:00	DEJZ WU	2016/08/11	12:30			See ACTR	Yes / No

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

White: Maxxam Yellow: Client

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Unit 105 - 349 Old Airport Road, Yellowknife, North West Territories Canada X1A 3X6 Tel:(867) 445-2448 Toll-free:800-563-6266 Fax:(905) 817-5779 www.maxxam.ca

Chain Of Custody Record

INVOICE TO:		Report Information		Project Information		Laboratory Use Only	
Company Name	#3269 ARCADIS Canada	Company Name		Quotation #		Maxxam Job #	Bottle Order #:
Contact Name	ANDREW HENDERSON	Contact Name	Same	P.O. #		B668559	501520
Address	329 CHURCHILL AVE NORTH SUITE 2000 OTTAWA ON K1Z 5B8	Address		Project #	102012-000, Kitikmeot DEW Lin	Chain Of Custody Record	Project Manager
Phone	(613) 721-0555 Fax: (613) 721-0029	Phone	Fax:	Project Name		C#501520-07-01	Parminder Virk
Email	ahenderson@franzenvironmental.com, andrew.henders	Email	ryan.fletcher@arcadis.com	Site #	CAM 1 Junny Lind Island		
				Sampled By	R. Fletcher		

Regulatory Criteria

Special Instructions

Note: For regulated drinking water samples - please use the Drinking Water Chain of Custody Form

Samples must be kept cool (< 10°C) from time of sampling until delivery to maxxam

Turnaround Time (TAT) Required

Please provide advance notice for rush projects

Regular (Standard) TAT (will be applied if Rush TAT is not specified) ☒

Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: _____ Time Required: _____ ☐
Rush Confirmation Number _____ *(call lab for #)*

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Regulated Drinking Water ? (Y / N)	Metals Field Filtered ? (Y / N)	AT1 BTEX and F1-F4 in Soil	Polychlorinated Biphenyls	Elements by ICPMS - Soils	arsenic, cadmium, chromium, cobalt, copper, lead, mickel, zinc, and mercury	Total Hexavalent Chromium	Mercury - Low Level (Total)	AT1 BTEX and F1-F4 in Water	PCB WATER	# of Bottles	Comments
1		16-C1-18A	Aug 10/16	20:30	Soil			X	X		X					4	
2		16-C1-18B	Aug 10/16	20:30				X	X		X					4	Metals in bags
3		16-C1-19A	Aug 11/16	8:15				X	X		X					4	
4		16-C1-19B		8:15				X	X		X					4	3 jars, 1 bag ea.
5		16-C1-20A		9:00				X	X		X					4	
6		16-C1-20B		9:00				X	X		X					4	
7		16-C1-21A		8:45				X	X		X					4	Lids are NOT
8		16-C1-21B		8:45				X	X		X					4	labels
9		16-C1-22A		9:30				X	X		X					4	
10		16-C1-22B	↓	9:30	↓			X	X		X					4	

RECEIVED IN YELLOWKNIFE
By: Michelle Finch 10:40
2016-08-14
Temp: 4.1 2.1 5 4 5 6 4 3 5 7 4 4 4 3

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Lab Use Only: Time Sensitive	Temperature (°C) on Receipt	Custody Seal Intact on Cooler?
Ryan Fletcher	Aug 14/16	15:00	DG DE JZ WV	2016/08/15	12:30	4	☐	See ACTR	☐ Yes ☐ No

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

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Chain Of Custody Record

INVOICE TO:		Report Information		Project Information		Laboratory Use Only	
Company Name	#3269 ARCADIS Canada	Company Name		Quotation #		Maxxam Job #	Bottle Order #:
Contact Name	ANDREW HENDERSON	Contact Name	Sawl	P.O. #		B668559D-T	501520
Address	329 CHURCHILL AVE NORTH SUITE 2000 OTTAWA ON K1Z 5B8	Address		Project #	102012-000, Kitikmeot DEW Lin	Chain Of Custody Record	Project Manager
Phone	(613) 721-0555 Fax: (613) 721-0029	Phone	Fax:	Project Name	CAM 1 Junny Lind Island	C#501520-08-01	Parminder Virk
Email	ahenderson@franzenvironmental.com, andrew.henders	Email	ryan.fletcher@arcadis.com	Site #			
				Sampled By	R. Fletcher		

Regulatory Criteria

Special Instructions

Note: For regulated drinking water samples - please use the Drinking Water Chain of Custody Form

Samples must be kept cool (< 10°C) from time of sampling until delivery to maxxam

Analysis Requested

Turnaround Time (TAT) Required

Please provide advance notice for rush projects

Regular (Standard) TAT
(will be applied if Rush TAT is not specified)
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.
X

Job Specific Rush TAT (if applies to entire submission)
Date Required: Time Required:
Rush Confirmation Number (call lab for #)

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Regulated Drinking Water ? (Y / N)	Metals Field Filtered ? (Y / N)	AT1 BTEX and F1-F4 in Soil	Polychlorinated Biphenyls	Elements by ICPMS - Soils	arsenic, cadmium, chromium, cobalt, copper, lead, nickel, zinc, and mercury	Total Hexavalent Chromium	Mercury - Low Level (Total)	AT1 BTEX and F1-F4 in Water	PCB WATER	# of Bottles	Comments
1		16-C1-23A	Aug 11/16	11:00	Soil			X	X		X					4	Metals in bags
2		16-C1-24A		11:00				X	X		X					4	
3		16-C1-24B		10:00				X	X		X					4	
4		16-C1-25A		10:00				X	X		X					4	1 bag, 3 jars ea.
5		16-C1-26A		10:30				X	X		X					4	
6		16-C1-26B		10:30				X	X		X					4	
7		16-C1-27A		14:45				X	X		X					4	Lids are Not labels
8		16-C1-27B		14:45				X	X		X					4	
9		16-C1-28A		14:15				X	X		X					4	
10		16-C1-28A	↓	14:15	↓			X	X		X					4	

RECEIVED IN YELLOWKNIFE
By: Michelle Fuller 10:40
2016-08-14
Temp: 4-4-2, 0-1-0, 4 5 1 7, 4 2 5, 5-4-5, 6-4-3, 5-7-4

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
Ryan Fletcher	Aug 12/16	15:00	DEJI WU	2016/08/15	12:30	

Lab Use Only: Time Sensitive ☐ | Temperature (°C) on Receipt: See ACTR | Custody Seal Intact on Cooler? ☐ Yes ☐ No

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

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Chain Of Custody Record

INVOICE TO:		Report Information		Project Information		Laboratory Use Only	
Company Name	#3269 ARCADIS Canada	Company Name	Same	Quotation #		Maxxam Job #	Bottle Order #:
Contact Name	ANDREW HENDERSON	Contact Name		P.O. #		B668559 D_T	501520
Address	329 CHURCHILL AVE NORTH SUITE 2000 OTTAWA ON K1Z 5B8	Address		Project #	102012-000, Kitikmeot DEW Lin	Chain Of Custody Record	Project Manager
Phone	(613) 721-0555 Fax: (613) 721-0029	Phone	Fax:	Project Name		C#501520-09-01	Parminder Virk
Email	ahenderson@franzenvironmental.com, andrew.henders	Email	ryan.fletcher@arcadis.com	Site #	CAM 1 Junny Lind Island		
				Sampled By	R. Fletcher		

Regulatory Criteria

Special Instructions

Note: For regulated drinking water samples - please use the Drinking Water Chain of Custody Form

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Analysis Requested

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Regulated Drinking Water ? (Y / N)	Metals Field Filtered ? (Y / N)	AT1 BTEX and F1-F4 in Soil	Polychlorinated Biphenyls	Elements by ICPMS - Soils	arsenic, cadmium, chromium, cobalt, copper, lead, nickel, zinc, and mercury	Total Hexavalent Chromium	Mercury - Low Level (Total)	AT1 BTEX and F1-F4 in Water	PCB WATER	# of Bottles	Comments
1		16-C1-29A	Aug11/16	14:30	Soil			X	X		X					4	
2		16-C1-29B		14:30				X	X		X					4	Metals in bags
3		16-C1-30A		14:00				X	X		X					4	
4		16-C1-30B		14:00				X	X		X					4	
5		16-C1-31A		15:00				X	X		X					4	1 bag + 3 jars ea
6		16-C1-31B		15:00				X	X		X					4	
7		16-C1-32A		16:00				X	X		X					4	x Lids are
8		16-C1-32B		16:00				X	X		X					4	NOT labels
9		16-C1-33A		16:30				X	X		X					4	
10		16-C1-33B	↓	16:30	↓			X	X		X					4	

RECEIVED IN YELLOWKNIFE
By: [signature] 10:40
2016 08 14
Temp: 4.4.2 / 4.5.7 / 4.2.5 / 5.4.5 / 6.4.3 / 5.7.4

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
Ryan Fletcher	Aug 12/16	15:00	Degan DEJI WV	2016/08/14	12:30	

Lab Use Only: Time Sensitive ☐ | Temperature (°C) on Receipt: See ACTR | Custody Seal Intact on Cooler? ☐ Yes ☐ No

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

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Turnaround Time (TAT) Required

Please provide advance notice for rush projects

Regular (Standard) TAT ☒
(will be applied if Rush TAT is not specified)
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: Time Required: ☐
Rush Confirmation Number: (call lab for #)

Chain Of Custody Record

Page 9 of 10

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Laboratory Use Only

Maxxam Job #: B668559 D_T
Bottle Order #: 501520
Chain Of Custody Record: C#501520-10-01
Project Manager: Parminder Virk

INVOICE TO:

Company Name: #3269 ARCADIS Canada
Contact Name: ANDREW HENDERSON
Address: 329 CHURCHILL AVE NORTH SUITE 2000 OTTAWA ON K1Z 5B8
Phone: (613) 721-0555 Fax: (613) 721-0029
Email: ahenderson@franzenvironmental.com, andrew.henders

Report Information

Company Name: Same
Contact Name:
Address:
Phone: Fax:
Email: ryan.fletcher@arcadis.com

Project Information

Quotation #:
P.O. #:
Project #: 102012-000, Kitikmeot DEW Lin
Project Name:
Site #: CAM 1 Junny Lind Island
Sampled By: R. Fletcher

Regulatory Criteria:

Special Instructions:

Note: For regulated drinking water samples - please use the Drinking Water Chain of Custody Form

Samples must be kept cool (< 10°C) from time of sampling until delivery to maxxam

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Please provide advance notice for rush projects

Regular (Standard) TAT (X)
(will be applied if Rush TAT is not specified)
Standard TAT = 5-7 Working days for most tests.
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Job Specific Rush TAT (if applies to entire submission)
Date Required: Time Required:
Rush Confirmation Number: *(call lab for #)*

Analysis Requested

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Regulated Drinking Water ? (Y / N)	Metals Field Filtered ? (Y / N)	AT1 BTEX and F1-F4 in Soil	Polychlorinated Biphenyls	Elements by ICPMS - Soils	arsenic, cadmium, chromium, cobalt, copper, lead, mickel, zinc, and mercury	Total Hexavalent Chromium	Mercury - Low Level (Total)	AT1 BTEX and F1-F4 in Water	PCB WATER	# of Bottles	Comments
1		16-C1-35A	Aug11/16	16:15	Soil			X	X		X					4	
2		16-C1-35B	Aug11/16	16:15	Soil			X	X		X					4	metals in bags
3																	2 bags in 3 jars,
4																	
5																	* Labels are NOT
6																	
7																	* Lids are NOT labels
8																	
9																	
10																	

RECEIVED IN YELLOWKNIFE
By: Michelle Burke 10:40
2016-08-14
4-4-2
0-1-0
Temp: 4 15 17
4.2.5
5.4.5
6.4.3
5.7.4

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
Ryan Fletcher	Aug 12/16	15:00	Degan DEJI WU	2016/08/15	12:30	

Lab Use Only

Time Sensitive	Temperature (°C) on Receipt	Custody Seal Intact on Cooler?
	See ACTR	Yes / No

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Chain Of Custody Record

Page 10 of 11

INVOICE TO:		Report Information		Project Information		Laboratory Use Only	
Company Name	#3269 ARCADIS Canada	Company Name	Same	Quotation #		Maxxam Job #	Bottle Order #:
Contact Name	ANDREW HENDERSON	Contact Name		P.O. #		B668559 D-T	501520
Address	329 CHURCHILL AVE NORTH SUITE 2000	Address		Project #	102012-000, Kitikmeot DEW Lin	Chain Of Custody Record	Project Manager
	OTTAWA ON K1Z 5B8			Project Name		C#501520-02-01	Parminder Virk
Phone	(613) 721-0555 Fax: (613) 721-0029	Phone	Fax:	Site #	CAM 1 Junny Lind Island		
Email	ahenderson@franzenvironmental.com, andrew.henders	Email	ryan.fletcher@arcadis.com	Sampled By	R. Fletcher		

Regulatory Criteria

Special Instructions

Note: For regulated drinking water samples - please use the Drinking Water Chain of Custody Form

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Please provide advance notice for rush projects

Regular (Standard) TAT [X]
(will be applied if Rush TAT is not specified)
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Job Specific Rush TAT (if applies to entire submission)
Date Required: _____ Time Required: _____
Rush Confirmation Number _____ *(call lab for #)*

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Regulated Drinking Water ? (Y / N)	Metals Field Filtered ? (Y / N)	Analysis Requested: AT1 BTEX and F1-F4 in Soil	Polychlorinated Biphenyls	Elements by ICPMS - Soils	arsenic, cadmium, chromium, cobalt, copper, lead, mickel, zinc, and mercury	Total Hexavalent Chromium	Mercury - Low Level (Total)	AT1 BTEX and F1-F4 in Water	PCB WATER			# of Bottles	Comments
1		C1 - Dup1	Aug9/16	—	Soil			X	X		X							4	
2		C1 - Dup2	Aug9/16	—	Soil			X	X		X							4	Metals in 2 bags
3		C1 - Dup3	Aug10/16	—	Soil			X	X		X							4	
4		C1 - Dup4	Aug9/16	—	Soil			X	X		X							4	
5		C1 - Dup5	Aug10/16	—	Soil			X	X		X							4	3 jars, 1 bag
6		C1 - Dup6	Aug11/16	—	Soil			X	X		X							4	** Lids are NOT labels
7		C1 - Dup7	Aug11/16	—	Soil			X	X		X							4	
8		C1 - Dup8	Aug11/16	—	Soil			X	X		X							4	
9																			
10																			

RECEIVED IN YELLOWKNIFE
By: [illegible] 10:40
2016 -08- 15
4-4-2
0-1-0
Temp: 4 1 5 17
4 2-5
5-4-5
6-4-3
5 7-4

* * RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Lab Use Only: Time Sensitive	Temperature (ºC) on Receipt	Custody Seal Intact on Cooler?
Ryan Fletcher	Aug 17/16	15:00	Dejan DEJI WU	2016/08/15	12:30		☐	See ACTR	☐ Yes ☐ No

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

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Chain Of Custody Record

Page 11 of 11

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Laboratory Use Only

Maxxam Job #: B668559 D-T
Bottle Order #: 501520
Chain Of Custody Record: C#501520-11-01
Project Manager: Parminder Virk

INVOICE TO:

Company Name: #3269 ARCADIS Canada
Contact Name: ANDREW HENDERSON
Address: 329 CHURCHILL AVE NORTH SUITE 2000, OTTAWA ON K1Z 5B8
Phone: (613) 721-0555 Fax: (613) 721-0029
Email: ahenderson@franzenvironmental.com, andrew.henders

Report Information

Company Name: Same
Contact Name:
Address:
Phone: Fax:
Email: ryan.fletcher@arcadis.com

Project Information

Quotation #:
P.O. #:
Project #: 102012-000, Kitikmeot DEW Lin
Project Name:
Site #: CAM 1 Junny Lind Island
Sampled By: R. Fletcher

Regulatory Criteria:

Special Instructions:

Note: For regulated drinking water samples - please use the Drinking Water Chain of Custody Form

Samples must be kept cool (< 10°C) from time of sampling until delivery to maxxam

Analysis Requested

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Regulated Drinking Water? (Y/N)	Metals Field Filtered? (Y/N)	AT1 BTEX and F1-F4 in Soil	Polychlorinated Biphenyls	Elements by ICPMS - Soils	arsenic, cadmium, chromium, cobalt, copper, lead, mickel, zinc, and mercury	Total Hexavalent Chromium	Mercury - Low Level (Total)	AT1 BTEX and F1-F4 in Water	PCB WATER	F1/BTEX	# of Bottles	Comments
1		CI-MW05	Aug10/16	11:00	GW	N	N				X	X	X	X	X		9	Metals NOT field filtered and NOT preserved as per client request → Total Metals analysis req.
2		CI-MW03	Aug10/16	14:15	GW	N	N				X	X	X	X	X		9	
3		CI-Dup1	Aug10/16	~	GW	N	N				X	X	X	X	X		9	
4		Trip Blank	~	~	~	~	~									X	2	
5																		
6																		
7																		
8																		
9																		
10																		

RECEIVED IN YELLOWKNIFE
By: Michelle Bruce 10:40
2016-08-14
Temp: 4-4-2 / 0-1-0 / 4 2 1 7.5 / 5-4-5 / 6-4-5

Turnaround Time (TAT) Required

Please provide advance notice for rush projects

Regular (Standard) TAT: A
(will be applied if Rush TAT is not specified)
Standard TAT = 5-7 Working days for most tests.
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Job Specific Rush TAT (if applies to entire submission)
Date Required: Time Required:
Rush Confirmation Number: (call lab for #)

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Time Sensitive	Temperature (°C) on Receipt	Custody Seal Intact on Cooler?
Ryan Fletcher	Aug 11/16	15:00	Dejan DEJ WV	2016/08/15	12:30	5	☐	See ATR	☐ Yes ☐ No

Lab Use Only

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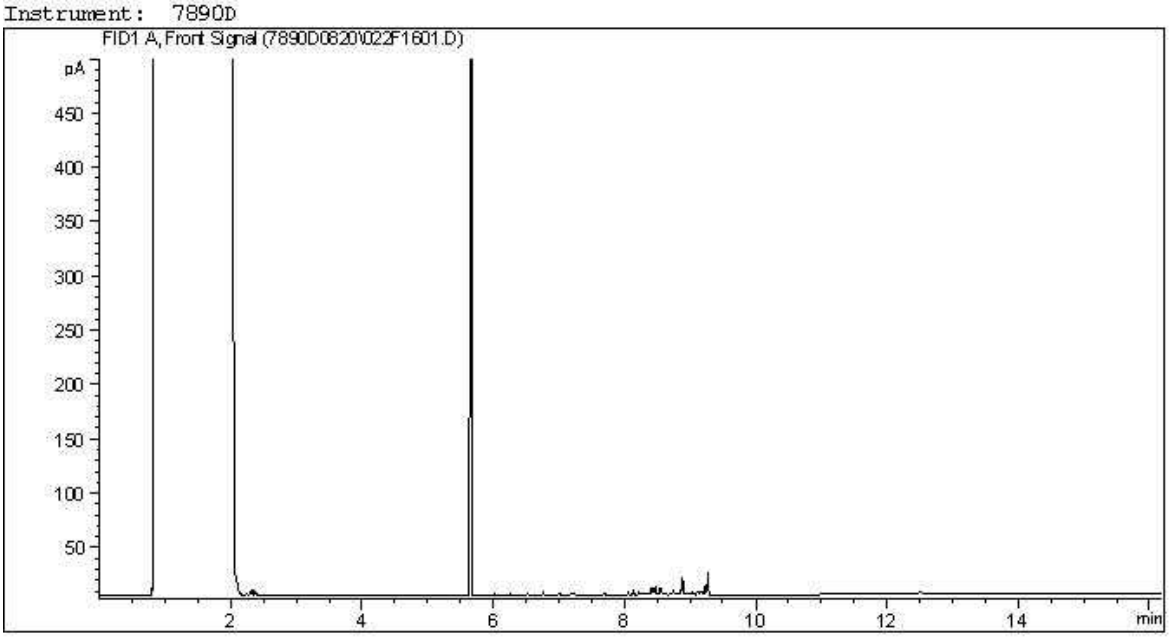
Maxxam Analytics International Corporation o/a Maxxam Analytics

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG5955

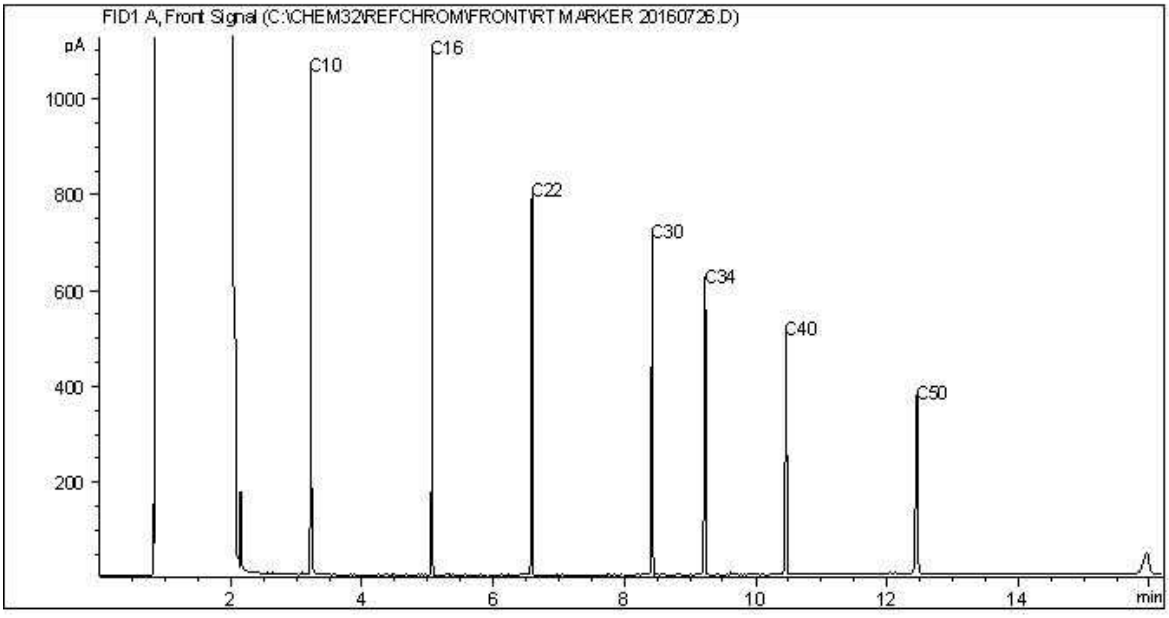
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: 16-C1-1A

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890D



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+

Page 1 of 1

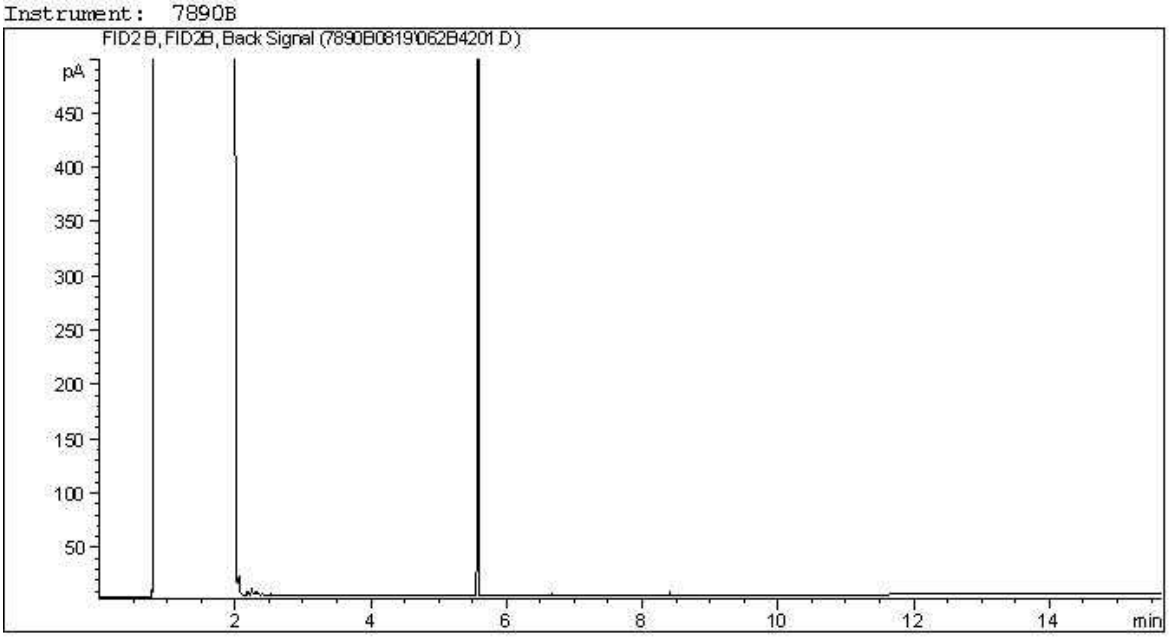
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG5956

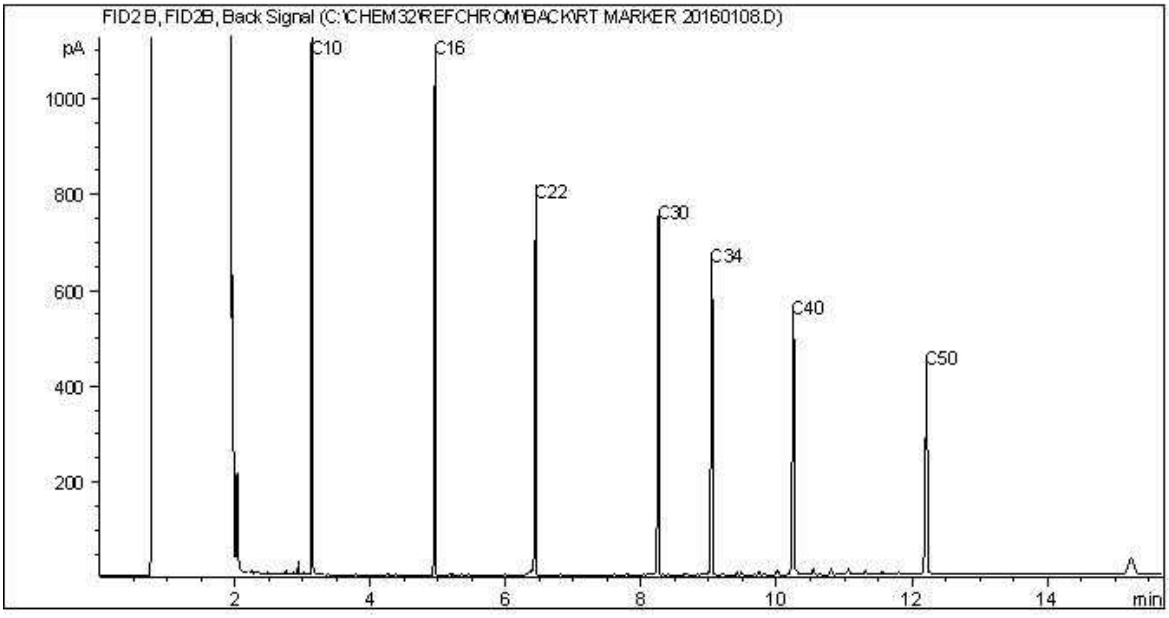
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: 16-C1-1B

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+

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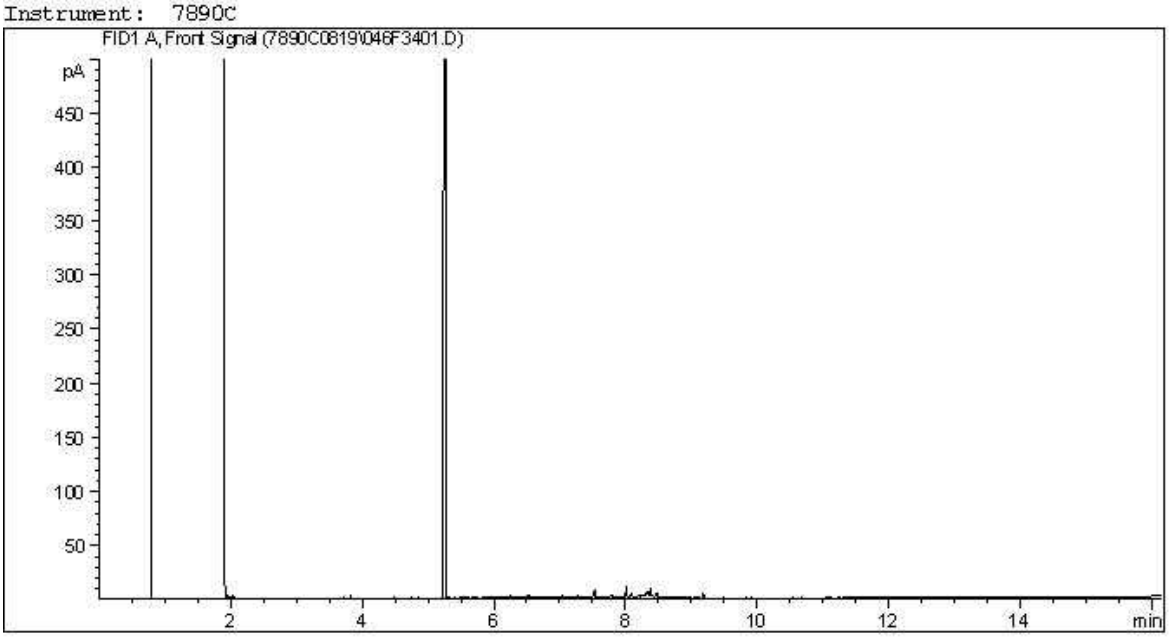
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG5957

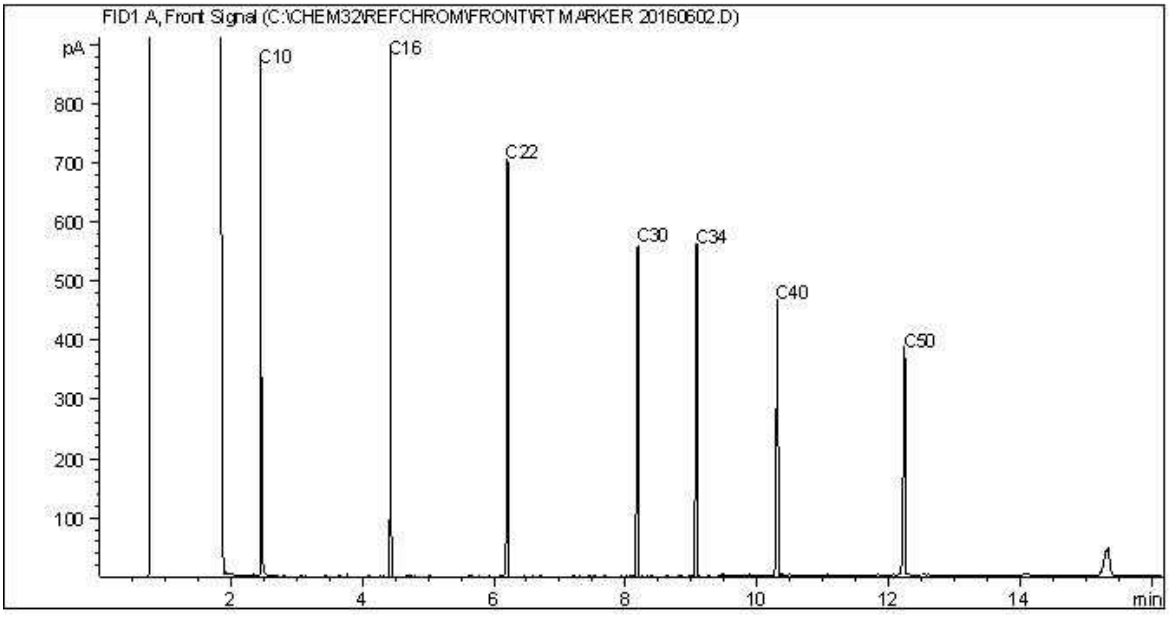
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: 16-C1-2A

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890C



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+

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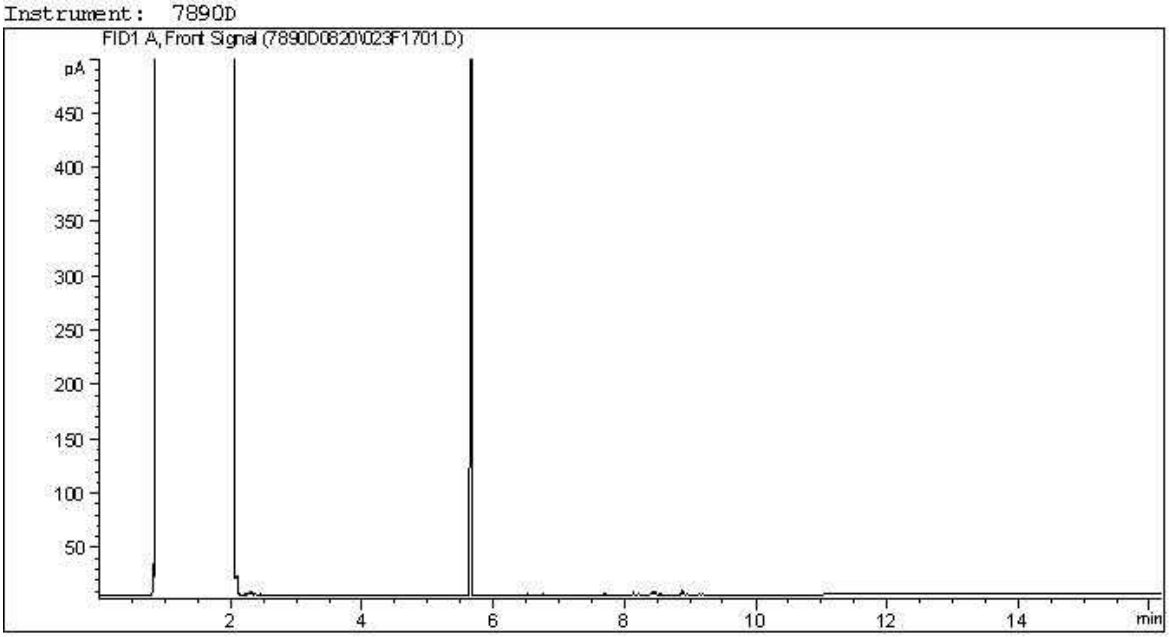
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG5958

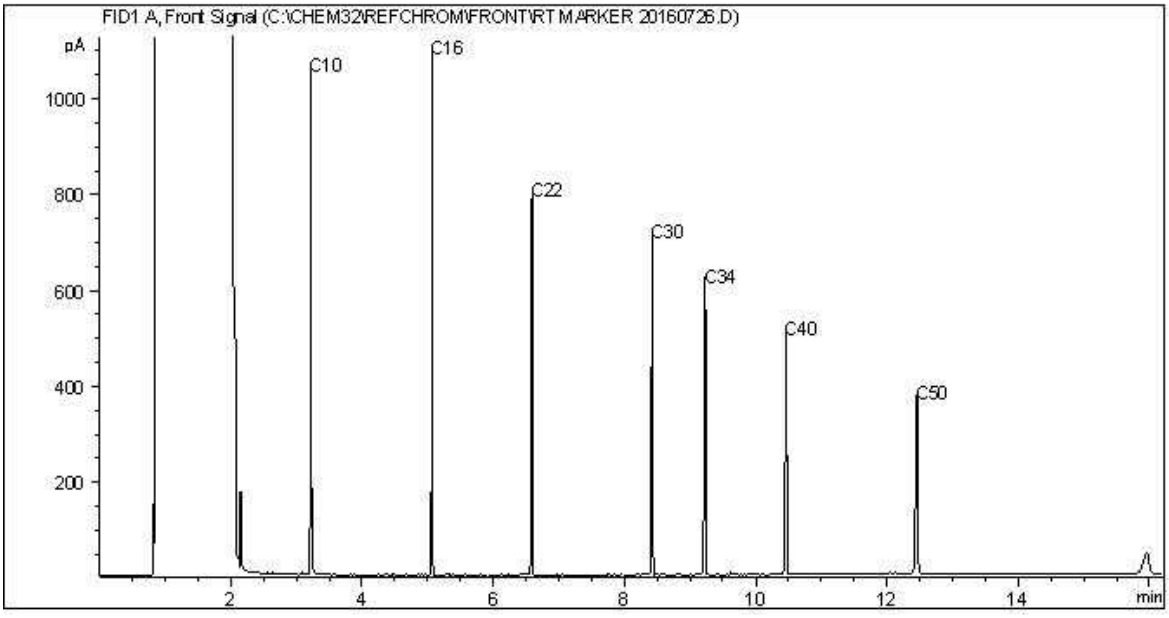
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: 16-C1-2B

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890D



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+

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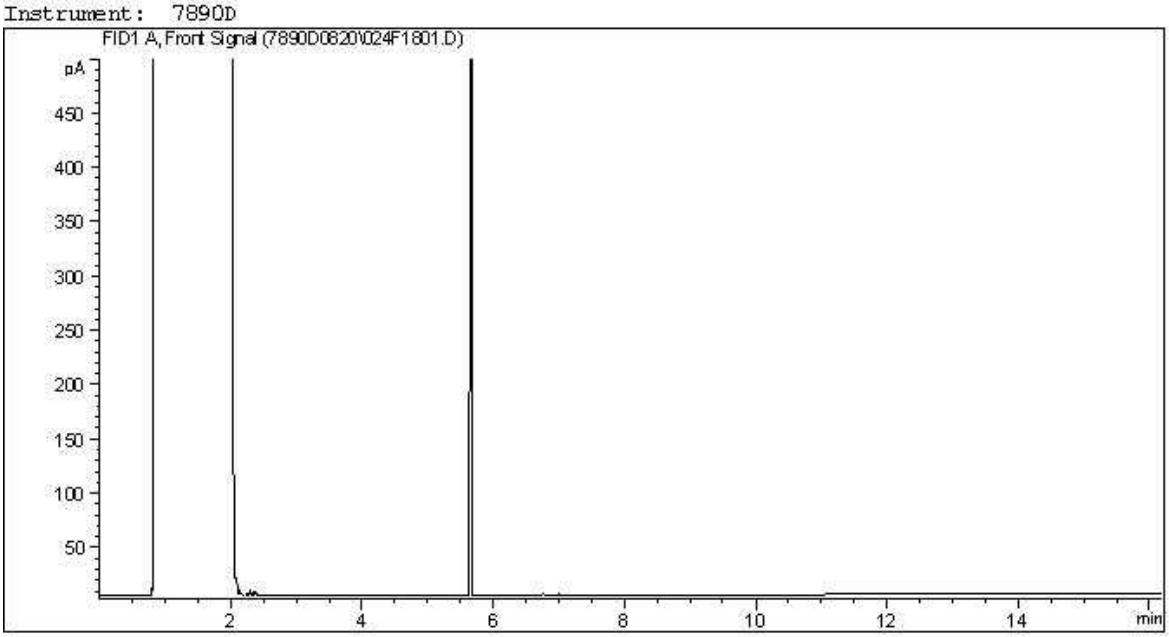
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG5959

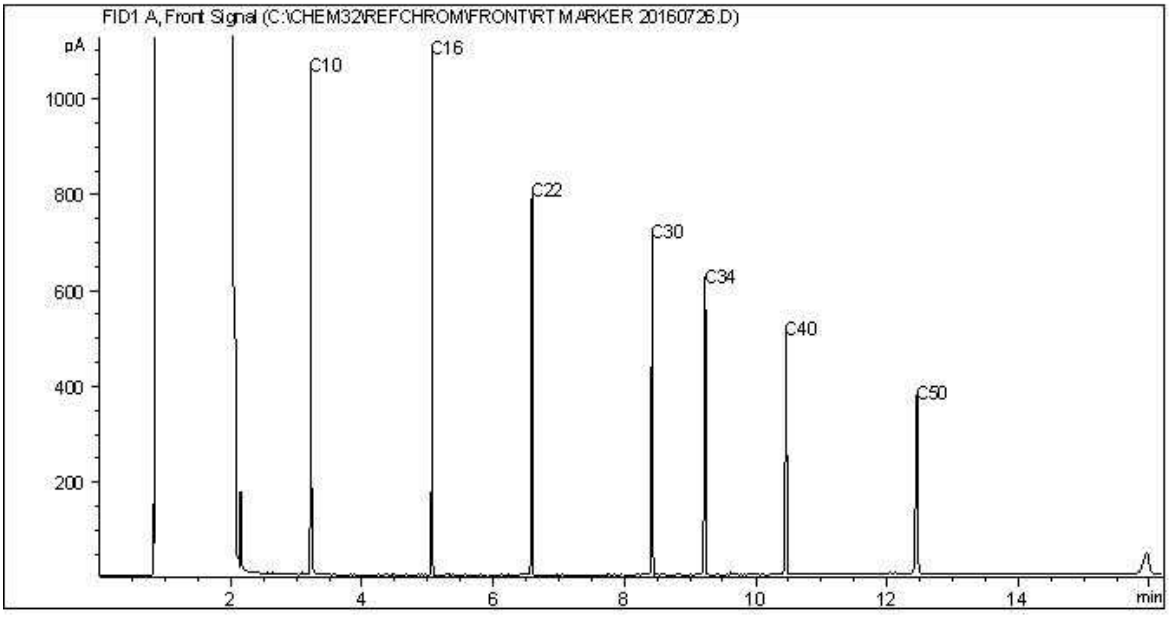
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: 16-C1-3A

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890D



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+

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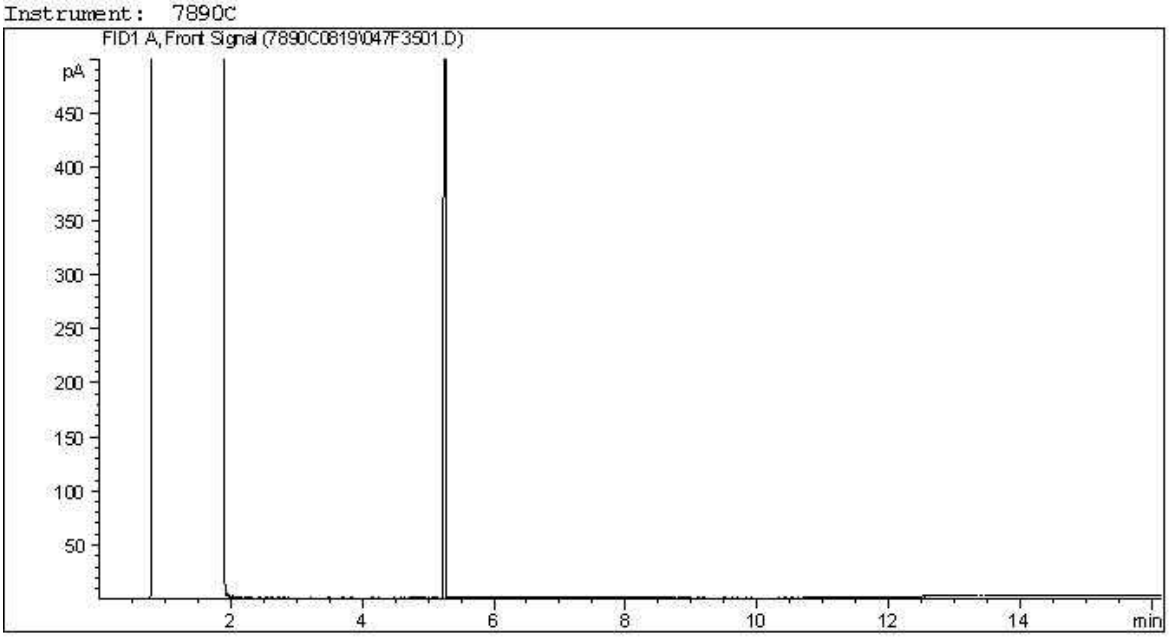
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG5960

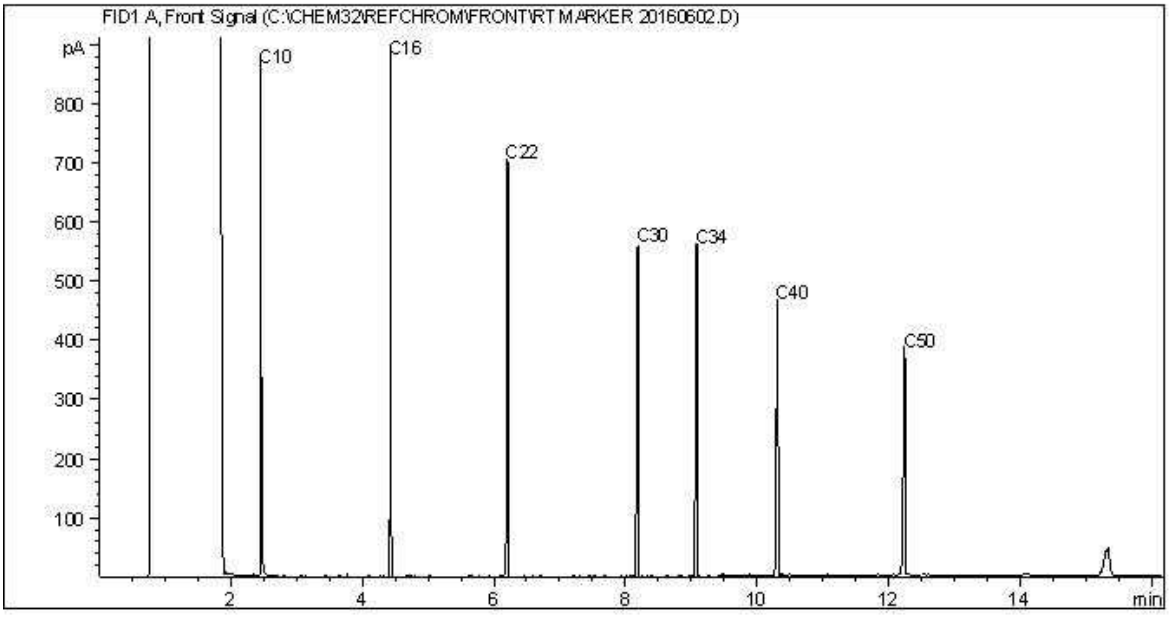
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: 16-C1-3B

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890C



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+

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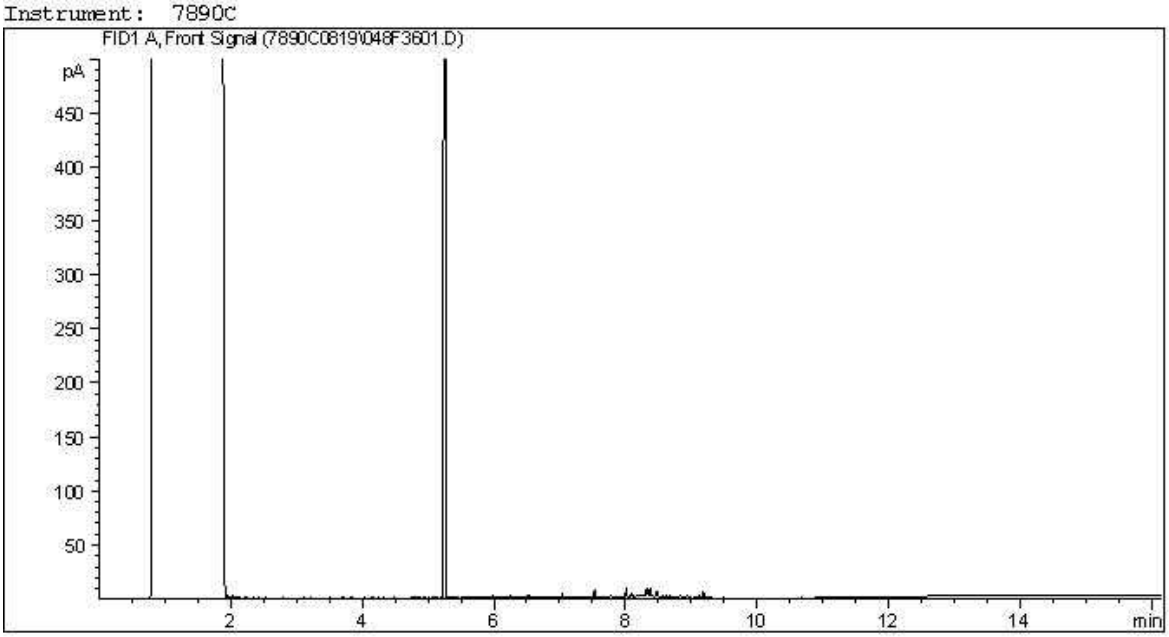
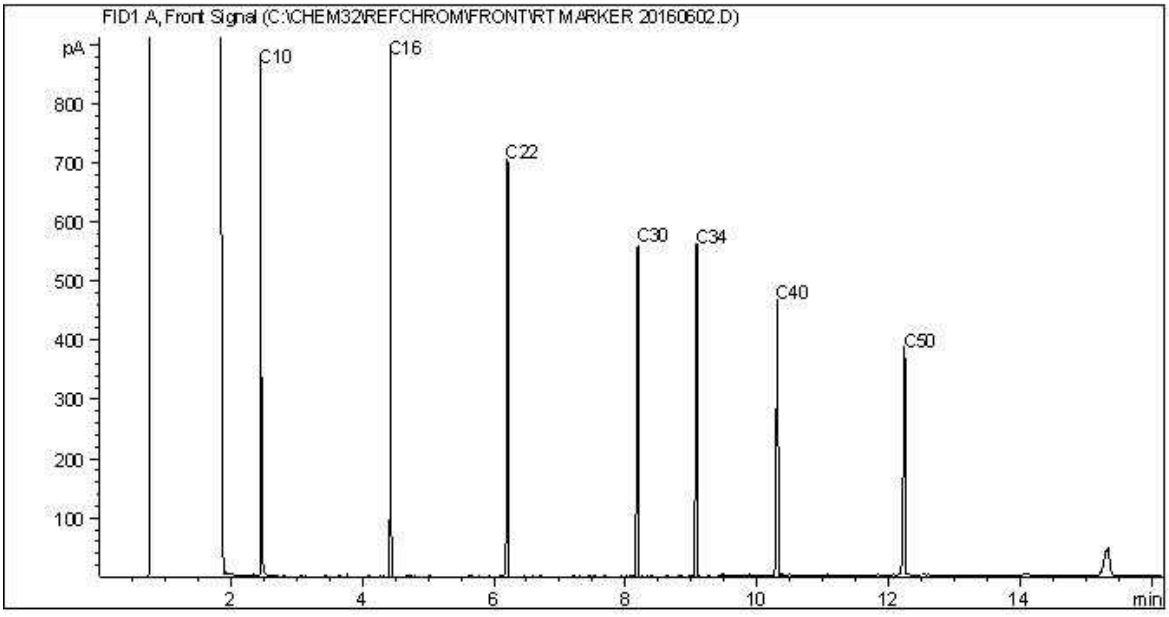
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890C



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+

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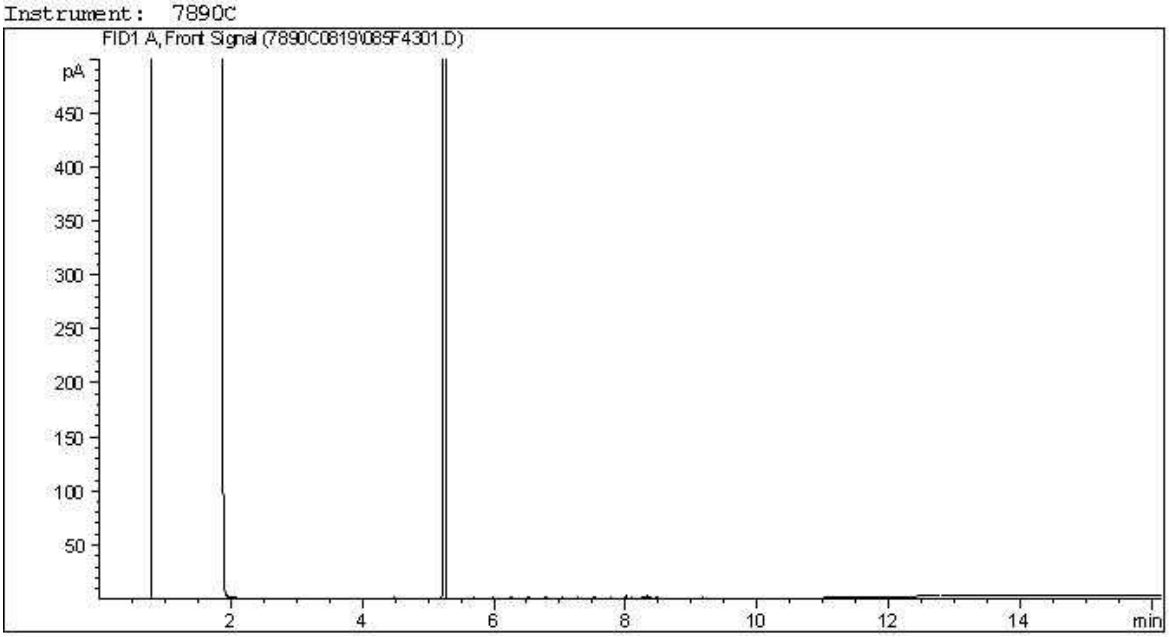
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG5962

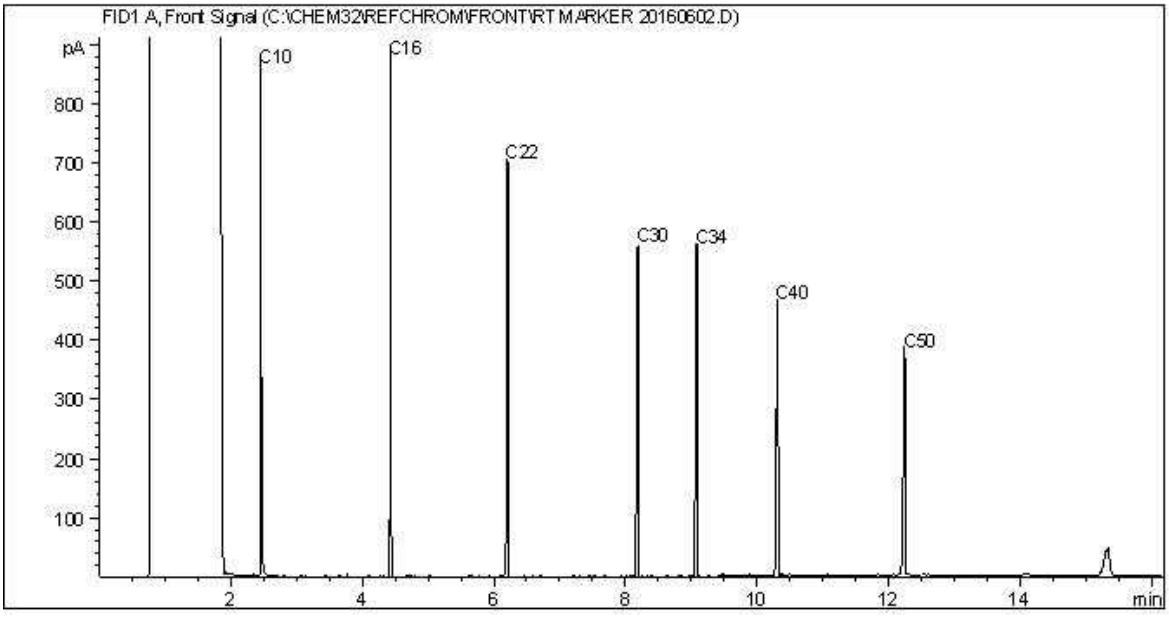
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: 16-C1-4B

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890C



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+

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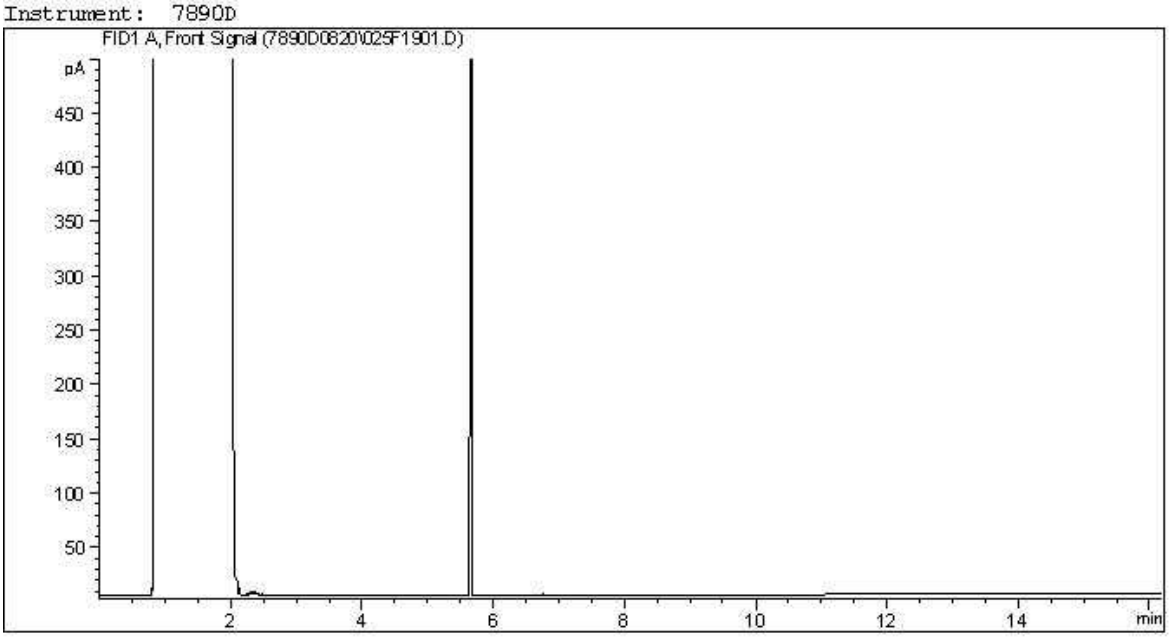
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG5963

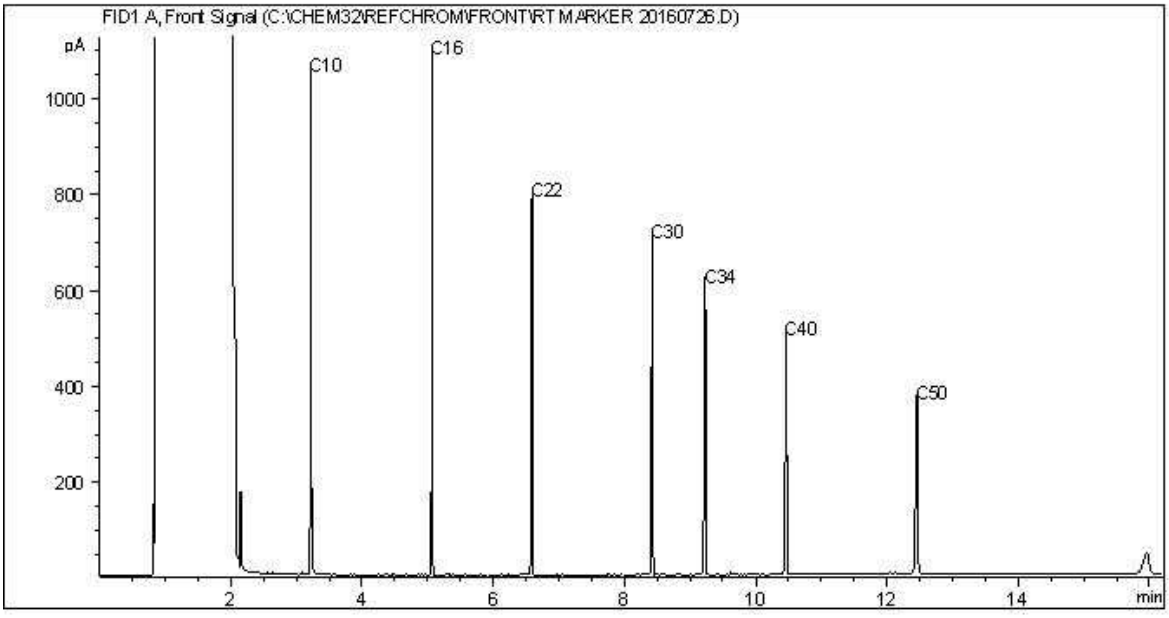
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: 16-C1-5A

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890D



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+

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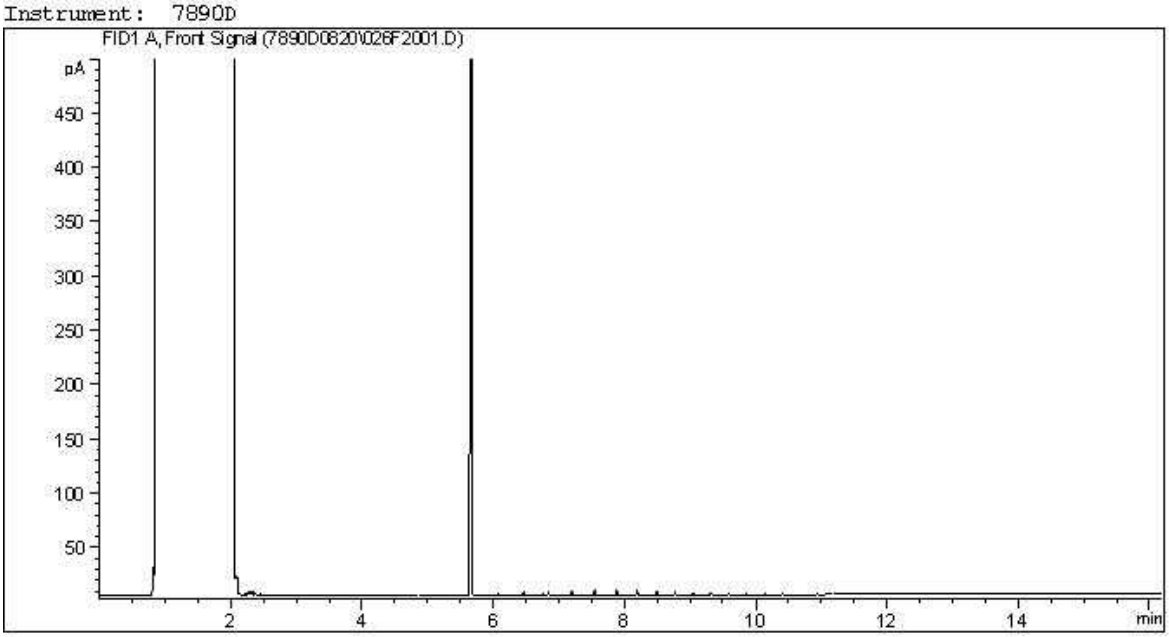
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG5964

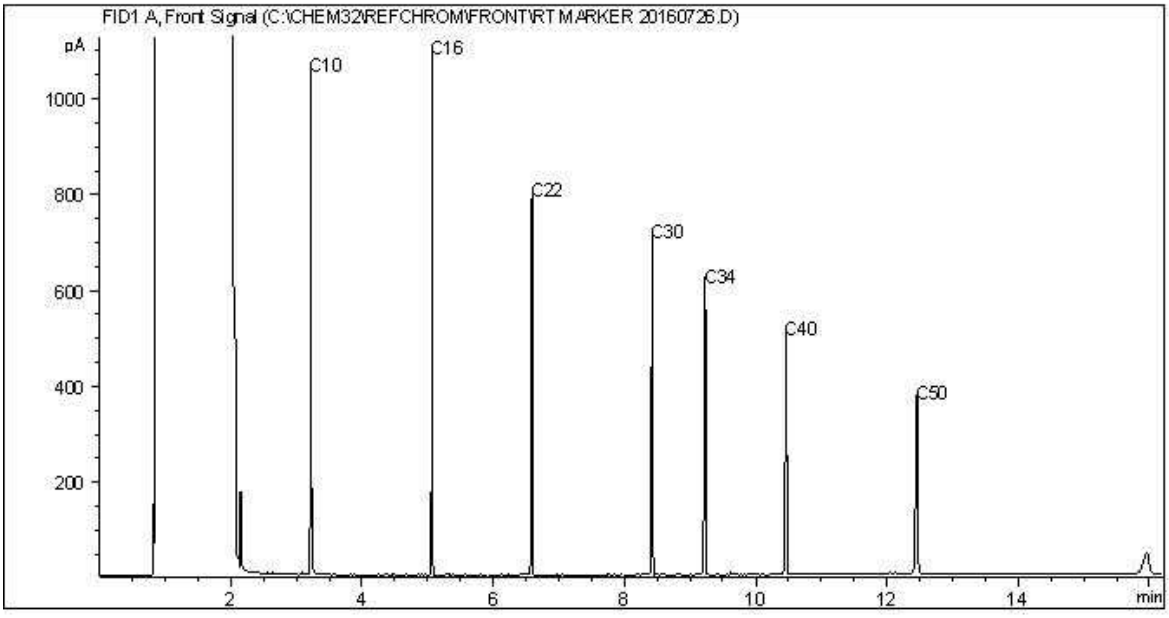
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: 16-C1-5B

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890D



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+

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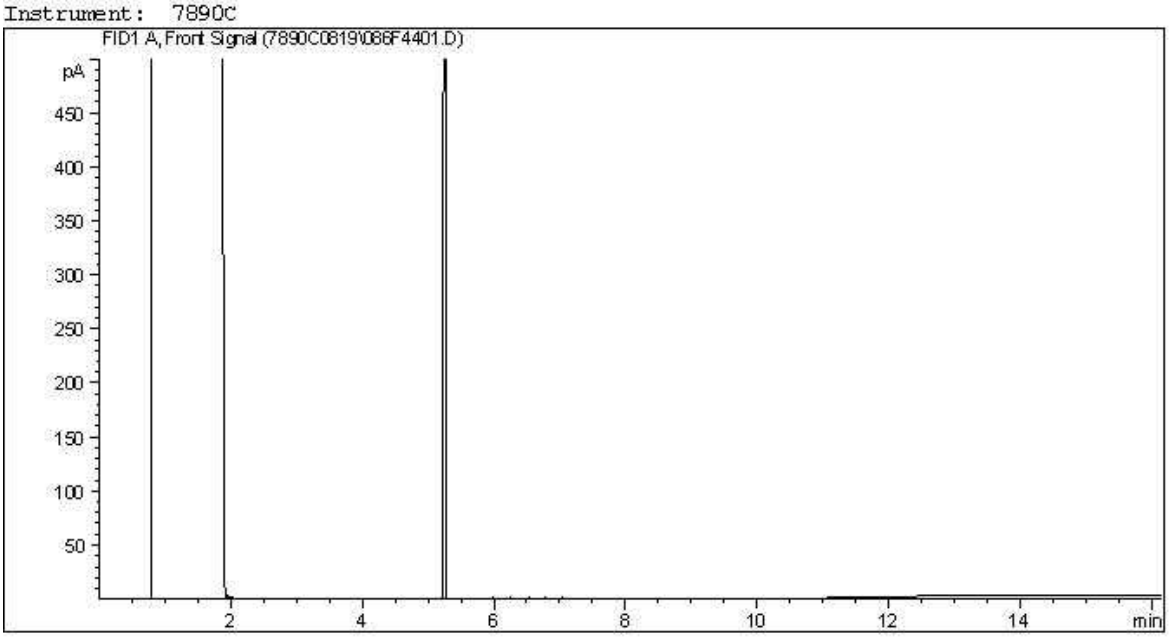
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG5973

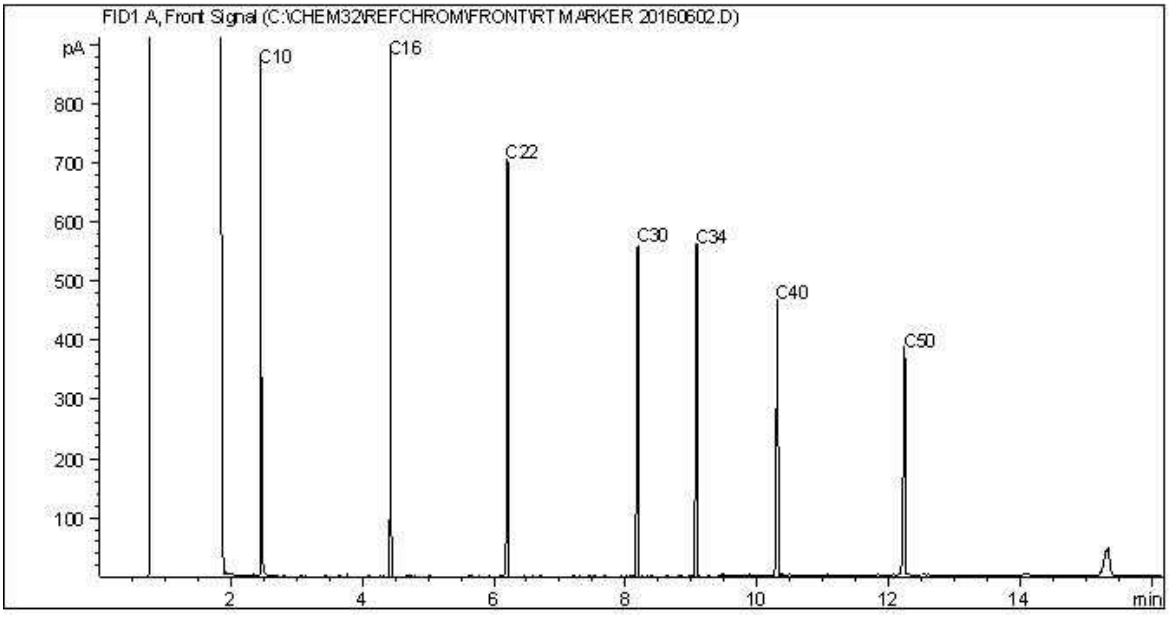
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: 16-C1-6A

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890C



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+

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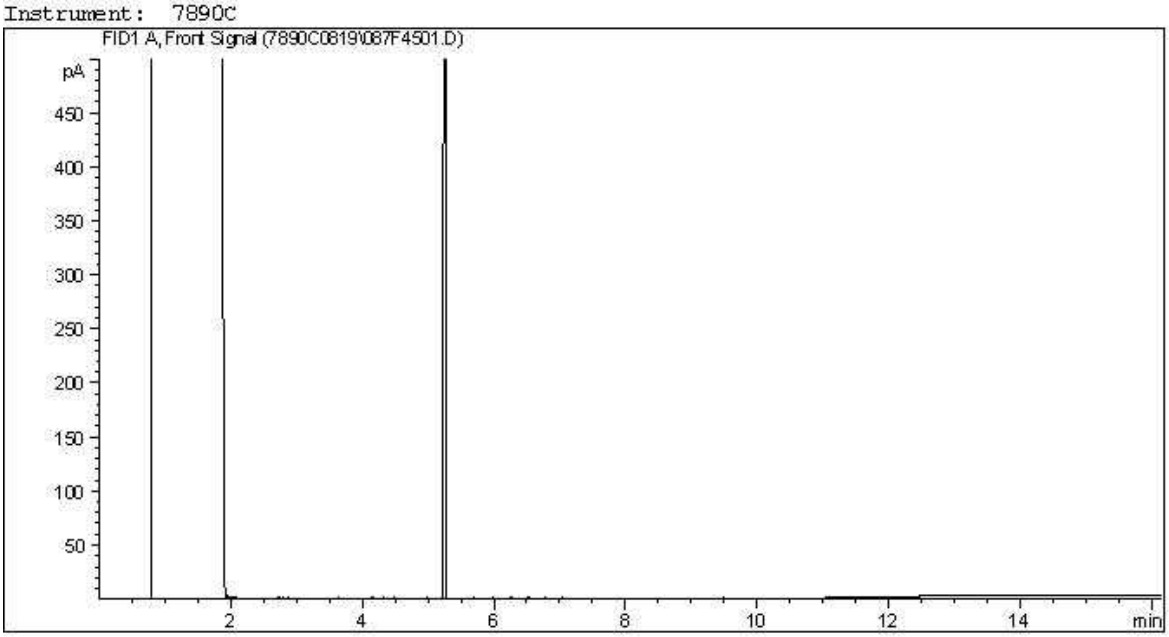
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG5974

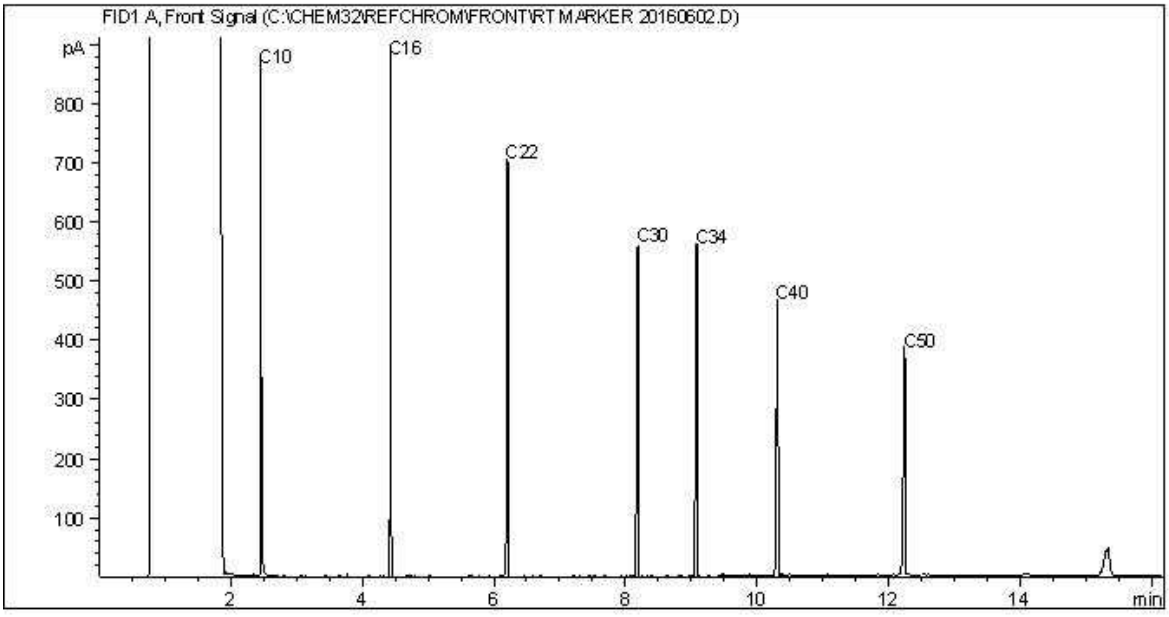
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: 16-C1-6B

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890C



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+

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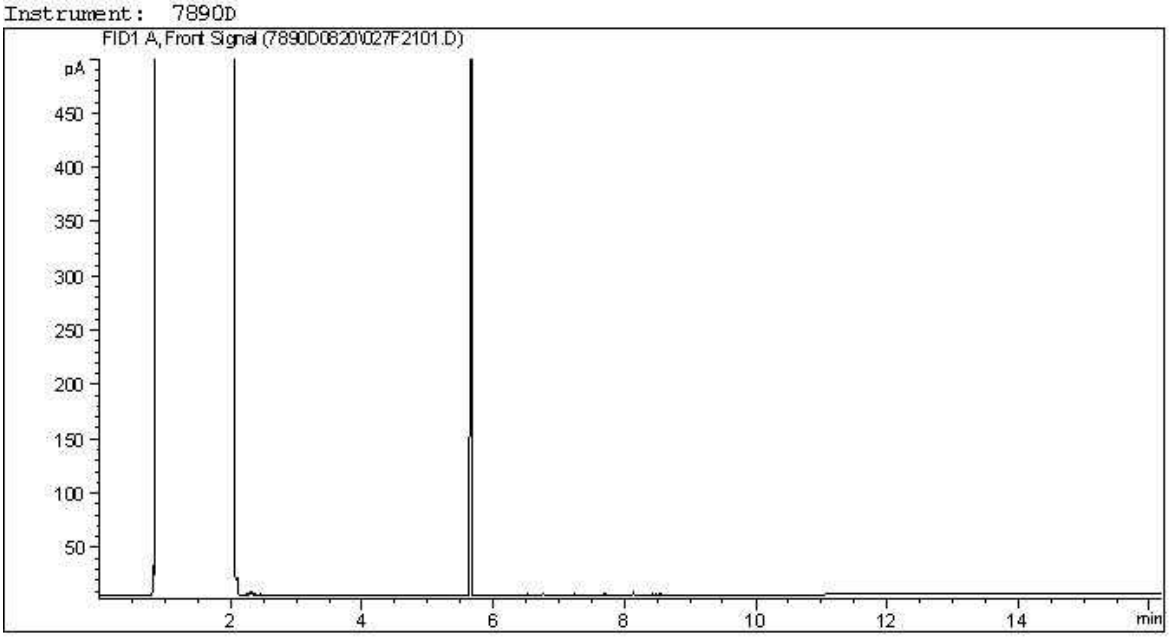
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG5975

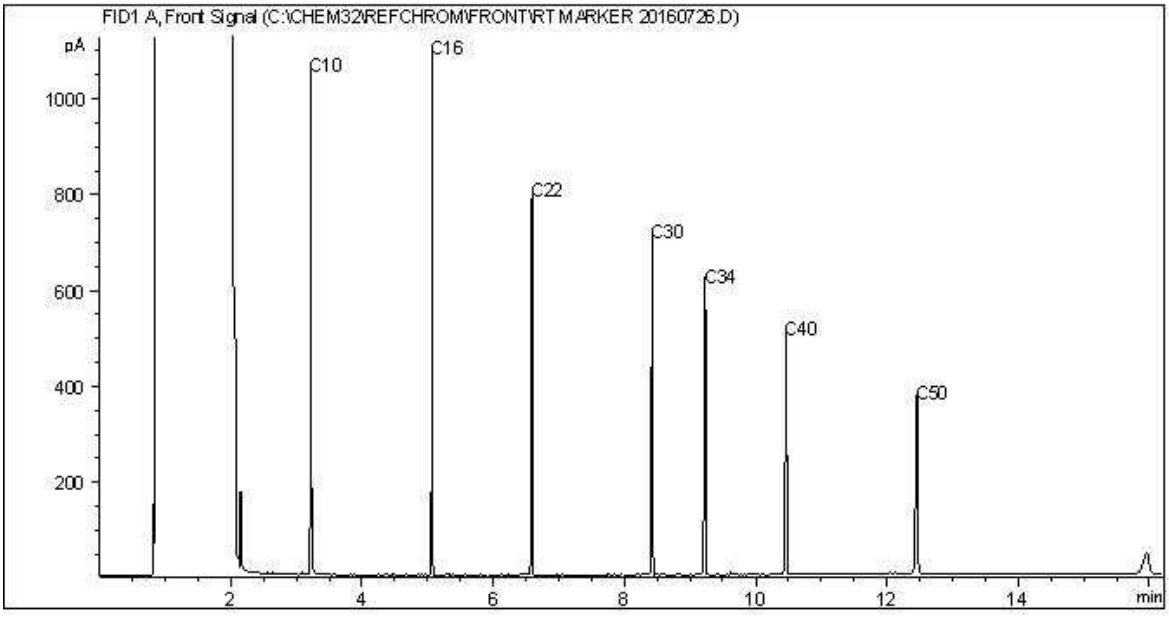
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: 16-C1-7A

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890D



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+

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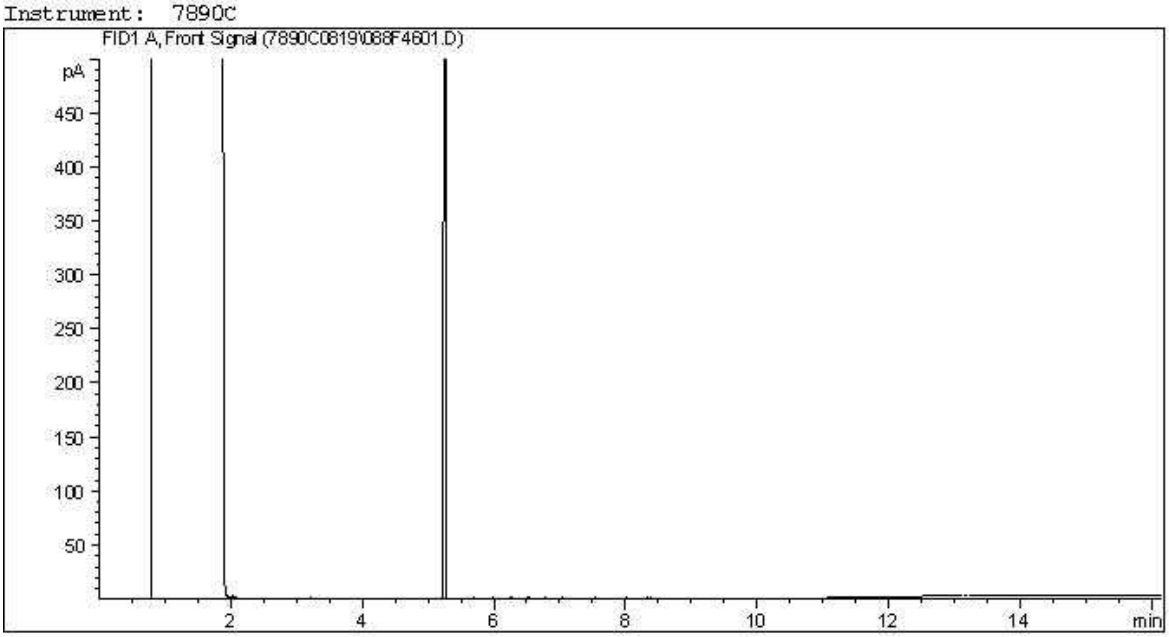
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG5976

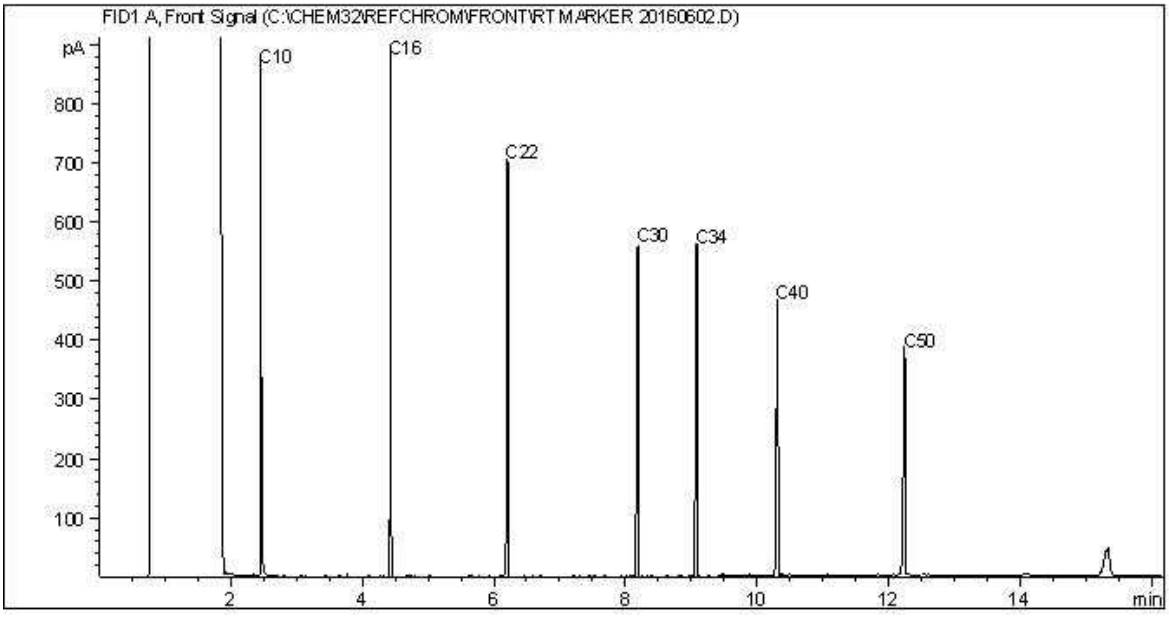
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: 16-C1-7B

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890C



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+

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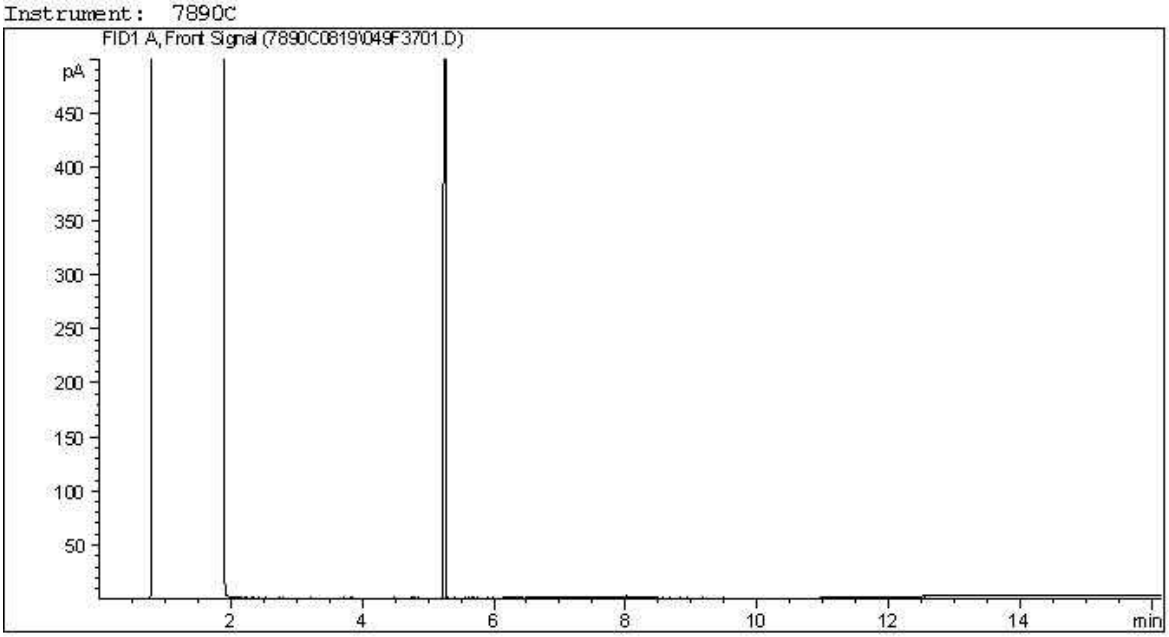
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG5977

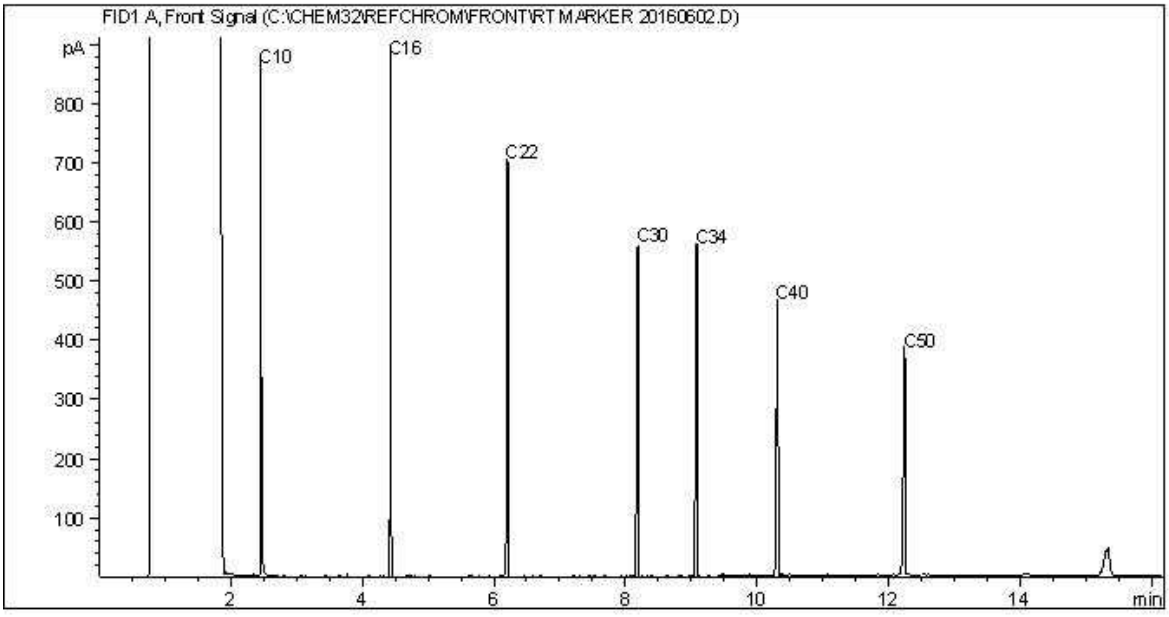
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: 16-C1-8A

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890C



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

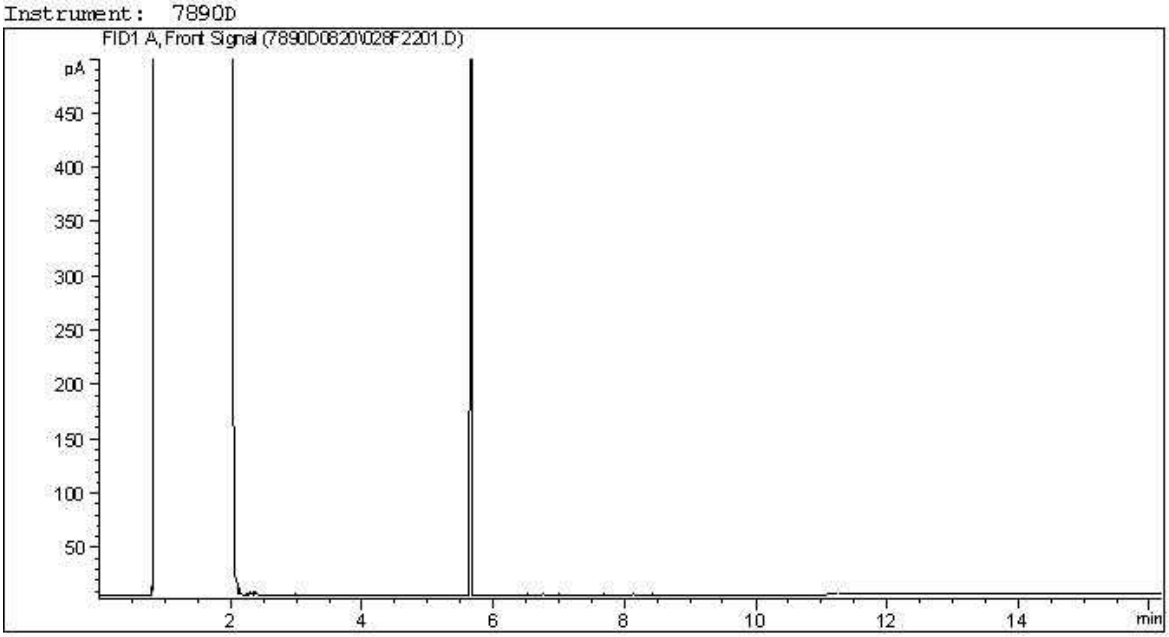
Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

Page 1 of 1

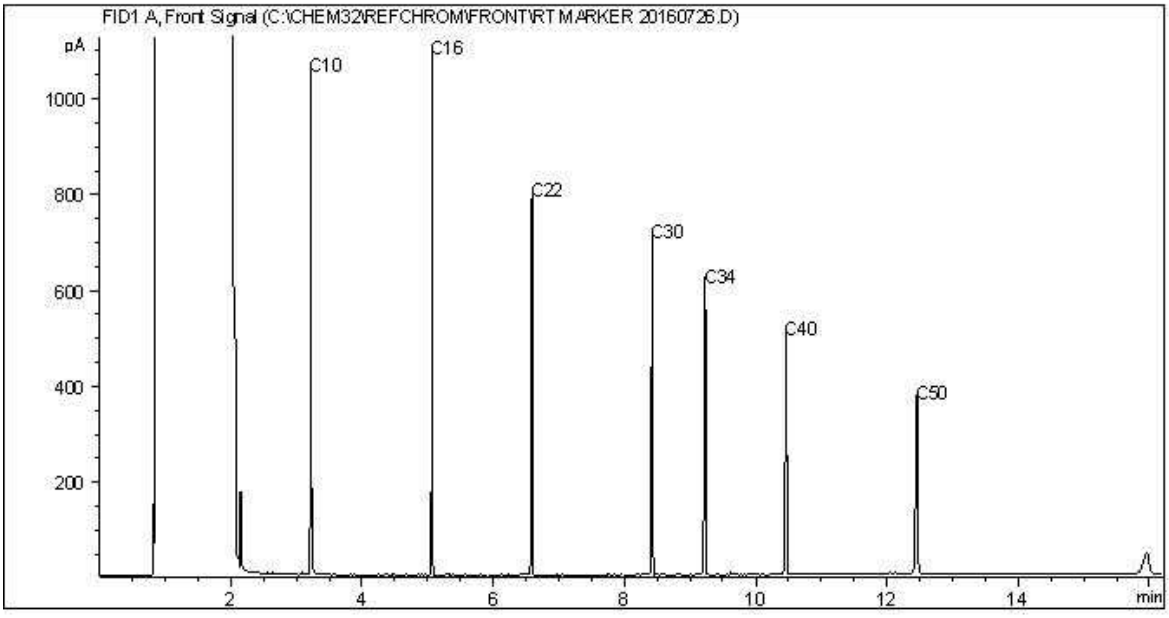
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890D



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+

Page 1 of 1

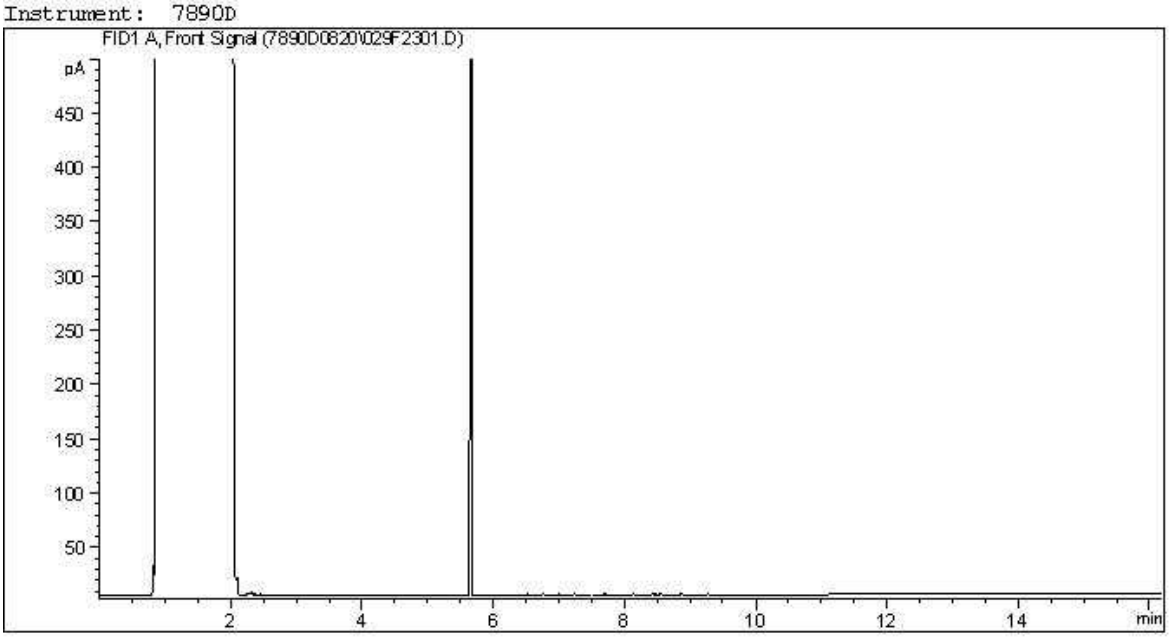
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG5979

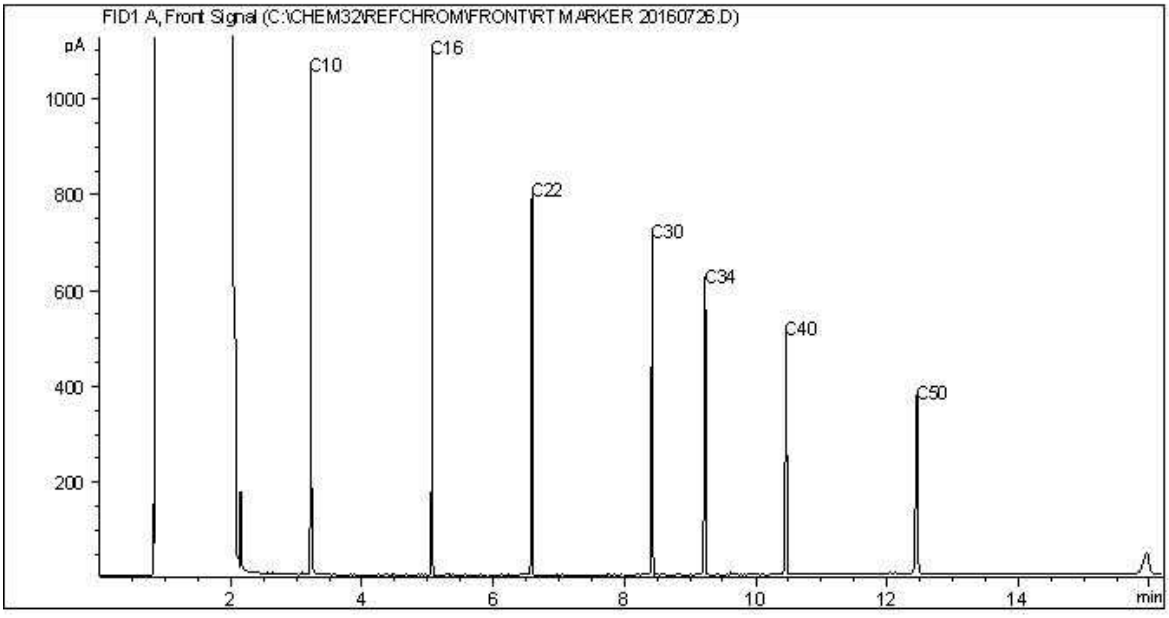
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: 16-C1-9A

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890D



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+

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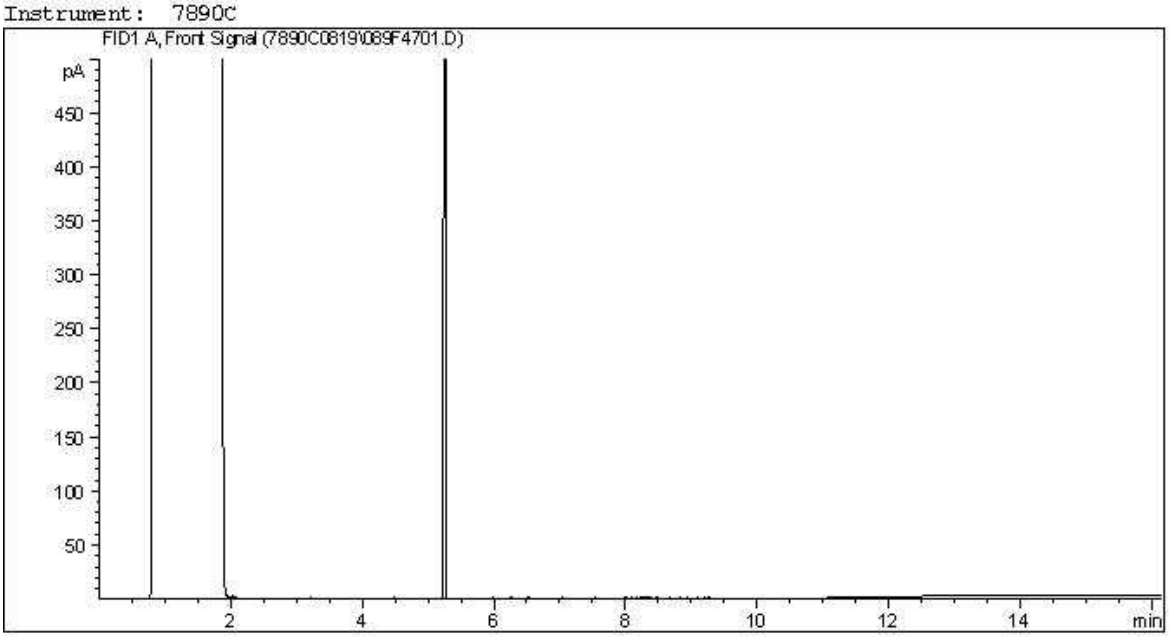
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG5980

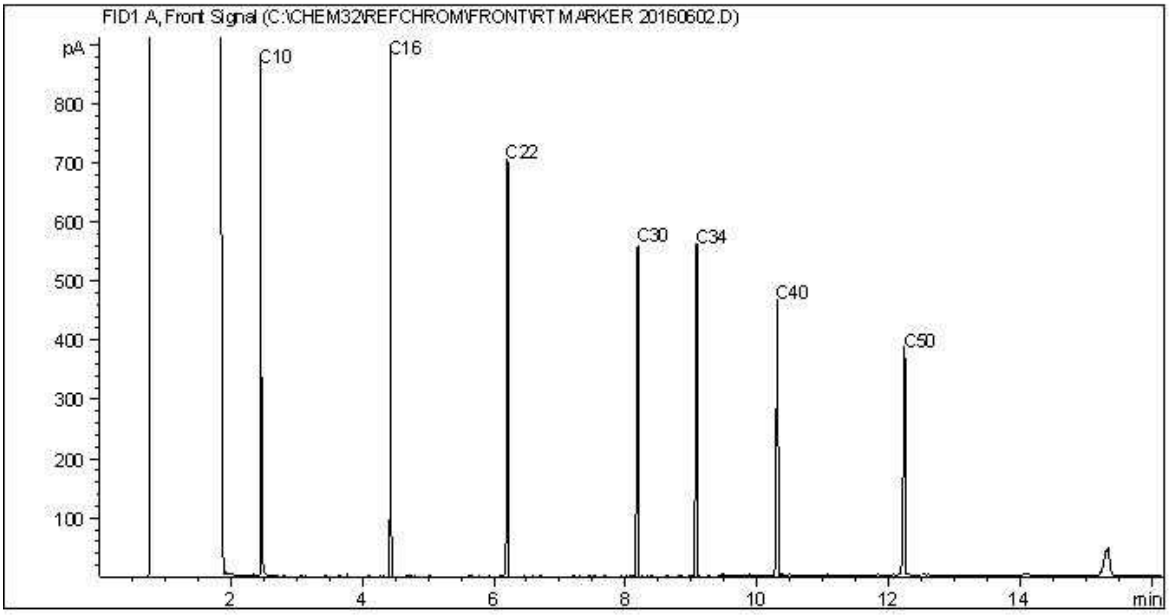
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: 16-C1-9B

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890C



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+

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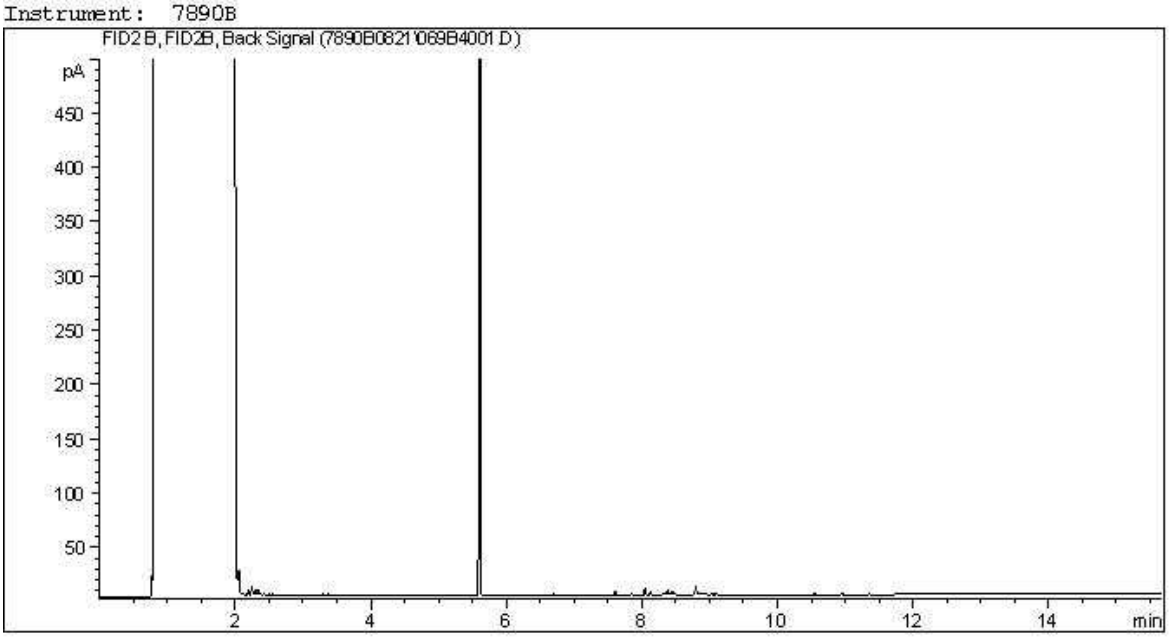
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG5981

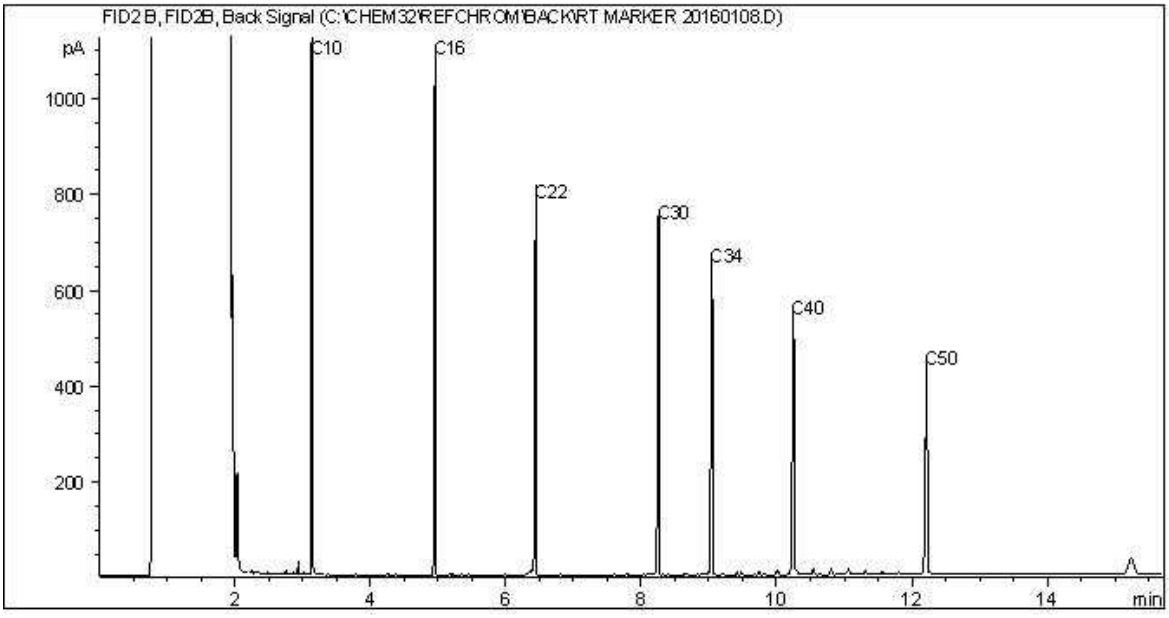
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: 16-C1-10A

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+

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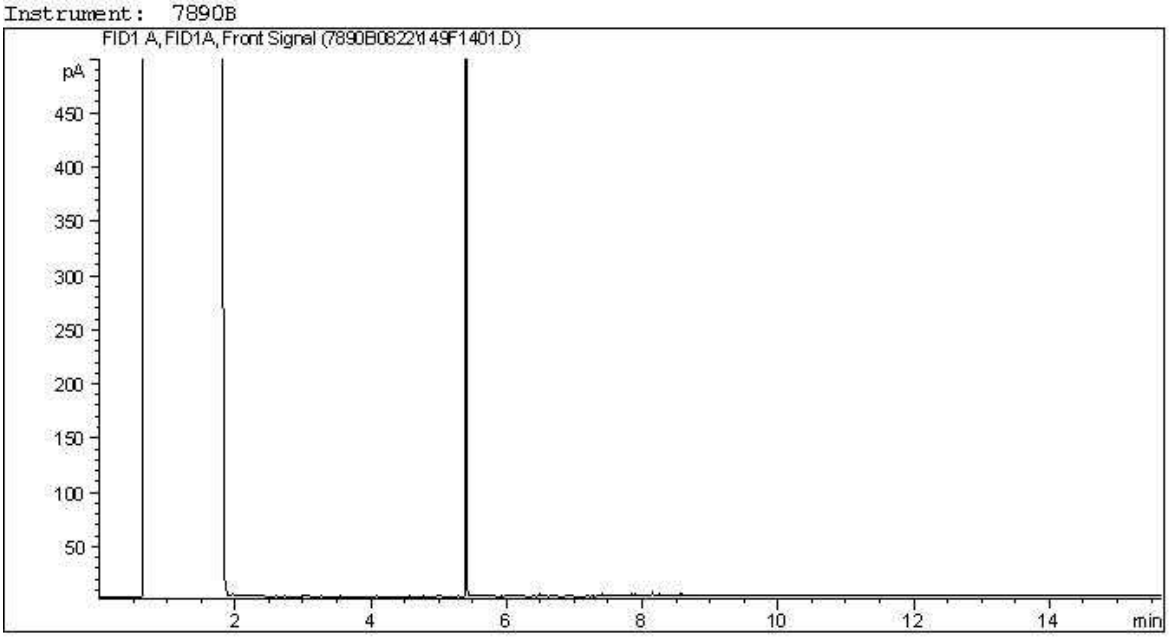
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG5982

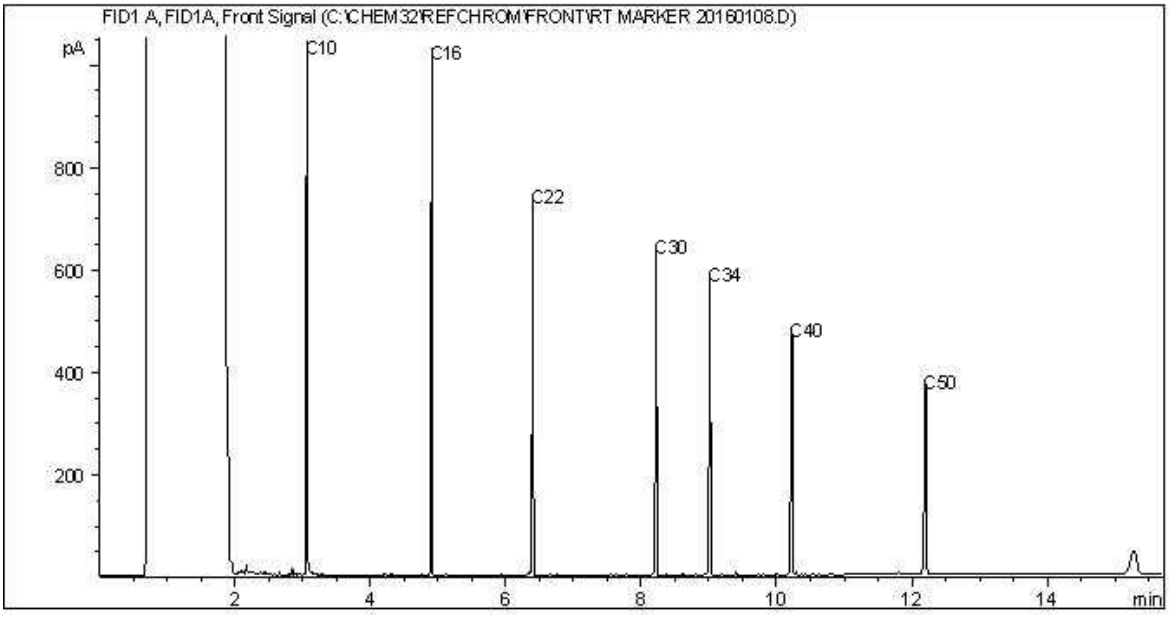
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: 16-C1-10B

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+

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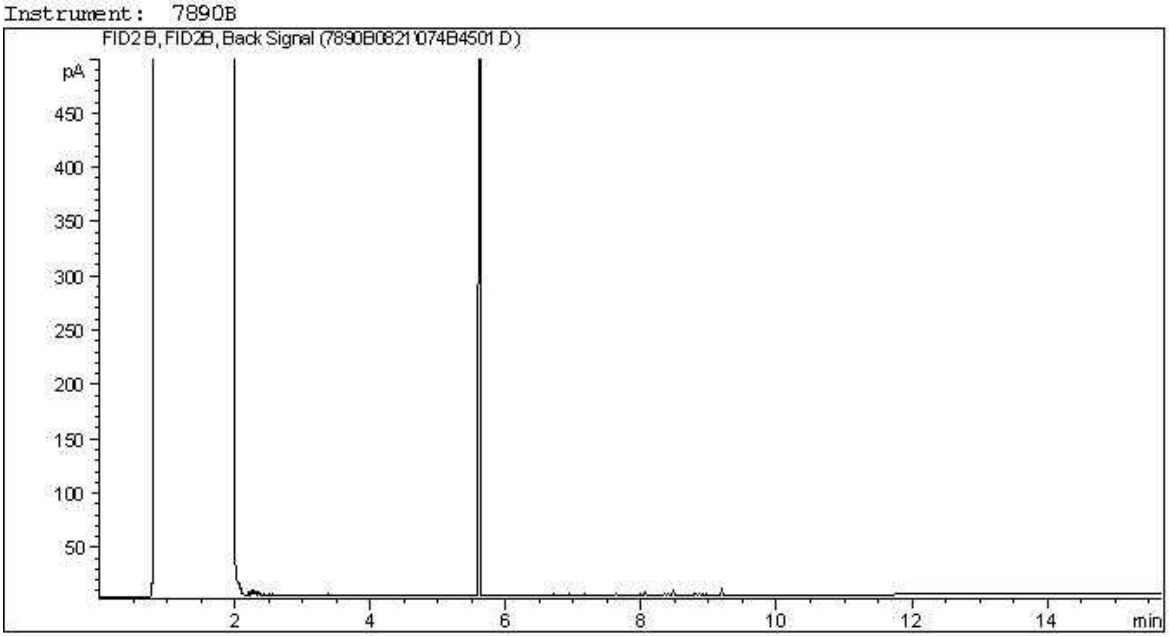
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG5986

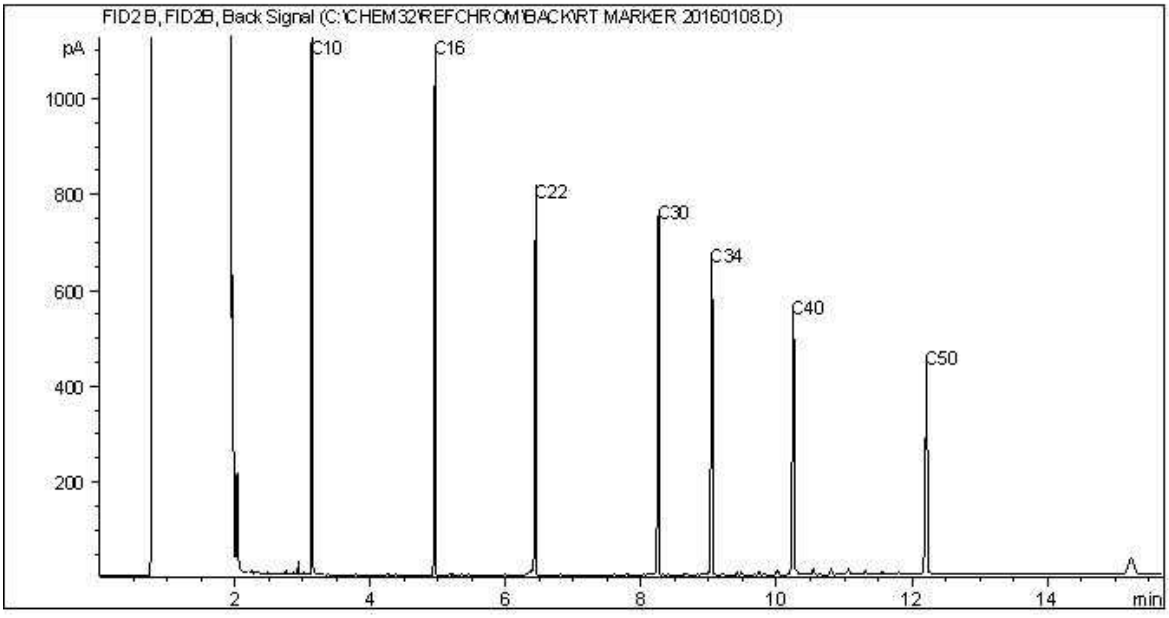
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: 16-C1-11A

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+

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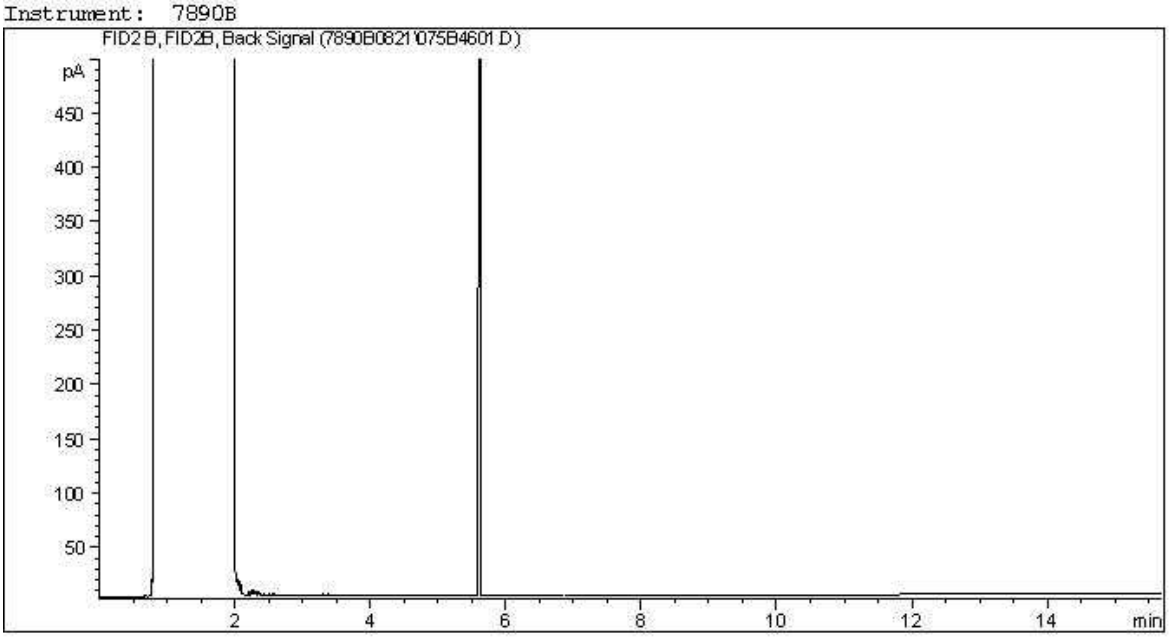
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG5987

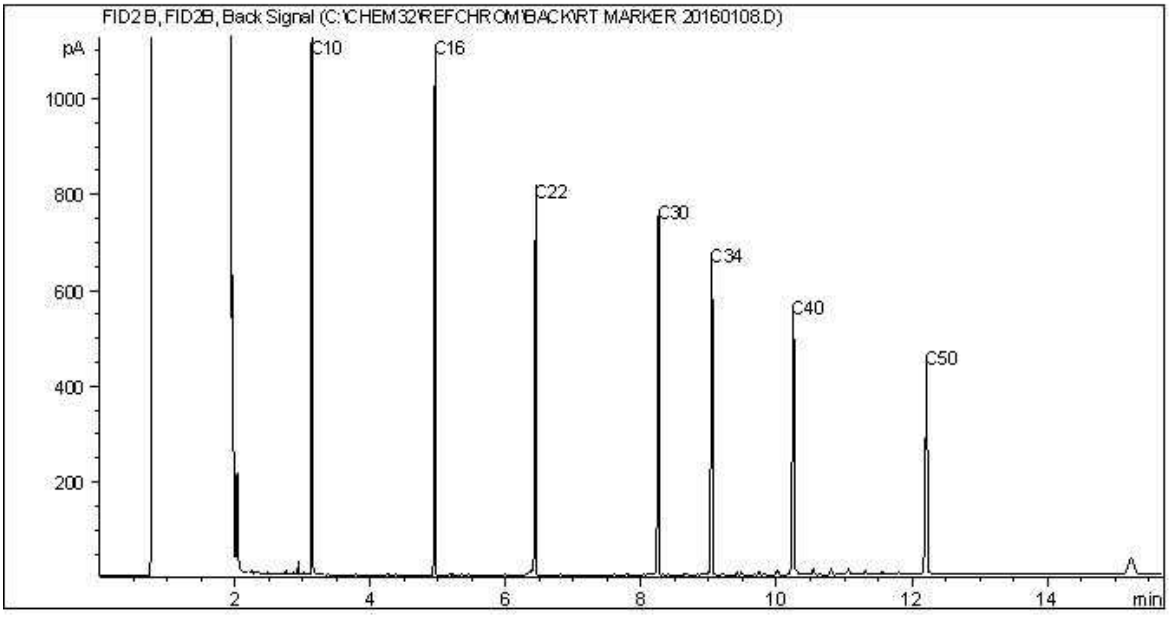
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: 16-C1-11B

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+

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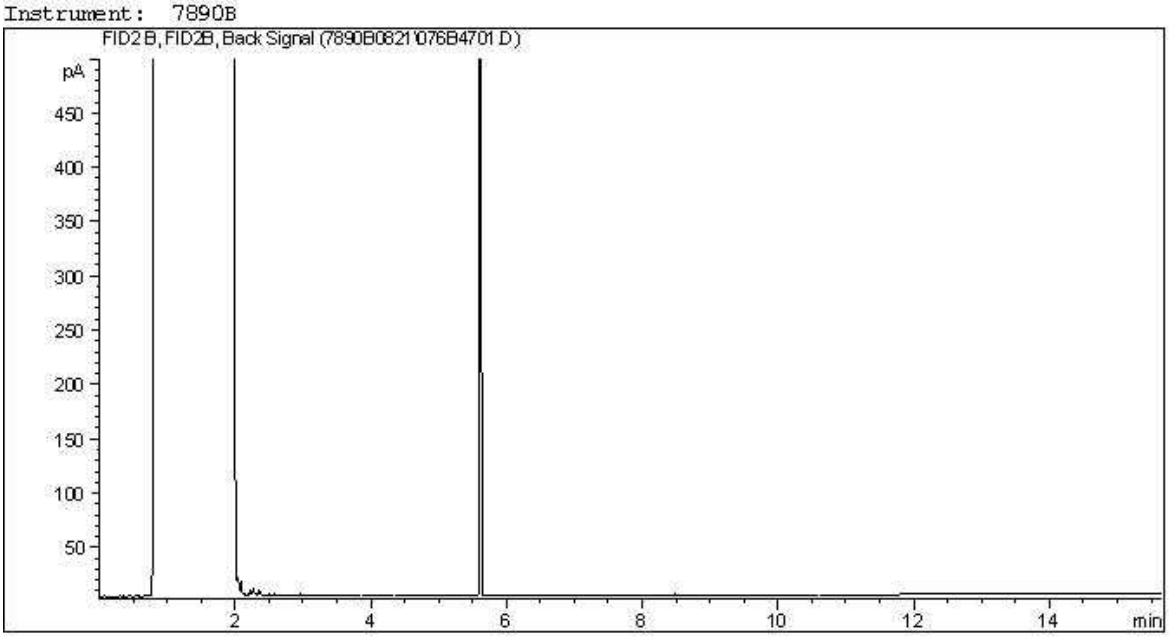
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG5988

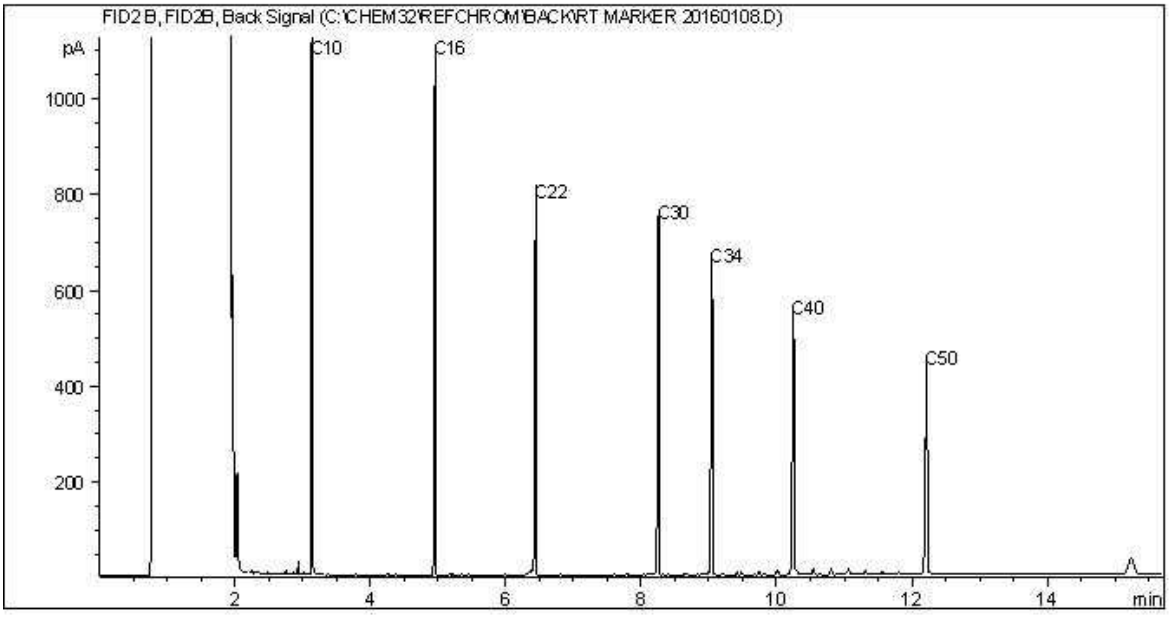
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: 16-C1-12A

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+

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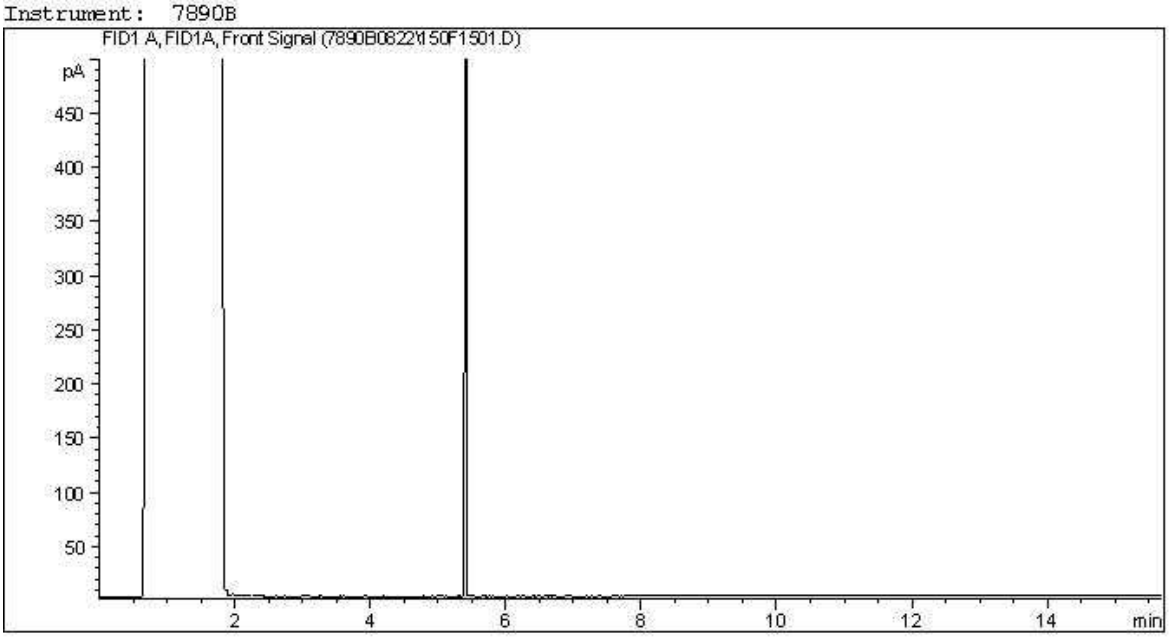
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG5989

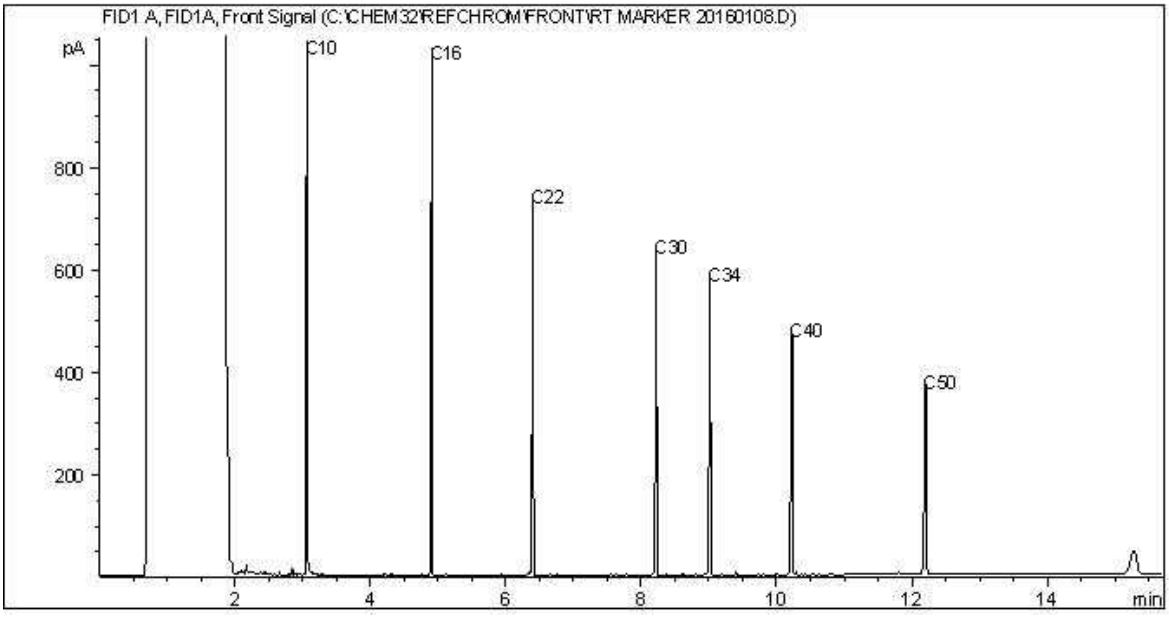
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: 16-C1-12B

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+

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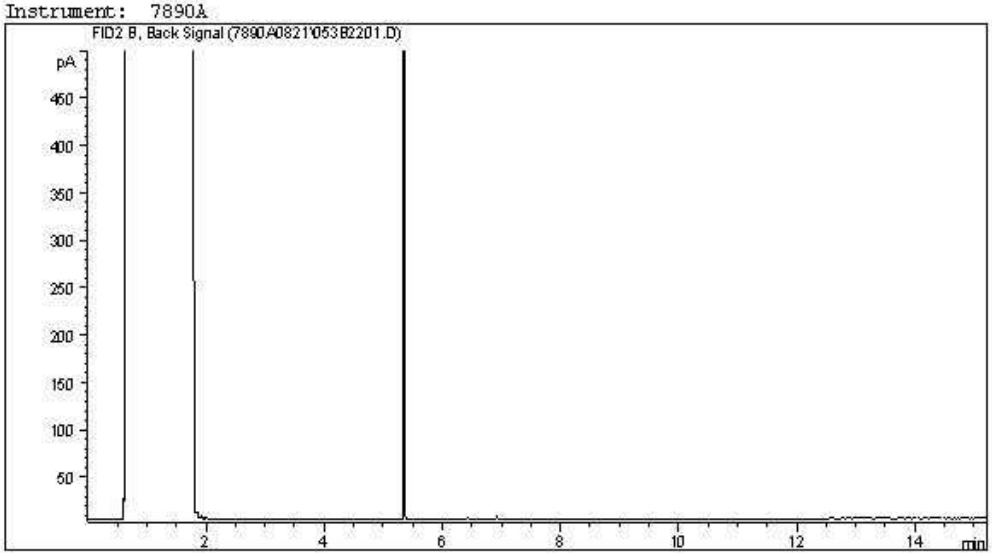
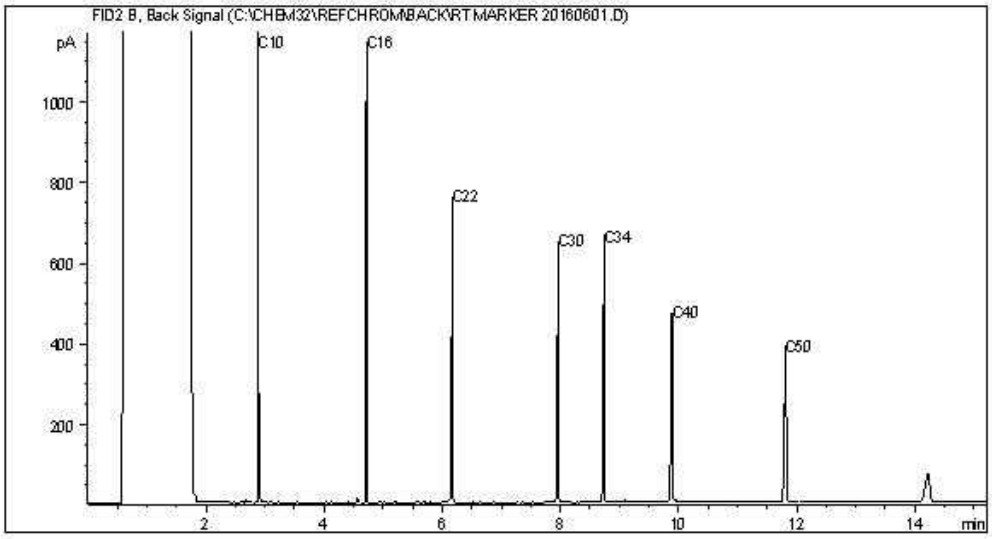
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890A



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+

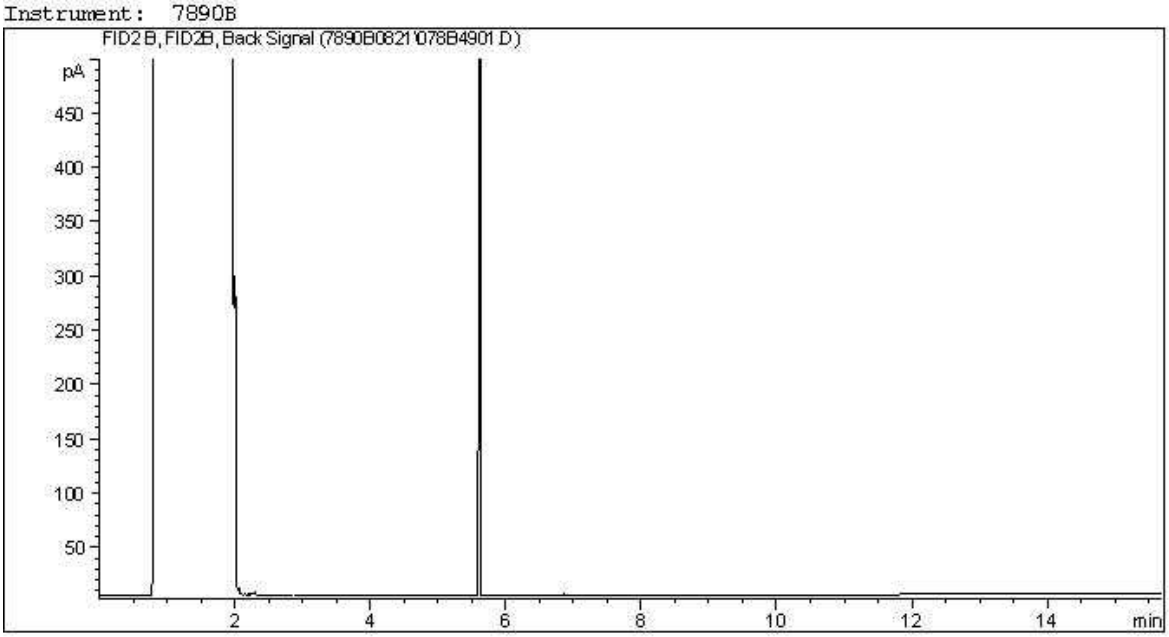
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG5991

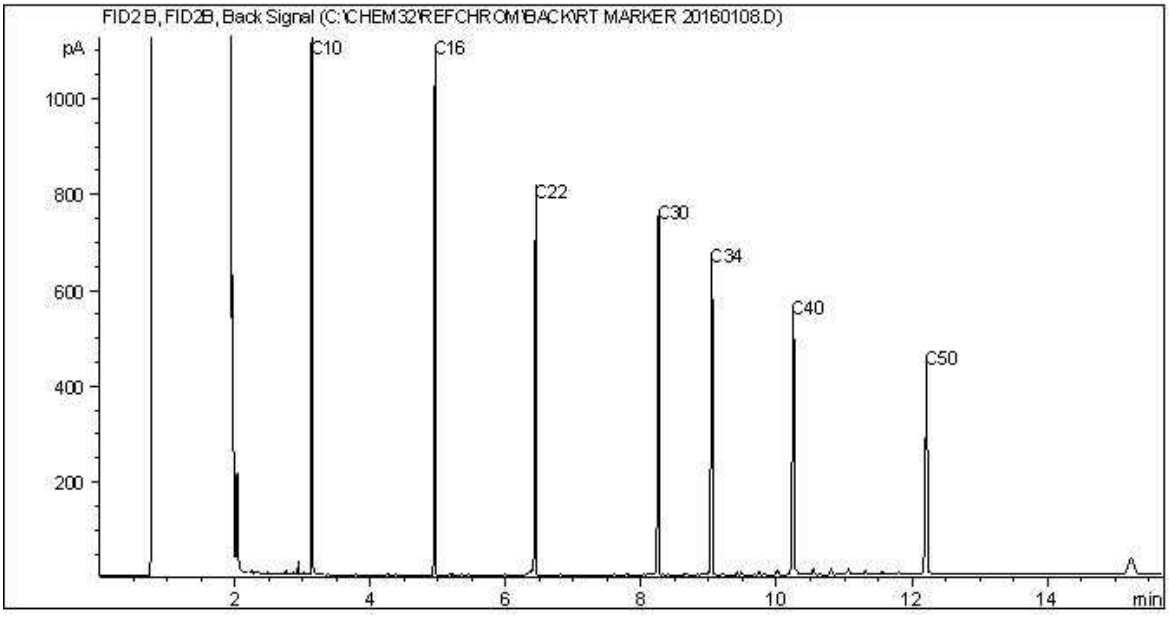
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: 16-C1-13B

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+

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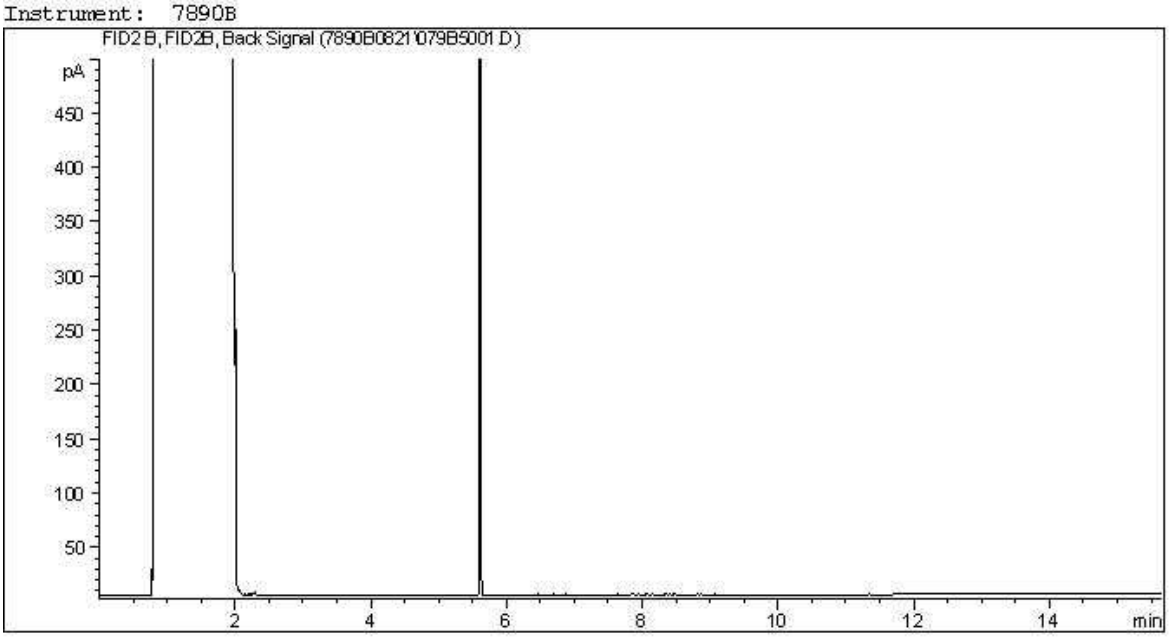
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG5992

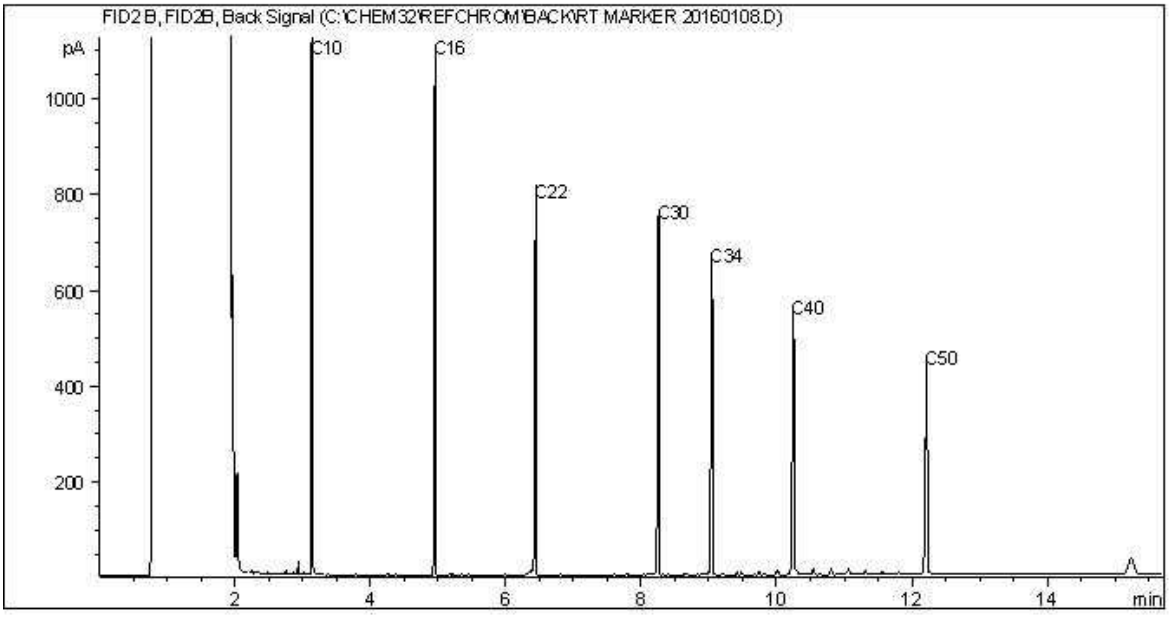
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: 16-C1-MW01A

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+

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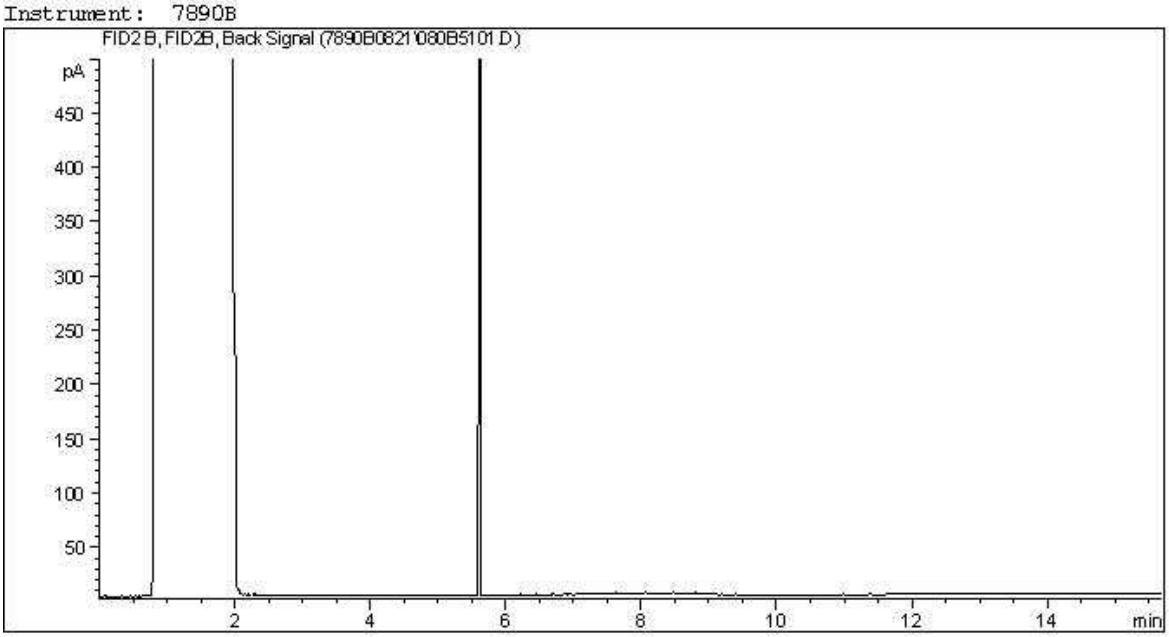
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG5993

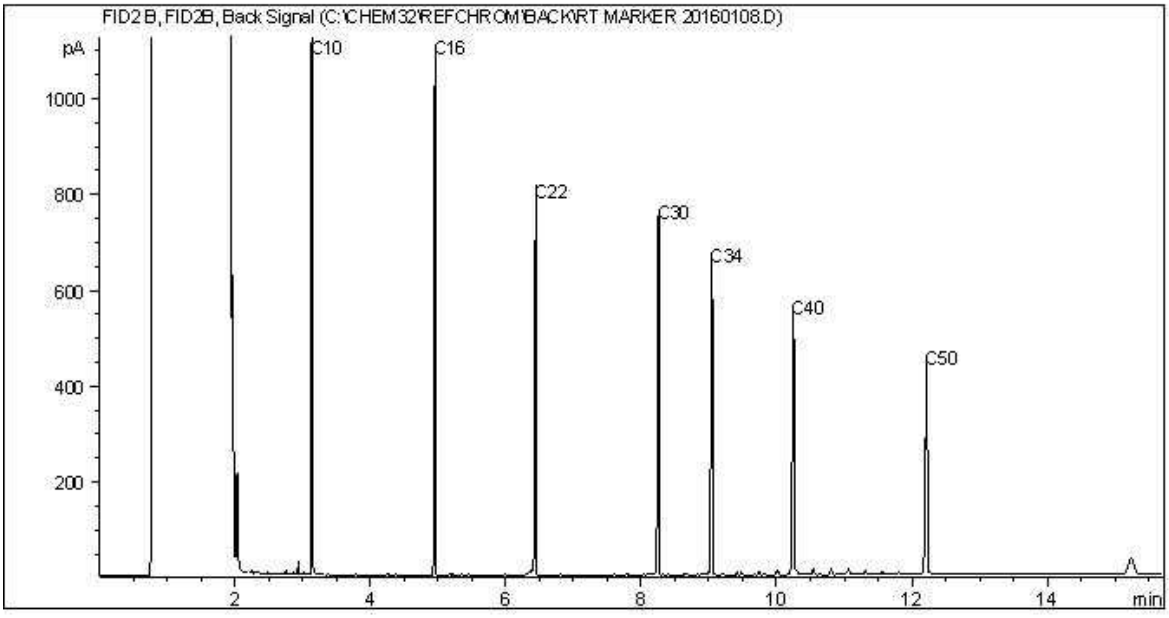
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: 16-C1-MW01B

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+

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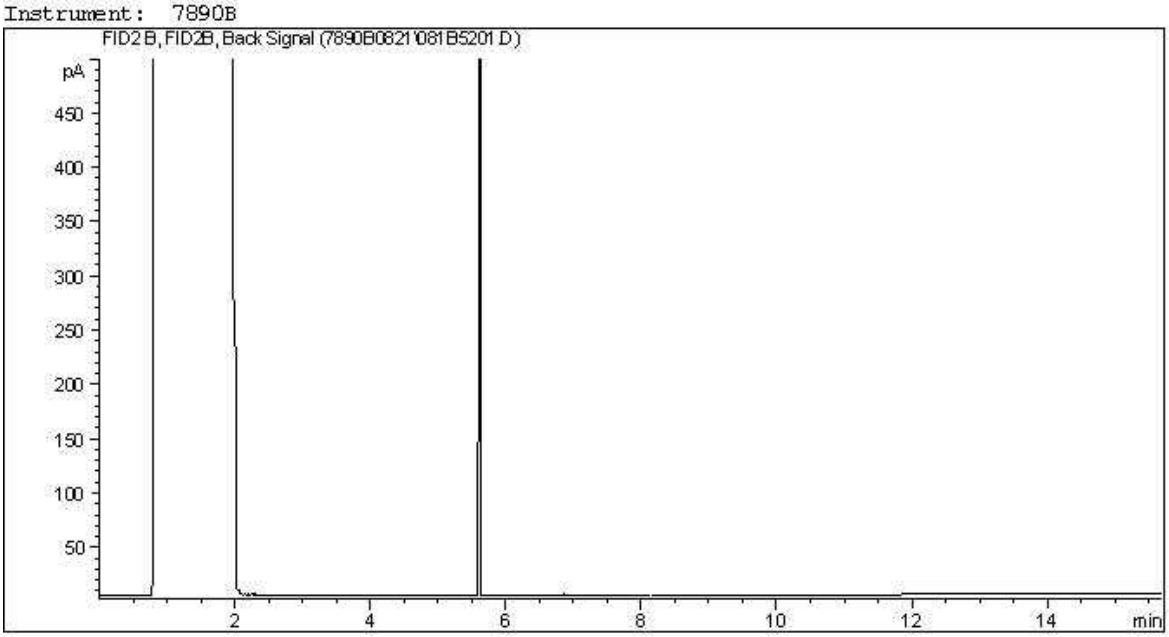
Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG5994

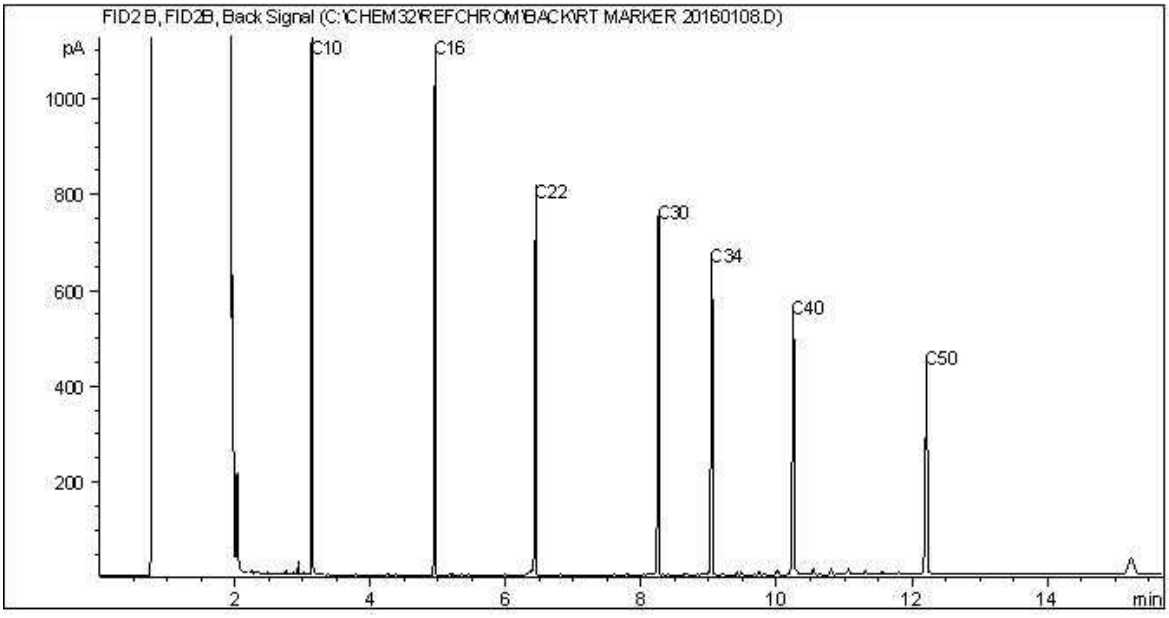
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: 16-C1-MW02A

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+

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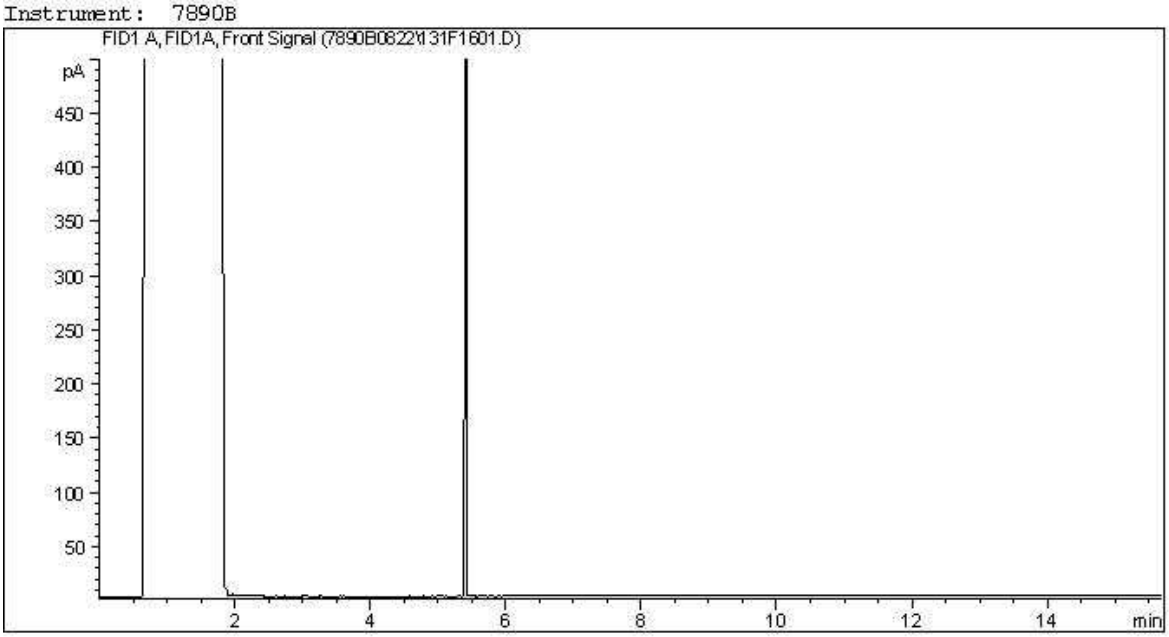
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG5995

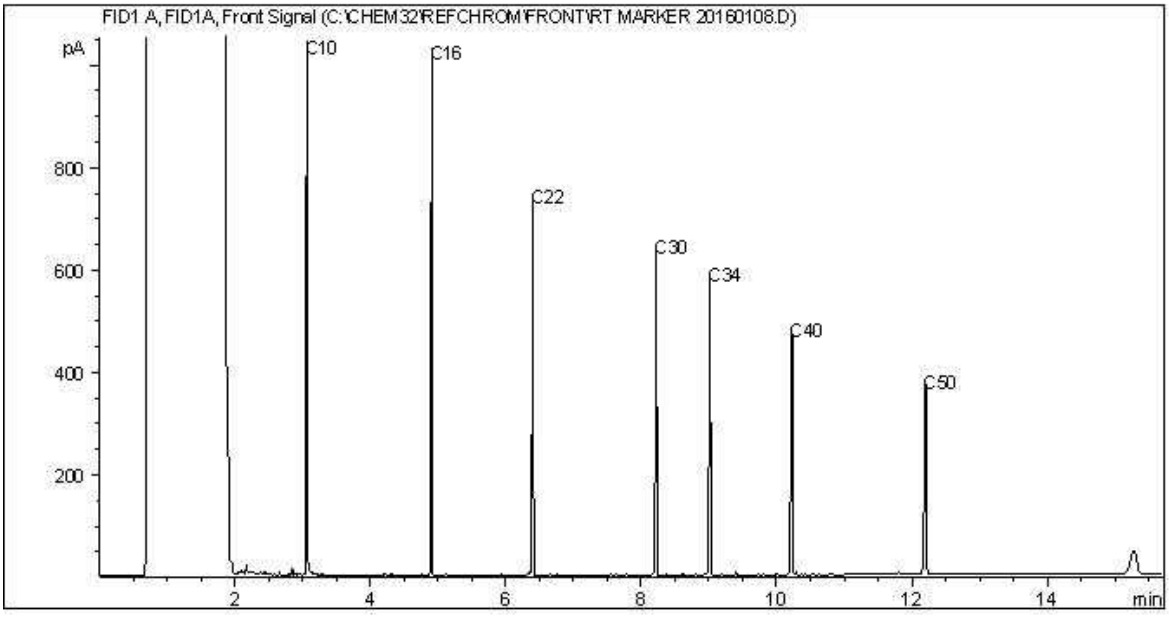
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: 16-C1-MW03A

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+

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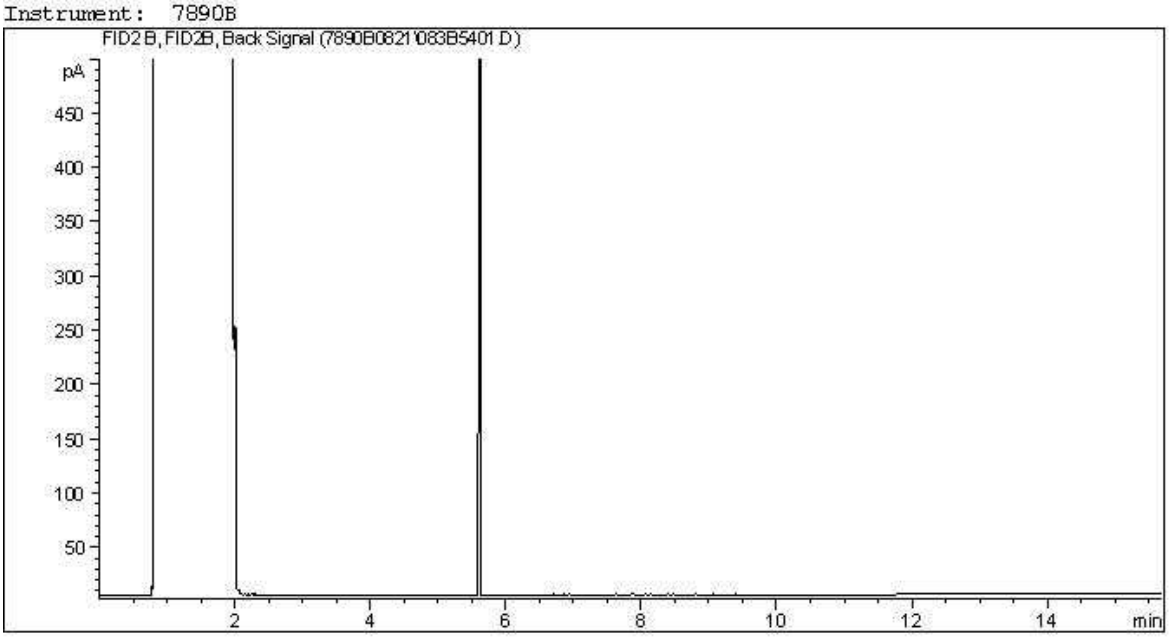
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG5997

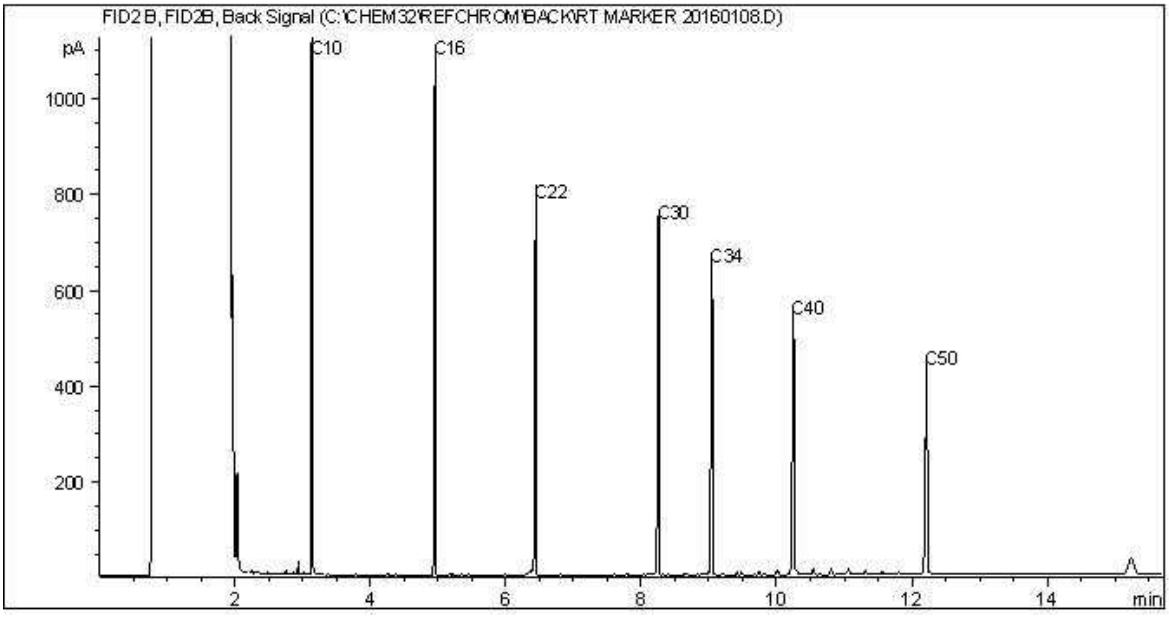
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: 16-C1-MW03B

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+

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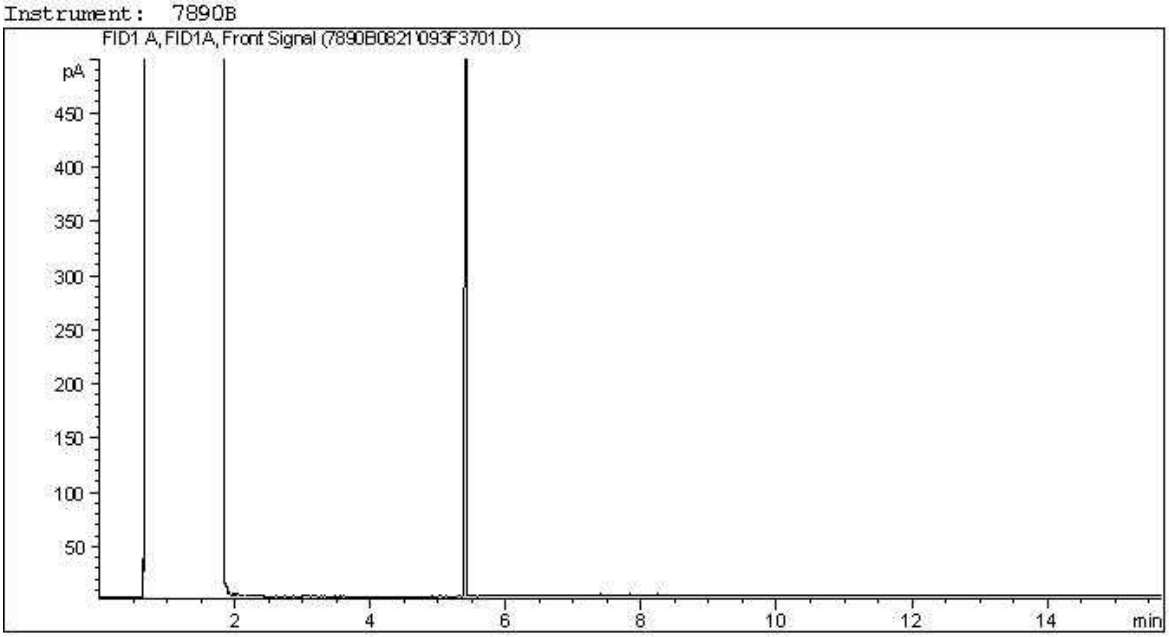
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG5998

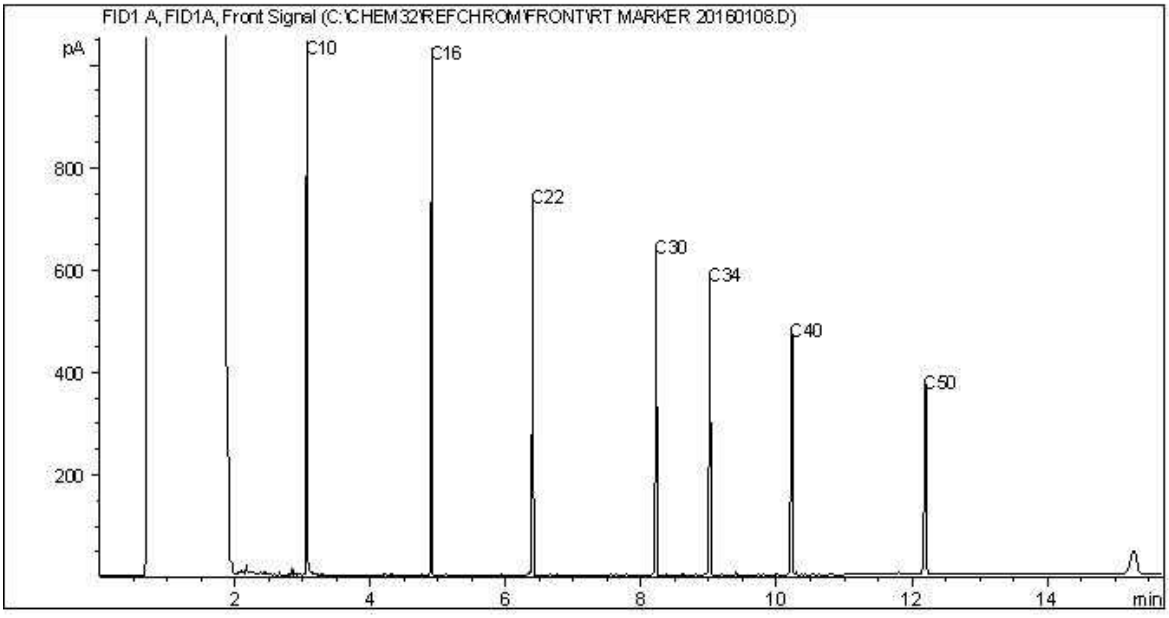
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: 16-C1-MW04A

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+

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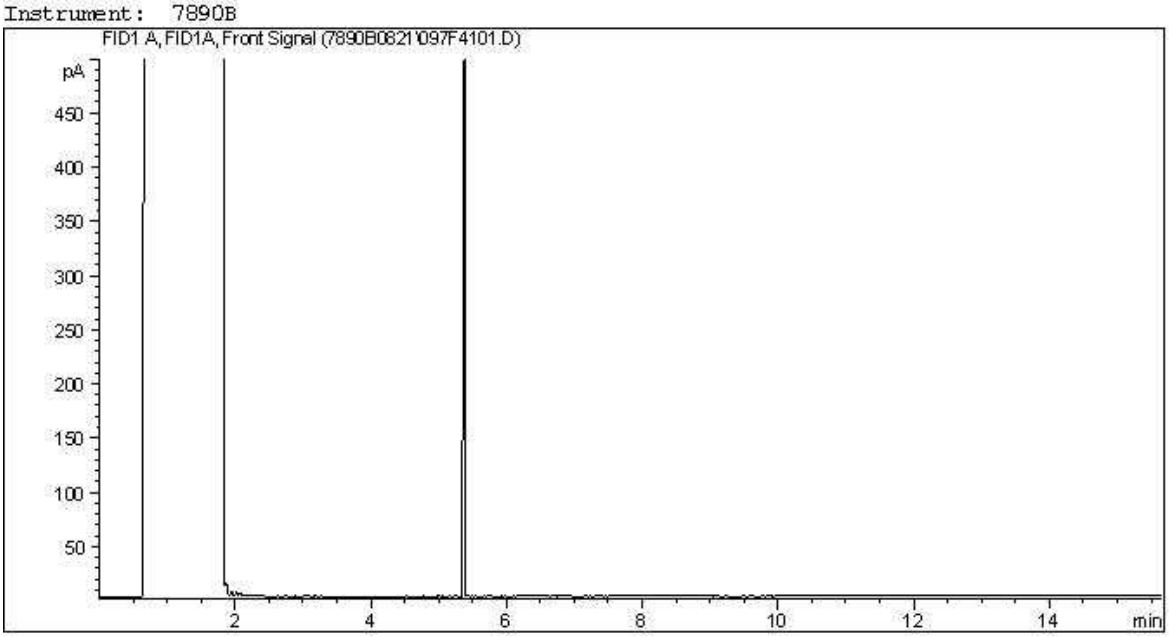
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG5999

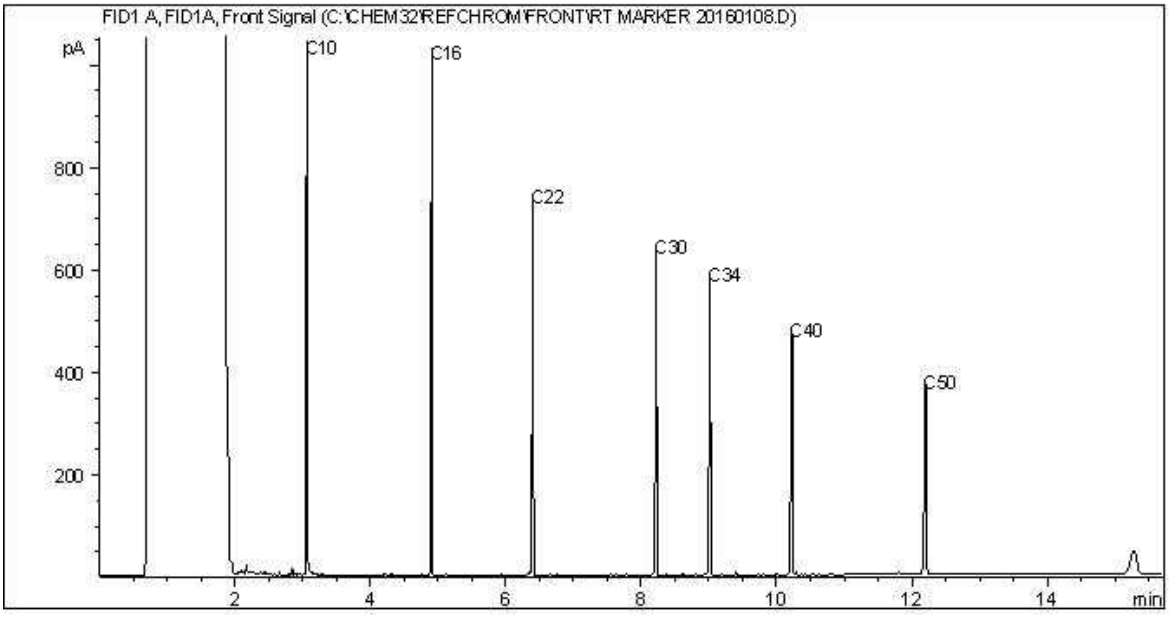
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: 16-C1-MW04B

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+

Page 1 of 1

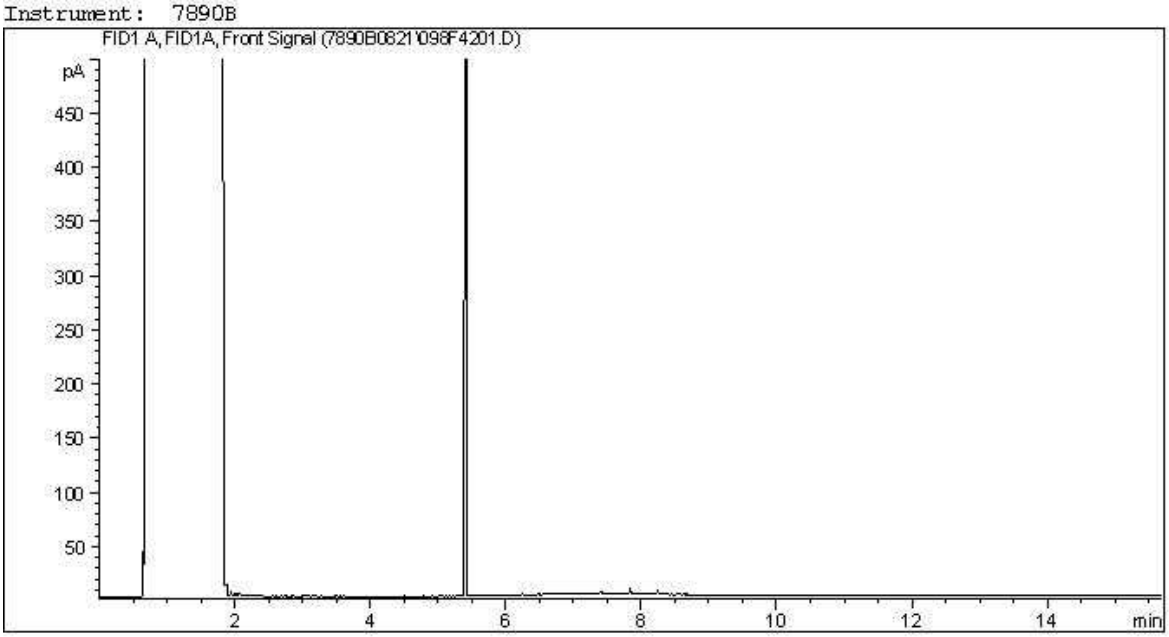
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG6000

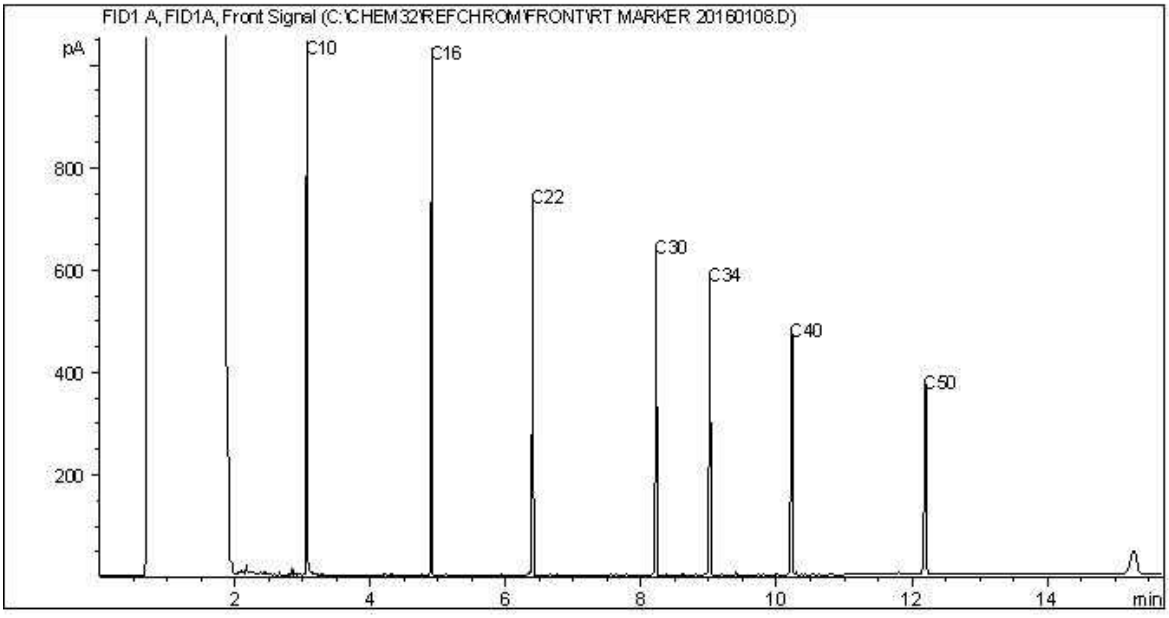
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: 16-C1-MW05A

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+

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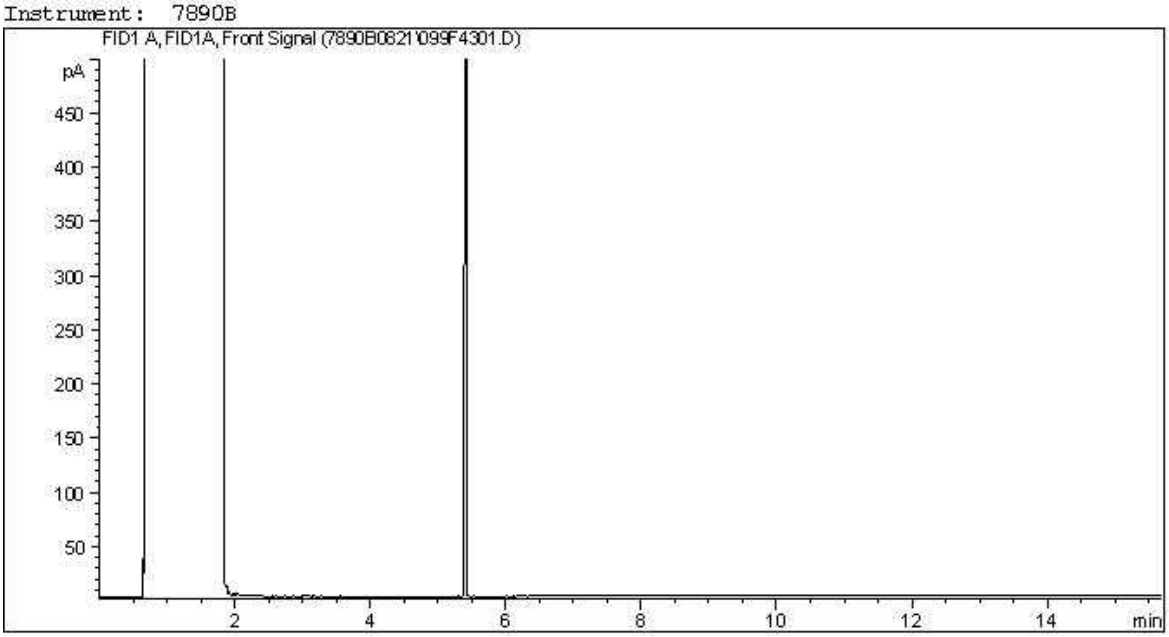
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG6001

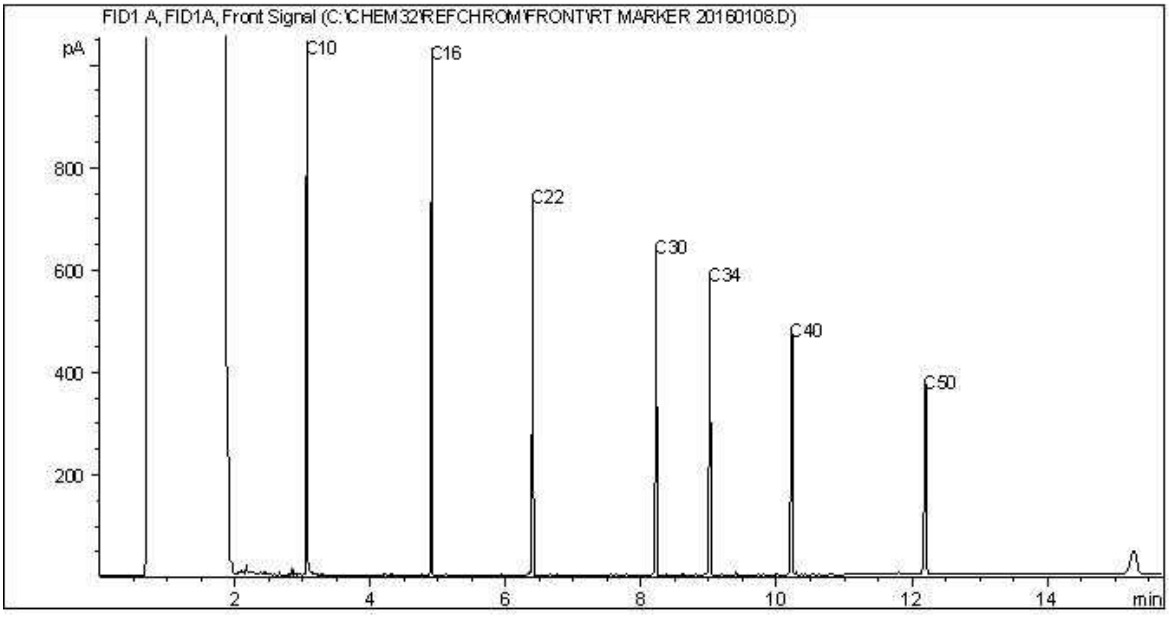
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: 16-C1-MW05B

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+

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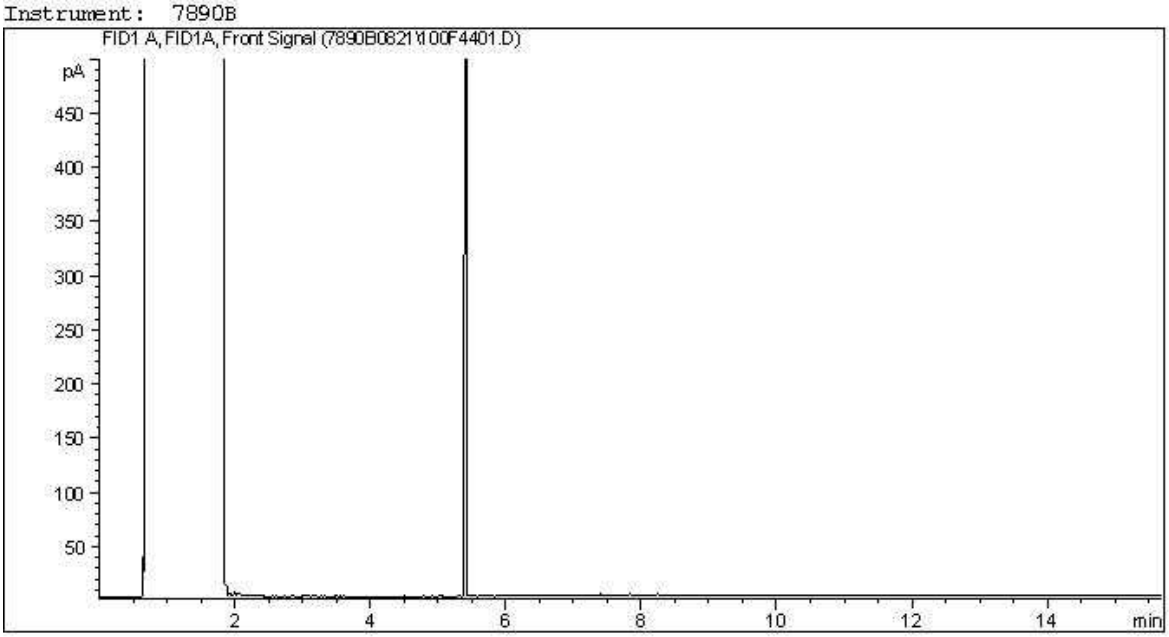
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG6002

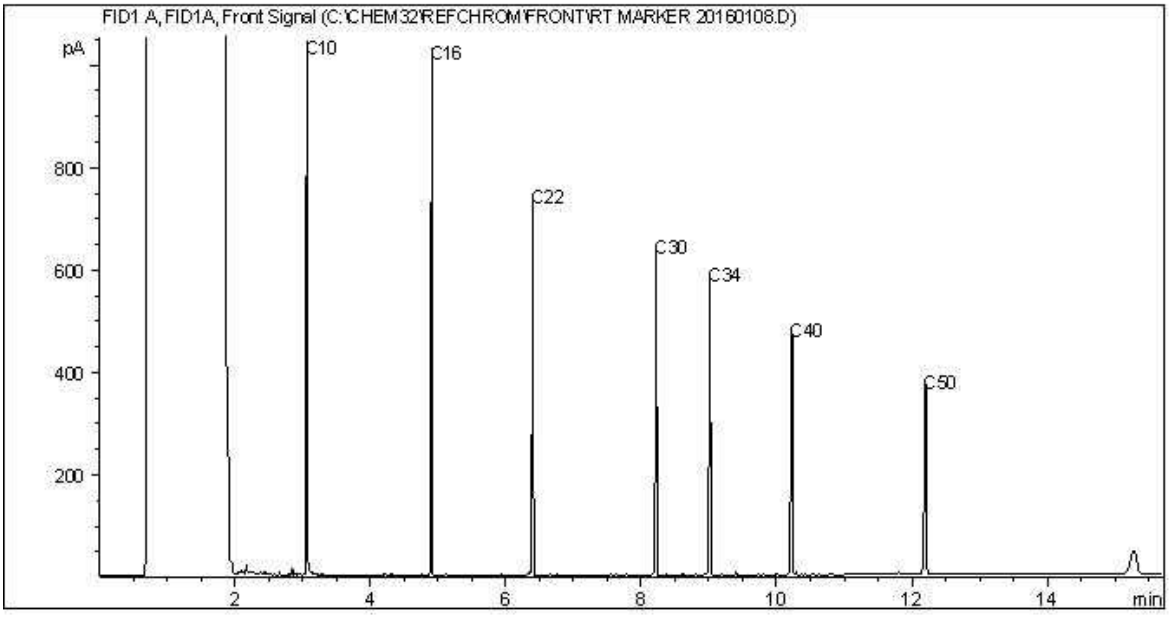
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: 16-C1-MW06A

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+

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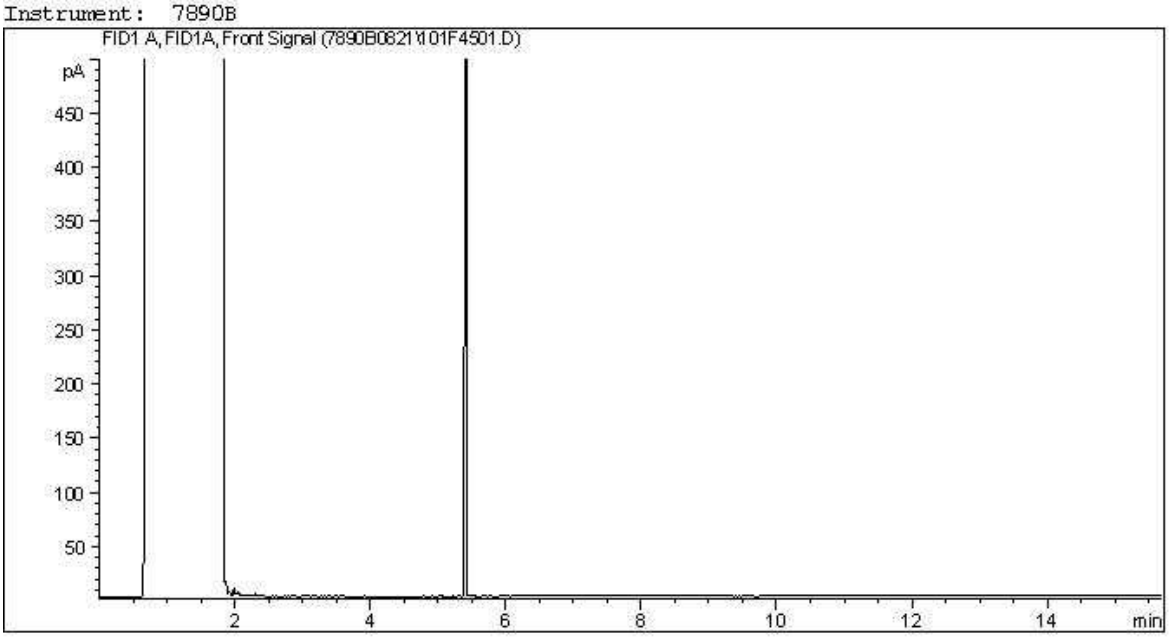
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG6003

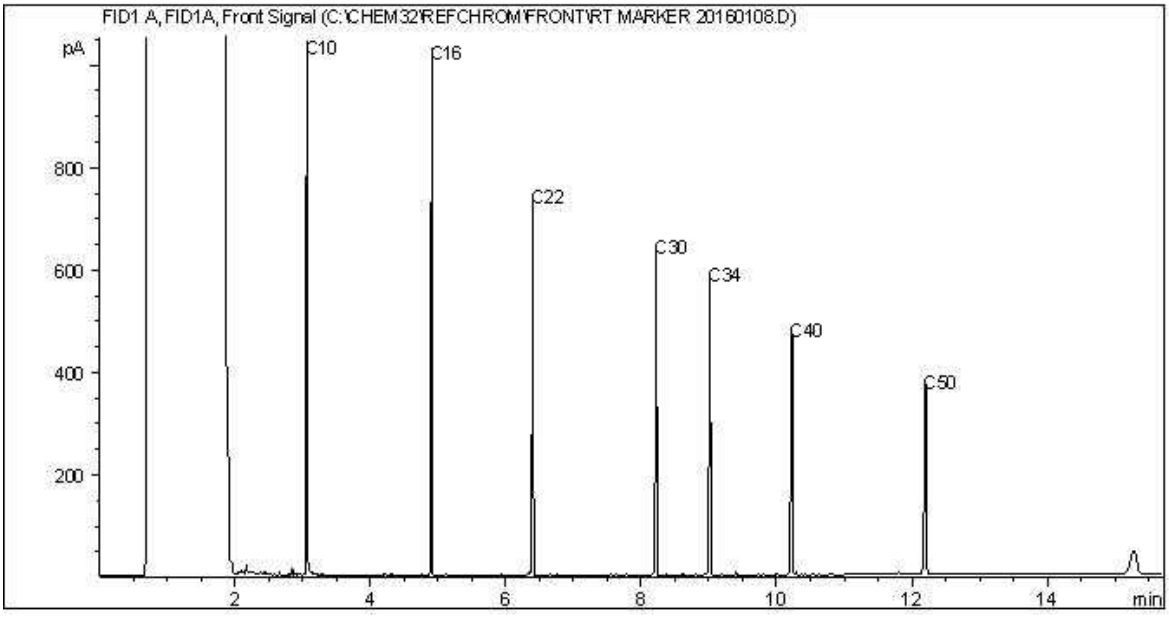
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: 16-C1-MW06B

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+

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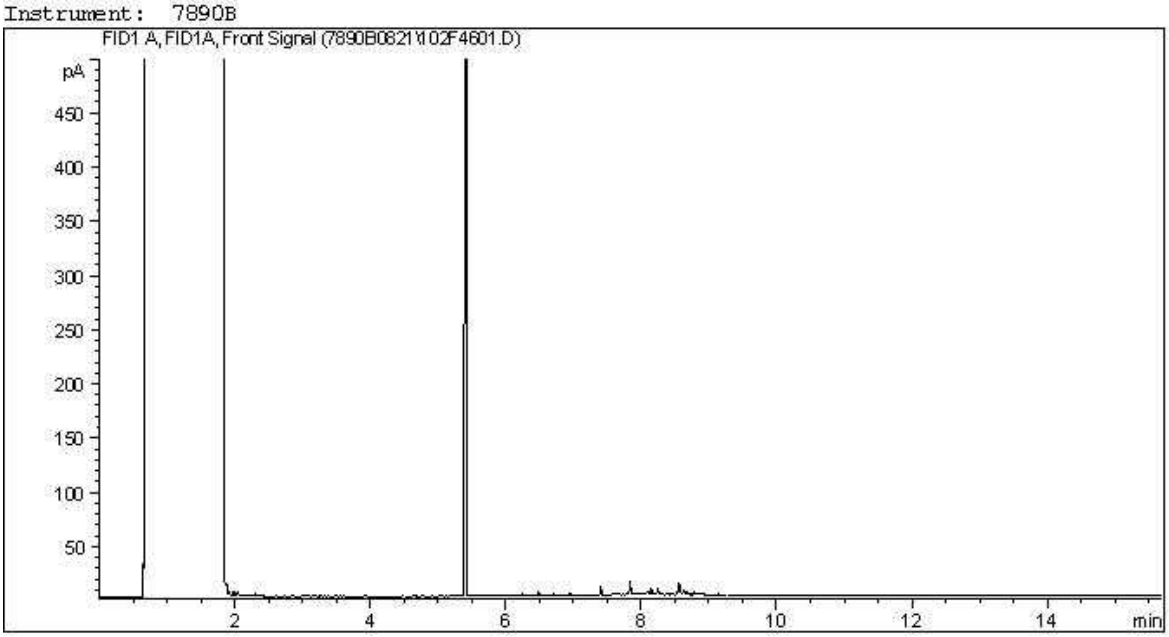
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG6004

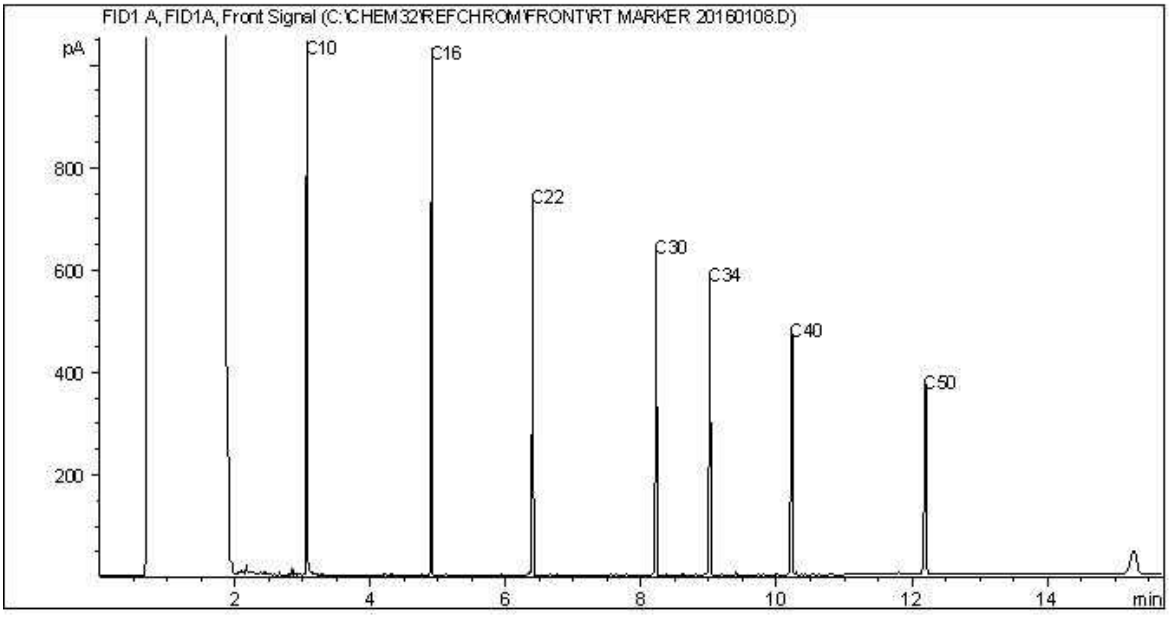
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: 16-C1-MW07A

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+

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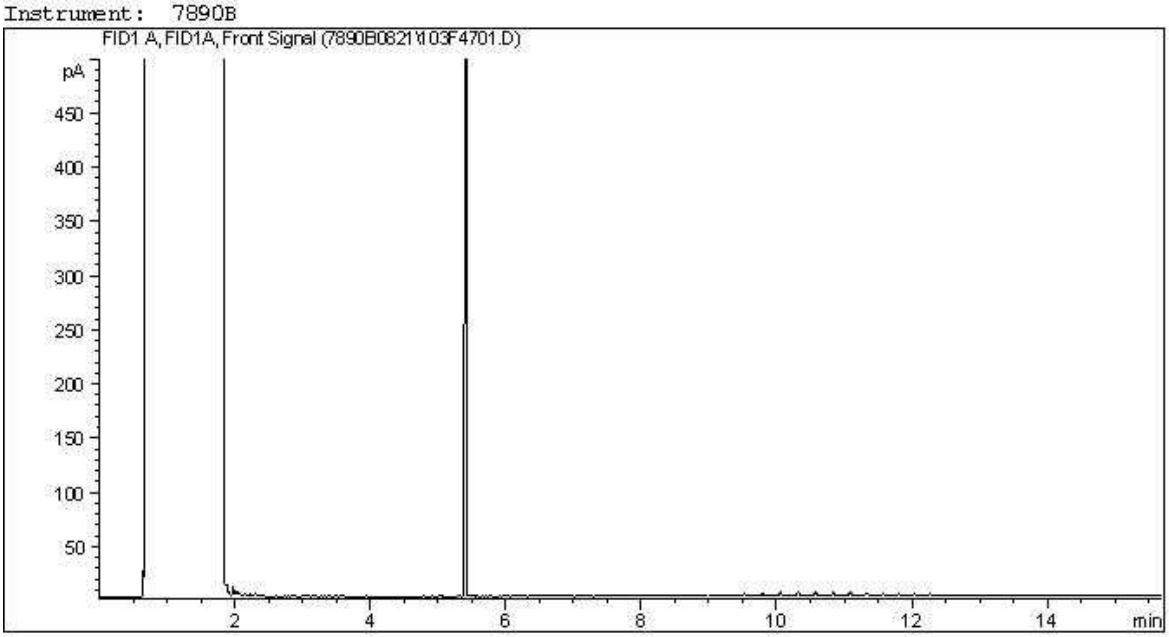
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG6005

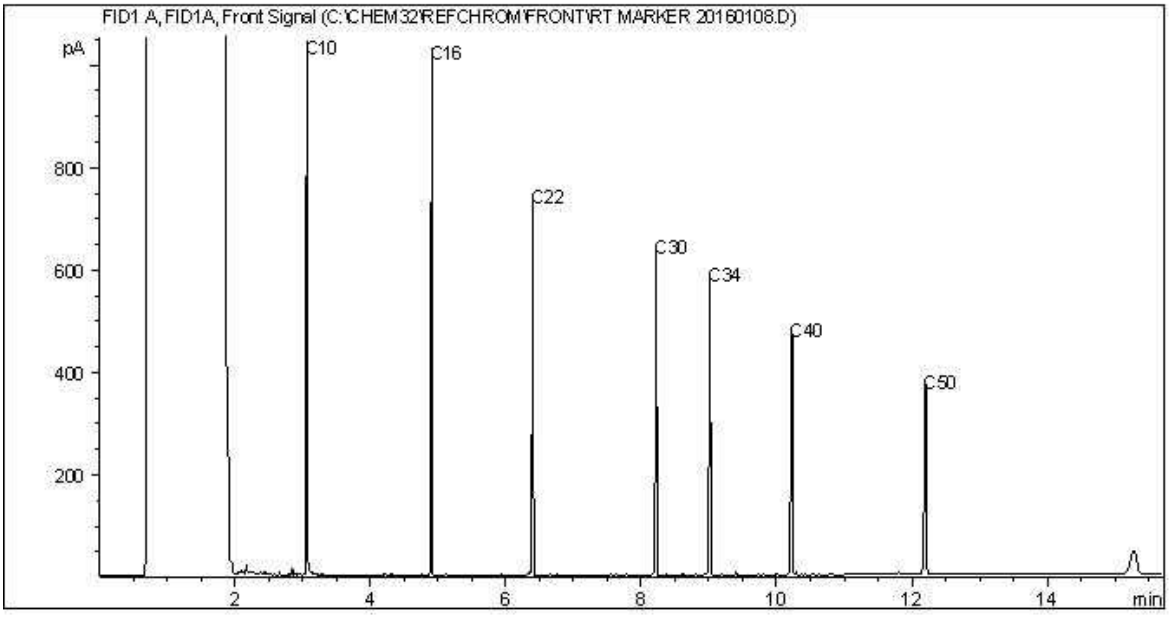
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: 16-C1-MW07B

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+

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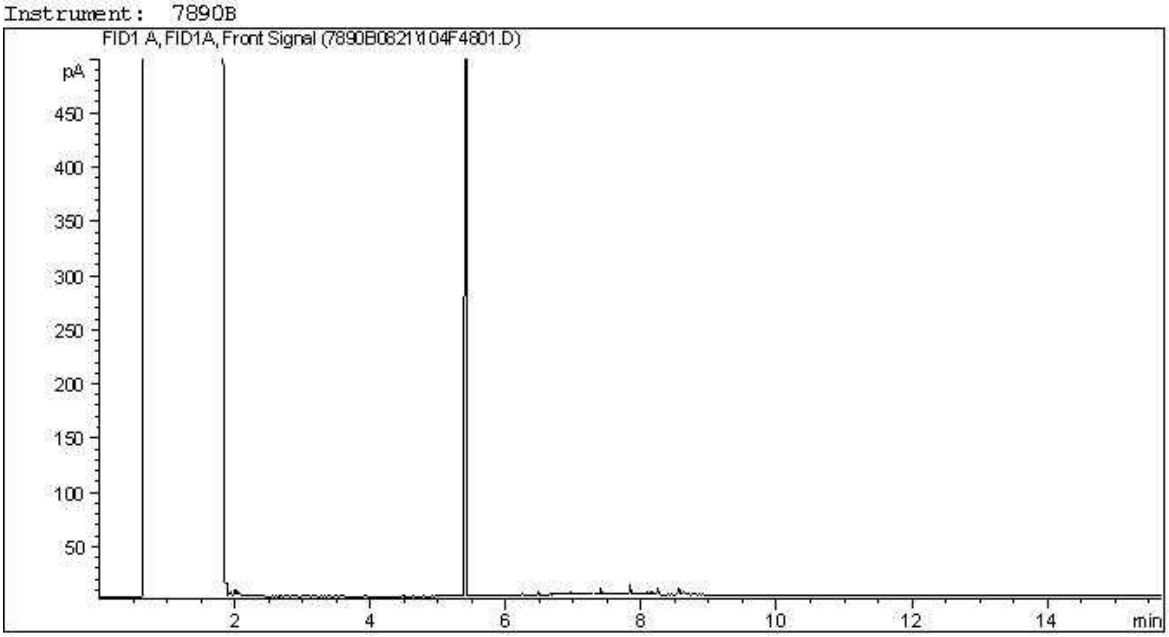
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG6008

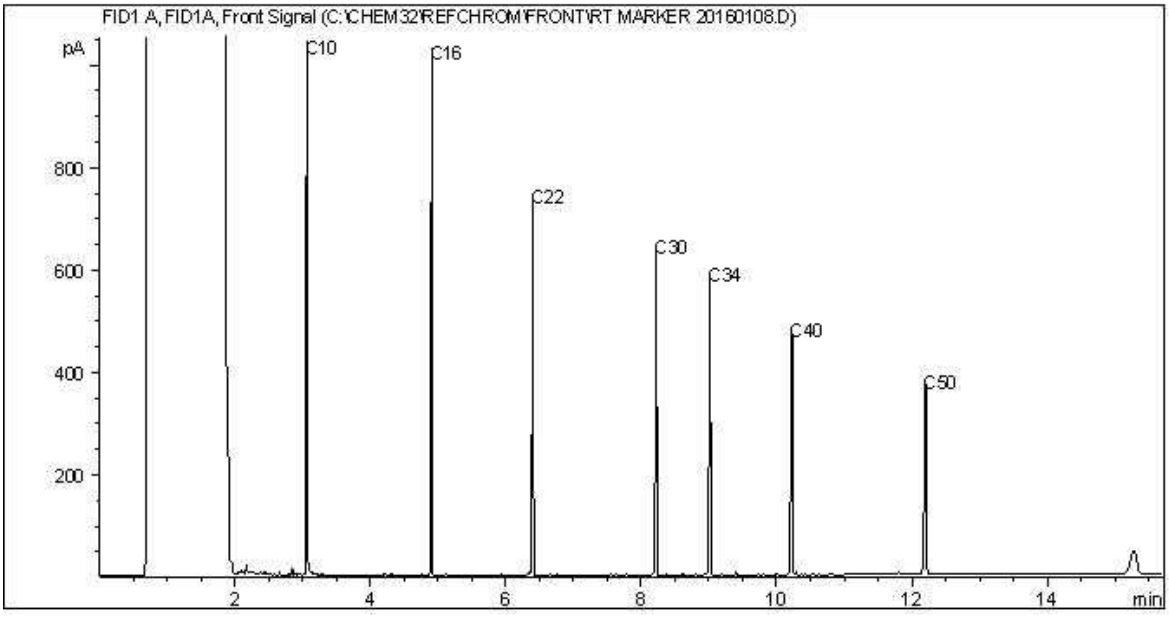
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: 16-C1-MW08A

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+

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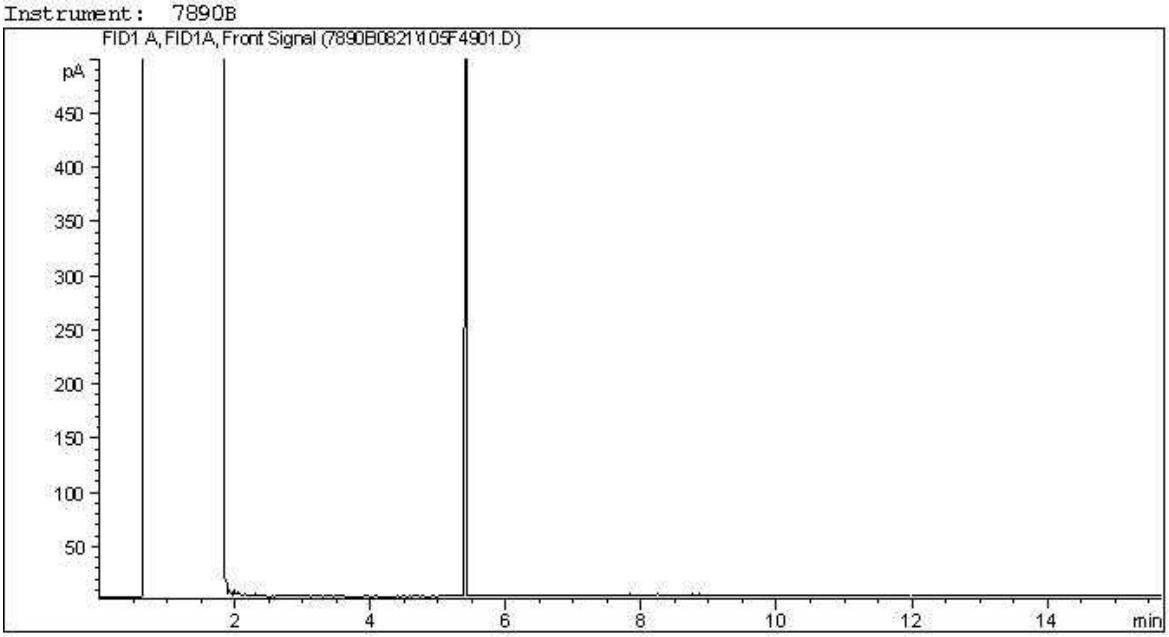
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG6009

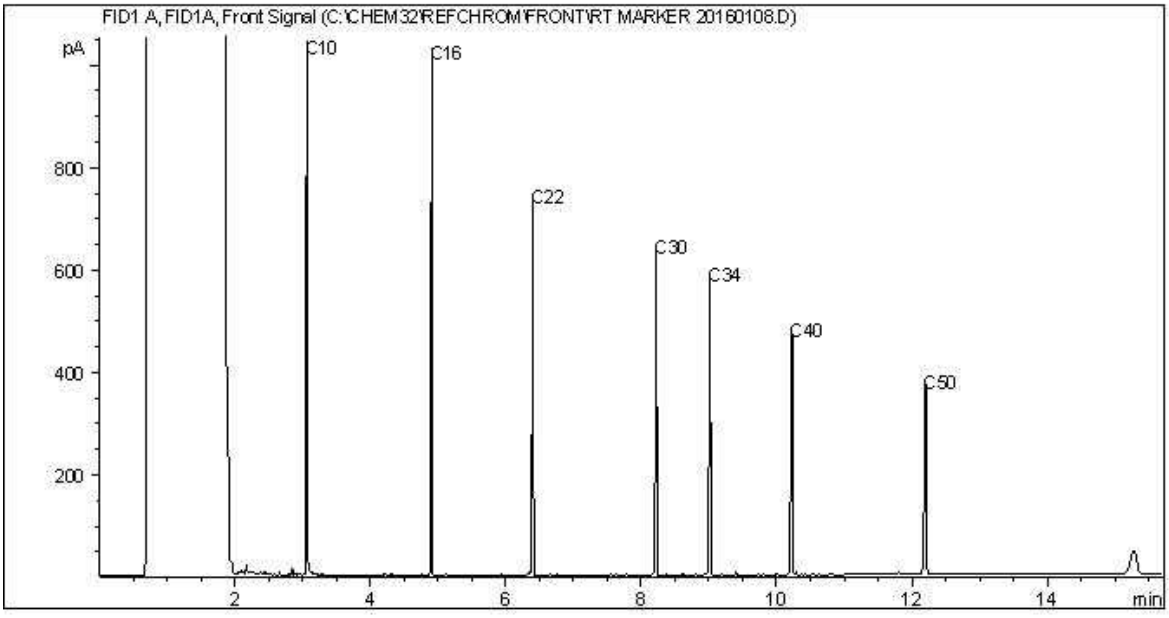
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: 16-C1-MW08B

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+

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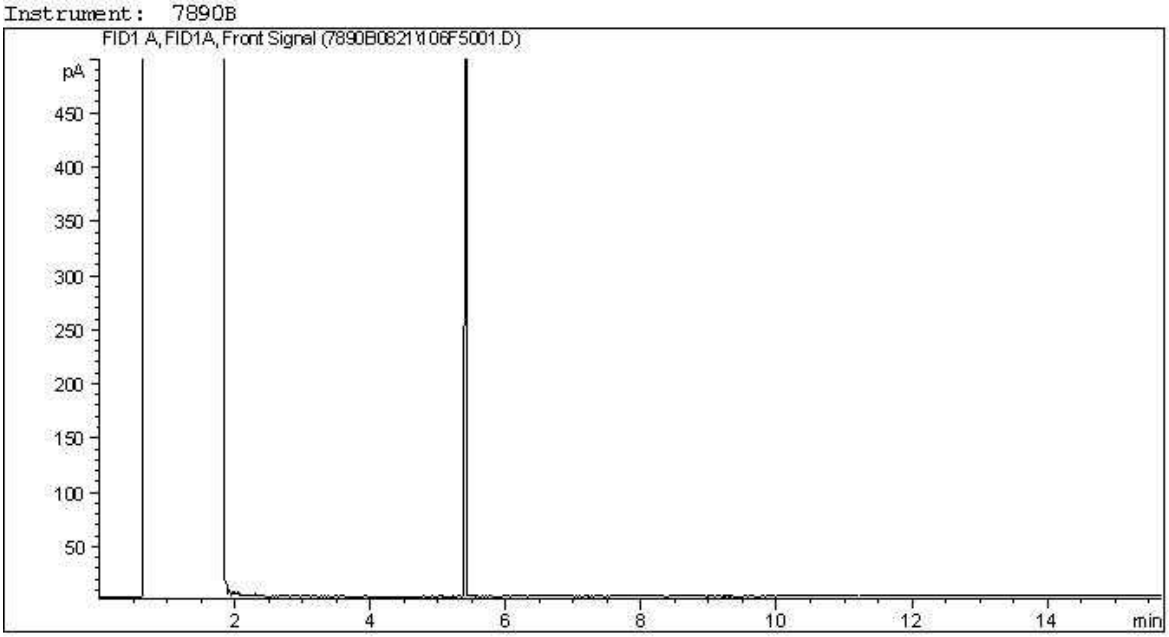
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG6010

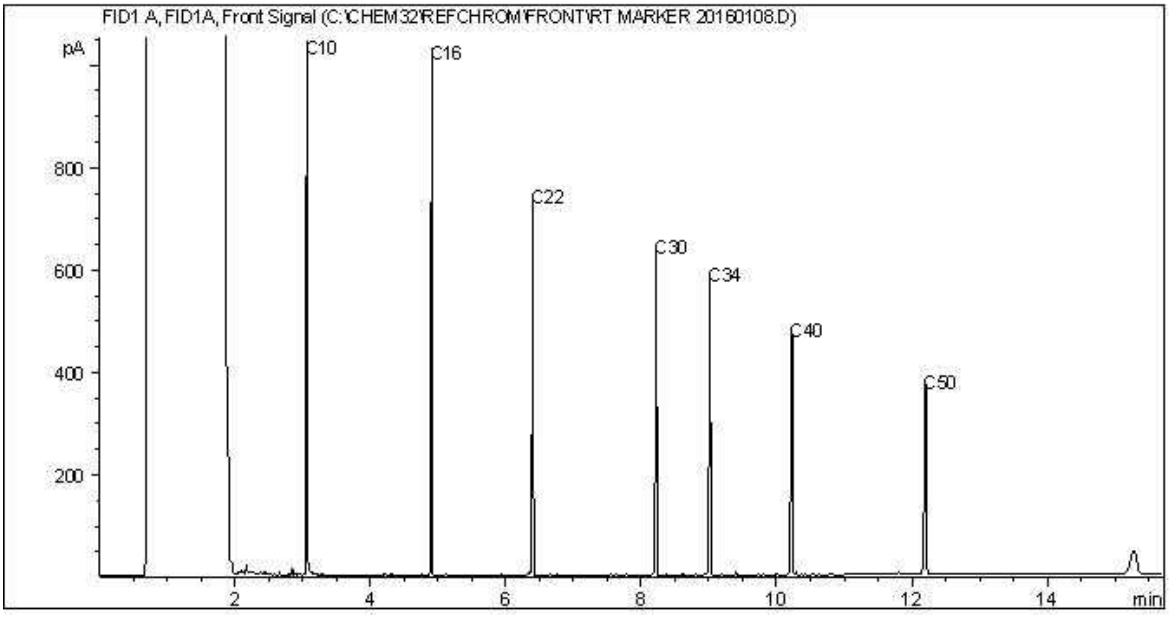
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: 16-C1-14A

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+

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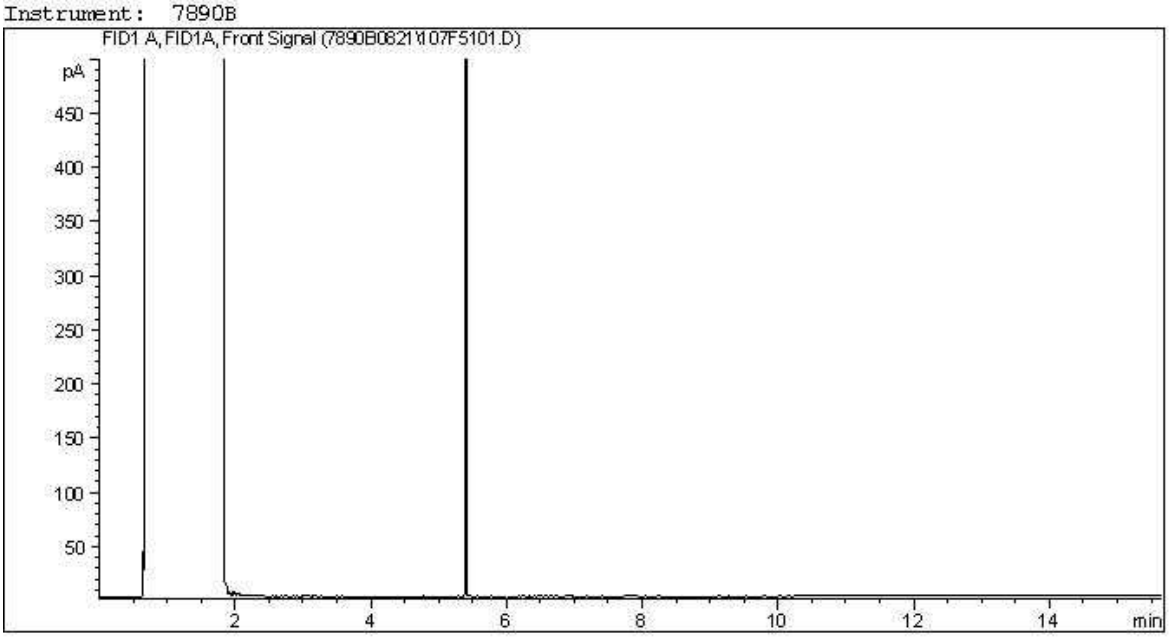
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG6011

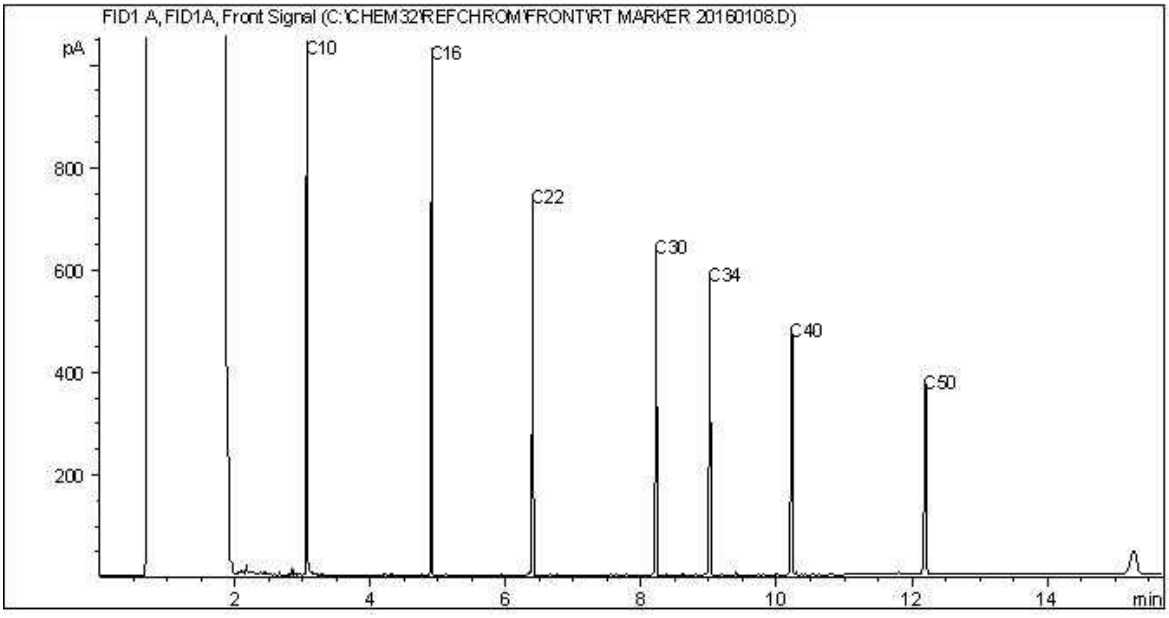
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: 16-C1-14B

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+

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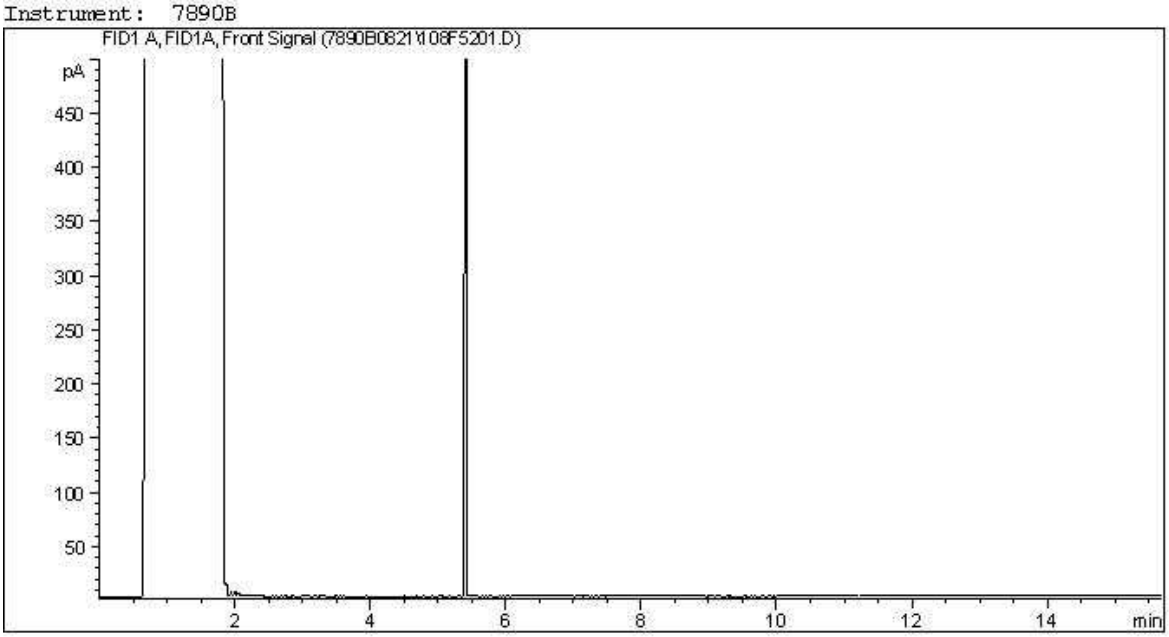
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG6012

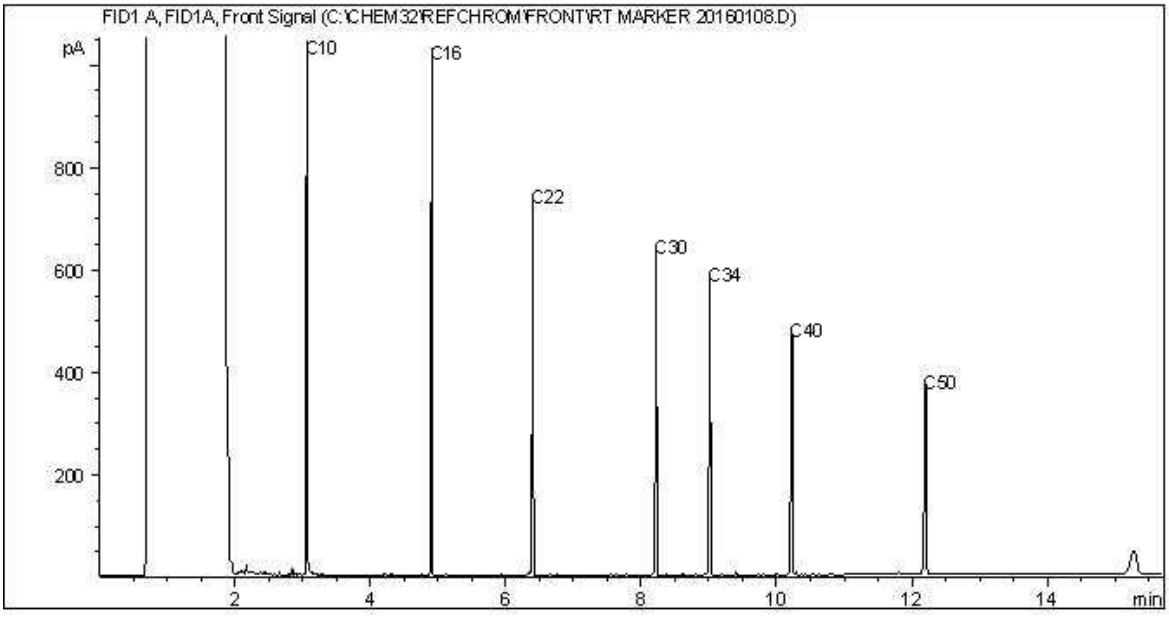
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: 16-C1-15A

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+

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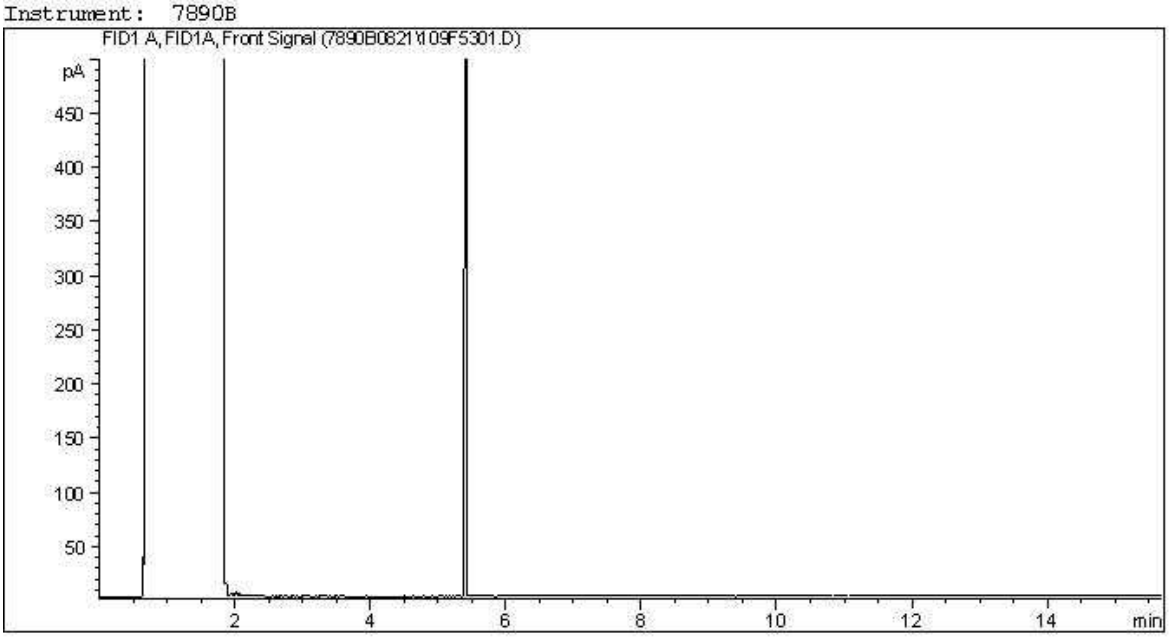
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG6013

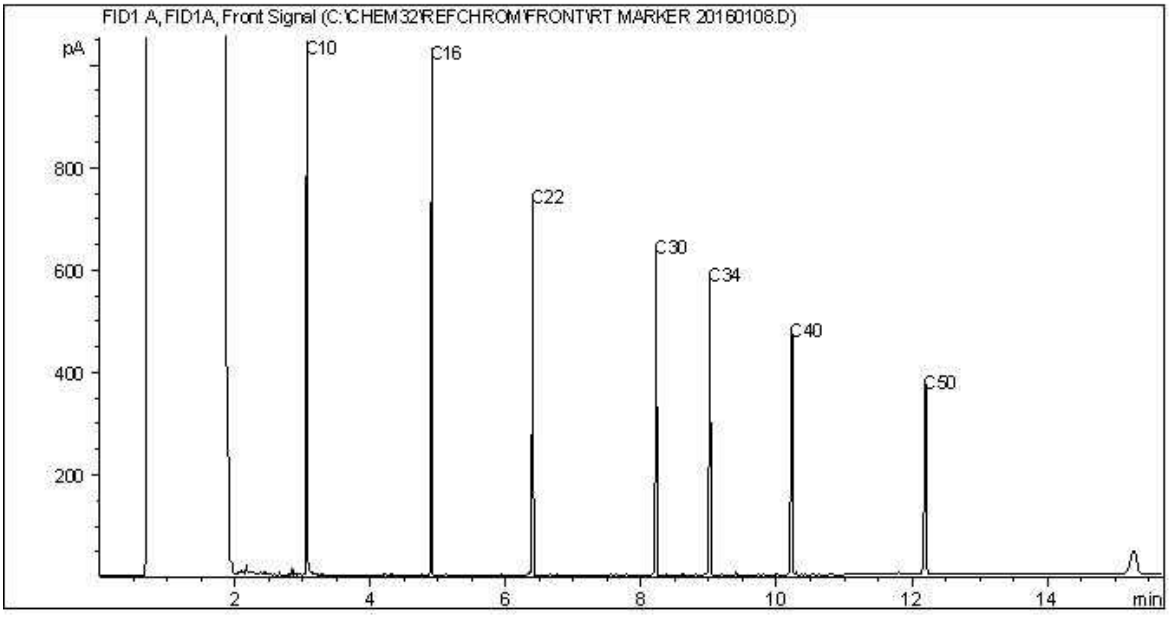
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: 16-C1-15B

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+

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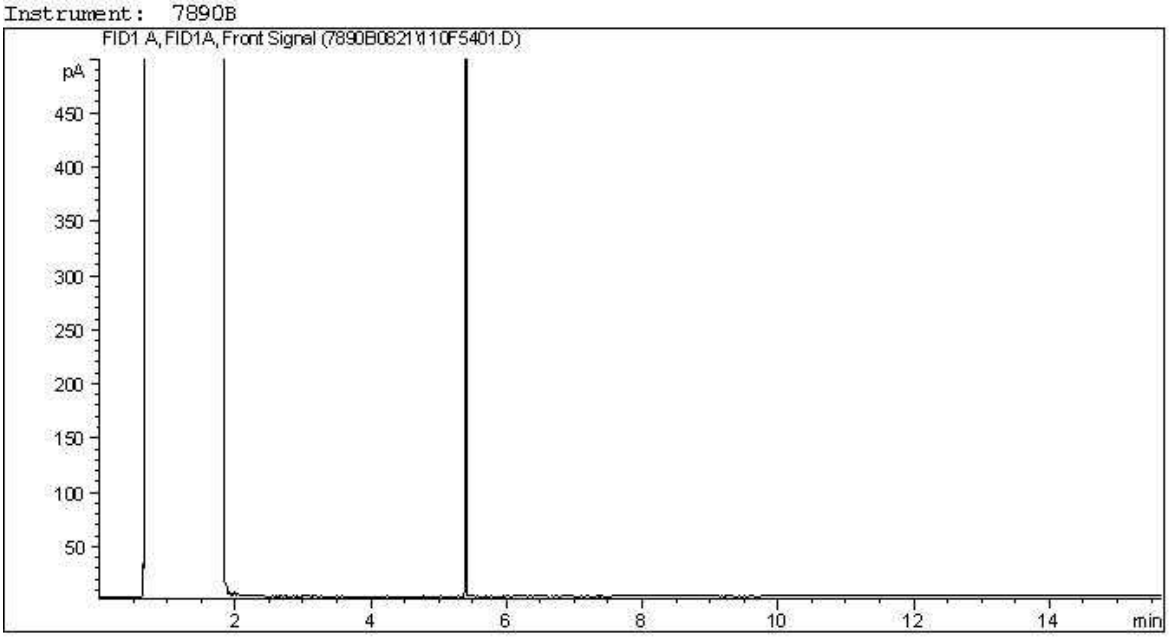
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG6014

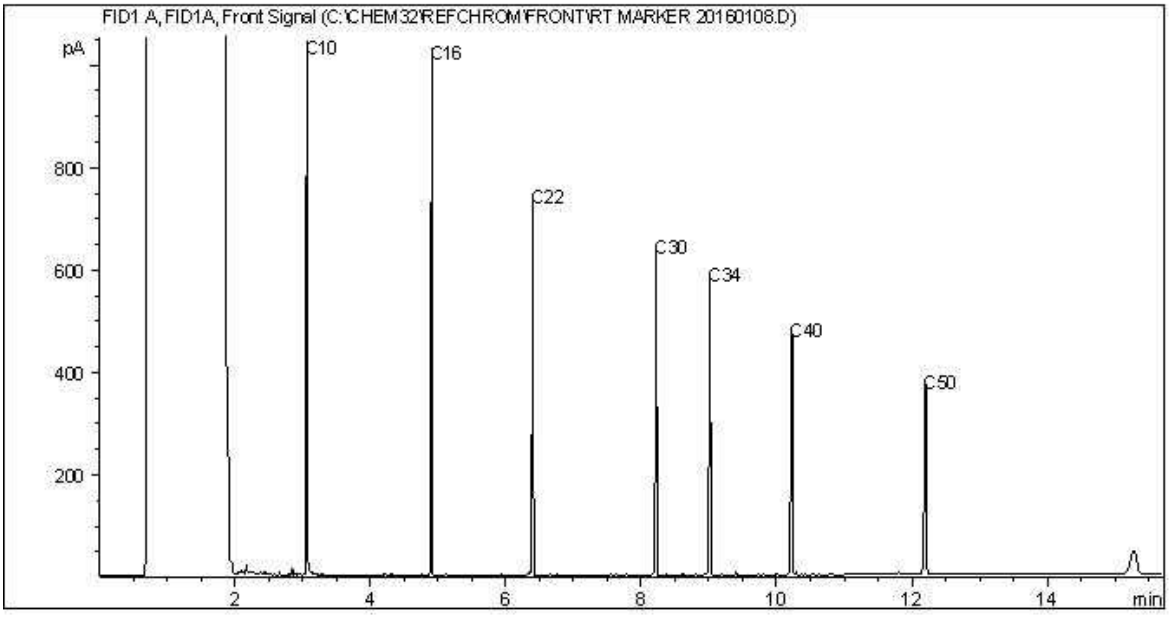
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: 16-C1-16A

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+

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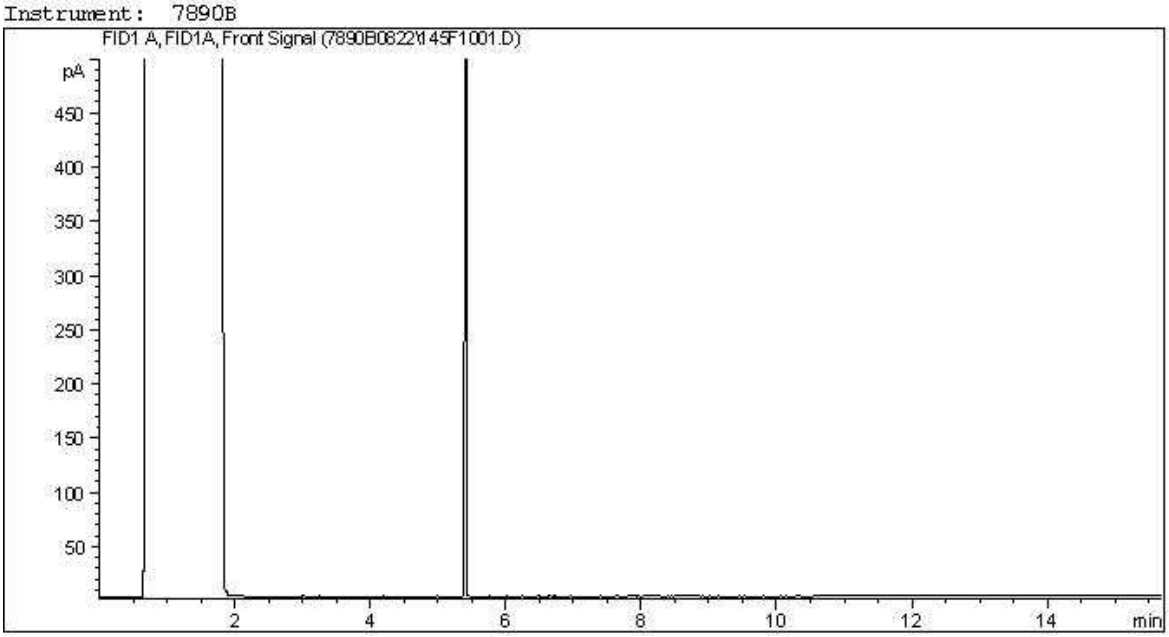
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG6015

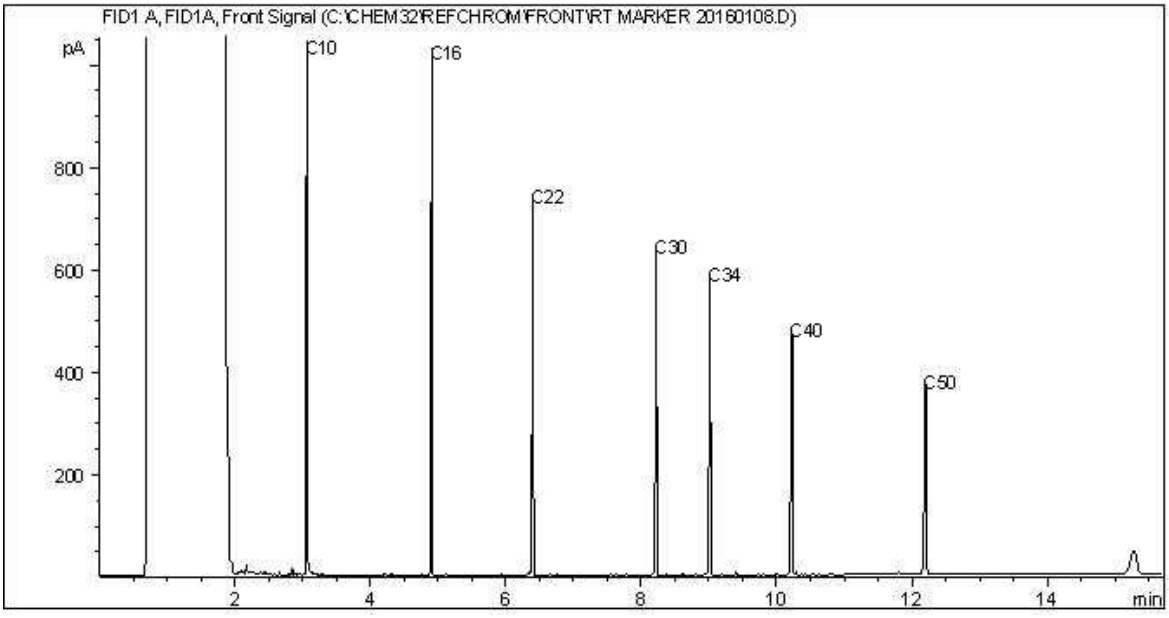
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: 16-C1-16B

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+

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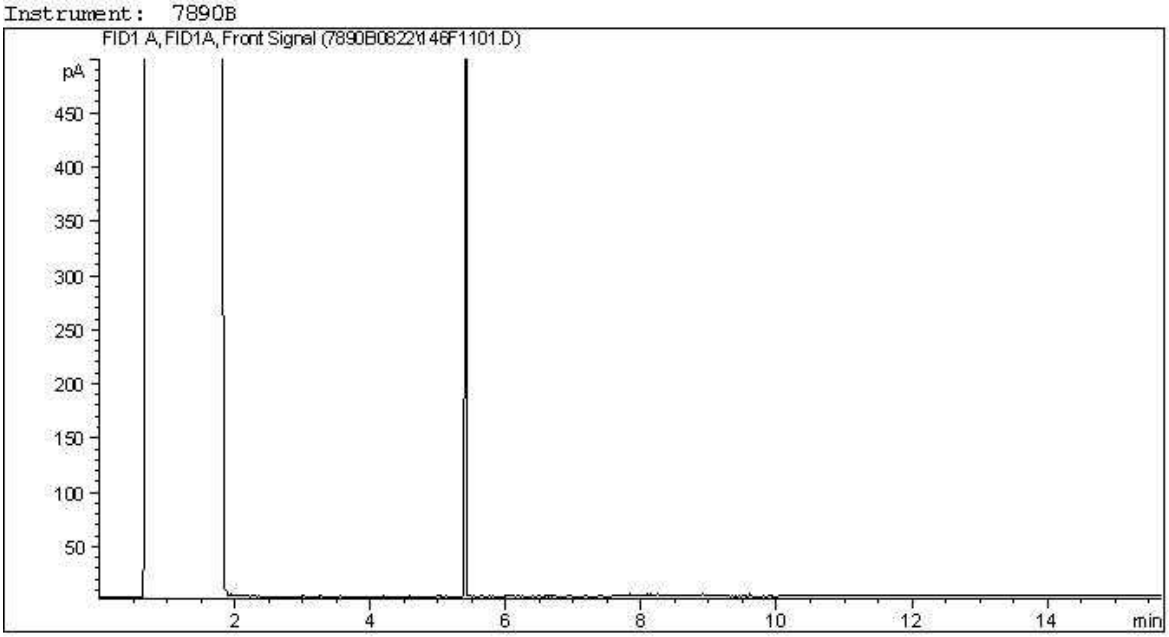
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG6016

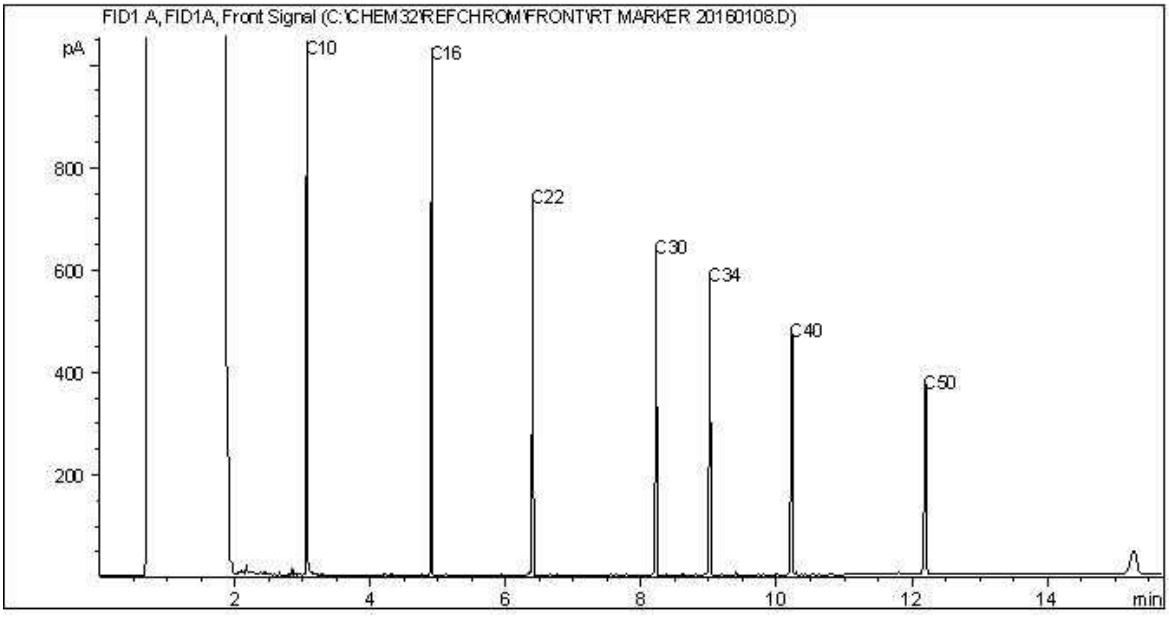
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: 16-C1-17A

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+

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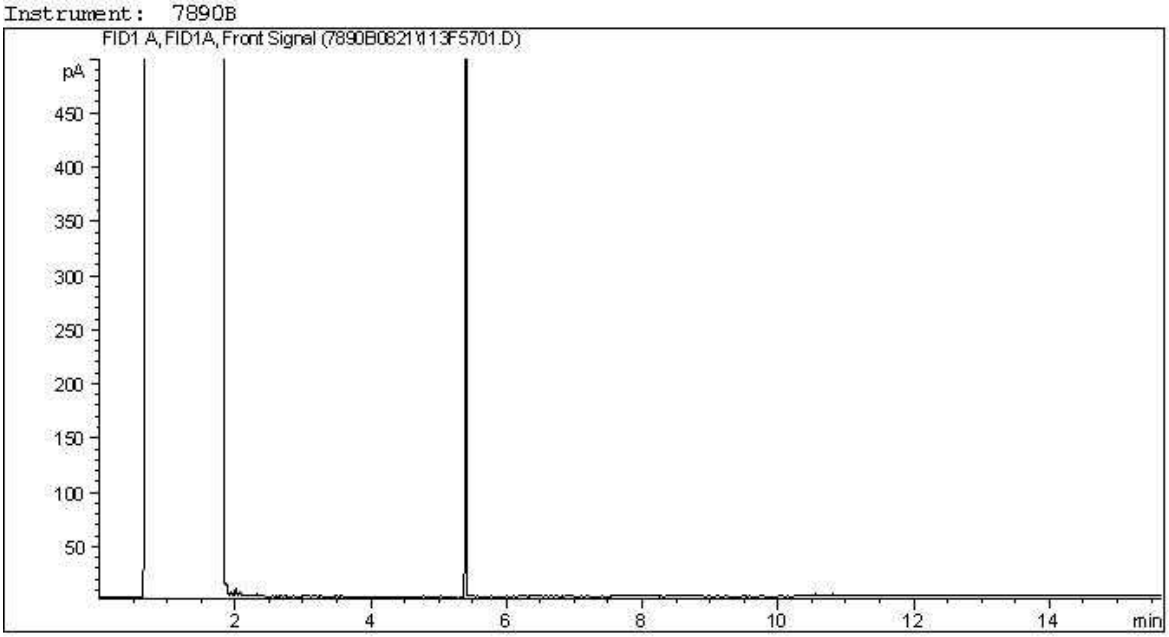
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG6017

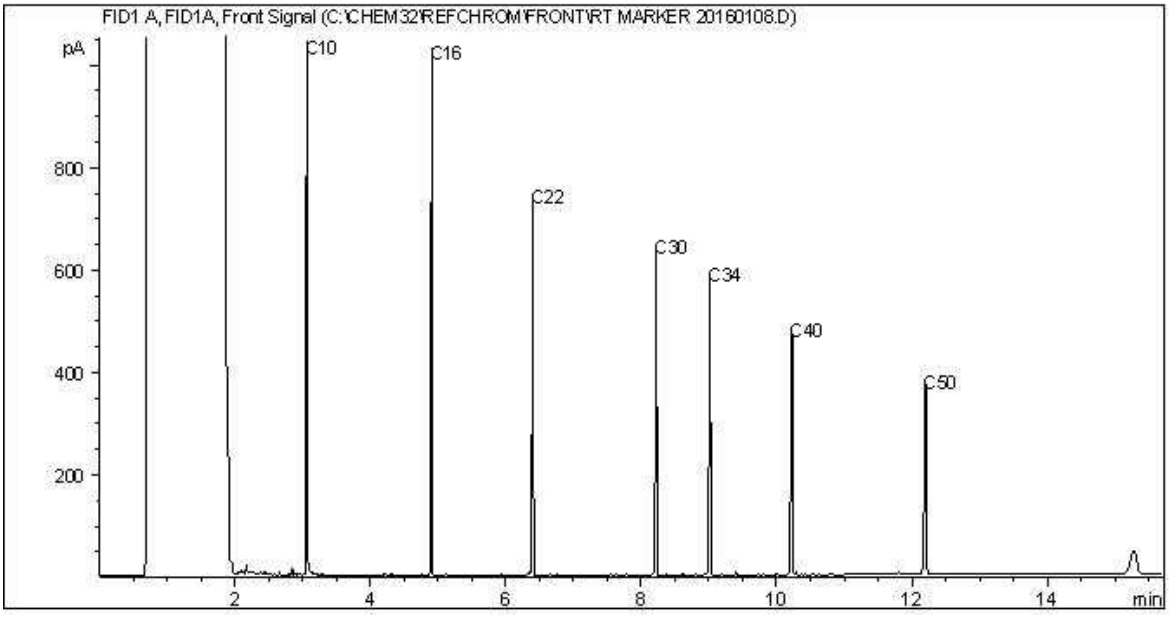
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: 16-C1-17B

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+

Page 1 of 1

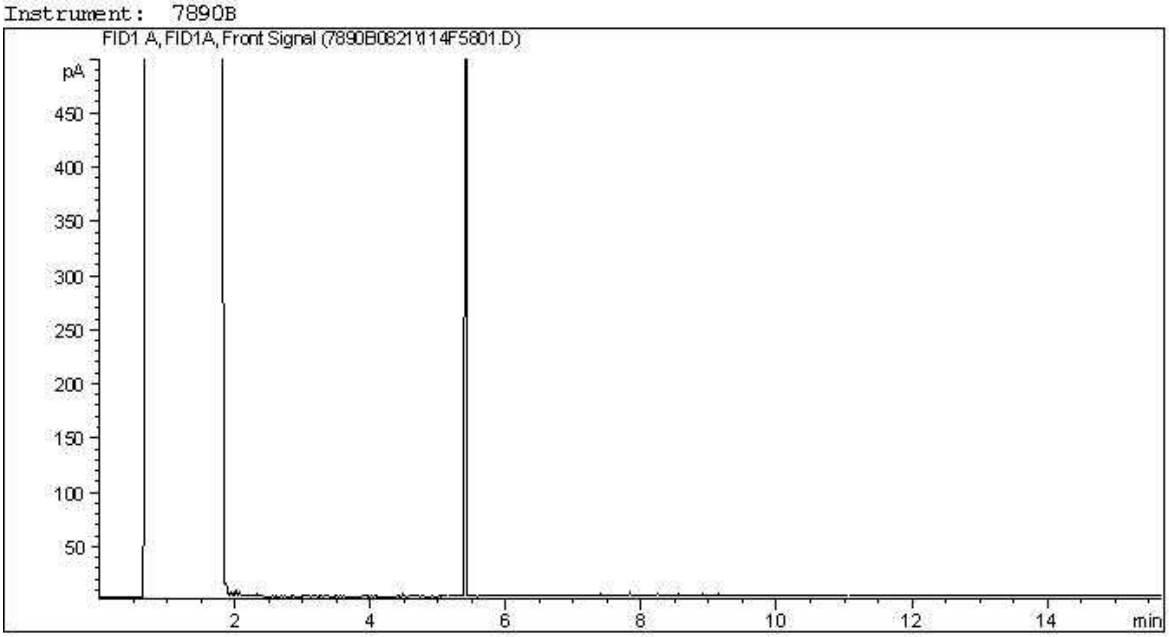
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG6018

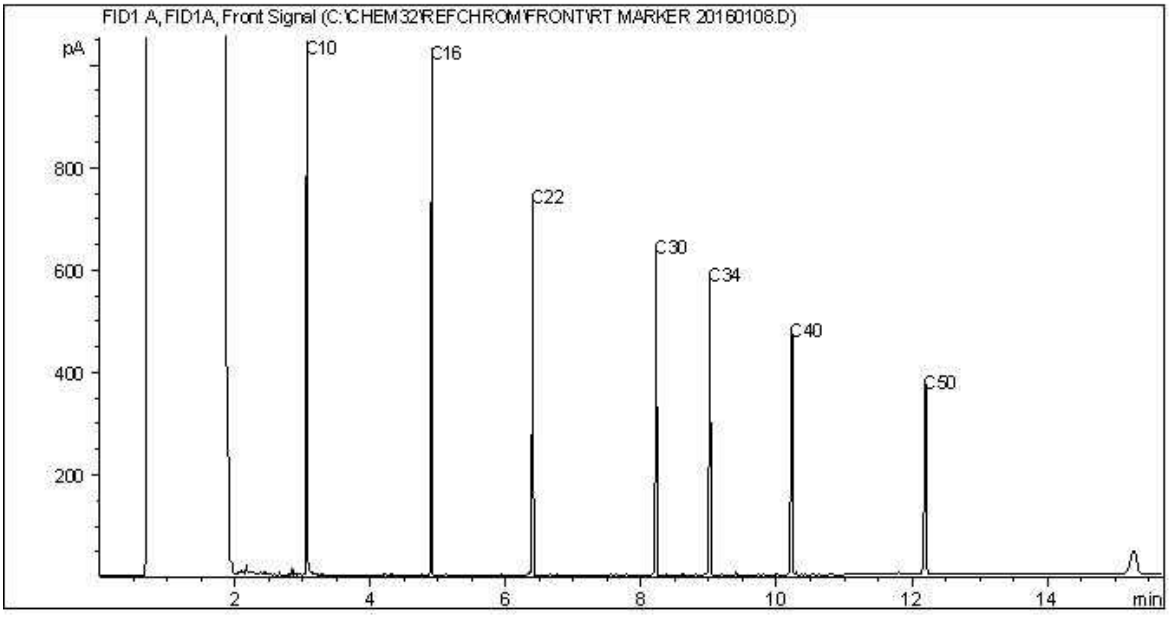
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: 16-C1-18A

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+

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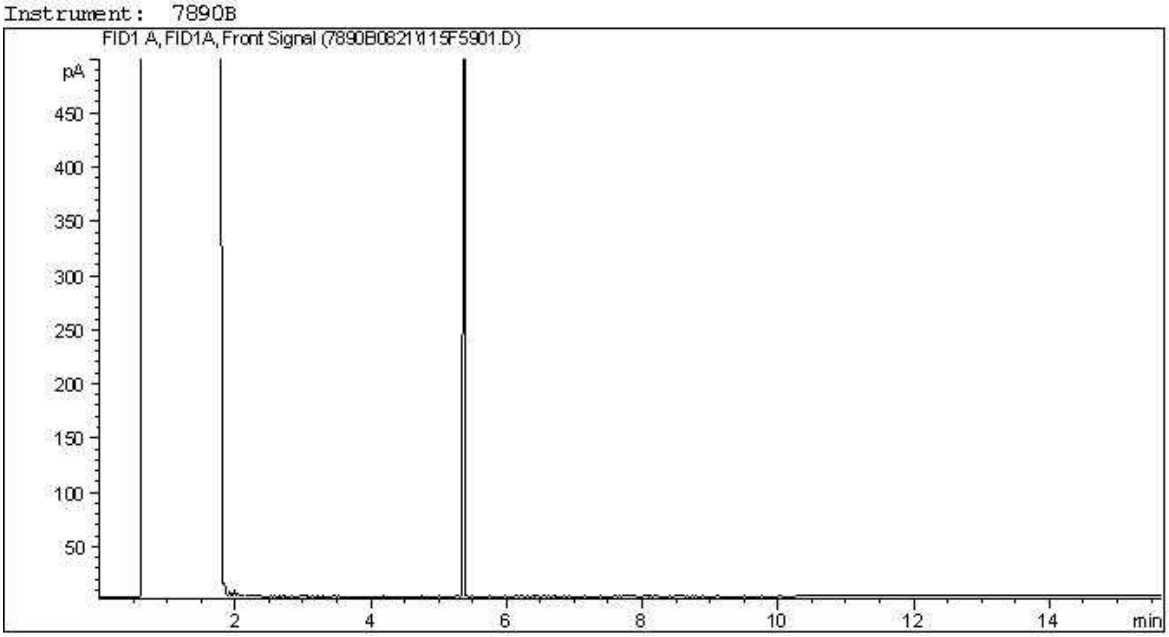
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG6019

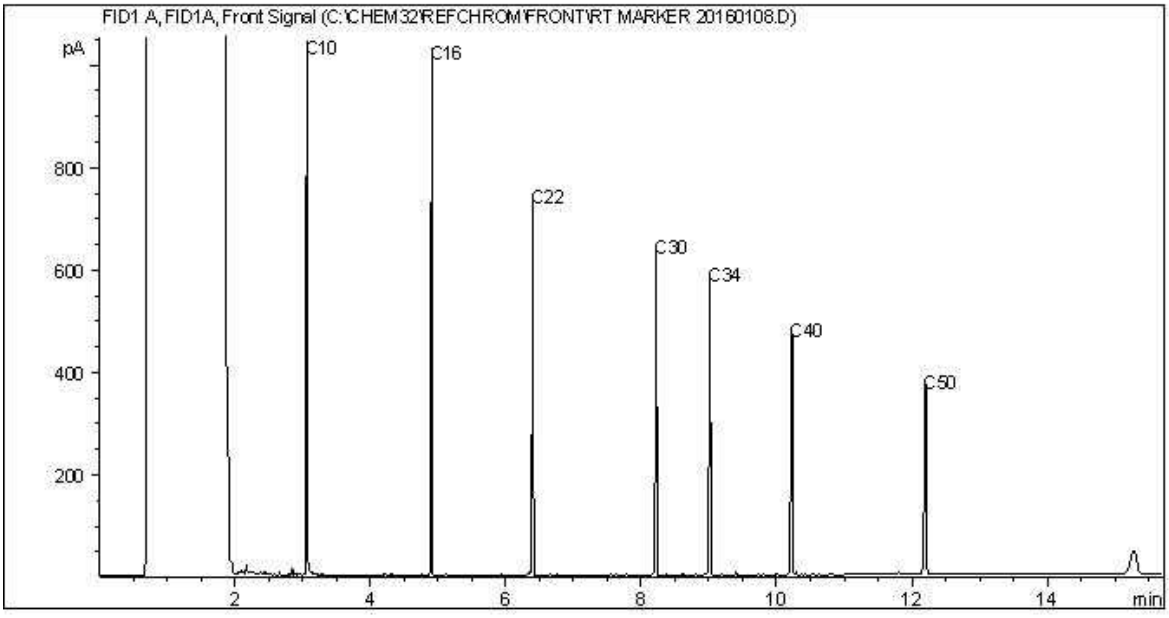
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: 16-C1-18B

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+

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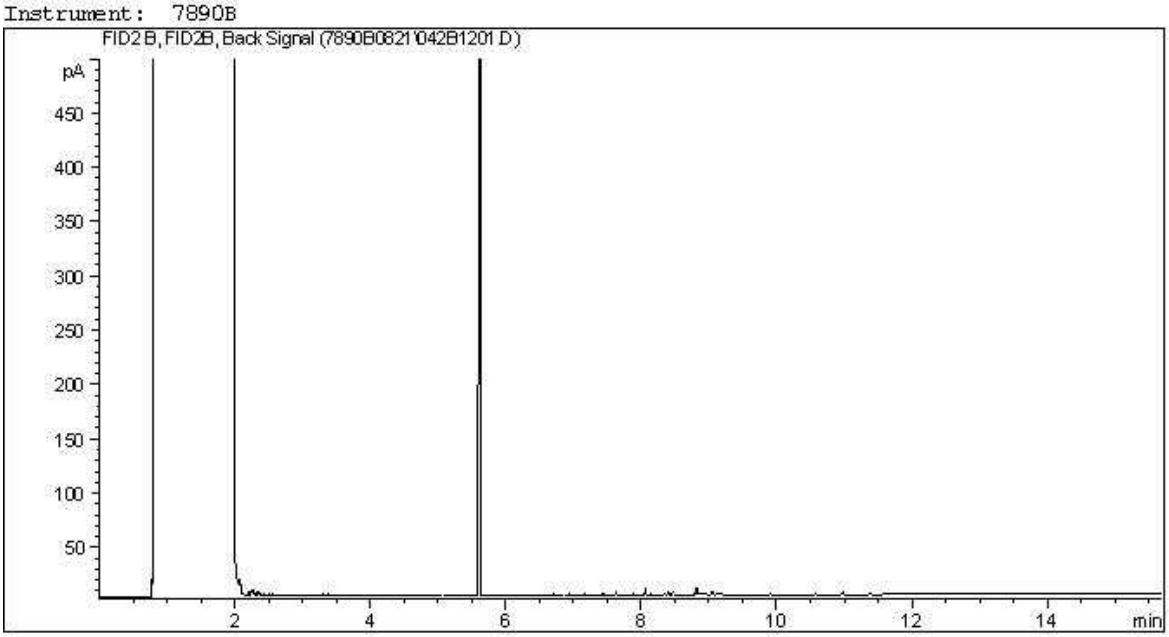
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG6020

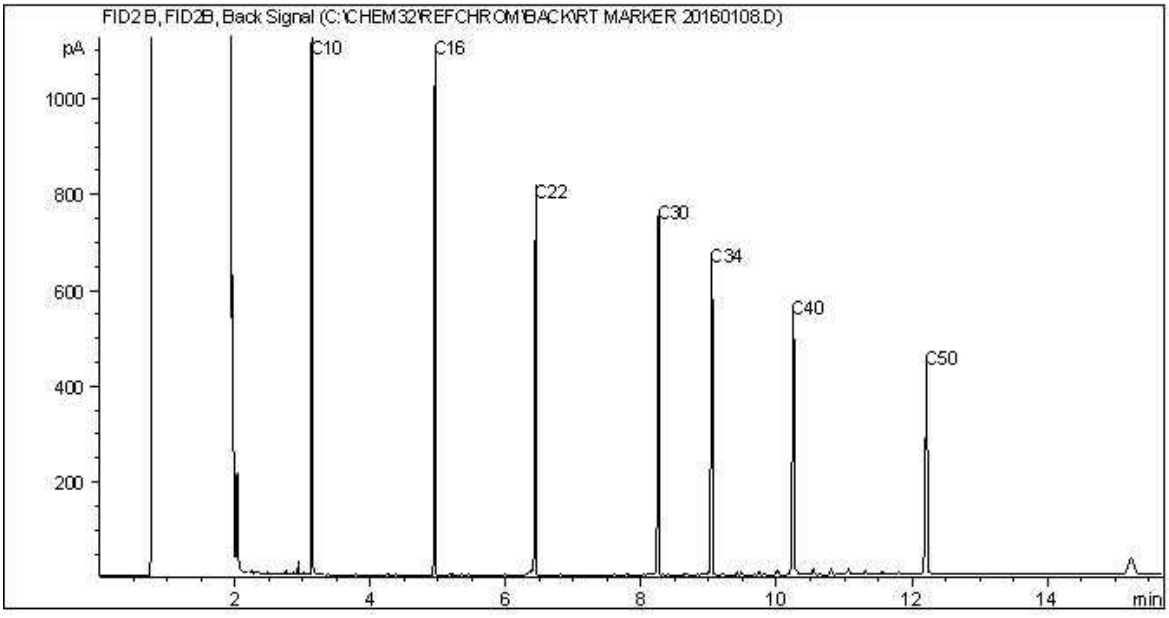
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: 16-C1-19A

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+	

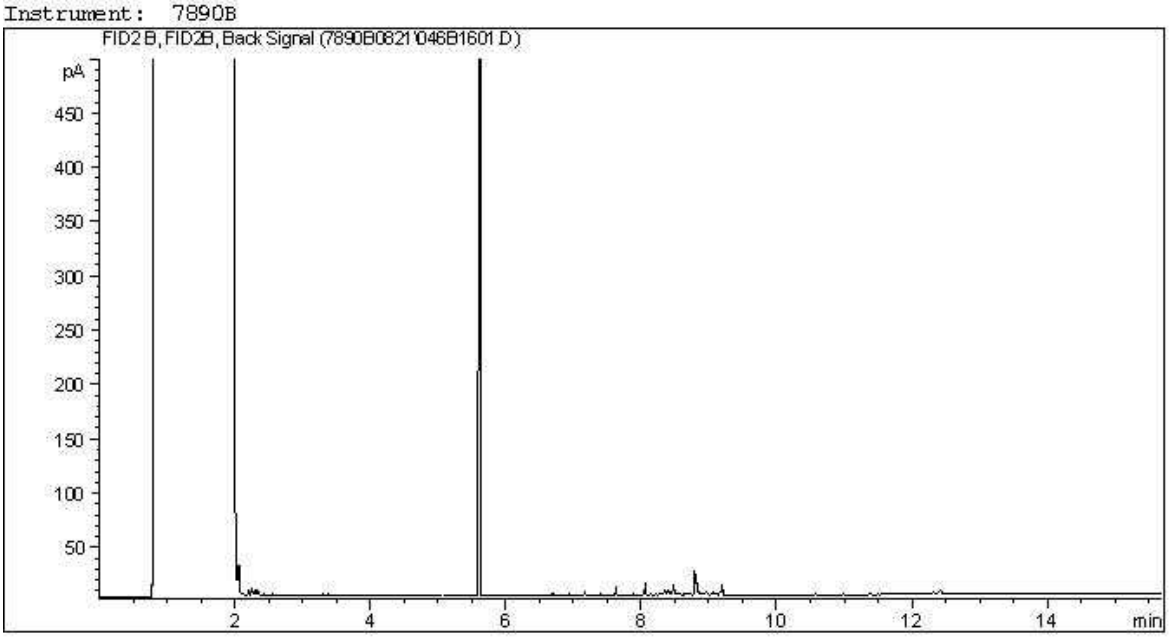
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG6021

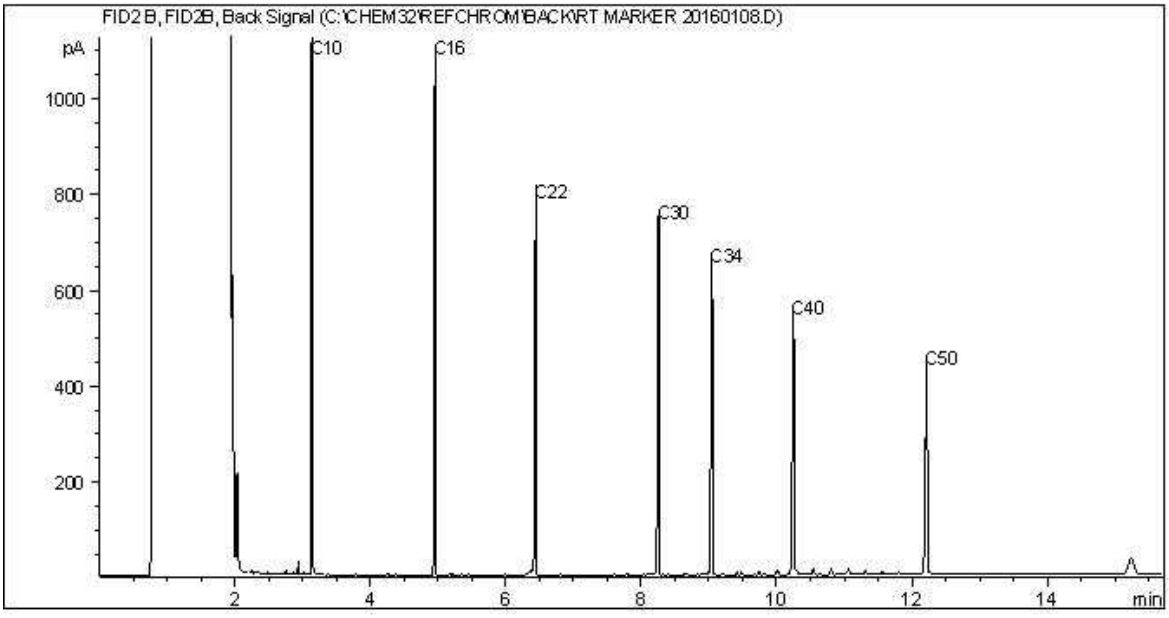
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: 16-C1-19B

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+

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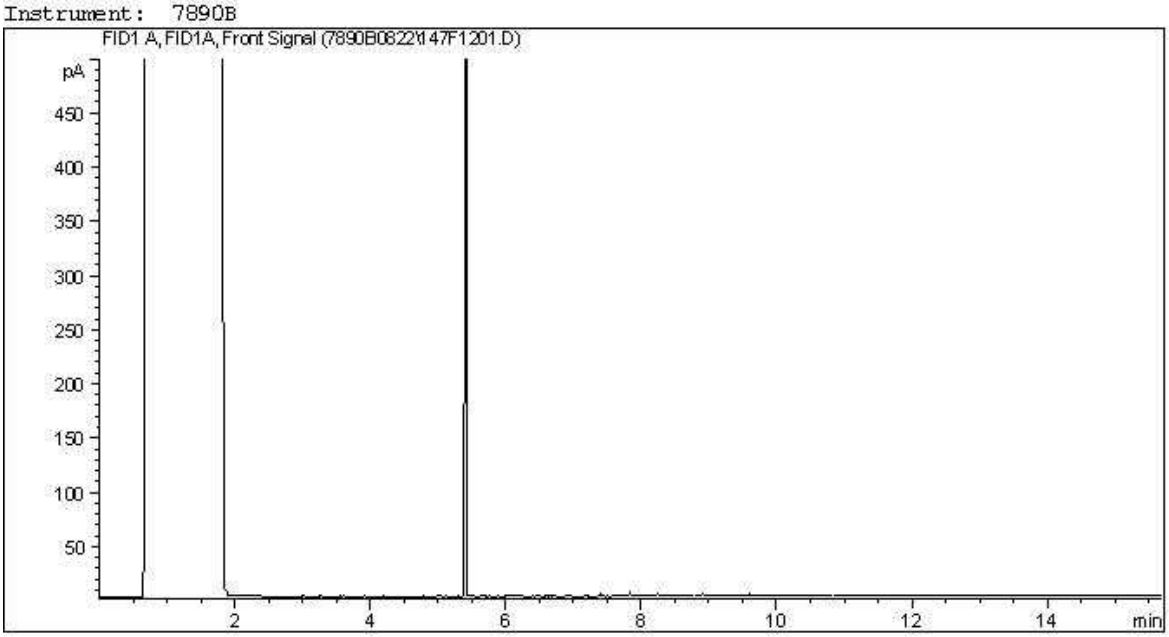
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG6022

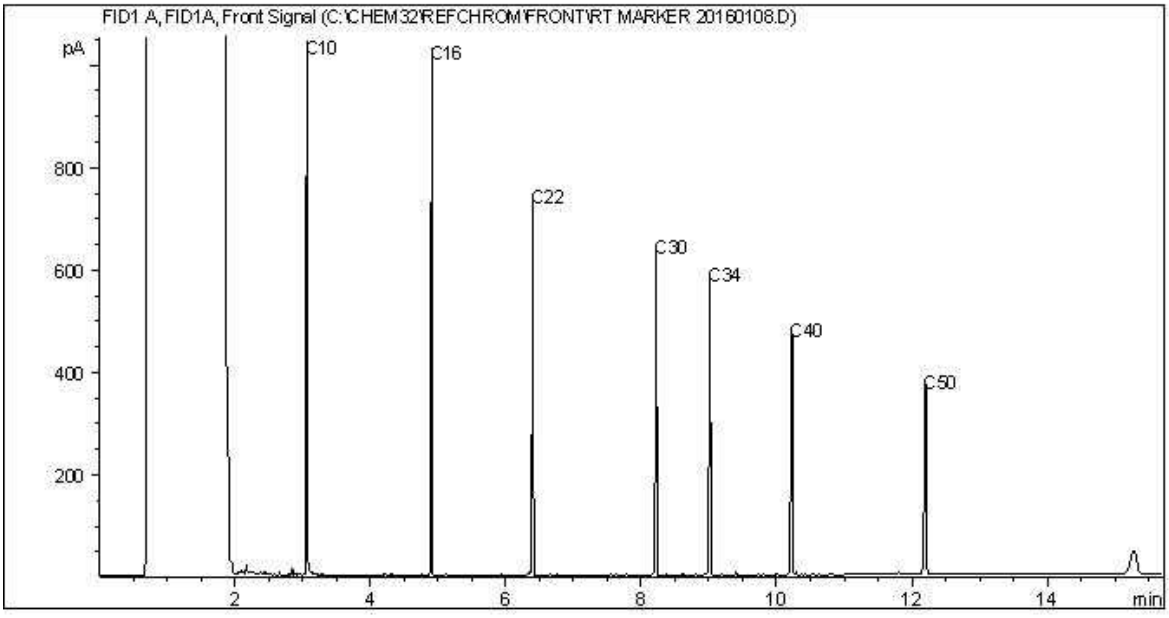
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: 16-C1-20A

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+

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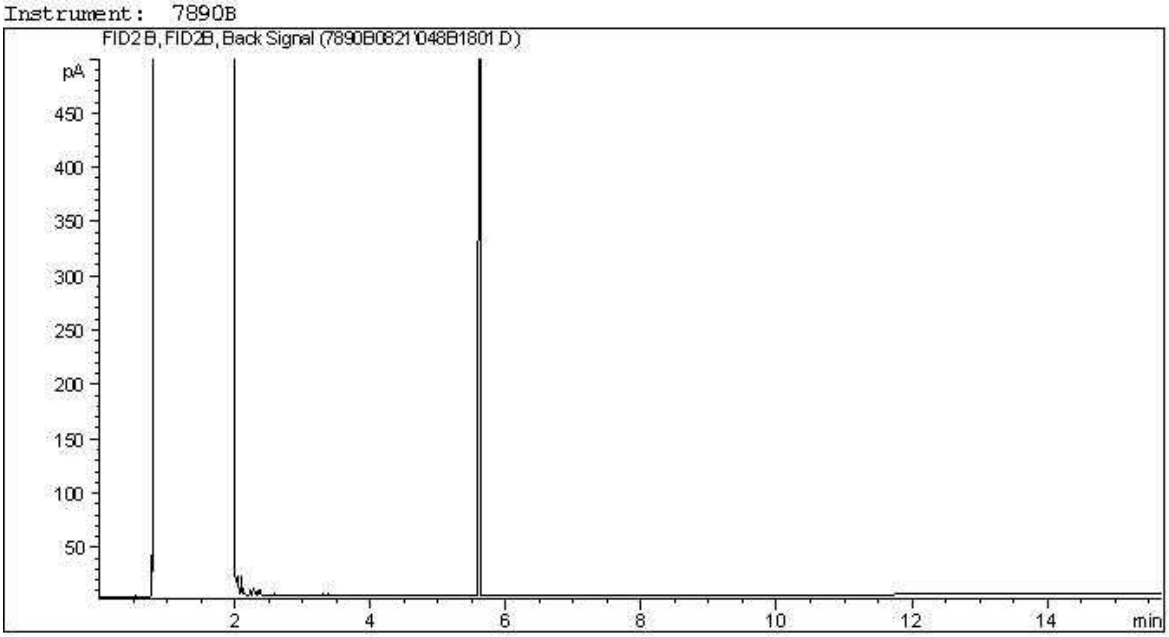
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG6023

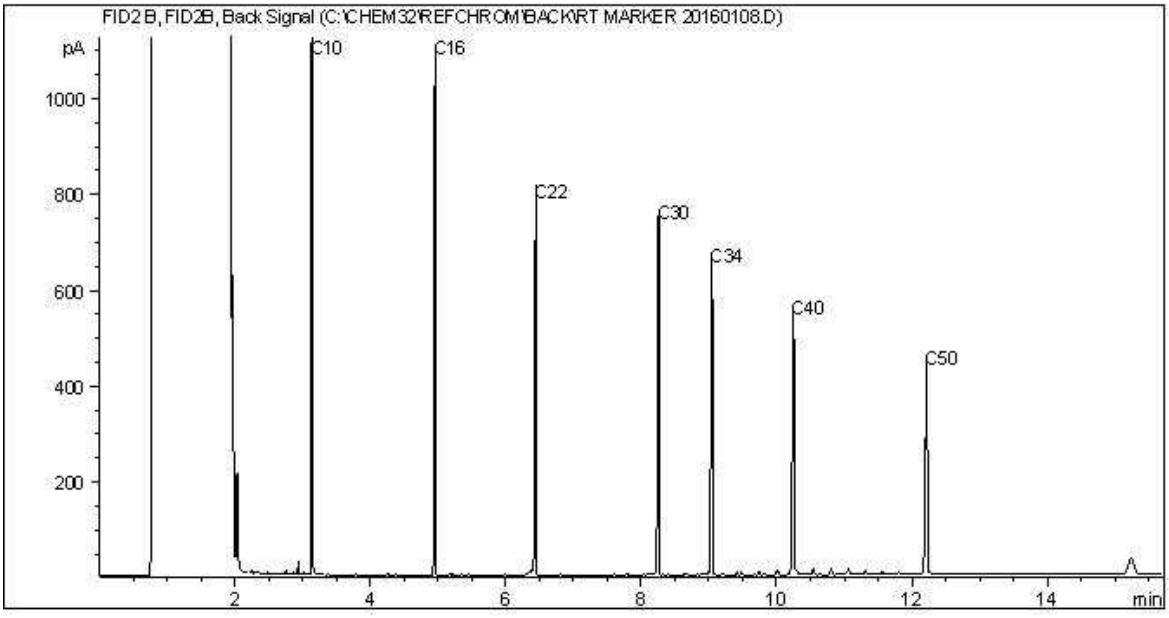
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: 16-C1-20B

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+

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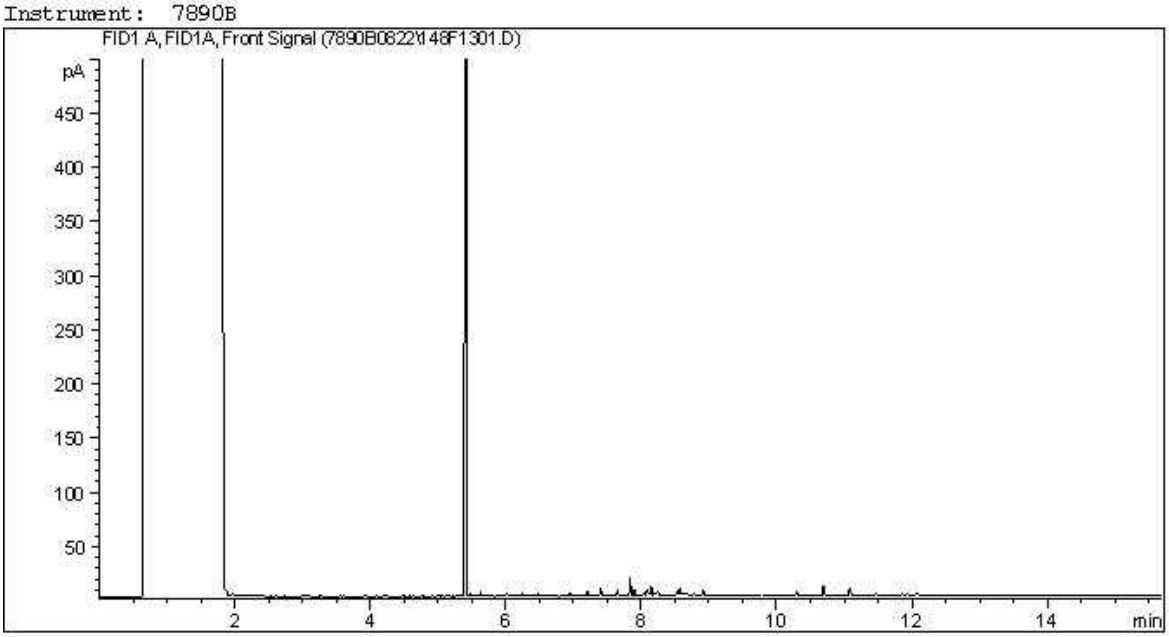
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG6024

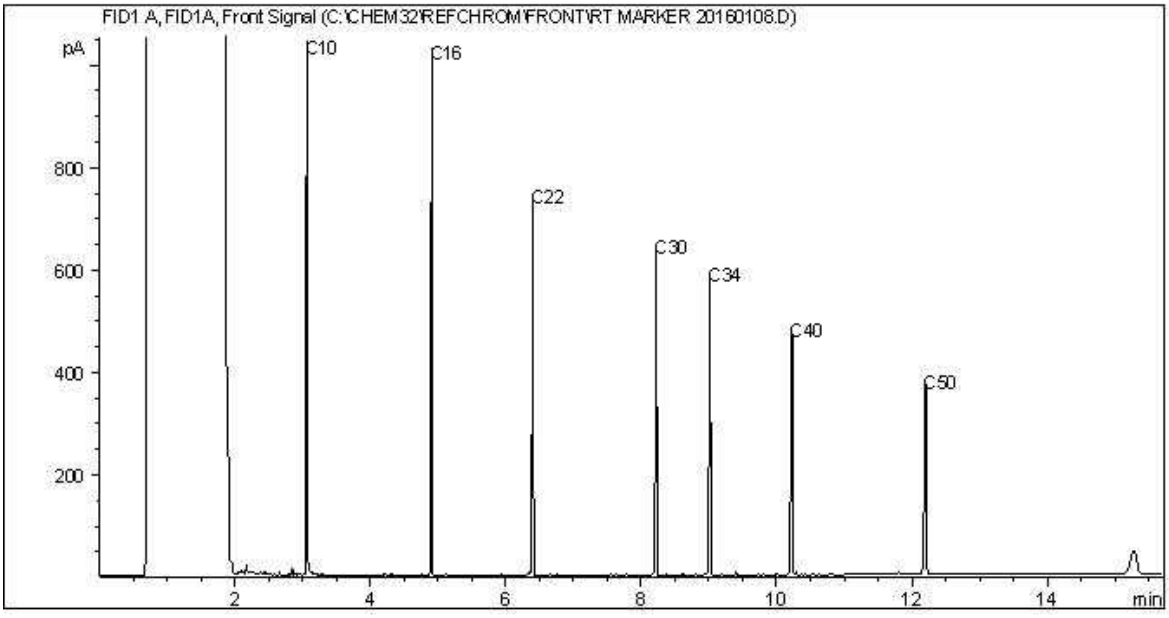
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: 16-C1-21A

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+

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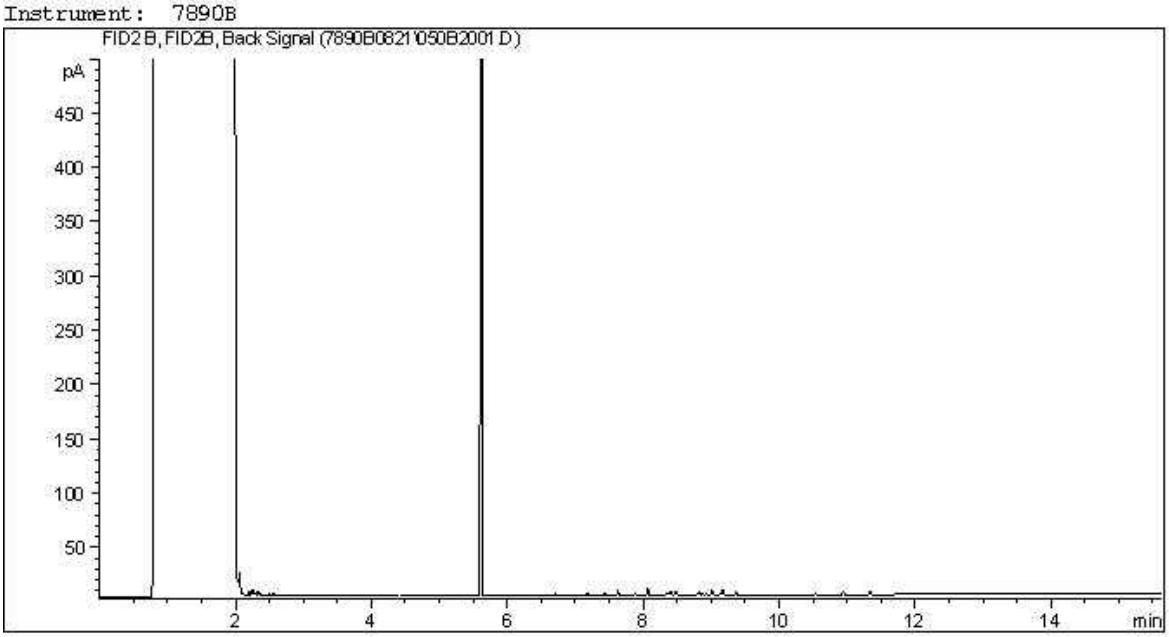
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG6025

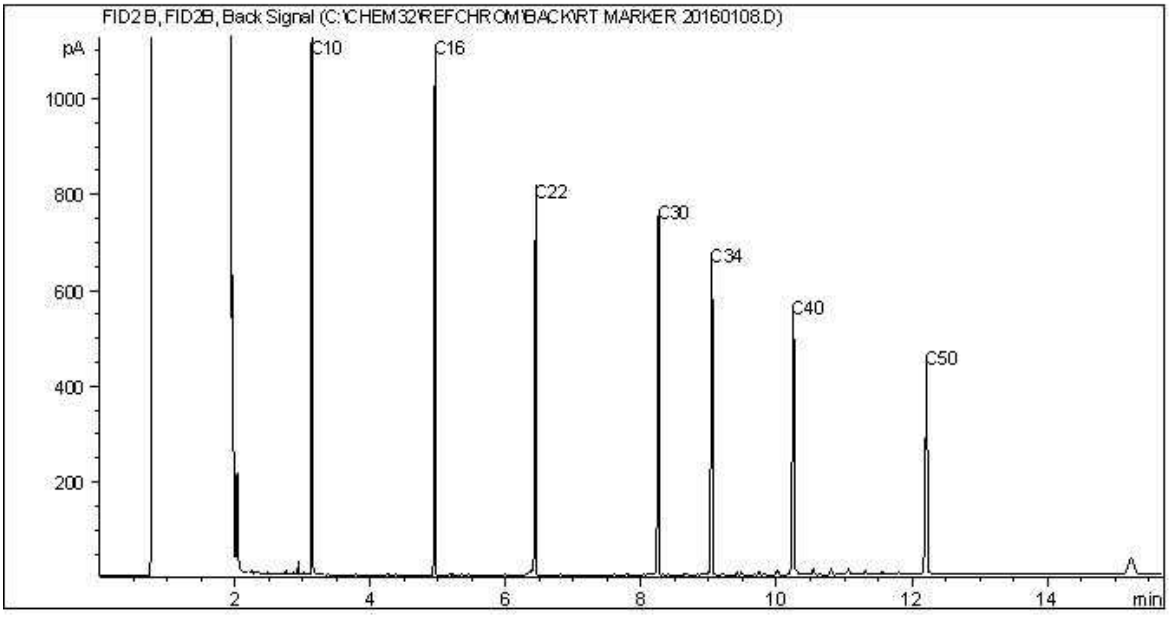
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: 16-C1-21B

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+

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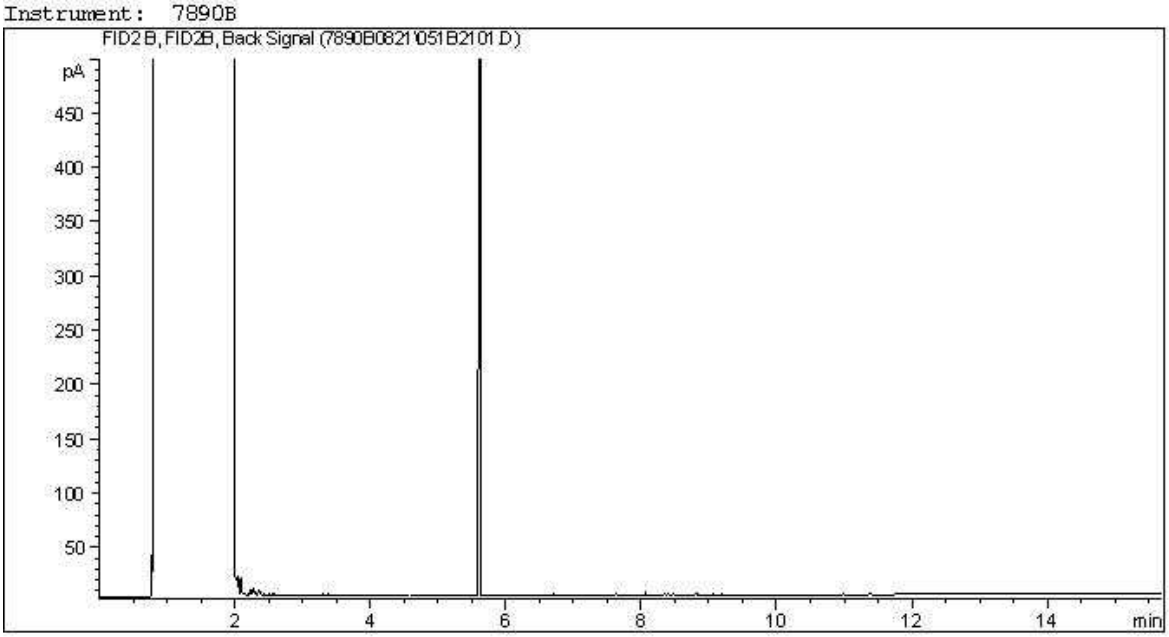
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG6026

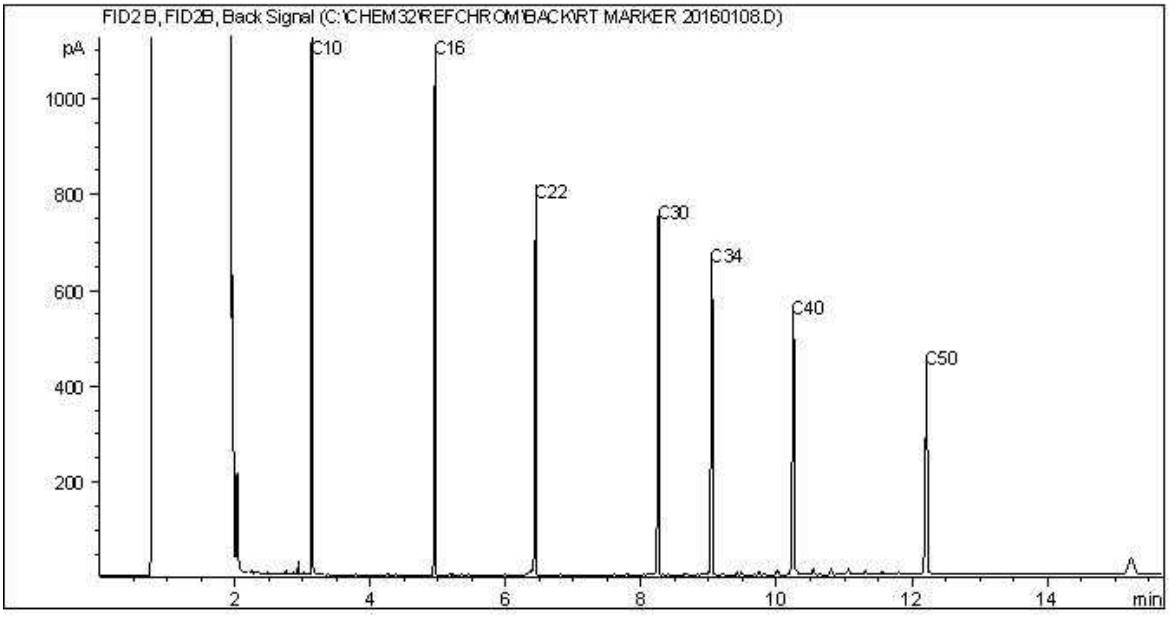
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: 16-C1-22A

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+

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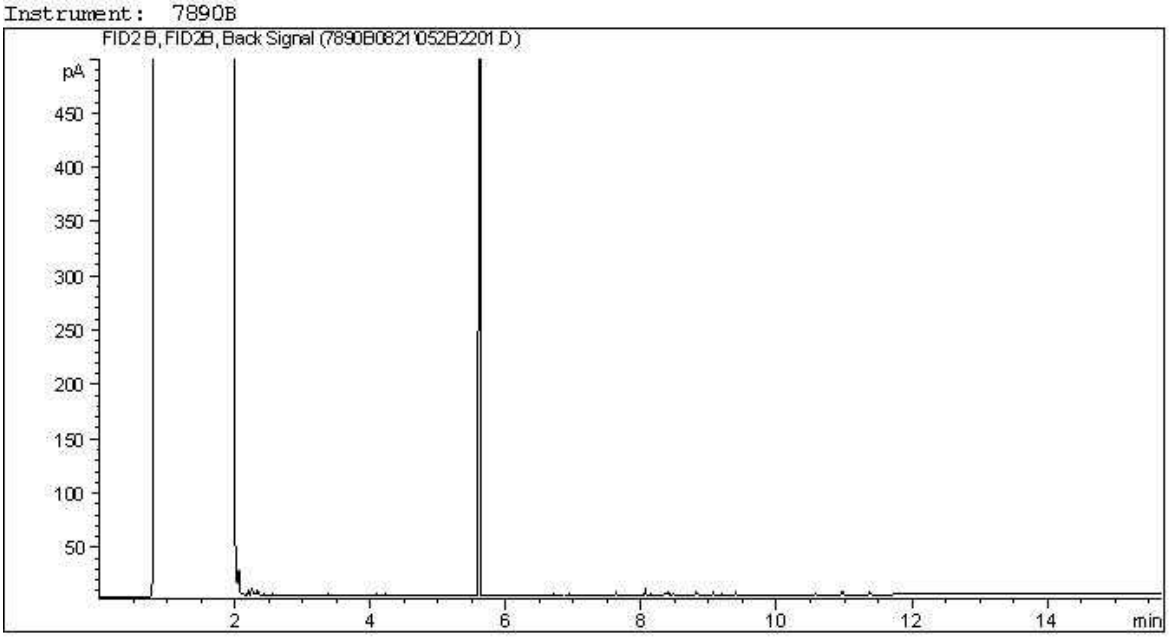
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG6027

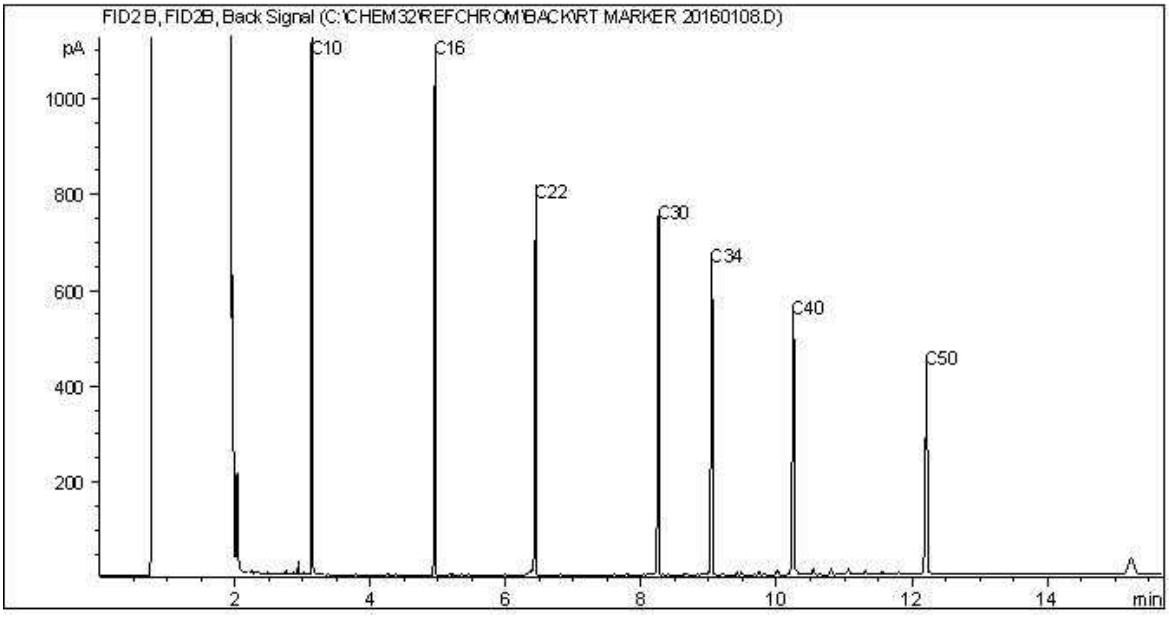
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: 16-C1-22B

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+

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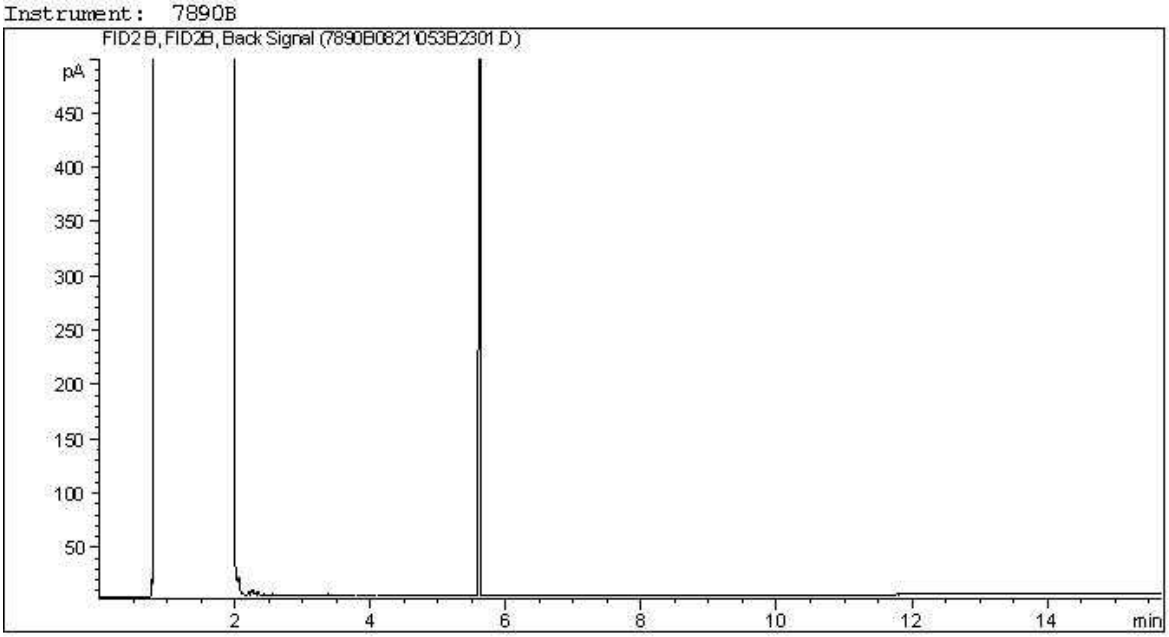
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG6032

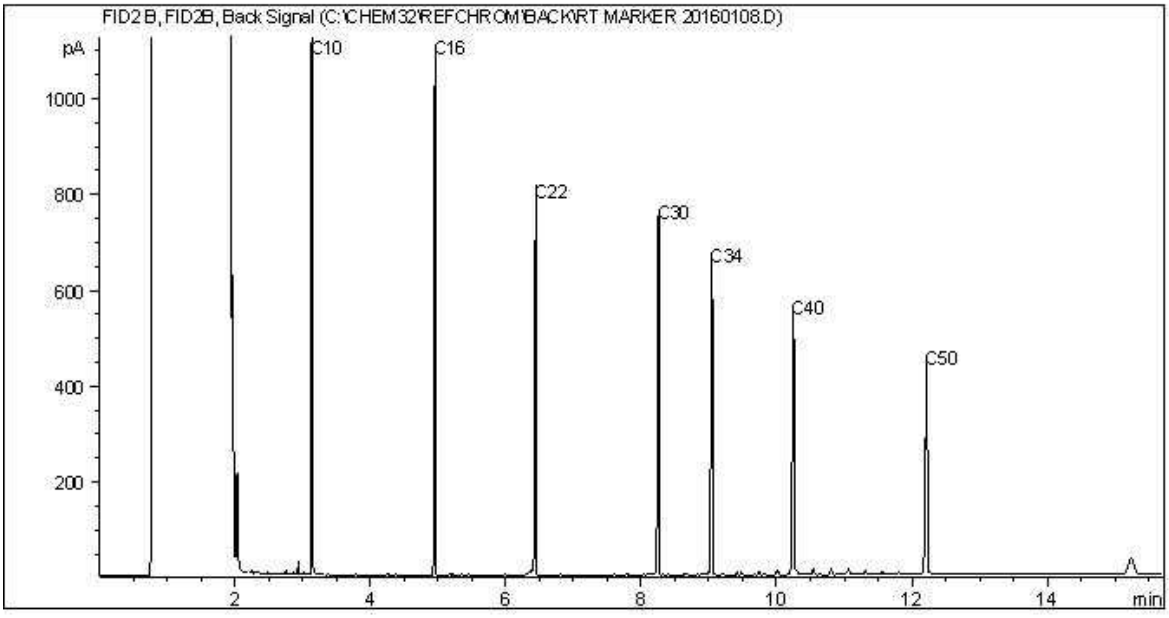
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: 16-C1-23A

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+

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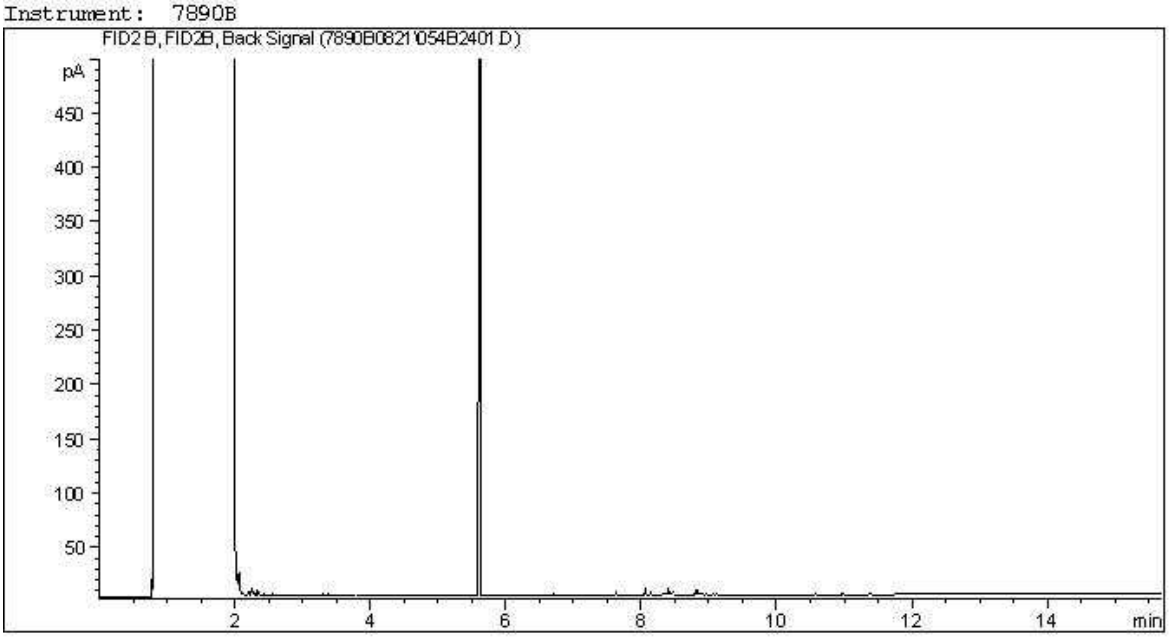
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG6033

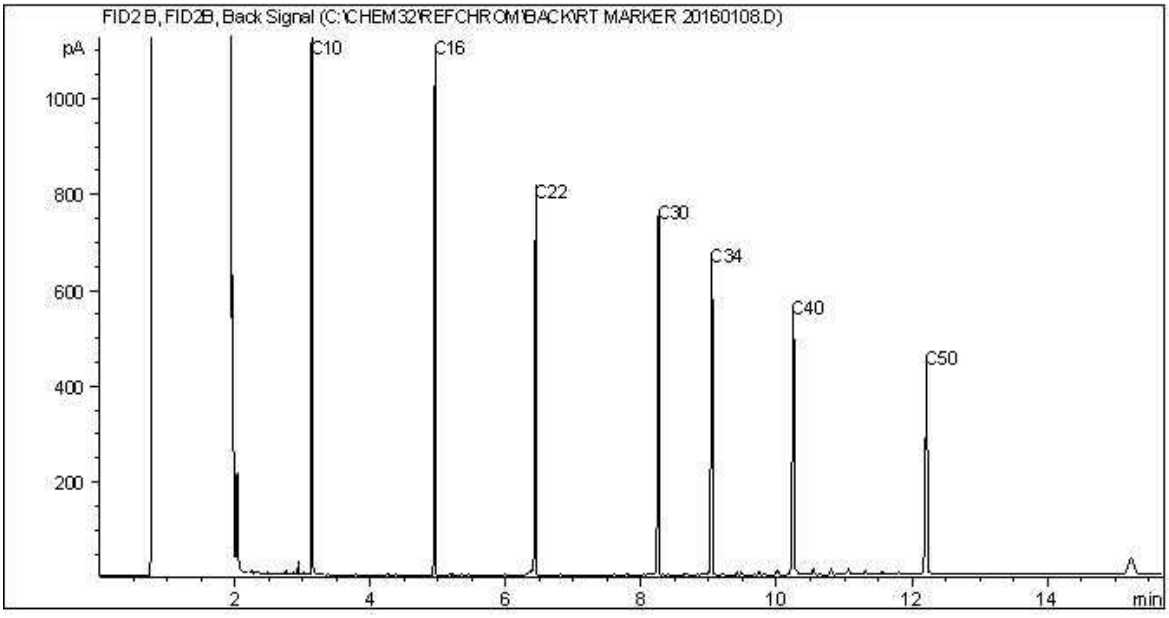
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: 16-C1-24A

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+

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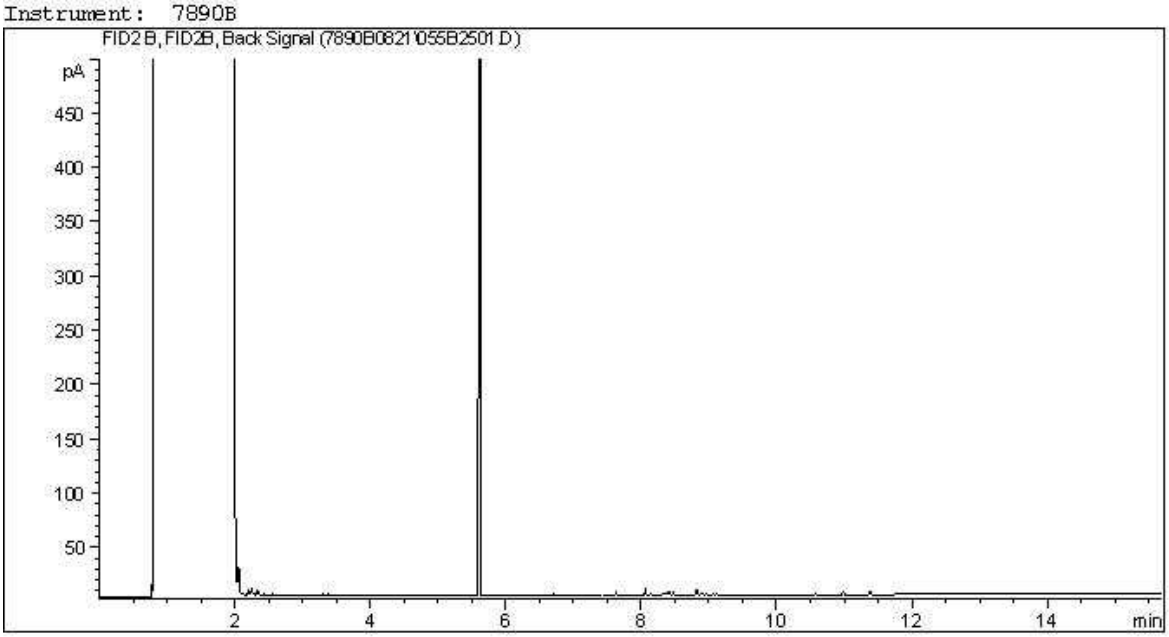
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG6034

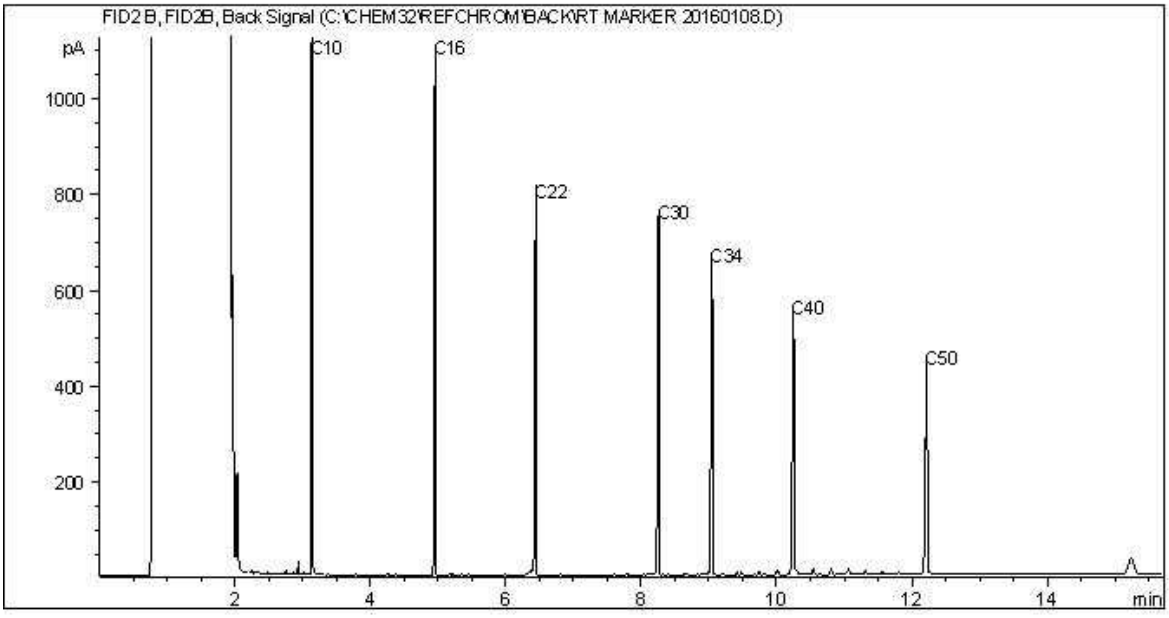
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: 16-C1-24B

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+

Page 1 of 1

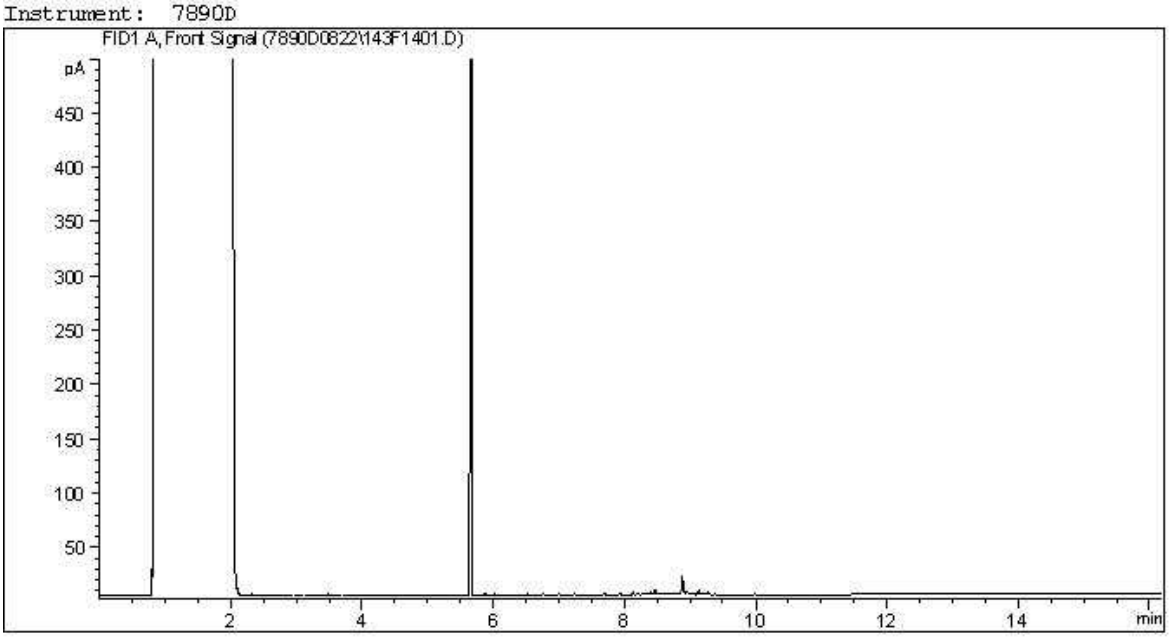
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG6035

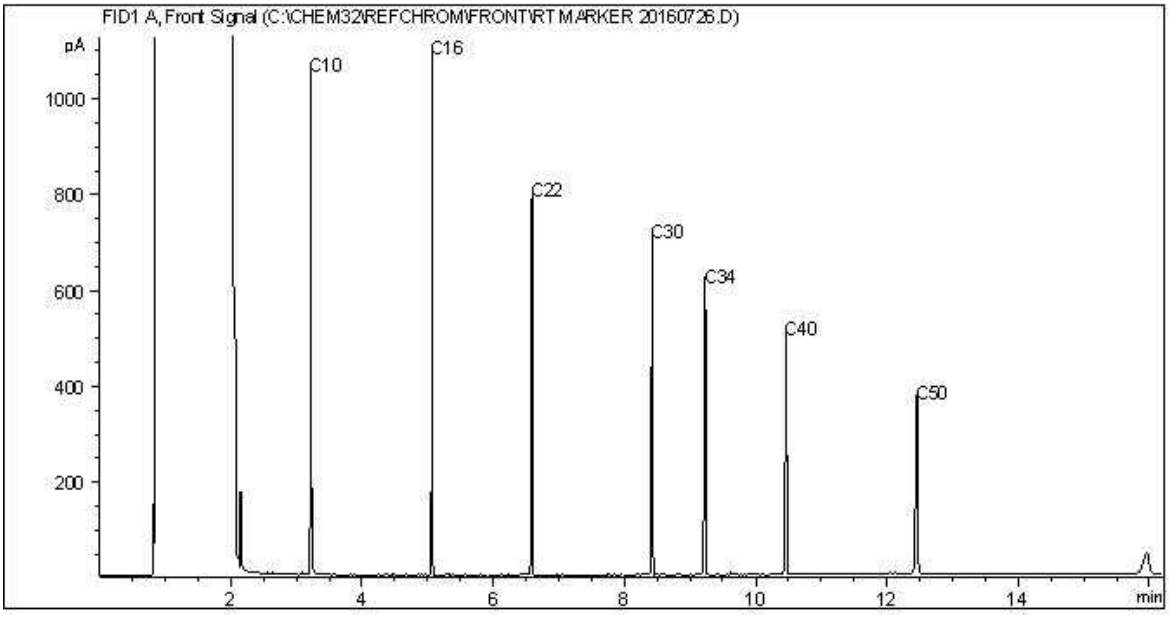
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: 16-C1-25A

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890D



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+

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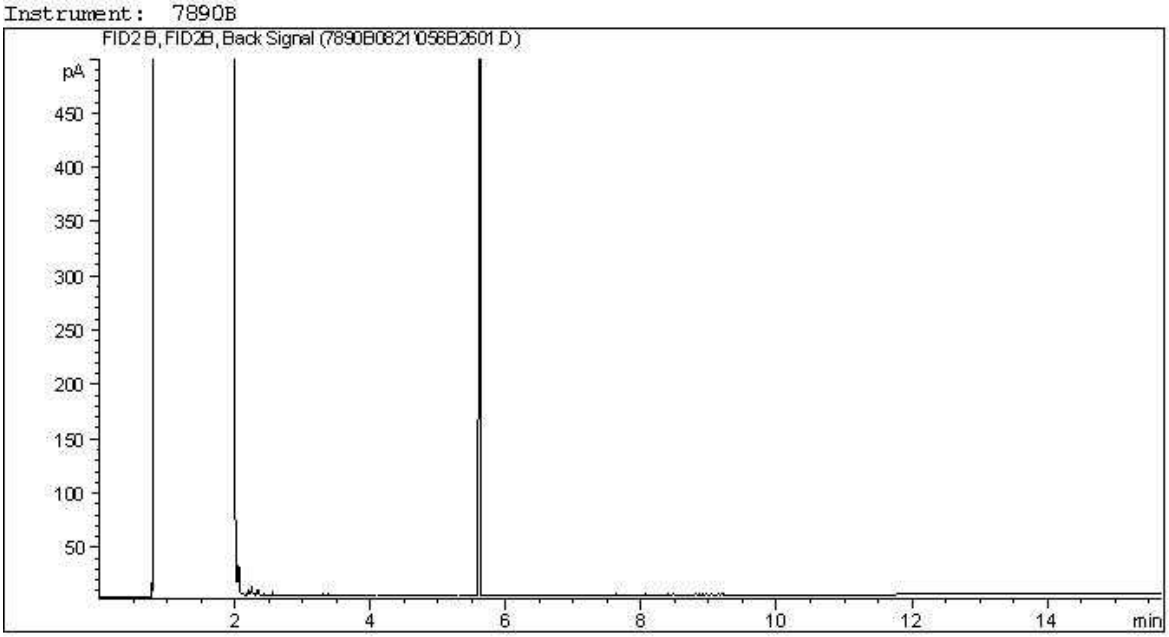
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG6036

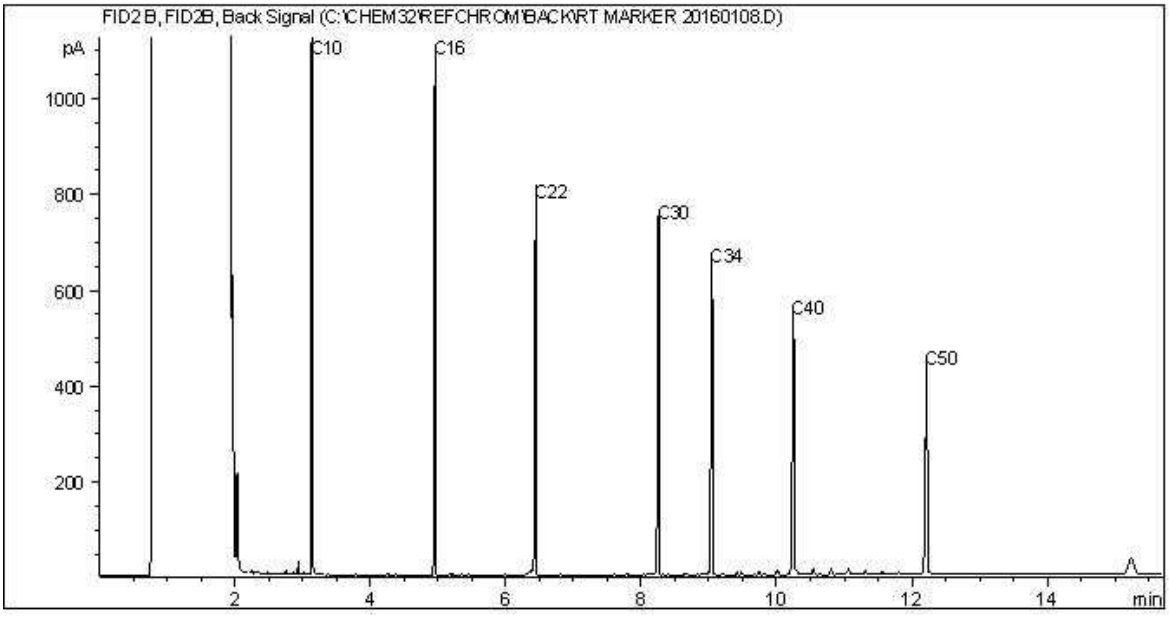
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: 16-C1-26A

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+

Page 1 of 1

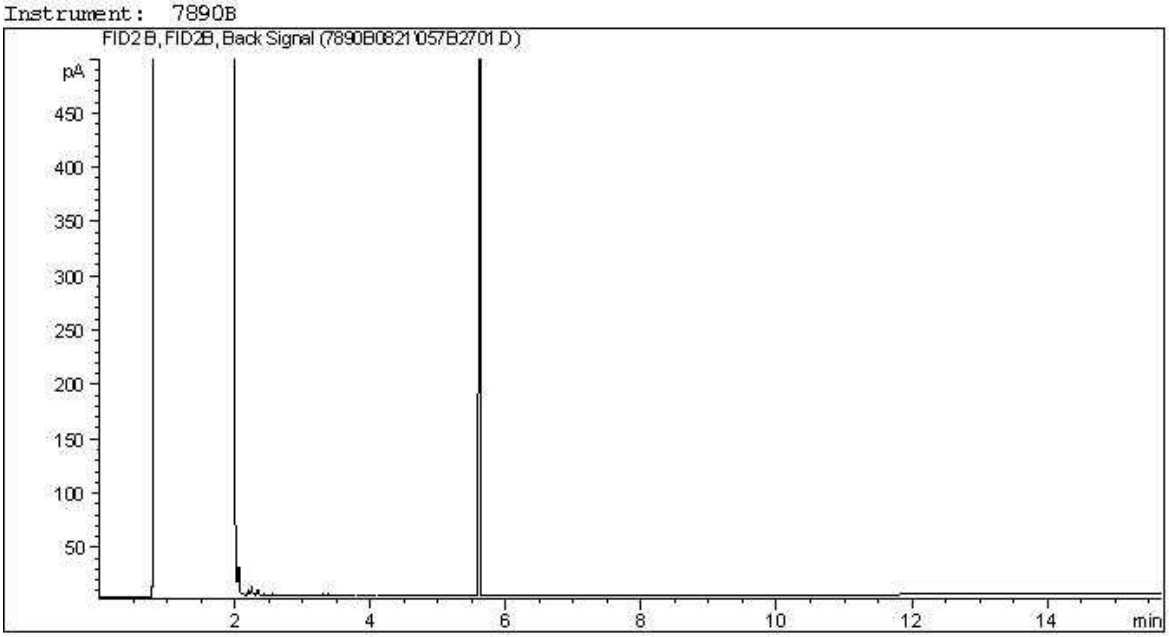
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG6037

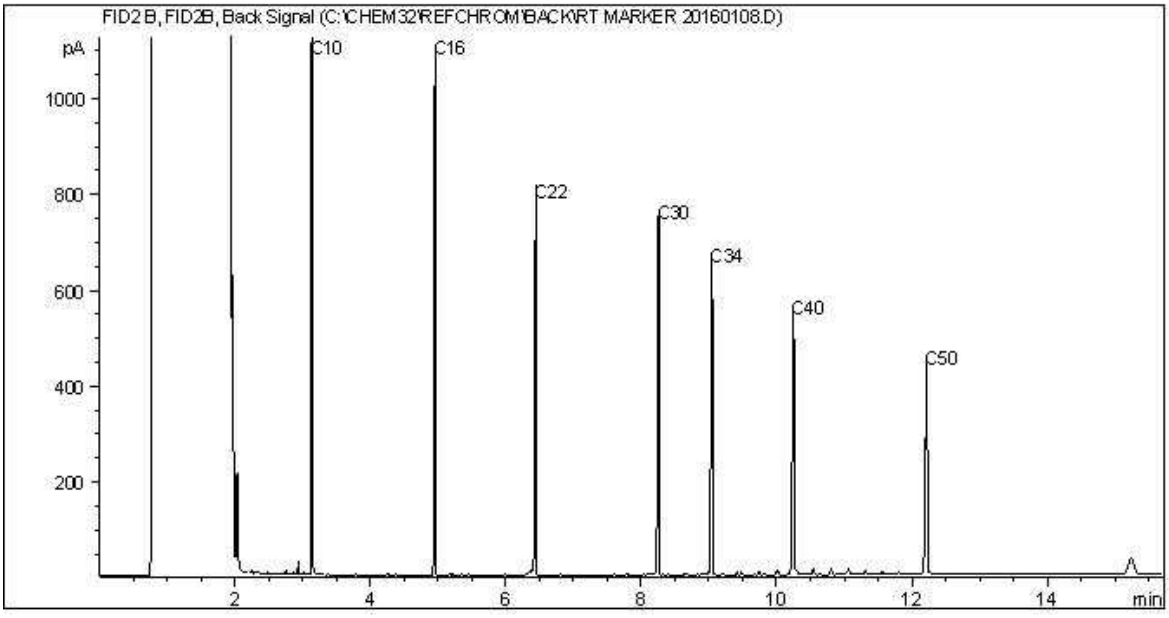
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: 16-C1-26B

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+

Page 1 of 1

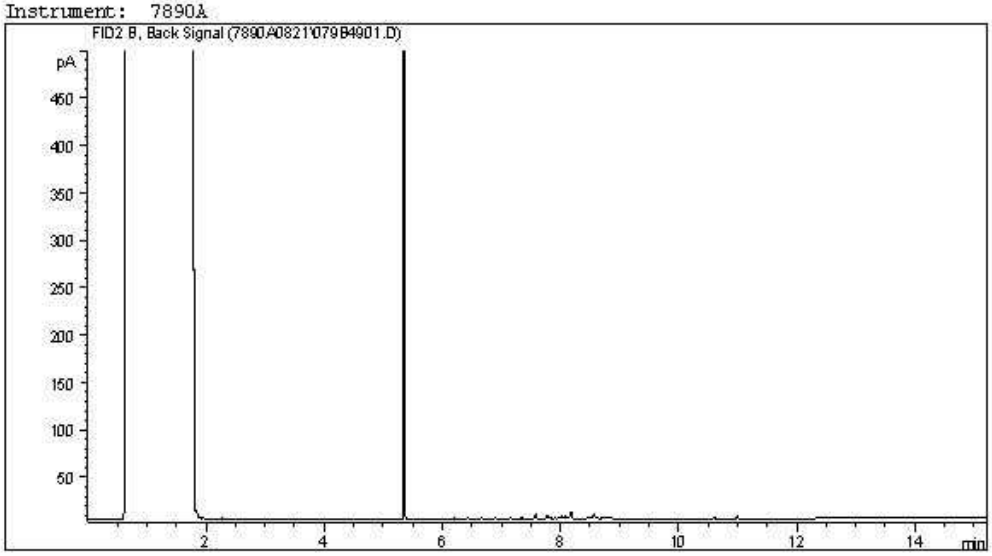
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG6038

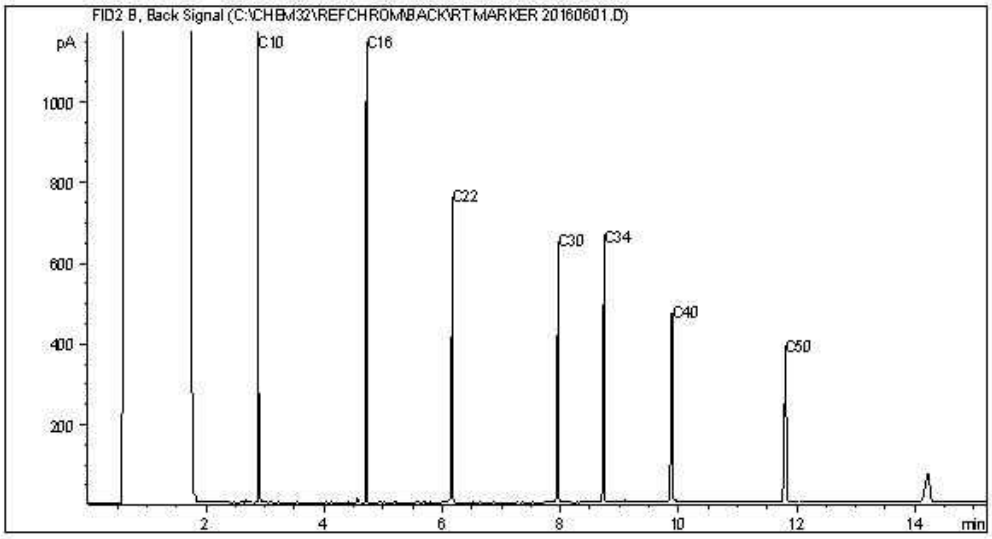
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: 16-C1-27A

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890A



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+

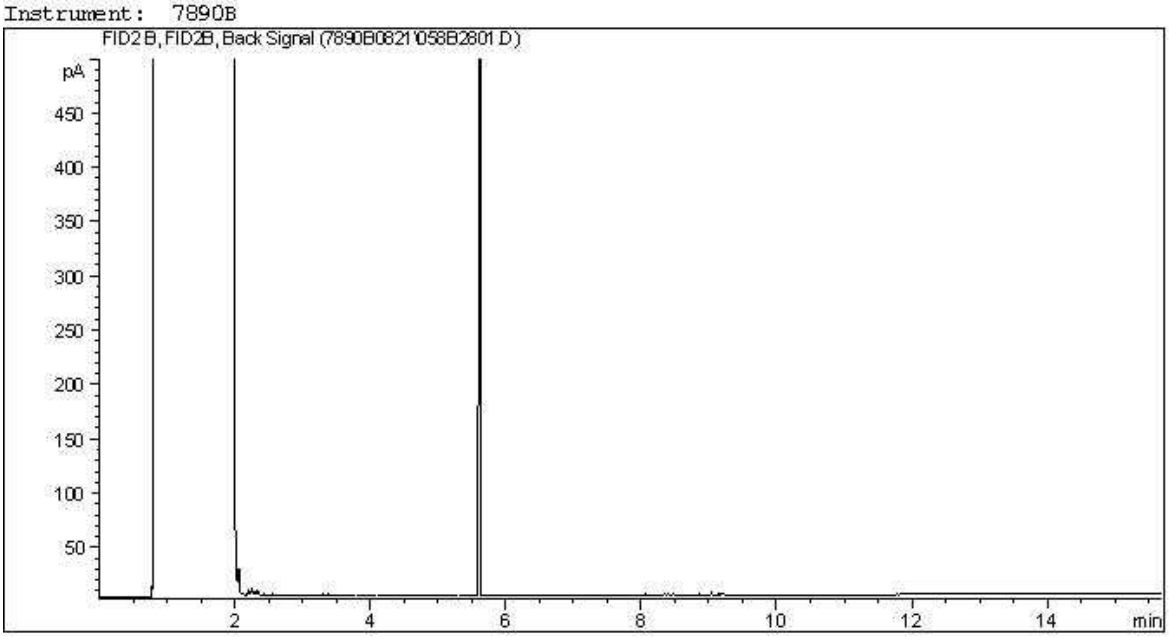
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG6039

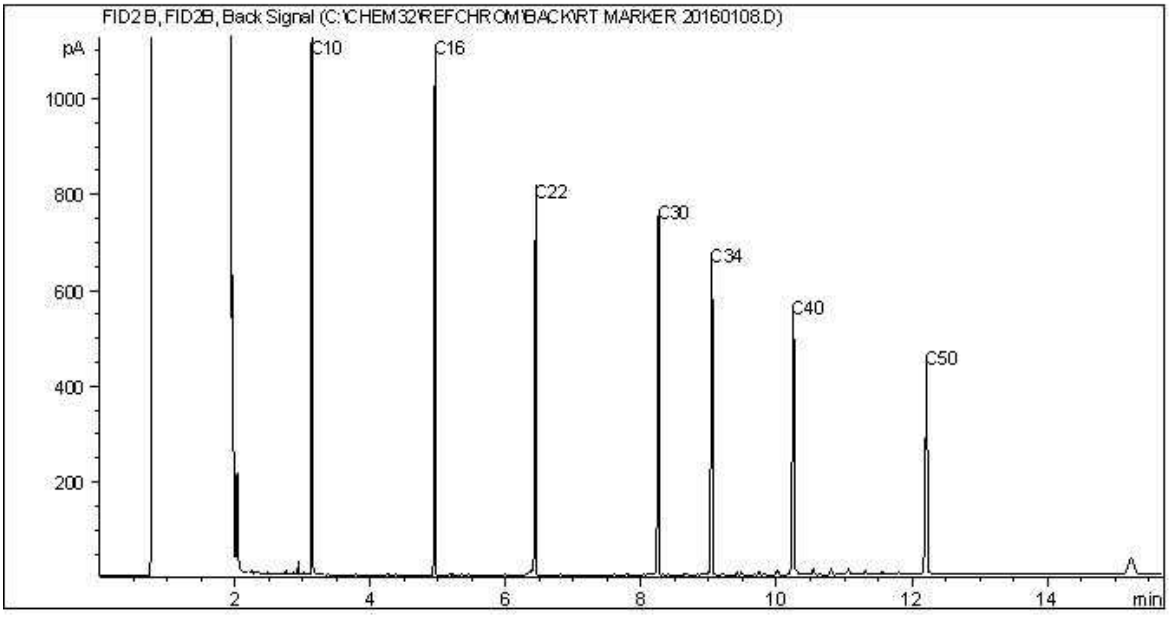
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: 16-C1-27B

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+

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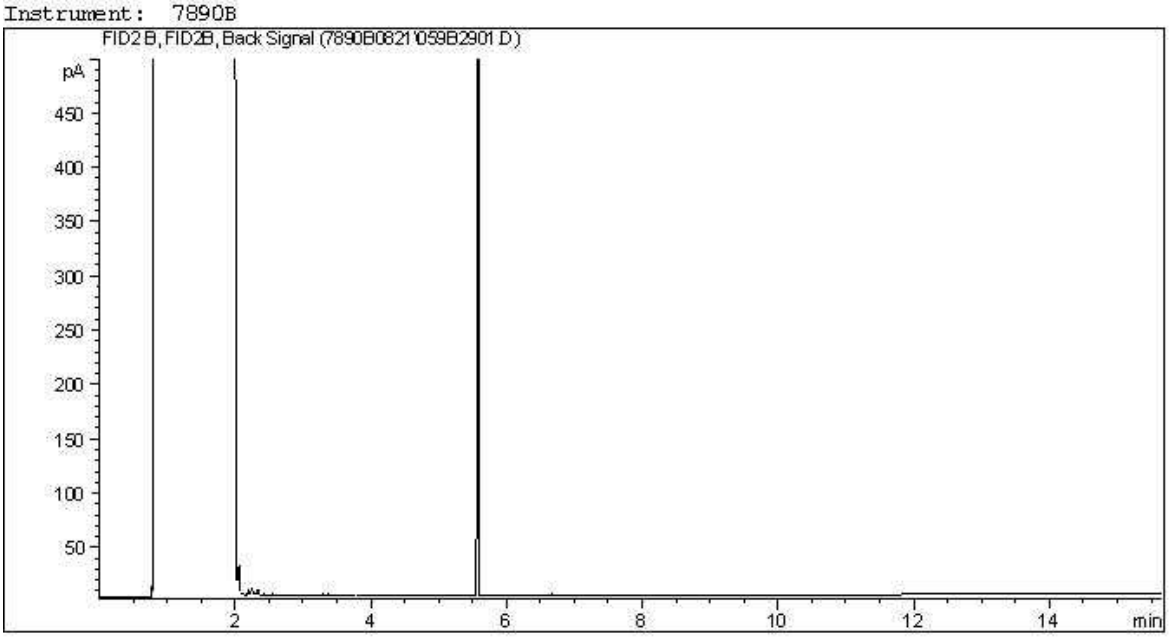
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG6040

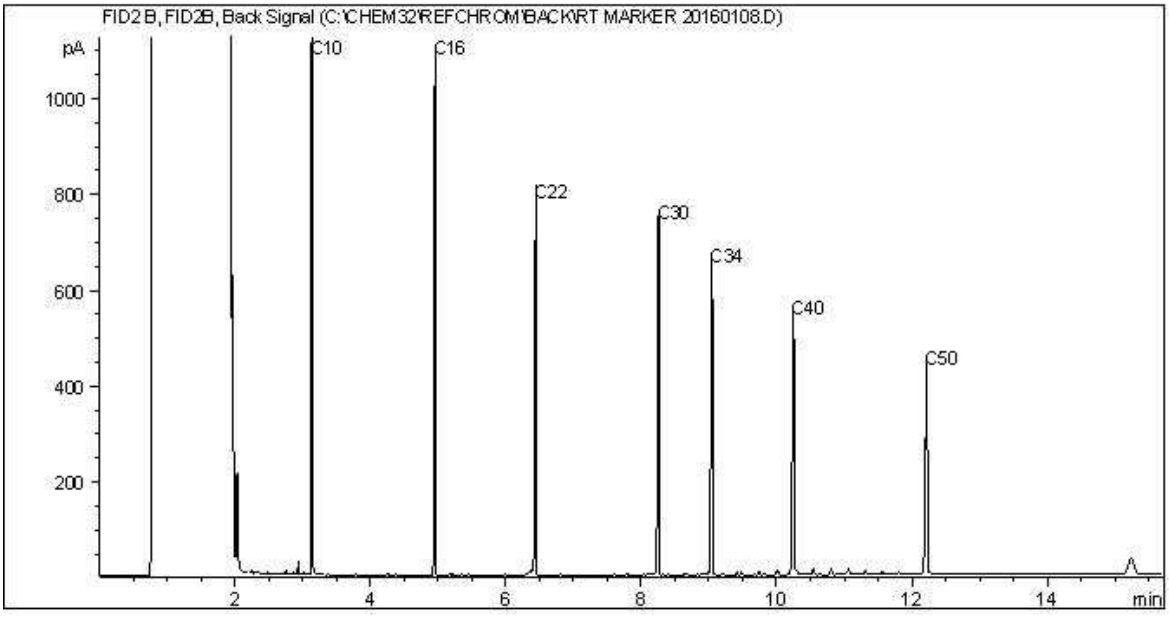
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: 16-C1-28A

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+

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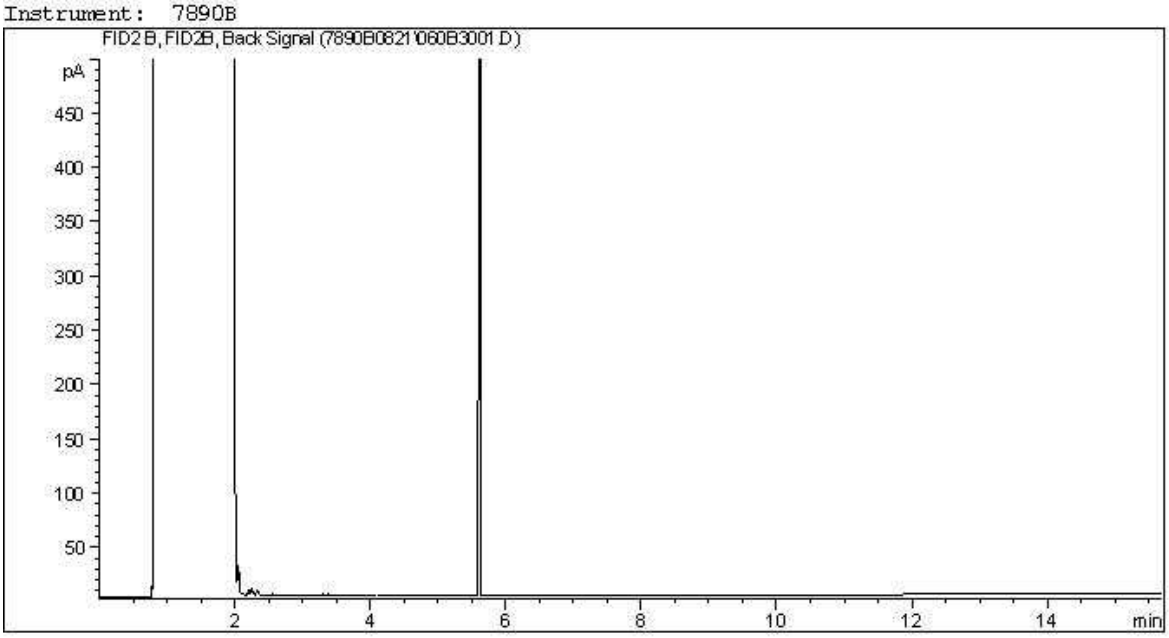
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG6041

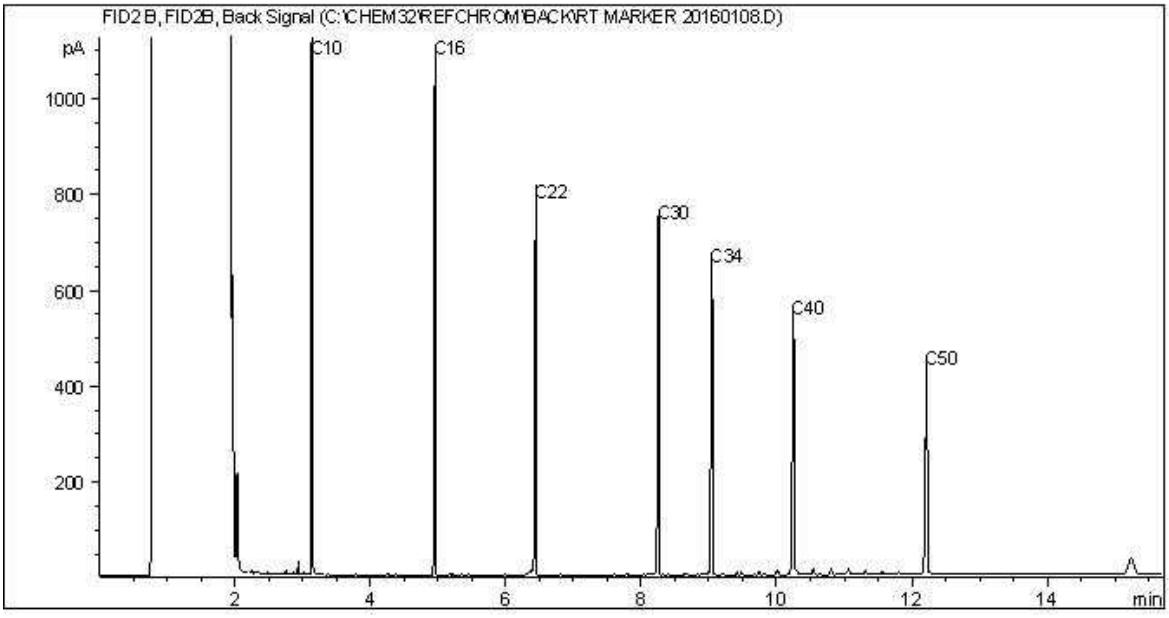
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: 16-C1-28B

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+

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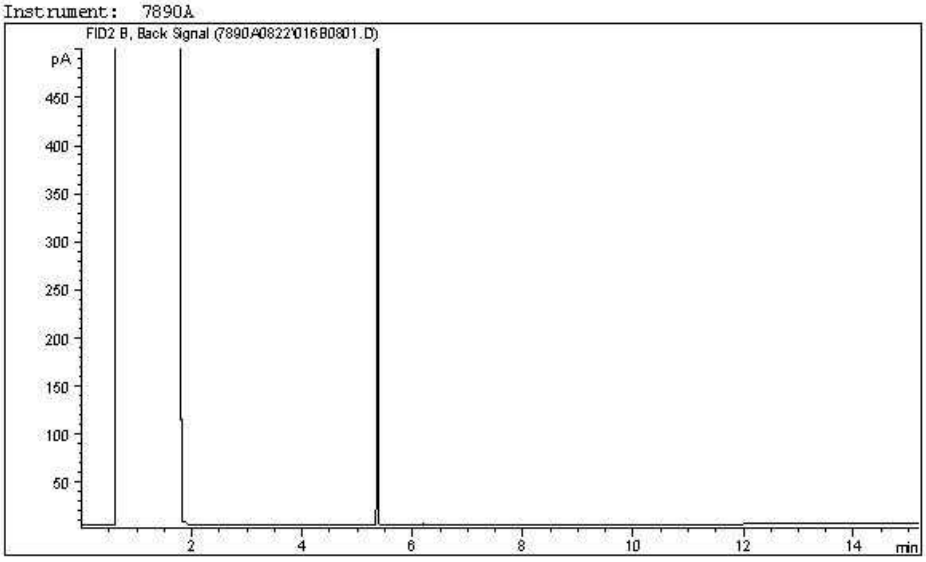
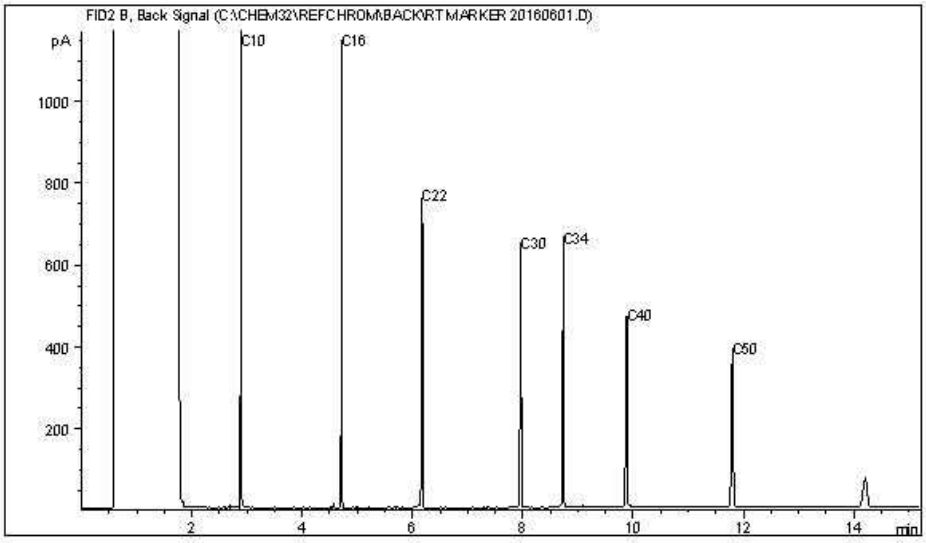
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890A



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+

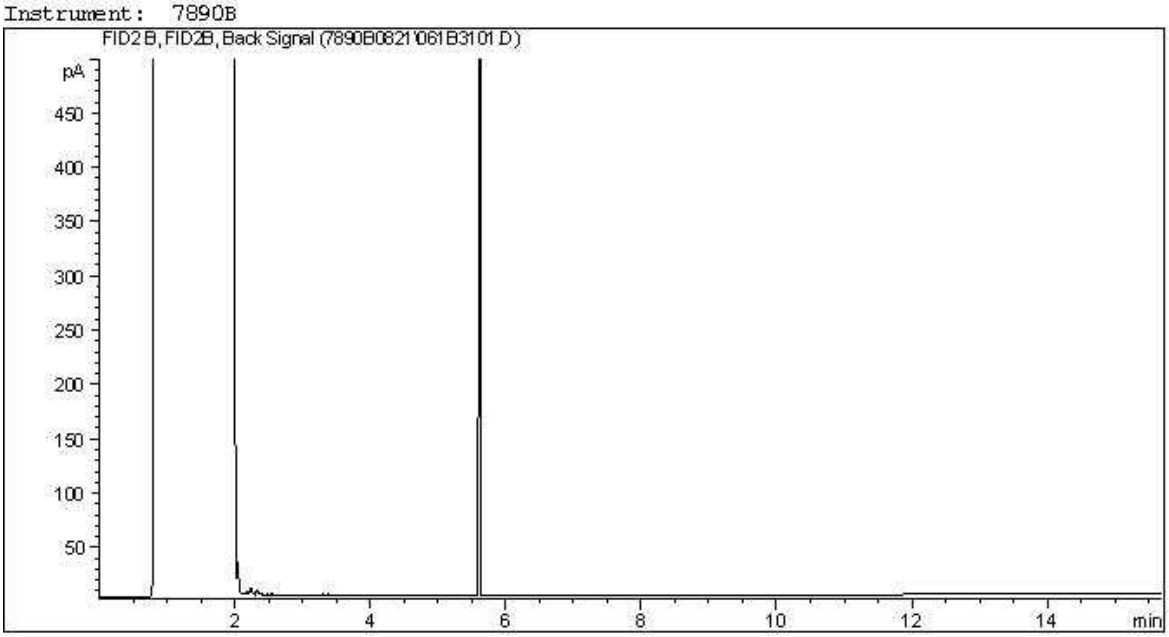
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG6069

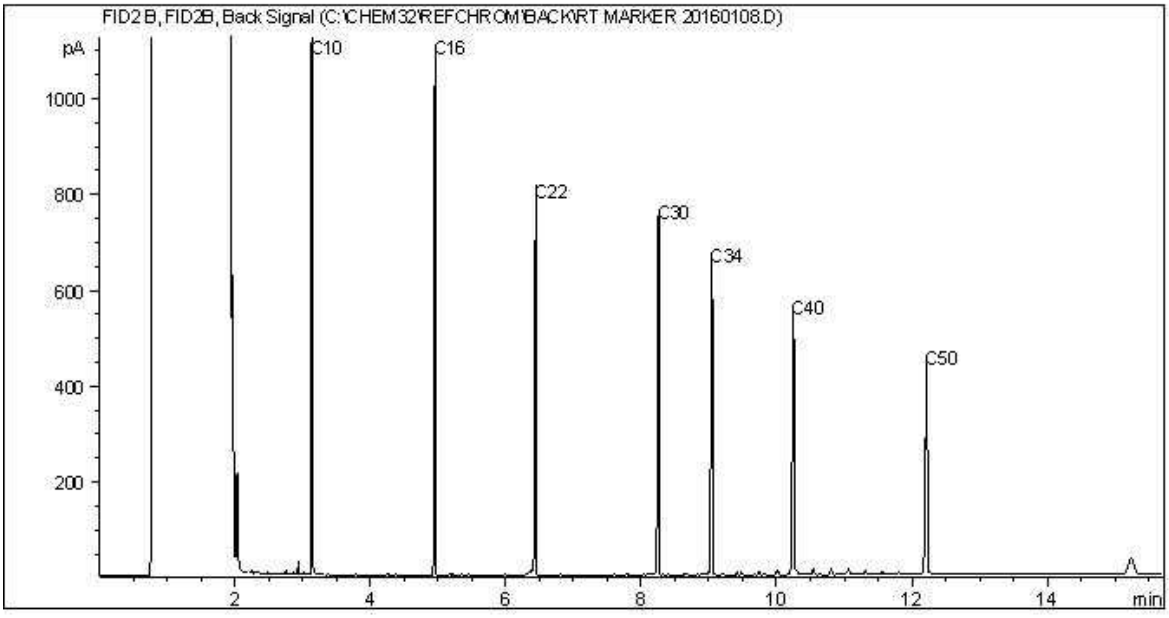
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: 16-C1-29B

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+

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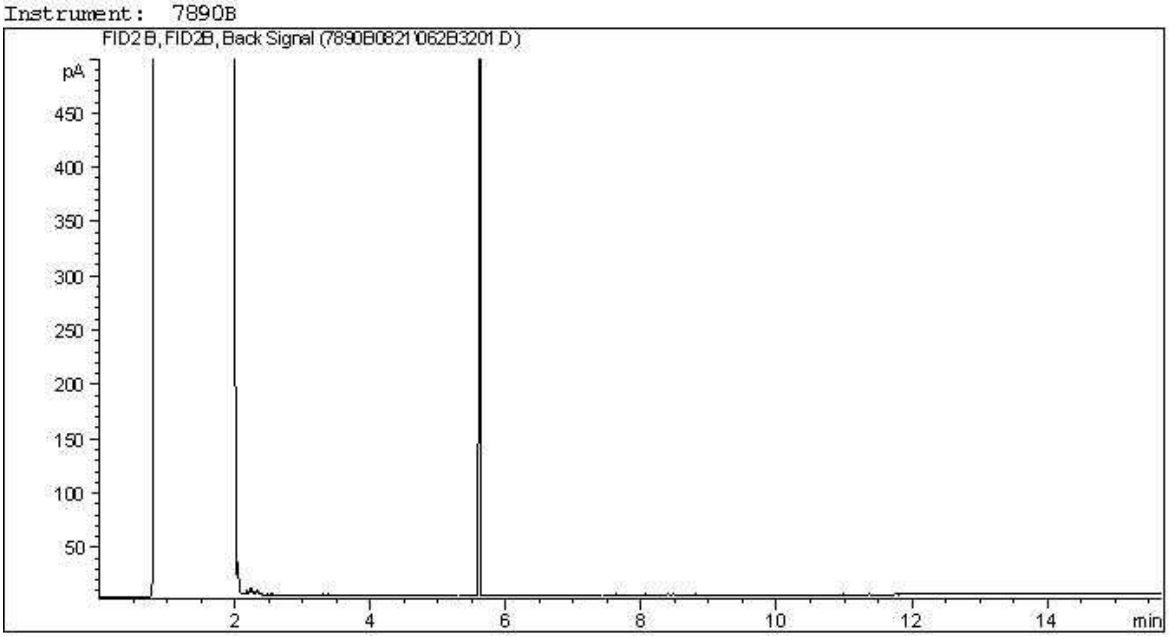
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG6070

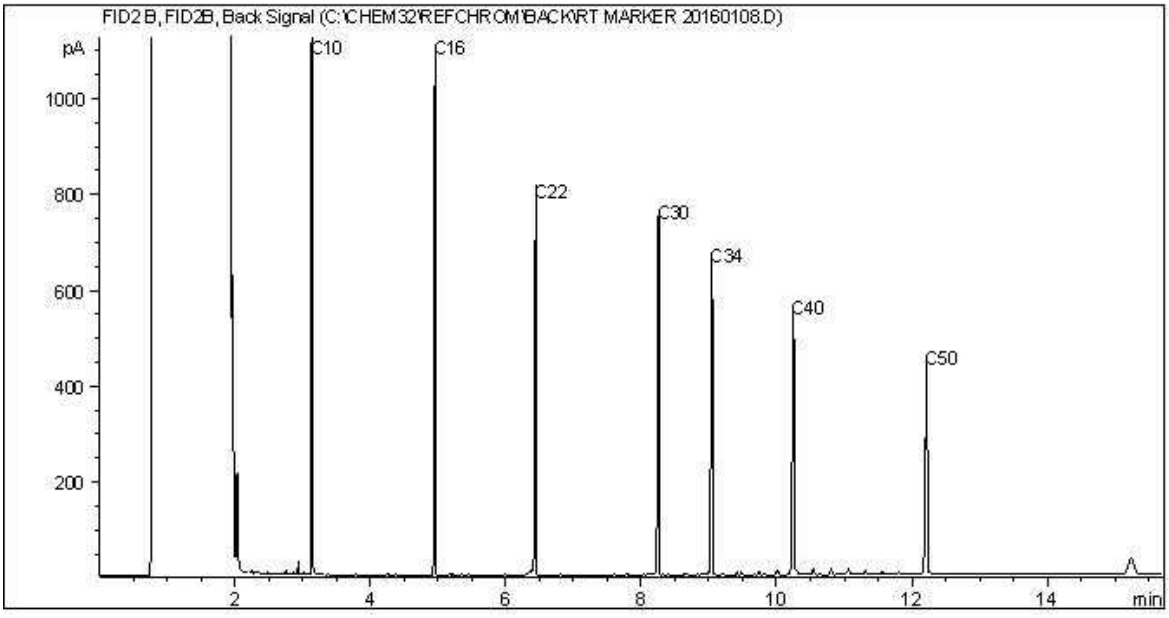
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: 16-C1-30A

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+

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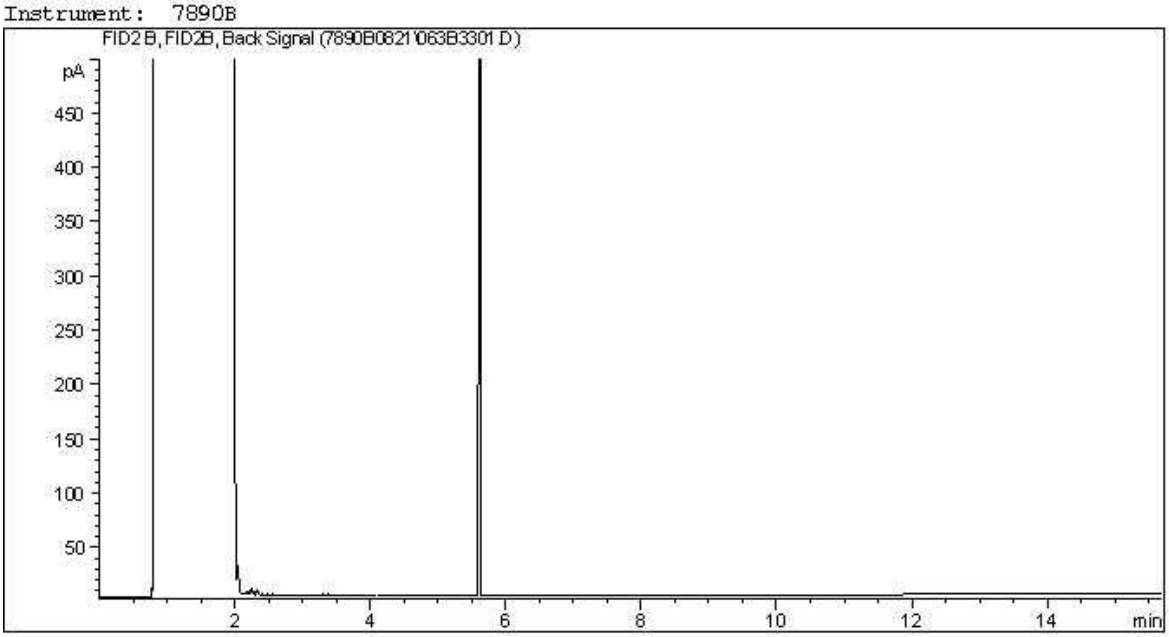
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG6071

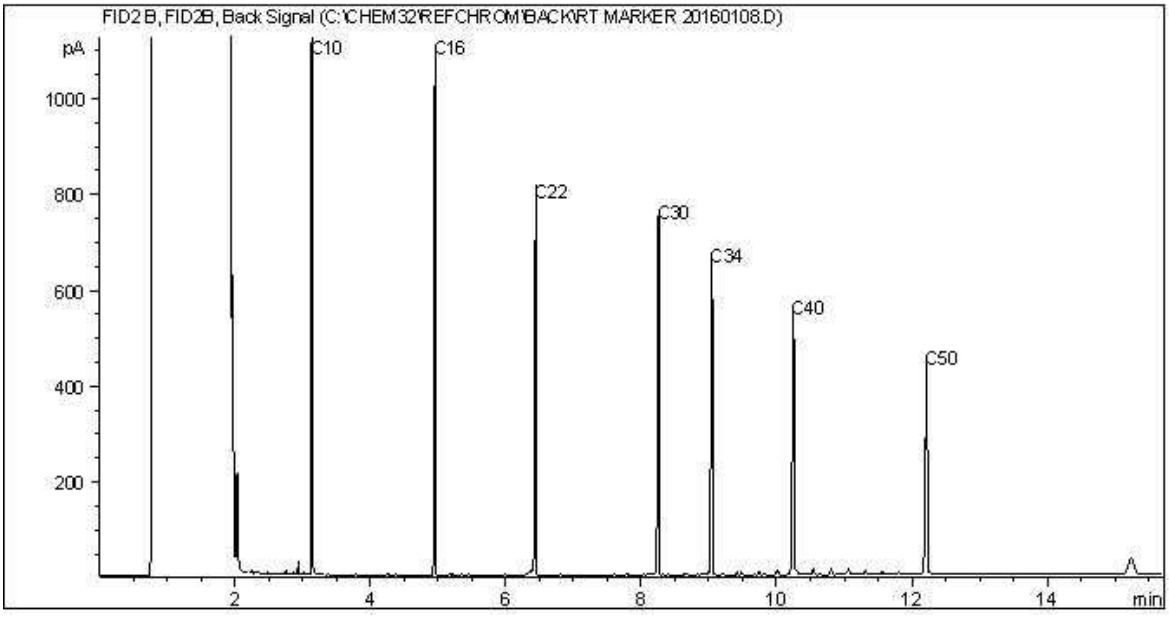
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: 16-C1-30B

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+

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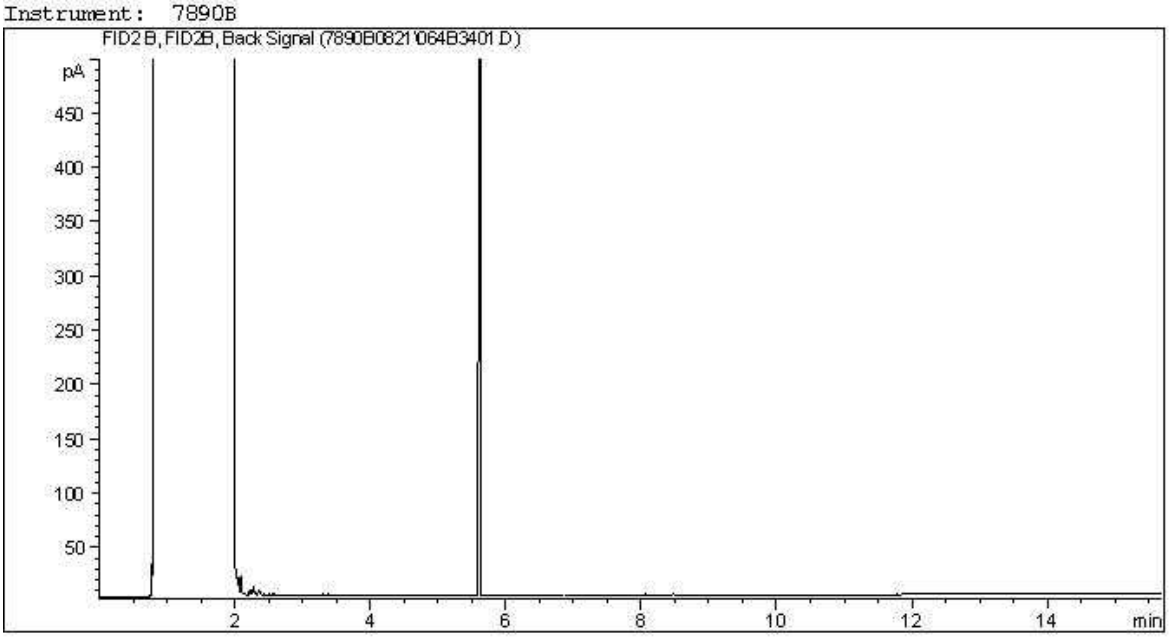
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG6072

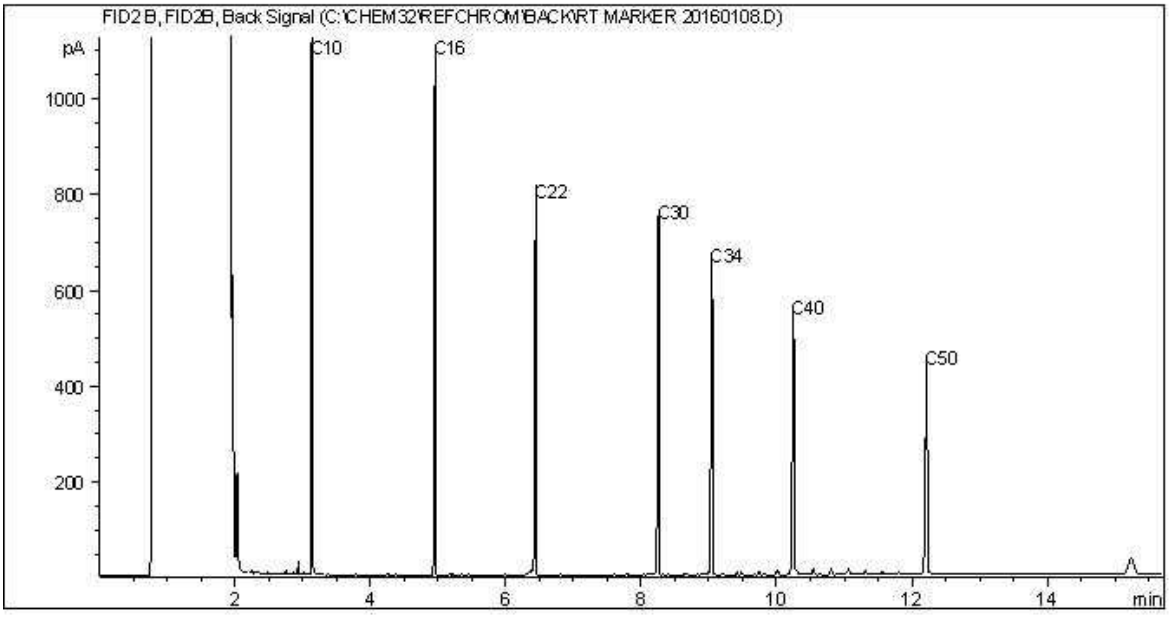
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: 16-C1-31A

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+

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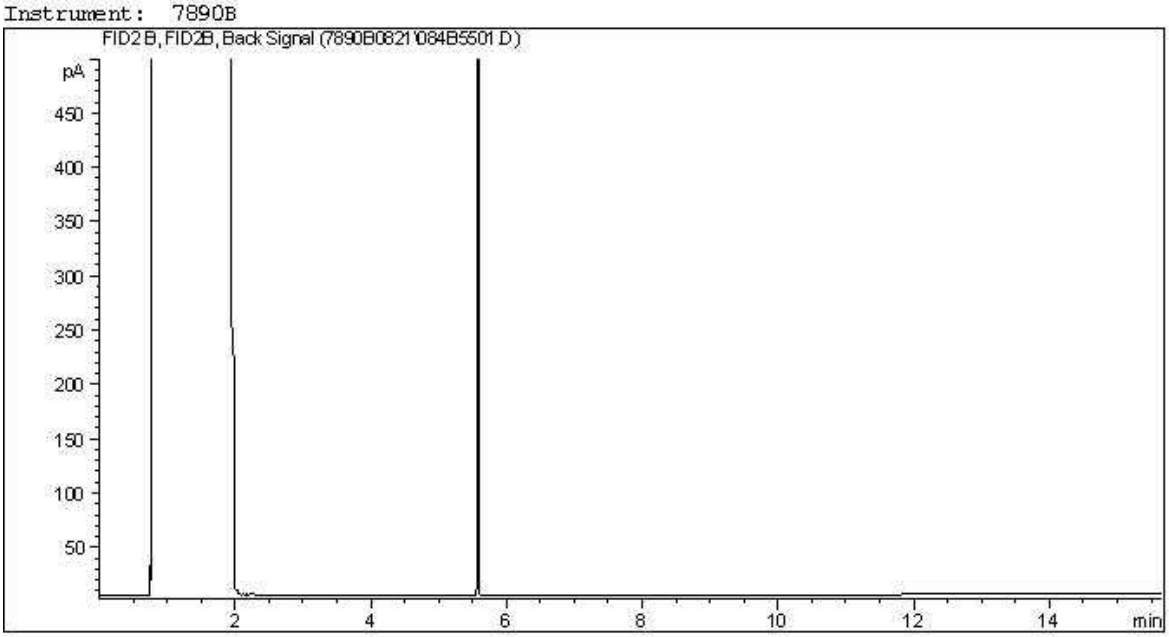
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG6073

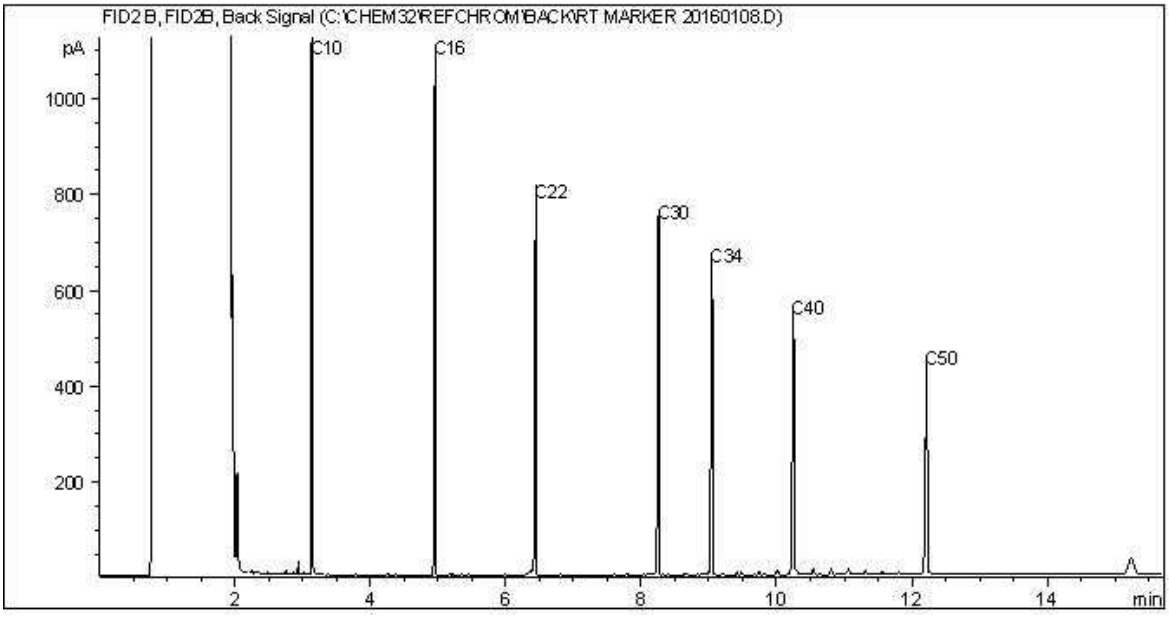
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: 16-C1-31B

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+

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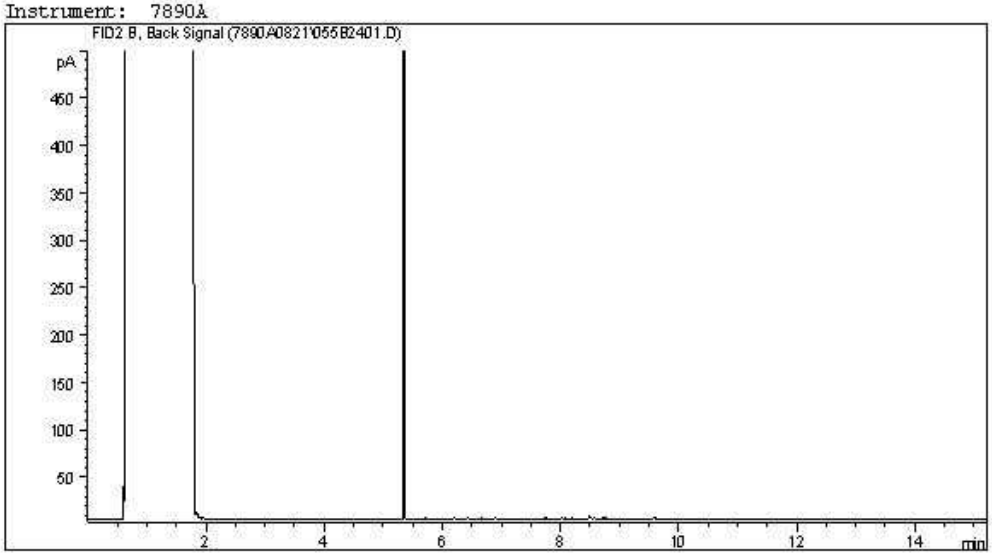
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG6074

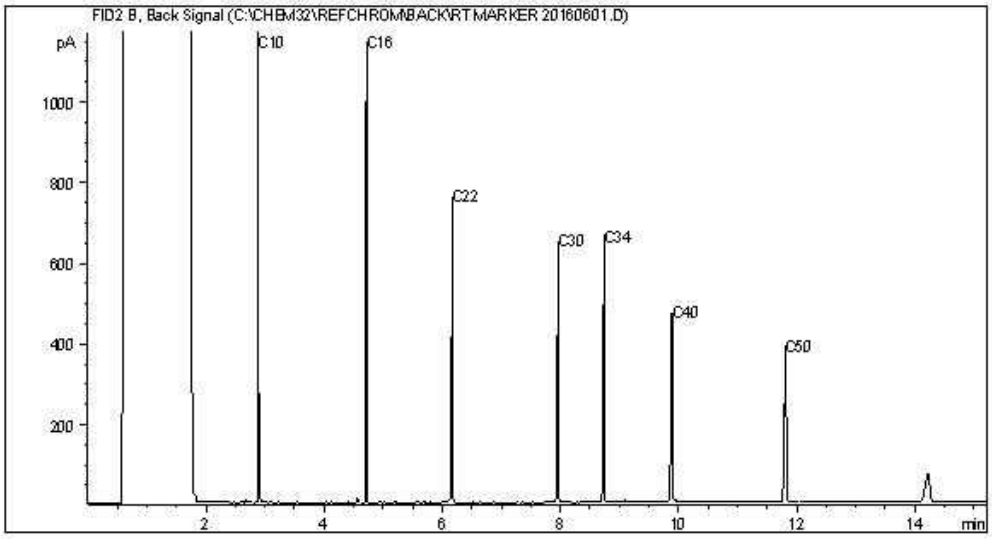
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: 16-C1-32A

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890A



Carbon Range Distribution - Reference Chromatogram



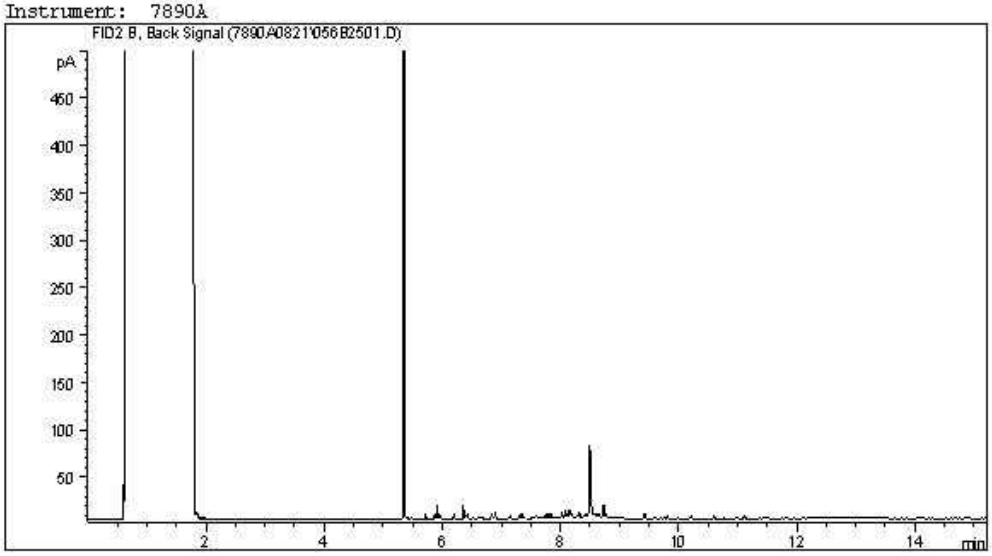
TYPICAL PRODUCT CARBON NUMBER RANGES

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

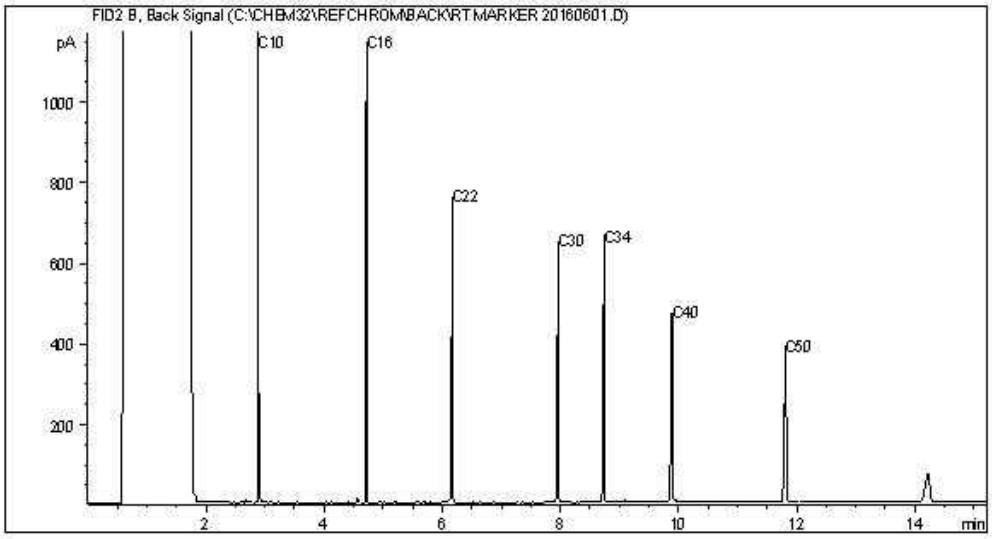
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890A



Carbon Range Distribution - Reference Chromatogram



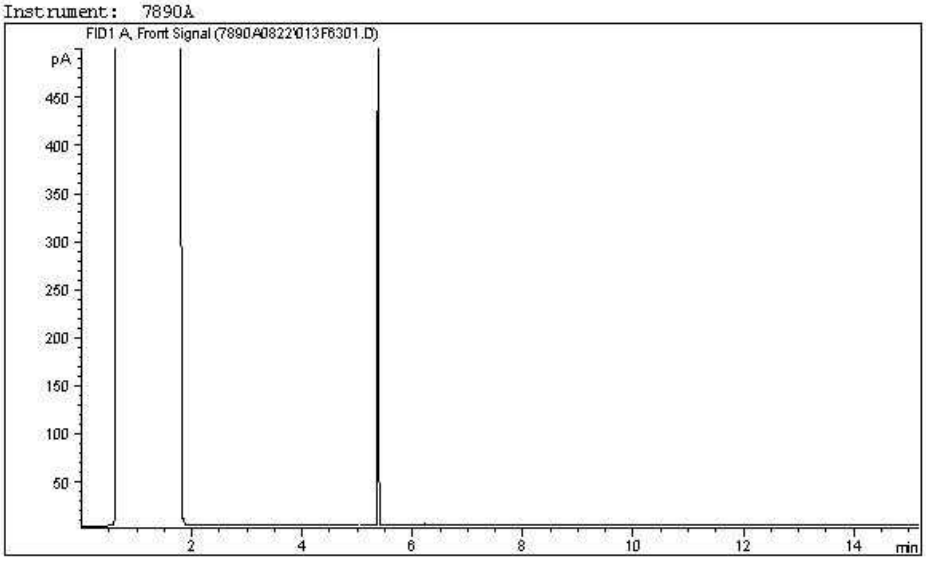
TYPICAL PRODUCT CARBON NUMBER RANGES

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

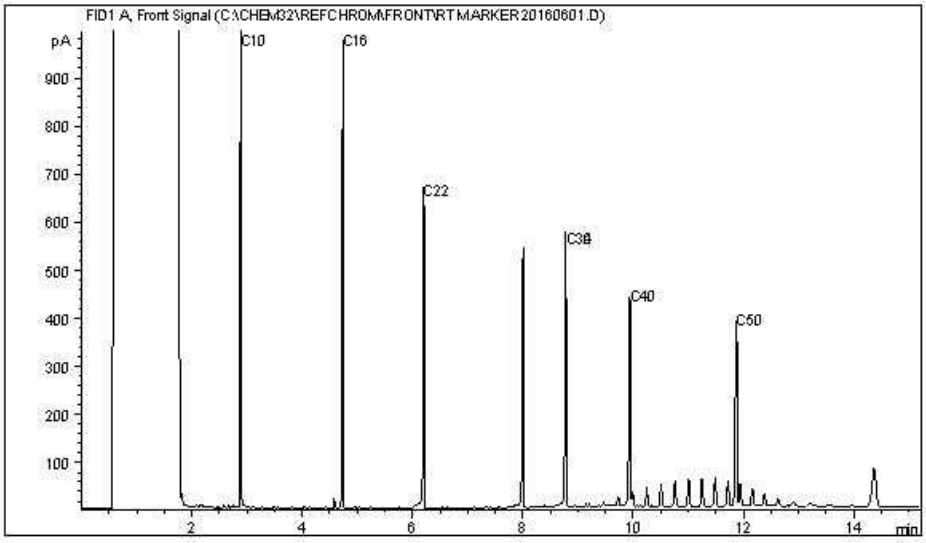
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890A



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+

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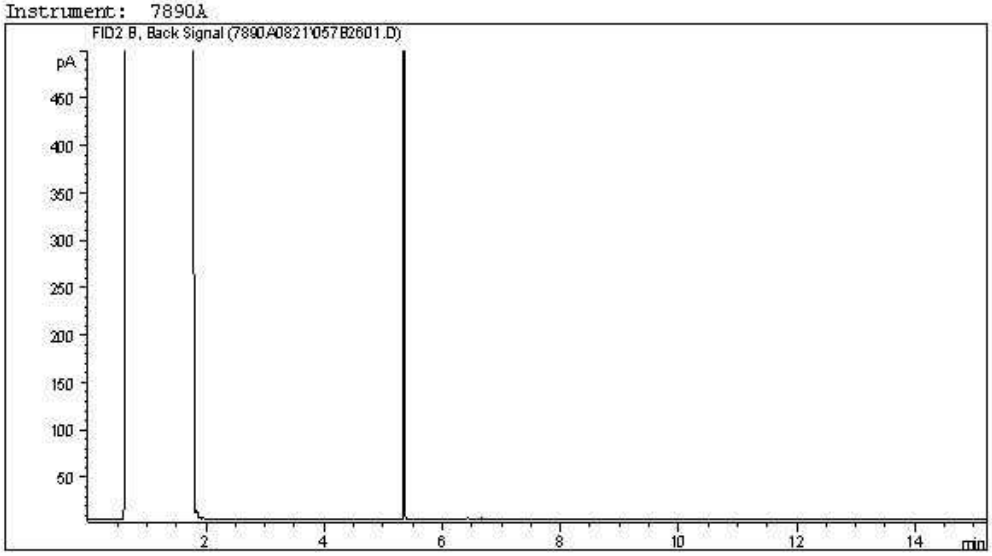
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG6077

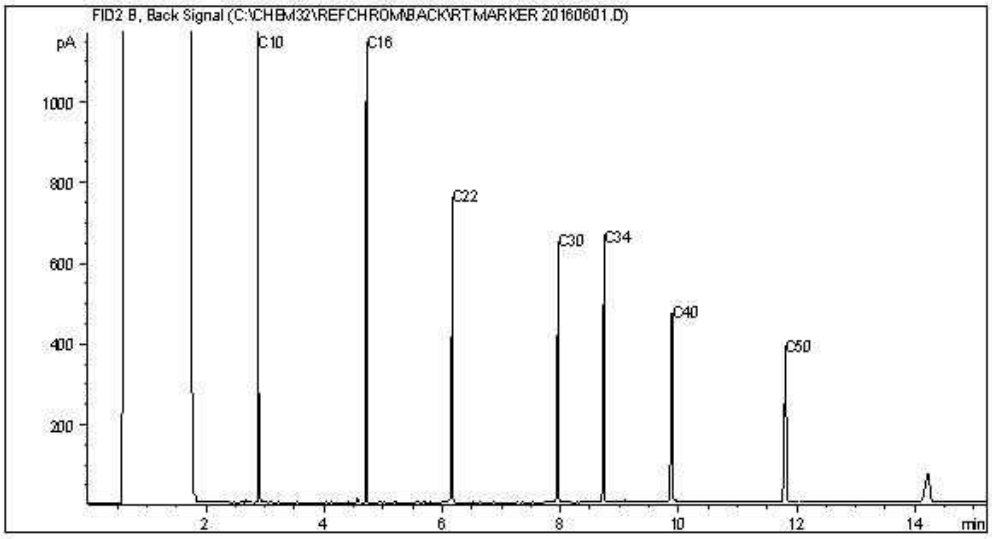
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: 16-C1-33B

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890A



Carbon Range Distribution - Reference Chromatogram



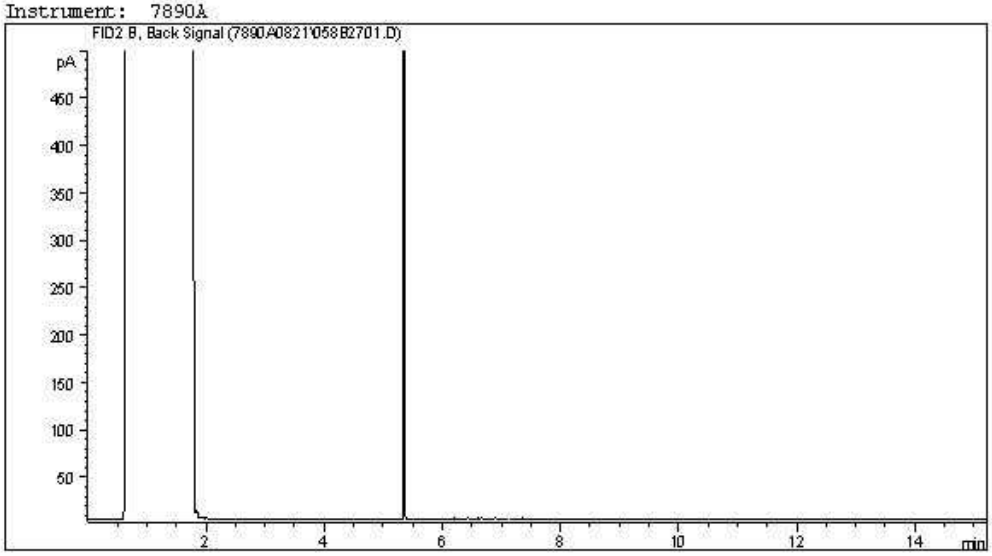
TYPICAL PRODUCT CARBON NUMBER RANGES

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

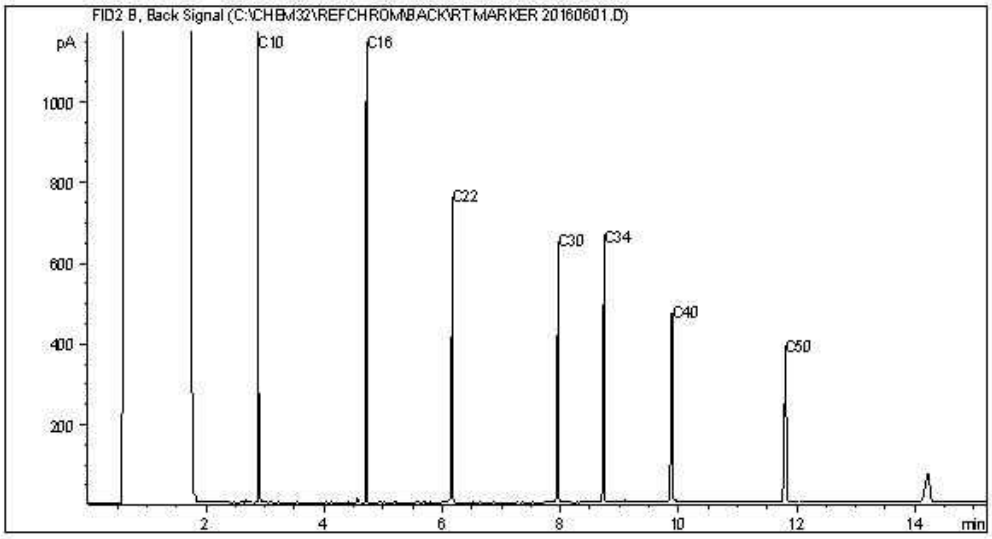
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890A



Carbon Range Distribution - Reference Chromatogram



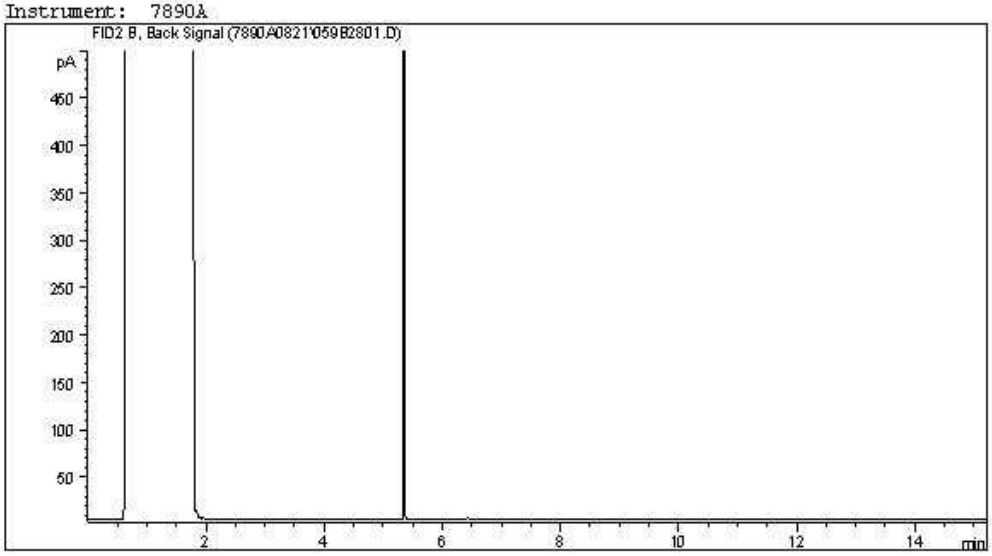
TYPICAL PRODUCT CARBON NUMBER RANGES

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

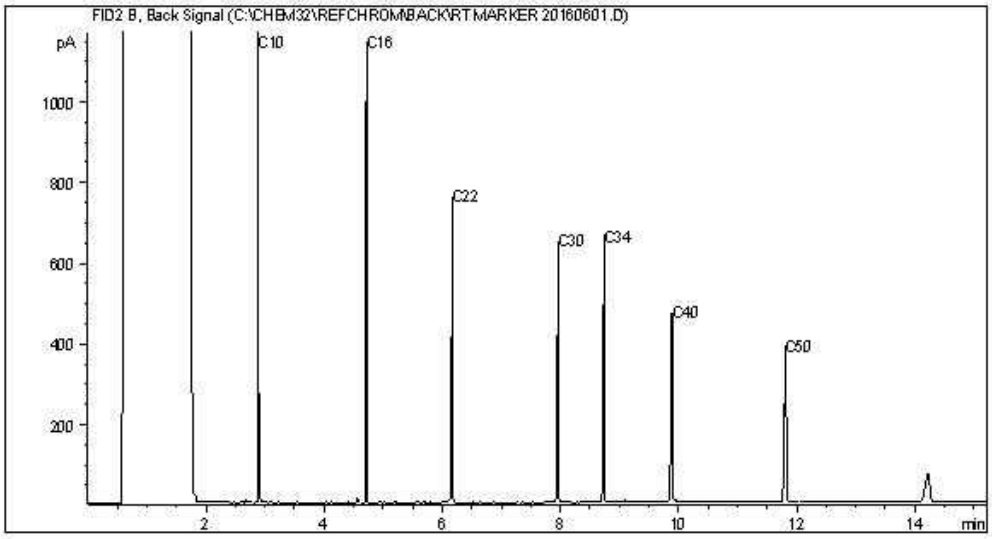
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890A



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+

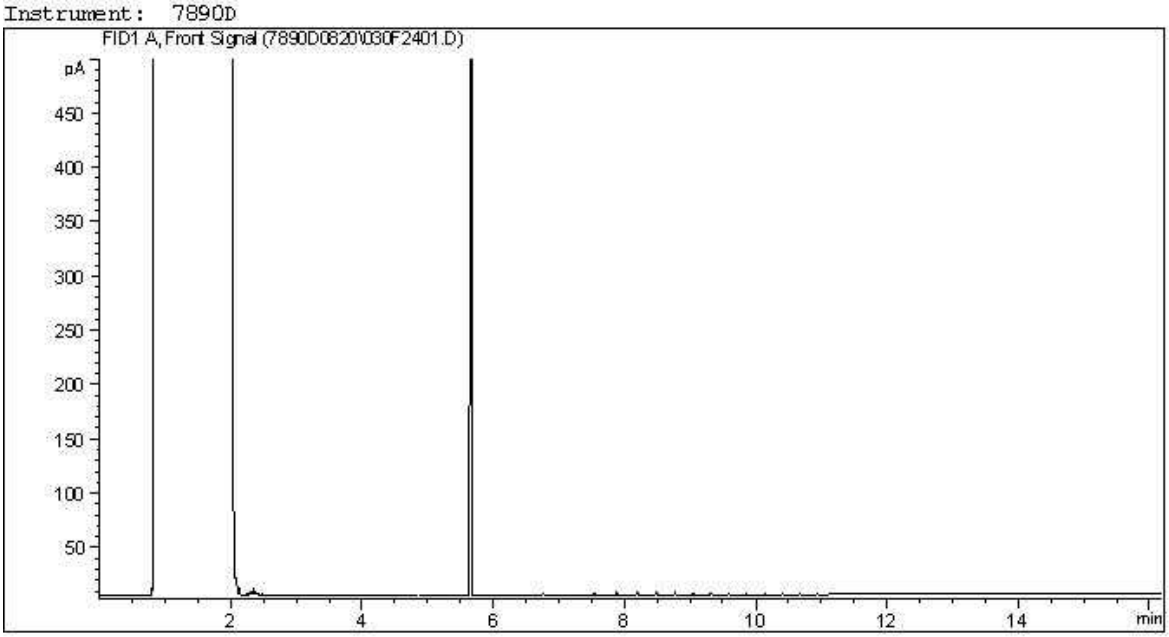
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG6087

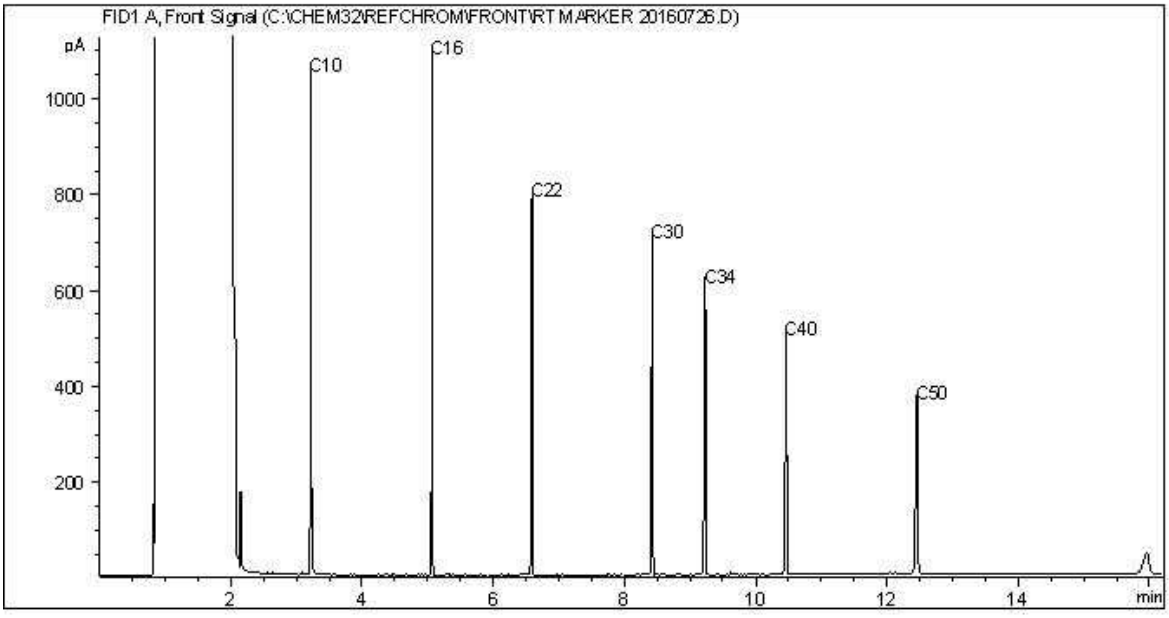
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: C1-DUP1

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890D



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+

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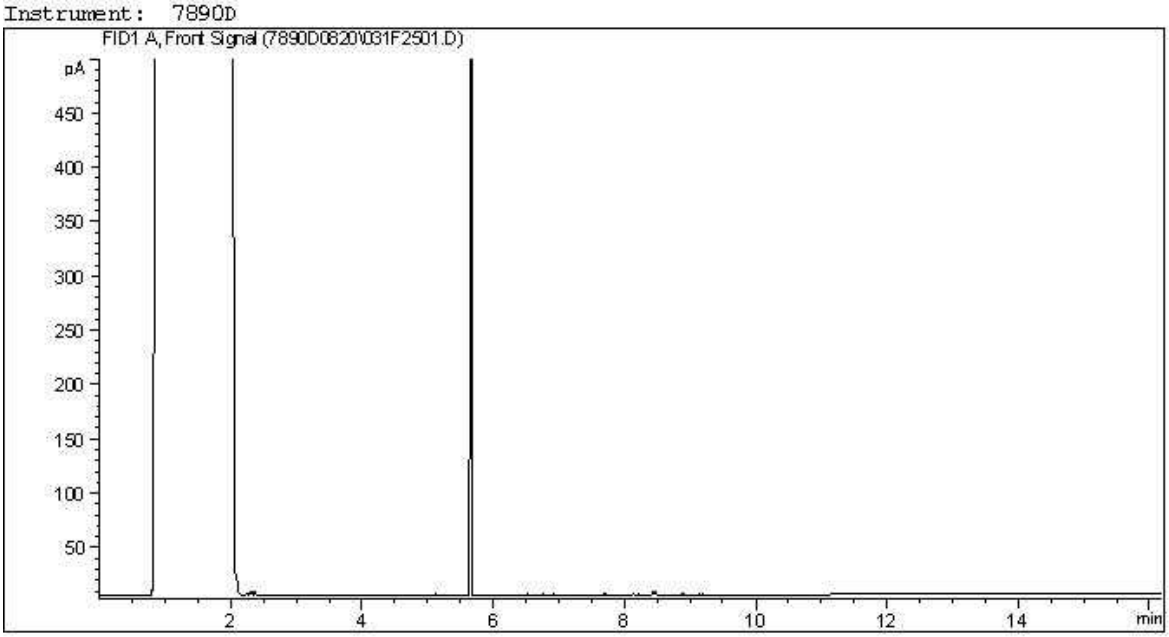
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG6088

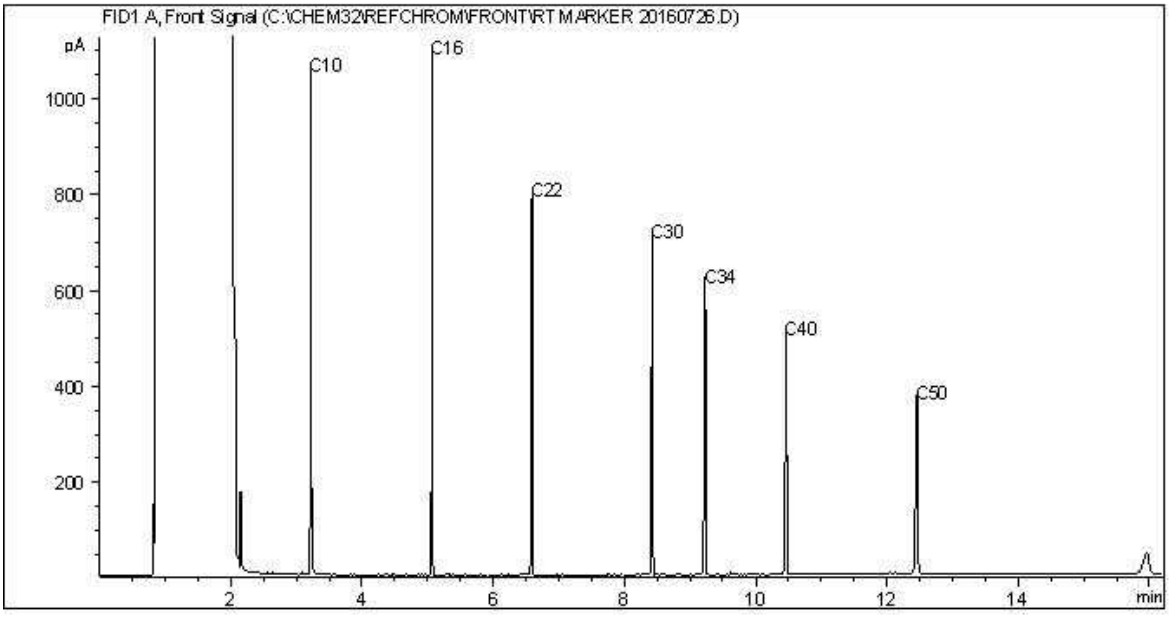
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: C1-DUP2

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890D



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+

Page 1 of 1

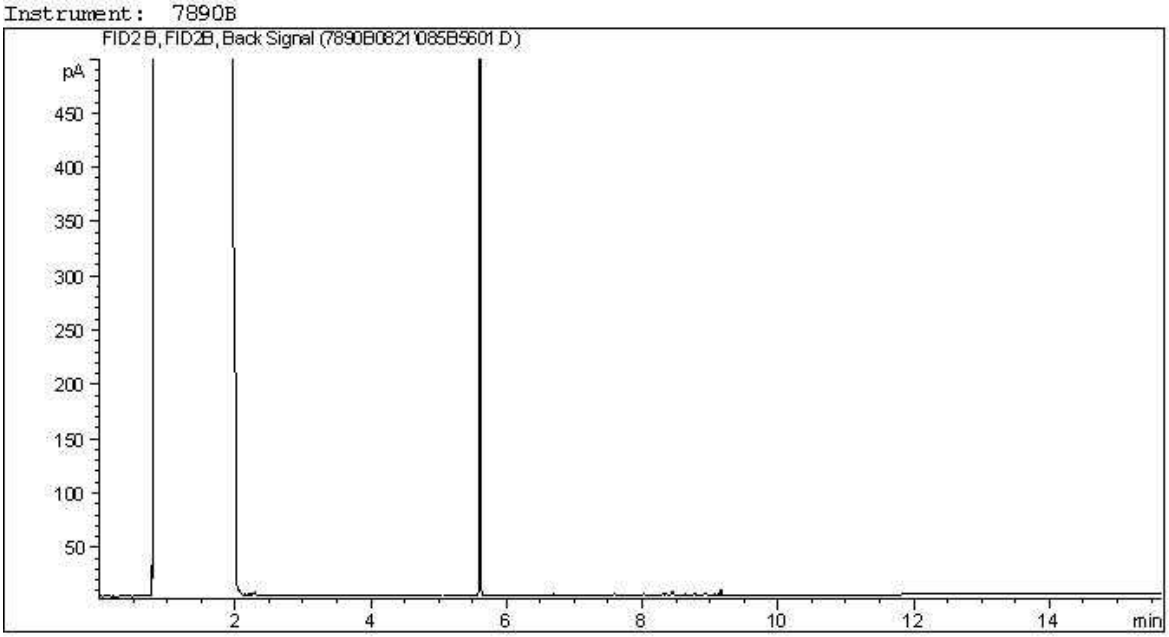
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG6089

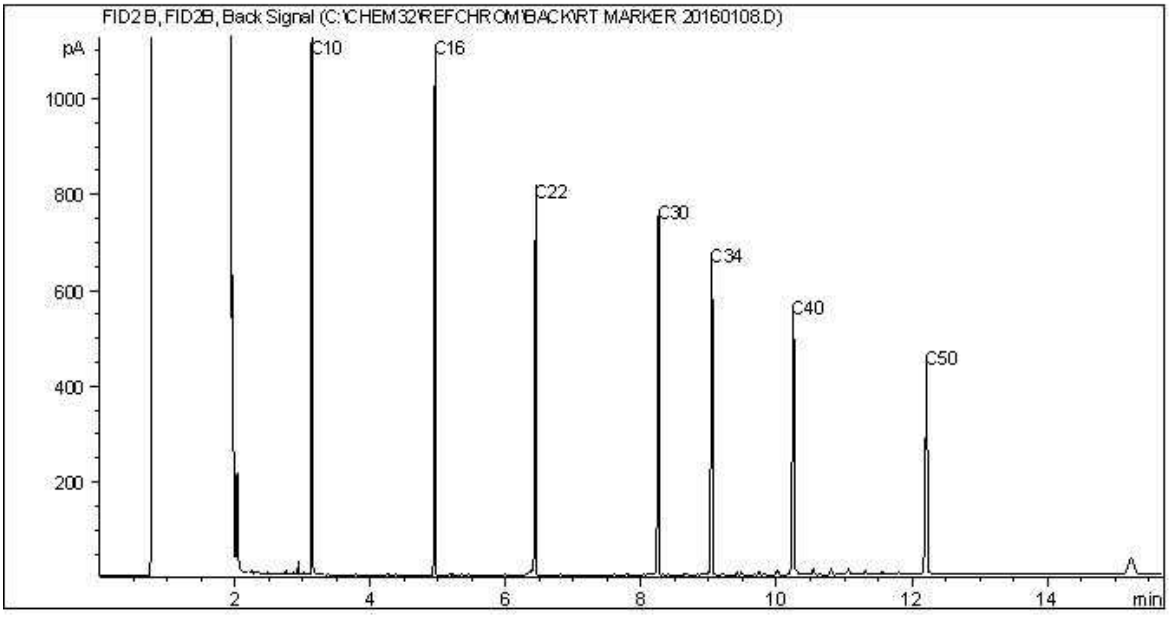
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: C1-DUP3

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+

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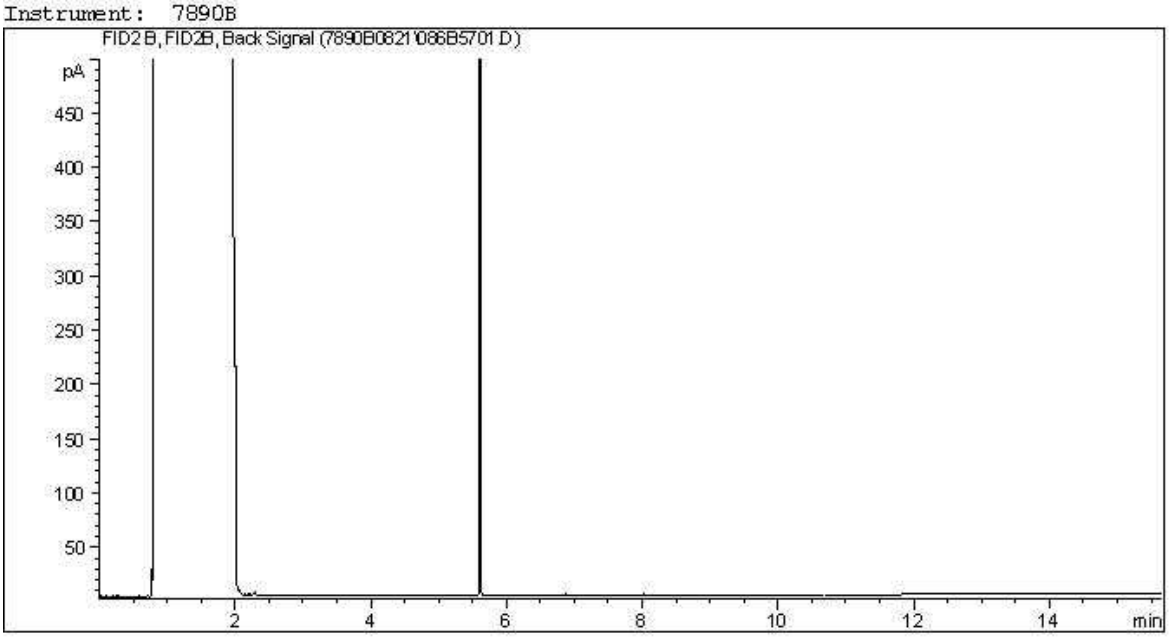
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG6090

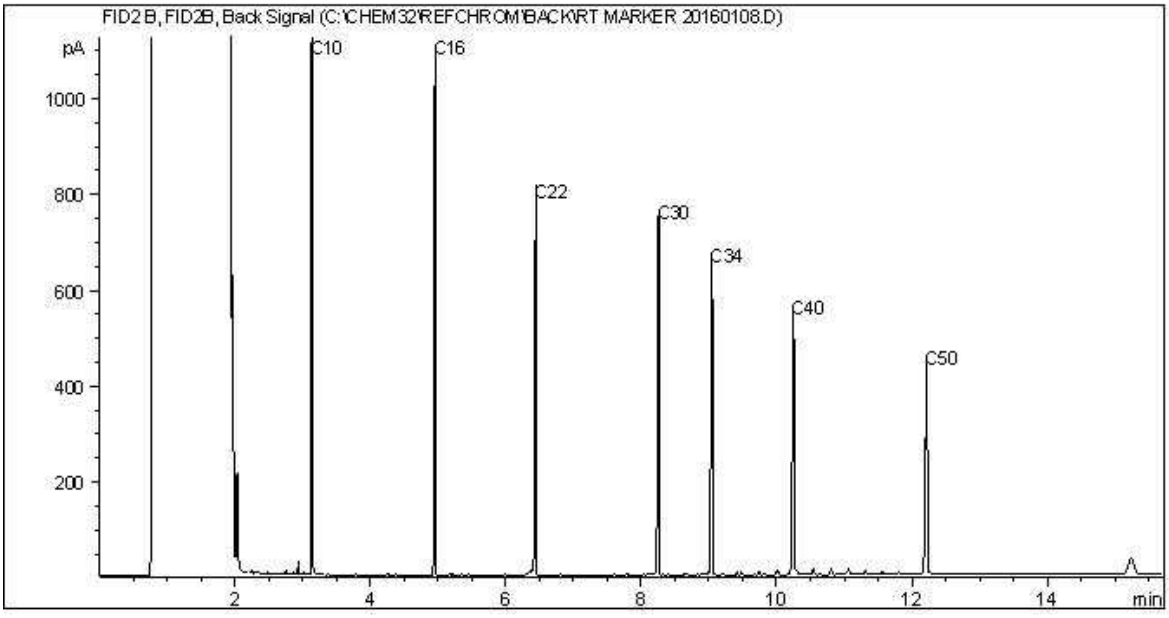
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: C1-DUP4

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+

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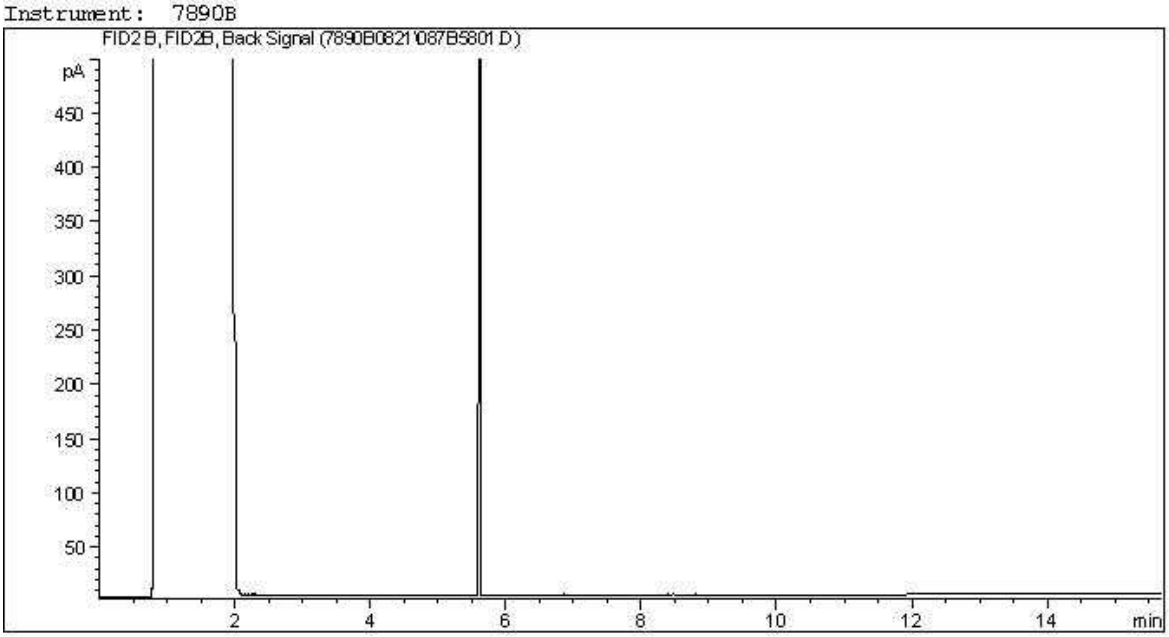
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG6091

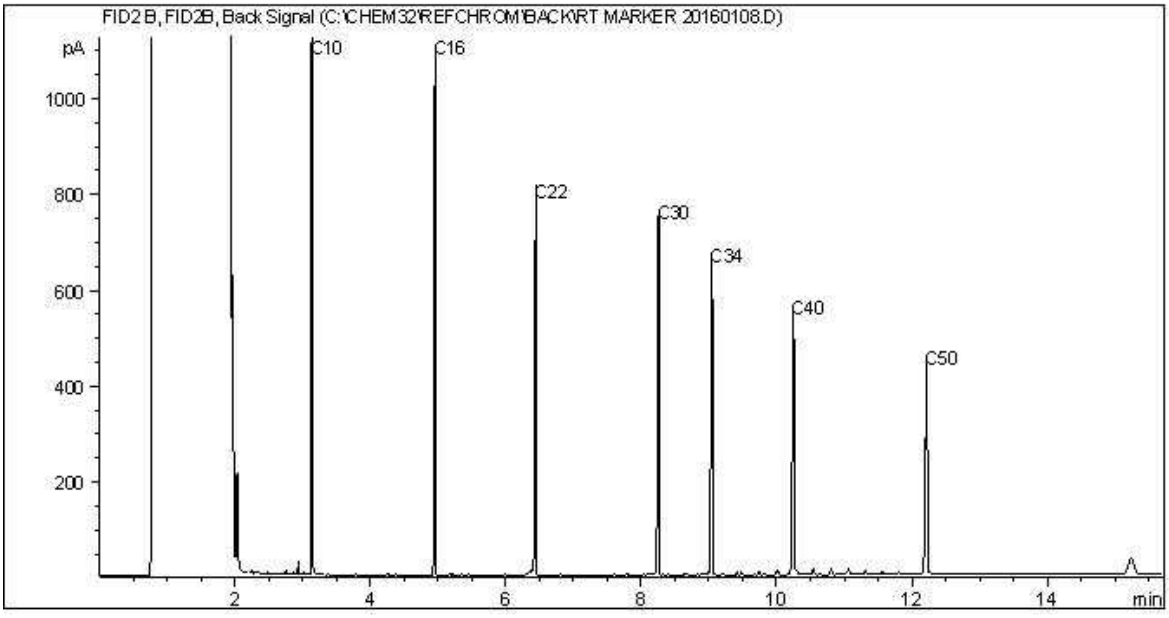
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: C1-DUP5

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+

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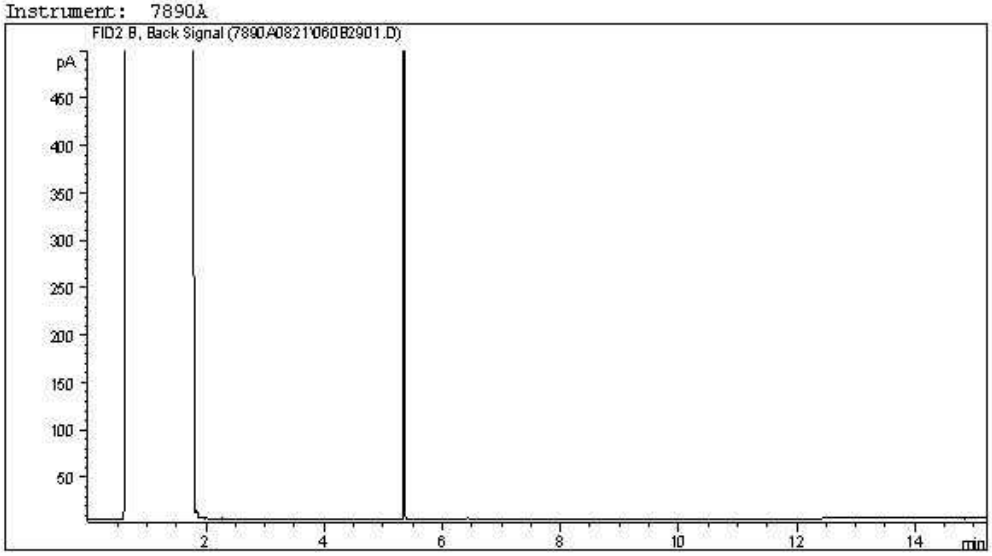
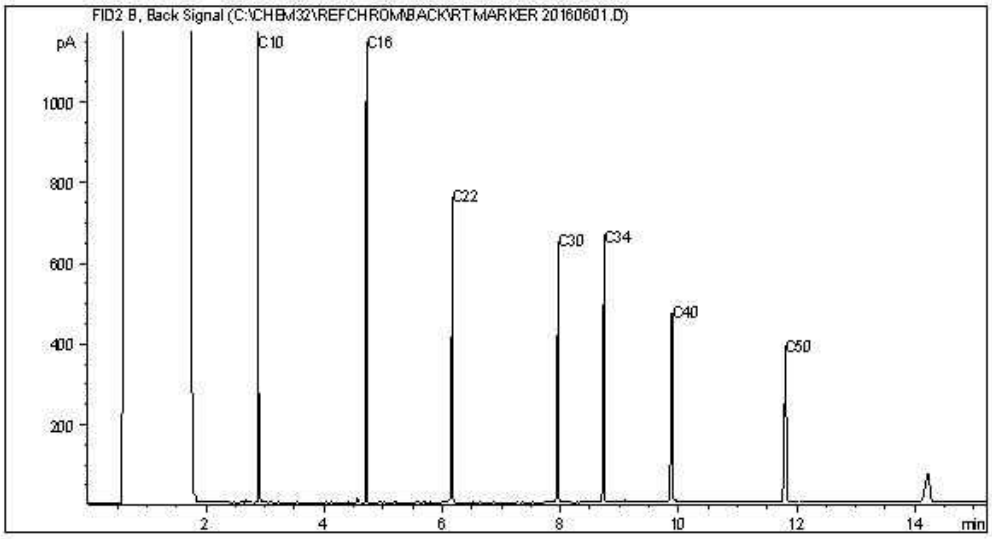
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890A



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+

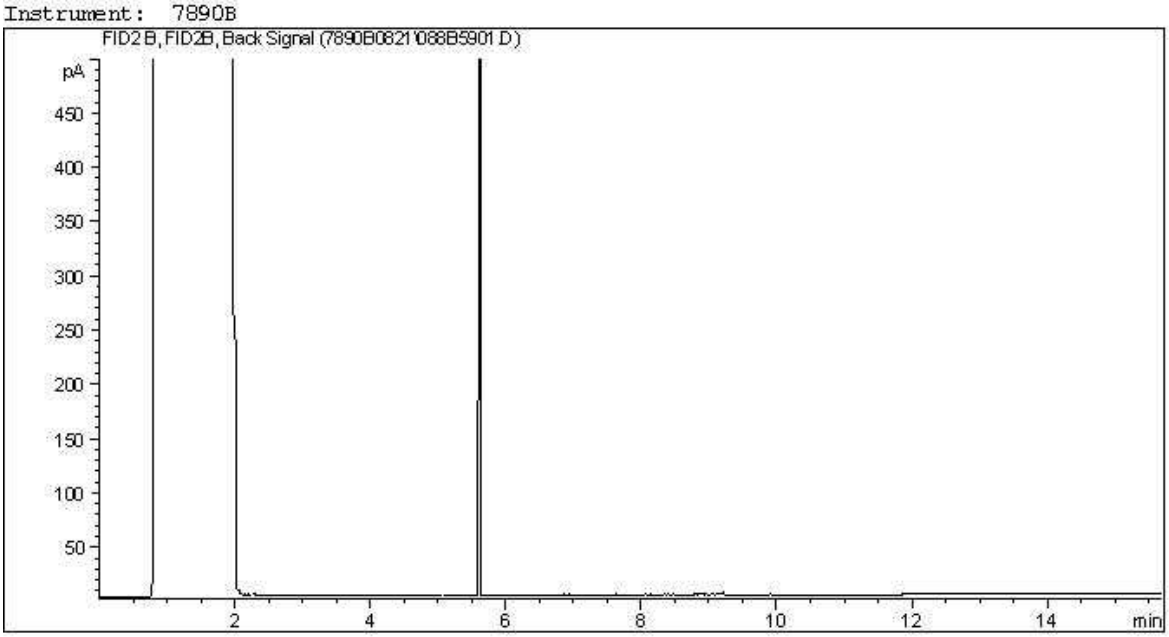
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG6093

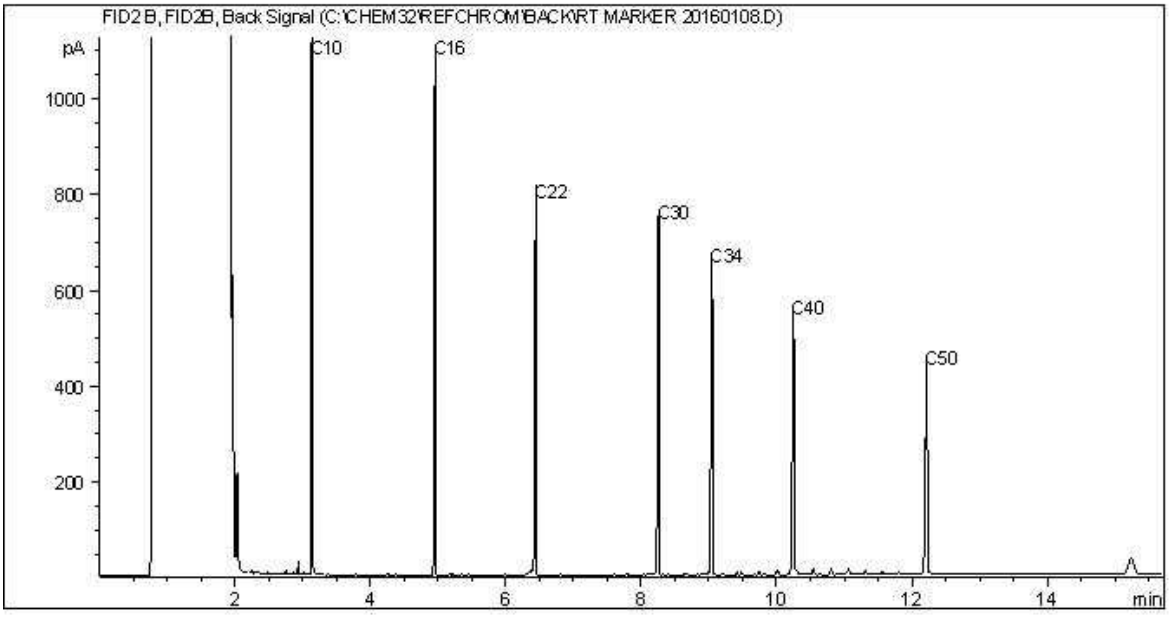
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: C1-DUP7

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+

Page 1 of 1

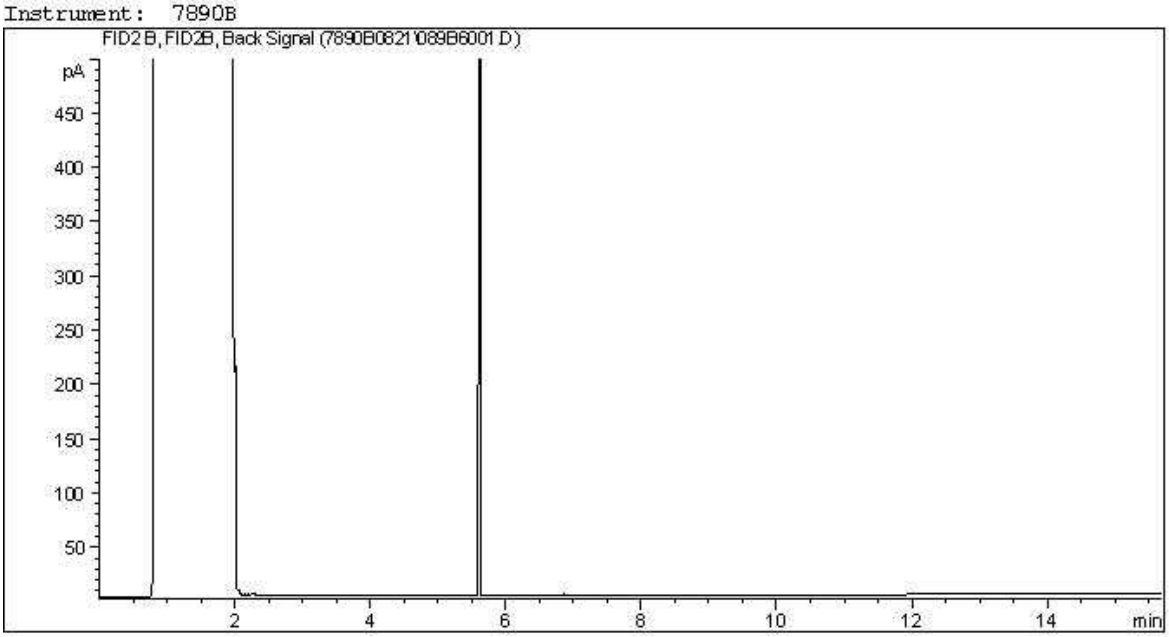
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG6094

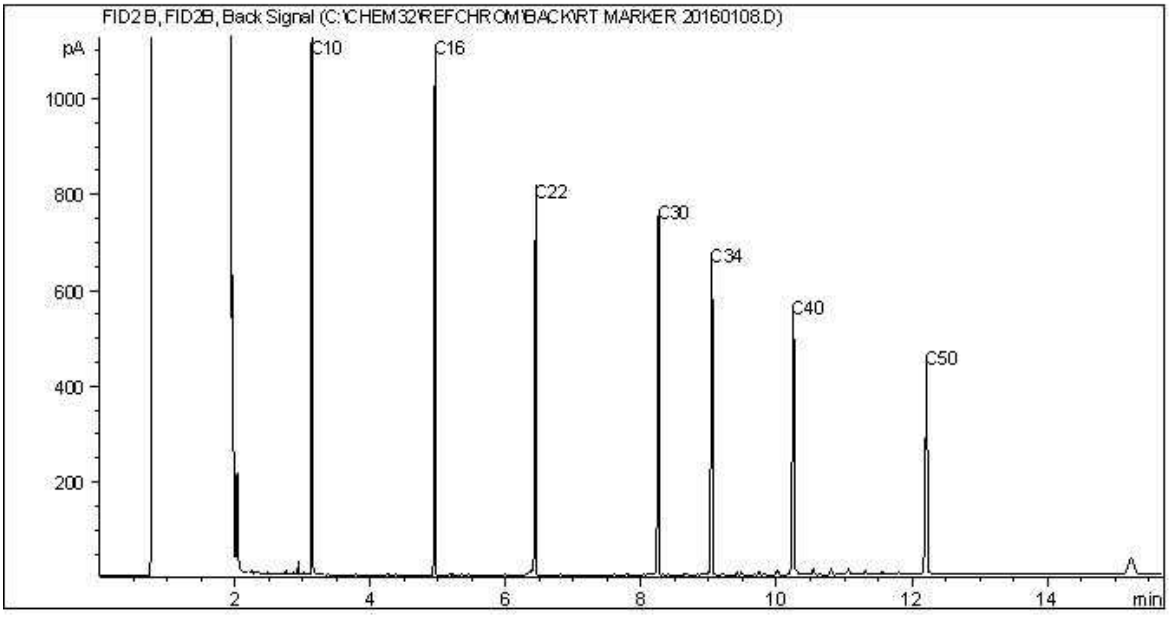
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: C1-DUP8

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+

Page 1 of 1

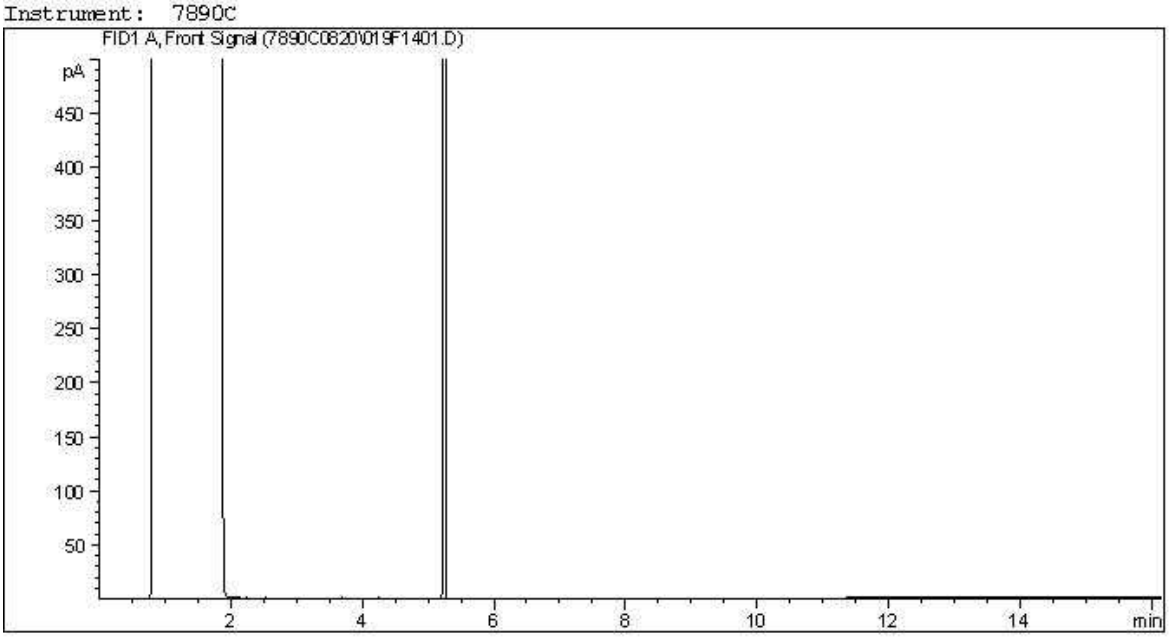
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG6137

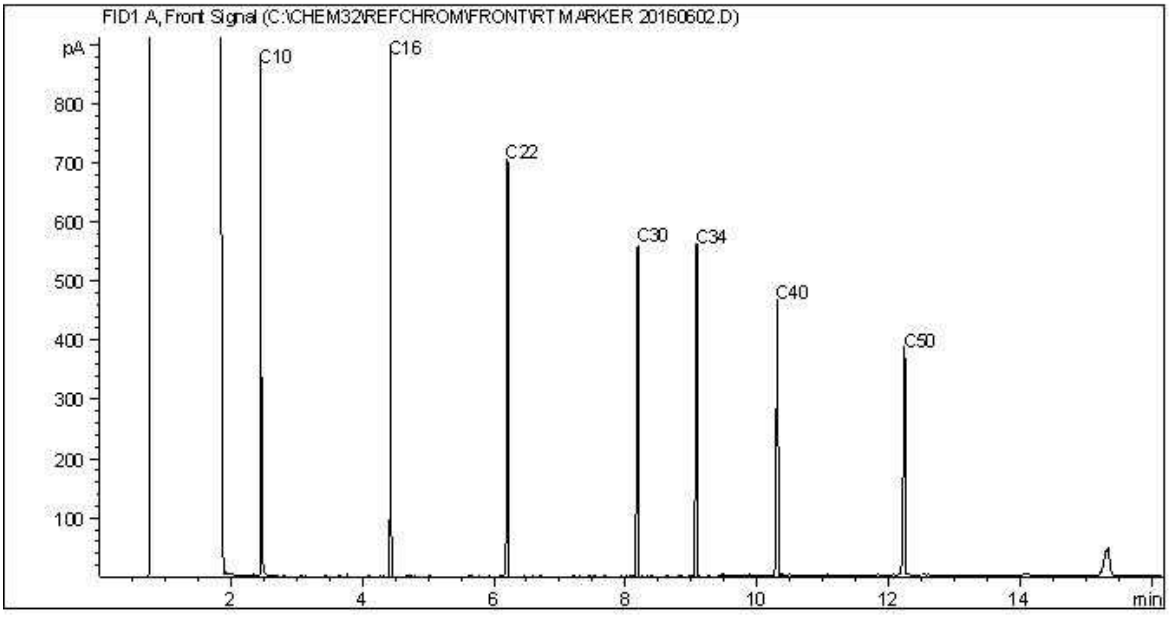
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: C1-MW05

CCME Hydrocarbons (F2-F4 in water) Chromatogram

Instrument: 7890C



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+

Page 1 of 1

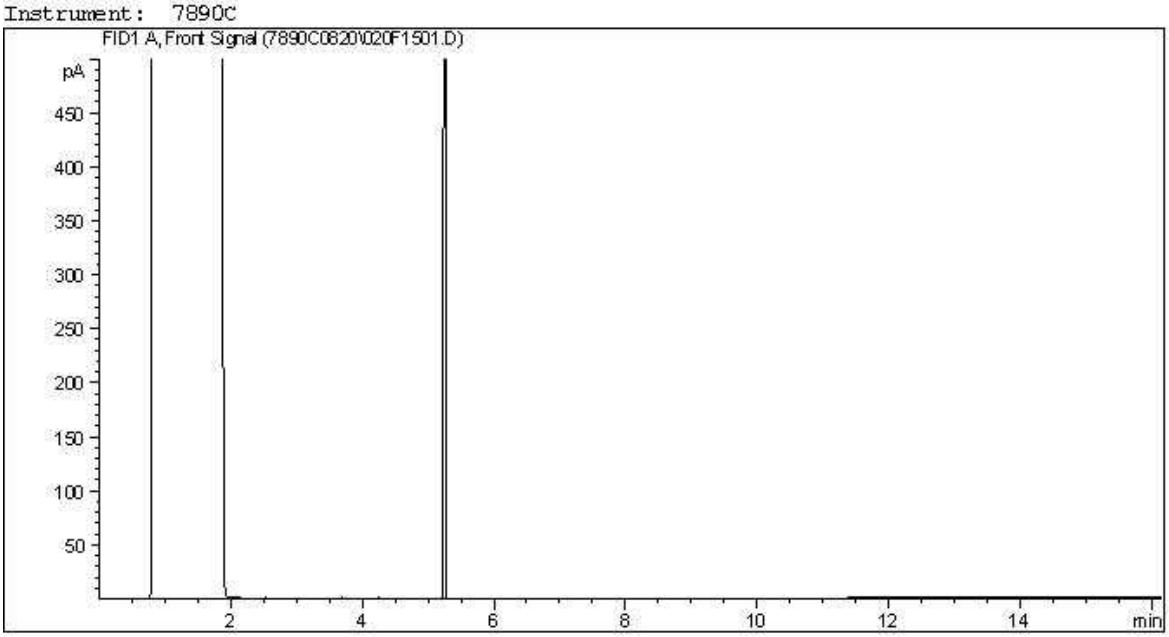
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG6138

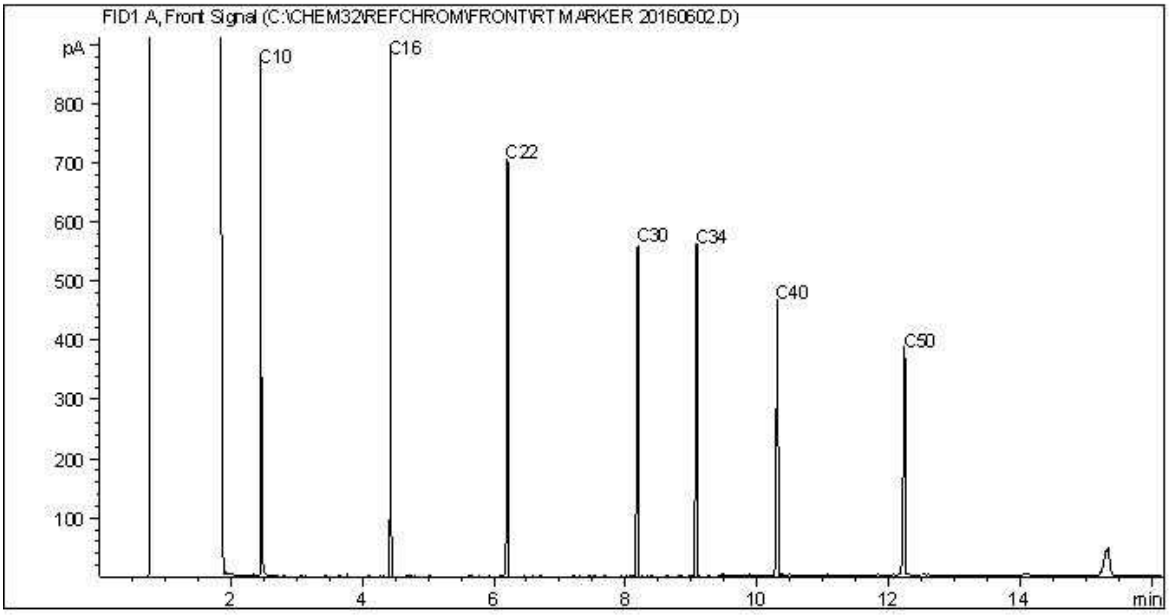
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: C1-MW03

CCME Hydrocarbons (F2-F4 in water) Chromatogram

Instrument: 7890C



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+

Page 1 of 1

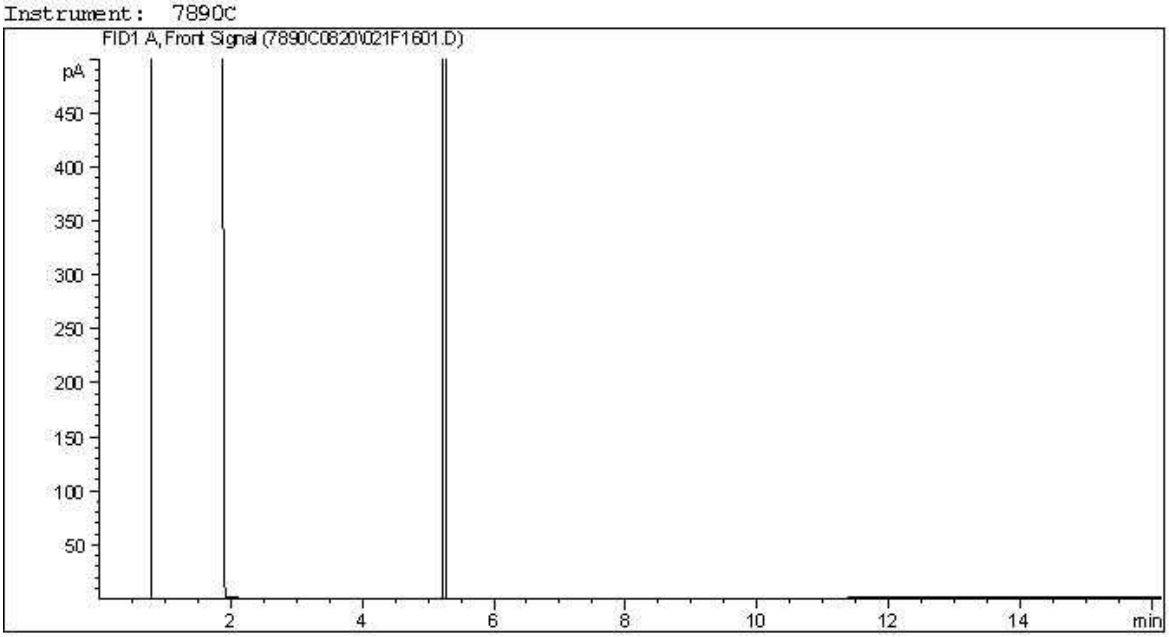
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B668559
Report Date: 2016/09/20
Maxxam Sample: PG6139

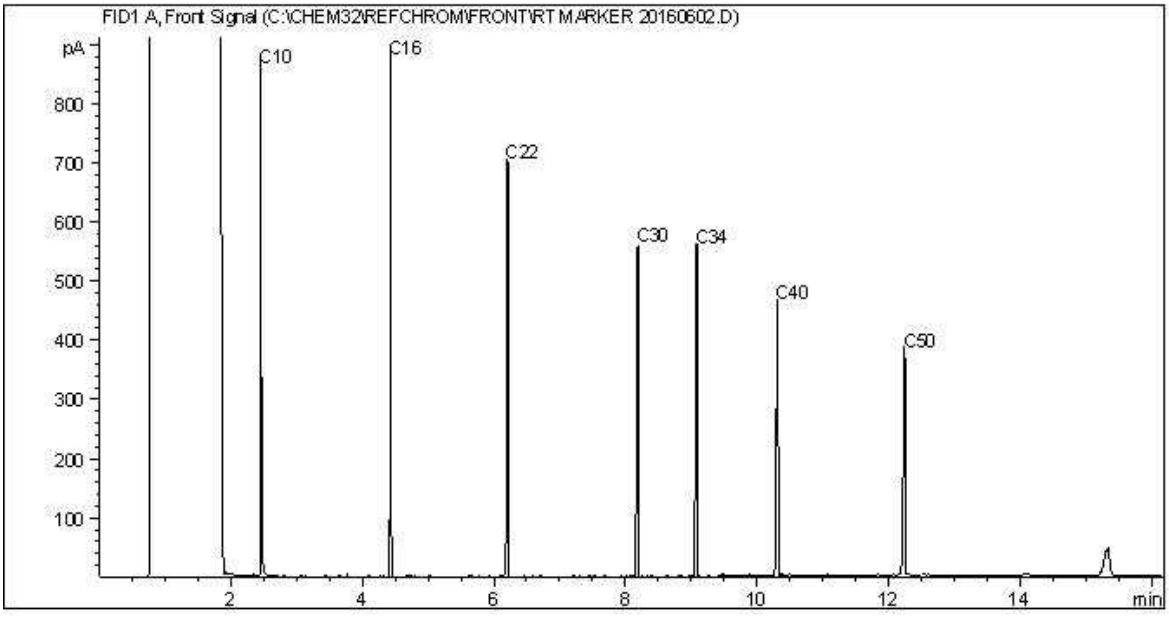
ARCADIS Canada
Client Project #: 102012-000, KITIKMEOT DEW LIN
Client ID: C1-DUP1

CCME Hydrocarbons (F2-F4 in water) Chromatogram

Instrument: 7890C



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+

Page 1 of 1

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

10 - 366493

ALS Environmental

Chain of Custody / Analytical Request Form
Canada Toll Free: 1 800 668 9878
www.alsglobal.com

Page 1 of 1

Report To	**Report Format / Distribution**	**Service Request:** (Rush subject to availability - Contact ALS to confirm TAT)
Company: Arcadis Canada	Standard: Other (specify):	X Regular (Standard Turnaround Times - Business Days)
Contact: Ryan Fletcher	Select: PDF X Excel X Digital Fax	Priority(2-4 Business Days)-50% surcharge - Contact ALS to confirm TAT
Address: 339 Churchill Ave N	Email 1: ryan.fletcher@arcadis.com	Emergency (1-2 Business Days)-100% Surcharge - Contact ALS to confirm TAT
Ottawa Ontario K2L 588	Email 2: andrew.henderson@arcadis.com	Same Day or Weekend Emergency - Contact ALS to confirm TAT
Phone: 613 721-0555 Fax: 613 721 0029		**Analysis Request**
Invoice To Same as Report ? (circle) Yes or No (if No, provide details)	**Client / Project Information**	(Indicate Filtered or Preserved, F/P)
Copy of Invoice with Report? (circle) Yes or No	Job #: 102012-000	
Company: Same	PO / AFE:	
Contact:	LSD:	
Address:		
Phone: Fax:	Quote #:	
Lab Work Order # (lab use only)	**ALS Contact:** **Sampler:** R. Fletcher	

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	PHCs F1/BTEX, F2-F4	PCB's	Metals (CCME)			see notes		PCB's in H2O	Metals (see note)	PHCs F1/BTEX F2-F4		Number of Containers
	16-CI-5A	Aug 9/16	13:00	Soil	X	X	X									5
	16-CI-8A	Aug 9/16	15:30	Soil	X	X	X									5
	16-CI-11A	Aug 10/16	16:00	Soil	X	X	X									5
	16-CI-12A	Aug 10/16	16:45	Soil	X	X	X									5
	16-CI-16A	Aug 10/16	20:00	Soil	X	X	X									5
	16-CI-20B	Aug 11/16	9:00	Soil	X	X	X									5
	16-CI-26A	Aug 11/16	10:30	Soil	X	X	X									5
	16-CI-29A	Aug 11/16	14:30	Soil	X	X	X									5
	CI-MW03	Aug 10/16	14:15	GW								X	X	X		

Special Instructions / Regulation with water or land use (CCME- Freshwater Aquatic Life/BC CSR-Commercial/AB Tier 1-Natural/ETC) / Hazardous Details

Metals Report ONLY arsenic, cadmium, chromium, cobalt, copper, lead, nickel, zinc, mercury / Metals not filtered & NOT preserved — TOTAL Metals req.

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by: Ryan Fletcher	Date: Aug 12/16	Time: 3pm	Received by:	Date:	Time:	Temperature: °C	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION | WHITE - LABORATORY COPY | YELLOW - CLIENT COPY | GENF 18.01 Front

WHITE PAPER CO. 604 951-3900

Maxxam
A Bureau Veritas Group Company

Maxxam Analytics International Corporation o/a Maxxam Analytics
Unit 105 - 349 Old Airport Road, Yellowknife, North West Territories Canada X1A 3X6 Tel:(867) 445-2448 Toll-free:800-563-6266 Fax:(905) 817-5779 www.maxxam.ca

Chain Of Custody Record

INVOICE TO:		Report Information		Project Information		Laboratory Use Only	
Company Name	#3269 ARCADIS Canada	Company Name		Quotation #		Maxxam Job #	Bottle Order #:
Contact Name	ANDREW HENDERSON	Contact Name	Same	P.O. #			501520
Address	329 CHURCHILL AVE NORTH SUITE 2000	Address		Project #	102012-000, Kitikmeot DEW Lin	Chain Of Custody Record	Project Manager
	OTTAWA ON K1Z 5B8			Project Name		C#501520-01-01	Parminder Virk
Phone	(613) 721-0555 Fax: (613) 721-0029	Phone	Fax:	Site #	CAM 1 Junny Lind Island		
Email	ahenderson@franzenvironmental.com, andrew.henders	Email		Sampled By			

Regulatory Criteria

Special Instructions

Note: For regulated drinking water samples - please use the Drinking Water Chain of Custody Form

Samples must be kept cool (< 10°C) from time of sampling until delivery to maxxam

Analysis Requested

Turnaround Time (TAT) Required

Please provide advance notice for rush projects

Regular (Standard) TAT
(will be applied if Rush TAT is not specified)
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: _____ Time Required: _____
Rush Confirmation Number _____ *(call lab for #)*

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Regulated Drinking Water ? (Y / N)	Metals Field Filtered ? (Y / N)	AT1 BTEX and F1-F4 in Soil	Polychlorinated Biphenyls	Elements by ICPMS - Soils	arsenic, cadmium, chromium, cobalt, copper, lead, mickel, zinc, and mercury	Total Hexavalent Chromium	Mercury - Low Level (Total)	AT1 BTEX and F1-F4 in Water	PCB WATER			# of Bottles	Comments
1		16-C1-1A	Aug 9/16	14:15	Soil			X	X		X							4	
2		16-C1-1B		14:15				X	X		X							4	Metals in
3		16-C1-2A		14:00				X	X		X							4	Soils
4		16-C1-2B		14:00				X	X		X							4	Lab
5		16-C1-3A		13:30				X	X		X							4	Types
6		16-C1-3B		13:30				X	X		X							4	
7		16-C1-4A		13:15				X	X		X							4	Labs NOT
8		16-C1-4B		13:15				X	X		X							4	Leeds
9		16-C1-5A		13:00				X	X		X							4	
10		16-C1-5B		13:00				X	X		X							4	

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Lab Use Only: Time Sensitive	Temperature (°C) on Receipt	Custody Seal Intact on Cooler?
Ryan Fichter	Aug 10/16	13:00					☐		☐ Yes ☐ No

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

White: Maxxam Yellow: Client

Maxxam Analytics International Corporation o/a Maxxam Analytics
Unit 105 - 349 Old Airport Road, Yellowknife, North West Territories Canada X1A 3X6 Tel:(867) 445-2448 Toll-free:800-563-6266 Fax:(905) 817-5779 www.maxxam.ca

Chain Of Custody Record

INVOICE TO:		Report Information		Project Information		Laboratory Use Only	
Company Name	#3269 ARCADIS Canada	Company Name		Quotation #		Maxxam Job #	Bottle Order #:
Contact Name	ANDREW HENDERSON	Contact Name	Same	P.O. #			501520
Address	329 CHURCHILL AVE NORTH SUITE 2000	Address		Project #	102012-000, Kitikmeot DEW Lin	Chain Of Custody Record	Project Manager
	OTTAWA ON K1Z 5B8			Project Name		C#501520-03-01	Parminder Virk
Phone	(613) 721-0555 Fax: (613) 721-0029	Phone	Fax:	Site #	CAM 1 Junny Lind Island		
Email	ahenderson@franzenvironmental.com, andrew.henders	Email	ryan.fletcher@arcadis.com	Sampled By	R. Fletcher		

Regulatory Criteria

Special Instructions

Note: For regulated drinking water samples - please use the Drinking Water Chain of Custody Form

Samples must be kept cool (< 10ºC) from time of sampling until delivery to maxxam

Analysis Requested

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Regulated Drinking Water ? (Y / N)	Metals Field Filtered ? (Y / N)	AT1 BTEX and F1-F4 in Soil	Polychlorinated Biphenyls	Elements by ICPMS - Soils	arsenic, cadmium, chromium, cobalt, copper, lead, mickel, zinc, and mercury	Total Hexavalent Chromium	Mercury - Low Level (Total)	AT1 BTEX and F1-F4 in Water	PCB WATER			# of Bottles	Comments
1		16-C1-6A	Aug 9/16	16:30	Soil			X	X		X							4	
2		16-C1-6B		16:30				X	X		X							4	Metals in
3		16-C1-7A		15:00				X	X		X							4	only
4		16-C1-7B		15:00				X	X		X							4	
5		16-C1-8A		15:30				X	X		X							4	1 jar
6		16-C1-8B		15:30				X	X		X							4	3 jars
7		16-C1-9A		16:00				X	X		X							4	
8		16-C1-9B		16:00				X	X		X							4	
9		16-C1-10A	Aug 10/16	17:30				X	X		X							4	Lids are not
10		16-C1-10B	Aug 10/16	17:30				X	X		X							4	labels

Turnaround Time (TAT) Required

Please provide advance notice for rush projects

Regular (Standard) TAT [X]

(will be applied if Rush TAT is not specified)

Standard TAT = 5-7 Working days for most tests.

Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)

Date Required: _____ Time Required: _____

Rush Confirmation Number _____ *(call lab for #)*

* * RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
Ryan Fletcher	Aug 10/16	13:00				

Lab Use Only

Time Sensitive	Temperature (ºC) on Receipt	Custody Seal Intact on Cooler?
[ ]		[ ] Yes [ ] No

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

White: Maxxam Yellow: Client

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Unit 105 - 349 Old Airport Road, Yellowknife, North West Territories Canada X1A 3X6 Tel:(867) 445-2448 Toll-free:800-563-6266 Fax:(905) 817-5779 www.maxxam.ca

Chain Of Custody Record

INVOICE TO:		Report Information		Project Information		Laboratory Use Only	
Company Name	#3269 ARCADIS Canada	Company Name	Same	Quotation #		Maxxam Job #	Bottle Order #:
Contact Name	ANDREW HENDERSON	Contact Name		P.O. #			501520
Address	329 CHURCHILL AVE NORTH SUITE 2000	Address		Project #	102012-000, Kitikmeot DEW Lin	Chain Of Custody Record	Project Manager
	OTTAWA ON K1Z 5B8			Project Name		C#501520-04-01	Parminder Virk
Phone	(613) 721-0555 Fax: (613) 721-0029	Phone	Fax:	Site #	CAM 1 Junny Lind Island		
Email	ahenderson@franzenvironmental.com, andrew.henders	Email	ryan.fiebig@arcadis.com	Sampled By	R Fiebig		

Regulatory Criteria

Special Instructions

Note: For regulated drinking water samples - please use the Drinking Water Chain of Custody Form

Samples must be kept cool (< 10°C) from time of sampling until delivery to maxxam

Turnaround Time (TAT) Required

Please provide advance notice for rush projects

Regular (Standard) TAT ☑
(will be applied if Rush TAT is not specified)
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Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: _____ Time Required: _____ ☐
Rush Confirmation Number _____ *(call lab for #)*

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Regulated Drinking Water ? (Y / N)	Metals Field Filtered ? (Y / N)	AT1 BTEX and F1-F4 in Soil	Polychlorinated Biphenyls	Elements by ICPMS - Soils	arsenic, cadmium, chromium, cobalt, copper, lead, mickel, zinc, and mercury	Total Hexavalent Chromium	Mercury - Low Level (Total)	AT1 BTEX and F1-F4 in Water	PCB WATER			# of Bottles	Comments
1		16-C1-11A	Aug/16	16:00	Soil			X	X		X							4	
2		16-C1-11B		16:00				X	X		X							4	Metals in bags
3		16-C1-12A		16:45				X	X		X							4	
4		16-C1-12B		16:45				X	X		X							4	
5		16-C1-13A		17:00				X	X		X							4	1 bag
6		16-C1-13B		17:00				X	X		X							4	
7		16-C1-MW01A		8:30				X	X		X							4	
8		16-C1-MW01B		8:30				X	X		X							4	
9		16-C1-MW02A		9:15				X	X		X							4	Lids are not tight
10		16-C1-MW03A	"	9:00				X	X		X							4	

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Lab Use Only: Time Sensitive	Temperature (°C) on Receipt	Custody Seal Intact on Cooler?
Ryan Fiebig	16/11/16	17:10					☐		☐ Yes ☐ No

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Chain Of Custody Record

INVOICE TO:		Report Information		Project Information		Laboratory Use Only	
Company Name	#3269 ARCADIS Canada	Company Name		Quotation #		Maxxam Job #	Bottle Order #:
Contact Name	ANDREW HENDERSON	Contact Name		P.O. #			501520
Address	329 CHURCHILL AVE NORTH SUITE 2000	Address		Project #	102012-000, Kitikmeot DEW Lin	Chain Of Custody Record	Project Manager
	OTTAWA ON K1Z 5B8			Project Name		C#501520-05-01	Parminder Virk
Phone	(613) 721-0555 Fax: (613) 721-0029	Phone	Fax:	Site #	CAM 1 Junny Lind Island		
Email	ahenderson@franzenvironmental.com, andrew.henders	Email		Sampled By			

Regulatory Criteria

Special Instructions

Note: For regulated drinking water samples - please use the Drinking Water Chain of Custody Form

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Date Required: _____ Time Required: _____

Rush Confirmation Number _____ *(call lab for #)*

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Regulated Drinking Water ? (Y / N)	Metals Field Filtered ? (Y / N)	Analysis Requested: AT1 BTEX and F1-F4 in Soil	Polychlorinated Biphenyls	Elements by ICPMS - Soils	arsenic, cadmium, chromium, cobalt, copper, lead, mickel, zinc, and mercury	Total Hexavalent Chromium	Mercury - Low Level (Total)	AT1 BTEX and F1-F4 in Water	PCB WATER			# of Bottles	Comments
1		16-C1-MW03B	Aug 10/16	9:00	Soil			X	X		X							4	
2		16-C1-MW04A		8:45				X	X		X							4	
3		16-C1-MW04B		8:45				X	X		X							4	
4		16-C1-MW05A		10:30				X	X		X							4	
5		16-C1-MW05B						X	X		X							4	
6		16-C1-MW05B		10:30				X	X		X							4	
7		16-C1-MW06A		9:45				X	X		X							4	
8		16-C1-MW06B		9:45				X	X		X							4	
9		16-C1-MW07A		10:00				X	X		X							4	
10		16-C1-MW07B		10:00				X	X		X							4	

* * RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Lab Use Only: Time Sensitive	Temperature (°C) on Receipt	Custody Seal Intact on Cooler?
Ryan Fitzgerald	Aug 10/16	15:00					☐		☐ Yes ☐ No

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

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Chain Of Custody Record

INVOICE TO:		Report Information		Project Information		Laboratory Use Only	
Company Name	#3269 ARCADIS Canada	Company Name	Same	Quotation #		Maxxam Job #	Bottle Order #:
Contact Name	ANDREW HENDERSON	Contact Name		P.O. #			501520
Address	329 CHURCHILL AVE NORTH SUITE 2000	Address		Project #	102012-000, Kitikmeot DEW Lin	Chain Of Custody Record	Project Manager
	OTTAWA ON K1Z 5B8			Project Name		C#501520-06-01	Parminder Virk
Phone	(613) 721-0555 Fax: (613) 721-0029	Phone	Fax:	Site #	CAM 1 Junny Lind Island		
Email	ahenderson@franzenvironmental.com, andrew.henders	Email	ryan.fletcher@arcadis.com	Sampled By	R. Fletcher		

Regulatory Criteria

Special Instructions

Note: For regulated drinking water samples - please use the Drinking Water Chain of Custody Form

Samples must be kept cool (< 10°C) from time of sampling until delivery to maxxam

Analysis Requested

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Regulated Drinking Water ? (Y / N)	Metals Field Filtered ? (Y / N)	AT1 BTEX and F1-F4 in Soil	Polychlorinated Biphenyls	Elements by ICPMS - Soils	arsenic, cadmium, chromium, cobalt, copper, lead, mickel, zinc, and mercury	Total Hexavalent Chromium	Mercury - Low Level (Total)	AT1 BTEX and F1-F4 in Water	PCB WATER			# of Bottles	Comments
1		16-C1-MW08A	Aug 9/16	10:15	Soil			X	X		X							4	
2		16-C1-MW08B		10:15				X	X		X							4	Metals in bags
3		16-C1-14A		21:00				X	X		X							4	
4		16-C1-14B		21:00				X	X		X							4	3 jars, 1 bag per
5		16-C1-15A		20:45				X	X		X							4	
6		16-C1-15B		20:45				X	X		X							4	
7		16-C1-16A		20:00				X	X		X							4	Lids are NOT
8		16-C1-16B		20:00				X	X		X							4	locats
9		16-C1-17A		20:15				X	X		X							4	
10		16-C1-17B	↓	20:15	↓			X	X		X							4	

Turnaround Time (TAT) Required

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Regular (Standard) TAT [X]
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Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: _____ Time Required: _____ [ ]
Rush Confirmation Number _____ *(call lab for #)*

* * RELINQUISHED BY; (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
Ryan Fletcher	Aug 9/16	10:00				

Lab Use Only

Time Sensitive	Temperature (°C) on Receipt	Custody Seal Intact on Cooler?
[ ]		[ ] Yes [ ] No

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Chain Of Custody Record

INVOICE TO:		Report Information		Project Information		Laboratory Use Only	
Company Name	#3269 ARCADIS Canada	Company Name		Quotation #		Maxxam Job #	Bottle Order #:
Contact Name	ANDREW HENDERSON	Contact Name	Ryan	P.O. #			501520
Address	329 CHURCHILL AVE NORTH SUITE 2000	Address		Project #	102012-000, Kitikmeot DEW Lin	Chain Of Custody Record	Project Manager
	OTTAWA ON K1Z 5B8			Project Name		C#501520-07-01	Parminder Virk
Phone	(613) 721-0555 Fax: (613) 721-0029	Phone	Fax:	Site #	CAM 1 Junny Lind Island		
Email	ahenderson@franzenvironmental.com, andrew.henders	Email	ryan.fletcher@arcadis.com	Sampled By	R.Fletcher		

Regulatory Criteria

Special Instructions

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Analysis Requested

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Regulated Drinking Water ? (Y/N)	Metals Field Filtered ? (Y/N)	AT1 BTEX and F1-F4 in Soil	Polychlorinated Biphenyls	Elements by ICPMS - Soils	arsenic, cadmium, chromium, cobalt, copper, lead, mickel, zinc, and mercury	Total Hexavalent Chromium	Mercury - Low Level (Total)	AT1 BTEX and F1-F4 in Water	PCB WATER			# of Bottles	Comments
1		16-C1-18A	Aug 10/16	20:30	Soil			X	X		X							4	
2		16-C1-18B	Aug 10/16	20:30				X	X		X							4	Metals in bags
3		16-C1-19A	Aug 11/16	8:15				X	X		X							4	
4		16-C1-19B		8:15				X	X		X							4	3 jars, 1 bag for.
5		16-C1-20A		9:40				X	X		X							4	
6		16-C1-20B		9:00				X	X		X							4	
7		16-C1-21A		8:45				X	X		X							4	Labels are NOT
8		16-C1-21B		8:45				X	X		X							4	labels
9		16-C1-22A		9:20				X	X		X							4	
10		16-C1-22B		9:30				X	X		X							4	

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Ryan Fletcher	Aug 11/16	15:00				

Lab Use Only

Time Sensitive	Temperature (°C) on Receipt	Custody Seal Intact on Cooler?
☐		☐ Yes ☐ No

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Chain Of Custody Record

INVOICE TO:		Report Information		Project Information		Laboratory Use Only	
Company Name	#3269 ARCADIS Canada	Company Name		Quotation #		Maxxam Job #	Bottle Order #:
Contact Name	ANDREW HENDERSON	Contact Name	Sarah	P.O. #			501520
Address	329 CHURCHILL AVE NORTH SUITE 2000	Address		Project #	102012-000, Kitikmeot DEW Lin	Chain Of Custody Record	Project Manager
	OTTAWA ON K1Z 5B8			Project Name		C#501520-08-01	Parminder Virk
Phone	(613) 721-0555 Fax: (613) 721-0029	Phone	Fax:	Site #	CAM 1 Junny Lind Island		
Email	ahenderson@franzenvironmental.com, andrew.henders	Email	lynn.fletcher@arcadis.com	Sampled By	L. Fletcher		

Regulatory Criteria

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Date Required: _____ Time Required: _____
Rush Confirmation Number _____ *(call lab for #)*

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Regulated Drinking Water ? (Y / N)	Metals Field Filtered ? (Y / N)	AT1 BTEX and F1-F4 in Soil	Polychlorinated Biphenyls	Elements by ICPMS - Soils	arsenic, cadmium, chromium, cobalt, copper, lead, nickel, zinc, and mercury	Total Hexavalent Chromium	Mercury - Low Level (Total)	AT1 BTEX and F1-F4 in Water	PCB WATER			# of Bottles	Comments
1		16-C1-23A	Aug 11/16	11:00	Soil			X	X		X							4	Metals in
2		16-C1-24A		11:00				X	X		X							4	eggs
3		16-C1-24B		10:00				X	X		X							4	
4		16-C1-25A		10:00				X	X		X							4	A bag, 3 jars ea.
5		16-C1-26A		10:30				X	X		X							4	
6		16-C1-26B		10:30				X	X		X							4	
7		16-C1-27A		14:45				X	X		X							4	*Lids are Not
8		16-C1-27B		14:45				X	X		X							4	labels
9		16-C1-28A		14:15				X	X		X							4	
10		16-C1-28A	↓	14:15	↓			X	X		X							4	

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Lab Use Only: Time Sensitive	Temperature (°C) on Receipt	Custody Seal Intact on Cooler?
Lynn Fletcher	Aug 11/16	15:00					☐		☐ Yes ☐ No

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Contact Name	ANDREW HENDERSON	Contact Name		P.O. #			501520
Address	329 CHURCHILL AVE NORTH SUITE 2000	Address		Project #	102012-000, Kitikmeot DEW Lin		
	OTTAWA ON K1Z 5B8			Project Name		Chain Of Custody Record	Project Manager
Phone	(613) 721-0555 Fax: (613) 721-0029	Phone	Fax:	Site #	CAM 1 Junny Lind Island	C#501520-09-01	Parminder Virk
Email	ahenderson@franzenvironmental.com, andrew.henders	Email		Sampled By			

Regulatory Criteria

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1		16-C1-29A	Aug 11/16	14:30	Soil			X	X		X							4	
2		16-C1-29B		14:30				X	X		X							4	Metals in bags
3		16-C1-30A		14:00				X	X		X							4	
4		16-C1-30B		14:00				X	X		X							4	
5		16-C1-31A		15:00				X	X		X							4	1 bag + 3 jars ea
6		16-C1-31B		15:00				X	X		X							4	
7		16-C1-32A		16:00				X	X		X							4	x Lids one
8		16-C1-32B		16:00				X	X		X							4	NOT Inc
9		16-C1-33A		16:30				X	X		X							4	
10		16-C1-33B	↓	16:30	↓			X	X		X							4	

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Lab Use Only: Time Sensitive	Temperature (°C) on Receipt	Custody Seal Intact on Cooler?
							☐		☐ Yes ☐ No

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Company Name	#3269 ARCADIS Canada	Company Name	Sound	Quotation #		Maxxam Job #	Bottle Order #:
Contact Name	ANDREW HENDERSON	Contact Name		P.O. #			501520
Address	329 CHURCHILL AVE NORTH SUITE 2000	Address		Project #	102012-000, Kitikmeot DEW Lin	Chain Of Custody Record	Project Manager
	OTTAWA ON K1Z 5B8			Project Name		C#501520-10-01	Parminder Virk
Phone	(613) 721-0555 Fax: (613) 721-0029	Phone	Fax:	Site #	CAM 1 Junny Lind Island		
Email	ahenderson@franzenvironmental.com, andrew.henders	Email	ryan.fletcher@arcadis.com	Sampled By	R. Fletcher		

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1		16-C1-35A	Aug 11/16	16:15	Soil			X	X		X							4	
2		16-C1-35B	Aug 11/16	16:15	Soil			X	X		X							4	
3																			
4																			
5																			
6																			
7																			
8																			
9																			
10																			

Turnaround Time (TAT) Required

Please provide advance notice for rush projects

Regular (Standard) TAT X

(will be applied if Rush TAT is not specified)

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Job Specific Rush TAT (if applies to entire submission)

Date Required: _____ Time Required: _____

Rush Confirmation Number _____ *(call lab for #)*

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
Ryan Fletcher	Aug 15/16	13:30				

Lab Use Only

Time Sensitive	Temperature (°C) on Receipt	Custody Seal Intact on Cooler?
		Yes / No

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

White: Maxxam Yellow: Client

Maxxam Analytics International Corporation o/a Maxxam Analytics
Unit 105 - 349 Old Airport Road, Yellowknife, North West Territories Canada X1A 3X6 Tel:(867) 445-2448 Toll-free:800-563-6266 Fax:(905) 817-5779 www.maxxam.ca

Chain Of Custody Record

INVOICE TO:		Report Information		Project Information		Laboratory Use Only	
Company Name	#3269 ARCADIS Canada	Company Name	Same	Quotation #		Maxxam Job #	Bottle Order #:
Contact Name	ANDREW HENDERSON	Contact Name		P.O. #			501520
Address	329 CHURCHILL AVE NORTH SUITE 2000	Address		Project #	102012-000, Kitikmeot DEW Lin	Chain Of Custody Record	Project Manager
	OTTAWA ON K1Z 5B8			Project Name		C#501520-02-01	Parminder Virk
Phone	(613) 721-0555 Fax: (613) 721-0029	Phone	Fax:	Site #	CAM 1 Junny Lind Island		
Email	ahenderson@franzenvironmental.com, andrew.henders	Email	ryan.fletcher@arcadis.com	Sampled By	R. Fletcher		

Regulatory Criteria

Special Instructions

Note: For regulated drinking water samples - please use the Drinking Water Chain of Custody Form

Samples must be kept cool (< 10°C) from time of sampling until delivery to maxxam

Turnaround Time (TAT) Required

Please provide advance notice for rush projects

Regular (Standard) TAT X

(will be applied if Rush TAT is not specified)

Standard TAT = 5-7 Working days for most tests.

Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)

Date Required: _____ Time Required: _____

Rush Confirmation Number _____ *(call lab for #)*

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Regulated Drinking Water ? (Y / N)	Metals Field Filtered ? (Y / N)	AT1 BTEX and F1-F4 in Soil	Polychlorinated Biphenyls	Elements by ICPMS - Soils	arsenic, cadmium, chromium, cobalt, copper, lead, mickel, zinc, and mercury	Total Hexavalent Chromium	Mercury - Low Level (Total)	AT1 BTEX and F1-F4 in Water	PCB WATER			# of Bottles	Comments
1		C1 - Dup 1	Aug 9/16	—	Soil			X	X		X							4	
2		C1 - Dup 2	Aug 9/16	—	Soil			X	X		X							4	
3		C1 - Dup 3	Aug 9/16	—	Soil			X	X		X							4	Metals bags
4		C1 - Dup 4	Aug 9/16	—	Soil			X	X		X							4	1 bag
5		C1 - Dup 5	Aug 10/16	—	Soil			X	X		X							4	
6		C1 - Dup 6	Aug 11/16	—	Soil			X	X		X							4	
7		C1 - Dup 7	Aug 11/16	—	Soil			X	X		X							4	Lids are NOT labels
8		C1 - Dup 8	Aug 11/16	—	Soil			X	X		X							4	
9																			
10																			

* * RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Lab Use Only: Time Sensitive	Temperature (°C) on Receipt	Custody Seal Intact on Cooler?
Ryan Fletcher	Aug 12/16	8:30					☐		☐ Yes ☐ No

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

White: Maxxam Yellow: Client

Maxxam
A Bureau Veritas Group Company

Maxxam Analytics International Corporation o/a Maxxam Analytics
Unit 105 - 349 Old Airport Road, Yellowknife, North West Territories Canada X1A 3X6 Tel:(867) 445-2448 Toll-free:800-563-6266 Fax:(905) 817-5779 www.maxxam.ca

Chain Of Custody Record

INVOICE TO:		Report Information		Project Information		Laboratory Use Only	
Company Name	#3269 ARCADIS Canada	Company Name	Canard	Quotation #		Maxxam Job #	Bottle Order #:
Contact Name	ANDREW HENDERSON	Contact Name		P.O. #			501520
Address	329 CHURCHILL AVE NORTH SUITE 2000	Address		Project #	102012-000, Kitikmeot DEW Lin	Chain Of Custody Record	Project Manager
	OTTAWA ON K1Z 5B8			Project Name		C#501520-11-01	Parminder Virk
Phone	(613) 721-0555 Fax: (613) 721-0029	Phone	Fax:	Site #	CAM 1 Junny Lind Island		
Email	ahenderson@franzenvironmental.com, andrew.henders	Email	[illegible]	Sampled By	R. Fletcher		

Regulatory Criteria

Special Instructions

Note: For regulated drinking water samples - please use the Drinking Water Chain of Custody Form

Samples must be kept cool (< 10ºC) from time of sampling until delivery to maxxam

Analysis Requested

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Regulated Drinking Water ? (Y / N)	Metals Field Filtered ? (Y / N)	AT1 BTEX and F1-F4 in Soil	Polychlorinated Biphenyls	Elements by ICPMS - Soils	arsenic, cadmium, chromium, cobalt, copper, lead, mickel, zinc, and mercury	Total Hexavalent Chromium	Mercury - Low Level (Total)	AT1 BTEX and F1-F4 in Water	PCB WATER	FILTER		# of Bottles	Comments
1		CI-MW05	Aug/16	11:00	Gw	N	N				X	X	X	X	X			9	
2		CI-MW03	Aug/16	14:15	Gw	N	N				X	X	X	X	X			9	Metals NOT field filtered and Lab filtered as per client request
3		CI-Dup1	Aug/16	—	Gw	N	N				X	X	X	X	X			9	
4		Trip Blank	—	—	—	—	—									X		2	
5																			Not present as per client request we Total Metals only
6																			
7																			
8																			
9																			
10																			

Turnaround Time (TAT) Required

Please provide advance notice for rush projects

Regular (Standard) TAT A

(will be applied if Rush TAT is not specified)

Standard TAT = 5-7 Working days for most tests.

Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)

Date Required: _____ Time Required: _____

Rush Confirmation Number _____ *(call lab for #)*

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
Ryan Fletcher	Aug/16	10:00				

Lab Use Only

Time Sensitive	Temperature (°C) on Receipt	Custody Seal Intact on Cooler?
☐		☐ Yes ☐ No

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

White: Maxxam Yellow: Client

ARCADIS Canada Inc. - Ottawa
ATTN: Ryan Fletcher
329 Churchill Ave N
Ottawa ON K2L 5B8

Date Received: 15-AUG-16
Report Date: 23-AUG-16 16:41 (MT)
Version: FINAL

Client Phone: 613-721-0029

Certificate of Analysis

Lab Work Order #: L1813348

Project P.O. #: NOT SUBMITTED
Job Reference: 102012-000
C of C Numbers: 10-366493
Legal Site Desc:

Taryn Williams, B.Sc.
Account Manager

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1813348-1 16-CI-5A Sampled By: RF on 09-AUG-16 @ 13:00 Matrix: soil							
Physical Tests							
% Moisture	4.55		0.50	%		22-AUG-16	R3531106
Metals							
Arsenic (As)	1.20		0.10	mg/kg	21-AUG-16	23-AUG-16	R3530784
Cadmium (Cd)	<0.020		0.020	mg/kg	21-AUG-16	23-AUG-16	R3530784
Chromium (Cr)	1.09		0.50	mg/kg	21-AUG-16	23-AUG-16	R3530784
Cobalt (Co)	0.46		0.10	mg/kg	21-AUG-16	23-AUG-16	R3530784
Copper (Cu)	1.11		0.50	mg/kg	21-AUG-16	23-AUG-16	R3530784
Lead (Pb)	1.64		0.50	mg/kg	21-AUG-16	23-AUG-16	R3530784
Mercury (Hg)	<0.0050		0.0050	mg/kg	21-AUG-16	22-AUG-16	R3531065
Nickel (Ni)	0.53		0.50	mg/kg	21-AUG-16	23-AUG-16	R3530784
Zinc (Zn)	<2.0		2.0	mg/kg	21-AUG-16	23-AUG-16	R3530784
Volatile Organic Compounds							
Benzene	<0.0050		0.0050	mg/kg	22-AUG-16	23-AUG-16	R3529440
Ethylbenzene	<0.015		0.015	mg/kg	22-AUG-16	23-AUG-16	R3529440
Toluene	<0.050		0.050	mg/kg	22-AUG-16	23-AUG-16	R3529440
o-Xylene	<0.050		0.050	mg/kg	22-AUG-16	23-AUG-16	R3529440
m+p-Xylene	<0.050		0.050	mg/kg	22-AUG-16	23-AUG-16	R3529440
Xylenes	<0.10		0.10	mg/kg	22-AUG-16	23-AUG-16	R3529440
Surrogate: 4-Bromofluorobenzene (SS)	126.0		70-130	%	22-AUG-16	23-AUG-16	R3529440
Surrogate: 3,4-Dichlorotoluene (SS)	124.0		70-130	%	22-AUG-16	23-AUG-16	R3529440
Surrogate: 1,4-Difluorobenzene (SS)	118.0		70-130	%	22-AUG-16	23-AUG-16	R3529440
Hydrocarbons							
F1 (C6-C10)	<10		10	mg/kg		23-AUG-16	
F1-BTEX	<10		10	mg/kg		23-AUG-16	
F2 (C10-C16)	<20		20	mg/kg		23-AUG-16	
F3 (C16-C34)	<20		20	mg/kg		23-AUG-16	
F4 (C34-C50)	<20		20	mg/kg		23-AUG-16	
Total Hydrocarbons (C6-C50)	<20		20	mg/kg		23-AUG-16	
Chrom. to baseline at nC50	YES				22-AUG-16	22-AUG-16	R3532010
Surrogate: 2-Bromobenzotrifluoride	81.6		70-130	%	22-AUG-16	22-AUG-16	R3532010
Polychlorinated Biphenyls							
Aroclor 1016	<0.010		0.010	mg/kg		19-AUG-16	R3530109
Aroclor 1221	<0.010		0.010	mg/kg		19-AUG-16	R3530109
Aroclor 1232	<0.010		0.010	mg/kg		19-AUG-16	R3530109
Aroclor 1242	<0.010		0.010	mg/kg		19-AUG-16	R3530109
Aroclor 1248	<0.010		0.010	mg/kg		19-AUG-16	R3530109
Aroclor 1254	<0.010		0.010	mg/kg		19-AUG-16	R3530109
Aroclor 1260	<0.010		0.010	mg/kg		19-AUG-16	R3530109
Aroclor 1262	<0.010		0.010	mg/kg		19-AUG-16	R3530109
Aroclor 1268	<0.010		0.010	mg/kg		19-AUG-16	R3530109
Surrogate: Decachlorobiphenyl	86.7		65-130	%		19-AUG-16	R3530109
Total PCBs	<0.050		0.050	mg/kg		19-AUG-16	R3530109

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1813348-1 16-CI-5A Sampled By: RF on 09-AUG-16 @ 13:00 Matrix: soil							
Polychlorinated Biphenyls							
L1813348-2 16-CI-8A Sampled By: RF on 09-AUG-16 @ 15:30 Matrix: soil							
Physical Tests							
% Moisture	7.51		0.50	%		22-AUG-16	R3531106
Metals							
Arsenic (As)	1.46		0.10	mg/kg	21-AUG-16	23-AUG-16	R3530784
Cadmium (Cd)	<0.020		0.020	mg/kg	21-AUG-16	23-AUG-16	R3530784
Chromium (Cr)	1.87		0.50	mg/kg	21-AUG-16	23-AUG-16	R3530784
Cobalt (Co)	0.66		0.10	mg/kg	21-AUG-16	23-AUG-16	R3530784
Copper (Cu)	0.97		0.50	mg/kg	21-AUG-16	23-AUG-16	R3530784
Lead (Pb)	2.18		0.50	mg/kg	21-AUG-16	23-AUG-16	R3530784
Mercury (Hg)	<0.0050		0.0050	mg/kg	21-AUG-16	22-AUG-16	R3531065
Nickel (Ni)	1.02		0.50	mg/kg	21-AUG-16	23-AUG-16	R3530784
Zinc (Zn)	3.8		2.0	mg/kg	21-AUG-16	23-AUG-16	R3530784
Volatile Organic Compounds							
Benzene	<0.0050		0.0050	mg/kg	22-AUG-16	23-AUG-16	R3529440
Ethylbenzene	<0.015		0.015	mg/kg	22-AUG-16	23-AUG-16	R3529440
Toluene	<0.050		0.050	mg/kg	22-AUG-16	23-AUG-16	R3529440
o-Xylene	<0.050		0.050	mg/kg	22-AUG-16	23-AUG-16	R3529440
m+p-Xylene	<0.050		0.050	mg/kg	22-AUG-16	23-AUG-16	R3529440
Xylenes	<0.10		0.10	mg/kg	22-AUG-16	23-AUG-16	R3529440
Surrogate: 4-Bromofluorobenzene (SS)	125.0		70-130	%	22-AUG-16	23-AUG-16	R3529440
Surrogate: 3,4-Dichlorotoluene (SS)	127.0		70-130	%	22-AUG-16	23-AUG-16	R3529440
Surrogate: 1,4-Difluorobenzene (SS)	127.0		70-130	%	22-AUG-16	23-AUG-16	R3529440
Hydrocarbons							
F1 (C6-C10)	<10		10	mg/kg		23-AUG-16	
F1-BTEX	<10		10	mg/kg		23-AUG-16	
F2 (C10-C16)	<20		20	mg/kg		23-AUG-16	
F3 (C16-C34)	<20		20	mg/kg		23-AUG-16	
F4 (C34-C50)	<20		20	mg/kg		23-AUG-16	
Total Hydrocarbons (C6-C50)	<20		20	mg/kg		23-AUG-16	
Chrom. to baseline at nC50	YES				22-AUG-16	22-AUG-16	R3532010
Surrogate: 2-Bromobenzotrifluoride	85.1		70-130	%	22-AUG-16	22-AUG-16	R3532010
Polychlorinated Biphenyls							
Aroclor 1016	<0.010		0.010	mg/kg		19-AUG-16	R3530109
Aroclor 1221	<0.010		0.010	mg/kg		19-AUG-16	R3530109
Aroclor 1232	<0.010		0.010	mg/kg		19-AUG-16	R3530109
Aroclor 1242	<0.010		0.010	mg/kg		19-AUG-16	R3530109
Aroclor 1248	<0.010		0.010	mg/kg		19-AUG-16	R3530109
Aroclor 1254	<0.010		0.010	mg/kg		19-AUG-16	R3530109
Aroclor 1260	<0.010		0.010	mg/kg		19-AUG-16	R3530109

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1813348-2 16-CI-8A Sampled By: RF on 09-AUG-16 @ 15:30 Matrix: soil							
Polychlorinated Biphenyls							
Aroclor 1262	<0.010		0.010	mg/kg		19-AUG-16	R3530109
Aroclor 1268	<0.010		0.010	mg/kg		19-AUG-16	R3530109
Surrogate: Decachlorobiphenyl	89.7		65-130	%		19-AUG-16	R3530109
Total PCBs	<0.050		0.050	mg/kg		19-AUG-16	R3530109
L1813348-3 16-CI-11A Sampled By: RF on 10-AUG-16 @ 16:00 Matrix: soil							
Physical Tests							
% Moisture	12.3		0.50	%		22-AUG-16	R3531106
Metals							
Arsenic (As)	0.35		0.10	mg/kg	21-AUG-16	23-AUG-16	R3530784
Cadmium (Cd)	<0.020		0.020	mg/kg	21-AUG-16	23-AUG-16	R3530784
Chromium (Cr)	0.94		0.50	mg/kg	21-AUG-16	23-AUG-16	R3530784
Cobalt (Co)	0.30		0.10	mg/kg	21-AUG-16	23-AUG-16	R3530784
Copper (Cu)	0.99		0.50	mg/kg	21-AUG-16	23-AUG-16	R3530784
Lead (Pb)	0.59		0.50	mg/kg	21-AUG-16	23-AUG-16	R3530784
Mercury (Hg)	<0.0050		0.0050	mg/kg	21-AUG-16	22-AUG-16	R3531065
Nickel (Ni)	0.82		0.50	mg/kg	21-AUG-16	23-AUG-16	R3530784
Zinc (Zn)	<2.0		2.0	mg/kg	21-AUG-16	23-AUG-16	R3530784
Volatile Organic Compounds							
Benzene	<0.0050		0.0050	mg/kg	22-AUG-16	23-AUG-16	R3529440
Ethylbenzene	<0.015		0.015	mg/kg	22-AUG-16	23-AUG-16	R3529440
Toluene	<0.050		0.050	mg/kg	22-AUG-16	23-AUG-16	R3529440
o-Xylene	<0.050		0.050	mg/kg	22-AUG-16	23-AUG-16	R3529440
m+p-Xylene	<0.050		0.050	mg/kg	22-AUG-16	23-AUG-16	R3529440
Xylenes	<0.10		0.10	mg/kg	22-AUG-16	23-AUG-16	R3529440
Surrogate: 4-Bromofluorobenzene (SS)	99.0		70-130	%	22-AUG-16	23-AUG-16	R3529440
Surrogate: 3,4-Dichlorotoluene (SS)	95.0		70-130	%	22-AUG-16	23-AUG-16	R3529440
Surrogate: 1,4-Difluorobenzene (SS)	102.0		70-130	%	22-AUG-16	23-AUG-16	R3529440
Hydrocarbons							
F1 (C6-C10)	<10		10	mg/kg		23-AUG-16	
F1-BTEX	<10		10	mg/kg		23-AUG-16	
F2 (C10-C16)	<20		20	mg/kg		23-AUG-16	
F3 (C16-C34)	<20		20	mg/kg		23-AUG-16	
F4 (C34-C50)	<20		20	mg/kg		23-AUG-16	
Total Hydrocarbons (C6-C50)	<20		20	mg/kg		23-AUG-16	
Chrom. to baseline at nC50	YES				22-AUG-16	22-AUG-16	R3532010
Surrogate: 2-Bromobenzotrifluoride	86.2		70-130	%	22-AUG-16	22-AUG-16	R3532010
Polychlorinated Biphenyls							
Aroclor 1016	<0.010		0.010	mg/kg		19-AUG-16	R3530109
Aroclor 1221	<0.010		0.010	mg/kg		19-AUG-16	R3530109
Aroclor 1232	<0.010		0.010	mg/kg		19-AUG-16	R3530109

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1813348-3 16-CI-11A Sampled By: RF on 10-AUG-16 @ 16:00 Matrix: soil							
Polychlorinated Biphenyls							
Aroclor 1242	<0.010		0.010	mg/kg		19-AUG-16	R3530109
Aroclor 1248	<0.010		0.010	mg/kg		19-AUG-16	R3530109
Aroclor 1254	<0.010		0.010	mg/kg		19-AUG-16	R3530109
Aroclor 1260	<0.010		0.010	mg/kg		19-AUG-16	R3530109
Aroclor 1262	<0.010		0.010	mg/kg		19-AUG-16	R3530109
Aroclor 1268	<0.010		0.010	mg/kg		19-AUG-16	R3530109
Surrogate: Decachlorobiphenyl	83.0		65-130	%		19-AUG-16	R3530109
Total PCBs	<0.050		0.050	mg/kg		19-AUG-16	R3530109
L1813348-4 16-CI-12A Sampled By: RF on 10-AUG-16 @ 16:45 Matrix: soil							
Physical Tests							
% Moisture	11.2		0.50	%		22-AUG-16	R3531106
Metals							
Arsenic (As)	0.32		0.10	mg/kg	21-AUG-16	23-AUG-16	R3530784
Cadmium (Cd)	<0.020		0.020	mg/kg	21-AUG-16	23-AUG-16	R3530784
Chromium (Cr)	1.18		0.50	mg/kg	21-AUG-16	23-AUG-16	R3530784
Cobalt (Co)	0.23		0.10	mg/kg	21-AUG-16	23-AUG-16	R3530784
Copper (Cu)	1.15		0.50	mg/kg	21-AUG-16	23-AUG-16	R3530784
Lead (Pb)	<0.50		0.50	mg/kg	21-AUG-16	23-AUG-16	R3530784
Mercury (Hg)	<0.0050		0.0050	mg/kg	21-AUG-16	22-AUG-16	R3531065
Nickel (Ni)	0.72		0.50	mg/kg	21-AUG-16	23-AUG-16	R3530784
Zinc (Zn)	<2.0		2.0	mg/kg	21-AUG-16	23-AUG-16	R3530784
Volatile Organic Compounds							
Benzene	<0.0050		0.0050	mg/kg	22-AUG-16	23-AUG-16	R3529440
Ethylbenzene	<0.015		0.015	mg/kg	22-AUG-16	23-AUG-16	R3529440
Toluene	<0.050		0.050	mg/kg	22-AUG-16	23-AUG-16	R3529440
o-Xylene	<0.050		0.050	mg/kg	22-AUG-16	23-AUG-16	R3529440
m+p-Xylene	<0.050		0.050	mg/kg	22-AUG-16	23-AUG-16	R3529440
Xylenes	<0.10		0.10	mg/kg	22-AUG-16	23-AUG-16	R3529440
Surrogate: 4-Bromofluorobenzene (SS)	96.0		70-130	%	22-AUG-16	23-AUG-16	R3529440
Surrogate: 3,4-Dichlorotoluene (SS)	96.0		70-130	%	22-AUG-16	23-AUG-16	R3529440
Surrogate: 1,4-Difluorobenzene (SS)	101.0		70-130	%	22-AUG-16	23-AUG-16	R3529440
Hydrocarbons							
F1 (C6-C10)	<10		10	mg/kg		23-AUG-16	
F1-BTEX	<10		10	mg/kg		23-AUG-16	
F2 (C10-C16)	<20		20	mg/kg		23-AUG-16	
F3 (C16-C34)	<20		20	mg/kg		23-AUG-16	
F4 (C34-C50)	<20		20	mg/kg		23-AUG-16	
Total Hydrocarbons (C6-C50)	<20		20	mg/kg		23-AUG-16	
Chrom. to baseline at nC50	YES				22-AUG-16	22-AUG-16	R3532010
Surrogate: 2-Bromobenzotrifluoride	78.6		70-130	%	22-AUG-16	22-AUG-16	R3532010

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1813348-4 16-CI-12A Sampled By: RF on 10-AUG-16 @ 16:45 Matrix: soil							
Hydrocarbons							
Polychlorinated Biphenyls							
Aroclor 1016	<0.010		0.010	mg/kg		19-AUG-16	R3530109
Aroclor 1221	<0.010		0.010	mg/kg		19-AUG-16	R3530109
Aroclor 1232	<0.010		0.010	mg/kg		19-AUG-16	R3530109
Aroclor 1242	<0.010		0.010	mg/kg		19-AUG-16	R3530109
Aroclor 1248	<0.010		0.010	mg/kg		19-AUG-16	R3530109
Aroclor 1254	<0.010		0.010	mg/kg		19-AUG-16	R3530109
Aroclor 1260	<0.010		0.010	mg/kg		19-AUG-16	R3530109
Aroclor 1262	<0.010		0.010	mg/kg		19-AUG-16	R3530109
Aroclor 1268	<0.010		0.010	mg/kg		19-AUG-16	R3530109
Surrogate: Decachlorobiphenyl	84.6		65-130	%		19-AUG-16	R3530109
Total PCBs	<0.050		0.050	mg/kg		19-AUG-16	R3530109
L1813348-5 16-CI-16A Sampled By: RF on 10-AUG-16 @ 20:00 Matrix: soil							
Physical Tests							
% Moisture	2.48		0.50	%		22-AUG-16	R3531106
Metals							
Arsenic (As)	0.97		0.10	mg/kg	21-AUG-16	23-AUG-16	R3530784
Cadmium (Cd)	0.022		0.020	mg/kg	21-AUG-16	23-AUG-16	R3530784
Chromium (Cr)	1.83		0.50	mg/kg	21-AUG-16	23-AUG-16	R3530784
Cobalt (Co)	0.63		0.10	mg/kg	21-AUG-16	23-AUG-16	R3530784
Copper (Cu)	1.00		0.50	mg/kg	21-AUG-16	23-AUG-16	R3530784
Lead (Pb)	1.76		0.50	mg/kg	21-AUG-16	23-AUG-16	R3530784
Mercury (Hg)	<0.0050		0.0050	mg/kg	21-AUG-16	22-AUG-16	R3531065
Nickel (Ni)	0.94		0.50	mg/kg	21-AUG-16	23-AUG-16	R3530784
Zinc (Zn)	2.8		2.0	mg/kg	21-AUG-16	23-AUG-16	R3530784
Volatile Organic Compounds							
Benzene	<0.0050		0.0050	mg/kg	22-AUG-16	23-AUG-16	R3529440
Ethylbenzene	<0.015		0.015	mg/kg	22-AUG-16	23-AUG-16	R3529440
Toluene	<0.050		0.050	mg/kg	22-AUG-16	23-AUG-16	R3529440
o-Xylene	<0.050		0.050	mg/kg	22-AUG-16	23-AUG-16	R3529440
m+p-Xylene	<0.050		0.050	mg/kg	22-AUG-16	23-AUG-16	R3529440
Xylenes	<0.10		0.10	mg/kg	22-AUG-16	23-AUG-16	R3529440
Surrogate: 4-Bromofluorobenzene (SS)	121.0		70-130	%	22-AUG-16	23-AUG-16	R3529440
Surrogate: 3,4-Dichlorotoluene (SS)	125.0		70-130	%	22-AUG-16	23-AUG-16	R3529440
Surrogate: 1,4-Difluorobenzene (SS)	123.0		70-130	%	22-AUG-16	23-AUG-16	R3529440
Hydrocarbons							
F1 (C6-C10)	<10		10	mg/kg		23-AUG-16	
F1-BTEX	<10		10	mg/kg		23-AUG-16	
F2 (C10-C16)	<20		20	mg/kg		23-AUG-16	
F3 (C16-C34)	<20		20	mg/kg		23-AUG-16	

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1813348-5 16-CI-16A Sampled By: RF on 10-AUG-16 @ 20:00 Matrix: soil							
Hydrocarbons							
F4 (C34-C50)	<20		20	mg/kg		23-AUG-16	
Total Hydrocarbons (C6-C50)	<20		20	mg/kg		23-AUG-16	
Chrom. to baseline at nC50	YES				22-AUG-16	22-AUG-16	R3532010
Surrogate: 2-Bromobenzotrifluoride	83.7		70-130	%	22-AUG-16	22-AUG-16	R3532010
Polychlorinated Biphenyls							
Aroclor 1016	<0.010		0.010	mg/kg		19-AUG-16	R3530109
Aroclor 1221	<0.010		0.010	mg/kg		19-AUG-16	R3530109
Aroclor 1232	<0.010		0.010	mg/kg		19-AUG-16	R3530109
Aroclor 1242	<0.010		0.010	mg/kg		19-AUG-16	R3530109
Aroclor 1248	<0.010		0.010	mg/kg		19-AUG-16	R3530109
Aroclor 1254	<0.010		0.010	mg/kg		19-AUG-16	R3530109
Aroclor 1260	<0.010		0.010	mg/kg		19-AUG-16	R3530109
Aroclor 1262	<0.010		0.010	mg/kg		19-AUG-16	R3530109
Aroclor 1268	<0.010		0.010	mg/kg		19-AUG-16	R3530109
Surrogate: Decachlorobiphenyl	89.5		65-130	%		19-AUG-16	R3530109
Total PCBs	<0.050		0.050	mg/kg		19-AUG-16	R3530109
L1813348-6 16-CI-20B Sampled By: RF on 11-AUG-16 @ 09:00 Matrix: soil							
Physical Tests							
% Moisture	14.0		0.50	%		22-AUG-16	R3531106
Metals							
Arsenic (As)	3.17		0.10	mg/kg	21-AUG-16	23-AUG-16	R3530784
Cadmium (Cd)	<0.020		0.020	mg/kg	21-AUG-16	23-AUG-16	R3530784
Chromium (Cr)	2.29		0.50	mg/kg	21-AUG-16	23-AUG-16	R3530784
Cobalt (Co)	0.62		0.10	mg/kg	21-AUG-16	23-AUG-16	R3530784
Copper (Cu)	1.28		0.50	mg/kg	21-AUG-16	23-AUG-16	R3530784
Lead (Pb)	5.77		0.50	mg/kg	21-AUG-16	23-AUG-16	R3530784
Mercury (Hg)	<0.0050		0.0050	mg/kg	21-AUG-16	22-AUG-16	R3531065
Nickel (Ni)	1.13		0.50	mg/kg	21-AUG-16	23-AUG-16	R3530784
Zinc (Zn)	2.9		2.0	mg/kg	21-AUG-16	23-AUG-16	R3530784
Volatile Organic Compounds							
Benzene	<0.0050		0.0050	mg/kg	22-AUG-16	23-AUG-16	R3529440
Ethylbenzene	<0.015		0.015	mg/kg	22-AUG-16	23-AUG-16	R3529440
Toluene	<0.050		0.050	mg/kg	22-AUG-16	23-AUG-16	R3529440
o-Xylene	<0.050		0.050	mg/kg	22-AUG-16	23-AUG-16	R3529440
m+p-Xylene	<0.050		0.050	mg/kg	22-AUG-16	23-AUG-16	R3529440
Xylenes	<0.10		0.10	mg/kg	22-AUG-16	23-AUG-16	R3529440
Surrogate: 4-Bromofluorobenzene (SS)	96.0		70-130	%	22-AUG-16	23-AUG-16	R3529440
Surrogate: 3,4-Dichlorotoluene (SS)	92.0		70-130	%	22-AUG-16	23-AUG-16	R3529440
Surrogate: 1,4-Difluorobenzene (SS)	96.0		70-130	%	22-AUG-16	23-AUG-16	R3529440
Hydrocarbons							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1813348-6 16-CI-20B Sampled By: RF on 11-AUG-16 @ 09:00 Matrix: soil							
Hydrocarbons							
F1 (C6-C10)	<10		10	mg/kg		23-AUG-16	
F1-BTEX	<10		10	mg/kg		23-AUG-16	
F2 (C10-C16)	<20		20	mg/kg		23-AUG-16	
F3 (C16-C34)	<20		20	mg/kg		23-AUG-16	
F4 (C34-C50)	<20		20	mg/kg		23-AUG-16	
Total Hydrocarbons (C6-C50)	<20		20	mg/kg		23-AUG-16	
Chrom. to baseline at nC50	YES				22-AUG-16	22-AUG-16	R3532010
Surrogate: 2-Bromobenzotrifluoride	79.0		70-130	%	22-AUG-16	22-AUG-16	R3532010
Polychlorinated Biphenyls							
Aroclor 1016	<0.010		0.010	mg/kg		19-AUG-16	R3530109
Aroclor 1221	<0.010		0.010	mg/kg		19-AUG-16	R3530109
Aroclor 1232	<0.010		0.010	mg/kg		19-AUG-16	R3530109
Aroclor 1242	<0.010		0.010	mg/kg		19-AUG-16	R3530109
Aroclor 1248	<0.010		0.010	mg/kg		19-AUG-16	R3530109
Aroclor 1254	<0.010		0.010	mg/kg		19-AUG-16	R3530109
Aroclor 1260	<0.010		0.010	mg/kg		19-AUG-16	R3530109
Aroclor 1262	<0.010		0.010	mg/kg		19-AUG-16	R3530109
Aroclor 1268	<0.010		0.010	mg/kg		19-AUG-16	R3530109
Surrogate: Decachlorobiphenyl	85.3		65-130	%		19-AUG-16	R3530109
Total PCBs	<0.050		0.050	mg/kg		19-AUG-16	R3530109
L1813348-7 16-CI-26A Sampled By: RF on 11-AUG-16 @ 01:30 Matrix: soil							
Physical Tests							
% Moisture	16.9		0.50	%		22-AUG-16	R3531106
Metals							
Arsenic (As)	1.73		0.10	mg/kg	21-AUG-16	23-AUG-16	R3530784
Cadmium (Cd)	0.030		0.020	mg/kg	21-AUG-16	23-AUG-16	R3530784
Chromium (Cr)	3.69		0.50	mg/kg	21-AUG-16	23-AUG-16	R3530784
Cobalt (Co)	0.87		0.10	mg/kg	21-AUG-16	23-AUG-16	R3530784
Copper (Cu)	1.37		0.50	mg/kg	21-AUG-16	23-AUG-16	R3530784
Lead (Pb)	4.49		0.50	mg/kg	21-AUG-16	23-AUG-16	R3530784
Mercury (Hg)	<0.0050		0.0050	mg/kg	21-AUG-16	22-AUG-16	R3531065
Nickel (Ni)	1.50		0.50	mg/kg	21-AUG-16	23-AUG-16	R3530784
Zinc (Zn)	4.8		2.0	mg/kg	21-AUG-16	23-AUG-16	R3530784
Volatile Organic Compounds							
Benzene	<0.0050		0.0050	mg/kg	22-AUG-16	23-AUG-16	R3529440
Ethylbenzene	<0.015		0.015	mg/kg	22-AUG-16	23-AUG-16	R3529440
Toluene	<0.050		0.050	mg/kg	22-AUG-16	23-AUG-16	R3529440
o-Xylene	<0.050		0.050	mg/kg	22-AUG-16	23-AUG-16	R3529440
m+p-Xylene	<0.050		0.050	mg/kg	22-AUG-16	23-AUG-16	R3529440
Xylenes	<0.10		0.10	mg/kg	22-AUG-16	23-AUG-16	R3529440

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

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Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1813348-7 16-CI-26A Sampled By: RF on 11-AUG-16 @ 01:30 Matrix: soil							
Volatile Organic Compounds							
Surrogate: 4-Bromofluorobenzene (SS)	107.0		70-130	%	22-AUG-16	23-AUG-16	R3529440
Surrogate: 3,4-Dichlorotoluene (SS)	103.0		70-130	%	22-AUG-16	23-AUG-16	R3529440
Surrogate: 1,4-Difluorobenzene (SS)	111.0		70-130	%	22-AUG-16	23-AUG-16	R3529440
Hydrocarbons							
F1 (C6-C10)	<10		10	mg/kg		23-AUG-16	
F1-BTEX	<10		10	mg/kg		23-AUG-16	
F2 (C10-C16)	<20		20	mg/kg		23-AUG-16	
F3 (C16-C34)	<20		20	mg/kg		23-AUG-16	
F4 (C34-C50)	<20		20	mg/kg		23-AUG-16	
Total Hydrocarbons (C6-C50)	<20		20	mg/kg		23-AUG-16	
Chrom. to baseline at nC50	YES				22-AUG-16	22-AUG-16	R3532010
Surrogate: 2-Bromobenzotrifluoride	85.6		70-130	%	22-AUG-16	22-AUG-16	R3532010
Polychlorinated Biphenyls							
Aroclor 1016	<0.010		0.010	mg/kg		19-AUG-16	R3530109
Aroclor 1221	<0.010		0.010	mg/kg		19-AUG-16	R3530109
Aroclor 1232	<0.010		0.010	mg/kg		19-AUG-16	R3530109
Aroclor 1242	<0.010		0.010	mg/kg		19-AUG-16	R3530109
Aroclor 1248	<0.010		0.010	mg/kg		19-AUG-16	R3530109
Aroclor 1254	<0.010		0.010	mg/kg		19-AUG-16	R3530109
Aroclor 1260	<0.010		0.010	mg/kg		19-AUG-16	R3530109
Aroclor 1262	<0.010		0.010	mg/kg		19-AUG-16	R3530109
Aroclor 1268	<0.010		0.010	mg/kg		19-AUG-16	R3530109
Surrogate: Decachlorobiphenyl	87.9		65-130	%		19-AUG-16	R3530109
Total PCBs	<0.050		0.050	mg/kg		19-AUG-16	R3530109
L1813348-8 16-CI-29A Sampled By: RF on 11-AUG-16 @ 14:30 Matrix: soil							
Physical Tests							
% Moisture	7.10		0.50	%		22-AUG-16	R3531106
Metals							
Arsenic (As)	0.89		0.10	mg/kg	21-AUG-16	23-AUG-16	R3530784
Cadmium (Cd)	<0.020		0.020	mg/kg	21-AUG-16	23-AUG-16	R3530784
Chromium (Cr)	2.82		0.50	mg/kg	21-AUG-16	23-AUG-16	R3530784
Cobalt (Co)	0.67		0.10	mg/kg	21-AUG-16	23-AUG-16	R3530784
Copper (Cu)	1.38		0.50	mg/kg	21-AUG-16	23-AUG-16	R3530784
Lead (Pb)	1.70		0.50	mg/kg	21-AUG-16	23-AUG-16	R3530784
Mercury (Hg)	<0.0050		0.0050	mg/kg	21-AUG-16	22-AUG-16	R3531065
Nickel (Ni)	1.52		0.50	mg/kg	21-AUG-16	23-AUG-16	R3530784
Zinc (Zn)	3.0		2.0	mg/kg	21-AUG-16	23-AUG-16	R3530784
Volatile Organic Compounds							
Benzene	<0.0050		0.0050	mg/kg	22-AUG-16	23-AUG-16	R3529440
Ethylbenzene	<0.015		0.015	mg/kg	22-AUG-16	23-AUG-16	R3529440

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

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Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1813348-8 16-CI-29A Sampled By: RF on 11-AUG-16 @ 14:30 Matrix: soil							
Volatile Organic Compounds							
Toluene	<0.050		0.050	mg/kg	22-AUG-16	23-AUG-16	R3529440
o-Xylene	<0.050		0.050	mg/kg	22-AUG-16	23-AUG-16	R3529440
m+p-Xylene	<0.050		0.050	mg/kg	22-AUG-16	23-AUG-16	R3529440
Xylenes	<0.10		0.10	mg/kg	22-AUG-16	23-AUG-16	R3529440
Surrogate: 4-Bromofluorobenzene (SS)	120.0		70-130	%	22-AUG-16	23-AUG-16	R3529440
Surrogate: 3,4-Dichlorotoluene (SS)	119.0		70-130	%	22-AUG-16	23-AUG-16	R3529440
Surrogate: 1,4-Difluorobenzene (SS)	128.0		70-130	%	22-AUG-16	23-AUG-16	R3529440
Hydrocarbons							
F1 (C6-C10)	<10		10	mg/kg		23-AUG-16	
F1-BTEX	<10		10	mg/kg		23-AUG-16	
F2 (C10-C16)	<20		20	mg/kg		23-AUG-16	
F3 (C16-C34)	<20		20	mg/kg		23-AUG-16	
F4 (C34-C50)	<20		20	mg/kg		23-AUG-16	
Total Hydrocarbons (C6-C50)	<20		20	mg/kg		23-AUG-16	
Chrom. to baseline at nC50	YES				22-AUG-16	22-AUG-16	R3532010
Surrogate: 2-Bromobenzotrifluoride	79.7		70-130	%	22-AUG-16	22-AUG-16	R3532010
Polychlorinated Biphenyls							
Aroclor 1016	<0.010		0.010	mg/kg		19-AUG-16	R3530109
Aroclor 1221	<0.010		0.010	mg/kg		19-AUG-16	R3530109
Aroclor 1232	<0.010		0.010	mg/kg		19-AUG-16	R3530109
Aroclor 1242	<0.010		0.010	mg/kg		19-AUG-16	R3530109
Aroclor 1248	<0.010		0.010	mg/kg		19-AUG-16	R3530109
Aroclor 1254	<0.010		0.010	mg/kg		19-AUG-16	R3530109
Aroclor 1260	<0.010		0.010	mg/kg		19-AUG-16	R3530109
Aroclor 1262	<0.010		0.010	mg/kg		19-AUG-16	R3530109
Aroclor 1268	<0.010		0.010	mg/kg		19-AUG-16	R3530109
Surrogate: Decachlorobiphenyl	87.4		65-130	%		19-AUG-16	R3530109
Total PCBs	<0.050		0.050	mg/kg		19-AUG-16	R3530109
L1813348-9 CI-MW03 Sampled By: RF on 10-AUG-16 @ 14:15 Matrix: water							
Total Metals							
Arsenic (As)-Total	0.00028		0.00010	mg/L		17-AUG-16	R3527747
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		17-AUG-16	R3527747
Chromium (Cr)-Total	0.00084		0.00010	mg/L		17-AUG-16	R3527747
Cobalt (Co)-Total	<0.00010		0.00010	mg/L		17-AUG-16	R3527747
Copper (Cu)-Total	0.00106		0.00050	mg/L		17-AUG-16	R3527747
Lead (Pb)-Total	0.000118		0.000050	mg/L		17-AUG-16	R3527747
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		21-AUG-16	R3531077
Nickel (Ni)-Total	0.00200		0.00050	mg/L		17-AUG-16	R3527747
Zinc (Zn)-Total	<0.0030		0.0030	mg/L		17-AUG-16	R3527747
Volatile Organic Compounds							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

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Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1813348-9 CI-MW03 Sampled By: RF on 10-AUG-16 @ 14:15 Matrix: water							
Volatile Organic Compounds							
Benzene	<0.00050		0.00050	mg/L		17-AUG-16	R3527107
Ethylbenzene	<0.00050		0.00050	mg/L		17-AUG-16	R3527107
Toluene	<0.00050		0.00050	mg/L		17-AUG-16	R3527107
o-Xylene	<0.00050		0.00050	mg/L		17-AUG-16	R3527107
m+p-Xylene	<0.00050		0.00050	mg/L		17-AUG-16	R3527107
Xylenes	<0.00071		0.00071	mg/L		17-AUG-16	R3527107
F1(C6-C10)	<0.10		0.10	mg/L		17-AUG-16	R3527107
F1-BTEX	<0.10		0.10	mg/L		17-AUG-16	R3527107
Surrogate: 4-Bromofluorobenzene (SS)	95.0		70-130	%		17-AUG-16	R3527107
Surrogate: 3,4-Dichlorotoluene (SS)	100.0		70-130	%		17-AUG-16	R3527107
Surrogate: 1,4-Difluorobenzene (SS)	99.0		70-130	%		17-AUG-16	R3527107
Hydrocarbons							
F2 (>C10-C16)	<0.10		0.10	mg/L	17-AUG-16	17-AUG-16	R3527920
F3 (C16-C34)	<0.25		0.25	mg/L	17-AUG-16	17-AUG-16	R3527920
F4 (C34-C50)	<0.25		0.25	mg/L	17-AUG-16	17-AUG-16	R3527920
Surrogate: 2-Bromobenzotrifluoride	73.0		60-140	%	17-AUG-16	17-AUG-16	R3527920
Polychlorinated Biphenyls							
Aroclor 1016	<0.000010		0.000010	mg/L		19-AUG-16	R3530921
Aroclor 1221	<0.000010		0.000010	mg/L		19-AUG-16	R3530921
Aroclor 1232	<0.000010		0.000010	mg/L		19-AUG-16	R3530921
Aroclor 1242	<0.000010		0.000010	mg/L		19-AUG-16	R3530921
Aroclor 1248	<0.000010		0.000010	mg/L		19-AUG-16	R3530921
Aroclor 1254	<0.000010		0.000010	mg/L		19-AUG-16	R3530921
Aroclor 1260	<0.000010		0.000010	mg/L		19-AUG-16	R3530921
Aroclor 1262	<0.000010		0.000010	mg/L		19-AUG-16	R3530921
Aroclor 1268	<0.000010		0.000010	mg/L		19-AUG-16	R3530921
Surrogate: Decachlorobiphenyl	74.4		65-130	%		19-AUG-16	R3530921
Total PCBs	<0.000050		0.000050	mg/L		19-AUG-16	R3530921

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Duplicate	Chromium (Cr)-Total	DUP-H	L1813348-9

Qualifiers for Individual Samples Listed:

Sample Numbe	Client ID	Qualifier	Description
L1813348-9	CI-MW03	SPL	HG-T - Sample was Preserved at the laboratory
		WSMT	HG-T - Water sample(s) for total mercury analysis was not submitted in glass or PTFE container with HCl preservative. Results may be biased low.

Sample Parameter Qualifier key listed:

Qualifier	Description
DUP-H	Duplicate results outside ALS DQO, due to sample heterogeneity.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
BTX,F1-ED	Soil	BTEX and F1 (C6-C10)	CCME CWS-PHC, Pub #1310, Dec 2001
BTX,F1-ED	Water	BTEX and F1 (C6-C10)	EPA 5021/8015&8260 GC-MS & FID
ETL-TVH,TEH-CCME-ED	Soil	CCME Total Hydrocarbons	CCME CWS-PHC, Pub #1310, Dec 2001

Analytical methods used for analysis of CCME Petroleum Hydrocarbons have been validated and comply with the Reference Method for the CWS PHC.

Hydrocarbon results are expressed on a dry weight basis.

In cases where results for both F4 and F4G are reported, the greater of the two results must be used in any application of the CWS PHC guidelines and the gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.
In samples where BTEX and F1 were analyzed , F1-BTEX represents a value where the sum of Benzene, Toluene, Ethylbenzene and total Xylenes has been subtracted from F1.

In samples where PAHs, F2 and F3 were analyzed, F2-Naphth represents the result where Naphthalene has been subtracted from F2. F3-PAH represents a result where the sum of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene has been subtracted from F3.

Unless otherwise qualified, the following quality control criteria have been met for the F1 hydrocarbon range:
1. All extraction and analysis holding times were met.
2. Instrument performance showing response factors for C6 and C10 within 30% of the response factor for toluene.
3. Linearity of gasoline response within 15% throughout the calibration range.

Unless otherwise qualified, the following quality control criteria have been met for the F2-F4 hydrocarbon ranges:
1. All extraction and analysis holding times were met.
2. Instrument performance showing C10, C16 and C34 response factors within 10% of their average.
3. Instrument performance showing the C50 response factor within 30% of the average of the C10, C16 and C34 response factors.
4. Linearity of diesel or motor oil response within 15% throughout the calibration range.

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.

F2-4-TMB-ED	Soil	CCME Total Extractable	CCME CWS-PHC, Pub #1310, Dec 2001
F2-4-TMB-ED		Hydrocarbons	

This analysis is carried out in accordance with the "Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil - Tier 1 Method, Canadian Council of Ministers of the Environment" For C10 to C50 hydrocarbons (F2, F3, F4) and gravimetric heavy hydrocarbons (F4G-sg), a subsample of the sediment/soil is extracted with 1:1 hexane:acetone using a rotary extractor. The extract undergoes a silica-gel clean-up to remove polar compounds. F2, F3 & F4 are analyzed by on-column GC/FID, and F4G-sg is analyzed gravimetrically.

Notes:
1. F2 (C10-C16): Sum of all hydrocarbons that elute between nC10 and nC16.
2. F3 (C16-C34): Sum of all hydrocarbons that elute between nC16 and nC34.
3. F4 (C34-C50): Sum of all hydrocarbons that elute between nC34 and nC50.
4. F4G: Gravimetric Heavy Hydrocarbons
5. F4G-sg: Gravimetric Heavy Hydrocarbons (F4G) after silica gel treatment.
6. Where F4 (C34-C50) and F4G-sg results are reported for a sample, the larger of the reported values is used for comparison against the relevant CCME standard for F4.
7. The gravimetric heavy hydrocarbon results (F4G-sg), cannot be added to the C6 to C50 hydrocarbon results.
8. This method is validated for use.
9. Data from analysis of quality control samples is available upon request.
10. Reported results are expressed as milligrams per dry kilogram.

HG-200.2-CVAA-ED	Soil	Mercury in Soil by CVAAS	EPA 200.2/1631E (Mod)

Reference Information

Soil samples are digested with nitric and hydrochloric acids, followed by analysis by CVAAS.

HG-T-CVAA-ED Water Total Mercury in Water by CVAAS EPA 1631E (mod)
Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.

MET-200.2-CCMS-ED Soil Metals in Soil by CRC ICPMS EPA 200.2/6020A (mod)
Soil samples are digested with nitric and hydrochloric acids, followed by analysis by CRC ICPMS.

Method Limitation: This method is not a total digestion technique. It is a very strong acid digestion that is intended to dissolve those metals that may be environmentally available. This method does not dissolve all silicate materials and may result in a partial extraction. depending on the sample matrix, for some metals, including, but not limited to Al, Ba, Be, Cr, Sr, Ti, Tl, and V.

MET-T-CCMS-ED Water Total Metals in Water by CRC 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.

PCB-ED Soil PCBs EPA 3570/8082-GC-ECD

PCB-ED Water PCBs EPA 3510/8082-GC-ECD

PREP-MOISTURE-ED Soil % Moisture Oven dry 105C-Gravimetric
The weighed portion of soil is placed in a 105°C oven to dry to a constant weight; the drying time will vary based on the moisture content of the soil. The dried soil weight is then used to calculate % moisture.

Reference: ASTM D2974-00.

** 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

Chain of Custody Numbers:

10-366493

GLOSSARY OF REPORT TERMS
Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
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 weight of sample
mg/L - unit of concentration based on volume, parts per million.
< - Less than.
D.L. - The reporting limit.
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: L1813348 Report Date: 23-AUG-16

Client: ARCADIS Canada Inc. - Ottawa
329 Churchill Ave N
Ottawa ON K2L 5B8
Contact: Ryan Fletcher

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
BTX,F1-ED	**Water**							
Batch R3527107								
WG2369160-2 LCS								
Benzene			110.6		%		70-130	17-AUG-16
Toluene			115.5		%		70-130	17-AUG-16
Ethylbenzene			113.9		%		70-130	17-AUG-16
o-Xylene			112.2		%		70-130	17-AUG-16
m+p-Xylene			110.4		%		70-130	17-AUG-16
WG2369160-3 LCS								
F1(C6-C10)			121.9		%		70-130	17-AUG-16
WG2369160-1 MB								
Benzene			<0.00050		mg/L		0.0005	17-AUG-16
Toluene			<0.00050		mg/L		0.0005	17-AUG-16
Ethylbenzene			<0.00050		mg/L		0.0005	17-AUG-16
o-Xylene			<0.00050		mg/L		0.0005	17-AUG-16
m+p-Xylene			<0.00050		mg/L		0.0005	17-AUG-16
F1(C6-C10)			<0.10		mg/L		0.1	17-AUG-16
Surrogate: 1,4-Difluorobenzene (SS)			99.0		%		70-130	17-AUG-16
Surrogate: 4-Bromofluorobenzene (SS)			97.0		%		70-130	17-AUG-16
Surrogate: 3,4-Dichlorotoluene (SS)			101.0		%		70-130	17-AUG-16
F2,F3,F4-ED	**Water**							
Batch R3527920								
WG2369502-2 LCS								
F2 (>C10-C16)			101.1		%		70-130	17-AUG-16
F3 (C16-C34)			94.8		%		70-130	17-AUG-16
F4 (C34-C50)			97.1		%		70-130	17-AUG-16
WG2369502-1 MB								
F2 (>C10-C16)			<0.10		mg/L		0.1	17-AUG-16
F3 (C16-C34)			<0.25		mg/L		0.25	17-AUG-16
F4 (C34-C50)			<0.25		mg/L		0.25	17-AUG-16
Surrogate: 2-Bromobenzotrifluoride			93.5		%		60-140	17-AUG-16
HG-T-CVAA-ED	**Water**							
Batch R3531077								
WG2372299-3 DUP		**L1813367-2**						
Mercury (Hg)-Total		<0.0000050	<0.000005C	RPD-NA	mg/L	N/A	20	21-AUG-16
WG2372299-2 LCS								
Mercury (Hg)-Total			105.0		%		80-120	21-AUG-16
WG2372299-1 MB								

Quality Control Report

Workorder: L1813348 Report Date: 23-AUG-16

Client: ARCADIS Canada Inc. - Ottawa
329 Churchill Ave N
Ottawa ON K2L 5B8
Contact: Ryan Fletcher

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
HG-T-CVAA-ED	**Water**							
Batch R3531077								
WG2372299-1 MB								
Mercury (Hg)-Total			<0.000005(		mg/L		0.000005	21-AUG-16
WG2372299-4 MS		**L1813348-9**						
Mercury (Hg)-Total			97.8		%		70-130	21-AUG-16
MET-T-CCMS-ED	**Water**							
Batch R3527747								
WG2369440-3 DUP		**L1811617-1**						
Arsenic (As)-Total		0.00024	0.00026		mg/L	8.7	20	17-AUG-16
Cadmium (Cd)-Total		0.0000055	0.0000050		mg/L	9.7	20	17-AUG-16
Cobalt (Co)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	17-AUG-16
Copper (Cu)-Total		0.0402	0.0405		mg/L	0.8	20	17-AUG-16
Lead (Pb)-Total		0.000161	0.000174		mg/L	7.3	20	17-AUG-16
Nickel (Ni)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	17-AUG-16
Zinc (Zn)-Total		0.0063	0.0067		mg/L	5.2	20	17-AUG-16
WG2369440-2 LCS								
Arsenic (As)-Total			104.1		%		80-120	17-AUG-16
Cadmium (Cd)-Total			95.9		%		80-120	17-AUG-16
Chromium (Cr)-Total			98.1		%		80-120	17-AUG-16
Cobalt (Co)-Total			99.4		%		80-120	17-AUG-16
Copper (Cu)-Total			98.4		%		80-120	17-AUG-16
Lead (Pb)-Total			100.9		%		80-120	17-AUG-16
Nickel (Ni)-Total			101.1		%		80-120	17-AUG-16
Zinc (Zn)-Total			96.7		%		80-120	17-AUG-16
WG2369440-1 MB								
Arsenic (As)-Total			<0.00010		mg/L		0.0001	17-AUG-16
Cadmium (Cd)-Total			<0.000005(		mg/L		0.000005	17-AUG-16
Chromium (Cr)-Total			<0.00010		mg/L		0.0001	17-AUG-16
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	17-AUG-16
Copper (Cu)-Total			<0.00050		mg/L		0.0005	17-AUG-16
Lead (Pb)-Total			<0.000050		mg/L		0.00005	17-AUG-16
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	17-AUG-16
Zinc (Zn)-Total			<0.0030		mg/L		0.003	17-AUG-16

Quality Control Report

Client: ARCADIS Canada Inc. - Ottawa
329 Churchill Ave N
Ottawa ON K2L 5B8
Contact: Ryan Fletcher

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-ED	**Water**							
Batch R3530191								
WG2369440-3 DUP		**L1811617-1**						
Chromium (Cr)-Total		0.00024	<0.00010	DUP-H	mg/L	N/A	20	21-AUG-16
PCB-ED	**Water**							
Batch R3530921								
WG2371457-2 LCS								
Aroclor 1260			74.9		%		65-130	19-AUG-16
WG2371457-1 MB								
Aroclor 1016			<0.000010		mg/L		0.00001	19-AUG-16
Aroclor 1221			<0.000010		mg/L		0.00001	19-AUG-16
Aroclor 1232			<0.000010		mg/L		0.00001	19-AUG-16
Aroclor 1242			<0.000010		mg/L		0.00001	19-AUG-16
Aroclor 1248			<0.000010		mg/L		0.00001	19-AUG-16
Aroclor 1254			<0.000010		mg/L		0.00001	19-AUG-16
Aroclor 1260			<0.000010		mg/L		0.00001	19-AUG-16
Aroclor 1262			<0.000010		mg/L		0.00001	19-AUG-16
Aroclor 1268			<0.000010		mg/L		0.00001	19-AUG-16
Surrogate: Decachlorobiphenyl			72.3		%		65-130	19-AUG-16
BTX,F1-ED	**Soil**							
Batch R3529440								
WG2372609-2 LCS								
Benzene			94.2		%		70-130	23-AUG-16
Toluene			111.9		%		70-130	23-AUG-16
Ethylbenzene			108.9		%		70-130	23-AUG-16
o-Xylene			113.9		%		70-130	23-AUG-16
m+p-Xylene			108.0		%		70-130	23-AUG-16
WG2372609-3 LCS								
F1(C6-C10)			100.7		%		70-130	23-AUG-16
WG2372609-1 MB								
Benzene			<0.0050		mg/kg		0.005	23-AUG-16
Toluene			<0.050		mg/kg		0.05	23-AUG-16
Ethylbenzene			<0.015		mg/kg		0.015	23-AUG-16
o-Xylene			<0.050		mg/kg		0.05	23-AUG-16
m+p-Xylene			<0.050		mg/kg		0.05	23-AUG-16
F1(C6-C10)			<10		mg/kg		10	23-AUG-16
Surrogate: 1,4-Difluorobenzene (SS)			113.0		%		70-130	23-AUG-16

Quality Control Report

Client: ARCADIS Canada Inc. - Ottawa
329 Churchill Ave N
Ottawa ON K2L 5B8
Contact: Ryan Fletcher

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
BTX,F1-ED	**Soil**							
Batch R3529440								
WG2372609-1 MB								
Surrogate: 4-Bromofluorobenzene (SS)			113.0		%		70-130	23-AUG-16
Surrogate: 3,4-Dichlorotoluene (SS)			106.0		%		70-130	23-AUG-16
F2-4-TMB-ED	**Soil**							
Batch R3532010								
WG2372995-2 LCS								
F2 (C10-C16)			90.6		%		70-130	22-AUG-16
F3 (C16-C34)			89.1		%		70-130	22-AUG-16
F4 (C34-C50)			95.3		%		70-130	22-AUG-16
WG2372995-1 MB								
F2 (C10-C16)			<20		mg/kg		20	22-AUG-16
F3 (C16-C34)			<20		mg/kg		20	22-AUG-16
F4 (C34-C50)			<20		mg/kg		20	22-AUG-16
Surrogate: 2-Bromobenzotrifluoride			81.7		%		70-130	22-AUG-16
HG-200.2-CVAA-ED	**Soil**							
Batch R3531065								
WG2372339-3 CRM		**TILL-1_SOIL**						
Mercury (Hg)			112.7		%		70-130	22-AUG-16
WG2372339-4 DUP		**L1813097-32**						
Mercury (Hg)		0.0879	0.0838		mg/kg	4.8	40	22-AUG-16
WG2372339-2 LCS								
Mercury (Hg)			128.0		%		70-130	22-AUG-16
WG2372339-1 MB								
Mercury (Hg)			<0.0050		mg/kg		0.005	22-AUG-16
MET-200.2-CCMS-ED	**Soil**							
Batch R3530784								
WG2372339-3 CRM		**TILL-1_SOIL**						
Arsenic (As)			110.9		%		70-130	22-AUG-16
Cadmium (Cd)			93.9		%		70-130	22-AUG-16
Chromium (Cr)			108.5		%		70-130	22-AUG-16
Cobalt (Co)			107.1		%		70-130	22-AUG-16
Copper (Cu)			102.7		%		70-130	22-AUG-16
Lead (Pb)			94.7		%		70-130	22-AUG-16
Nickel (Ni)			107.2		%		70-130	22-AUG-16
Zinc (Zn)			98.4		%		70-130	22-AUG-16
WG2372339-4 DUP		**L1813097-32**						

Quality Control Report

Client: ARCADIS Canada Inc. - Ottawa
329 Churchill Ave N
Ottawa ON K2L 5B8
Contact: Ryan Fletcher

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-200.2-CCMS-ED	**Soil**							
Batch R3530784								
WG2372339-4 DUP		**L1813097-32**						
Arsenic (As)		128	126		mg/kg	1.0	30	23-AUG-16
Cadmium (Cd)		0.494	0.483		mg/kg	2.1	30	23-AUG-16
Chromium (Cr)		7.42	7.67		mg/kg	3.4	30	23-AUG-16
Cobalt (Co)		4.55	4.67		mg/kg	2.7	30	23-AUG-16
Copper (Cu)		96.8	94.0		mg/kg	2.9	30	23-AUG-16
Lead (Pb)		1.95	1.96		mg/kg	0.5	40	23-AUG-16
Nickel (Ni)		18.1	17.8		mg/kg	1.9	30	23-AUG-16
Zinc (Zn)		22.5	25.9		mg/kg	14	30	23-AUG-16
WG2372339-2 LCS								
Arsenic (As)			101.9		%		80-120	22-AUG-16
Cadmium (Cd)			101.1		%		80-120	22-AUG-16
Chromium (Cr)			99.6		%		80-120	22-AUG-16
Cobalt (Co)			100.5		%		80-120	22-AUG-16
Copper (Cu)			99.4		%		80-120	22-AUG-16
Lead (Pb)			102.8		%		80-120	22-AUG-16
Nickel (Ni)			101.6		%		80-120	22-AUG-16
Zinc (Zn)			96.1		%		80-120	22-AUG-16
WG2372339-1 MB								
Arsenic (As)			<0.10		mg/kg		0.1	22-AUG-16
Cadmium (Cd)			<0.020		mg/kg		0.02	22-AUG-16
Chromium (Cr)			<0.50		mg/kg		0.5	22-AUG-16
Cobalt (Co)			<0.10		mg/kg		0.1	22-AUG-16
Copper (Cu)			<0.50		mg/kg		0.5	22-AUG-16
Lead (Pb)			<0.50		mg/kg		0.5	22-AUG-16
Nickel (Ni)			<0.50		mg/kg		0.5	22-AUG-16
Zinc (Zn)			<2.0		mg/kg		2	22-AUG-16
PCB-ED	**Soil**							
Batch R3530109								
WG2369662-3 CRM		**PCB_SOIL_CRM915-050**						
Aroclor 1260			82.9		%		65-130	19-AUG-16
WG2369662-4 DUP		**L1813348-8**						
Aroclor 1016		<0.010	<0.010	RPD-NA	mg/kg	N/A	50	19-AUG-16
Aroclor 1221		<0.010	<0.010	RPD-NA	mg/kg	N/A	50	19-AUG-16
Aroclor 1232		<0.010	<0.010	RPD-NA	mg/kg	N/A	50	19-AUG-16

Quality Control Report

Client: ARCADIS Canada Inc. - Ottawa
329 Churchill Ave N
Ottawa ON K2L 5B8
Contact: Ryan Fletcher

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PCB-ED	**Soil**							
Batch R3530109								
WG2369662-4 DUP		**L1813348-8**						
Aroclor 1242		<0.010	<0.010	RPD-NA	mg/kg	N/A	50	19-AUG-16
Aroclor 1248		<0.010	<0.010	RPD-NA	mg/kg	N/A	50	19-AUG-16
Aroclor 1254		<0.010	<0.010	RPD-NA	mg/kg	N/A	50	19-AUG-16
Aroclor 1260		<0.010	<0.010	RPD-NA	mg/kg	N/A	50	19-AUG-16
Aroclor 1262		<0.010	<0.010	RPD-NA	mg/kg	N/A	50	19-AUG-16
Aroclor 1268		<0.010	<0.010	RPD-NA	mg/kg	N/A	50	19-AUG-16
WG2369662-2 LCS								
Aroclor 1268			85.3		%		65-130	19-AUG-16
WG2369662-1 MB								
Aroclor 1016			<0.010		mg/kg		0.01	19-AUG-16
Aroclor 1221			<0.010		mg/kg		0.01	19-AUG-16
Aroclor 1232			<0.010		mg/kg		0.01	19-AUG-16
Aroclor 1242			<0.010		mg/kg		0.01	19-AUG-16
Aroclor 1248			<0.010		mg/kg		0.01	19-AUG-16
Aroclor 1254			<0.010		mg/kg		0.01	19-AUG-16
Aroclor 1260			<0.010		mg/kg		0.01	19-AUG-16
Aroclor 1262			<0.010		mg/kg		0.01	19-AUG-16
Aroclor 1268			<0.010		mg/kg		0.01	19-AUG-16
Surrogate: Decachlorobiphenyl			81.6		%		65-130	19-AUG-16
PREP-MOISTURE-ED	**Soil**							
Batch R3531106								
WG2372646-3 DUP		**L1812546-10**						
% Moisture		28.6	27.9		%	2.4	20	22-AUG-16
WG2372646-6 DUP		**L1816629-6**						
% Moisture		15.9	15.8		%	0.3	20	22-AUG-16
WG2372646-2 LCS								
% Moisture			101.4		%		90-110	22-AUG-16
WG2372646-5 LCS								
% Moisture			100.9		%		90-110	22-AUG-16
WG2372646-1 MB								
% Moisture			<0.50		%		0.5	22-AUG-16
WG2372646-4 MB								
% Moisture			<0.50		%		0.5	22-AUG-16

Quality Control Report

Workorder: L1813348 Report Date: 23-AUG-16

Client: ARCADIS Canada Inc. - Ottawa
329 Churchill Ave N
Ottawa ON K2L 5B8
Contact: Ryan Fletcher

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
DUP-H	Duplicate results outside ALS DQO, due to sample heterogeneity.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Quality Control Report

Workorder: L1813348 Report Date: 23-AUG-16

Client: ARCADIS Canada Inc. - Ottawa
329 Churchill Ave N
Ottawa ON K2L 5B8
Contact: Ryan Fletcher

Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
Volatile Organic Compounds							
BTEX and F1 (C6-C10)							
	1	09-AUG-16 13:00	22-AUG-16 00:00	7	12	days	EHT
	2	09-AUG-16 15:30	22-AUG-16 00:00	7	12	days	EHT
	3	10-AUG-16 16:00	22-AUG-16 00:00	7	11	days	EHT
	4	10-AUG-16 16:45	22-AUG-16 00:00	7	11	days	EHT
	5	10-AUG-16 20:00	22-AUG-16 00:00	7	11	days	EHT
	6	11-AUG-16 09:00	22-AUG-16 00:00	7	11	days	EHT
	7	11-AUG-16 01:30	22-AUG-16 00:00	7	11	days	EHT
	8	11-AUG-16 14:30	22-AUG-16 00:00	7	10	days	EHT

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 L1813348 were received on 15-AUG-16 10:40.

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.

10- 366493

L1813348-COFC

Chain of Custody / Analytical Request Form
Canada Toll Free: 1 800 668 9878
www.alsglobal.com

Page 1 of 1

Report To		Report Format / Distribution		Service Request: (Rush subject to availability - Contact ALS to confirm TAT)	
Company:	Arcadis Canada	Standard:	Other (specify):	X	Regular (Standard Turnaround Times - Business Days)
Contact:	Ryan Fletcher	Select: PDF X	Excel X Digital Fax		Priority(2-4 Business Days)-50% surcharge - Contact ALS to confirm TAT
Address:	329 Churchill Ave N	Email 1:	ryan.fletcher@arcadis.com		Emergency (1-2 Business Days)-100% Surcharge - Contact ALS to confirm TAT
	Ottawa Ontario K1Z5B8	Email 2:	andrew.henderson@arcadis.com		Same Day or Weekend Emergency - Contact ALS to confirm TAT
Phone:	613 721-0555 Fax: 613 721 0029			**Analysis Request**	
Invoice To	Same as Report ? (circle) Yes or No (if No, provide details)	**Client / Project Information**		(Indicate Filtered or Preserved, F/P)	
	Copy of Invoice with Report? (circle) Yes or No	Job #:	102012-000		
Company:	Same	PO / AFE:			
Contact:		LSD:			
Address:					
Phone:	Fax:	Quote #:			
Lab Work Order # (lab use only)	L1813348	**ALS Contact:**	**Sampler:** R. Fletcher		

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	PHC's F1/BTEX, F2-F4	PCB's	Metals, ICPMS	see notes	PCBs 1420	Metals (see note)	PAC's F1/BTEX F2-F4	Number of Containers
	16-CI-5A	Aug 9/16	13:00	Soil	X	X	X					5
	16-CI-8A	Aug 9/16	15:30	Soil	X	X	X					5
	16-CI-11A	Aug 10/16	16:00	Soil	X	X	X					5
	16-CI-17A	Aug 10/16	16:45	Soil	X	X	X					5
	16-CI-16A	Aug 10/16	20:00	Soil	X	X	X					5
	16-CI-20B	Aug 11/16	9:00	Soil	X	X	X					5
	16-CI-26A	Aug 11/16	10:30	Soil	X	X	X					5
	16-CI-29A	Aug 11/16	14:30	Soil	X	X	X					5
	CI-MW03	Aug 10/16	14:15	GW					X	X	X	

Special Instructions / Regulation with water or land use (CCME- Freshwater Aquatic Life/BC CSR-Commercial/AB Tier 1-Natural/ETC) / Hazardous Details

Metals Report ONLY arsenic, cadmium, chromium, cobalt, copper, lead, nickel, zinc, mercury / Metals not filtered + NOT preserved – TOTAL Metals req.

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)			SHIPMENT VERIFICATION (lab use only)			
Released by: Ryan Fletcher	Date: Aug 12/16	Time: 3pm	Received by:	Date: 15 Aug 2016	Time: 10:40	Temperature: 1.7 °C	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF

GENERAL TERMS AND CONDITIONS:

These terms and conditions are incorporated in and form part of the Agreement between ALS Laboratory Group – Environmental Division ("ALS") and the party named in the Offer (the "Client").

1. Definitions. Capitalized Terms not defined in these Terms and Conditions have the definitions set out in the other Agreement documents.
2. The Services. ALS will provide the Services to the Client as described in the Offer and in any change of custody form provided with any sample.
3. Prices. ALS may review and change all prices, fees, surcharges or other charges set out in the Agreement if there are changes to ALS's cost beyond ALS's control, including changes in legislative requirements, Client variations of sample numbers and Client requests for changes to standard reporting requirements. Notwithstanding Condition 3, all quotations are reviewed and updated on a yearly basis.
4. Payment Terms. The Client shall pay ALS within 30 days of the invoice date OAC. ALS may, for reasonable business reasons, require the Client to arrange for payment in advance.
5. Quotation Numbers. The Client shall provide the quotation number to ALS (where applicable) to ensure correct pricing.
6. Taxes. Applicable taxes are not included in prices, surcharges and additional fees and will be added at the time of invoicing.
7. Quality Control. ALS has an extensive QA/QC program and all analytical data reported is analyzed using approved, referenced procedures followed by checks and reviews of senior managers and quality assurance personnel.
8. No Guarantee of Results. Results are obtained from chemical measurements. The Client is responsible for informing itself on the limitation of the results and acknowledges that the results are not guaranteed.
9. Standard of Care. ALS will use reasonable care and diligence as required by the laws of the province or territory where the sample is tested.
10. Storage. Where possible, ALS will store samples for 30 days from the date a final report is issued to the Client, after which ALS may discard the sample.
11. Holds. If the Client requests a sample be placed on hold, ALS will store the sample for 60 days for the quoted price, after which ALS will invoice the Client and discard the sample.
12. Archives. If the Client requests a sample be archived, ALS will store the sample for 6 months for the quoted price, after which ALS will invoice the Client and discard the sample.
13. Handling Protocol. Legal sample handling protocol must be arranged before samples are collected. ALS may charge a 20% surcharge on the list price plus the hourly technologist or chemist rates for legal sample protocol. Samples processed under legal protocol are stored indefinitely (storage charges may apply).
14. Samples. The quality, condition, content and source of samples stored and tested are not known to ALS except as declared and described on the chain of custody form completed and submitted by the Client and accompanying the sample.
15. Risk of Loss. ALS will use reasonable care to protect samples during storage, however all samples are stored at the Client's risk and the Client is responsible for obtaining appropriate insurance, if desired. The Client acknowledges that during the performance of the Services samples may be altered, lost, damaged or destroyed and the Client releases ALS from any claim the Client may have for any loss or damage to the sample.
16. Environmental. The Client must comply with all applicable environment legislation, including labeling all hazardous samples to comply with WHMIS and TDG regulations, and must provide appropriate material safety data sheets that include the nature of the hazard and a contact name and phone number to call for information. The Client will indemnify ALS for all loss or damages, including any fine or cost of complying with an order of any government authority, resulting from the Client's breach of this paragraph.
17. Hazardous Materials Disposal. ALS may return, at the Client's cost, hazardous material to the Client for disposal.
18. Hazardous Materials Surcharge. ALS may apply an additional surcharge for handling of hazardous samples or samples with Naturally Occuring Radioactive Materials (NORM), H2S, CN, etc.
19. Sample Containers. ALS may ship sample containers to the Client's location by the most cost effective means using ALS preferred courier suppliers, within the specified project timeline.
20. Additional Charges. ALS may charge the Client (a) its cost for emergency bottle shipments and shipments to and from a remote site, and (b) where pick up and delivery services are provided, subject in each instance to a minimum charge of $25.00.
21. Large Bottle Orders. The Client shall provide ALS with 24 hours notice for large bottle orders.
22. Re-Tests. ALS reserves the right to re-test any samples that remains in its possession. Re-tests requested by the Client may be charged.
23. Waiver. The Client is responsible for making any assessment regarding the suitability of the Services and the intended results for the Client's purposes and waives any claims against ALS it may have as a result of the interpretation of the results. The Client shall indemnify ALS for all claims made by any third party against ALS in respect of all losses however arising from the performance of the Services or the use of any report provided in the performance of the Services.
24. Limitation of Liability. In no event shall ALS be liable for any consequential, indirect, incidental, special, exemplary or punitive damages, whether foreseeable of unforeseeable, (including claims for loss of profits or revenue or losses caused by stoppage of other work or impairment of other assets) incurred by the Client arising out of breach or failure of express of implied warranty, breach of contract, breach of warranty, misrepresentation, negligence, strict liability in tort or otherwise. In any event, the liability of ALS to the Client shall be limited to the cost of testing the sample as requested in the chain of custody form under which the sample was originally deposited. For the purposes of this paragraph and paragraphs 8, 15, 16, 23 and 25, as the applicable, "ALS" includes without limitations its directors, officers, employees and affiliates and the "Client" includes without limitation any third party that may have a claim against ALS through the Client.
25. Notice of Liability. Notwithstanding paragraph 24, ALS shall not be liable to the Client unless the Client provides notice in writing to ALS of such loss or damage, together with full particulars thereof, within 30 days of the Client's receipt of the report of the analysis of the sample giving rise to such liability. The provisions of this paragraph allocate the risk under the Agreement between the Client and ALS, and the fees to be paid by the Client to ALS reflect this allocation of risks and the limitations of liability in this Agreement.
26. Entire Agreement. The Agreement is the entire agreement between the parties and supercedes and takes precedence over any terms and conditions contained in any documentation provided by the Client. ALS's execution of any subsequent documentation from the Client only acknowledges receipt and not acceptance of any terms or conditions therein. If there is a conflict between these terms and conditions and any other Agreement document, these terms and conditions prevail.

GENF 19.00 Terms

APPENDIX C

Field Notes

MW 01 Dry

ANNEX J3: Monitoring Well Sampling Log (Complete All Fields)

Site Name: CAM-1 Landfill Name: Non-Haz

Monitoring Well ID: MW01 UTM Coordinates: North East

Sample Number(s) include dups.: — None Dry well

Bottles filled (by parameter type): — N/A

Date of Sampling Event: Aug 10/16 Time: 10 am

Weather: Sun, windy 18°C

Names of Samplers: Ryan Fletcher

Description of Well Condition and Surrounding ground conditions (note ponding of water): excellent condition

Lock (condition, presence, model, manufacturer): cut and replaced as per TOR

Pre-Measured Data (From Water Well Record Log)

*Depth of well installation (cm)= Diameter of well (cm)= 38

*Depth to top of screen (cm)= Length screened section (cm)=

*note: *depths are from ground surface*

Field Measurements

Measurement method (interface probe, tape, etc): I.P.

Well pipe height above ground (cm) (to top of pipe)= 50 cm

Static water level (cm) from top of pipe = N/A

Static water level (cm) (below ground surface) calculated = N/A

Measured well refusal depth (cm) (measure after sampling)= 2,092 cm

Thickness of water column (cm)= N/A Static volume of water in well (mL)= N/A

Free product thickness (mm)= N/A None Evidence of sludge or siltation: NO

Purging Information Summary*

Purging/sampling equipment, sampling technique and equipment calibration information: N/A

Well purged (Y/N): N/A Recharge Rate: N/A

Volume Purged (L) (note multiple purging events if applicable): —

Parameter	Initial	Intermediate	Final	*Notes (if not stabilized)*
pH				
Conductivity (uS/cm)	N/A			
Turbidity (NTU)				
Temperature (degC)				

Visual/olfactory observations (incl. colour, odour, presence of free product/sheen/globules, siltation...): N/A

Decontamination of sampling equipment

Type of decontamination fluid (s): N/A

Number washes: Number rinses:

Other Relevant Comments:

* Complete field notes including a full suite of water quality indicator parameters VS time should be appended to this summary as per US *EPA Low-Flow (Minimal Drawdown) Ground-Water Sampliong Procedures (EPA/540/S-95/504 or most recent)* .

MW02 Dry

ANNEX J3: Monitoring Well Sampling Log (Complete All Fields)

Site Name: CAM I Landfill Name: Van-Hue

Monitoring Well ID: MW02 UTM Coordinates: North East

Sample Number(s) include dups.: ~~CI-MW02~~ - 9 jars RF - DUP

Bottles filled (by parameter type): ~~PHC 4, PCB 2, Met.1S 3~~

Date of Sampling Event: Aug 10/16 Time: 15:15

Weather: Sun, windy 10-12°C

Names of Samplers: R. Fletcher

Description of Well Condition and Surrounding ground conditions (note ponding of water): Excellent

Lock (condition, presence, model, manufacturer): cut & replaced as per TOR

~2 mins pumping

Pre-Measured Data (From Water Well Record Log)

*Depth of well installation (cm)= Diameter of well (cm)= 3.8cm

*Depth to top of screen (cm)= Length screened section (cm)=

*note: *depths are from ground surface*

Field Measurements

Measurement method (interface probe, tape, etc): I.P.

Well pipe height above ground (cm) (to top of pipe)= 34cm

Static water level (cm) from top of pipe = 144.0 cm

Static water level (cm) (below ground surface) calculated =

Measured well refusal depth (cm) (measure after sampling)= 187.6 cm

Thickness of water column (cm)= 43.6cm Static volume of water in well (mL)=

Free product thickness (mm)= ~~—~~ 0 Evidence of sludge or siltation: None

Purging Information Summary*

Purging/sampling equipment, sampling technique and equipment calibration information: Low Flow peristaltic pump

Well purged (Y/N): Y Recharge Rate:

Volume Purged (L) (note multiple purging events if applicable): Dry - purged only 300mL - no re-charge

Parameter	Initial	Intermediate	Final	Notes (if not stabilized)
pH				
Conductivity (uS/cm)		N/A		
Turbidity (NTU)				
Temperature (degC)				

Visual/olfactory observations (incl. colour, odour, presence of free product/sheen/globules, siltation...): clear, no odour, no sheen

Decontamination of sampling equipment

Type of decontamination fluid (s): N/A - dedicated sampling train

Number washes: Number rinses: —

Other Relevant Comments: No re-charge pumped dry @ ~300mL waited 20 min! (no re-charge)

* Complete field notes including a full suite of water quality indicator parameters VS time should be appended to this summary as per US *EPA Low-Flow (Minimal Drawdown) Ground-Water Sampliong Procedures (EPA/540/S-95/504 or most recent)* .

MW06 Ctd. (Dup)

ANNEX J3: Monitoring Well Sampling Log (Complete All Fields)

Site Name: CAM-1 Landfill Name: Tiverton

Monitoring Well ID: MW06 UTM Coordinates: North East

Sample Number(s) include dups.: N/A

Bottles filled (by parameter type): N/A - insuff. H2O

Date of Sampling Event: Aug 10/16 Time:

Weather: Sun, windy, 10°C

Names of Samplers: Ryan Fletcher

Description of Well Condition and Surrounding ground conditions (note ponding of water): excellent

Lock (condition, presence, model, manufacturer): Cut and replaced as per TOR

Pre-Measured Data (From Water Well Record Log)

*Depth of well installation (cm)= Diameter of well (cm)= 3.8

*Depth to top of screen (cm)= Length screened section (cm)=

*note: *depths are from ground surface*

Field Measurements

Measurement method (interface probe, tape, etc): I.P.

Well pipe height above ground (cm) (to top of pipe)= 60cm

Static water level (cm) from top of pipe = ~~N/A~~ 1.612 m

Static water level (cm) (below ground surface) calculated = N/A ~~1.627~~ RF

Measured well refusal depth (cm) (measure after sampling)= 1.627 m

Thickness of water column (cm)= 0.015 m Static volume of water in well (mL)=

Free product thickness (mm)= None Evidence of sludge or siltation: NO

Purging Information Summary*

Purging/sampling equipment, sampling technique and equipment calibration information: N/A insuff. H2O

Well purged (Y/N): N / N/A Recharge Rate: —

Volume Purged (L) (note multiple purging events if applicable): N/A

Parameter	Initial	Intermediate	Final	*Notes (if not stabilized)*
pH				
Conductivity (uS/cm)	N/A			
Turbidity (NTU)				
Temperature (degC)				

Visual/olfactory observations (incl. colour, odour, presence of free product/sheen/globules, siltation...): N/A

Decontamination of sampling equipment

Type of decontamination fluid (s): N/A

Number washes: Number rinses:

Other Relevant Comments:

* Complete field notes including a full suite of water quality indicator parameters VS time should be appended to this summary as per US *EPA Low-Flow (Minimal Drawdown) Ground-Water Sampling Procedures (EPA/540/S-95/504 or most recent)* .

MW07 Frozen (Dry)

ANNEX J3: Monitoring Well Sampling Log (Complete All Fields)

Site Name: CAM-1 Landfill Name: Tier II

Monitoring Well ID: MW07 UTM Coordinates: North East

Sample Number(s) include dups.: N/A

Bottles filled (by parameter type): N/A - Frozen

Date of Sampling Event: Aug 10/16 Time: 1130

Weather: Sun, windy, 10°C

Names of Samplers: Ryan Fletcher

Description of Well Condition and Surrounding ground conditions (note ponding of water): Excellent

Lock (condition, presence, model, manufacturer): Cut + replaced as per TOR

Pre-Measured Data (From Water Well Record Log)

*Depth of well installation (cm)= Diameter of well (cm)= 3.0

*Depth to top of screen (cm)= Length screened section (cm)=

*note: *depths are from ground surface*

Field Measurements

Measurement method (interface probe, tape, etc): I.P.

Well pipe height above ground (cm) (to top of pipe)= 50 cm

Static water level (cm) from top of pipe = N/A

Static water level (cm) (below ground surface) calculated = N/A

Measured well refusal depth (cm) (measure after sampling)= 1.506m - Frozen

Thickness of water column (cm)= N/A Static volume of water in well (mL)=

Free product thickness (mm)= none Evidence of sludge or siltation: NO

Purging Information Summary*

Purging/sampling equipment, sampling technique and equipment calibration information: Lyrce on probe N/A

Well purged (Y/N): N/A Recharge Rate: N/A

Volume Purged (L) (note multiple purging events if applicable): N/A

Parameter	Initial	Intermediate	Final	Notes (if not stabilized)
pH		N/A		
Conductivity (uS/cm)				
Turbidity (NTU)				
Temperature (degC)				

Visual/olfactory observations (incl. colour, odour, presence of free product/sheen/globules, siltation...): N/A

Decontamination of sampling equipment

Type of decontamination fluid (s):

Number washes: N/A Number rinses:

Other Relevant Comments:

* Complete field notes including a full suite of water quality indicator parameters VS time should be appended to this summary as per US *EPA Low-Flow (Minimal Drawdown) Ground-Water Sampliong Procedures (EPA/540/S-95/504 or most recent)* .

(1) @ 16-C1-11A, C1-Dup3, ESG + ALS (16-C1-11A)

(2) @ 16-C1-12A, C1-Dup4, ESG + ALS (16-C1-12A)

Soil Sampling Log

Site Name: CAM-1 Jenny Lind Island

Landfill Name: See Below

Date & Time of Sampling Event: August 10 /2016

Weather: Sun 10°C - 15°C light wind

Name of Sampling Staff: R.Fletcher

Sampling equipment and decontamination methods: Stainless Steel Shovel - Alcanox and water rinse

	Soil Sampling Location ID		UTM Coordinates North (m)	UTM Coordinates East (m)	Sample Depth	Notes: *Including (but not limited to) visual/olfactory observations (colour, odour, evidence of contamiantion...), depth and reason for refusal if required depth not achieved...*	
Station West Landfill							
17:30	C1-10	A	7620901.3	389059.5	0-0.15	Gravelly, cobbly sand, brown, moist, n/o	4
		B			~~0.4-0.5~~ 0.25-0.3	Refusal on cobbles/boulders - same description	4
16:00	C1-11	A	7620922.1	388987.6	0-0.15	light brown med to coarse sand, some gravel, moist, n/o	4
Aug 10		B			0.4-0.5	Same	4
16:45	C1-12	A	7620957.4	389001.9	0-0.15	Same as C1-11 A/B	4
Aug 10		B			0.4-0.5		4
17:00	C1-13	A	7620969.5	389044.6	0-0.15	Brown sand + gravel, some cobbles, moist, n/o	4
		B			~~0.4-0.5~~ 0.3-0.4	Saturated @ 0.2 → same soil descrip to depth (Refusal Starting)	4 RF
Non-Hazardous Waste Landfill ex "16-C1-MW01A"							6
8:30	MW-01	A	7620893.8	389277	0-0.15 ✓	Brown med to coarse sand + gravel, some cobbles, moist n/o	4
Aug 10		B			0.4-0.5 ✓	Same to depth	4
9:15	MW-02	A	7620968.2	389333.2	0-0.15 ✓	Brown gravelly sand, moist, n/o - cobbles	4
Aug 10					~~0.4-0.5~~	Refusal @ 0.2 - no sample - boulders	
9:00	MW-03	A	7621002.6	389287.5	0-0.15 ✓	light brown sand + gravel, mostly gravel, moist, n/o	4
Aug 10		B			~~0.4-0.5~~ 0.3-0.35	Same - cobbles @ bottom - Refusal on cobbles/boulders	4
8:45	MW-04	A	7620986.2	389282.3	0-0.15 ✓	Brown med to coarse sand + gravel, cobbles, moist, n/o	4
Aug 10		B			0.4-0.5 ✓	Same, turning orange @ 0.35	4

→ no second sample available

(A)¹ @ 16-C1-20B, C1-Dup6, ALS, ESG 9:00
↳16-C1-20B ↳16-C1-20B

(A)² @ 16-C1-26A, C1-Dup7, ALS, ESG 10:30
↳16-C1-26A
(16-C1-26A

Soil Sampling Log

Site Name: CAM-1 Jenny Lind Island
Landfill Name: See Below
Date & Time of Sampling Event: August 11 /2016
Weather: Sun, windy, 10°C
Name of Sampling Staff: R.Fletcher
Sampling equipment and decontamination methods: Stainless Steel Shovel - Alcanox and water rinse

Soil Sampling Location ID	UTM Coordinates North (m)	UTM Coordinates East (m)	Sample Depth	Notes: *Including (but not limited to) visual/olfactory observations (colour, odour, evidence of contamiantion...), depth and reason for refusal if required depth not achieved...*	
Station East Landfill					
8:15 C1-19 A	7620804.4	389772.4	0-0.15 ~~✓~~	Dark brown to black topsoily gravelly sand, cobbles + boulders, bedrock	4
Aug 11 B			0.4-0.5 ✓	Same to Depth	4
~~8:45~~ 9:00 C1-20 A	7620723.2	389877.1	0-0.15 ✓	Dark brown gravelly sand, moist, n/o, cobbles	4
Aug 11 B			0.4-0.5 ✓	Light brown @ 0.4	4 (A)¹
8:45 C1-21 A	7620688.1	389834.2	0-0.15 ✓	Dark brown gravelly sand, moist, n/o	4
Aug 11 B			~~0.4-0.5~~ 0.35-0.4	Refusal cobbles - same description	4
9:30 C1-22 A	7620646.7	389795.9	0-0.15 ✓	Med brown sand + gravel, moist, n/o	4
Aug 11 B			~~0.4-0.5~~ 0.3-0.4	Refusal @ boulders - same description	4
Main Landfill					
11:00 C1-23 A	7620718.6	389629.1	0-0.15 ✓	Dark brown gravelly sand, moist, n/o fractured bedrock	4
NO			0.4-0.5 NO	Refusal @ 0.2 - bedrock, no sample collected	—
10:00 C1-24 A	7620608.8	389752	0-0.15 ✓	Dark brown gravelly sand, moist, n/o	4
B			0.4-0.5 ✓	Mostly sand @ 0.35 to 0.5	4
10:15 C1-25 A	7620578.5	389697.5	0-0.15 ✓	Dark brown organic sand, gravel, fractured bedrock plates, moist, n/o	4
NO (B) sample			~~0.4-0.5~~ NO	~~Refusal~~ @ 0.2 - no second sample	NO (A)²
10:30 C1-26 A	7620604.4	389645.8	0-0.15 ✓	light grey/brown sand + gravel, moist, n/o	4
B			~~0.4-0.5~~ 0.25-0.35	Refusal @ bedrock 0.35	—

(C1-26A (Dup7)

C1-29B (Dup6)

(*)1 16-C1-29A, DupE, ESG, ALS (parent → 16-C1-29A)

Soil Sampling Log

Site Name: CAM-1 Jenny Lind Island
Landfill Name: See Below
Date & Time of Sampling Event: August 11 /2016
Weather: Sun, windy, 12°C
Name of Sampling Staff: R.Fletcher
Sampling equipment and decontamination methods: Stainless Steel Shovel - Alcanox and water rinse

Soil Sampling Location ID		UTM Coordinates North (m)	UTM Coordinates East (m)	Sample Depth	Notes: *Including (but not limited to) visual/olfactory observations (colour, odour, evidence of contamiantion...), depth and reason for refusal if required depth not achieved...*	
USAF Landfill						
14:45 C1-27	A	7619250.3	388501.5	0-0.15 ✓	light brown sand + gravel, moist, n/o	4
	B			0.4-0.5 ✓	same to depth	4
14:15 C1-28	A	7619291.8	388458.9	0-0.15 ✓	Grey brown sand + gravel, moist, n/o	4
	B			0.4-0.5 ✓	Same to depth	4
14:30 C1-29	A	7619300.9	388498.7	0-0.15 ✓	Brown coarse sand, some gravel to depth, n/o, moist	4 (*)1
	B			0.4-0.5 ✓	H20 @ 0.4m - same to depth	4
14:00 C1-30	A	7619337.5	388452	0-0.15 ✓	Topsoily to 0.1, then brown sand + gravel, moist, n/o	4
	B			0.4-0.5 ✓	same to depth	4
15:00 C1-31	A	7619338.1	388489.7	0-0.15 ✓	Same as others	4
	B			0.4-0.5 ✓	Same no H2O	4
East Landing Area Landfill						
14:00 C1-32 Aug 11	A	7618240.4	388199.8	0-0.15 ✓	Organics to 0.12, H20 @ 0.2 Grey fine sand + gravel, mo	4
	B			0.4-0.5 ✓	Grey sand, wet, gravel, n/o cobbles @ 0.3	4
16:30 C1-33	A	7618191.8	388181.3	0-0.15 ✓	Mostly gravel, some sand, moist, n/o	4
	B			~~0.4-0.5~~ 0.2-0.3	Refusal - stalking	4
C1-34		7618206.9	388142.2	0-0.15	Rocks + Pebbles - Building (No soil)	No sample
				0.4-0.5		
16:15 C1-35	A	7618235.7	388138.1	0-0.15	Brown gravelly sand, cobbles, moist, n/o	4
	B			0.4-0.5	Same to depth	4

Note: changed mind about 33 - able to get very coarse sand w difficulty

Note:
A = 0-0.15 m
B = 0.4-0.5m

n/o = no odour

Soil Sampling Log

Site Name: CAM-1 Jenny Lind Island
Landfill Name: See below
Date & Time of Sampling Event: August 9 - /2016
Weather:
Name of Sampling Staff: R.Fletcher RF
Sampling equipment and decontamination methods: Stainless Steel Shovel - Alcanox and water rinse

Soil Sampling Location ID			UTM Coordinates North (m)	UTM Coordinates East (m)	Sample Depth	Notes: *Including (but not limited to) visual/olfactory observations (colour, odour, evidence of contamiantion...), depth and reason for refusal if required depth not achieved...*	Containers
Borrow Area North Landfill ex "16-C1-1A"							
14:15 Aug 9	C1-1	A	7621337.8	389749.9	0-0.15 ✓	Dark brown sand, organics, veg. @ surface moist, n/o	4
		B			~~0.4-0.5~~ 0.3-0.4	Reddish brown sand, gravel + cobbles, refusal on cobbles	4
14:00 Aug 9	C1-2	A	7621432	389707.7	0-0.15 ✓	Dark brown/black sand + cobbles, organic @ surface, moist, n/o	4
		B			~~0.4-0.5~~ 0.3-0.4	Refusal on Cobbles some light brown sand, same as above, more cobbles	4
13:30 Aug 9	C1-3	A	7621370.3	389674.9	0-0.15 ✓	Med. brown sand + gravel, moist, n/o	4
		B			0.4-0.5 ✓	Same	4
13:15 Aug 9	C1-4	A	7621293.8	389680.6	0-0.15 ✓	Dark brown medium sand + gravel, trace cobbles, moist, n/o	4
		B			~~0.4-0.5~~ 0.3-0.4	Same Refusal @ 0.4 (cobbles) - heavy cobbles @ 0.35	4
13:00 Aug 9	C1-5	A	7621223.5	389660.9	0-0.15 ✓ 5A	Light brown. medium to coarse sand, some gravel, no odour	4 (3 jar, 2 bag)
		B			0.4-0.5 ✓ 5B	Same as 0-0.15	4 (" ") (D)
Northeast Landfill							
16:30 Aug 9	C1-6	A	7621109.7	389556.7	0-0.15	Reddish brown sand + gravel w cobbles, moist, n/o	4
		B			~~0.4-0.5~~ 0.3-0.35	Refusal on Boulder, some, more cobbles, boulder @ bottom	4
15:00 Aug 9	C1-7	A	7621160.9	389483.1	0-0.15 ✓	light brown to grey sand + gravel, moist, n/o	4
		B			0.4-0.5 ✓	light brown sand + gravel moist, n/o, ~~high gravel/cobbles~~	4
15:30 Aug 9	C1-8	A	7621184.3	389520.9	0-0.15 ✓	Med brown med. sand, trace to some gravel, moist, n/o	4
		B			0.4-0.5 ✓	same w gravel + cobbles, high gravel/cobbles @ depth	4
16:00 Aug 9	C1-9	A	7621178.6	389558.9	0-0.15 ✓	Med brown sand + gravel, moist, n/o	4
		B			~~0.4-0.5~~ 0.35-0.45	mostly gravel, some med sand, refusal on heavy gravel	4

(D)

ALS, Dup1, + ESG collected @ C1-5A
2 vials 3 jars — 3 jars 1 bag — 3 jars 1 bag

ALS, Dup2, + ESG @ C1-8A
2 vials — 3 jars — 3 jars 1 bag

(A)' @ 16-C1-16A, Dup5, ALS + ESG
(16-C1-16A

Soil Sampling Log

Site Name: CAM-1 Jenny Lind Island

Landfill Name: See Below

Date & Time of Sampling Event: August 10 /2016

Weather: Sun, windy, 10-15°C

Name of Sampling Staff: R.Fletcher

Sampling equipment and decontamination methods: Stainless Steel Shovel - Alcanox and water rinse

Soil Sampling Location ID		UTM Coordinates North (m)	UTM Coordinates East (m)	Sample Depth	Notes: *Including (but not limited to) visual/olfactory observations (colour, odour, evidence of contamiantion...), depth and reason for refusal if required depth not achieved...*	
Tier II Disposal Facility	eg. "16-C1-MW06A"					
10:30 MW-05 Aug 10	A	7620729.5	389155	0-0.15 ✓	Brown gravelly sand, cobbles, moist, n/o	4
	B			0.4-0.5 ✓	Same	4
9:45 MW-06 Aug 10	A	7620812.2	389129.4	0-0.15 ✓	Dark brown sand + gravel, moist, n/o	4
	B			0.4-0.5 ✓	Same	4
10:00 MW-07 Aug 10	A	7620778.5	389068.7	0-0.15 ✓	Dark brn organic sand + gravel (some black) to 0.1, then brown sand + gravel	4
	B			0.4-0.5 ✓	Brown sand + gravel, moist, n/o	4
10:15 MW-08 Aug 10	A	7620729.2	389051.7	0-0.15 ✓	Dark brown sand + gravel, cobbles, n/o, moist	4
	B			0.4-0.5 ✓	same - lots of cobbles	4
Southeast Landfill						
21:00 C1-14	A	7620632.5	389245.6	0-0.15 ✓	Brown Gravelly sand, moist, n/o	4
	B			0.4-0.5 ✓	Same to depth	4
20:45 C1-15	A	7620596.1	389234.5	0-0.15 ✓	Gravelly sand, light brown, moist, n/o	4
	B			0.4-0.5 ✓	Same	
20:00 C1-16 Aug 10	A	7620549.6	389262.5	0-0.15 ✓	Fine toned light brown sand, moist, n/o	4 (A)'
	B			0.4-0.5 ✓	Same → becoming reddish @ 0.45	4
20:15 C1-17 Aug 10	A	7620531.1	389233.4	0-0.15 ✓	Dark brown sand + gravel, moist n/o	4
	B			~~0.4-0.5~~ 0.3-0.35	Reddish brown @ 0.35 (very hard) cobbles, moist n/o - Refusal on cobbles	
20:30 C1-18 Aug 10	A	7620531.7	389196.4	0-0.15 ✓	Med Brown sand, some gravel, moist, n/o	4
	B			0.4-0.5 ✓	Same to bottom	4

MW04 CTD (Dry)

ANNEX J3: Monitoring Well Sampling Log (Complete All Fields)

Site Name: CAM-1 Landfill Name: Non-Haz

Monitoring Well ID: MW04 UTM Coordinates: North East

Sample Number(s) include dups.: CL-MW04 / ALS-Dup CL-MW04

Bottles filled (by parameter type): No sample

Date of Sampling Event: Aug 10 Time: 13:45

Weather: Sun, wind 10-12°C

Names of Samplers: R. Fletcher

Description of Well Condition and Surrounding ground conditions (note ponding of water): Excellent

Lock (condition, presence, model, manufacturer): chopped + replaced

RF / Lbl. H2O - no recharge

Pre-Measured Data (From Water Well Record Log)

*Depth of well installation (cm)= Diameter of well (cm)= 3.8cm

*Depth to top of screen (cm)= Length screened section (cm)=

*note: *depths are from ground surface*

Field Measurements

Measurement method (interface probe, tape, etc): I.P.

Well pipe height above ground (cm) (to top of pipe)= 41 cm

Static water level (cm) from top of pipe = 136.2 cm Depth 210.0cm

Static water level (cm) (below ground surface) calculated =

Measured well refusal depth (cm) (measure after sampling)=

Thickness of water column (cm)= 73.8 Static volume of water in well (mL)=

Free product thickness (mm)= — None Evidence of sludge or siltation: No

Purging Information Summary*

Purging/sampling equipment, sampling technique and equipment calibration information:

Well purged (Y/N): Y Recharge Rate: N/A RF

Volume Purged (L) (note multiple purging events if applicable): Dry, ~3 min pumping w low-flow (~~700~~ mL purged)

400 mL / Bucket was on an angle when first read

Parameter	Initial	Intermediate	Final	Notes (if not stabilized)
pH	11.42			insuff.
Conductivity (uS/cm)	720			H2O
Turbidity (NTU)				No
Temperature (degC)	4.48			recharge

Visual/olfactory observations (incl. colour, odour, presence of free product/sheen/globules, siltation...): clear

Decontamination of sampling equipment

Type of decontamination fluid (s): N/A - dedicated sample train

Number washes: Number rinses:

Other Relevant Comments: No - recharge dry w < 3 min pumping w low flow

* Complete field notes including a full suite of water quality indicator parameters VS time should be appended to this summary as per US *EPA Low-Flow (Minimal Drawdown) Ground-Water Sampling Procedures (EPA/540/S-95/504 or most recent)* .

MW03

ANNEX J3: Monitoring Well Sampling Log (Complete All Fields)

Site Name: CAM-1 Landfill Name: Non-Haz

Monitoring Well ID: MW03 UTM Coordinates: North East

Sample Number(s) include dups.: CI-MW03 / ALS Dup CI-MW03

Bottles filled (by parameter type): 9 pHC 4, Metals 3, PCB 2 (Sand Rain all)

Date of Sampling Event: Aug 10/16 Time: 14:15

Weather: Sun Windy, 10-12 °C

Names of Samplers: R. Fletcher

Description of Well Condition and Surrounding ground conditions (note ponding of water): Excellent

Lock (condition, presence, model, manufacturer): cut + replaced as per TOR

Pre-Measured Data (From Water Well Record Log)

*Depth of well installation (cm)= Diameter of well (cm)= 3.8cm

*Depth to top of screen (cm)= Length screened section (cm)=

*note: *depths are from ground surface*

Field Measurements

Measurement method (interface probe, tape, etc): I.P.

Well pipe height above ground (cm) (to top of pipe)= 34 cm

Static water level (cm) from top of pipe = 1.113 m Depth 2.06 l/m

Static water level (cm) (below ground surface) calculated =

Measured well refusal depth (cm) (measure after sampling)= 2.06 l/m

Thickness of water column (cm)= 96.8cm Static volume of water in well (mL)=

Free product thickness (mm)= None Evidence of sludge or siltation: No

Purging Information Summary*

Purging/sampling equipment, sampling technique and equipment calibration information: Low-Flow

Well purged (Y/N): Y Recharge Rate:

Volume Purged (L) (note multiple purging events if applicable): 3800 mL

Parameter	Initial	Intermediate	Final	Notes (if not stabilized)
pH	8.85	8.40	8.33	
Conductivity (uS/cm)	693	694	694	
Turbidity (NTU)				
Temperature (degC)	5.09	4.76	4.72	

Visual/olfactory observations (incl. colour, odour, presence of free product/sheen/globules, siltation...): clear, no odour, no sheen

Decontamination of sampling equipment

Type of decontamination fluid (s): N/A - Dedicated sampling train

Number washes: — Number rinses: —

Other Relevant Comments: clear purge H2O

* Complete field notes including a full suite of water quality indicator parameters VS time should be appended to this summary as per US *EPA Low-Flow (Minimal Drawdown) Ground-Water Sampliong Procedures (EPA/540/S-95/504 or most recent)* .

Maximum = 9 jars

ALS = 9 jars

MW08

Dry

ANNEX J3: Monitoring Well Sampling Log (Complete All Fields)

Site Name: CAM-1 Landfill Name: Trench

Monitoring Well ID: MW08 UTM Coordinates: North East

Sample Number(s) include dups.: N/A

Bottles filled (by parameter type): N/A

Date of Sampling Event: Aug 10/16 Time: 1145

Weather: Sun, windy, 10-12°C

Names of Samplers: Ryan Flatch

Description of Well Condition and Surrounding ground conditions (note ponding of water): Excellent

Lock (condition, presence, model, manufacturer): Cut + replaced as per TOR

Pre-Measured Data (From Water Well Record Log)

*Depth of well installation (cm)= Diameter of well (cm)= 3.8

*Depth to top of screen (cm)= Length screened section (cm)=

*note: *depths are from ground surface*

Field Measurements

Measurement method (interface probe, tape, etc): I.P.

Well pipe height above ground (cm) (to top of pipe)= 50cm

Static water level (cm) from top of pipe = N/A

Static water level (cm) (below ground surface) calculated = N/A

Measured well refusal depth (cm) (measure after sampling)= 1.63 DRY

Thickness of water column (cm)= N/A Static volume of water in well (mL)= N/A

Free product thickness (mm)= None Evidence of sludge or siltation: NO

Purging Information Summary*

Purging/sampling equipment, sampling technique and equipment calibration information: N/A

Well purged (Y/N): N/A Recharge Rate: N/A

Volume Purged (L) (note multiple purging events if applicable): N/A

Parameter	Initial	Intermediate	Final	Notes (if not stabilized)
pH		N/A		
Conductivity (uS/cm)				
Turbidity (NTU)				
Temperature (degC)				

Visual/olfactory observations (incl. colour, odour, presence of free product/sheen/globules, siltation...): N/A

Decontamination of sampling equipment

Type of decontamination fluid (s):

Number washes: N/A Number rinses:

Other Relevant Comments:

* Complete field notes including a full suite of water quality indicator parameters VS time should be appended to this summary as per US *EPA Low-Flow (Minimal Drawdown) Ground-Water Sampliong Procedures (EPA/540/S-95/504 or most recent)* .

MW05

ANNEX J3: Monitoring Well Sampling Log (Complete All Fields)

Site Name: CAM-1 Landfill Name: Tire IT

Monitoring Well ID: MW05 UTM Coordinates: North East

Sample Number(s) include dups.: CL-MW05 / CL-Dup1 (Maxxam)

Bottles filled (by parameter type): PCB (2x500mL), Metals (7 plastic, 2 amber), PHC (2 vial, 2 amber), 1 general

Date of Sampling Event: Aug 10/16 Time: 11:00

Weather: Sun, windy, 10-12°C

Names of Samplers: R. Flutch

Description of Well Condition and Surrounding ground conditions (note ponding of water): Good — excellent condition

Lock (condition, presence, model, manufacturer): cut and replaced

Pre-Measured Data (From Water Well Record Log)

*Depth of well installation (cm)= Diameter of well (cm)= 3.8 cm (1.5")

*Depth to top of screen (cm)= Length screened section (cm)=

*note: *depths are from ground surface*

Field Measurements

Measurement method (interface probe, tape, etc): I.P.

Well pipe height above ground (cm) (to top of pipe)= 30 cm

Static water level (cm) from top of pipe = 147.1 cm

Static water level (cm) (below ground surface) calculated = 117.1 cm

Measured well refusal depth (cm) (measure after sampling)= ~~23.7 cm~~

Thickness of water column (cm)= 23.7 cm Static volume of water in well (mL)=

Free product thickness (mm)= None Evidence of sludge or siltation: None

Purging Information Summary*

Purging/sampling equipment, sampling technique and equipment calibration information: low flow

Well purged (Y/N): Y Recharge Rate:

Volume Purged (L) (note multiple purging events if applicable): 3.8 L total 15 minutes low-flow

Parameter	Initial	Intermediate	Final	Notes (if not stabilized)
pH	7.74	7.64	7.69	
Conductivity (uS/cm)	887	827	801	
Turbidity (NTU)				
Temperature (degC)	2.23	1.83	1.43	

Visual/olfactory observations (incl. colour, odour, presence of free product/sheen/globules, siltation...): clear — no odour

Decontamination of sampling equipment

Type of decontamination fluid (s): N/A — Dedicated sampling train

Number washes: Number rinses:

Other Relevant Comments:

* Complete field notes including a full suite of water quality indicator parameters VS time should be appended to this summary as per US *EPA Low-Flow (Minimal Drawdown) Ground-Water Sampling Procedures (EPA/540/S-95/504 or most recent)* .

9 bottles / sample

PHC (4 vials), PCB (2 vials), Metals (3 vials)

10202-000 Aug 10/16 1/

CAM-7

MW05 GW 11:00

Time	Temp	Cond	DO	pH	ORP
0	2.15	867	15.23	7.64	172.4
5	1.83	827	14.97	7.64	175.2
10	1.54	807	14.67	7.66	177.4
15	1.43	801	14.47	7.69	179.2
20		Sampled			

MW04 GW 13:45

Time	Temp	Cond	DO	pH	ORP
5	4.48	720	15.94	11.42	183.2
10	DRY @ 3 mins ~400 mL				
15	(maybe 350 mL)				
20					
25	↳ no recharge				
	worked 15 mins				

10202-CCC Aug 10/16 2

GW cont

MW03 14:15

Time	Temp	Cond	DO	pH	ORP
5	5.09	693	13.00	8.85	179.8
10	4.95	696	12.77	8.36	179.7
15	4.76	694	12.97	8.40	182.1
20	4.72	694	12.91	8.33	185.5
25		Sampled			

MW02 15:15

Time	Temp	Cond	DO	pH	ORP
5	5.67	1011	12.77	11.25	193.0
10	~~6.02~~	~~1034~~	~~12.44~~	~~11.48~~	~~175.4~~
15		DRY			
20					
25					

Rite in the Rain

ANNEX M: Thermistor Inspection Template

Inspector Name: S. Boresek	Inspection Date: 11 August 2016
Inspector Signature / Prepared By: S. Boresek	

Thermistor Information (*Some Information can be pre-populated from thermistor logs)

Site Name:	CAM-1	Landfill:	Tier II Disposal Facility
Thermistor Number:	VT-1	Inclination:	Vertical
Datalogger model no:	RX-16	Datalogger cable download model:	CCUSB
*Install Date:		First Date Event	Last Date Event 27 Aug/14
*Coordinates and Elevation	N	E	Elev
Length of Cable (m)	2.30m	Cable Lead Above Ground (m)	1.03m
Datalogger Serial #	07060015	Nodal Points	16

Thermistor Inspection

	Good	Needs Maintenance	Description
Casing	☑	☐	
Cover	☑	☐	
Data Logger	☐	☐	
Cable	☑	☐	
Beads	☑	☐	
Lock condition	☑ NEW	☐	
Battery Installation Date	Expires: 07/2019		
Battery Levels	Main 11.34	Aux 13.87	

Manual Ground Temperature Readings

Bead	ohms	Degrees C
	1.1295	6.1347
	1.0286	2.8342
	0.9592	0.5477
	0.9181	-0.8172
	0.8810	-2.0697
	0.8333	-3.6871
	0.8009	-4.7352
	0.7765	-5.6611

Bead	ohms	Degrees C
9	0.7503	-6.5878
10	0.7289	-7.3540
11	0.7102	-8.0350
	0.6948	-8.6002
	0.6813	-9.0972
	0.6711	-9.4787
	0.6600	-9.8941
	0.6532	-10.1517

Battery Information

Batteries changed ? Yes ☐ No ☒ Monitoring Year: 7

Battery model number installed or model of battery in place: OLBIS, OLBI

Expected remaining battery life (years): 3 - Expires 07/2019

Datalogger Programming (Describe programming completed; beads and frequency)

None

Observations and Proposed Maintenance

None Required

ANNEX M: Thermistor Inspection Template

Inspector Name: S. Borcsok	Inspection Date: August 2016
Inspector Signature / Prepared By: S Borcsok	

Thermistor Information (*Some Information can be pre-populated from thermistor logs)

Site Name: CAM-1		Landfill: Tic- II Disposal Facility	
Thermistor Number: VT-2		Inclination: Vertical	
Datalogger model no: RX-16		Datalogger cable download model: CCU8	
*Install Date:		First Date Event	Last Date Event 27 Aug/14
*Coordinates and Elevation	N	E	Elev
Length of Cable (m) 5.26m	Cable Lead Above Ground (m) 1.06m		
Datalogger Serial # 07050030	Nodal Points 16		

Thermistor Inspection

	Good	Needs Maintenance	Description
Casing	☑	☐	
Cover	☑	☐	
Data Logger	☑	☐	
Cable	☑	☐	
Beads	☑	☐	
Lock condition	☑ NEW	☐	
Battery Installation Date	Expires 07/2019		
Battery Levels	Main 11.34	Aux 12.77	

Manual Ground Temperature Readings

Bead	ohms	Degrees C
1	1.3063	11.9863
2	1.3021	11.8451
3	1.3006	11.7938
4	1.3161	12.3157
5	1.3615	13.8599
6	1.2777	11.0264
7	1.1299	6.1472
8	~~1.0334~~ 1.0334	2.9918

Bead	ohms	Degrees C
	0.9592	0.5477
	0.9188	-0.7968
	0.8792	-2.1265
	0.8444	-3.3083
	0.7980	-4.9081
	0.7668	-6.0028
	0.7425	-6.8659
	0.7241	-7.5277

Battery Information

Batteries changed ? Yes ☐ No ☒ Monitoring Year: 7

Battery model number installed or model of battery in place: ULBIS, ULBI

Expected remaining battery life (years): 3 - Expires 07/2019

Datalogger Programming (Describe programming completed; beads and frequency)

None

Observations and Proposed Maintenance

None Required

ANNEX M: Thermistor Inspection Template

Inspector Name: S Borcsok	Inspection Date: 11 August 2016
Inspector Signature / Prepared By: S Borcsok	

Thermistor Information (*Some Information can be pre-populated from thermistor logs)

Site Name:	CAM-1	Landfill:	Tier II Disposal Facility
Thermistor Number:	VT-3	Inclination:	Vertical
Datalogger model no:	RX-16	Datalogger cable download model:	CCUSB
*Install Date:		First Date Event	Last Date Event 27 Aug 14
*Coordinates and Elevation	N	E	Elev
Length of Cable (m)	2.35m	Cable Lead Above Ground (m)	1.03m
Datalogger Serial #		Nodal Points	16

Thermistor Inspection

	Good	Needs Maintenance	Description
Casing	☑	☐	
Cover	☑	☐	
Data Logger	☑	☐	
Cable	☑	☐	
Beads	☑	☐	
Lock condition	☑	☐ NEW Lock	
Battery Installation Date	Batteries expire on 2019/07		
Battery Levels	Main 11.34 V	Aux 13.75 V	

Manual Ground Temperature Readings

Bead	ohms V	Degrees C
1	1.1262	6.0074
2	1.0343	3.0193
3	0.9616	0.6285
4	0.9236	-0.6363
5	0.8858	-1.9026
6	0.8375	-3.5933
7	0.8065	-4.6111
8	0.7771	-5.6397

Bead	ohms V	Degrees C
9	0.7582	-6.3082
10	0.7365	-7.0821
11	0.7186	-7.7268
12	0.7047	-8.2358
13	0.6911	-8.7253
14	0.6796	-9.1852
15	0.6687	-9.5674
16	0.6656	-9.6849

Battery Information

Batteries changed ? Yes ☐ No ☒ Monitoring Year: 7

Battery model number installed or model of battery in place: ULBI5, ULBI

Expected remaining battery life (years): 3 - Expired 07/2019

Datalogger Programming (Describe programming completed; beads and frequency)

None

Observations and Proposed Maintenance

None required

ANNEX M: Thermistor Inspection Template

Inspector Name: S. Barcsok	Inspection Date: 11 August 2016
Inspector Signature / Prepared By: S Barcsok	

Thermistor Information (*Some Information can be pre-populated from thermistor logs)

Site Name:	CAM-1	Landfill:	Tier II Disposal Facility
Thermistor Number:	VT-4	Inclination:	vertical
Datalogger model no:	RX-16	Datalogger cable download model:	CCUSB
*Install Date:		First Date Event	Last Date Event 27Aug/14
*Coordinates and Elevation	N	E	Elev
Length of Cable (m)	2.63m	Cable Lead Above Ground (m)	0.96m
Datalogger Serial #	07060006	Nodal Points	13

Thermistor Inspection

	Good	Needs Maintenance	Description
Casing	☑	☐	
Cover	☑	☐	
Data Logger	☑	☐	
Cable	☑	☐	
Beads	☑	☐	
Lock condition	☑ NEW	☐	
Battery installation Date	Expires 07/2019		
Battery Levels	Main 11.34	Aux 13.63	

Manual Ground Temperature Readings

Bead	ohms V	Degrees C
1	1.3625	13.8939
2	1.3304	12.7986
3	1.2002	8.4557
4	1.0750	4.3531
5	1.0006	1.9197
6	0.9422	-0.0166
7	0.9114	-1.0442
8	0.8827	-2.0081

Bead	ohms V	Degrees C
9	0.8419	-3.3918
10	0.7859	-5.3291
11	0.7546	-6.4357
12	0.7365	-7.0821
13	0.7175	-7.7683
14	0.0000	381.0738
15	0.0000	381.0738
16	0.0000	381.0738

Battery Information

Batteries changed ? Yes ☐ No ☒ Monitoring Year: 7

Battery model number installed or model of battery in place: ULBI5, ULBI

Expected remaining battery life (years): 3 - Expires ~~NOW~~ 07/2019

Datalogger Programming (Describe programming completed; beads and frequency)

None

Observations and Proposed Maintenance

None Required

CAM-1 Borrow Area North Landfill 9 August 2016

ANNEX P: Preliminary Stability Assessment

Feature	Severity Rating	Extent
Settlement	Acceptable	Occasional
Erosion	Acceptable	Occasional
Lateral Movement	Not observed	None
Frost Action	Not observed	None
Sloughing	Not observed	None
Cracking	Not observed	None
Animal Burrows	Not observed	None
Vegetation establishment	Not observed	None
Staining	Acceptable	Occasional
Vegetation Stress	Not observed	None
Seepage/Ponded Water	Acceptable (Ponded Water at toe)	Isolated
Debris and/or liner exposure	Not observed	None
Other	~~Not observed~~ Vehicle rut - Acceptable	~~None~~ Isolated
Overall Landfill Performance	Acceptable	

Performance/ Severity Rating	Description
Acceptable	Noted features are of little consequence. The landfill is performing as designed. Minor deviations in environmental or physical performance may be observed, such as isolated areas of erosion, settlement.
Marginal	Physical/environmental performance appears to be deteriorating with time. Observations may include an increase in size or number of features of note, such as differential settlement, erosion or cracking. No significant impact on landfill stability to date, but potential for failure is assessed as low or moderate.
Significant	Significant or potentially significant changes affecting landfill stability, such as significant changes in slope geometry, significant erosion or differential settlement; scarp development. The potential for failure is assessed as imminent.
Unacceptable	Stability of landfill is compromised to the extent that ability to contain waste materials is compromised. Examples may include: - Debris exposed in erosion channels or areas of differential settlement. - Liner exposed. - Slope failure.

Extent	Description
Isolated	Singular feature
Occasional	Features of note occurring at irregular intervals/locations
Numerous	Many features of note, impacted less than 50% of the surface area of the landfill
Extensive	Impacting greater than 50% of the surface area of the landfill

CAM-1 Northeast Landfill 10 August 2016

ANNEX P: Preliminary Stability Assessment

Feature	Severity Rating	Extent
Settlement	Acceptable	Occasional
Erosion	Acceptable	Occasional
Lateral Movement	Not observed	None
Frost Action	Not observed	None
Sloughing	Not observed	None
Cracking	Not observed	None
Animal Burrows	Not observed	None
Vegetation establishment	Acceptable	Isolated (very sparse)
Staining	Not observed	None
Vegetation Stress	Not observed	None
Seepage/Ponded Water	Not observed	None
Debris and/or liner exposure	Not observed	None
Other	Acceptable (Uneven Side Slope)	Isolated
Overall Landfill Performance	ACCEPTABLE	

Performance/ Severity Rating	Description
Acceptable	Noted features are of little consequence. The landfill is performing as designed. Minor deviations in environmental or physical performance may be observed, such as isolated areas of erosion, settlement.
Marginal	Physical/environmental performance appears to be deteriorating with time. Observations may include an increase in size or number of features of note, such as differential settlement, erosion or cracking. No significant impact on landfill stability to date, but potential for failure is assessed as low or moderate.
Significant	Significant or potentially significant changes affecting landfill stability, such as significant changes in slope geometry, significant erosion or differential settlement; scarp development. The potential for failure is assessed as imminent.
Unacceptable	Stability of landfill is compromised to the extent that ability to contain waste materials is compromised. Examples may include: - Debris exposed in erosion channels or areas of differential settlement. - Liner exposed. - Slope failure.

Extent	Description
Isolated	Singular feature
Occasional	Features of note occurring at irregular intervals/locations
Numerous	Many features of note, impacted less than 50% of the surface area of the landfill
Extensive	Impacting greater than 50% of the surface area of the landfill

CAM-1 Station West Landfill 11 August 2016

ANNEX P: Preliminary Stability Assessment

Feature	Severity Rating	Extent
Settlement	Acceptable	Occasional
Erosion	Acceptable	Occasional
Lateral Movement	Not observed	None
Frost Action	Not observed	None
Sloughing	Not observed	None
Cracking	Acceptable	Occasional
Animal Burrows	Not observed	None
Vegetation establishment	Not observed	None
Staining	Acceptable	Occasional
Vegetation Stress	Not observed	None
Seepage/Ponded Water	Not observed	None
Debris and/or liner exposure	Not observed	None
Other	Acceptable *	Occasional
Overall Landfill Performance	Acceptable	

Performance/ Severity Rating	Description
Acceptable	Noted features are of little consequence. The landfill is performing as designed. Minor deviations in environmental or physical performance may be observed, such as isolated areas of erosion, settlement.
Marginal	Physical/environmental performance appears to be deteriorating with time. Observations may include an increase in size or number of features of note, such as differential settlement, erosion or cracking. No significant impact on landfill stability to date, but potential for failure is assessed as low or moderate.
Significant	Significant or potentially significant changes affecting landfill stability, such as significant changes in slope geometry, significant erosion or differential settlement; scarp development. The potential for failure is assessed as imminent.
Unacceptable	Stability of landfill is compromised to the extent that ability to contain waste materials is compromised. Examples may include: - Debris exposed in erosion channels or areas of differential settlement. - Liner exposed. - Slope failure.

Extent	Description
Isolated	Singular feature
Occasional	Features of note occurring at irregular intervals/locations
Numerous	Many features of note, impacted less than 50% of the surface area of the landfill
Extensive	Impacting greater than 50% of the surface area of the landfill

* Equipment tracks/ruts west of landfill and uneven surface (Feature C) on West corner of landfill

CAM-1 Non-Hazardous Waste Landfill 10 August 2016

ANNEX P: Preliminary Stability Assessment

Feature	Severity Rating	Extent
Settlement	Acceptable	Occasional
Erosion	Not observed	None
Lateral Movement	Not observed	None
Frost Action	Not observed	None
Sloughing	Not observed	None
Cracking	Not observed	None
Animal Burrows	Not observed	None
Vegetation establishment	Not observed	None
Staining	Not observed	None
Vegetation Stress	Not observed	None
Seepage/Ponded Water	Not observed	None
Debris and/or liner exposure	Acceptable	Occasional
Other	Not observed	None
Overall Landfill Performance	Acceptable	

Performance/ Severity Rating	Description
Acceptable	Noted features are of little consequence. The landfill is performing as designed. Minor deviations in environmental or physical performance may be observed, such as isolated areas of erosion, settlement.
Marginal	Physical/environmental performance appears to be deteriorating with time. Observations may include an increase in size or number of features of note, such as differential settlement, erosion or cracking. No significant impact on landfill stability to date, but potential for failure is assessed as low or moderate.
Significant	Significant or potentially significant changes affecting landfill stability, such as significant changes in slope geometry, significant erosion or differential settlement; scarp development. The potential for failure is assessed as imminent.
Unacceptable	Stability of landfill is compromised to the extent that ability to contain waste materials is compromised. Examples may include: - Debris exposed in erosion channels or areas of differential settlement. - Liner exposed. - Slope failure.

Extent	Description
Isolated	Singular feature
Occasional	Features of note occurring at irregular intervals/locations
Numerous	Many features of note, impacted less than 50% of the surface area of the landfill
Extensive	Impacting greater than 50% of the surface area of the landfill

CAM-1 Tier II Disposal Facility 10 August 2016

ANNEX P: Preliminary Stability Assessment

Feature	Severity Rating	Extent
Settlement	Acceptable	Occasional
Erosion	Acceptable	Occasional
Lateral Movement	Not observed.	None
Frost Action	Not observed.	None
Sloughing	Not observed.	None
Cracking	Not observed	None
Animal Burrows	Not observed	None
Vegetation establishment	Not observed	None
Staining	Acceptable	Isolated
Vegetation Stress	Not observed	None
Seepage/Ponded Water	Not observed	None
Debris and/or liner exposure	Not observed	None
Other	Not observed	None
Overall Landfill Performance	Acceptable	

Performance/ Severity Rating	Description
Acceptable	Noted features are of little consequence. The landfill is performing as designed. Minor deviations in environmental or physical performance may be observed, such as isolated areas of erosion, settlement.
Marginal	Physical/environmental performance appears to be deteriorating with time. Observations may include an increase in size or number of features of note, such as differential settlement, erosion or cracking. No significant impact on landfill stability to date, but potential for failure is assessed as low or moderate.
Significant	Significant or potentially significant changes affecting landfill stability, such as significant changes in slope geometry, significant erosion or differential settlement; scarp development. The potential for failure is assessed as imminent.
Unacceptable	Stability of landfill is compromised to the extent that ability to contain waste materials is compromised. Examples may include: - Debris exposed in erosion channels or areas of differential settlement. - Liner exposed. - Slope failure.

Extent	Description
Isolated	Singular feature
Occasional	Features of note occurring at irregular intervals/locations
Numerous	Many features of note, impacted less than 50% of the surface area of the landfill
Extensive	Impacting greater than 50% of the surface area of the landfill

CAM-1 Southeast Landfill 10 August 2016

ANNEX P: Preliminary Stability Assessment

Feature	Severity Rating	Extent
Settlement	Acceptable	Occasional
Erosion	Not observed	None
Lateral Movement	Not observed	None
Frost Action	Not observed	None
Sloughing	Not observed	None
Cracking	Not observed	None
Animal Burrows	Not observed	None
Vegetation establishment *	~~Not observed~~ Acceptable	None Isolated
Staining	Not observed	None
Vegetation Stress	Not observed	None
Seepage/Ponded Water	Not observed	None
Debris and/or liner exposure	Not observed	None
Other	Acceptable (Tire ruts)	Isolated
Overall Landfill Performance	Acceptable	

Performance/ Severity Rating	Description
Acceptable	Noted features are of little consequence. The landfill is performing as designed. Minor deviations in environmental or physical performance may be observed, such as isolated areas of erosion, settlement.
Marginal	Physical/environmental performance appears to be deteriorating with time. Observations may include an increase in size or number of features of note, such as differential settlement, erosion or cracking. No significant impact on landfill stability to date, but potential for failure is assessed as low or moderate.
Significant	Significant or potentially significant changes affecting landfill stability, such as significant changes in slope geometry, significant erosion or differential settlement; scarp development. The potential for failure is assessed as imminent.
Unacceptable	Stability of landfill is compromised to the extent that ability to contain waste materials is compromised. Examples may include: - Debris exposed in erosion channels **or areas of differential settlement.** - Liner exposed. - Slope failure.

Extent	Description
Isolated	Singular feature
Occasional	Features of note occurring at irregular intervals/locations
Numerous	Many features of note, impacted less than 50% of the surface area of the landfill
Extensive	Impacting greater than 50% of the surface area of the landfill

* Observation re-assessed during reporting phase

CAM-1 Station East Landfill 11 August 2016

ANNEX P: Preliminary Stability Assessment

Feature	Severity Rating	Extent
Settlement	Acceptable	Occasional
Erosion	Acceptable	Occasional
Lateral Movement	Not observed	None
Frost Action	Not observed	None
Sloughing	Not observed	None
Cracking	Not observed	None
Animal Burrows	Not observed	None
Vegetation establishment	Not observed	None
Staining	Not observed	None
Vegetation Stress	Not observed	None
Seepage/Ponded Water	Not observed	None
Debris and/or liner exposure	Not observed	None
Other	Not observed	None
Overall Landfill Performance	Acceptable	

Performance/ Severity Rating	Description
Acceptable	Noted features are of little consequence. The landfill is performing as designed. Minor deviations in environmental or physical performance may be observed, such as isolated areas of erosion, settlement.
Marginal	Physical/environmental performance appears to be deteriorating with time. Observations may include an increase in size or number of features of note, such as differential settlement, erosion or cracking. No significant impact on landfill stability to date, but potential for failure is assessed as low or moderate.
Significant	Significant or potentially significant changes affecting landfill stability, such as significant changes in slope geometry, significant erosion or differential settlement; scarp development. The potential for failure is assessed as imminent.
Unacceptable	Stability of landfill is compromised to the extent that ability to contain waste materials is compromised. Examples may include: - Debris exposed in erosion channels or areas of differential settlement. - Liner exposed. - Slope failure.

Extent	Description
Isolated	Singular feature
Occasional	Features of note occurring at irregular intervals/locations
Numerous	Many features of note, impacted less than 50% of the surface area of the landfill
Extensive	Impacting greater than 50% of the surface area of the landfill

CAM-1 Main Landfill 11 August 2016

ANNEX P: Preliminary Stability Assessment

Feature	Severity Rating	Extent
Settlement	Acceptable	Occasional
Erosion	Acceptable	Occasional
Lateral Movement	Not observed	None
Frost Action	Not observed	None
Sloughing	Not observed	None
Cracking	Not observed	None
Animal Burrows	Not observed	None
Vegetation establishment	~~Not observed~~ Acceptable	None Occasional
Staining	Acceptable	Isolated
Vegetation Stress	Not observed	None
Seepage/Ponded Water	Not observed	None
Debris and/or liner exposure	Not observed	None
Other	Not observed	None
Overall Landfill Performance	Acceptable	

Performance/ Severity Rating	Description
Acceptable	Noted features are of little consequence. The landfill is performing as designed. Minor deviations in environmental or physical performance may be observed, such as isolated areas of erosion, settlement.
Matginal	Physical/environmental performance appears to be deteriorating with time. Observations may include an increase in size or number of features of note, such as differential settlement, erosion or cracking. No significant impact on landfill stability to date, but potential for failure is assessed as low or moderate.
Significant	Significant or potentially significant changes affecting landfill stability, such as significant changes in slope geometry, significant erosion or differential settlement; scarp development. The potential for failure is assessed as imminent.
Unacceptable	Stability of landfill is compromised to the extent that ability to contain waste materials is compromised. Examples may include: - Debris exposed in erosion channels or areas of differential settlement. - Liner exposed. - Slope failure.

Extent	Description
Isolated	Singular feature
Occasional	Features of note occurring at irregular intervals/locations
Numerous	Many features of note, impacted less than 50% of the surface area of the landfill
Extensive	Impacting greater than 50% of the surface area of the landfill

* Observation re-assessed during reporting phase.

CAM-1 USAF Landfill 11 August 2016

ANNEX P: Preliminary Stability Assessment

Feature	Severity Rating	Extent
Settlement	Not observed	None
Erosion	Acceptable	Isolated
Lateral Movement	Not observed	None
Frost Action	Not observed	None
Sloughing	Not observed	None
Cracking	Not observed	None
Animal Burrows	Not observed	None
Vegetation establishment	Not observed	None
Staining	Not observed	None
Vegetation Stress	Not observed	None
Seepage/Ponded Water	Not observed	None
Debris and/or liner exposure	Not observed	None
Other	Not observed	None
Overall Landfill Performance	ACCEPTABLE	

Performance/ Severity Rating	Description
Acceptable	Noted features are of little consequence. The landfill is performing as designed. Minor deviations in environmental or physical performance may be observed, such as isolated areas of erosion, settlement.
Marginal	Physical/environmental performance appears to be deteriorating with time. Observations may include an increase in size or number of features of note, such as differential settlement, erosion or cracking. No significant impact on landfill stability to date, but potential for failure is assessed as low or moderate.
Significant	Significant or potentially significant changes affecting landfill stability, such as significant changes in slope geometry, significant erosion or differential settlement; scarp development. The potential for failure is assessed as imminent.
Unacceptable	Stability of landfill is compromised to the extent that ability to contain waste materials is compromised. Examples may include: - Debris exposed in erosion channels or areas of differential settlement. - Liner exposed. - Slope failure.

Extent	Description
Isolated	Singular feature
Occasional	Features of note occurring at irregular intervals/locations
Numerous	Many features of note, impacted less than 50% of the surface area of the landfill
Extensive	Impacting greater than 50% of the surface area of the landfill

CAM-1 East Landing Landfill 11 August 2016

ANNEX P: Preliminary Stability Assessment

Feature	Severity Rating	Extent
Settlement	Acceptable	Occasional
Erosion	Acceptable	None
Lateral Movement	Not observed	None
Frost Action	Not observed	None
Sloughing	Not observed	None
Cracking	Acceptable	Occasional
Animal Burrows	Not observed	None
Vegetation establishment	Not observed	None
Staining	Not observed	None
Vegetation Stress	Not observed	None
Seepage/Ponded Water	Not observed	None
Debris and/or liner exposure	Not observed	None
Other	Not observed	None
Overall Landfill Performance	Acceptable	

Performance/ Severity Rating	Description
Acceptable	Noted features are of little consequence. The landfill is performing as designed. Minor deviations in environmental or physical performance may be observed, such as isolated areas of erosion, settlement.
Marginal	Physical/environmental performance appears to be deteriorating with time. Observations may include an increase in size or number of features of note, such as differential settlement, erosion or cracking. No significant impact on landfill stability to date, but potential for failure is assessed as low or moderate.
Significant	Significant or potentially significant changes affecting landfill stability, such as significant changes in slope geometry, significant erosion or differential settlement; scarp development. The potential for failure is assessed as imminent.
Unacceptable	Stability of landfill is compromised to the extent that ability to contain waste materials is compromised. Examples may include: - Debris exposed in erosion channels or areas of differential settlement. - Liner exposed. - Slope failure.

Extent	Description
Isolated	Singular feature
Occasional	Features of note occurring at irregular intervals/locations
Numerous	Many features of note, impacted less than 50% of the surface area of the landfill
Extensive	Impacting greater than 50% of the surface area of the landfill

APPENDIX D

QA/QC Discussion of Results

QUALITY ASSURANCE/QUALITY CONTROL

A Quality Assurance/Quality Control (QA/QC) program was implemented to monitor the quality of the analytical results. The main objective of this QA/QC program is to ensure that sampling data and analytical results are complete, precise, representative and comparable.

All samples were given sequential alphanumerical coding before submitting to the analytical laboratories; this coding method masked any information concerning site location, sample type or possible concentrations in the samples.

All soil and groundwater samples were sent for analysis to Maxxam Analytics Ltd, Edmonton, Alberta with PCB analysis being conducted in Mississauga, Ontario. To ensure the quality of analytical results, 10% of duplicate samples were sent to a second laboratory (ALS – Edmonton, Alberta) and analyzed for inter-laboratory comparison purposes. All results are presented in the table to this Appendix (Appendix D, Table 1 for soil and Table 2 for groundwater).

Sampling procedures and laboratory analytical precision are evaluated by calculating the relative percent difference (RPD) for a sample and duplicate pair according the following equation:

$$RPD = | X_1 - X_2 | / X_{avg} \times 100$$

where: x_1 and x_1 are the duplicate concentrations and x_{avg} is the mean of these two values.

The duplicate results were evaluated using criteria developed by Zeiner (1994), which draws from several data validation guidelines developed by the United States Environmental Protection Agency (USEPA). According to these criteria, the RPD for duplicate samples should be less than 40% for aqueous samples, and less than 60% for solid samples. In addition, the newly developed CCME Guidance manual – PN1551; 2016 indicates the use of RPD values of less than 40% for aqueous samples, and less than 60% for soils. RPDs can only be calculated when the compound is detected in both the original and the duplicate sample at concentrations of five times above the reportable detection limit (or method detection limit - MDL), or greater. Alternative criteria are used to evaluate duplicate pairs where one or both of the results are less than five times the MDL, or where one or both of the results is less than the MDL (i.e. nd or 'not-detected'). The alternative criteria used for the evaluation of the data, adapted from Zeiner (1994), are presented in the table below. When both concentrations are less than the MDL, no calculation/evaluation criterion is required. For this review, based on DEW Line criteria, the RPD for duplicate samples comparison

criteria of less than 30% for aqueous samples, and less than 30% for solid samples was implemented.

Criteria for the Evaluation of Blind and Duplicate Sample Results

Scenario	Result A	Result B	Criteria for Acceptance	
			Aqueous (water)	Soil (Soil)
A	nd	nd	Acceptable precision; no evaluation required	
B	nd	positive	result B – 0.5 x MDL < MDL	result B – 0.5 x MDL < 2 x MDL
C	positive and > 5 x MDL	positive and > 5 x MDL	RPD < 40% (Zeiner) RPD <30% DEW Line	RPD <60% (Zeiner) RPD <30% DEW Line
D	positive and < or = 5 x MDL	positive	|result B – result A| < MDL[1]	|result B – result A| < 2 x MDL[1]

Source(s):
Zeiner, S.T., Realistic Criteria for the Evaluation of Field Duplicate Sample Results, Proceedings of Superfund XV, November 29-December 1, 1994, Sheraton Washington Hotel, Washington, D.C. – modified to use Method Detection Limit (MDL) or Reportable Detection Limit (RDL) in lieu of the Quantitation Limit (QL), the Instrument Detection Limit (IDL) and/or Laboratory Reporting Limit (LRL).

DCC Dew Line Monitoring Kitik16 RFP – Annex K, Section 1.2.2

Notes:
nd – not detected
RPD – relative percent difference, |result A - result B| / |(result A + result B)/2|
1. When result reported was less than half the quantitation limit, half the limit was used in the equation.

The precision is considered acceptable when the evaluation criteria are met or when both results are below the MDL. When the evaluation criteria are not satisfied, the following apply:

- nd vs. positive – unacceptable precision: the positive result is considered an estimate and the nd result is considered inconclusive.
- Positive vs. positive – unacceptable precision: the res

SHIPPING AND TRANSPORTATION

Samples were kept in coolers and shipped to the contract laboratories as soon as Arcadis field staff arrived back in Cambridge Bay and all attempts were made to expedite this procedure. Samples were shipped priority air to Yellowknife laboratory depots. The laboratories were notified and waybill numbers were provided to aid in sample transfer of custody and tracking.

Sample Temperatures

Cooler temperatures were within acceptable ranges when received in at the Maxxam Yellowknife depot based on the COCs attached in the laboratory results section of this report; however, when the PCB samples were transferred between Maxxam Yellowknife and Maxxam Mississauga (no longer within Arcadis custody), the temperatures of two of the three coolers sent were above the 10 degrees Celsius target temperature upon arrival. Although, not ideal; Arcadis does not believe this effected the integrity of the sample results given the extremely low volatility of PCBs.

Sample Holding Times

Sample holding times were exceeded for samples 16-C1-25A (Maxxam PG6035) and 16-C1-28A (Maxxam PG6040) for the analytes PHC F1/BTEX. Although all efforts were made to get the samples to the laboratory on time, given the volume of samples, Maxxam was unable to extract the above-mentioned samples within the 7-day recommended window. Given that no other detections of F1 or BTEX were present at the CAM-1 site in 2016 or historically, it is not believed that this holding time exceedance has affected the integrity of the sample results and the sample results should be relied upon.

Hold times for the ALS duplicate soil samples for F1/BTEX were also exceeded, as outlined on the ALS laboratory certificates of analysis. As stated above given that no other detections of F1 or BTEX were present at the CAM-1 site in 2016 or historically, it is not believed that this holding time exceedance has affected the integrity of the sample results and the sample results should be relied upon.

METHOD DETECTION LIMITS (MDLS)

Method detection limits were raised for sample 16-C1-20A (surface) with Maxxam ID PG6022. The MDLs were raised in this sample due to matrix interference with analytes Cr, Co, Cu, Pb, Sb, Mo, Ni, Se, Ag, As, Tl, Sn, Ti, U, V, Zn, Be, Cd being affected. After review of the sample results, it is not believed that this raise in detection limits caused any bias or any major exceedances were missed and the results should be relied upon.

QA/QC SAMPLE RESULTS

Soil samples were compared against intra-laboratory duplicates (i.e., Maxxam to Maxxam via a parent sample and blind duplicate sample) and inter-laboratory duplicates (i.e., Maxxam parent sample and an identical ALS sample).

Soil

A total of eight duplicate and eight inter-laboratory samples were collected and analyzed at the CAM-1 site. In the case of soil samples, some minor differences were noted within the sample results when field duplicates were compared with the originals, although all differences are considered to be within acceptable limits as compared with the criteria outlined above with one exception noted in Table 1.

Metals Analyses

In some instances, minor variance of analytical results occurred between the project laboratory (Maxxam) and the inter-lab analysis (ALS); however, these discrepancies are very small and are considered to be well within an acceptable level.

One sample parent (16-C1-8A Maxxam) and its duplicate (Dup 2) reported unacceptable results for Copper, Lead, and Arsenic. When comparing the parent sample (Maxxam 16-C1-8A) with the inter-laboratory ALS sample (16-C1-8A), all analytes reported concentrations within acceptable ranges. Therefore, it is concluded that the duplicate sample (Dup 2) may have reported abnormally high concentrations, which could be attributed to small metal fragments present in the sample or the heterogeneous nature of the soil samples.

Overall, the data set is considered within acceptable ranges and the results are considered reliable.

Hydrocarbon Analyses

All soil samples reported non-detect concentrations for hydrocarbons and are considered to meet the QA/QC criteria. The data set is considered acceptable and reliable.

It should be noted that the recommended holding time of 7 days was exceeded for F1/BTEX for both the Maxxam and ALS samples. Arcadis took all necessary steps to ensure that this was circumvented including priority shipping as soon as Arcadis returned to Cambridge Bay at the end of the sampling program; however, given the remote nature of the site and long transit times for shipping, these holding time exceedances could not be avoided. In spite of the holding time exceedances, Arcadis believes that this did not effect the integrity of the sample set and that all results should be considered reliable.

PCB Analyses

All soil samples reported non-detect concentrations for PCBs and are considered to meet the QA/QC criteria. The data set is considered acceptable and reliable.

Groundwater

One groundwater duplicate sample and one inter-laboratory sample was collected and analyzed at the CAM-1 site. In the case of groundwater, only minor concentration variances were noted and are well within the acceptable range.

The sample submitted to ALS (C1-MW03) contained two qualifiers. The first was SPL (Sample Preserved at the laboratory): this is a typical procedure for laboratories to preserve the metals sample upon receipt of non-field preserved samples and should not effect the sample results or reliability. The second was WSMT (Water sample for total mercury analysis not submitted in glass or PTFE container with HCI preservative: no field preservatives were to be added as per the DEW line requirements; therefore, this is a standard flag that the laboratory must apply in this circumstance and has no bearing on this project.

One trip blank was also submitted to assess any potential external environmental impacts potentially introduced to the samples during collection, transportation, packaging, and shipping. The trip blank reported all non-detect concentrations; therefore, it is believed that no sampling bias was introduced to the sample set and the sample results should be relied upon.

Overall, the soil and groundwater sample results are broadly coherent and within the same range of results for both laboratories. In general, the reliability and accuracy of the analytical results is considered as good and should be relied upon.

Summary of 2016 Soil Duplicate Analytical Data																
Sample ID	Location	Year	Depth (cm)	Cu [mg/kg]	Ni [mg/kg]	Co [mg/kg]	Cd [mg/kg]	Pb [mg/kg]	Zn [mg/kg]	Cr [mg/kg]	As [mg/kg]	Hg [mg/kg]	Total PCB [mg/kg]	F1 C_6-C_{10} [mg/kg]	F2 C_{10}-C_{16} [mg/kg]	F3 C_{16}-C_{34} [mg/kg]
Maxxam RPD				1	1	0.5	0.05	0.5	10	1	1	0.05	0.01	12	10	50
ALS RPD				0.5	0.5	0.1	0.02	0.5	2	0.5	0.1	0.005	0.05	10	20	20
	C1-5 Surface															
16-C1-5A	C1-5	2016	0-15	1.70	<1	<0.5	<0.05	1.60	<10	<1.0	1.00	<0.05	<0.01	<12	<10	<50
Dup 1				<1.0	<1.0	<0.50	<0.050	1.60	<10	1.20	1.20	<0.050	<0.010	<12	<10	<50
RPD (Parent and Dup)				1.20	--	--	--	0	--	0.7	0.2	--	--	--	--	--
Aceptable (Y/N)				Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
16-C1-5A ALS				1.11	0.53	0.46	<0.020	1.64	<2.0	1.09	1.20	<0.0050	<0.050	<10	<20	<20
RPD (interlab)				0.09	0.03	0.21	--	0.04	--	0.70	0.00	--	--	--	--	--
Aceptable (Y/N)				Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	C1-8 Surface															
16-C1-8A	C1-8	2016	0-15	1.10	<1.0	0.55	<0.050	2.80	<10	1.40	2.10	<0.050	<0.01	<12	<10	<50
Dup 2				3.30	2.40	1.30	<0.050	12.00	10.00	2.40	13.00	<0.050	<0.010	<12	<10	<50
RPD (Parent and Dup)				2.20	1.90	0.75	--	69%	--	1.00	78%	--	--	--	--	--
Aceptable (Y/N)				N	Y	Y	Y	N	Y	Y	N	Y	Y	Y	Y	Y
16-C1-8A ALS				0.97	1.02	0.66	<0.020	2.18	3.80	1.87	1.46	<0.0050	<0.050	<10	<20	<20
RPD (interlab)				0.13	0.52	0.11	--	0.62	--	0.47	0.64	--	--	--	--	--
Aceptable (Y/N)				Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	C1-11 Surface															
16-C1-11A	C1-11	2016	0-15	1.20	1.00	<0.50	<0.050	0.71	<10	1.80	<1.0	<0.050	<0.01	<12	<10	<50
Dup 3				1.00	<1.0	<0.50	<0.050	0.80	<10	1.30	<1.0	<0.050	<0.010	<12	<10	<50
RPD (Parent and Dup)				0.20	0.50	--	--	0.09	--	0.50	--	--	--	--	--	--
Aceptable (Y/N)				Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
16-C1-11A ALS				0.99	0.82	0.30	<0.020	0.59	<2.0	0.94	0.35	<0.0050	<0.050	<10	<20	<20
RPD (interlab)				0.21	0.18	0.20	--	0.12	--	0.86	--	--	--	--	--	--
Aceptable (Y/N)				Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	C1-12 Surface															
16-C1-12A	C1-12	2016	0-15	1.00	<1.0	<0.50	<0.050	<0.50	<10	<1.0	<1.0	<0.050	<0.010	<12	<10	<50
Dup 4				1.80	<1.0	<0.50	<0.050	0.53	<10	1.20	<1.0	<0.050	<0.010	<12	<10	<50
RPD (Parent and Dup)				0.80	--	--	--	0.28	--	0.70	--	--	--	--	--	--
Aceptable (Y/N)				Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
16-C1-12A ALS				1.15	0.72	0.23	<0.020	<0.50	<2.0	1.18	0.32	<0.0050	<0.050	<10	<20	<20
RPD (interlab)				0.15	--	--	--	--	--	0.68	--	--	--	--	--	--
Aceptable (Y/N)				Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Summary of 2016 Soil Duplicate Analytical Data																
Sample ID	Location	Year	Depth (cm)	Cu [mg/kg]	Ni [mg/kg]	Co [mg/kg]	Cd [mg/kg]	Pb [mg/kg]	Zn [mg/kg]	Cr [mg/kg]	As [mg/kg]	Hg [mg/kg]	Total PCB [mg/kg]	F1 C_6-C_{10} [mg/kg]	F2 C_{10}-C_{16} [mg/kg]	F3 C_{16}-C_{34} [mg/kg]
Maxxam RPD				1	1	0.5	0.05	0.5	10	1	1	0.05	0.01	12	10	50
	C1-16 Surface															
16-C1-16A	C1-16	2016	0-15	<1.0	<1.0	<0.50	<0.050	2.00	<10	1.50	<1.0	<0.050	<0.010	<12	<10	<50
Dup 5				<1.0	1.00	0.69	<0.050	1.80	<10	1.90	<1.0	<0.050	<0.010	<12	<10	<50
RPD (Parent and Dup)				--	0.50	0.44	--	0.20	--	0.40	--	--	--	--	--	--
Aceptable (Y/N)				Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
16-C1-16A ALS				1.00	0.94	0.63	0.02	1.76	2.80	1.83	0.97	<0.0050	<0.050	<10	<20	<20
RPD (interlab)				--	0.44	0.38	0.00	0.24	--	0.33	0.47	--	--	--	--	--
Aceptable (Y/N)				Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	C1-20 Depth															
16-C1-20B	C1-20	2016	40-50	1.50	1.20	0.62	<0.050	4.60	<10	2.30	2.30	<0.050	<0.01	<12	<10	<50
Dup 6				1.20	<1.0	0.51	<0.050	5.00	<10	2.10	2.00	<0.050	<0.010	<12	<10	<50
RPD (Parent and Dup)				0.30	0.70	0.11	--	0.40	--	0.20	0.30	--	--	--	--	--
Aceptable (Y/N)				Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
16-C1-20B ALS				1.28	1.13	0.62	<0.020	5.77	2.90	2.29	3.17	<0.0050	<0.050	<10	<20	<20
RPD (interlab)				0.22	0.07	0.00	--	1.17	--	0.01	0.87	--	--	--	--	--
Aceptable (Y/N)				Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	C1-26 Surface															
16-C1-26A	C1-26	2016	0-15	1.50	1.50	0.79	<0.050	4.50	<10	3.70	1.40	<0.050	<0.010	<12	<10	<50
Dup 7				1.50	1.30	0.70	<0.050	4.50	<10	3.40	1.20	<0.050	<0.010	<12	<10	<50
RPD (Parent and Dup)				0.00	0.20	0.09	--	0.00	--	0.30	0.20	--	--	--	--	--
Aceptable (Y/N)				Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
16-C1-26A ALS				1.37	1.50	0.87	0.03	4.49	4.80	3.69	1.73	<0.0050	<0.050	<10	<20	<20
RPD (interlab)				0.13	0.00	0.08	--	0.01	--	0.01	0.33	--	--	--	--	--
Aceptable (Y/N)				Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	C1-29 Surface															
16-C1-29A	C1-29	2016	0-15	2.40	1.60	0.62	<0.050	2.00	<10	3.80	<1.0	<0.050	<0.010	<12	<10	<50
Dup 8				1.70	1.70	0.69	<0.050	2.30	<10	2.70	1.00	<0.050	<0.010	<12	<10	<50
RPD (Parent and Dup)				0.70	0.10	0.07	--	0.30	--	1.10	0.50	--	--	--	--	--
Aceptable (Y/N)				Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
16-C1-29A ALS				1.38	1.52	0.67	<0.020	1.70	3.00	2.82	0.89	<0.0050	<0.050	<10	<20	<20
RPD (interlab)				1.02	0.08	0.05	--	0.3	--	0.98	0.39	--	--	--	--	--
Aceptable (Y/N)				Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Notes:

-- Not calculated - meets criteira

Y Meets Criteria

N Does not meet criteria

Summary of 2016 Groundwater Duplicate Analytical Data

Sample ID	Location	Year	Depth (cm)	Cu [mg/L]	Ni [mg/L]	Co [mg/L]	Cd [mg/L]	Pb [mg/L]	Zn [mg/L]	Cr [mg/L]	As [mg/L]	Hg [mg/L]	Total PCB [mg/L]	F1 C_6-C_{10} [mg/L]	F2 C_{10}-C_{16} [mg/L]	F3 C_{16}-C_{34} [mg/L]
Maxxam RDL				0.0002	0.0005	0.0003	0.00002	0.0002	0.003	0.001	0.0002	0.002	0.05	0.1	0.1	0.2
ALS RDL				0.0005	0.0005	0.0001	0.000005	0.00005	0.003	0.0001	0.0001	0.000005	0.00005	0.1	0.1	0.25
Monitoring Data																
	MW-03															
C1-MW03	MW-03	2016	0-15	0.0010	0.0020	<0.00030	<0.000020	<0.00020	<0.0030	<0.0010	0.00028	0.0000027	<0.050	<0.10	<0.10	<0.20
Dup 1				0.0034	0.0021	<0.00030	<0.000020	<0.00020	<0.0030	<0.0010	0.0010	0.0000036	<0.050	<0.10	<0.10	<0.20
RPD (Parent and Dup)				0.0024	0.0001	--	--	--	--	--	0.0007	0.0000009	--	--	--	--
Aceptable (Y/N)				Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
C1-MW03 ALS				0.00106	0.002	<0.00010	<0.0000050	0.000118	<0.003	0.00084	0.00028	<0.0000050	<0.000050	<0.10	<0.10	<0.25
RPD (interlab)				0.00006	0.00000	--	--	--	--	--	0.00000	--	--	--	--	--
Aceptable (Y/N)				Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Notes:

-- Not calculated - meets criteira

Y Meets Criteria

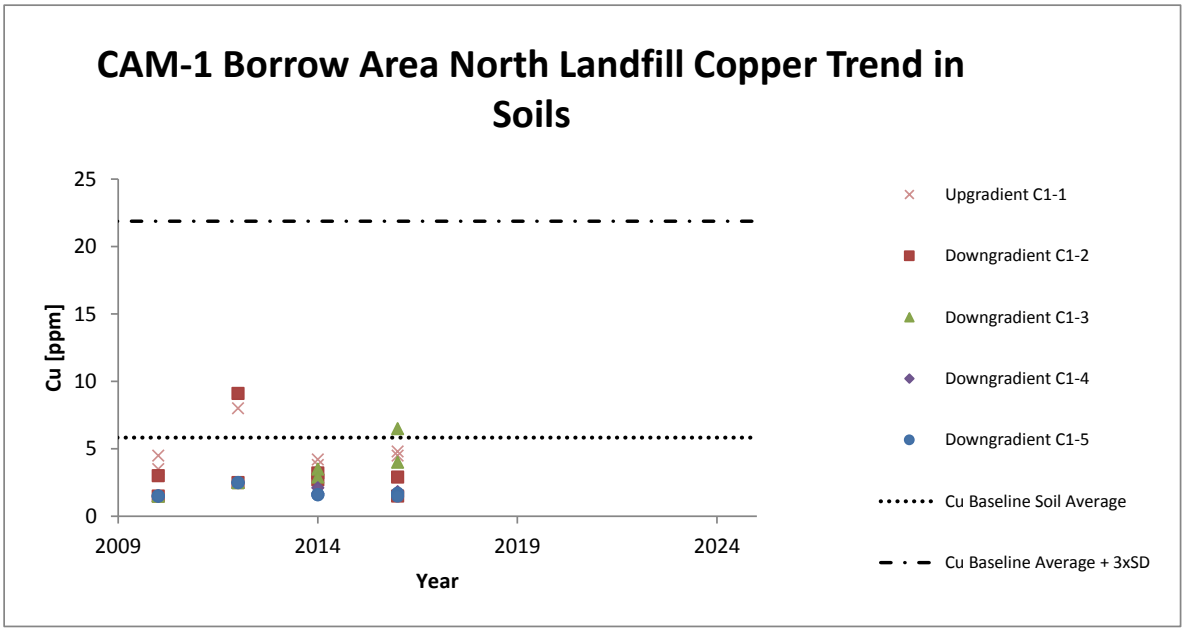
	TRIP BLANK
Volatiles (ug/L)	
Benzene	<0.40
Toluene	<0.40
Ethylbenzene	<0.40
m & p-Xylene	<0.80
o-Xylene	<0.40
Xylenes (Total)	<0.80
F1 (C6-C10) - BTEX	<100
F1 (C6-C10)	<100

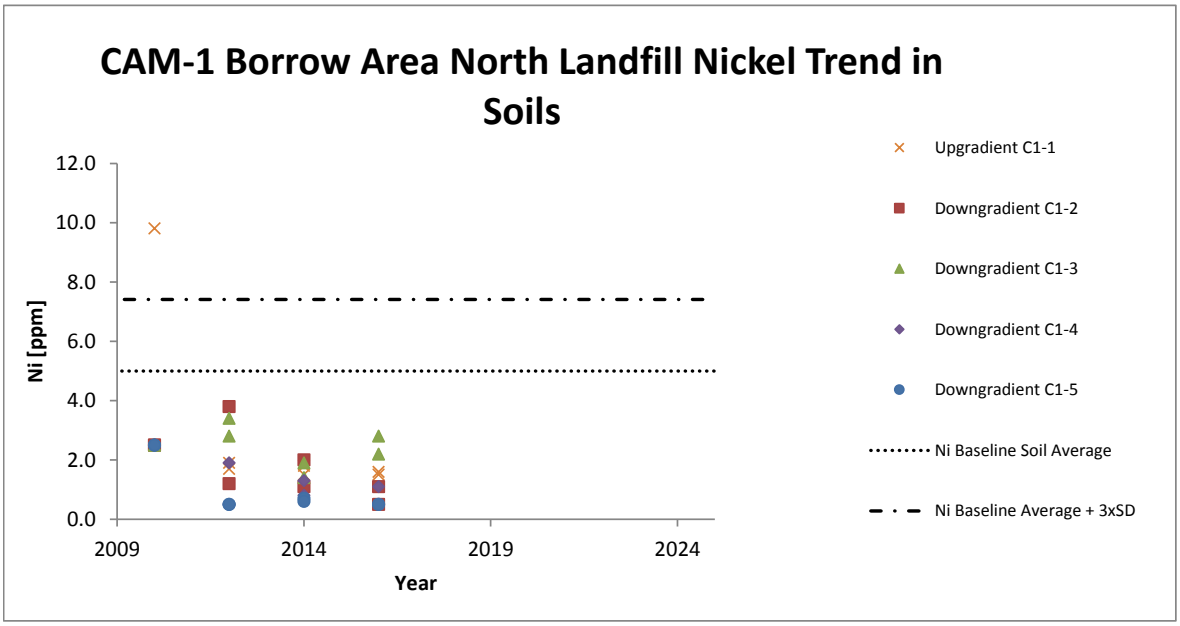
APPENDIX E

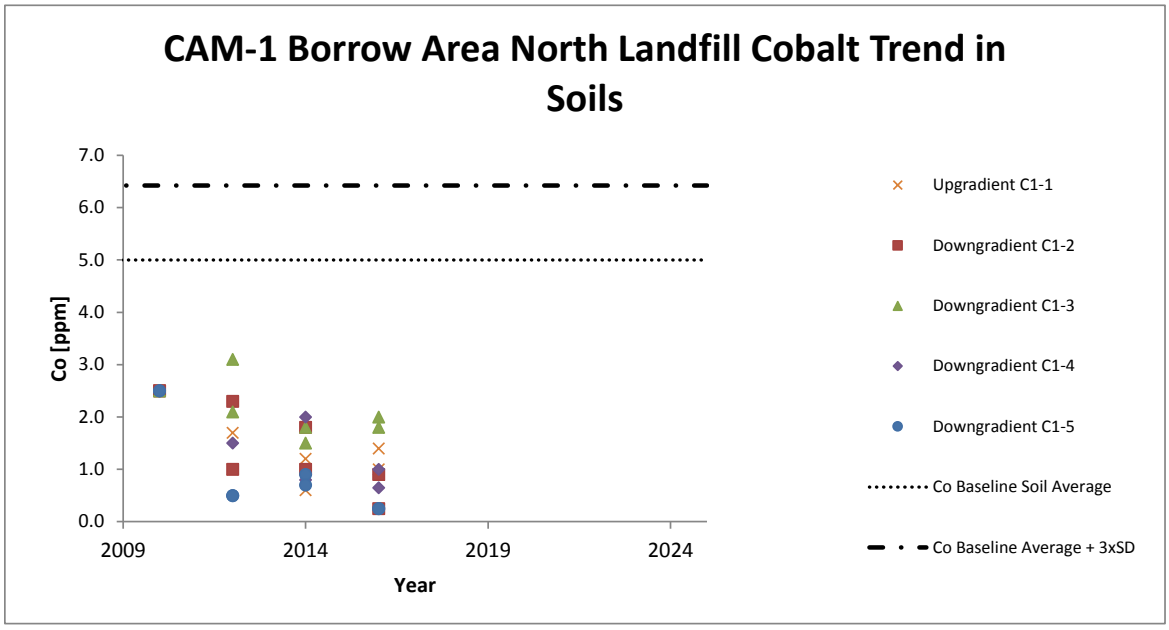
Soil Trend Analysis Graphs

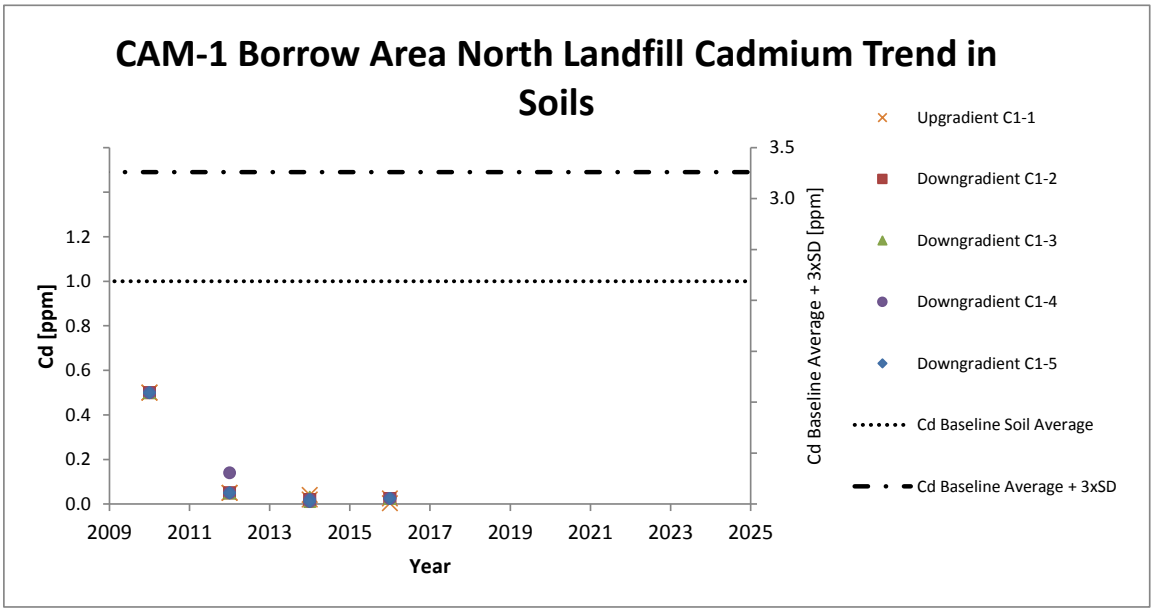
APPENDIX E1

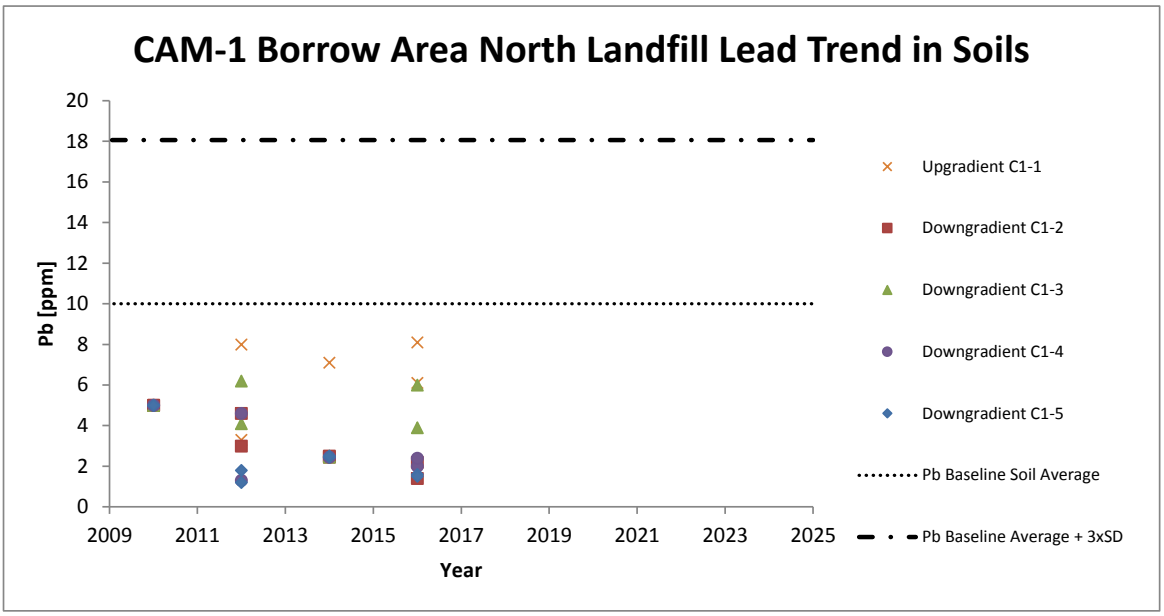
Borrow Area North Landfill

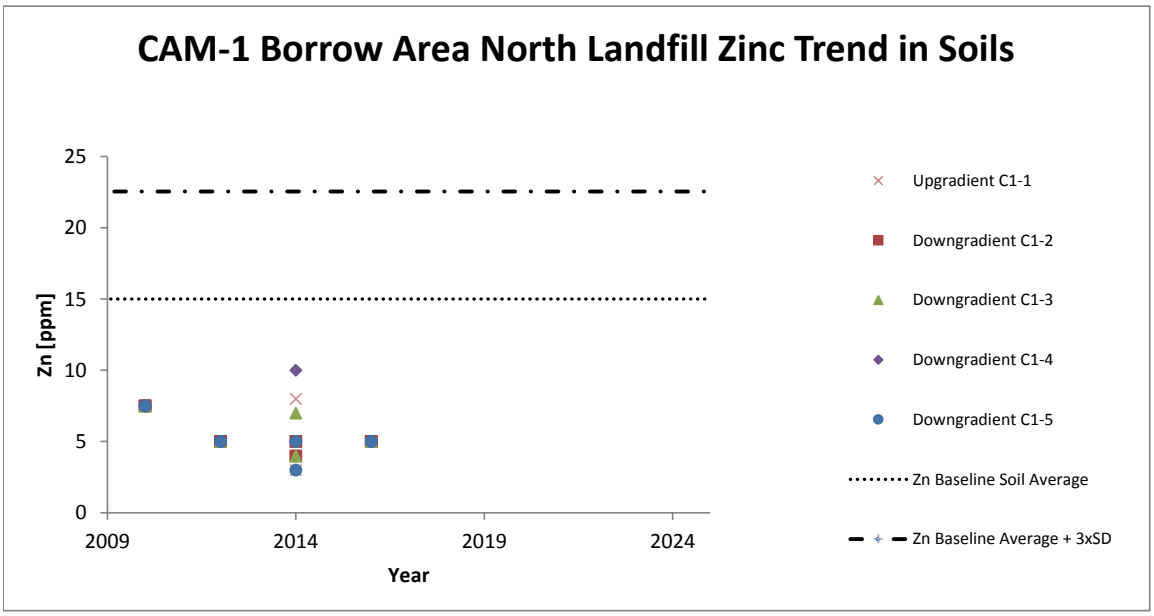

CAM-1 Borrow Area North Landfill Copper Trend in Soils
Cu [ppm]
25
20
15
10
5
0
2009
2014
2019
2024
Year
Upgradient C1-1
Downgradient C1-2
Downgradient C1-3
Downgradient C1-4
Downgradient C1-5
Cu Baseline Soil Average
Cu Baseline Average + 3xSD

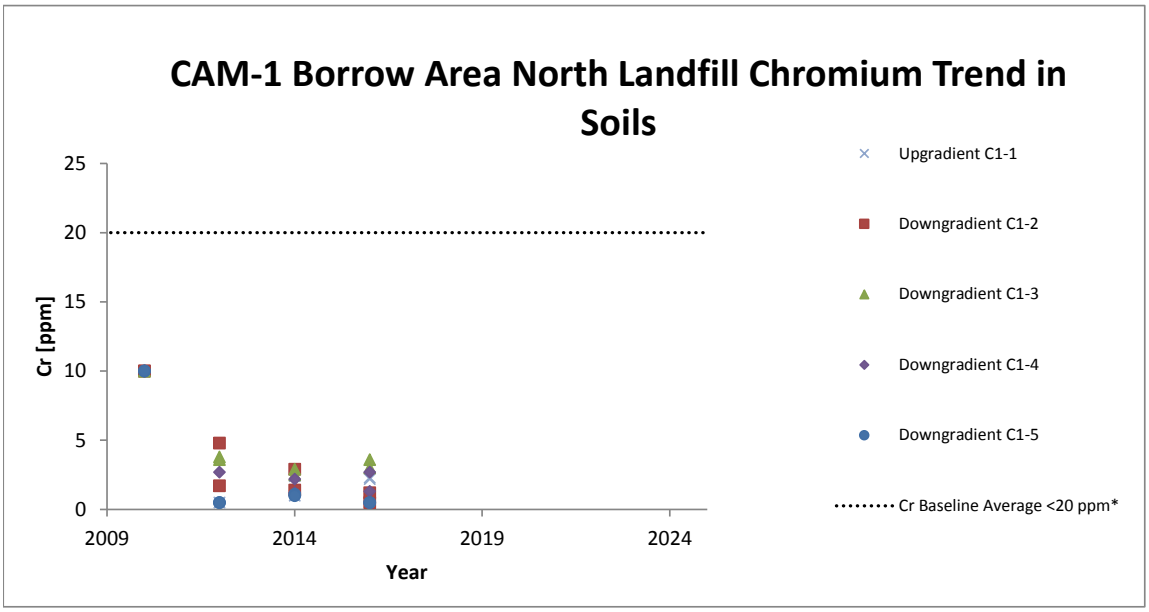

CAM-1 Borrow Area North Landfill Nickel Trend in Soils
Ni [ppm]
12.0
10.0
8.0
6.0
4.0
2.0
0.0
2009
2014
2019
2024
Year
Upgradient C1-1
Downgradient C1-2
Downgradient C1-3
Downgradient C1-4
Downgradient C1-5
Ni Baseline Soil Average
Ni Baseline Average + 3xSD


CAM-1 Borrow Area North Landfill Cobalt Trend in Soils
Co [ppm]
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
2009
2014
2019
2024
Year
Upgradient C1-1
Downgradient C1-2
Downgradient C1-3
Downgradient C1-4
Downgradient C1-5
Co Baseline Soil Average
Co Baseline Average + 3xSD

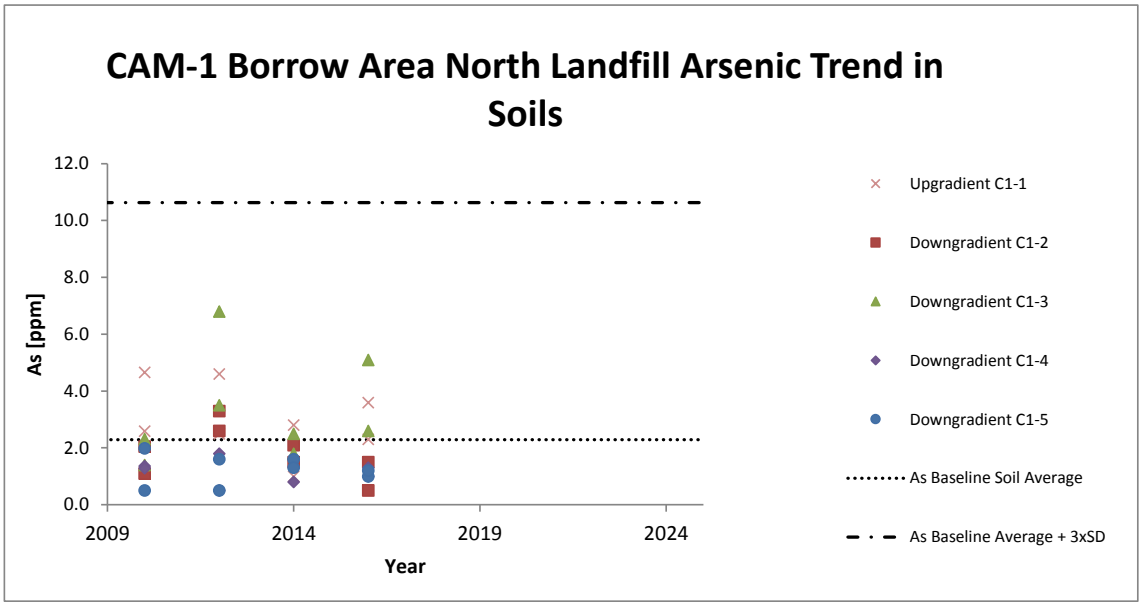

CAM-1 Borrow Area North Landfill Cadmium Trend in Soils
Cd [ppm]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
3.5
3.0
Cd Baseline Average + 3xSD [ppm]
2009
2011
2013
2015
2017
2019
2021
2023
2025
Year
Upgradient C1-1
Downgradient C1-2
Downgradient C1-3
Downgradient C1-4
Downgradient C1-5
Cd Baseline Soil Average
Cd Baseline Average + 3xSD

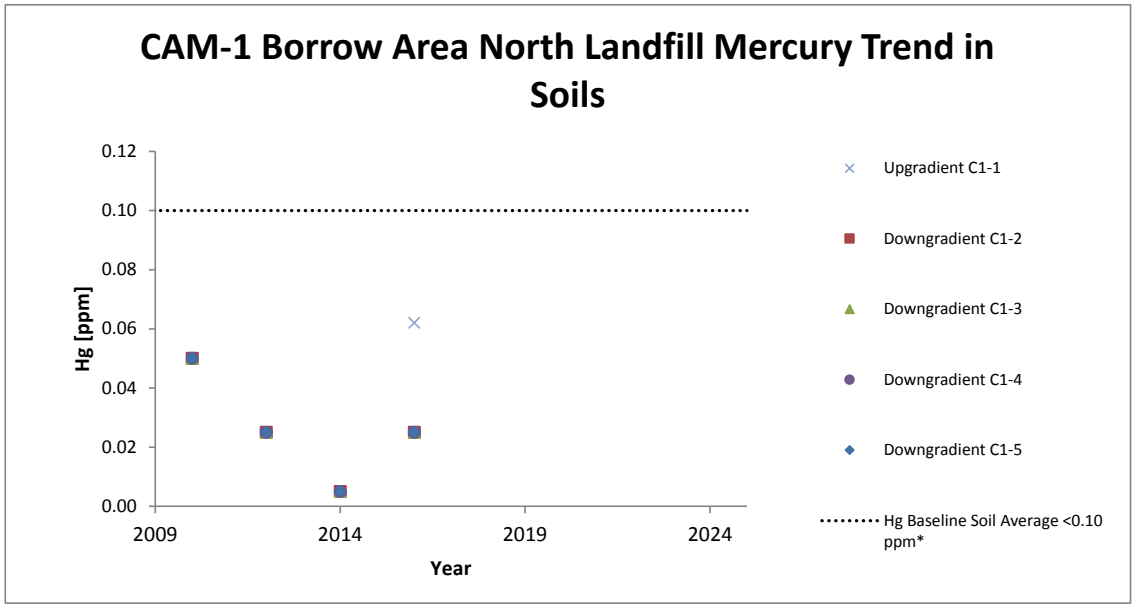

CAM-1 Borrow Area North Landfill Lead Trend in Soils
Pb [ppm]
Year
Upgradient C1-1
Downgradient C1-2
Downgradient C1-3
Downgradient C1-4
Downgradient C1-5
Pb Baseline Soil Average
Pb Baseline Average + 3xSD


CAM-1 Borrow Area North Landfill Zinc Trend in Soils
Zn [ppm]
Year
Upgradient C1-1
Downgradient C1-2
Downgradient C1-3
Downgradient C1-4
Downgradient C1-5
Zn Baseline Soil Average
Zn Baseline Average + 3xSD

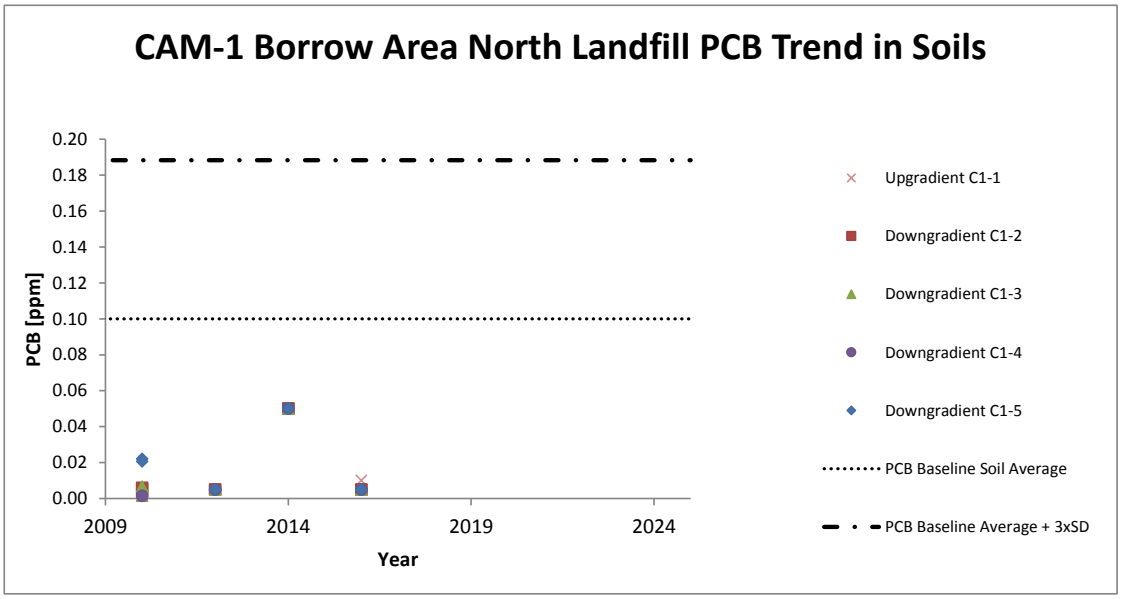


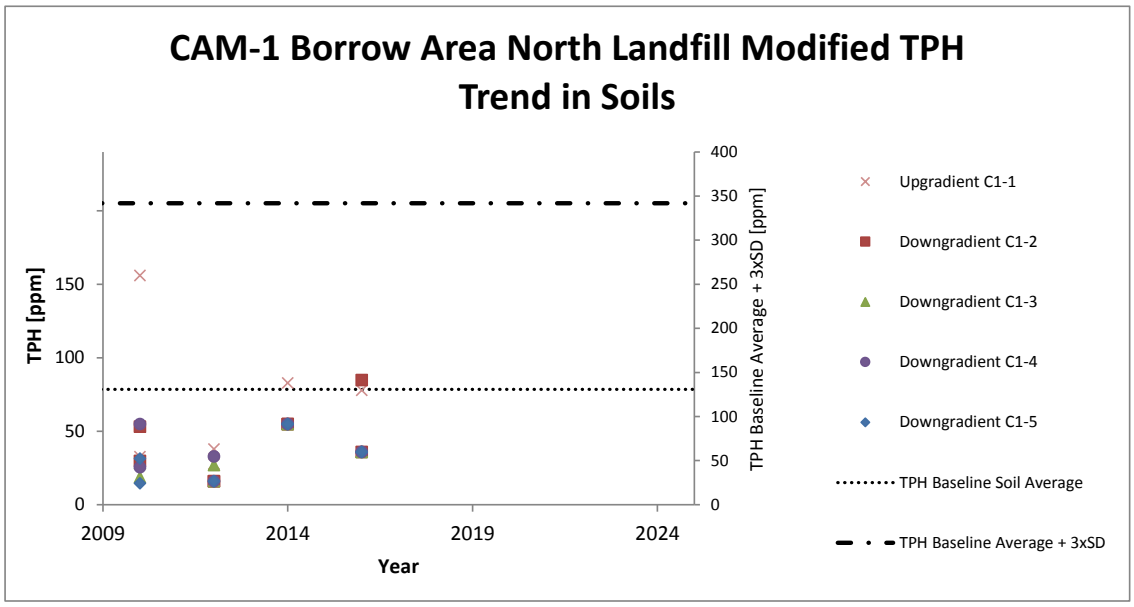
*Cr Baseline Average SD = 0





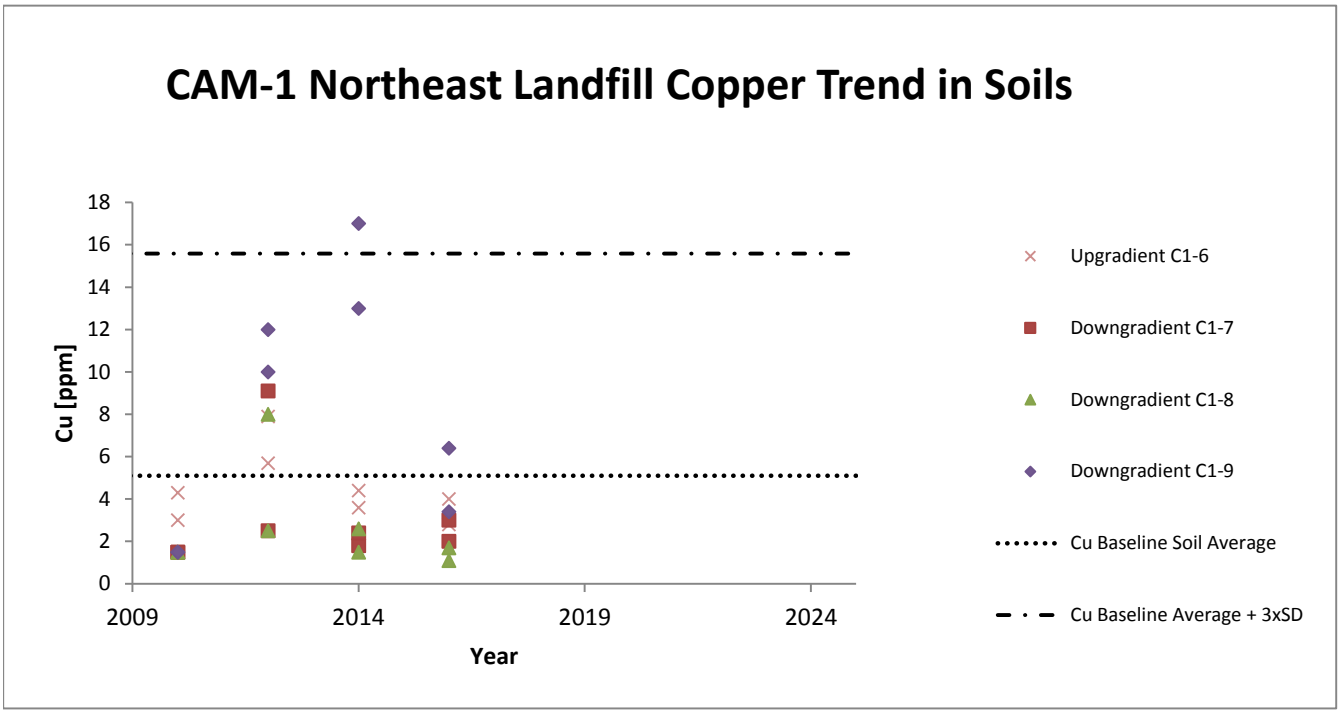
*Hg Baseline Average SD = 0

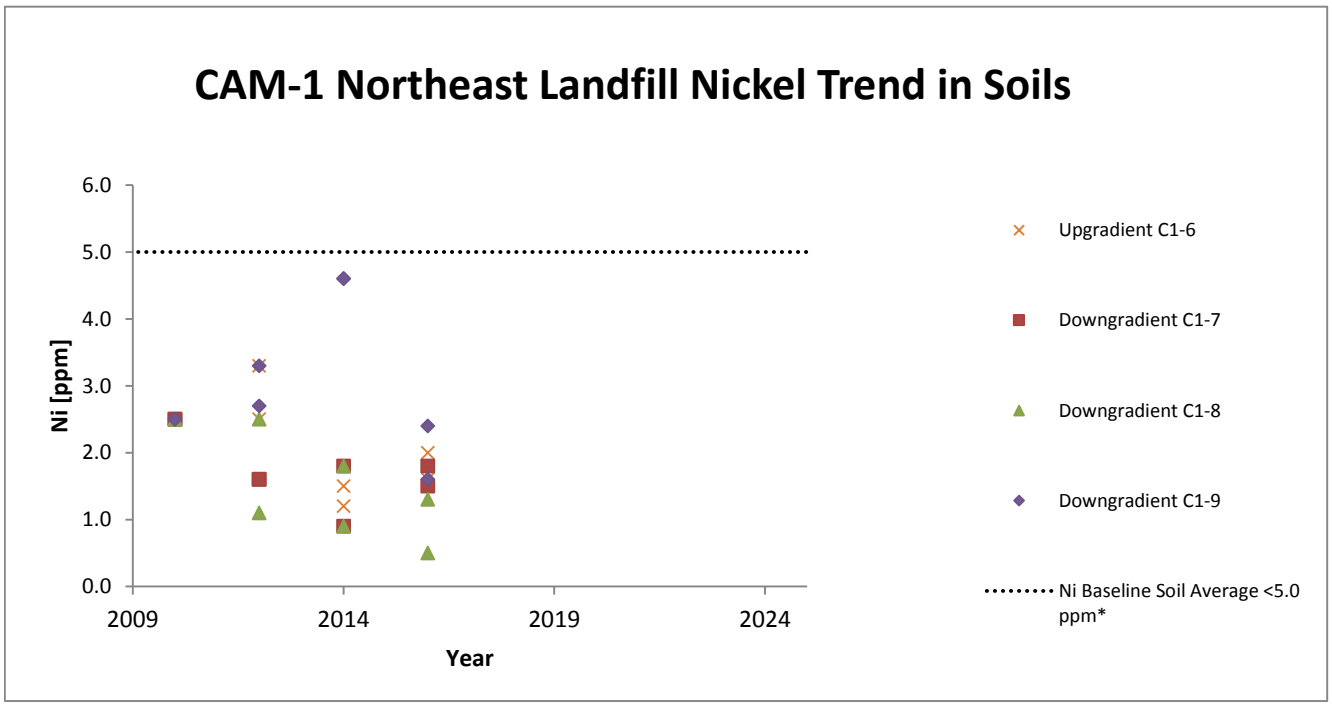



CAM-1 Borrow Area North Landfill Modified TPH Trend in Soils
TPH [ppm]
TPH Baseline Average + 3xSD [ppm]
Year
0
50
100
150
0
50
100
150
200
250
300
350
400
2009
2014
2019
2024
Upgradient C1-1
Downgradient C1-2
Downgradient C1-3
Downgradient C1-4
Downgradient C1-5
TPH Baseline Soil Average
TPH Baseline Average + 3xSD

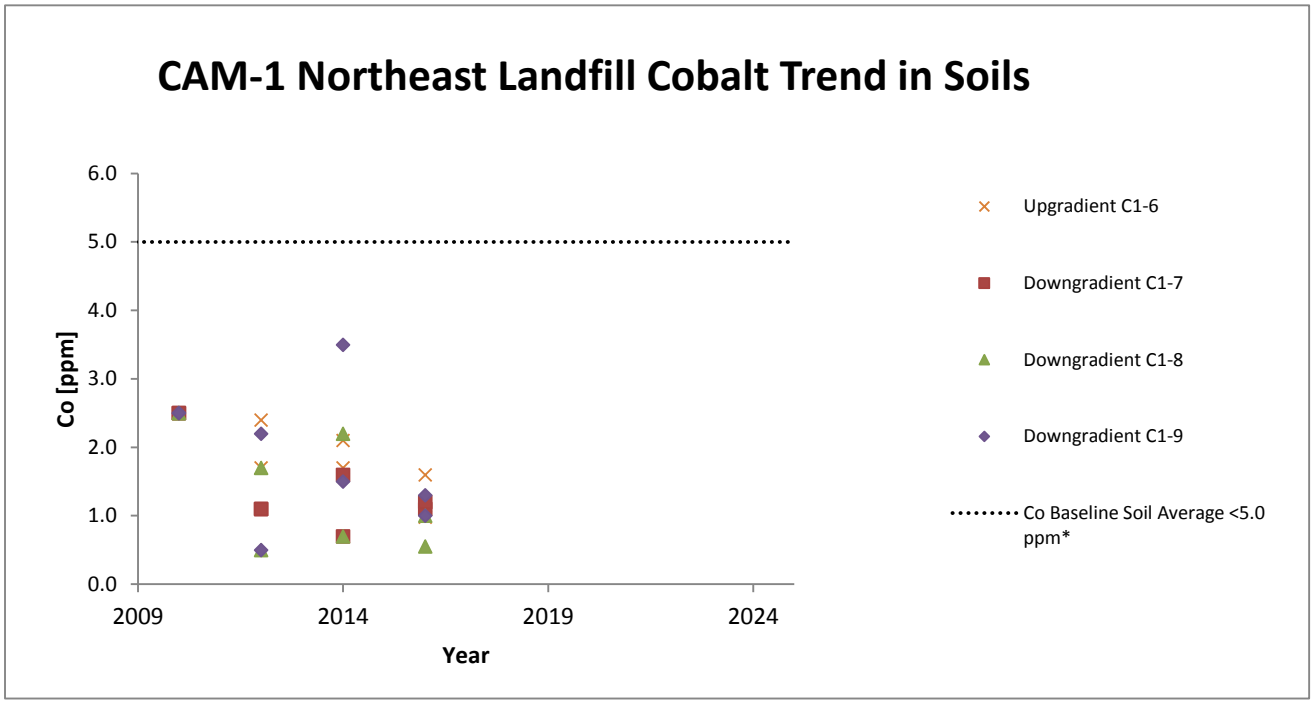
APPENDIX E2

Northeast Landfill

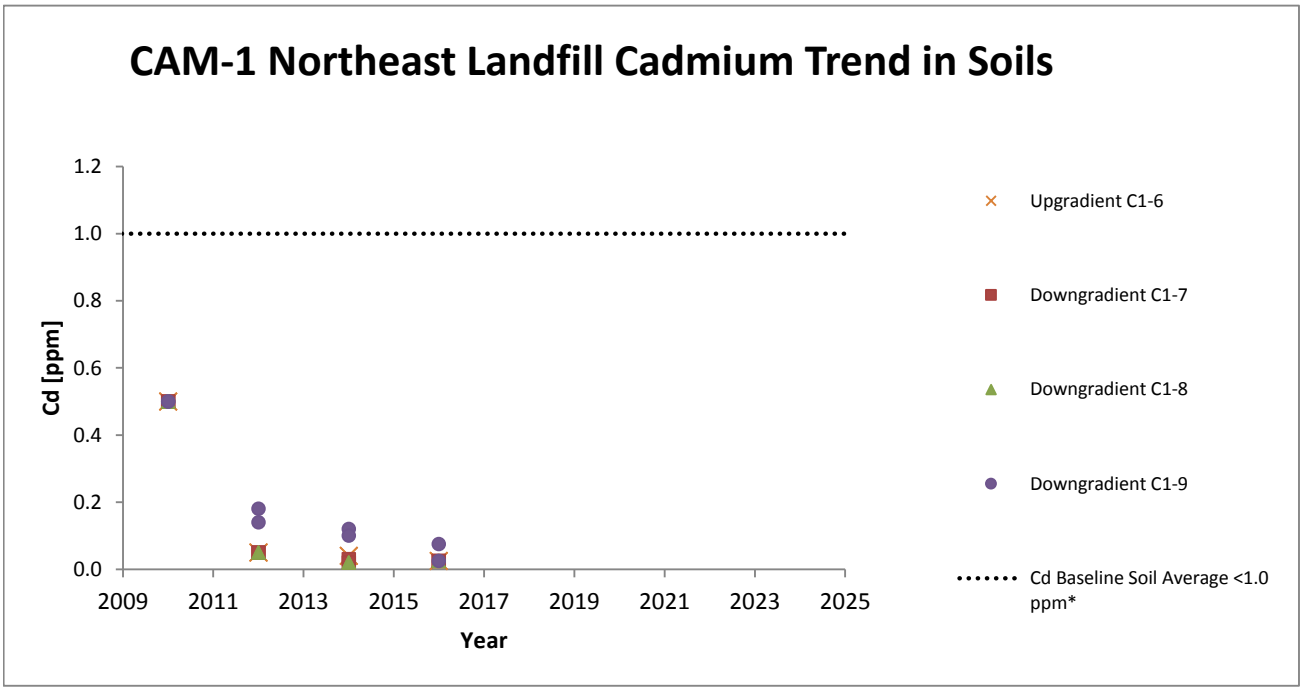




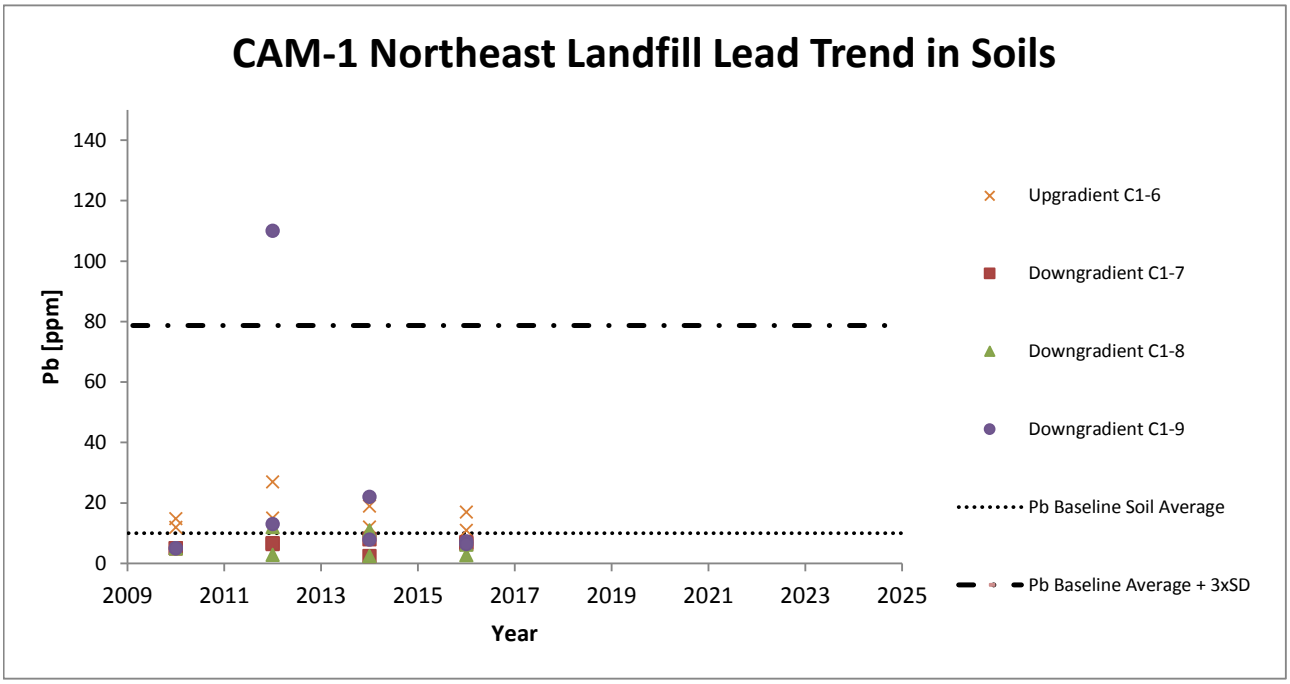
*Ni Baseline Average SD = 0

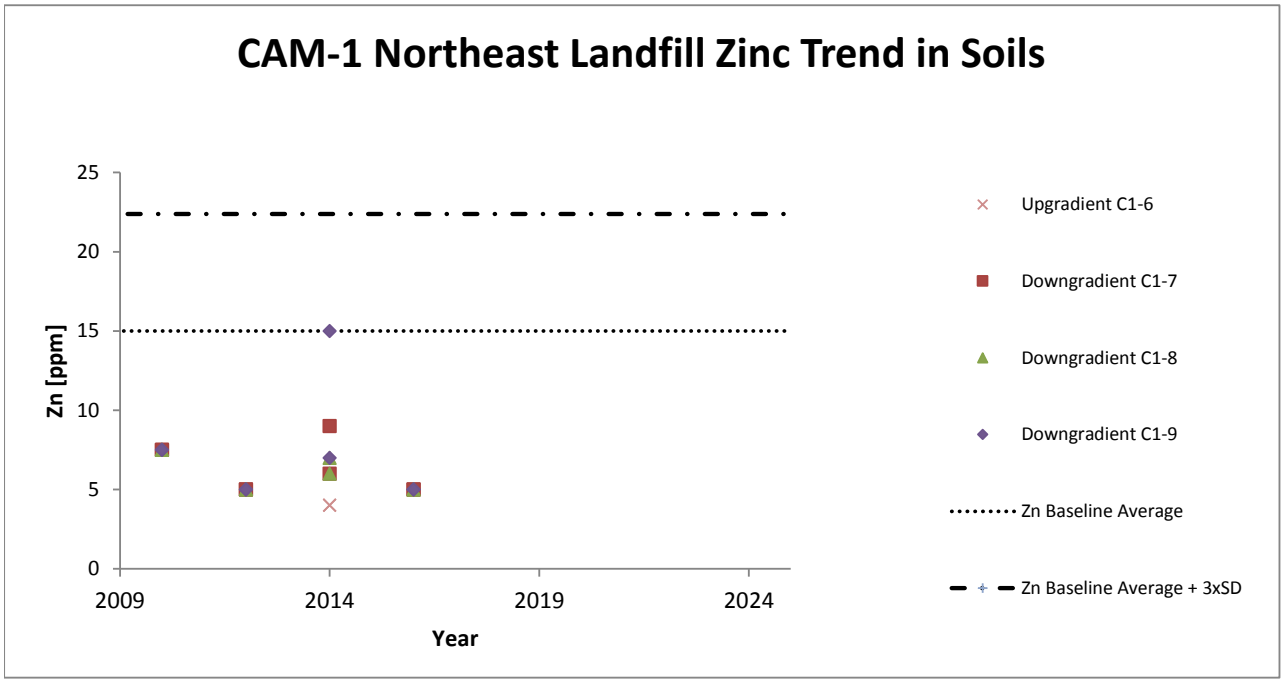


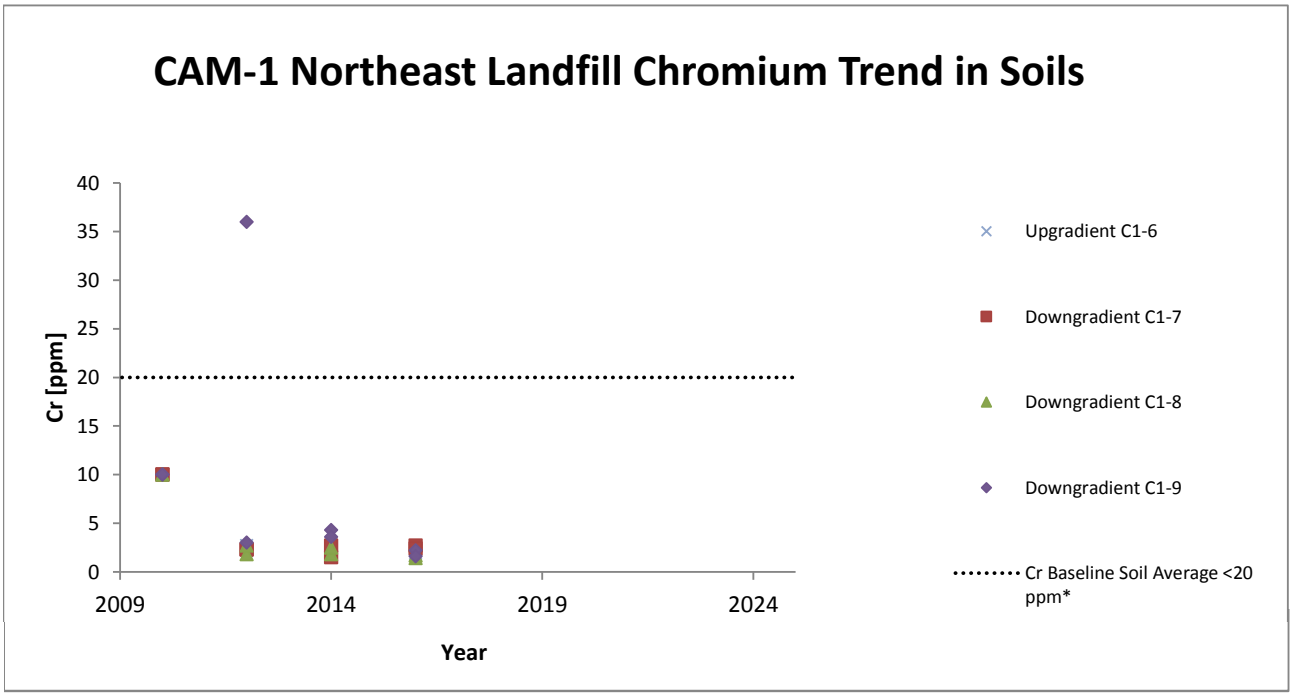
*Co Baseline Average SD = 0



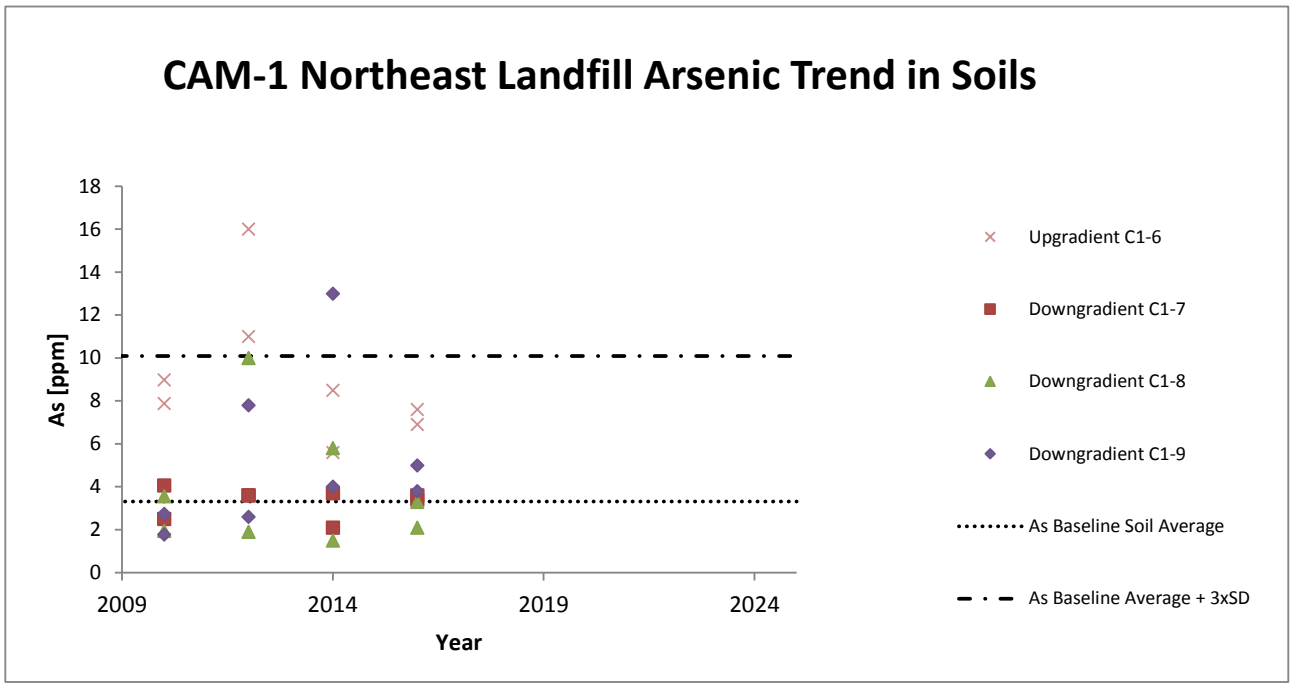
*Cd Baseline Average SD = 0

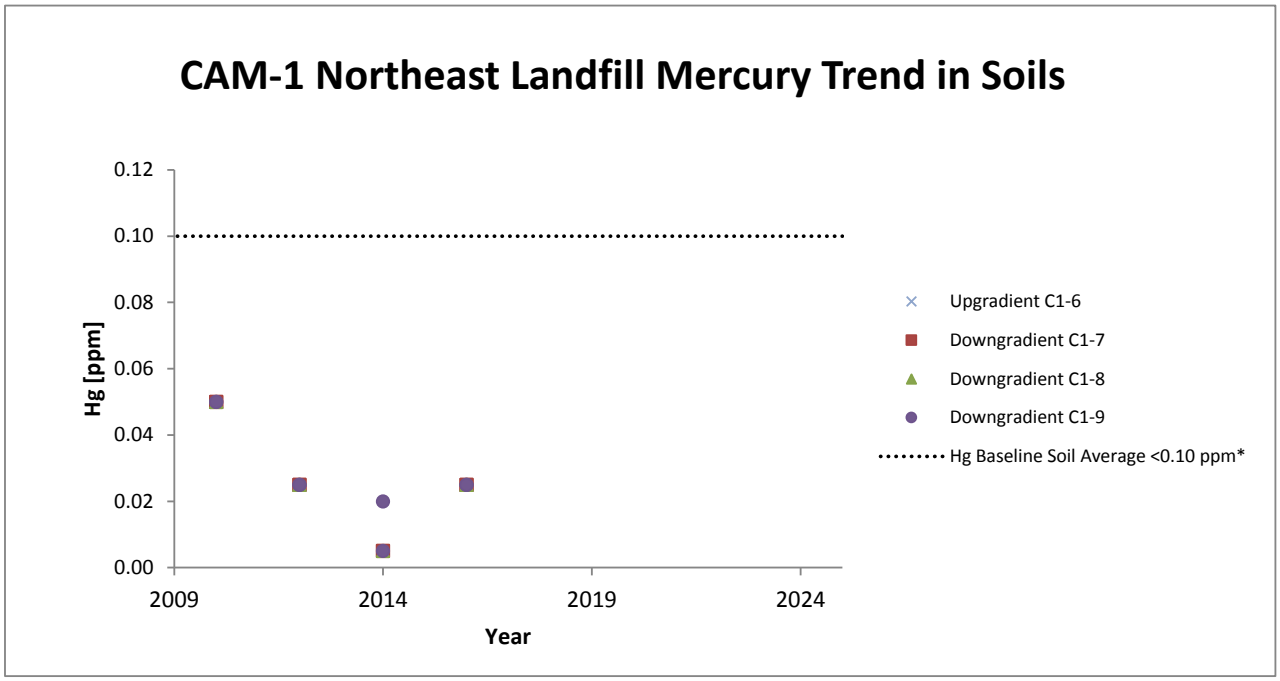

CAM-1 Northeast Landfill Lead Trend in Soils
Pb [ppm]
140
120
100
80
60
40
20
0
2009
2011
2013
2015
2017
2019
2021
2023
2025
Year
Upgradient C1-6
Downgradient C1-7
Downgradient C1-8
Downgradient C1-9
Pb Baseline Soil Average
Pb Baseline Average + 3xSD


CAM-1 Northeast Landfill Zinc Trend in Soils
Zn [ppm]
25
20
15
10
5
0
2009
2014
2019
2024
Year
Upgradient C1-6
Downgradient C1-7
Downgradient C1-8
Downgradient C1-9
Zn Baseline Average
Zn Baseline Average + 3xSD

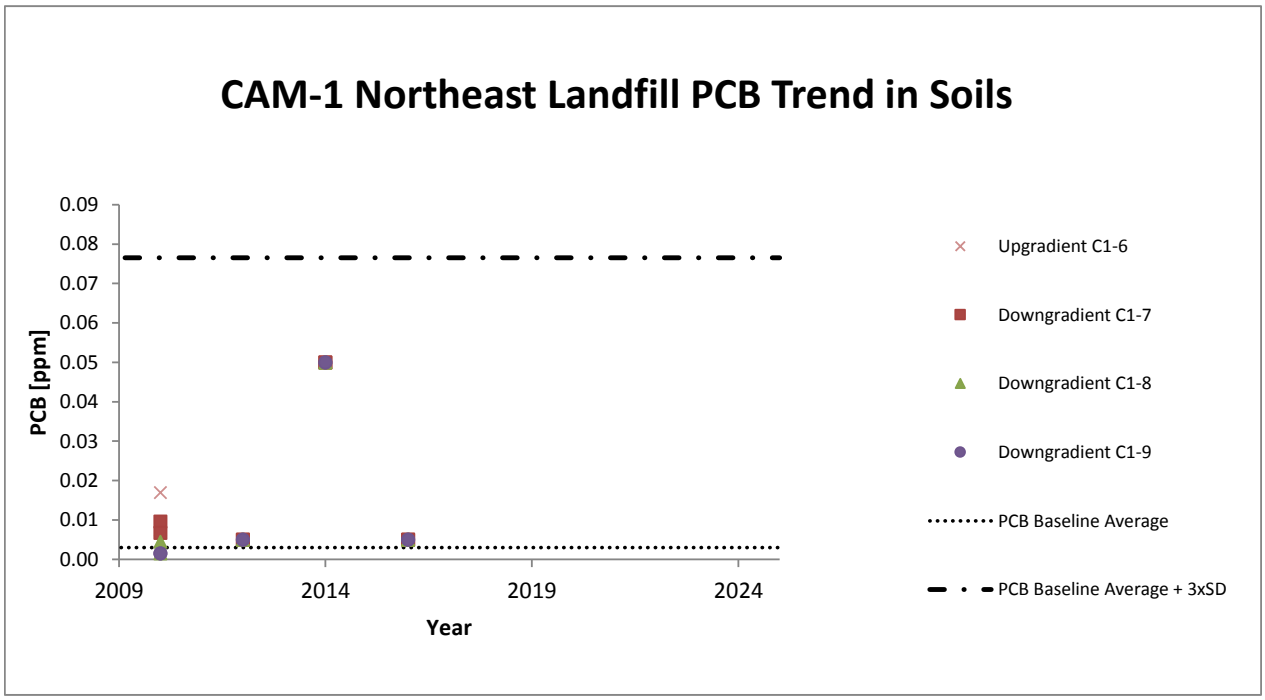


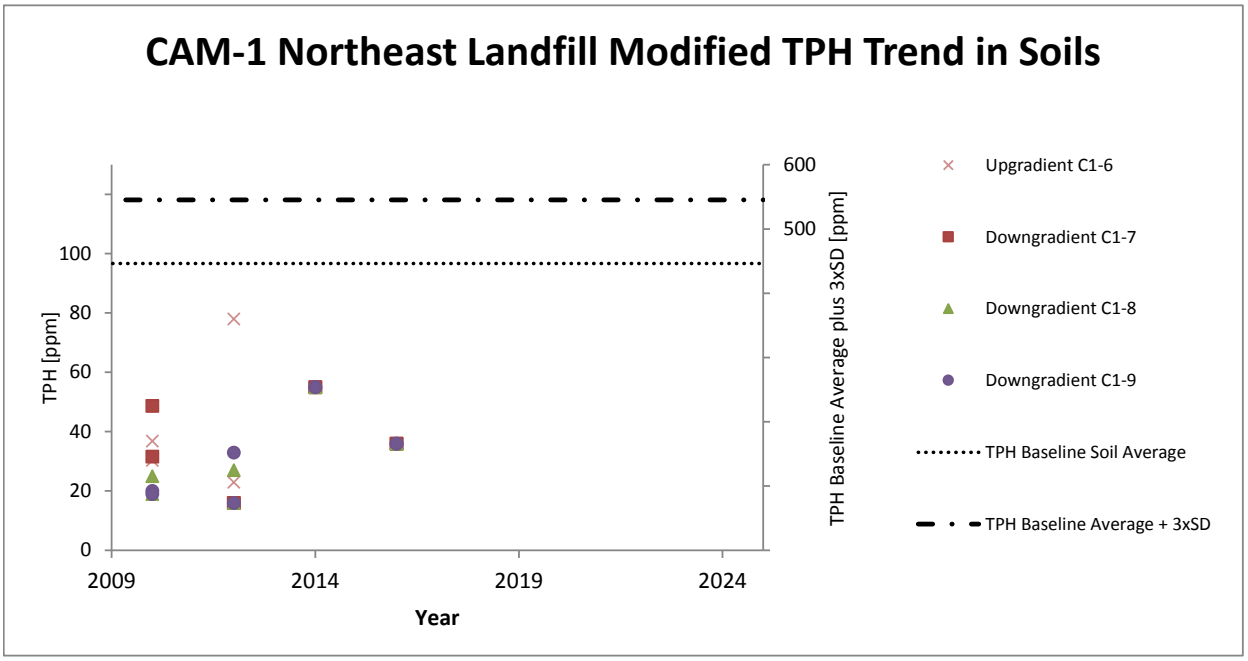
*Cr Baseline Average SD = 0

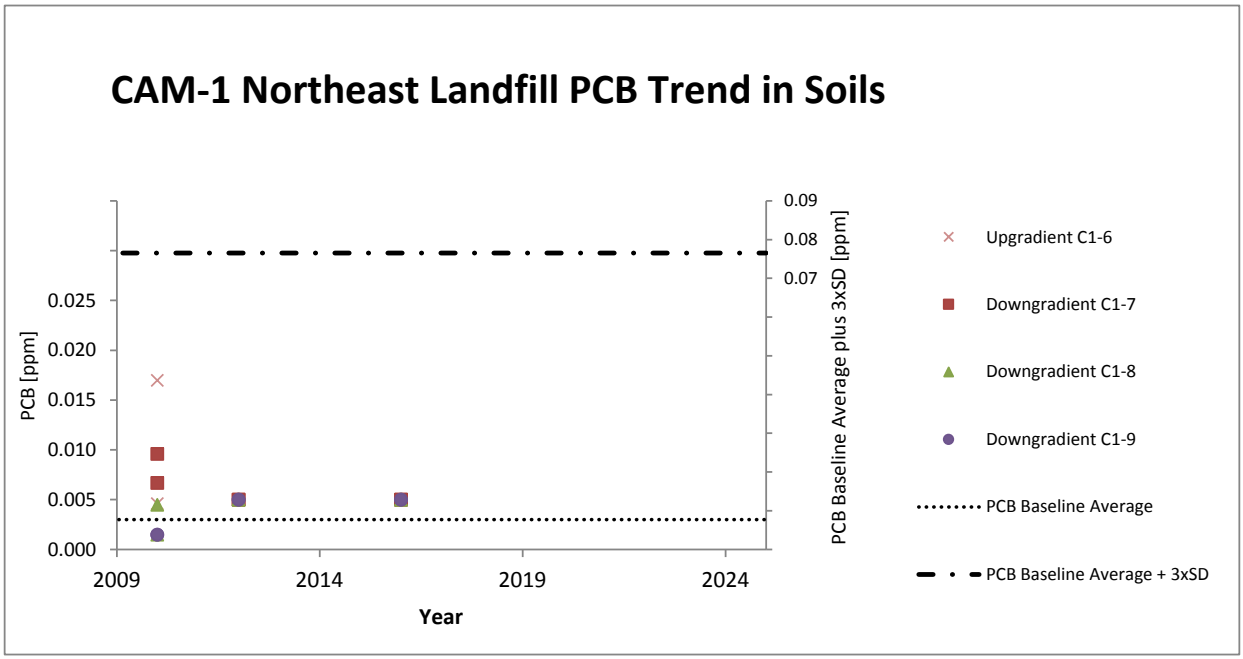




*Hg Baseline Average SD = 0





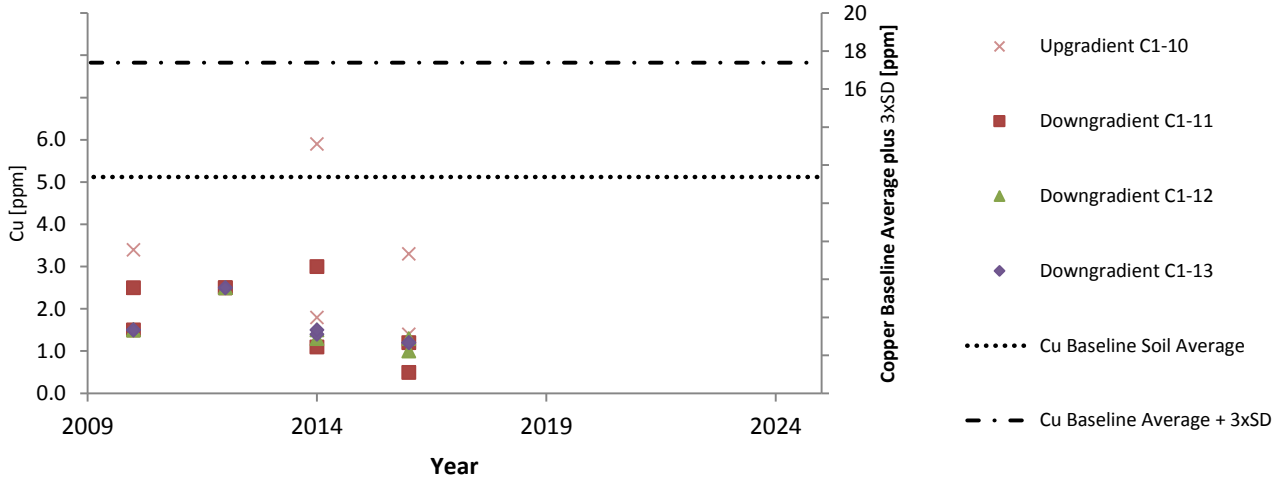


2014 PCB results were all below detection but the detection limit was high at <0.1 ppm.
This chart shows PCB values without the 2014 below detection results.

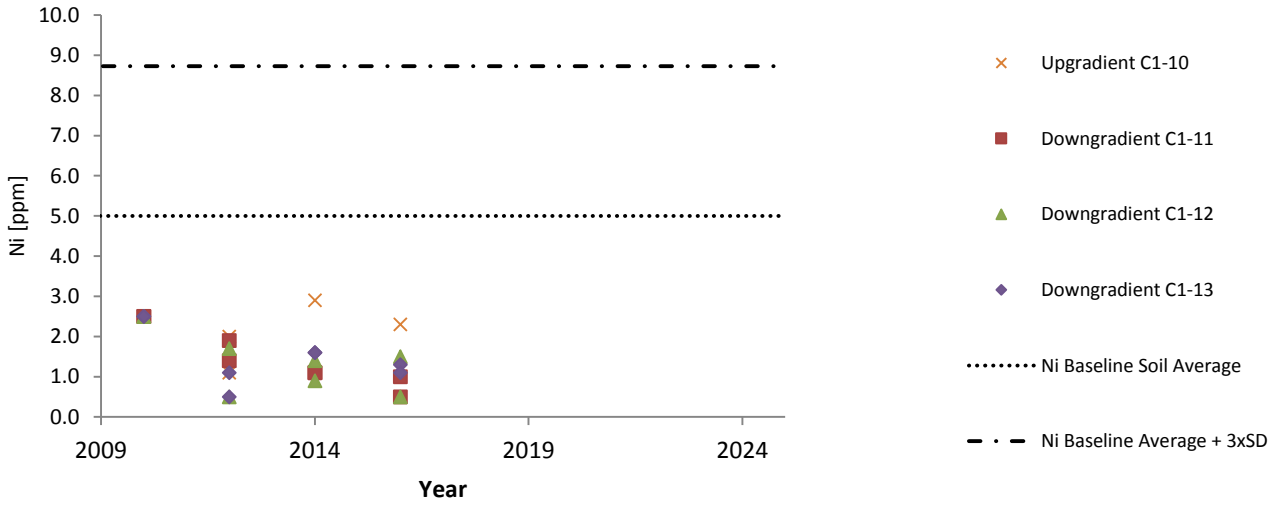
APPENDIX E3

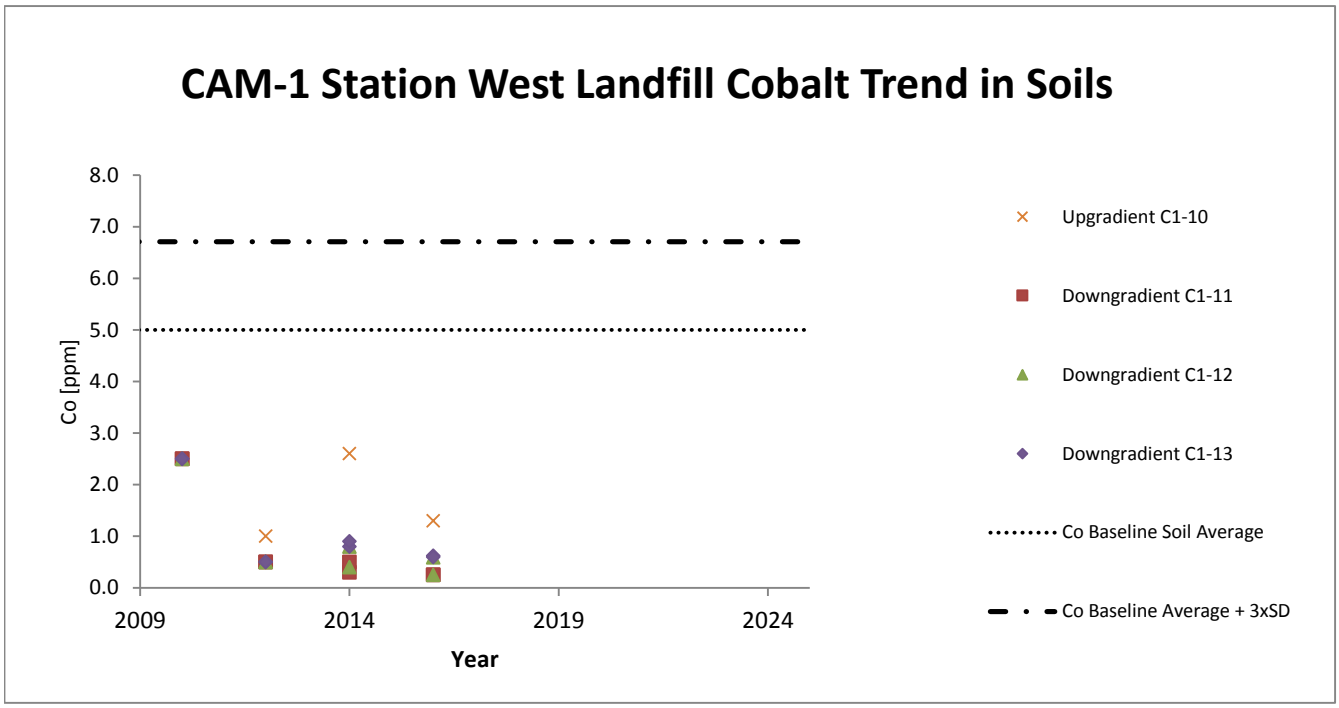
Station West Landfill

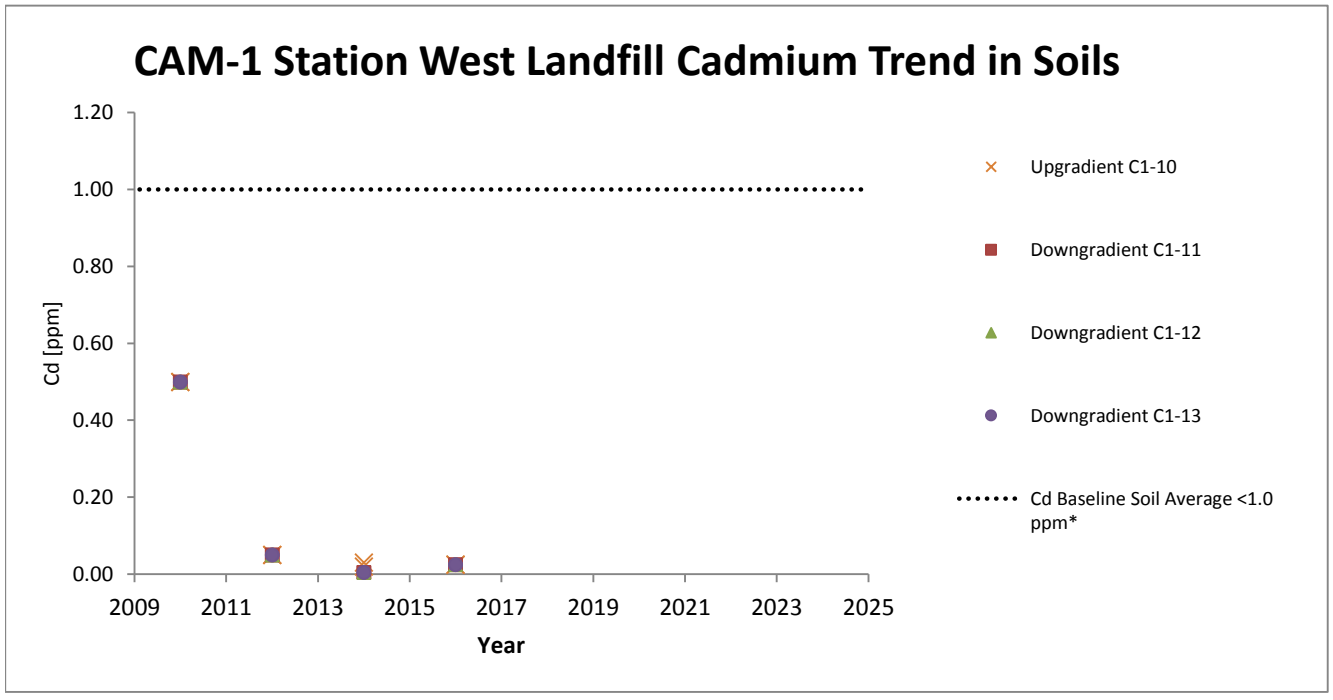
CAM-1 Station West Landfill Copper Trend in Soils



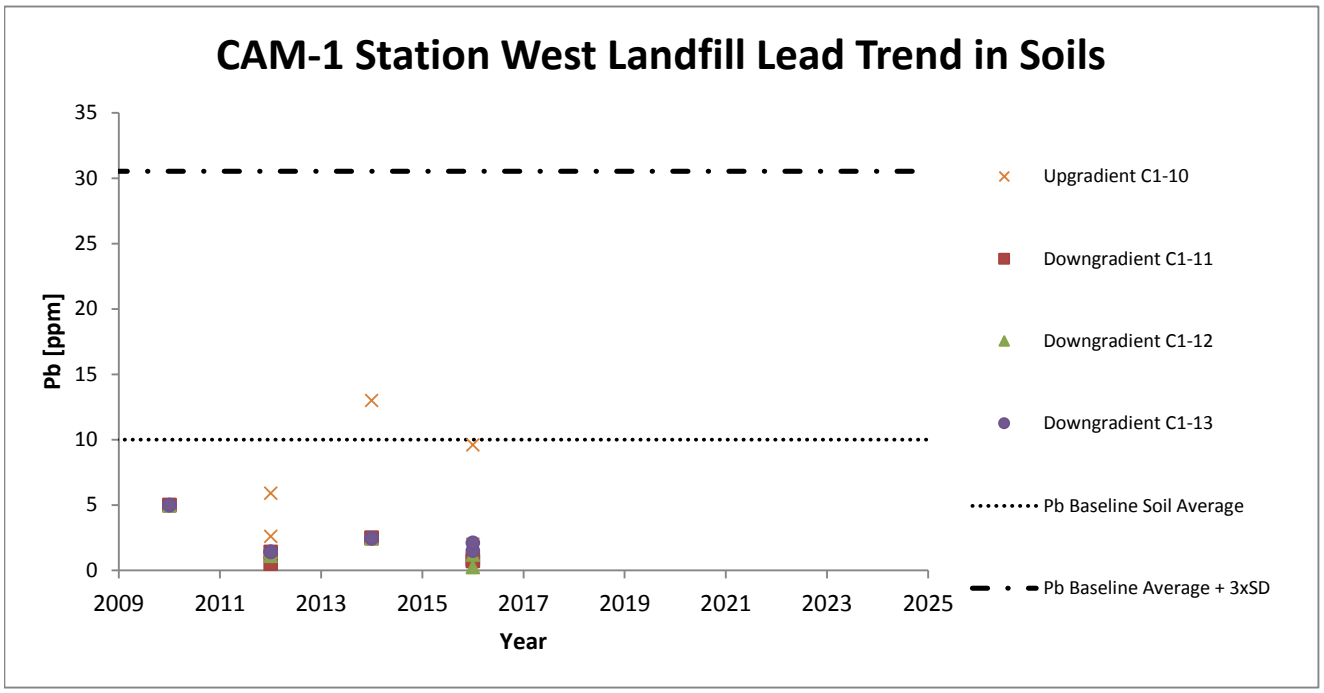
CAM-1 Station West Landfill Nickel Trend in Soils

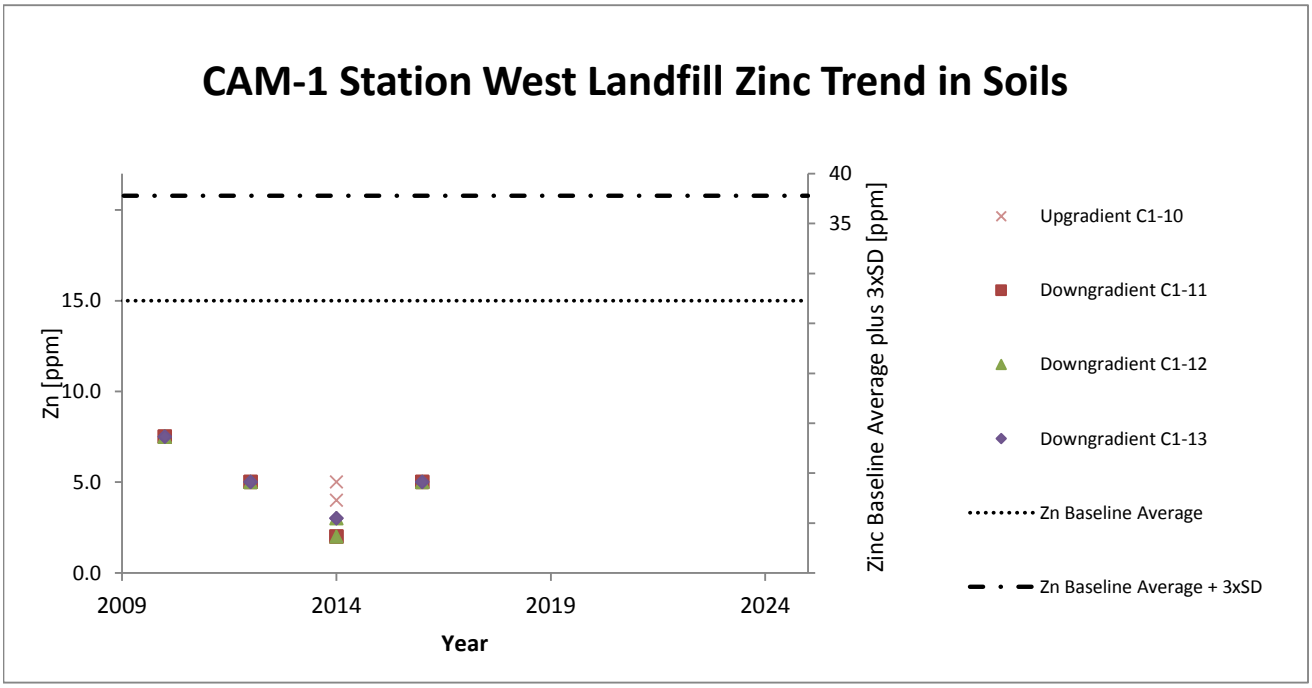




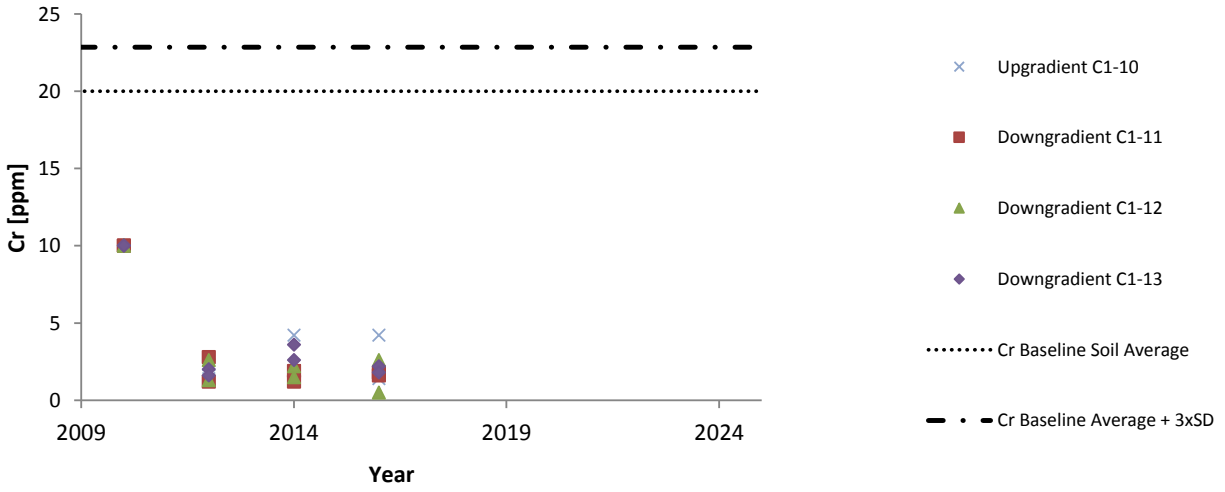


*Co Baseline Average SD = 0

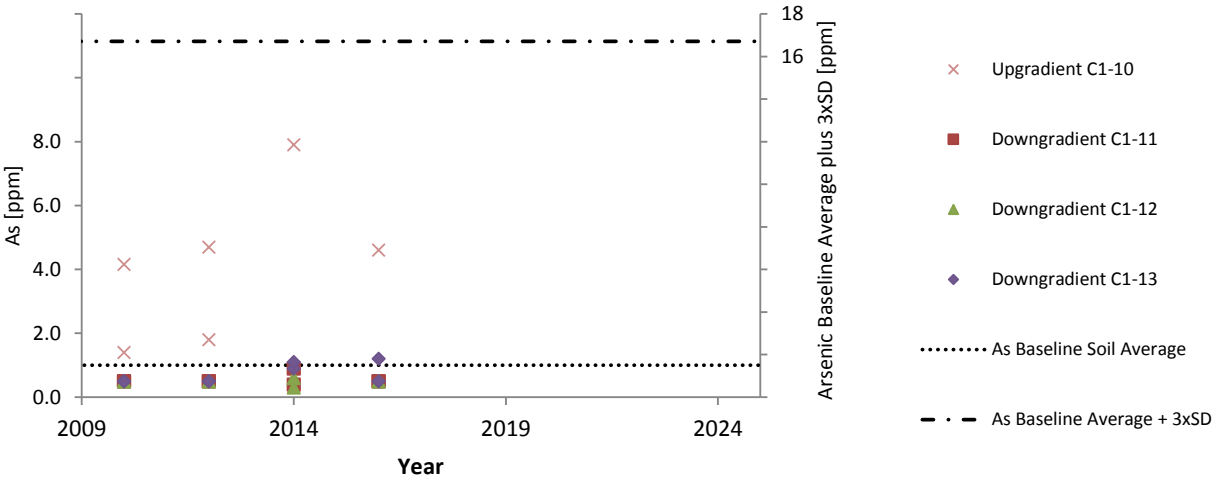

CAM-1 Station West Landfill Lead Trend in Soils
Pb [ppm]
35
30
25
20
15
10
5
0
2009
2011
2013
2015
2017
2019
2021
2023
2025
Year
Upgradient C1-10
Downgradient C1-11
Downgradient C1-12
Downgradient C1-13
Pb Baseline Soil Average
Pb Baseline Average + 3xSD


CAM-1 Station West Landfill Zinc Trend in Soils
Zn [ppm]
15.0
10.0
5.0
0.0
40
35
Zinc Baseline Average plus 3xSD [ppm]
2009
2014
2019
2024
Year
Upgradient C1-10
Downgradient C1-11
Downgradient C1-12
Downgradient C1-13
Zn Baseline Average
Zn Baseline Average + 3xSD

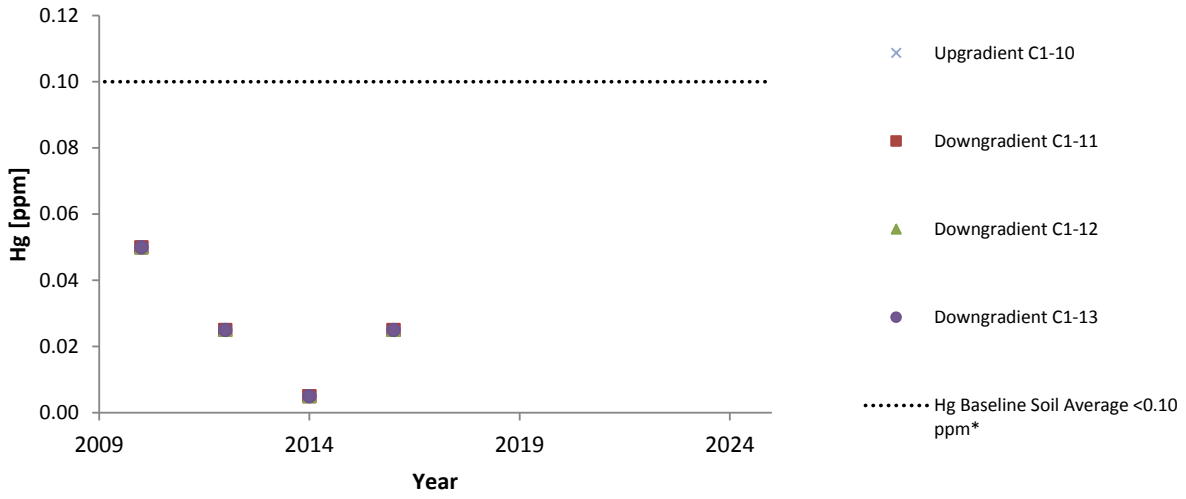
CAM-1 Station West Landfill Chromium Trend in Soils



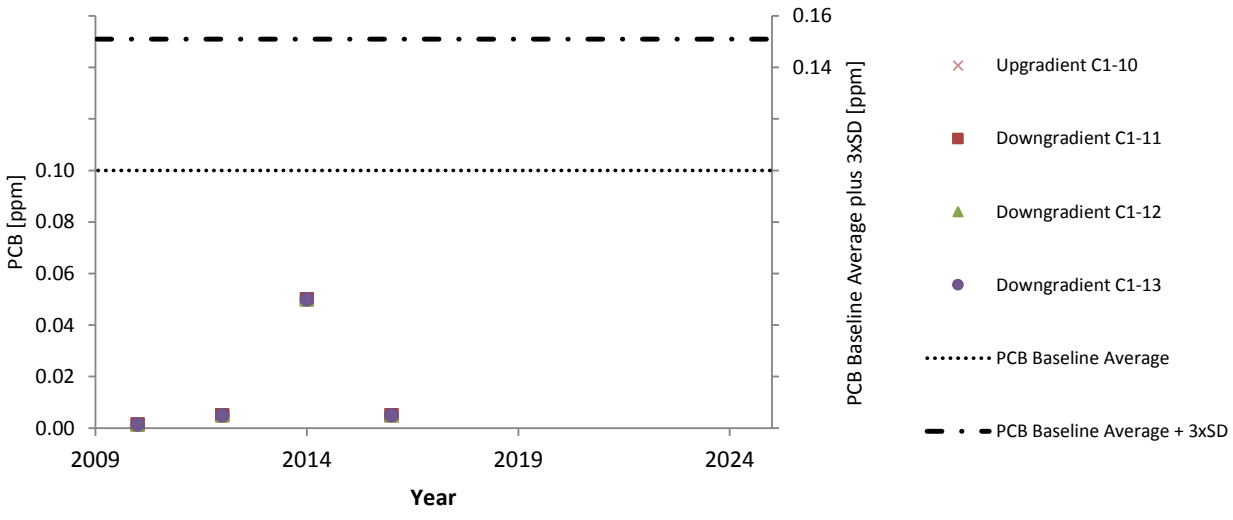
CAM-1 Station West Landfill Arsenic Trend in Soils

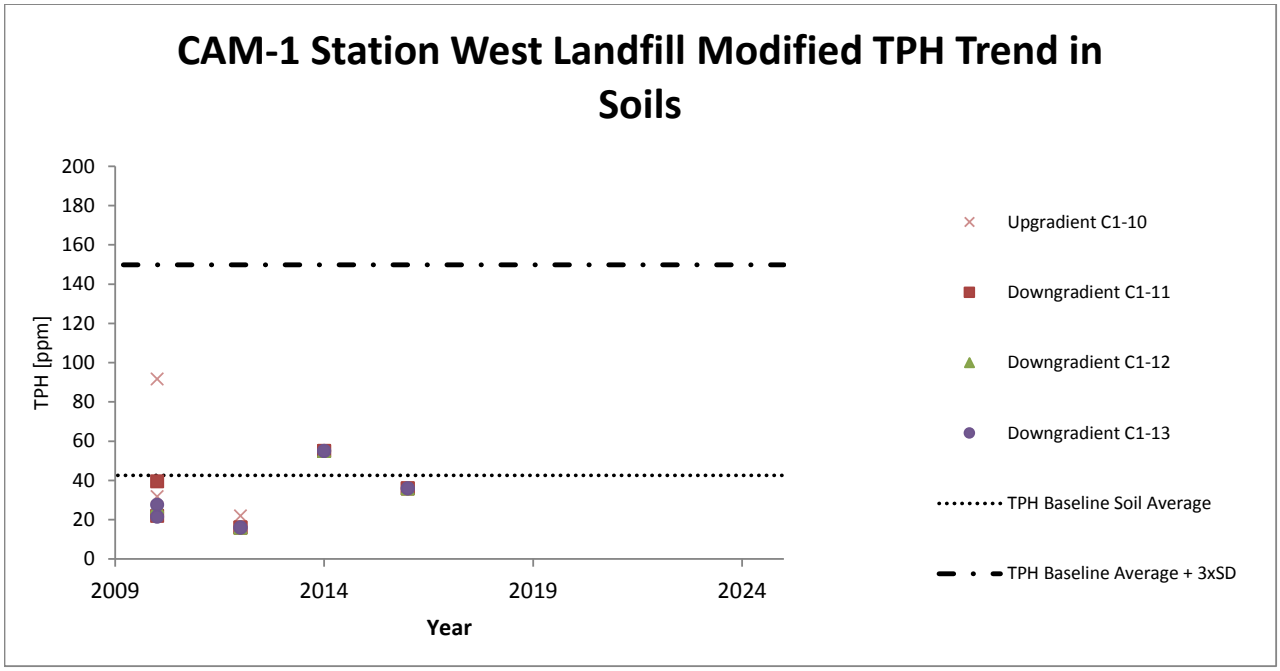


CAM-1 Station West Landfill Mercury Trend in Soils



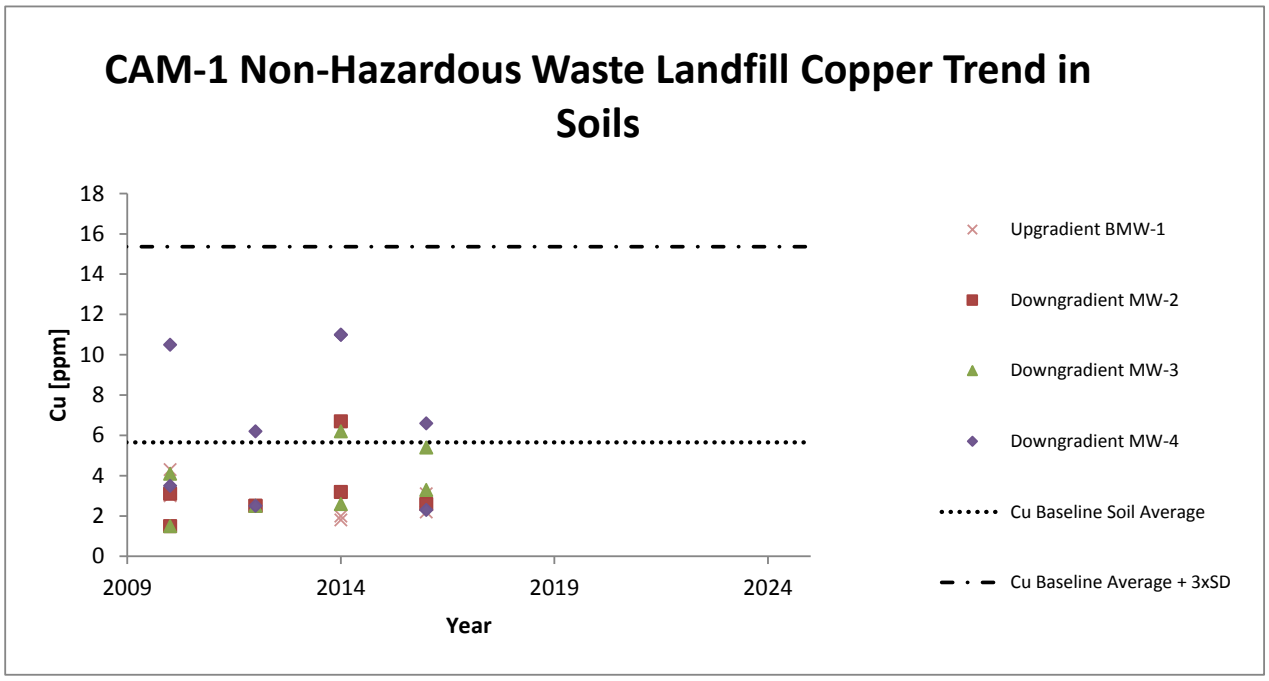
CAM-1 Station West Landfill PCB Trend in Soils

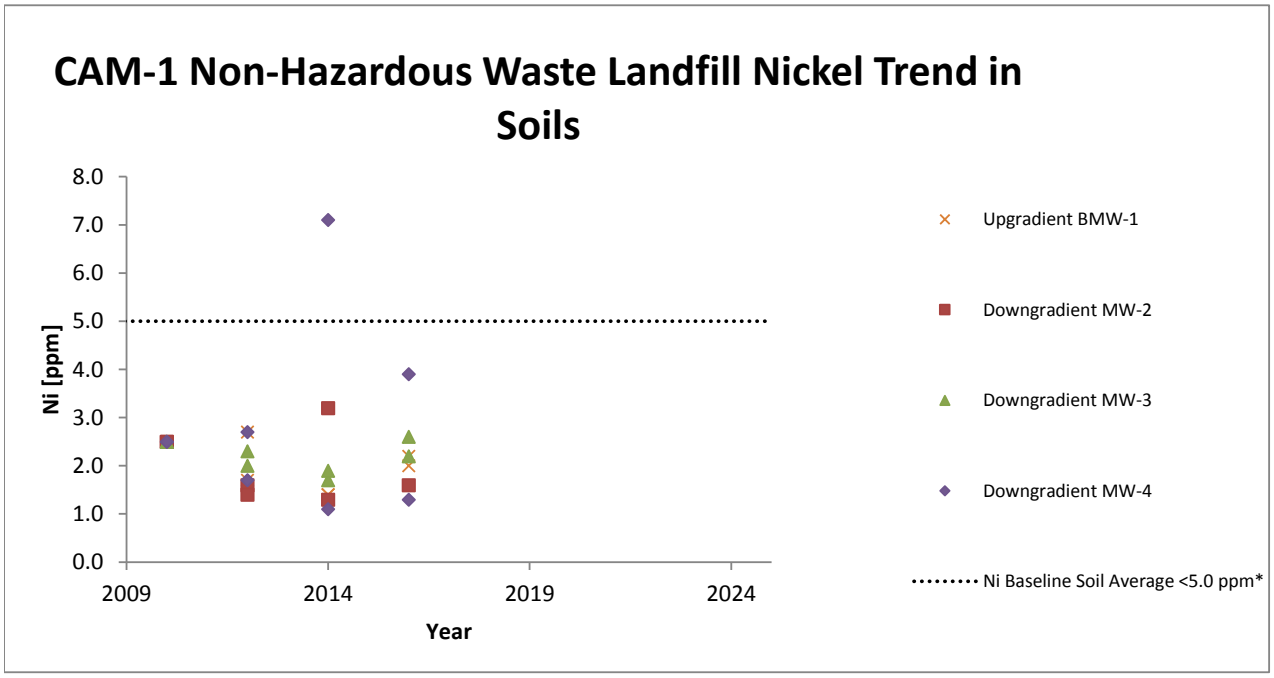



CAM-1 Station West Landfill Modified TPH Trend in Soils
TPH [ppm]
200
180
160
140
120
100
80
60
40
20
0
2009
2014
2019
2024
Year
Upgradient C1-10
Downgradient C1-11
Downgradient C1-12
Downgradient C1-13
TPH Baseline Soil Average
TPH Baseline Average + 3xSD

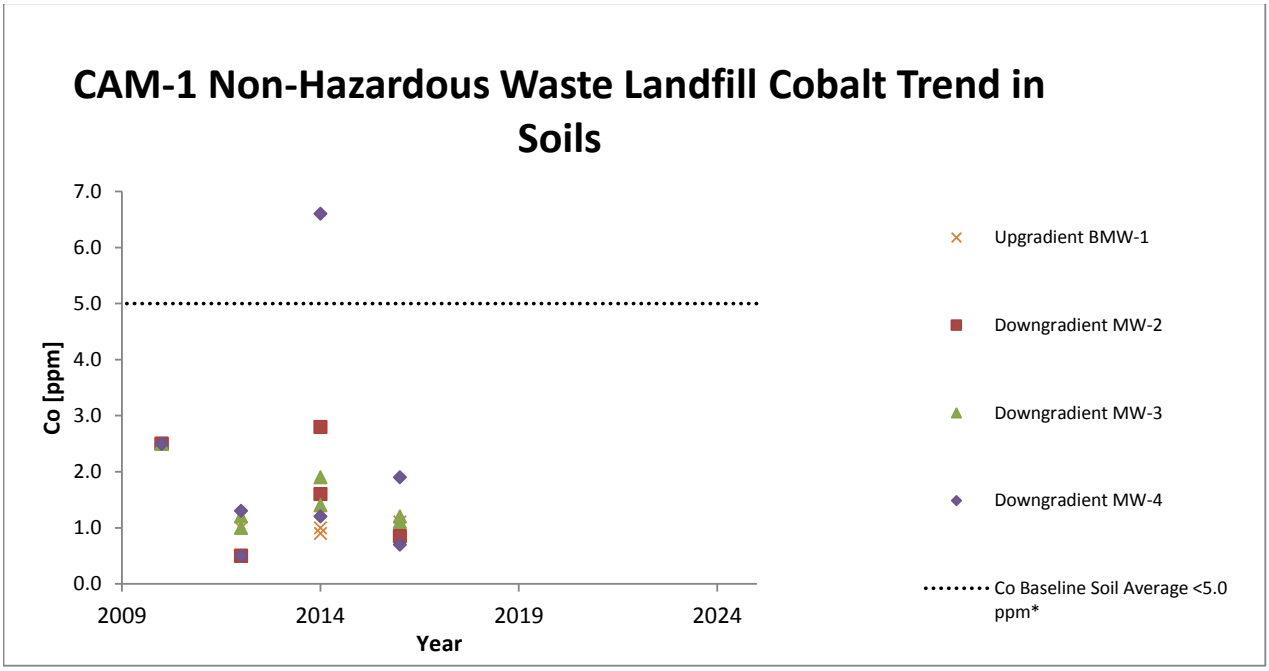
APPENDIX E4

Non-Hazardous Waste Landfill

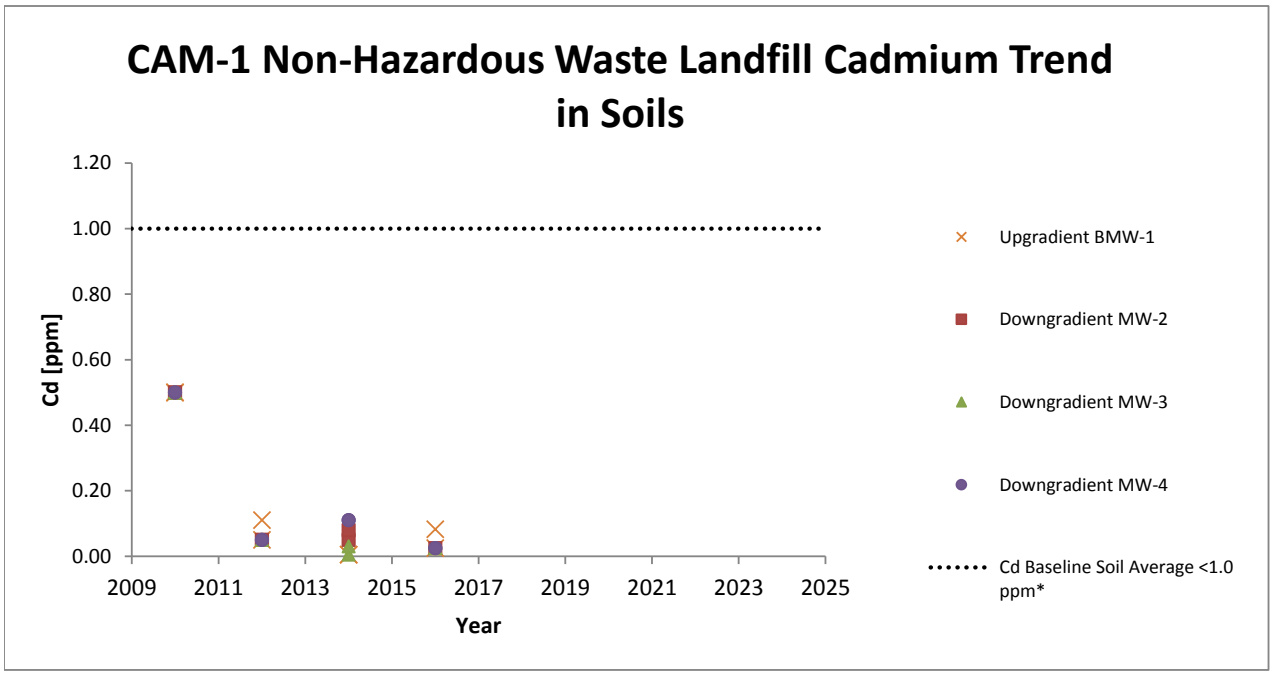




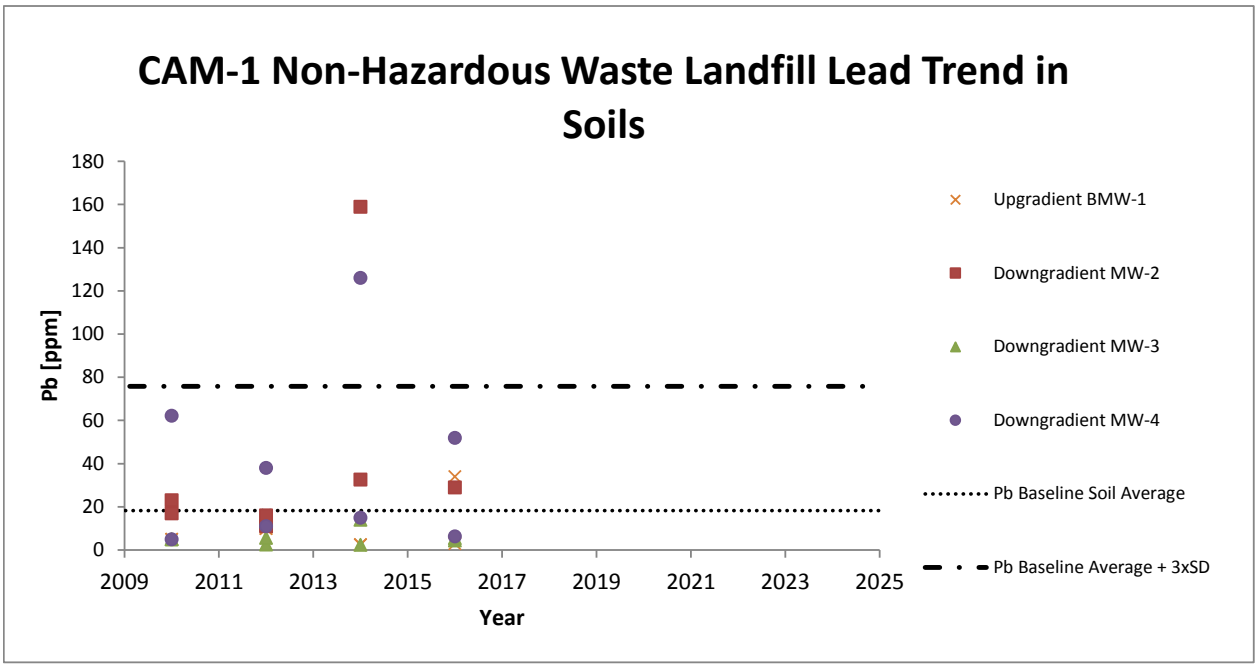
*Ni Baseline Average SD = 0

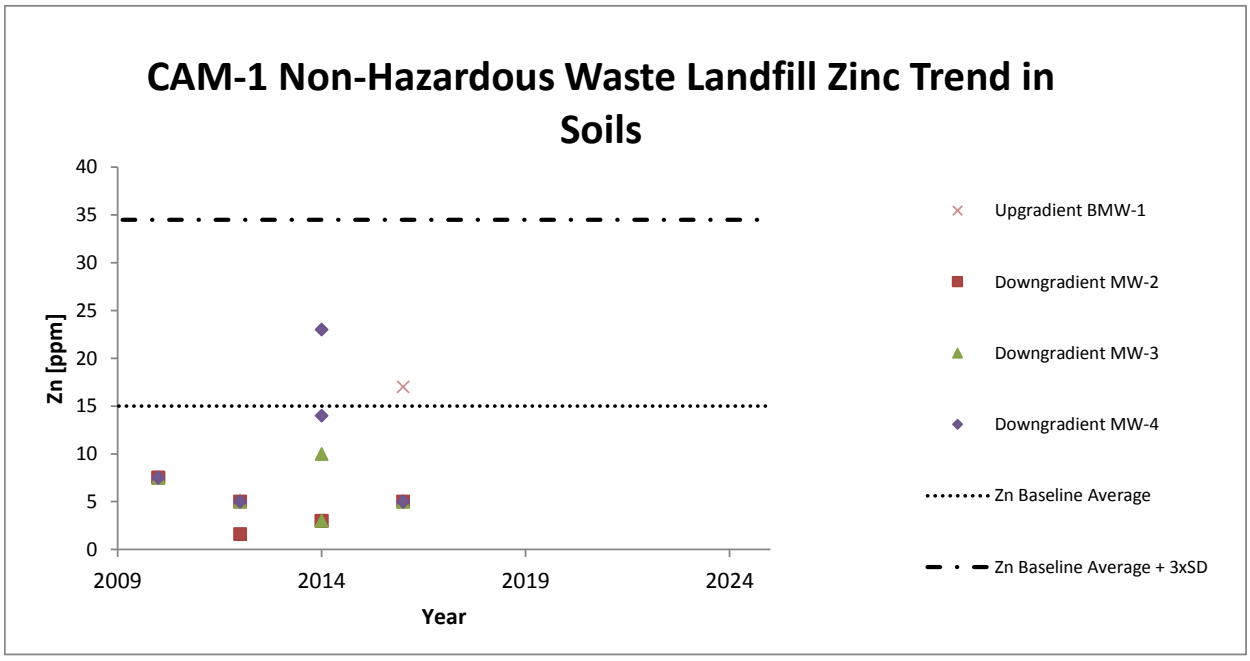


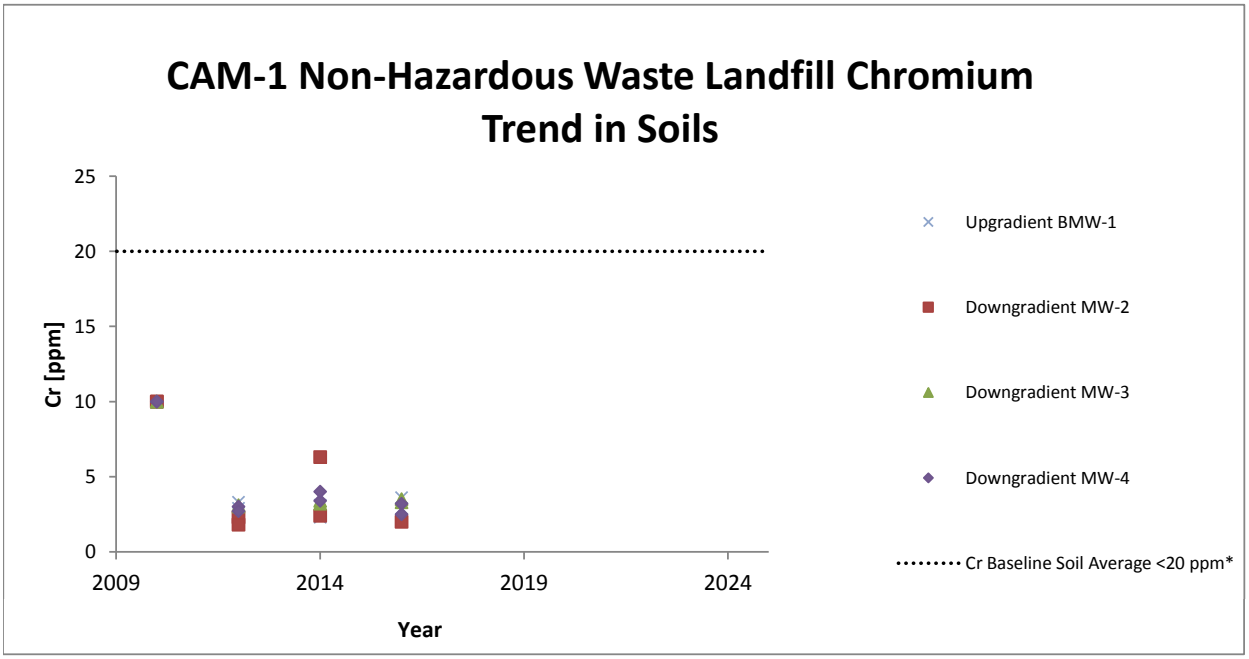
*Co Baseline Average SD = 0



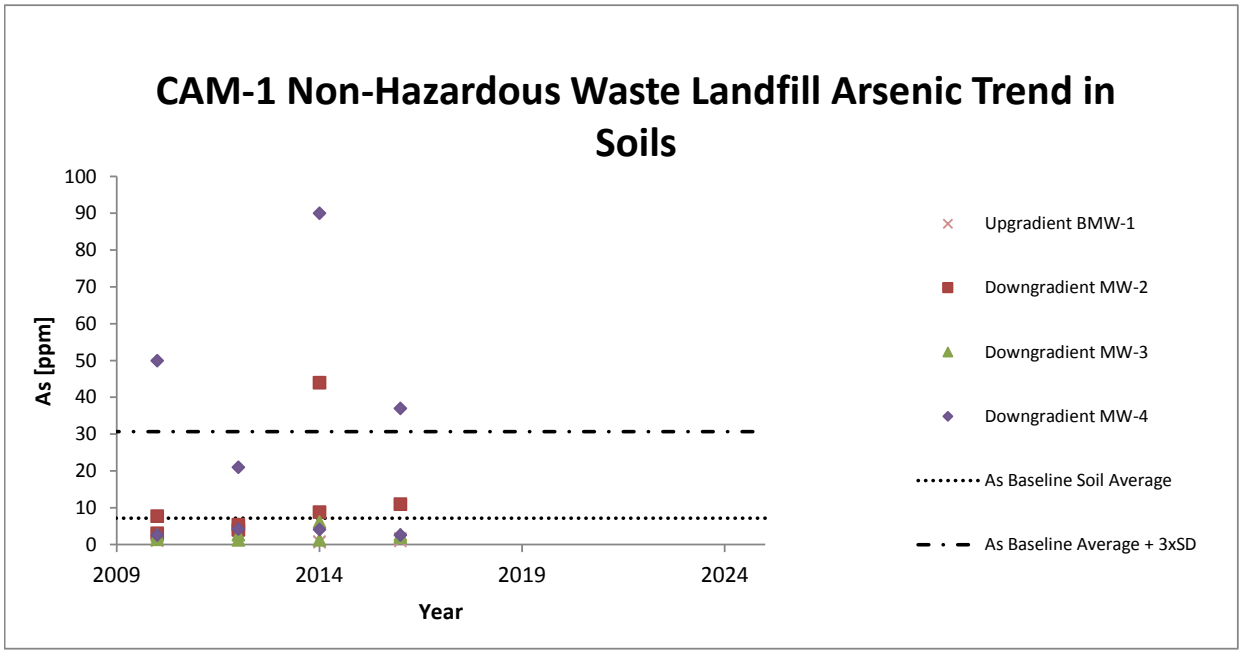
*Cd Baseline Average SD = 0

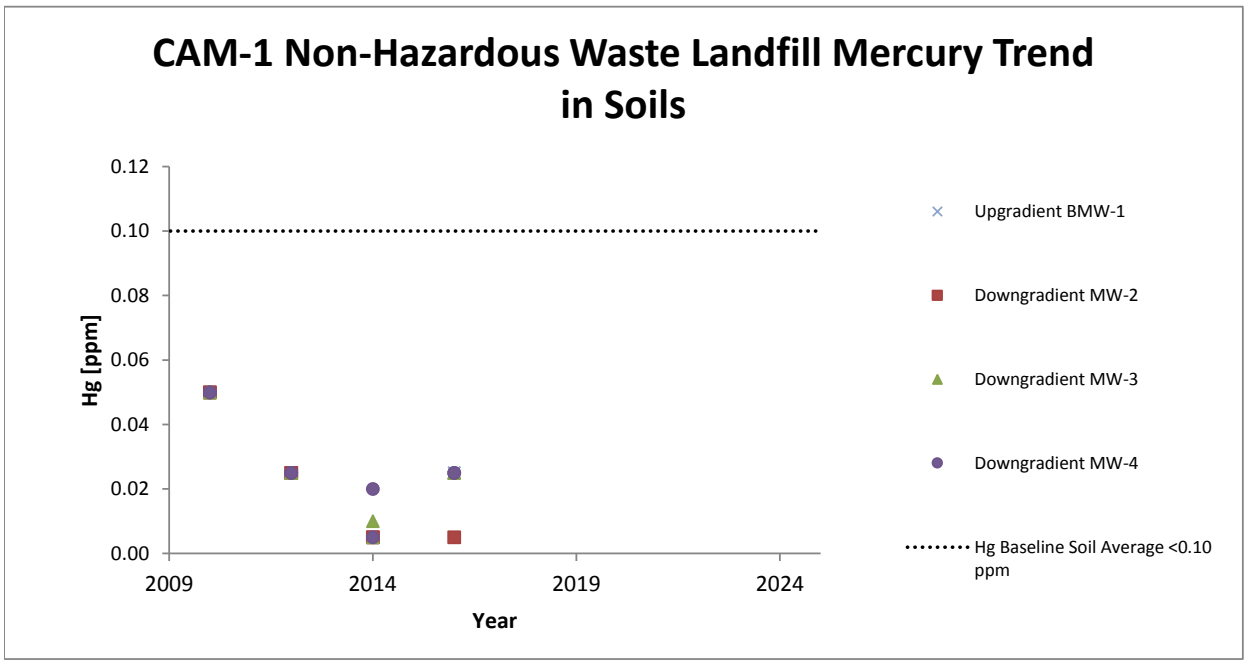

CAM-1 Non-Hazardous Waste Landfill Lead Trend in Soils
Pb [ppm]
180
160
140
120
100
80
60
40
20
0
2009
2011
2013
2015
2017
2019
2021
2023
2025
Year
Upgradient BMW-1
Downgradient MW-2
Downgradient MW-3
Downgradient MW-4
Pb Baseline Soil Average
Pb Baseline Average + 3xSD


CAM-1 Non-Hazardous Waste Landfill Zinc Trend in Soils
Zn [ppm]
40
35
30
25
20
15
10
5
0
2009
2014
2019
2024
Year
Upgradient BMW-1
Downgradient MW-2
Downgradient MW-3
Downgradient MW-4
Zn Baseline Average
Zn Baseline Average + 3xSD

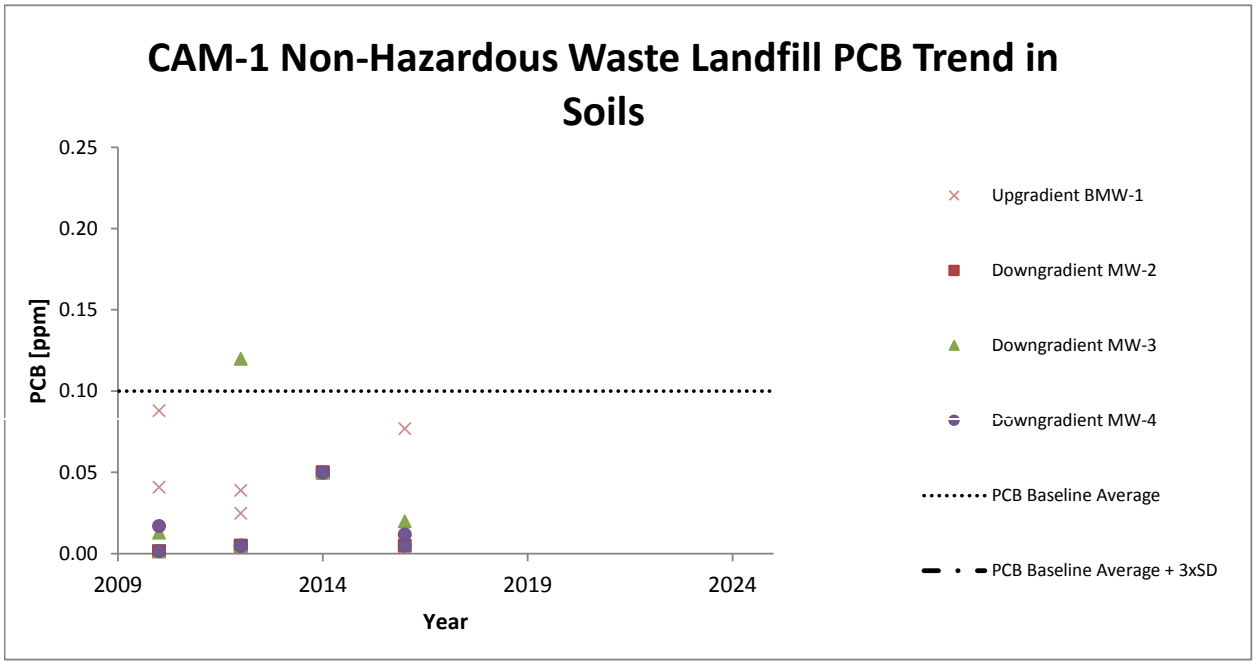


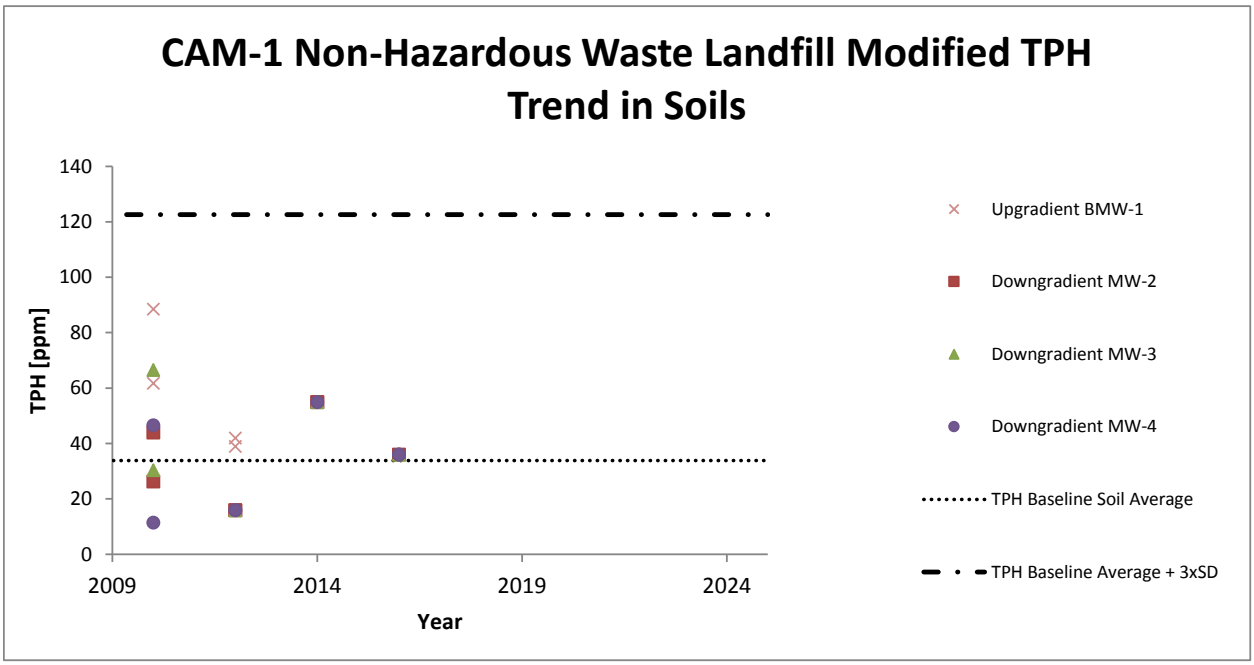
*Cr Baseline Average SD = 0





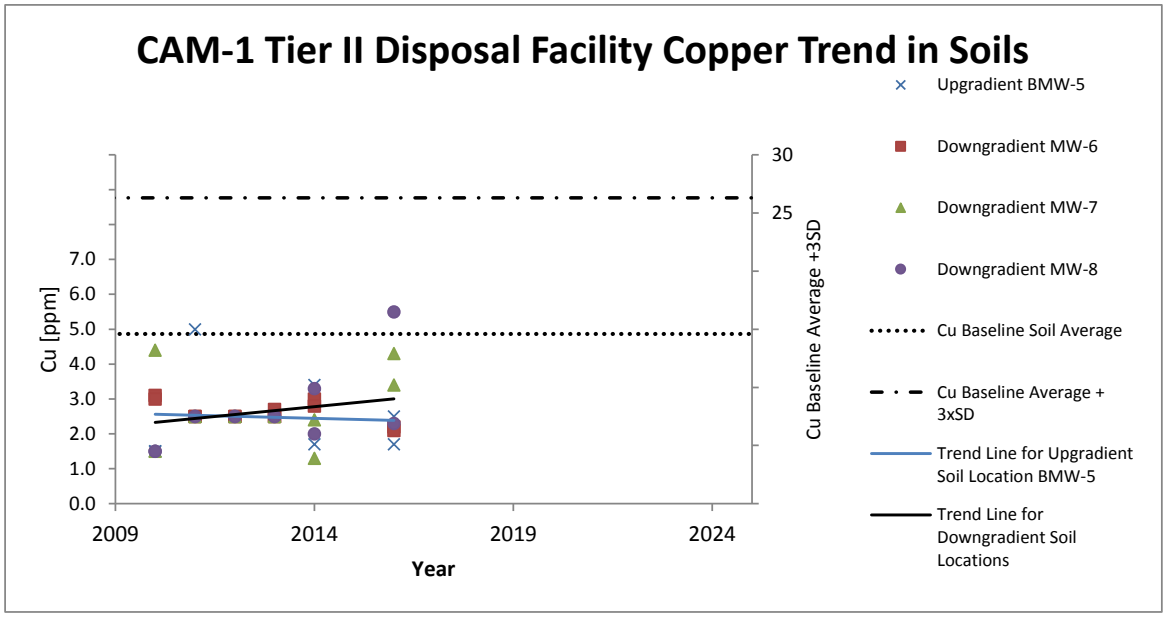
*Hg Baseline Average SD = 0

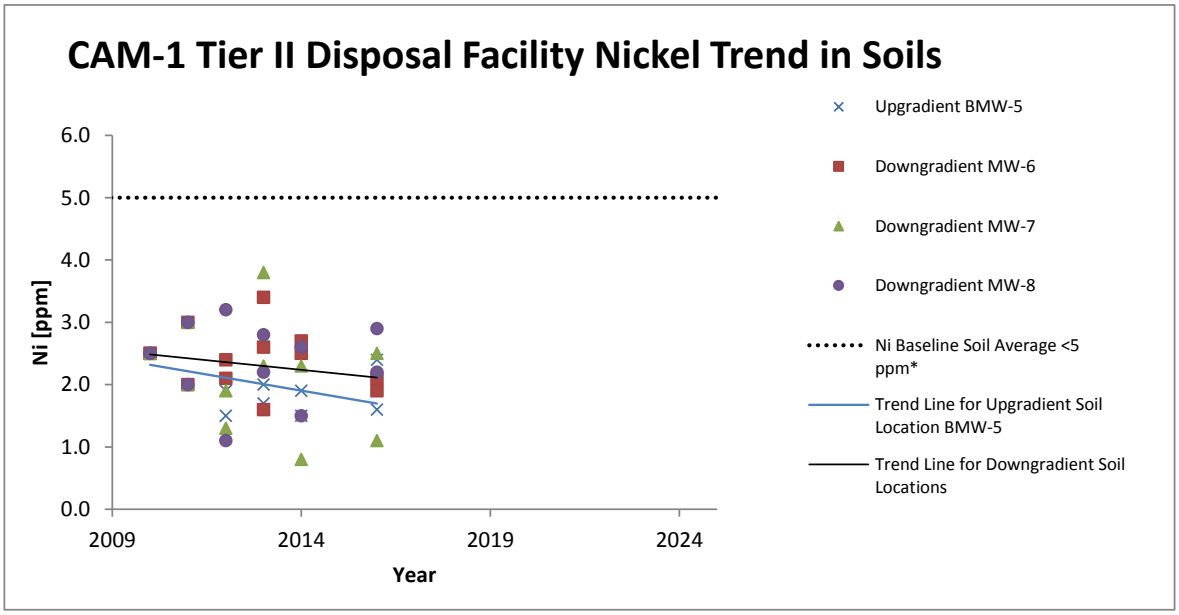



CAM-1 Non-Hazardous Waste Landfill Modified TPH Trend in Soils
TPH [ppm]
140
120
100
80
60
40
20
0
2009
2014
2019
2024
Year
Upgradient BMW-1
Downgradient MW-2
Downgradient MW-3
Downgradient MW-4
TPH Baseline Soil Average
TPH Baseline Average + 3xSD

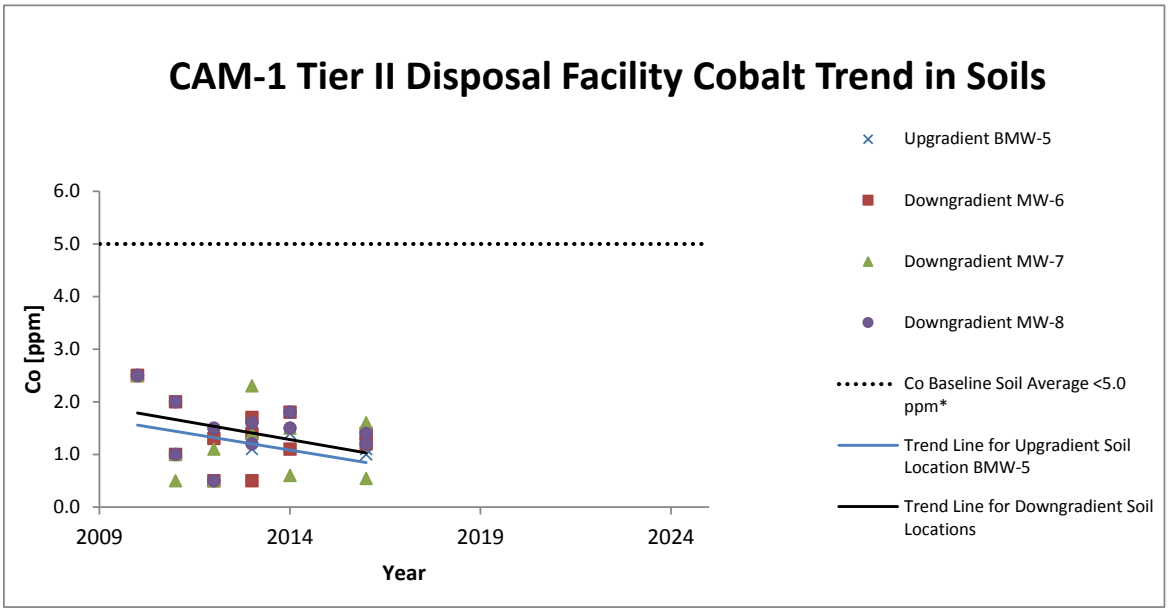
APPENDIX E5

Tier II Disposal Facility

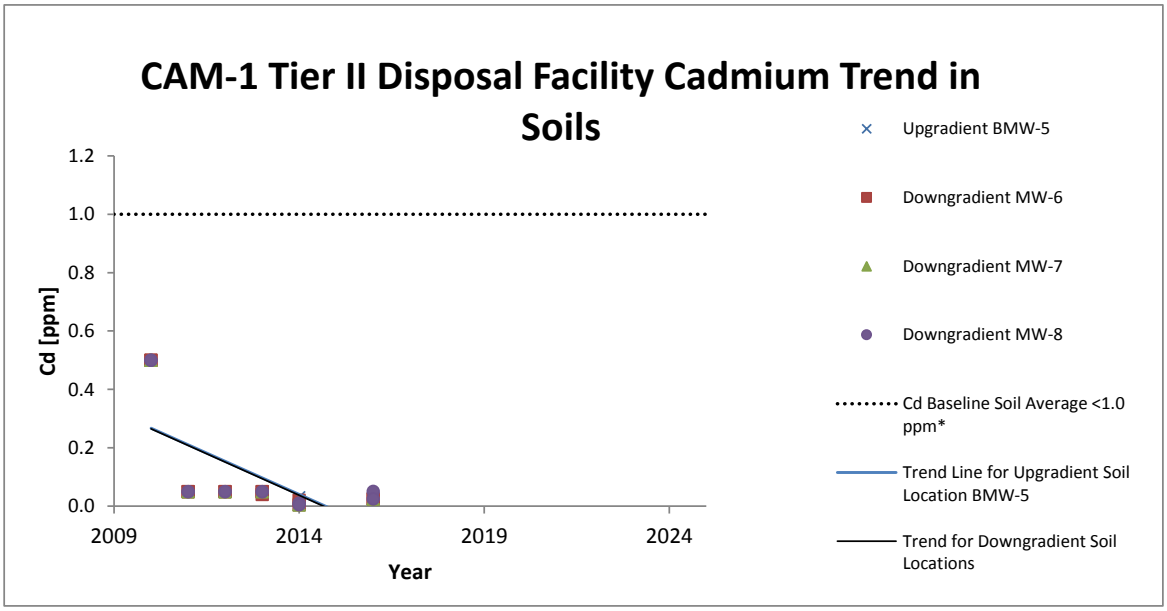




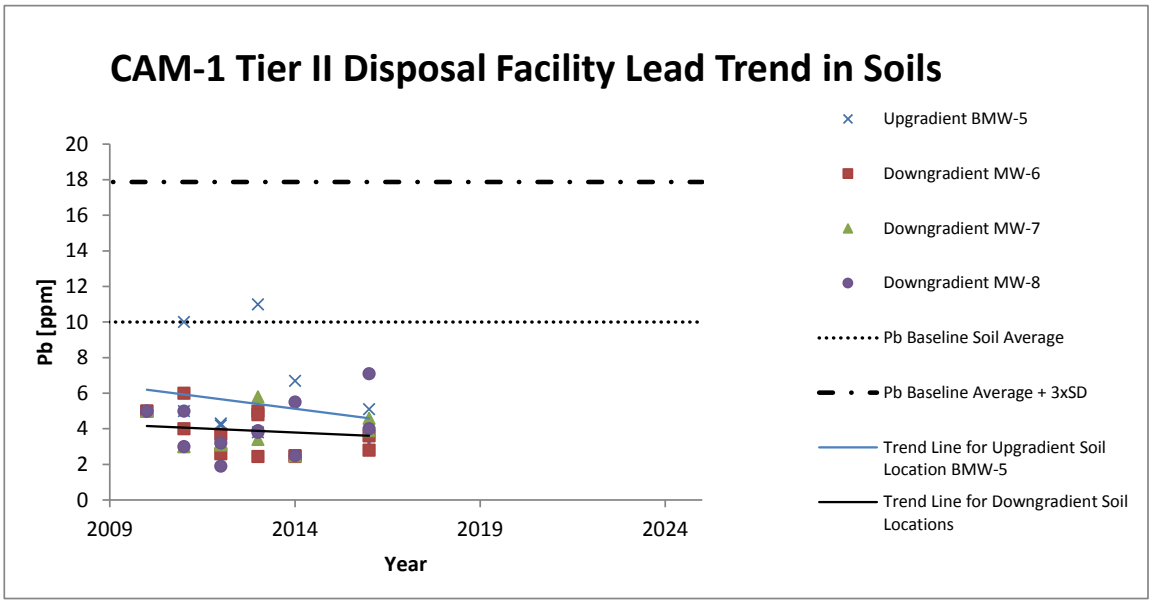
* Ni Baseline SD = 0

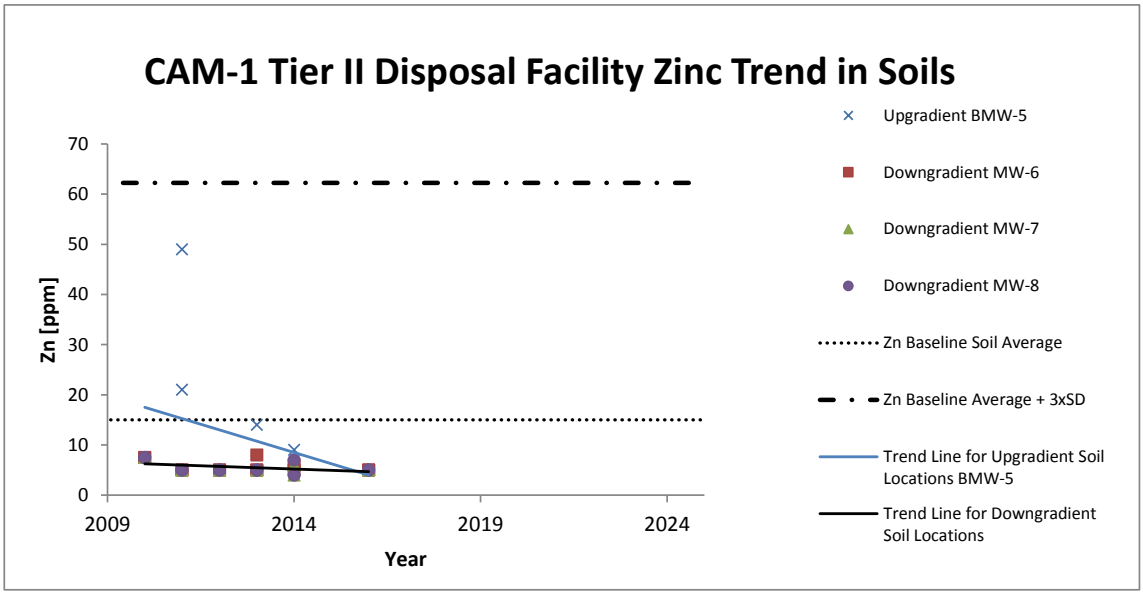


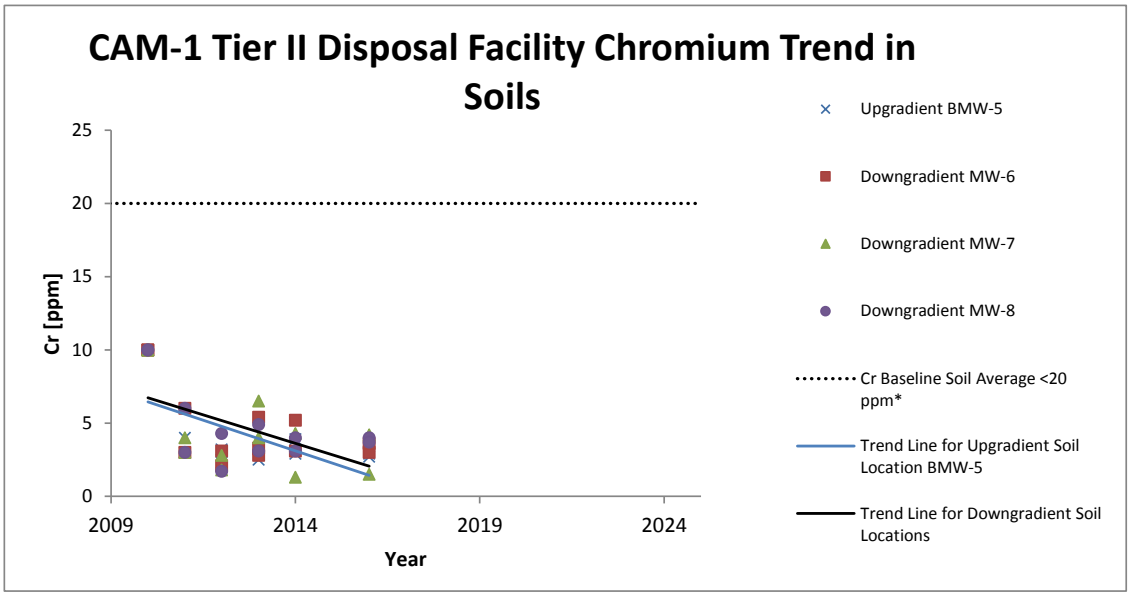
* Co Baseline SD = 0



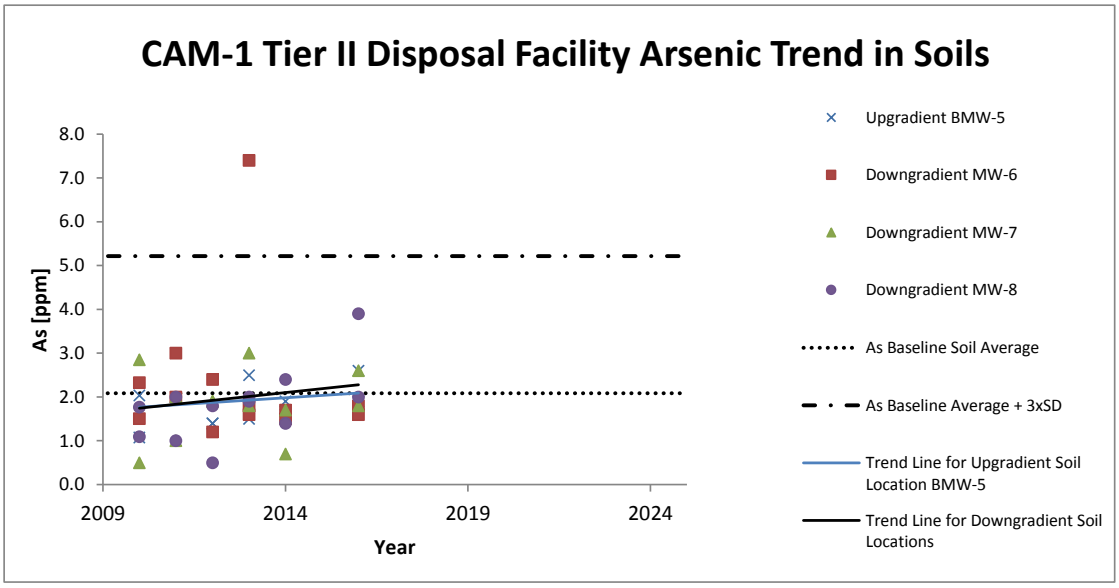
* Cd Baseline SD = 0

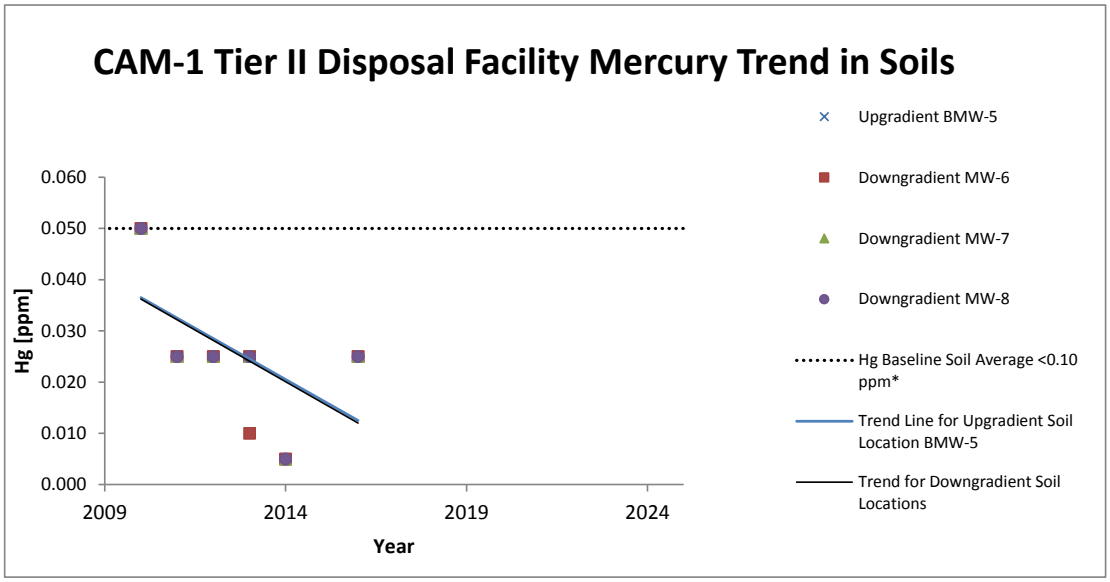

CAM-1 Tier II Disposal Facility Lead Trend in Soils
Pb [ppm]
20
18
16
14
12
10
8
6
4
2
0
2009
2014
2019
2024
Year
Upgradient BMW-5
Downgradient MW-6
Downgradient MW-7
Downgradient MW-8
Pb Baseline Soil Average
Pb Baseline Average + 3xSD
Trend Line for Upgradient Soil Location BMW-5
Trend Line for Downgradient Soil Locations


CAM-1 Tier II Disposal Facility Zinc Trend in Soils
Zn [ppm]
70
60
50
40
30
20
10
0
2009
2014
2019
2024
Year
Upgradient BMW-5
Downgradient MW-6
Downgradient MW-7
Downgradient MW-8
Zn Baseline Soil Average
Zn Baseline Average + 3xSD
Trend Line for Upgradient Soil Locations BMW-5
Trend Line for Downgradient Soil Locations

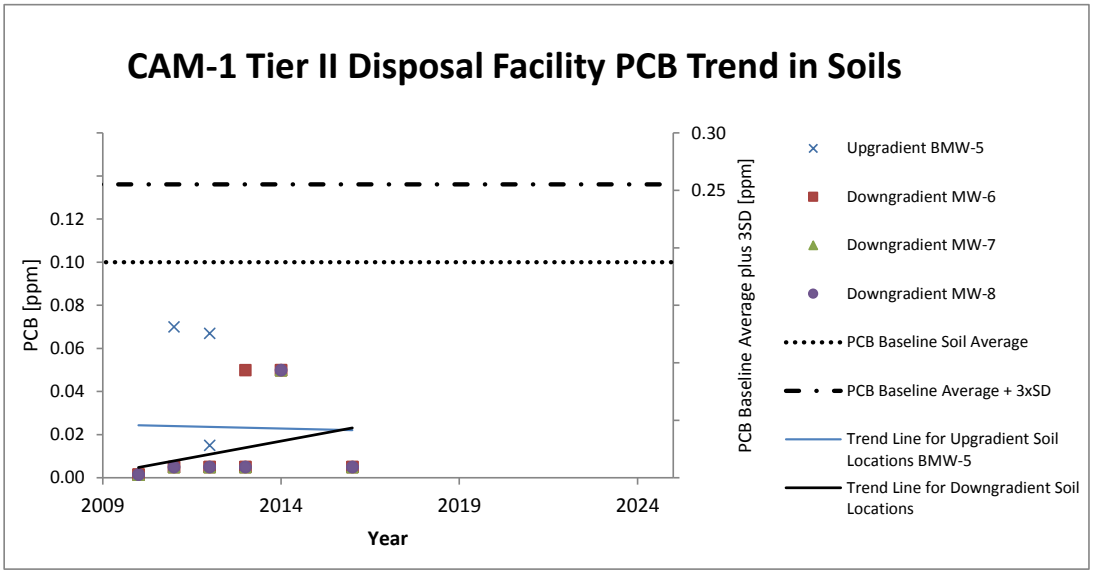


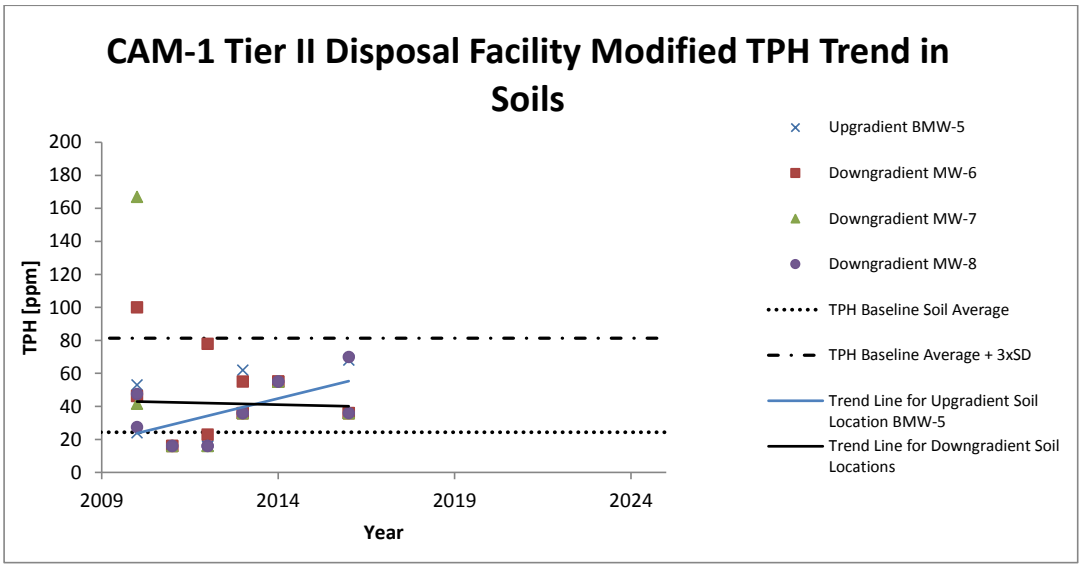
* Cr Baseline SD = 0





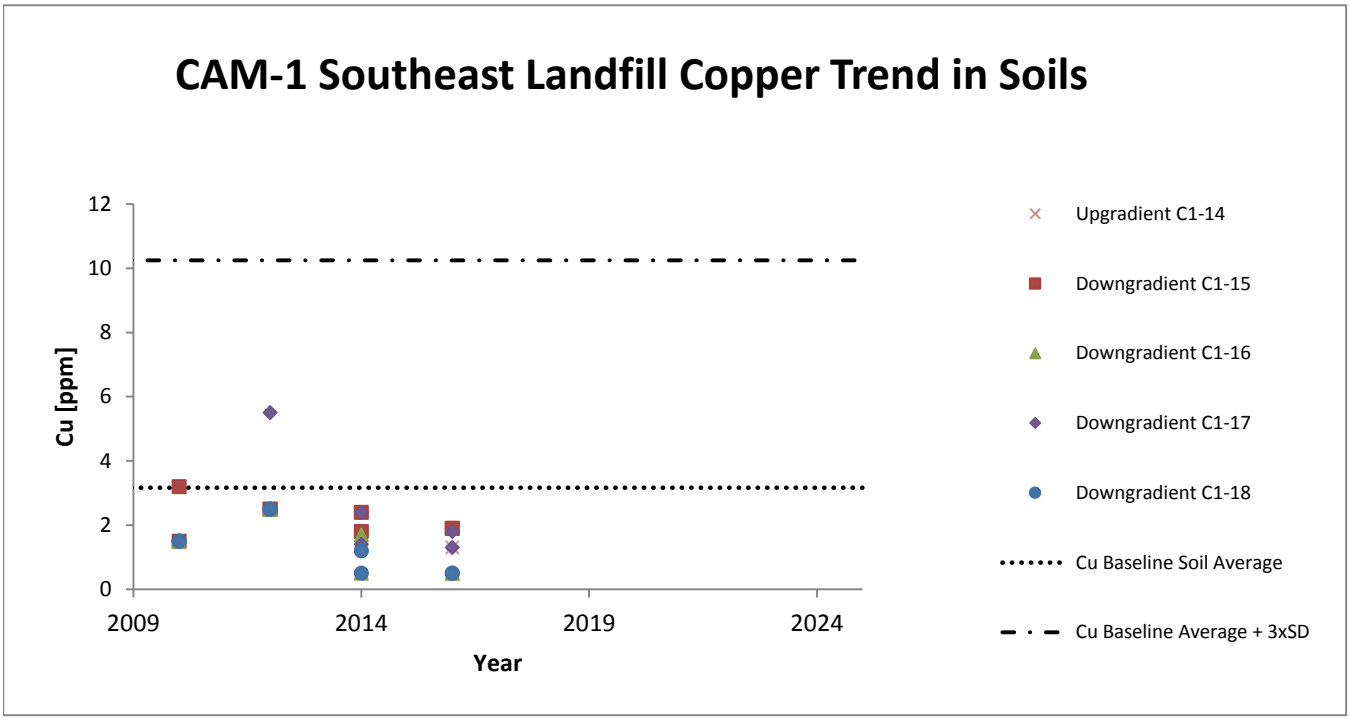
* Hg Baseline SD = 0

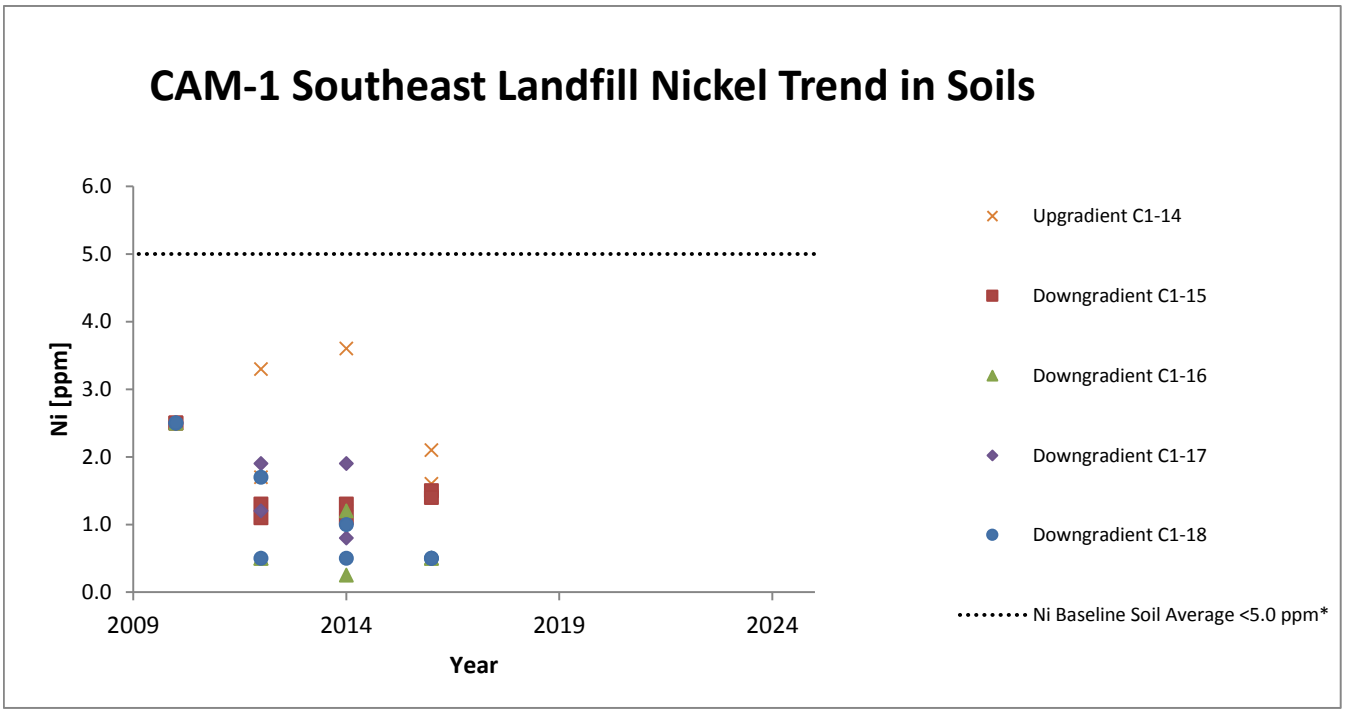



CAM-1 Tier II Disposal Facility Modified TPH Trend in Soils
TPH [ppm]
200
180
160
140
120
100
80
60
40
20
0
2009
2014
2019
2024
Year
Upgradient BMW-5
Downgradient MW-6
Downgradient MW-7
Downgradient MW-8
TPH Baseline Soil Average
TPH Baseline Average + 3xSD
Trend Line for Upgradient Soil Location BMW-5
Trend Line for Downgradient Soil Locations

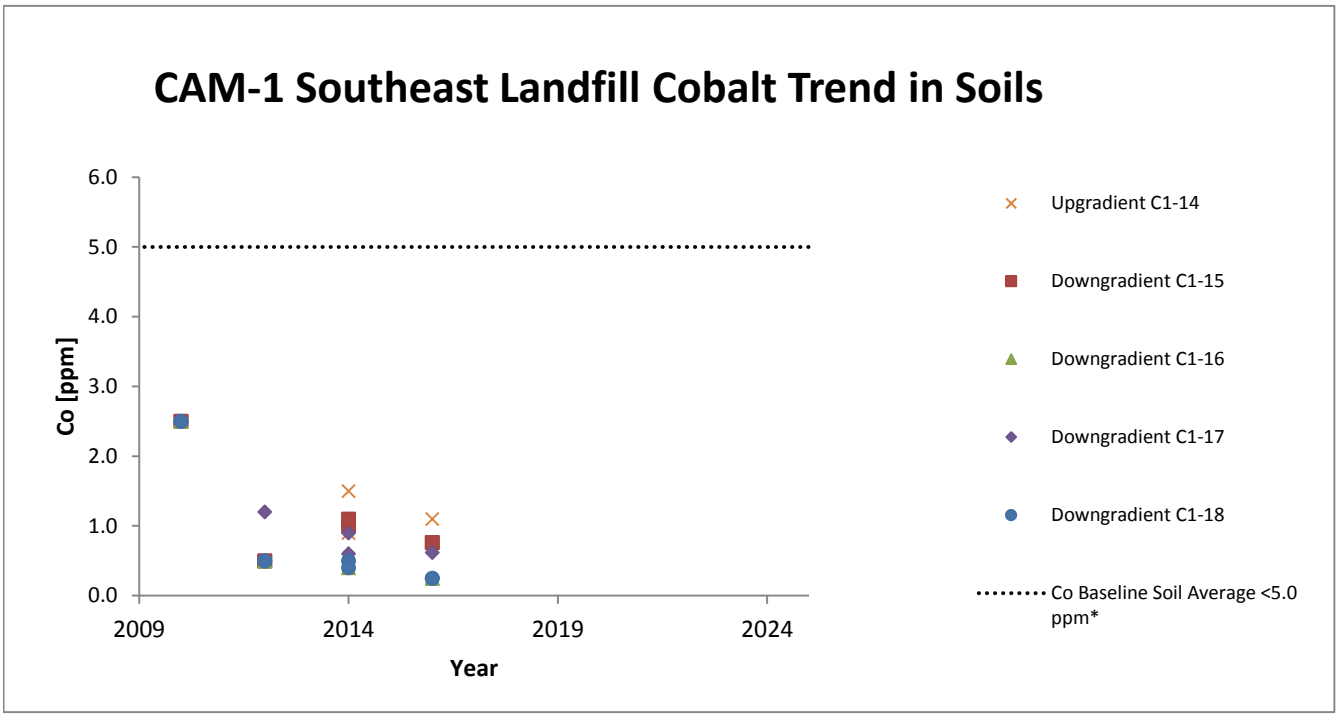
APPENDIX E6

Southeast Landfill

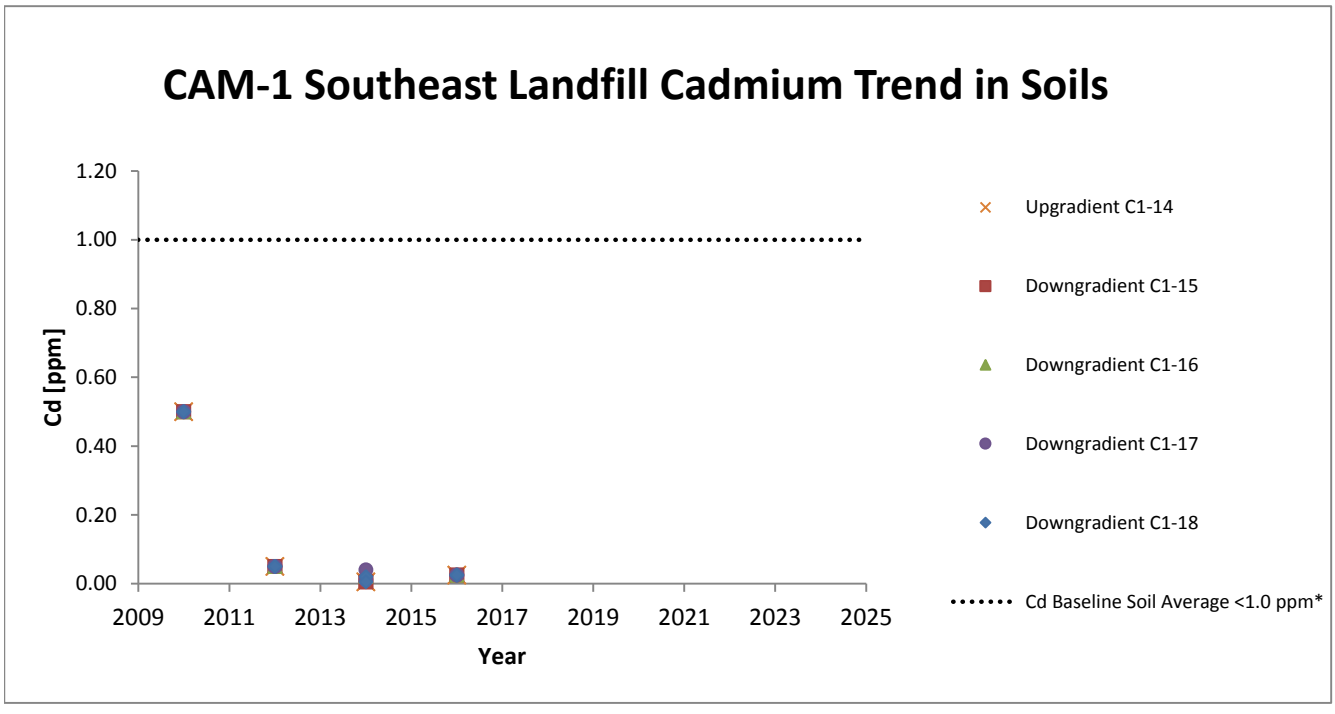




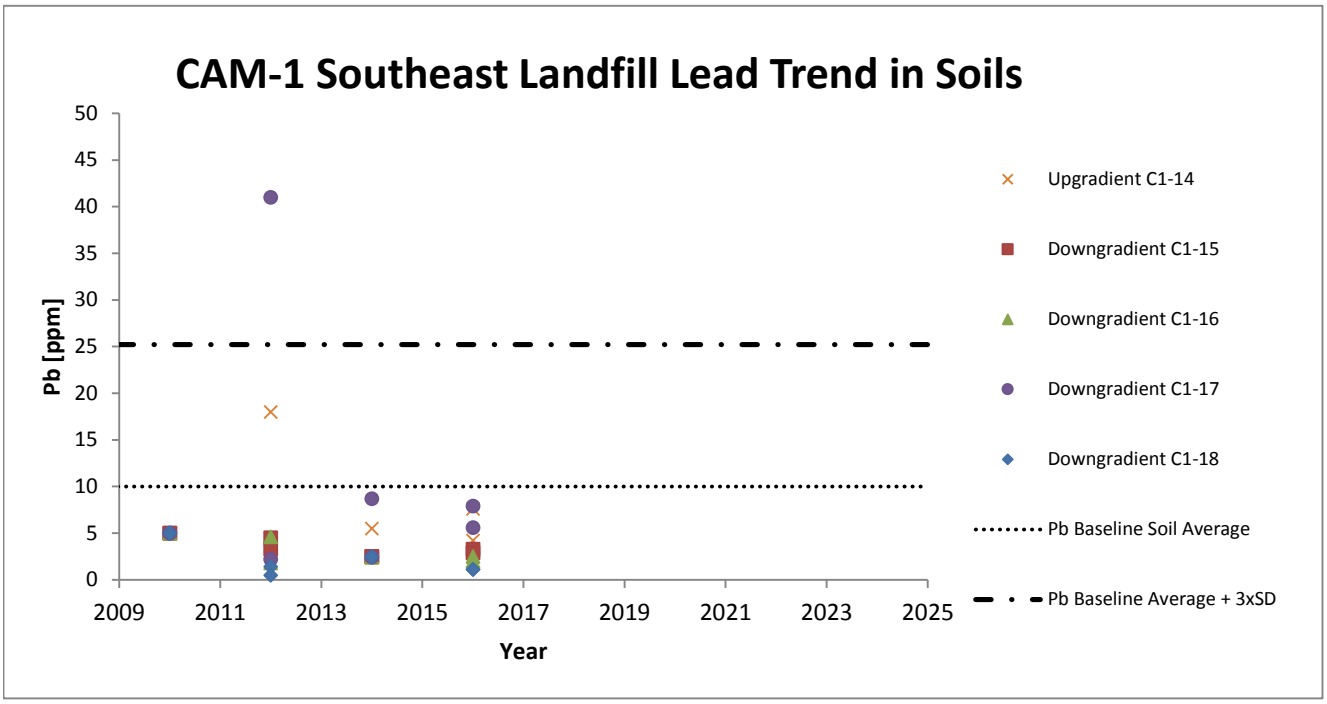
*Ni Baseline Average SD = 0

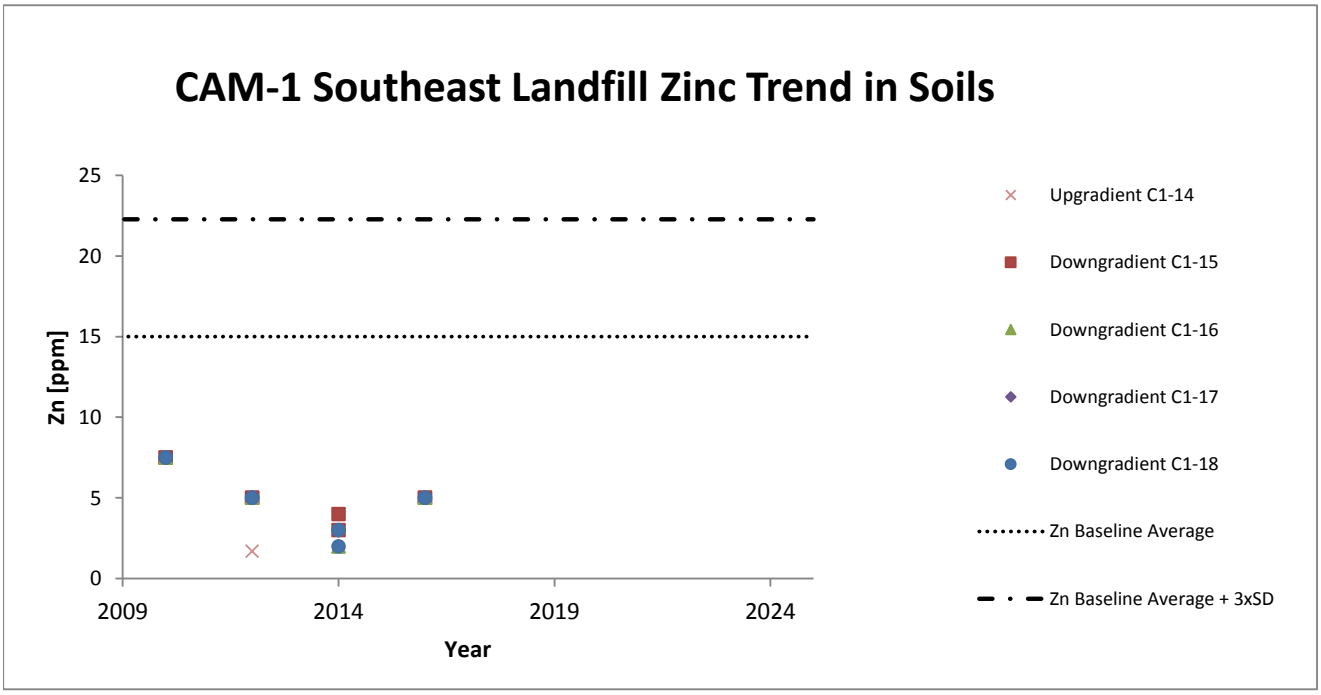


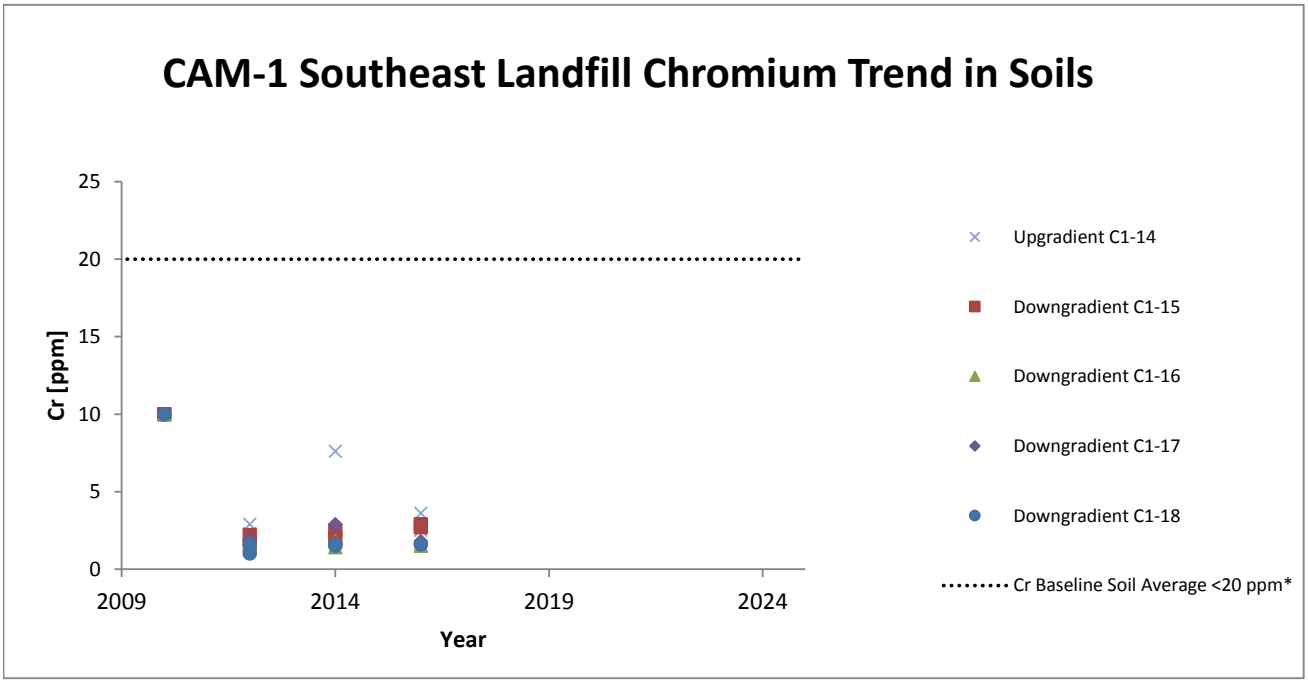
*Co Baseline Average SD = 0



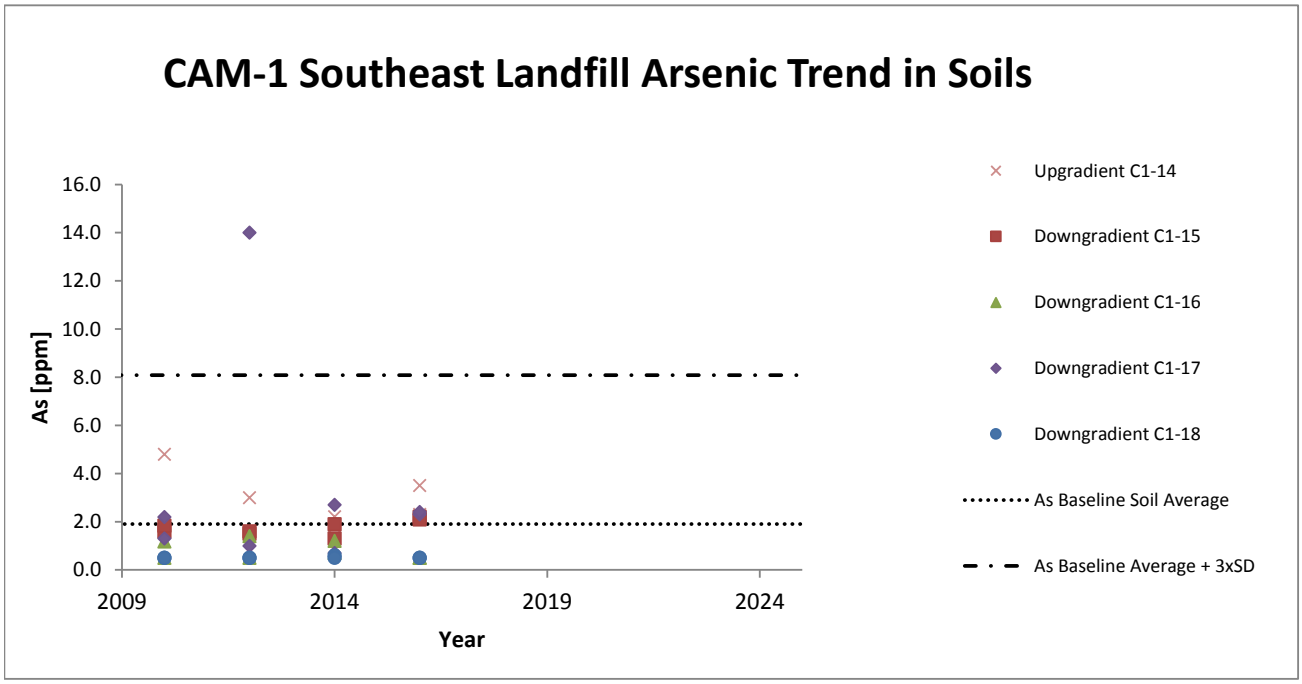
*Co Baseline Average SD = 0

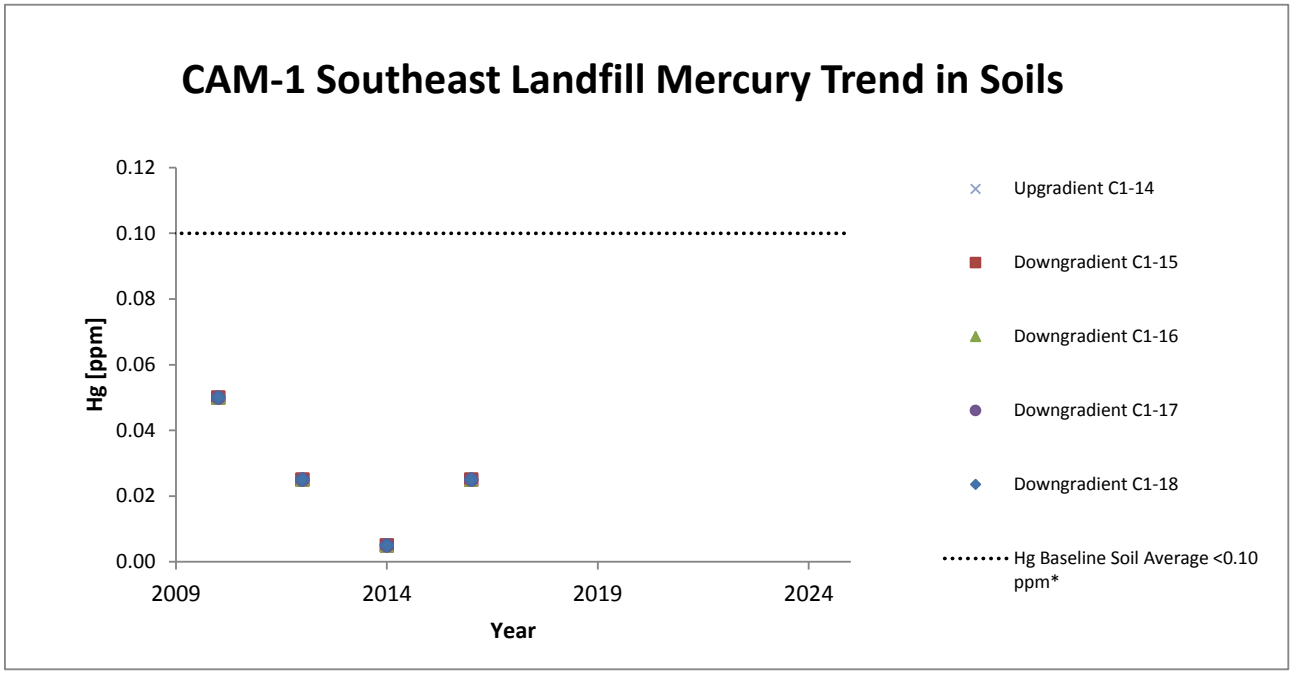

CAM-1 Southeast Landfill Lead Trend in Soils
Pb [ppm]
50
45
40
35
30
25
20
15
10
5
0
2009
2011
2013
2015
2017
2019
2021
2023
2025
Year
Upgradient C1-14
Downgradient C1-15
Downgradient C1-16
Downgradient C1-17
Downgradient C1-18
Pb Baseline Soil Average
Pb Baseline Average + 3xSD


CAM-1 Southeast Landfill Zinc Trend in Soils
Zn [ppm]
25
20
15
10
5
0
2009
2014
2019
2024
Year
Upgradient C1-14
Downgradient C1-15
Downgradient C1-16
Downgradient C1-17
Downgradient C1-18
Zn Baseline Average
Zn Baseline Average + 3xSD

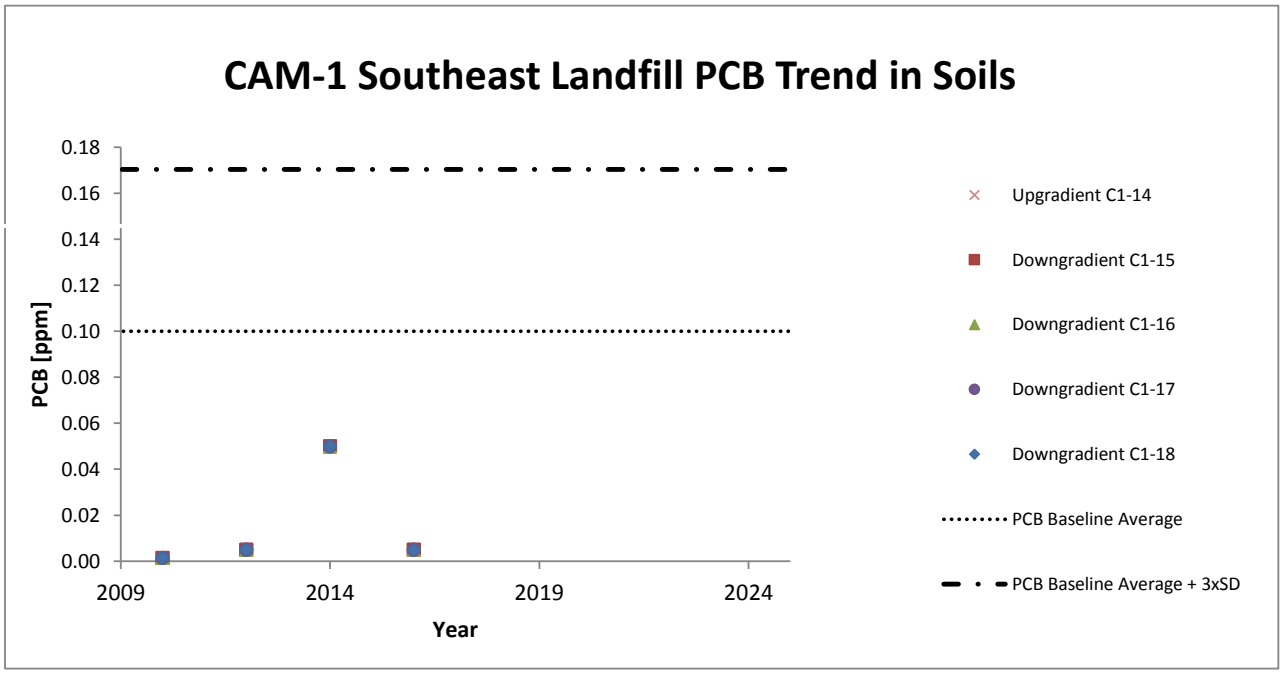


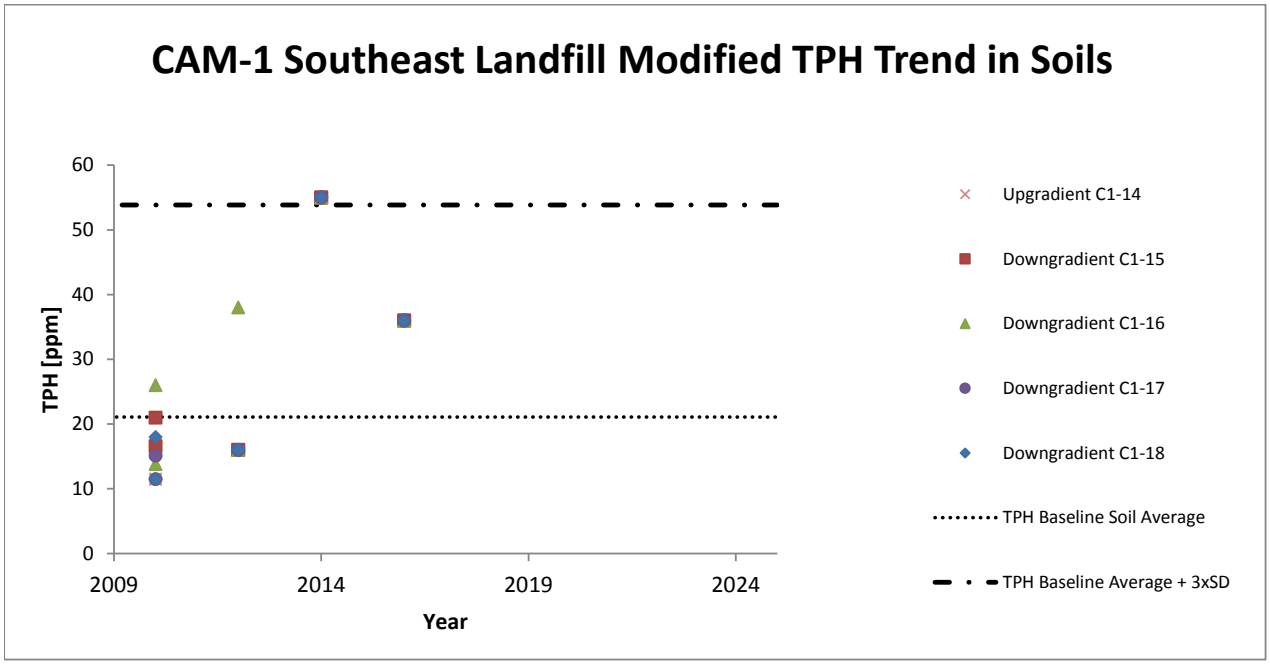
*Cr Baseline Average SD = 0





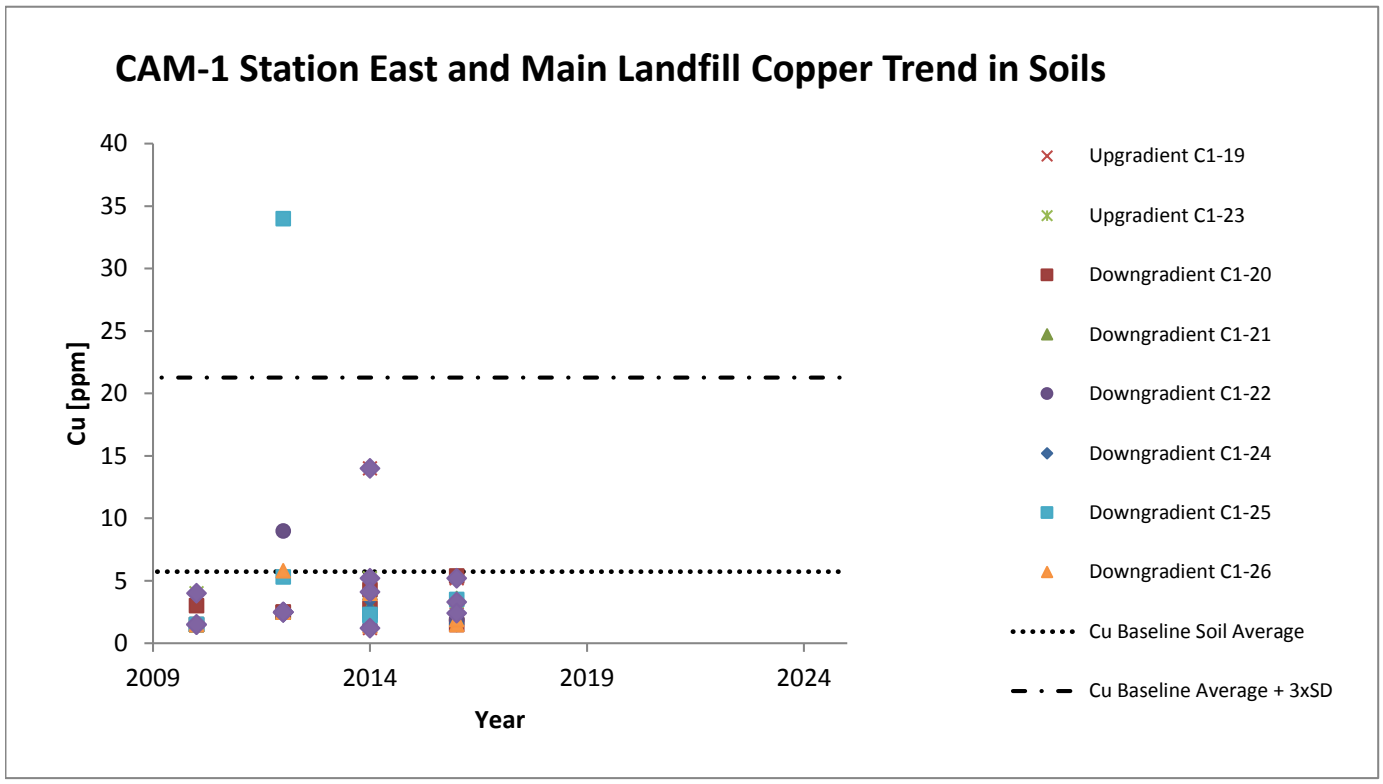
*Hg Baseline Average SD = 0

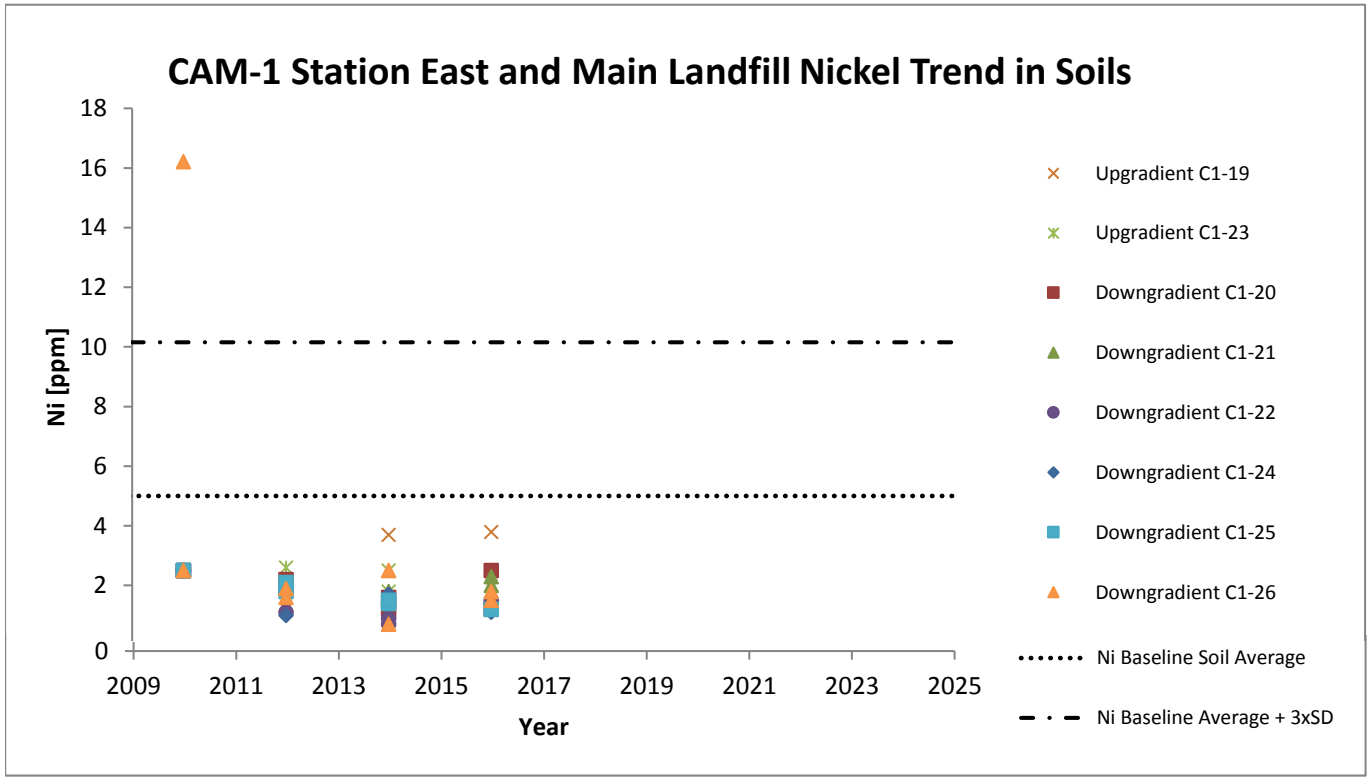


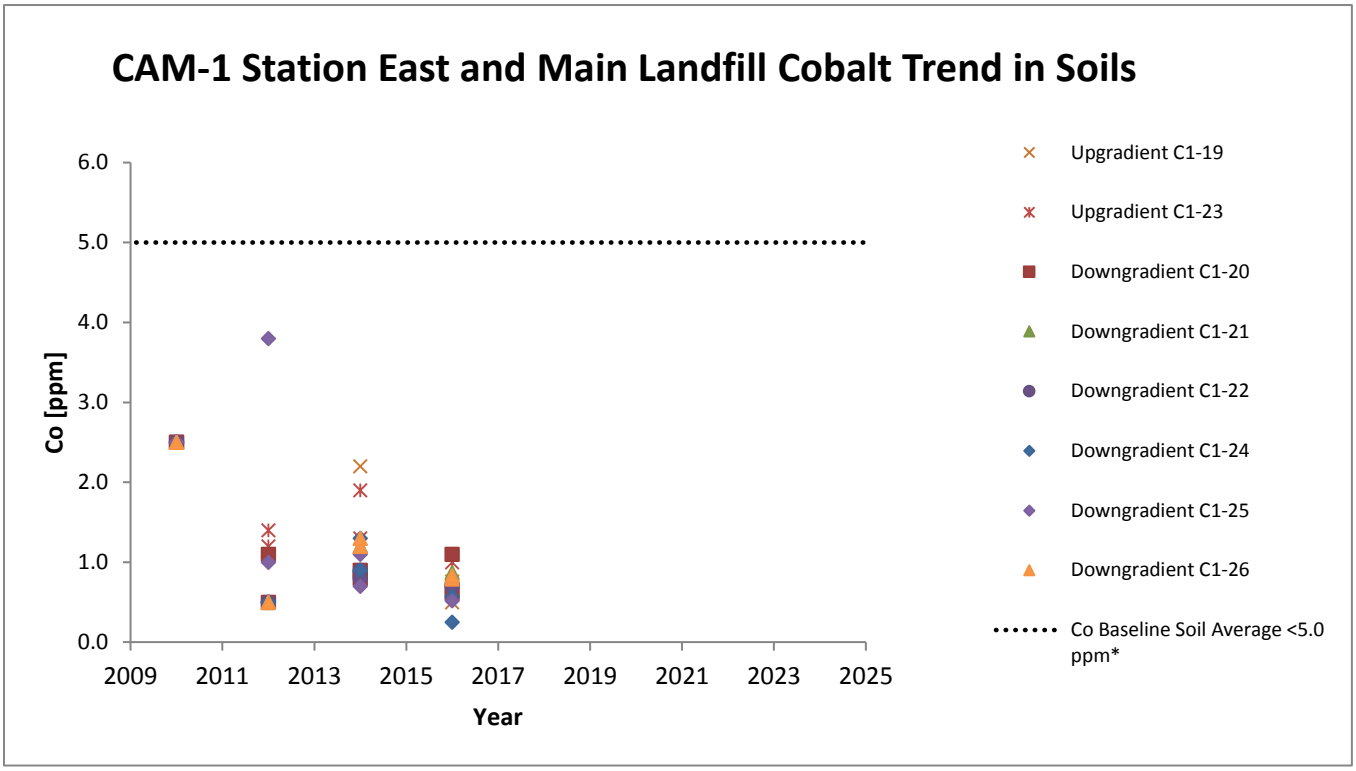

CAM-1 Southeast Landfill Modified TPH Trend in Soils
TPH [ppm]
60
50
40
30
20
10
0
2009
2014
2019
2024
Year
Upgradient C1-14
Downgradient C1-15
Downgradient C1-16
Downgradient C1-17
Downgradient C1-18
TPH Baseline Soil Average
TPH Baseline Average + 3xSD

APPENDIX E7

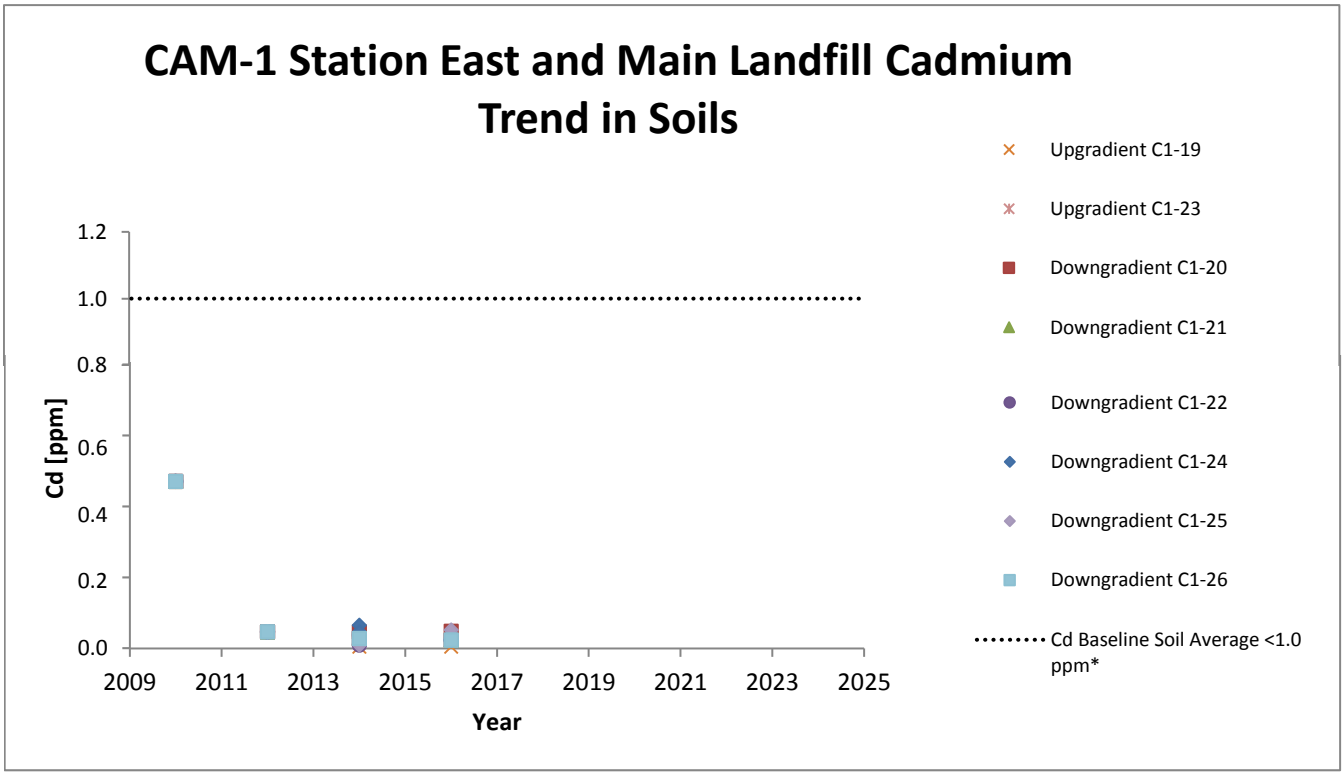
Station East and Main Landfill


CAM-1 Station East and Main Landfill Copper Trend in Soils
Cu [ppm]
Year
0
5
10
15
20
25
30
35
40
2009
2014
2019
2024
Upgradient C1-19
Upgradient C1-23
Downgradient C1-20
Downgradient C1-21
Downgradient C1-22
Downgradient C1-24
Downgradient C1-25
Downgradient C1-26
Cu Baseline Soil Average
Cu Baseline Average + 3xSD

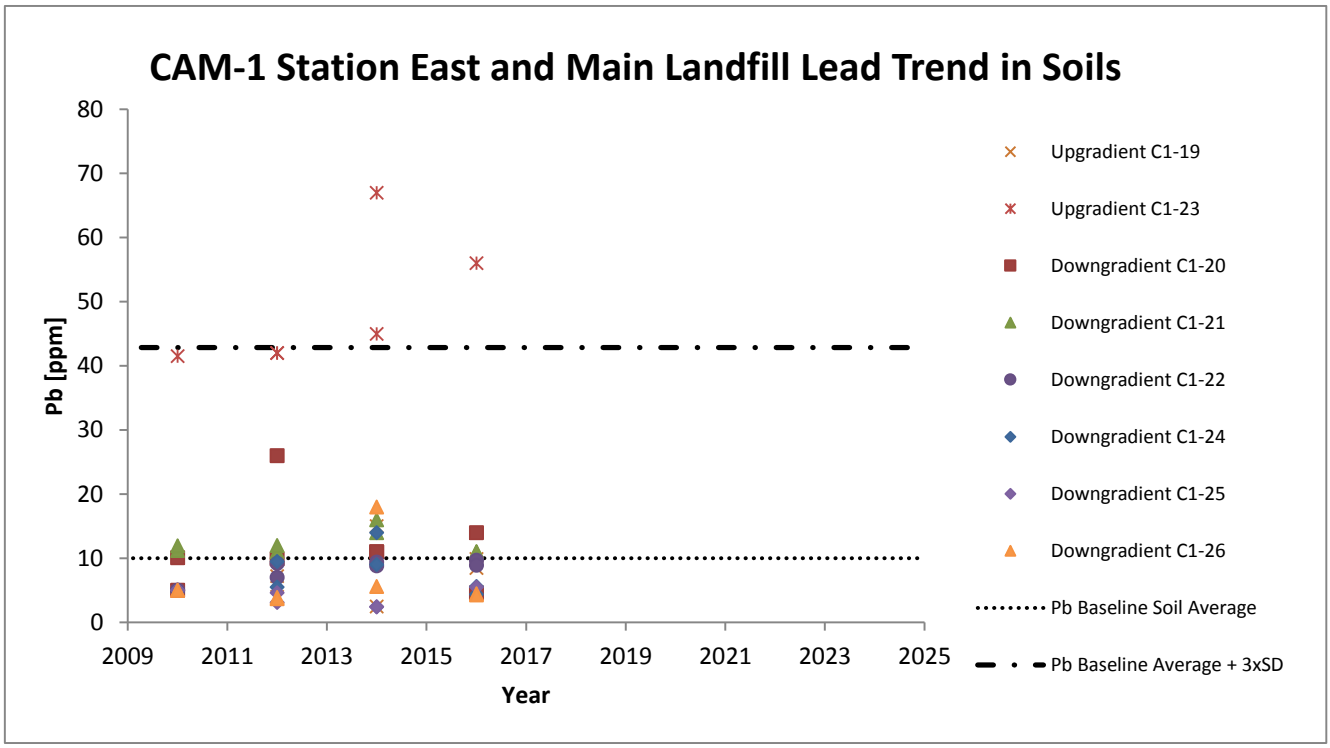

CAM-1 Station East and Main Landfill Nickel Trend in Soils
Ni [ppm]
Year
0
2
4
6
8
10
12
14
16
18
2009
2011
2013
2015
2017
2019
2021
2023
2025
Upgradient C1-19
Upgradient C1-23
Downgradient C1-20
Downgradient C1-21
Downgradient C1-22
Downgradient C1-24
Downgradient C1-25
Downgradient C1-26
Ni Baseline Soil Average
Ni Baseline Average + 3xSD

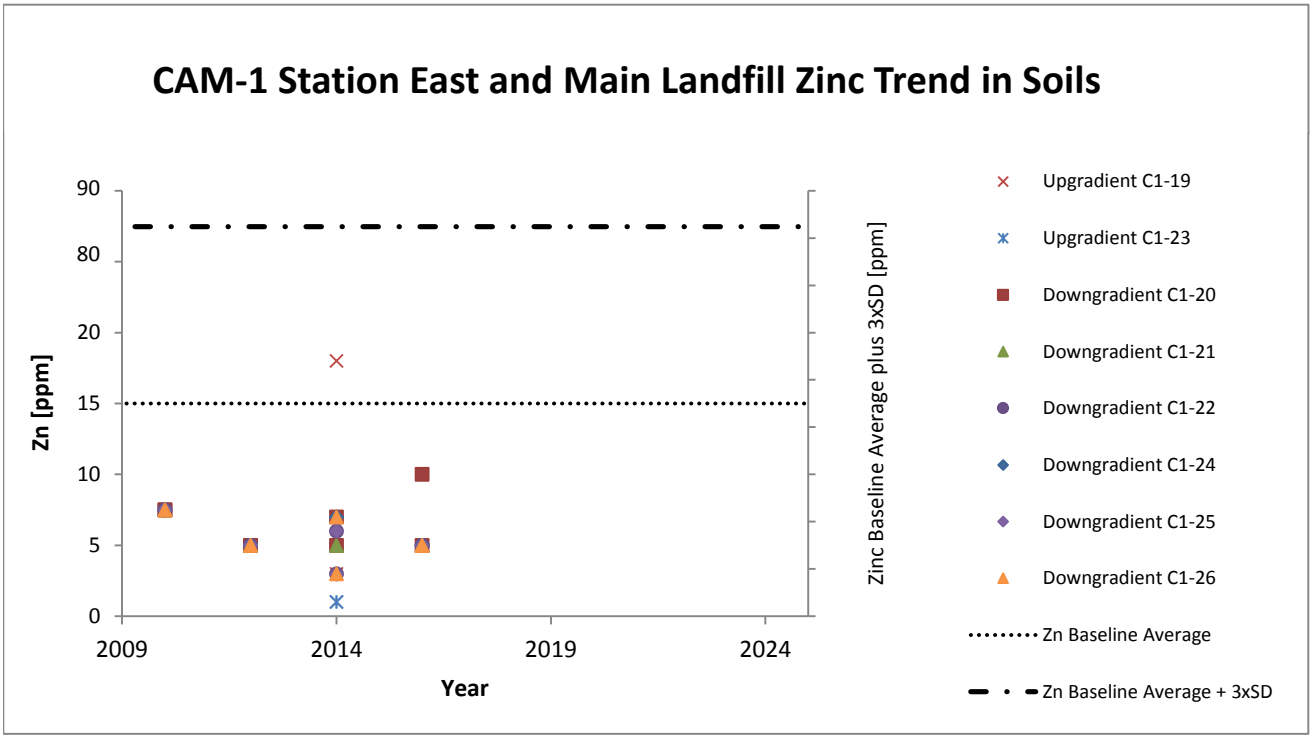


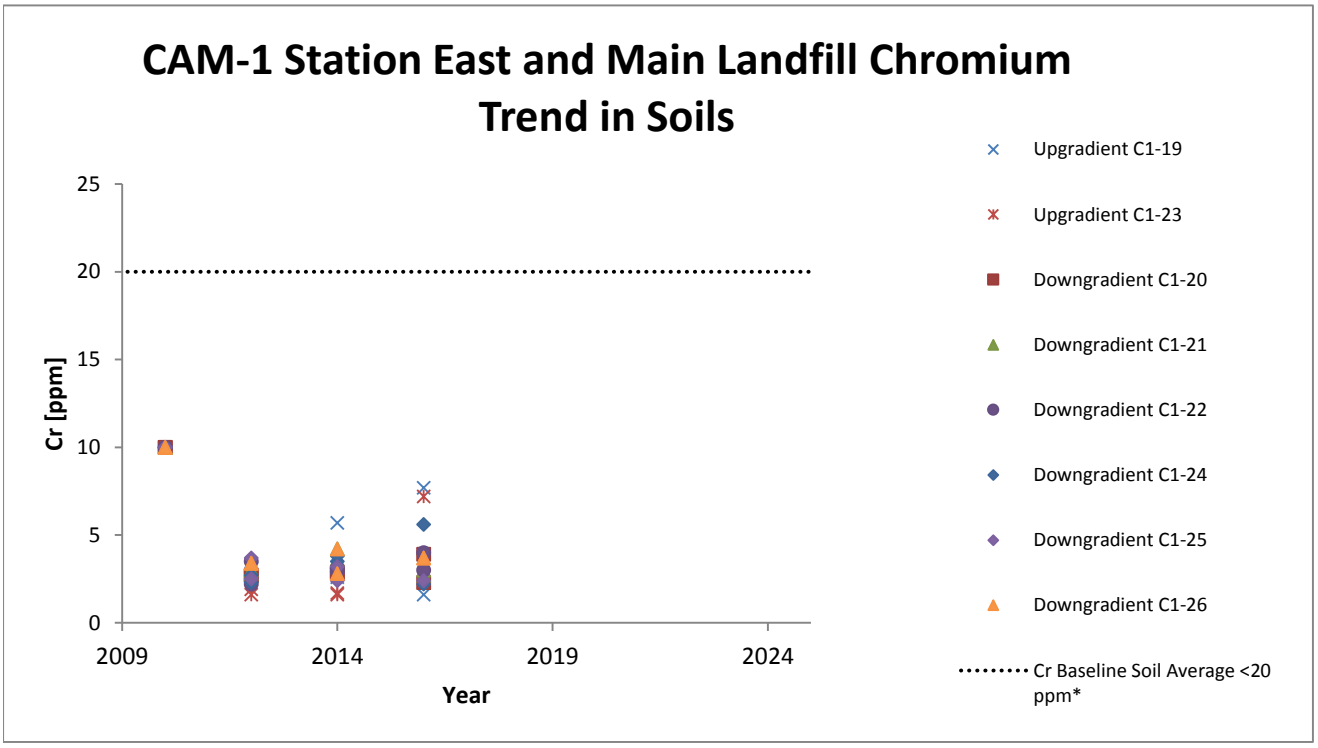
*Co Baseline soil average SD=0



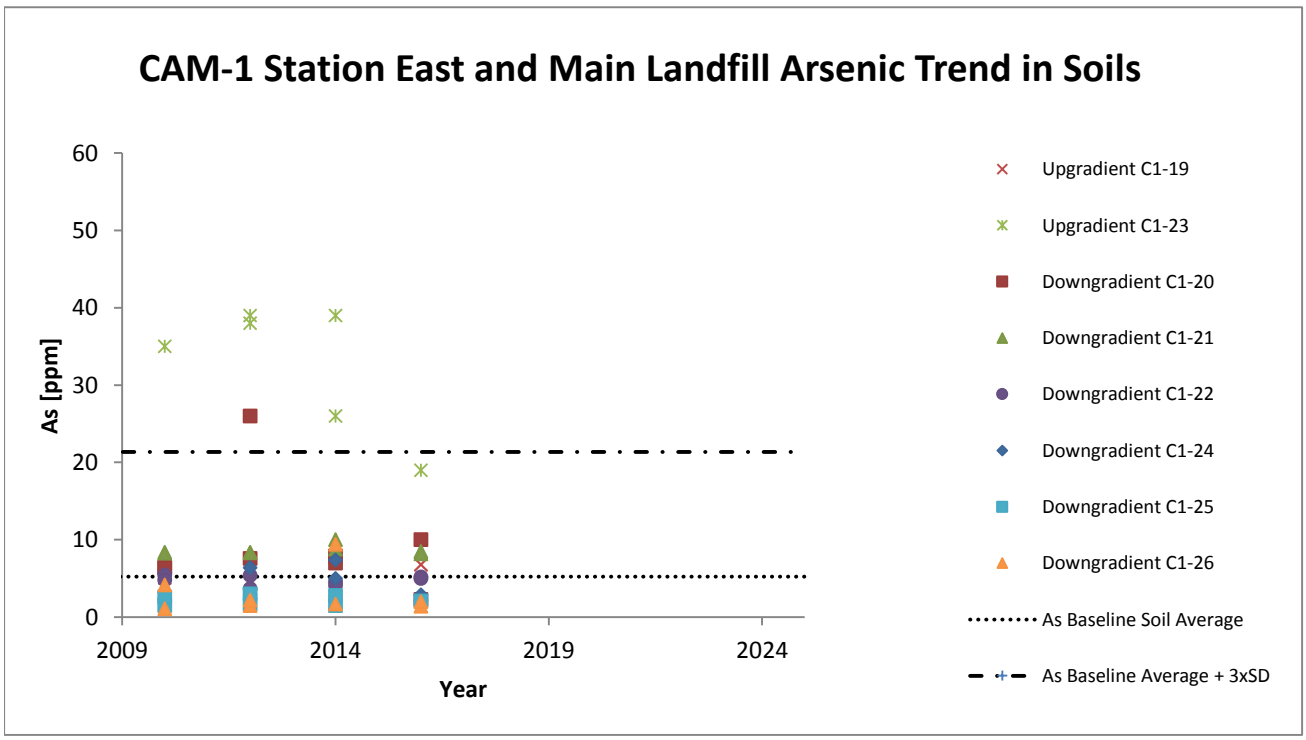
*Cd Baseline soil average SD=0

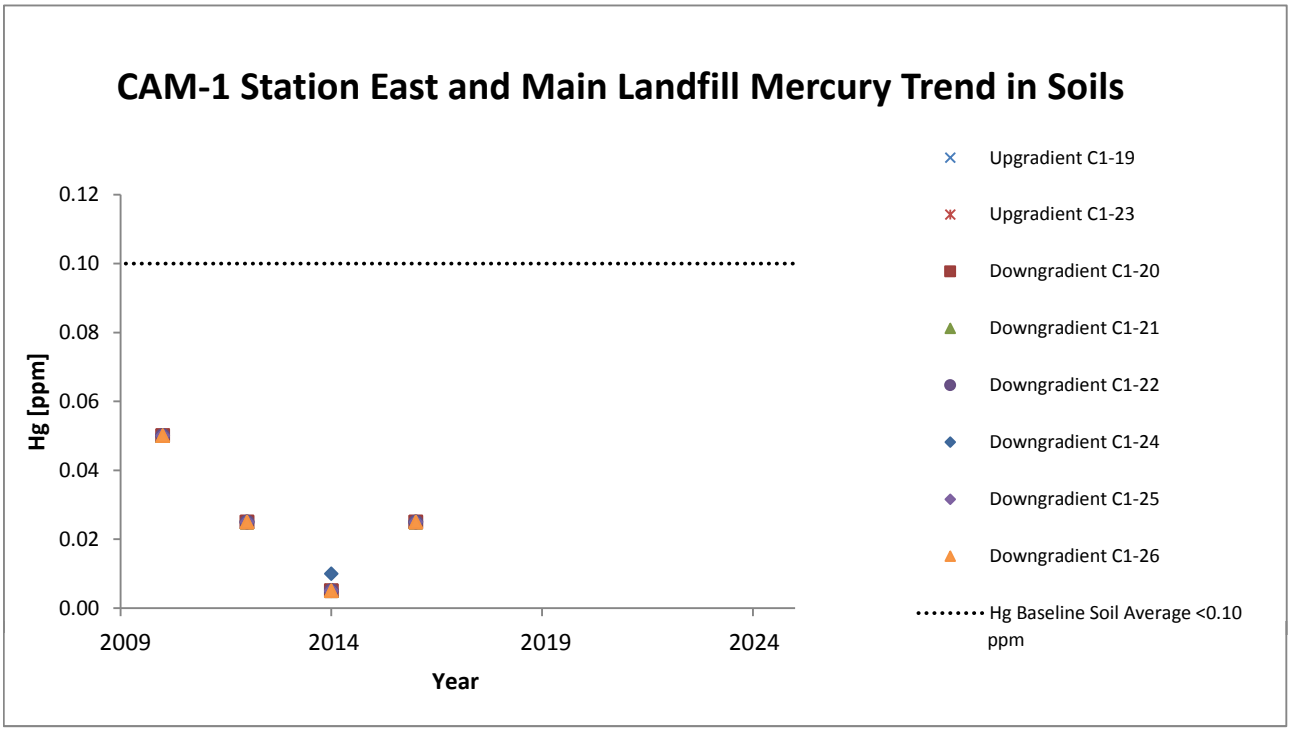

CAM-1 Station East and Main Landfill Lead Trend in Soils
Pb [ppm]
80
70
60
50
40
30
20
10
0
2009
2011
2013
2015
2017
2019
2021
2023
2025
Year
Upgradient C1-19
Upgradient C1-23
Downgradient C1-20
Downgradient C1-21
Downgradient C1-22
Downgradient C1-24
Downgradient C1-25
Downgradient C1-26
Pb Baseline Soil Average
Pb Baseline Average + 3xSD


CAM-1 Station East and Main Landfill Zinc Trend in Soils
Zn [ppm]
90
80
20
15
10
5
0
2009
2014
2019
2024
Year
Zinc Baseline Average plus 3xSD [ppm]
Upgradient C1-19
Upgradient C1-23
Downgradient C1-20
Downgradient C1-21
Downgradient C1-22
Downgradient C1-24
Downgradient C1-25
Downgradient C1-26
Zn Baseline Average
Zn Baseline Average + 3xSD

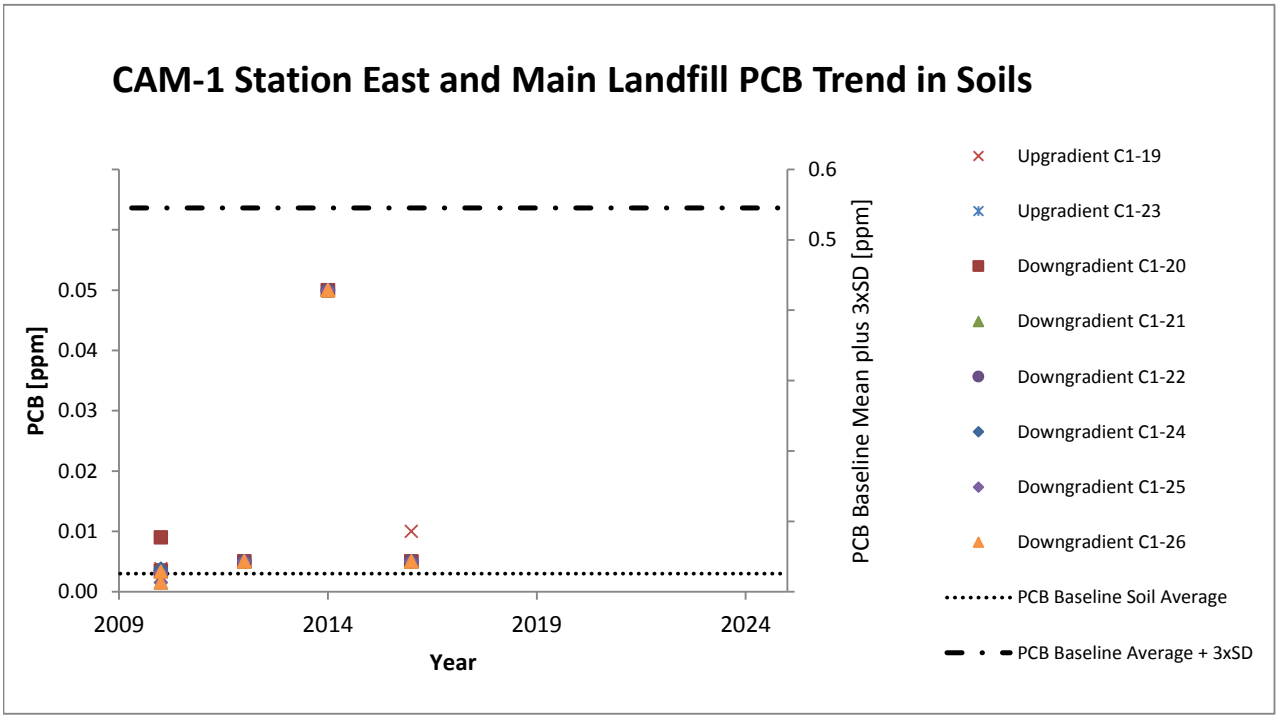


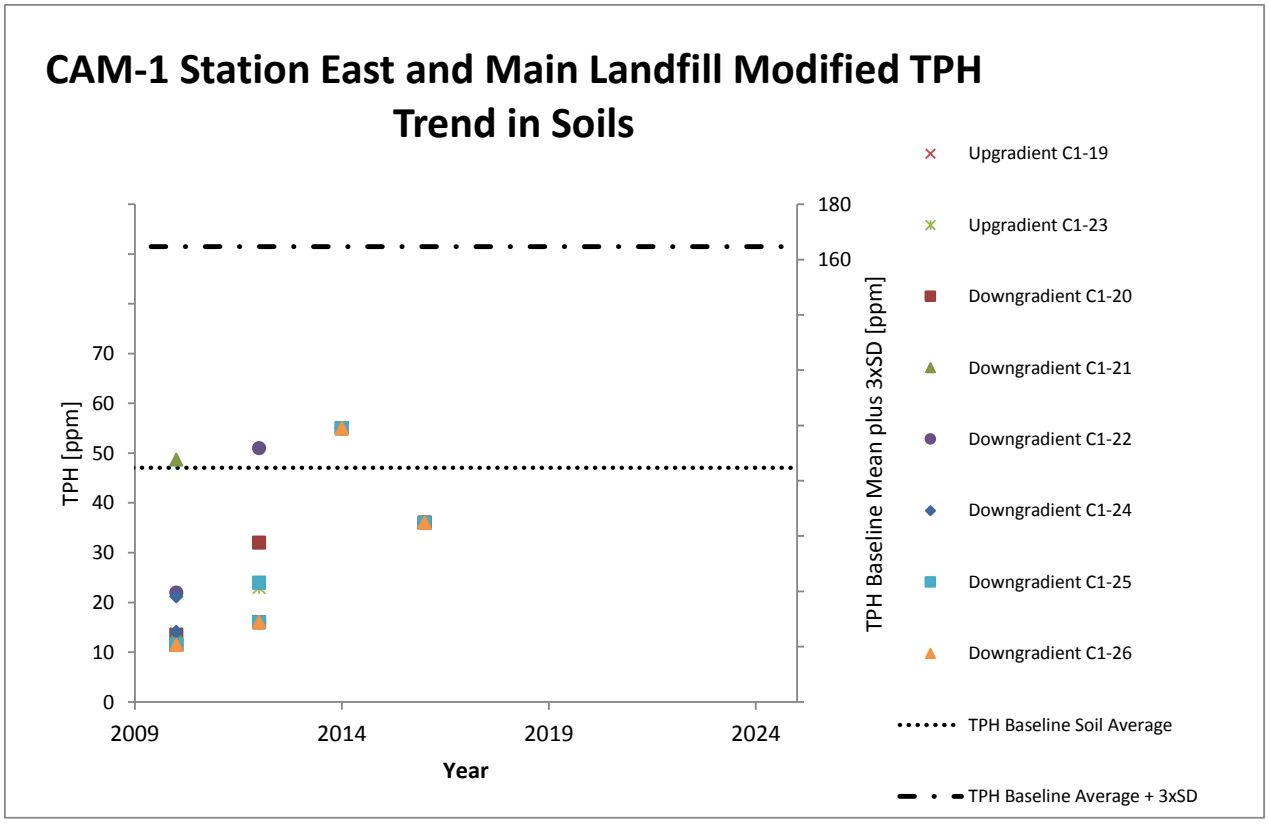
*Cr Baseline soil average SD=0

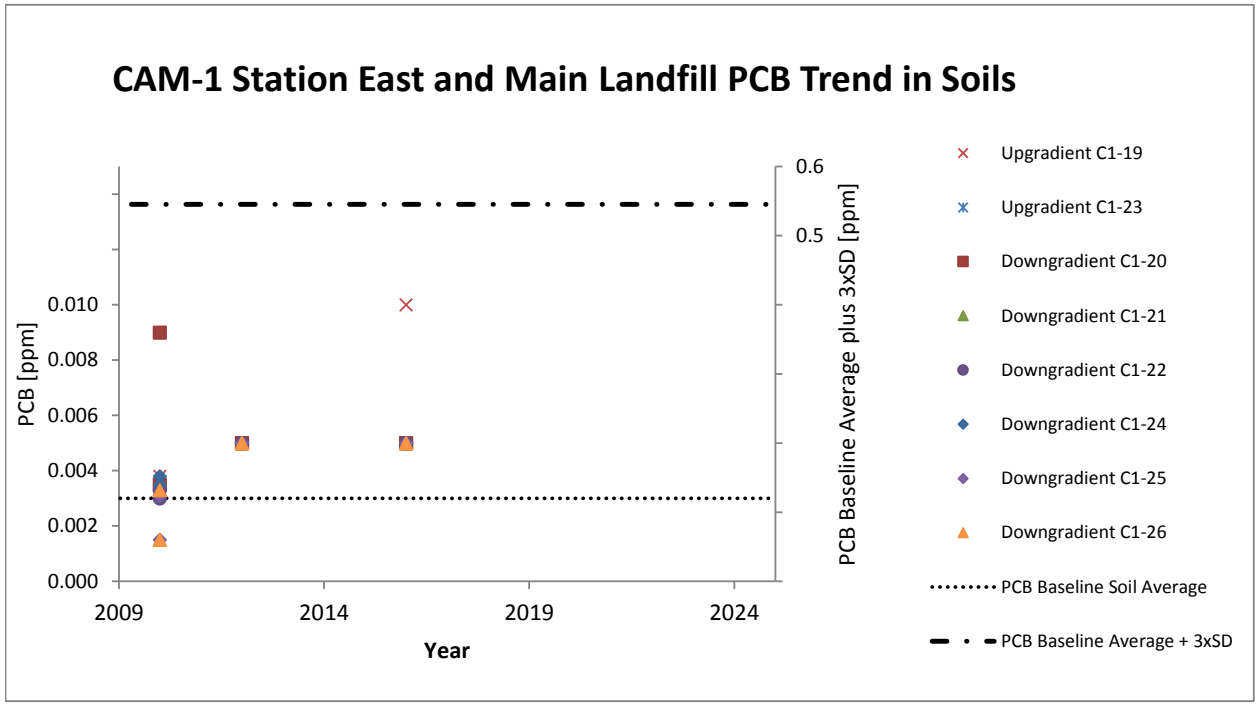




*Hg Baseline soil average SD=0



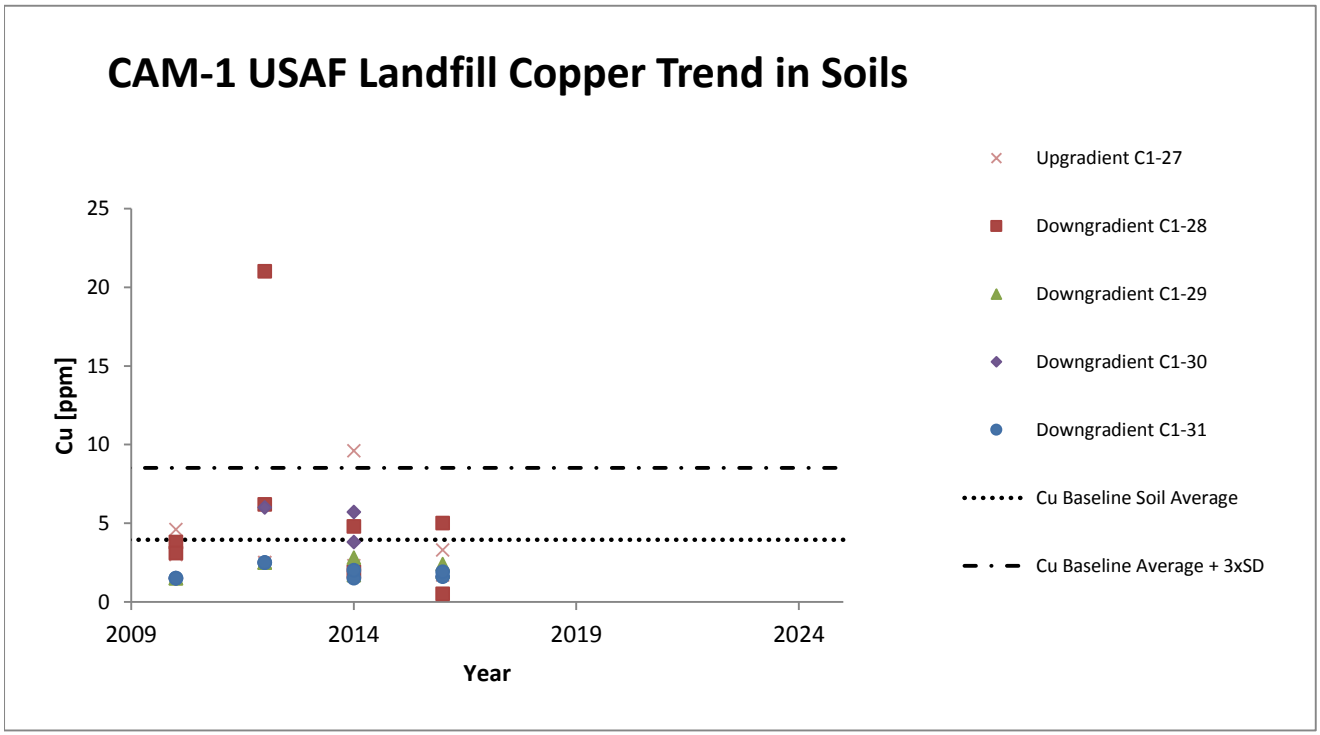


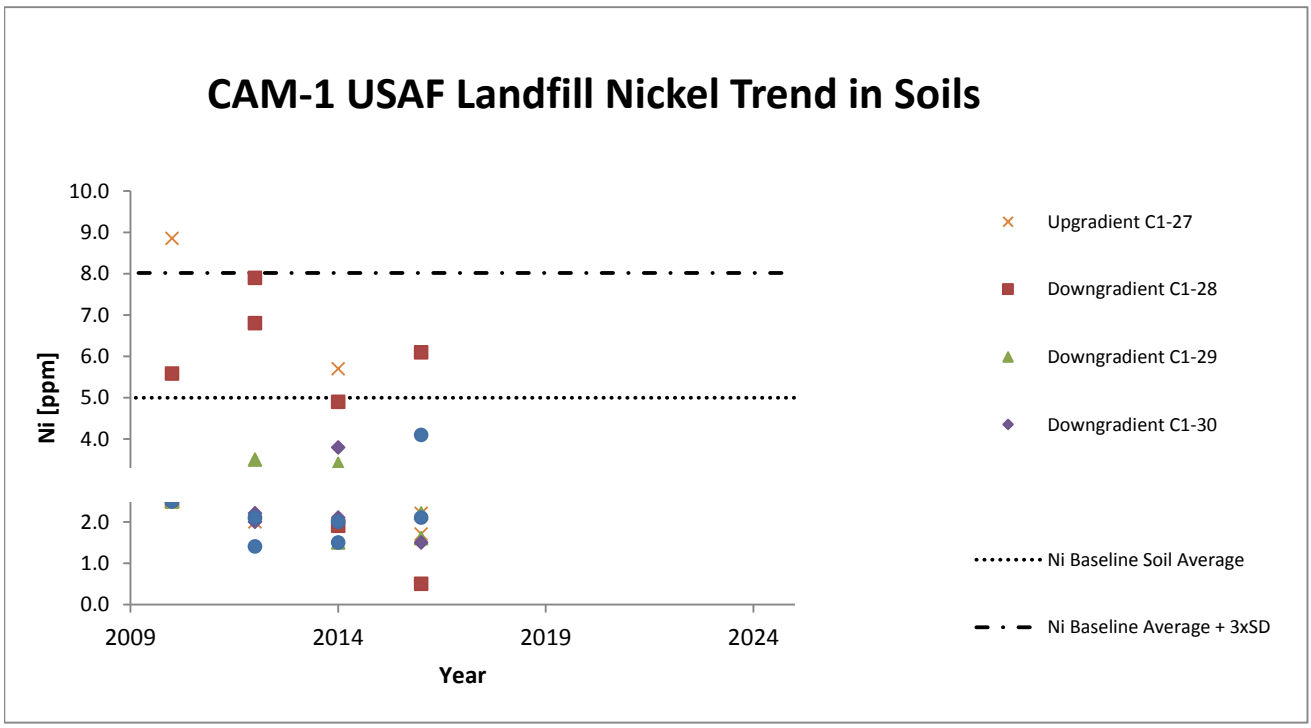


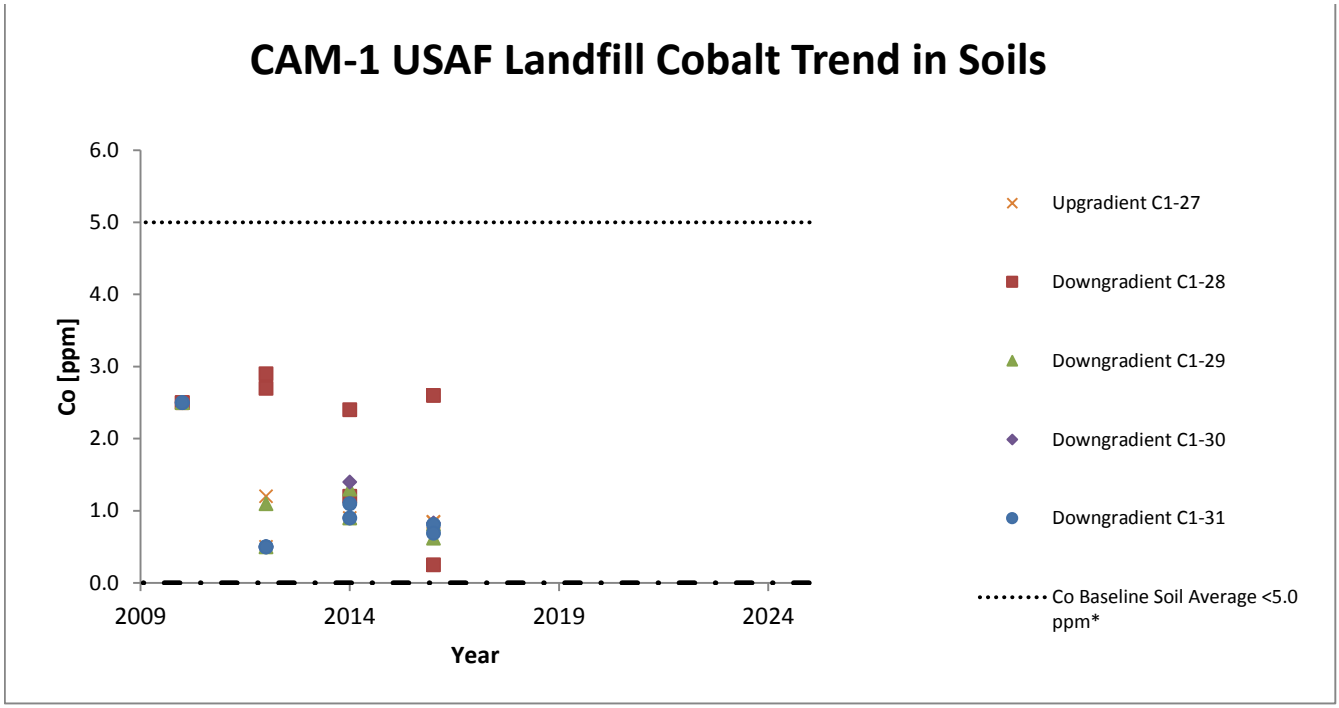
PCB samples analyzed in 2014 were all below detection but the detection limit provided by the contractor was high at 0.1ppm
This chart shows results with the 2014 below detection data not included.

APPENDIX E8

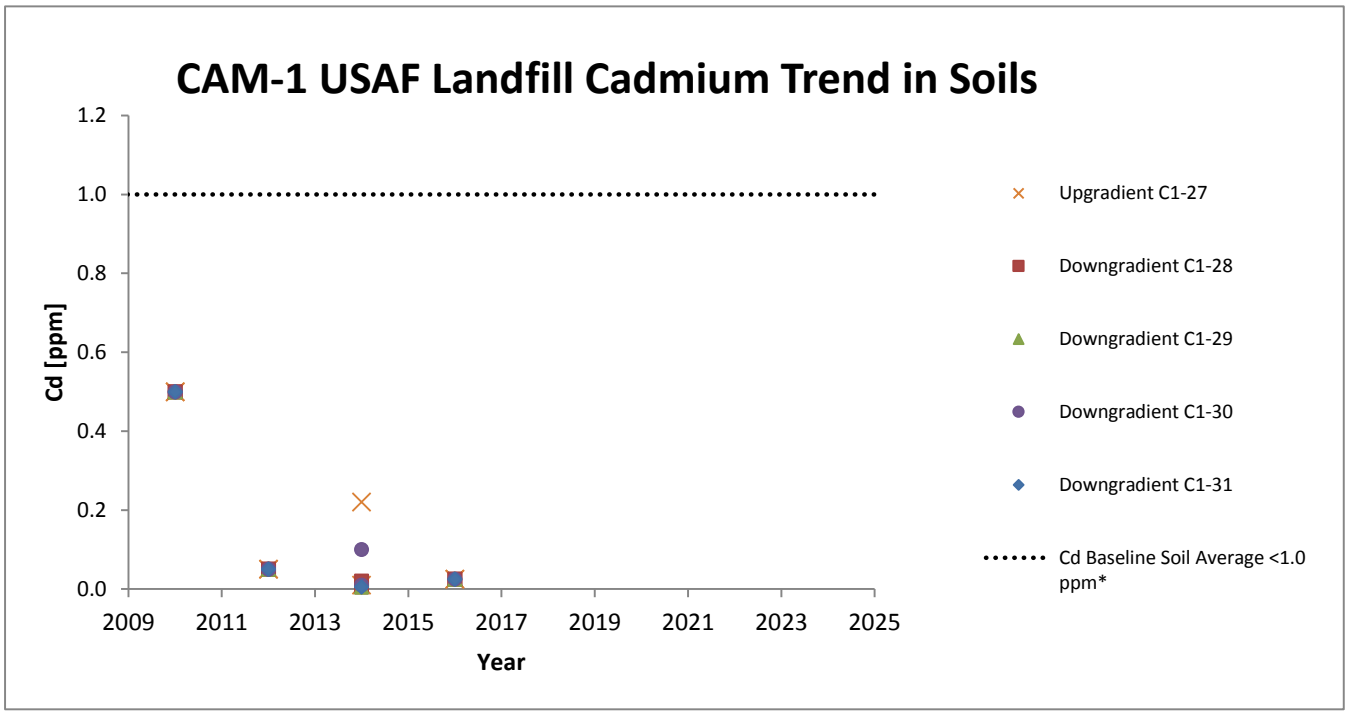
USAF Landfill


CAM-1 USAF Landfill Copper Trend in Soils
Cu [ppm]
25
20
15
10
5
0
2009
2014
2019
2024
Year
Upgradient C1-27
Downgradient C1-28
Downgradient C1-29
Downgradient C1-30
Downgradient C1-31
Cu Baseline Soil Average
Cu Baseline Average + 3xSD

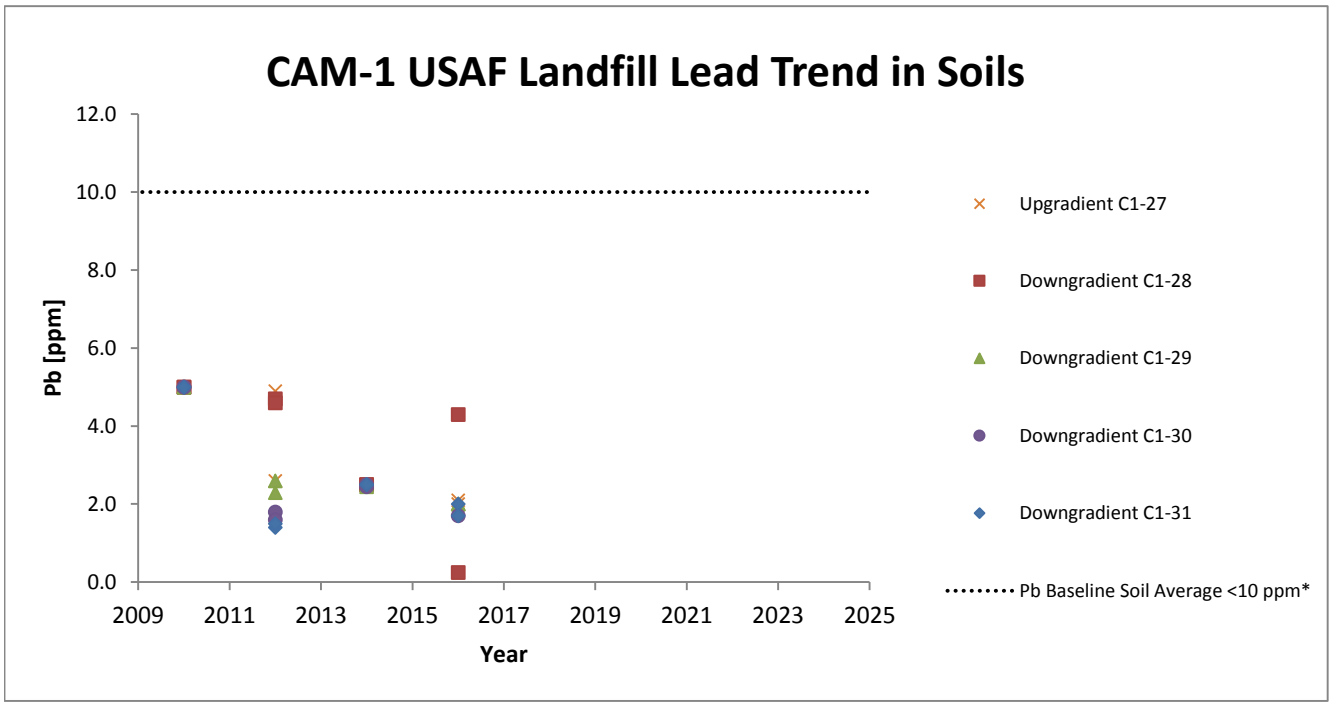

CAM-1 USAF Landfill Nickel Trend in Soils
Ni [ppm]
10.0
9.0
8.0
7.0
6.0
5.0
4.0
2.0
1.0
0.0
2009
2014
2019
2024
Year
Upgradient C1-27
Downgradient C1-28
Downgradient C1-29
Downgradient C1-30
Ni Baseline Soil Average
Ni Baseline Average + 3xSD



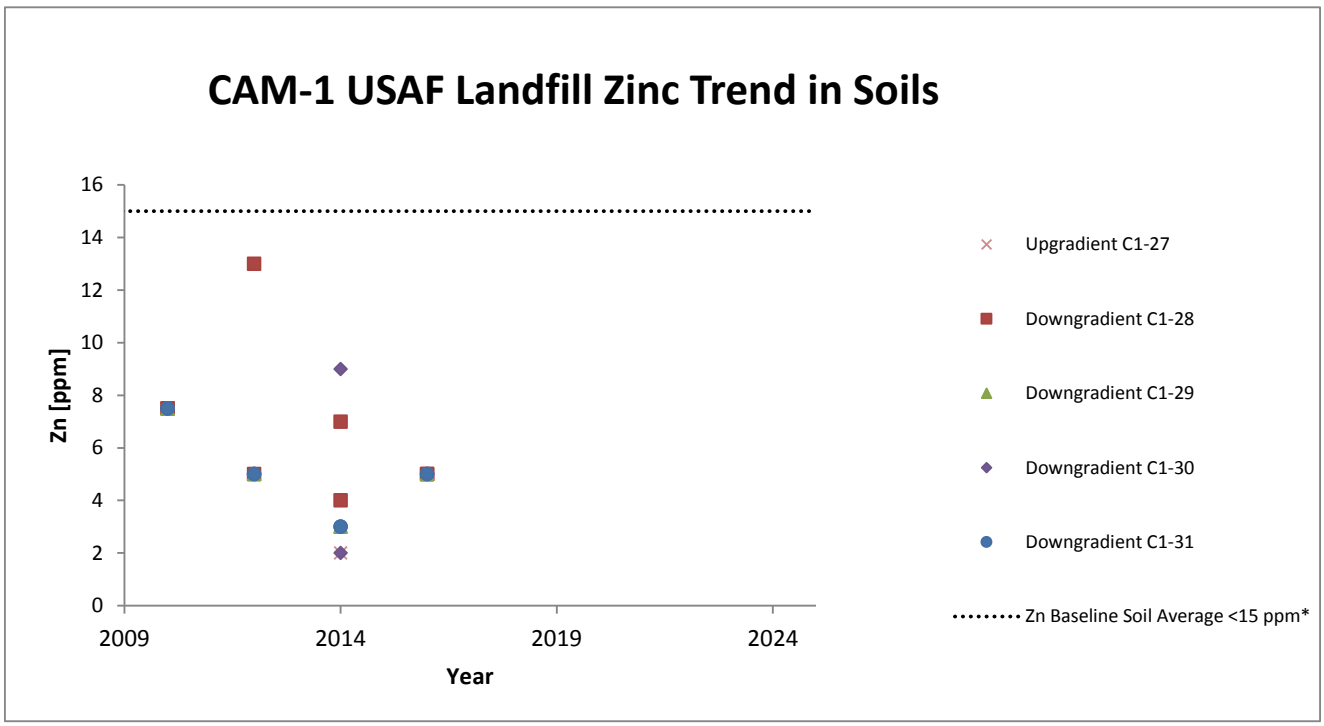
*Co Baseline Average SD = 0



*Cd Baseline Average SD = 0

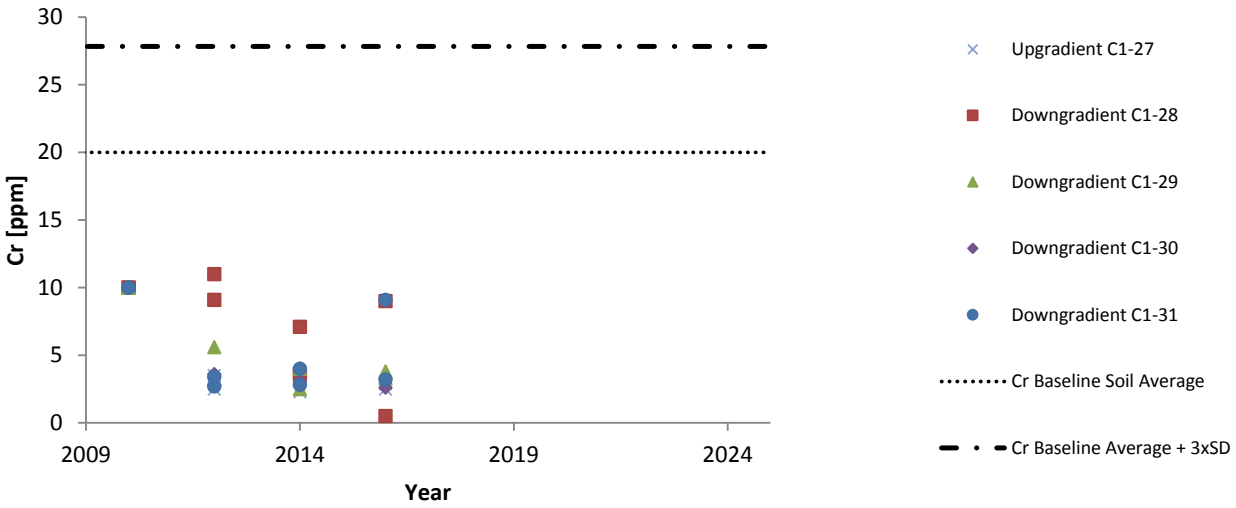


*Pb Baseline Average SD = 0

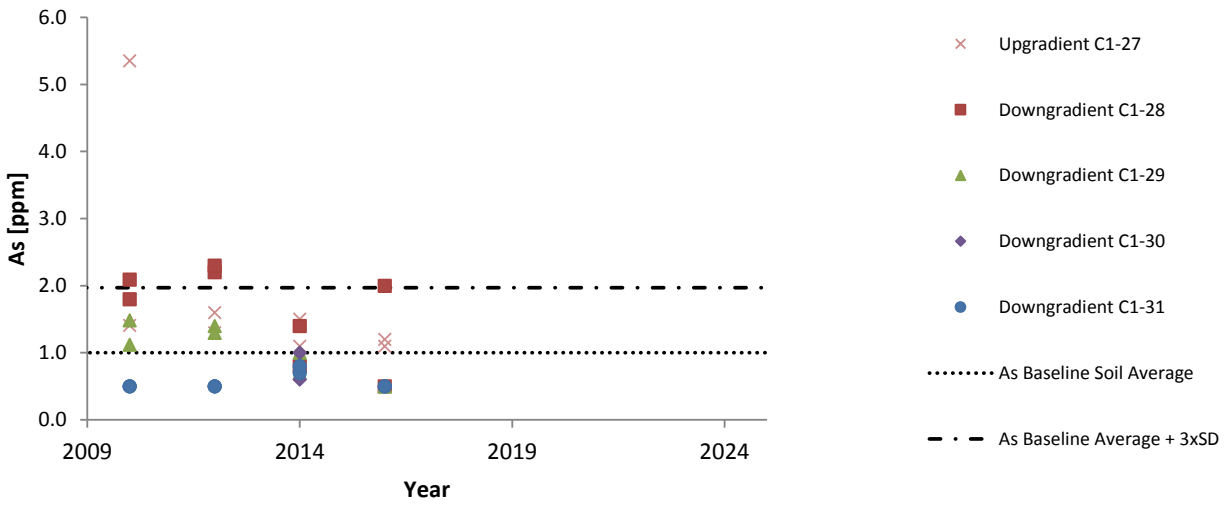


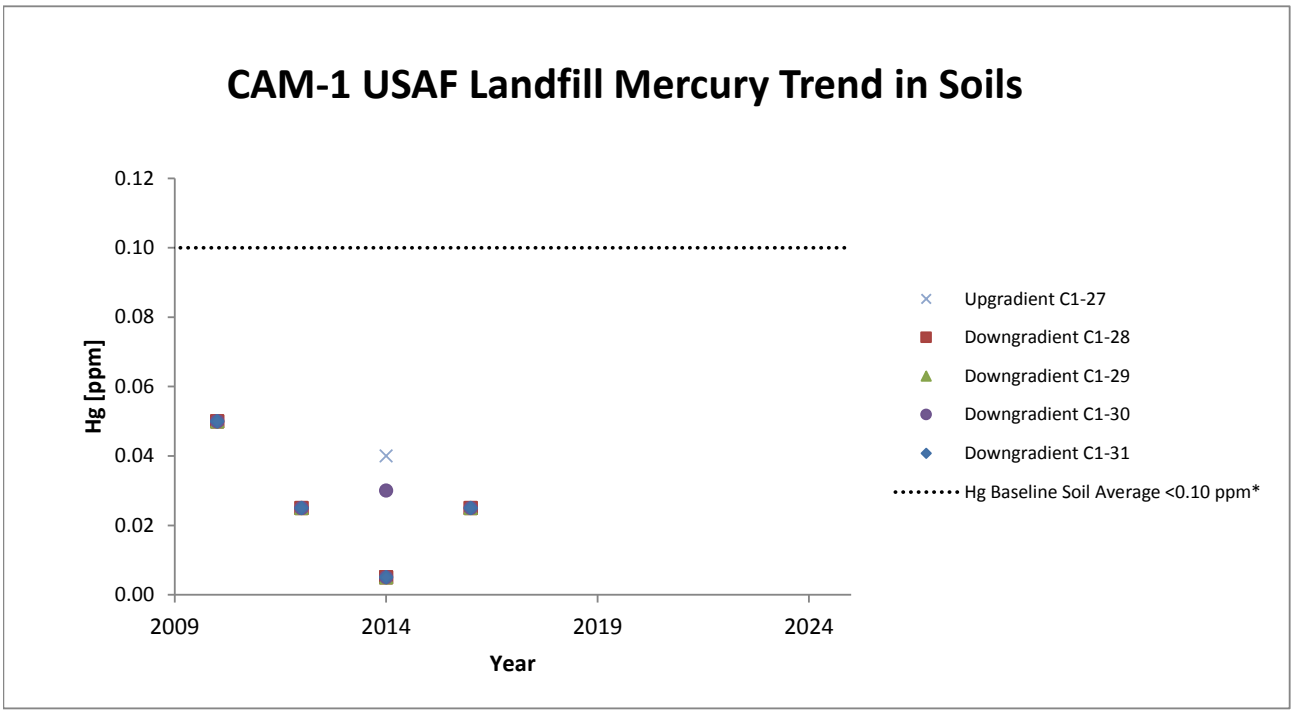
*Zn Baseline Average SD = 0

CAM-1 USAF Landfill Chromium Trend in Soils

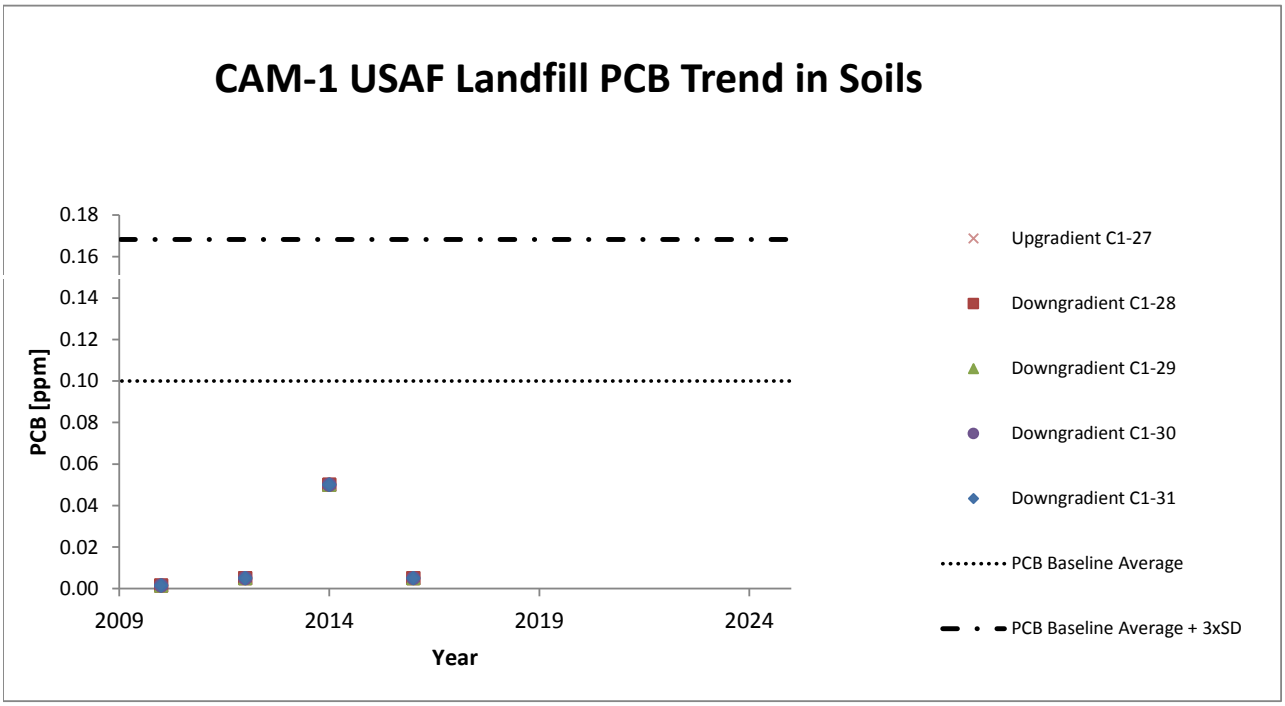


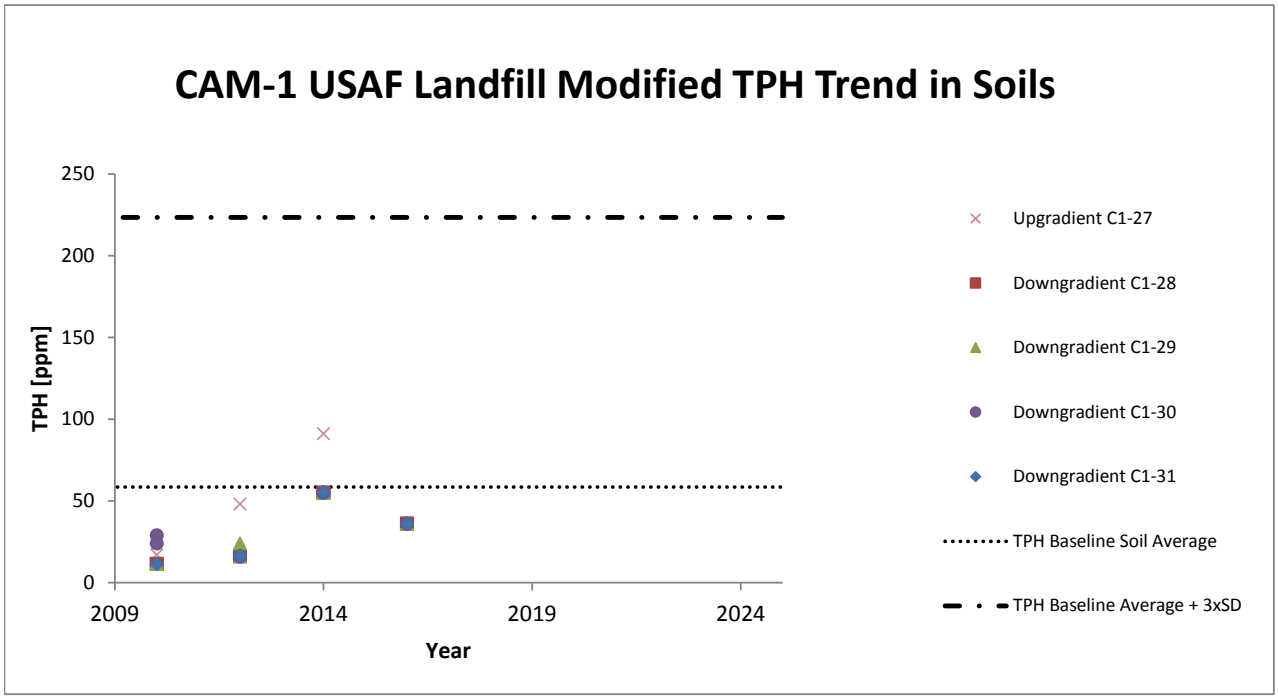
CAM-1 USAF Landfill Arsenic Trend in Soils





*Hg Baseline Average SD = 0

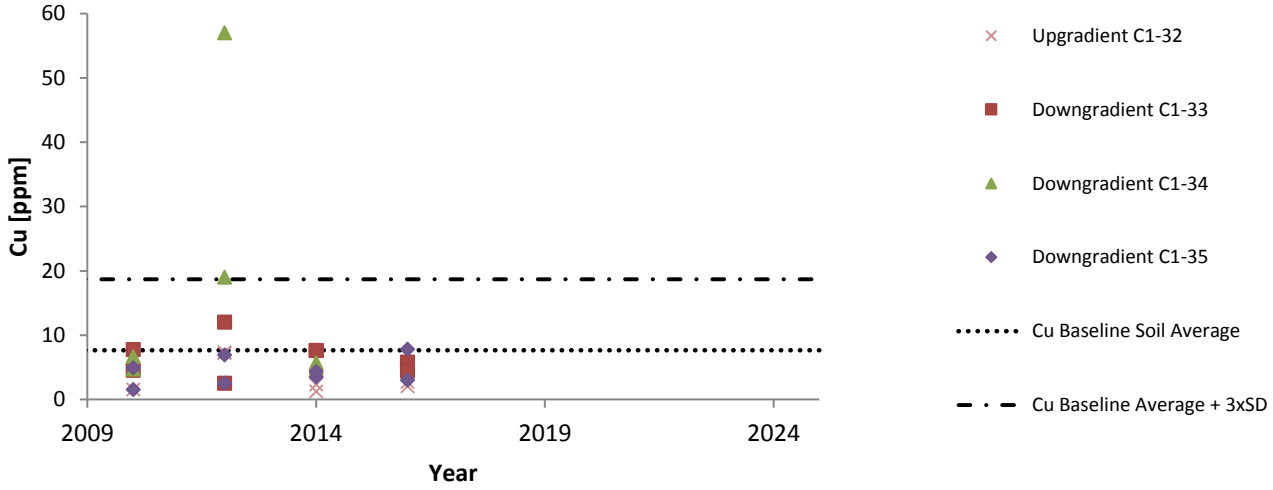



CAM-1 USAF Landfill Modified TPH Trend in Soils
250
200
150
100
50
0
TPH [ppm]
2009
2014
2019
2024
Year
Upgradient C1-27
Downgradient C1-28
Downgradient C1-29
Downgradient C1-30
Downgradient C1-31
TPH Baseline Soil Average
TPH Baseline Average + 3xSD

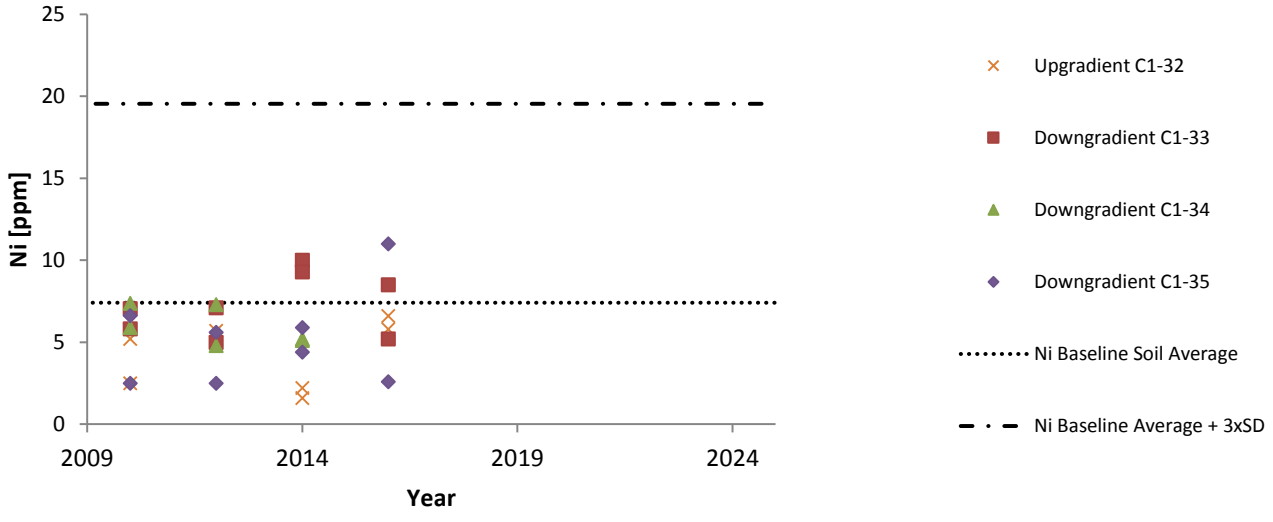
APPENDIX E9

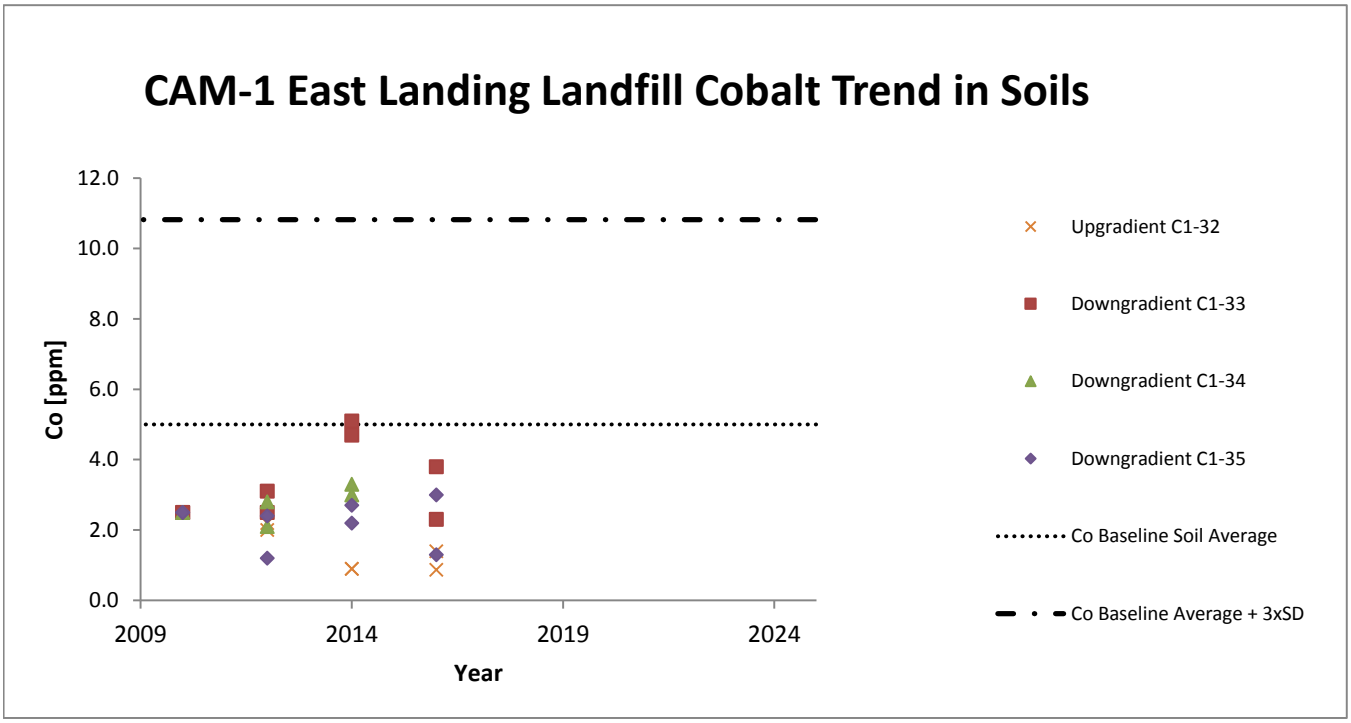
East Landing Landfill

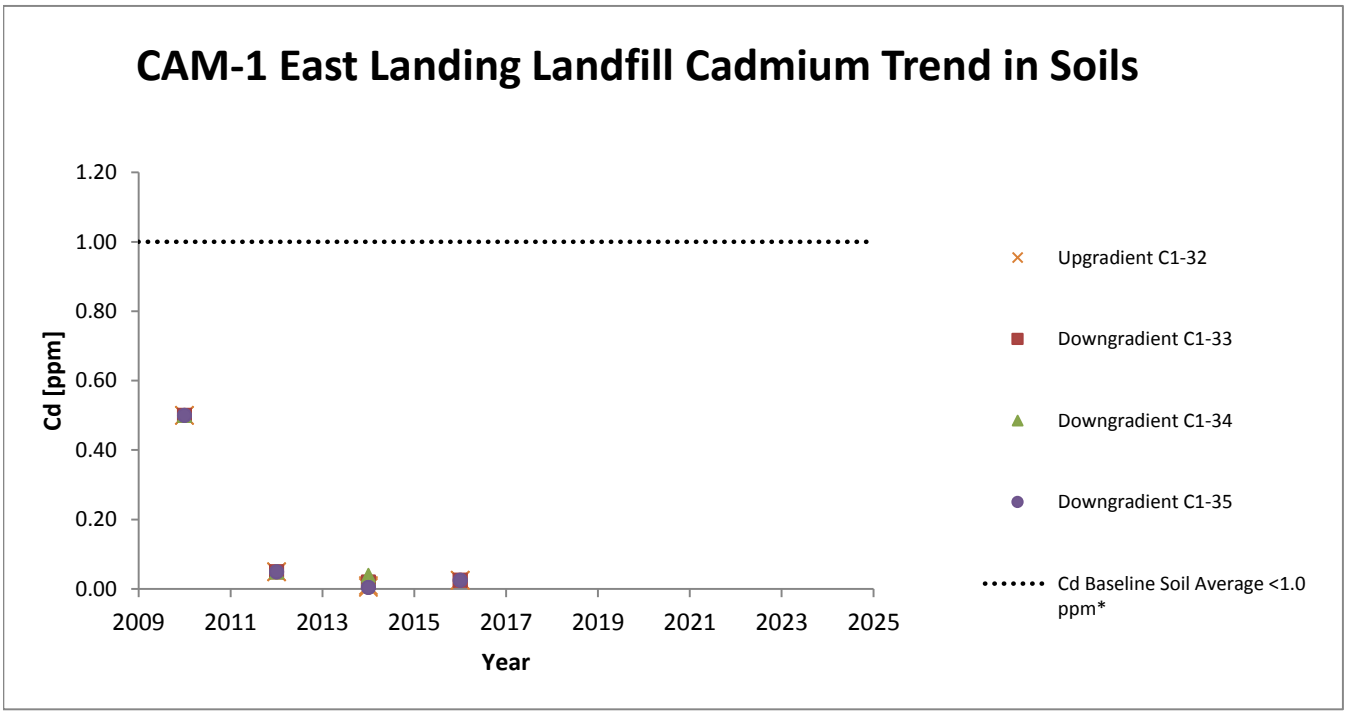
CAM-1 East Landing Landfill Copper Trend in Soils



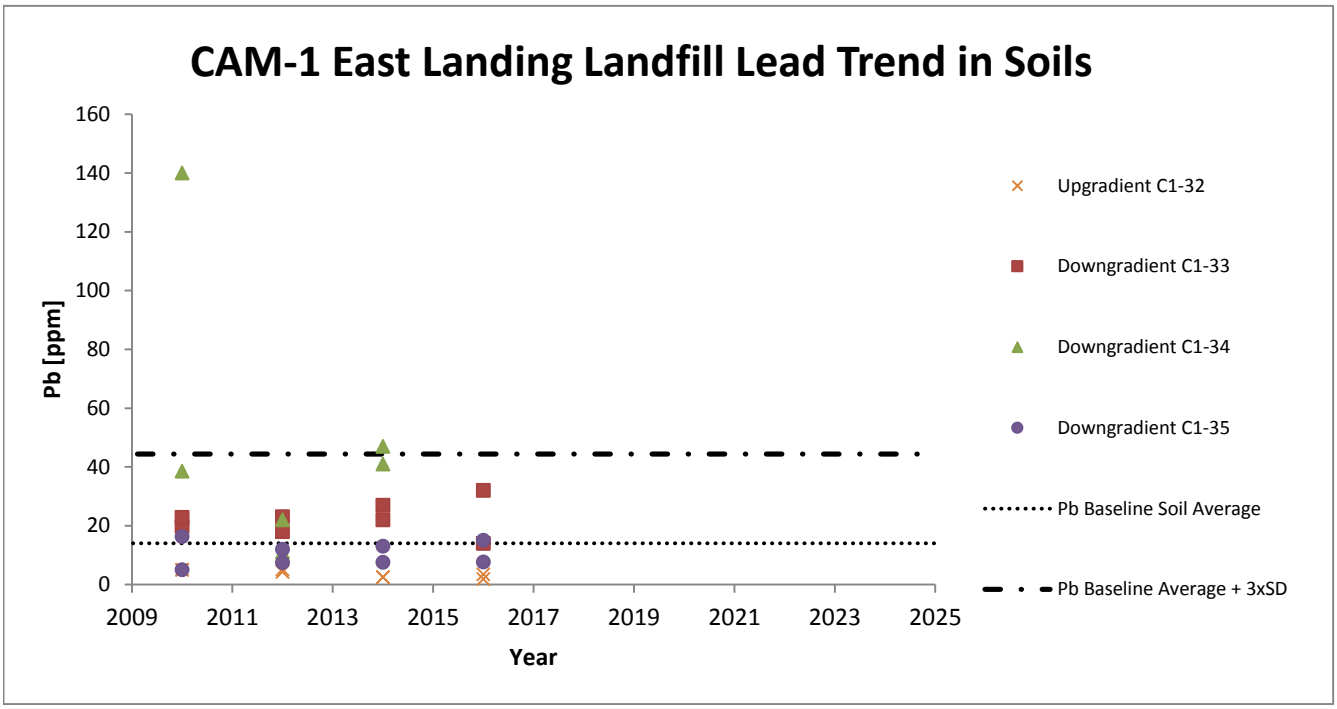
CAM-1 East Landing Landfill Nickel Trend in Soils

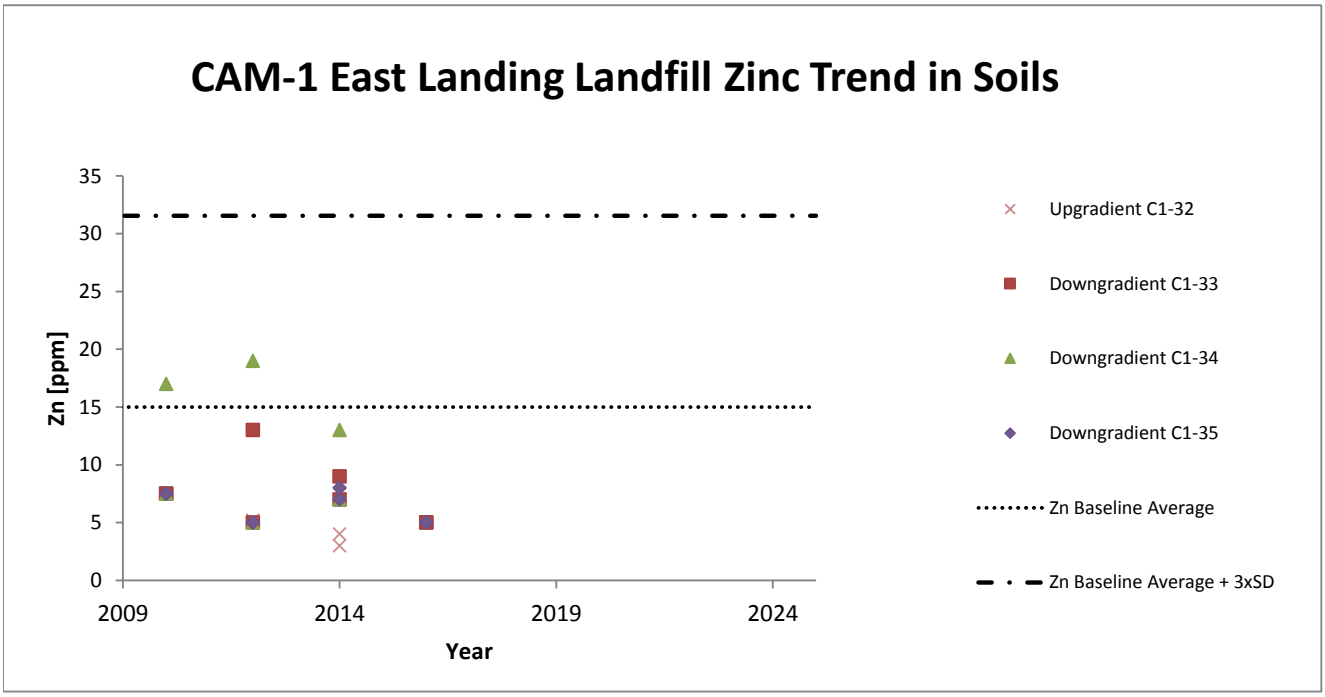


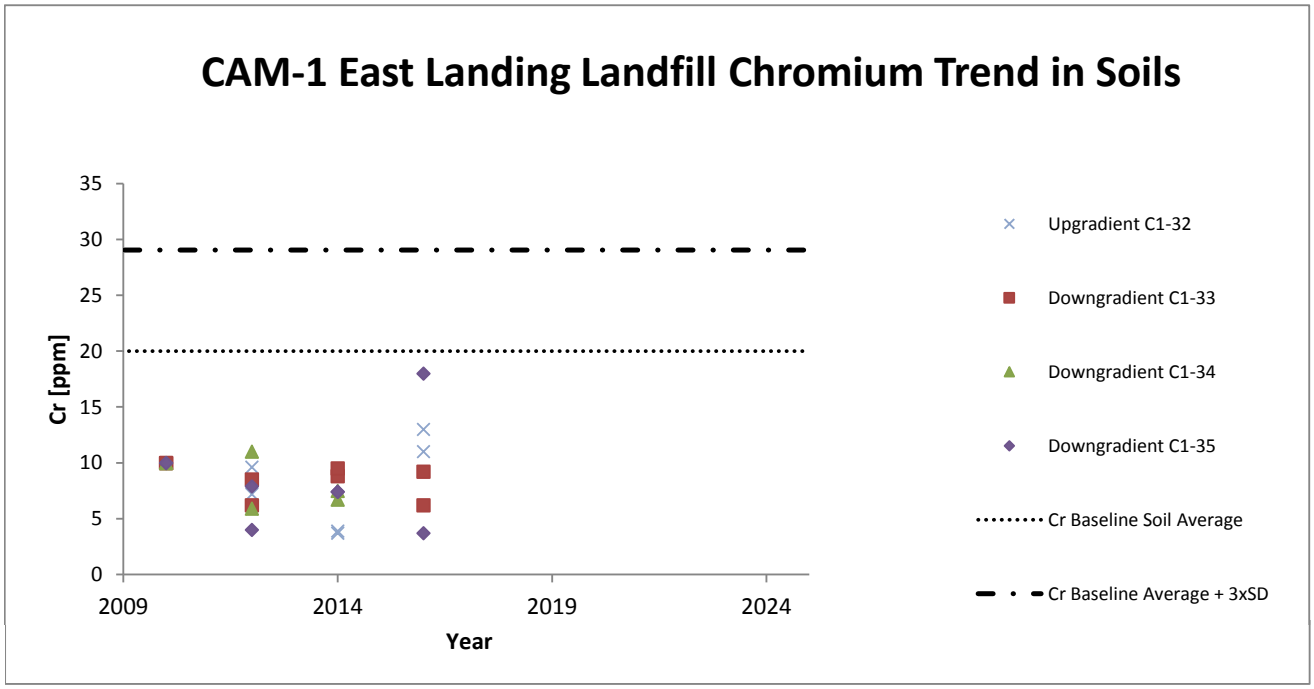


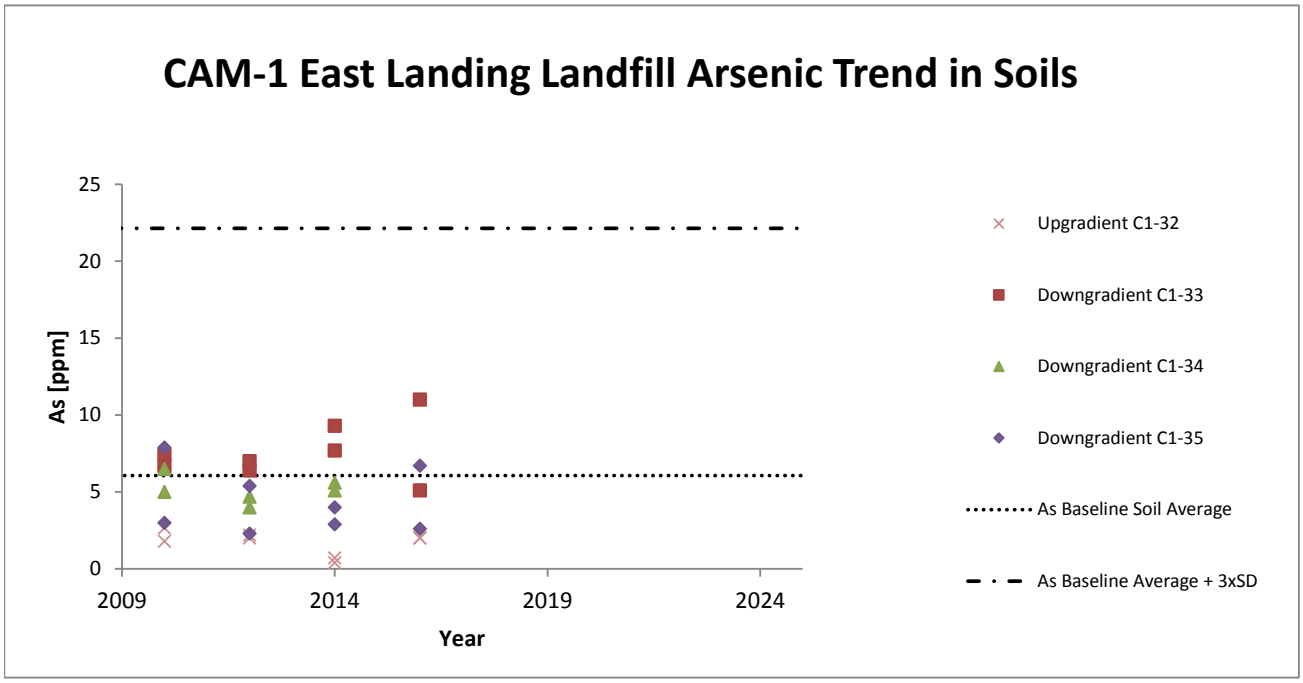


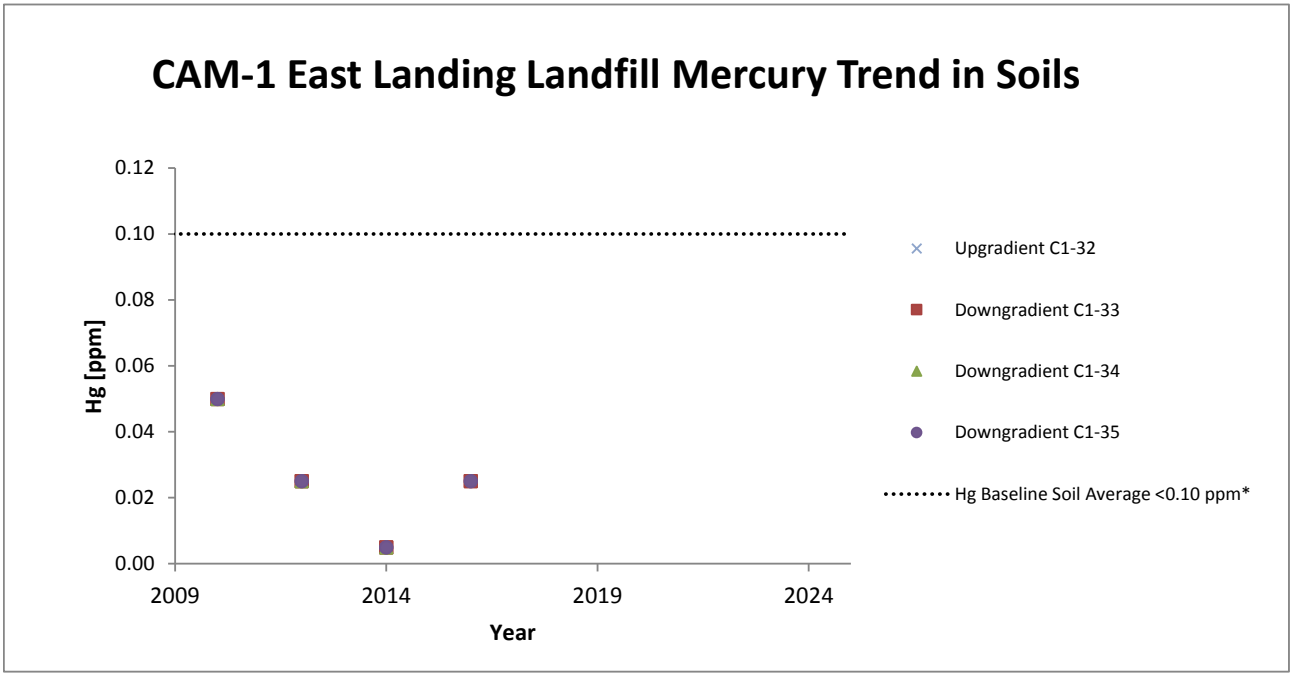
*Co Baseline Average SD = 0


CAM-1 East Landing Landfill Lead Trend in Soils
Pb [ppm]
160
140
120
100
80
60
40
20
0
2009
2011
2013
2015
2017
2019
2021
2023
2025
Year
Upgradient C1-32
Downgradient C1-33
Downgradient C1-34
Downgradient C1-35
Pb Baseline Soil Average
Pb Baseline Average + 3xSD

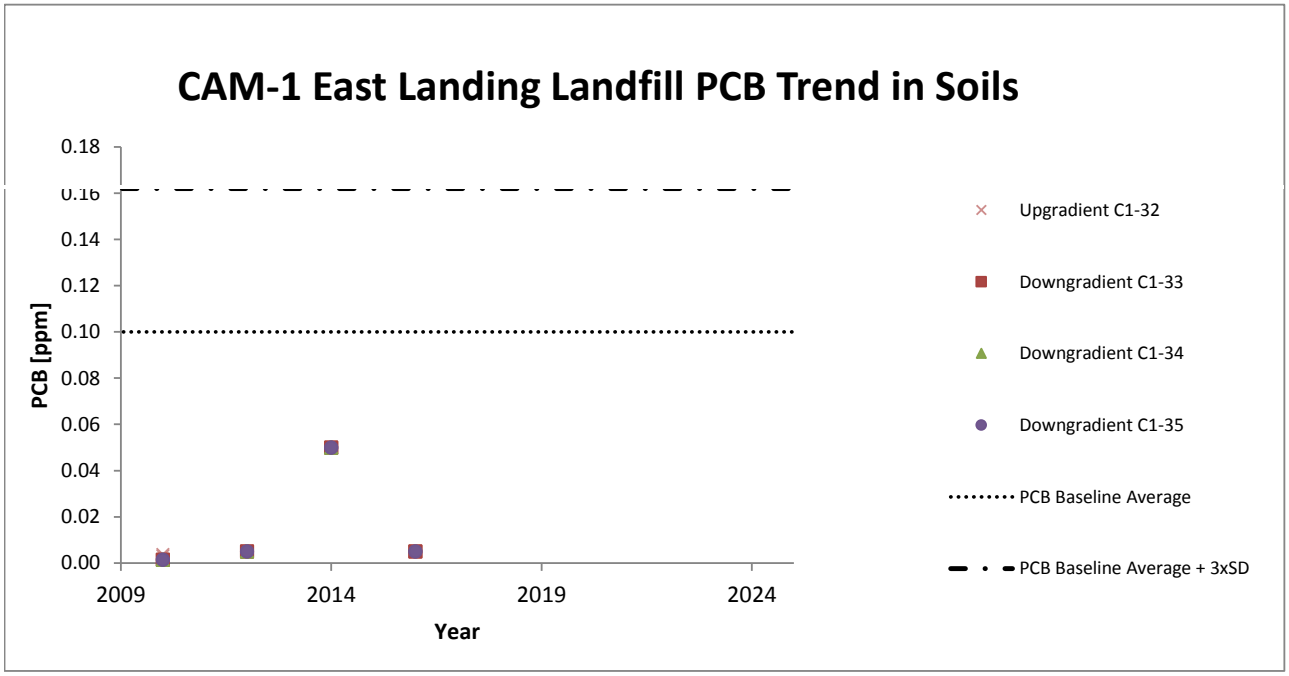

CAM-1 East Landing Landfill Zinc Trend in Soils
Zn [ppm]
35
30
25
20
15
10
5
0
2009
2014
2019
2024
Year
Upgradient C1-32
Downgradient C1-33
Downgradient C1-34
Downgradient C1-35
Zn Baseline Average
Zn Baseline Average + 3xSD

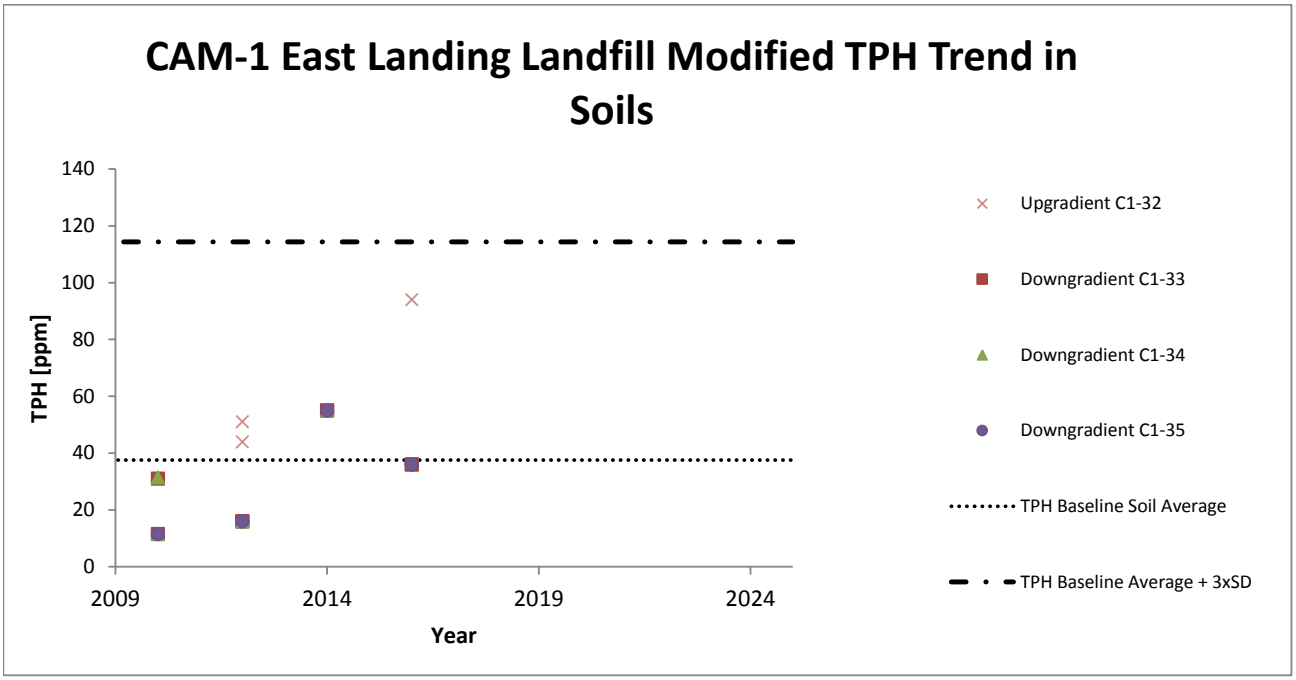

CAM-1 East Landing Landfill Chromium Trend in Soils
Cr [ppm]
35
30
25
20
15
10
5
0
2009
2014
2019
2024
Year
Upgradient C1-32
Downgradient C1-33
Downgradient C1-34
Downgradient C1-35
Cr Baseline Soil Average
Cr Baseline Average + 3xSD


CAM-1 East Landing Landfill Arsenic Trend in Soils
As [ppm]
25
20
15
10
5
0
2009
2014
2019
2024
Year
Upgradient C1-32
Downgradient C1-33
Downgradient C1-34
Downgradient C1-35
As Baseline Soil Average
As Baseline Average + 3xSD



*Hg Baseline Average SD = 0

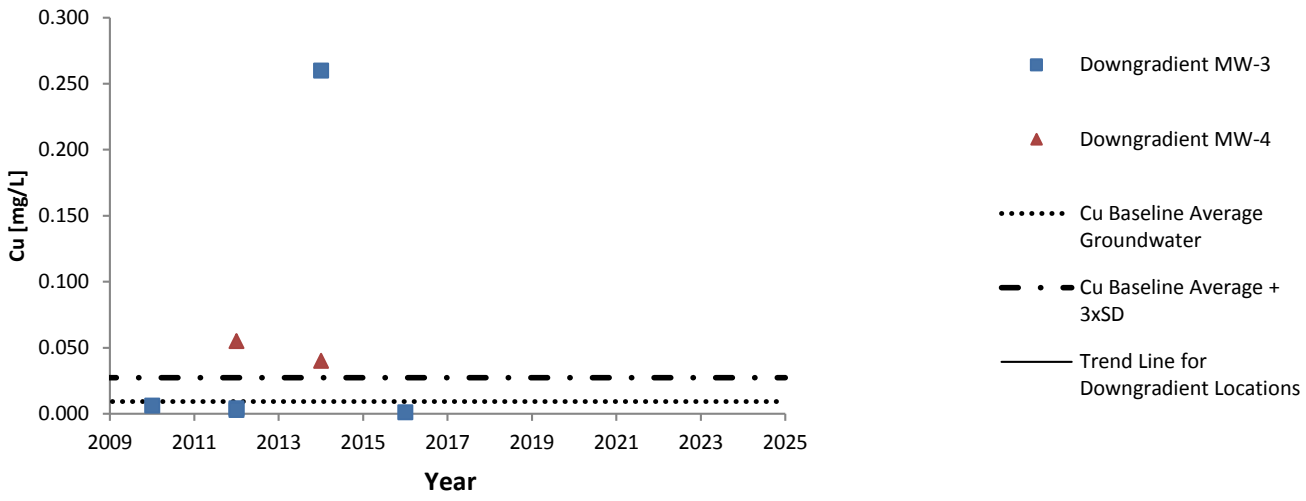



CAM-1 East Landing Landfill Modified TPH Trend in Soils
TPH [ppm]
140
120
100
80
60
40
20
0
2009
2014
2019
2024
Year
Upgradient C1-32
Downgradient C1-33
Downgradient C1-34
Downgradient C1-35
TPH Baseline Soil Average
TPH Baseline Average + 3xSD

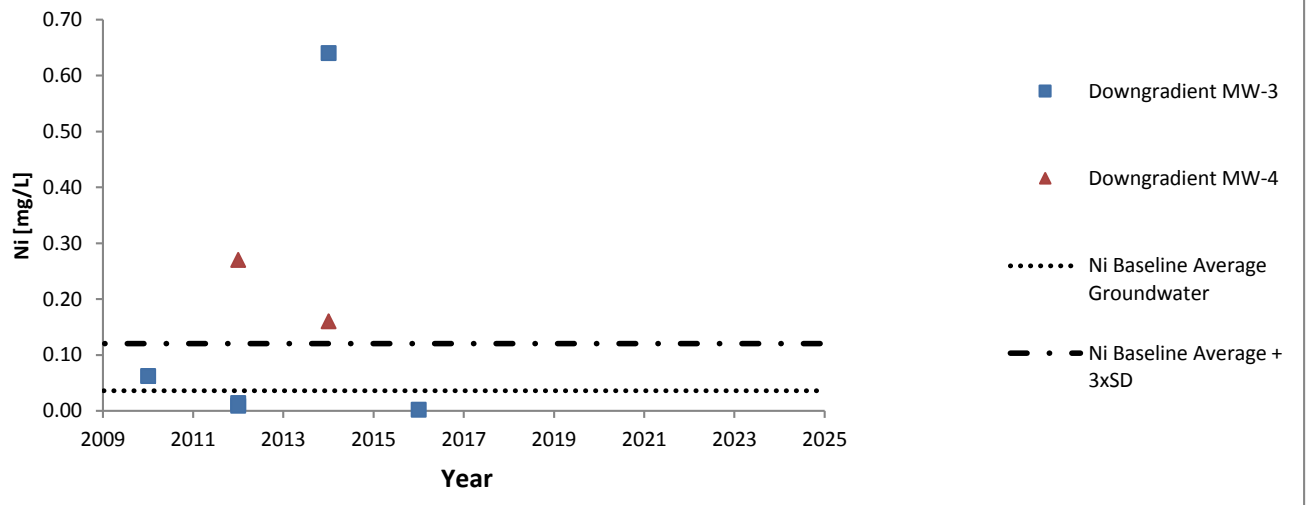
APPENDIX F

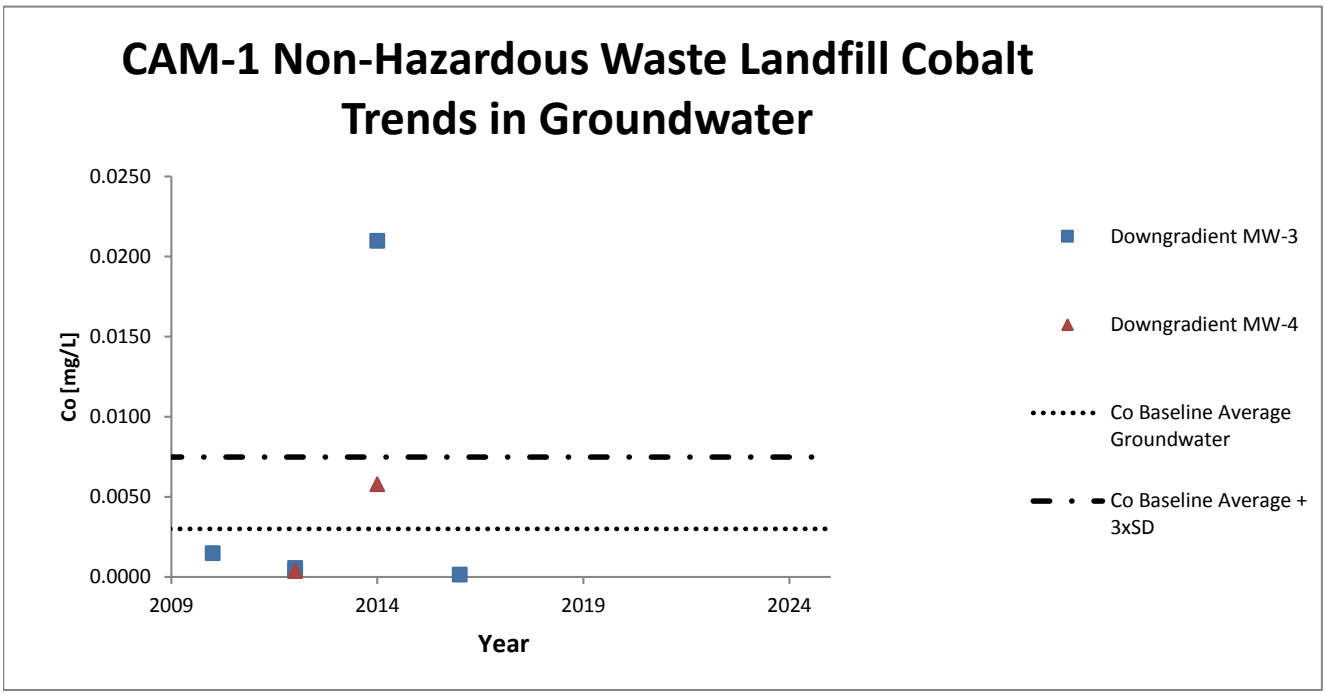
Groundwater Trend Analysis Graphs

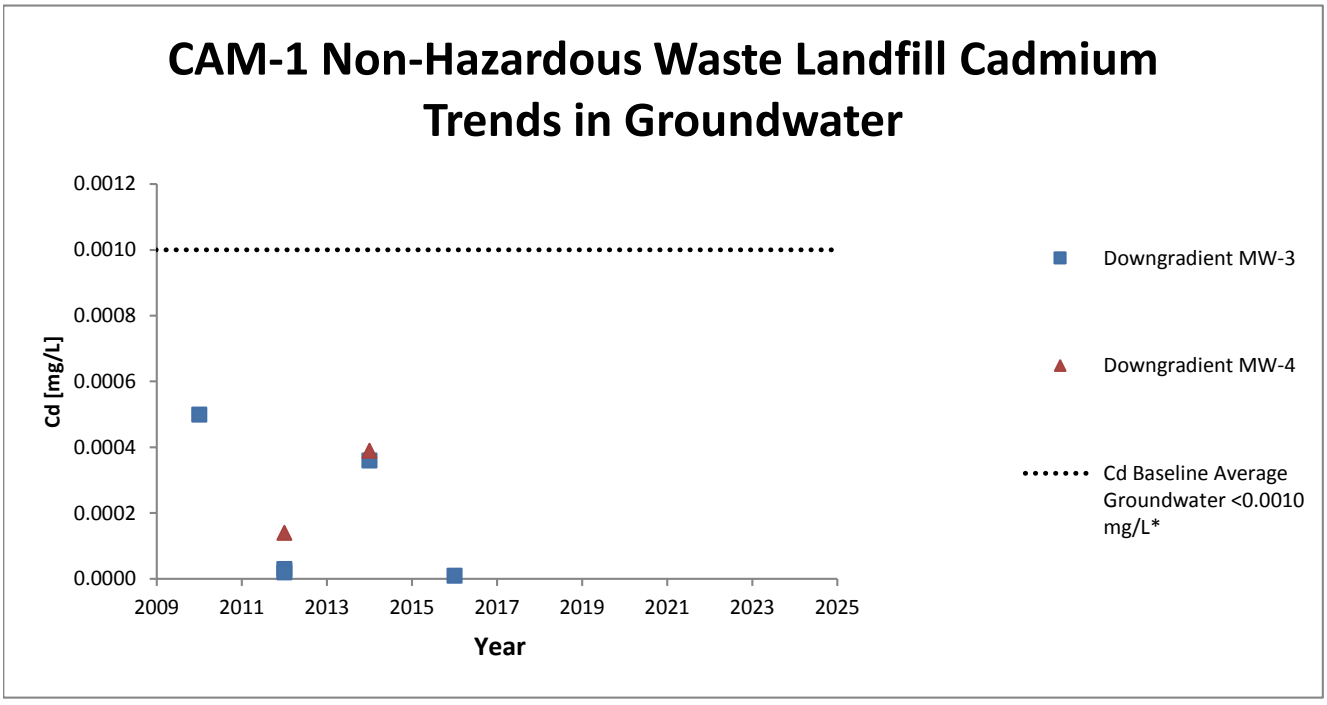
CAM-1 Non-Hazardous Waste Landfill Copper Trends in Groundwater



CAM-1 Non-Hazardous Waste Landfill Nickel Trends in Groundwater

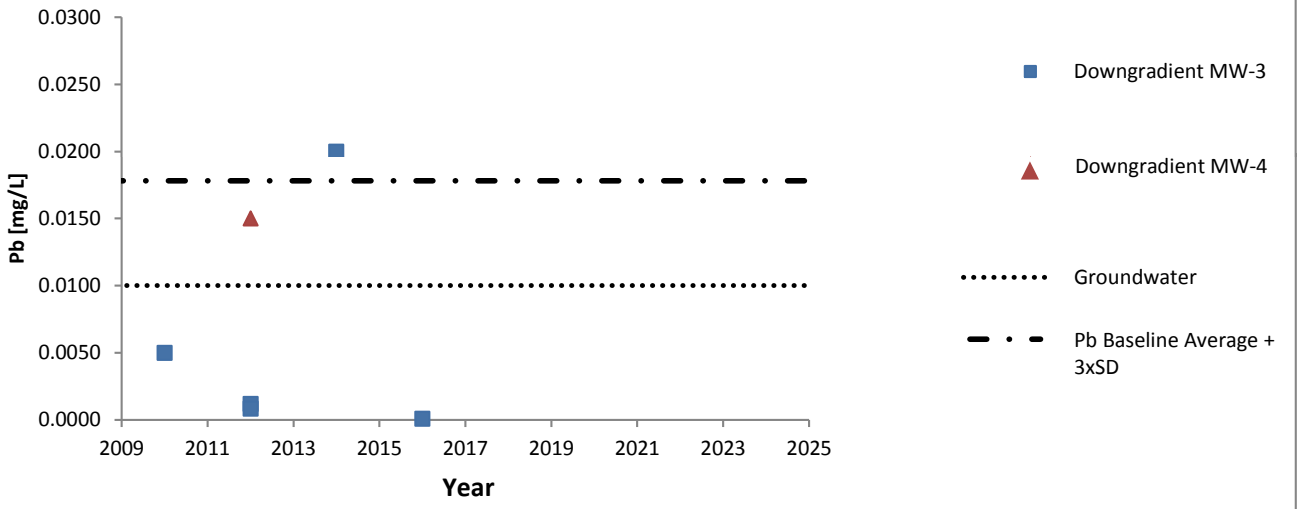




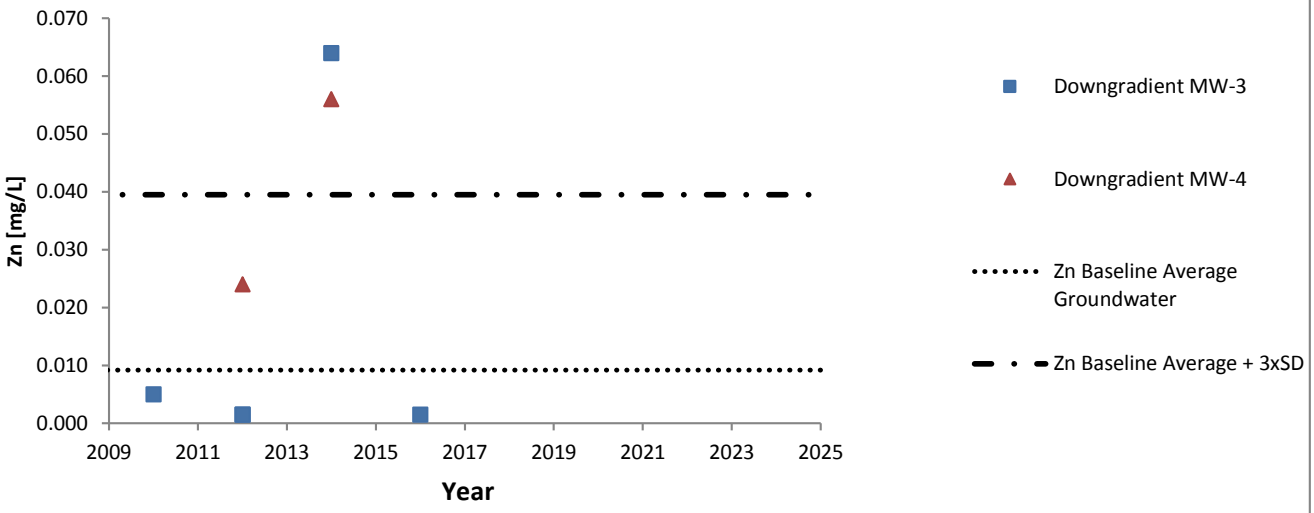


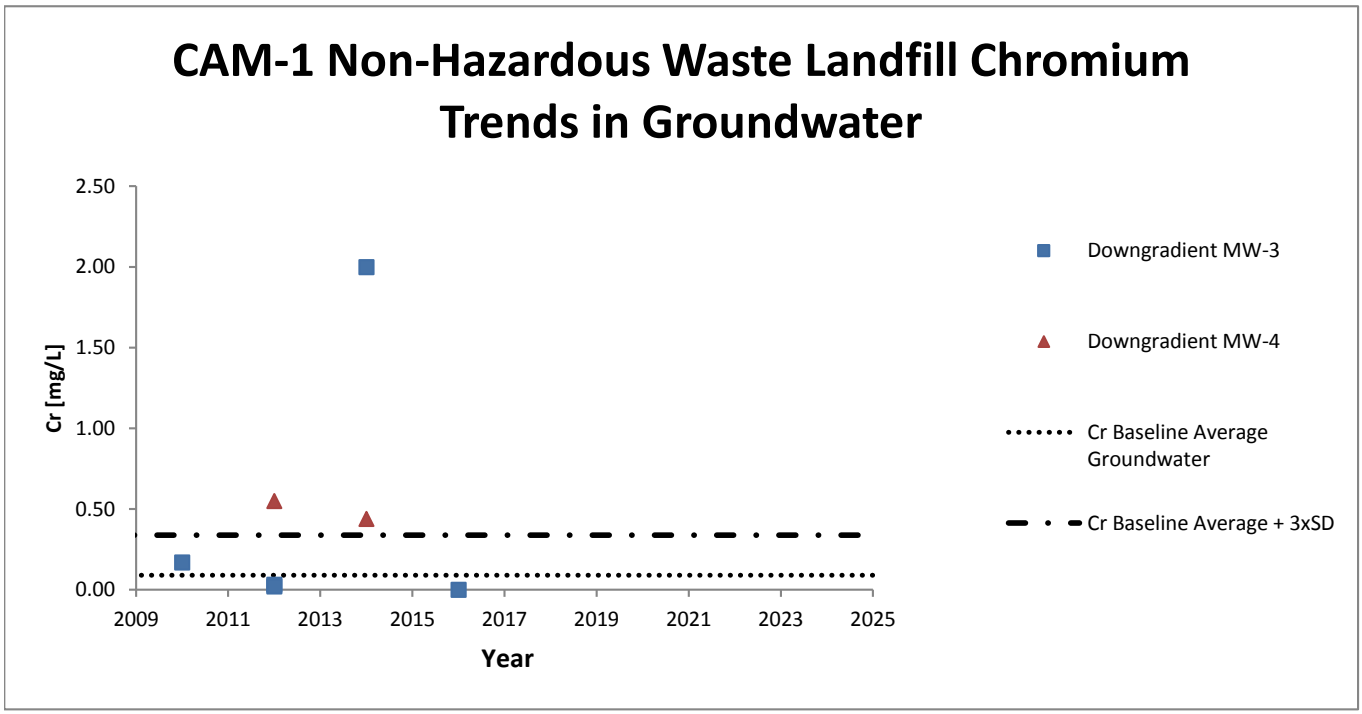
* Cd Baseline SD = 0

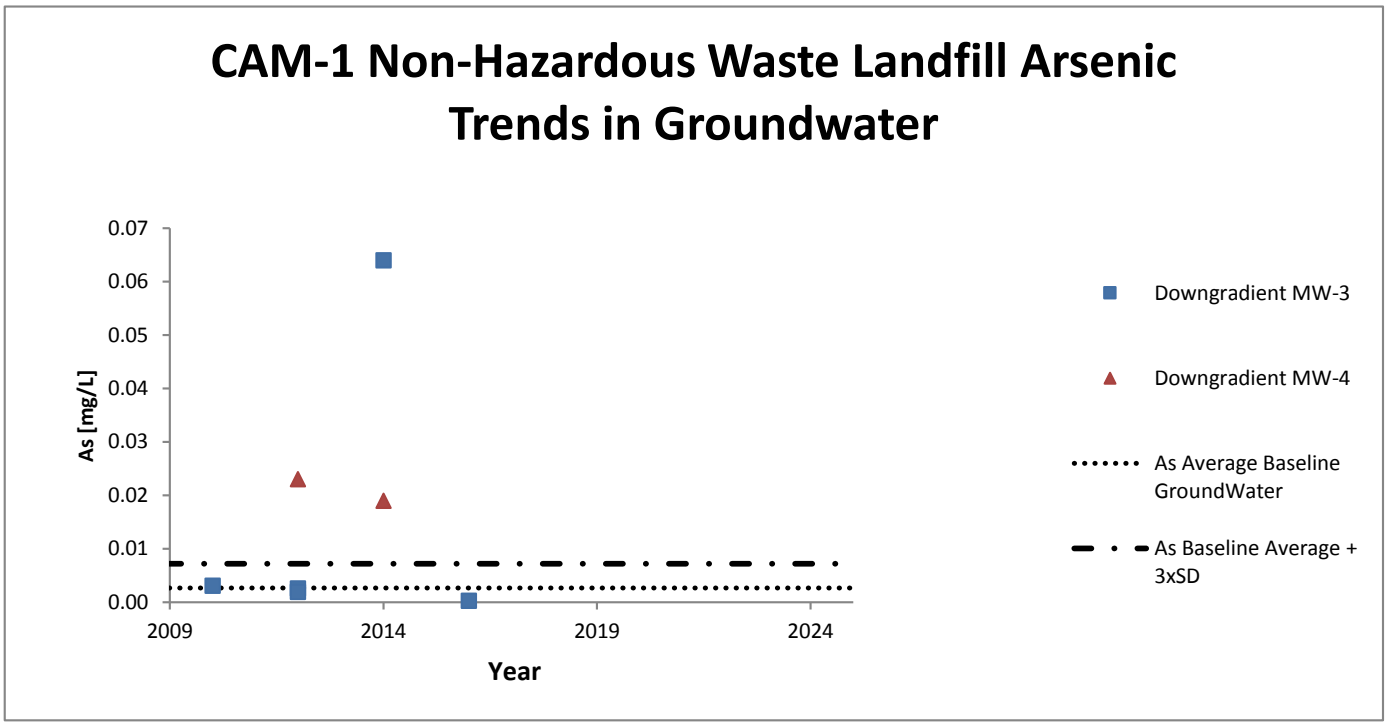
CAM-1 Non-Hazardous Waste Landfill Lead Trends in Groundwater

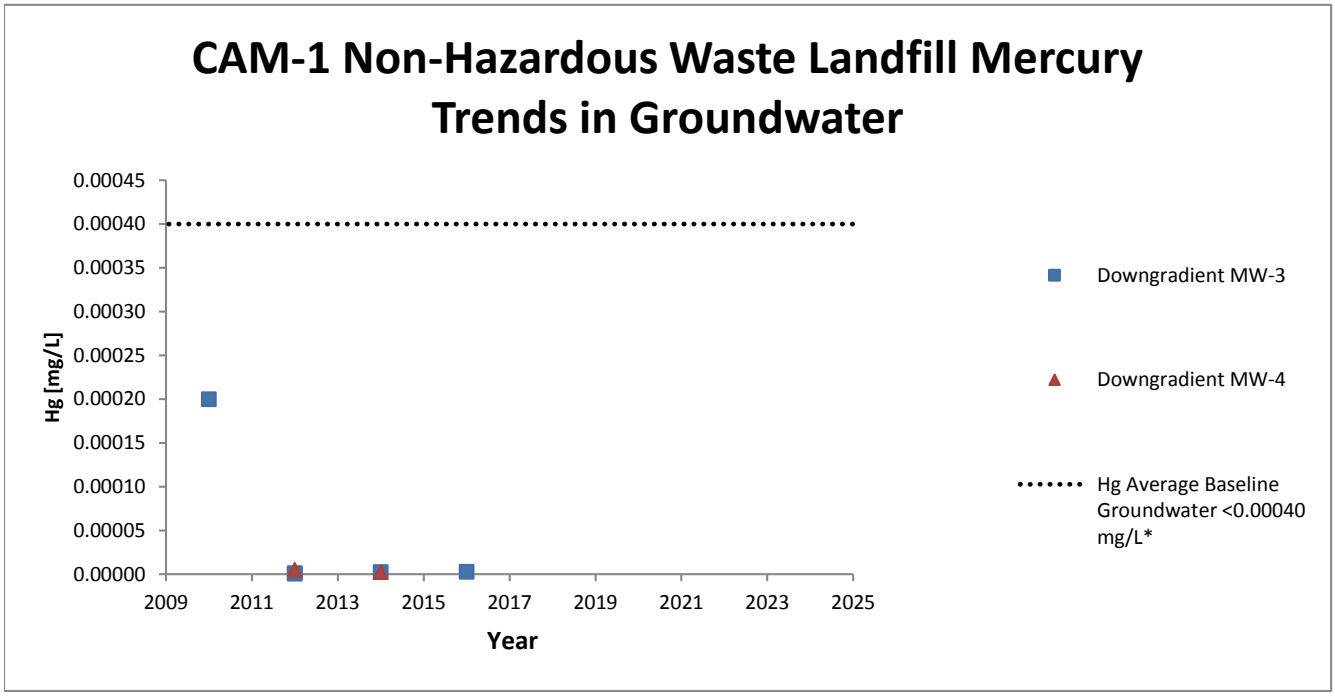


CAM-1 Non-Hazardous Waste Landfill Zinc Trends in Groundwater



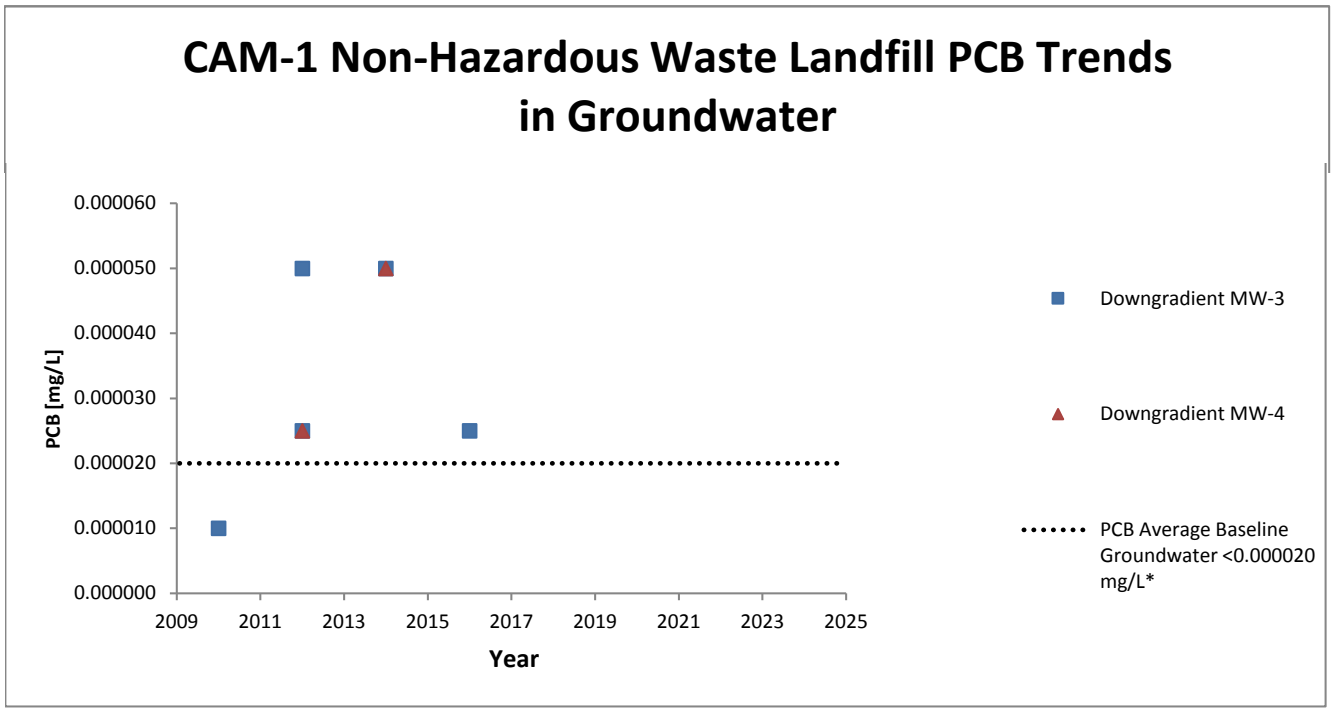

CAM-1 Non-Hazardous Waste Landfill Chromium Trends in Groundwater
Cr [mg/L]
2.50
2.00
1.50
1.00
0.50
0.00
2009
2011
2013
2015
2017
2019
2021
2023
2025
Year
Downgradient MW-3
Downgradient MW-4
Cr Baseline Average Groundwater
Cr Baseline Average + 3xSD


CAM-1 Non-Hazardous Waste Landfill Arsenic Trends in Groundwater
As [mg/L]
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
2009
2014
2019
2024
Year
Downgradient MW-3
Downgradient MW-4
As Average Baseline GroundWater
As Baseline Average + 3xSD

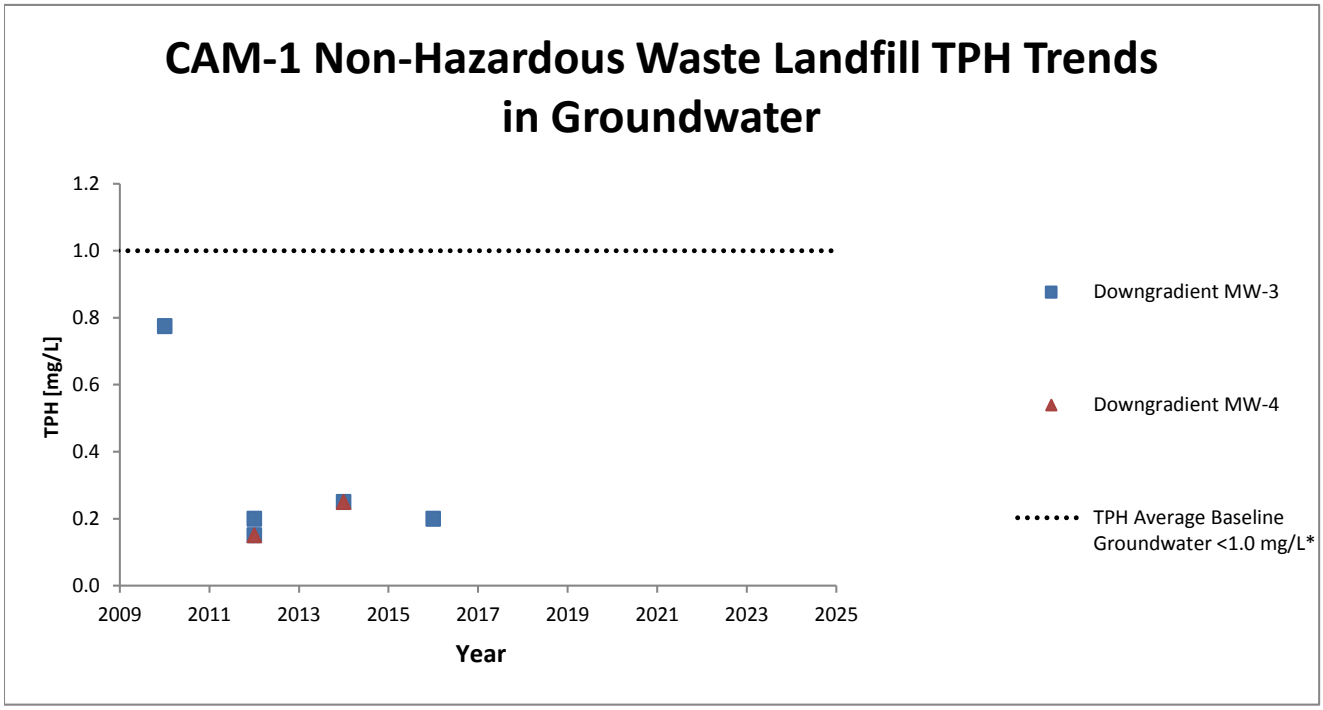


Hg Baseline SD = 0

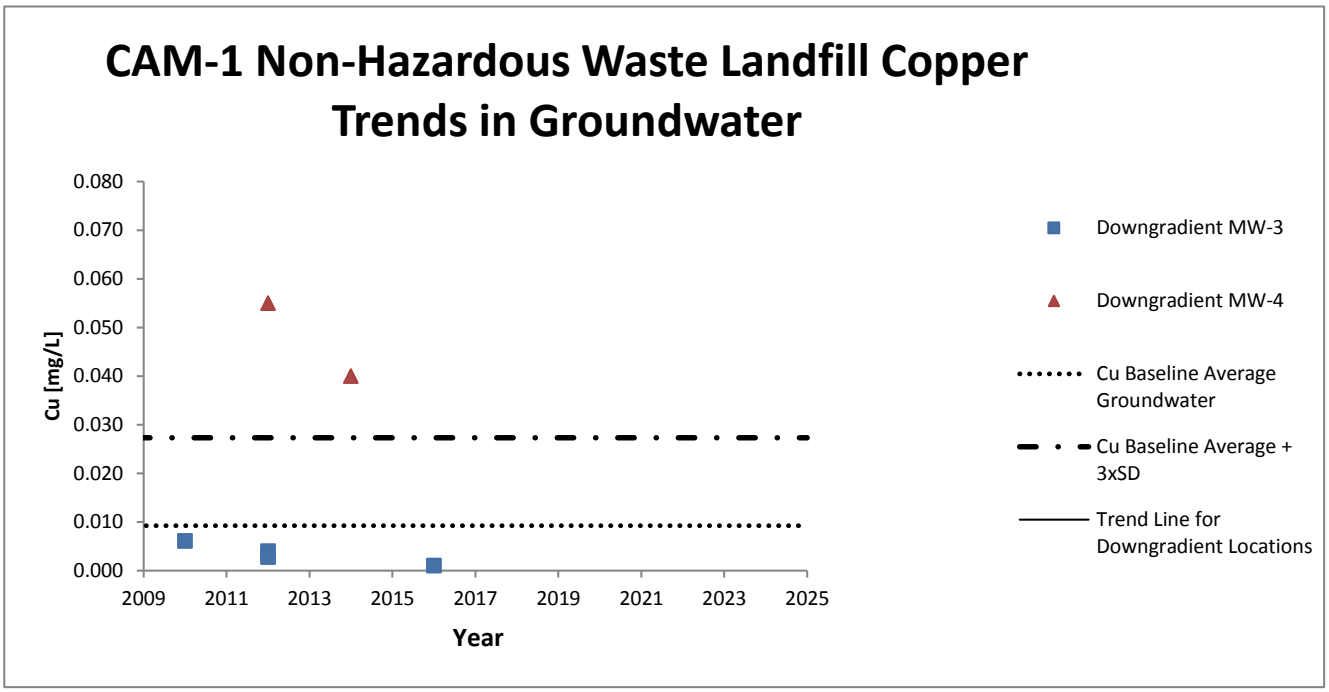
*



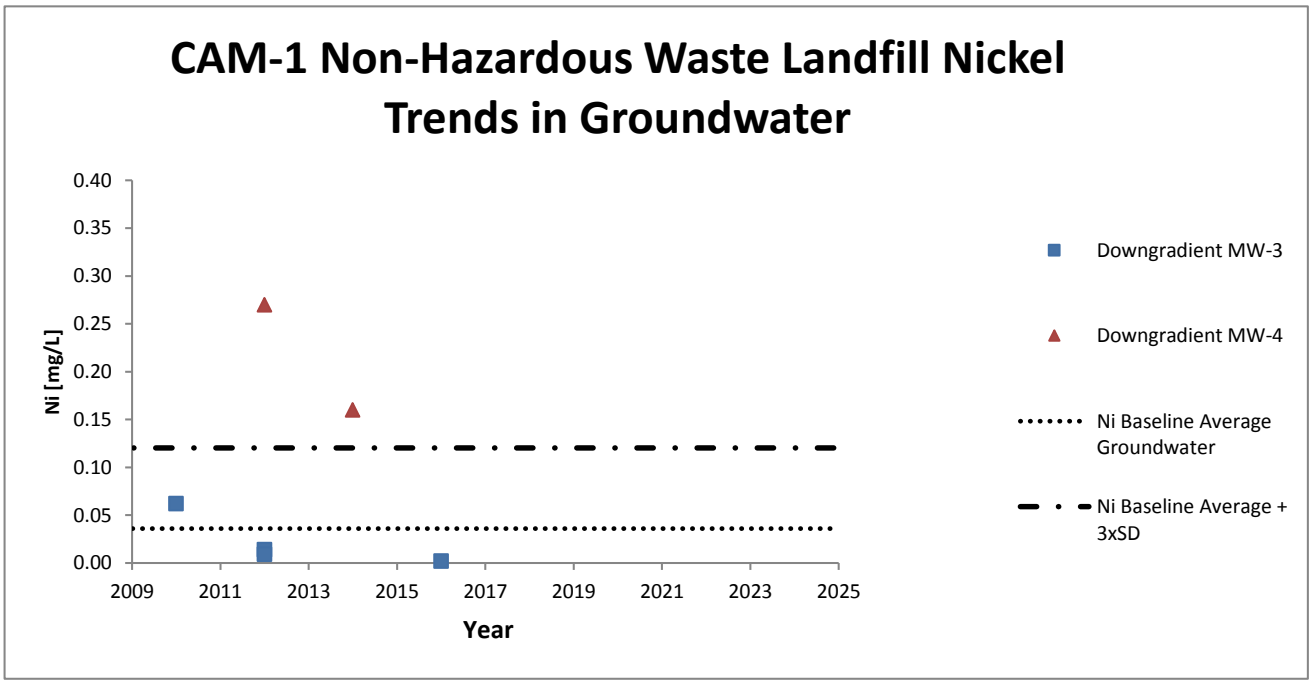
*PCB Baseline SD = 0



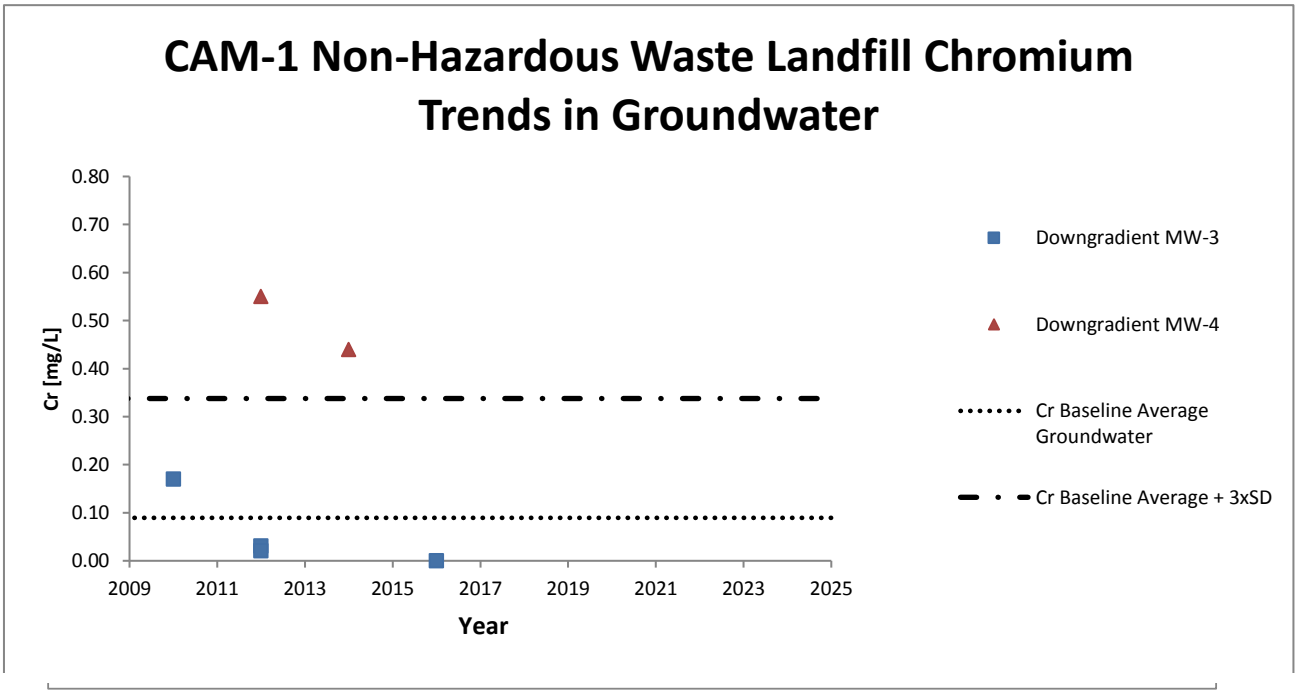
*TPH Baseline SD = 0



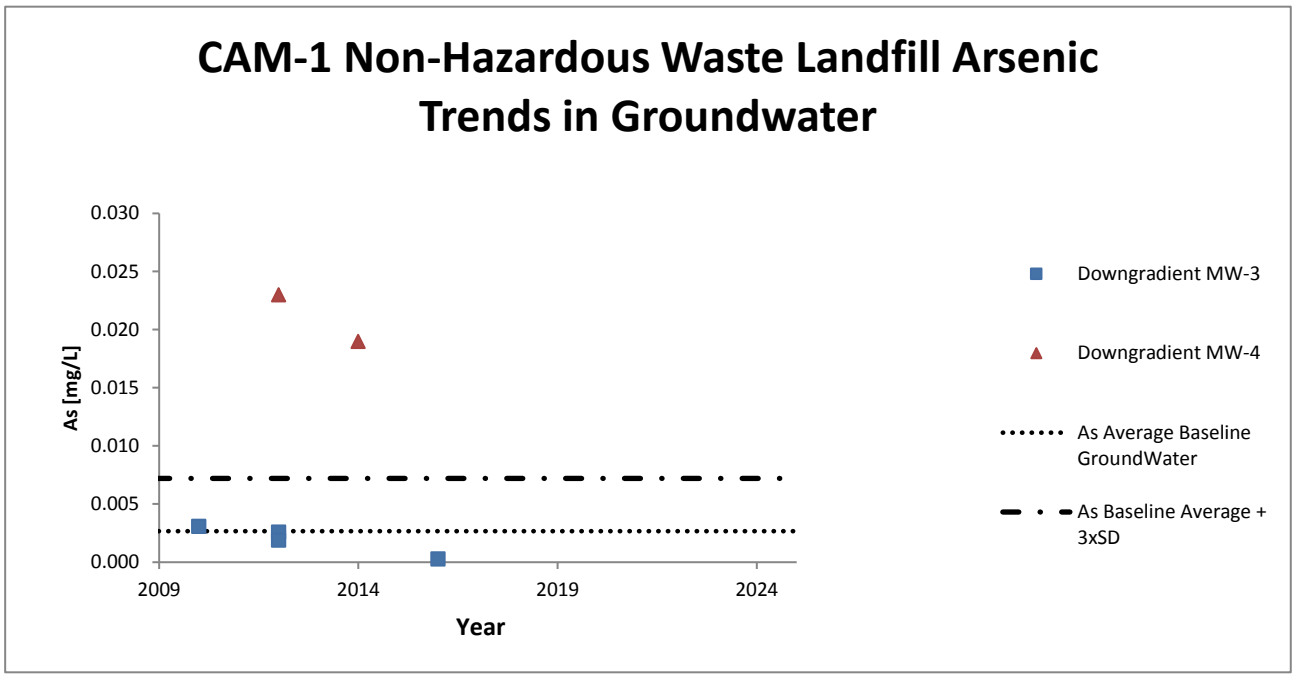
Higher copper levels were found in MW-3 in 2014 (0.26ppm). This chart does not show that higher value in order to better display previous year's results.



Higher nickel levels were found in MW-3 in 2014 (0.64 ppm). This chart does not show that higher value in order to better display previous year's results.

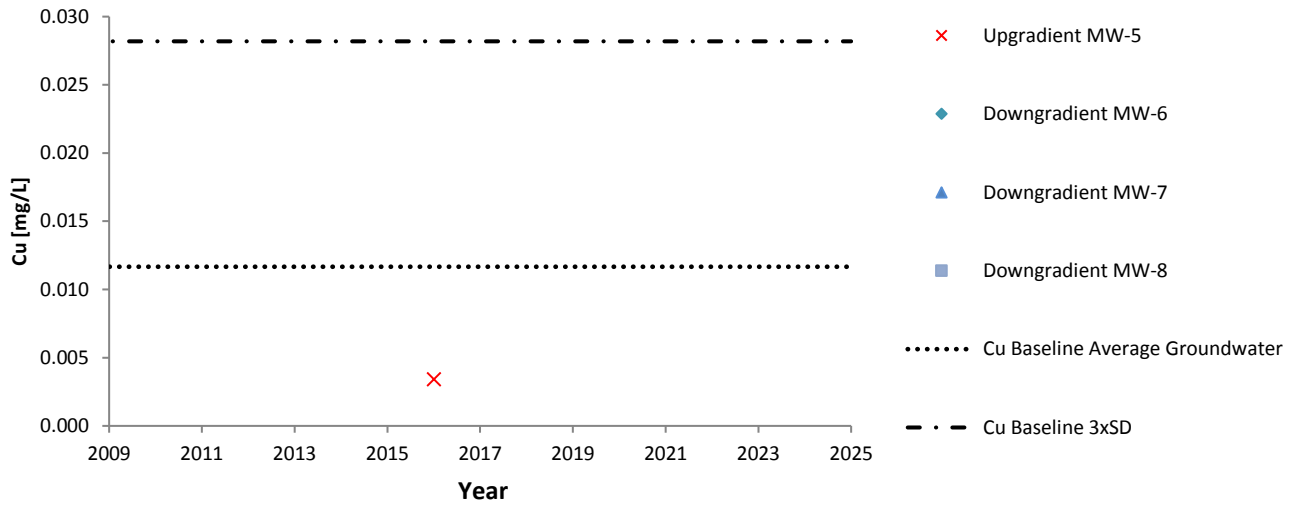


Higher chromium levels were found in MW-3 in 2014 (0.021 ppm). This chart does not show that higher value in order to better display previous year's results.

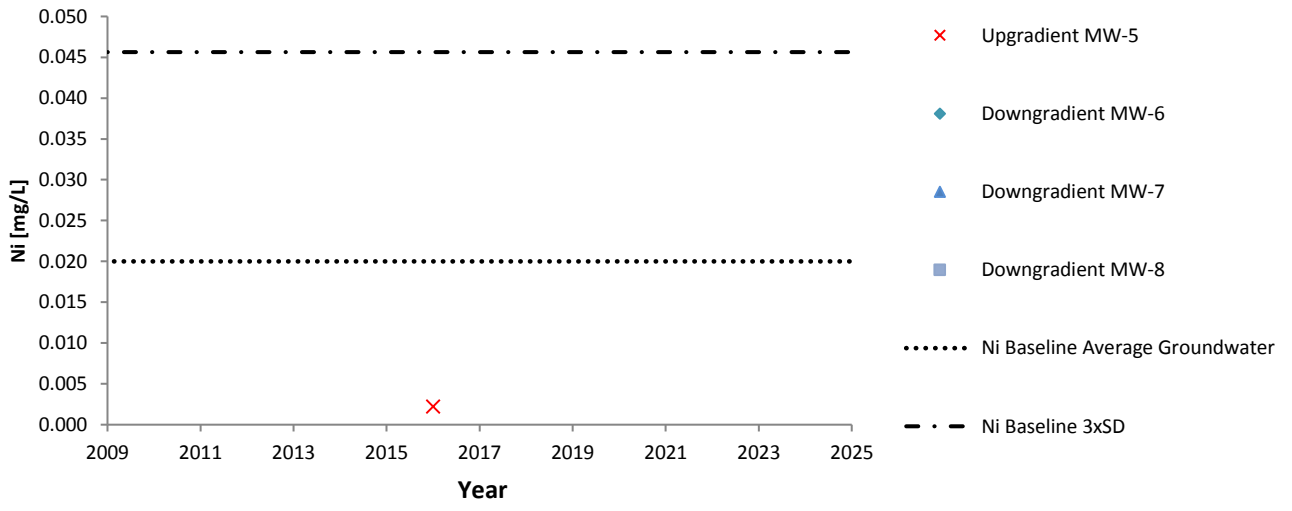


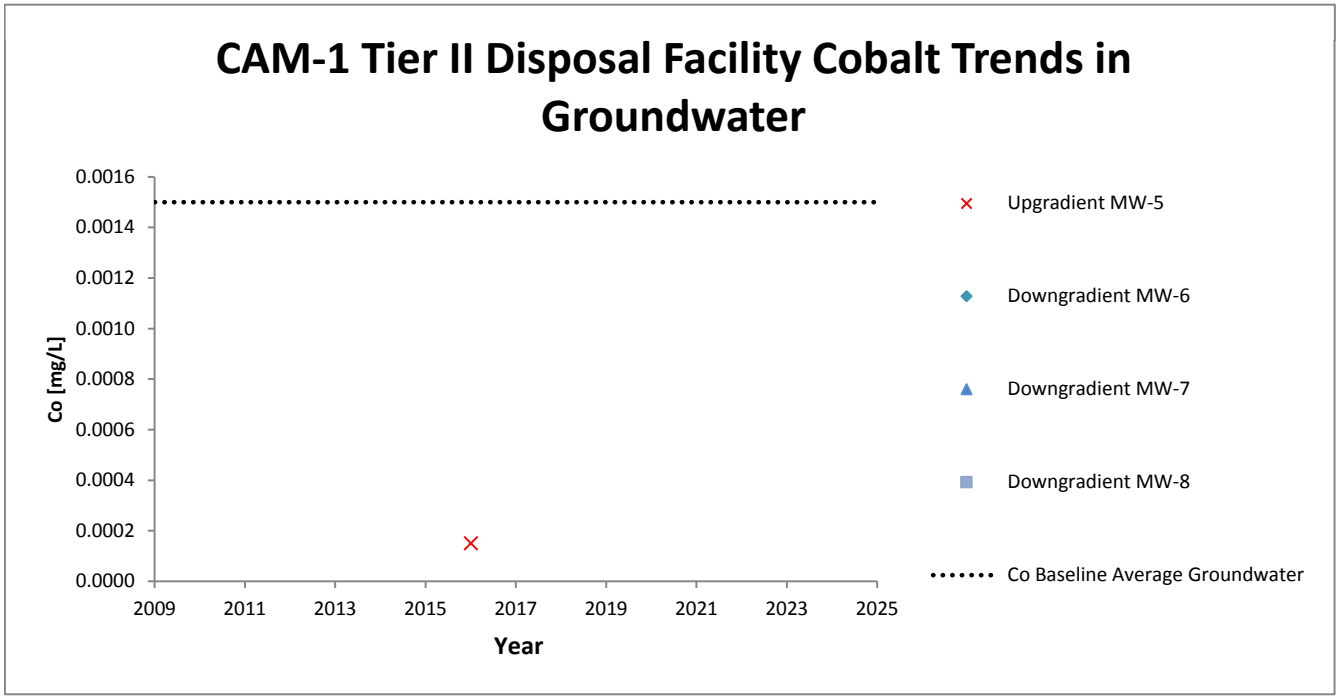
Higher arsenic levels were found in MW-3 in 2014 (0.064 ppm). This chart does not show that higher value in order to better display previous year's results.

CAM-1 Tier II Disposal Facility Copper Trends in Groundwater

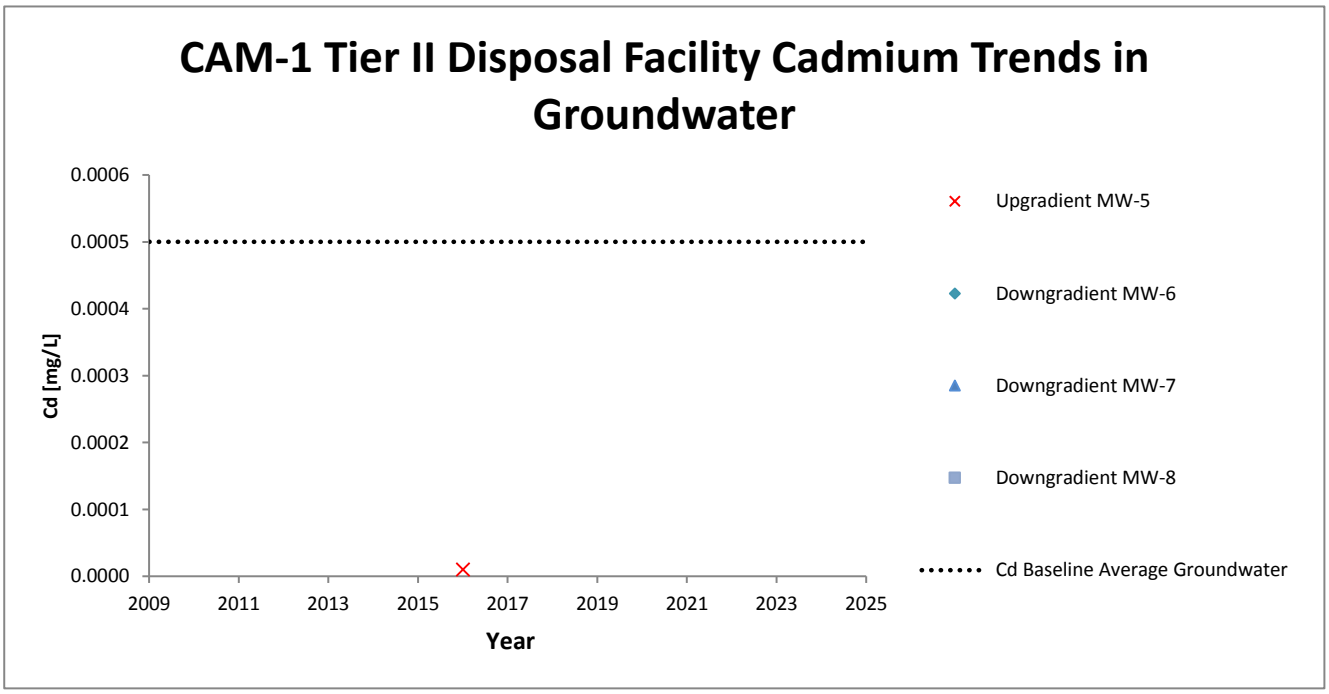


CAM-1 Tier II Disposal Facility Nickel Trends in Groundwater



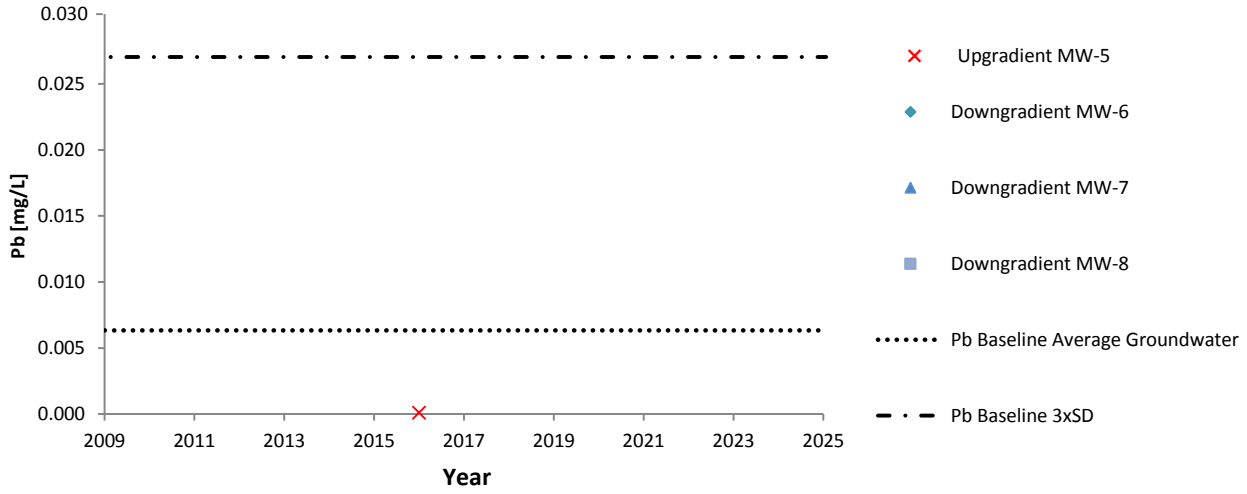


* Co Baseline SD = 0

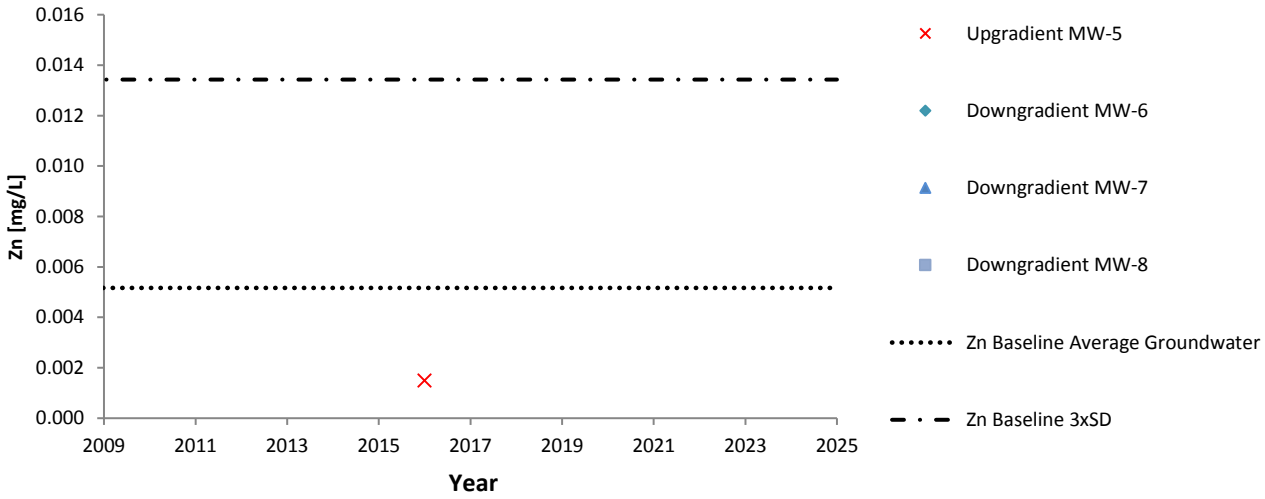


* Cd Baseline SD = 0

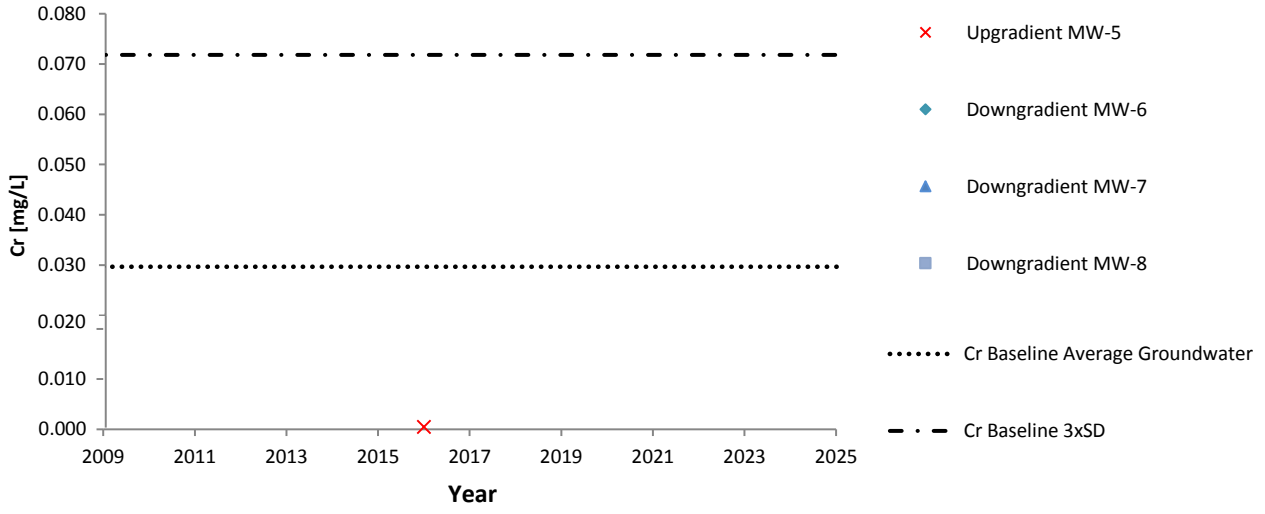
CAM-1 Tier II Disposal Facility Lead Trends in Groundwater



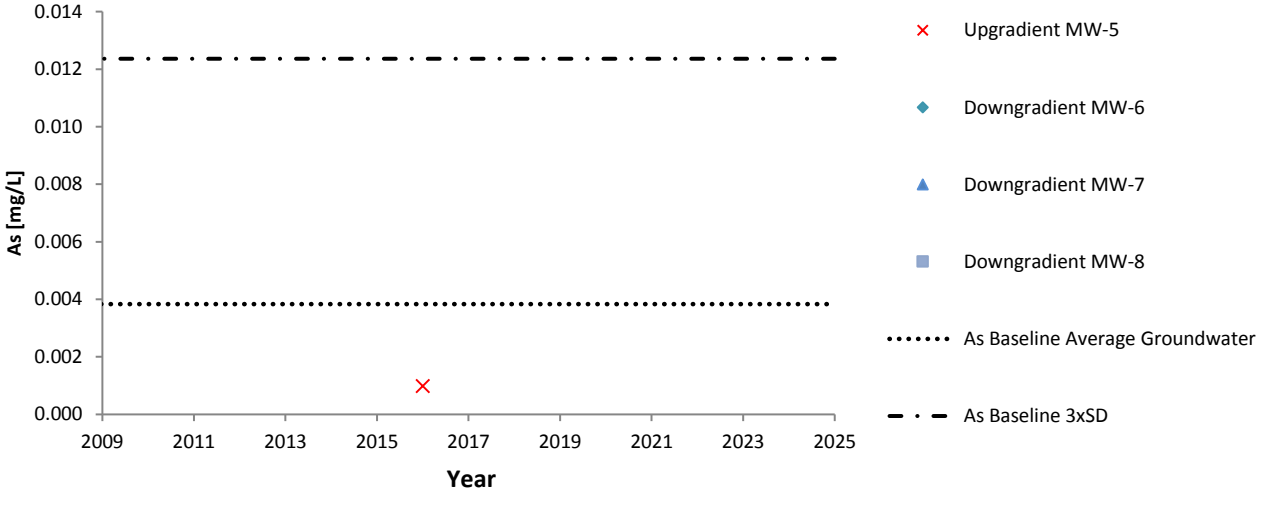
CAM-1 Tier II Disposal Facility Zinc Trends in Groundwater

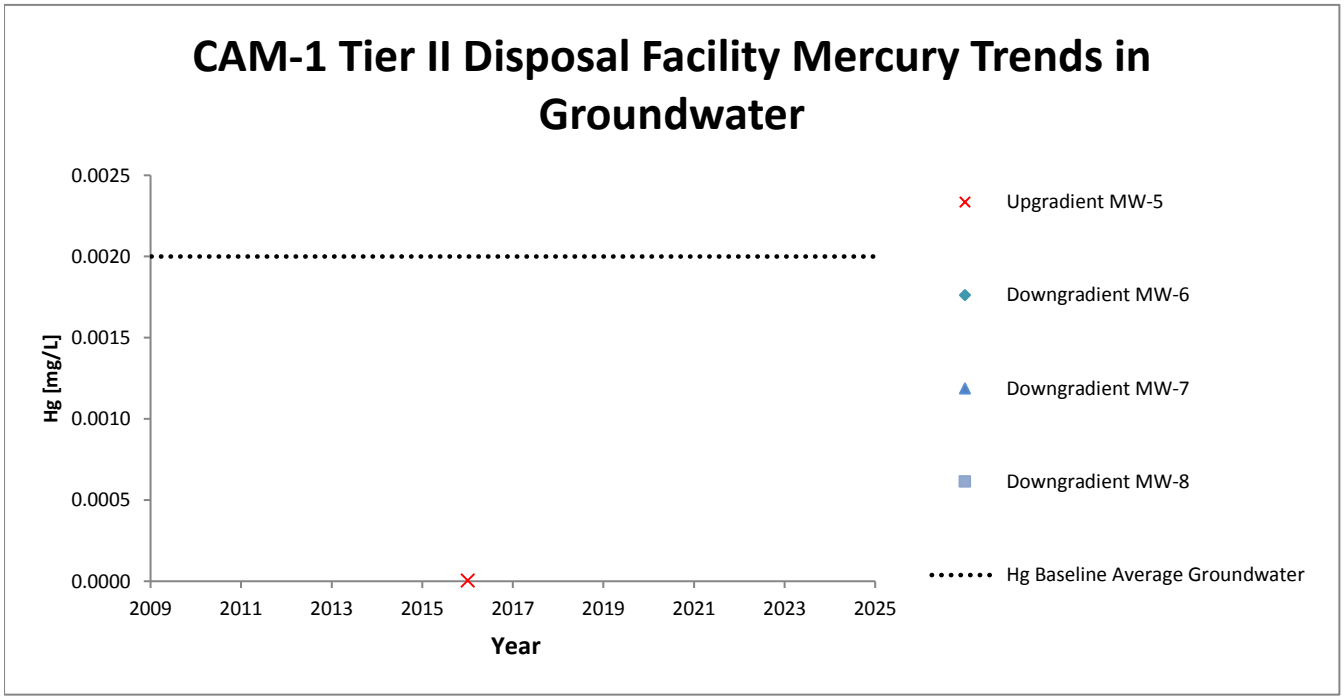


CAM-1 Tier II Disposal Facility Chromium Trends in Groundwater

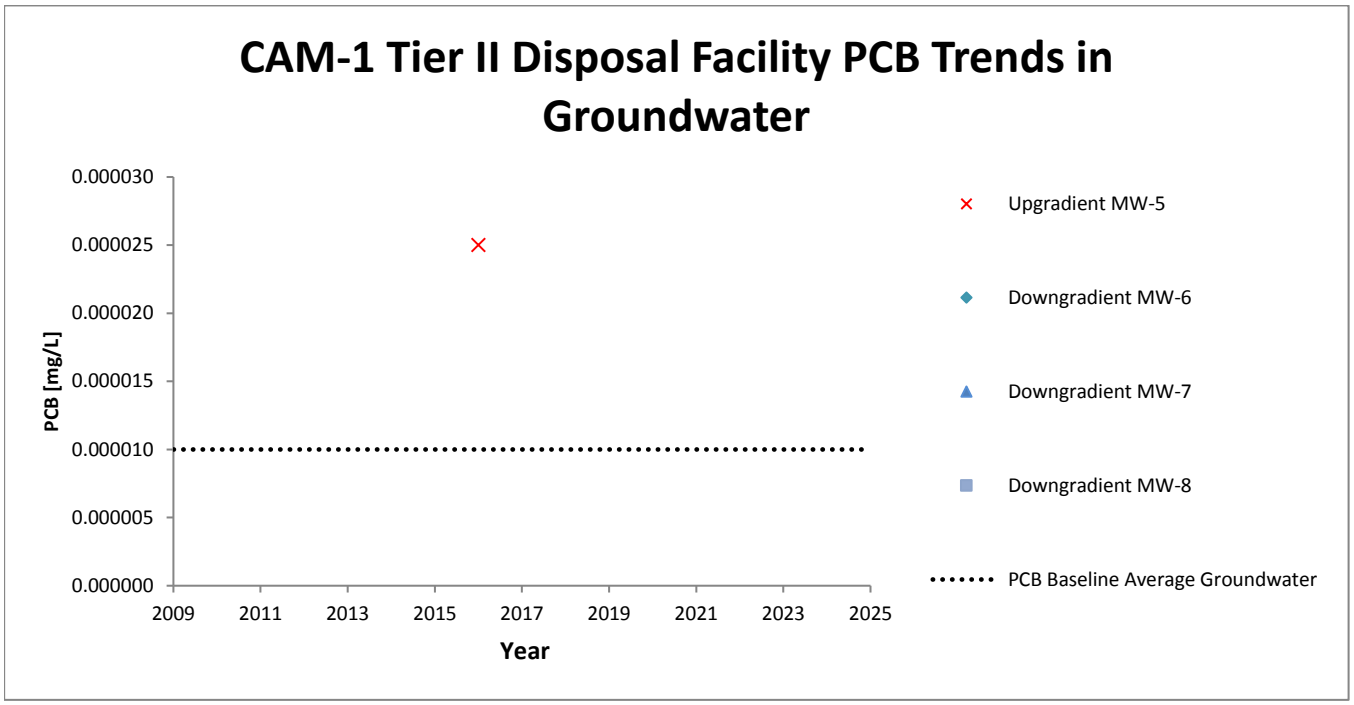


CAM-1 Tier II Disposal Facility Arsenic Trends in Groundwater

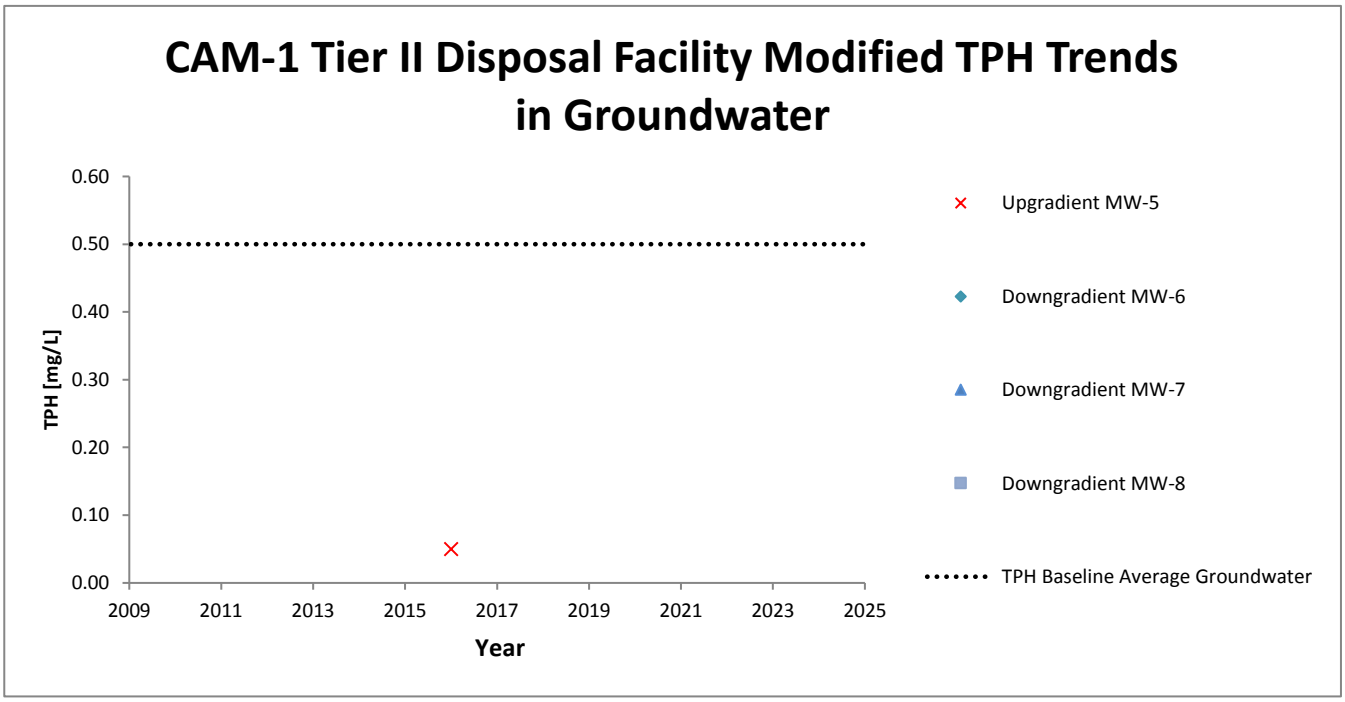




*Hg Baseline Average SD = 0



*PCB Baseline Average SD = 0



* TPH Baseline Average SD = 0

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