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 PIN-2 FORMER DEW LINE SITE

Cape Young, Nunavut

March 12, 2019

LONG-TERM LANDFILL MONITORING AT THE PIN-2 FORMER DEW LINE SITE

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Separate Package:

CD ROM- Containing All Raw 2018 PIN-2 Site Photographs

ACRONYMS AND ABBREVIATIONS

bgs	below ground surface
BOC	natural biogenic organic compound
DEW	Distant Early Warning
DGPS	Differential Global Positioning System
DND	Department of National Defence
GPS	Global Positioning System
HDPE	High Density Polyethylene
LRR	Long Range Radar
masl	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
RODI	Reverse Osmosis Deionized
RPD	Relative Percent Difference
SSR	Short-Range Radar
TOR	Terms of Reference
USAF	United States Air Force

EXECUTIVE SUMMARY

Public Services and Procurement Canada (PSPC) was engaged by Department of National Defence (DND) to procure environmental services for the monitoring of Distant Early Warning (DEW) Line sites in Canada. PSPC acquired the services of Arcadis Canada Inc. (Arcadis) to perform the work and the management of the monitoring of DND DEW Line Sites (PIN-2, PIN-3, PIN-4, CAM-1, CAM-2, CAM-3, CAM-4, and CAM-M) in the Kitikmeot Region, Nunavut Settlement Area, for the years 2016 to 2020. This report documents the findings of the field program for the 2018 monitoring year conducted at the former DEW Line Site PIN-2, located at Cape Young, Nunavut.

The 2018 monitoring program took place between August 15 and 21, 2018 and included the inspection/monitoring of nine landfills including the Airstrip Landfill, United States Air Force (USAF) Landfill, Station West Landfill, Tier II Soil Disposal Facility, Airstrip South Landfill, Pallet Line West Landfill, Non-Hazardous Waste Landfill, South Landfill – East, and the South Borrow Landfill.

The objective of the landfill monitoring program was to assess the performance of these landfills from an environmental and geotechnical perspective, which included a visual inspection, soil sampling, groundwater sampling, and thermal monitoring (downloading data from thermistors installed in the Tier II Soil Disposal Facility) in accordance with the Logistics and Work Plan monitoring program prepared for the PIN-2 site.

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. In some instances, there is insufficient information to establish reliable trends; therefore, additional data points are required to be able to confidently determine if trends are present.

The main observations and required actions for future monitoring events at the PIN-2 site are shown below:

Landfill	Main Observations and Conclusions	Required Action for Future Monitoring Events
Airstrip Landfill	Landfill performance is acceptable. No environmental issues or trends of concern in soil were identified.	Continue environmental and geotechnical monitoring as per existing monitoring schedule

Landfill	Main Observations and Conclusions	Required Action for Future Monitoring Events
USAF Landfill	Landfill performance is acceptable. Downgradient soil concentrations of chromium, copper, nickel, lead and PCBs were elevated compared to upgradient samples, baseline and baseline + 3 standard deviations. However, these are not considered to be a concern at this time. The reported elevated concentrations are similar to those reported in previous monitoring rounds and should be re-assessed following future monitoring events for any observable changes in concentrations over time.	Continue environmental and geotechnical monitoring as per existing monitoring schedule
Station West Landfill	Landfill performance is acceptable. No environmental issues or trends of concern in soil were identified.	Continue environmental and geotechnical monitoring as per existing monitoring schedule
Tier II Soil Disposal Facility	Landfill performance is acceptable. Minor settlement and erosion features are present, but these do not affect landfill stability. One soil sampling station at the downgradient sample station MW-02 (at depth), where an upward trend in soil concentrations related to arsenic may be developing, should be re-assessed following future monitoring events. Attention should also be directed to downgradient sample station MW-01 (at depth) which appears to have increased in chromium soil concentration in both 2016 and 2018 when compared to 2012 and 2014. This does not represent an upward trend at this time; however, continued observation is recommended following future sampling events. No groundwater issues or trends of concern were observed.	Continue environmental and geotechnical monitoring as per existing monitoring schedule
Airstrip South Landfill	Landfill performance is acceptable. No environmental issues or trends of concern in soil were identified.	Continue environmental and geotechnical monitoring as per existing monitoring schedule
Pallet Line West Landfill	Landfill performance is acceptable. Minor settlement was observed but does not affect landfill stability. No environmental issues or trends of concern in soil were identified other than at sample station P2-10 (at depth) and at the upgradient P2-09 location. Downgradient sample station P2-10 (at depth) appears to be developing an upward trend related to the arsenic concentration in soil and upgradient sample station P2-09 appears to be developing an upward trend related to copper, lead and zinc. These should be re-assessed following future monitoring events. Inorganic element concentrations were observed to increase in both upgradient and downgradient locations; therefore, more data is required from future monitoring events to obtain an accurate appraisal of landfill performance.	Continue environmental and geotechnical monitoring as per existing monitoring schedule

Landfill	Main Observations and Conclusions	Required Action for Future Monitoring Events
Non-Hazardous Waste Landfill (NHWL)	Landfill performance is acceptable. Minor settlement and erosion features are present, but these do not affect landfill stability. Downgradient soil sample station, MW-06 depth, reported an elevated arsenic and zinc concentration in 2018. No distinct trend is apparent at this MW-06 depth sampling station although this station should be re-assessed in future monitoring events. No environmental issues or trends of concern in soil were identified.	Continue environmental and geotechnical monitoring as per existing monitoring schedule
South Landfill – East	Landfill performance is acceptable. No trends of concern in soil were identified. PCB soil concentrations at upgradient P2-17 depth should be reviewed following from future sampling events.	Continue environmental and geotechnical monitoring as per existing monitoring schedule
South Borrow Landfill	Landfill performance is acceptable. No environmental issues or trends of concern in soil were identified. PHC concentrations are reported as high compared to the rest of the PIN-2 site; however, Arcadis believes that these are natural biogenic organic compound (BOC) false positives caused by sample media with an extremely high organic content (i.e. peat content). A detailed review of the PHC sample chromatograms also supports this hypothesis. The chromatograms showed the samples registering primarily in the C22 to C34 carbon chain range with no obvious peak, which is indicative of interference from naturally occurring organic material and are not related to a refined petroleum product.	Continue environmental and geotechnical monitoring as per existing monitoring schedule

1 BACKGROUND

1.1 Context and Mandate

Public Services and Procurement Canada (PSPC) was engaged by Department of National Defence (DND) to procure environmental services for the monitoring of Distant Early Warning (DEW) Line sites in Canada. PSPC acquired the services of Arcadis Canada Inc. (Arcadis) to perform the work which included the management of the monitoring of DND DEW Line Sites (PIN-2, PIN-3, PIN-4, CAM-1, CAM-2, CAM-3, CAM-4 and CAM-M) in the Kitikmeot Region, Nunavut Settlement Area, for the years 2016 to 2020. This report documents the findings of the field program for the 2018 monitoring year conducted at the former DEW Line Site PIN-2, located at Cape Young, Nunavut.

Arcadis' 2018 monitoring field program took place between August 15 and 21, 2018 and entailed the inspection/monitoring of nine landfills including the Airstrip Landfill, United States Air Force (USAF) Landfill, Station West Landfill, Tier II Soil Disposal Facility, Airstrip South Landfill, Pallet Line West Landfill, Non-Hazardous Waste (NHW) Landfill, South Landfill - East and the South Borrow Landfill.

The objective of this monitoring program was to assess the performance of these landfills from an environmental and geotechnical perspective, and included a visual inspection, soil sampling, groundwater sampling, and thermal monitoring (downloading data from thermistors installed in the Tier II Soil Disposal Facility) in accordance with the Logistics and Work Plan prepared by Arcadis for the PIN-2 site.

1.1.1 Site Location

The DEW Line site at PIN-2, Cape Young, Nunavut, is located on the mainland along the coast of Dolphin and Union Strait, approximately 150 km north of Kugluktuk (formerly Coppermine). PIN-2 Cape Young is located at approximately 68° 55' 56" N and 116° 55' 49" W. The nearest community with an aircraft charter base and full range of commercial and public services is Cambridge Bay, located approximately 465 km to the east. The site location is shown on the inset Key Plan of Figure PIN-2.1.

Access to the PIN-2 site was by chartered fixed wing aircraft supplied by Kitikmeot Air, and the field team was based out of Kugluktuk, NU for the duration of the field program. There remains an aircraft hangar on site that was used as a staging point during the 2018 monitoring program. There were no on-site accommodations or transportation made available to Arcadis while on site, although accommodations associated with the Long-Range Radar (LRR) station are present in relatively close proximity to the site and were taken into consideration as part of emergency planning. The gravel airstrip on site was observed to be in good condition.

1.1.2 Background

PIN-2 was an auxiliary site within the original DEW Line system. The station was constructed as a prototype DEW Line site in the 1950's and operated until the early 1990's when the DEW Line system was replaced by the more modern North Warning System (NWS). The PIN-2 DEW Line station was decommissioned in the summer of 1993. An NWS LRR site was established approximately 8 km southwest of the former DEW Line site.

The environmental cleanup and demolition of the former PIN-2 DEW Line facilities commenced in 2009 and were completed in the summer of 2011. All site structures were demolished except for an aircraft hangar.

The cleanup included the remediation of existing landfills as well as the construction of two new engineered facilities, namely a non-hazardous waste (NHW) landfill for the disposal of site debris and demolition waste, and a Tier II Soil Disposal Facility for the disposal of contaminated soil and hazardous waste.

1.1.3 Site Description and Site Features

The site is in a low-lying area approximately 15 to 20 metres above sea level. The landscape is generally flat and characterized by coarse grained (i.e. varying cobble, gravel and sand composition) esker ridges. The site is situated within the zone of continuous permafrost.

For ease of discussion, the overall site was broken into three areas; the Station Area (encompassing the majority of the former site infrastructure, including several landfills); the Airstrip Area (the shoreline of Dolphin and Union Strait); and the Station South Area which includes two landfills, located south of the intersection of the main station access road and the Harding River Road access road heading southwest at permanent Benchmark #4 (BM-4).

Figure PIN-2.1 shows the overall site plan, landfill locations, BM-4 and other notable site features.

1.2 Logistics and Work Plan

Prior to mobilization, Arcadis prepared a Logistics and Work Plan, dated July 20, 2018, which was submitted and accepted by DND. The Logistics and Work Plan was used as a reference to guide the 2018 environmental sampling and monitoring work completed at the PIN-2 landfill. A copy of the Work Plan was taken with the Arcadis field staff for on-site reference purposes. The Work Plan also included a copy of the Nunavut Water Board water use license.

1.3 Objective

The objective of the DEW Line landfill monitoring program is to collect sufficient information to assess the performance, integrity, and stability of the landfills from an environmental and geotechnical perspective for human health and environmental protection. Furthermore, an additional objective of the program is to collect information, in accordance with the monitoring requirements outlined below in Section 1.4, in a thorough and consistent manner during each monitoring event.

PSPC has specified the requirements for the Landfill Monitoring Program in the document entitled, *"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-3 Shepherd Bay, CAM-2 Gladman Point, Shepherd Bay, and CAM-4 Pelly Bay – DEW Line Sites, Kitikmeot Region, Nunavut, DND Project # KITIK 16",* dated November 2015. Specifically, Section 3 of the TOR outlined the study objectives in detail. The monitoring schedule for PIN-2 is detailed in Table 1-1 below:

Table 1-1 Monitoring Schedule – PIN-2 Cape Young

No. of Years After Construction	Monitoring Event No.	Year of Monitoring Event
1	1	2012
2	2	2013
3	3	2014
4	4	2015
5	5	2016

No. of Years After Construction	Monitoring Event No.	Year of Monitoring Event
7*	6	2018
10	7	2021
15	8	2026
25	9	2036

* monitoring event covered under the current contract.

1.4 Scope of Work

The scope of work for the Long-Term Landfill Monitoring Program at PIN-2 was defined in the TOR (Reference A) and in the accepted Arcadis proposal number P-6298 (Reference C) as submitted to PSPC. The scope of work includes the following activities summarized below in Table 1-2 as per Section 5 of the TOR.

Table 1-2: PIN-2 Cape Young Scope of Work

Landfill	Type	Visual Inspection (Y/N)	Soil Sampling (# of locations and depths)	Groundwater Sampling (# of MWs)	Thermal Monitoring (# of Thermistors
Airstrip Landfill	Regraded	Y	6 x 2	none	none
USAF Landfill	Regraded	Y	4 x 2	none	none
Station West Landfill	Regraded	Y	4 x 2	none	none
Tier II Soil Disposal Facility	Tier II	Y	4 x 2	4	4
Airstrip South Landfill	Regraded	Y	4 x 2	none	none
Pallet Line West Landfill	Regraded	Y	4 x 2	none	none
Non-Hazardous Waste Landfill	NHW	Y	4 x 2	4	none
South Landfill - East	Regraded	Y	4 x 2	none	None
South Borrow Landfill	Regraded	Y	4 x 2	none	none
Total		9	76	8	4

1.5 Site Geology, Hydrogeology and Hydrology

The PIN-2 site is in a continuous permafrost zone with medium to high ground ice content. According to the map entitled, "*Geology of Nunavut (Reference I)*", the bedrock geology is comprised Paleozoic undivided carbonate and siliciclastic rocks. Based on field observations, the surficial geology at the PIN-2 site consisted of weathered bedrock overlain by coarse grained esker material consisting primarily of gravel to cobble deposits.

Groundwater flow is expected to be seasonal, occurring mainly in the summer period of maximum active layer thaw. Groundwater is located at shallow depths and is greatly influenced by local permafrost conditions. Surficial drainage at the site is localized to intermittent small ponded areas adjacent to the landfill features and varies between the respective landfill locations. Standing surface water (ponding water) was observed immediately adjacent to the South Borrow landfill structure base on its north and southwest sides. A large standing water body is observed approximately 60 m east of the Airstrip South Landfill.

1.6 Site Land-Use Description

Cape Young is uninhabited; however, there is still an active LRR station operated by the NWS located approximately 8 km southwest of the former PIN-2 facility and associated landfill sites. The airstrip at the former PIN-2 site is utilized by DND for operations and maintenance of the LRR station.

The PIN-2 site is known to be a habitat for Lesser Snow Geese, Canada Geese, Ross's Geese, Muskoxen and Arctic Foxes (all observed during the 2018 site visit). Based on wildlife monitor observations, a grizzly bear was in the Cape Young area during the 2018 monitoring program; however, the bear did not approach the landfill locations.

1.7 Field Program Staff

The 2018 PIN-2 DEW Line monitoring event was conducted by Arcadis qualified personnel with extensive experience in remote northern environments and at other DEW line monitoring sites. The following personnel were present on site:

Arcadis Canada Scientific Team and Roles

- Charles Gravelle, P.Eng. (CG) – Geotechnical Field Staff Lead/Principal Engineer
- Ryan Janzen, P.Eng. (RJ) – Geotechnical Field Staff
- Ryan Fletcher, C.Tech, EP (RF) – Environmental Field Staff Lead

Inuit Support Team and Roles

- Preston Kaitak-Pangun (#5211-185909) – Wildlife Monitor
- Dettrick Hala (#5211-204415) – Wildlife Monitor
- Felix Anablak (#5211-206672) – Environmental Helper
- Jeffery Niptanatiak (#5211-185941) – Environmental Helper

1.8 Weather Conditions

Historical weather conditions for the PIN-2 site are presented in Table 1-3 The 1961-1990 Climate Normals and averages (temperature and precipitation totals) prepared by Environment Canada and Climate Change for Cape Young are also listed.

Note that Climate Normals for the period between 1981 and 2010 are not available. The closest location for which Climate Normal data exists for this time period is at Kugluktuk, NU, located approximately 120 km south east of Cape Young, NU.

Table 1-3: Summary of Historical Temperature and Precipitation Conditions (Cape Young)

Climate Normals (1961- 1990)	Jan	Feb	March	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Daily Maximum Temp (°C)	-23.2	-23.4	-20.7	-11.4	-1.3	9.9	15.6	13.1	6.5	-3.5	-14.8	-20.3
Daily Average Temp. (°C)	-27.3	-27.7	-25.3	-16.3	-5.3	5.5	10.9	9.0	3.3	-6.6	-18.7	-24.5
Daily Minimum Temp. (°C)	-31.4	-32.0	-29.8	-21.2	-9.2	1.0	6.1	4.8	0.1	-9.8	-22.6	-28.6
Precipitation (mm)	10.4	8.4	9.9	10.0	14.6	16.6	44.5	45.1	37.8	26.5	13.0	10.4

An outline of the weather conditions encountered during the 2018 field work conducted by Arcadis is provided in Section 2.1.2. as well as on the individual Inspection Checklists for each landfill visited.

1.8.1 Additional Work in 2018

Three additional work items were conducted as part of the 2018 work program, as requested by DND as follows:

1. Arcadis collected and analyzed two (2) additional soil samples at PIN-2
    a. Collected a soil sample from the cover material of the Tier II Disposal Facility;
    b. Collected a soil sample from the cover material of the Non-Hazardous Waste Landfill;
    c. The samples were both collected from a depth of approximately 0.3 m below grade;
    d. Collected approximately 10 L of material per sample location; and
    e. Submitted both samples for particle size distribution.

2. Arcadis inspected the Former Hazardous Waste Temporary Storage Area and Beach Landing Area at PIN-2
    a. Collected photographs of each area to show the extent and exact status and the condition of the locations (four photographs showing the four corners and four in the center of the area);
    b. Indicated a field reference in the photographs for scale;
    c. Collected GPS coordinates and view directions for all photographs;
    d. Recorded any evidence of waste (i.e., soil/waste bags, parts of sea cans, garbage, etc.);
    e. Removed the remaining hazardous waste storage warning sign from the site and disposed of in Yellowknife at the Yellowknife landfill.
    f. Results of the inspection will be provided under a separate cover.
3. Arcadis replaced the damaged cover cap on Thermistor VT-2 at PIN-2

1.8.2 Deviations from the TOR, Proposal, Work Plan, and/or Kick-off Meeting

Two minor sampling deviations occurred during the 2018 monitoring event. Soil sample station P2-19 exhibited refusal at 0.15 m below ground surface on bedrock; therefore, no at depth sample could be obtained. Monitoring well MW-08 was observed to be dry and no sample was collected from this location. No other deviations from the TOR, proposal, work plan, and/or the kick-off meeting were encountered.

Arcadis could not get the .lsf file from thermistor VT-4 to download using the Lakewood systems Prolog software. The field staff attempted to download the file 4 separate times without any success. Arcadis staff closely reviewed the data and excel files and determined that the data was a complete set. Upon having discussions with Lakewood Systems (on October 25, 2018), the original .lsf file is not able to be retrieved; however, an .lsf file was created using the .RAW file from VT-4 and sent to Alison Street on October 25, 2018 at 13:08.

Challenges were encountered collecting soil samples at the full depth as specified in the TOR (i.e., 40-50 cm) in some locations (as outlined below in Table 2-3). Attempts were made using a pick-axe to advance the test pits to the required depth; however, bedrock was encountered, and the test pits met refusal at the depth noted in the field notes and on the soil sampling logs. Depth samples were collected from the bottom of the test pits at the maximum depth achievable.

Challenges were also encountered with regards to weather while on site. The weather was very cold, rainy, and extremely windy (gusting to 80 km/hr). This slowed the field program down from the anticipated and proposed schedule. The field crew was forced to return to the site for 5 hours on the morning of August 20, 2018 in order to achieve the proposed scope of work. This return trip was conducted on the way back to Yellowknife (as part of the demobilization) and no additional costs were incurred as a result.

No other challenges were encountered during the 2018 field program at PIN-2.

1.9 Project References

Project references include:

A 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, PIN-2 Cape Young, CAM-2 Gladman Point, and CAM-4 Pelly Bay – DEW Line Sites, Kitikmeot Region, Nunavut, DND Project # KITIK 16, November 2015. (Specifically, Annex A and Annex S)

B Englobe Corp., The collection of Landfill Monitoring Data at the Former PIN-2 Distant Early Warning Line Site, Cape Young, Nunavut, Revised Final Report – 2016 (O/Ref.: CD3654) (Y/Ref.: DLC MON (KITIK13), April 2017.

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

D Arcadis Canada Inc., Meeting Minutes, Kitikmeot DEW Line Sites May 2018 Kickoff Meeting, dated May 30, 2018.

E Arcadis Canada Inc., Logistics and Work Plan & HASP documentation, PIN-2 site (Kitikmeot DEW Line Sites), 20 July 2018.

F Englobe Corp., The collection of Landfill Monitoring Data at the Former PIN-2 Distant Early Warning Line Site, Cape Young, Nunavut, Final Report – 2015 (O/Ref.: CD3654) (Y/Ref.: DLC MON (KITIK13), May 2016

G Englobe Corp., The collection of Landfill Monitoring Data at the Former PIN-2 Distant Early Warning Line Site, Cape Young, Nunavut, Final Report – 2014 (O/Ref.: CD3654) (Y/Ref.: DLC MON (KITIK13), June 2015

H Biogenie, The Collection of Landfill Monitoring Data at the Former PIN-2 DEW Line Site, Cape Young, Nunavut, Final Report – 2013 Season (O/Ref.: CD3654) (Y/Ref.: DLC MON (KITIK13). January 2014.

I AECOM, Defence Construction Canada, PIN-2 Cape Young, Baseline Landfill Monitoring, January 14, 2013.

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

K Natural Resources Canada, Canada Permafrost Map, 1995.

1.10 Report Structure

This report describes the work completed in August 2018 at the following PIN-2 landfill locations;

- Airstrip Landfill,
- USAF Landfill,
- Station West Landfill,
- Tier II Soil Disposal Facility,
- Airstrip South Landfill,
- Pallet Line West Landfill,
- Non-Hazardous Waste Landfill,
- South Landfill – East, and
- South Borrow Landfill.

Results from soil and groundwater sampling, and visual inspection of the respective landfills on site are presented in the formats described in the TOR (Reference A).

The report has been organized such that the results for each landfill are presented within a separate section as presented below in Table 1-4.

Table 1-4: Report Structure by Landfill at PIN-2

Landfill Identification	Section Number	Analytical Tables	Associated Figure Numbers
Airstrip Landfill	3	Table 1	PIN-2.2A (Visual) PIN-2.2B (Soil)
USAF Landfill	4	Table 2	PIN-2.3A (Visual) PIN-2.3B (Soil)
Station West Landfill	5	Table 3	PIN-2.4A (Visual) PIN-2.4B (Soil)
Tier II Soil Disposal Facility	6	Table 4 Table 4A (GW)	PIN-2.5A (Visual) PIN-2.5B (Soil) PIN-2.5C (GW)
Airstrip South Landfill	7	Table 5	PIN-2.6A (Visual) PIN-2.6A (Soil)
Pallet Line West Landfill	8	Table 6	PIN-2.7A (Visual) PIN-2.7B (Soil)
Non-Hazardous Waste Landfill	9	Table 7 Table 7A (GW)	PIN-2.8A (Visual) PIN-2.8B (Soil) PIN-2.8C (GW)
South Landfill - East	10	Table 8	PIN-2.9A (Visual) PIN-2.9B (Soil)
South Borrow Landfill	11	Table 9	PIN-2.10A (Visual) PIN-2.10B (Soil)

Each section details all the relevant information for the respective landfill areas included as part of the current 2018 Landfill Monitoring Program. Each of the individual landfill sections include:

- A brief description of the landfill;
- Completed Visual Inspection Checklist;
- A Preliminary Stability Assessment;
- A discussion of all the visual inspection issues assessed;
- The overall performance rating of the landfill;
- A photo log sheet (as Appendix I);
- Annotated drawings of each landfill (in Figures section following main text);
- Soil sample logs analytical data;
- Monitoring well sampling logs and analytical data (if applicable);
- A discussion and comparison of chemical data to background and previous years monitoring events;
- Graphed trends of chemical data (As Appendix G for soil and Appendix H for groundwater);
- Completed thermistor inspection forms (if applicable);
- Analysis of overall performance of the landfill; and
- Any recommendations for further action and conclusions.

The photographic record for all landfills is presented in Appendix I. The original photos are included in electronic format (.jpg) and are attached as a separate addendum CD/DVD-ROM to the report. An electronic version of the report and its component tables, figures and data files is included as a separate CD/DVD-ROM submittal to this report.

Certificates of Analysis, QA/QC analytical results and field notes are attached in the applicable appendices.

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 (SSHASP) was submitted and accepted by DND. The plan outlined the general safety rules and procedures that were adhered to while working at the site. It also presented additional precautions and procedures in the event of an emergency. Prior to commencing the field work, all project staff participating in the monitoring and assessment activities were required to familiarize themselves with the contents of the SSHASP and sign the Statement of Compliance document.

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

- Obtaining maps to assist in identifying/characterizing the dominant physical features near the site (e.g., topographic maps and aerial photographs);
- Carrying and knowing how to use emergency communication devices such as satellite phones, which were tested for functionality and sufficient airtime prior to mobilization;
- Checking the weather prior to travel 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;
- 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 possible for a number of days; and
- Knowing how to use all emergency equipment and testing it prior to mobilization to the field.

The remote nature of the PIN-2 Cape Young site 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 site. Arcadis ensured that all staff on site received a site safety orientation and field-specific training on contaminated sites, which was issued on Day 1 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 Kugluktuk from Yellowknife, then to and from the PIN-2 site each day via a chartered Dornier 328 aircraft operated by Kitikmeot Air. On-site transportation consisted of an ATV and foot travel. Accommodations while in Kugluktuk were provided by Kikiak Contracting (IFR#0624). No on-site accommodations were required for this contract. The following Table 2-1 outlines the field schedule for PIN-2.

Table 2-1: 2018 Field Schedule for PIN-2 Cape Young

August 2018						
Sunday	**Monday**	**Tuesday**	**Wednesday**	**Thursday**	**Friday**	**Saturday**
12	13	14	15	16	17	18
			Mobilized to Yellowknife	Charter to Kugluktuk	Site Work	Site Work
19	20	21	22	25	26	27
Site Work	Site Work in AM, charter back to Yellowknife	Demobilization to Ontario				

Weather during the field inspection and monitoring event consisted of a mixture of sun, clouds, rain, light flurries, and high winds. Temperatures ranged from 2 to 9 degrees Celsius.

2.1.3 Visual Inspection

Visual inspection of each landfill was conducted by Mr. Charles Gravelle, P.Eng., with assistance from Mr. Ryan Janzen, P. Eng., based on the guidelines presented in Section 5.2 of the TOR. A visual inspection checklist (provided in Annex J1 of the TOR and reproduced herein for each individual landfill section) was completed for each landfill site inspected. Inspection information recorded for each landfill included its designation, type, date, monitoring event number, weather conditions, and the name of the inspector. Observations related to the following potential site conditions were recorded for each landfill:

- Settlement;
- Erosion;
- Lateral movement;
- Frost action;
- Sloughing;
- Cracking;
- Animal burrows;
- Vegetation establishment;
- Staining;
- Vegetation stress;
- 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 on field notes as well as referenced with electronic DGPS coordinates for purposes of evaluating their location, dimensions, and extent.

Photographic records were taken to document the general condition of the landfill. Photographs were taken to substantiate recorded observations including where no concerns were identified. All photographs were referenced to existing monuments where possible and a 1 metre long survey rod (with 1 cm marked intervals) was used as an indication of scale in the visual inspection photographs. Photographs were taken using a digital camera with a 35 mm equivalent focal length of 24.0 mm. A detailed sketch of each landfill showing the results of the inspection was created and later transcribed into AutoCAD to create the site figures.

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

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

2.1.3.1 Stability Assessment

Arcadis used the following Performance/Severity rating reference guide for purposes of assessing the geotechnical performance of the landfill sites inspected and the extent of any features noted.

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 or 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, and/or • Slope failure.

Performance / Severity Rating	Description
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

2.1.4 Soil Sampling

Soil sampling at each landfill site was completed concurrently with the other monitoring activities. A Soil Sampling Log (as was provided in Annex J2 of the TOR) was completed at each soil sampling location. Soil sampling logs for each monitoring station are provided in the individual landfill sections of this report.

Two samples were collected from each sampling location: one sample from 0-15 cm depth, and one sample from 40-50 cm depth wherever possible. Samples were collected from test pits that had been manually excavated with hand tools (pickaxe and stainless-steel shovel), which were decontaminated between locations using Alconox and distilled water. Each soil sample was collected directly into one laboratory supplied zip-top plastic bag, one 125 mL glass jar, and two 40 mL clear glass vials with methanol for preservation. All sample containers were pre-sterilized and supplied by the laboratory.

All soil sampling locations were backfilled after the collection of soil samples. All locations were photographed during sampling and after backfilling was complete. A list of these photographs is included in **Appendix I** for each landfill.

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 PIN-2

DEW Line Site	Landfill	Proposed # of Soil Sampling Locations	Actual # of Soil Sampling Locations	Total # of Samples Submitted for Analysis
PIN-2 Cape Young	Airstrip Landfill	6 x 2	12	12
	USAF Landfill	4 x 2	8	8
	Station West Landfill	4 x 2	8	8
	Tier II Soil Disposal Facility	4 x 2	8	8
	Airstrip South Landfill	4 x 2	8	8
	Pallet Line West Landfill	4 x 2	8	8
	Non-Hazardous Waste Landfill	4 x 2	8	8
	South Landfill – East	4 x 2	7*	7*
	South Borrow Landfill	4 x 2	8	8
PIN-2 Total		**76**	**75**	**75****

* Soil sample station P2-19 had refusal on bedrock at 0.15 m below grade; therefore, no depth sample could be obtained.

** Total sample submission numbers in the table above do not include duplicates, field blanks, trip blanks, or equipment blanks.

Limited depth was achieved at several soil sample stations as outlined below in Table 2-3 :

Table 2-3: Summary of Soil Sample Depth Limitations at PIN-2

DEW Line Site	Landfill	Soil Sampling Station ID	Sampling Depth of Lower Sample (cm)	Reasoning for limitation
PIN-2 Cape Young	USAF Landfill	P2-2	30-40	Refusal on bedrock
		P2-4	15-20	Refusal on bedrock
	Station West Landfill	P2-5	15-25	Refusal on bedrock
	Pallet Line West Landfill	P2-10	30-40	Refusal on bedrock
		P2-12	15-30	Refusal on bedrock
	South Landfill – East	P2-18	20-30	Refusal on bedrock
		P2-19	No depth sample	Refusal on bedrock

Soil samples were analyzed for the following parameters:

- Petroleum Hydrocarbons (PHCs) F1-F4 fractions;
- Inorganic elements: arsenic, cadmium, chromium, cobalt, copper, lead, nickel, zinc (note the removal of the analyte mercury, as requested by DND during the 2018 kick off meeting); and,
- Polychlorinated Biphenyls (PCBs): Total Aroclors.

Soil analyses were carried out by Maxxam Analytics (the Edmonton, Alberta facility for PHCs and Inorganics and the Mississauga, Ontario facility for PCBs), both ISO 17025 certified laboratories. The analytical results, including laboratory certificates of analysis, are presented in Appendix B.

QA/QC protocols were implemented for the soil sampling program. Blind duplicates were obtained from at least 10% of the soil samples collected. As requested by DND, no samples for inter-laboratory analyses were collected as part of this monitoring program. The specific locations where blind duplicates were collected were determined in the field and noted in the field notes. In addition, one equipment blank was obtained by running laboratory-supplied reverse osmosis de-ionized (RODI) water over the stainless-steel shovel, then collecting it into laboratory-supplied sample containers.

2.1.4.1 Soil Sample Analysis

Arcadis conducted a chemical analysis review on the results of the soil samples collected and present these results in Sections 3 through 11 of this report. When discussing the analytical results and trends throughout the report the term “elevated” is used to describe a concentration for any given analyte that has reported concentrations above either the baseline or baseline +3x standard deviations. These comparison values vary from one landfill to another and can be viewed on the analytical tables presented in the table section of this report, following the main text.

The method detection limits for the DEW Line sites for PHCs in soil are far lower than the typical laboratory MDLs reported. The low MDLs combined with the approach used to determine the comparison value (i.e., *“For DEW Line Monitoring Data Tables, the background and baseline sample results were summarized by calculating the arithmetic mean, standard deviation, maximum concentration and minimum concentration along with the 95%^ confidence value of the mean. Concentrations which were below the detection limit were included in the calculations as half of the detection limit”*) created very low comparison reference values for PHCs (F1 through F4). It should also be noted that the action level for petroleum hydrocarbon remediation at DEW Line sites is typically 2500 mg/kg; therefore, detectible hydrocarbon contamination below this concentration is not uncommon in the vicinity of the landfills.

When completing the analysis on PHCs in soil at the PIN-2 site, Arcadis took into consideration the reported concentration of PHCs (fractions F1 through F4) in the soil sample when writing and assessing concentrations greater than baseline and baseline +3x standard deviations values, as well as assessing any potential trends. Based on the two factors outlined in the previous paragraph, there are many instances where concentrations of PHCs were reported at concentrations that would be considered very low by industry standards (e.g., less than 100 mg/kg for PHC F4), but were still observed to “exceed” the site comparison value (i.e., many instances of a comparison value in the range of 8 mg/kg at PIN-2 for PHC F3

and F4 in soil). Soil concentrations greater than site comparison values are noted and discussed in the respective discussion of results and soil trend analysis for each landfill site; however, Arcadis also provides a qualifier in each respective comparison tables frequently stating that the concentrations are not considered to be a concern and are considered very low for PHC F3 or PHC F4 parameters.

Another factor considered in the evaluation of PHCs was the presence of natural organic peat. Such natural biogenic organic compounds (BOCs) can contain PHC F3 concentrations ranging from 150 mg/kg up to 1430 mg/kg along with PHC F4 concentrations varying from 150 mg/kg up to 1580 mg/kg. BOCs often have low (<30 mg/kg) PHC F2 concentrations. PHC F3 concentrations in uncontaminated samples occurs at a carbon length >C22. Arcadis reviewed laboratory chromatogram distribution charts in order to differentiate between a natural organic peat versus a refined petroleum product.

2.1.5 Groundwater Sampling

Groundwater sampling at each monitoring well installed around the Tier II Soil Disposal Facility and the Non-Hazardous Waste Landfill was completed concurrently with the other monitoring activities. A Monitoring Well Sampling Report (updated groundwater monitoring log provided by DND in 2018) was completed at each groundwater sampling location. These sampling reports note:

- Condition of the monitoring well;
- Any ponding water at the monitoring well location;
- Lock details;
- Monitoring well installation details;
- Water elevation(s);
- Depth to bottom of well;
- Height of well stick-up;
- Colour, odour, presence and thickness of free product if applicable;
- Purge volume and sampling equipment used; and
- pH, conductivity and in-situ temperature after each well volume purged and before sampling.

Monitoring wells were purged prior to sampling, with pH, conductivity, turbidity and temperature being measured continually during purging using the Horiba U-52 multi-parameter meter. These parameters were recorded every five minutes and groundwater sampling did not begin until the difference between measurements was <10% for all parameters. The purging and sampling of each monitoring well was completed using dedicated sampling equipment consisting of 6 mm diameter high density polyethylene (HDPE) tubing connected to a low flow peristaltic pump. Each well was purged and sampled using dedicated tubing supplies which were removed upon completion of sampling to prevent damage due to freezing. Other sampling equipment, such as the interface probe and the Horiba U-52 multi-parameter meter, were decontaminated between monitoring events using Alconox and distilled water.

Groundwater samples were collected at the locations specified in the TOR. The number of locations at each landfill is shown on the Table below.

:

Table 2-4: Summary of Groundwater Sampling Locations at PIN-2

Monitoring Well ID	Observations	# of Groundwater Samples Collected
Tier II Soil Disposal Facility		
MW-01	Excellent Condition	1
MW-02	Excellent Condition	1
MW-03	Excellent Condition	1
MW-04	Excellent Condition	1
Non-Hazardous Waste Landfill		
MW-05	Excellent Condition	1
MW-06	Excellent Condition	1
MW-07	Excellent Condition	1
MW-08	Excellent Condition – frozen groundwater	none

Groundwater samples were collected at seven of the eight monitoring well locations using the low-flow method as specified in the TOR. No sample was obtained from MW-08 as the groundwater was frozen.

Groundwater samples were analyzed for the following parameters (note the removal of PCB analysis and the analyte mercury, as requested by DND during the 2018 kick off meeting):

- Inorganic elements – total concentrations: arsenic, cadmium, chromium, cobalt, copper, lead, nickel, zinc. (groundwater samples were not filtered or preserved, as per DND instructions); and
- Petroleum Hydrocarbons (PHCs): F1-F4 fractions.

Groundwater analyses was carried out by Maxxam Analytics of Edmonton, Alberta, an ISO 17025 certified laboratory.

Arcadis conducted a chemical analysis review on the results of the groundwater samples collected and present these results in Section 6 and Section 9 of this report. When discussing the analytical results and trends throughout the report the term “slightly elevated” is used to describe a concentration for any given analyte that has reported concentrations above the baseline and “moderately elevated” where the concentration was found to be greater than baseline +3x standard deviations. These comparison values vary from one landfill to another and can be viewed on the analytical tables presented in the tables section of this report following the main text.

2.1.6 Thermal Monitoring

Thermal monitoring at the Tier II Soil Disposal Facility was completed concurrently with the other monitoring requirements. At each thermistor installation location, an updated (2018) Thermistor Annual Maintenance Report was completed (as provided by DND). 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 manual readings of thermistors using a digital readout that is compatible with the thermistors or a multimeter and switch box;
- Drawing a sketch to indicate the location of each cable;
- Manually reading the individual beads of each thermistor installation using a multi-meter and Lakewood Systems switch box;
- Installation of a new cap on VT-2; 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 are being recorded.

Thermal monitoring data was retrieved from four thermistor installations as specified in the TOR and shown below in Table 2-5:

Table 2-5: Summary of Thermal Monitoring at PIN-2

DEW Line Site	Landfill	Thermistor ID	Observations/Notes
PIN-2 Cape Young	Tier II Soil Disposal Facility	VT-1	Beads 4, 6, 7, 8, 9, 11, and 15 appear to be malfunctioning. No other issues observed.
		VT-2	New cap was installed. Manual readings could not be collected for beads 10, 11, 12, 13, 14, 15, or 16. No other 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 Visual Inspection Checklist, Soil Sampling Log and Monitoring Well Sampling Log (TOR annexes J2 and J3), as updated by DND in 2018. In addition, field notes regarding thermistor inspections were recorded on the field form provided as Annex M – Thermistor Inspection Template, with updates provided by DND in 2018. A copy of the field notes is provided in **Appendix E**.

2.2.2 Data Collection

The visual inspection was conducted with the aid of a Trimble R2 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 1.0 m, with most results falling within the 0.2 and 0.5 m accuracy range. DGPS data was tied into local site controls, including the eight existing monitoring wells, four existing thermistor installations and bench mark CM1. 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) are 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 and field measurements. During the previous monitoring event in 2016, 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 2018 monitoring report are considered to be more accurate than those reported using visual observations only in 2016. 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, as well as in Excel format on the appended CD/DVD ROM.

2.3 Quality Assurance and Quality Control

Quality assurance and quality control (QA/QC) was carried out in accordance to the procedures outlined in Annex K of the TOR with alterations as specified by DND during the project kick off meeting (i.e., the elimination of the inter-laboratory analysis requirements). QA/QC protocols were implemented for the soil and groundwater sampling programs. Blind duplicate samples and quality control and assurance measures were applied as appropriate. Blind duplicates were obtained for at least 10% of the soil and groundwater samples collected. As requested by DND, no samples for inter-laboratory analyses were collected as part of this monitoring program.

The specific location where the blind duplicate was collected was determined in the field. One trip blank, one field blank, and one equipment blank were also collected as part of the groundwater sampling program.

Field personnel employed Arcadis' Quality Assurance/Quality Control (QA/QC) protocols, including appropriate techniques for soil and groundwater 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, laboratory prepared 125 mL glass jars fitted with screw-tight Teflon-lined lids and 40 mL vials with methanol preservative (For PHC F1 analysis only). Groundwater samples were collected from monitoring wells and placed in a variety of appropriately sized and prepared laboratory supplied vessels. Sample numbers were clearly marked on the containers. The soil jars and water bottles were filled to capacity with zero headspace and stored in coolers with cold packs to moderate temperature fluctuations during transport to the laboratory. To prevent cross contamination field staff wore new nitrile gloves at each sample location.

The samples were transported to the project laboratory accompanied by a Chain of Custody form. Soil samples for PHC F1 were preserved in the field using methanol. No preservative is required for F2 to F4 fraction PHCs in soil. Groundwater samples for PHC F1 and PHC F2 to F4 were preserved with sodium bisulfate. No preservatives for groundwater were used in laboratory-supplied sampling containers (metals) and no field filtering was conducted by Arcadis, as specified in the TOR. Upon sample receipt, the laboratory added a preservative to the groundwater samples submitted for metals analyses, as is required under their standard protocols.

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 a minimum of 10% of the locations. At the request of DND, no inter-laboratory analysis was completed as part of the 2018 monitoring. The specific locations where blind duplicates were collected was determined in the field, as it was dependent on the amount of groundwater and/or soil available at each location.

Travel blanks for groundwater were 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.

Field duplicates for groundwater were collected by transferring laboratory supplied water, guaranteed to be free of any organics and inorganics (based on analysis), into the appropriate laboratory supplied sampling containers. The field blanks were collected in the field at the same time as the groundwater sample collection.

Two sets of equipment blanks were collected. The first set was collected by running laboratory supplied water, guaranteed to be free of any organics and inorganics (based on analysis), over the stainless-steel shovel that was used to dig the test pits and allowing the water to drain into laboratory supplied sample containers. The second set was collected by pumping laboratory supplied water, guaranteed to be free of any organics and inorganics (based on analysis), through new tubing from the same batch that was used to sample the groundwater wells and into laboratory supplied sample containers.

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

3 PIN-2: AIRSTRIP LANDFILL

3.1 Landfill Description

The Airstrip Landfill is a regraded landfill located approximately 600 m north of the existing hangar on the north side of the airstrip. The current configuration of the landfill consists of two lobes: Lobe A (large lobe situated on the southwest side) and Lobe E & F (smaller lobe located on the northeast side).

The remediation of this landfill consisted of the removal of all scattered surface debris, the removal of contaminated soil (exceeding the Tier II criteria) and the regrading/ capping of the remaining areas with 0.4 m of Type 2 granular fill followed by a final cap of 0.6 m of Type 1 granular fill.

The long-term monitoring plan for the Airstrip Landfill consists of visual inspection and the collection of soil samples.

The landfill layout, visual observations and photographic locations are presented on **Figure PIN-2.2A** and the soil analytical results are presented on **Figure PIN-2.2B** both located at the rear of the report.

3.2 Summary of Work Conducted

3.2.1 Visual Inspection

A visual inspection was completed on the Airstrip Landfill on August 19, 2018. The inspection was completed with no deviations from the visual inspection work plan.

3.2.2 Soil Sampling

Soil sampling at the Airstrip Landfill was conducted on August 20, 2018 and included the collection of 12 soil samples from six soil sample stations (P2-21, P2-22, P2-23, P2-24, P2-25, and P2-26). Duplicate sample 8 (Dup 8) was collected at station P2-21B.

Table 3-1 details the soil sampling activities conducted at the Airstrip Landfill.

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

Sample Location	Sample ID	Sample Depth (m bgs)	Notes
P2-21 (up-gradient)	P2-21A	0 - 0.15	Grey, cobbles/gravel, some to trace sand, no odours
	P2-21B	0.4 – 0.5	Grey, cobbles/gravel, some to trace sand, no odours
P2-22 (down-gradient)	P2-22A	0 - 0.15	Brown/grey, coarse to medium sand, some gravel, trace cobbles, no odours
	P2-22B	0.4 – 0.5	Brown/grey, coarse to medium sand, some gravel, trace cobbles, no odours
P2-23 (down-gradient)	P2-23A	0 - 0.15	Grey gravel/cobbles, no fines, trace coarse sand, no odours
	P2-23B	0.4 – 0.5	Grey gravel/cobbles, no fines, trace coarse sand, no odours

Sample Location	Sample ID	Sample Depth (m bgs)	Notes
P2-24 (down-gradient)	P2-24A	0 - 0.15	Grey gravel/cobbles, no fines, trace coarse sand, no odours
	P2-24B	0.4 – 0.5	Grey gravel/cobbles, no fines, trace coarse sand, no odours
P2-25 (down-gradient)	P2-25A	0 - 0.15	Grey/brown gravel/cobbles, no fines, coarse sand, no odours
	P2-25B	0.4 – 0.5	Grey/brown gravel/cobbles, no fines, coarse sand, no odours
P2-26 (down-gradient)	P2-26A	0 - 0.15	Grey/brown gravel/cobbles, no fines, trace coarse sand, no odours
	P2-26B	0.4 – 0.5	Grey/brown gravel/cobbles, no fines, trace coarse sand, no odours

3.2.3 Groundwater Sampling

No groundwater monitoring wells are present at the Airstrip Landfill.

3.2.4 Thermal Monitoring

No thermistors are present at the Airstrip Landfill.

3.3 Results of the Monitoring Program

3.3.1 Visual Inspection

The visual inspection was conducted in compliance with Section 5.2 of the TOR, and details are provided in Sections 3.3.1.1 through 3.3.1.5. **Figure PIN-2.2A** presents the visual inspection findings and photographic locations for the Airstrip Landfill.

3.3.1.1 Inspection Checklist

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

Table 3-2: Visual Inspection Checklist – Airstrip Landfill

SITE NAME: PIN-2 Cape Young
LANDFILL DESIGNATION: Airstrip Landfill LANDFILL TYPE: Regraded DATE OF INSPECTION: 19 August 2018 WEATHER CONDITIONS: Overcast with some breaks in the cloud cover, windy. Some precipitation.
DATE OF PREVIOUS INSPECTION: 16 August 2016
INSPECTED BY: Ryan Janzen and Charles Gravelle
REPORT PREPARED BY: Ryan Janzen **The inspector represents to the best of their knowledge that 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.**

Table 3-2: Visual Inspection Checklist – Airstrip Landfill

Checklist Item	Present (Yes/No)	Feature Number	Feature Location	GPS Coordinates Easting/Northing/Zone (Taken from Centre of Feature)		Length (m)	Width (m)	Depth (m)	Extent Relative to Landfill Surface	Description	Comparison with Historical Observations	Severity Rating/ Additional Comments	Photographic Records (photo reference, location, view point & direction, feature of note, scale)
Settlement	Yes	B	NE section of Lobe A	502596.4882, 7647322.9258	11 North	2.7	1.0	0.2	<1%	Linear depression	Slightly larger than in 2016	Acceptable	ALF_11-12
Settlement	Yes	C	S side of Lobe E/F	502658.9846, 7647336.8135	11 North	3.0	0.1	0.1	<1%	Linear depression	No change	Acceptable	ALF_41-42
Settlement	Yes	E	N side of Lobe A	502594.7433, 7647344.8865	11 North	2.9	0.5	0.1	<1%	Linear depression	Slightly longer than in 2016	Acceptable	ALF_22-23
Erosion	Yes	F	N side of Lobe A	502574.2733, 7647363.4358	11 North	7.9	0.1	0.05	<1%	Minor erosive feature, linear channel down slope	Slightly smaller than in 2016	Acceptable	ALF_24
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…)	Yes	A	NE edge of Lobe A	502595.214, 7647375.4794 502628.5374, 7647335.9697 502631.9233, 7647334.278	11 North	0.3	0.03	-	<1%	Metal debris – perforated strips, total of four	No change	Acceptable Surface debris that appears to have been left behind after construction (not exposed from beneath cover). Suggest collecting these during the next inspection.	ALF_35, 46-48

Table 3-2: Visual Inspection Checklist – Airstrip Landfill												
Checklist Item	**Present (Yes/No)**	**Feature Number**	**Feature Location**	**GPS Coordinates Easting/Northing/Zone (Taken from Centre of Feature)**		**Length (m)**	**Width (m)**	**Depth (m)**	**Extent Relative to Landfill Surface**	**Description**	**Comparison with Historical Observations**	**Severity Rating/ 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	N edge of Lobe E/F	502607.4083, 7647390.3599 502643.4015, 7647404.1339	11 North	0.15	0.1	-	<1%	Metal debris – perforated strips, total of two	No change	Acceptable Surface debris that appears to have been left behind after construction (not exposed from beneath cover). Suggest collecting these during the next inspection.	ALF_34, 36

3.3.1.2 Preliminary Stability Assessment

The Preliminary Stability Assessment for the Airstrip Landfill was conducted on August 19, 2018 as per the TOR and the results are provided below in Table 3-3.

Table 3-3: Preliminary Stability Assessment – Airstrip Landfill

Feature	Severity Rating	Extent
Settlement	Acceptable	Occasional
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	Acceptable	Occasional (outside landfill footprint)
Overall Landfill Performance	**Acceptable**	

Note: please refer to Performance/Severity rating reference guide in Section 2.1.3.1 above.

3.3.1.3 Photographic Records

The detailed photographic record for the Airstrip Landfill has been completed as per Section 5.5 of the TOR and is included as **Appendix I**. The Photographic Record only contains an index of photographs collected; full sized photographs are contained in the appended CD/DVD-ROM. **Figure PIN-2.2A** illustrates the photograph locations and viewpoint directions.

3.3.1.4 Trend Analysis

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

Table 3-4: Visual Inspection Trends - Airstrip Landfill

Checklist Item	Feature ID	Comparison with Historical Observations
Settlement	B	Length has increased from 2.2 m in 2016 to 2.7 m in 2018.
	C	No significant change.
	E	Length has increased from 2.0 m in 2016 to 2.9 m in 2018.
Erosion	F	Observed length has decreased from 9.0 m in 2016 to 7.9 m in 2018.
Other	A	No significant change.
	D	No significant change.

3.3.1.5 Discussion of Results/Trends

A comparison of the visual inspection results of the 2016 and 2018 monitoring events at the Airstrip Landfill indicates that previously observed settlement and erosion features increased in size or saw no significant change. The decrease in the observed length of Feature F is attributed to erosive infill during meltwater events. No new features were observed. The results of the visual inspection and the observed trends indicate that the performance of the landfill is acceptable.

3.3.2 Soil Sampling

Soil sampling of the Airstrip Landfill was conducted on August 20, 2018. The soil sampling was conducted in compliance with Section 5.3.1 and 5.3.2 of the TOR. 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 12 soil samples were collected from six soil sample locations at the Airstrip Landfill and analyzed for inorganic elements (arsenic, cadmium, chromium, cobalt, copper, nickel, and zinc), polychlorinated biphenyls (PCBs), and Petroleum Hydrocarbons (PHC F1, F2, F3, and F4).

The full current and historical analytical results are presented in Table 1 in the Tables section of this report immediately following the main text. The laboratory certificates of analysis and chains of custody are presented in Appendix B of this report. **Figure PIN-2.2B** presents a summary of significant soil analytical results.

3.3.2.2 Discussion of Results – Comparison to Baseline/Background

Analytical results were compared against background concentrations, baseline data – arithmetic mean, and baseline data mean + 3x standard deviation. The following Table 3-5 summarizes the comparison of results.

Table 3-5: Evaluation of Results by Parameter- Airstrip Landfill

Parameter	B.K.	B.S.	B.S. +	Discussion of Results
Arsenic (As)	2.9	5.4	11.3	Concentrations greater than baseline concentration of 5.4 mg/kg were observed at downgradient soil samples P2-23 surface (8.5 mg/kg) and depth (5.6 mg/kg), P2-26 surface and depth (both at 6.6 mg/kg) and at P2-24 surface (6.0 mg/kg). All sample concentrations were below the baseline +3 standard deviation. These minor elevated concentrations are not considered a concern.
Cadmium (Cd)	1.0	1.0	1.0	All soil sample results were below the laboratory method detection limit; therefore, below both background and baseline concentrations for Cd.
Chromium (Cr)	20.0	20.0	20.0	All soil sample concentrations were below both background and baseline concentrations for Cr.
Cobalt (Co)	5.0	5.0	5.0	All soil sample concentrations were below both background and baseline concentrations for Co.
Copper (Cu)	8.7	7.2	17.4	Concentrations greater than the 7.2 mg/kg baseline value were noted at upgradient soil sample P2-21 surface (10 mg/kg) and downgradient sample P2-24 surface (8.2 mg/kg). Both samples were below the baseline +3 standard deviation and are similar to background concentrations. All other sample concentrations were below the baseline. These minor elevated concentrations are not considered a concern.
Lead (Pb)	10.0	10.0	10.0	All soil sample concentrations were below both background and baseline concentrations for Pb.
Nickel (Ni)	5.0	5.0	5.0	All soil sample concentrations were below both background and baseline concentrations for Ni.
Zinc (Zn)	15.0	15.0	15.0	The baseline and baseline +3 standard deviation were exceeded in downgradient sample P2-23 surface (20 mg/kg). All other soil sample concentrations were below both background and baseline concentrations for Zn. This minor elevated concentration is not a concern.
PCBs (Total)	0.010	0.1	0.1	All soil sample results were below the laboratory method detection limit; therefore, below both background and baseline concentrations for PCBs.
F1 (C_6-C_{10})	N/A	40.0	40.0	All soil sample results were below the laboratory method detection limit for PHC F1.
F2 (C_{10}-C_{16})	N/A	40.0	40.0	All soil sample results were either below the laboratory method detection limit or were below the baseline concentrations for PHC F2.
F3 (C_{16}-C_{34})	N/A	40.0	40.0	All soil sample results were either below the laboratory method detection limit or were below the baseline concentrations for PHC F3.
F4 (C_{34}-C_{50})	N/A	N/A	N/A	PHC F4 concentrations were detected at upgradient P2-21 surface (8.1 mg/kg), P2-21 depth -duplicate (7.5 mg/kg), downgradient P2-25 surface (9.1 mg/kg), P2-25 depth (7.1 mg/kg) and at downgradient P2-26 depth (13 mg/kg). These concentrations are not considered to be an issue and are very low for PHC F4 in soil. All remaining PHC F4 concentrions were less than the laboratory detection limit of 6 mg/kg.

Note: B.K. = background concentration in mg/kg, B.S. = baseline concentration in mg/kg, B.S. + =baseline data mean + 3x standard deviations. Soil concentrations are shown are in 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 (one graph per analyte tested) including a visual comparison to baseline, the baseline +3 standard deviations and results from previous monitoring years using differentiating colours (See **Appendix G1**). The following Table 3-6 provides a summary of the soil trend analysis findings and presents a discussion of the observed trends by parameter.

Table 3-6: Discussion of Trends – Airstrip Landfill

Parameter	Discussion of Trends
Arsenic (As)	Based on current and historical results, As has no observable trend at any of the sample stations at the Airstrip Landfill. All concentrations are within what would be expected of the natural variation from one sampling event to another.
Cadmium (Cd)	Based on most soil sample results as being below the laboratory method detection limit, Cd has no observable trend.
Chromium (Cr)	Based on current and historical results, Cr has no observable trend at any of the sample stations at the Airstrip Landfill. Reported concentrations are within what would be expected as natural variation from one sampling event to another. However, it was observed that the results from 2016 appear to be anomalously high (e.g., downgradient P2-24 surface and P-24 depth, downgradient P2-23 surface, and upgradient P2-21 depth).
Cobalt (Co)	Based on current and historical results, Co has no observable trend at any of the sample stations at the Airstrip Landfill. All concentrations are within what would be expected as natural variation from one sampling event to another.
Copper (Cu)	Based on current and historical results, Cu has no observable trend at any of the sample stations at the Airstrip Landfill. All reported concentrations are within what would be expected as natural variation from one sampling event to another. A few anomalously high concentrations were reported in 2018 (i.e., upgradient P2-21 surface at 10 mg/kg, downgradient P2-24 surface at 8.2 mg/kg. Other elevated anomalous concentrations are also observed in previous monitoring years at different sample stations. These are not believed to be trend setting concentrations and are likely as a result of natural variation in heterogeneous soil.
Lead (Pb)	Based on current and historical results, Pb has no observable trend at any of the sample stations at the Airstrip Landfill. All concentrations are within what would be expected as natural variation from one sampling event to another.
Nickel (Ni)	Based on current and historical results, Ni has no observable trend at any of the sample stations at the Airstrip Landfill. All reported concentrations are within what would be expected as natural variation from one sampling event to another. A few anomalously high concentrations were reported throughout the monitoring years. These are not believed to be trend setting concentrations and are likely from a natural variation in heterogeneous soil.
Zinc (Zn)	Based on current and historical results, Zn has no observable trend at any of the sample stations at the Airstrip Landfill. All concentrations are within what would be expected as natural variation from one sampling event to another. One anomalously high concentration was reported in 2018 (i.e., downgradient P2-23 surface at 20 mg/kg). This is not believed to be a trend setting concentration and is likely as a result of natural variation in heterogeneous soil.
PCBs (Total)	All soil sample concentrations were below the laboratory detection limits; therefore, PCBs are considered to have no observable trend at the Airstrip Landfill.

Parameter	Discussion of Trends
F1 (C_6-C_{10})	All soil sample concentrations were below the laboratory detection limits; therefore, PHC F1 is considered to have no observable trend at the Airstrip Landfill.
F2 (C_{10}-C_{16})	Based on most soil sample results being below the laboratory detection limits or very low concentrations, PHC F2 is considered to have no observable trend at the Airstrip Landfill.
F3 (C_{16}-C_{34})	Based on most soil sample results being below the laboratory detection limits or very low concentrations, PHC F3 is considered to have no observable trend at the Airstrip Landfill.
F4 (C_{34}-C_{50})	Based on most soil sample results being below the laboratory detection limits or very low concentrations, PHC F4 is considered to have no observable trend at the Airstrip Landfill.

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 Airstrip Landfill; therefore, no groundwater sampling or analysis was conducted.

3.3.4 Thermal Monitoring

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

3.4 Conclusions and Overall Landfill Performance

Based on the results of the 2018 monitoring program, the overall performance of the Airstrip 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 have no significant observable trends with no obvious concentration increases or decreases over time. This indicates that the landfill is performing as intended and no leachate is present in the surrounding environments.

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 PIN-2: USAF LANDFILL

4.1 Landfill Description

The USAF Landfill is located approximately 500 m northwest of the main existing hangar building. During DEW Line operations, this landfill was covered with a liner which was rehabilitated at the time of closure.

This landfill was subsequently regraded and recapped as part of the most recent site remediation program. This included the removal of surface and partially exposed debris, followed by surface regrading with 0.75 m of Type 2 granular fill.

The long-term monitoring plan for the USAF landfill entailed the completion of a visual inspection and the collection of soil samples from designated locations.

The landfill layout, visual observations and photographic locations are presented on **Figure PIN-2.3A** and the soil analytical results are presented on **Figure PIN-2.3B** both of which are provided at the rear of this report.

4.2 Summary of Work Conducted

4.2.1 Visual Inspection

Visual inspection of the USAF Landfill was conducted on August 19, 2018. The visual inspection of the landfill was completed with no deviations from the accepted work plan.

4.2.2 Soil Sampling

Soil sampling at the USAF Landfill was conducted on August 20, 2018 and consisted of the collection of eight soil samples from four soil sample stations (P2-1, P2-2, P2-3, and P2-4). Depth limitations were encountered at soil sampling stations P2-2, where refusal on bedrock limited the depth sample from 0.15 to 0.25 metres below ground surface, and at station P2-4, where refusal on bedrock limited the depth of sample from 0.15 to 0.2 metres below ground surface. Duplicate number 7 (Dup 7) was collected at sample station P2-2A (surface).

Table 4-1 outlines the soil sampling activities conducted at the USAF Landfill.

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

Sample Location	Sample ID	Sample Depth (m bgs)	Notes
P2-1 (up-gradient)	P2-1A	0 – 0.15	Black peat, organics, roots, no odour
	P2-1B	0.4 – 0.5	Brown gravel, some silt, no odour
P2-2 (down-gradient)	P2-2A	0 – 0.15	Brown gravel, some coarse sand, no odour
	P2-2B	0.3 – 0.4	Brown gravel, some coarse sand, no odour – refusal on bedrock
	P2-3A	0 – 0.15	Brown/grey coarse sand and gravel, no odour

Sample Location	Sample ID	Sample Depth (m bgs)	Notes
P2-3 (down-gradient)	P2-3B	0.4 – 0.5	Brown/grey coarse sand and gravel, some silt, no odour
P2-4 (down-gradient)	P2-4A	0 - 0.15	Brown gravel, some course sand, trace silt, no odour
	P2-4B	0.15 – 0.2	Brown gravel, some course sand, trace silt, no odour – refusal on bedrock

4.2.3 Groundwater Sampling

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

4.2.4 Thermal Monitoring

No thermistors are present at the USAF Landfill; therefore, no thermal monitoring was performed.

4.3 Results of the Monitoring Program

The following Sections 4.3.1 through 4.3.4 summarize the results of the PIN-2 monitoring program at the USAF Landfill.

4.3.1 Visual Inspection

The visual inspection was conducted in compliance with Section 5.2 of the TOR and details are provided below in the following Sections 4.3.1.1 through 4.3.1.5. **Figure PIN-2.3A** presents the visual inspection findings and photographic locations.

4.3.1.1 Inspection Checklist

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

Table 4-2: Visual Inspection Checklist – USAF Landfill

SITE NAME: PIN-2 Cape Young
LANDFILL DESIGNATION: USAF Landfill LANDFILL TYPE: Regraded DATE OF INSPECTION: 19 August 2018 WEATHER CONDITIONS: Overcast, raining and windy. ~ 0°C.
DATE OF PREVIOUS INSPECTION: 16 August 2016
INSPECTED BY: Ryan Janzen and Charles Gravelle
REPORT PREPARED BY: Ryan Janzen The inspector represents to the best of their knowledge that 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.

Table 4-2: Visual Inspection Checklist – USAF Landfill

Checklist Item	Present (Yes/No)	Feature Number	Feature Location	GPS Coordinates Easting/Northing/Zone (Taken from Centre of Feature)		Length (m)	Width (m)	Depth (m)	Extent Relative to Landfill Surface	Description	Comparison with Historical Observations	Severity Rating/ Additional Comments	Photographic Records (photo reference, location, view point & direction, feature of note, scale)
Settlement	Yes	A	Midpoint of W slope	502210.842, 7646922.4969	11 North	0.6	0.4	0.3	<1%	Minor depression	Slightly larger than in 2016	Acceptable	USAF # 6-7
Settlement	Yes	B	Top of W slope	502200.204, 7646937.04	11 North	2.5	1.1	0.1	<1%	Minor depression	Significantly wider at one extent than in 2016	Acceptable	USAF # 8-9
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	No												
Presence & Condition of Monitoring Instruments	No												
Features of Note/Other Relevant Observations (e.g., signs of activity, ruts…)	No												

4.3.1.2 Preliminary Stability Assessment

The Preliminary Stability Assessment for the USAF Landfill was conducted on August 19, 2018 as per the TOR and the results are provided below in Table 4-3.

Table 4-3: Preliminary Stability Assessment – USAF 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	Not Observed	None
Other	Not Observed	None
Overall Landfill Performance	**Acceptable**	

Note: please refer to Performance/Severity rating reference guide in Section 2.1.3.1 above.

4.3.1.3 Photographic Records

The detailed photographic record for the USAF Landfill has been completed as per Section 5.5 of the TOR and is included as Appendix I. The Photographic Record only contains an index of photographs collected; full sized photographs are contained in the separately appended CD/DVD-ROM. **Figure PIN-2.3A** illustrates the photograph locations and directions.

4.3.1.4 Trend Analysis

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

Table 4-4: Visual Inspection Trends - USAF Landfill

Checklist Item	Feature Number	Comparison with Historical Observations
Settlement	A B	Length increased from 0.4 m in 2016 to 0.6 m in 2018. Shape of feature appears to have changed, at one end width has increased from 0.25 m in 2016 to 1.1 m in 2018. Total length is unchanged.

4.3.1.5 Discussion of Results/Trends

A comparison of the visual inspection results of the 2016 and 2018 monitoring events at the USAF Landfill indicates that previously observed settlement features increased in size or saw no significant change. No new features were observed. The results of the visual inspection and the observed trends indicate that the performance of the landfill is acceptable.

4.3.2 Soil Sampling

Soil sampling of the USAF Landfill was conducted on August 20, 2018. The soil sampling was conducted in compliance with Section 5.3.1 and 5.3.2 of the TOR 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 USAF Landfill and analysed for inorganic elements (arsenic, cadmium, chromium, cobalt, copper, nickel, and zinc), polychlorinated biphenyls (PCBs), and Petroleum Hydrocarbons (PHC F1, F2, F3, and F4).

The full current and historical analytical results are presented in **Table 2** in the Tables section of this report immediately following the main text. The laboratory certificates of analysis and chain of custody forms are presented in **Appendix B** of this report. **Figure PIN-2.3B** presents a summary of significant soil analytical results.

4.3.2.2 Discussion of Results – Comparison to Baseline/Background

Analytical results were compared against background concentrations, baseline data – arithmetic mean, and baseline date mean + 3x standard deviation. The following Table 4-5 summarizes the comparison of results.

Table 4-5: Evaluation of Results by Parameter - USAF Landfill

Parameter	B.K.	B.S.	B.S. +	Discussion of Results
Arsenic (As)	2.9	3.8	15.5	Concentrations greater than the baseline of 3.8 mg/kg were noted at downgradient soil samples P2-04 surface (5.1 mg/kg) and depth (4.8 mg/kg). The downgradient P2-02 surface sample was greater than baseline (5.6 mg/kg) but its duplicate was less than baseline (at 2.1 mg/kg); the average of these two values was used to evaluate trends. All samples reported concentrations below the baseline +3 standard deviation. These concentrations are consistent with previous monitoring events. All other soil samples reported concentrations below both background and baseline concentrations for As. These minor elevated concentrations are not considered a concern.
Cadmium (Cd)	1.0	1.0	1.0	All soil samples reported concentrations below both background and baseline concentrations for Cd.
Chromium (Cr)	20.0	20.0	20.0	All soil samples reported concentrations below both background and baseline concentrations for Cr with the exception of downgradient sample station P2-04 surface (24 mg/kg). Previous monitoring rounds (i.e., 2012 and 2016) also reported elevated Cr concentrations at 230 mg/kg and 87 mg/kg, respectively. These elevated concentrations from 2012/2016 are not considered a concern following a comparison with current 2018 findings and Cr trends in surface samples.
Cobalt (Co)	5.0	5.0	5.0	The baseline and baseline +3 standard deviation were exceeded at downgradient sample stations P2-02 surface (duplicate DUP-7 at 7.6 mg/kg) and P2-02 depth (6.7 mg/kg). The P2-02 surface original sample met the baseline criterion; the average of the original and its field duplicate were used to evaluate trends. All other soil samples reported concentrations below both background and baseline concentrations for Co. These minor elevated concentrations are not considered a concern.
Copper (Cu)	8.7	7.7	16.1	The baseline and baseline +3 standard deviation were exceeded at downgradient sample stations P2-02 surface duplicate (21 mg/kg) and P2-02 depth (17 mg/kg). The P2-02 surface original sample met the baseline criterion; the average of the original and its field duplicate were used to evaluate trends. Concentrations greater than baseline were noted at sample stations upgradient P2-01 surface (8.8 mg/kg) and downgradient P2-04 surface (10 mg/kg). These minor elevated concentrations are not presently considered a concern; however, should be re-assessed for any changes following future monitoring. The remaining sample stations reported below both background and baseline concentrations for Cu.
Lead (Pb)	10.0	10.0	10.0	The baseline and baseline +3 standard deviation were exceeded at downgradient sample stations P2-04 surface (36 mg/kg) and P2-04 depth (16 mg/kg). These elevated concentrations are not presently considered a concern; however, should be re-assessed following future monitoring. The remaining sample stations reported below both background and baseline concentrations for Pb.

Parameter	B.K.	B.S.	B.S. +	Discussion of Results
Nickel (Ni)	5.0	5.0	5.0	The baseline and baseline +3 standard deviation were exceeded at downgradient sample stations P2-04 surface (9.6 mg/kg), P2-04 depth (5.5 mg/kg), P2-02 surface Duplicate DUP-7 (14 mg/kg) (with original sample P2-02 surface at 2.7 mg/kg), and P2-02 depth (13 mg/kg). The P2-02 surface original sample met the baseline criterion; the average of the original and its field duplicate were used to evaluate trends. These elevated concentrations are not presently considered a concern; however, should be re-assessed following future monitoring. The remaining sample stations reported below both background and baseline concentrations for Ni.
Zinc (Zn)	15.0	15.0	36.3	Concentrations greater than the baseline were noted at downgradient samples P2-02 surface (in the duplicate sample at 32 mg/kg; while original sample at 14 mg/kg), P2-02 depth (33 mg/kg), P2-03 surface (16 mg/kg), P2-04 surface (25 mg/kg), and P2-04 depth (25 mg/kg). All these reported elevated concentrations are consistent with previous monitoring events. All other soil samples reported concentrations below both background and baseline concentrations for Zn. These minor elevated concentrations are not considered a concern.
PCBs (Total)	0.01	0.1	0.1	The downgradient sample station reported exceedances of PCBs above the baseline and baseline +3 standard deviation at P2-04 surface (0.350 mg/kg) and P2-04 depth (0.390 mg/kg). These exceedances are similar to those reported during previous monitoring. The PCB concentrations in soil at the P2-04 location should re-assessed following the next monitoring event. All other soil sample results were below the laboratory method detection limit; therefore, below both background and baseline concentrations for PCBs.
F1 (C_6-C_{10})	N/A	10.0	10.0	All soil samples results were below the laboratory method detection limitfor F1.
F2 (C_{10}-C_{16})	N/A	4.0	4.0	The baseline and baseline +3 standard deviation were exceeded at downgradient sample station P2-04 depth (7.8 mg/kg) and at P2-02 surface duplicate (12 mg/kg); however, these are still considered extremely low soil concentration for PHC F2. The P2-02 surface original sample met the baseline criterion; the average of the original and its field duplicate were used to evaluate trends. All remaining soil samples were either below the laboratory detection limit or were below the baseline concentrations for F2.
F3 (C_{16}-C_{34})	N/A	9.0	9.0	The baseline and baseline +3 standard deviation were exceeded at upgradient sample stations P2-01 surface (110 mg/kg), P2-01 depth (49 mg/kg), downgradient stations P2-02 surface (duplicate at 45 mg/kg; original sample at 9.7 mg/kg), P2-02 depth (10 mg/kg), P2-03 surface (21 mg/kg), P2-04 surface (14 mg/kg), and P2-04 depth (10 mg/kg). These concentrations are not considered to be an issue and are very low for PHC F3 in soil. In addition, the sample matrix in the elevated samples is black peat and these reported concentrations are believed to be false positives related to natural biogenic organic compounds (BOCs). This is supported by our review of the related chromatograms (Appendix B).
F4 (C_{34}-C_{50})	N/A	8.0	8.0	The baseline and baseline +3 standard deviation were exceeded at upgradient sample P2-01 surface (21 mg/kg), P2-01 depth (12 mg/kg) and

Parameter	B.K.	B.S.	B.S. +	Discussion of Results
				downgradient samples P2-02 surface (23 mg/kg at the duplicate sample while non-detect in the original P2-02 surface sample). These concentrations are not considered to be an issue and are very low for PHC F4 in soil. In addition, the sample matrix in the elevated samples is black peat and these reported concentrations are believed to be false positives related to BOCs. This is supported by our review of the related chromatograms (Appendix B).

Note: B.K. = background concentration in mg/kg, B.S. = baseline concentration in mg/kg, B.S. + = baseline data mean + 3x standard deviations. Soil concentrations shown are in mg/kg.

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 (one graph per analyte tested) including a visual comparison to baseline, the baseline +3 standard deviations and results from previous monitoring years using differentiating colours (See **Appendix G2**). The followingTable 4-6 provides a summary of soil trend analysis findings and presents a discussion of the observed trends by parameter.

Table 4-6: Discussion of Trends – USAF Landfill

Parameter	Discussion of Trends
Arsenic (As)	Based on current and historical results, As has no observable trend at any of the sample stations at the USAF Landfill. All reported concentrations are within what would be expected of the natural variation from one sampling event to another. A single anomalously high concentration above baseline +3 standard deviation was reported at downgradient sample station P2-02 depth (20 mg/kg) in 2016.
Cadmium (Cd)	Based on current and historical results, Cd has no observable trend at any of the sample stations at the USAF Landfill. All reported concentrations are within what would be expected of the natural variation from one sampling event to another.
Chromium (Cr)	Based on current and historical results, Cr has no observable trend at any of the sample stations at the USAF Landfill. All reported concentrations are within what would be expected of the natural variation from one sampling event to another. The elevated concentrations from 2012/2016 are not considered a concern following a comparison with current 2018 findings and Cr trends in surface samples.
Cobalt (Co)	Based on current and historical results, Co has no observable trend at any of the sample stations at the USAF Landfill. All reported concentrations are within what would be expected of the natural variation from one sampling event to another. A few anomalously high concentrations were reported in 2018 (i.e., downgradient P2-02 surface at 7.6 mg/kg, P2-02 depth at 6.7 mg/kg). These are not believed to be trend setting concentrations and are typical of natural variation in heterogeneous soil.
Copper (Cu)	Based on current and historical results, Cu has no observable trend at any of the sample stations at the USAF Landfill. All reported concentrations are within what would be expected of the natural variation from one sampling event to another. A few anomalously high concentrations were reported in 2016 (i.e. downgradient P2-04 surface at 56 mg/kg) and in 2018 (i.e., downgradient P2-02 surface at 3.2 mg/kg (with field duplicate DUP-7 at 21 mg/kg),

Parameter	Discussion of Trends
	P2-02 depth at 17 mg/kg). These are not believed to be trend setting concentrations and are likely a result of natural variation in heterogeneous soil.
Lead (Pb)	Based on current and historical results, Pb has no observable trend at any of the sample stations at the USAF Landfill. All reported concentrations are within what would be expected of the natural variation from one sampling event to another.
Nickel (Ni)	Based on current and historical results, Ni has no observable trend at most of the sample stations at the USAF Landfill. All reported concentrations are within what would be expected of the natural variation from one sampling event to another. A few anomalously high concentrations were reported throughout the monitoring years. These are not believed to be trend setting concentrations and are likely from natural variation heterogeneous soil. Ni concentrations at the downgradient sample station P2-04 surface have decreased from 2012, 2016, and 2018 and may represent a downward trend at this station.
Zinc (Zn)	Based on current and historical results, Zn has no observable trend at any of the sample stations at the USAF Landfill. All reported concentrations are within what would be expected of the natural variation from one sampling event to another.
PCBs (Total)	Based on current and historical results, PCBs have no observable trend at any of the sample stations at the USAF Landfill. Downgradient monitoring point P2-04 should be reviewed for PCB soil concentrations following future monitoring to re-assess for potential trends.
F1 (C_6-C_{10})	Based on all concentrations being below the laboratory method detection limit, PHC F1 is considered to have no observable trend at the USAF Landfill.
F2 (C_{10}-C_{16})	Based on mostly concentrations below the laboratory method detection limit or very low concentrations, PHC F2 is considered to have no observable trend at the USAF Landfill.
F3 (C_{16}-C_{34})	Based on either concentrations below the laboratory method detection limit or very low concentrations, PHC F3 is considered to have no observable trend at the USAF Landfill.
F4 (C_{34}-C_{50})	Based on either concentrations below the laboratory method detection limit or very low concentrations, PHC F4 is considered to have no observable trend at the USAF Landfill.

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 USAF Landfill; therefore, no groundwater sampling or analysis was conducted.

4.3.4 Thermal Monitoring

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

4.4 Conclusions and Overall Landfill Performance

Based on the results of the 2018 monitoring program, the overall performance of the USAF Landfill is acceptable.

4.5 Recommendations and Conclusions

Downgradient concentrations of chromium, copper, nickel, lead and PCBs were elevated compared to upgradient samples, baseline and baseline + 3 standard deviations. However, these are not considered to be a concern at this time. The reported concentrations are similar to those reported in previous monitoring rounds and should continue to be re-assessed following future monitoring events for any observable changes in concentrations over time.

Based on review and analysis of chemical data, it appears that the soil concentrations for the parameters tested have no major observable trends with no obvious soil concentration increases or decreases over time. This indicates that the landfill is performing as intended and no leachate is present in the surrounding environments.

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 USAF landfill performance is acceptable. No remedial work or deviations from the monitoring plan are recommended at this time.

5 PIN-2: STATION WEST LANDFILL

5.1 Landfill Description

The Station West Landfill is located approximately 100 m southwest of the USAF Landfill and 640 m east of the existing aircraft hangar. There is a minor trail heading southwest from the landfill, but no road exists that connects this landfill to the Station Area. The remediation of this landfill included the removal of surface and partially exposed debris followed by the regrading/ recapping of the landfill surface using 0.75 m thickness of Type 2 granular fill.

The long-term monitoring plan for the Station West landfill entailed visual monitoring and collection of soil samples from prescribed locations. The landfill layout, visual observations and photographic locations are presented on Figure PIN-2.4A and soil analytical results are presented on **Figure PIN-2.4B**, both located at the rear of this report.

5.2 Summary of Work Conducted

5.2.1 Visual Inspection

A visual inspection was conducted on the Station West Landfill on August 19, 2018. 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 20, 2018 and consisted of the collection of eight soil samples from four soil sample stations (P2-5, P2-6, P2-7, and P2-8). Depth limitations were encountered at soil sampling station P2-5, where refusal on bedrock limited the depth sample from 0.15 to 0.25 metres below ground surface. Duplicate number 6 (Dup 6) was collected at station P2-8B. Table 5-1 outlines the soil sampling activities conducted at the Station Landfill.

Table 5-1: Summary of Work Conducted by Soil Sampling Location – Station West Landfill

Sample Location	Sample ID	Sample Depth (m bgs)	Notes
P2-5 (up-gradient)	P2-5A	0 – 0.15	Brown gravel, trace coarse sand, no odour
	P2-5B	0.15 – 0.25	Brown gravel, trace coarse sand, no odour. Refusal on bedrock.
P2-6 (down-gradient)	P2-6A	0 – 0.15	Brown to black organics, roots, no odour
	P2-6B	0.4 – 0.5	Brown sand and gravel, no odour
P2-7 (down-gradient)	P2-7A	0 – 0.15	Dark brown sand and gravel, organics, no odour
	P2-7B	0.4 – 0.5	Brown/grey gravel, some sand, no odour
P2-8 (down-gradient)	P2-8A	0 – 0.15	Brown/black peat, some sand and gravel, no odour
	P2-8B	0.4 – 0.5	Brown sand and gravel, no odour

5.2.3 Groundwater Sampling

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

5.2.4 Thermal Monitoring

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

5.3 Results of the Monitoring Program

The following Sections 5.3.1 through 5.3.4 summarize the results of the PIN-2 monitoring program at the Station West Landfill.

5.3.1 Visual Inspection

The visual inspection of the Station West Landfill was conducted on August 19, 2018. The visual inspection was conducted in compliance with Section 5.2 of the TOR and details are provided below in the following Sections 5.3.1.1 through 5.3.1.5. **Figure PIN-2.4A** presents the visual inspection findings and photographic locations.

5.3.1.1 Inspection Checklist

The visual inspection was completed as per the TOR 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: PIN-2 Cape Young
LANDFILL DESIGNATION: Station West Landfill LANDFILL TYPE: Regraded DATE OF INSPECTION: 19 August 2018 WEATHER CONDITIONS: Overcast, some rain and windy. ~0 C
DATE OF PREVIOUS INSPECTION: 16 August 2016
INSPECTED BY: Ryan Janzen and Charles Gravelle
REPORT PREPARED BY: Ryan Janzen The inspector represents to the best of their knowledge that 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.

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

Checklist Item	Present (Yes/No)	Feature Number	Feature Location	GPS Coordinates Easting/Northing/Zone (Taken from Centre of Feature)	Length (m)	Width (m)	Depth (m)	Extent Relative to Landfill Surface	Description	Comparison with Historical Observations	Severity Rating/ Additional Comments	Photographic Records (photo reference, location, view point & direction, feature of note, scale)
Settlement	No											
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	No											
Presence & Condition of Monitoring Instruments	No											
Features of Note/Other Relevant Observations (e.g., signs of activity, ruts…)	Yes	A1	Middle of upper landfill surface	502132.5621, 7646812.83	11 North 14.2	0.3	0.1	<1%	Vehicle tracks (loader)	No significant change	Acceptable Caused by rough grading at surface with cobble material. Dozer or loader made a large number of turns in the area.	SW # 15
		A2		502132.6519, 7646812.334	11 North 16.7	0.3	0.1	<1%	Vehicle tracks (loader)	No significant change		SW # 15
		B	S slope of landfill	502135.6582, 7646792.635	11 North 5.0	3.0	0.1	<1%	Vehicle tracks (loader)	No significant change		SW # 13-14

5.3.1.2 Preliminary Stability Assessment

The Preliminary Stability Assessment for the Station West Landfill was conducted on August 19, 2018 as per the TOR and the results are provided below in Table 5-3.

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

Feature	Severity Rating	Extent
Settlement	Not Observed	None
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	Not Observed	None
Other	Acceptable	Occasional
Overall Landfill Performance	**Acceptable**	

Note: please refer to Performance/Severity rating reference guide in Section 2.1.3.1 above.

5.3.1.3 Photographic Records

The detailed photographic record for the Station West Landfill has been completed as per Section 5.5 of the TOR and is included as **Appendix I**. The photographic record only contains an index of photographs collected; full sized photographs are contained in an Appended CD/DVD-ROM, separate to this report. **Figure PIN-2.4A** illustrates the photograph locations and directions.

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 5-4 outlines the results of the visual trend analysis.

Table 5-4: Visual Inspection Trends – Station West Landfill

Checklist Item	Feature Number	Comparison with Historical Observations
Other (Vehicle Tracks)	A B	No significant change from 2016 to 2018. No significant change from 2016 to 2018.

5.3.1.5 Discussion of Results/Trends

A comparison of the visual inspection results of the 2016 and 2018 monitoring events at the Station West Landfill indicates that features showed no significant change. No new features were observed. The results of the visual inspection and the observed trends indicate that the performance of the landfill is acceptable.

5.3.2 Soil Sampling

Soil sampling of the Station West Landfill was conducted on August 20, 2018. The soil sampling was conducted in compliance with Section 5.3.1 and 5.3.2 of the TOR 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 and analysed for inorganic elements (arsenic, cadmium, chromium, cobalt, copper, nickel, and zinc), polychlorinated biphenyls (PCBs), and Petroleum Hydrocarbons (PHC F1, F2, F3, and F4).

The full current and historical analytical results are presented in **Table 3** in the Tables section of this report immediately following the main text. The laboratory certificates of analysis and chain of custody forms are presented in **Appendix B** of this report. **Figure PIN-2.4B** presents a summary of significant soil analytical results.

5.3.2.2 Discussion of Results – Comparison to Baseline/Background

Analytical results were compared against background concentrations, baseline data – arithmetic mean, and baseline date mean + 3x standard deviation. The following Table 5-5 summarizes the comparison of results.

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

Parameter	B.K.	B.S.	B.S. +	Discussion of Results
Arsenic (As)	2.9	3.5	6.8	Concentrations greater than baseline of 3.5 mg/kg were noted at downgradient soil samples P2-06 surface (4.8 mg/kg) and depth (6.4 mg/kg). All other samples reported concentrations below the baseline. These minor elevated concentrations are not considered a concern.
Cadmium (Cd)	1.0	1.0	1.0	All soil samples were either below the laboratory method detection limit or were below baseline concentrations for Cd.
Chromium (Cr)	20.0	20.0	20.0	All soil samples reported concentrations below both background and baseline concentrations for Cr.

Parameter	B.K.	B.S.	B.S. +	Discussion of Results
Cobalt (Co)	5.0	5.0	5.0	All soil samples reported concentrations below both background and baseline concentrations for Co.
Copper (Cu)	8.7	5.8	13.1	A concentration greater than the baseline of 5.8 mg/kg was noted at one downgradient sample station P2-07 depth (6.8 mg/kg). All other samples reported concentrations below the baseline. This single elevated concentration is not considered a concern.
Lead (Pb)	10.0	10.0	10.0	All soil samples reported concentrations below both background and baseline concentrations for Pb.
Nickel (Ni)	5.0	5.0	5.0	The baseline and baseline +3 standard deviation were exceeded in downgradient samples P2-06 depth (5.7 mg/kg) and P2-07 depth (5.4 mg/kg). All other soil samples reported concentrations below both background and baseline concentrations for Ni. These minor elevated concentrations are not considered a concern.
Zinc (Zn)	15.0	15.0	15.0	The baseline and baseline +3 standard deviation were exceeded in downgradient samples P2-06 surface (18 mg/kg) and P2-07 surface (23 mg/kg). An anomalous detection of Zn was reported at upgradient sample P2-05 surface in 2014 (101.0 mg/kg) compared to 55 mg/kg in 2016 and 8.5 mg/kg in 2018. All other soil samples reported concentrations at or below both background and baseline concentrations for Zn. These minor elevated concentrations are not considered a concern.
PCBs (Total)	0.01	0.1	0.1	All soil samples were below the laboratory method detection limit; therefore, below both background and baseline concentrations for PCBs.
F1 (C_6-C_{10})	N/A	10.0	10.0	All soil samples were below the laboratory method detection limit for F1.
F2 (C_{10}-C_{16})	N/A	4.0	4.0	The baseline and baseline +3 standard deviation (at 4.0 mg/kg) were exceeded at downgradient sample stations P2-07 surface (5.6 mg/kg) and at P2-08 depth duplicate (5.0 mg/kg); however, this is still considered an extremely low soil concentration for PHC F2. The sample original for P2-08 depth met the baseline criterion. All other soil samples were below the laboratory method detection limit or were below the baseline concentrations for PHC F2.
F3 (C_{16}-C_{34})	N/A	9.0	9.0	The baseline and baseline +3 standard deviation were exceeded at downgradient sample stations P2-06 surface (43 mg/kg), P2-07 surface (95 mg/kg), P2-07 depth (24 mg/kg), P2-08 surface (59 mg/kg), and P2-08 depth (20 mg/kg; with its duplicate at 22 mg/kg (DUP-6)). These concentrations are not considered to be an issue and are very low for PHC F3 in soil.
F4 (C_{34}-C_{50})	N/A	8.0	8.0	The baseline and baseline +3 standard deviation were exceeded at downgradient sample stations P2-06 surface (8.7 mg/kg), P2-07 surface (61 mg/kg), P2-08 surface (19 mg/kg), and P2-08 depth (10 mg/kg) and at the P2-08 depth duplicate (9.1 mg/kg). These concentrations are not considered to be an issue and are considered low for PHC F4 in soil.

Note: B.K. = background concentration in mg/kg, B.S. = baseline concentration in mg/kg, B.S. + =baseline data mean + 3x standard deviations. Concentrations shown are in mg/kg.

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 (one graph per analyte tested) including a visual comparison to baseline, the baseline +3 standard deviations and results from previous monitoring years using differentiating colours (See **Appendix G3**). The following Table 5-6 provides a summary of soil trend analysis findings and presents a discussion of the observed trends by parameter.

Table 5-6: Discussion of Trends – Station West Landfill

Parameter	Discussion of Trends
Arsenic (As)	Based on current and historical results, As has no observable trend at any of the sample stations at the Station West Landfill. All reported concentrations are typical of natural variation from one sampling event to another.
Cadmium (Cd)	Based on current and historical results, Cd has no observable trend at any of the sample stations at the Station West Landfill. All reported concentrations are typical of natural variation from one sampling event to another.
Chromium (Cr)	Based on current and historical results, Cr has no observable trend at any of the sample stations at the Station West Landfill. All reported concentrations are typical of natural variation from one sampling event to another.
Cobalt (Co)	Based on current and historical results, Co has no observable trend at any of the sample stations at the Station West Landfill. All reported concentrations are typical of natural variation from one sampling event to another.
Copper (Cu)	Based on current and historical results, Cu has no observable trend at any of the sample stations at the Station West Landfill. All reported concentrations are typical of natural variation from one sampling event to another.
Lead (Pb)	Based on current and historical results, Pb has no observable trend at any of the sample stations at the Station West Landfill. All reported concentrations are typical of natural variation from one sampling event to another.
Nickel (Ni)	Based on current and historical results, Ni has no observable trend at most of the sample stations at the Station West Landfill. All reported concentrations are typical of natural variation from one sampling event to another.
Zinc (Zn)	Based on most current and historical results, Zn has no observable trend at any of the sample stations at the Station West Landfill. All reported concentrations are typical of natural variation from one sampling event to another.
PCBs (Total)	Based on current and historical results, PCBs have no observable trend at any of the sample stations at the Station West Landfill. All reported concentrations are typical of natural variation from one sampling event to another.
F1 (C_6-C_{10})	Based on all concentrations being below the laboratory method detection limit, PHC F1 is considered to have no observable trend at the Station West Landfill.
F2 (C_{10}-C_{16})	Based on most concentrations being below the laboratory method detection limit or very low concentrations, PHC F2 is considered to have no observable trend at the Station West Landfill.
F3 (C_{16}-C_{34})	Based on either concentrations being below the laboratory method detection limit or very low concentrations, PHC F3 is considered to have no observable trend at the Station West Landfill.
F4 (C_{34}-C_{50})	Based on the low concentrations observed, PHC F4 is considered to have no observable trend at the Station West Landfill.

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 2018 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 have no obvious soil concentration increases or decreases over time. This indicates that the landfill is performing as intended and no leachate is present in the surrounding environments.

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 Station West landfill performance is acceptable. No remedial work or deviations from the monitoring plan are recommended at this time.

6 PIN-2: TIER II SOIL DISPOSAL FACILITY

6.1 Landfill Description

A Tier II Soil Disposal Facility was constructed at the PIN-2 site for the disposal of Tier II contaminated soil excavated during the DEW Line clean-up program. The facility is located approximately 300 m southwest of the existing hangar (Station Area).

The Tier II Soil Disposal Facility design is a double containment system. The landfill was constructed with the placement of low-permeability, saturated, compacted berms keyed into frozen/saturated ground below existing ground, the installation of a liner system over the berms and along the landfill base, and the placement of a surface liner system over the landfill contents. The placement of sufficient overlying granular fill was also completed to promote freeze-back of the landfill contents.

Four groundwater monitoring wells were installed around the landfill perimeter, and four thermistors were installed within the landfill to monitor ground temperatures.

The long-term monitoring plan consists of visual monitoring, collection of soil and groundwater samples, and monitoring of subsurface ground temperatures in the berms and main body of the landfill.

The landfill layout, visual observations and photographic locations are presented on **Figure PIN-2.5A**, soil analytical results on **Figure PIN-2.5B**, and groundwater results on **Figure PIN-2.5C**, all of which are included at the rear of the report.

6.2 Summary of Work Conducted

6.2.1 Visual Inspection

A visual inspection was completed at the Tier II Soil Disposal Facility on August 17, 2018. The visual inspection of the landfill was completed with no deviations from the accepted work plan.

6.2.2 Soil Sampling

Soil sampling at the Tier II Soil Disposal Facility was conducted on August 17, 2018 and consisted of the collection of eight soil samples from four soil sample stations (MW-01, MW-02, MW-03, and MW-04). Duplicate number 1 (Dup 1) was collected at station MW-01A.

Table 6-1 outlines the soil sampling activities conducted at the Tier II Soil Disposal Facility.

Table 6-1: Summary of Work Conducted by Soil Sampling Location- Tier II Soil Disposal Facility

Sample Location	Sample ID	Sample Depth (m bgs)	Notes
MW-01 (down-gradient)	MW-01A	0 - 0.15	Dark brown, gravel, silty, organics, some sand, no odour
	MW-01B	0.4 – 0.5	Dark brown, gravel, silty, some sand, no odour
MW-02 (down-gradient)	MW-02A	0 - 0.15	Dark brown, gravel, silty sand, some sand, no odour
	MW-02B	0.4 – 0.5	Light to dark brown gravel, silt, some sand, no odour
MW-03 (down-gradient)	MW-03A	0 - 0.15	Dark brown, gravel, silty, some sand, some organics, no odour
	MW-03B	0.4 – 0.5	Dark brown, gravel, silty, some sand, no odour
MW-04 (up-gradient)	MW-04A	0 - 0.15	Light brown, gravel, silty, some sand, no odour
	MW-04B	0.4 – 0.5	Light brown, gravel, silty, some sand, no odour

6.2.3 Groundwater Sampling

Groundwater monitoring at the Tier II Soil Disposal Facility was conducted on August 19, 2018 and consisted of the inspection and groundwater monitoring of four monitoring wells (MW-01, MW-02, MW-03, and MW-04). All monitoring wells contained water and groundwater samples were collected for analysis. Monitoring well sampling logs are presented in **Appendix D**. Updated (2018) monitoring well field logs were filled out for each well. The following Table 6-2 outlines the groundwater sampling activities conducted at the Tier II Soil Disposal Facility.

Table 6-2: Summary of Work Conducted by Monitoring Well- Tier II Soil Disposal Facility

Monitoring Well ID Tier II Soil Disposal Facility	Observations	# of Groundwater Samples Collected
MW-01	Excellent condition	1
MW-02	Excellent condition	1
MW-03	Excellent condition	1
MW-04	Excellent condition	1

6.2.4 Thermal Monitoring

Four thermistors (VT-1, VT-2, VT-3, and VT-4) are present at the Tier II Soil Disposal Facility. Each of the thermistor installations was inspected and data downloaded from the data loggers as per Section 5.4 of the TOR. Updated (2018) thermistor inspection reports were filled out for each of the installations and further details are provided in Section 6.3.4.

6.3 Results of the Monitoring Program

The following Sections 6.3.1 through 6.3.3 summarize the results of the PIN-2 monitoring program at the Tier II Soil Disposal Facility.

6.3.1 Visual Inspection

The visual inspection was conducted in compliance with Section 5.2 of the TOR and details are provided below in the following Sections 6.3.1.1 through 6.3.1.5. **Figure PIN-2.5A** presents the visual inspection findings and photographic locations.

6.3.1.1 Inspection Checklist

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

Table 6-3: Visual Inspection Checklist – Tier II Soil Disposal Facility

SITE NAME: PIN-2 Cape Young
LANDFILL DESIGNATION: Tier II Soil Disposal Facility LANDFILL TYPE: Tier II DATE OF INSPECTION: 17 August 2018 WEATHER CONDITIONS: Overcast and gusting, intermittent precipitation. Clearing in the evening. ~0C
DATE OF PREVIOUS INSPECTION: 16 August 2016
INSPECTED BY: Ryan Janzen and Charles Gravelle
REPORT PREPARED BY: Ryan Janzen The inspector represents to the best of their knowledge that 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.

Table 6-3: Visual Inspection Checklist – Tier II Soil Disposal Facility

Checklist Item	Present (Yes/No)	Feature Number	Feature Location	GPS Coordinates Easting/Northing/Zone (Taken from Centre of Feature)		Length (m)	Width (m)	Depth (m)	Extent Relative to Landfill Surface	Description	Comparison with Historical Observations	Severity Rating/ Additional Comments	Photographic Records (photo reference, location, view point & direction, feature of note, scale)
Settlement	Yes	A	SW crest	502432.6906, 7646282.0858 502447.3523, 7646269.6511 502451.5672, 7646265.2127 502455.9487, 7646257.1389	11 North	0.4-3.0	0.3-0.6	0.1-0.15	<1%	Four minor depressions	No change	Acceptable Oval shaped settlements	Tier II # 10, 11, 29, 30, 37-39
Settlement	No	D	NE crest		11 North	-	-	-	<1%	Minor depression	Not observed in 2016 or 2018	Acceptable (non-existent) Not observed in 2015 either	None
Settlement	Yes	I	E crest	502500.1666, 7646286.2524	11 North	2.5	0.8	0.05	<1%	Minor depression	No change	Acceptable	Tier II # 21-22
Settlement	Yes	J	SW slope	502435.6293, 7646275.4725 502440.9964, 7646274.6895	11 North	3.5	2.5	0.1	<1%	Depressed area, uneven ground	Larger than observed in 2016	Acceptable Previously noted as discrete features, now noted as encompassing larger area	Tier II # 31-36
Settlement	Yes	M (new)	W corner on crest	502424.2564, 7646295.9478	11 North	0.8	0.15	0.1	<1%	Minor depression	New observation	Acceptable	Tier II # 73-74
Erosion	Yes	B	SW slope	502432.0310, 7646281.8776	11 North	7.7	0.15	0.05	<1%	Minor linear erosion	No change	Acceptable Very difficult to see	Tier II # 37, 39
Erosion	Yes	C1 C2 C3 C4 C5	SE slope	502493.0937, 7646277.1837 502479.0968, 7646265.7294 502472.0096, 7646258.7387 502491.6183, 7646278.2780 502492.9602, 7646279.8062	11 North	3.9 4.6 10.2 4.8 4.4	0.1 0.1 0.3 0.1 0.1	0.05 0.05 0.1 0.05 0.05	<1%	5x minor linear erosion	Individual sub-features are smaller than noted in 2016. Previously logged as a single item with three sub-features; five sub-features were noted in 2018.	Acceptable Could also be due to material/grading pattern – not necessarily erosion	Tier II # 12-17
Erosion	Yes	E1 E2	NW slope	502420.4000, 7646313.6218 502440.1003, 7646324.7816	11 North	13.2 8.0	0.5 0.3	0.1 0.05	<1%	2x minor linear erosion	No change	Acceptable Could also be due to material/grading pattern – not necessarily erosion	Tier II # 52-55
Erosion	Yes	G	NW slope	502408.8280, 7646312.5791	11 North	19.8	2.0	0.05	<1%	Minor linear erosion	Longer and wider than observed in 2016	Acceptable Could also be due to material/grading pattern – not necessarily erosion	Tier II # 50-51
Erosion	Yes	H	NE slope	502486.9018, 7646313.7491	11 North	7.9	0.3	0.1	<1%	Minor linear erosion	Smaller than noted in 2016	Acceptable	Tier II # 69-70
Erosion	No	K	NW slope		11 North	-	-	-	<1%	Minor linear erosion	Not observed in 2018	Acceptable Photos taken at co-ordinates provided	Tier II # 43, 48
Erosion	Yes	L	N corner slope	502457.7203, 7646353.0927	11 North	5.0	0.3	0.1	<1%	Minor linear erosion	Smaller than noted in 2016	Acceptable	Tier II # 67-68

Table 6-3: Visual Inspection Checklist – Tier II Soil Disposal Facility

Checklist Item	Present (Yes/No)	Feature Number	Feature Location	GPS Coordinates Easting/Northing/Zone (Taken from Centre of Feature)	Length (m)	Width (m)	Depth (m)	Extent Relative to Landfill Surface	Description	Comparison with Historical Observations	Severity Rating/ Additional Comments	Photographic Records (photo reference, location, view point & direction, feature of note, scale)
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	Yes	VT-1	Landfill embankment	502434.2000, 7646280.9342	11 North	-	-	-	<1%	Thermistors	No change	Cap at VT-2 replaced	Tier II # 37
		VT-2		502464.9600, 7646274.2400									
		VT-3		502460.2600, 7646307.4142									
		VT-4		502497.3600, 7646284.2400									
		MW-1	Outside landfill footprint	502402.9480, 7646319.6875	11 North	-	-	-		Monitoring wells	No change	Good condition	Tier II # 1, 27, 49, 71
		MW-2		502421.9110, 7646239.6750									
		MW-3		502497.8530, 7646236.7557									
		MW-4		502549.3230, 7646319.7577									
Features of Note/Other Relevant Observations (e.g., signs of activity, ruts…)	Yes	F1	Flat surface at top of landfill	502454.5449, 7646320.1703 502460.5064, 7646302.3396	11 North	13.0	0.15	0.05	<1%	Shallow striations – vehicle tracks (wildlife monitors on ATVs use the landfill as an observation point)	No change in severity, although dimensions are noted with more detail this program	Acceptable Noted as per spec, but this is not a significant issue	Tier II # 59-62
		F2				12.1	0.15	0.05					
		F3				13.8	0.15	0.05					
		F4				4.4	0.15	0.05					
		F5				3.2	0.15	0.05					
		F6				2.0	0.15	0.05					
		F7				8.0	0.15	0.05					

6.3.1.2 Preliminary Stability Assessment

The Preliminary Stability Assessment for the Tier II Soil Disposal Facility was conducted on August 17, 2018 as per the TOR and the results are provided below in Table 6-4.

Table 6-4: Preliminary Stability Assessment – Tier II Soil 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	Not Observed	None
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**	

Note: please refer to Performance/Severity rating reference guide in Section 2.1.3.1 above.

6.3.1.3 Photographic Records

The detailed photographic record for the Tier II Soil Disposal Facility has been completed as per Section 5.5 of the TOR and is included as **Appendix I**. The Photographic Record only contains an index of photographs collected; full sized photographs are contained in the separately appended CD/DVD-ROM. **Figure PIN-2.5A** illustrates the photograph locations and directions.

6.3.1.4 Trend Analysis

A trend analysis was conducted with regards to observations made during the visual inspection of the Tier II Soil Disposal Facility. The following Table 6-5 outlines the results of the visual trend analysis.

Table 6-5: Visual Inspection Trends - Tier II Soil Disposal Facility

Checklist Item	Feature Number	Comparison with Historical Observations
Settlement	A	No significant change from 2016 to 2018.
	D	Not observed in 2018.
	I	No significant change from 2016 to 2018.
	J	Area previously classified as two small depressions, now identified as one larger depression. Maximum extents have increased from 2.0 m in 2016 to 3.5 m in 2018.
	M (new)	New observation in 2018.
Erosion	B	No significant change from 2016 to 2018.
	C	This set of features now comprises five sub-features (only three noted in 2016).
	E	No significant change from 2016 to 2018.
	G	Length has increased from 16 m in 2016 to 19.8 m in 2018, width from 0.5 m in 2016 to 2.0 m in 2018 at the feature's widest point, at the crest.
	H	Measured dimensions had decreased from 2016 to 2018.
	K	Not observed in 2018.
	L	Measured dimensions had decreased from 2016 to 2018.
Other (vehicle tracks)	F	No significant change from 2016 to 2018.

6.3.1.5 Discussion of Results/Trends

A comparison of the visual inspection results of the 2016 and 2018 monitoring events at the Tier II Soil Disposal Facility indicates that settlement features generally had no significant change, with one now re-classified to encompass a larger area than previously noted. One new settlement feature was noted, and one previously noted feature was not observed. Erosion features typically showed no significant change, with one set of features expanding from three to five sub-features, one feature increasing in length and width, and one feature not observed in 2018. No new erosion features were observed. The results of the visual inspection and the observed trends indicate that the performance of the landfill is acceptable.

6.3.2 Soil Sampling

Soil sampling of the Tier II Soil Disposal Facility was conducted on August 17, 2018. The soil sampling was conducted in compliance with Section 5.3.1 and 5.3.2 of the TOR 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 eight soil samples were analysed from four soil sample locations at the Tier II Soil Disposal Facility and analysed for inorganic elements (arsenic, cadmium, chromium, cobalt, copper, nickel, and zinc), polychlorinated biphenyls (PCBs), and Petroleum Hydrocarbons (PHC F1, F2, F3, and F4).

The full current and historical analytical results are presented in **Table 4** in the Tables section of this report immediately following the main text. The laboratory certificates of analysis and chain of custody forms are

presented in **Appendix B** of this report. **Figure PIN-2.5B** presents a summary of significant soil analytical results.

6.3.2.2 Discussion of Results – Comparison to Baseline/Background

Analytical results were compared against background concentrations, baseline data – arithmetic mean, and baseline date mean + 3x standard deviation. The following Table 6-6 summarizes the comparison of results.

Table 6-6: Evaluation of Results by Parameter – Tier II Soil Disposal Facility

Parameter	B.K.	B.S.	B.S. +	Discussion of Results
Arsenic (As)	2.9	4.2	11.5	The baseline and baseline +3 standard deviation were exceeded in downgradient sample MW-01 depth (18 mg/kg). Concentrations greater than baseline was noted at downgradient sample stations MW-01 surface (4.6 mg/kg and its duplicate at 4.7 mg/kg), MW-02 surface (4.4 mg/kg), and MW-02 depth (7.9 mg/kg). All other samples reported concentrations below the baseline. These minor elevated concentrations are not considered a concern and the concentration noted at MW-01 depth is believed to be anomalous when compared to results of previous monitoring events.
Cadmium (Cd)	1.0	1.0	1.0	All soil samples reported concentrations below both background and baseline concentrations for Cd.
Chromium (Cr)	20.0	20.0	20.0	All soil samples reported concentrations below both background and baseline concentrations for Cr.
Cobalt (Co)	5.0	5.0	5.0	All soil samples reported concentrations below both background and baseline concentrations for Co.
Copper (Cu)	8.7	5.2	16.6	Concentrations greater than baseline concentration of 5.2 mg/kg were noted at downgradient sample stations MW-01 surface (9.1 mg/kg and its duplicate at 9.0 mg/kg), MW-01 depth (5.9 mg/kg), MW-02 surface (9.0 mg/kg), and MW-02 depth (8.3 mg/kg). All other samples reported concentrations below the baseline. These slightly elevated concentrations are not considered a concern.
Lead (Pb)	10.0	10.0	10.0	All soil samples reported concentrations below both background and baseline concentrations for Pb.
Nickel (Ni)	5.0	5.0	5.0	The baseline and baseline +3 standard deviation were exceeded in downgradient samples MW-01 surface (8.5 mg/kg; and its duplicate at 6.6 mg/kg), MW-01 depth (5.3 mg/kg), MW-02 surface (6.6 mg/kg), and MW-02 depth (5.4 mg/kg). All other soil samples reported concentrations below both background and baseline concentrations for Ni. These minor elevated concentrations are not considered a concern.
Zinc (Zn)	15.0	15.0	36.6	Concentrations greater than baseline were noted in downgradient samples MW-01 surface (original sample met baseline at 14 mg/kg although its duplicate was greater at 16 mg/kg; an average of these two data points was used to evaluate trends), MW-01 depth (22 mg/kg), MW-02 surface (22 mg/kg), MW-02 depth (17 mg/kg) and MW-03 surface (17

Parameter	B.K.	B.S.	B.S. +	Discussion of Results
				mg/kg). All other soil samples reported concentrations below both background and baseline concentrations for Zn. These minor elevated concentrations are not considered a concern and are consistent with previous monitoring events.
PCBs (Total)	0.10	0.050	0.050	All soil samples were below the laboratory method detection limit; therefore, below both background and baseline concentrations for PCBs.
F1 (C_6-C_{10})	N/A	10.0.	10.0	All soil samples were below the laboratory method detection limit for PHC F1.
F2 (C_{10}-C_{16})	N/A	4.0	4.0	All soil samples were below the laboratory method detection limit for PHC F2.
F3 (C_{16}-C_{34})	N/A	17.4	58.1	Concentrations greater than baseline were noted at downgradient sample stations MW-01 surface (51 mg/kg in original sample but at 11 mg/kg in its duplicate; the average of the data points at 31 mg/kg was used to evaluate trends), MW-01 depth (28 mg/kg), MW-02 surface (26 mg/kg), and MW-03 surface (25 mg/kg). These concentrations are not considered to be an issue and are very low for PHC F3 in soil. All sample results met B.S.+ 3x standard deviations in 2018.
F4 (C_{34}-C_{50})	N/A	17.8	62.4	All soil samples were below the laboratory method detection limit or aat concentrations below the baseline for PHC F4.

Note: B.K. = background concentration in mg/kg, B.S. = baseline concentration in mg/kg, B.S. + =baseline data mean + 3x standard deviations. Concentrations shown are in mg/kg.

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 (one graph per analyte tested) including a visual comparison to baseline, the baseline +3 standard deviations and results from previous monitoring years using differentiating colours (See **Appendix G4**). The following Table 6-7 provides a summary of soil trend analysis findings and presents a discussion of the observed trends by parameter.

Table 6-7: Discussion of Trends – Tier II Soil Disposal Facility

Parameter	Discussion of Trends
Arsenic (As)	Based on current and historical results, As has no observable trend at any of the sample stations at the Tier II Soil Disposal Facility. Most reported concentrations are within what would be expected of the natural variation from one sampling event to another. The one exception is at downgradient sample station MW-02 depth, where an upward trend may be developing. This should be monitored closely during future monitoring events. A single anomalously high concentration was reported at downgradient sample station MW-01 depth in 2018; however, this does not represent a trend setting concentration and is believed to be an anomaly due to the heterogeneous nature of the soils.
Cadmium (Cd)	Based on current and historical results, Cd has no observable trend at any of the sample stations at the Tier II Soil Disposal Facility. All reported concentrations are within what would be expected of the natural variation from one sampling event to another.

Parameter	Discussion of Trends
Chromium (Cr)	Based on current and historical results, Cr has no observable trend at any of the sample stations at the Tier II Soil Disposal Facility. All reported concentrations are within what would be expected of the natural variation from one sampling event to another. Downgradient sample station MW-01 depth appears to have increased in concentration in both 2016 and 2018 when compared to 2012 and 2014. This does not represent an upward trend at this point; however, this location should continue to be monitored during future monitoring events.
Cobalt (Co)	Based on current and historical results, Co has no observable trend at any of the sample stations at the Tier II Soil Disposal Facility. All reported concentrations are within what would be expected of the natural variation from one sampling event to another.
Copper (Cu)	Based on current and historical results, Cu has no observable trend at any of the sample stations at the Tier II Soil Disposal Facility. All reported concentrations are within what would be expected of the natural variation from one sampling event to another.
Lead (Pb)	Based on current and historical results, Pb has no observable trend at any of the sample stations at the Tier II Soil Disposal Facility. All reported concentrations are within what would be expected of the natural variation from one sampling event to another.
Nickel (Ni)	Based on current and historical results, Ni has no observable trend at most of the sample stations at the Tier II Soil Disposal Facility. All reported concentrations are within what would be expected of the natural variation from one sampling event to another.
Zinc (Zn)	Based on current and historical results, Zn has no observable trend at any of the sample stations at the Tier II Soil Disposal Facility. All reported concentrations are within what would be expected of the natural variation from one sampling event to another.
PCBs (Total)	Based on current and historical results, PCBs have no observable trend at any of the sample stations at the Tier II Soil Disposal Facility. All samples were below the laboratory method detection limit.
F1 (C_6-C_{10})	Based on most concentrations being below the laboratory method detection limit, PHC F1 is considered to have no observable trend at the Tier II Soil Disposal Facility.
F2 (C_{10}-C_{16})	Based on all concentrations being very low or below the laboratory method detection limit, PHC F2 is considered to have no observable trend at the Tier II Soil Disposal Facility.
F3 (C_{16}-C_{34})	Based on the concentrations being either below the laboratory method detection limit or being very low, PHC F3 is considered to have no observable trend at the Tier II Soil Disposal Facility.
F4 (C_{34}-C_{50})	Based on the concentrations being either below the laboratory method detection limit or being very low, PHC F4 is considered to have no observable trend at the Tier II Soil Disposal Facility.

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 (MW-01, MW-02, MW-03, and MW-04) are present at the Tier II Soil Disposal Facility. Groundwater sampling of the Tier II Soil Disposal Facility was conducted on August 19, 2018. The single groundwater duplicate sample was collected from MW-03. The groundwater sampling

was conducted in compliance with Section 5.3.1 and 5.3.3 of the TOR and details are provided below in the following Sections 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. Monitoring well sampling logs are presented in **Appendix D**.

6.3.3.2 Water Levels/Groundwater Flow

Groundwater levels were collected and are presented in the Table below.

Table 6-8: Summary of Groundwater Levels - Tier II Soil Disposal Facility

Monitoring Well ID	Monitoring Well Elevation (m)	Water Level (TOC) (m)	Well Stick up (m)	Water Level (from ground surface) (m)	Groundwater Elevation (m asl)
MW-01	11.8	2.035	0.56	1.475	10.33
MW-02	11.5	1.380	0.54	0.84	10.66
MW-03	12.6	1.991	0.62	1.371	11.23
MW-04	13.4	1.558	0.55	1.008	12.39

Based on the available information, it appears that the groundwater flow is in an easterly direction, as groundwater elevations decreased from MW-4 through MW-1. Groundwater contours are presented on **Figure PIN-2.5C** in the Figures section of this report.

6.3.3.3 Groundwater Laboratory Analytical Results

Four groundwater samples were analyzed at the Tier II Soil Disposal Facility and analysed for total inorganic elements (arsenic, cadmium, chromium, cobalt, copper, nickel, and zinc) and Petroleum Hydrocarbons (PHC F1, F2, F3, and F4).

The full current and historical analytical results are presented in **Table 4A** in the Tables section of this report immediately following the main text. The laboratory certificates of analysis and chain of custody forms are presented in **Appendix B** of this report. **Figure PIN-2.5C** presents a summary of significant groundwater analytical results.

6.3.3.4 Discussion of Groundwater Results by Parameter

Analytical results were compared against baseline data – arithmetic mean, and baseline data mean + 3x standard deviation. The following Table 6-9 summarizes the comparison of results.

Table 6-9: Evaluation of Groundwater Analytical Results – Tier II Soil Disposal Facility

Parameter	B.S.	B.S. +	Discussion of Results
Arsenic (As)	0.0046	0.0164	All groundwater concentrations were below the baseline concentrations for As.
Cadmium (Cd)	0.0010	0.0010	All groundwater concentrations were below the laboratory method detection limit for Cd.
Chromium (Cr)	0.1634	0.7018	All groundwater concentrations were either below the laboratory method detection limit or below the baseline concentrations for Cr.
Cobalt (Co)	0.0030	0.0030	All groundwater concentrations were below the laboratory method detection limit for Co.
Copper (Cu)	0.0244	0.0914	All groundwater concentrations were below the baseline concentrations for Cu.
Lead (Pb)	0.0010	0.0010	All groundwater concentrations were below the laboratory method detection limit for Pb.
Nickel (Ni)	0.0752	0.3689	All groundwater concentrations were below the baseline concentrations for Ni.
Zinc (Zn)	0.0463	0.2744	All groundwater concentrations were either below the laboratory method detection limit or were below the baseline concentrations for Zn.
F1 (C_6-C_{10})	0.050	0.050	All groundwater concentrations were below the laboratory method detection limit for PHC F1.
F2 (C_{10}-C_{16})	0.50	0.50	All groundwater concentrations were below the laboratory method detection limit for PHC F2.
F3 (C_{16}-C_{34})	1.0	1.0	All groundwater concentrations were below the laboratory method detection limit for PHC F3.
F4 (C_{34}-C_{50})	1.0	1.0	All groundwater concentrations were below the laboratory method detection limit for PHC F4.

Note: B.S. = baseline concentration in mg/kg, B.S. + =baseline data mean + 3x standard deviations. Concentrations shown are in mg/L.

6.3.3.5 Groundwater Trend Analysis by Parameter and Discussion of Trends

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 (one graph per analyte tested) including a visual comparison to baseline, the baseline +3 standard deviations and results from previous monitoring years using differentiating colours (See **Appendix H1**). The following Table 6-10 provides a summary of groundwater trend analysis findings and presents a discussion of the observed trends by parameter.

Table 6-10: Evaluation of Groundwater Chemistry Trends – Tier II Soil Disposal Facility

Parameter	Discussion of Trends
Arsenic (As)	Based on current and historical results, As has no observable trend at any of the groundwater sample stations tested at the Tier II Soil Disposal Facility. Reported concentrations are representative of a natural variation in sampling events.
Cadmium (Cd)	Based on current and historical results, Cd has no observable trend at any of the groundwater sample stations tested at the Tier II Soil Disposal Facility. Reported concentrations are within what would be expected of the natural variation from one sampling event to another.
Chromium (Cr)	Based on current and historical results, Cr has no observable trend at any of the groundwater sample stations tested at the Tier II Soil Disposal Facility. Reported concentrations are representative of a natural variation in sampling events.
Cobalt (Co)	Based on current and historical results, Co has no observable trend at any of the groundwater sample stations tested at the Tier II Soil Disposal Facility. Reported concentrations are within what would be expected of the natural variation from one sampling event to another.
Copper (Cu)	Based on current and historical results, Cu has no observable trend at any of the groundwater sample stations tested at the Tier II Soil Disposal Facility. Reported concentrations are representative of a natural variation in sampling events.
Lead (Pb)	Based on current and historical results, Pb has no observable trend at any of the groundwater sample stations tested at the Tier II Soil Disposal Facility. Reported concentrations are within what would be expected of the natural variation from one sampling event to another.
Nickel (Ni)	Based on current and historical results, Ni has no observable trend at any of the groundwater sample stations tested at the Tier II Soil Disposal Facility. Reported concentrations are representative of a natural variation in sampling events.
Zinc (Zn)	Based on current and historical results, Zn has no observable trend at any of the groundwater sample stations tested at the Tier II Soil Disposal Facility. Reported concentrations are within what would be expected of the natural variation from one sampling event to another.
F1 (C_6-C_{10})	Based on current and historical results and all concentrations being below the laboratory method detection limit, PHC F1 has no observable trend.
F2 (C_{10}-C_{16})	Based on current and historical results and all concentrations being below the laboratory method detection limit, PHC F2 has no observable trend.
F3 (C_{16}-C_{34})	Based on current and historical results and all concentrations being below the laboratory method detection limit, PHC F3 has no observable trend.
F4 (C_{34}-C_{50})	Based on current and historical results and all concentrations being below the laboratory method detection limit, PHC F4 has no observable trend.

6.3.4 Thermal Monitoring

6.3.4.1 Thermistor Annual Maintenance Reports

As per Section 5.4.3 of the TOR, thermistor inspection logs were filled out for thermistors as provided in **Appendix C**.

6.3.4.2 Summary of Findings from Annual DEW Line Thermal Reports

Raw thermistor data from our 2018 monitoring session was sent to DND for reference and review as part of the PIN-2 draft Field Progress report. No analyzed thermistor data was provided to Arcadis for inclusion into the 2018 monitoring report.

6.4 Conclusions and Overall Landfill Performance

Based on the results of the 2018 monitoring program, the overall performance of the Tier II Soil Disposal Facility is acceptable.

6.5 Recommendations and Conclusions

One soil sampling station at the downgradient sample station MW-02 (at depth), where an upward trend in soil concentrations related to arsenic may be developing, should be re-assessed following future monitoring events. Attention should also be directed to downgradient sample station MW-01 (at depth) which appears to have increased in chromium soil concentration in both 2016 and 2018 when compared to 2012 and 2014. This does not represent an upward trend at this point; however, a re-assessment is recommended following future sampling events.

Based on review and analysis of chemical data, it appears that both the soil and groundwater concentrations for the parameters tested have no significant observable trends with no obvious concentration increases or decreases over time. This indicates that the landfill is performing as intended and no leachate is present in the surrounding environments.

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 Soil Disposal Facility performance is acceptable. No remedial work or deviations from the monitoring plan are recommended at this time.

7 PIN-2: AIRSTRIP SOUTH LANDFILL

7.1 Landfill Description

The Airstrip South Landfill is located within a former borrow area approximately 640 m southeast of the aircraft hangar (Station Area) and south of the east end of the airstrip.

The ground cover surrounding the landfill has historically been observed to be quite wet in August; a permanent water body is present in the immediate area. The area to the northwest of the west toe of the landfill is partially vegetated.

The remediation of this landfill included the removal of surface debris and of contaminated soils in excess of the Tier II criteria and was followed by capping and regrading the landfill surface with 0.4 m of Type 2 granular fill overlain by 0.4 m Type 1 material.

The long-term monitoring plan for the Airstrip South Landfill consisted of visual inspection and the collection of soil samples.

The landfill layout, visual observations and photographic locations are presented on **Figures PIN-2.6A** and soil analytical results are presented on **Figures PIN-2.6B**, both of which are located at the rear of the report.

7.2 Summary of Work Conducted

7.2.1 Visual Inspection

A visual inspection was completed at the Airstrip South Landfill on August 19, 2018. The visual inspection of the landfill was completed with no deviations from the accepted work plan.

7.2.2 Soil Sampling

Soil sampling at the Airstrip South Landfill was conducted on August 19, 2018 and consisted of the collection of eight soil samples from four soil sample stations (P2-13, P2-14, P2-15, and P2-16). The Table below outlines the soil sampling activities conducted at the Airstrip South Landfill.

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

Sample Location	Sample ID	Sample Depth (m bgs)	Notes
P2-13 (up-gradient)	P2-13A	0 - 0.15	Brown gravel, some coarse sand, cobbles, no odour
	P2-13B	0.4 - 0.5	As above
P2-14 (down-gradient)	P2-14A	0 - 0.15	Grey sand and gravel, no odour
	P2-14B	0.4 – 0.5	As above
P2-15 (down-gradient)	P2-15A	0 - 0.15	Grey gravel, some sand, no odour
	P2-15B	0.4 – 0.5	Gravel

Sample Location	Sample ID	Sample Depth (m bgs)	Notes
P2-16 (down-gradient)	P2-16A	0 - 0.15	Broken grey bedrock, some sand, organics at surface, no odour
	P2-16B	0.4 – 0.5	As above

7.2.3 Groundwater Sampling

No groundwater monitoring wells are present at the Airstrip South Landfill; therefore, no groundwater monitoring or analyses was performed.

7.2.4 Thermal Monitoring

No thermistors are present at the Airstrip South Landfill; therefore, no thermal monitoring was performed.

7.3 Results of the Monitoring Program

The following Sections 7.3.1 through 7.3.4 summarize the results of the PIN-2 monitoring program at the Airstrip South Landfill.

7.3.1 Visual Inspection

The visual inspection was conducted in compliance with Section 5.2 of the TOR and details are provided below in the following Sections 7.3.1.1 through 7.3.1.5. **Figure PIN-2.6A** presents the visual inspection findings and photographic locations.

7.3.1.1 Inspection Checklist

The visual was completed as per the TOR and the visual inspection checklist is included as Table 7-2 of this report below.

Table 7-2: Visual Inspection Checklist – Airstrip South Landfill

SITE NAME: PIN-2 Cape Young
LANDFILL DESIGNATION: Airstrip South Landfill LANDFILL TYPE: Regraded DATE OF INSPECTION: 19 August 2018 WEATHER CONDITIONS: Overcast, windy. Morning fog. ~3C
DATE OF PREVIOUS INSPECTION: 15 August 2016
INSPECTED BY: Ryan Janzen and Charles Gravelle
REPORT PREPARED BY: Ryan Janzen The inspector represents to the best of their knowledge that 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.

Table 7-2: Visual Inspection Checklist – Airstrip South Landfill

Checklist Item	Present (Yes/No)	Feature ID	Feature Location	GPS Coordinates Easting/Northing/Zone (Taken from Centre of Feature)		Length (m)	Width (m)	Depth (m)	Extent Relative to Landfill Surface	Description	Comparison with Historical Observations	Severity Rating/ Additional Comments	Photographic Records (photo reference, location, view point & direction, feature of note, scale)
Settlement	Yes	A	W edge of landfill	503186.6613, 7646298.5256	11 North	6.0	0.3	0.1	<1%	Linear depression	No significant change	Acceptable	ASLF # 9-10
Settlement	Yes	B	W edge of landfill	503194.6284, 7646276.8308	11 North	0.3	0.3	0.1	<1%	Minor depression	No significant change	Acceptable	ASLF # 11-12
Settlement	Yes	C	W edge of landfill	503197.2037, 7646272.5278	11 North	0.8	0.3	0.15	<1%	Linear depression	No significant change	Acceptable	ASLF # 13-14
Settlement	Yes	D (new)	W edge of landfill	503196.8485, 7646274.7042	11 North	0.6	0.4	0.1	<1%	Minor depression	New observation	Acceptable Feature due to settling of fines into cap material	ASLF # 18-19
Settlement	Yes	E (new)	W edge of landfill	503188.107, 7646292.8913	11 North	0.5	0.4	0.15	<1%	Minor depression	New observation	Acceptable Feature due to settling of fines into cap material	ASLF # 20-21
Erosion	No												
Lateral Movement	No												
Frost Action	No												
Sloughing	No												
Cracking	No												
Animal Burrows	No												
Vegetation Establishment	Yes	F	SW quadrant of landfill	503205.9919, 7646266.9383 (center of area)	11 North	200m^2	GPS	-	~5%	Revegetated area, very sparse	Significantly larger than as shown on previous figures	Acceptable Not noted in previous notes, though present on previous figures	ASLF # 16-17
Vegetation Establishment	Yes	G	SE quadrant of landfill	503233.1491, 7646284.344 (center of area)	11 North	75m^2	GPS	-	~2%	Revegetated area, very sparse	Appears slightly larger than as shown on previous figures.	Acceptable Not noted in previous notes, though present on previous figures	ASLF # 1
Staining	No												
Vegetation Stress	No												
Seepage Points (or) Ponded Water	No												
Debris and/or Liner Exposed	No												
Presence & Condition of Monitoring Instruments	No												

Table 7-2: Visual Inspection Checklist – Airstrip South Landfill												
Checklist Item	**Present (Yes/No)**	**Feature ID**	**Feature Location**	**GPS Coordinates Easting/Northing/Zone (Taken from Centre of Feature)**	**Length (m)**	**Width (m)**	**Depth (m)**	**Extent Relative to Landfill Surface**	**Description**	**Comparison with Historical Observations**	**Severity Rating/ 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…)	No											

7.3.1.2 Preliminary Stability Assessment

The Preliminary Stability Assessment for the Airstrip South Landfill was conducted on August 19, 2018 as per the TOR and the results are provided below in.

Table 7-3: Preliminary Stability Assessment – Airstrip South 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	Not Observed	None
Overall Landfill Performance	**Acceptable**	

Note: please refer to Performance/Severity rating reference guide in Section 2.1.3.1 above.

7.3.1.3 Photographic Records

The detailed photographic record for the Airstrip South Landfill has been completed as per Section 5.5 of the TOR and is included as **Appendix I**. The Photographic Record only contains an index of photographs collected; full sized photographs are contained as a separately appended CD/DVD-ROM. **Figure PIN-2.6A** illustrates the photograph locations and directions.

7.3.1.4 Trend Analysis

A trend analysis was conducted with regards to observations made during the visual inspection of the Airstrip South Landfill. The following outlines the results of the visual trend analysis.

Table 7-4: Visual Inspection Trends – Airstrip South Landfill

Checklist Item	Feature Number	Comparison with Historical Observations
Settlement	A	No significant change from 2016 to 2018.
	B	No significant change from 2016 to 2018.
	C	No significant change from 2016 to 2018.
	D	New observation in 2018.
	E	New observation in 2018.
Vegetation	F	Appears larger than on previous figures (no dimensions given in 2016 report).
	G	Appears larger than on previous figures (no dimensions given in 2016 report).

7.3.1.5 Discussion of Results/Trends

A comparison of the visual inspection results of the 2016 and 2018 monitoring events at the Airstrip South Landfill indicates that most settlement features generally did not undergo significant change, with only two new minor settlement features observed. Vegetated areas appear to be expanding; though there are no dimensions given from the 2016 program, a comparison of observed areas against previous figures indicates larger areas. The results of the visual inspection and the observed trends indicate that the performance of the landfill is acceptable.

7.3.2 Soil Sampling

Soil sampling of the Airstrip South Landfill was conducted on August 19, 2018. The soil sampling was conducted in compliance with Section 5.3.1 and 5.3.2 of the TOR 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 Airstrip South Landfill and analysed for inorganic elements (arsenic, cadmium, chromium, cobalt, copper, nickel, and zinc), polychlorinated biphenyls (PCBs), and Petroleum Hydrocarbons (PHC F1, F2, F3, and F4).

The full current and historical analytical results are presented in **Table 5** in the Tables section of this report immediately following the main text. The laboratory certificates of analysis and chain of custody forms are presented in **Appendix B** of this report. **Figure PIN-2.6B** presents a summary of significant soil analytical results.

7.3.2.2 Discussion of Results – Comparison to Baseline/Background

Analytical results were compared against background concentrations, baseline data – arithmetic mean, and baseline date mean + 3x standard deviation. The following Table 7-5 summarizes the comparison of results.

Table 7-5: Evaluation of Results by Parameter - Airstrip South Landfill

Parameter	B.K.	B.S.	B.S. +	Discussion of Results
Arsenic (As)	2.9	2.9	6.9	Concentrations greater than baseline concentration of 2.9 mg/kg were noted at downgradient soil samples P2-15 surface (3.8 mg/kg), P2-15 depth (3.7 mg/kg), and P2-16 surface (3.7 mg/kg). All other samples reported concentrations below the baseline. These minor elevated concentrations are not considered a concern and are consistent with previous monitoring rounds.
Cadmium (Cd)	1.0	1.0	1.0	All soil samples reported concentrations below both background and baseline concentrations for Cd.
Chromium (Cr)	20.0	20.0	20.0	All soil samples reported concentrations below both background and baseline concentrations for Cr.
Cobalt (Co)	5.0	5.0	5.0	All soil samples reported concentrations below both background and baseline concentrations for Co.
Copper (Cu)	8.7	8.4	25.1	All soil samples reported concentrations below both background and baseline concentrations for Cu.
Lead (Pb)	10.0	10.0	10.0	All soil samples reported concentrations below both background and baseline concentrations for Pb.
Nickel (Ni)	5.0	5.0	5.0	All soil samples reported concentrations below both background and baseline concentrations for Ni. Some historical exceedances of baseline +3 standard deviations were observed across the site; however, are likely anomalous due to the heterogeneity of the soil.
Zinc (Zn)	15.0	15.0	15.0	The baseline and baseline +3 standard deviation were exceeded in upgradient samples P2-13 surface (22 mg/kg), and downgradient samples P2-14 surface (19 mg/kg), P2-14 depth (17 mg/kg), and P2-16 surface (25 mg/kg). All other soil samples reported concentrations below both background and baseline concentrations for Zn. These minor elevated concentrations are not considered a concern and are consistent with concentrations reported during previous monitoring events.
PCBs (Total)	0.01	0.1	0.1	All soil samples were below the laboratory method detection limit; therefore, below both background and baseline concentrations for PCBs.
F1 (C_6-C_{10})	N/A	10.0	10.0	All soil samples were below the laboratory method detection limit for PHC F1.
F2 (C_{10}-C_{16})	N/A	4.0	4.0	All soil samples were below the laboratory method detection limit for PHC F2.
F3 (C_{16}-C_{34})	N/A	16.8	36.1	The baseline and baseline +3 standard deviation were exceeded at downgradient sample station P2-14 surface (44 mg/kg) and was above the baseline at sample station P2-14 depth (28 mg/kg). These concentrations are not considered to be an issue and are very low for PHC F3 in soil.

Parameter	B.K.	B.S.	B.S. +	Discussion of Results
F4 (C_{34}-C_{50})	N/A	9.8	32.9	Concentrations greater than baseline were noted at downgradient sample station P2-14 surface (16 mg/kg). This concentration is not considered to be an issue and is very low for the PHC F4 parameter in soil.

Note: B.K. = background concentration in mg/kg, B.S. = baseline concentration in mg/kg, B.S. + =baseline data mean + 3x standard deviations. Concentrations shown are in mg/kg.

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 (one graph per analyte tested) including a visual comparison to baseline, the baseline +3 standard deviations and results from previous monitoring years using differentiating colours (See **Appendix G5**). The following Table 7-6 provides a summary of soil trend analysis findings and presents a discussion of the observed trends by parameter.

Table 7-6: Discussion of Trends – Airstrip South Landfill

Parameter	Discussion of Trends
Arsenic (As)	Based on current and historical results, As has no observable trend at any of the sample stations at the Airstrip South Landfill. All reported concentrations are within what would be expected of the natural variation from one sampling event to another.
Cadmium (Cd)	Based on current and historical results, Cd has no observable trend at any of the sample stations at the Airstrip South Landfill. All reported concentrations are typical of a natural variation in sampling events.
Chromium (Cr)	Based on current and historical results, Cr has no observable trend at any of the sample stations at the Airstrip South Landfill. All reported concentrations are within what would be expected of the natural variation from one sampling event to another. Uncharacteristically high concentrations were reported at most sample stations in 2016; however, these are believed to be anomalous and do not correspond with the 2012, 2014, and the current 2018 monitoring data.
Cobalt (Co)	Based on current and historical results, Co has no observable trend at any of the sample stations at the Airstrip South Landfill. All reported concentrations are typical of a natural variation in sampling events.
Copper (Cu)	Based on current and historical results, Cu has no observable trend at any of the sample stations at the Airstrip South Landfill. All reported concentrations are typical of a natural variation in sampling events. Elevated concentrations were reported in 2016 at downgradient sample P2-14 (depth); however, the 2016 data appears to be anomalous and do not correspond with the 2012, 2014, and the current 2018 monitoring data.
Lead (Pb)	Based on current and historical results, Pb has no observable trend at any of the sample stations at the Airstrip South Landfill. All reported concentrations are within what would be expected of the natural variation from one sampling event to another.
Nickel (Ni)	Based on current and historical results, Ni has no observable trend at any of the sample stations at the Airstrip South Landfill. All reported concentrations are typical of a natural variation in sampling events. Uncharacteristically high concentrations were reported at most sample stations in 2016; however, these are believed to be anomalous and do not correspond with the 2012, 2014, and the current 2018 monitoring data.

Parameter	Discussion of Trends
Zinc (Zn)	Based on current and historical results, Zn has no observable trend at any of the sample stations at the Airstrip South Landfill. All reported concentrations are typical of a natural variation in sampling events. The one exception is at upgradient sample station P2-13 depth, where a downward trend may be developing.
PCBs (Total)	Based on current and historical results, PCBs have no observable trend at any of the sample stations at the Airstrip South Landfill.
F1 (C_6-C_{10})	Based on all concentrations being below the laboratory method detection limit, PHC F1 is considered to have no observable trend at the Airstrip South Landfill.
F2 (C_{10}-C_{16})	Based on most concentrations being below the laboratory method detection limit, PHC F2 is considered to have no observable trend at the Airstrip South Landfill.
F3 (C_{16}-C_{34})	Based on either concentrations being below the laboratory method detection limit or very low concentrations, PHC F3 is considered to have no observable trend at the Airstrip South Landfill.
F4 (C_{34}-C_{50})	Based on either concentrations being below the laboratory method detection limit or very low concentrations, PHC F4 is considered to have no observable trend at the Airstrip South Landfill.

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

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

7.3.4 Thermal Monitoring

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

7.4 Conclusions and Overall Landfill Performance

Based on the results of the 2018 monitoring program, the overall performance of the Airstrip South Landfill 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 have no obvious soil concentration increases or decreases over time. This indicates that the landfill is performing as intended and no leachate is present in the surrounding environments.

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 Airstrip South landfill performance is acceptable. No remedial work or deviations from the monitoring plan are recommended at this time.

8 PIN-2: PALLET LINE WEST LANDFILL

8.1 Landfill Description

The Pallet Line West Landfill is located approximately 400 m south of the existing aircraft hangar. The landfill is accessible via a trail from the main access road. The overburden in the area of the landfill is very cobbly with shallow bedrock. Vegetation density is low to moderate and locally more developed near the Landfill along the southwest perimeter of the area.

The Pallet Line West Landfill was remediated by excavating the Tier II contaminated soils present in the area, removing the surface debris, regrading the landfill and subsequently capping with 0.4 m of Type 1 granular fill over 0.4 m of Type 2 granular fill.

The long-term monitoring plan from the Pallet Line West Landfill consisted of visual inspection and the collection of soil samples.

The landfill layout, visual observations and photographic locations are presented on **Figure PIN-2.7A** and soil analytical results are presented on **Figure PIN-2.7B**, both located at the rear of this report.

8.2 Summary of Work Conducted

8.2.1 Visual Inspection

A visual inspection was completed at the Pallet Line West Landfill August 19, 2018. 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 Pallet Line West Landfill was conducted on August 19, 2018 and consisted of the collection of eight soil samples from four soil sample stations (P2-9, P2-10, P2-11, and P2-12). Depth limitations were encountered at P2-9 and P2-12, both from refusal on bedrock. Duplicate number 5 (Dup 5) was collected at station P2-10A. Table 8-1 outlines the soil sampling activities conducted at the Pallet Line West Landfill.

Table 8-1: Summary of Work Conducted by Soil Sampling Location – Pallet Line West Landfill

Sample Location	Sample ID	Sample Depth (m bgs)	Notes
P2-9 (up-gradient)	P2-9A	0 - 0.15	Grey/brown gravel, some coarse sand, no odour
	P2-9B	0.3 – 0.4	As above
P2-10 (down-gradient)	P2-10A	0 - 0.15	Dark brown peat, organic odour, roots, wet
	P2-10B	0.4 – 0.5	Dark brown broken bedrock, some sand, some silt, no odour, refusal on bedrock
P2-11 (down-gradient)	P2-11A	0 - 0.15	Dark brown broken bedrock, some sand, organics, no odour
	P2-11B	0.4 – 0.5	As above, no organics
P2-12 (down-gradient)	P2-12A	0 - 0.15	Dark brown organic peat with sand, organic odour
	P2-12B	0.15 – 0.3	As above, refusal on bedrock

8.2.3 Groundwater Sampling

No groundwater monitoring wells are present at the Pallet Line West Landfill.

8.2.4 Thermal Monitoring

No thermistors are present at the Pallet Line West Landfill.

8.3 Results of the Monitoring Program

The following Sections 8.3.1 through 8.3.4 summarize the results of the PIN-2 monitoring program at the Pallet Line West Landfill.

8.3.1 Visual Inspection

The visual inspection was conducted in compliance with Section 5.2 of the TOR and details are provided below in the following Sections 8.3.1.1 through 8.3.1.5. **Figure PIN-2.7A** presents the visual inspection findings and photographic locations.

8.3.1.1 Inspection Checklist

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

Table 8-2: Visual Inspection Checklist –Pallet Line West Landfill

SITE NAME: PIN-2 Cape Young
LANDFILL DESIGNATION: Pallet Line West Landfill LANDFILL TYPE: Regraded DATE OF INSPECTION: 19 August 2018 WEATHER CONDITIONS: Sunny, windy and cool. ~2C
DATE OF PREVIOUS INSPECTION: 16 August 2016
INSPECTED BY: Ryan Janzen and Charles Gravelle
REPORT PREPARED BY: Ryan Janzen The inspector represents to the best of their knowledge that 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.

Table 8-2: Visual Inspection Checklist –Pallet Line West Landfill

Checklist Item	Present (Yes/No)	Feature Number	Feature Location	GPS Coordinates Easting/Northing/Zone (Taken from Centre of Feature)		Length (m)	Width (m)	Depth (m)	Extent Relative to Landfill Surface	Description	Comparison with Historical Observations	Severity Rating/ Additional Comments	Photographic Records (photo reference, location, view point & direction, feature of note, scale)
Settlement	Yes	A	S crest	502583.656, 7645758.9564	11 North	1.2	0.2	0.05	<1%	Linear depression	Slightly longer than in 2016	Acceptable	PLW # 15-16
Settlement	Yes	B	NW crest	502552.987, 7645849.4631	11 North	2.5	0.2	0.05	<1%	Linear depression	Slightly longer than in 2016	Acceptable	PLW # 6-7
Settlement	Yes	C1 C2/C3	NE crest	502602.7199, 7645819.6478 502611.1353, 7645821.0652	11 North	1.6 0.8	0.7 0.4	0.05 0.05	<1%	Localized depressions	No change since 2016	Acceptable Appear to be dozer tracks left from traversing crest C2/C3 are clearly from the same vehicle and immediately adjacent	PLW # 24-27
Settlement	Yes	D	E crest	502617.8116, 7645799.2748	11 North	0.4	0.4	0.05	<1%	Minor depression	No change since 2016		PLW # 21-22
Erosion	No												
Lateral Movement	No												
Frost Action	No												
Sloughing	No												
Cracking	No												
Animal Burrows	No												
Vegetation Establishment	Yes	E F (new)	NW side SE side	None previously given 502606.0725, 7645764.3568	11 North	NA 46	NA 5.8	NA 0	NA ~10%	Revegetated area Revegetated area, very sparse	Not observed in 2018 New observation; not noted in 2016	Acceptable Variety of plant types	PLW # 4 PLW # 18-19
Staining	No												
Vegetation Stress	No												
Seepage Points (or) Ponded Water	No												
Debris and/or Liner Exposed	No												
Presence & Condition of Monitoring Instruments	No												

Table 8-2: Visual Inspection Checklist –Pallet Line West Landfill												
Checklist Item	**Present (Yes/No)**	**Feature Number**	**Feature Location**	**GPS Coordinates Easting/Northing/Zone (Taken from Centre of Feature)**	**Length (m)**	**Width (m)**	**Depth (m)**	**Extent Relative to Landfill Surface**	**Description**	**Comparison with Historical Observations**	**Severity Rating/ 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…)	No											

8.3.1.2 Preliminary Stability Assessment

The Preliminary Stability Assessment for the Pallet Line West Landfill was conducted on August 19, 2018 as per the TOR and the results are provided below in Table 8-3.

Table 8-3: Preliminary Stability Assessment – Pallet Line West 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	Not Observed	None
Overall Landfill Performance	**Acceptable**	

Note: please refer to Performance/Severity rating reference guide in Section 2.1.3.1 above.

8.3.1.3 Photographic Records

The detailed photographic record for the Pallet Line West Landfill has been completed as per Section 5.5 of the TOR and is included as **Appendix I**. The Photographic Record only contains an index of photographs collected; full sized photographs are contained in the separately appended CD/DVD-ROM. **Figure PIN-2.7A** illustrates the photograph locations and directions.

8.3.1.4 Trend Analysis

A trend analysis was conducted with regards to observations made during the visual inspection of the Pallet Line West Landfill. The following Table 8-4 outlines the results of the visual trend analysis.

Table 8-4: Visual Inspection Trends – Pallet Line West Landfill

Checklist Item	Feature ID	Comparison with Historical Observations
Settlement	A	Length has increased from 1.0 m in 2016 to 1.2 m in 2018.
	B	Length has increased from 1.5 m in 2016 to 2.5 m in 2018.
	C1-C3	No change since 2016.
	D	No change since 2016.
Vegetation	E	Feature was not identified alphabetically in 2016 report, though it appeared on figures. Thus, Feature E is not designated 'new'. Not observed in 2018, although there is vegetation adjacent the landfill footprint. As is visible in Photograph PLW_4, it appears that cover was placed over existing vegetated ground.
	F (new)	Covers almost 10% of landfill footprint, although vegetation is very sparse.

8.3.1.5 Discussion of Results/Trends

A comparison of the visual inspection results of the 2016 and 2018 monitoring events at the Pallet Line West Landfill indicates that two existing settlement features increased in size while the other previous noted features had no significant change. A vegetated area (Feature E) originally noted in 2016 was observed in 2018 to be adjacent the landfill footprint – not on the cap material as previously noted. The vegetated area observed in 2018 is in a different location and is substantially larger than the one noted on the 2016 figures. No new features were observed. The results of the visual inspection and the observed trends indicate that the performance of the landfill is acceptable.

8.3.2 Soil Sampling

Soil sampling of the Pallet Line West Landfill was conducted on August 19, 2018. The soil sampling was conducted in compliance with Section 5.3.1 and 5.3.2 of the TOR 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 eight soil samples were analysed from four soil sample locations at the Pallet Line West Landfill and analysed for inorganic elements (arsenic, cadmium, chromium, cobalt, copper, nickel, and zinc), polychlorinated biphenyls (PCBs), and Petroleum Hydrocarbons (PHC F1, F2, F3, and F4).

The full current and historical analytical results are presented in **Table 6** in the Tables section of this report immediately following the main text. The laboratory certificates of analysis and chain of custody forms are presented in **Appendix B** of this report. **Figure PIN-2.7B** presents a summary of significant soil analytical results.

8.3.2.2 Discussion of Results – Comparison to Baseline/Background

Analytical results were compared against background concentrations, baseline data – arithmetic mean, and baseline date mean + 3x standard deviation. The following Table 8-5 summarizes the comparison of results.

Table 8-5: Evaluation of Results by Parameter – Pallet Line West Landfill

Parameter	B.K.	B.S.	B.S. +	Discussion of Results
Arsenic (As)	2.9	3.9	16.7	The baseline +3 standard deviation was exceeded in downgradient sample station P2-10 depth (25 mg/kg) and above the baseline at sample station P2-10 surface (5.4 mg/kg with its duplicate at 4.8 mg/kg). All other samples reported concentrations below the baseline. The slight exceedances noted at station P2-10 surface are not a concern; however, the reported concentration at P2-10 depth is increased from previous data points (i.e., 2012= 2.6 mg/kg, 2014= 7 mg/kg, 2016= 9.9 mg/kg) and should be re-assessed following future monitoring events.
Cadmium (Cd)	1.0	1.0	1.0	All soil samples were below both background and baseline concentrations for Cd.
Chromium (Cr)	20.0	20.0	20.0	All soil samples reported concentrations below both background and baseline concentrations for Cr.
Cobalt (Co)	5.0	5.0	5.0	All soil samples reported concentrations below both background and baseline concentrations for Co.
Copper (Cu)	8.7	10.4	34.1	All soil samples reported concentrations below both background and baseline concentrations for Cu, with the exception of P2-9 surface (15 mg/kg).
Lead (Pb)	10.0	10.0	10.0	All soil samples reported concentrations below both background and baseline concentrations for Pb.
Nickel (Ni)	5.0	5.5	15.7	Concentrations greater than baseline were noted in upgradient sample station P2-09 depth (6.1 mg/kg), and downgradient sample stations P2-10 depth (8.8 mg/kg), and P2-12 depth (5.6 mg/kg). All other soil samples reported concentrations below both background and baseline concentrations for Ni. The concentrations noted are not a concern at this time.
Zinc (Zn)	15.0	40.5	200.7	Concentrations greater than baseline were noted at upgradient sample stations P2-09 surface (120 mg/kg) and P2-09 depth (53 mg/kg), as well as downgradient sample stations P2-10 depth (51 mg/kg), and P2-12 surface (46 mg/kg). All other soil samples reported concentrations below both background and baseline concentrations for Zn. The minor exceedances noted are not a concern at this time.
PCBs (Total)	0.01	0.1	0.1	All soil samples were below the laboratory method detection limit; therefore, below both background and baseline concentrations for PCBs
F1 (C_6-C_{10})	N/A	10.0	10.0	All soil samples were below the laboratory method detection limit for PHC F1 except for downgradient sample station P2-12 surface that was slightly greater than the baseline and baseline +3 standard deviations at 11 mg/kg. This concentration is not considered to be an issue and is very low for PHC F1 in soil.
F2 (C_{10}-C_{16})	N/A	4.0	4.0	Concentrations greater than baseline were noted at upgradient sample stations P2-09 surface (6.3 mg/kg), P2-09 depth (4.2 mg/kg), and downgradient sample stations P2-10 surface (4.5 mg/kg, with its duplicate

Parameter	B.K.	B.S.	B.S. +	Discussion of Results
				at 12 mg/kg; an average of these two data points (8.3 mg/kg) was used to evaluate for trends), at P2-11 surface (5.6 mg/kg) and P2-12 depth (7.9 mg/kg). These concentrations are not considered to be an issue and are very low for PHC F2 in soil.
F3 (C_{16}-C_{34})	N/A	109.6	664.4	All soil samples reported concentrations below baseline concentration for PHC F3 in soil.
F4 (C_{34}-C_{50})	N/A	54.8	310.2	A concentration greater than baseline was noted at upgradient sample station P2-09 surface (240 mg/kg). All other soil samples reported concentrations below baseline concentration for PHC F4. This concentration is not considered to be an issue and is very low for PHC F4 in soil.

Note: B.K. = background concentration in mg/kg, B.S. = baseline concentration in mg/kg, B.S. + =baseline data mean + 3x standard deviations. Concentrations shown are in mg/kg.

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 (one graph per analyte tested) including a visual comparison to baseline, the baseline +3 standard deviations and results from previous monitoring years using differentiating colours (See **Appendix G1**). The followingTable 8-6 provides a summary of soil trend analysis findings and presents a discussion of the observed trends by parameter.

Table 8-6: Discussion of Trends – Pallet Line West Landfill

Parameter	Discussion of Trends
Arsenic (As)	Based on current and historical results, As has no observable trend at most of the sample stations at the Pallet Line West Landfill. Most reported concentrations are within what would be expected of the natural variation from one sampling event to another. Downgradient sample station P2-10 depth appears to be developing an upward trend and should be reviewed following future monitoring events, as concentrations in 2018 are well above background and the upgradient monitoring locations.
Cadmium (Cd)	Based on current and historical results, Cd has no observable trend at any of the sample stations at the Pallet Line West Landfill. All reported concentrations are typical of a natural variation in sampling events.
Chromium (Cr)	Based on current and historical results, Cr has no observable trend at any of the sample stations at the Pallet Line West Landfill. All reported concentrations are within what would be expected of the natural variation from one sampling event to another
Cobalt (Co)	Based on current and historical results, Co has no observable trend at any of the sample stations at the Pallet Line West Landfill. All reported concentrations are typical of a natural variation in sampling events.
Copper (Cu)	Based on current and historical results, Cu has no observable trend at many of the sample stations at the Pallet Line West Landfill. Most reported concentrations are within what would be expected of the natural variation from one sampling event to another. Upgradient sample station P2-09 surface may be beginning to develop a slight upward trend and copper data trends should be reviewed following future monitoring events.

Parameter	Discussion of Trends
Lead (Pb)	Based on current and historical results, Pb has no observable trend at many of the sample stations at the Pallet Line West Landfill. Most reported concentrations are typical of a natural variation in sampling events. Upgradient sample station P2-09 surface may be beginning to develop a slight upward trend and should be re-assessed following future monitoring events.
Nickel (Ni)	Based on current and historical results, Ni has no observable trend at any of the sample stations at the Pallet Line West Landfill. All reported concentrations are within what would be expected of the natural variation from one sampling event to another
Zinc (Zn)	Based on current and historical results, Zn has no observable trend at many of the sample stations at the Pallet Line West Landfill. Most reported concentrations are typical of a natural variation in sampling events. Upgradient sample station P2-09 surface may be beginning to develop a slight upward trend and should be re-assessed following future monitoring events.
PCBs (Total)	Based on current and historical results, PCBs have no observable trend at any of the sample stations at the Pallet Line West Landfill. All samples were below the laboratory method detection limit.
F1 (C_6-C_{10})	Based on either concentrations being below the laboratory method detection limit or very low concentrations, PHC F1 is considered to have no observable trend at the Pallet Line West Landfill.
F2 (C_{10}-C_{16})	Based on either concentrations being below the laboratory method detection limit or very low concentrations, PHC F2 is considered to have no observable trend at the Pallet Line West Landfill.
F3 (C_{16}-C_{34})	Based on either concentrations being below the laboratory method detection limit or very low concentrations, PHC F3 is considered to have no observable trend at the Pallet Line West Landfill.
F4 (C_{34}-C_{50})	Based on either concentrations being below the laboratory method detection limit or very low concentrations, PHC F4 is considered to have no observable trend at the Pallet Line West Landfill.

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 Pallet Line West Landfill; therefore, no groundwater sampling or analysis was conducted.

8.3.4 Thermal Monitoring

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

8.4 Conclusions and Overall Landfill Performance

Based on the results of the 2018 monitoring program, the overall performance of the Pallet Line West Landfill is acceptable.

8.5 Recommendations and Conclusions

Overall, based on review and analysis of chemical data, it appears that the soil concentrations for the parameters tested have no significant observable trends with no obvious concentration increases over time.

Downgradient sample station P2-10 (at depth) appears to be developing an upward trend related to the arsenic concentration in soil and upgradient sample station P2-09 appears to be developing an upward trend related to copper, lead and zinc. These should be re-assessed following future monitoring events. Inorganic elements reported increases in both upgradient and downgradient locations; therefore, more data is required from future monitoring events to obtain an accurate appraisal of landfill performance.

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 Pallet Line West landfill performance is acceptable. No remedial work or deviations from the monitoring plan are recommended at this time.

9 PIN-2: NON-HAZARDOUS WASTE LANDFILL

9.1 Landfill Description

The Non-Hazardous Waste (NHW) Landfill is a new landfill constructed for the disposal of non-hazardous wastes and debris generated and collected during the site decommissioning and clean-up activities. The landfill is located near the intersection of the main station access road and the Harding River Road approximately 1600 m south of the existing aircraft hangar.

The design of this landfill includes internal perimeter berms, placement of a top geomembrane and a cover of compacted Type 2 granular fill over the landfilled material. Four groundwater monitoring wells were installed around the perimeter of the landfill.

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

The landfill layout, visual observations and photographic locations are presented on **Figure PIN-2.8A**, soil analytical results on **Figure PIN-2.8B** and groundwater results on **Figure PIN-2.8C**, all of which are located at the rear of the report.

9.2 Summary of Work Conducted

9.2.1 Visual Inspection

A visual inspection was conducted on the NHW Landfill on August 18, 2018. The visual inspection of the landfill was completed with no deviations from the accepted work plan.

9.2.2 Soil Sampling

Soil sampling at the NHW Landfill was conducted on August 18, 2018 and consisted of the collection of eight soil samples from four soil sample stations (MW-05, MW-06, MW-07, and MW-08). Duplicate number 2 (Dup 2) was collected at station MW-06B. The following Table 9-1 outlines the soil sampling activities conducted at the Non-Hazardous Waste Landfill.

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

Sample Location	Sample ID	Sample Depth (m bgs)	Notes
MW-05 (down-gradient)	MW-05A	0 - 0.15	Grey gravel and sand, trace silt, no odour
	MW-05B	0.4 – 0.5	As above
MW-06 (down-gradient)	MW-06A	0 - 0.15	Light brown to beige gravel and sand, some silt, no odour
	MW-06B	0.4 – 0.5	As above, orange-coloured sand

Sample Location	Sample ID	Sample Depth (m bgs)	Notes
MW-07 (down-gradient)	MW-07A	0 - 0.15	Dark brown gravel, boulders and cobbles, some silty sand, no odour
	MW-07B	0.4 – 0.5	As above
MW-08 (up-gradient)	MW-08A	0 - 0.15	Grey gravel, trace sand, no odour
	MW-08B	0.4 – 0.5	As above

9.2.3 Groundwater Sampling

Groundwater monitoring at the NHW Landfill was conducted on August 19, 2018 and consisted of the inspection and groundwater monitoring of four monitoring wells (MW-05, MW-06, MW-07, and MW-08). One well, MW-8, was observed to be frozen. Monitoring wells MW-05, MW-06, and MW-07 contained water and groundwater samples were collected for analysis. Monitoring well sampling logs are presented in **Appendix D**. Table 9-2 outlines the soil sampling activities conducted at the Non-Hazardous Waste Landfill.

Table 9-2: Summary of Work Conducted by Monitoring Well – NHW Landfill

Monitoring Well ID	Observations	# of Groundwater Samples Collected
NHW Landfill		
MW-05	Excellent condition	1
MW-06	Excellent condition	1
MW-07	Excellent condition	1
MW-08	Excellent condition – frozen groundwater	none

9.2.4 Thermal Monitoring

No thermistors are present at the NHW Landfill, and as such, no thermal monitoring was performed.

9.3 Results of the Monitoring Program

The following sections 9.3.1 through 9.3.4 summarize the results of the PIN-2 monitoring program at the NHW Landfill.

9.3.1 Visual Inspection

The visual inspection was conducted in compliance with Section 5.2 of the TOR and details are provided below in the following Sections 9.3.1.1 through 9.3.1.5. **Figure PIN-2.8A** presents the visual inspection findings and photographic locations.

9.3.1.1 Inspection Checklist

The visual inspection was completed as per the TOR and the visual inspection checklist is included as Table 9-3 of this report below.

Table 9-3: Visual Inspection Checklist – NHW Landfill

SITE NAME: PIN-2 Cape Young
LANDFILL DESIGNATION: Non-Hazardous Waste Landfill LANDFILL TYPE: Non-Hazardous DATE OF INSPECTION: 18 August 2018 WEATHER CONDITIONS: Overcast, windy. Some rain. ~4C
DATE OF PREVIOUS INSPECTION: 16 August 2016
INSPECTED BY: Ryan Janzen and Charles Gravelle
REPORT PREPARED BY: Ryan Janzen The inspector represents to the best of their knowledge that 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.

Table 9-3: Visual Inspection Checklist – NHW Landfill

Checklist Item	Present (Yes/No)	Feature Number	Feature Location	GPS Coordinates Easting/Northing/Zone (Taken from Centre of Feature)		Length (m)	Width (m)	Depth (m)	Extent Relative to Landfill Surface	Description	Comparison with Historical Observations	Severity Rating/ Additional Comments	Photographic Records (photo reference, location, view point & direction, feature of note, scale)
Settlement	Yes	A1	W corner, close to crest	503024.5298, 7645242.2482	11 North	0.5	0.3	0.05	<1%	Minor depression	No change since 2016	Acceptable	NH # 40-41
		A2		503038.8812, 7645243.7302		2.2	0.5	0.1	<1%	Minor depression	No change since 2016		NH # 37-38
Settlement	Yes	C	S corner, E crest	503083.093, 7645236.1425	11 North	4.0	0.5	0.1	<1%	Minor depression	No change since 2016	Acceptable	NH # 12-13, 24
Settlement	Yes	D1	NE side, crest	503078.4006, 7645287.4822	11 North	1.6	0.9	0.05	<1%	Minor depression	Length has increased slightly	Acceptable	NH # 60-61
		D2		503082.1396, 7645285.3989		1.7	0.8	0.05	<1%	Minor depression	Length has increased slightly		NH # 64
Settlement	Yes	G	W corner, close to crest	503028.5105, 7645253.1984	11 North	0.6	0.4	0.1	<1%	Minor depression	No change since 2016	Acceptable	NH # 39
Erosion	Yes	B1	S corner, from crest to toe	503090.4437, 7645218.7281	11 North	9.8	0.5	0.1	<1%	Minor erosion	Dimensions noted are within the range given in previous reports B5, as shown on previous figures, was not observed	Marginal S corner and SE slope show more frequent and larger erosion features than other sides	NH # 14, 16-19, 22-23, 46-47
		B2		503086.4384, 7645209.5947		6.0	0.1	0.1	<1%	Minor erosion			
		B3		503081.6465, 7645206.5257		7.5	0.5	0.1	<1%	Minor erosion			
		B4		503079.1954, 7645204.9198		8.5	0.6	0.1	<1%	Minor erosion			
		B5		503060.2567, 7645214.5427		-	-	-	-	Minor erosion			
Erosion	Yes	E1	N corner and NE slope	503078.6558, 7645284.3072	11 North	7.2	0.3	0.1	<1%	Minor erosion	Dimensions noted are smaller than the range given in previous reports	Acceptable	NH # 57, 59, 62-63
		E2		503064.6018, 7645291.7706		6.3	0.3	0.1	<1%	Minor erosion			
		E3		503054.9275, 7645297.0926		8.4	0.3	0.1	<1%	Minor erosion			
Erosion	Yes	H	SE crest	503085.3821, 7645226.4352	11 North	2.6	0.15	0.05	<1%	Minor erosion	No change since 2016	Marginal S corner and SE slope show more frequent and larger erosion features than other sides	NH # 15
Erosion	Yes	I	SE slope	503099.8167, 7645239.3263	11 North	9.5	0.4	0.1	<1%	Minor erosion	No change since 2016	Marginal S corner and SE slope show more frequent and larger erosion features than other sides	NH # 10-11
Erosion	Yes	J	SW slope	503065.6406, 7645212.2576	11 North	8.4	0.3	0.1	<1%	Minor erosion	No change since 2016	Marginal S corner and SE slope show more frequent and larger erosion features than other sides	NH # 44-45
Erosion	Yes	K	NE slope	503058.7991, 7645294.9817	11 North	7.2	0.2	0.05	<1%	Minor erosion	No change since 2016	Acceptable	NH # 58
Erosion	Yes	L (new)	SE slope	503103.7854, 7645244.924	11 North	4.3	0.2	0.1	<1%	Minor erosion	New observation	Acceptable	NH # 66-67
Erosion	Yes	M (new)	SE slope	503094.3549, 7645238.739	11 North	1.4	0.6	0.15	<1%	Minor erosion	New observation	Acceptable Due to fines being washed into cap	NH # 68

Table 9-3: Visual Inspection Checklist – NHW Landfill

Checklist Item	Present (Yes/No)	Feature Number	Feature Location	GPS Coordinates Easting/Northing/Zone (Taken from Centre of Feature)		Length (m)	Width (m)	Depth (m)	Extent Relative to Landfill Surface	Description	Comparison with Historical Observations	Severity Rating/ Additional Comments	Photographic Records (photo reference, location, view point & direction, feature of note, scale)
Lateral Movement													
Frost Action													
Sloughing													
Cracking													
Animal Burrows													
Vegetation Establishment	Yes	O	SW slope	503051.7338, 7645231.3655 (large area)	11 North	25.5	10.8	0	~2%	Sparse vegetation	Larger than as shown on previous figures (no dimensions given previously)	Acceptable Appears to be a single variety	NH # 27, 44, 46
Staining													
Vegetation Stress													
Seepage Points (or) Ponded Water													
Debris and/or Liner Exposed	No												
Presence & Condition of Monitoring Instruments	Yes	MW-5 MW-6 MW-7 MW-8	Outside landfill perimeter	502998.011, 7645229.27 503040.92, 7645203.6487 503076.078, 7645192.4987 503086.581, 7645311.4887	11 North	-	-	-	-	Monitoring wells	No change	Good condition	NH # 31, 42, 48, 1
Features of Note/Other Relevant Observations (e.g., signs of activity, ruts…)	Yes	F1 F2	SE slope, at crest	503091.8288, 7645258.6933 503093.7507, 7645258.8798	11 North	21.0 30.3	0.2 0.2	0.05 0.05	<1%	Vehicle tracks, two parallel tire marks	Dimensions slightly different than listed in previous report	Acceptable Minor depressions	NH # 8-9
Features of Note/Other Relevant Observations (e.g., signs of activity, ruts…)	Yes	N (new)	N corner, at crest	503059.0972, 7645300.787	11 North	-	-	-	<1%	Roughly graded area (poor finishing)	Newly noted as a feature, but no change since 2016	Acceptable	BH # 57-58

9.3.1.2 Preliminary Stability Assessment

The Preliminary Stability Assessment for the NHW Landfill was conducted on August 18, 2018 as per the TOR and the results are provided below in Table 9-4.

Table 9-4: Preliminary Stability Assessment – NHW Landfill

Feature	Severity Rating	Extent
Settlement	Acceptable	Occasional
Erosion	Marginal	Numerous
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**	

Note: please refer to Performance/Severity rating reference guide in Section 2.1.3.1 above.

9.3.1.3 Photographic Records

The detailed photographic record for the NHW Landfill has been completed as per Section 5.5 of the TOR and is included as **Appendix I**. The Photographic Record only contains an index of photographs collected; full sized photographs are contained in separately provided and appended CD/DVD-ROM. **Figure PIN-2.8A** illustrates the photograph locations and directions.

9.3.1.4 Trend Analysis

A trend analysis was conducted with regards to observations made during the visual inspection of the NHW Landfill. The following Table 9-5 outlines the results of the visual trend analysis.

Table 9-5: Visual Inspection Trends - NHW Landfill

Checklist Item	Feature ID	Comparison with Historical Observations
Settlement	A1	Within ranges noted in the 2016 report. No significant change.
	A2	Within ranges noted in the 2016 report. No significant change.
	C	No change since 2016.
	D1	Length increased from 0.4 m in 2016 to 1.6 m in 2018.
	D2	Length increased from 0.4 m in 2016 to 1.6 m in 2018.
	G	No change since 2016.
Erosion	B1	Dimensions are within range noted in 2016 report. No significant change.
	B2	Dimensions are within range noted in 2016 report. No significant change.
	B3	Dimensions are within range noted in 2016 report. No significant change.
	B4	Dimensions are within range noted in 2016 report. No significant change.
	B5	Feature was not found in 2018. Photos taken at co-ordinates given.
	E1	Dimensions are smaller than the range noted in 2016 report.
	E2	Dimensions are smaller than the range noted in 2016 report.
	E3	Dimensions are smaller than the range noted in 2016 report.
	H	No change since 2016.
	I	No change since 2016.
	J	No change since 2016.
	K	No change since 2016.
	L	New feature in 2018.
	M	New feature in 2018.
Vegetation Establishment	O	Larger than as shown on previous figures (no dimensions given previously).
Other	F	Vehicle tracks are of a slightly different length than noted in previous reports.
	N	Rough grading is noted in 2016, but it was not designated as a feature. No change since 2016.

9.3.1.5 Discussion of Results/Trends

A comparison of the visual inspection results of the 2016 and 2018 monitoring events at the NHW Landfill indicates that several previously observed settlement and erosion features increased slightly in size, and that two new erosion features were observed in 2018. The results of the visual inspection and the observed trends indicate that the performance of the landfill is acceptable.

9.3.2 Soil Sampling

Soil sampling of the NHW Landfill was conducted on August 18, 2018. The soil sampling was conducted in compliance with Section 5.3.1 and 5.3.2 of the TOR 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 six soil samples were analysed from three soil sample locations at the Non-Hazardous Waste Landfill and analysed for inorganic elements (arsenic, cadmium, chromium, cobalt, copper, nickel, and zinc), polychlorinated biphenyls (PCBs), and Petroleum Hydrocarbons (PHC F1, F2, F3, and F4).

The full current and historical analytical results are presented in **Table 7** in the Tables section of this report immediately following the main text. The laboratory certificates of analysis and chain of custody forms are presented in **Appendix B** of this report. **Figure PIN-2.8B** presents a summary of significant soil analytical results.

9.3.2.2 Discussion of Results – Comparison to Baseline/Background

Analytical results were compared against background concentrations, baseline data – arithmetic mean, and baseline date mean + 3x standard deviation. The following Table 9-6 summarizes the comparison of results.

Table 9-6: Evaluation of Results by Parameter – NHW Landfill

Parameter	B.K.	B.S.	B.S. +	Discussion of Results
Arsenic (As)	2.9	3.8	11.7	The baseline and baseline +3 standard deviation were exceeded in downgradient sample MW-06 depth (15 mg/kg with its duplicate at 18 mg/kg). All other samples reported concentrations below the baseline. This MW-06 depth sample station should be re-assessed following future monitoring events.
Cadmium (Cd)	1.0	1.0	1.0	All soil samples reported concentrations below both background and baseline concentrations for Cd.
Chromium (Cr)	20.0	20.0	20.0	All soil samples reported concentrations below both background and baseline concentrations for Cr.
Cobalt (Co)	5.0	5.0	5.0	All soil samples reported concentrations below both background and baseline concentrations for Co.
Copper (Cu)	8.7	6.5	27.7	All soil samples reported concentrations below both background and baseline concentrations for Cu.
Lead (Pb)	10.0	10.0	10.0	All soil samples reported concentrations below both background and baseline concentrations for Pb.
Nickel (Ni)	5.0	5.0	5.0	All soil samples reported concentrations below both background and baseline concentrations for Ni.
Zinc (Zn)	15.0	15.0	15.0	The baseline and baseline +3 standard deviations were exceeded in downgradient samples MW-06 surface (17 mg/kg), MW-06 depth (62 mg/kg and a duplicate at 64 mg/kg), and MW-07 surface (17 mg/kg). All other soil samples reported concentrations below both background and baseline concentrations for Zn. Other than MW-06 depth, these elevated Zn concentrations are present in the downgradient soil sample locations but are observed as marginally greater than background. This MW-06 depth sample station should be re-assessed following future monitoring events.
PCBs (Total)	0.01	0.1	0.1	All soil samples were mostly below the laboratory method detection limit or were below both background and baseline concentrations for PCBs.

Parameter	B.K.	B.S.	B.S. +	Discussion of Results
F1 (C_6-C_{10})	N/A	10.0	10.0	All soil samples were below the laboratory method detection limit for PHC F1.
F2 (C_{10}-C_{16})	N/A	4.0	4.0	All soil samples were below the laboratory method detection limit for PHC F2 except for the duplicate from MW-06 depth (at 5.2 mg/kg). This minor detection is not considered to be an issue and is very low for PHC F2 in soil.
F3 (C_{16}-C_{34})	N/A	20.3	99.9	A concentration greater than baseline was noted at downgradient sample station MW-06 surface (22 mg/kg). This minor detection is not considered to be an issue and is very low for PHC F3 in soil.
F4 (C_{34}-C_{50})	N/A	16.3	49.9	All soil samples were below the laboratory method detection limit for PHC F4.

Note: B.K. = background concentration in mg/kg, B.S. = baseline concentration in mg/kg, B.S. + =baseline data mean + 3x standard deviations. Concentrations shown are in mg/kg.

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 (one graph per analyte tested) including a visual comparison to baseline, the baseline +3 standard deviations and results from previous monitoring years using differentiating colours (See **Appendix G7**). The following Table 9-7 provides a summary of soil trend analysis findings and presents a discussion of the observed trends by parameter.

Table 9-7: Discussion of Trends – NHW Landfill

Parameter	Discussion of Trends
Arsenic (As)	Based on current and historical results, As has no overall observable trend at the majority of the sample stations at the NHW Landfill, as all but one station reported concentrations within what would be expected of the natural variation from one sampling event to another. No trend is evident at the current time; however, this sample station (MW-06 depth) should be re-assessed following future monitoring events.
Cadmium (Cd)	Based on current and historical results, Cd has no observable trend at any of the sample stations at the NHW Landfill. All reported concentrations are within what would be expected of the natural variation from one sampling event to another.
Chromium (Cr)	Based on current and historical results, Cr has no observable trend at any of the sample stations at the NHW Landfill. All reported concentrations are within what would be expected of the natural variation from one sampling event to another. Uncharacteristically high concentrations were reported at two sample stations in 2016 (downgradient MW-07 surface, upgradient MW-08 surface); however, these are believed to be anomalous and do not correspond with the 2012, 2014, and the current 2018 monitoring data.
Cobalt (Co)	Based on current and historical results, Co has no observable trend at any of the sample stations at the NHW Landfill. All reported concentrations are within what would be expected of the natural variation from one sampling event to another.
Copper (Cu)	Based on current and historical results, Cu has no observable trend at any of the sample stations at the NHW Landfill. All reported concentrations are typical of a natural variation in sampling events.

Parameter	Discussion of Trends
Lead (Pb)	Overall, based on current and historical results, Pb has no observable trend at all but one of the sample stations at the NHW Landfill. Most reported concentrations are within what would be expected of the natural variation from one sampling event to another. Downgradient sample station MW-06 depth may be exhibiting a very slight upward trend; however, the concentrations are still well below background and this is not considered a concern at this time.
Nickel (Ni)	Based on current and historical results, Ni has no observable trend at any of the sample stations at the NHW Landfill. All reported concentrations are typical of a natural variation in sampling events.
Zinc (Zn)	Based on current and historical results, Zn has no observable trend at any of the sample stations at the NHW Landfill. Elevated zinc concentrations observed at downgradient sample MW-06 (depth) should be re-assessed following the next monitoring event.
PCBs (Total)	Based on current and historical results, PCBs have no observable trend at any of the sample stations at the NHW Landfill. Most samples were below the laboratory method detection limit or were below the baseline.
F1 (C_6-C_{10})	Based on all concentrations being below the laboratory method detection limit, PHC F1 is considered to have no observable trend at the NHW Landfill.
F2 (C_{10}-C_{16})	Based on most concentrations being below the laboratory method detection limit, PHC F2 is considered to have no observable trend at the NHW Landfill.
F3 (C_{16}-C_{34})	Based on either concentrations below the laboratory method detection limit or very low concentrations, PHC F3 is considered to have no observable trend at the NHW Landfill.
F4 (C_{34}-C_{50})	Based on either concentrations below the laboratory method detection limit or very low concentrations, PHC F4 is considered to have no observable trend at the NHW Landfill.

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

Four groundwater monitoring wells (MW-05, MW-06, MW-07, and MW-08) are present at the Non-Hazardous Waste Landfill. Groundwater sampling of the Non-Hazardous Waste Landfill was conducted on August 19, 2018. The groundwater sampling was conducted in compliance with Section 5.3.1 and 5.3.3 of the TOR and details are provided below in the following Sections 9.3.3.1 to 9.3.3.5.

9.3.3.1 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. Monitoring well sampling logs are presented in **Appendix D**.

9.3.3.2 Water Levels/Groundwater Flow

Groundwater levels were collected and are presented in the Table below.

Table 9-8: Summary of Groundwater Levels - Non-Hazardous Waste Landfill

Monitoring Well ID	Monitoring Well Elevation (m)	Water Level (TOC) (m)	Well Stick up (m)	Water Level (from ground surface) (m)	Groundwater Elevation (m asl)
MW-05	20.6	1.867	0.54	1.327	19.27
MW-06	21.8	1.991	0.58	1.411	20.4
MW-07	21.8	2.321	0.495	1.826	19.97
MW-08	20.5	N/A	N/A	N/A	N/A

It should be noted that MW-05, MW-06, and MW-07 are in a straight line; therefore, inadequate information is available to triangulate a groundwater flow direction and, as such, no groundwater contours were created for the Non-Hazardous Waste Landfill.

9.3.3.3 Groundwater Laboratory Analytical Results

Three groundwater samples were collected at the NHW Landfill and analyzed for inorganic elements (arsenic, cadmium, chromium, cobalt, copper, nickel, and zinc) and Petroleum Hydrocarbons (PHC F1, F2, F3, and F4).

The full current and historical analytical results are presented in **Table 7A** in the Tables section of this report immediately following the main text. The laboratory certificates of analysis and chain of custody forms are presented in **Appendix B** of this report. Figure PIN-2.8C presents a summary of significant groundwater analytical results.

9.3.3.4 Discussion of Groundwater Results by Parameter

Analytical results were compared against baseline data – arithmetic mean, and baseline data mean + 3x standard deviation. The following Table summarizes the comparison of results.

Table 9-9: Evaluation of Groundwater Analytical Results – Non-Hazardous Waste Landfill

Parameter	B.S.	B.S. +	Discussion of Results
Arsenic (As)	0.0284	0.0778	All groundwater concentrations were below the baseline concentrations for As.
Cadmium (Cd)	0.0010	0.0010	All groundwater concentrations were below the laboratory method detection limit for Cd.
Chromium (Cr)	0.0931	0.2249	All groundwater concentrations were either below the laboratory method detection limit or were below the baseline concentrations for Cr.
Cobalt (Co)	0.0048	0.0159	All groundwater concentrations were below the laboratory method detection limit for Co.
Copper (Cu)	0.0744	0.1798	All groundwater concentrations were below the baseline concentrations for Cu.

Parameter	B.S.	B.S. +	Discussion of Results
Lead (Pb)	0.0121	0.0338	All groundwater concentrations were below the laboratory method detection limit for Pb.
Nickel (Ni)	0.0537	0.1861	All groundwater concentrations were below the baseline concentrations for Ni.
Zinc (Zn)	0.42	2.27	All groundwater concentrations were either below the laboratory method detection limit or were below the baseline concentrations for Zn.
F1 (C_6-C_{10})	0.050	0.050	All groundwater concentrations were below the laboratory method detection limit for PHC F1.
F2 (C_{10}-C_{16})	0.50	0.50	All groundwater concentrations were below the laboratory method detection limit for PHC F2.
F3 (C_{16}-C_{34})	1.0	1.0	All groundwater concentrations were below the laboratory method detection limit for PHC F3.
F4 (C_{34}-C_{50})	1.0	1.0	All groundwater concentrations were below the laboratory method detection limit for PHC F4.

Note: B.S. = baseline concentration in mg/kg, B.S. + = baseline data mean + 3x standard deviations. Concentrations shown are in mg/L.

9.3.3.5 Groundwater Trend Analysis by Parameter and Discussion of Trends

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 (one graph per analyte tested) including a visual comparison to baseline, the baseline +3 standard deviations and results from previous monitoring years using differentiating colours (See **Appendix H2**). The following Table provides a summary of groundwater trend analysis findings and presents a discussion of the observed trends by parameter.

Table 9-10: Evaluation of Groundwater Chemistry Trends- NHW Landfill

Parameter	Discussion of Trends
Arsenic (As)	Based on current and historical results, As has no observable trend at any of the groundwater sample stations tested at the Non-Hazardous Waste Landfill. All reported concentrations are typical of a natural variation in sampling events.
Cadmium (Cd)	Based on current and historical results, Cd has no observable trend at any of the groundwater sample stations tested at the Non-Hazardous Waste Landfill. All reported concentrations are typical of a natural variation in sampling events.
Chromium (Cr)	Based on current and historical results, Cr has no observable trend at any of the groundwater sample stations tested at the Non-Hazardous Waste Landfill. Reported concentrations are within what would be expected of the natural variation from one sampling event to another.
Cobalt (Co)	Based on current and historical results, Co has no observable trend at any of the groundwater sample stations tested at the Non-Hazardous Waste Landfill. All reported concentrations are typical of a natural variation in sampling events.
Copper (Cu)	Based on current and historical results, Cu has no observable trend at any of the groundwater sample stations tested at the Non-Hazardous Waste Landfill. All reported concentrations are typical of a natural variation in sampling events.

Parameter	Discussion of Trends
Lead (Pb)	Based on current and historical results, Pb has no observable trend at any of the groundwater sample stations tested at the Non-Hazardous Waste Landfill. Reported concentrations are within what would be expected of the natural variation from one sampling event to another.
Nickel (Ni)	Based on current and historical results, Ni has no observable trend at any of the groundwater sample stations tested at the Non-Hazardous Waste Landfill. All reported concentrations are typical of a natural variation in sampling events.
Zinc (Zn)	Based on current and historical results, Zn has no observable trend at any of the groundwater sample stations tested at the Non-Hazardous Waste Landfill. All reported concentrations are typical of a natural variation in sampling events.
F1 (C_6-C_{10})	Based on current and historical results and all concentrations being below the laboratory method detection limit, PHC F1 has no observable trend.
F2 (C_{10}-C_{16})	Based on current and historical results and all concentrations being below the laboratory method detection limit, PHC F2 has no observable trend.
F3 (C_{16}-C_{34})	Based on current and historical results and all concentrations being below the laboratory method detection limit, PHC F3 has no observable trend.
F4 (C_{34}-C_{50})	Based on current and historical results and all concentrations being below the laboratory method detection limit, PHC F4 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.

9.3.4 Thermal Monitoring

No thermistors are present at the Non-Hazardous Waste Landfill and, as such, no thermal monitoring was conducted.

9.4 Conclusions and Overall Landfill Performance

Based on the results of the 2018 monitoring program, the overall performance of the NHW Landfill is acceptable.

9.5 Recommendations and Conclusions

Following a review of NHW soil sample stations and parameters tested, no significant observable trends with no obvious concentration increases or decreases over time were observed. Downgradient soil sample station, MW-06 depth, reported an increase in arsenic concentrations for two consecutive monitoring events. This sampling station should be re-assessed following future monitoring events. Elevated zinc concentrations were observed at downgradient sample MW-06 (surface and depth) and should be re-assessed following the next monitoring event.

The groundwater results reported no exceedances and showed no significant observable trends to indicate concentration increases over time.

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 NHW landfill performance is acceptable. No remedial work or deviations from the monitoring plan are recommended at this time.

10 PIN-2: SOUTH LANDFILL EAST

10.1 Landfill Description

The South Landfill East is located 1.7 km south-southeast of the existing aircraft hangar, 50 m to the east of the Station Access Road, south of the intersection with the Harding River Road. Overburden surrounding the landfill has been largely removed to bedrock as part of the site remediation program.

Remediation of this landfill consisted of removal of surface debris and covering the landfill with 0.4 m of Type 2 granular fill overlain by an additional 0.4 m of Type 1 granular fill.

The long-term monitoring plan from the South Landfill East consists of visual inspection and the collection of soil samples.

The landfill layout, visual observations and photographic locations are presented on **Figure PIN-2.9A** and soil analytical results are presented on **Figure PIN-2.9B**, both located at the rear of this report.

10.2 Summary of Work Conducted

10.2.1 Visual Inspection

A visual inspection was completed at the South Landfill East on August 17, 2018. The visual inspection of the landfill was completed with no deviations from the accepted work plan.

10.2.2 Soil Sampling

Soil sampling at the South Landfill-East was conducted on August 18, 2018 and consisted of the collection of eight soil samples from four soil sample stations (P2-17, P2-18, P2-19, and P2-20). Depth limitations were encountered at soil sampling stations P2-19, where no depth sample was available, and at soil sampling station P2-18, where refusal on bedrock limited the depth sample from 0.2 to 0.3 metres below ground surface. Duplicate number 3 (Dup 3) was collected at station P2-17B. The following Table 10-1 outlines the soil sampling activities conducted at the South Landfill-East.

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

Sample Location	Sample ID	Sample Depth (m bgs)	Notes
P2-17 (upgradient)	P2-17A	0 – 0.15	Dark brown gravelly sand, organics at surface, no odour
	P2-17B	0.4 – 0.5	As above
P2-18 (down-gradient)	P2-18A	0 – 0.15	Light grey broken rock, coarse sand, some silt, gravelly, no odour
	P2-18B	0.2 – 0.3	As above. Refusal on bedrock.
P2-19 (down-gradient)	P2-19A	0 – 0.15	Light brown/beige broken bedrock, some silt, no odour
	P2-19B	No depth sample	No depth sample available
	P2-20A	0 – 0.15	Dark brown/black organics, no odour

Sample Location	Sample ID	Sample Depth (m bgs)	Notes
P2-20 (down-gradient)	P2-20B	0.4 – 0.5	Light brown gravelly sand, no odour

10.2.3 Groundwater Sampling

No groundwater monitoring wells are present at South Landfill East.

10.2.4 Thermal Monitoring

No thermistors are present at South Landfill East.

10.3 Results of the Monitoring Program

The following Sections 10.3.1 through 10.3.4 summarize the results of the PIN-2 monitoring program at South Landfill East.

10.3.1 Visual Inspection

The visual inspection was conducted in compliance with Section 5.2 of the TOR and details are provided below in the following Sections 8.3.1.1 through 8.3.1.5. **Figure PIN-2.9A** presents the visual inspection findings and photographic locations.

10.3.1.1 Inspection Checklist

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

Table 10-2: Visual Inspection Checklist – South Landfill East

SITE NAME: PIN-2 Cape Young
LANDFILL DESIGNATION: South Landfill East LANDFILL TYPE: Regraded DATE OF INSPECTION: 17 August 2018 WEATHER CONDITIONS: Overcast, windy. Some fog. ~2C
DATE OF PREVIOUS INSPECTION: 15 August 2016
INSPECTED BY: Ryan Janzen and Charles Gravelle
REPORT PREPARED BY: Ryan Janzen The inspector represents to the best of their knowledge that 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.

Table 10-2: Visual Inspection Checklist – South Landfill East

Checklist Item	Present (Yes/No)	Feature Number	Feature Location	GPS Coordinates Easting/Northing/Zone (Taken from Centre of Feature)		Length (m)	Width (m)	Depth (m)	Extent Relative to Landfill Surface	Description	Comparison with Historical Observations	Severity Rating/ Additional Comments	Photographic Records (photo reference, location, view point & direction, feature of note, scale)
Settlement	Yes	A	E corner	503524.4115, 7645055.4574	11 North	6.6	0.3	0.1	<1%	Minor depression - linear	No significant change	Acceptable	SLFE # 9-11
Settlement	Yes	C	NE slope	503496.8589, 7645089.0691	11 North	0.6	0.15	0.05	<1%	Minor depression	No significant change	Acceptable	SLFE # 14-15
Settlement	Yes	D	Middle (top)	503481.5804, 503481.5804	11 North	0.3	0.15	0.1	<1%	Minor depression	No significant change	Acceptable	SLFE # 24-25
Settlement	Yes	E (new)	NE slope	503499.0998, 7645082.9723	11 North	1.8	0.3	0.1	<1%	Minor depression	New observation	Acceptable	SLFE # 30-31
Settlement	Yes	F (new)	NE slope	503503.1467, 7645080.6377	11 North	0.3	0.3	0.1	<1%	Minor depression	New observation	Acceptable	SLFE # 28-29
Erosion	Yes	B	Middle (top)	503488.4225, 7645065.2982	11 North	9.9	0.15	0.1	<1%	Minor erosion - linear	Smaller than previously noted	Acceptable	SLFE # 12-13
Lateral Movement	No												
Frost Action	No												
Sloughing	No												
Cracking	No												
Animal Burrows	No												
Vegetation Establishment	Yes	G	NW slope	503463.3356, 7645088.1578	11 North	30	15	0	~5%	Sparse vegetation	No significant change	Acceptable	
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												

10.3.1.2 Preliminary Stability Assessment

The Preliminary Stability Assessment for the South Landfill East was conducted on August 17, 2018 as per the TOR and the results are provided below in Table 10-3.

Table 10-3: Preliminary Stability Assessment – South Landfill East

Feature	Severity Rating	Extent
Settlement	Acceptable	Occasional
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	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	Not Observed	None
Overall Landfill Performance	**Acceptable**	

Note: please refer to Performance/Severity rating reference guide in Section 2.1.3.1 above.

10.3.1.3 Photographic Records

The detailed photographic record for the South Landfill East has been completed as per Section 5.5 of the TOR and is included as **Appendix I**. The Photographic Record only contains an index of photographs collected; full sized photographs are contained in separately appended CD/DVD-ROM. **Figure PIN-2.9A** illustrates the photograph locations and directions.

10.3.1.4 Trend Analysis

A trend analysis was conducted with regards to observations made during the visual inspection of the South Landfill East. The following Table 10-4 outlines the results of the visual trend analysis.

Table 10-4: Visual Inspection Trends - South Landfill East

Checklist Item	Feature Number	Comparison with Historical Observations
Settlement	A	No change since 2016.
	C	No change since 2016.
	D	No change since 2016.
	E	New observation in 2018.
	F	New observation in 2018.
Erosion	B	Smaller than dimensions noted in previous report.
Vegetation	G	No significant change.

10.3.1.5 Discussion of Results/Trends

A comparison of the visual inspection results of the 2016 and 2018 monitoring events at the South Landfill East indicates that existing settlement features do not show any significant change. Two new settlement features were observed. The existing erosion feature appears to have decreased in size. The vegetated area has not experienced any significant change. Based on these results, the performance of the landfill is acceptable.

10.3.2 Soil Sampling

Soil sampling of the South Landfill-East was conducted on August 18, 2018. The soil sampling was conducted in compliance with Section 5.3.1 and 5.3.2 of the TOR 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 eight soil samples were analysed from four soil sample locations at the South Landfill-East and analysed for inorganic elements (arsenic, cadmium, chromium, cobalt, copper, nickel, and zinc), polychlorinated biphenyls (PCBs), and Petroleum Hydrocarbons (PHC F1, F2, F3, and F4).

The full current and historical analytical results are presented in **Table 8** in the Tables section of this report immediately following the main text. The laboratory certificates of analysis and chain of custody forms are presented in **Appendix B** of this report. **Figure PIN-2.9B** presents a summary of significant soil analytical results.

10.3.2.2 Discussion of Results – Comparison to Baseline/Background

Analytical results were compared against background concentrations, baseline data – arithmetic mean, and baseline date mean + 3x standard deviation. The following Table summarizes the comparison of results.

Table 10-5: Evaluation of Results by Parameter- South Landfill East

Parameter	B.K.	B.S.	B.S. +	Discussion of Results
Arsenic (As)	2.9	2.4	4.5	A concentration greater than baseline was noted at downgradient sample station P2-18 surface (2.6 mg/kg) and at upgradient P2-17 depth original (at 2.5 mg/kg while its duplicate was 2.1 mg/kg). All other samples reported concentrations at or below the baseline. These minor elevated concentrations are not considered a concern and are all at or below the background level.
Cadmium (Cd)	1.0	1.0	1.0	All soil samples reported concentrations below both background and baseline concentrations for Cd.
Chromium (Cr)	20.0	20.0	20.0	All soil samples reported concentrations below both background and baseline concentrations for Cr.
Cobalt (Co)	5.0	5.0	5.0	All soil samples reported concentrations below both background and baseline concentrations for Co.
Copper (Cu)	8.7	9.9	37.8	All soil samples reported concentrations below both background and baseline concentrations for Cu; with the exception of upgradient P2-17 depth original (at 15 mg/kg while its duplicate was 9.4 mg/kg; with its average at 12.2 mg/kg used to evaluate trends). These minor elevated concentrations are not considered a concern and are all at or below the background level.
Lead (Pb)	10.0	10.0	10.0	All soil samples reported concentrations below both background and baseline concentrations for Pb.
Nickel (Ni)	5.0	5.0	14.4	All soil samples reported concentrations below both background and baseline concentrations for Ni.
Zinc (Zn)	15.0	15.1	49.0	Concentrations greater than baseline were noted in upgradient sample station P2-17 surface (24 mg/kg) and downgradient sample station P2-18 depth (18 mg/kg). All other soil samples reported concentrations below both background and baseline concentrations for Zn. These slightly elevated concentrations are not a concern at this time.
PCBs (Total)	0.010	0.10	0.10	Except for the upgradient station P2-17 depth duplicate (Dup-3), all soil samples were below the laboratory method detection limit; therefore, below both background and baseline concentrations for PCBs. The P2-17 depth duplicate total PCB result was 0.13 mg/kg which differed from its original sample at <0.01 mg/kg and does not correlate with its original sample. No trend is evident. PCB concentrations at upgradient P2-17 depth should be reviewed following any future sampling event.
F1 (C_6-C_{10})	N/A	10.0	10.0	All soil samples were below the laboratory method detection limit for PHC F1.
F2 (C_{10}-C_{16})	N/A	4.0	4.0	All soil samples were below the laboratory method detection limit for PHC F2.
F3 (C_{16}-C_{34})	N/A	29.4	178.6	All soil samples were below the laboratory method detection limit; therefore, below baseline concentration for PHC F3 in soil.
F4 (C_{34}-C_{50})	N/A	9.7	30.5	All soil samples were below baseline concentration for PHC F4 in soil.

Note: B.K. = background concentration in mg/kg, B.S. = baseline concentration in mg/kg, B.S. + =baseline data mean + 3x standard deviations. Concentrations shown are in mg/kg.

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 (one graph per analyte tested) including a visual comparison to baseline, the baseline +3 standard deviations and results from previous monitoring years using differentiating colours (See **Appendix G8**). The following Table provides a summary of soil trend analysis findings and presents a discussion of the observed trends by parameter.

Table 10-6: Discussion of Trends – South Landfill East

Parameter	Discussion of Trends
Arsenic (As)	Based on current and historical results, As has no observable trend at any of the sample stations at the South Landfill East. All reported concentrations are typical of the natural variation in sampling events.
Cadmium (Cd)	Based on current and historical results, Cd has no observable trend at any of the sample stations at the South Landfill East. All reported concentrations are within what would be expected of the natural variation from one sampling event to another.
Chromium (Cr)	Based on current and historical results, Cr has no observable trend at any of the sample stations at the South Landfill East. All reported concentrations are typical of the natural variation in sampling events.
Cobalt (Co)	Based on current and historical results, Co has no observable trend at any of the sample stations at the South Landfill East. All reported concentrations are within what would be expected of the natural variation from one sampling event to another.
Copper (Cu)	Based on current and historical results, Cu has no observable trend at any of the sample stations at the South Landfill East. All reported concentrations are typical of the natural variation in sampling events.
Lead (Pb)	Based on current and historical results, Pb has no observable trend at any of the sample stations at the South Landfill East. All reported concentrations are within what would be expected of the natural variation from one sampling event to another.
Nickel (Ni)	Based on current and historical results, Ni has no observable trend at any of the sample stations at the South Landfill East. All reported concentrations are typical of the natural variation in sampling events.
Zinc (Zn)	Based on current and historical results, Zn has no observable trend at any of the sample stations at the South Landfill East. All reported concentrations are typical of the natural variation in sampling events.
PCBs (Total)	Based on current and historical results, PCBs have no observable trend at any of the sample stations at the South Landfill East. Aside from the duplicate from upgradient P2-17 depth, all samples were below the laboratory method detection limit. No trend is evident. PCB concentrations at upgradient P2-17 depth should be reviewed following any future sampling event.
F1 (C_6-C_{10})	Based on concentrations below the laboratory method detection limit, PHC F1 is considered to have no observable trend at the South Landfill East.
F2 (C_{10}-C_{16})	Based on concentrations below the laboratory method detection limit, PHC F2 is considered to have no observable trend at South Landfill East.
F3 (C_{16}-C_{34})	Based on either concentrations below the laboratory method detection limit or very low concentrations, PHC F3 is considered to have no observable trend at the South Landfill East.

Parameter	Discussion of Trends
F4 (C_{34}-C_{50})	Based on either concentrations below the laboratory method detection limit or very low concentrations, PHC F4 is considered to have no observable trend at the South Landfill East.

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 South Landfill East; therefore, no groundwater sampling or analysis was conducted.

10.3.4 Thermal Monitoring

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

10.4 Conclusions and Overall Landfill Performance

Based on the results of the 2018 monitoring program, the overall performance of the South Landfill East 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 have no significant observable trends with no obvious concentration increases or decreases 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 South Landfill East performance is acceptable. No remedial work or revisions to the monitoring plan are recommended at this time.

11 PIN-2: SOUTH BORROW LANDFILL

11.1 Landfill Description

The South Borrow Landfill is located on the west side of the Station Access Road, at the southern end of the site, approximately 3.56 km distant from the existing aircraft hangar. The tundra downgradient of the landfill is quite wet, with lush vegetation and a thick organic mat. Standing water was observed historically and again in 2018 along the toe of the landfill, particularly at the southwest and northwest corners.

The remediation of this landfill consisted of the removal of surface debris, regrading, and capping with 0.4 m of Type 2 granular fill overlain by 0.4 m of Type 1 granular fill.

The long-term monitoring plan from the South Borrow Landfill consists of visual inspection and the collection of soil samples.

The landfill layout, visual observations and photographic locations are presented on **Figure PIN-2.10A** and soil analytical results are presented on **Figure PIN-2.10B**, both located at the rear of this report.

11.2 Summary of Work Conducted

11.2.1 Visual Inspection

A visual inspection was completed at the South Borrow Landfill on August 17, 2018. The visual inspection of the landfill was completed with no deviations from the accepted work plan.

11.2.2 Soil Sampling

Soil sampling at the South Borrow Landfill was conducted on August 18, 2018 and consisted of the collection of eight (8) soil samples from four (4) soil sample stations (P2-27, P2-28, P2-29, and P2-30). Table 11-1 outlines the soil sampling activities conducted at the South Borrow Landfill.

Table 11-1: Summary of Work Conducted by Soil Sampling Location – South Borrow Landfill

Sample Location	Sample ID	Sample Depth (m bgs)	Notes
P2-27 (down-gradient)	P2-27A	0 - 0.15	Dark brown peat, organic odour, saturated
	P2-27B	0.4 – 0.5	Dark grey silty sand, saturated, no odour
P2-28 (down-gradient)	P2-28A	0 - 0.15	Black peat, organic odour, saturated
	P2-28B	0.4 – 0.5	As above
P2-29 (down-gradient)	P2-29A	0 - 0.15	Black peat, organic odour, saturated
	P2-29B	0.4 – 0.5	As above
P2-30 (up-gradient)	P2-30A	0 - 0.15	Dark brown gravel, cobbles, sandy, no odour
	P2-30B	0.4 – 0.5	As above

11.2.3 Groundwater Sampling

No groundwater monitoring wells are present at the South Borrow Landfill.

11.2.4 Thermal Monitoring

No thermistors are present at the South Borrow Landfill.

11.3 Results of the Monitoring Program

The following Sections 11.3.1 through 11.3.4 summarize the results of the PIN-2 monitoring program at the South Borrow Landfill.

11.3.1 Visual Inspection

The visual inspection was conducted in compliance with Section 5.2 of the TOR and details are provided below in the following Sections 11.3.1.1 through 11.3.1.5. **Figure PIN-2.10A** presents the visual inspection findings and photographic locations.

11.3.1.1 Inspection Checklist

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

Table 11-2: Visual Inspection Checklist – South Borrow Landfill

SITE NAME: PIN-2 Cape Young
LANDFILL DESIGNATION: South Borrow Landfill LANDFILL TYPE: Regraded DATE OF INSPECTION: 17 August 2018 WEATHER CONDITIONS: Mixed sun and cloud, windy. Some rain. ~0C
DATE OF PREVIOUS INSPECTION: 15 August 2016
INSPECTED BY: Ryan Janzen and Charles Gravelle
REPORT PREPARED BY: Ryan Janzen The inspector represents to the best of their knowledge that 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.

Table 11-2: Visual Inspection Checklist – South Borrow Landfill

Checklist Item	Present (Yes/No)	Feature Number	Feature Location	GPS Coordinates Easting/Northing/Zone (Taken from Centre of Feature)		Length (m)	Width (m)	Depth (m)	Extent Relative to Landfill Surface	Description	Comparison with Historical Observations	Severity Rating/ Additional Comments	Photographic Records (photo reference, location, view point & direction, feature of note, scale)
Settlement	Yes	A1 A2	N slope	503927.1028, 7643495.0762 503937.0758, 7643496.4219	11 North	0.8 0.7	0.5 0.6	0.1 0.05	<1%	Minor depressions	No significant change	Acceptable	SB # 3-4, 11-12
Settlement	Yes	D1 D2	E slope	503956.2386, 7643476.7694 503946.2387, 7643448.2687	11 North	0.8 0.8	0.6 0.5	0.15 0.1	<1%	Minor depressions	No significant change	Acceptable	SB # 23-24, 31-32
Settlement	Yes	F	S slope	503943.1183, 7643439.3614	11 North	0.3	0.3	0.05	<1%	Minor depression	No significant change	Acceptable	SB # 25-26
Settlement	Yes	G	W slope	503925.6554, 7643463.742	11 North	1.7	0.3	0.05	<1%	Minor depression	No significant change	Acceptable	SB # 13-14
Settlement	Yes	H	Middle of landfill	503941.3385, 7643486.4973	11 North	0.3	0.3	0.1	<1%	Minor depression	No significant change	Acceptable	SB # 33-34
Erosion	Yes	C	NE side	503949.0682, 7643482.6937	11 North	3.2	0.2	0.1	<1%	Minor erosion	No significant change	Acceptable	SB # 29-30
Lateral Movement	No												
Frost Action	No												
Sloughing	No												
Cracking	No												
Animal Burrows	No												
Vegetation Establishment	No												
Staining	Yes	B	SW toe	503925.6268, 7643438.7715	11 North	6.3	0.8	-	<1%	Rust-coloured organic material	Water level in surrounding ponded water (Feature E2) appears lower than in 2016	Acceptable	SB # 17-18
Staining	Yes	I	NW toe	503925.2424, 7643501.7196	11 North	0.5	0.2	-	<1%	Rust-coloured organic material	Water level in surrounding ponded water (Feature E1) appears lower than in 2016	Acceptable	SB # 5
Vegetation Stress	No												
Seepage Points (or) Ponded Water	Yes	E1 E2	SW toe NW toe	503924.2696, 7643446.0156 503923.4232, 7643502.4445	11 North	4.0 6.3	2.0 0.8	0.25 0.05	<1% <1%	Ponded water in the lowlands adjacent to LF. Naturally occurring – not due to LF design	Water levels appear lower than in 2016	Acceptable	SB # 5, 15, 16, 35, 36
Debris and/or Liner Exposed	No												
Presence & Condition of Monitoring Instruments	No												

Table 11-2: Visual Inspection Checklist – South Borrow Landfill												
Checklist Item	**Present (Yes/No)**	**Feature Number**	**Feature Location**	**GPS Coordinates Easting/Northing/Zone (Taken from Centre of Feature)**	**Length (m)**	**Width (m)**	**Depth (m)**	**Extent Relative to Landfill Surface**	**Description**	**Comparison with Historical Observations**	**Severity Rating/ 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…)	No											

11.3.1.2 Preliminary Stability Assessment

The Preliminary Stability Assessment for the South Borrow Landfill was conducted on August 17, 2018 as per the TOR and the results are provided below in Table 11-3.

Table 11-3: Preliminary Stability Assessment – South Borrow Landfill

Feature	Severity Rating	Extent
Settlement	Acceptable	Occasional
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	Acceptable	Occasional
Vegetation Stress	Not Observed	None
Seepage / Ponded Water	Acceptable (Ponding outside landfill)	Occasional
Debris and/or Liner Exposure	Not Observed	None
Other	Not Observed	None
Overall Landfill Performance	**Acceptable**	

Note: please refer to Performance/Severity rating reference guide in Section 2.1.3.1 above.

11.3.1.3 Photographic Records

The detailed photographic record for the South Borrow Landfill has been completed as per Section 5.5 of the TOR and is included as **Appendix I**. The Photographic Record only contains an index of photographs collected; full sized photographs are contained in separately appended CD/DVD-ROM. **Figure PIN-2.10A** illustrates the photograph locations and directions.

11.3.1.4 Trend Analysis

A trend analysis was conducted with regards to observations made during the visual inspection of the South Borrow. The following Table 11-4 outlines the results of the visual trend analysis.

Table 11-4: Visual Inspection Trends – South Borrow Landfill

Checklist Item	Feature Number	Comparison with Historical Observations
Settlement	A1/A2	No significant change from 2016 to 2018.
	D1/D2	No significant change from 2016 to 2018.
	F	No significant change from 2016 to 2018.
	G	No significant change from 2016 to 2018.
	H	No significant change from 2016 to 2018.
Erosion	C	Size has decreased from 4.0 m in 2016 to 3.2 m in 2018.
Staining	B	This is not true staining but rust coloured organic material. No significant change in area extent.
	I	This is not true staining but rust coloured organic material. No significant change in area extent.
Ponded Water	E1	Water levels appear lower than in 2016, but no significant change.
	E2	

11.3.1.5 Discussion of Results/Trends

A comparison of the visual inspection results of the 2016 and 2018 monitoring events at the South Borrow Landfill indicates no significant change. Features previously noted as staining appear to be in fact organic material, and ponded water adjacent the landfill is naturally occurring – not the result of seepage or leaching. No new features were observed. Based on the visual inspection, the performance of the landfill is acceptable.

11.3.2 Soil Sampling

Soil sampling of the South Borrow Landfill was conducted on August 18, 2018. The soil sampling was conducted in compliance with Section 5.3.1 and 5.3.2 of the TOR 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 eight soil samples were analysed from four soil sample locations at the South Borrow Landfill and analysed for inorganic elements (arsenic, cadmium, chromium, cobalt, copper, nickel, and zinc), polychlorinated biphenyls (PCBs), and Petroleum Hydrocarbons (PHC F1, F2, F3, and F4).

The full current and historical analytical results are presented in **Table 9** in the Tables section of this report immediately following the main text. The laboratory certificates of analysis and chain of custody forms are presented in **Appendix B** of this report. **Figure PIN-2.10B** presents a summary of significant soil analytical results.

11.3.2.2 Discussion of Results – Comparison to Baseline/Background

Analytical results were compared against background concentrations, baseline data – arithmetic mean, and baseline date mean + 3x standard deviation. The following Table summarizes the comparison of results.

Table 11-5: Evaluation of Results by Parameter – South Borrow Landfill

Parameter	B.K.	B.S.	B.S. +	Discussion of Results
Arsenic (As)	2.9	3.0	8.3	Concentrations greater than baseline were noted in downgradient sample stations P2-28 surface (5.7 mg/kg), P2-28 depth (4.1 mg/kg), and P2-29 depth (7.3 mg/kg). All other samples reported concentrations below the baseline. These minor elevated concentrations are not considered a concern at this time.
Cadmium (Cd)	1.0	1.0	1.0	All soil samples reported concentrations below both background and baseline concentrations for Cd.
Chromium (Cr)	20.0	20.0	20.0	All soil samples reported concentrations below both background and baseline concentrations for Cr.
Cobalt (Co)	5.0	5.0	5.0	All soil samples reported concentrations below both background and baseline concentrations for Co.
Copper (Cu)	8.7	14.0	42.0	Concentrations greater than baseline were noted at downgradient sample stations P2-28 depth (37 mg/kg), P2-29 depth (40 mg/kg). All soil samples reported concentrations below both background and baseline concentrations for Cu. These concentrations are all below the baseline +3 standard deviations value.
Lead (Pb)	10.0	10.0	10.0	All soil samples reported concentrations below both background and baseline concentrations for Pb.
Nickel (Ni)	5.0	10.2	35.2	Concentrations greater than baseline were noted in downgradient sample stations P2-28 depth (15 mg/kg), P2-29 surface (11 mg/kg), and P2-29 depth (15 mg/kg). All other soil samples reported concentrations below both background and baseline concentrations for Ni. The concentrations above are just above baseline and well below baseline +3 standard deviations. This is not currently considered an issue.
Zinc (Zn)	15.0	15.0	15.0	The baseline and baseline +3 standard deviations were exceeded in upgradient sample station P2-30 surface (16 mg/kg) and downgradient sample stations P2-27 surface (25 mg/kg), and at P2-28 surface (29 mg/kg). All other soil samples reported concentrations below both background and baseline concentrations for Zn. The elevated zinc concentrations are present both up and downgradient to the South Borrow landfill. Zn may be naturally elevated in the area surrounding this landfill. Further, reported concentrations are within what would be expected of the natural variation from one sampling event to another. As such, Zn is not considered a concern at this time.
PCBs (Total)	0.010	0.10	0.10	All soil samples were below the laboratory method detection limit; therefore, below both background and baseline concentrations for PCBs.
F1 (C_6-C_{10})	N/A	10.0	10.0	The baseline and baseline +3 standard deviations were exceeded for downgradient sample station P2-27 surface (19 mg/kg). The remaining samples were below the laboratory method detection limit for PHC F1.
F2 (C_{10}-C_{16})	N/A	8.1	25.3	All soil samples were below baseline concentration for PHC F2 in soil.
F3 (C_{16}-C_{34})	N/A	99.7	435.7	The baseline and baseline +3 standard deviations were exceeded for downgradient sample stations P2-28 surface (670 mg/kg), P2-28 depth (920 mg/kg), P2-29 surface (700 mg/kg), P2-29 depth (810 mg/kg).

Parameter	B.K.	B.S.	B.S. +	Discussion of Results
				Concentrations greater than baseline were also observed at downgradient sample stations P2-27 surface (210 mg/kg) and P2-27 depth (100 mg/kg). All of these samples were collected in peat with close to 100% organic content. Arcadis believes that these concentrations are natural biogenic organic compound (BOC) false positives and do not represent a PHC impact at this landfill. This is supported by our review of the related chromatograms (Appendix B).
F4 (C_{34}-C_{50})	N/A	36.4	153.7	The baseline and baseline +3 standard deviations were exceeded for downgradient sample stations P2-28 surface (190 mg/kg), P2-28 depth (280 mg/kg), P2-29 surface (240 mg/kg), P2-29 depth (260 mg/kg). All of these samples were collected in peat with close to 100% organic content. Arcadis believes that these concentrations are BOC false positives and do not represent a PHC impact at this landfill. This is supported by our review of the related chromatograms (Appendix B).

Note: B.K. = background concentration in mg/kg, B.S. = baseline concentration in mg/kg, B.S. + =baseline data mean + 3x standard deviations. Concentrations shown are in mg/kg.

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 (one graph per analyte tested) including a visual comparison to baseline, the baseline +3 standard deviations and results from previous monitoring years using differentiating colours (See **Appendix G9**). The following Table provides a summary of soil trend analysis findings and presents a discussion of the observed trends by parameter.

Table 11-6: Discussion of Trends – South Borrow Landfill

Parameter	Discussion of Trends
Arsenic (As)	Based on current and historical results, As has no observable trend at any of the sample stations at the South Borrow Landfill. All reported concentrations are within what would be expected of the natural variation from one sampling event to another.
Cadmium (Cd)	Based on current and historical results, Cd has no observable trend at any of the sample stations at the South Borrow Landfill. All reported concentrations are typical of the natural variation in sampling events.
Chromium (Cr)	Based on current and historical results, Cr has no observable trend at any of the sample stations at the South Borrow Landfill. All reported concentrations are within what would be expected of the natural variation from one sampling event to another
Cobalt (Co)	Based on current and historical results, Co has no observable trend at any of the sample stations at the South Borrow Landfill. All reported concentrations are typical of the natural variation in sampling events.
Copper (Cu)	Based on current and historical results, Cu has no observable trend at any of the sample stations at the South Borrow Landfill. All reported concentrations are within what would be expected of the natural variation from one sampling event to another.
Lead (Pb)	Based on current and historical results, Pb has no observable trend at any of the sample stations at the South Borrow Landfill. All reported concentrations are typical of the natural variation in sampling events.

Parameter	Discussion of Trends
Nickel (Ni)	Based on current and historical results, Ni has no observable trend at any of the sample stations at the South Borrow Landfill. All reported concentrations are within what would be expected of the natural variation from one sampling event to another
Zinc (Zn)	Based on current and historical results, Zn has no observable trend at any of the sample stations at the South Borrow Landfill. All reported concentrations are typical of the natural variation in sampling events.
PCBs (Total)	Based on current and historical results, PCBs have no observable trend at any of the sample stations at the South Borrow Landfill. All reported concentrations are below the laboratory method detection limit.
F1 (C_6-C_{10})	Based on current and historical results, PHC F1 is considered to have no observable trend at the South Borrow Landfill. All reported concentrations are typical of the natural variation in sampling events.
F2 (C_{10}-C_{16})	Based on current and historical results, PHC F2 is considered to have no observable trend at the South Borrow Landfill. All reported concentrations are within what would be expected of the natural variation from one sampling event to another.
F3 (C_{16}-C_{34})	Based on current and historical results, PHC F3 is considered to have no observable trend at the South Borrow Landfill. All reported concentrations are typical of the natural variation in sampling events.
F4 (C_{34}-C_{50})	Based on current and historical results, PHC F4 is considered to have no observable trend at the South Borrow Landfill. All reported concentrations are within what would be expected of the natural variation from one sampling event to another. Arcadis believes that any detected PHC F4 concentrations are BOC false positives and do not represent a PHC impact at this landfill

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 South Borrow Landfill; therefore, no groundwater sampling or analysis was conducted.

11.3.4 Thermal Monitoring

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

11.4 Conclusions and Overall Landfill Performance

Based on the results of the 2018 monitoring program, the overall performance of the South Borrow Landfill is acceptable. Ponded water and staining (which actually appears to be rust-coloured organic material) are considered to be naturally occurring and not a result of any landfill leakage.

11.5 Recommendations and Conclusions

Based on review and analysis of chemical data, it appears that the soil concentrations for the parameters tested have no significant observable trends with no obvious concentration increases or decreases over time.

PHC concentrations are reported as high compared to the rest of the PIN-2 site; however, Arcadis believes that these are natural biogenic organic compound (BOC) false positives caused by sample media with an extremely high organic content (i.e. peat content). A detailed review of the PHC chromatograms for these samples also supports this hypothesis. The chromatograms showed the samples primarily registering in the C22 to C34 carbon chain range with no obvious peak, which is indicative of interference from naturally occurring organic material and are not related to a refined petroleum product. Chromatograms are available for review in **Appendix B**.

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 South Borrow landfill performance is acceptable. No remedial work or changes to the monitoring program are recommended at this time.

12 RESULTS OF THE 2018 ADDITIONAL WORK

As part of the additional work completed, Arcadis collected and analyzed two (2) additional soil samples at PIN-2 as follows:

a. Collected a soil sample from the cover material of the Tier II Disposal Facility;

b. Collected a soil sample from the cover material of the Non-Hazardous Waste Landfill;

c. The samples were both collected from a depth of approximately 0.3 m below grade;

d. Collected approximately 10 L of material per sample location; and

e. Submitted both samples for particle size distribution.

The laboratory reports for the grain size analysis are provided in **Appendix B**. Both samples were submitted and analyzed for a custom particle size distribution using the Carter SSMA 55.4 analytical method. The following Table 12-1 provides the results of the sieve analysis at both the Non-Hazardous Waste Landfill and the Tier II Soil Disposal Facility.

Table 12-1: Summary of Grain Size Distribution: Non-Hazardous Waste Landfill and Tier II Soil Disposal Facility

Sampling Date		2018-08-19	2018-08-19
	UNITS	NON-HAZ	TIER II
Percent Retained			
Sieve 4" (>100mm)	%	<0.01	<0.01
Sieve 3.5" (>90mm)	%	<0.01	<0.01
Sieve 3" (>75mm)	%	<0.01	<0.01
Sieve 2.5" (>63mm)	%	<0.01	<0.01
Sieve 2" (>50mm)	%	<0.01	<0.01
Sieve 1.5" (>37.5mm)	%	14.88	10.99
Sieve 1" (>25mm)	%	33.61	20.11
Sieve 3/4" (>19mm)	%	37.69	26.23
Sieve 1/2" (>12.5mm)	%	48.73	45.01
Sieve 3/8" (>9.5mm)	%	55.13	53.10
Sieve 5/16" (>8mm)	%	59.14	56.84
Sieve 1/4" (>6.3mm)	%	65.04	63.41
Sieve - #4 (>4.75mm)	%	71.74	71.35
Sieve - #5 (>4.00mm)	%	74.09	74.16
Sieve - #7 (>2.80mm)	%	79.75	80.29
Sieve - #8 (>2.36mm)	%	81.97	82.91
Sieve - #10 (>2.00mm)	%	83.86	85.08
Percent Passing			
<100mm, Sieve ASTM 4"	%	100.0	100.0
<90mm, Sieve ASTM 3.5"	%	100.0	100.0
<75mm, Sieve ASTM 3"	%	100.0	100.0

Sampling Date		2018-08-19	2018-08-19
	UNITS	NON-HAZ	TIER II
<63mm, Sieve ASTM 2.5"	%	100.0	100.0
<50mm, Sieve ASTM 2"	%	100.0	100.0
<37.5mm, Sieve ASTM 1.5"	%	85.12	89.01
<25mm, Sieve ASTM 1"	%	66.39	79.89
<19mm, Sieve ASTM 3/4"	%	62.31	73.77
<12.5mm, Sieve ASTM 1/2"	%	51.27	54.99
<9.5mm, Sieve ASTM 3/8"	%	44.87	46.90
<8mm, Sieve ASTM 5/16"	%	40.86	43.16
<6.3mm, Sieve ASTM 1/4"	%	34.96	36.59
<4.75mm, Sieve #4	%	28.26	28.65
<4.00mm, Sieve #5	%	25.91	25.84
<2.80mm, Sieve #7	%	20.25	19.71
<2.36mm, Sieve #8	%	18.03	17.09
<2.00mm, Sieve #10	%	16.14	14.92

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FIGURES

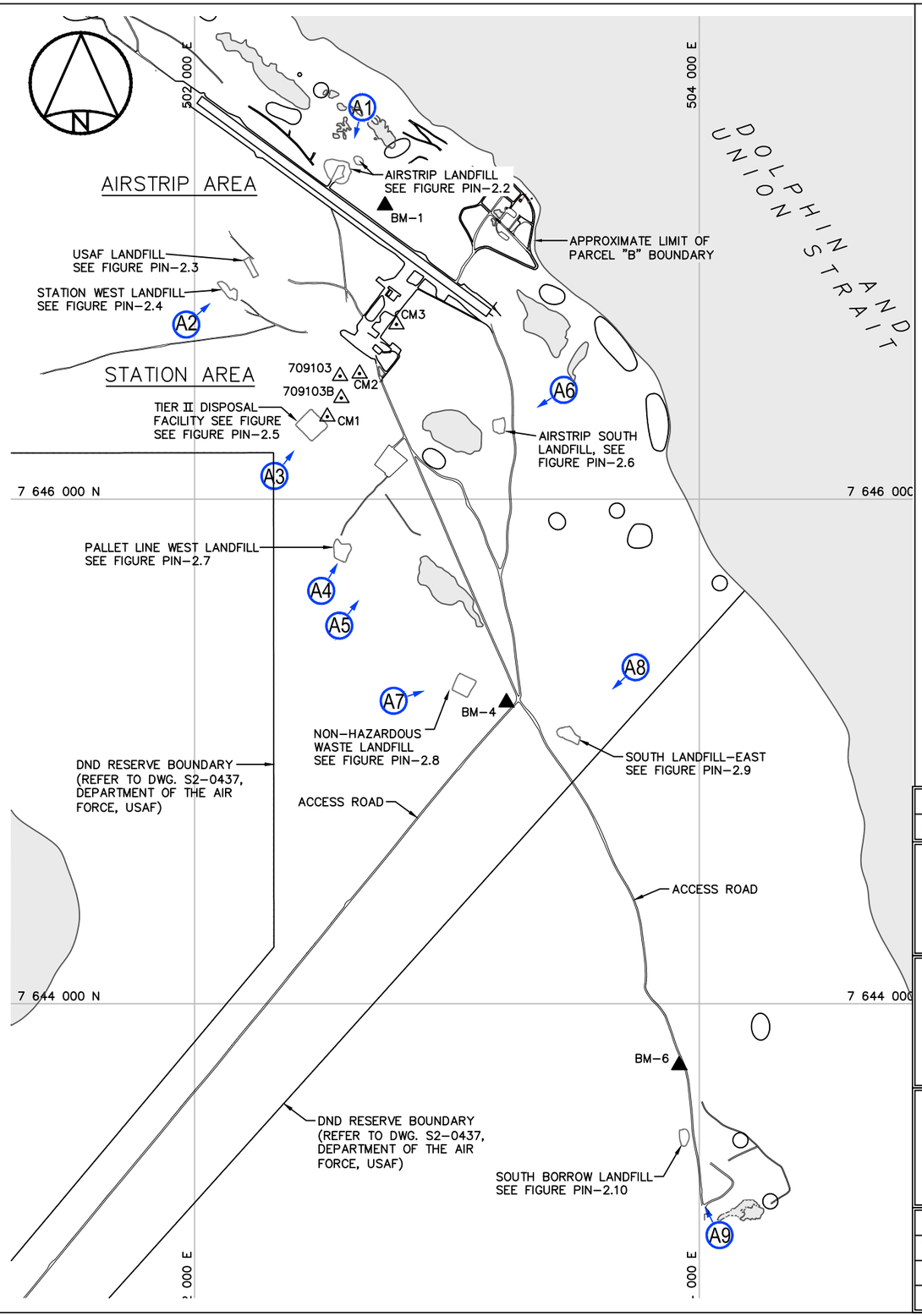
LOCATION OF CAPE YOUNG WITHIN NUNAVUT TERRITORY

SCALE: NTS

SURVEY CONTROL MONUMENTS				
NO.	UTM COORDINATES		ELEV.	DESCRIPTION
	NORTHING	EASTING		
CM1	7 646 327.029	502 525.754	13.804	PIN-2 BASELINE STA. 0+00
CM2	7 646 497.473	502 653.662	13.993	PIN-2 BASELINE STA. 7+00
CM3	7 646 692.507	502 799.974	14.534	PIN-2 BASELINE STA. 15+00
709103	7 646 487.974	502 576.191	13.790	GEODETIC BENCHMARK
709103B	7 646 400.920	502 581.212	13.954	GEODETIC BENCHMARK

NOTE: BASELINE STATIONS SHOWN ARE IN IMPERIAL UNITS.

PERMANENT BENCHMARK (AS-BUILT)				
NO.	UTM COORDINATES		ELEV.	DESCRIPTION
	NORTHING	EASTING		
BM-1	7 647 164.203	502 754.676	14.398	25mm DIA. STEEL PIPE
BM-4	7 645 194.471	503 236.108	17.189	25mm DIA. STEEL PIPE
BM-6	7 643 756.513	503 920.587	13.296	25mm DIA. STEEL PIPE



LEGEND

- CM1 — SURVEY CONTROL MONUMENT (5)
- BM-1 — PERMANENT BENCHMARK LOCATION (3)
- ARCHAEOLOGICAL FEATURES
- APPROXIMATE LOCATION OF PROPERTY BOUNDARY
- BODY OF WATER
- X — AERIAL PHOTOGRAPH (2018)

0m 200m 400m 600m 800m 1000m

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00	DRAFT V.5	2019.03.08	R.F.	T.A	C.G.

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COLLECTION OF LANDFILL MONITORING DATA

PIN-2, CAPE YOUNG, NUNAVUT

OVERALL SITE PLAN

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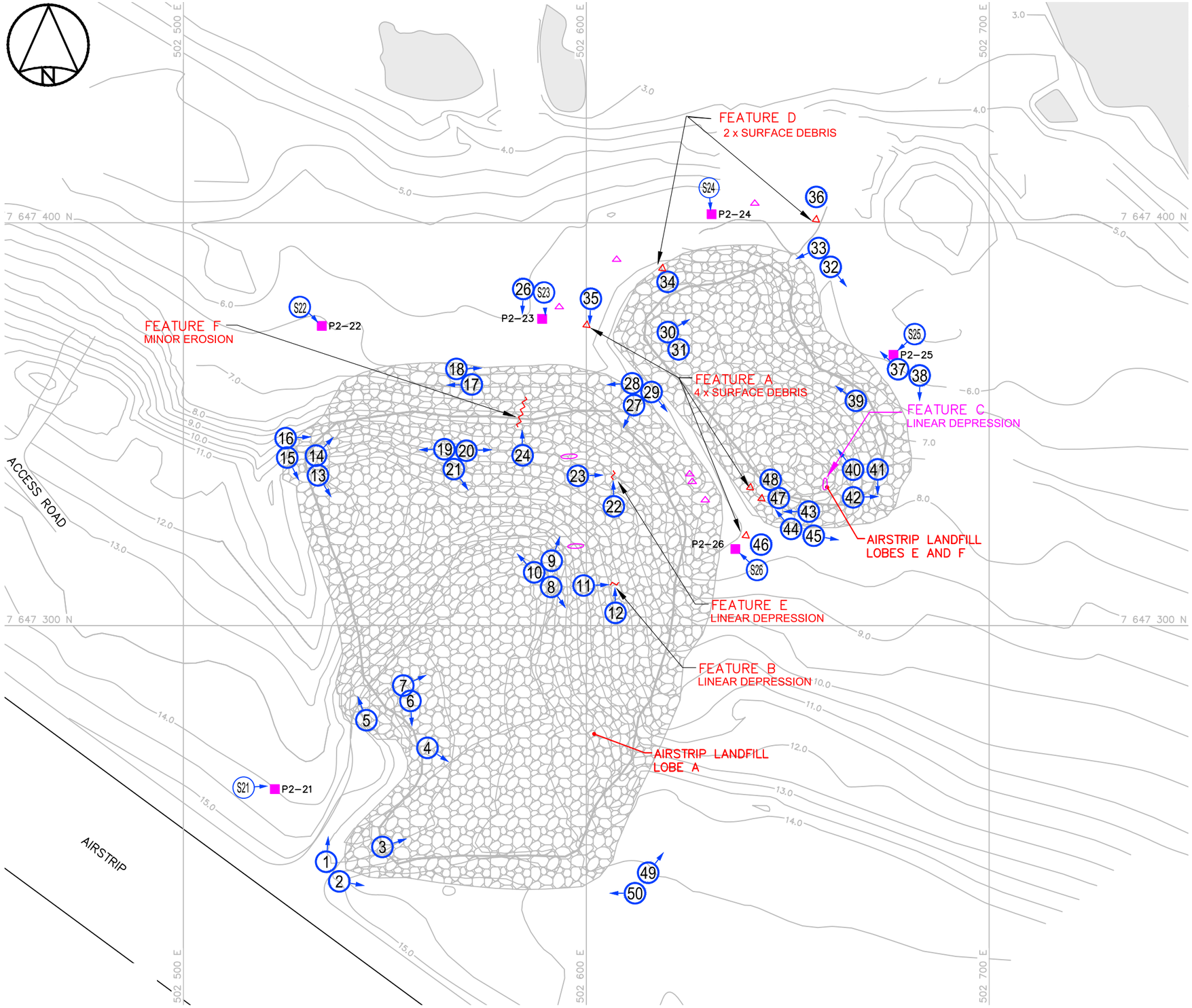
MEASUREMENT UNIT	SCALE:	DATE (month-year):
Metre	1 : 20,000	MARCH 2019
DRAWN BY: R. FLETCHER	VERIFIED BY: T. AUSTRINS	APPROVED BY: C. GRAVELLE P. ENG
PROJECT NO: 102012-000	DRAWING NO: 102012-000-PIN-2.1	PAGE 1

FIGURE PIN-2.1



LEGEND

- MONITORING SOIL SAMPLE LOCATION (6)
- APPROX. PHOTOGRAPHIC VIEWPOINT (2018)
- BODY OF WATER
- LANDFILL EXTENT
- ELEVATION CONTOUR
- DEBRIS (NTS)
- SETTLEMENT
- MINOR EROSION
- APPROXIMATE 2016 OBSERVATIONS (TO ILLUSTRATE CHANGES)

0m 10m 20m 30m 40m 50m

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PIN-2, CAPE YOUNG, NUNAVUT

AIRSTRIP LANDFILL PLAN/MONITORING/OBSERVATIONS

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MEASUREMENT UNIT	SCALE:	DATE (month-year):
Metre	1 : 1,000	MARCH 2019
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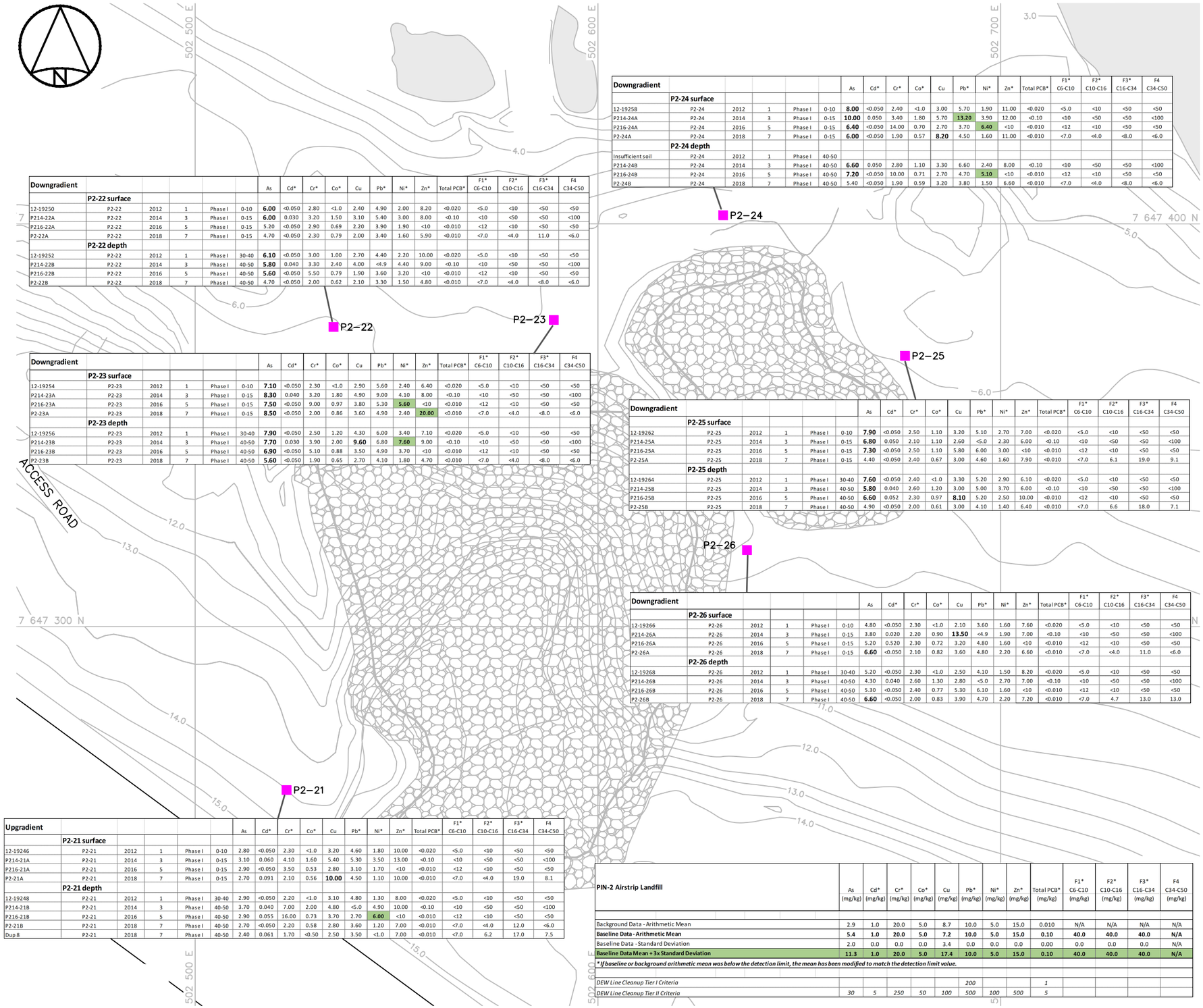
PROJECT NO: 102012-000	DRAWING NO: 102012-000-PIN-2.2	PAGE 2

FIGURE PIN-2.2A



Downgradient						As	Cd*	Cr*	Co*	Cu	Pb*	Ni*	Zn*	Total PCB*	F1* C6-C10	F2* C10-C16	F3* C16-C34	F4 C34-C50
	P2-22 surface																	
12-19250	P2-22	2012	1	Phase I	0-10	**6.00**	<0.050	2.80	<1.0	2.40	4.90	2.00	8.20	<0.020	<5.0	<10	<50	<50
P214-22A	P2-22	2014	3	Phase I	0-15	**6.00**	0.030	3.20	1.50	3.10	5.40	3.00	8.00	<0.10	<10	<50	<50	<100
P216-22A	P2-22	2016	5	Phase I	0-15	5.20	<0.050	2.90	0.69	2.20	3.90	1.90	<10	<0.010	<12	<10	<50	<50
P2-22A	P2-22	2018	7	Phase I	0-15	4.70	<0.050	2.30	0.79	2.00	3.40	1.60	5.90	<0.010	<7.0	<4.0	11.0	<6.0
	P2-22 depth																	
12-19252	P2-22	2012	1	Phase I	30-40	**6.10**	<0.050	3.00	1.00	2.70	4.40	2.20	10.00	<0.020	<5.0	<10	<50	<50
P214-22B	P2-22	2014	3	Phase I	40-50	**5.80**	0.040	3.30	2.40	4.00	<4.9	4.40	9.00	<0.10	<10	<50	<50	<100
P216-22B	P2-22	2016	5	Phase I	40-50	**5.60**	<0.050	5.50	0.79	1.90	3.60	3.20	<10	<0.010	<12	<10	<50	<50
P2-22B	P2-22	2018	7	Phase I	40-50	4.70	<0.050	2.00	0.62	2.10	3.30	1.50	4.80	<0.010	<7.0	<4.0	<8.0	<6.0

Downgradient						As	Cd*	Cr*	Co*	Cu	Pb*	Ni*	Zn*	Total PCB*	F1* C6-C10	F2* C10-C16	F3* C16-C34	F4 C34-C50
	P2-23 surface																	
12-19254	P2-23	2012	1	Phase I	0-10	**7.10**	<0.050	2.30	<1.0	2.90	5.60	2.40	6.40	<0.020	<5.0	<10	<50	<50
P214-23A	P2-23	2014	3	Phase I	0-15	**8.30**	0.040	3.20	1.80	4.90	9.00	4.10	8.00	<0.10	<10	<50	<50	<100
P216-23A	P2-23	2016	5	Phase I	0-15	**7.50**	<0.050	9.00	0.97	3.80	5.30	5.60	<10	<0.010	<12	<10	<50	<50
P2-23A	P2-23	2018	7	Phase I	0-15	**8.50**	<0.050	2.00	0.86	3.60	4.90	2.40	20.00	<0.010	<7.0	<4.0	<8.0	<6.0
	P2-23 depth																	
12-19256	P2-23	2012	1	Phase I	30-40	**7.90**	<0.050	2.50	1.20	4.30	6.00	3.40	7.10	<0.020	<5.0	<10	<50	<50
P214-23B	P2-23	2014	3	Phase I	40-50	**7.70**	0.030	3.90	2.00	**9.60**	6.80	7.60	9.00	<0.10	<10	<50	<50	<100
P216-23B	P2-23	2016	5	Phase I	40-50	**6.90**	<0.050	5.10	0.88	3.50	4.90	3.70	<10	<0.010	<12	<10	<50	<50
P2-23B	P2-23	2018	7	Phase I	40-50	**5.60**	<0.050	1.90	0.65	2.70	4.10	1.80	4.70	<0.010	<7.0	<4.0	<8.0	<6.0

Upgradient						As	Cd*	Cr*	Co*	Cu	Pb*	Ni*	Zn*	Total PCB*	F1* C6-C10	F2* C10-C16	F3* C16-C34	F4 C34-C50
	P2-21 surface																	
12-19246	P2-21	2012	1	Phase I	0-10	2.80	<0.050	2.30	<1.0	3.20	4.60	1.80	10.00	<0.020	<5.0	<10	<50	<50
P214-21A	P2-21	2014	3	Phase I	0-15	3.10	0.060	4.10	1.60	5.40	5.30	3.50	13.00	<0.10	<10	<50	<50	<100
P216-21A	P2-21	2016	5	Phase I	0-15	2.90	<0.050	3.50	0.53	2.80	3.10	1.70	<10	<0.010	<12	<10	<50	<50
P2-21A	P2-21	2018	7	Phase I	0-15	2.70	0.091	2.10	0.56	**10.00**	4.50	1.10	10.00	<0.010	<7.0	<4.0	19.0	8.1
	P2-21 depth																	
12-19248	P2-21	2012	1	Phase I	30-40	2.90	<0.050	2.20	<1.0	3.10	4.80	1.30	8.00	<0.020	<5.0	<10	<50	<50
P214-21B	P2-21	2014	3	Phase I	40-50	3.70	0.040	7.00	2.00	4.80	<5.0	4.90	10.00	<0.10	<10	<50	<50	<100
P216-21B	P2-21	2016	5	Phase I	40-50	2.90	0.055	16.00	0.73	3.70	2.70	6.00	<10	<0.010	<12	<10	<50	<50
P2-21B	P2-21	2018	7	Phase I	40-50	2.70	<0.050	2.20	0.58	2.80	3.60	1.20	7.00	<0.010	<7.0	<4.0	12.0	<6.0
Dup 8	P2-21	2018	7	Phase I	40-50	2.40	0.061	1.70	<0.50	2.50	3.50	<1.0	7.00	<0.010	<7.0	6.2	17.0	7.5

Downgradient						As	Cd*	Cr*	Co*	Cu	Pb*	Ni*	Zn*	Total PCB*	F1* C6-C10	F2* C10-C16	F3* C16-C34	F4 C34-C50
	P2-24 surface																	
12-19258	P2-24	2012	1	Phase I	0-10	**8.00**	<0.050	2.40	<1.0	3.00	5.70	1.90	11.00	<0.020	<5.0	<10	<50	<50
P214-24A	P2-24	2014	3	Phase I	0-15	**10.00**	0.050	3.40	1.80	5.70	13.20	3.90	12.00	<0.10	<10	<50	<50	<100
P216-24A	P2-24	2016	5	Phase I	0-15	**6.40**	<0.050	14.00	0.70	2.70	3.70	6.40	<10	<0.010	<12	<10	<50	<50
P2-24A	P2-24	2018	7	Phase I	0-15	**6.00**	<0.050	1.90	0.57	**8.20**	4.50	1.60	11.00	<0.010	<7.0	<4.0	<8.0	<6.0
	P2-24 depth																	
Insufficient soil	P2-24	2012	1	Phase I	40-50													
P214-24B	P2-24	2014	3	Phase I	40-50	**6.60**	0.050	2.80	1.10	3.30	6.60	2.40	8.00	<0.10	<10	<50	<50	<100
P216-24B	P2-24	2016	5	Phase I	40-50	**7.20**	<0.050	10.00	0.71	2.70	4.70	5.10	<10	<0.010	<12	<10	<50	<50
P2-24B	P2-24	2018	7	Phase I	40-50	5.40	<0.050	1.90	0.59	3.20	3.80	1.50	6.60	<0.010	<7.0	<4.0	<8.0	<6.0

Downgradient						As	Cd*	Cr*	Co*	Cu	Pb*	Ni*	Zn*	Total PCB*	F1* C6-C10	F2* C10-C16	F3* C16-C34	F4 C34-C50
	P2-25 surface																	
12-19262	P2-25	2012	1	Phase I	0-10	**7.90**	<0.050	2.50	1.10	3.20	5.10	2.70	7.00	<0.020	<5.0	<10	<50	<50
P214-25A	P2-25	2014	3	Phase I	0-15	**6.80**	0.050	2.10	1.10	2.60	<5.0	2.30	6.00	<0.10	<10	<50	<50	<100
P216-25A	P2-25	2016	5	Phase I	0-15	**7.30**	<0.050	2.50	1.10	5.80	6.00	3.00	<10	<0.010	<12	<10	<50	<50
P2-25A	P2-25	2018	7	Phase I	0-15	4.40	<0.050	2.40	0.67	3.00	4.60	1.60	7.90	<0.010	<7.0	6.1	19.0	9.1
	P2-25 depth																	
12-19264	P2-25	2012	1	Phase I	30-40	**7.60**	<0.050	2.40	<1.0	3.30	5.20	2.90	6.10	<0.020	<5.0	<10	<50	<50
P214-25B	P2-25	2014	3	Phase I	40-50	**5.80**	0.040	2.60	1.20	3.00	5.00	3.70	6.00	<0.10	<10	<50	<50	<100
P216-25B	P2-25	2016	5	Phase I	40-50	**6.60**	0.052	2.30	0.97	**8.10**	5.20	2.50	10.00	<0.010	<12	<10	<50	<50
P2-25B	P2-25	2018	7	Phase I	40-50	4.90	<0.050	2.00	0.61	3.00	4.10	1.40	6.40	<0.010	<7.0	6.6	18.0	7.1

Downgradient						As	Cd*	Cr*	Co*	Cu	Pb*	Ni*	Zn*	Total PCB*	F1* C6-C10	F2* C10-C16	F3* C16-C34	F4 C34-C50
	P2-26 surface																	
12-19266	P2-26	2012	1	Phase I	0-10	4.80	<0.050	2.30	<1.0	2.10	3.60	1.60	7.60	<0.020	<5.0	<10	<50	<50
P214-26A	P2-26	2014	3	Phase I	0-15	3.80	0.020	2.20	0.90	**13.50**	<4.9	1.90	7.00	<0.10	<10	<50	<50	<100
P216-26A	P2-26	2016	5	Phase I	0-15	5.20	0.520	2.30	0.72	3.20	4.80	1.60	<10	<0.010	<12	<10	<50	<50
P2-26A	P2-26	2018	7	Phase I	0-15	**6.60**	<0.050	2.10	0.82	3.60	4.80	2.20	6.60	<0.010	<7.0	<4.0	11.0	<6.0
	P2-26 depth																	
12-19268	P2-26	2012	1	Phase I	30-40	5.20	<0.050	2.30	<1.0	2.50	4.10	1.50	8.20	<0.020	<5.0	<10	<50	<50
P214-26B	P2-26	2014	3	Phase I	40-50	4.30	0.040	2.60	1.30	2.80	<5.0	2.70	7.00	<0.10	<10	<50	<50	<100
P216-26B	P2-26	2016	5	Phase I	40-50	5.30	<0.050	2.40	0.77	5.30	6.10	1.60	<10	<0.010	<12	<10	<50	<50
P2-26B	P2-26	2018	7	Phase I	40-50	**6.60**	<0.050	2.00	0.83	3.90	4.70	2.20	7.20	<0.010	<7.0	4.7	13.0	13.0

PIN-2 Airstrip Landfill	As (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C6-C10 (mg/kg)	F2* C10-C16 (mg/kg)	F3* C16-C34 (mg/kg)	F4 C34-C50 (mg/kg)
Background Data - Arithmetic Mean	2.9	1.0	20.0	5.0	8.7	10.0	5.0	15.0	0.010	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean	**5.4**	**1.0**	**20.0**	**5.0**	**7.2**	**10.0**	**5.0**	**15.0**	**0.10**	**40.0**	**40.0**	**40.0**	**N/A**
Baseline Data - Standard Deviation	2.0	0.0	0.0	0.0	3.4	0.0	0.0	0.0	0.00	0.0	0.0	0.0	N/A
Baseline Data Mean + 3x Standard Deviation	**11.3**	**1.0**	**20.0**	**5.0**	**17.4**	**10.0**	**5.0**	**15.0**	**0.10**	**40.0**	**40.0**	**40.0**	**N/A**
If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.													
DEW Line Cleanup Tier I Criteria						*200*			*1*				
DEW Line Cleanup Tier II Criteria	*30*	*5*	*250*	*50*	*100*	*500*	*100*	*500*	*5*				

LEGEND

MONITORING SOIL SAMPLE LOCATION (6)

Legend	
XX	Sample exceeds baseline mean
XX	Sample exceeds baseline mean + 3x SD

0m 10m 20m 30m 40m 50m

NO.	VERSION	DATE	BY	VERIF.	APPR.
00	DRAFT V.5	2019–03–08	R.F.	T.A.	C.G.

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COLLECTION OF LANDFILL MONITORING DATA

PIN-2, CAPE YOUNG, NUNAVUT

AIRSTRIP LANDFILL SOIL CHEMISTRY

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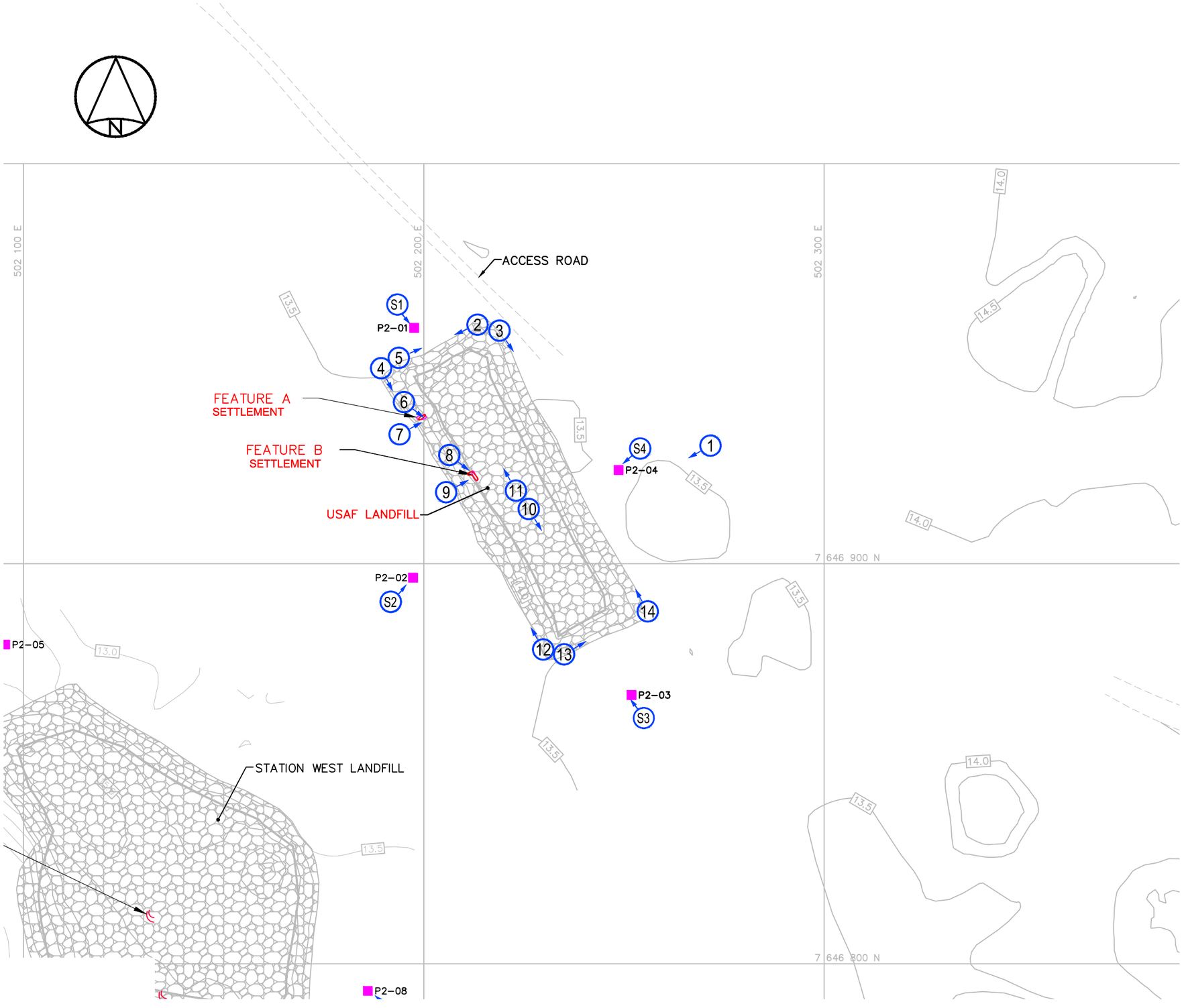
MEASUREMENT UNIT	SCALE:	DATE (month–year):
Metre	1 : 1,000	MARCH 2019
DRAWN BY:	**VERIFIED BY:**	**APPROVED BY:**
R. FLETCHER	T. AUSTRINS	C. GRAVELLE P. ENG
PROJECT NO:	**DRAWING NO:**	**PAGE**
102012-000	102012-000-PIN-2.2	2

FIGURE PIN-2.2B



LEGEND

- MONITORING SOIL SAMPLE LOCATION (4)
- APPROX. PHOTOGRAPHIC VIEWPOINT (2018)
- LANDFILL EXTENT
- ELEVATION CONTOUR
- SETTLEMENT
- APPROXIMATE 2016 OBSERVATIONS (TO ILLUSTRATE CHANGES)

0m 10m 20m 30m 40m 50m

NO.	VERSION	DATE	BY	VERIF.	APPR.
00	DRAFT V.5	2019.03.08	R.F.	T.A.	C.G.

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COLLECTION OF LANDFILL MONITORING DATA

PIN-2, CAPE YOUNG, NUNAVUT

USAF LANDFILL PLAN/MONITORING/OBSRVATIONS

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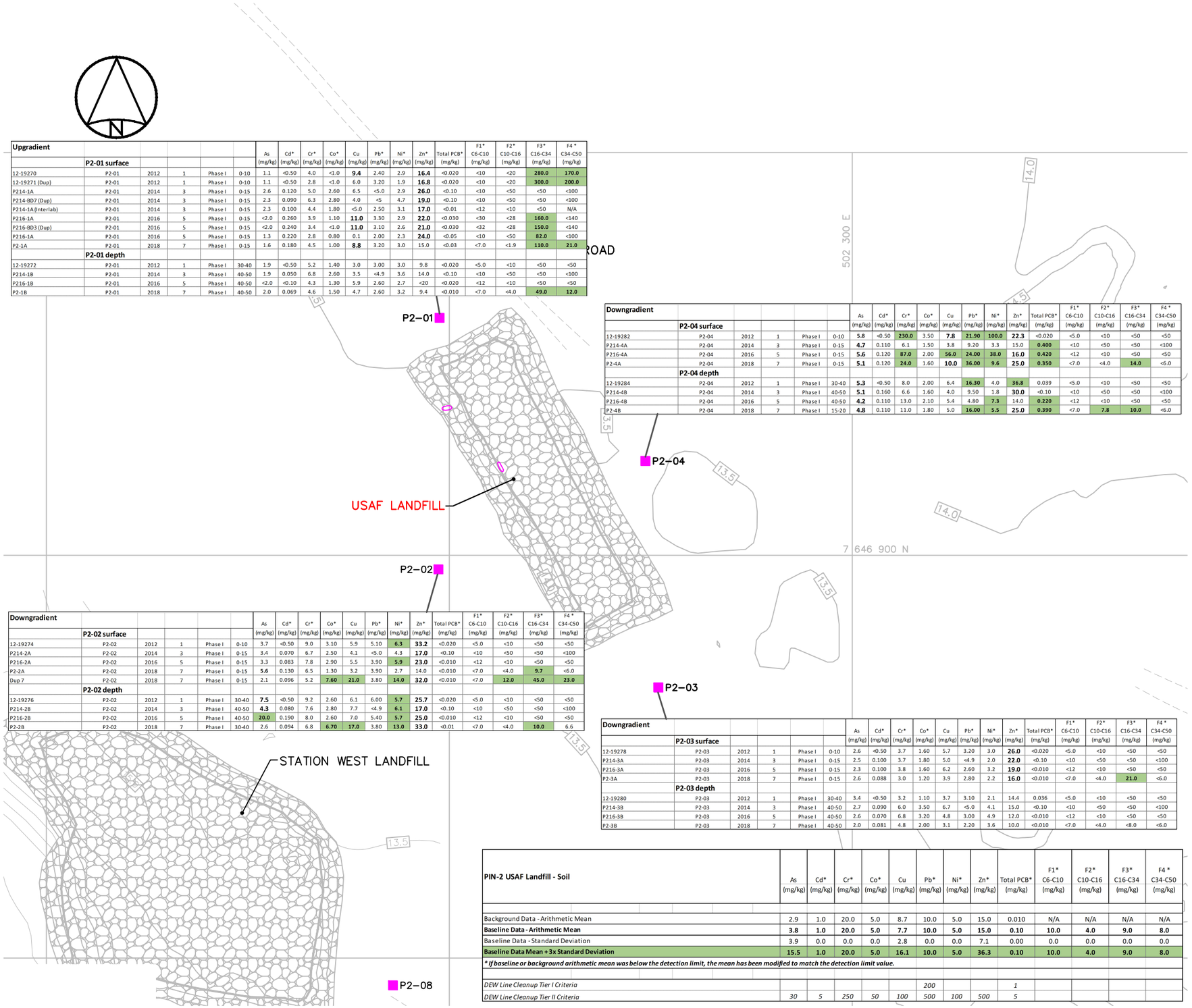
MEASUREMENT UNIT	SCALE:	DATE (month-year):
Metre	1 : 1,000	MARCH 2019
DRAWN BY: R. FLETCHER	VERIFIED BY: T. AUSTRINS	APPROVED BY: C. GRAVELLE P. ENG
PROJECT NO: 102012-000	DRAWING NO: 102012-000-PIN-2.3	PAGE 3

FIGURE PIN-2.3A



Upgradient						As (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C6-C10 (mg/kg)	F2* C10-C16 (mg/kg)	F3* C16-C34 (mg/kg)	F4 * C34-C50 (mg/kg)
	P2-01 surface																	
12-19270	P2-01	2012	1	Phase I	0-10	1.1	<0.50	4.0	<1.0	**9.4**	2.40	2.9	**16.4**	<0.020	<10	<20	**280.0**	**170.0**
12-19271 (Dup)	P2-01	2012	1	Phase I	0-10	1.1	<0.50	2.8	<1.0	6.0	3.20	1.9	**16.8**	<0.020	<10	<20	**300.0**	**200.0**
P214-1A	P2-01	2014	3	Phase I	0-15	2.6	0.120	5.0	2.60	6.5	<5.0	2.9	**26.0**	<0.10	<10	<50	<50	<100
P214-BD7 (Dup)	P2-01	2014	3	Phase I	0-15	2.3	0.090	6.3	2.80	4.0	<5	4.7	**19.0**	<0.10	<10	<50	<50	<100
P214-1A (Interlab)	P2-01	2014	3	Phase I	0-15	2.3	0.100	4.4	1.80	<5.0	2.50	3.1	**17.0**	<0.01	<12	<10	<50	N/A
P216-1A	P2-01	2016	5	Phase I	0-15	<2.0	0.260	3.9	1.10	**11.0**	3.30	2.9	**22.0**	<0.030	<30	<28	**160.0**	<140
P216-BD3 (Dup)	P2-01	2016	5	Phase I	0-15	<2.0	0.240	3.4	<1.0	**11.0**	3.10	2.6	**21.0**	<0.030	<32	<28	**150.0**	<140
P216-1A	P2-01	2016	5	Phase I	0-15	1.3	0.220	2.8	0.80	0.1	2.00	2.3	**24.0**	<0.05	<10	<50	**82.0**	<100
P2-1A	P2-01	2018	7	Phase I	0-15	1.6	0.180	4.5	1.00	**8.8**	3.20	3.0	15.0	<0.03	<7.0	<1.9	**110.0**	**21.0**
	P2-01 depth																	
12-19272	P2-01	2012	1	Phase I	30-40	1.9	<0.50	5.2	1.40	3.0	3.00	3.0	9.8	<0.020	<5.0	<10	<50	<50
P214-1B	P2-01	2014	3	Phase I	40-50	1.9	0.050	6.8	2.60	3.5	<4.9	3.6	14.0	<0.10	<10	<50	<50	<100
P216-1B	P2-01	2016	5	Phase I	40-50	<2.0	<0.10	4.3	1.30	5.9	2.60	2.7	<20	<0.020	<12	<10	<50	<50
P2-1B	P2-01	2018	7	Phase I	40-50	2.0	0.069	4.6	1.50	4.7	2.60	3.2	9.4	<0.010	<7.0	<4.0	**49.0**	**12.0**

Downgradient						As (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C6-C10 (mg/kg)	F2* C10-C16 (mg/kg)	F3* C16-C34 (mg/kg)	F4 * C34-C50 (mg/kg)
	P2-04 surface																	
12-19282	P2-04	2012	1	Phase I	0-10	**5.8**	<0.50	**230.0**	3.50	**7.8**	**21.90**	**100.0**	**22.3**	<0.020	<5.0	<10	<50	<50
P214-4A	P2-04	2014	3	Phase I	0-15	**4.7**	0.110	6.1	1.50	3.8	9.20	3.3	15.0	**0.400**	<10	<50	<50	<100
P216-4A	P2-04	2016	5	Phase I	0-15	**5.6**	0.120	**87.0**	2.00	**56.0**	**24.00**	**38.0**	**16.0**	**0.420**	<12	<10	<50	<50
P2-4A	P2-04	2018	7	Phase I	0-15	**5.1**	0.120	**24.0**	1.60	**10.0**	**36.00**	**9.6**	**25.0**	**0.350**	<7.0	<4.0	**14.0**	<6.0
	P2-04 depth																	
12-19284	P2-04	2012	1	Phase I	30-40	**5.3**	<0.50	8.0	2.00	6.4	**16.30**	4.0	**36.8**	0.039	<5.0	<10	<50	<50
P214-4B	P2-04	2014	3	Phase I	40-50	**5.1**	0.160	6.6	1.60	4.0	9.50	1.8	**30.0**	<0.10	<10	<50	<50	<100
P216-4B	P2-04	2016	5	Phase I	40-50	**4.2**	0.110	13.0	2.10	5.4	4.80	**7.3**	14.0	**0.220**	<12	<10	<50	<50
P2-4B	P2-04	2018	7	Phase I	15-20	**4.8**	0.110	11.0	1.80	5.0	**16.00**	**5.5**	**25.0**	**0.390**	<7.0	**7.8**	**10.0**	<6.0

Downgradient						As (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C6-C10 (mg/kg)	F2* C10-C16 (mg/kg)	F3* C16-C34 (mg/kg)	F4 * C34-C50 (mg/kg)
	P2-02 surface																	
12-19274	P2-02	2012	1	Phase I	0-10	3.7	<0.50	9.0	3.10	5.9	5.10	**6.3**	**33.2**	<0.020	<5.0	<10	<50	<50
P214-2A	P2-02	2014	3	Phase I	0-15	3.4	0.070	6.7	2.50	4.1	<5.0	4.3	**17.0**	<0.10	<10	<50	<50	<100
P216-2A	P2-02	2016	5	Phase I	0-15	3.3	0.083	7.8	2.90	5.5	3.90	**5.9**	**23.0**	<0.010	<12	<10	<50	<50
P2-2A	P2-02	2018	7	Phase I	0-15	**5.6**	0.130	6.5	1.30	3.2	3.90	2.7	14.0	<0.010	<7.0	<4.0	**9.7**	<6.0
Dup 7	P2-02	2018	7	Phase I	0-15	2.1	0.096	5.2	**7.60**	**21.0**	3.80	**14.0**	**32.0**	<0.010	<7.0	**12.0**	**45.0**	**23.0**
	P2-02 depth																	
12-19276	P2-02	2012	1	Phase I	30-40	**7.5**	<0.50	9.2	2.60	6.1	6.00	**5.7**	**25.7**	<0.020	<5.0	<10	<50	<50
P214-2B	P2-02	2014	3	Phase I	40-50	**4.3**	0.080	7.6	2.80	7.7	<4.9	**6.1**	**17.0**	<0.10	<10	<50	<50	<100
P216-2B	P2-02	2016	5	Phase I	40-50	**20.0**	0.190	8.0	2.60	7.0	5.40	**5.7**	**25.0**	<0.010	<12	<10	<50	<50
P2-2B	P2-02	2018	7	Phase I	30-40	2.6	0.094	6.8	**6.70**	**17.0**	3.80	**13.0**	**33.0**	<0.01	<7.0	<4.0	**10.0**	6.6

Downgradient						As (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C6-C10 (mg/kg)	F2* C10-C16 (mg/kg)	F3* C16-C34 (mg/kg)	F4 * C34-C50 (mg/kg)
	P2-03 surface																	
12-19278	P2-03	2012	1	Phase I	0-10	2.6	<0.50	3.7	1.60	5.7	3.20	3.0	**26.0**	<0.020	<5.0	<10	<50	<50
P214-3A	P2-03	2014	3	Phase I	0-15	2.5	0.100	3.7	1.80	5.0	<4.9	2.0	**22.0**	<0.10	<10	<50	<50	<100
P216-3A	P2-03	2016	5	Phase I	0-15	2.3	0.100	3.8	1.60	6.2	2.60	3.2	**19.0**	<0.010	<12	<10	<50	<50
P2-3A	P2-03	2018	7	Phase I	0-15	2.6	0.088	3.0	1.20	3.9	2.80	2.2	**16.0**	<0.010	<7.0	<4.0	**21.0**	<6.0
	P2-03 depth																	
12-19280	P2-03	2012	1	Phase I	30-40	3.4	<0.50	3.2	1.10	3.7	3.10	2.1	14.4	0.036	<5.0	<10	<50	<50
P214-3B	P2-03	2014	3	Phase I	40-50	2.7	0.090	6.0	3.50	6.7	<5.0	4.1	15.0	<0.10	<10	<50	<50	<100
P216-3B	P2-03	2016	5	Phase I	40-50	2.6	0.070	6.8	3.20	4.8	3.00	4.9	12.0	<0.010	<12	<10	<50	<50
P2-3B	P2-03	2018	7	Phase I	40-50	2.0	0.081	4.8	2.00	3.1	2.20	3.6	10.0	<0.010	<7.0	<4.0	<8.0	<6.0

PIN-2 USAF Landfill - Soil	As (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C6-C10 (mg/kg)	F2* C10-C16 (mg/kg)	F3* C16-C34 (mg/kg)	F4 * C34-C50 (mg/kg)
Background Data - Arithmetic Mean	2.9	1.0	20.0	5.0	8.7	10.0	5.0	15.0	0.010	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean	**3.8**	**1.0**	**20.0**	**5.0**	**7.7**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**4.0**	**9.0**	**8.0**
Baseline Data - Standard Deviation	3.9	0.0	0.0	0.0	2.8	0.0	0.0	7.1	0.00	0.0	0.0	0.0	0.0
Baseline Data Mean + 3x Standard Deviation	**15.5**	**1.0**	**20.0**	**5.0**	**16.1**	**10.0**	**5.0**	**36.3**	**0.10**	**10.0**	**4.0**	**9.0**	**8.0**
**** If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.***													
DEW Line Cleanup Tier I Criteria						*200*			*1*				
DEW Line Cleanup Tier II Criteria	*30*	*5*	*250*	*50*	*100*	*500*	*100*	*500*	*5*				

LEGEND

MONITORING SOIL SAMPLE LOCATION (4)

Legend	
XX	Sample exceeds baseline mean
XX	Sample exceeds baseline mean + 3x SD

0m 10m 20m 30m 40m 50m

NO.	VERSION	DATE	BY	VERIF.	APPR.
00	DRAFT V.5	2019.03.08	R.F.	T.A.	C.G.

Construction de Défense Canada
Defence Construction Canada

COLLECTION OF LANDFILL MONITORING DATA

PIN-2, CAPE YOUNG, NUNAVUT

USAF LANDFILL SOIL CHEMISTRY

ARCADIS
1050 Morrison Drive, Suite 201, Ottawa, Ontario, K2H 8K7
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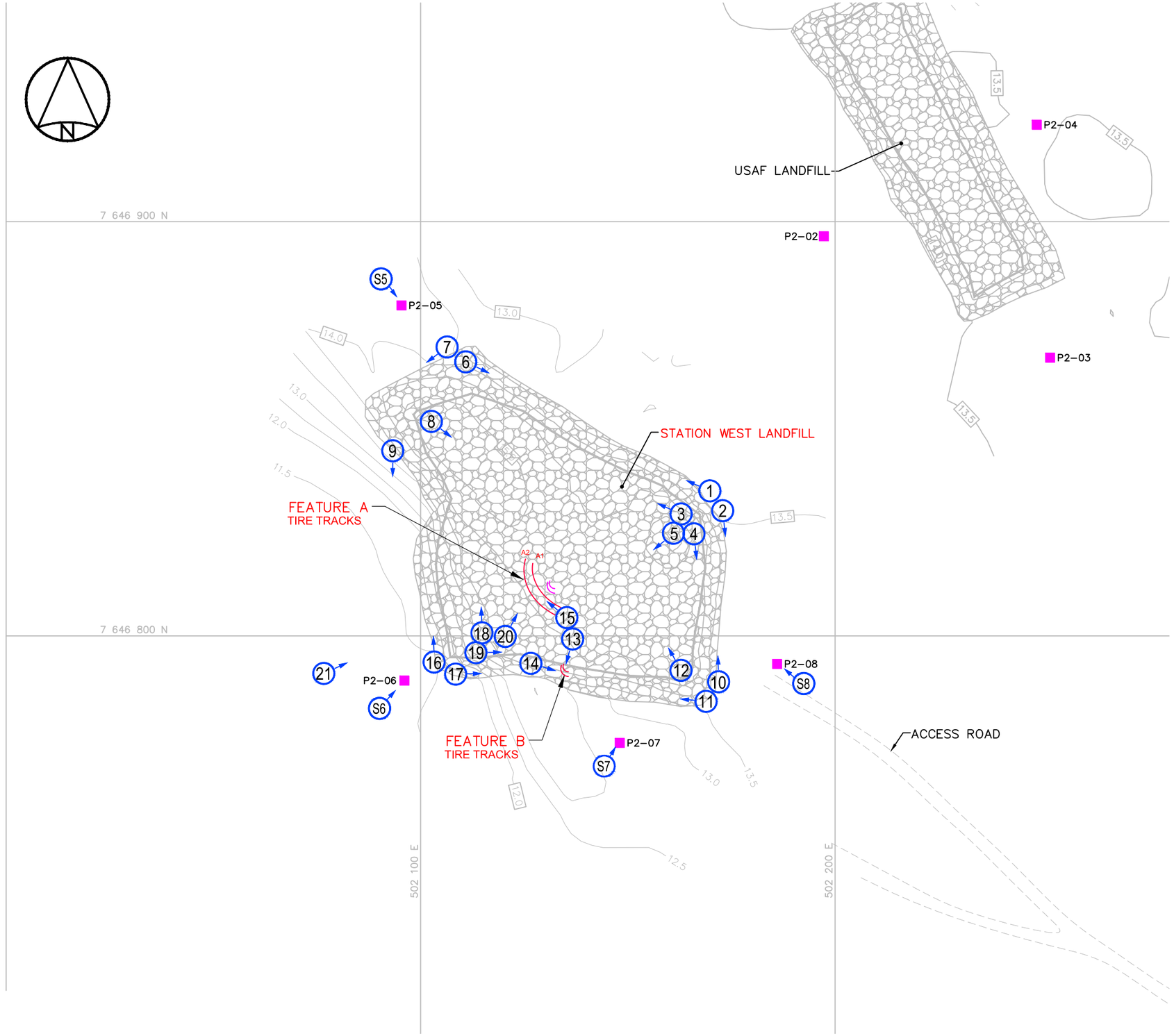
MEASUREMENT UNIT	SCALE:	DATE (month–year):
Metre	1 : 1,000	MARCH 2019
DRAWN BY:	**VERIFIED BY:**	**APPROVED BY:**
R. FLETCHER	T. AUSTRINS	C. GRAVELLE P. ENG
PROJECT NO:	**DRAWING NO:**	**PAGE**
102012-000	102012-000-PIN-2.3	3

FIGURE PIN-2.3B



LEGEND

- MONITORING SOIL SAMPLE LOCATION (4)
- APPROX. PHOTOGRAPHIC VIEWPOINT (2018)
- LANDFILL EXTENT
- ELEVATION CONTOUR
- TIRE TRACKS
- APPROXIMATE 2016 OBSERVATIONS (TO ILLUSTRATE CHANGES)

0m 10m 20m 30m 40m 50m

NO.	VERSION	DATE	BY	VERIF.	APPR.
00	DRAFT V.5	2019.03.08	R.F.	T.A.	C.G.

Construction de Défense Canada
Defence Construction Canada

COLLECTION OF LANDFILL MONITORING DATA

PIN-2, CAPE YOUNG, NUNAVUT

STATION WEST LANDFILL PLAN/MONITORING/OBSERVATIONS

ARCADIS
1050 Morrison Drive, Suite 201, Ottawa, Ontario, K2H 8K7
Office General +1 613 721 0555

MEASUREMENT UNIT	SCALE:	DATE (month-year):
Metre	1 : 1,000	MARCH 2019
DRAWN BY:	**VERIFIED BY:**	**APPROVED BY:**
R. FLETCHER	T. AUSTRINS	C. GRAVELLE P. ENG
PROJECT NO:	**DRAWING NO:**	**PAGE**
102012-000	102012-000-PIN-2.4	3

FIGURE PIN-2.4A

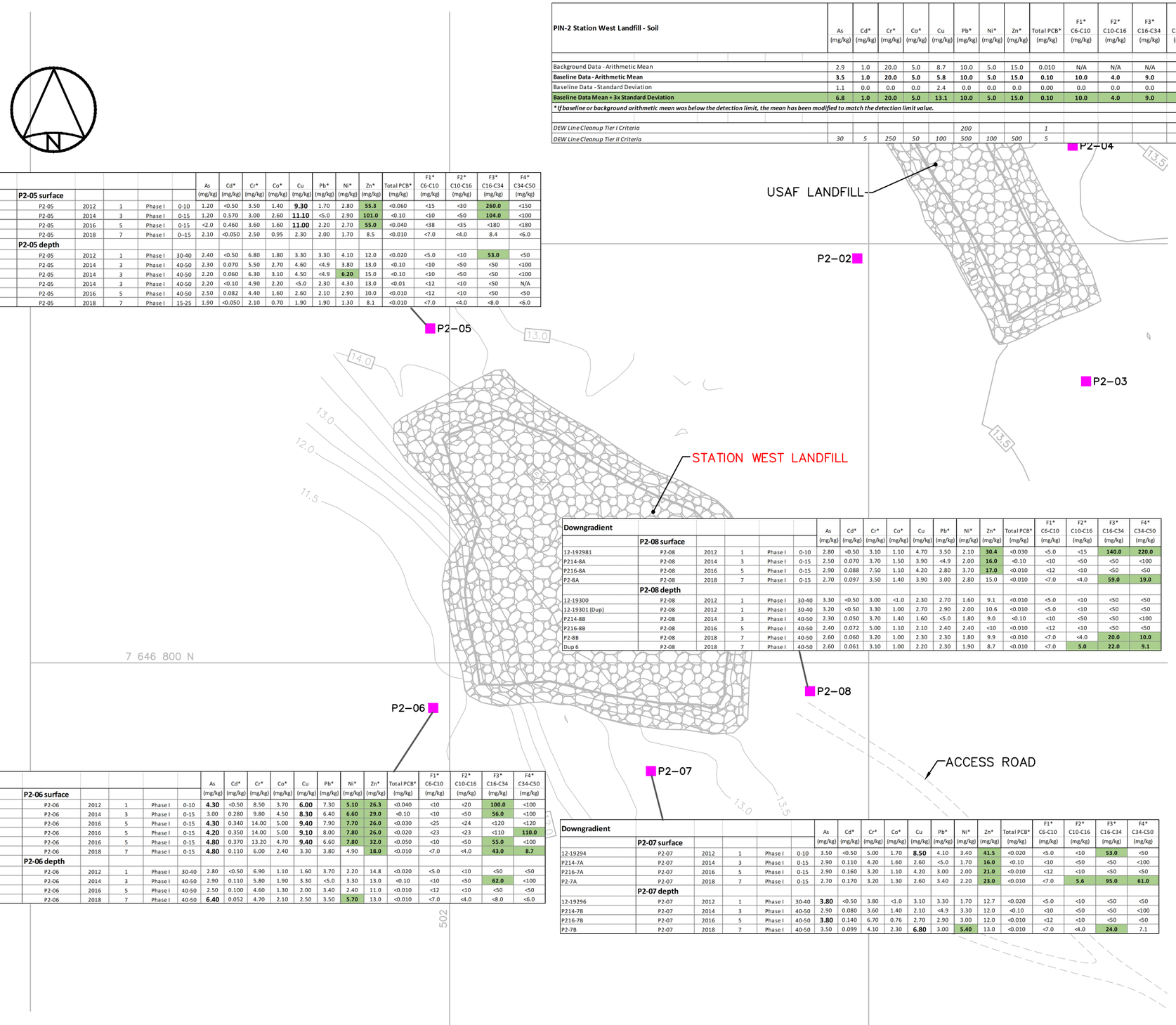
PIN-2 Station West Landfill - Soil	As (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C6-C10 (mg/kg)	F2* C10-C16 (mg/kg)	F3* C16-C34 (mg/kg)	F4* C34-C50 (mg/kg)
Background Data - Arithmetic Mean	2.9	1.0	20.0	5.0	8.7	10.0	5.0	15.0	0.010	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean	**3.5**	**1.0**	**20.0**	**5.0**	**5.8**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**4.0**	**9.0**	**8.0**
Baseline Data - Standard Deviation	1.1	0.0	0.0	0.0	2.4	0.0	0.0	0.0	0.000	0.0	0.0	0.0	0.0
Baseline Data Mean + 3x Standard Deviation	**6.8**	**1.0**	**20.0**	**5.0**	**13.1**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**4.0**	**9.0**	**8.0**
**** If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.***													
DEW Line Cleanup Tier I Criteria						*200*			*1*				
DEW Line Cleanup Tier II Criteria	*30*	*5*	*250*	*50*	*100*	*500*	*100*	*500*	*5*				

Upgradient						As (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C6-C10 (mg/kg)	F2* C10-C16 (mg/kg)	F3* C16-C34 (mg/kg)	F4* C34-C50 (mg/kg)
	P2-05 surface																	
12-192861	P2-05	2012	1	Phase I	0-10	1.20	<0.50	3.50	1.40	**9.30**	1.70	2.80	**55.3**	<0.060	<15	<30	**260.0**	<150
P214-5A	P2-05	2014	3	Phase I	0-15	1.20	0.570	3.00	2.60	**11.10**	<5.0	2.90	**101.0**	<0.10	<10	<50	**104.0**	<100
P216-5A	P2-05	2016	5	Phase I	0-15	<2.0	0.460	3.60	1.60	**11.00**	2.20	2.70	**55.0**	<0.040	<38	<35	<180	<180
P2-5A	P2-05	2018	7	Phase I	0–15	2.10	<0.050	2.50	0.95	2.30	2.00	1.70	8.5	<0.010	<7.0	<4.0	8.4	<6.0
	P2-05 depth																	
12-19288	P2-05	2012	1	Phase I	30-40	2.40	<0.50	6.80	1.80	3.30	3.30	4.10	12.0	<0.020	<5.0	<10	**53.0**	<50
P214-5B	P2-05	2014	3	Phase I	40-50	2.30	0.070	5.50	2.70	4.60	<4.9	3.80	13.0	<0.10	<10	<50	<50	<100
P214-BD8 (Dup)	P2-05	2014	3	Phase I	40-50	2.20	0.060	6.30	3.10	4.50	<4.9	**6.20**	15.0	<0.10	<10	<50	<50	<100
P214-5B (Interlab)	P2-05	2014	3	Phase I	40-50	2.20	<0.10	4.90	2.20	<5.0	2.30	4.30	13.0	<0.01	<12	<10	<50	N/A
P216-5B	P2-05	2016	5	Phase I	40-50	2.50	0.082	4.40	1.60	2.60	2.10	2.90	10.0	<0.010	<12	<10	<50	<50
P2-5B	P2-05	2018	7	Phase I	15-25	1.90	<0.050	2.10	0.70	1.90	1.90	1.30	8.1	<0.010	<7.0	<4.0	<8.0	<6.0

Downgradient						As (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C6-C10 (mg/kg)	F2* C10-C16 (mg/kg)	F3* C16-C34 (mg/kg)	F4* C34-C50 (mg/kg)
	P2-08 surface																	
12-192981	P2-08	2012	1	Phase I	0-10	2.80	<0.50	3.10	1.10	4.70	3.50	2.10	**30.4**	<0.030	<5.0	<15	**140.0**	**220.0**
P214-8A	P2-08	2014	3	Phase I	0-15	2.50	0.070	3.70	1.50	3.90	<4.9	2.00	**16.0**	<0.10	<10	<50	<50	<100
P216-8A	P2-08	2016	5	Phase I	0-15	2.90	0.088	7.50	1.10	4.20	2.80	3.70	**17.0**	<0.010	<12	<10	<50	<50
P2-8A	P2-08	2018	7	Phase I	0-15	2.70	0.097	3.50	1.40	3.90	3.00	2.80	15.0	<0.010	<7.0	<4.0	**59.0**	**19.0**
	P2-08 depth																	
12-19300	P2-08	2012	1	Phase I	30-40	3.30	<0.50	3.00	<1.0	2.30	2.70	1.60	9.1	<0.010	<5.0	<10	<50	<50
12-19301 (Dup)	P2-08	2012	1	Phase I	30-40	3.20	<0.50	3.30	1.00	2.70	2.90	2.00	10.6	<0.010	<5.0	<10	<50	<50
P214-8B	P2-08	2014	3	Phase I	40-50	2.30	0.050	3.70	1.40	1.60	<5.0	1.80	9.0	<0.10	<10	<50	<50	<100
P216-8B	P2-08	2016	5	Phase I	40-50	2.40	0.072	5.00	1.10	2.10	2.40	2.40	<10	<0.010	<12	<10	<50	<50
P2-8B	P2-08	2018	7	Phase I	40-50	2.60	0.060	3.20	1.00	2.30	2.30	1.80	9.9	<0.010	<7.0	<4.0	**20.0**	**10.0**
Dup 6	P2-08	2018	7	Phase I	40-50	2.60	0.061	3.10	1.00	2.20	2.30	1.90	8.7	<0.010	<7.0	**5.0**	**22.0**	**9.1**

Downgradient						As (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C6-C10 (mg/kg)	F2* C10-C16 (mg/kg)	F3* C16-C34 (mg/kg)	F4* C34-C50 (mg/kg)
	P2-06 surface																	
12-192901	P2-06	2012	1	Phase I	0-15	**4.30**	<0.50	8.50	3.70	**6.00**	7.30	**5.10**	**26.3**	<0.040	<10	<20	**100.0**	<100
P214-6A	P2-06	2014	3	Phase I	0-15	3.00	0.280	9.80	4.50	**8.30**	6.40	**6.60**	**29.0**	<0.10	<10	<50	**56.0**	<100
P216-6A	P2-06	2016	5	Phase I	0-15	**4.30**	0.340	14.00	5.00	**9.40**	7.90	**7.70**	**26.0**	<0.030	<25	<24	<120	<120
P216-BD4 (Dup)	P2-06	2016	5	Phase I	0-15	**4.20**	0.350	14.00	5.00	**9.10**	8.00	**7.80**	**26.0**	<0.020	<23	<23	<110	**110.0**
P216-6A (Interlab)	P2-06	2016	5	Phase I	0-15	**4.80**	0.370	13.20	4.70	**9.40**	6.60	**7.80**	**32.0**	<0.050	<10	<50	**55.0**	<100
P2-6A	P2-06	2018	7	Phase I	0-15	**4.80**	0.110	6.00	2.40	3.30	3.80	4.90	**18.0**	<0.010	<7.0	<4.0	**43.0**	**8.7**
	P2-06 depth																	
12-19292	P2-06	2012	1	Phase I	30-40	2.80	<0.50	6.90	1.10	1.60	3.70	2.20	14.8	<0.020	<5.0	<10	<50	<50
P214-6B	P2-06	2014	3	Phase I	40-50	2.90	0.110	5.80	1.90	3.30	<5.0	3.30	13.0	<0.10	<10	<50	**62.0**	<100
P216-6B	P2-06	2016	5	Phase I	40-50	2.50	0.100	4.60	1.30	2.00	3.40	2.40	11.0	<0.010	<12	<10	<50	<50
P2-6B	P2-06	2018	7	Phase I	40-50	**6.40**	0.052	4.70	2.10	2.50	3.50	**5.70**	13.0	<0.010	<7.0	<4.0	<8.0	<6.0

Downgradient						As (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C6-C10 (mg/kg)	F2* C10-C16 (mg/kg)	F3* C16-C34 (mg/kg)	F4* C34-C50 (mg/kg)
	P2-07 surface																	
12-19294	P2-07	2012	1	Phase I	0-10	3.50	<0.50	5.00	1.70	**8.50**	4.10	3.40	**41.5**	<0.020	<5.0	<10	**53.0**	<50
P214-7A	P2-07	2014	3	Phase I	0-15	2.90	0.110	4.20	1.60	2.60	<5.0	1.70	**16.0**	<0.10	<10	<50	<50	<100
P216-7A	P2-07	2016	5	Phase I	0-15	2.90	0.160	3.20	1.10	4.20	3.00	2.00	**21.0**	<0.010	<12	<10	<50	<50
P2-7A	P2-07	2018	7	Phase I	0-15	2.70	0.170	3.20	1.30	2.60	3.40	2.20	**23.0**	<0.010	<7.0	**5.6**	**95.0**	**61.0**
	P2-07 depth																	
12-19296	P2-07	2012	1	Phase I	30-40	**3.80**	<0.50	3.80	<1.0	3.10	3.30	1.70	12.7	<0.020	<5.0	<10	<50	<50
P214-7B	P2-07	2014	3	Phase I	40-50	2.90	0.080	3.60	1.40	2.10	<4.9	3.30	12.0	<0.10	<10	<50	<50	<100
P216-7B	P2-07	2016	5	Phase I	40-50	**3.80**	0.140	6.70	0.76	2.70	2.90	3.00	12.0	<0.010	<12	<10	<50	<50
P2-7B	P2-07	2018	7	Phase I	40-50	3.50	0.099	4.10	2.30	**6.80**	3.00	**5.40**	13.0	<0.010	<7.0	<4.0	**24.0**	7.1



LEGEND

MONITORING SOIL SAMPLE LOCATION (4)

Legend	
XX	Sample exceeds baseline mean
XX	Sample exceeds baseline mean + 3x SD

0m 10m 20m 30m 40m 50m

NO.	VERSION	DATE	BY	VERIF.	APPR.
00	DRAFT V.5	2019.03.08	R.F.	T.A.	C.G.

Construction de Défense Canada
Defence Construction Canada

COLLECTION OF LANDFILL MONITORING DATA

PIN-2, CAPE YOUNG, NUNAVUT

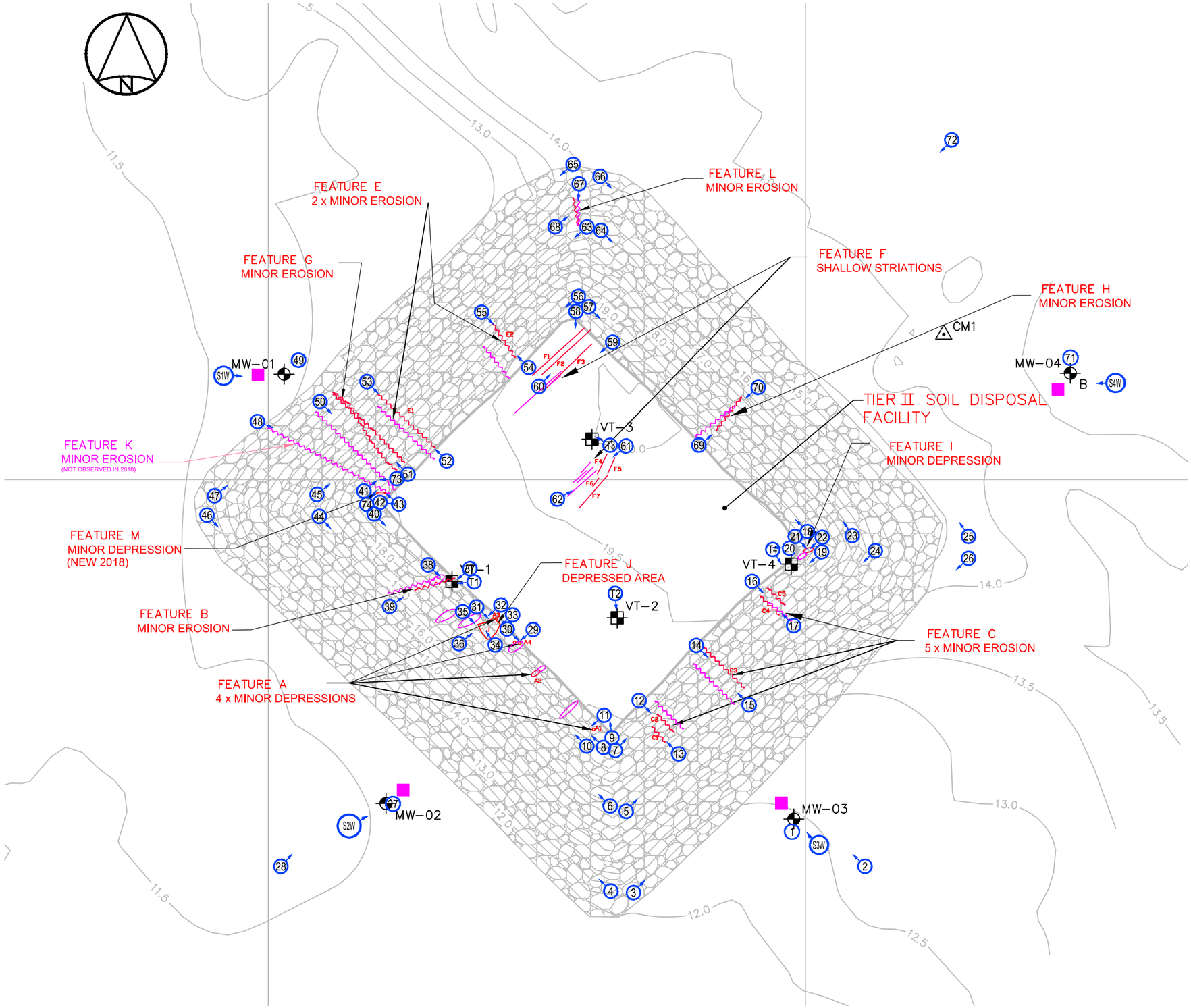
STATION WEST LANDFILL SOIL CHEMISTRY

ARCADIS

1050 Morrison Drive, Suite 201, Ottawa, Ontario, K2H 8K7
Office General +1 613 721 0555

MEASUREMENT UNIT	SCALE:	DATE (month–year):
Metre	1 : 1,000	MARCH 2019
DRAWN BY:	**VERIFIED BY:**	**APPROVED BY:**
R. FLETCHER	T. AUSTRINS	C. GRAVELLE P. ENG
PROJECT NO:	**DRAWING NO:**	**PAGE**
102012-000	102012-000-PIN-2.4	3

FIGURE PIN-2.4B



0m 7.5m 15.0m 22.5m 30.0m 37.5m

LEGEND

- MONITORING WELL LOCATION (3)
- BACKGROUND MONITORING WELL LOCATION (1)
- GROUND TEMPERATURE CABLE LOCATION (4)
- MONITORING SOIL SAMPLE LOCATION (4)
- APPROX. PHOTOGRAPHIC VIEWPOINT (2018)
- LANDFILL EXTENT
- ELEVATION CONTOUR
- MINOR SETTLEMENT
- MINOR EROSION
- SHALLOW STRIATIONS
- CONTROL MONUMENT
- APPROXIMATE 2016 OBSERVATIONS (TO ILLUSTRATE CHANGES)

NO.	VERSION	DATE	BY	VERIF.	APPR.
00	DRAFT V.5	2019.03.08	R.F.	T.A.	C.G.

Construction de Défense Canada
Defence Construction Canada

COLLECTION OF LANDFILL MONITORING DATA

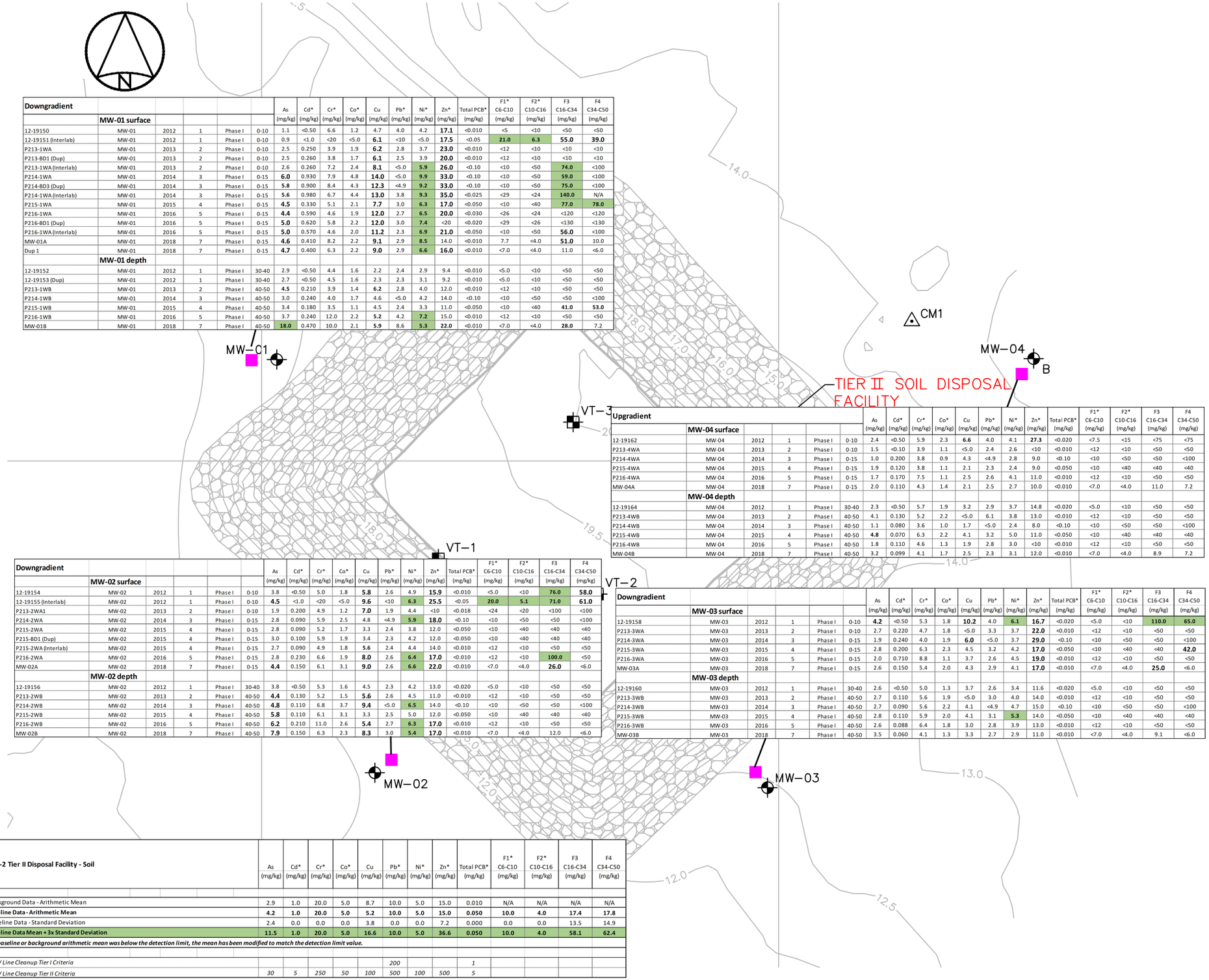
PIN-2, CAPE YOUNG, NUNAVUT

TIER II SOIL DISPOSAL FACILITY PLAN/MONITORING / OBSERVATIONS

ARCADIS
1050 Morrison Drive, Suite 201, Ottawa, Ontario, K2H 8K7
Office General +1 613 721 0555

MEASUREMENT UNIT	SCALE:	DATE (month-year):
Metre	1 : 750	MARCH 2019
DRAWN BY: R. FLETCHER	VERIFIED BY: T. AUSTRINS	APPROVED BY: C. GRAVELLE P. ENG
PROJECT NO: 102012-000	DRAWING NO: 102012-000-PIN-2.5	PAGE 1

FIGURE PIN-2.5A



Downgradient						As	Cd*	Cr*	Co*	Cu	Pb*	Ni*	Zn*	Total PCB*	F1* C6-C10	F2* C10-C16	F3 C16-C34	F4 C34-C50
						(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
	MW-01 surface																	
12-19150	MW-01	2012	1	Phase I	0-10	1.1	<0.50	6.6	1.2	4.7	4.0	4.2	**17.1**	<0.010	<5	<10	<50	<50
12-19151 (Interlab)	MW-01	2012	1	Phase I	0-10	0.9	<1.0	<20	<5.0	**6.1**	<10	<5.0	**17.5**	<0.05	**21.0**	**6.3**	**55.0**	**39.0**
P213-1WA	MW-01	2013	2	Phase I	0-10	2.5	0.250	3.9	1.9	**6.2**	2.8	3.7	**23.0**	<0.010	<12	<10	<10	<10
P213-BD1 (Dup)	MW-01	2013	2	Phase I	0-10	2.5	0.260	3.8	1.7	**6.1**	2.5	3.9	**20.0**	<0.010	<12	<10	<10	<10
P213-1WA (Interlab)	MW-01	2013	2	Phase I	0-10	2.6	0.260	7.2	2.4	**8.1**	<5.0	**5.9**	**26.0**	<0.10	<10	<10	<50	<100
P214-1WA	MW-01	2014	3	Phase I	0-15	**6.0**	0.930	7.9	4.8	**14.0**	<5.0	**9.9**	**33.0**	<0.10	<10	<10	<50	**59.0**	<100
P214-BD3 (Dup)	MW-01	2014	3	Phase I	0-15	**5.8**	0.900	8.4	4.3	**12.3**	<4.9	**9.2**	**33.0**	<0.10	<10	<10	<50	**75.0**	<100
P214-1WA (Interlab)	MW-01	2014	3	Phase I	0-15	**5.6**	0.980	6.7	4.4	**13.0**	3.8	**9.3**	**35.0**	<0.025	<29	<24	**140.0**	N/A
P215-1WA	MW-01	2015	4	Phase I	0-15	**4.5**	0.330	5.1	2.1	**7.7**	3.0	**6.3**	**17.0**	<0.050	<10	<40	**77.0**	**78.0**
P216-1WA	MW-01	2016	5	Phase I	0-15	**4.4**	0.590	4.6	1.9	**12.0**	2.7	**6.5**	**20.0**	<0.030	<26	<24	<120	<120
P216-BD1 (Dup)	MW-01	2016	5	Phase I	0-15	**5.0**	0.620	5.8	2.2	**12.0**	3.0	**7.4**	<20	<0.020	<29	<26	<130	<130
P216-1WA (Interlab)	MW-01	2016	5	Phase I	0-15	**5.0**	0.570	4.6	2.0	**11.2**	2.3	**6.9**	**21.0**	<0.050	<10	<50	**56.0**	<100
MW-01A	MW-01	2018	7	Phase I	0-15	**4.6**	0.410	8.2	2.2	**9.1**	2.9	**8.5**	14.0	<0.010	7.7	<4.0	**51.0**	10.0
Dup 1	MW-01	2018	7	Phase I	0-15	**4.7**	0.400	6.3	2.2	**9.0**	2.9	**6.6**	**16.0**	<0.010	<7.0	<4.0	11.0	<6.0
	MW-01 depth																	
12-19152	MW-01	2012	1	Phase I	30-40	2.9	<0.50	4.4	1.6	2.2	2.4	2.9	9.4	<0.010	<5.0	<10	<50	<50
12-19153 (Dup)	MW-01	2012	1	Phase I	30-40	2.7	<0.50	4.5	1.6	2.3	2.3	3.1	9.2	<0.010	<5.0	<10	<50	<50
P213-1WB	MW-01	2013	2	Phase I	40-50	**4.5**	0.210	3.9	1.4	**6.2**	2.8	4.0	12.0	<0.010	<12	<10	<50	<50
P214-1WB	MW-01	2014	3	Phase I	40-50	3.0	0.240	4.0	1.7	4.6	<5.0	4.2	14.0	<0.10	<10	<50	<50	<100
P215-1WB	MW-01	2015	4	Phase I	40-50	3.4	0.180	3.5	1.1	4.5	2.4	3.3	11.0	<0.050	<10	<40	**41.0**	**53.0**
P216-1WB	MW-01	2016	5	Phase I	40-50	3.7	0.240	12.0	2.2	**5.2**	4.2	**7.2**	15.0	<0.010	<12	<10	<50	<50
MW-01B	MW-01	2018	7	Phase I	40-50	**18.0**	0.470	10.0	2.1	**5.9**	8.6	**5.3**	**22.0**	<0.010	<7.0	<4.0	**28.0**	7.2

Upgradient						As	Cd*	Cr*	Co*	Cu	Pb*	Ni*	Zn*	Total PCB*	F1* C6-C10	F2* C10-C16	F3 C16-C34	F4 C34-C50
						(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
	MW-04 surface																	
12-19162	MW-04	2012	1	Phase I	0-10	2.4	<0.50	5.9	2.3	**6.6**	4.0	4.1	**27.3**	<0.020	<7.5	<15	<75	<75
P213-4WA	MW-04	2013	2	Phase I	0-10	1.5	<0.10	3.9	1.1	<5.0	2.4	2.6	<10	<0.010	<12	<10	<50	<50
P214-4WA	MW-04	2014	3	Phase I	0-15	1.0	0.200	3.8	0.9	4.3	<4.9	2.8	9.0	<0.10	<10	<50	<50	<100
P215-4WA	MW-04	2015	4	Phase I	0-15	1.9	0.120	3.8	1.1	2.1	2.3	2.4	9.0	<0.050	<10	<40	<40	<40
P216-4WA	MW-04	2016	5	Phase I	0-15	1.7	0.170	7.5	1.1	2.5	2.6	4.1	11.0	<0.010	<12	<10	<50	<50
MW-04A	MW-04	2018	7	Phase I	0-15	2.0	0.110	4.3	1.4	2.1	2.5	2.7	10.0	<0.010	<7.0	<4.0	11.0	7.2
	MW-04 depth																	
12-19164	MW-04	2012	1	Phase I	30-40	2.3	<0.50	5.7	1.9	3.2	2.9	3.7	14.8	<0.020	<5.0	<10	<50	<50
P213-4WB	MW-04	2013	2	Phase I	40-50	4.1	0.130	5.2	2.2	<5.0	6.1	3.8	13.0	<0.010	<12	<10	<50	<50
P214-4WB	MW-04	2014	3	Phase I	40-50	1.1	0.080	3.6	1.0	1.7	<5.0	2.4	8.0	<0.10	<10	<50	<50	<100
P215-4WB	MW-04	2015	4	Phase I	40-50	**4.8**	0.070	6.3	2.2	4.1	3.2	5.0	11.0	<0.050	<10	<40	<40	<40
P216-4WB	MW-04	2016	5	Phase I	40-50	1.8	0.110	4.6	1.3	1.9	2.8	3.0	<10	<0.010	<12	<10	<50	<50
MW-04B	MW-04	2018	7	Phase I	40-50	3.2	0.099	4.1	1.7	2.5	2.3	3.1	12.0	<0.010	<7.0	<4.0	8.9	7.2

Downgradient						As	Cd*	Cr*	Co*	Cu	Pb*	Ni*	Zn*	Total PCB*	F1* C6-C10	F2* C10-C16	F3 C16-C34	F4 C34-C50
						(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
	MW-02 surface																	
12-19154	MW-02	2012	1	Phase I	0-10	3.8	<0.50	5.0	1.8	**5.8**	2.6	4.9	**15.9**	<0.010	<5.0	<10	**76.0**	**58.0**
12-19155 (Interlab)	MW-02	2012	1	Phase I	0-10	**4.5**	<1.0	<20	<5.0	**9.6**	<10	**6.3**	**25.5**	<0.05	**20.0**	**5.1**	**71.0**	**61.0**
P213-2WA1	MW-02	2013	2	Phase I	0-10	1.9	0.200	4.9	1.2	**7.0**	1.9	4.4	<10	<0.018	<24	<20	<100	<100
P214-2WA	MW-02	2014	3	Phase I	0-15	2.8	0.090	5.9	2.5	4.8	<4.9	**5.9**	**18.0**	<0.10	<10	<50	<50	<100
P215-2WA	MW-02	2015	4	Phase I	0-15	2.8	0.090	5.2	1.7	3.3	2.4	3.8	12.0	<0.050	<10	<40	<40	<40
P215-BD1 (Dup)	MW-02	2015	4	Phase I	0-15	3.0	0.100	5.9	1.9	3.4	2.3	4.2	12.0	<0.050	<10	<40	<40	<40
P215-2WA (Interlab)	MW-02	2015	4	Phase I	0-15	2.7	0.090	4.9	1.8	**5.6**	2.4	4.4	14.0	<0.010	<12	<10	<50	<50
P216-2WA	MW-02	2016	5	Phase I	0-15	2.8	0.230	6.6	1.9	**8.0**	2.6	**6.4**	**17.0**	<0.010	<12	<10	**100.0**	<50
MW-02A	MW-02	2018	7	Phase I	0-15	**4.4**	0.150	6.1	3.1	**9.0**	2.6	**6.6**	**22.0**	<0.010	<7.0	<4.0	**26.0**	<6.0
	MW-02 depth																	
12-19156	MW-02	2012	1	Phase I	30-40	3.8	<0.50	5.3	1.6	4.5	2.3	4.2	13.0	<0.020	<5.0	<10	<50	<50
P213-2WB	MW-02	2013	2	Phase I	40-50	**4.4**	0.130	5.2	1.5	**5.6**	2.6	4.5	11.0	<0.010	<12	<10	<50	<50
P214-2WB	MW-02	2014	3	Phase I	40-50	**4.8**	0.110	6.8	3.7	**9.4**	<5.0	**6.5**	14.0	<0.10	<10	<50	<50	<100
P215-2WB	MW-02	2015	4	Phase I	40-50	**5.8**	0.110	6.1	3.1	3.3	2.5	5.0	12.0	<0.050	<10	<40	<40	<40
P216-2WB	MW-02	2016	5	Phase I	40-50	**6.2**	0.210	11.0	2.6	**5.4**	2.7	**6.3**	**17.0**	<0.010	<12	<10	<50	<50
MW-02B	MW-02	2018	7	Phase I	40-50	**7.9**	0.150	6.3	2.3	**8.3**	3.0	**5.4**	**17.0**	<0.010	<7.0	<4.0	12.0	<6.0

Upgradient						As	Cd*	Cr*	Co*	Cu	Pb*	Ni*	Zn*	Total PCB*	F1* C6-C10	F2* C10-C16	F3 C16-C34	F4 C34-C50
						(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
	MW-03 surface																	
12-19158	MW-03	2012	1	Phase I	0-10	**4.2**	<0.50	5.3	1.8	**10.2**	4.0	**6.1**	**16.7**	<0.020	<5.0	<10	**110.0**	**65.0**
P213-3WA	MW-03	2013	2	Phase I	0-10	2.7	0.220	4.7	1.8	<5.0	3.3	3.7	**22.0**	<0.010	<12	<10	<50	<50
P214-3WA	MW-03	2014	3	Phase I	0-15	1.9	0.240	4.0	1.9	**6.0**	<5.0	3.7	**29.0**	<0.10	<10	<50	<50	<100
P215-3WA	MW-03	2015	4	Phase I	0-15	2.8	0.200	6.3	2.3	4.5	3.2	4.2	**17.0**	<0.050	<10	<40	<40	**42.0**
P216-3WA	MW-03	2016	5	Phase I	0-15	2.0	0.710	8.8	1.1	3.7	2.6	4.5	**19.0**	<0.010	<12	<10	<50	<50
MW-03A	MW-03	2018	7	Phase I	0-15	2.6	0.150	5.4	2.0	4.3	2.9	4.1	**17.0**	<0.010	<7.0	<4.0	**25.0**	<6.0
	MW-03 depth																	
12-19160	MW-03	2012	1	Phase I	30-40	2.6	<0.50	5.0	1.3	3.7	2.6	3.4	11.6	<0.020	<5.0	<10	<50	<50
P213-3WB	MW-03	2013	2	Phase I	40-50	2.7	0.110	5.6	1.9	<5.0	3.0	4.0	14.0	<0.010	<12	<10	<50	<50
P214-3WB	MW-03	2014	3	Phase I	40-50	2.7	0.090	5.6	2.2	4.1	<4.9	4.7	15.0	<0.10	<10	<50	<50	<100
P215-3WB	MW-03	2015	4	Phase I	40-50	2.8	0.110	5.9	2.0	4.1	3.1	**5.3**	14.0	<0.050	<10	<40	<40	<40
P216-3WB	MW-03	2016	5	Phase I	40-50	2.6	0.088	6.4	1.8	3.0	2.8	3.9	13.0	<0.010	<12	<10	<50	<50
MW-03B	MW-03	2018	7	Phase I	40-50	3.5	0.060	4.1	1.3	3.3	2.7	2.9	11.0	<0.010	<7.0	<4.0	9.1	<6.0

PIN-2 Tier II Disposal Facility - Soil	As (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C6-C10 (mg/kg)	F2* C10-C16 (mg/kg)	F3 C16-C34 (mg/kg)	F4 C34-C50 (mg/kg)
Background Data - Arithmetic Mean	2.9	1.0	20.0	5.0	8.7	10.0	5.0	15.0	0.010	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean	**4.2**	**1.0**	**20.0**	**5.0**	**5.2**	**10.0**	**5.0**	**15.0**	**0.050**	**10.0**	**4.0**	**17.4**	**17.8**
Baseline Data - Standard Deviation	2.4	0.0	0.0	0.0	3.8	0.0	0.0	7.2	0.000	0.0	0.0	13.5	14.9
Baseline Data Mean + 3x Standard Deviation	**11.5**	**1.0**	**20.0**	**5.0**	**16.6**	**10.0**	**5.0**	**36.6**	**0.050**	**10.0**	**4.0**	**58.1**	**62.4**
**** If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.***													
DEW Line Cleanup Tier I Criteria						*200*			*1*				
DEW Line Cleanup Tier II Criteria	*30*	*5*	*250*	*50*	*100*	*500*	*100*	*500*	*5*				

LEGEND

- MONITORING WELL LOCATION (3)
- B — BACKGROUND MONITORING WELL LOCATION (1)
- GROUND TEMPERATURE CABLE LOCATION (4)
- MONITORING SOIL SAMPLE LOCATION (4)
- CM1 — CONTROL MONUMENT

Legend	
XX	Sample exceeds baseline mean
XX	Sample exceeds baseline mean + 3x SD

0m 7.5m 15.0m 22.5m 30.0m 37.5m

NO.	VERSION	DATE	BY	VERIF.	APPR.
00	DRAFT V.5	2019.03.08	R.F.	T.A.	C.G.

Construction de Défense Canada
Defence Construction Canada

COLLECTION OF LANDFILL MONITORING DATA

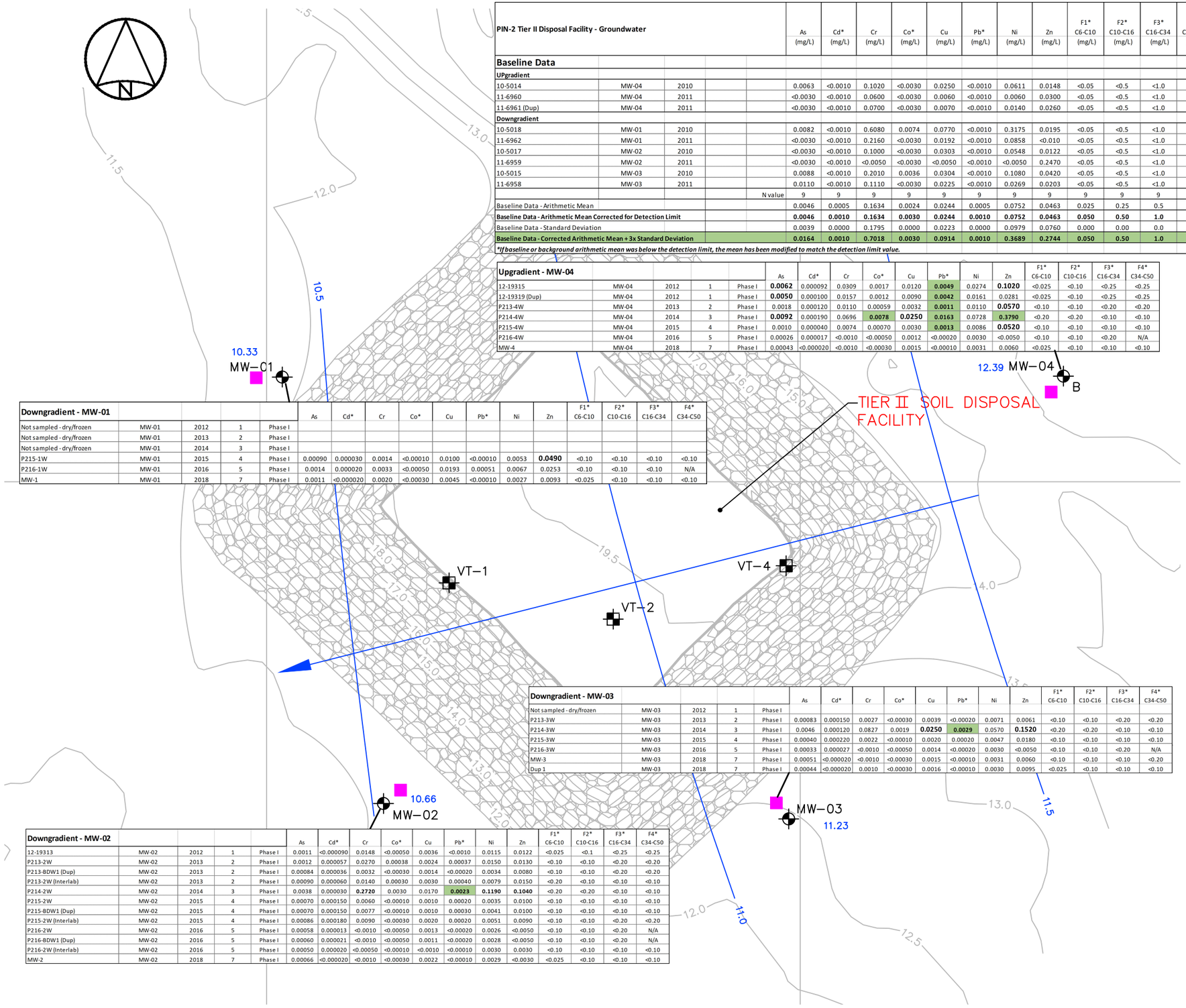
PIN-2, CAPE YOUNG, NUNAVUT

TIER II SOIL DISPOSAL FACILITY SOIL CHEMISTRY

ARCADIS
1050 Morrison Drive, Suite 201, Ottawa, Ontario, K2H 8K7
Office General +1 613 721 0555

MEASUREMENT UNIT	SCALE:	DATE (month–year):
Metre	1 : 750	MARCH 2019
DRAWN BY: R. FLETCHER	VERIFIED BY: T. AUSTRINS	APPROVED BY: C. GRAVELLE P. ENG
PROJECT NO: 102012-000	DRAWING NO: 102012-000-PIN-2.5	PAGE 2

FIGURE PIN-2.5B



PIN-2 Tier II Disposal Facility - Groundwater					As (mg/L)	Cd* (mg/L)	Cr (mg/L)	Co* (mg/L)	Cu (mg/L)	Pb* (mg/L)	Ni (mg/L)	Zn (mg/L)	F1* C6-C10 (mg/L)	F2* C10-C16 (mg/L)	F3* C16-C34 (mg/L)	F4* C34-C50 (mg/L)
Baseline Data																
UPgradient																
10-5014	MW-04	2010			0.0063	<0.0010	0.1020	<0.0030	0.0250	<0.0010	0.0611	0.0148	<0.05	<0.5	<1.0	<1.0
11-6960	MW-04	2011			<0.0030	<0.0010	0.0600	<0.0030	0.0060	<0.0010	0.0060	0.0300	<0.05	<0.5	<1.0	<1.0
11-6961 (Dup)	MW-04	2011			<0.0030	<0.0010	0.0700	<0.0030	0.0070	<0.0010	0.0140	0.0260	<0.05	<0.5	<1.0	<1.0
Downgradient																
10-5018	MW-01	2010			0.0082	<0.0010	0.6080	0.0074	0.0770	<0.0010	0.3175	0.0195	<0.05	<0.5	<1.0	<1.0
11-6962	MW-01	2011			<0.0030	<0.0010	0.2160	<0.0030	0.0192	<0.0010	0.0858	<0.010	<0.05	<0.5	<1.0	<1.0
10-5017	MW-02	2010			<0.0030	<0.0010	0.1000	<0.0030	0.0303	<0.0010	0.0548	0.0122	<0.05	<0.5	<1.0	<1.0
11-6959	MW-02	2011			<0.0030	<0.0010	<0.0050	<0.0030	<0.0050	<0.0010	<0.0050	0.2470	<0.05	<0.5	<1.0	<1.0
10-5015	MW-03	2010			0.0088	<0.0010	0.2010	0.0036	0.0304	<0.0010	0.1080	0.0420	<0.05	<0.5	<1.0	<1.0
11-6958	MW-03	2011			0.0110	<0.0010	0.1110	<0.0030	0.0225	<0.0010	0.0269	0.0203	<0.05	<0.5	<1.0	<1.0
				N value	9	9	9	9	9	9	9	9	9	9	9	9
Baseline Data - Arithmetic Mean					0.0046	0.0005	0.1634	0.0024	0.0244	0.0005	0.0752	0.0463	0.025	0.25	0.5	0.5
Baseline Data - Arithmetic Mean Corrected for Detection Limit					**0.0046**	**0.0010**	**0.1634**	**0.0030**	**0.0244**	**0.0010**	**0.0752**	**0.0463**	**0.050**	**0.50**	**1.0**	**1.0**
Baseline Data - Standard Deviation					0.0039	0.0000	0.1795	0.0000	0.0223	0.0000	0.0979	0.0760	0.000	0.00	0.0	0.0
Baseline Data - Corrected Arithmetic Mean + 3x Standard Deviation					**0.0164**	**0.0010**	**0.7018**	**0.0030**	**0.0914**	**0.0010**	**0.3689**	**0.2744**	**0.050**	**0.50**	**1.0**	**1.0**

If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.

Upgradient - MW-04					As	Cd*	Cr	Co*	Cu	Pb*	Ni	Zn	F1* C6-C10	F2* C10-C16	F3* C16-C34	F4* C34-C50
12-19315	MW-04	2012	1	Phase I	**0.0062**	0.000092	0.0309	0.0017	0.0120	**0.0049**	0.0274	**0.1020**	<0.025	<0.10	<0.25	<0.25
12-19319 (Dup)	MW-04	2012	1	Phase I	**0.0050**	0.000100	0.0157	0.0012	0.0090	**0.0042**	0.0161	0.0281	<0.025	<0.10	<0.25	<0.25
P213-4W	MW-04	2013	2	Phase I	0.0018	0.000120	0.0110	0.00059	0.0032	**0.0011**	0.0110	**0.0570**	<0.10	<0.10	<0.20	<0.20
P214-4W	MW-04	2014	3	Phase I	**0.0092**	0.000190	0.0696	**0.0078**	**0.0250**	**0.0163**	0.0728	**0.3790**	<0.20	<0.20	<0.10	<0.10
P215-4W	MW-04	2015	4	Phase I	0.0010	0.000040	0.0074	0.00070	0.0030	**0.0013**	0.0086	**0.0520**	<0.10	<0.10	<0.10	<0.10
P216-4W	MW-04	2016	5	Phase I	0.00026	0.000017	<0.0010	<0.00050	0.0012	<0.00020	0.0030	<0.0050	<0.10	<0.10	<0.20	N/A
MW-4	MW-04	2018	7	Phase I	0.00043	<0.000020	<0.0010	<0.00030	0.0015	<0.00010	0.0031	0.0060	<0.025	<0.10	<0.10	<0.10

Downgradient - MW-01					As	Cd*	Cr	Co*	Cu	Pb*	Ni	Zn	F1* C6-C10	F2* C10-C16	F3* C16-C34	F4* C34-C50
Not sampled - dry/frozen	MW-01	2012	1	Phase I												
Not sampled - dry/frozen	MW-01	2013	2	Phase I												
Not sampled - dry/frozen	MW-01	2014	3	Phase I												
P215-1W	MW-01	2015	4	Phase I	0.00090	0.000030	0.0014	<0.00010	0.0100	<0.00010	0.0053	**0.0490**	<0.10	<0.10	<0.10	<0.10
P216-1W	MW-01	2016	5	Phase I	0.0014	0.000020	0.0033	<0.00050	0.0193	0.00051	0.0067	0.0253	<0.10	<0.10	<0.10	N/A
MW-1	MW-01	2018	7	Phase I	0.0011	<0.000020	0.0020	<0.00030	0.0045	<0.00010	0.0027	0.0093	<0.025	<0.10	<0.10	<0.10

Downgradient - MW-03					As	Cd*	Cr	Co*	Cu	Pb*	Ni	Zn	F1* C6-C10	F2* C10-C16	F3* C16-C34	F4* C34-C50
Not sampled - dry/frozen	MW-03	2012	1	Phase I												
P213-3W	MW-03	2013	2	Phase I	0.00083	0.000150	0.0027	<0.00030	0.0039	<0.00020	0.0071	0.0061	<0.10	<0.10	<0.20	<0.20
P214-3W	MW-03	2014	3	Phase I	0.0046	0.000120	0.0827	0.0019	**0.0250**	**0.0029**	0.0570	**0.1520**	<0.20	<0.20	<0.10	<0.10
P215-3W	MW-03	2015	4	Phase I	0.00040	0.000220	0.0022	<0.00010	0.0020	0.00020	0.0047	0.0180	<0.10	<0.10	<0.10	<0.10
P216-3W	MW-03	2016	5	Phase I	0.00033	0.000027	<0.0010	<0.00050	0.0014	<0.00020	0.0030	<0.0050	<0.10	<0.10	<0.20	N/A
MW-3	MW-03	2018	7	Phase I	0.00051	<0.000020	<0.0010	<0.00030	0.0015	<0.00010	0.0031	0.0060	<0.10	<0.10	<0.10	<0.20
Dup 1	MW-03	2018	7	Phase I	0.00044	<0.000020	0.0010	<0.00030	0.0016	<0.00010	0.0030	0.0095	<0.025	<0.10	<0.10	<0.10

Downgradient - MW-02					As	Cd*	Cr	Co*	Cu	Pb*	Ni	Zn	F1* C6-C10	F2* C10-C16	F3* C16-C34	F4* C34-C50
12-19313	MW-02	2012	1	Phase I	0.0011	<0.000090	0.0148	<0.00050	0.0036	<0.0010	0.0115	0.0122	<0.025	<0.1	<0.25	<0.25
P213-2W	MW-02	2013	2	Phase I	0.0012	0.000057	0.0270	0.00038	0.0024	0.00037	0.0150	0.0130	<0.10	<0.10	<0.20	<0.20
P213-BDW1 (Dup)	MW-02	2013	2	Phase I	0.00084	0.000036	0.0032	<0.00030	0.0014	<0.00020	0.0034	0.0080	<0.10	<0.10	<0.20	<0.20
P213-2W (Interlab)	MW-02	2013	2	Phase I	0.00090	0.000060	0.0140	0.00030	0.0030	0.00040	0.0079	0.0150	<0.20	<0.10	<0.10	<0.10
P214-2W	MW-02	2014	3	Phase I	0.0038	0.000030	**0.2720**	0.0030	0.0170	**0.0023**	**0.1190**	**0.1040**	<0.20	<0.20	<0.10	<0.10
P215-2W	MW-02	2015	4	Phase I	0.00070	0.000150	0.0060	<0.00010	0.0010	0.00020	0.0035	0.0100	<0.10	<0.10	<0.10	<0.10
P215-BDW1 (Dup)	MW-02	2015	4	Phase I	0.00070	0.000150	0.0077	<0.00010	0.0010	0.00030	0.0041	0.0100	<0.10	<0.10	<0.10	<0.10
P215-2W (Interlab)	MW-02	2015	4	Phase I	0.00086	0.000180	0.0090	<0.00030	0.0020	0.00020	0.0051	0.0090	<0.10	<0.10	<0.20	<0.20
P216-2W	MW-02	2016	5	Phase I	0.00058	0.000013	<0.0010	<0.00050	0.0013	<0.00020	0.0026	<0.0050	<0.10	<0.10	<0.20	N/A
P216-BDW1 (Dup)	MW-02	2016	5	Phase I	0.00060	0.000021	<0.0010	<0.00050	0.0011	<0.00020	0.0028	<0.0050	<0.10	<0.10	<0.20	N/A
P216-2W (Interlab)	MW-02	2016	5	Phase I	0.00050	0.000020	<0.00050	<0.00010	<0.0010	<0.00010	0.0030	0.0030	<0.10	<0.10	<0.10	<0.10
MW-2	MW-02	2018	7	Phase I	0.00066	<0.000020	<0.0010	<0.00030	0.0022	<0.00010	0.0029	<0.0030	<0.025	<0.10	<0.10	<0.10

LEGEND

- MONITORING WELL LOCATION (3)
- B — BACKGROUND MONITORING WELL LOCATION (1)
- GROUND TEMPERATURE CABLE LOCATION (4)
- MONITORING SOIL SAMPLE LOCATION (4)
- CM1 — CONTROL MONUMENT
- 100.00 — GROUNDWATER ELEVATION (M.A.S.L.)
- INTERPRETED GROUNDWATER ELEVATION CONTOUR
- INTERPRETED GROUNDWATER FLOW DIRECTION

Legend	
XX	Sample exceeds baseline mean
XX	Sample exceeds baseline mean + 3x SD

0m 7.5m 15.0m 22.5m 30.0m 37.5m

NO.	VERSION	DATE	BY	VERIF.	APPR.
00	DRAFT V.5	2019.03.08	R.F.	T.A.	C.G.

Construction de Défense Canada
Defence Construction Canada

COLLECTION OF LANDFILL MONITORING DATA

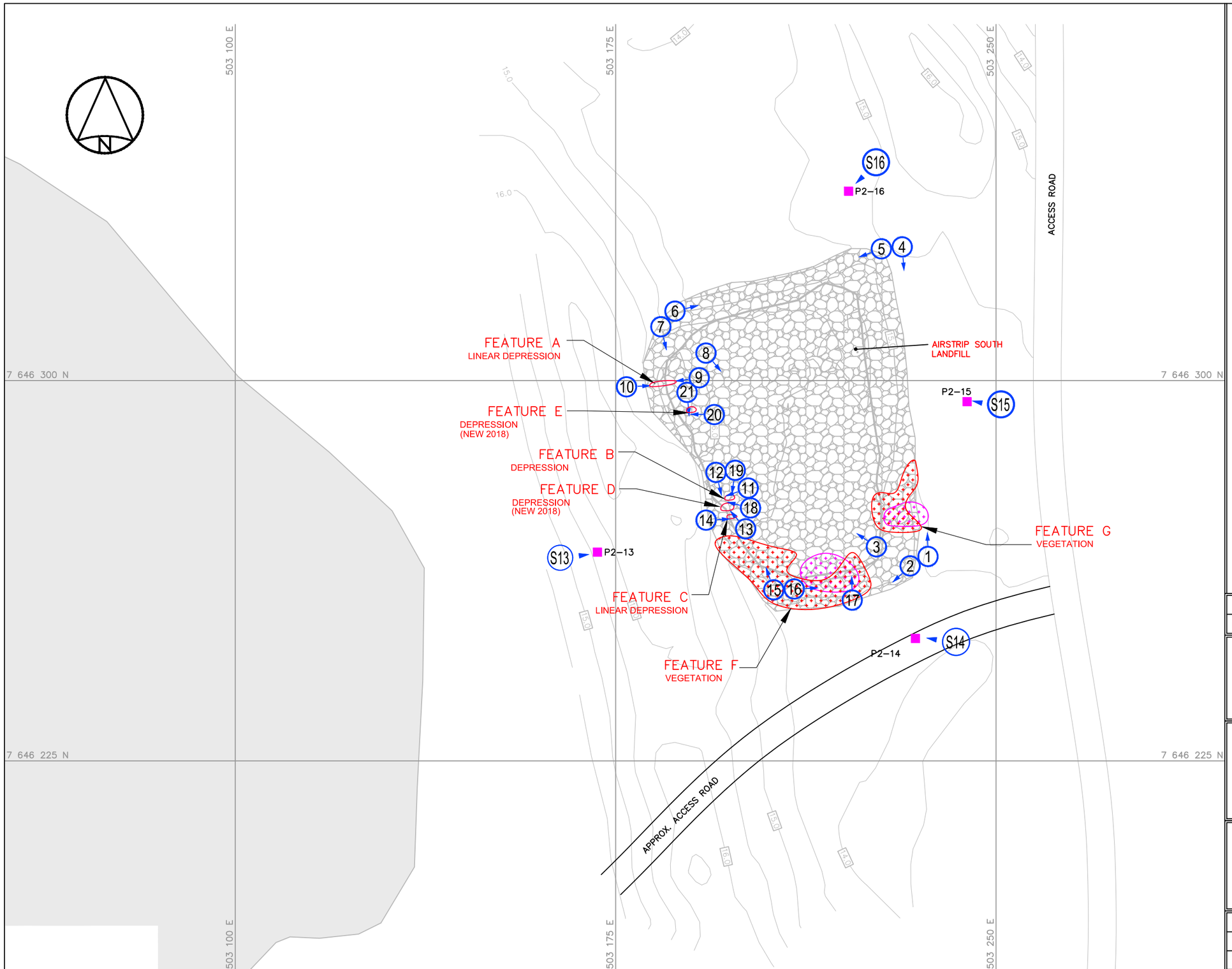
PIN-2, CAPE YOUNG, NUNAVUT

TIER II SOIL DISPOSAL FACILITY GROUNDWATER CHEMISTRY

ARCADIS
1050 Morrison Drive, Suite 201, Ottawa, Ontario, K2H 8K7
Office General +1 613 721 0555

MEASUREMENT UNIT	SCALE:	DATE (month–year):
Metre	1 : 750	MARCH 2019
DRAWN BY: R. FLETCHER	VERIFIED BY: T. AUSTRINS	APPROVED BY: C. GRAVELLE P. ENG
PROJECT NO: 102012-000	DRAWING NO: 102012-000-PIN-2.5	PAGE 3

FIGURE PIN-2.5C



LEGEND

- MONITORING SOIL SAMPLE LOCATION (4)
- APPROX. PHOTOGRAPHIC VIEWPOINT (2018)
- BODY OF WATER
- LANDFILL EXTENT
- ELEVATION CONTOUR
- LINEAR DEPRESSION
- SPARSE VEGETATION
- APPROXIMATE 2016 OBSERVATIONS (TO ILLUSTRATE CHANGES)

0m 7.5m 15.0m 22.5m 30.0m 37.5m

NO.	VERSION	DATE	BY	VERIF.	APPR.
00	DRAFT V.5	2019.03.08	R.F.	T.A.	C.G.

Construction de Défense Canada
Defence Construction Canada

COLLECTION OF LANDFILL MONITORING DATA

PIN-2, CAPE YOUNG, NUNAVUT

AIRSTRIP SOUTH LANDFILL PLAN/MONITORING/OBSERVATIONS

ARCADIS
1050 Morrison Drive, Suite 201, Ottawa, Ontario, K2H 8K7
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MEASUREMENT UNIT	SCALE:	DATE (month–year):
Metre	1 : 750	MARCH 2019
DRAWN BY: R. FLETCHER	VERIFIED BY: T. AUSTRINS	APPROVED BY: C. GRAVELLE P. ENG
PROJECT NO: 102012-000	DRAWING NO: 102012-000- PIN-2.6	PAGE 1

FIGURE PIN-2.6A

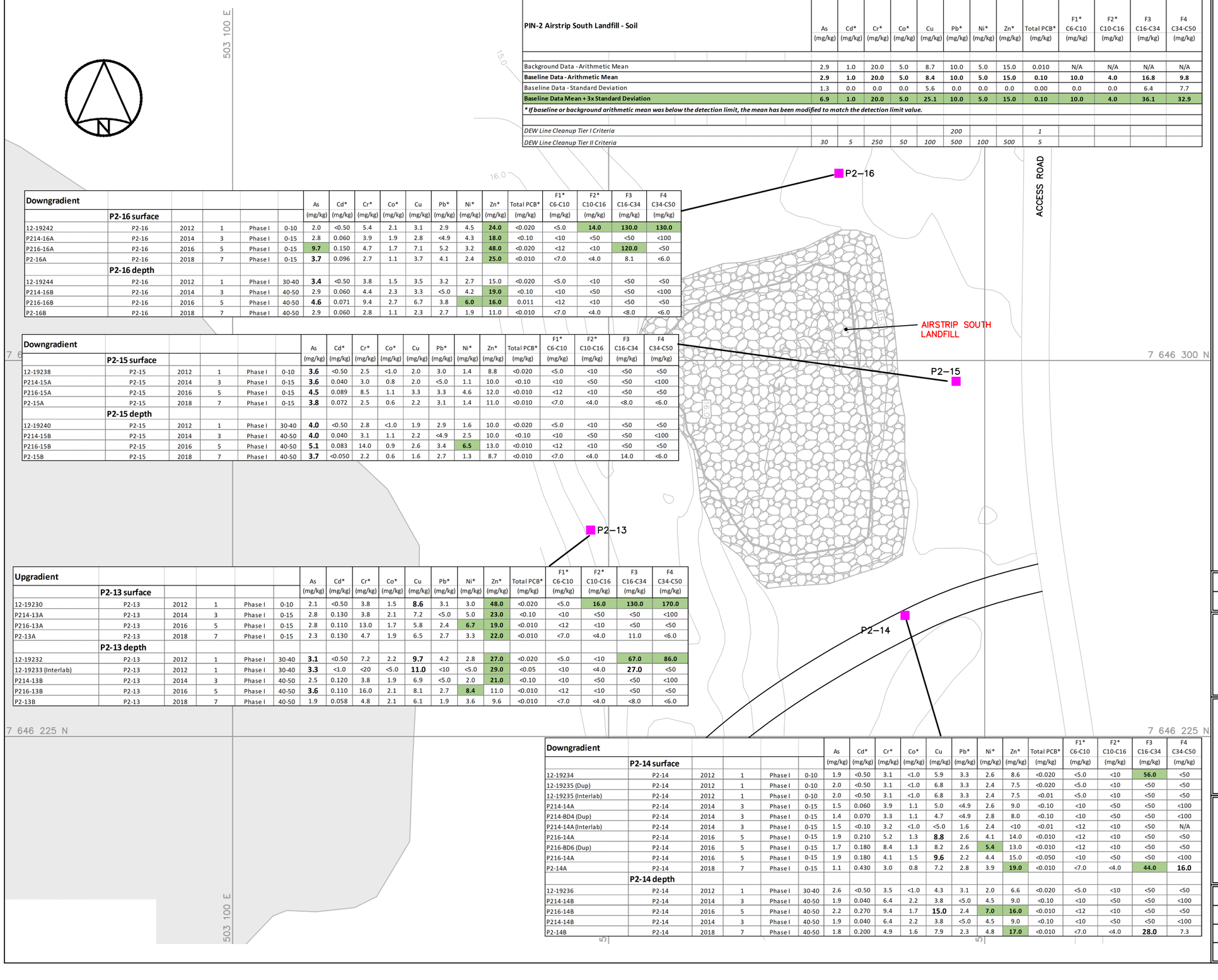
PIN-2 Airstrip South Landfill - Soil	As (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C6-C10 (mg/kg)	F2* C10-C16 (mg/kg)	F3 C16-C34 (mg/kg)	F4 C34-C50 (mg/kg)
Background Data - Arithmetic Mean	2.9	1.0	20.0	5.0	8.7	10.0	5.0	15.0	0.010	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean	**2.9**	**1.0**	**20.0**	**5.0**	**8.4**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**4.0**	**16.8**	**9.8**
Baseline Data - Standard Deviation	1.3	0.0	0.0	0.0	5.6	0.0	0.0	0.0	0.00	0.0	0.0	6.4	7.7
Baseline Data Mean + 3x Standard Deviation	**6.9**	**1.0**	**20.0**	**5.0**	**25.1**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**4.0**	**36.1**	**32.9**
If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.													
DEW Line Cleanup Tier I Criteria						*200*			*1*				
DEW Line Cleanup Tier II Criteria	*30*	*5*	*250*	*50*	*100*	*500*	*100*	*500*	*5*				

Downgradient						As (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C6-C10 (mg/kg)	F2* C10-C16 (mg/kg)	F3 C16-C34 (mg/kg)	F4 C34-C50 (mg/kg)
	P2-16 surface																	
12-19242	P2-16	2012	1	Phase I	0-10	2.0	<0.50	5.4	2.1	3.1	2.9	4.5	**24.0**	<0.020	<5.0	**14.0**	**130.0**	**130.0**
P214-16A	P2-16	2014	3	Phase I	0-15	2.8	0.060	3.9	1.9	2.8	<4.9	4.3	**18.0**	<0.10	<10	<50	<50	<100
P216-16A	P2-16	2016	5	Phase I	0-15	**9.7**	0.150	4.7	1.7	7.1	5.2	3.2	**48.0**	<0.020	<12	<10	**120.0**	<50
P2-16A	P2-16	2018	7	Phase I	0-15	**3.7**	0.096	2.7	1.1	3.7	4.1	2.4	**25.0**	<0.010	<7.0	<4.0	8.1	<6.0
	P2-16 depth																	
12-19244	P2-16	2012	1	Phase I	30-40	**3.4**	<0.50	3.8	1.5	3.5	3.2	2.7	15.0	<0.020	<5.0	<10	<50	<50
P214-16B	P2-16	2014	3	Phase I	40-50	2.9	0.060	4.4	2.3	3.3	<5.0	4.2	**19.0**	<0.10	<10	<50	<50	<100
P216-16B	P2-16	2016	5	Phase I	40-50	**4.6**	0.071	9.4	2.7	6.7	3.8	**6.0**	**16.0**	0.011	<12	<10	<50	<50
P2-16B	P2-16	2018	7	Phase I	40-50	2.9	0.060	2.8	1.1	2.3	2.7	1.9	11.0	<0.010	<7.0	<4.0	<8.0	<6.0

Downgradient						As (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C6-C10 (mg/kg)	F2* C10-C16 (mg/kg)	F3 C16-C34 (mg/kg)	F4 C34-C50 (mg/kg)
	P2-15 surface																	
12-19238	P2-15	2012	1	Phase I	0-10	**3.6**	<0.50	2.5	<1.0	2.0	3.0	1.4	8.8	<0.020	<5.0	<10	<50	<50
P214-15A	P2-15	2014	3	Phase I	0-15	**3.6**	0.040	3.0	0.8	2.0	<5.0	1.1	10.0	<0.10	<10	<50	<50	<100
P216-15A	P2-15	2016	5	Phase I	0-15	**4.5**	0.089	8.5	1.1	3.3	3.3	4.6	12.0	<0.010	<12	<10	<50	<50
P2-15A	P2-15	2018	7	Phase I	0-15	**3.8**	0.072	2.5	0.6	2.2	3.1	1.4	11.0	<0.010	<7.0	<4.0	<8.0	<6.0
	P2-15 depth																	
12-19240	P2-15	2012	1	Phase I	30-40	**4.0**	<0.50	2.8	<1.0	1.9	2.9	1.6	10.0	<0.020	<5.0	<10	<50	<50
P214-15B	P2-15	2014	3	Phase I	40-50	**4.0**	0.040	3.1	1.1	2.2	<4.9	2.5	10.0	<0.10	<10	<50	<50	<100
P216-15B	P2-15	2016	5	Phase I	40-50	**5.1**	0.083	14.0	0.9	2.6	3.4	**6.5**	13.0	<0.010	<12	<10	<50	<50
P2-15B	P2-15	2018	7	Phase I	40-50	**3.7**	<0.050	2.2	0.6	1.6	2.7	1.3	8.7	<0.010	<7.0	<4.0	14.0	<6.0

Upgradient						As (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C6-C10 (mg/kg)	F2* C10-C16 (mg/kg)	F3 C16-C34 (mg/kg)	F4 C34-C50 (mg/kg)
	P2-13 surface																	
12-19230	P2-13	2012	1	Phase I	0-10	2.1	<0.50	3.8	1.5	**8.6**	3.1	3.0	**48.0**	<0.020	<5.0	**16.0**	**130.0**	**170.0**
P214-13A	P2-13	2014	3	Phase I	0-15	2.8	0.130	3.8	2.1	7.2	<5.0	5.0	**23.0**	<0.10	<10	<50	<50	<100
P216-13A	P2-13	2016	5	Phase I	0-15	2.8	0.110	13.0	1.7	5.8	2.4	**6.7**	**19.0**	<0.010	<12	<10	<50	<50
P2-13A	P2-13	2018	7	Phase I	0-15	2.3	0.130	4.7	1.9	6.5	2.7	3.3	**22.0**	<0.010	<7.0	<4.0	11.0	<6.0
	P2-13 depth																	
12-19232	P2-13	2012	1	Phase I	30-40	**3.1**	<0.50	7.2	2.2	**9.7**	4.2	2.8	**27.0**	<0.020	<5.0	<10	**67.0**	**86.0**
12-19233 (Interlab)	P2-13	2012	1	Phase I	30-40	**3.3**	<1.0	<20	<5.0	**11.0**	<10	<5.0	**29.0**	<0.05	<10	<4.0	**27.0**	<50
P214-13B	P2-13	2014	3	Phase I	40-50	2.5	0.120	3.8	1.9	6.9	<5.0	2.0	**21.0**	<0.10	<10	<50	<50	<100
P216-13B	P2-13	2016	5	Phase I	40-50	**3.6**	0.110	16.0	2.1	8.1	2.7	**8.4**	11.0	<0.010	<12	<10	<50	<50
P2-13B	P2-13	2018	7	Phase I	40-50	1.9	0.058	4.8	2.1	6.1	1.9	3.6	9.6	<0.010	<7.0	<4.0	<8.0	<6.0

Downgradient						As (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C6-C10 (mg/kg)	F2* C10-C16 (mg/kg)	F3 C16-C34 (mg/kg)	F4 C34-C50 (mg/kg)
	P2-14 surface																	
12-19234	P2-14	2012	1	Phase I	0-10	1.9	<0.50	3.1	<1.0	5.9	3.3	2.6	8.6	<0.020	<5.0	<10	**56.0**	<50
12-19235 (Dup)	P2-14	2012	1	Phase I	0-10	2.0	<0.50	3.1	<1.0	6.8	3.3	2.4	7.5	<0.020	<5.0	<10	<50	<50
12-19235 (Interlab)	P2-14	2012	1	Phase I	0-10	2.0	<0.50	3.1	<1.0	6.8	3.3	2.4	7.5	<0.01	<5.0	<10	<50	<50
P214-14A	P2-14	2014	3	Phase I	0-15	1.5	0.060	3.9	1.1	5.0	<4.9	2.6	9.0	<0.10	<10	<50	<50	<100
P214-BD4 (Dup)	P2-14	2014	3	Phase I	0-15	1.4	0.070	3.3	1.1	4.7	<4.9	2.8	8.0	<0.10	<10	<50	<50	<100
P214-14A (Interlab)	P2-14	2014	3	Phase I	0-15	1.5	<0.10	3.2	<1.0	<5.0	1.6	2.4	<10	<0.01	<12	<10	<50	N/A
P216-14A	P2-14	2016	5	Phase I	0-15	1.9	0.210	5.2	1.3	**8.8**	2.6	4.1	14.0	<0.010	<12	<10	<50	<50
P216-BD6 (Dup)	P2-14	2016	5	Phase I	0-15	1.7	0.180	8.4	1.3	8.2	2.6	**5.4**	13.0	<0.010	<12	<10	<50	<50
P216-14A	P2-14	2016	5	Phase I	0-15	1.9	0.180	4.1	1.5	**9.6**	2.2	4.4	15.0	<0.050	<10	<50	<50	<100
P2-14A	P2-14	2018	7	Phase I	0-15	1.1	0.430	3.0	0.8	7.2	2.8	3.9	**19.0**	<0.010	<7.0	<4.0	**44.0**	**16.0**
	P2-14 depth																	
12-19236	P2-14	2012	1	Phase I	30-40	2.6	<0.50	3.5	<1.0	4.3	3.1	2.0	6.6	<0.020	<5.0	<10	<50	<50
P214-14B	P2-14	2014	3	Phase I	40-50	1.9	0.040	6.4	2.2	3.8	<5.0	4.5	9.0	<0.10	<10	<50	<50	<100
P216-14B	P2-14	2016	5	Phase I	40-50	2.2	0.270	9.4	1.7	**15.0**	2.4	**7.0**	**16.0**	<0.010	<12	<10	<50	<50
P214-14B	P2-14	2014	3	Phase I	40-50	1.9	0.040	6.4	2.2	3.8	<5.0	4.5	9.0	<0.10	<10	<50	<50	<100
P2-14B	P2-14	2018	7	Phase I	40-50	1.8	0.200	4.9	1.6	7.9	2.3	4.8	**17.0**	<0.010	<7.0	<4.0	**28.0**	7.3



LEGEND

MONITORING SOIL SAMPLE LOCATION (4)

Legend	
XX	Sample exceeds baseline mean
XX	Sample exceeds baseline mean + 3x SD

0m 7.5m 15.0m 22.5m 30.0m 37.5m

NO.	VERSION	DATE	BY	VERIF.	APPR.
00	DRAFT V.5	2019.03.08	R.F.	T.A.	C.G.

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COLLECTION OF LANDFILL MONITORING DATA

PIN-2, CAPE YOUNG, NUNAVUT

AIRSTRIP SOUTH LANDFILL SOIL CHEMISTRY

ARCADIS

1050 Morrison Drive, Suite 201, Ottawa, Ontario, K2H 8K7
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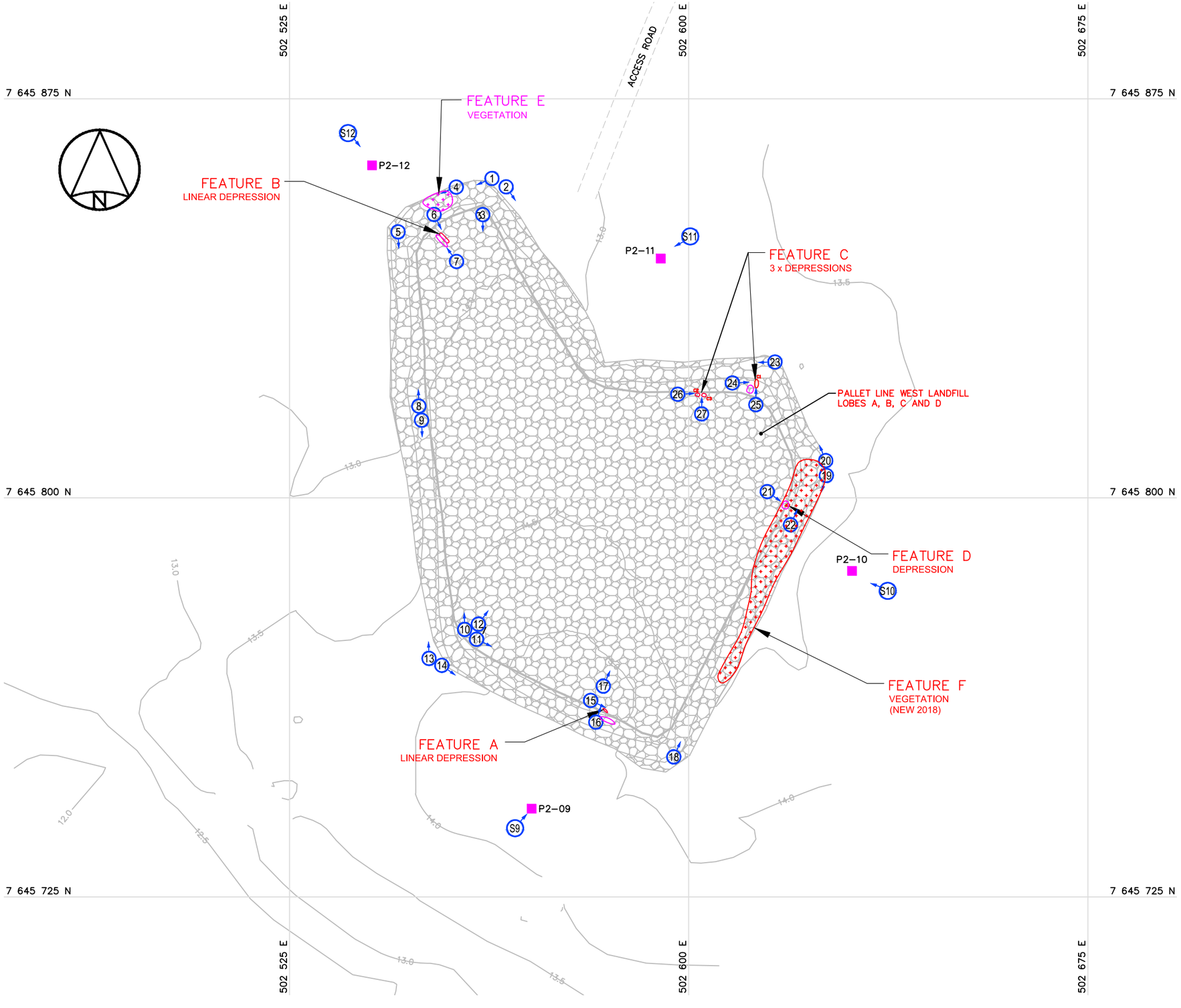
MEASUREMENT UNIT	SCALE:	DATE (month–year):
Metre	1 : 750	MARCH 2019
DRAWN BY:	VERIFIED BY:	APPROVED BY:
R. FLETCHER	T. AUSTRINS	C. GRAVELLE P. ENG
PROJECT NO:	DRAWING NO:	PAGE
102012-000	102012-000- PIN-2.6	2

FIGURE PIN-2.6B



LEGEND

- MONITORING SOIL SAMPLE LOCATION (4)
- APPROX. PHOTOGRAPHIC VIEWPOINT (2018)
- LANDFILL EXTENT
- ELEVATION CONTOUR
- DEPRESSION
- VEGETATION
- APPROXIMATE 2016 OBSERVATIONS (TO ILLUSTRATE CHANGES)

0m 7.5m 15.0m 22.5m 30.0m 37.5m

NO.	VERSION	DATE	BY	VERIF.	APPR.
00	DRAFT V.5	2019.03.08	R.F.	T.A.	C.G.

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COLLECTION OF LANDFILL MONITORING DATA

PIN-2, CAPE YOUNG, NUNAVUT

PALLET LINE WEST LANDFILL PLAN/MONITORING/OBSERVATIONS

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1050 Morrison Drive, Suite 201, Ottawa, Ontario, K2H 8K7
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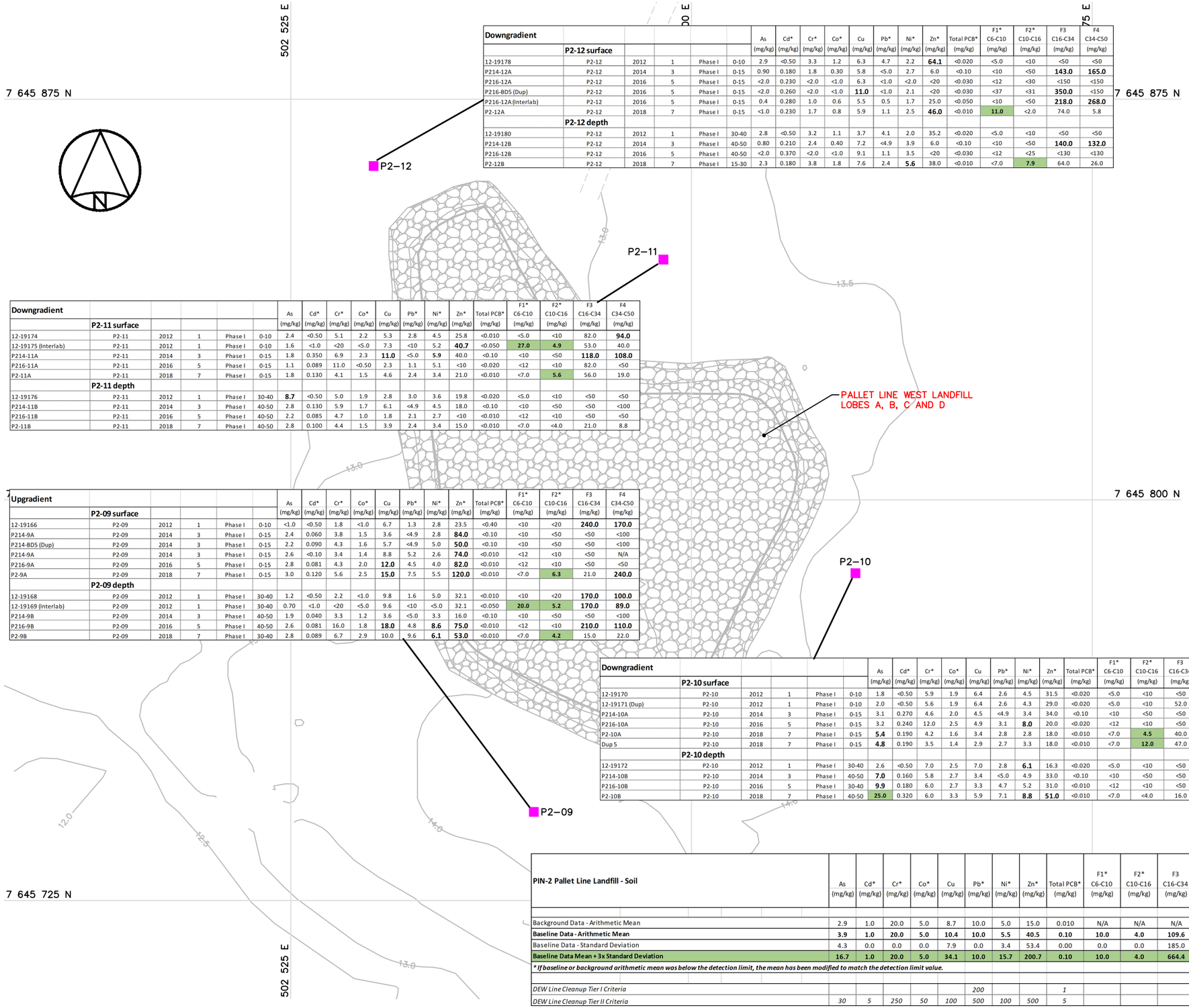
MEASUREMENT UNIT	SCALE:	DATE (month–year):
Metre	1 : 750	MARCH 2019
DRAWN BY: R. FLETCHER	VERIFIED BY: T. AUSTRINS	APPROVED BY: C. GRAVELLE P. ENG
PROJECT NO: 102012-000	DRAWING NO: 102012-000-PIN-2,7	PAGE 1

FIGURE PIN-2.7A



Downgradient						As	Cd*	Cr*	Co*	Cu	Pb*	Ni*	Zn*	Total PCB*	F1* C6-C10	F2* C10-C16	F3 C16-C34	F4 C34-C50
	P2-12 surface					(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
12-19178	P2-12	2012	1	Phase I	0-10	2.9	<0.50	3.3	1.2	6.3	4.7	2.2	**64.1**	<0.020	<5.0	<10	<50	<50
P214-12A	P2-12	2014	3	Phase I	0-15	0.90	0.180	1.8	0.30	5.8	<5.0	2.7	6.0	<0.10	<10	<50	**143.0**	**165.0**
P216-12A	P2-12	2016	5	Phase I	0-15	<2.0	0.230	<2.0	<1.0	6.3	<1.0	<2.0	<20	<0.030	<12	<30	<150	<150
P216-BD5 (Dup)	P2-12	2016	5	Phase I	0-15	<2.0	0.260	<2.0	<1.0	**11.0**	<1.0	2.1	<20	<0.030	<37	<31	**350.0**	<150
P216-12A (Interlab)	P2-12	2016	5	Phase I	0-15	0.4	0.280	1.0	0.6	5.5	0.5	1.7	25.0	<0.050	<10	<50	**218.0**	**268.0**
P2-12A	P2-12	2018	7	Phase I	0-15	<1.0	0.230	1.7	0.8	5.9	1.1	2.5	**46.0**	<0.010	**11.0**	<2.0	74.0	5.8
	P2-12 depth																	
12-19180	P2-12	2012	1	Phase I	30-40	2.8	<0.50	3.2	1.1	3.7	4.1	2.0	35.2	<0.020	<5.0	<10	<50	<50
P214-12B	P2-12	2014	3	Phase I	40-50	0.80	0.210	2.4	0.40	7.2	<4.9	3.9	6.0	<0.10	<10	<50	**140.0**	**132.0**
P216-12B	P2-12	2016	5	Phase I	40-50	<2.0	0.370	<2.0	<1.0	9.1	1.1	3.5	<20	<0.030	<12	<25	<130	<130
P2-12B	P2-12	2018	7	Phase I	15-30	2.3	0.180	3.8	1.8	7.6	2.4	**5.6**	38.0	<0.010	<7.0	**7.9**	64.0	26.0

Downgradient						As	Cd*	Cr*	Co*	Cu	Pb*	Ni*	Zn*	Total PCB*	F1* C6-C10	F2* C10-C16	F3 C16-C34	F4 C34-C50
	P2-11 surface					(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
12-19174	P2-11	2012	1	Phase I	0-10	2.4	<0.50	5.1	2.2	5.3	2.8	4.5	25.8	<0.010	<5.0	<10	82.0	**94.0**
12-19175 (Interlab)	P2-11	2012	1	Phase I	0-10	1.6	<1.0	<20	<5.0	7.3	<10	5.2	**40.7**	<0.050	**27.0**	**4.9**	53.0	40.0
P214-11A	P2-11	2014	3	Phase I	0-15	1.8	0.350	6.9	2.3	**11.0**	<5.0	**5.9**	40.0	<0.10	<10	<50	**118.0**	**108.0**
P216-11A	P2-11	2016	5	Phase I	0-15	1.1	0.089	11.0	<0.50	2.3	1.1	5.1	<10	<0.020	<12	<10	82.0	<50
P2-11A	P2-11	2018	7	Phase I	0-15	1.8	0.130	4.1	1.5	4.6	2.4	3.4	21.0	<0.010	<7.0	**5.6**	56.0	19.0
	P2-11 depth																	
12-19176	P2-11	2012	1	Phase I	30-40	**8.7**	<0.50	5.0	1.9	2.8	3.0	3.6	19.8	<0.020	<5.0	<10	<50	<50
P214-11B	P2-11	2014	3	Phase I	40-50	2.8	0.130	5.9	1.7	6.1	<4.9	4.5	18.0	<0.10	<10	<50	<50	<100
P216-11B	P2-11	2016	5	Phase I	40-50	2.2	0.085	4.7	1.0	1.8	2.1	2.7	<10	<0.010	<12	<10	<50	<50
P2-11B	P2-11	2018	7	Phase I	40-50	2.8	0.100	4.4	1.5	3.9	2.4	3.4	15.0	<0.010	<7.0	<4.0	21.0	8.8

Upgradient						As	Cd*	Cr*	Co*	Cu	Pb*	Ni*	Zn*	Total PCB*	F1* C6-C10	F2* C10-C16	F3 C16-C34	F4 C34-C50
	P2-09 surface					(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
12-19166	P2-09	2012	1	Phase I	0-10	<1.0	<0.50	1.8	<1.0	6.7	1.3	2.8	23.5	<0.40	<10	<20	**240.0**	**170.0**
P214-9A	P2-09	2014	3	Phase I	0-15	2.4	0.060	3.8	1.5	3.6	<4.9	2.8	**84.0**	<0.10	<10	<50	<50	<100
P214-BD5 (Dup)	P2-09	2014	3	Phase I	0-15	2.2	0.090	4.3	1.6	5.7	<4.9	5.0	**50.0**	<0.10	<10	<50	<50	<100
P214-9A	P2-09	2014	3	Phase I	0-15	2.6	<0.10	3.4	1.4	8.8	5.2	2.6	**74.0**	<0.010	<12	<10	<50	N/A
P216-9A	P2-09	2016	5	Phase I	0-15	2.8	0.081	4.3	2.0	**12.0**	4.5	4.0	**82.0**	<0.010	<12	<10	<50	<50
P2-9A	P2-09	2018	7	Phase I	0-15	3.0	0.120	5.6	2.5	**15.0**	7.5	5.5	**120.0**	<0.010	<7.0	**6.3**	21.0	**240.0**
	P2-09 depth																	
12-19168	P2-09	2012	1	Phase I	30-40	1.2	<0.50	2.2	<1.0	9.8	1.6	5.0	32.1	<0.010	<10	<20	**170.0**	**100.0**
12-19169 (Interlab)	P2-09	2012	1	Phase I	30-40	0.70	<1.0	<20	<5.0	9.6	<10	<5.0	32.1	<0.050	**20.0**	**5.2**	**170.0**	**89.0**
P214-9B	P2-09	2014	3	Phase I	40-50	1.9	0.040	3.3	1.2	3.6	<5.0	3.3	16.0	<0.10	<10	<50	<50	<100
P216-9B	P2-09	2016	5	Phase I	40-50	2.6	0.081	16.0	1.8	**18.0**	4.8	**8.6**	**75.0**	<0.010	<12	<10	**210.0**	**110.0**
P2-9B	P2-09	2018	7	Phase I	30-40	2.8	0.089	6.7	2.9	10.0	9.6	**6.1**	**53.0**	<0.010	<7.0	**4.2**	15.0	22.0

Downgradient						As	Cd*	Cr*	Co*	Cu	Pb*	Ni*	Zn*	Total PCB*	F1* C6-C10	F2* C10-C16	F3 C16-C34	F4 C34-C50
	P2-10 surface					(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
12-19170	P2-10	2012	1	Phase I	0-10	1.8	<0.50	5.9	1.9	6.4	2.6	4.5	31.5	<0.020	<5.0	<10	<50	<50
12-19171 (Dup)	P2-10	2012	1	Phase I	0-10	2.0	<0.50	5.6	1.9	6.4	2.6	4.3	29.0	<0.020	<5.0	<10	52.0	<50
P214-10A	P2-10	2014	3	Phase I	0-15	3.1	0.270	4.6	2.0	4.5	<4.9	3.4	34.0	<0.10	<10	<50	<50	<100
P216-10A	P2-10	2016	5	Phase I	0-15	3.2	0.240	12.0	2.5	4.9	3.1	**8.0**	20.0	<0.020	<12	<10	<50	<50
P2-10A	P2-10	2018	7	Phase I	0-15	**5.4**	0.190	4.2	1.6	3.4	2.8	2.8	18.0	<0.010	<7.0	**4.5**	40.0	22.0
Dup 5	P2-10	2018	7	Phase I	0-15	**4.8**	0.190	3.5	1.4	2.9	2.7	3.3	18.0	<0.010	<7.0	**12.0**	47.0	20.0
	P2-10 depth																	
12-19172	P2-10	2012	1	Phase I	30-40	2.6	<0.50	7.0	2.5	7.0	2.8	**6.1**	16.3	<0.020	<5.0	<10	<50	<50
P214-10B	P2-10	2014	3	Phase I	40-50	**7.0**	0.160	5.8	2.7	3.4	<5.0	4.9	33.0	<0.10	<10	<50	<50	<100
P216-10B	P2-10	2016	5	Phase I	30-40	**9.9**	0.180	6.0	2.7	3.3	4.7	5.2	31.0	<0.010	<12	<10	<50	<50
P2-10B	P2-10	2018	7	Phase I	40-50	**25.0**	0.320	6.0	3.3	5.9	7.1	**8.8**	**51.0**	<0.010	<7.0	<4.0	16.0	<6.0

PIN-2 Pallet Line Landfill - Soil	As (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C6-C10 (mg/kg)	F2* C10-C16 (mg/kg)	F3 C16-C34 (mg/kg)	F4 C34-C50 (mg/kg)
Background Data - Arithmetic Mean	2.9	1.0	20.0	5.0	8.7	10.0	5.0	15.0	0.010	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean	**3.9**	**1.0**	**20.0**	**5.0**	**10.4**	**10.0**	**5.5**	**40.5**	**0.10**	**10.0**	**4.0**	**109.6**	**54.8**
Baseline Data - Standard Deviation	4.3	0.0	0.0	0.0	7.9	0.0	3.4	53.4	0.00	0.0	0.0	185.0	85.1
Baseline Data Mean + 3x Standard Deviation	**16.7**	**1.0**	**20.0**	**5.0**	**34.1**	**10.0**	**15.7**	**200.7**	**0.10**	**10.0**	**4.0**	**664.4**	**310.2**
** If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.*													
DEW Line Cleanup Tier I Criteria						*200*			*1*				
DEW Line Cleanup Tier II Criteria	*30*	*5*	*250*	*50*	*100*	*500*	*100*	*500*	*5*				

LEGEND

MONITORING SOIL SAMPLE LOCATION (4)

Legend	
XX	Sample exceeds baseline mean
XX	Sample exceeds baseline mean + 3x SD

0m 7.5m 15.0m 22.5m 30.0m 37.5m

NO.	VERSION	DATE	BY	VERIF.	APPR.
00	DRAFT V.5	2019.03.08	R.F.	T.A.	C.G.

Construction de Défense Canada
Defence Construction Canada

COLLECTION OF LANDFILL MONITORING DATA

PIN-2, CAPE YOUNG, NUNAVUT

PALLET LINE WEST LANDFILL SOIL CHEMISTRY

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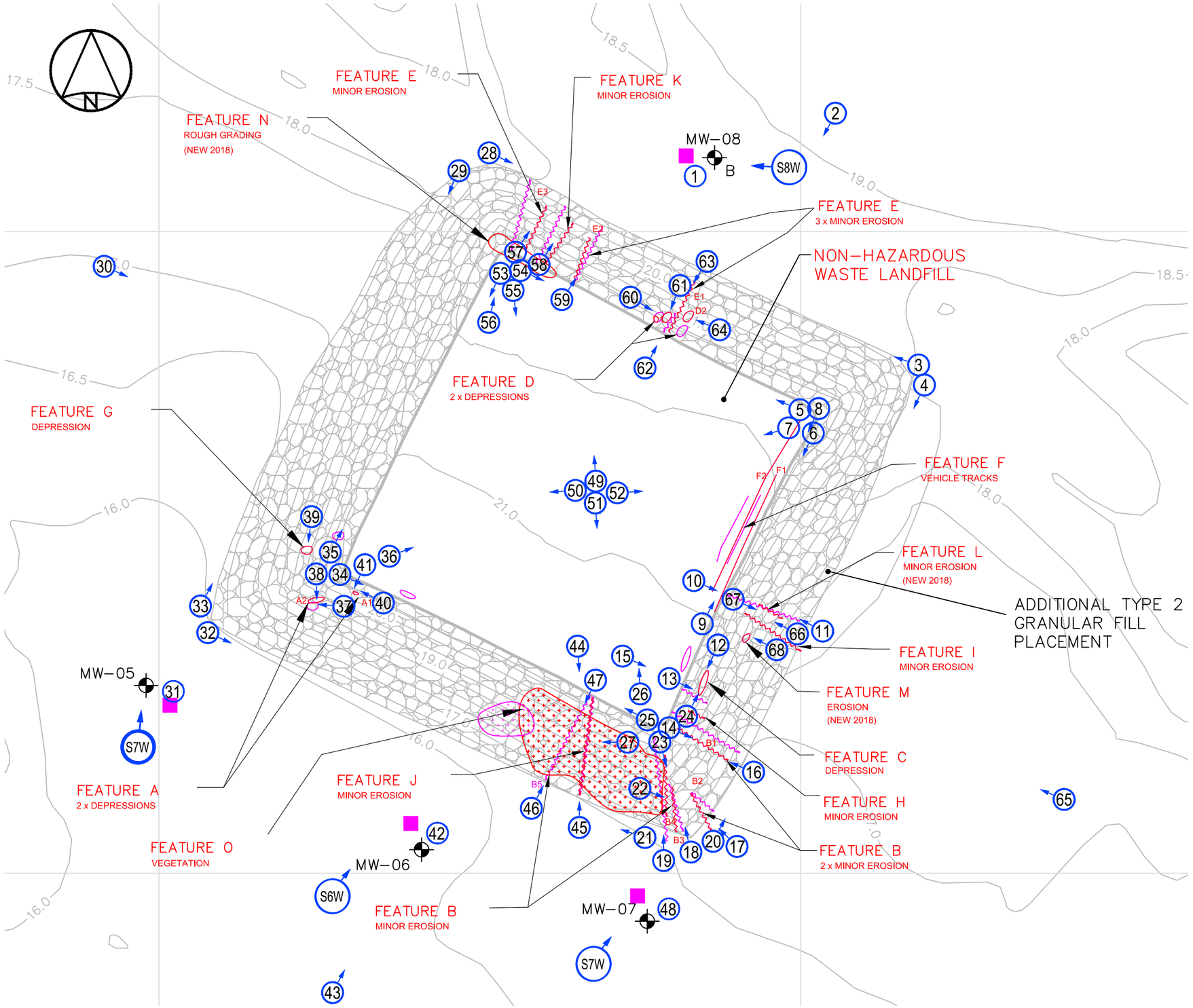
MEASUREMENT UNIT	SCALE:	DATE (month–year):
Metre	1 : 750	MARCH 2019
DRAWN BY: R. FLETCHER	VERIFIED BY: T. AUSTRINS	APPROVED BY: C. GRAVELLE P. ENG
PROJECT NO: 102012-000	DRAWING NO: 102012-000-PIN-2,7	PAGE 2

FIGURE PIN-2.7B



LEGEND

- MONITORING SOIL SAMPLE LOCATION (4)
- MONITORING WELL LOCATION (3)
- BACKGROUND MONITORING WELL LOCATION (1)
- APPROX. PHOTOGRAPHIC VIEWPOINT (2016)
- LANDFILL EXTENT
- ELEVATION CONTOUR
- MINOR SETTLEMENT
- MINOR EROSION
- VEHICLE TRACKS
- SPARSE VEGETATION
- APPROXIMATE 2016 OBSERVATIONS (TO ILLUSTRATE CHANGES)

0m 10m 20m 30m

NO.	VERSION	DATE	BY	VERIF.	APPR.
00	DRAFT V.5	2019.03.08	R.F.	T.A.	C.G.

Construction de Défense Canada
Defence Construction Canada

COLLECTION OF LANDFILL MONITORING DATA

PIN-2, CAPE YOUNG, NUNAVUT

NON-HAZARDOUS WASTE LANDFILL PLAN/MONITORING/OBSERVATIONS

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1050 Morrison Drive, Suite 201, Ottawa, Ontario, K2H 8K7
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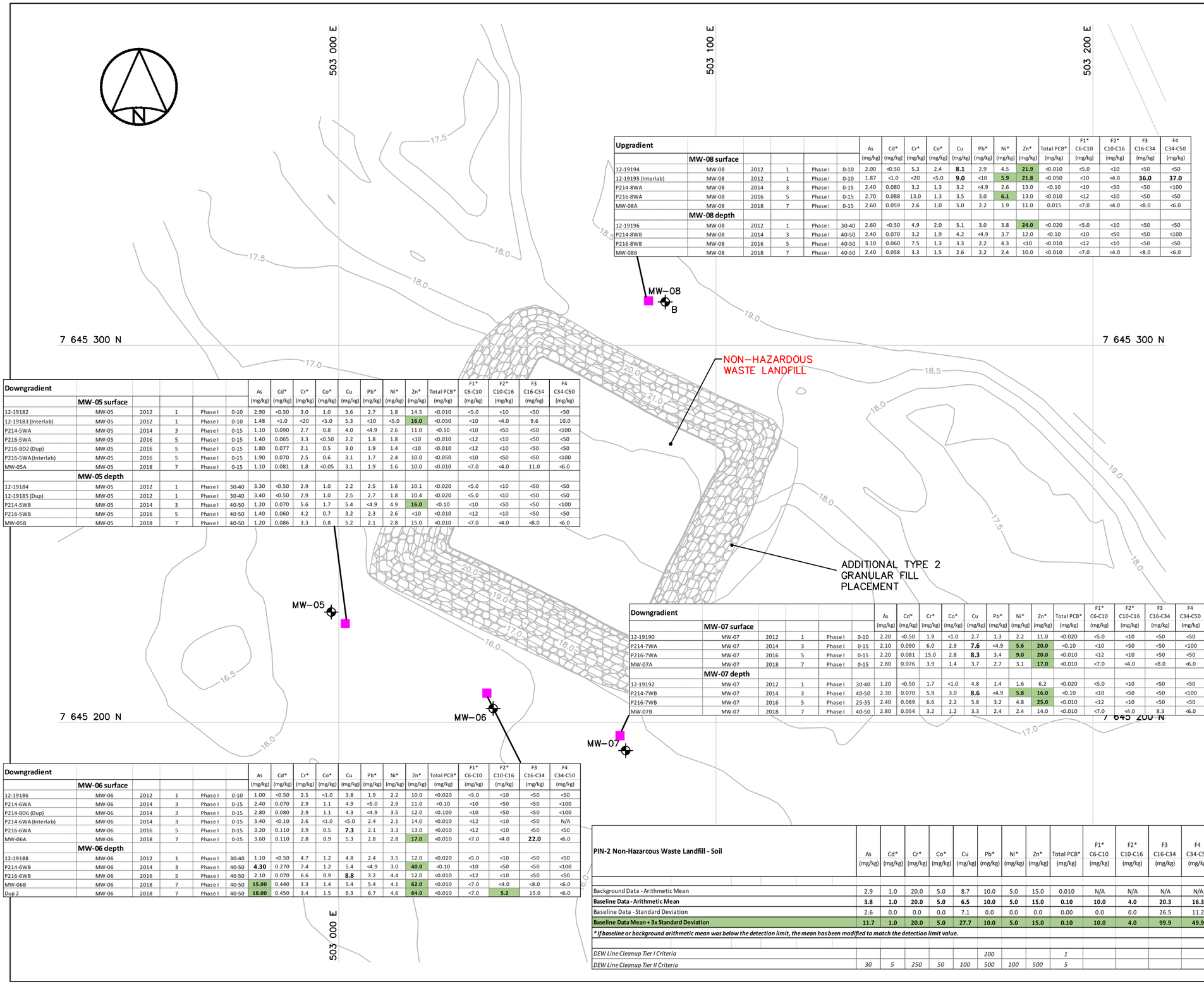
MEASUREMENT UNIT	SCALE:	DATE (month-year):
Metre	1 : 580	MARCH 2019
DRAWN BY: R. FLETCHER	VERIFIED BY: T. AUSTRINS	APPROVED BY: C. GRAVELLE P. ENG
PROJECT NO: 102012-000	DRAWING NO: 102012-000-PIN-2.8	PAGE 1

FIGURE PIN-2.8A



Upgradient						As (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C6-C10 (mg/kg)	F2* C10-C16 (mg/kg)	F3 C16-C34 (mg/kg)	F4 C34-C50 (mg/kg)
MW-08 surface																		
12-19194	MW-08	2012	1	Phase I	0-10	2.00	<0.50	5.3	2.4	**8.1**	2.9	4.5	**21.9**	<0.010	<5.0	<10	<50	<50
12-19195 (Interlab)	MW-08	2012	1	Phase I	0-10	1.87	<1.0	<20	<5.0	**9.0**	<10	**5.9**	**21.8**	<0.050	<10	<4.0	**36.0**	**37.0**
P214-8WA	MW-08	2014	3	Phase I	0-15	2.40	0.080	3.2	1.3	3.2	<4.9	2.6	13.0	<0.10	<10	<50	<50	<100
P216-8WA	MW-08	2016	5	Phase I	0-15	2.70	0.088	13.0	1.3	3.5	3.0	**6.1**	13.0	<0.010	<12	<10	<50	<50
MW-08A	MW-08	2018	7	Phase I	0-15	2.60	0.059	2.6	1.0	5.0	2.2	1.9	11.0	0.015	<7.0	<4.0	<8.0	<6.0
MW-08 depth																		
12-19196	MW-08	2012	1	Phase I	30-40	2.60	<0.50	4.9	2.0	5.1	3.0	3.8	**24.0**	<0.020	<5.0	<10	<50	<50
P214-8WB	MW-08	2014	3	Phase I	40-50	2.40	0.070	3.2	1.9	4.2	<4.9	3.7	12.0	<0.10	<10	<50	<50	<100
P216-8WB	MW-08	2016	5	Phase I	40-50	3.10	0.060	7.5	1.3	3.3	2.2	4.3	<10	<0.010	<12	<10	<50	<50
MW-08B	MW-08	2018	7	Phase I	40-50	2.40	0.058	3.3	1.5	2.6	2.2	2.4	10.0	<0.010	<7.0	<4.0	<8.0	<6.0

Downgradient						As (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C6-C10 (mg/kg)	F2* C10-C16 (mg/kg)	F3 C16-C34 (mg/kg)	F4 C34-C50 (mg/kg)
MW-05 surface																		
12-19182	MW-05	2012	1	Phase I	0-10	2.90	<0.50	3.0	1.0	3.6	2.7	1.8	14.5	<0.010	<5.0	<10	<50	<50
12-19183 (Interlab)	MW-05	2012	1	Phase I	0-10	1.48	<1.0	<20	<5.0	5.3	<10	<5.0	**16.0**	<0.050	<10	<4.0	9.6	10.0
P214-5WA	MW-05	2014	3	Phase I	0-15	1.10	0.090	2.7	0.8	4.0	<4.9	2.6	11.0	<0.10	<10	<50	<50	<100
P216-5WA	MW-05	2016	5	Phase I	0-15	1.40	0.065	3.3	<0.50	2.2	1.8	1.8	<10	<0.010	<12	<10	<50	<50
P216-BD2 (Dup)	MW-05	2016	5	Phase I	0-15	1.80	0.077	2.1	0.5	3.0	1.9	1.4	<10	<0.010	<12	<10	<50	<50
P216-5WA (Interlab)	MW-05	2016	5	Phase I	0-15	1.90	0.070	2.5	0.6	3.1	1.7	2.4	10.0	<0.050	<10	<50	<50	<100
MW-05A	MW-05	2018	7	Phase I	0-15	1.10	0.081	1.8	<0.05	3.1	1.9	1.6	10.0	<0.010	<7.0	<4.0	11.0	<6.0
MW-05 depth																		
12-19184	MW-05	2012	1	Phase I	30-40	3.30	<0.50	2.9	1.0	2.2	2.5	1.6	10.1	<0.020	<5.0	<10	<50	<50
12-19185 (Dup)	MW-05	2012	1	Phase I	30-40	3.40	<0.50	2.9	1.0	2.5	2.7	1.8	10.4	<0.020	<5.0	<10	<50	<50
P214-5WB	MW-05	2014	3	Phase I	40-50	1.20	0.070	5.6	1.7	5.4	<4.9	4.9	**16.0**	<0.10	<10	<50	<50	<100
P216-5WB	MW-05	2016	5	Phase I	40-50	1.40	0.060	4.2	0.7	3.2	2.3	2.6	<10	<0.010	<12	<10	<50	<50
MW-05B	MW-05	2018	7	Phase I	40-50	1.20	0.086	3.3	0.8	5.2	2.1	2.8	15.0	<0.010	<7.0	<4.0	<8.0	<6.0

Downgradient						As (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C6-C10 (mg/kg)	F2* C10-C16 (mg/kg)	F3 C16-C34 (mg/kg)	F4 C34-C50 (mg/kg)
MW-07 surface																		
12-19190	MW-07	2012	1	Phase I	0-10	2.20	<0.50	1.9	<1.0	2.7	1.3	2.2	11.0	<0.020	<5.0	<10	<50	<50
P214-7WA	MW-07	2014	3	Phase I	0-15	2.10	0.090	6.0	2.9	**7.6**	<4.9	**5.6**	**20.0**	<0.10	<10	<50	<50	<100
P216-7WA	MW-07	2016	5	Phase I	0-15	2.20	0.081	15.0	2.8	**8.3**	3.4	**9.0**	**20.0**	<0.010	<12	<10	<50	<50
MW-07A	MW-07	2018	7	Phase I	0-15	2.80	0.076	3.9	1.4	3.7	2.7	3.1	**17.0**	<0.010	<7.0	<4.0	<8.0	<6.0
MW-07 depth																		
12-19192	MW-07	2012	1	Phase I	30-40	1.20	<0.50	1.7	<1.0	4.8	1.4	1.6	6.2	<0.020	<5.0	<10	<50	<50
P214-7WB	MW-07	2014	3	Phase I	40-50	2.30	0.070	5.9	3.0	**8.6**	<4.9	**5.8**	**16.0**	<0.10	<10	<50	<50	<100
P216-7WB	MW-07	2016	5	Phase I	25-35	2.40	0.089	6.6	2.2	5.8	3.2	4.8	**25.0**	<0.010	<12	<10	<50	<50
MW-07B	MW-07	2018	7	Phase I	40-50	2.80	0.054	3.2	1.2	3.3	2.4	2.4	14.0	<0.010	<7.0	<4.0	8.3	<6.0

Downgradient						As (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C6-C10 (mg/kg)	F2* C10-C16 (mg/kg)	F3 C16-C34 (mg/kg)	F4 C34-C50 (mg/kg)
MW-06 surface																		
12-19186	MW-06	2012	1	Phase I	0-10	1.00	<0.50	2.5	<1.0	3.8	1.9	2.2	10.0	<0.020	<5.0	<10	<50	<50
P214-6WA	MW-06	2014	3	Phase I	0-15	2.40	0.070	2.9	1.1	4.9	<5.0	2.9	11.0	<0.10	<10	<50	<50	<100
P214-BD6 (Dup)	MW-06	2014	3	Phase I	0-15	2.80	0.080	2.9	1.1	4.3	<4.9	3.5	12.0	<0.100	<10	<50	<50	<100
P214-6WA (Interlab)	MW-06	2014	3	Phase I	0-15	3.40	<0.10	2.6	<1.0	<5.0	2.4	2.1	14.0	<0.010	<12	<10	<50	N/A
P216-6WA	MW-06	2016	5	Phase I	0-15	3.20	0.110	3.9	0.5	**7.3**	2.1	3.3	13.0	<0.010	<12	<10	<50	<50
MW-06A	MW-06	2018	7	Phase I	0-15	3.60	0.110	2.8	0.9	5.3	2.8	2.8	**17.0**	<0.010	<7.0	<4.0	**22.0**	<6.0
MW-06 depth																		
12-19188	MW-06	2012	1	Phase I	30-40	1.10	<0.50	4.7	1.2	4.8	2.4	3.5	12.0	<0.020	<5.0	<10	<50	<50
P214-6WB	MW-06	2014	3	Phase I	40-50	**4.30**	0.270	7.4	1.2	5.4	<4.9	3.0	**40.0**	<0.10	<10	<50	<50	<100
P216-6WB	MW-06	2016	5	Phase I	40-50	2.10	0.070	6.6	0.9	**8.8**	3.2	4.4	12.0	<0.010	<12	<10	<50	<50
MW-06B	MW-06	2018	7	Phase I	40-50	**15.00**	0.440	3.3	1.4	5.4	5.4	4.1	**62.0**	<0.010	<7.0	<4.0	<8.0	<6.0
Dup 2	MW-06	2018	7	Phase I	40-50	**18.00**	0.450	3.4	1.5	6.3	6.7	4.6	**64.0**	<0.010	<7.0	**5.2**	15.0	<6.0

PIN-2 Non-Hazarcous Waste Landfill - Soil	As (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C6-C10 (mg/kg)	F2* C10-C16 (mg/kg)	F3 C16-C34 (mg/kg)	F4 C34-C50 (mg/kg)
Background Data - Arithmetic Mean	2.9	1.0	20.0	5.0	8.7	10.0	5.0	15.0	0.010	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean	**3.8**	**1.0**	**20.0**	**5.0**	**6.5**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**4.0**	**20.3**	**16.3**
Baseline Data - Standard Deviation	2.6	0.0	0.0	0.0	7.1	0.0	0.0	0.0	0.00	0.0	0.0	26.5	11.2
Baseline Data Mean + 3x Standard Deviation	**11.7**	**1.0**	**20.0**	**5.0**	**27.7**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**4.0**	**99.9**	**49.9**
If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.													
DEW Line Cleanup Tier I Criteria						*200*			*1*				
DEW Line Cleanup Tier II Criteria	*30*	*5*	*250*	*50*	*100*	*500*	*100*	*500*	*5*				

LEGEND

- MONITORING SOIL SAMPLE LOCATION (4)
- MONITORING WELL LOCATION (3)
- B — BACKGROUND MONITORING WELL LOCATION (1)

Legend	
XX	Sample exceeds baseline mean
XX	Sample exceeds baseline mean + 3x SD

0m 10m 20m 30m 40m 50m

NO.	VERSION	DATE	BY	VERIF.	APPR.
00	DRAFT V.5	2019.03.08	R.F.	T.A.	C.G.

Construction de Défense Canada
Defence Construction Canada

COLLECTION OF LANDFILL MONITORING DATA

PIN-2, CAPE YOUNG, NUNAVUT

NON-HAZARDOUS WASTE LANDFILL SOIL CHEMISTRY

ARCADIS
1050 Morrison Drive, Suite 201, Ottawa, Ontario, K2H 8K7
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MEASUREMENT UNIT	SCALE:	DATE (month–year):
Metre	1 : 1,000	MARCH 2019
DRAWN BY:	**VERIFIED BY:**	**APPROVED BY:**
R. FLETCHER	T. AUSTRINS	C. GRAVELLE P. ENG
PROJECT NO:	**DRAWING NO:**	**PAGE**
102012-000	102012-000-PIN-2.8	2

FIGURE PIN-2.8B

PIN-2 Non-Hazarcous Waste Landfill - Groundwater					As (mg/L)	Cd* (mg/L)	Cr (mg/L)	Co (mg/L)	Cu (mg/L)	Pb (mg/L)	Ni (mg/L)	Zn (mg/L)	F1* C6-C10 (mg/L)	F2* C10-C16 (mg/L)	F3* C16-C34 (mg/L)	F4* C34-C50 (mg/L)
Baseline Data																
Upgradient																
No data - well dry/frozen																
Downgradient																
10-5020	MW-05	2010			0.050	<0.0010	0.10	0.010	0.080	0.020	0.080	0.080	<0.050	<0.5	<1.0	<1.0
10-5021 (Dup)	MW-05	2010			0.040	<0.0010	0.14	<0.0030	0.060	0.020	0.090	0.060	<0.050	<0.5	<1.0	<1.0
10-5019	MW-06	2010			0.046	<0.0010	0.090	0.005	0.149	0.018	0.088	0.865	<0.050	<0.5	<1.0	<1.0
10-5016	MW-07	2010			0.022	<0.0010	0.16	0.009	0.066	0.011	0.097	0.039	<0.050	<0.5	<1.0	<1.0
11-6964	MW-05	2011			0.013	<0.0010	0.066	<0.0030	0.069	<0.010	0.006	0.212	<0.050	<0.5	<1.0	<1.0
11-6963	MW-06	2011			0.016	<0.0010	0.027	<0.0030	0.058	<0.010	<0.0050	1.650	<0.050	<0.5	<1.0	<1.0
11-6965	MW-07	2011			0.011	<0.0010	0.074	0.004	0.040	<0.010	0.012	0.053	<0.050	<0.5	<1.0	<1.0
				N value	7	7	7	7	7	7	7	7	7	7	7	7
Baseline Data - Arithmetic Mean					0.0284	0.0010	0.0931	0.0048	0.0744	0.0121	0.0537	0.42	0.025	0.25	0.5	0.5
Baseline Data - Arithmetic Mean Corrected for Detection Limit					**0.0284**	**0.0010**	**0.0931**	**0.0048**	**0.0744**	**0.0121**	**0.0537**	**0.42**	**0.050**	**0.50**	**1.0**	**1.0**
Baseline Data - Standard Deviation					0.0165	0.0000	0.0439	0.0037	0.0351	0.0072	0.0441	0.62	0.000	0.00	0.0	0.0
Baseline Data - Corrected Arithmetic Mean + 3x Standard Deviation					**0.0778**	**0.0010**	**0.2249**	**0.0159**	**0.1798**	**0.0338**	**0.1861**	**2.27**	**0.050**	**0.50**	**1.0**	**1.0**
If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.																

Downgradient - MW-05					As	Cd*	Cr*	Co*	Cu	Pb*	Ni*	Zn*	Total PCB*	F1* C6-C10	F2* C10-C16	F3 C16-C34
12-19316	MW-05	2012	1	Phase I	0.0227	0.00022	0.0424	0.0043	0.0275	0.0110	0.0229	0.0870	<0.025	<0.10	<0.25	<0.25
P214-5W	MW-05	2014	3	Phase I	0.0061	<0.000010	**0.264**	0.0015	0.0460	0.0023	0.0390	0.0650	<0.20	<0.20	<0.10	<0.10
P214-BDW1 (Dup)	MW-05	2014	3	Phase I	0.0177	**0.110**	**0.704**	0.0047	**0.123**	0.0064	**0.115**	0.1630	<0.20	<0.20	0.10	<0.10
P214-5W (Interlab)	MW-05	2014	3	Phase I	0.0056	**0.0880**	**0.210**	0.0012	0.0380	0.0026	0.0320	0.0500	<0.10	<0.10	<0.20	N/A
P216-5W	MW-05	2016	5	Phase I	0.00031	0.000016	<0.0010	<0.00050	0.0012	<0.00020	0.0024	0.0110	<0.10	<0.10	<0.20	N/A
MW-5	MW-05	2018	7	Phase I	0.00040	<0.000020	0.0025	<0.00030	0.0014	<0.00010	0.0021	0.0220	<0.025	<0.10	<0.10	<0.10

Downgradient - MW-06					As	Cd*	Cr*	Co*	Cu	Pb*	Ni*	Zn*	Total PCB*	F1* C6-C10	F2* C10-C16	F3 C16-C34
12-19317	MW-06	2012	1	Phase I	0.0274	0.00029	0.0418	**0.0050**	0.0670	**0.0130**	0.0530	**1.1500**	<0.025	<0.10	<0.25	<0.25
P214-6W	MW-06	2014	3	Phase I	0.0179	0.00013	**0.8780**	**0.0069**	**0.237**	0.0069	**0.239**	**3.7000**	<0.20	<0.20	<0.10	<0.10
P216-6W	MW-06	2016	5	Phase I	0.00080	0.000041	0.0140	<0.00050	0.0126	0.00038	0.0203	**0.4620**	<0.10	<0.10	<0.20	N/A
MW-6	MW-06	2018	7	Phase I	0.00051	<0.000020	<0.0010	<0.00030	0.0026	<0.00010	0.0029	0.1200	<0.025	<0.10	<0.10	<0.10

Downgradient - MW-07					As	Cd*	Cr*	Co*	Cu	Pb*	Ni*	Zn*	Total PCB*	F1* C6-C10	F2* C10-C16	F3 C16-C34
12-19318	MW-07	2012	1	Phase I	0.0100	0.00016	0.0131	0.0044	0.0140	0.0053	0.0140	0.0260	<0.025	<0.10	<0.25	<0.25
P214-7W	MW-07	2014	3	Phase I	0.0130	0.00037	**0.485**	**0.0130**	0.0620	0.0067	**0.132**	0.2660	<0.20	<0.20	0.10	0.10
P216-7W	MW-07	2016	5	Phase I	0.00045	0.000015	0.0044	<0.00050	0.0044	<0.00020	0.0040	0.0102	<0.10	<0.10	<0.20	N/A
MW-7	MW-07	2018	7	Phase I	0.00052	<0.000020	<0.0010	<0.00030	0.0011	<0.00010	0.0011	0.0035	<0.025	<0.10	<0.10	<0.10

503 000 E
503 100 E
503 200 E
7 645 300 N
7 645 200 N
MW–08 B
MW–05
MW–06
MW–07
NON–HAZARDOUS WASTE LANDFILL
ADDITIONAL TYPE 2 GRANULAR FILL PLACEMENT
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LEGEND

- MONITORING SOIL SAMPLE LOCATION (4)
- MONITORING WELL LOCATION (3)
- B BACKGROUND MONITORING WELL LOCATION (1)

Legend	
XX	Sample exceeds baseline mean
XX	Sample exceeds baseline mean + 3x SD

0m 10m 20m 30m 40m 50m

NO.	VERSION	DATE	BY	VERIF.	APPR.
00	DRAFT V.5	2019.03.08	R.F.	T.A.	C.G.

Construction de Défense Canada
Defence Construction Canada

COLLECTION OF LANDFILL MONITORING DATA

PIN-2, CAPE YOUNG, NUNAVUT

NON-HAZARDOUS WASTE LANDFILL GROUNDWATER CHEMISTRY

ARCADIS
1050 Morrison Drive, Suite 201, Ottawa, Ontario, K2H 8K7
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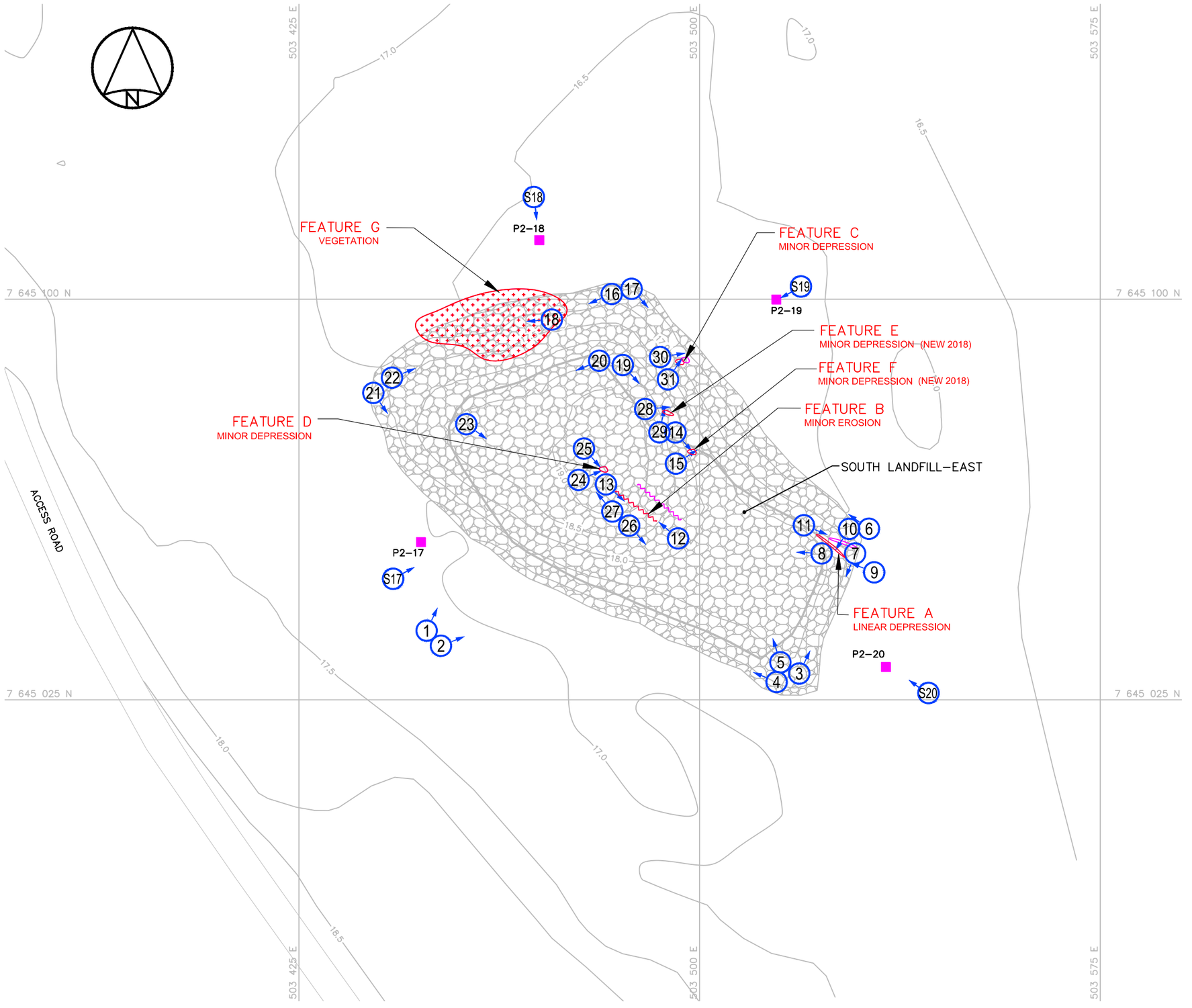
MEASUREMENT UNIT	SCALE:	DATE (month–year):
Metre	1 : 1,000	MARCH 2019
DRAWN BY: R. FLETCHER	VERIFIED BY: T. AUSTRINS	APPROVED BY: C. GRAVELLE P. ENG
PROJECT NO: 102012-000	DRAWING NO: 102012-000-PIN-2.8	PAGE 3

FIGURE PIN-2.8C



LEGEND

- MONITORING SOIL SAMPLE LOCATION (4)
- APPROX. PHOTOGRAPHIC VIEWPOINT (2018)
- LANDFILL EXTENT
- ELEVATION CONTOUR
- MINOR SETTLEMENT
- MINOR EROSION
- SPARSE VEGETATION
- APPROXIMATE 2016 OBSERVATIONS (TO ILLUSTRATE CHANGES)

0m 7.5m 15.0m 22.5m 30.0m 37.5m

NO.	VERSION	DATE	BY	VERIF.	APPR.
00	DRFT V.5	2019.03.08	R.F.	T.A.	C.G.

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Defence Construction Canada

COLLECTION OF
LANDFILL MONITORING DATA

PIN-2, CAPE YOUNG, NUNAVUT

SOUTH LANDFILL - EAST
PLAN/MONITORING/OBSERVATIONS

ARCADIS

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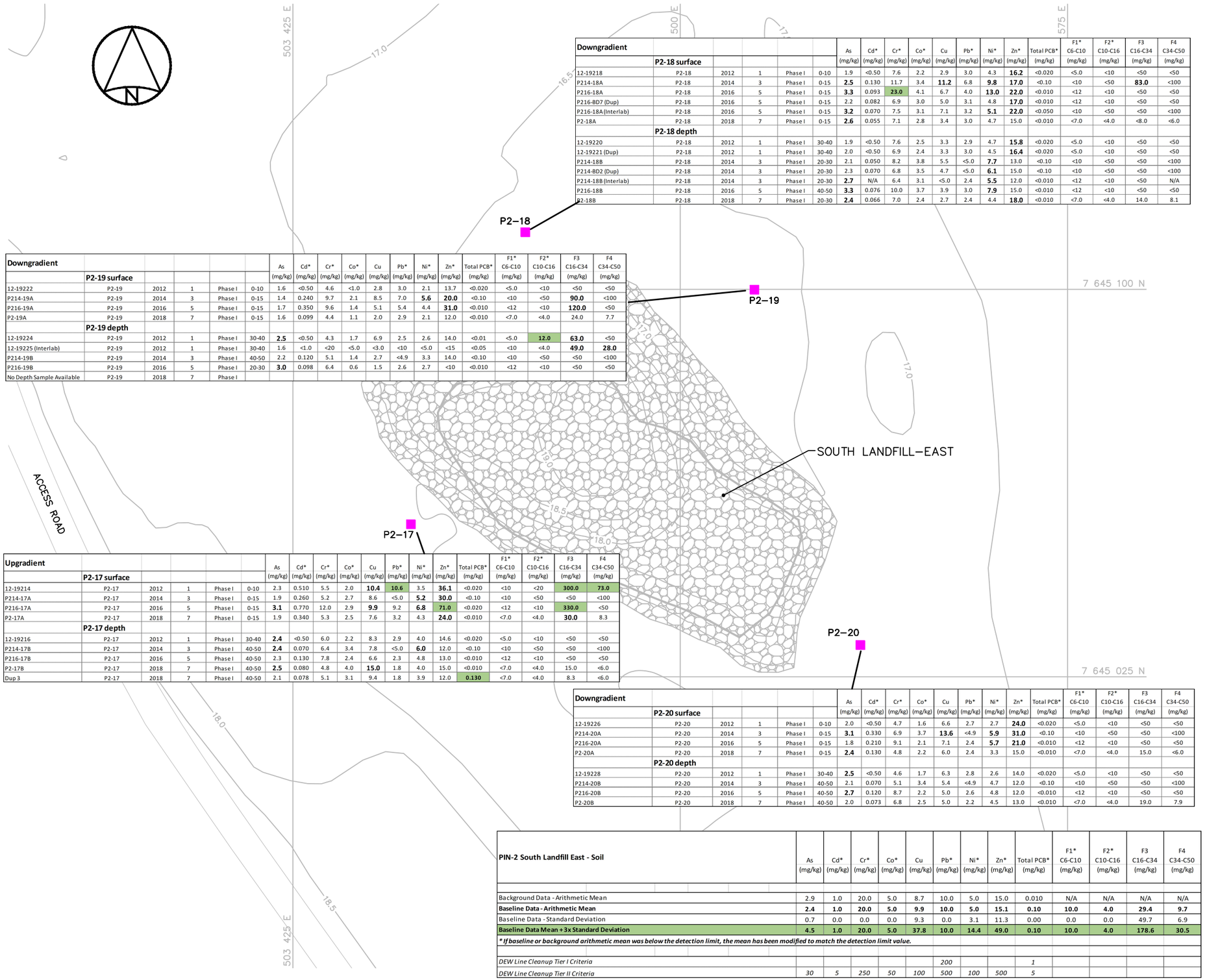
MEASUREMENT UNIT	SCALE:	DATE (month–year):
Metre	1 : 750	MARCH 2019
DRAWN BY:	VERIFIED BY:	APPROVED BY:
R. FLETCHER	T. AUSTRINS	C. GRAVELLE P. ENG
PROJECT NO:	DRAWING NO:	PAGE
102012-000	102012-000-PIN-2.9	1

FIGURE PIN-2.9A



Downgradient						As	Cd*	Cr*	Co*	Cu	Pb*	Ni*	Zn*	Total PCB*	F1* C6-C10	F2* C10-C16	F3 C16-C34	F4 C34-C50
						(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
P2-19 surface																		
12-19222	P2-19	2012	1	Phase I	0-10	1.6	<0.50	4.6	<1.0	2.8	3.0	2.1	13.7	<0.020	<5.0	<10	<50	<50
P214-19A	P2-19	2014	3	Phase I	0-15	1.4	0.240	9.7	2.1	8.5	7.0	**5.6**	**20.0**	<0.10	<10	<50	**90.0**	<100
P216-19A	P2-19	2016	5	Phase I	0-15	1.7	0.350	9.6	1.4	5.1	5.4	4.4	**31.0**	<0.010	<12	<10	**120.0**	<50
P2-19A	P2-19	2018	7	Phase I	0-15	1.6	0.099	4.4	1.1	2.0	2.9	2.1	12.0	<0.010	<7.0	<4.0	24.0	7.7
P2-19 depth																		
12-19224	P2-19	2012	1	Phase I	30-40	**2.5**	<0.50	4.3	1.7	6.9	2.5	2.6	14.0	<0.01	<5.0	**12.0**	**63.0**	<50
12-19225 (Interlab)	P2-19	2012	1	Phase I	30-40	1.6	<1.0	<20	<5.0	<3.0	<10	<5.0	<15	<0.05	<10	<4.0	**49.0**	**28.0**
P214-19B	P2-19	2014	3	Phase I	40-50	2.2	0.120	5.1	1.4	2.7	<4.9	3.3	14.0	<0.10	<10	<50	<50	<100
P216-19B	P2-19	2016	5	Phase I	20-30	**3.0**	0.098	6.4	0.6	1.5	2.6	2.7	<10	<0.010	<12	<10	<50	<50
No Depth Sample Available	P2-19	2018	7	Phase I														

Upgradient						As	Cd*	Cr*	Co*	Cu	Pb*	Ni*	Zn*	Total PCB*	F1* C6-C10	F2* C10-C16	F3 C16-C34	F4 C34-C50
						(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
P2-17 surface																		
12-19214	P2-17	2012	1	Phase I	0-10	2.3	0.510	5.5	2.0	**10.4**	**10.6**	3.5	**36.1**	<0.020	<10	<20	**300.0**	**73.0**
P214-17A	P2-17	2014	3	Phase I	0-15	1.9	0.260	5.2	2.7	8.6	<5.0	**5.2**	**30.0**	<0.10	<10	<50	<50	<100
P216-17A	P2-17	2016	5	Phase I	0-15	**3.1**	0.770	12.0	2.9	**9.9**	9.2	**6.8**	71.0	<0.020	<12	<10	**330.0**	<50
P2-17A	P2-17	2018	7	Phase I	0-15	1.9	0.340	5.3	2.5	7.6	3.2	4.3	**24.0**	<0.010	<7.0	<4.0	**30.0**	8.3
P2-17 depth																		
12-19216	P2-17	2012	1	Phase I	30-40	**2.4**	<0.50	6.0	2.2	8.3	2.9	4.0	14.6	<0.020	<5.0	<10	<50	<50
P214-17B	P2-17	2014	3	Phase I	40-50	**2.4**	0.070	6.4	3.4	7.8	<5.0	**6.0**	12.0	<0.10	<10	<50	<50	<100
P216-17B	P2-17	2016	5	Phase I	40-50	2.3	0.130	7.8	2.4	6.6	2.3	4.8	13.0	<0.010	<12	<10	<50	<50
P2-17B	P2-17	2018	7	Phase I	40-50	**2.5**	0.080	4.8	4.0	**15.0**	1.8	4.0	15.0	<0.010	<7.0	<4.0	15.0	<6.0
Dup 3	P2-17	2018	7	Phase I	40-50	2.1	0.078	5.1	3.1	9.4	1.8	3.9	12.0	**0.130**	<7.0	<4.0	8.3	<6.0

Downgradient						As	Cd*	Cr*	Co*	Cu	Pb*	Ni*	Zn*	Total PCB*	F1* C6-C10	F2* C10-C16	F3 C16-C34	F4 C34-C50
						(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
P2-20 surface																		
12-19226	P2-20	2012	1	Phase I	0-10	2.0	<0.50	4.7	1.6	6.6	2.7	2.7	**24.0**	<0.020	<5.0	<10	<50	<50
P214-20A	P2-20	2014	3	Phase I	0-15	**3.1**	0.330	6.9	3.7	**13.6**	<4.9	**5.9**	**31.0**	<0.10	<10	<50	<50	<100
P216-20A	P2-20	2016	5	Phase I	0-15	1.8	0.210	9.1	2.1	7.1	2.4	**5.7**	**21.0**	<0.010	<12	<10	<50	<50
P2-20A	P2-20	2018	7	Phase I	0-15	**2.4**	0.130	4.8	2.2	6.0	2.4	3.3	15.0	<0.010	<7.0	<4.0	15.0	<6.0
P2-20 depth																		
12-19228	P2-20	2012	1	Phase I	30-40	**2.5**	<0.50	4.6	1.7	6.3	2.8	2.6	14.0	<0.020	<5.0	<10	<50	<50
P214-20B	P2-20	2014	3	Phase I	40-50	2.1	0.070	5.1	3.4	5.4	<4.9	4.7	12.0	<0.10	<10	<50	<50	<100
P216-20B	P2-20	2016	5	Phase I	40-50	**2.7**	0.120	8.7	2.2	5.0	2.6	4.8	12.0	<0.010	<12	<10	<50	<50
P2-20B	P2-20	2018	7	Phase I	40-50	2.0	0.073	6.8	2.5	5.0	2.2	4.5	13.0	<0.010	<7.0	<4.0	19.0	7.9

PIN-2 South Landfill East - Soil	As (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1* C6-C10 (mg/kg)	F2* C10-C16 (mg/kg)	F3 C16-C34 (mg/kg)	F4 C34-C50 (mg/kg)
Background Data - Arithmetic Mean	2.9	1.0	20.0	5.0	8.7	10.0	5.0	15.0	0.010	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean	**2.4**	**1.0**	**20.0**	**5.0**	**9.9**	**10.0**	**5.0**	**15.1**	**0.10**	**10.0**	**4.0**	**29.4**	**9.7**
Baseline Data - Standard Deviation	0.7	0.0	0.0	0.0	9.3	0.0	3.1	11.3	0.00	0.0	0.0	49.7	6.9
Baseline Data Mean + 3x Standard Deviation	**4.5**	**1.0**	**20.0**	**5.0**	**37.8**	**10.0**	**14.4**	**49.0**	**0.10**	**10.0**	**4.0**	**178.6**	**30.5**
**** If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.***													
DEW Line Cleanup Tier I Criteria						*200*			*1*				
DEW Line Cleanup Tier II Criteria	*30*	*5*	*250*	*50*	*100*	*500*	*100*	*500*	*5*				

LEGEND

MONITORING SOIL SAMPLE LOCATION (4)

Legend	
XX	Sample exceeds baseline mean
XX	Sample exceeds baseline mean + 3x SD

0m 7.5m 15.0m 22.5m 30.0m 37.5m

NO.	VERSION	DATE	BY	VERIF.	APPR.
00	DRAFT V.5	2019.03.08	R.F.	T.A.	C.G.

Construction de Défense Canada
Defence Construction Canada

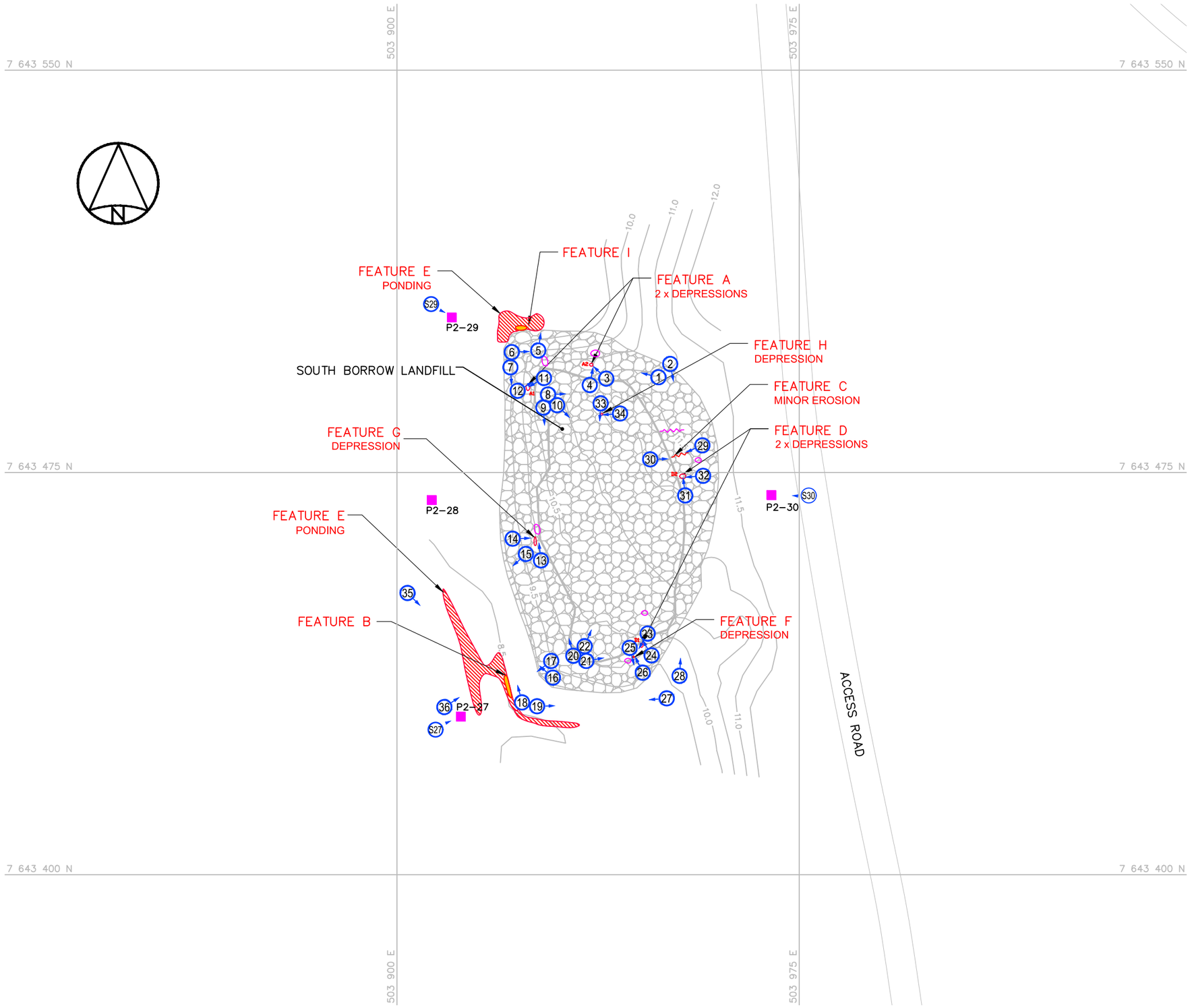
COLLECTION OF
LANDFILL MONITORING DATA
PIN-2, CAPE YOUNG, NUNAVUT

SOUTH LANDFILL - EAST
SOIL CHEMISTRY

ARCADIS
1050 Morrison Drive, Suite 201, Ottawa, Ontario, K2H 8K7
Office General +1 613 721 0555

MEASUREMENT UNIT	SCALE:	DATE (month–year):
Metre	1 : 750	MARCH 2019
DRAWN BY:	**VERIFIED BY:**	**APPROVED BY:**
R. FLETCHER	T. AUSTRINS	C. GRAVELLE P. ENG
PROJECT NO:	**DRAWING NO:**	**PAGE**
102012-000	102012-000-PIN-2.9	2

FIGURE PIN-2.9B



LEGEND

- MONITORING SOIL SAMPLE LOCATION (4)
- APPROX. PHOTOGRAPHIC VIEWPOINT (2018)
- LANDFILL EXTENT
- ELEVATION CONTOUR
- MINOR SETTLEMENT
- RUST-COLOURED ORGANIC MATERIAL
- PONDING
- MINOR EROSION
- APPROXIMATE 2016 OBSERVATIONS (TO ILLUSTRATE CHANGES)

0m 7.5m 15.0m 22.5m 30.0m 37.5m

NO.	VERSION	DATE	BY	VERIF.	APPR.
00	DRAFT V.5	2019.03.08	R.F.	T.A.	C.G.

Construction de Défense Canada
Defence Construction Canada

COLLECTION OF
LANDFILL MONITORING DATA

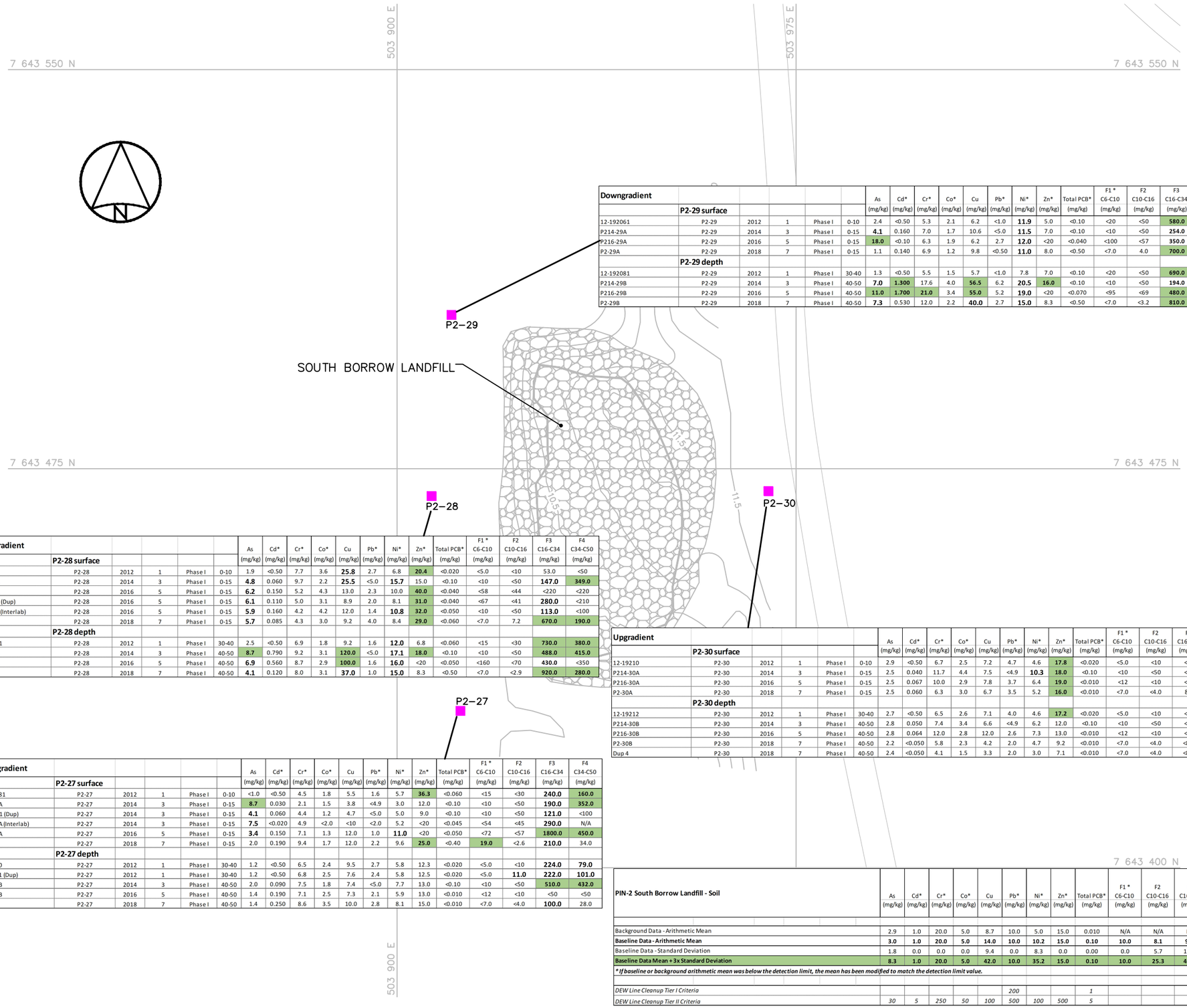
PIN-2, CAPE YOUNG, NUNAVUT

SOUTH BORROW LANDFILL
PLAN/MONITORING/OBSERVATIONS

ARCADIS
1050 Morrison Drive, Suite 201, Ottawa, Ontario, K2H 8K7
Office General +1 613 721 0555

MEASUREMENT UNIT	SCALE:	DATE (month-year):
Metre	1 : 750	MARCH 2019
DRAWN BY:	VERIFIED BY:	APPROVED BY:
R. FLETCHER	T. AUSTRINS	C. GRAVELLE P. ENG
PROJECT NO:	DRAWING NO:	PAGE
102012-000	102012-000-PIN-2.10	1

FIGURE PIN-2.10A



Downgradient						As (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1 * C6-C10 (mg/kg)	F2 C10-C16 (mg/kg)	F3 C16-C34 (mg/kg)	F4 C34-C50 (mg/kg)
	P2-29 surface																	
12-192061	P2-29	2012	1	Phase I	0-10	2.4	<0.50	5.3	2.1	6.2	<1.0	**11.9**	5.0	<0.10	<20	<50	**580.0**	**290.0**
P214-29A	P2-29	2014	3	Phase I	0-15	**4.1**	0.160	7.0	1.7	10.6	<5.0	**11.5**	7.0	<0.10	<10	<50	**254.0**	**220.0**
P216-29A	P2-29	2016	5	Phase I	0-15	**18.0**	<0.10	6.3	1.9	6.2	2.7	**12.0**	<20	<0.040	<100	<57	**350.0**	<290
P2-29A	P2-29	2018	7	Phase I	0-15	1.1	0.140	6.9	1.2	9.8	<0.50	**11.0**	8.0	<0.50	<7.0	4.0	**700.0**	**240.0**
	P2-29 depth																	
12-192081	P2-29	2012	1	Phase I	30-40	1.3	<0.50	5.5	1.5	5.7	<1.0	7.8	7.0	<0.10	<20	<50	**690.0**	**290.0**
P214-29B	P2-29	2014	3	Phase I	40-50	**7.0**	**1.300**	17.6	4.0	**56.5**	6.2	**20.5**	**16.0**	<0.10	<10	<50	**194.0**	**207.0**
P216-29B	P2-29	2016	5	Phase I	40-50	**11.0**	**1.700**	**21.0**	3.4	**55.0**	5.2	**19.0**	<20	<0.070	<95	<69	**480.0**	<350
P2-29B	P2-29	2018	7	Phase I	40-50	**7.3**	0.530	12.0	2.2	**40.0**	2.7	**15.0**	8.3	<0.50	<7.0	<3.2	**810.0**	**260.0**

Downgradient						As (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1 * C6-C10 (mg/kg)	F2 C10-C16 (mg/kg)	F3 C16-C34 (mg/kg)	F4 C34-C50 (mg/kg)
	P2-28 surface																	
12-19202	P2-28	2012	1	Phase I	0-10	1.9	<0.50	7.7	3.6	**25.8**	2.7	6.8	**20.4**	<0.020	<5.0	<10	53.0	<50
P214-28A	P2-28	2014	3	Phase I	0-15	**4.8**	0.060	9.7	2.2	**25.5**	<5.0	**15.7**	15.0	<0.10	<10	<50	**147.0**	**349.0**
P216-28A	P2-28	2016	5	Phase I	0-15	**6.2**	0.150	5.2	4.3	13.0	2.3	10.0	**40.0**	<0.040	<58	<44	<220	<220
P216-BD8 (Dup)	P2-28	2016	5	Phase I	0-15	**6.1**	0.110	5.0	3.1	8.9	2.0	8.1	**31.0**	<0.040	<67	<41	**280.0**	<210
P216-28A (Interlab)	P2-28	2016	5	Phase I	0-15	**5.9**	0.160	4.2	4.2	12.0	1.4	**10.8**	**32.0**	<0.050	<10	<50	**113.0**	<100
P2-28A	P2-28	2018	7	Phase I	0-15	**5.7**	0.085	4.3	3.0	9.2	4.0	8.4	**29.0**	<0.060	<7.0	7.2	**670.0**	**190.0**
	P2-28 depth																	
12-192041	P2-28	2012	1	Phase I	30-40	2.5	<0.50	6.9	1.8	9.2	1.6	**12.0**	6.8	<0.060	<15	<30	**730.0**	**380.0**
P214-28B	P2-28	2014	3	Phase I	40-50	**8.7**	0.790	9.2	3.1	**120.0**	<5.0	**17.1**	**18.0**	<0.10	<10	<50	**488.0**	**415.0**
P216-28B	P2-28	2016	5	Phase I	40-50	**6.9**	0.560	8.7	2.9	**100.0**	1.6	**16.0**	<20	<0.050	<160	<70	**430.0**	<350
P2-28B	P2-28	2018	7	Phase I	40-50	**4.1**	0.120	8.0	3.1	**37.0**	1.0	**15.0**	8.3	<0.50	<7.0	<2.9	**920.0**	**280.0**

Upgradient						As (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1 * C6-C10 (mg/kg)	F2 C10-C16 (mg/kg)	F3 C16-C34 (mg/kg)	F4 C34-C50 (mg/kg)
	P2-30 surface																	
12-19210	P2-30	2012	1	Phase I	0-10	2.9	<0.50	6.7	2.5	7.2	4.7	4.6	**17.8**	<0.020	<5.0	<10	<50	<50
P214-30A	P2-30	2014	3	Phase I	0-15	2.5	0.040	11.7	4.4	7.5	<4.9	**10.3**	**18.0**	<0.10	<10	<50	<50	<100
P216-30A	P2-30	2016	5	Phase I	0-15	2.5	0.067	10.0	2.9	7.8	3.7	6.4	**19.0**	<0.010	<12	<10	<50	<50
P2-30A	P2-30	2018	7	Phase I	0-15	2.5	0.060	6.3	3.0	6.7	3.5	5.2	**16.0**	<0.010	<7.0	<4.0	8.7	<6.0
	P2-30 depth																	
12-19212	P2-30	2012	1	Phase I	30-40	2.7	<0.50	6.5	2.6	7.1	4.0	4.6	**17.2**	<0.020	<5.0	<10	<50	<50
P214-30B	P2-30	2014	3	Phase I	40-50	2.8	0.050	7.4	3.4	6.6	<4.9	6.2	12.0	<0.10	<10	<50	<50	<100
P216-30B	P2-30	2016	5	Phase I	40-50	2.8	0.064	12.0	2.8	12.0	2.6	7.3	13.0	<0.010	<12	<10	<50	<50
P2-30B	P2-30	2018	7	Phase I	40-50	2.2	<0.050	5.8	2.3	4.2	2.0	4.7	9.2	<0.010	<7.0	<4.0	<8.0	<6.0
Dup 4	P2-30	2018	7	Phase I	40-50	2.4	<0.050	4.1	1.5	3.3	2.0	3.0	7.1	<0.010	<7.0	<4.0	<8.0	<6.0

Downgradient						As (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1 * C6-C10 (mg/kg)	F2 C10-C16 (mg/kg)	F3 C16-C34 (mg/kg)	F4 C34-C50 (mg/kg)
	P2-27 surface																	
12-191981	P2-27	2012	1	Phase I	0-10	<1.0	<0.50	4.5	1.8	5.5	1.6	5.7	**36.3**	<0.060	<15	<30	**240.0**	**160.0**
P214-27A	P2-27	2014	3	Phase I	0-15	**8.7**	0.030	2.1	1.5	3.8	<4.9	3.0	12.0	<0.10	<10	<50	**190.0**	**352.0**
P214-BD1 (Dup)	P2-27	2014	3	Phase I	0-15	**4.1**	0.060	4.4	1.2	4.7	<5.0	5.0	9.0	<0.10	<10	<50	**121.0**	<100
P214-27A (Interlab)	P2-27	2014	3	Phase I	0-15	**7.5**	<0.020	4.9	<2.0	<10	<2.0	5.2	<20	<0.045	<54	<45	**290.0**	N/A
P216-27A	P2-27	2016	5	Phase I	0-15	**3.4**	0.150	7.1	1.3	12.0	1.0	**11.0**	<20	<0.050	<72	<57	**1800.0**	**450.0**
P2-27A	P2-27	2018	7	Phase I	0-15	2.0	0.190	9.4	1.7	12.0	2.2	9.6	**25.0**	<0.40	**19.0**	<2.6	**210.0**	34.0
	P2-27 depth																	
12-19200	P2-27	2012	1	Phase I	30-40	1.2	<0.50	6.5	2.4	9.5	2.7	5.8	12.3	<0.020	<5.0	<10	**224.0**	**79.0**
12-19201 (Dup)	P2-27	2012	1	Phase I	30-40	1.2	<0.50	6.8	2.5	7.6	2.4	5.8	12.5	<0.020	<5.0	**11.0**	**222.0**	**101.0**
P214-27B	P2-27	2014	3	Phase I	40-50	2.0	0.090	7.5	1.8	7.4	<5.0	7.7	13.0	<0.10	<10	<50	**510.0**	**432.0**
P216-27B	P2-27	2016	5	Phase I	40-50	1.4	0.190	7.1	2.5	7.3	2.1	5.9	13.0	<0.010	<12	<10	<50	<50
P2-27B	P2-27	2018	7	Phase I	40-50	1.4	0.250	8.6	3.5	10.0	2.8	8.1	15.0	<0.010	<7.0	<4.0	**100.0**	28.0

PIN-2 South Borrow Landfill - Soil	As (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (mg/kg)	Total PCB* (mg/kg)	F1 * C6-C10 (mg/kg)	F2 C10-C16 (mg/kg)	F3 C16-C34 (mg/kg)	F4 C34-C50 (mg/kg)
Background Data - Arithmetic Mean	2.9	1.0	20.0	5.0	8.7	10.0	5.0	15.0	0.010	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean	**3.0**	**1.0**	**20.0**	**5.0**	**14.0**	**10.0**	**10.2**	**15.0**	**0.10**	**10.0**	**8.1**	**99.7**	**36.4**
Baseline Data - Standard Deviation	1.8	0.0	0.0	0.0	9.4	0.0	8.3	0.0	0.00	0.0	5.7	112.0	39.1
Baseline Data Mean + 3x Standard Deviation	**8.3**	**1.0**	**20.0**	**5.0**	**42.0**	**10.0**	**35.2**	**15.0**	**0.10**	**10.0**	**25.3**	**435.7**	**153.7**
** If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.*													
DEW Line Cleanup Tier I Criteria						*200*			*1*				
DEW Line Cleanup Tier II Criteria	*30*	*5*	*250*	*50*	*100*	*500*	*100*	*500*	*5*				

LEGEND

MONITORING SOIL SAMPLE LOCATION (4)

Legend	
XX	Sample exceeds baseline mean
XX	Sample exceeds baseline mean + 3x SD

0m 7.5m 15.0m 22.5m 30.0m 37.5m

NO.	VERSION	DATE	BY	VERIF.	APPR.
00	DRAFT V.5	2019.03.08	R.F.	T.A.	C.G.

Construction de Défense Canada
Defence Construction Canada

COLLECTION OF LANDFILL MONITORING DATA

PIN-2, CAPE YOUNG, NUNAVUT

SOUTH BORROW LANDFILL SOIL CHEMISTRY

ARCADIS
1050 Morrison Drive, Suite 201, Ottawa, Ontario, K2H 8K7
Office General +1 613 721 0555

MEASUREMENT UNIT	SCALE:	DATE (month–year):
Metre	1 : 750	MARCH 2019
DRAWN BY:	**VERIFIED BY:**	**APPROVED BY:**
R. FLETCHER	T. AUSTRINS	C. GRAVELLE P. ENG
PROJECT NO:	**DRAWING NO:**	**PAGE**
102012-000	102012-000-PIN-2.10	2

FIGURE PIN-2.10B

TABLES

Table 1:

PIN-2 Airstrip Landfill - Summary of Soil Monitoring Analytical Data

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Sample #	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (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)	F4 C_{34}-C_{50} (mg/kg)
Background Data - Arithmetic Mean						2.9	1.0	20.0	5.0	8.7	10.0	5.0	15.0	0.010	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean						**5.4**	**1.0**	**20.0**	**5.0**	**7.2**	**10.0**	**5.0**	**15.0**	**0.10**	**40.0**	**40.0**	**40.0**	**N/A**
Baseline Data - Standard Deviation						2.0	0.0	0.0	0.0	3.4	0.0	0.0	0.0	0.00	0.0	0.0	0.0	N/A
Baseline Data Mean + 3x Standard Deviation						**11.3**	**1.0**	**20.0**	**5.0**	**17.4**	**10.0**	**5.0**	**15.0**	**0.10**	**40.0**	**40.0**	**40.0**	**N/A**
**** If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.***																		
DEW Line Cleanup Tier I Criteria											*200*			*1*				
DEW Line Cleanup Tier II Criteria						*30*	*5*	*250*	*50*	*100*	*500*	*100*	*500*	*5*				
Monitoring Data																		
Upgradient																		
	P2-21 surface																	
12-19246	P2-21	2012	1	Phase I	0-10	2.80	<0.050	2.30	<1.0	3.20	4.60	1.80	10.00	<0.020	<5.0	<10	<50	<50
P214-21A	P2-21	2014	3	Phase I	0-15	3.10	0.060	4.10	1.60	5.40	5.30	3.50	13.00	<0.10	<10	<50	<50	<100
P216-21A	P2-21	2016	5	Phase I	0-15	2.90	<0.050	3.50	0.53	2.80	3.10	1.70	<10	<0.010	<12	<10	<50	<50
P2-21A	P2-21	2018	7	Phase II	0-15	2.70	0.091	2.10	0.56	**10.00**	4.50	1.10	10.00	<0.010	<7.0	<4.0	19.0	8.1
	P2-21 depth																	
12-19248	P2-21	2012	1	Phase I	30-40	2.90	<0.050	2.20	<1.0	3.10	4.80	1.30	8.00	<0.020	<5.0	<10	<50	<50
P214-21B	P2-21	2014	3	Phase I	40-50	3.70	0.040	7.00	2.00	4.80	<5.0	4.90	10.00	<0.10	<10	<50	<50	<100
P216-21B	P2-21	2016	5	Phase I	40-50	2.90	0.055	16.00	0.73	3.70	2.70	**6.00**	<10	<0.010	<12	<10	<50	<50
P2-21B	P2-21	2018	7	Phase II	40-50	2.70	<0.050	2.20	0.58	2.80	3.60	1.20	7.00	<0.010	<7.0	<4.0	12.0	<6.0
Dup 8	P2-21	2018	7	Phase II	40-50	2.40	0.061	1.70	<0.50	2.50	3.50	<1.0	7.00	<0.010	<7.0	6.2	17.0	7.5

Table 1:

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Sample #	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (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)	F4 C_{34}-C_{50} (mg/kg)
Background Data - Arithmetic Mean						2.9	1.0	20.0	5.0	8.7	10.0	5.0	15.0	0.010	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean						**5.4**	**1.0**	**20.0**	**5.0**	**7.2**	**10.0**	**5.0**	**15.0**	**0.10**	**40.0**	**40.0**	**40.0**	**N/A**
Baseline Data - Standard Deviation						2.0	0.0	0.0	0.0	3.4	0.0	0.0	0.0	0.00	0.0	0.0	0.0	N/A
Baseline Data Mean + 3x Standard Deviation						**11.3**	**1.0**	**20.0**	**5.0**	**17.4**	**10.0**	**5.0**	**15.0**	**0.10**	**40.0**	**40.0**	**40.0**	**N/A**
**** If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.***																		
DEW Line Cleanup Tier I Criteria											*200*			*1*				
DEW Line Cleanup Tier II Criteria						*30*	*5*	*250*	*50*	*100*	*500*	*100*	*500*	*5*				
Downgradient																		
	P2-22 surface																	
12-19250	P2-22	2012	1	Phase I	0-10	**6.00**	<0.050	2.80	<1.0	2.40	4.90	2.00	8.20	<0.020	<5.0	<10	<50	<50
P214-22A	P2-22	2014	3	Phase I	0-15	**6.00**	0.030	3.20	1.50	3.10	5.40	3.00	8.00	<0.10	<10	<50	<50	<100
P216-22A	P2-22	2016	5	Phase I	0-15	5.20	<0.050	2.90	0.69	2.20	3.90	1.90	<10	<0.010	<12	<10	<50	<50
P2-22A	P2-22	2018	7	Phase II	0-15	4.70	<0.050	2.30	0.79	2.00	3.40	1.60	5.90	<0.010	<7.0	<4.0	11.0	<6.0
	P2-22 depth																	
12-19252	P2-22	2012	1	Phase I	30-40	**6.10**	<0.050	3.00	1.00	2.70	4.40	2.20	10.00	<0.020	<5.0	<10	<50	<50
P214-22B	P2-22	2014	3	Phase I	40-50	**5.80**	0.040	3.30	2.40	4.00	<4.9	4.40	9.00	<0.10	<10	<50	<50	<100
P216-22B	P2-22	2016	5	Phase I	40-50	**5.60**	<0.050	5.50	0.79	1.90	3.60	3.20	<10	<0.010	<12	<10	<50	<50
P2-22B	P2-22	2018	7	Phase II	40-50	4.70	<0.050	2.00	0.62	2.10	3.30	1.50	4.80	<0.010	<7.0	<4.0	<8.0	<6.0

Table 1:

PIN-2 Airstrip Landfill - Summary of Soil Monitoring Analytical Data

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Sample #	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (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)	F4 C_{34}-C_{50} (mg/kg)
Background Data - Arithmetic Mean						2.9	1.0	20.0	5.0	8.7	10.0	5.0	15.0	0.010	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean						**5.4**	**1.0**	**20.0**	**5.0**	**7.2**	**10.0**	**5.0**	**15.0**	**0.10**	**40.0**	**40.0**	**40.0**	**N/A**
Baseline Data - Standard Deviation						2.0	0.0	0.0	0.0	3.4	0.0	0.0	0.0	0.00	0.0	0.0	0.0	N/A
Baseline Data Mean + 3x Standard Deviation						**11.3**	**1.0**	**20.0**	**5.0**	**17.4**	**10.0**	**5.0**	**15.0**	**0.10**	**40.0**	**40.0**	**40.0**	**N/A**
**** If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.***																		
DEW Line Cleanup Tier I Criteria											*200*			*1*				
DEW Line Cleanup Tier II Criteria						*30*	*5*	*250*	*50*	*100*	*500*	*100*	*500*	*5*				
Downgradient																		
	P2-23 surface																	
12-19254	P2-23	2012	1	Phase I	0-10	**7.10**	<0.050	2.30	<1.0	2.90	5.60	2.40	6.40	<0.020	<5.0	<10	<50	<50
P214-23A	P2-23	2014	3	Phase I	0-15	**8.30**	0.040	3.20	1.80	4.90	9.00	4.10	8.00	<0.10	<10	<50	<50	<100
P216-23A	P2-23	2016	5	Phase I	0-15	**7.50**	<0.050	9.00	0.97	3.80	5.30	**5.60**	<10	<0.010	<12	<10	<50	<50
P2-23A	P2-23	2018	7	Phase II	0-15	**8.50**	<0.050	2.00	0.86	3.60	4.90	2.40	**20.00**	<0.010	<7.0	<4.0	<8.0	<6.0
	P2-23 depth																	
12-19256	P2-23	2012	1	Phase I	30-40	**7.90**	<0.050	2.50	1.20	4.30	6.00	3.40	7.10	<0.020	<5.0	<10	<50	<50
P214-23B	P2-23	2014	3	Phase I	40-50	**7.70**	0.030	3.90	2.00	**9.60**	6.80	**7.60**	9.00	<0.10	<10	<50	<50	<100
P216-23B	P2-23	2016	5	Phase I	40-50	**6.90**	<0.050	5.10	0.88	3.50	4.90	3.70	<10	<0.010	<12	<10	<50	<50
P2-23B	P2-23	2018	7	Phase II	40-50	**5.60**	<0.050	1.90	0.65	2.70	4.10	1.80	4.70	<0.010	<7.0	<4.0	<8.0	<6.0

Table 1:

PIN-2 Airstrip Landfill - Summary of Soil Monitoring Analytical Data

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Sample #	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (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)	F4 C_{34}-C_{50} (mg/kg)
Background Data - Arithmetic Mean						2.9	1.0	20.0	5.0	8.7	10.0	5.0	15.0	0.010	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean						**5.4**	**1.0**	**20.0**	**5.0**	**7.2**	**10.0**	**5.0**	**15.0**	**0.10**	**40.0**	**40.0**	**40.0**	**N/A**
Baseline Data - Standard Deviation						2.0	0.0	0.0	0.0	3.4	0.0	0.0	0.0	0.00	0.0	0.0	0.0	N/A
Baseline Data Mean + 3x Standard Deviation						**11.3**	**1.0**	**20.0**	**5.0**	**17.4**	**10.0**	**5.0**	**15.0**	**0.10**	**40.0**	**40.0**	**40.0**	**N/A**
**** If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.***																		
DEW Line Cleanup Tier I Criteria											*200*			*1*				
DEW Line Cleanup Tier II Criteria						*30*	*5*	*250*	*50*	*100*	*500*	*100*	*500*	*5*				
Downgradient																		
	P2-24 surface																	
12-19258	P2-24	2012	1	Phase I	0-10	**8.00**	<0.050	2.40	<1.0	3.00	5.70	1.90	11.00	<0.020	<5.0	<10	<50	<50
P214-24A	P2-24	2014	3	Phase I	0-15	**10.00**	0.050	3.40	1.80	5.70	**13.20**	3.90	12.00	<0.10	<10	<50	<50	<100
P216-24A	P2-24	2016	5	Phase I	0-15	**6.40**	<0.050	14.00	0.70	2.70	3.70	**6.40**	<10	<0.010	<12	<10	<50	<50
P2-24A	P2-24	2018	7	Phase II	0-15	**6.00**	<0.050	1.90	0.57	**8.20**	4.50	1.60	11.00	<0.010	<7.0	<4.0	<8.0	<6.0
	P2-24 depth																	
Insufficient soil	P2-24	2012	1	Phase I	40-50													
P214-24B	P2-24	2014	3	Phase I	40-50	**6.60**	0.050	2.80	1.10	3.30	6.60	2.40	8.00	<0.10	<10	<50	<50	<100
P216-24B	P2-24	2016	5	Phase I	40-50	**7.20**	<0.050	10.00	0.71	2.70	4.70	**5.10**	<10	<0.010	<12	<10	<50	<50
P2-24B	P2-24	2018	7	Phase II	40-50	5.40	<0.050	1.90	0.59	3.20	3.80	1.50	6.60	<0.010	<7.0	<4.0	<8.0	<6.0

Table 1:

PIN-2 Airstrip Landfill - Summary of Soil Monitoring Analytical Data

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Sample #	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (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)	F4 C_{34}-C_{50} (mg/kg)
Background Data - Arithmetic Mean						2.9	1.0	20.0	5.0	8.7	10.0	5.0	15.0	0.010	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean						**5.4**	**1.0**	**20.0**	**5.0**	**7.2**	**10.0**	**5.0**	**15.0**	**0.10**	**40.0**	**40.0**	**40.0**	**N/A**
Baseline Data - Standard Deviation						2.0	0.0	0.0	0.0	3.4	0.0	0.0	0.0	0.00	0.0	0.0	0.0	N/A
Baseline Data Mean + 3x Standard Deviation						**11.3**	**1.0**	**20.0**	**5.0**	**17.4**	**10.0**	**5.0**	**15.0**	**0.10**	**40.0**	**40.0**	**40.0**	**N/A**
**** If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.***																		
DEW Line Cleanup Tier I Criteria											*200*			*1*				
DEW Line Cleanup Tier II Criteria						*30*	*5*	*250*	*50*	*100*	*500*	*100*	*500*	*5*				
Downgradient																		
	P2-25 surface																	
12-19262	P2-25	2012	1	Phase I	0-10	**7.90**	<0.050	2.50	1.10	3.20	5.10	2.70	7.00	<0.020	<5.0	<10	<50	<50
P214-25A	P2-25	2014	3	Phase I	0-15	**6.80**	0.050	2.10	1.10	2.60	<5.0	2.30	6.00	<0.10	<10	<50	<50	<100
P216-25A	P2-25	2016	5	Phase I	0-15	**7.30**	<0.050	2.50	1.10	5.80	6.00	3.00	<10	<0.010	<12	<10	<50	<50
P2-25A	P2-25	2018	7	Phase II	0-15	4.40	<0.050	2.40	0.67	3.00	4.60	1.60	7.90	<0.010	<7.0	6.1	19.0	9.1
	P2-25 depth																	
12-19264	P2-25	2012	1	Phase I	30-40	**7.60**	<0.050	2.40	<1.0	3.30	5.20	2.90	6.10	<0.020	<5.0	<10	<50	<50
P214-25B	P2-25	2014	3	Phase I	40-50	**5.80**	0.040	2.60	1.20	3.00	5.00	3.70	6.00	<0.10	<10	<50	<50	<100
P216-25B	P2-25	2016	5	Phase I	40-50	**6.60**	0.052	2.30	0.97	**8.10**	5.20	2.50	10.00	<0.010	<12	<10	<50	<50
P2-25B	P2-25	2018	7	Phase II	40-50	4.90	<0.050	2.00	0.61	3.00	4.10	1.40	6.40	<0.010	<7.0	6.6	18.0	7.1

Table 1:

PIN-2 Airstrip Landfill - Summary of Soil Monitoring Analytical Data

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Sample #	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (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)	F4 C_{34}-C_{50} (mg/kg)
Background Data - Arithmetic Mean						2.9	1.0	20.0	5.0	8.7	10.0	5.0	15.0	0.010	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean						**5.4**	**1.0**	**20.0**	**5.0**	**7.2**	**10.0**	**5.0**	**15.0**	**0.10**	**40.0**	**40.0**	**40.0**	**N/A**
Baseline Data - Standard Deviation						2.0	0.0	0.0	0.0	3.4	0.0	0.0	0.0	0.00	0.0	0.0	0.0	N/A
Baseline Data Mean + 3x Standard Deviation						**11.3**	**1.0**	**20.0**	**5.0**	**17.4**	**10.0**	**5.0**	**15.0**	**0.10**	**40.0**	**40.0**	**40.0**	**N/A**
**** If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.***																		
DEW Line Cleanup Tier I Criteria											*200*			*1*				
DEW Line Cleanup Tier II Criteria						*30*	*5*	*250*	*50*	*100*	*500*	*100*	*500*	*5*				
Downgradient																		
	P2-26 surface																	
12-19266	P2-26	2012	1	Phase I	0-10	4.80	<0.050	2.30	<1.0	2.10	3.60	1.60	7.60	<0.020	<5.0	<10	<50	<50
P214-26A	P2-26	2014	3	Phase I	0-15	3.80	0.020	2.20	0.90	**13.50**	<4.9	1.90	7.00	<0.10	<10	<50	<50	<100
P216-26A	P2-26	2016	5	Phase I	0-15	5.20	0.520	2.30	0.72	3.20	4.80	1.60	<10	<0.010	<12	<10	<50	<50
P2-26A	P2-26	2018	7	Phase II	0-15	**6.60**	<0.050	2.10	0.82	3.60	4.80	2.20	6.60	<0.010	<7.0	<4.0	11.0	<6.0
	P2-26 depth																	
12-19268	P2-26	2012	1	Phase I	30-40	5.20	<0.050	2.30	<1.0	2.50	4.10	1.50	8.20	<0.020	<5.0	<10	<50	<50
P214-26B	P2-26	2014	3	Phase I	40-50	4.30	0.040	2.60	1.30	2.80	<5.0	2.70	7.00	<0.10	<10	<50	<50	<100
P216-26B	P2-26	2016	5	Phase I	40-50	5.30	<0.050	2.40	0.77	5.30	6.10	1.60	<10	<0.010	<12	<10	<50	<50
P2-26B	P2-26	2018	7	Phase II	40-50	**6.60**	<0.050	2.00	0.83	3.90	4.70	2.20	7.20	<0.010	<7.0	4.7	13.0	13.0

N/A = not analyzed

Legend

XX	**Sample exceeds baseline mean**
XX	**Sample exceeds baseline mean + 3x SD**

Table 2:

PIN-2 USAF Landfill - Summary of Soil Monitoring Analytical Data

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Sample #	Location	Year	Monitoring Year	Monitoring Phase	depth (cm)	As (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (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)	F4 * C_{34}-C_{50} (mg/kg)
Background Data - Arithmetic Mean						2.9	1.0	20.0	5.0	8.7	10.0	5.0	15.0	0.010	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean						**3.8**	**1.0**	**20.0**	**5.0**	**7.7**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**4.0**	**9.0**	**8.0**
Baseline Data - Standard Deviation						3.9	0.0	0.0	0.0	2.8	0.0	0.0	7.1	0.00	0.0	0.0	0.0	0.0
Baseline Data Mean + 3x Standard Deviation						**15.5**	**1.0**	**20.0**	**5.0**	**16.1**	**10.0**	**5.0**	**36.3**	**0.10**	**10.0**	**4.0**	**9.0**	**8.0**
**** If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.***																		
DEW Line Cleanup Tier I Criteria											*200*			*1*				
DEW Line Cleanup Tier II Criteria						*30*	*5*	*250*	*50*	*100*	*500*	*100*	*500*	*5*				
Monitoring Data																		
Upgradient																		
	P2-01 surface																	
12-19270	P2-01	2012	1	Phase I	0-10	1.1	<0.50	4.0	<1.0	**9.4**	2.40	2.9	**16.4**	<0.020	<10	<20	**280.0**	**170.0**
12-19271 (Dup)	P2-01	2012	1	Phase I	0-10	1.1	<0.50	2.8	<1.0	6.0	3.20	1.9	**16.8**	<0.020	<10	<20	**300.0**	**200.0**
P214-1A	P2-01	2014	3	Phase I	0-15	2.6	0.120	5.0	2.60	6.5	<5.0	2.9	**26.0**	<0.10	<10	<50	<50	<100
P214-BD7 (Dup)	P2-01	2014	3	Phase I	0-15	2.3	0.090	6.3	2.80	4.0	<5	4.7	**19.0**	<0.10	<10	<50	<50	<100
P214-1A (Interlab)	P2-01	2014	3	Phase I	0-15	2.3	0.100	4.4	1.80	<5.0	2.50	3.1	**17.0**	<0.01	<12	<10	<50	N/A
P216-1A	P2-01	2016	5	Phase I	0-15	<2.0	0.260	3.9	1.10	**11.0**	3.30	2.9	**22.0**	<0.030	<30	<28	**160.0**	<140
P216-BD3 (Dup)	P2-01	2016	5	Phase I	0-15	<2.0	0.240	3.4	<1.0	**11.0**	3.10	2.6	**21.0**	<0.030	<32	<28	**150.0**	<140
P216-1A	P2-01	2016	5	Phase I	0-15	1.3	0.220	2.8	0.80	0.1	2.00	2.3	**24.0**	<0.05	<10	<50	**82.0**	<100
P2-1A	P2-01	2018	7	Phase II	0-15	1.6	0.180	4.5	1.00	**8.8**	3.20	3.0	15.0	<0.03	<7.0	<1.9	**110.0**	**21.0**
	P2-01 depth																	
12-19272	P2-01	2012	1	Phase I	30-40	1.9	<0.50	5.2	1.40	3.0	3.00	3.0	9.8	<0.020	<5.0	<10	<50	<50
P214-1B	P2-01	2014	3	Phase I	40-50	1.9	0.050	6.8	2.60	3.5	<4.9	3.6	14.0	<0.10	<10	<50	<50	<100
P216-1B	P2-01	2016	5	Phase I	40-50	<2.0	<0.10	4.3	1.30	5.9	2.60	2.7	<20	<0.020	<12	<10	<50	<50
P2-1B	P2-01	2018	7	Phase II	40-50	2.0	0.069	4.6	1.50	4.7	2.60	3.2	9.4	<0.010	<7.0	<4.0	**49.0**	**12.0**

Table 2:

PIN-2 USAF Landfill - Summary of Soil Monitoring Analytical Data

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Sample #	Location	Year	Monitoring Year	Monitoring Phase	depth (cm)	As (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (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)	F4 * C_{34}-C_{50} (mg/kg)
Background Data - Arithmetic Mean						2.9	1.0	20.0	5.0	8.7	10.0	5.0	15.0	0.010	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean						**3.8**	**1.0**	**20.0**	**5.0**	**7.7**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**4.0**	**9.0**	**8.0**
Baseline Data - Standard Deviation						3.9	0.0	0.0	0.0	2.8	0.0	0.0	7.1	0.00	0.0	0.0	0.0	0.0
Baseline Data Mean + 3x Standard Deviation						**15.5**	**1.0**	**20.0**	**5.0**	**16.1**	**10.0**	**5.0**	**36.3**	**0.10**	**10.0**	**4.0**	**9.0**	**8.0**
**** If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.***																		
DEW Line Cleanup Tier I Criteria											*200*			*1*				
DEW Line Cleanup Tier II Criteria						*30*	*5*	*250*	*50*	*100*	*500*	*100*	*500*	*5*				
Downgradient																		
	P2-02 surface																	
12-19274	P2-02	2012	1	Phase I	0-10	3.7	<0.50	9.0	3.10	5.9	5.10	**6.3**	**33.2**	<0.020	<5.0	<10	<50	<50
P214-2A	P2-02	2014	3	Phase I	0-15	3.4	0.070	6.7	2.50	4.1	<5.0	4.3	**17.0**	<0.10	<10	<50	<50	<100
P216-2A	P2-02	2016	5	Phase I	0-15	3.3	0.083	7.8	2.90	5.5	3.90	**5.9**	**23.0**	<0.010	<12	<10	<50	<50
P2-2A	P2-02	2018	7	Phase II	0-15	**5.6**	0.130	6.5	1.30	3.2	3.90	2.7	14.0	<0.010	<7.0	<4.0	**9.7**	<6.0
Dup 7	P2-02	2018	7	Phase II	0-15	2.1	0.096	5.2	**7.60**	**21.0**	3.80	**14.0**	**32.0**	<0.010	<7.0	**12.0**	**45.0**	**23.0**
	P2-02 depth																	
12-19276	P2-02	2012	1	Phase I	30-40	**7.5**	<0.50	9.2	2.60	6.1	6.00	**5.7**	**25.7**	<0.020	<5.0	<10	<50	<50
P214-2B	P2-02	2014	3	Phase I	40-50	**4.3**	0.080	7.6	2.80	7.7	<4.9	**6.1**	**17.0**	<0.10	<10	<50	<50	<100
P216-2B	P2-02	2016	5	Phase I	40-50	**20.0**	0.190	8.0	2.60	7.0	5.40	**5.7**	**25.0**	<0.010	<12	<10	<50	<50
P2-2B	P2-02	2018	7	Phase II	30-40	2.6	0.094	6.8	**6.70**	**17.0**	3.80	**13.0**	**33.0**	<0.01	<7.0	<4.0	**10.0**	6.6

Table 2:

PIN-2 USAF Landfill - Summary of Soil Monitoring Analytical Data

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Sample #	Location	Year	Monitoring Year	Monitoring Phase	depth (cm)	As (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (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)	F4 * C_{34}-C_{50} (mg/kg)
Background Data - Arithmetic Mean						2.9	1.0	20.0	5.0	8.7	10.0	5.0	15.0	0.010	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean						**3.8**	**1.0**	**20.0**	**5.0**	**7.7**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**4.0**	**9.0**	**8.0**
Baseline Data - Standard Deviation						3.9	0.0	0.0	0.0	2.8	0.0	0.0	7.1	0.00	0.0	0.0	0.0	0.0
Baseline Data Mean + 3x Standard Deviation						**15.5**	**1.0**	**20.0**	**5.0**	**16.1**	**10.0**	**5.0**	**36.3**	**0.10**	**10.0**	**4.0**	**9.0**	**8.0**
**** If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.***																		
DEW Line Cleanup Tier I Criteria											*200*			*1*				
DEW Line Cleanup Tier II Criteria						*30*	*5*	*250*	*50*	*100*	*500*	*100*	*500*	*5*				
Downgradient																		
	P2-03 surface																	
12-19278	P2-03	2012	1	Phase I	0-10	2.6	<0.50	3.7	1.60	5.7	3.20	3.0	**26.0**	<0.020	<5.0	<10	<50	<50
P214-3A	P2-03	2014	3	Phase I	0-15	2.5	0.100	3.7	1.80	5.0	<4.9	2.0	**22.0**	<0.10	<10	<50	<50	<100
P216-3A	P2-03	2016	5	Phase I	0-15	2.3	0.100	3.8	1.60	6.2	2.60	3.2	**19.0**	<0.010	<12	<10	<50	<50
P2-3A	P2-03	2018	7	Phase II	0-15	2.6	0.088	3.0	1.20	3.9	2.80	2.2	**16.0**	<0.010	<7.0	<4.0	**21.0**	<6.0
	P2-03 depth																	
12-19280	P2-03	2012	1	Phase I	30-40	3.4	<0.50	3.2	1.10	3.7	3.10	2.1	14.4	0.036	<5.0	<10	<50	<50
P214-3B	P2-03	2014	3	Phase I	40-50	2.7	0.090	6.0	3.50	6.7	<5.0	4.1	15.0	<0.10	<10	<50	<50	<100
P216-3B	P2-03	2016	5	Phase I	40-50	2.6	0.070	6.8	3.20	4.8	3.00	4.9	12.0	<0.010	<12	<10	<50	<50
P2-3B	P2-03	2018	7	Phase II	40-50	2.0	0.081	4.8	2.00	3.1	2.20	3.6	10.0	<0.010	<7.0	<4.0	<8.0	<6.0

Table 2:

PIN-2 USAF Landfill - Summary of Soil Monitoring Analytical Data

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Sample #	Location	Year	Monitoring Year	Monitoring Phase	depth (cm)	As (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (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)	F4 * C_{34}-C_{50} (mg/kg)
Background Data - Arithmetic Mean						2.9	1.0	20.0	5.0	8.7	10.0	5.0	15.0	0.010	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean						**3.8**	**1.0**	**20.0**	**5.0**	**7.7**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**4.0**	**9.0**	**8.0**
Baseline Data - Standard Deviation						3.9	0.0	0.0	0.0	2.8	0.0	0.0	7.1	0.00	0.0	0.0	0.0	0.0
Baseline Data Mean + 3x Standard Deviation						**15.5**	**1.0**	**20.0**	**5.0**	**16.1**	**10.0**	**5.0**	**36.3**	**0.10**	**10.0**	**4.0**	**9.0**	**8.0**
**** If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.***																		
DEW Line Cleanup Tier I Criteria											*200*			*1*				
DEW Line Cleanup Tier II Criteria						*30*	*5*	*250*	*50*	*100*	*500*	*100*	*500*	*5*				
Downgradient																		
	P2-04 surface																	
12-19282	P2-04	2012	1	Phase I	0-10	**5.8**	<0.50	**230.0**	3.50	**7.8**	**21.90**	**100.0**	**22.3**	<0.020	<5.0	<10	<50	<50
P214-4A	P2-04	2014	3	Phase I	0-15	**4.7**	0.110	6.1	1.50	3.8	9.20	3.3	15.0	**0.400**	<10	<50	<50	<100
P216-4A	P2-04	2016	5	Phase I	0-15	**5.6**	0.120	**87.0**	2.00	**56.0**	**24.00**	**38.0**	**16.0**	**0.420**	<12	<10	<50	<50
P2-4A	P2-04	2018	7	Phase II	0-15	**5.1**	0.120	**24.0**	1.60	**10.0**	**36.00**	**9.6**	**25.0**	**0.350**	<7.0	<4.0	**14.0**	<6.0
	P2-04 depth																	
12-19284	P2-04	2012	1	Phase I	30-40	**5.3**	<0.50	8.0	2.00	6.4	**16.30**	4.0	**36.8**	0.039	<5.0	<10	<50	<50
P214-4B	P2-04	2014	3	Phase I	40-50	**5.1**	0.160	6.6	1.60	4.0	9.50	1.8	**30.0**	<0.10	<10	<50	<50	<100
P216-4B	P2-04	2016	5	Phase I	40-50	**4.2**	0.110	13.0	2.10	5.4	4.80	**7.3**	14.0	**0.220**	<12	<10	<50	<50
P2-4B	P2-04	2018	7	Phase II	15-20	**4.8**	0.110	11.0	1.80	5.0	**16.00**	**5.5**	**25.0**	**0.390**	<7.0	**7.8**	**10.0**	<6.0

N/A = not analyzed

Legend	
XX	**Sample exceeds baseline mean**
XX	**Sample exceeds baseline mean + 3x SD**

Table 3:

PIN-2 Station West Landfill - Summary of Soil Monitoring Analytical Data

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Sample #	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (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)	F4* C_{34}-C_{50} (mg/kg)
Background Data - Arithmetic Mean						2.9	1.0	20.0	5.0	8.7	10.0	5.0	15.0	0.010	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean						**3.5**	**1.0**	**20.0**	**5.0**	**5.8**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**4.0**	**9.0**	**8.0**
Baseline Data - Standard Deviation						1.1	0.0	0.0	0.0	2.4	0.0	0.0	0.0	0.00	0.0	0.0	0.0	0.0
Baseline Data Mean + 3x Standard Deviation						**6.8**	**1.0**	**20.0**	**5.0**	**13.1**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**4.0**	**9.0**	**8.0**
**** If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.***																		
DEW Line Cleanup Tier I Criteria											*200*			*1*				
DEW Line Cleanup Tier II Criteria						*30*	*5*	*250*	*50*	*100*	*500*	*100*	*500*	*5*				
Monitoring Data																		
Upgradient																		
	P2-05 surface																	
12-19286[1]	P2-05	2012	1	Phase I	0-10	1.20	<0.50	3.50	1.40	**9.30**	1.70	2.80	**55.3**	<0.060	<15	<30	**260.0**	<150
P214-5A	P2-05	2014	3	Phase I	0-15	1.20	0.570	3.00	2.60	**11.10**	<5.0	2.90	**101.0**	<0.10	<10	<50	**104.0**	<100
P216-5A	P2-05	2016	5	Phase I	0-15	<2.0	0.460	3.60	1.60	**11.00**	2.20	2.70	**55.0**	<0.040	<38	<35	<180	<180
P2-5A	P2-05	2018	7	Phase II	0--15	2.10	<0.050	2.50	0.95	2.30	2.00	1.70	8.5	<0.010	<7.0	<4.0	8.4	<6.0
	P2-05 depth																	
12-19288	P2-05	2012	1	Phase I	30-40	2.40	<0.50	6.80	1.80	3.30	3.30	4.10	12.0	<0.020	<5.0	<10	**53.0**	<50
P214-5B	P2-05	2014	3	Phase I	40-50	2.30	0.070	5.50	2.70	4.60	<4.9	3.80	13.0	<0.10	<10	<50	<50	<100
P214-BD8 (Dup)	P2-05	2014	3	Phase I	40-50	2.20	0.060	6.30	3.10	4.50	<4.9	**6.20**	15.0	<0.10	<10	<50	<50	<100
P214-5B (Interlab)	P2-05	2014	3	Phase I	40-50	2.20	<0.10	4.90	2.20	<5.0	2.30	4.30	13.0	<0.01	<12	<10	<50	N/A
P216-5B	P2-05	2016	5	Phase I	40-50	2.50	0.082	4.40	1.60	2.60	2.10	2.90	10.0	<0.010	<12	<10	<50	<50
P2-5B	P2-05	2018	7	Phase II	15-25	1.90	<0.050	2.10	0.70	1.90	1.90	1.30	8.1	<0.010	<7.0	<4.0	<8.0	<6.0

Table 3:

PIN-2 Station West Landfill - Summary of Soil Monitoring Analytical Data

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Sample #	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (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)	F4* C_{34}-C_{50} (mg/kg)
Background Data - Arithmetic Mean						2.9	1.0	20.0	5.0	8.7	10.0	5.0	15.0	0.010	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean						**3.5**	**1.0**	**20.0**	**5.0**	**5.8**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**4.0**	**9.0**	**8.0**
Baseline Data - Standard Deviation						1.1	0.0	0.0	0.0	2.4	0.0	0.0	0.0	0.00	0.0	0.0	0.0	0.0
Baseline Data Mean + 3x Standard Deviation						**6.8**	**1.0**	**20.0**	**5.0**	**13.1**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**4.0**	**9.0**	**8.0**
**** If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.***																		
DEW Line Cleanup Tier I Criteria											*200*			*1*				
DEW Line Cleanup Tier II Criteria						*30*	*5*	*250*	*50*	*100*	*500*	*100*	*500*	*5*				
Downgradient																		
	P2-06 surface																	
12-19290[1]	P2-06	2012	1	Phase I	0-10	**4.30**	<0.50	8.50	3.70	**6.00**	7.30	**5.10**	**26.3**	<0.040	<10	<20	**100.0**	<100
P214-6A	P2-06	2014	3	Phase I	0-15	3.00	0.280	9.80	4.50	**8.30**	6.40	**6.60**	**29.0**	<0.10	<10	<50	**56.0**	<100
P216-6A	P2-06	2016	5	Phase I	0-15	**4.30**	0.340	14.00	5.00	**9.40**	7.90	**7.70**	**26.0**	<0.030	<25	<24	<120	<120
P216-BD4 (Dup)	P2-06	2016	5	Phase I	0-15	**4.20**	0.350	14.00	5.00	**9.10**	8.00	**7.80**	**26.0**	<0.020	<23	<23	<110	**110.0**
P216-6A (Interlab)	P2-06	2016	5	Phase I	0-15	**4.80**	0.370	13.20	4.70	**9.40**	6.60	**7.80**	**32.0**	<0.050	<10	<50	**55.0**	<100
P2-6A	P2-06	2018	7	Phase II	0-15	**4.80**	0.110	6.00	2.40	3.30	3.80	4.90	**18.0**	<0.010	<7.0	<4.0	**43.0**	**8.7**
	P2-06 depth																	
12-19292	P2-06	2012	1	Phase I	30-40	2.80	<0.50	6.90	1.10	1.60	3.70	2.20	14.8	<0.020	<5.0	<10	<50	<50
P214-6B	P2-06	2014	3	Phase I	40-50	2.90	0.110	5.80	1.90	3.30	<5.0	3.30	13.0	<0.10	<10	<50	**62.0**	<100
P216-6B	P2-06	2016	5	Phase I	40-50	2.50	0.100	4.60	1.30	2.00	3.40	2.40	11.0	<0.010	<12	<10	<50	<50
P2-6B	P2-06	2018	7	Phase II	40-50	**6.40**	0.052	4.70	2.10	2.50	3.50	**5.70**	13.0	<0.010	<7.0	<4.0	<8.0	<6.0

Table 3:

PIN-2 Station West Landfill - Summary of Soil Monitoring Analytical Data

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Sample #	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (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)	F4* C_{34}-C_{50} (mg/kg)
Background Data - Arithmetic Mean						2.9	1.0	20.0	5.0	8.7	10.0	5.0	15.0	0.010	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean						**3.5**	**1.0**	**20.0**	**5.0**	**5.8**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**4.0**	**9.0**	**8.0**
Baseline Data - Standard Deviation						1.1	0.0	0.0	0.0	2.4	0.0	0.0	0.0	0.00	0.0	0.0	0.0	0.0
Baseline Data Mean + 3x Standard Deviation						**6.8**	**1.0**	**20.0**	**5.0**	**13.1**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**4.0**	**9.0**	**8.0**
**** If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.***																		
DEW Line Cleanup Tier I Criteria											*200*			*1*				
DEW Line Cleanup Tier II Criteria						*30*	*5*	*250*	*50*	*100*	*500*	*100*	*500*	*5*				
Downgradient																		
	P2-07 surface																	
12-19294	P2-07	2012	1	Phase I	0-10	3.50	<0.50	5.00	1.70	**8.50**	4.10	3.40	**41.5**	<0.020	<5.0	<10	**53.0**	<50
P214-7A	P2-07	2014	3	Phase I	0-15	2.90	0.110	4.20	1.60	2.60	<5.0	1.70	**16.0**	<0.10	<10	<50	<50	<100
P216-7A	P2-07	2016	5	Phase I	0-15	2.90	0.160	3.20	1.10	4.20	3.00	2.00	**21.0**	<0.010	<12	<10	<50	<50
P2-7A	P2-07	2018	7	Phase II	0-15	2.70	0.170	3.20	1.30	2.60	3.40	2.20	**23.0**	<0.010	<7.0	**5.6**	**95.0**	**61.0**
	P2-07 depth																	
12-19296	P2-07	2012	1	Phase I	30-40	**3.80**	<0.50	3.80	<1.0	3.10	3.30	1.70	12.7	<0.020	<5.0	<10	<50	<50
P214-7B	P2-07	2014	3	Phase I	40-50	2.90	0.080	3.60	1.40	2.10	<4.9	3.30	12.0	<0.10	<10	<50	<50	<100
P216-7B	P2-07	2016	5	Phase I	40-50	**3.80**	0.140	6.70	0.76	2.70	2.90	3.00	12.0	<0.010	<12	<10	<50	<50
P2-7B	P2-07	2018	7	Phase II	40-50	3.50	0.099	4.10	2.30	**6.80**	3.00	**5.40**	13.0	<0.010	<7.0	<4.0	**24.0**	7.1

Table 3:

PIN-2 Station West Landfill - Summary of Soil Monitoring Analytical Data

Link to: Table of Contents

Sample #	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (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)	F4* C_{34}-C_{50} (mg/kg)
Background Data - Arithmetic Mean						2.9	1.0	20.0	5.0	8.7	10.0	5.0	15.0	0.010	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean						**3.5**	**1.0**	**20.0**	**5.0**	**5.8**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**4.0**	**9.0**	**8.0**
Baseline Data - Standard Deviation						1.1	0.0	0.0	0.0	2.4	0.0	0.0	0.0	0.00	0.0	0.0	0.0	0.0
Baseline Data Mean + 3x Standard Deviation						**6.8**	**1.0**	**20.0**	**5.0**	**13.1**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**4.0**	**9.0**	**8.0**
**** If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.***																		
DEW Line Cleanup Tier I Criteria											*200*			*1*				
DEW Line Cleanup Tier II Criteria						*30*	*5*	*250*	*50*	*100*	*500*	*100*	*500*	*5*				
Downgradient																		
	P2-08 surface																	
12-19298[1]	P2-08	2012	1	Phase I	0-10	2.80	<0.50	3.10	1.10	4.70	3.50	2.10	**30.4**	<0.030	<5.0	<15	**140.0**	**220.0**
P214-8A	P2-08	2014	3	Phase I	0-15	2.50	0.070	3.70	1.50	3.90	<4.9	2.00	**16.0**	<0.10	<10	<50	<50	<100
P216-8A	P2-08	2016	5	Phase I	0-15	2.90	0.088	7.50	1.10	4.20	2.80	3.70	**17.0**	<0.010	<12	<10	<50	<50
P2-8A	P2-08	2018	7	Phase II	0-15	2.70	0.097	3.50	1.40	3.90	3.00	2.80	15.0	<0.010	<7.0	<4.0	**59.0**	**19.0**
	P2-08 depth																	
12-19300	P2-08	2012	1	Phase I	30-40	3.30	<0.50	3.00	<1.0	2.30	2.70	1.60	9.1	<0.010	<5.0	<10	<50	<50
12-19301 (Dup)	P2-08	2012	1	Phase I	30-40	3.20	<0.50	3.30	1.00	2.70	2.90	2.00	10.6	<0.010	<5.0	<10	<50	<50
P214-8B	P2-08	2014	3	Phase I	40-50	2.30	0.050	3.70	1.40	1.60	<5.0	1.80	9.0	<0.10	<10	<50	<50	<100
P216-8B	P2-08	2016	5	Phase I	40-50	2.40	0.072	5.00	1.10	2.10	2.40	2.40	<10	<0.010	<12	<10	<50	<50
P2-8B	P2-08	2018	7	Phase II	40-50	2.60	0.060	3.20	1.00	2.30	2.30	1.80	9.9	<0.010	<7.0	<4.0	**20.0**	**10.0**
Dup 6	P2-08	2018	7	Phase II	40-50	2.60	0.061	3.10	1.00	2.20	2.30	1.90	8.7	<0.010	<7.0	**5.0**	**22.0**	**9.1**

N/A = not analyzed

1 - PHC and PCB detection limits increased due to high moisture content

Legend

XX **Sample exceeds baseline mean**

XX **Sample exceeds baseline mean + 3x SD**

Table 4:

PIN-2 Tier II Disposal Facility - Summary of Soil Monitoring Analytical Data

Link to: Table of Contents

Sample #	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (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)	F4 C_{34}-C_{50} (mg/kg)
Background Data - Arithmetic Mean						2.9	1.0	20.0	5.0	8.7	10.0	5.0	15.0	0.010	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean						**4.2**	**1.0**	**20.0**	**5.0**	**5.2**	**10.0**	**5.0**	**15.0**	**0.050**	**10.0**	**4.0**	**17.4**	**17.8**
Baseline Data - Standard Deviation						2.4	0.0	0.0	0.0	3.8	0.0	0.0	7.2	0.000	0.0	0.0	13.5	14.9
Baseline Data Mean + 3x Standard Deviation						**11.5**	**1.0**	**20.0**	**5.0**	**16.6**	**10.0**	**5.0**	**36.6**	**0.050**	**10.0**	**4.0**	**58.1**	**62.4**
**** If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.***																		
DEW Line Cleanup Tier I Criteria											*200*			*1*				
DEW Line Cleanup Tier II Criteria						*30*	*5*	*250*	*50*	*100*	*500*	*100*	*500*	*5*				
Monitoring Data																		
Upgradient																		
	MW-04 surface																	
12-19162	MW-04	2012	1	Phase I	0-10	2.4	<0.50	5.9	2.3	**6.6**	4.0	4.1	**27.3**	<0.020	<7.5	<15	<75	<75
P213-4WA	MW-04	2013	2	Phase I	0-10	1.5	<0.10	3.9	1.1	<5.0	2.4	2.6	<10	<0.010	<12	<10	<50	<50
P214-4WA	MW-04	2014	3	Phase I	0-15	1.0	0.200	3.8	0.9	4.3	<4.9	2.8	9.0	<0.10	<10	<50	<50	<100
P215-4WA	MW-04	2015	4	Phase I	0-15	1.9	0.120	3.8	1.1	2.1	2.3	2.4	9.0	<0.050	<10	<40	<40	<40
P216-4WA	MW-04	2016	5	Phase I	0-15	1.7	0.170	7.5	1.1	2.5	2.6	4.1	11.0	<0.010	<12	<10	<50	<50
MW-04A	MW-04	2018	7	Phase II	0-15	2.0	0.110	4.3	1.4	2.1	2.5	2.7	10.0	<0.010	<7.0	<4.0	11.0	<6.0
	MW-04 depth																	
12-19164	MW-04	2012	1	Phase I	30-40	2.3	<0.50	5.7	1.9	3.2	2.9	3.7	14.8	<0.020	<5.0	<10	<50	<50
P213-4WB	MW-04	2013	2	Phase I	40-50	4.1	0.130	5.2	2.2	<5.0	6.1	3.8	13.0	<0.010	<12	<10	<50	<50
P214-4WB	MW-04	2014	3	Phase I	40-50	1.1	0.080	3.6	1.0	1.7	<5.0	2.4	8.0	<0.10	<10	<50	<50	<100
P215-4WB	MW-04	2015	4	Phase I	40-50	**4.8**	0.070	6.3	2.2	4.1	3.2	5.0	11.0	<0.050	<10	<40	<40	<40
P216-4WB	MW-04	2016	5	Phase I	40-50	1.8	0.110	4.6	1.3	1.9	2.8	3.0	<10	<0.010	<12	<10	<50	<50
MW-04B	MW-04	2018	7	Phase II	40-50	3.2	0.099	4.1	1.7	2.5	2.3	3.1	12.0	<0.010	<7.0	<4.0	8.9	<6.0

Table 4:

PIN-2 Tier II Disposal Facility - Summary of Soil Monitoring Analytical Data

Link to: Table of Contents

Sample #	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (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)	F4 C_{34}-C_{50} (mg/kg)
Background Data - Arithmetic Mean						2.9	1.0	20.0	5.0	8.7	10.0	5.0	15.0	0.010	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean						**4.2**	**1.0**	**20.0**	**5.0**	**5.2**	**10.0**	**5.0**	**15.0**	**0.050**	**10.0**	**4.0**	**17.4**	**17.8**
Baseline Data - Standard Deviation						2.4	0.0	0.0	0.0	3.8	0.0	0.0	7.2	0.000	0.0	0.0	13.5	14.9
Baseline Data Mean + 3x Standard Deviation						**11.5**	**1.0**	**20.0**	**5.0**	**16.6**	**10.0**	**5.0**	**36.6**	**0.050**	**10.0**	**4.0**	**58.1**	**62.4**
**** If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.***																		
DEW Line Cleanup Tier I Criteria											*200*			*1*				
DEW Line Cleanup Tier II Criteria						*30*	*5*	*250*	*50*	*100*	*500*	*100*	*500*	*5*				
Downgradient																		
	MW-01 surface																	
12-19150	MW-01	2012	1	Phase I	0-10	1.1	<0.50	6.6	1.2	4.7	4.0	4.2	**17.1**	<0.010	<5	<10	<50	<50
12-19151 (Interlab)	MW-01	2012	1	Phase I	0-10	0.9	<1.0	<20	<5.0	**6.1**	<10	<5.0	**17.5**	<0.05	**21.0**	**6.3**	**55.0**	**39.0**
P213-1WA	MW-01	2013	2	Phase I	0-10	2.5	0.250	3.9	1.9	**6.2**	2.8	3.7	**23.0**	<0.010	<12	<10	<10	<10
P213-BD1 (Dup)	MW-01	2013	2	Phase I	0-10	2.5	0.260	3.8	1.7	**6.1**	2.5	3.9	**20.0**	<0.010	<12	<10	<10	<10
P213-1WA (Interlab)	MW-01	2013	2	Phase I	0-10	2.6	0.260	7.2	2.4	**8.1**	<5.0	**5.9**	**26.0**	<0.10	<10	<50	**74.0**	<100
P214-1WA	MW-01	2014	3	Phase I	0-15	**6.0**	0.930	7.9	4.8	**14.0**	<5.0	**9.9**	**33.0**	<0.10	<10	<50	**59.0**	<100
P214-BD3 (Dup)	MW-01	2014	3	Phase I	0-15	**5.8**	0.900	8.4	4.3	**12.3**	<4.9	**9.2**	**33.0**	<0.10	<10	<50	**75.0**	<100
P214-1WA (Interlab)	MW-01	2014	3	Phase I	0-15	**5.6**	0.980	6.7	4.4	**13.0**	3.8	**9.3**	**35.0**	<0.025	<29	<24	**140.0**	N/A
P215-1WA	MW-01	2015	4	Phase I	0-15	**4.5**	0.330	5.1	2.1	**7.7**	3.0	**6.3**	**17.0**	<0.050	<10	<40	**77.0**	**78.0**
P216-1WA	MW-01	2016	5	Phase I	0-15	**4.4**	0.590	4.6	1.9	**12.0**	2.7	**6.5**	**20.0**	<0.030	<26	<24	<120	<120
P216-BD1 (Dup)	MW-01	2016	5	Phase I	0-15	**5.0**	0.620	5.8	2.2	**12.0**	3.0	**7.4**	<20	<0.020	<29	<26	<130	<130
P216-1WA (Interlab)	MW-01	2016	5	Phase I	0-15	**5.0**	0.570	4.6	2.0	**11.2**	2.3	**6.9**	**21.0**	<0.050	<10	<50	**56.0**	<100
MW-01A	MW-01	2018	7	Phase II	0-15	**4.6**	0.410	8.2	2.2	**9.1**	2.9	**8.5**	14.0	<0.010	7.7	<4.0	**51.0**	10.0
Dup 1	MW-01	2018	7	Phase II	0-15	**4.7**	0.400	6.3	2.2	**9.0**	2.9	**6.6**	**16.0**	<0.010	<7.0	<4.0	11.0	<6.0
	MW-01 depth																	
12-19152	MW-01	2012	1	Phase I	30-40	2.9	<0.50	4.4	1.6	2.2	2.4	2.9	9.4	<0.010	<5.0	<10	<50	<50
12-19153 (Dup)	MW-01	2012	1	Phase I	30-40	2.7	<0.50	4.5	1.6	2.3	2.3	3.1	9.2	<0.010	<5.0	<10	<50	<50
P213-1WB	MW-01	2013	2	Phase I	40-50	**4.5**	0.210	3.9	1.4	**6.2**	2.8	4.0	12.0	<0.010	<12	<10	<50	<50
P214-1WB	MW-01	2014	3	Phase I	40-50	3.0	0.240	4.0	1.7	4.6	<5.0	4.2	14.0	<0.10	<10	<50	<50	<100
P215-1WB	MW-01	2015	4	Phase I	40-50	3.4	0.180	3.5	1.1	4.5	2.4	3.3	11.0	<0.050	<10	<40	**41.0**	**53.0**
P216-1WB	MW-01	2016	5	Phase I	40-50	3.7	0.240	12.0	2.2	**5.2**	4.2	**7.2**	15.0	<0.010	<12	<10	<50	<50
MW-01B	MW-01	2018	7	Phase II	40-50	**18.0**	0.470	10.0	2.1	**5.9**	8.6	**5.3**	**22.0**	<0.010	<7.0	<4.0	**28.0**	7.2

Table 4:

PIN-2 Tier II Disposal Facility - Summary of Soil Monitoring Analytical Data

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Sample #	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (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)	F4 C_{34}-C_{50} (mg/kg)
Background Data - Arithmetic Mean						2.9	1.0	20.0	5.0	8.7	10.0	5.0	15.0	0.010	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean						**4.2**	**1.0**	**20.0**	**5.0**	**5.2**	**10.0**	**5.0**	**15.0**	**0.050**	**10.0**	**4.0**	**17.4**	**17.8**
Baseline Data - Standard Deviation						2.4	0.0	0.0	0.0	3.8	0.0	0.0	7.2	0.000	0.0	0.0	13.5	14.9
Baseline Data Mean + 3x Standard Deviation						**11.5**	**1.0**	**20.0**	**5.0**	**16.6**	**10.0**	**5.0**	**36.6**	**0.050**	**10.0**	**4.0**	**58.1**	**62.4**
**** If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.***																		
DEW Line Cleanup Tier I Criteria											*200*			*1*				
DEW Line Cleanup Tier II Criteria						*30*	*5*	*250*	*50*	*100*	*500*	*100*	*500*	*5*				
Downgradient																		
	MW-02 surface																	
12-19154	MW-02	2012	1	Phase I	0-10	3.8	<0.50	5.0	1.8	**5.8**	2.6	4.9	**15.9**	<0.010	<5.0	<10	**76.0**	**58.0**
12-19155 (Interlab)	MW-02	2012	1	Phase I	0-10	**4.5**	<1.0	<20	<5.0	**9.6**	<10	**6.3**	**25.5**	<0.05	**20.0**	**5.1**	**71.0**	**61.0**
P213-2WA[1]	MW-02	2013	2	Phase I	0-10	1.9	0.200	4.9	1.2	**7.0**	1.9	4.4	<10	<0.018	<24	<20	<100	<100
P214-2WA	MW-02	2014	3	Phase I	0-15	2.8	0.090	5.9	2.5	4.8	<4.9	**5.9**	**18.0**	<0.10	<10	<50	<50	<100
P215-2WA	MW-02	2015	4	Phase I	0-15	2.8	0.090	5.2	1.7	3.3	2.4	3.8	12.0	<0.050	<10	<40	<40	<40
P215-BD1 (Dup)	MW-02	2015	4	Phase I	0-15	3.0	0.100	5.9	1.9	3.4	2.3	4.2	12.0	<0.050	<10	<40	<40	<40
P215-2WA (Interlab)	MW-02	2015	4	Phase I	0-15	2.7	0.090	4.9	1.8	**5.6**	2.4	4.4	14.0	<0.010	<12	<10	<50	<50
P216-2WA	MW-02	2016	5	Phase I	0-15	2.8	0.230	6.6	1.9	**8.0**	2.6	**6.4**	**17.0**	<0.010	<12	<10	**100.0**	<50
MW-02A	MW-02	2018	7	Phase II	0-15	**4.4**	0.150	6.1	3.1	**9.0**	2.6	**6.6**	**22.0**	<0.010	<7.0	<4.0	**26.0**	<6.0
	MW-02 depth																	
12-19156	MW-02	2012	1	Phase I	30-40	3.8	<0.50	5.3	1.6	4.5	2.3	4.2	13.0	<0.020	<5.0	<10	<50	<50
P213-2WB	MW-02	2013	2	Phase I	40-50	**4.4**	0.130	5.2	1.5	**5.6**	2.6	4.5	11.0	<0.010	<12	<10	<50	<50
P214-2WB	MW-02	2014	3	Phase I	40-50	**4.8**	0.110	6.8	3.7	**9.4**	<5.0	**6.5**	14.0	<0.10	<10	<50	<50	<100
P215-2WB	MW-02	2015	4	Phase I	40-50	**5.8**	0.110	6.1	3.1	3.3	2.5	5.0	12.0	<0.050	<10	<40	<40	<40
P216-2WB	MW-02	2016	5	Phase I	40-50	**6.2**	0.210	11.0	2.6	**5.4**	2.7	**6.3**	**17.0**	<0.010	<12	<10	<50	<50
MW-02B	MW-02	2018	7	Phase II	40-50	**7.9**	0.150	6.3	2.3	**8.3**	3.0	**5.4**	**17.0**	<0.010	<7.0	<4.0	12.0	<6.0

Table 4:

PIN-2 Tier II Disposal Facility - Summary of Soil Monitoring Analytical Data

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Sample #	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (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)	F4 C_{34}-C_{50} (mg/kg)
Background Data - Arithmetic Mean						2.9	1.0	20.0	5.0	8.7	10.0	5.0	15.0	0.010	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean						**4.2**	**1.0**	**20.0**	**5.0**	**5.2**	**10.0**	**5.0**	**15.0**	**0.050**	**10.0**	**4.0**	**17.4**	**17.8**
Baseline Data - Standard Deviation						2.4	0.0	0.0	0.0	3.8	0.0	0.0	7.2	0.000	0.0	0.0	13.5	14.9
Baseline Data Mean + 3x Standard Deviation						**11.5**	**1.0**	**20.0**	**5.0**	**16.6**	**10.0**	**5.0**	**36.6**	**0.050**	**10.0**	**4.0**	**58.1**	**62.4**
**** If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.***																		
DEW Line Cleanup Tier I Criteria											*200*			*1*				
DEW Line Cleanup Tier II Criteria						*30*	*5*	*250*	*50*	*100*	*500*	*100*	*500*	*5*				
Downgradient																		
	MW-03 surface																	
12-19158	MW-03	2012	1	Phase I	0-10	**4.2**	<0.50	5.3	1.8	**10.2**	4.0	**6.1**	**16.7**	<0.020	<5.0	<10	**110.0**	**65.0**
P213-3WA	MW-03	2013	2	Phase I	0-10	2.7	0.220	4.7	1.8	<5.0	3.3	3.7	**22.0**	<0.010	<12	<10	<50	<50
P214-3WA	MW-03	2014	3	Phase I	0-15	1.9	0.240	4.0	1.9	**6.0**	<5.0	3.7	**29.0**	<0.10	<10	<50	<50	<100
P215-3WA	MW-03	2015	4	Phase I	0-15	2.8	0.200	6.3	2.3	4.5	3.2	4.2	**17.0**	<0.050	<10	<40	<40	**42.0**
P216-3WA	MW-03	2016	5	Phase I	0-15	2.0	0.710	8.8	1.1	3.7	2.6	4.5	**19.0**	<0.010	<12	<10	<50	<50
MW-03A	MW-03	2018	7	Phase II	0-15	2.6	0.150	5.4	2.0	4.3	2.9	4.1	**17.0**	<0.010	<7.0	<4.0	**25.0**	<6.0
	MW-03 depth																	
12-19160	MW-03	2012	1	Phase I	30-40	2.6	<0.50	5.0	1.3	3.7	2.6	3.4	11.6	<0.020	<5.0	<10	<50	<50
P213-3WB	MW-03	2013	2	Phase I	40-50	2.7	0.110	5.6	1.9	<5.0	3.0	4.0	14.0	<0.010	<12	<10	<50	<50
P214-3WB	MW-03	2014	3	Phase I	40-50	2.7	0.090	5.6	2.2	4.1	<4.9	4.7	15.0	<0.10	<10	<50	<50	<100
P215-3WB	MW-03	2015	4	Phase I	40-50	2.8	0.110	5.9	2.0	4.1	3.1	**5.3**	14.0	<0.050	<10	<40	<40	<40
P216-3WB	MW-03	2016	5	Phase I	40-50	2.6	0.088	6.4	1.8	3.0	2.8	3.9	13.0	<0.010	<12	<10	<50	<50
MW-03B	MW-03	2018	7	Phase II	40-50	3.5	0.060	4.1	1.3	3.3	2.7	2.9	11.0	<0.010	<7.0	<4.0	9.1	<6.0

N/A = not analyzed

1 - PHC and PCB detection limits increased due to high moisture content

Legend

XX **Sample exceeds baseline mean**

XX **Sample exceeds baseline mean + 3x SD**

Table 4A:

PIN-2 Tier II Disposal Facility - Summary of Groundwater Monitoring Analytical Data

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Sample ID	Location	Date	Monitoring Year	Monitoring Phase	As (mg/L)	Cd* (mg/L)	Cr (mg/L)	Co* (mg/L)	Cu (mg/L)	Pb* (mg/L)	Ni (mg/L)	Zn (mg/L)	F1* C_6-C_{10} (mg/L)	F2* C_{10}-C_{16} (mg/L)	F3* C_{16}-C_{34} (mg/L)	F4* C_{34}-C_{50} (mg/L)
Baseline Data																
UPgradient																
10-5014	MW-04	2010			0.0063	<0.0010	0.1020	<0.0030	0.0250	<0.0010	0.0611	0.0148	<0.05	<0.5	<1.0	<1.0
11-6960	MW-04	2011			<0.0030	<0.0010	0.0600	<0.0030	0.0060	<0.0010	0.0060	0.0300	<0.05	<0.5	<1.0	<1.0
11-6961 (Dup)	MW-04	2011			<0.0030	<0.0010	0.0700	<0.0030	0.0070	<0.0010	0.0140	0.0260	<0.05	<0.5	<1.0	<1.0
Downgradient																
10-5018	MW-01	2010			0.0082	<0.0010	0.6080	0.0074	0.0770	<0.0010	0.3175	0.0195	<0.05	<0.5	<1.0	<1.0
11-6962	MW-01	2011			<0.0030	<0.0010	0.2160	<0.0030	0.0192	<0.0010	0.0858	<0.010	<0.05	<0.5	<1.0	<1.0
10-5017	MW-02	2010			<0.0030	<0.0010	0.1000	<0.0030	0.0303	<0.0010	0.0548	0.0122	<0.05	<0.5	<1.0	<1.0
11-6959	MW-02	2011			<0.0030	<0.0010	<0.0050	<0.0030	<0.0050	<0.0010	<0.0050	0.2470	<0.05	<0.5	<1.0	<1.0
10-5015	MW-03	2010			0.0088	<0.0010	0.2010	0.0036	0.0304	<0.0010	0.1080	0.0420	<0.05	<0.5	<1.0	<1.0
11-6958	MW-03	2011			0.0110	<0.0010	0.1110	<0.0030	0.0225	<0.0010	0.0269	0.0203	<0.05	<0.5	<1.0	<1.0
				N value	9	9	9	9	9	9	9	9	9	9	9	9
Baseline Data - Arithmetic Mean					0.0046	0.0005	0.1634	0.0024	0.0244	0.0005	0.0752	0.0463	0.025	0.25	0.5	0.5
Baseline Data - Arithmetic Mean Corrected for Detection Limit					**0.0046**	**0.0010**	**0.1634**	**0.0030**	**0.0244**	**0.0010**	**0.0752**	**0.0463**	**0.050**	**0.50**	**1.0**	**1.0**
Baseline Data - Standard Deviation					0.0039	0.0000	0.1795	0.0000	0.0223	0.0000	0.0979	0.0760	0.000	0.00	0.0	0.0
Baseline Data - Corrected Arithmetic Mean + 3x Standard Deviation					**0.0164**	**0.0010**	**0.7018**	**0.0030**	**0.0914**	**0.0010**	**0.3689**	**0.2744**	**0.050**	**0.50**	**1.0**	**1.0**
If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.																
Monitoring Data																
Upgradient - MW-04																
12-19315	MW-04	2012	1	Phase I	**0.0062**	0.000092	0.0309	0.0017	0.0120	**0.0049**	0.0274	**0.1020**	<0.025	<0.10	<0.25	<0.25
12-19319 (Dup)	MW-04	2012	1	Phase I	**0.0050**	0.000100	0.0157	0.0012	0.0090	**0.0042**	0.0161	0.0281	<0.025	<0.10	<0.25	<0.25
P213-4W	MW-04	2013	2	Phase I	0.0018	0.000120	0.0110	0.00059	0.0032	**0.0011**	0.0110	**0.0570**	<0.10	<0.10	<0.20	<0.20
P214-4W	MW-04	2014	3	Phase I	**0.0092**	0.000190	0.0696	**0.0078**	**0.0250**	**0.0163**	0.0728	**0.3790**	<0.20	<0.20	<0.10	<0.10
P215-4W	MW-04	2015	4	Phase I	0.0010	0.000040	0.0074	0.00070	0.0030	**0.0013**	0.0086	**0.0520**	<0.10	<0.10	<0.10	<0.10
P216-4W	MW-04	2016	5	Phase I	0.00026	0.000017	<0.0010	<0.00050	0.0012	<0.00020	0.0030	<0.0050	<0.10	<0.10	<0.20	N/A
MW-4	MW-04	2018	7	Phase II	0.00043	<0.000020	<0.0010	<0.00030	0.0015	<0.00010	0.0031	0.0060	<0.025	<0.10	<0.10	<0.10

Table 4A:

PIN-2 Tier II Disposal Facility - Summary of Groundwater Monitoring Analytical Data

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Sample ID	Location	Date	Monitoring Year	Monitoring Phase	As (mg/L)	Cd* (mg/L)	Cr (mg/L)	Co* (mg/L)	Cu (mg/L)	Pb* (mg/L)	Ni (mg/L)	Zn (mg/L)	F1* C_6-C_{10} (mg/L)	F2* C_{10}-C_{16} (mg/L)	F3* C_{16}-C_{34} (mg/L)	F4* C_{34}-C_{50} (mg/L)
Baseline Data																
UPgradient																
10-5014	MW-04	2010			0.0063	<0.0010	0.1020	<0.0030	0.0250	<0.0010	0.0611	0.0148	<0.05	<0.5	<1.0	<1.0
11-6960	MW-04	2011			<0.0030	<0.0010	0.0600	<0.0030	0.0060	<0.0010	0.0060	0.0300	<0.05	<0.5	<1.0	<1.0
11-6961 (Dup)	MW-04	2011			<0.0030	<0.0010	0.0700	<0.0030	0.0070	<0.0010	0.0140	0.0260	<0.05	<0.5	<1.0	<1.0
Downgradient																
10-5018	MW-01	2010			0.0082	<0.0010	0.6080	0.0074	0.0770	<0.0010	0.3175	0.0195	<0.05	<0.5	<1.0	<1.0
11-6962	MW-01	2011			<0.0030	<0.0010	0.2160	<0.0030	0.0192	<0.0010	0.0858	<0.010	<0.05	<0.5	<1.0	<1.0
10-5017	MW-02	2010			<0.0030	<0.0010	0.1000	<0.0030	0.0303	<0.0010	0.0548	0.0122	<0.05	<0.5	<1.0	<1.0
11-6959	MW-02	2011			<0.0030	<0.0010	<0.0050	<0.0030	<0.0050	<0.0010	<0.0050	0.2470	<0.05	<0.5	<1.0	<1.0
10-5015	MW-03	2010			0.0088	<0.0010	0.2010	0.0036	0.0304	<0.0010	0.1080	0.0420	<0.05	<0.5	<1.0	<1.0
11-6958	MW-03	2011			0.0110	<0.0010	0.1110	<0.0030	0.0225	<0.0010	0.0269	0.0203	<0.05	<0.5	<1.0	<1.0
				N value	9	9	9	9	9	9	9	9	9	9	9	9
Baseline Data - Arithmetic Mean					0.0046	0.0005	0.1634	0.0024	0.0244	0.0005	0.0752	0.0463	0.025	0.25	0.5	0.5
Baseline Data - Arithmetic Mean Corrected for Detection Limit					**0.0046**	**0.0010**	**0.1634**	**0.0030**	**0.0244**	**0.0010**	**0.0752**	**0.0463**	**0.050**	**0.50**	**1.0**	**1.0**
Baseline Data - Standard Deviation					0.0039	0.0000	0.1795	0.0000	0.0223	0.0000	0.0979	0.0760	0.000	0.00	0.0	0.0
Baseline Data - Corrected Arithmetic Mean + 3x Standard Deviation					**0.0164**	**0.0010**	**0.7018**	**0.0030**	**0.0914**	**0.0010**	**0.3689**	**0.2744**	**0.050**	**0.50**	**1.0**	**1.0**
Downgradient - MW-01																
Not sampled - dry/frozen	MW-01	2012	1	Phase I												
Not sampled - dry/frozen	MW-01	2013	2	Phase I												
Not sampled - dry/frozen	MW-01	2014	3	Phase I												
P215-1W	MW-01	2015	4	Phase I	0.00090	0.000030	0.0014	<0.00010	0.0100	<0.00010	0.0053	**0.0490**	<0.10	<0.10	<0.10	<0.10
P216-1W	MW-01	2016	5	Phase I	0.0014	0.000020	0.0033	<0.00050	0.0193	0.00051	0.0067	0.0253	<0.10	<0.10	<0.10	N/A
MW-1	MW-01	2018	7	Phase II	0.0011	<0.000020	0.0020	<0.00030	0.0045	<0.00010	0.0027	0.0093	<0.025	<0.10	<0.10	<0.10

Table 4A:

PIN-2 Tier II Disposal Facility - Summary of Groundwater Monitoring Analytical Data

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Sample ID	Location	Date	Monitoring Year	Monitoring Phase	As (mg/L)	Cd* (mg/L)	Cr (mg/L)	Co* (mg/L)	Cu (mg/L)	Pb* (mg/L)	Ni (mg/L)	Zn (mg/L)	F1* C_6-C_{10} (mg/L)	F2* C_{10}-C_{16} (mg/L)	F3* C_{16}-C_{34} (mg/L)	F4* C_{34}-C_{50} (mg/L)
Baseline Data																
UPgradient																
10-5014	MW-04	2010			0.0063	<0.0010	0.1020	<0.0030	0.0250	<0.0010	0.0611	0.0148	<0.05	<0.5	<1.0	<1.0
11-6960	MW-04	2011			<0.0030	<0.0010	0.0600	<0.0030	0.0060	<0.0010	0.0060	0.0300	<0.05	<0.5	<1.0	<1.0
11-6961 (Dup)	MW-04	2011			<0.0030	<0.0010	0.0700	<0.0030	0.0070	<0.0010	0.0140	0.0260	<0.05	<0.5	<1.0	<1.0
Downgradient																
10-5018	MW-01	2010			0.0082	<0.0010	0.6080	0.0074	0.0770	<0.0010	0.3175	0.0195	<0.05	<0.5	<1.0	<1.0
11-6962	MW-01	2011			<0.0030	<0.0010	0.2160	<0.0030	0.0192	<0.0010	0.0858	<0.010	<0.05	<0.5	<1.0	<1.0
10-5017	MW-02	2010			<0.0030	<0.0010	0.1000	<0.0030	0.0303	<0.0010	0.0548	0.0122	<0.05	<0.5	<1.0	<1.0
11-6959	MW-02	2011			<0.0030	<0.0010	<0.0050	<0.0030	<0.0050	<0.0010	<0.0050	0.2470	<0.05	<0.5	<1.0	<1.0
10-5015	MW-03	2010			0.0088	<0.0010	0.2010	0.0036	0.0304	<0.0010	0.1080	0.0420	<0.05	<0.5	<1.0	<1.0
11-6958	MW-03	2011			0.0110	<0.0010	0.1110	<0.0030	0.0225	<0.0010	0.0269	0.0203	<0.05	<0.5	<1.0	<1.0
				N value	9	9	9	9	9	9	9	9	9	9	9	9
Baseline Data - Arithmetic Mean					0.0046	0.0005	0.1634	0.0024	0.0244	0.0005	0.0752	0.0463	0.025	0.25	0.5	0.5
Baseline Data - Arithmetic Mean Corrected for Detection Limit					**0.0046**	**0.0010**	**0.1634**	**0.0030**	**0.0244**	**0.0010**	**0.0752**	**0.0463**	**0.050**	**0.50**	**1.0**	**1.0**
Baseline Data - Standard Deviation					0.0039	0.0000	0.1795	0.0000	0.0223	0.0000	0.0979	0.0760	0.000	0.00	0.0	0.0
Baseline Data - Corrected Arithmetic Mean + 3x Standard Deviation					**0.0164**	**0.0010**	**0.7018**	**0.0030**	**0.0914**	**0.0010**	**0.3689**	**0.2744**	**0.050**	**0.50**	**1.0**	**1.0**
Downgradient - MW-02																
12-19313	MW-02	2012	1	Phase I	0.0011	<0.000090	0.0148	<0.00050	0.0036	<0.0010	0.0115	0.0122	<0.025	<0.1	<0.25	<0.25
P213-2W	MW-02	2013	2	Phase I	0.0012	0.000057	0.0270	0.00038	0.0024	0.00037	0.0150	0.0130	<0.10	<0.10	<0.20	<0.20
P213-BDW1 (Dup)	MW-02	2013	2	Phase I	0.00084	0.000036	0.0032	<0.00030	0.0014	<0.00020	0.0034	0.0080	<0.10	<0.10	<0.20	<0.20
P213-2W (Interlab)	MW-02	2013	2	Phase I	0.00090	0.000060	0.0140	0.00030	0.0030	0.00040	0.0079	0.0150	<0.20	<0.10	<0.10	<0.10
P214-2W	MW-02	2014	3	Phase I	0.0038	0.000030	**0.2720**	0.0030	0.0170	**0.0023**	**0.1190**	**0.1040**	<0.20	<0.20	<0.10	<0.10
P215-2W	MW-02	2015	4	Phase I	0.00070	0.000150	0.0060	<0.00010	0.0010	0.00020	0.0035	0.0100	<0.10	<0.10	<0.10	<0.10
P215-BDW1 (Dup)	MW-02	2015	4	Phase I	0.00070	0.000150	0.0077	<0.00010	0.0010	0.00030	0.0041	0.0100	<0.10	<0.10	<0.10	<0.10
P215-2W (Interlab)	MW-02	2015	4	Phase I	0.00086	0.000180	0.0090	<0.00030	0.0020	0.00020	0.0051	0.0090	<0.10	<0.10	<0.20	<0.20
P216-2W	MW-02	2016	5	Phase I	0.00058	0.000013	<0.0010	<0.00050	0.0013	<0.00020	0.0026	<0.0050	<0.10	<0.10	<0.20	N/A
P216-BDW1 (Dup)	MW-02	2016	5	Phase I	0.00060	0.000021	<0.0010	<0.00050	0.0011	<0.00020	0.0028	<0.0050	<0.10	<0.10	<0.20	N/A
P216-2W (Interlab)	MW-02	2016	5	Phase I	0.00050	0.000020	<0.00050	<0.00010	<0.0010	<0.00010	0.0030	0.0030	<0.10	<0.10	<0.10	<0.10
MW-2	MW-02	2018	7	Phase II	0.00066	<0.000020	<0.0010	<0.00030	0.0022	<0.00010	0.0029	<0.0030	<0.025	<0.10	<0.10	<0.10

Table 4A:

PIN-2 Tier II Disposal Facility - Summary of Groundwater Monitoring Analytical Data

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Sample ID	Location	Date	Monitoring Year	Monitoring Phase	As (mg/L)	Cd* (mg/L)	Cr (mg/L)	Co* (mg/L)	Cu (mg/L)	Pb* (mg/L)	Ni (mg/L)	Zn (mg/L)	F1* C_6-C_{10} (mg/L)	F2* C_{10}-C_{16} (mg/L)	F3* C_{16}-C_{34} (mg/L)	F4* C_{34}-C_{50} (mg/L)
Baseline Data																
UPgradient																
10-5014	MW-04	2010			0.0063	<0.0010	0.1020	<0.0030	0.0250	<0.0010	0.0611	0.0148	<0.05	<0.5	<1.0	<1.0
11-6960	MW-04	2011			<0.0030	<0.0010	0.0600	<0.0030	0.0060	<0.0010	0.0060	0.0300	<0.05	<0.5	<1.0	<1.0
11-6961 (Dup)	MW-04	2011			<0.0030	<0.0010	0.0700	<0.0030	0.0070	<0.0010	0.0140	0.0260	<0.05	<0.5	<1.0	<1.0
Downgradient																
10-5018	MW-01	2010			0.0082	<0.0010	0.6080	0.0074	0.0770	<0.0010	0.3175	0.0195	<0.05	<0.5	<1.0	<1.0
11-6962	MW-01	2011			<0.0030	<0.0010	0.2160	<0.0030	0.0192	<0.0010	0.0858	<0.010	<0.05	<0.5	<1.0	<1.0
10-5017	MW-02	2010			<0.0030	<0.0010	0.1000	<0.0030	0.0303	<0.0010	0.0548	0.0122	<0.05	<0.5	<1.0	<1.0
11-6959	MW-02	2011			<0.0030	<0.0010	<0.0050	<0.0030	<0.0050	<0.0010	<0.0050	0.2470	<0.05	<0.5	<1.0	<1.0
10-5015	MW-03	2010			0.0088	<0.0010	0.2010	0.0036	0.0304	<0.0010	0.1080	0.0420	<0.05	<0.5	<1.0	<1.0
11-6958	MW-03	2011			0.0110	<0.0010	0.1110	<0.0030	0.0225	<0.0010	0.0269	0.0203	<0.05	<0.5	<1.0	<1.0
				N value	9	9	9	9	9	9	9	9	9	9	9	9
Baseline Data - Arithmetic Mean					0.0046	0.0005	0.1634	0.0024	0.0244	0.0005	0.0752	0.0463	0.025	0.25	0.5	0.5
Baseline Data - Arithmetic Mean Corrected for Detection Limit					**0.0046**	**0.0010**	**0.1634**	**0.0030**	**0.0244**	**0.0010**	**0.0752**	**0.0463**	**0.050**	**0.50**	**1.0**	**1.0**
Baseline Data - Standard Deviation					0.0039	0.0000	0.1795	0.0000	0.0223	0.0000	0.0979	0.0760	0.000	0.00	0.0	0.0
Baseline Data - Corrected Arithmetic Mean + 3x Standard Deviation					**0.0164**	**0.0010**	**0.7018**	**0.0030**	**0.0914**	**0.0010**	**0.3689**	**0.2744**	**0.050**	**0.50**	**1.0**	**1.0**
Downgradient - MW-03																
Not sampled - dry/frozen	MW-03	2012	1	Phase I												
P213-3W	MW-03	2013	2	Phase I	0.00083	0.000150	0.0027	<0.00030	0.0039	<0.00020	0.0071	0.0061	<0.10	<0.10	<0.20	<0.20
P214-3W	MW-03	2014	3	Phase I	0.0046	0.000120	0.0827	0.0019	**0.0250**	**0.0029**	0.0570	**0.1520**	<0.20	<0.20	<0.10	<0.10
P215-3W	MW-03	2015	4	Phase I	0.00040	0.000220	0.0022	<0.00010	0.0020	0.00020	0.0047	0.0180	<0.10	<0.10	<0.10	<0.10
P216-3W	MW-03	2016	5	Phase I	0.00033	0.000027	<0.0010	<0.00050	0.0014	<0.00020	0.0030	<0.0050	<0.10	<0.10	<0.20	N/A
MW-3	MW-03	2018	7	Phase II	0.00051	<0.000020	<0.0010	<0.00030	0.0015	<0.00010	0.0031	0.0094	<0.025	<0.10	<0.10	<0.10
Dup 1	MW-03	2018	7	Phase II	0.00044	<0.000020	0.0010	<0.00030	0.0016	<0.00010	0.0030	0.0095	<0.025	<0.10	<0.10	<0.10

N/A = not analyzed

Legend	
XX	**Sample exceeds baseline mean**
XX	**Sample exceeds baseline mean + 3x SD**

Table 5:

PIN-2 Airstrip South Landfill - Summary of Soil Monitoring Analytical Data

Link to: Table of Contents

Sample #	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (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)	F4 C_{34}-C_{50} (mg/kg)
Background Data - Arithmetic Mean						2.9	1.0	20.0	5.0	8.7	10.0	5.0	15.0	0.010	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean						**2.9**	**1.0**	**20.0**	**5.0**	**8.4**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**4.0**	**16.8**	**9.8**
Baseline Data - Standard Deviation						1.3	0.0	0.0	0.0	5.6	0.0	0.0	0.0	0.00	0.0	0.0	6.4	7.7
Baseline Data Mean + 3x Standard Deviation						**6.9**	**1.0**	**20.0**	**5.0**	**25.1**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**4.0**	**36.1**	**32.9**
**** If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.***																		
DEW Line Cleanup Tier I Criteria											*200*			*1*				
DEW Line Cleanup Tier II Criteria						*30*	*5*	*250*	*50*	*100*	*500*	*100*	*500*	*5*				
Monitoring Data																		
Upgradient																		
	P2-13 surface																	
12-19230	P2-13	2012	1	Phase I	0-10	2.1	<0.50	3.8	1.5	**8.6**	3.1	3.0	**48.0**	<0.020	<5.0	**16.0**	**130.0**	**170.0**
P214-13A	P2-13	2014	3	Phase I	0-15	2.8	0.130	3.8	2.1	7.2	<5.0	5.0	**23.0**	<0.10	<10	<50	<50	<100
P216-13A	P2-13	2016	5	Phase I	0-15	2.8	0.110	13.0	1.7	5.8	2.4	**6.7**	**19.0**	<0.010	<12	<10	<50	<50
P2-13A	P2-13	2018	7	Phase II	0-15	2.3	0.130	4.7	1.9	6.5	2.7	3.3	**22.0**	<0.010	<7.0	<4.0	11.0	<6.0
	P2-13 depth																	
12-19232	P2-13	2012	1	Phase I	30-40	**3.1**	<0.50	7.2	2.2	**9.7**	4.2	2.8	**27.0**	<0.020	<5.0	<10	**67.0**	**86.0**
12-19233 (Interlab)	P2-13	2012	1	Phase I	30-40	**3.3**	<1.0	<20	<5.0	**11.0**	<10	<5.0	**29.0**	<0.05	<10	<4.0	**27.0**	<50
P214-13B	P2-13	2014	3	Phase I	40-50	2.5	0.120	3.8	1.9	6.9	<5.0	2.0	**21.0**	<0.10	<10	<50	<50	<100
P216-13B	P2-13	2016	5	Phase I	40-50	**3.6**	0.110	16.0	2.1	8.1	2.7	**8.4**	11.0	<0.010	<12	<10	<50	<50
P2-13B	P2-13	2018	7	Phase II	40-50	1.9	0.058	4.8	2.1	6.1	1.9	3.6	9.6	<0.010	<7.0	<4.0	<8.0	<6.0

Table 5:

PIN-2 Airstrip South Landfill - Summary of Soil Monitoring Analytical Data

Link to: Table of Contents

Sample #	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (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)	F4 C_{34}-C_{50} (mg/kg)
Background Data - Arithmetic Mean						2.9	1.0	20.0	5.0	8.7	10.0	5.0	15.0	0.010	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean						**2.9**	**1.0**	**20.0**	**5.0**	**8.4**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**4.0**	**16.8**	**9.8**
Baseline Data - Standard Deviation						1.3	0.0	0.0	0.0	5.6	0.0	0.0	0.0	0.00	0.0	0.0	6.4	7.7
Baseline Data Mean + 3x Standard Deviation						**6.9**	**1.0**	**20.0**	**5.0**	**25.1**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**4.0**	**36.1**	**32.9**
**** If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.***																		
DEW Line Cleanup Tier I Criteria											*200*			*1*				
DEW Line Cleanup Tier II Criteria						*30*	*5*	*250*	*50*	*100*	*500*	*100*	*500*	*5*				
Downgradient																		
	P2-14 surface																	
12-19234	P2-14	2012	1	Phase I	0-10	1.9	<0.50	3.1	<1.0	5.9	3.3	2.6	8.6	<0.020	<5.0	<10	**56.0**	<50
12-19235 (Dup)	P2-14	2012	1	Phase I	0-10	2.0	<0.50	3.1	<1.0	6.8	3.3	2.4	7.5	<0.020	<5.0	<10	<50	<50
12-19235 (Interlab)	P2-14	2012	1	Phase I	0-10	2.0	<0.50	3.1	<1.0	6.8	3.3	2.4	7.5	<0.01	<5.0	<10	<50	<50
P214-14A	P2-14	2014	3	Phase I	0-15	1.5	0.060	3.9	1.1	5.0	<4.9	2.6	9.0	<0.10	<10	<50	<50	<100
P214-BD4 (Dup)	P2-14	2014	3	Phase I	0-15	1.4	0.070	3.3	1.1	4.7	<4.9	2.8	8.0	<0.10	<10	<50	<50	<100
P214-14A (Interlab)	P2-14	2014	3	Phase I	0-15	1.5	<0.10	3.2	<1.0	<5.0	1.6	2.4	<10	<0.01	<12	<10	<50	N/A
P216-14A	P2-14	2016	5	Phase I	0-15	1.9	0.210	5.2	1.3	**8.8**	2.6	4.1	14.0	<0.010	<12	<10	<50	<50
P216-BD6 (Dup)	P2-14	2016	5	Phase I	0-15	1.7	0.180	8.4	1.3	8.2	2.6	**5.4**	13.0	<0.010	<12	<10	<50	<50
P216-14A (Interlab)	P2-14	2016	5	Phase I	0-15	1.9	0.180	4.1	1.5	**9.6**	2.2	4.4	15.0	<0.050	<10	<50	<50	<100
P2-14A	P2-14	2018	7	Phase II	0-15	1.1	0.430	3.0	0.8	7.2	2.8	3.9	**19.0**	<0.010	<7.0	<4.0	**44.0**	**16.0**
	P2-14 depth																	
12-19236	P2-14	2012	1	Phase I	30-40	2.6	<0.50	3.5	<1.0	4.3	3.1	2.0	6.6	<0.020	<5.0	<10	<50	<50
P214-14B	P2-14	2014	3	Phase I	40-50	1.9	0.040	6.4	2.2	3.8	<5.0	4.5	9.0	<0.10	<10	<50	<50	<100
P216-14B	P2-14	2016	5	Phase I	40-50	2.2	0.270	9.4	1.7	**15.0**	2.4	**7.0**	**16.0**	<0.010	<12	<10	<50	<50
P2-14B	P2-14	2018	7	Phase II	40-50	1.8	0.200	4.9	1.6	7.9	2.3	4.8	**17.0**	<0.010	<7.0	<4.0	**28.0**	7.3

Table 5:

PIN-2 Airstrip South Landfill - Summary of Soil Monitoring Analytical Data

Link to: Table of Contents

Sample #	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (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)	F4 C_{34}-C_{50} (mg/kg)
Background Data - Arithmetic Mean						2.9	1.0	20.0	5.0	8.7	10.0	5.0	15.0	0.010	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean						**2.9**	**1.0**	**20.0**	**5.0**	**8.4**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**4.0**	**16.8**	**9.8**
Baseline Data - Standard Deviation						1.3	0.0	0.0	0.0	5.6	0.0	0.0	0.0	0.00	0.0	0.0	6.4	7.7
Baseline Data Mean + 3x Standard Deviation						**6.9**	**1.0**	**20.0**	**5.0**	**25.1**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**4.0**	**36.1**	**32.9**
**** If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.***																		
DEW Line Cleanup Tier I Criteria											*200*			*1*				
DEW Line Cleanup Tier II Criteria						*30*	*5*	*250*	*50*	*100*	*500*	*100*	*500*	*5*				
Downgradient																		
	P2-15 surface																	
12-19238	P2-15	2012	1	Phase I	0-10	**3.6**	<0.50	2.5	<1.0	2.0	3.0	1.4	8.8	<0.020	<5.0	<10	<50	<50
P214-15A	P2-15	2014	3	Phase I	0-15	**3.6**	0.040	3.0	0.8	2.0	<5.0	1.1	10.0	<0.10	<10	<50	<50	<100
P216-15A	P2-15	2016	5	Phase I	0-15	**4.5**	0.089	8.5	1.1	3.3	3.3	4.6	12.0	<0.010	<12	<10	<50	<50
P2-15A	P2-15	2018	7	Phase II	0-15	**3.8**	0.072	2.5	0.6	2.2	3.1	1.4	11.0	<0.010	<7.0	<4.0	<8.0	<6.0
	P2-15 depth																	
12-19240	P2-15	2012	1	Phase I	30-40	**4.0**	<0.50	2.8	<1.0	1.9	2.9	1.6	10.0	<0.020	<5.0	<10	<50	<50
P214-15B	P2-15	2014	3	Phase I	40-50	**4.0**	0.040	3.1	1.1	2.2	<4.9	2.5	10.0	<0.10	<10	<50	<50	<100
P216-15B	P2-15	2016	5	Phase I	40-50	**5.1**	0.083	14.0	0.9	2.6	3.4	**6.5**	13.0	<0.010	<12	<10	<50	<50
P2-15B	P2-15	2018	7	Phase II	40-50	**3.7**	<0.050	2.2	0.6	1.6	2.7	1.3	8.7	<0.010	<7.0	<4.0	14.0	<6.0

Table 5:

PIN-2 Airstrip South Landfill - Summary of Soil Monitoring Analytical Data

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Sample #	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (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)	F4 C_{34}-C_{50} (mg/kg)
Background Data - Arithmetic Mean						2.9	1.0	20.0	5.0	8.7	10.0	5.0	15.0	0.010	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean						**2.9**	**1.0**	**20.0**	**5.0**	**8.4**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**4.0**	**16.8**	**9.8**
Baseline Data - Standard Deviation						1.3	0.0	0.0	0.0	5.6	0.0	0.0	0.0	0.00	0.0	0.0	6.4	7.7
Baseline Data Mean + 3x Standard Deviation						**6.9**	**1.0**	**20.0**	**5.0**	**25.1**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**4.0**	**36.1**	**32.9**
**** If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.***																		
DEW Line Cleanup Tier I Criteria											*200*			*1*				
DEW Line Cleanup Tier II Criteria						*30*	*5*	*250*	*50*	*100*	*500*	*100*	*500*	*5*				
Downgradient																		
	P2-16 surface																	
12-19242	P2-16	2012	1	Phase I	0-10	2.0	<0.50	5.4	2.1	3.1	2.9	4.5	**24.0**	<0.020	<5.0	**14.0**	**130.0**	**130.0**
P214-16A	P2-16	2014	3	Phase I	0-15	2.8	0.060	3.9	1.9	2.8	<4.9	4.3	**18.0**	<0.10	<10	<50	<50	<100
P216-16A	P2-16	2016	5	Phase I	0-15	**9.7**	0.150	4.7	1.7	7.1	5.2	3.2	**48.0**	<0.020	<12	<10	**120.0**	<50
P2-16A	P2-16	2018	7	Phase II	0-15	**3.7**	0.096	2.7	1.1	3.7	4.1	2.4	**25.0**	<0.010	<7.0	<4.0	8.1	<6.0
	P2-16 depth																	
12-19244	P2-16	2012	1	Phase I	30-40	**3.4**	<0.50	3.8	1.5	3.5	3.2	2.7	15.0	<0.020	<5.0	<10	<50	<50
P214-16B	P2-16	2014	3	Phase I	40-50	2.9	0.060	4.4	2.3	3.3	<5.0	4.2	**19.0**	<0.10	<10	<50	<50	<100
P216-16B	P2-16	2016	5	Phase I	40-50	**4.6**	0.071	9.4	2.7	6.7	3.8	**6.0**	**16.0**	0.011	<12	<10	<50	<50
P2-16B	P2-16	2018	7	Phase II	40-50	2.9	0.060	2.8	1.1	2.3	2.7	1.9	11.0	<0.010	<7.0	<4.0	<8.0	<6.0

N/A = not analyzed

Legend	
XX	**Sample exceeds baseline mean**
XX	**Sample exceeds baseline mean + 3x SD**

Table 6:

PIN-2 Pallet Line West Landfill - Summary of Soil Monitoring Analytical Data

Link to: Table of Contents

Sample #	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (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)	F4 C_{34}-C_{50} (mg/kg)
Background Data - Arithmetic Mean						2.9	1.0	20.0	5.0	8.7	10.0	5.0	15.0	0.010	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean						**3.9**	**1.0**	**20.0**	**5.0**	**10.4**	**10.0**	**5.5**	**40.5**	**0.10**	**10.0**	**4.0**	**109.6**	**54.8**
Baseline Data - Standard Deviation						4.3	0.0	0.0	0.0	7.9	0.0	3.4	53.4	0.00	0.0	0.0	185.0	85.1
Baseline Data Mean + 3x Standard Deviation						**16.7**	**1.0**	**20.0**	**5.0**	**34.1**	**10.0**	**15.7**	**200.7**	**0.10**	**10.0**	**4.0**	**664.4**	**310.2**
**** If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.***																		
DEW Line Cleanup Tier I Criteria											*200*			*1*				
DEW Line Cleanup Tier II Criteria						*30*	*5*	*250*	*50*	*100*	*500*	*100*	*500*	*5*				
Monitoring Data																		
Upgradient																		
	P2-09 surface																	
12-19166	P2-09	2012	1	Phase I	0-10	<1.0	<0.50	1.8	<1.0	6.7	1.3	2.8	23.5	<0.40	<10	<20	**240.0**	**170.0**
P214-9A	P2-09	2014	3	Phase I	0-15	2.4	0.060	3.8	1.5	3.6	<4.9	2.8	**84.0**	<0.10	<10	<50	<50	<100
P214-BD5 (Dup)	P2-09	2014	3	Phase I	0-15	2.2	0.090	4.3	1.6	5.7	<4.9	5.0	**50.0**	<0.10	<10	<50	<50	<100
P214-9A	P2-09	2014	3	Phase I	0-15	2.6	<0.10	3.4	1.4	8.8	5.2	2.6	**74.0**	<0.010	<12	<10	<50	N/A
P216-9A	P2-09	2016	5	Phase I	0-15	2.8	0.081	4.3	2.0	**12.0**	4.5	4.0	**82.0**	<0.010	<12	<10	<50	<50
P2-9A	P2-09	2018	7	Phase II	0-15	3.0	0.120	5.6	2.5	**15.0**	7.5	5.5	**120.0**	<0.010	<7.0	**6.3**	21.0	**240.0**
	P2-09 depth																	
12-19168	P2-09	2012	1	Phase I	30-40	1.2	<0.50	2.2	<1.0	9.8	1.6	5.0	32.1	<0.010	<10	<20	**170.0**	**100.0**
12-19169 (Interlab)	P2-09	2012	1	Phase I	30-40	0.70	<1.0	<20	<5.0	9.6	<10	<5.0	32.1	<0.050	**20.0**	**5.2**	**170.0**	**89.0**
P214-9B	P2-09	2014	3	Phase I	40-50	1.9	0.040	3.3	1.2	3.6	<5.0	3.3	16.0	<0.10	<10	<50	<50	<100
P216-9B	P2-09	2016	5	Phase I	40-50	2.6	0.081	16.0	1.8	**18.0**	4.8	**8.6**	**75.0**	<0.010	<12	<10	**210.0**	**110.0**
P2-9B	P2-09	2018	7	Phase II	30-40	2.8	0.089	6.7	2.9	10.0	9.6	**6.1**	**53.0**	<0.010	<7.0	**4.2**	15.0	22.0

Table 6:

PIN-2 Pallet Line West Landfill - Summary of Soil Monitoring Analytical Data

Link to: Table of Contents

Sample #	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (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)	F4 C_{34}-C_{50} (mg/kg)
Background Data - Arithmetic Mean						2.9	1.0	20.0	5.0	8.7	10.0	5.0	15.0	0.010	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean						**3.9**	**1.0**	**20.0**	**5.0**	**10.4**	**10.0**	**5.5**	**40.5**	**0.10**	**10.0**	**4.0**	**109.6**	**54.8**
Baseline Data - Standard Deviation						4.3	0.0	0.0	0.0	7.9	0.0	3.4	53.4	0.00	0.0	0.0	185.0	85.1
Baseline Data Mean + 3x Standard Deviation						**16.7**	**1.0**	**20.0**	**5.0**	**34.1**	**10.0**	**15.7**	**200.7**	**0.10**	**10.0**	**4.0**	**664.4**	**310.2**
**** If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.***																		
DEW Line Cleanup Tier I Criteria											*200*			*1*				
DEW Line Cleanup Tier II Criteria						*30*	*5*	*250*	*50*	*100*	*500*	*100*	*500*	*5*				
Downgradient																		
	P2-10 surface																	
12-19170	P2-10	2012	1	Phase I	0-10	1.8	<0.50	5.9	1.9	6.4	2.6	4.5	31.5	<0.020	<5.0	<10	<50	<50
12-19171 (Dup)	P2-10	2012	1	Phase I	0-10	2.0	<0.50	5.6	1.9	6.4	2.6	4.3	29.0	<0.020	<5.0	<10	52.0	<50
P214-10A	P2-10	2014	3	Phase I	0-15	3.1	0.270	4.6	2.0	4.5	<4.9	3.4	34.0	<0.10	<10	<50	<50	<100
P216-10A	P2-10	2016	5	Phase I	0-15	3.2	0.240	12.0	2.5	4.9	3.1	**8.0**	20.0	<0.020	<12	<10	<50	<50
P2-10A	P2-10	2018	7	Phase II	0-15	**5.4**	0.190	4.2	1.6	3.4	2.8	3.8	18.0	<0.010	<7.0	**4.5**	40.0	22.0
Dup 5	P2-10	2018	7	Phase II	0-15	**4.8**	0.190	3.5	1.4	2.9	2.7	3.8	18.0	<0.010	<7.0	**12.0**	47.0	20.0
	P2-10 depth																	
12-19172	P2-10	2012	1	Phase I	30-40	2.6	<0.50	7.0	2.5	7.0	2.8	**6.1**	16.3	<0.020	<5.0	<10	<50	<50
P214-10B	P2-10	2014	3	Phase I	40-50	**7.0**	0.160	5.8	2.7	3.4	<5.0	4.9	33.0	<0.10	<10	<50	<50	<100
P216-10B	P2-10	2016	5	Phase I	30-40	**9.9**	0.180	6.0	2.7	3.3	4.7	5.2	31.0	<0.010	<12	<10	<50	<50
P2-10B	P2-10	2018	7	Phase II	40-50	**25.0**	0.320	6.0	3.3	5.9	7.1	**8.8**	**51.0**	<0.010	<7.0	<4.0	16.0	<6.0

Table 6:

PIN-2 Pallet Line West Landfill - Summary of Soil Monitoring Analytical Data

Link to: Table of Contents

Sample #	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (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)	F4 C_{34}-C_{50} (mg/kg)
Background Data - Arithmetic Mean						2.9	1.0	20.0	5.0	8.7	10.0	5.0	15.0	0.010	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean						**3.9**	**1.0**	**20.0**	**5.0**	**10.4**	**10.0**	**5.5**	**40.5**	**0.10**	**10.0**	**4.0**	**109.6**	**54.8**
Baseline Data - Standard Deviation						4.3	0.0	0.0	0.0	7.9	0.0	3.4	53.4	0.00	0.0	0.0	185.0	85.1
Baseline Data Mean + 3x Standard Deviation						**16.7**	**1.0**	**20.0**	**5.0**	**34.1**	**10.0**	**15.7**	**200.7**	**0.10**	**10.0**	**4.0**	**664.4**	**310.2**
**** If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.***																		
DEW Line Cleanup Tier I Criteria											*200*			*1*				
DEW Line Cleanup Tier II Criteria						*30*	*5*	*250*	*50*	*100*	*500*	*100*	*500*	*5*				
Downgradient																		
	P2-11 surface																	
12-19174	P2-11	2012	1	Phase I	0-10	2.4	<0.50	5.1	2.2	5.3	2.8	4.5	25.8	<0.010	<5.0	<10	82.0	**94.0**
12-19175 (Interlab)	P2-11	2012	1	Phase I	0-10	1.6	<1.0	<20	<5.0	7.3	<10	5.2	**40.7**	<0.050	**27.0**	**4.9**	53.0	40.0
P214-11A	P2-11	2014	3	Phase I	0-15	1.8	0.350	6.9	2.3	**11.0**	<5.0	**5.9**	40.0	<0.10	<10	<50	**118.0**	**108.0**
P216-11A	P2-11	2016	5	Phase I	0-15	1.1	0.089	11.0	<0.50	2.3	1.1	5.1	<10	<0.020	<12	<10	82.0	<50
P2-11A	P2-11	2018	7	Phase II	0-15	1.8	0.130	4.1	1.5	4.6	2.4	3.4	21.0	<0.010	<7.0	**5.6**	56.0	19.0
	P2-11 depth																	
12-19176	P2-11	2012	1	Phase I	30-40	**8.7**	<0.50	5.0	1.9	2.8	3.0	3.6	19.8	<0.020	<5.0	<10	<50	<50
P214-11B	P2-11	2014	3	Phase I	40-50	2.8	0.130	5.9	1.7	6.1	<4.9	4.5	18.0	<0.10	<10	<50	<50	<100
P216-11B	P2-11	2016	5	Phase I	40-50	2.2	0.085	4.7	1.0	1.8	2.1	2.7	<10	<0.010	<12	<10	<50	<50
P2-11B	P2-11	2018	7	Phase II	40-50	2.8	0.100	4.4	1.5	3.9	2.4	3.4	15.0	<0.010	<7.0	<4.0	21.0	8.8

Table 6:

PIN-2 Pallet Line West Landfill - Summary of Soil Monitoring Analytical Data

Link to: Table of Contents

Sample #	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (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)	F4 C_{34}-C_{50} (mg/kg)
Background Data - Arithmetic Mean						2.9	1.0	20.0	5.0	8.7	10.0	5.0	15.0	0.010	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean						**3.9**	**1.0**	**20.0**	**5.0**	**10.4**	**10.0**	**5.5**	**40.5**	**0.10**	**10.0**	**4.0**	**109.6**	**54.8**
Baseline Data - Standard Deviation						4.3	0.0	0.0	0.0	7.9	0.0	3.4	53.4	0.00	0.0	0.0	185.0	85.1
Baseline Data Mean + 3x Standard Deviation						**16.7**	**1.0**	**20.0**	**5.0**	**34.1**	**10.0**	**15.7**	**200.7**	**0.10**	**10.0**	**4.0**	**664.4**	**310.2**
**** If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.***																		
DEW Line Cleanup Tier I Criteria											*200*			*1*				
DEW Line Cleanup Tier II Criteria						*30*	*5*	*250*	*50*	*100*	*500*	*100*	*500*	*5*				
Downgradient																		
	P2-12 surface																	
12-19178	P2-12	2012	1	Phase I	0-10	2.9	<0.50	3.3	1.2	6.3	4.7	2.2	**64.1**	<0.020	<5.0	<10	<50	<50
P214-12A	P2-12	2014	3	Phase I	0-15	0.90	0.180	1.8	0.30	5.8	<5.0	2.7	6.0	<0.10	<10	<50	**143.0**	**165.0**
P216-12A	P2-12	2016	5	Phase I	0-15	<2.0	0.230	<2.0	<1.0	6.3	<1.0	<2.0	<20	<0.030	<12	<30	<150	<150
P216-BD5 (Dup)	P2-12	2016	5	Phase I	0-15	<2.0	0.260	<2.0	<1.0	**11.0**	<1.0	2.1	<20	<0.030	<37	<31	**350.0**	<150
P216-12A (Interlab)	P2-12	2016	5	Phase I	0-15	0.4	0.280	1.0	0.6	5.5	0.5	1.7	25.0	<0.050	<10	<50	**218.0**	**268.0**
P2-12A	P2-12	2018	7	Phase II	0-15	<1.0	0.230	1.7	0.8	5.9	1.1	2.5	**46.0**	<0.030	**11.0**	<2.0	74.0	5.8
	P2-12 depth																	
12-19180	P2-12	2012	1	Phase I	30-40	2.8	<0.50	3.2	1.1	3.7	4.1	2.0	35.2	<0.020	<5.0	<10	<50	<50
P214-12B	P2-12	2014	3	Phase I	40-50	0.80	0.210	2.4	0.40	7.2	<4.9	3.9	6.0	<0.10	<10	<50	**140.0**	**132.0**
P216-12B	P2-12	2016	5	Phase I	40-50	<2.0	0.370	<2.0	<1.0	9.1	1.1	3.5	<20	<0.030	<12	<25	<130	<130
P2-12B	P2-12	2018	7	Phase II	15-30	2.3	0.180	3.8	1.8	7.6	2.4	**5.6**	38.0	<0.010	<7.0	**7.9**	64.0	26.0

N/A = not analyzed

Legend

XX **Sample exceeds baseline mean**

XX **Sample exceeds baseline mean + 3x SD**

Table 7:

PIN-2 Non-Hazardous Waste Landfill - Summary of Soil Monitoring Analytical Data

Link to: Table of Contents

Sample #	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (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)	F4 C_{34}-C_{50} (mg/kg)
Background Data - Arithmetic Mean						2.9	1.0	20.0	5.0	8.7	10.0	5.0	15.0	0.010	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean						**3.8**	**1.0**	**20.0**	**5.0**	**6.5**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**4.0**	**20.3**	**16.3**
Baseline Data - Standard Deviation						2.6	0.0	0.0	0.0	7.1	0.0	0.0	0.0	0.00	0.0	0.0	26.5	11.2
Baseline Data Mean + 3x Standard Deviation						**11.7**	**1.0**	**20.0**	**5.0**	**27.7**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**4.0**	**99.9**	**49.9**
**** If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.***																		
DEW Line Cleanup Tier I Criteria											*200*			*1*				
DEW Line Cleanup Tier II Criteria						*30*	*5*	*250*	*50*	*100*	*500*	*100*	*500*	*5*				
Monitoring Data																		
Upgradient																		
	MW-08 surface																	
12-19194	MW-08	2012	1	Phase I	0-10	2.00	<0.50	5.3	2.4	**8.1**	2.9	4.5	**21.9**	<0.010	<5.0	<10	<50	<50
12-19195 (Interlab)	MW-08	2012	1	Phase I	0-10	1.87	<1.0	<20	<5.0	**9.0**	<10	**5.9**	**21.8**	<0.050	<10	<4.0	**36.0**	**37.0**
P214-8WA	MW-08	2014	3	Phase I	0-15	2.40	0.080	3.2	1.3	3.2	<4.9	2.6	13.0	<0.10	<10	<50	<50	<100
P216-8WA	MW-08	2016	5	Phase I	0-15	2.70	0.088	13.0	1.3	3.5	3.0	**6.1**	13.0	<0.010	<12	<10	<50	<50
MW-08A	MW-08	2018	7	Phase II	0-15	2.60	0.059	2.6	1.0	5.0	2.2	1.9	11.0	0.015	<7.0	<4.0	<8.0	<6.0
	MW-08 depth																	
12-19196	MW-08	2012	1	Phase I	30-40	2.60	<0.50	4.9	2.0	5.1	3.0	3.8	**24.0**	<0.020	<5.0	<10	<50	<50
P214-8WB	MW-08	2014	3	Phase I	40-50	2.40	0.070	3.2	1.9	4.2	<4.9	3.7	12.0	<0.10	<10	<50	<50	<100
P216-8WB	MW-08	2016	5	Phase I	40-50	3.10	0.060	7.5	1.3	3.3	2.2	4.3	<10	<0.010	<12	<10	<50	<50
MW-08B	MW-08	2018	7	Phase II	40-50	2.40	0.058	3.3	1.5	2.6	2.2	2.4	10.0	<0.010	<7.0	<4.0	<8.0	<6.0

Table 7:

PIN-2 Non-Hazardous Waste Landfill - Summary of Soil Monitoring Analytical Data

Link to: Table of Contents

Sample #	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (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)	F4 C_{34}-C_{50} (mg/kg)
Background Data - Arithmetic Mean						2.9	1.0	20.0	5.0	8.7	10.0	5.0	15.0	0.010	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean						**3.8**	**1.0**	**20.0**	**5.0**	**6.5**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**4.0**	**20.3**	**16.3**
Baseline Data - Standard Deviation						2.6	0.0	0.0	0.0	7.1	0.0	0.0	0.0	0.00	0.0	0.0	26.5	11.2
Baseline Data Mean + 3x Standard Deviation						**11.7**	**1.0**	**20.0**	**5.0**	**27.7**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**4.0**	**99.9**	**49.9**
**** If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.***																		
DEW Line Cleanup Tier I Criteria											*200*			*1*				
DEW Line Cleanup Tier II Criteria						*30*	*5*	*250*	*50*	*100*	*500*	*100*	*500*	*5*				
Downgradient																		
	MW-05 surface																	
12-19182	MW-05	2012	1	Phase I	0-10	2.90	<0.50	3.0	1.0	3.6	2.7	1.8	14.5	<0.010	<5.0	<10	<50	<50
12-19183 (Interlab)	MW-05	2012	1	Phase I	0-10	1.48	<1.0	<20	<5.0	5.3	<10	<5.0	**16.0**	<0.050	<10	<4.0	9.6	10.0
P214-5WA	MW-05	2014	3	Phase I	0-15	1.10	0.090	2.7	0.8	4.0	<4.9	2.6	11.0	<0.10	<10	<50	<50	<100
P216-5WA	MW-05	2016	5	Phase I	0-15	1.40	0.065	3.3	<0.50	2.2	1.8	1.8	<10	<0.010	<12	<10	<50	<50
P216-BD2 (Dup)	MW-05	2016	5	Phase I	0-15	1.80	0.077	2.1	0.5	3.0	1.9	1.4	<10	<0.010	<12	<10	<50	<50
P216-5WA (Interlab)	MW-05	2016	5	Phase I	0-15	1.90	0.070	2.5	0.6	3.1	1.7	2.4	10.0	<0.050	<10	<50	<50	<100
MW-05A	MW-05	2018	7	Phase II	0-15	1.10	0.081	1.8	<0.05	3.1	1.9	1.6	10.0	<0.010	<7.0	<4.0	11.0	<6.0
	MW-05 depth																	
12-19184	MW-05	2012	1	Phase I	30-40	3.30	<0.50	2.9	1.0	2.2	2.5	1.6	10.1	<0.020	<5.0	<10	<50	<50
12-19185 (Dup)	MW-05	2012	1	Phase I	30-40	3.40	<0.50	2.9	1.0	2.5	2.7	1.8	10.4	<0.020	<5.0	<10	<50	<50
P214-5WB	MW-05	2014	3	Phase I	40-50	1.20	0.070	5.6	1.7	5.4	<4.9	4.9	**16.0**	<0.10	<10	<50	<50	<100
P216-5WB	MW-05	2016	5	Phase I	40-50	1.40	0.060	4.2	0.7	3.2	2.3	2.6	<10	<0.010	<12	<10	<50	<50
MW-05B	MW-05	2018	7	Phase II	40-50	1.20	0.086	3.3	0.8	5.2	2.1	2.8	15.0	<0.010	<7.0	<4.0	<8.0	<6.0

Table 7:

PIN-2 Non-Hazardous Waste Landfill - Summary of Soil Monitoring Analytical Data

Link to: Table of Contents

Sample #	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (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)	F4 C_{34}-C_{50} (mg/kg)
Background Data - Arithmetic Mean						2.9	1.0	20.0	5.0	8.7	10.0	5.0	15.0	0.010	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean						**3.8**	**1.0**	**20.0**	**5.0**	**6.5**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**4.0**	**20.3**	**16.3**
Baseline Data - Standard Deviation						2.6	0.0	0.0	0.0	7.1	0.0	0.0	0.0	0.00	0.0	0.0	26.5	11.2
Baseline Data Mean + 3x Standard Deviation						**11.7**	**1.0**	**20.0**	**5.0**	**27.7**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**4.0**	**99.9**	**49.9**
**** If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.***																		
DEW Line Cleanup Tier I Criteria											*200*			*1*				
DEW Line Cleanup Tier II Criteria						*30*	*5*	*250*	*50*	*100*	*500*	*100*	*500*	*5*				
Downgradient																		
	MW-06 surface																	
12-19186	MW-06	2012	1	Phase I	0-10	1.00	<0.50	2.5	<1.0	3.8	1.9	2.2	10.0	<0.020	<5.0	<10	<50	<50
P214-6WA	MW-06	2014	3	Phase I	0-15	2.40	0.070	2.9	1.1	4.9	<5.0	2.9	11.0	<0.10	<10	<50	<50	<100
P214-BD6 (Dup)	MW-06	2014	3	Phase I	0-15	2.80	0.080	2.9	1.1	4.3	<4.9	3.5	12.0	<0.100	<10	<50	<50	<100
P214-6WA (Interlab)	MW-06	2014	3	Phase I	0-15	3.40	<0.10	2.6	<1.0	<5.0	2.4	2.1	14.0	<0.010	<12	<10	<50	N/A
P216-6WA	MW-06	2016	5	Phase I	0-15	3.20	0.110	3.9	0.5	**7.3**	2.1	3.3	13.0	<0.010	<12	<10	<50	<50
MW-06A	MW-06	2018	7	Phase II	0-15	3.60	0.110	2.8	0.9	5.3	2.8	2.8	**17.0**	<0.010	<7.0	<4.0	**22.0**	<6.0
	MW-06 depth																	
12-19188	MW-06	2012	1	Phase I	30-40	1.10	<0.50	4.7	1.2	4.8	2.4	3.5	12.0	<0.020	<5.0	<10	<50	<50
P214-6WB	MW-06	2014	3	Phase I	40-50	**4.30**	0.270	7.4	1.2	5.4	<4.9	3.0	**40.0**	<0.10	<10	<50	<50	<100
P216-6WB	MW-06	2016	5	Phase I	40-50	2.10	0.070	6.6	0.9	**8.8**	3.2	4.4	12.0	<0.010	<12	<10	<50	<50
MW-06B	MW-06	2018	7	Phase II	40-50	**15.00**	0.440	3.3	1.4	5.4	5.4	4.1	**62.0**	<0.010	<7.0	<4.0	<8.0	<6.0
Dup 2	MW-06	2018	7	Phase II	40-50	**18.00**	0.450	3.4	1.5	6.3	6.7	4.6	**64.0**	<0.010	<7.0	**5.2**	15.0	<6.0

Table 7:

PIN-2 Non-Hazardous Waste Landfill - Summary of Soil Monitoring Analytical Data

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Sample #	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (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)	F4 C_{34}-C_{50} (mg/kg)
Background Data - Arithmetic Mean						2.9	1.0	20.0	5.0	8.7	10.0	5.0	15.0	0.010	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean						**3.8**	**1.0**	**20.0**	**5.0**	**6.5**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**4.0**	**20.3**	**16.3**
Baseline Data - Standard Deviation						2.6	0.0	0.0	0.0	7.1	0.0	0.0	0.0	0.00	0.0	0.0	26.5	11.2
Baseline Data Mean + 3x Standard Deviation						**11.7**	**1.0**	**20.0**	**5.0**	**27.7**	**10.0**	**5.0**	**15.0**	**0.10**	**10.0**	**4.0**	**99.9**	**49.9**
**** If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.***																		
DEW Line Cleanup Tier I Criteria											*200*			*1*				
DEW Line Cleanup Tier II Criteria						*30*	*5*	*250*	*50*	*100*	*500*	*100*	*500*	*5*				
Downgradient																		
	MW-07 surface																	
12-19190	MW-07	2012	1	Phase I	0-10	2.20	<0.50	1.9	<1.0	2.7	1.3	2.2	11.0	<0.020	<5.0	<10	<50	<50
P214-7WA	MW-07	2014	3	Phase I	0-15	2.10	0.090	6.0	2.9	**7.6**	<4.9	**5.6**	**20.0**	<0.10	<10	<50	<50	<100
P216-7WA	MW-07	2016	5	Phase I	0-15	2.20	0.081	15.0	2.8	**8.3**	3.4	**9.0**	**20.0**	<0.010	<12	<10	<50	<50
MW-07A	MW-07	2018	7	Phase II	0-15	2.80	0.076	3.9	1.4	3.7	2.7	3.1	**17.0**	<0.010	<7.0	<4.0	<8.0	<6.0
	MW-07 depth																	
12-19192	MW-07	2012	1	Phase I	30-40	1.20	<0.50	1.7	<1.0	4.8	1.4	1.6	6.2	<0.020	<5.0	<10	<50	<50
P214-7WB	MW-07	2014	3	Phase I	40-50	2.30	0.070	5.9	3.0	**8.6**	<4.9	**5.8**	**16.0**	<0.10	<10	<50	<50	<100
P216-7WB	MW-07	2016	5	Phase I	25-35	2.40	0.089	6.6	2.2	5.8	3.2	4.8	**25.0**	<0.010	<12	<10	<50	<50
MW-07B	MW-07	2018	7	Phase II	40-50	2.80	0.054	3.2	1.2	3.3	2.4	2.4	14.0	<0.010	<7.0	<4.0	8.3	<6.0

N/A = not analyzed

Legend	
XX	Sample exceeds baseline mean
XX	Sample exceeds baseline mean + 3x SD

Table 7A:

PIN-2 Non-Hazardous Waste Landfill - Summary of Groundwater Monitoring Analytical Data

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Sample ID	Location	Date	Monitoring Year	Monitoring Phase	As (mg/L)	Cd* (mg/L)	Cr (mg/L)	Co (mg/L)	Cu (mg/L)	Pb (mg/L)	Ni (mg/L)	Zn (mg/L)	F1* C_6-C_{10} (mg/L)	F2* C_{10}-C_{16} (mg/L)	F3* C_{16}-C_{34} (mg/L)	F4* C_{34}-C_{50} (mg/L)
Baseline Data																
Upgradient																
No data - well dry/frozen																
Downgradient																
10-5020	MW-05	2010			0.050	<0.0010	0.10	0.010	0.080	0.020	0.080	0.080	<0.050	<0.5	<1.0	<1.0
10-5021 (Dup)	MW-05	2010			0.040	<0.0010	0.14	<0.0030	0.060	0.020	0.090	0.060	<0.050	<0.5	<1.0	<1.0
10-5019	MW-06	2010			0.046	<0.0010	0.090	0.005	0.149	0.018	0.088	0.865	<0.050	<0.5	<1.0	<1.0
10-5016	MW-07	2010			0.022	<0.0010	0.16	0.009	0.066	0.011	0.097	0.039	<0.050	<0.5	<1.0	<1.0
11-6964	MW-05	2011			0.013	<0.0010	0.066	<0.0030	0.069	<0.010	0.006	0.212	<0.050	<0.5	<1.0	<1.0
11-6963	MW-06	2011			0.016	<0.0010	0.027	<0.0030	0.058	<0.010	<0.0050	1.650	<0.050	<0.5	<1.0	<1.0
11-6965	MW-07	2011			0.011	<0.0010	0.074	0.004	0.040	<0.010	0.012	0.053	<0.050	<0.5	<1.0	<1.0
				N value	7	7	7	7	7	7	7	7	7	7	7	7
Baseline Data - Arithmetic Mean					0.0284	0.0010	0.0931	0.0048	0.0744	0.0121	0.0537	0.42	0.025	0.25	0.5	0.5
Baseline Data - Arithmetic Mean Corrected for Detection Limit					**0.0284**	**0.0010**	**0.0931**	**0.0048**	**0.0744**	**0.0121**	**0.0537**	**0.42**	**0.050**	**0.50**	**1.0**	**1.0**
Baseline Data - Standard Deviation					0.0165	0.0000	0.0439	0.0037	0.0351	0.0072	0.0441	0.62	0.000	0.00	0.0	0.0
Baseline Data - Corrected Arithmetic Mean + 3x Standard Deviation					**0.0778**	**0.0010**	**0.2249**	**0.0159**	**0.1798**	**0.0338**	**0.1861**	**2.27**	**0.050**	**0.50**	**1.0**	**1.0**
If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.																
Monitoring Data																
Upgradient - MW-08																
Not sampled - frozen	MW-08	2012	1	Phase I												
Not sampled - insufficient water	MW-08	2014	3	Phase I												
Not sampled - dry	MW-08	2016	5	Phase I												
Not sampled - frozen	MW-08	2018	7	Phase II												

Table 7A:

PIN-2 Non-Hazardous Waste Landfill - Summary of Groundwater Monitoring Analytical Data

Link to: Table of Contents

Sample ID	Location	Date	Monitoring Year	Monitoring Phase	As (mg/L)	Cd* (mg/L)	Cr (mg/L)	Co (mg/L)	Cu (mg/L)	Pb (mg/L)	Ni (mg/L)	Zn (mg/L)	F1* C_6-C_{10} (mg/L)	F2* C_{10}-C_{16} (mg/L)	F3* C_{16}-C_{34} (mg/L)	F4* C_{34}-C_{50} (mg/L)
Baseline Data																
Upgradient																
No data - well dry/frozen																
Downgradient																
10-5020	MW-05	2010			0.050	<0.0010	0.10	0.010	0.080	0.020	0.080	0.080	<0.050	<0.5	<1.0	<1.0
10-5021 (Dup)	MW-05	2010			0.040	<0.0010	0.14	<0.0030	0.060	0.020	0.090	0.060	<0.050	<0.5	<1.0	<1.0
10-5019	MW-06	2010			0.046	<0.0010	0.090	0.005	0.149	0.018	0.088	0.865	<0.050	<0.5	<1.0	<1.0
10-5016	MW-07	2010			0.022	<0.0010	0.16	0.009	0.066	0.011	0.097	0.039	<0.050	<0.5	<1.0	<1.0
11-6964	MW-05	2011			0.013	<0.0010	0.066	<0.0030	0.069	<0.010	0.006	0.212	<0.050	<0.5	<1.0	<1.0
11-6963	MW-06	2011			0.016	<0.0010	0.027	<0.0030	0.058	<0.010	<0.0050	1.650	<0.050	<0.5	<1.0	<1.0
11-6965	MW-07	2011			0.011	<0.0010	0.074	0.004	0.040	<0.010	0.012	0.053	<0.050	<0.5	<1.0	<1.0
				N value	7	7	7	7	7	7	7	7	7	7	7	7
Baseline Data - Arithmetic Mean					0.0284	0.0010	0.0931	0.0048	0.0744	0.0121	0.0537	0.42	0.025	0.25	0.5	0.5
Baseline Data - Arithmetic Mean Corrected for Detection Limit					**0.0284**	**0.0010**	**0.0931**	**0.0048**	**0.0744**	**0.0121**	**0.0537**	**0.42**	**0.050**	**0.50**	**1.0**	**1.0**
Baseline Data - Standard Deviation					0.0165	0.0000	0.0439	0.0037	0.0351	0.0072	0.0441	0.62	0.000	0.00	0.0	0.0
Baseline Data - Corrected Arithmetic Mean + 3x Standard Deviation					**0.0778**	**0.0010**	**0.2249**	**0.0159**	**0.1798**	**0.0338**	**0.1861**	**2.27**	**0.050**	**0.50**	**1.0**	**1.0**
If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.																
Downgradient - MW-05																
12-19316	MW-05	2012	1	Phase I	0.0227	0.00022	0.0424	0.0043	0.0275	0.0110	0.0229	0.0870	<0.025	<0.10	<0.25	<0.25
P214-5W	MW-05	2014	3	Phase I	0.0061	<0.000010	**0.264**	0.0015	0.0460	0.0023	0.0390	0.0650	<0.20	<0.20	<0.10	<0.10
P214-BDW1 (Dup)	MW-05	2014	3	Phase I	0.0177	**0.110**	**0.704**	0.0047	**0.123**	0.0064	**0.115**	0.1630	<0.20	<0.20	0.10	<0.10
P214-5W (Interlab)	MW-05	2014	3	Phase I	0.0056	**0.0880**	**0.210**	0.0012	0.0380	0.0026	0.0320	0.0500	<0.10	<0.10	<0.20	N/A
P216-5W	MW-05	2016	5	Phase I	0.00031	0.000016	<0.0010	<0.00050	0.0012	<0.00020	0.0024	0.0110	<0.10	<0.10	<0.20	N/A
MW-5	MW-05	2018	7	Phase II	0.00040	<0.000020	0.0025	<0.00030	0.0014	<0.00010	0.0021	0.0220	<0.025	<0.10	<0.10	<0.10

Table 7A:

PIN-2 Non-Hazardous Waste Landfill - Summary of Groundwater Monitoring Analytical Data

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Sample ID	Location	Date	Monitoring Year	Monitoring Phase	As (mg/L)	Cd* (mg/L)	Cr (mg/L)	Co (mg/L)	Cu (mg/L)	Pb (mg/L)	Ni (mg/L)	Zn (mg/L)	F1* C_6-C_{10} (mg/L)	F2* C_{10}-C_{16} (mg/L)	F3* C_{16}-C_{34} (mg/L)	F4* C_{34}-C_{50} (mg/L)
Baseline Data																
Upgradient																
No data - well dry/frozen																
Downgradient																
10-5020	MW-05	2010			0.050	<0.0010	0.10	0.010	0.080	0.020	0.080	0.080	<0.050	<0.5	<1.0	<1.0
10-5021 (Dup)	MW-05	2010			0.040	<0.0010	0.14	<0.0030	0.060	0.020	0.090	0.060	<0.050	<0.5	<1.0	<1.0
10-5019	MW-06	2010			0.046	<0.0010	0.090	0.005	0.149	0.018	0.088	0.865	<0.050	<0.5	<1.0	<1.0
10-5016	MW-07	2010			0.022	<0.0010	0.16	0.009	0.066	0.011	0.097	0.039	<0.050	<0.5	<1.0	<1.0
11-6964	MW-05	2011			0.013	<0.0010	0.066	<0.0030	0.069	<0.010	0.006	0.212	<0.050	<0.5	<1.0	<1.0
11-6963	MW-06	2011			0.016	<0.0010	0.027	<0.0030	0.058	<0.010	<0.0050	1.650	<0.050	<0.5	<1.0	<1.0
11-6965	MW-07	2011			0.011	<0.0010	0.074	0.004	0.040	<0.010	0.012	0.053	<0.050	<0.5	<1.0	<1.0
				N value	7	7	7	7	7	7	7	7	7	7	7	7
Baseline Data - Arithmetic Mean					0.0284	0.0010	0.0931	0.0048	0.0744	0.0121	0.0537	0.42	0.025	0.25	0.5	0.5
Baseline Data - Arithmetic Mean Corrected for Detection Limit					**0.0284**	**0.0010**	**0.0931**	**0.0048**	**0.0744**	**0.0121**	**0.0537**	**0.42**	**0.050**	**0.50**	**1.0**	**1.0**
Baseline Data - Standard Deviation					0.0165	0.0000	0.0439	0.0037	0.0351	0.0072	0.0441	0.62	0.000	0.00	0.0	0.0
Baseline Data - Corrected Arithmetic Mean + 3x Standard Deviation					**0.0778**	**0.0010**	**0.2249**	**0.0159**	**0.1798**	**0.0338**	**0.1861**	**2.27**	**0.050**	**0.50**	**1.0**	**1.0**
If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.																
Downgradient - MW-06																
12-19317	MW-06	2012	1	Phase I	0.0274	0.00029	0.0418	**0.0050**	0.0670	**0.0130**	0.0530	**1.1500**	<0.025	<0.10	<0.25	<0.25
P214-6W	MW-06	2014	3	Phase I	0.0179	0.00013	**0.8780**	**0.0069**	**0.237**	0.0069	**0.239**	**3.7000**	<0.20	<0.20	<0.10	<0.10
P216-6W	MW-06	2016	5	Phase I	0.00080	0.000041	0.0140	<0.00050	0.0126	0.00038	0.0203	**0.4620**	<0.10	<0.10	<0.20	N/A
MW-6	MW-06	2018	7	Phase II	0.00051	<0.000020	<0.0010	<0.00030	0.0026	<0.00010	0.0029	0.1200	<0.025	<0.10	<0.10	<0.10

Table 7A:

PIN-2 Non-Hazardous Waste Landfill - Summary of Groundwater Monitoring Analytical Data

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Sample ID	Location	Date	Monitoring Year	Monitoring Phase	As (mg/L)	Cd* (mg/L)	Cr (mg/L)	Co (mg/L)	Cu (mg/L)	Pb (mg/L)	Ni (mg/L)	Zn (mg/L)	F1* C_6-C_{10} (mg/L)	F2* C_{10}-C_{16} (mg/L)	F3* C_{16}-C_{34} (mg/L)	F4* C_{34}-C_{50} (mg/L)
Baseline Data																
Upgradient																
No data - well dry/frozen																
Downgradient																
10-5020	MW-05	2010			0.050	<0.0010	0.10	0.010	0.080	0.020	0.080	0.080	<0.050	<0.5	<1.0	<1.0
10-5021 (Dup)	MW-05	2010			0.040	<0.0010	0.14	<0.0030	0.060	0.020	0.090	0.060	<0.050	<0.5	<1.0	<1.0
10-5019	MW-06	2010			0.046	<0.0010	0.090	0.005	0.149	0.018	0.088	0.865	<0.050	<0.5	<1.0	<1.0
10-5016	MW-07	2010			0.022	<0.0010	0.16	0.009	0.066	0.011	0.097	0.039	<0.050	<0.5	<1.0	<1.0
11-6964	MW-05	2011			0.013	<0.0010	0.066	<0.0030	0.069	<0.010	0.006	0.212	<0.050	<0.5	<1.0	<1.0
11-6963	MW-06	2011			0.016	<0.0010	0.027	<0.0030	0.058	<0.010	<0.0050	1.650	<0.050	<0.5	<1.0	<1.0
11-6965	MW-07	2011			0.011	<0.0010	0.074	0.004	0.040	<0.010	0.012	0.053	<0.050	<0.5	<1.0	<1.0
				N value	7	7	7	7	7	7	7	7	7	7	7	7
Baseline Data - Arithmetic Mean					0.0284	0.0010	0.0931	0.0048	0.0744	0.0121	0.0537	0.42	0.025	0.25	0.5	0.5
Baseline Data - Arithmetic Mean Corrected for Detection Limit					**0.0284**	**0.0010**	**0.0931**	**0.0048**	**0.0744**	**0.0121**	**0.0537**	**0.42**	**0.050**	**0.50**	**1.0**	**1.0**
Baseline Data - Standard Deviation					0.0165	0.0000	0.0439	0.0037	0.0351	0.0072	0.0441	0.62	0.000	0.00	0.0	0.0
Baseline Data - Corrected Arithmetic Mean + 3x Standard Deviation					**0.0778**	**0.0010**	**0.2249**	**0.0159**	**0.1798**	**0.0338**	**0.1861**	**2.27**	**0.050**	**0.50**	**1.0**	**1.0**
If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.																
Downgradient - MW-07																
12-19318	MW-07	2012	1	Phase I	0.0100	0.00016	0.0131	0.0044	0.0140	0.0053	0.0140	0.0260	<0.025	<0.10	<0.25	<0.25
P214-7W	MW-07	2014	3	Phase I	0.0130	0.00037	**0.485**	**0.0130**	0.0620	0.0067	**0.132**	0.2660	<0.20	<0.20	0.10	0.10
P216-7W	MW-07	2016	5	Phase I	0.00045	0.000015	0.0044	<0.00050	0.0044	<0.00020	0.0040	0.0102	<0.10	<0.10	<0.20	N/A
MW-7	MW-07	2018	7	Phase II	0.00052	<0.000020	<0.0010	<0.00030	0.0011	<0.00010	0.0011	0.0035	<0.025	<0.10	<0.10	<0.10

N/A = not analyzed

Legend

XX	**Sample exceeds baseline mean**
XX	**Sample exceeds baseline mean + 3x SD**

Table 8:

PIN-2 South Landfill East - Summary of Soil Monitoring Analytical Data

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Sample #	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (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)	F4 C_{34}-C_{50} (mg/kg)
Background Data - Arithmetic Mean						2.9	1.0	20.0	5.0	8.7	10.0	5.0	15.0	0.010	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean						**2.4**	**1.0**	**20.0**	**5.0**	**9.9**	**10.0**	**5.0**	**15.1**	**0.10**	**10.0**	**4.0**	**29.4**	**9.7**
Baseline Data - Standard Deviation						0.7	0.0	0.0	0.0	9.3	0.0	3.1	11.3	0.00	0.0	0.0	49.7	6.9
Baseline Data Mean + 3x Standard Deviation						**4.5**	**1.0**	**20.0**	**5.0**	**37.8**	**10.0**	**14.4**	**49.0**	**0.10**	**10.0**	**4.0**	**178.6**	**30.5**
**** If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.***																		
DEW Line Cleanup Tier I Criteria											*200*			*1*				
DEW Line Cleanup Tier II Criteria						*30*	*5*	*250*	*50*	*100*	*500*	*100*	*500*	*5*				
Monitoring Data																		
Upgradient																		
	P2-17 surface																	
12-19214	P2-17	2012	1	Phase I	0-10	2.3	0.510	5.5	2.0	**10.4**	**10.6**	3.5	**36.1**	<0.020	<10	<20	**300.0**	**73.0**
P214-17A	P2-17	2014	3	Phase I	0-15	1.9	0.260	5.2	2.7	8.6	<5.0	**5.2**	**30.0**	<0.10	<10	<50	<50	<100
P216-17A	P2-17	2016	5	Phase I	0-15	**3.1**	0.770	12.0	2.9	**9.9**	9.2	**6.8**	**71.0**	<0.020	<12	<10	**330.0**	<50
P2-17A	P2-17	2018	7	Phase II	0-15	1.9	0.340	5.3	2.5	7.6	3.2	4.3	**24.0**	<0.010	<7.0	<4.0	**30.0**	8.3
	P2-17 depth																	
12-19216	P2-17	2012	1	Phase I	30-40	**2.4**	<0.50	6.0	2.2	8.3	2.9	4.0	14.6	<0.020	<5.0	<10	<50	<50
P214-17B	P2-17	2014	3	Phase I	40-50	**2.4**	0.070	6.4	3.4	7.8	<5.0	**6.0**	12.0	<0.10	<10	<50	<50	<100
P216-17B	P2-17	2016	5	Phase I	40-50	2.3	0.130	7.8	2.4	6.6	2.3	4.8	13.0	<0.010	<12	<10	<50	<50
P2-17B	P2-17	2018	7	Phase II	40-50	**2.5**	0.080	4.8	4.0	**15.0**	1.8	4.0	15.0	<0.010	<7.0	<4.0	15.0	<6.0
Dup 3	P2-17	2018	7	Phase II	40-50	2.1	0.078	5.1	3.1	9.4	1.8	3.9	12.0	**0.130**	<7.0	<4.0	8.3	<6.0

Table 8:

PIN-2 South Landfill East - Summary of Soil Monitoring Analytical Data

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Sample #	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (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)	F4 C_{34}-C_{50} (mg/kg)
Background Data - Arithmetic Mean						2.9	1.0	20.0	5.0	8.7	10.0	5.0	15.0	0.010	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean						**2.4**	**1.0**	**20.0**	**5.0**	**9.9**	**10.0**	**5.0**	**15.1**	**0.10**	**10.0**	**4.0**	**29.4**	**9.7**
Baseline Data - Standard Deviation						0.7	0.0	0.0	0.0	9.3	0.0	3.1	11.3	0.00	0.0	0.0	49.7	6.9
Baseline Data Mean + 3x Standard Deviation						**4.5**	**1.0**	**20.0**	**5.0**	**37.8**	**10.0**	**14.4**	**49.0**	**0.10**	**10.0**	**4.0**	**178.6**	**30.5**
**** If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.***																		
DEW Line Cleanup Tier I Criteria											*200*			*1*				
DEW Line Cleanup Tier II Criteria						*30*	*5*	*250*	*50*	*100*	*500*	*100*	*500*	*5*				
Downgradient																		
	P2-18 surface																	
12-19218	P2-18	2012	1	Phase I	0-10	1.9	<0.50	7.6	2.2	2.9	3.0	4.3	**16.2**	<0.020	<5.0	<10	<50	<50
P214-18A	P2-18	2014	3	Phase I	0-15	**2.5**	0.130	11.7	3.4	**11.2**	6.8	**9.8**	**17.0**	<0.10	<10	<50	**83.0**	<100
P216-18A	P2-18	2016	5	Phase I	0-15	**3.3**	0.093	**23.0**	4.1	6.7	4.0	**13.0**	**22.0**	<0.010	<12	<10	<50	<50
P216-BD7 (Dup)	P2-18	2016	5	Phase I	0-15	2.2	0.082	6.9	3.0	5.0	3.1	4.8	**17.0**	<0.010	<12	<10	<50	<50
P216-18A (Interlab)	P2-18	2016	5	Phase I	0-15	**3.2**	0.070	7.5	3.1	7.1	3.2	**5.1**	**22.0**	<0.050	<10	<50	<50	<100
P2-18A	P2-18	2018	7	Phase II	0-15	**2.6**	0.055	7.1	2.8	3.4	3.0	4.7	15.0	<0.010	<7.0	<4.0	<8.0	<6.0
	P2-18 depth																	
12-19220	P2-18	2012	1	Phase I	30-40	1.9	<0.50	7.6	2.5	3.3	2.9	4.7	**15.8**	<0.020	<5.0	<10	<50	<50
12-19221 (Dup)	P2-18	2012	1	Phase I	30-40	2.0	<0.50	6.9	2.4	3.3	3.0	4.5	**16.4**	<0.020	<5.0	<10	<50	<50
P214-18B	P2-18	2014	3	Phase I	20-30	2.1	0.050	8.2	3.8	5.5	<5.0	**7.7**	13.0	<0.10	<10	<50	<50	<100
P214-BD2 (Dup)	P2-18	2014	3	Phase I	20-30	2.3	0.070	6.8	3.5	4.7	<5.0	**6.1**	15.0	<0.10	<10	<50	<50	<100
P214-18B (Interlab)	P2-18	2014	3	Phase I	20-30	**2.7**	N/A	6.4	3.1	<5.0	2.4	**5.5**	12.0	<0.010	<12	<10	<50	N/A
P216-18B	P2-18	2016	5	Phase I	40-50	**3.3**	0.076	10.0	3.7	3.9	3.0	**7.9**	15.0	<0.010	<12	<10	<50	<50
P2-18B	P2-18	2018	7	Phase II	20-30	**2.4**	0.066	7.0	2.4	2.7	2.4	4.4	**18.0**	<0.010	<7.0	<4.0	14.0	8.1

Table 8:

PIN-2 South Landfill East - Summary of Soil Monitoring Analytical Data

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Sample #	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (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)	F4 C_{34}-C_{50} (mg/kg)
Background Data - Arithmetic Mean						2.9	1.0	20.0	5.0	8.7	10.0	5.0	15.0	0.010	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean						**2.4**	**1.0**	**20.0**	**5.0**	**9.9**	**10.0**	**5.0**	**15.1**	**0.10**	**10.0**	**4.0**	**29.4**	**9.7**
Baseline Data - Standard Deviation						0.7	0.0	0.0	0.0	9.3	0.0	3.1	11.3	0.00	0.0	0.0	49.7	6.9
Baseline Data Mean + 3x Standard Deviation						**4.5**	**1.0**	**20.0**	**5.0**	**37.8**	**10.0**	**14.4**	**49.0**	**0.10**	**10.0**	**4.0**	**178.6**	**30.5**
**** If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.***																		
DEW Line Cleanup Tier I Criteria											*200*			*1*				
DEW Line Cleanup Tier II Criteria						*30*	*5*	*250*	*50*	*100*	*500*	*100*	*500*	*5*				
Downgradient																		
	P2-19 surface																	
12-19222	P2-19	2012	1	Phase I	0-10	1.6	<0.50	4.6	<1.0	2.8	3.0	2.1	13.7	<0.020	<5.0	<10	<50	<50
P214-19A	P2-19	2014	3	Phase I	0-15	1.4	0.240	9.7	2.1	8.5	7.0	**5.6**	**20.0**	<0.10	<10	<50	**90.0**	<100
P216-19A	P2-19	2016	5	Phase I	0-15	1.7	0.350	9.6	1.4	5.1	5.4	4.4	**31.0**	<0.010	<12	<10	**120.0**	<50
P2-19A	P2-19	2018	7	Phase II	0-15	1.6	0.099	4.4	1.1	2.0	2.9	2.1	12.0	<0.010	<7.0	<4.0	24.0	7.7
	P2-19 depth																	
12-19224	P2-19	2012	1	Phase I	30-40	**2.5**	<0.50	4.3	1.7	6.9	2.5	2.6	14.0	<0.01	<5.0	**12.0**	**63.0**	<50
12-19225 (Interlab)	P2-19	2012	1	Phase I	30-40	1.6	<1.0	<20	<5.0	<3.0	<10	<5.0	<15	<0.05	<10	<4.0	**49.0**	**28.0**
P214-19B	P2-19	2014	3	Phase I	40-50	2.2	0.120	5.1	1.4	2.7	<4.9	3.3	14.0	<0.10	<10	<50	<50	<100
P216-19B	P2-19	2016	5	Phase I	20-30	**3.0**	0.098	6.4	0.6	1.5	2.6	2.7	<10	<0.010	<12	<10	<50	<50
No Depth Sample Available	P2-19	2018	7	Phase II														

Table 8:

PIN-2 South Landfill East - Summary of Soil Monitoring Analytical Data

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Sample #	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (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)	F4 C_{34}-C_{50} (mg/kg)
Background Data - Arithmetic Mean						2.9	1.0	20.0	5.0	8.7	10.0	5.0	15.0	0.010	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean						**2.4**	**1.0**	**20.0**	**5.0**	**9.9**	**10.0**	**5.0**	**15.1**	**0.10**	**10.0**	**4.0**	**29.4**	**9.7**
Baseline Data - Standard Deviation						0.7	0.0	0.0	0.0	9.3	0.0	3.1	11.3	0.00	0.0	0.0	49.7	6.9
Baseline Data Mean + 3x Standard Deviation						**4.5**	**1.0**	**20.0**	**5.0**	**37.8**	**10.0**	**14.4**	**49.0**	**0.10**	**10.0**	**4.0**	**178.6**	**30.5**
**** If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.***																		
DEW Line Cleanup Tier I Criteria											*200*			*1*				
DEW Line Cleanup Tier II Criteria						*30*	*5*	*250*	*50*	*100*	*500*	*100*	*500*	*5*				
Downgradient																		
	P2-20 surface																	
12-19226	P2-20	2012	1	Phase I	0-10	2.0	<0.50	4.7	1.6	6.6	2.7	2.7	**24.0**	<0.020	<5.0	<10	<50	<50
P214-20A	P2-20	2014	3	Phase I	0-15	**3.1**	0.330	6.9	3.7	**13.6**	<4.9	**5.9**	**31.0**	<0.10	<10	<50	<50	<100
P216-20A	P2-20	2016	5	Phase I	0-15	1.8	0.210	9.1	2.1	7.1	2.4	**5.7**	**21.0**	<0.010	<12	<10	<50	<50
P2-20A	P2-20	2018	7	Phase II	0-15	**2.4**	0.130	4.8	2.2	6.0	2.4	3.3	15.0	<0.010	<7.0	<4.0	15.0	<6.0
	P2-20 depth																	
12-19228	P2-20	2012	1	Phase I	30-40	**2.5**	<0.50	4.6	1.7	6.3	2.8	2.6	14.0	<0.020	<5.0	<10	<50	<50
P214-20B	P2-20	2014	3	Phase I	40-50	2.1	0.070	5.1	3.4	5.4	<4.9	4.7	12.0	<0.10	<10	<50	<50	<100
P216-20B	P2-20	2016	5	Phase I	40-50	**2.7**	0.120	8.7	2.2	5.0	2.6	4.8	12.0	<0.010	<12	<10	<50	<50
P2-20B	P2-20	2018	7	Phase II	40-50	2.0	0.073	6.8	2.5	5.0	2.2	4.5	13.0	<0.010	<7.0	<4.0	19.0	7.9

N/A = not analyzed

Legend

XX **Sample exceeds baseline mean**

XX **Sample exceeds baseline mean + 3x SD**

Table 9:

PIN-2 South Borrow Landfill - Summary of Soil Monitoring Analytical Data

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Sample #	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (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)	F4 C_{34}-C_{50} (mg/kg)
Background Data - Arithmetic Mean						2.9	1.0	20.0	5.0	8.7	10.0	5.0	15.0	0.010	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean						**3.0**	**1.0**	**20.0**	**5.0**	**14.0**	**10.0**	**10.2**	**15.0**	**0.10**	**10.0**	**8.1**	**99.7**	**36.4**
Baseline Data - Standard Deviation						1.8	0.0	0.0	0.0	9.4	0.0	8.3	0.0	0.00	0.0	5.7	112.0	39.1
Baseline Data Mean + 3x Standard Deviation						**8.3**	**1.0**	**20.0**	**5.0**	**42.0**	**10.0**	**35.2**	**15.0**	**0.10**	**10.0**	**25.3**	**435.7**	**153.7**
**** If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.***																		
DEW Line Cleanup Tier I Criteria											*200*			*1*				
DEW Line Cleanup Tier II Criteria						*30*	*5*	*250*	*50*	*100*	*500*	*100*	*500*	*5*				
Monitoring Data																		
Upgradient																		
	P2-30 surface																	
12-19210	P2-30	2012	1	Phase I	0-10	2.9	<0.50	6.7	2.5	7.2	4.7	4.6	**17.8**	<0.020	<5.0	<10	<50	<50
P214-30A	P2-30	2014	3	Phase I	0-15	2.5	0.040	11.7	4.4	7.5	<4.9	**10.3**	**18.0**	<0.10	<10	<50	<50	<100
P216-30A	P2-30	2016	5	Phase I	0-15	2.5	0.067	10.0	2.9	7.8	3.7	6.4	**19.0**	<0.010	<12	<10	<50	<50
P2-30A	P2-30	2018	7	Phase II	0-15	2.5	0.060	6.3	3.0	6.7	3.5	5.2	**16.0**	<0.010	<7.0	<4.0	8.7	<6.0
	P2-30 depth																	
12-19212	P2-30	2012	1	Phase I	30-40	2.7	<0.50	6.5	2.6	7.1	4.0	4.6	**17.2**	<0.020	<5.0	<10	<50	<50
P214-30B	P2-30	2014	3	Phase I	40-50	2.8	0.050	7.4	3.4	6.6	<4.9	6.2	12.0	<0.10	<10	<50	<50	<100
P216-30B	P2-30	2016	5	Phase I	40-50	2.8	0.064	12.0	2.8	12.0	2.6	7.3	13.0	<0.010	<12	<10	<50	<50
P2-30B	P2-30	2018	7	Phase II	40-50	2.2	<0.050	5.8	2.3	4.2	2.0	4.7	9.2	<0.010	<7.0	<4.0	<8.0	<6.0
Dup 4	P2-30	2018	7	Phase II	40-50	2.4	<0.050	4.1	1.5	3.3	2.0	3.0	7.1	<0.010	<7.0	<4.0	<8.0	<6.0

Table 9:

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Sample #	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (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)	F4 C_{34}-C_{50} (mg/kg)
Background Data - Arithmetic Mean						2.9	1.0	20.0	5.0	8.7	10.0	5.0	15.0	0.010	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean						**3.0**	**1.0**	**20.0**	**5.0**	**14.0**	**10.0**	**10.2**	**15.0**	**0.10**	**10.0**	**8.1**	**99.7**	**36.4**
Baseline Data - Standard Deviation						1.8	0.0	0.0	0.0	9.4	0.0	8.3	0.0	0.00	0.0	5.7	112.0	39.1
Baseline Data Mean + 3x Standard Deviation						**8.3**	**1.0**	**20.0**	**5.0**	**42.0**	**10.0**	**35.2**	**15.0**	**0.10**	**10.0**	**25.3**	**435.7**	**153.7**
**** If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.***																		
DEW Line Cleanup Tier I Criteria											*200*			*1*				
DEW Line Cleanup Tier II Criteria						*30*	*5*	*250*	*50*	*100*	*500*	*100*	*500*	*5*				
Downgradient																		
	P2-27 surface																	
12-19198[1]	P2-27	2012	1	Phase I	0-10	<1.0	<0.50	4.5	1.8	5.5	1.6	5.7	**36.3**	<0.060	<15	<30	**240.0**	**160.0**
P214-27A	P2-27	2014	3	Phase I	0-15	**8.7**	0.030	2.1	1.5	3.8	<4.9	3.0	12.0	<0.10	<10	<50	**190.0**	**352.0**
P214-BD1 (Dup)	P2-27	2014	3	Phase I	0-15	**4.1**	0.060	4.4	1.2	4.7	<5.0	5.0	9.0	<0.10	<10	<50	**121.0**	<100
P214-27A (Interlab)	P2-27	2014	3	Phase I	0-15	**7.5**	<0.020	4.9	<2.0	<10	<2.0	5.2	<20	<0.045	<54	<45	**290.0**	N/A
P216-27A	P2-27	2016	5	Phase I	0-15	**3.4**	0.150	7.1	1.3	12.0	1.0	**11.0**	<20	<0.050	<72	<57	**1800.0**	**450.0**
P2-27A	P2-27	2018	7	Phase II	0-15	2.0	0.190	9.4	1.7	12.0	2.2	9.6	**25.0**	<0.40	**19.0**	<2.6	**210.0**	34.0
	P2-27 depth																	
12-19200	P2-27	2012	1	Phase I	30-40	1.2	<0.50	6.5	2.4	9.5	2.7	5.8	12.3	<0.020	<5.0	<10	**224.0**	**79.0**
12-19201 (Dup)	P2-27	2012	1	Phase I	30-40	1.2	<0.50	6.8	2.5	7.6	2.4	5.8	12.5	<0.020	<5.0	**11.0**	**222.0**	**101.0**
P214-27B	P2-27	2014	3	Phase I	40-50	2.0	0.090	7.5	1.8	7.4	<5.0	7.7	13.0	<0.10	<10	<50	**510.0**	**432.0**
P216-27B	P2-27	2016	5	Phase I	40-50	1.4	0.190	7.1	2.5	7.3	2.1	5.9	13.0	<0.010	<12	<10	<50	<50
P2-27B	P2-27	2018	7	Phase II	40-50	1.4	0.250	8.6	3.5	10.0	2.8	8.1	15.0	<0.010	<7.0	<4.0	**100.0**	28.0

Table 9:

PIN-2 South Borrow Landfill - Summary of Soil Monitoring Analytical Data

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Sample #	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (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)	F4 C_{34}-C_{50} (mg/kg)
Background Data - Arithmetic Mean						2.9	1.0	20.0	5.0	8.7	10.0	5.0	15.0	0.010	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean						**3.0**	**1.0**	**20.0**	**5.0**	**14.0**	**10.0**	**10.2**	**15.0**	**0.10**	**10.0**	**8.1**	**99.7**	**36.4**
Baseline Data - Standard Deviation						1.8	0.0	0.0	0.0	9.4	0.0	8.3	0.0	0.00	0.0	5.7	112.0	39.1
Baseline Data Mean + 3x Standard Deviation						**8.3**	**1.0**	**20.0**	**5.0**	**42.0**	**10.0**	**35.2**	**15.0**	**0.10**	**10.0**	**25.3**	**435.7**	**153.7**
**** If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.***																		
DEW Line Cleanup Tier I Criteria											*200*			*1*				
DEW Line Cleanup Tier II Criteria						*30*	*5*	*250*	*50*	*100*	*500*	*100*	*500*	*5*				
Downgradient																		
	P2-28 surface																	
12-19202	P2-28	2012	1	Phase I	0-10	1.9	<0.50	7.7	3.6	**25.8**	2.7	6.8	**20.4**	<0.020	<5.0	<10	53.0	<50
P214-28A	P2-28	2014	3	Phase I	0-15	**4.8**	0.060	9.7	2.2	**25.5**	<5.0	**15.7**	15.0	<0.10	<10	<50	**147.0**	**349.0**
P216-28A	P2-28	2016	5	Phase I	0-15	**6.2**	0.150	5.2	4.3	13.0	2.3	10.0	**40.0**	<0.040	<58	<44	<220	<220
P216-BD8 (Dup)	P2-28	2016	5	Phase I	0-15	**6.1**	0.110	5.0	3.1	8.9	2.0	8.1	**31.0**	<0.040	<67	<41	**280.0**	<210
P216-28A (Interlab)	P2-28	2016	5	Phase I	0-15	**5.9**	0.160	4.2	4.2	12.0	1.4	**10.8**	**32.0**	<0.050	<10	<50	**113.0**	<100
P2-28A	P2-28	2018	7	Phase II	0-15	**5.7**	0.085	4.3	3.0	9.2	4.0	8.4	**29.0**	<0.060	<7.0	7.2	**670.0**	**190.0**
	P2-28 depth																	
12-19204[1]	P2-28	2012	1	Phase I	30-40	2.5	<0.50	6.9	1.8	9.2	1.6	**12.0**	6.8	<0.060	<15	<30	**730.0**	**380.0**
P214-28B	P2-28	2014	3	Phase I	40-50	**8.7**	0.790	9.2	3.1	**120.0**	<5.0	**17.1**	**18.0**	<0.10	<10	<50	**488.0**	**415.0**
P216-28B	P2-28	2016	5	Phase I	40-50	**6.9**	0.560	8.7	2.9	**100.0**	1.6	**16.0**	<20	<0.050	<160	<70	**430.0**	<350
P2-28B	P2-28	2018	7	Phase II	40-50	**4.1**	0.120	8.0	3.1	**37.0**	1.0	**15.0**	8.3	<0.50	<7.0	<2.9	**920.0**	**280.0**

Table 9:

PIN-2 South Borrow Landfill - Summary of Soil Monitoring Analytical Data

Link to: Table of Contents

Sample #	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As (mg/kg)	Cd* (mg/kg)	Cr* (mg/kg)	Co* (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni* (mg/kg)	Zn* (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)	F4 C_{34}-C_{50} (mg/kg)
Background Data - Arithmetic Mean						2.9	1.0	20.0	5.0	8.7	10.0	5.0	15.0	0.010	N/A	N/A	N/A	N/A
Baseline Data - Arithmetic Mean						**3.0**	**1.0**	**20.0**	**5.0**	**14.0**	**10.0**	**10.2**	**15.0**	**0.10**	**10.0**	**8.1**	**99.7**	**36.4**
Baseline Data - Standard Deviation						1.8	0.0	0.0	0.0	9.4	0.0	8.3	0.0	0.00	0.0	5.7	112.0	39.1
Baseline Data Mean + 3x Standard Deviation						**8.3**	**1.0**	**20.0**	**5.0**	**42.0**	**10.0**	**35.2**	**15.0**	**0.10**	**10.0**	**25.3**	**435.7**	**153.7**
**** If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.***																		
DEW Line Cleanup Tier I Criteria											*200*			*1*				
DEW Line Cleanup Tier II Criteria						*30*	*5*	*250*	*50*	*100*	*500*	*100*	*500*	*5*				
Downgradient																		
	P2-29 surface																	
12-19206[1]	P2-29	2012	1	Phase I	0-10	2.4	<0.50	5.3	2.1	6.2	<1.0	**11.9**	5.0	<0.10	<20	<50	**580.0**	**290.0**
P214-29A	P2-29	2014	3	Phase I	0-15	**4.1**	0.160	7.0	1.7	10.6	<5.0	**11.5**	7.0	<0.10	<10	<50	**254.0**	**220.0**
P216-29A	P2-29	2016	5	Phase I	0-15	**18.0**	<0.10	6.3	1.9	6.2	2.7	**12.0**	<20	<0.040	<100	<57	**350.0**	<290
P2-29A	P2-29	2018	7	Phase II	0-15	1.1	0.140	6.9	1.2	9.8	<0.50	**11.0**	8.0	<0.50	<7.0	4.0	**700.0**	**240.0**
	P2-29 depth																	
12-19208[1]	P2-29	2012	1	Phase I	30-40	1.3	<0.50	5.5	1.5	5.7	<1.0	7.8	7.0	<0.10	<20	<50	**690.0**	**290.0**
P214-29B	P2-29	2014	3	Phase I	40-50	**7.0**	**1.300**	17.6	4.0	**56.5**	6.2	**20.5**	**16.0**	<0.10	<10	<50	**194.0**	**207.0**
P216-29B	P2-29	2016	5	Phase I	40-50	**11.0**	**1.700**	**21.0**	3.4	**55.0**	5.2	**19.0**	<20	<0.070	<95	<69	**480.0**	<350
P2-29B	P2-29	2018	7	Phase II	40-50	**7.3**	0.530	12.0	2.2	**40.0**	2.7	**15.0**	8.3	<0.50	<7.0	<3.2	**810.0**	**260.0**

N/A = not analyzed

1 - PHC and PCB detection limits increased due to high moisture content

Legend

XX **Sample exceeds baseline mean**

XX **Sample exceeds baseline mean + 3x SD**

APPENDIX A

Statement of Limitations

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 17, 18, 19 and 20, 2018. 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

B1- Laboratory QA/QC Reports and Certificates of Analysis- Soil

B2- Laboratory QA/QC Reports and Certificates of Analysis- Groundwater

APPENDIX B1 Laboratory Certificates - Soil

Your Project #: 102012
Site Location: NU
Your C.O.C. #: 117371

Attention: TROY AUSTRINS

ARCADIS Canada Inc
1050 Morrison Drive
Suite 201
Ottawa, ON
Canada K2H 8K7

Report Date: 2018/09/24
Report #: R2624027
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B877406
Received: 2018/09/11, 08:40

Sample Matrix: Soil
Samples Received: 2

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Particle Size - Dry Sieve (Custom)	2	2018/09/21	2018/09/21	WIN SOP-00039	Carter SSMA 55.4
Particle Size - Dry Sieve (Custom)	2	2018/09/11	2018/09/21	WIN SOP-00039	Carter SSMA 55.4

Remarks:

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

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

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

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Maxxam, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
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.

Your Project #: 102012
Site Location: NU
Your C.O.C. #: 117371

Attention: TROY AUSTRINS

ARCADIS Canada Inc
1050 Morrison Drive
Suite 201
Ottawa, ON
Canada K2H 8K7

Report Date: 2018/09/24
Report #: R2624027
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B877406
Received: 2018/09/11, 08:40

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Amanda Hung, B.Sc., Project Manager
Email: AHung@maxxam.ca
Phone# (204)772-7276 Ext:7062215

==========

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 Job #: B877406
Report Date: 2018/09/24

ARCADIS Canada Inc
Client Project #: 102012
Site Location: NU

CUSTOM PARTICLE SIZE DISTRIBUTION (SOIL)

Maxxam ID		UG8432	UG8433		
Sampling Date		2018/08/19 16:00	2018/08/19 17:00		
COC Number		117371	117371		
	UNITS	NON-HAZ	TIER II	RDL	QC Batch
Percent Retained					
Sieve 4" (>100mm)	%	<0.01	<0.01	0.01	9137870
Sieve 3.5" (>90mm)	%	<0.01	<0.01	0.01	9137870
Sieve 3" (>75mm)	%	<0.01	<0.01	0.01	9137870
Sieve 2.5" (>63mm)	%	<0.01	<0.01	0.01	9137870
Sieve 2" (>50mm)	%	<0.01	<0.01	0.01	9137870
Sieve 1.5" (>37.5mm)	%	14.88	10.99	0.01	9137870
Sieve 1" (>25mm)	%	33.61	20.11	0.01	9137870
Sieve 3/4" (>19mm)	%	37.69	26.23	0.01	9137870
Sieve 1/2" (>12.5mm)	%	48.73	45.01	0.01	9137870
Sieve 3/8" (>9.5mm)	%	55.13	53.10	0.01	9137870
Sieve 5/16" (>8mm)	%	59.14	56.84	0.01	9137870
Sieve 1/4" (>6.3mm)	%	65.04	63.41	0.01	9137870
Sieve - #4 (>4.75mm)	%	71.74	71.35	0.01	9137870
Sieve - #5 (>4.00mm)	%	74.09	74.16	0.01	9137870
Sieve - #7 (>2.80mm)	%	79.75	80.29	0.01	9137870
Sieve - #8 (>2.36mm)	%	81.97	82.91	0.01	9137870
Sieve - #10 (>2.00mm)	%	83.86	85.08	0.01	9137870
Percent Passing					
<100mm, Sieve ASTM 4"	%	100.0	100.0	0.01	9153153
<90mm, Sieve ASTM 3.5"	%	100.0	100.0	0.01	9153153
<75mm, Sieve ASTM 3"	%	100.0	100.0	0.01	9153153
<63mm, Sieve ASTM 2.5"	%	100.0	100.0	0.01	9153153
<50mm, Sieve ASTM 2"	%	100.0	100.0	0.01	9153153
<37.5mm, Sieve ASTM 1.5"	%	85.12	89.01	0.01	9153153
<25mm, Sieve ASTM 1"	%	66.39	79.89	0.01	9153153
<19mm, Sieve ASTM 3/4"	%	62.31	73.77	0.01	9153153
<12.5mm, Sieve ASTM 1/2"	%	51.27	54.99	0.01	9153153
<9.5mm, Sieve ASTM 3/8"	%	44.87	46.90	0.01	9153153
<8mm, Sieve ASTM 5/16"	%	40.86	43.16	0.01	9153153
<6.3mm, Sieve ASTM 1/4"	%	34.96	36.59	0.01	9153153
<4.75mm, Sieve #4	%	28.26	28.65	0.01	9153153
<4.00mm, Sieve #5	%	25.91	25.84	0.01	9153153
RDL = Reportable Detection Limit					

Maxxam Analytics International Corporation o/a Maxxam Analytics Winnipeg: Unit D, 675 Berry Street R3H 1A7 Telephone (204) 772-7276 Fax (204) 772-2386

Maxxam Job #: B877406
Report Date: 2018/09/24

ARCADIS Canada Inc
Client Project #: 102012
Site Location: NU

CUSTOM PARTICLE SIZE DISTRIBUTION (SOIL)

Maxxam ID		UG8432	UG8433		
Sampling Date		2018/08/19 16:00	2018/08/19 17:00		
COC Number		117371	117371		
	UNITS	NON-HAZ	TIER II	RDL	QC Batch
<2.80mm, Sieve #7	%	20.25	19.71	0.01	9153153
<2.36mm, Sieve #8	%	18.03	17.09	0.01	9153153
<2.00mm, Sieve #10	%	16.14	14.92	0.01	9153153
RDL = Reportable Detection Limit					

Maxxam Analytics International Corporation o/a Maxxam Analytics Winnipeg: Unit D, 675 Berry Street R3H 1A7 Telephone (204) 772-7276 Fax (204) 772-2386

Maxxam Job #: B877406
Report Date: 2018/09/24

ARCADIS Canada Inc
Client Project #: 102012
Site Location: NU

GENERAL COMMENTS

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

Package 1	19.3°C

Results relate only to the items tested.

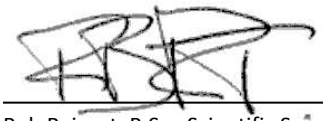
Maxxam Analytics International Corporation o/a Maxxam Analytics Winnipeg: Unit D, 675 Berry Street R3H 1A7 Telephone (204) 772-7276 Fax (204) 772-2386

Maxxam Job #: B877406
Report Date: 2018/09/24

ARCADIS Canada Inc
Client Project #: 102012
Site Location: NU

VALIDATION SIGNATURE PAGE

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



Rob Reinert, B.Sc., Scientific Specialist

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 Winnipeg: Unit D, 675 Berry Street R3H 1A7 Telephone (204) 772-7276 Fax (204) 772-2386

Maxxam
A Bureau Veritas Group Company

6740 Campobello Road, Mississauga, Ontario L5N 2L8
Phone: 905-817-5700 Fax: 905-817-5779 Toll Free: 800-563-6266
CAM FCD-01191/3

CHAIN OF CUSTODY RECORD 117371 Page ____ of ____

Invoice Information	Report Information (if differs from invoice)	Project Information (where applicable)	Turnaround Time (TAT) Required
Company Name: Arcadis	Company Name:	Quotation #:	☑ Regular TAT (5-7 days) Most analyses
Contact Name: Ryan-Janzen	Contact Name:	P.O. #/ AFE#:	PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS
Address: 1050 Morrison Dr. Suite 201	Address:	Project #: 102012	Rush TAT (Surcharges will be applied)
Phone: 647.989.7965 Fax:	Phone: Fax:	Site Location: NU	☐ 1 Day ☐ 2 Days ☐ 3-4 Days
Email: ryan.janzen@arcadis.com	Email: troy.austrins@arcadis.com	Site #:	Date Required:
		Sampled By: RJ/RF	Rush Confirmation #:

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Regulation 153	Other Regulations
☐ Table 1 ☐ Res/Park ☐ Med/ Fine	☐ CCME ☐ Sanitary Sewer Bylaw
☐ Table 2 ☐ Ind/Comm ☐ Coarse	☐ MISA ☐ Storm Sewer Bylaw
☐ Table 3 ☐ Agri/ Other	☐ PWQO Region ____
☐ Table ____	☐ Other (Specify) ____
FOR RSC (PLEASE CIRCLE) Y / N	☐ REG 558 (MIN. 3 DAY TAT REQUIRED)

Include Criteria on Certificate of Analysis: Y / N

SAMPLES MUST BE KEPT COOL (< 10 °C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

	SAMPLE IDENTIFICATION	DATE SAMPLED (YYYY/MM/DD)	TIME SAMPLED (HH:MM)	MATRIX	# OF CONTAINERS SUBMITTED	FIELD FILTERED (CIRCLE) Metals / Hg / CrVI	BTEX/ PHC F1	PHCs F2 - F4	VOCs	REG 153 METALS & INORGANICS	REG 153 (CPMS METALS	REG 153 METALS (Hg, Cr VI, ICPMS Metals, HWS - B)	Industrial Sieve (custom)							HOLD- DO NOT ANALYZE
1	Non-Haz	2018.08.19	1600	soil	1								X							
2	Tier II	"	1700	soil	1								X							
3																				
4																				
5																				
6																				
7																				
8																				
9																				
10																				

RECEIVED IN OTTAWA

LABORATORY USE ONLY

CUSTODY SEAL Y / N		COOLER TEMPERATURES
Present	Intact	
Y	Y	23, 20, 23
N	N	19.7/19.1/19.1

COOLING MEDIA PRESENT: Y / (N)

COMMENTS: To go to Winnipeg

NO Ice

RELINQUISHED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)	RECEIVED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)
[signature]	2018.09.07	1555	[signature]	2018/09/07	16 00
			Rachelle St-Amant	2018/09/11	0840

MAXXAM JOB # B877406

Unless otherwise agreed to in writing, work submitted on this Chain of Custody is subject to Maxxam's standard Terms and Conditions. Signing of this Chain of Custody document is acknowledgment and acceptance of our terms which are available for viewing at www.maxxam.ca/terms. Sample container, preservation, hold time and packages information can be viewed at http://maxxam.ca/wp-content/uploads/Ontario-COC.pdf.

COC-1004 (03/17)

White: Maxxam ~ Yellow: Client

Your Project #: 102012-000
Site Location: PIN-2

Attention: Ryan Fletcher

ARCADIS Canada Inc
1050 Morrison Drive
Suite 201
Ottawa, ON
Canada K2H 8K7

Your C.O.C. #: 1 of 8, 2 of 8, 3 of 8, 4 of 8, 5 of 8, 6 of 8, 7 of 8, 8 of 8

Report Date: 2018/08/30
Report #: R2611940
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B871860
Received: 2018/08/21, 10:00

Sample Matrix: Soil
Samples Received: 83

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
BTEX/F1 by HS GC/MS/FID (MeOH extract)	1	2018/08/25	2018/08/26	AB SOP-00039	CCME CWS/EPA 8260d m
BTEX/F1 by HS GC/MS/FID (MeOH extract) (2)	66	N/A	2018/08/25	AB SOP-00039	CCME CWS/EPA 8260d m
BTEX/F1 by HS GC/MS/FID (MeOH extract) (2)	16	N/A	2018/08/26	AB SOP-00039	CCME CWS/EPA 8260d m
F1-BTEX	83	N/A	2018/08/27	AB SOP-00039	Auto Calc
CCME Hydrocarbons (F2-F4 in soil) (3)	29	2018/08/25	2018/08/25	AB SOP-00036 / AB SOP-00040	CCME PHC-CWS m
CCME Hydrocarbons (F2-F4 in soil) (3)	34	2018/08/25	2018/08/26	AB SOP-00036 / AB SOP-00040	CCME PHC-CWS m
CCME Hydrocarbons (F2-F4 in soil) (3)	20	2018/08/25	2018/08/27	AB SOP-00036 / AB SOP-00040	CCME PHC-CWS m
Elements by ICPMS - Soils	75	2018/08/25	2018/08/25	AB SOP-00001 / AB SOP-00043	EPA 6020b R2 m
Elements by ICPMS - Soils	6	2018/08/28	2018/08/28	AB SOP-00001 / AB SOP-00043	EPA 6020b R2 m
Elements by ICPMS - Soils	2	2018/08/28	2018/08/29	AB SOP-00001 / AB SOP-00043	EPA 6020b R2 m
Moisture	83	N/A	2018/08/26	AB SOP-00002	CCME PHC-CWS m
Non Routine/Non Validated Matrix Tested (4)	22	N/A	2018/08/27		
Polychlorinated Biphenyls in Soil (1)	4	2018/08/25	2018/08/25	CAL SOP-00149	EPA 8082A R1 m
Polychlorinated Biphenyls in Soil (1)	22	2018/08/25	2018/08/26	CAL SOP-00149	EPA 8082A R1 m
Polychlorinated Biphenyls in Soil (1)	12	2018/08/25	2018/08/27	CAL SOP-00149	EPA 8082A R1 m
Polychlorinated Biphenyls in Soil (1)	1	2018/08/26	2018/08/26	CAL SOP-00149	EPA 8082A R1 m
Polychlorinated Biphenyls in Soil (1)	25	2018/08/26	2018/08/27	CAL SOP-00149	EPA 8082A R1 m
Polychlorinated Biphenyls in Soil (1)	3	2018/08/26	2018/08/28	CAL SOP-00149	EPA 8082A R1 m
Polychlorinated Biphenyls in Soil (1)	16	2018/08/26	2018/08/29	CAL SOP-00149	EPA 8082A R1 m
Total PCBs in Soil (1)	64	N/A	2018/08/27	CAL SOP-00149	Auto Calc
Total PCBs in Soil (1)	19	N/A	2018/08/29	CAL SOP-00149	Auto Calc

Your Project #: 102012-000
Site Location: PIN-2

Attention: Ryan Fletcher

ARCADIS Canada Inc
1050 Morrison Drive
Suite 201
Ottawa, ON
Canada K2H 8K7

Your C.O.C. #: 1 of 8, 2 of 8, 3 of 8, 4 of 8, 5 of 8, 6 of 8, 7 of 8, 8 of 8

Report Date: 2018/08/30
Report #: R2611940
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B871860
Received: 2018/08/21, 10:00

Remarks:

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

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

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

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Maxxam, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) This test was performed by Maxxam Calgary Environmental
(2) No lab extraction date is given for F1BTEX & VOC samples that are field preserved with methanol. Extraction date is date sampled unless otherwise stated.
(3) 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.
(4) Sample(s) analyzed using methodologies that have not been subjected to Maxxam's standard validation process for the submitted matrix and is not an accredited method. Analysis performed with client consent, however results should be viewed with discretion.

Encryption Key

Your Project #: 102012-000
Site Location: PIN-2

Attention: Ryan Fletcher

ARCADIS Canada Inc
1050 Morrison Drive
Suite 201
Ottawa, ON
Canada K2H 8K7

Your C.O.C. #: 1 of 8, 2 of 8, 3 of 8, 4 of 8, 5 of 8, 6 of 8, 7 of 8, 8 of 8

Report Date: 2018/08/30
Report #: R2611940
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B871860
Received: 2018/08/21, 10:00

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Parminder Virk, Project Manager
Email: PVirk@maxxam.ca
Phone# (403)735-2235

==========

This report has been generated and distributed using a secure automated process.
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 Job #: B871860
Report Date: 2018/08/30

ARCADIS Canada Inc
Client Project #: 102012-000
Site Location: PIN-2
Sampler Initials: RF

AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		UD6374		
Sampling Date		2018/08/20 08:20		
COC Number		1 of 8		
	UNITS	P2-3A	RDL	QC Batch
Ext. Pet. Hydrocarbon				
F2 (C10-C16 Hydrocarbons)	mg/kg	<4.0	4.0	9117410
F3 (C16-C34 Hydrocarbons)	mg/kg	21	8.0	9117410
F4 (C34-C50 Hydrocarbons)	mg/kg	<6.0	6.0	9117410
Reached Baseline at C50	mg/kg	Yes	N/A	9117410
Physical Properties				
Moisture	%	13	0.30	9117227
Volatiles				
Xylenes (Total)	mg/kg	<0.045	0.045	9116074
F1 (C6-C10) - BTEX	mg/kg	<7.0	7.0	9116074
F1 (C6-C10)	mg/kg	<7.0 (1)	7.0	9115806
Surrogate Recovery (%)				
1,4-Difluorobenzene (sur.)	%	99	N/A	9115806
4-Bromofluorobenzene (sur.)	%	96	N/A	9115806
D10-o-Xylene (sur.)	%	96	N/A	9115806
D4-1,2-Dichloroethane (sur.)	%	98	N/A	9115806
O-TERPHENYL (sur.)	%	116	N/A	9117410

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Detection limits calculated based on method detection limits (MDLs).

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

Maxxam Job #: B871860
Report Date: 2018/08/30

ARCADIS Canada Inc
Client Project #: 102012-000
Site Location: PIN-2
Sampler Initials: RF

AT1 BTEX AND F1-F4 IN SOIL (VIALS)

Maxxam ID		UD6370			UD6371	UD6371		UD6372		
Sampling Date		2018/08/20 08:15			2018/08/20 08:15	2018/08/20 08:15		2018/08/20 08:00		
COC Number		1 of 8			1 of 8	1 of 8		1 of 8		
	UNITS	P2-1A	RDL	QC Batch	P2-1B	P2-1B Lab-Dup	QC Batch	P2-2A	RDL	QC Batch
Ext. Pet. Hydrocarbon										
F2 (C10-C16 Hydrocarbons)	mg/kg	<1.9 (1)	1.9	9117429	<4.0	N/A	9117591	<4.0	4.0	9117575
F3 (C16-C34 Hydrocarbons)	mg/kg	110 (1)	7.0	9117429	49	N/A	9117591	9.7	8.0	9117575
F4 (C34-C50 Hydrocarbons)	mg/kg	21 (1)	4.9	9117429	12	N/A	9117591	<6.0	6.0	9117575
Reached Baseline at C50	mg/kg	Yes	N/A	9117429	Yes	N/A	9117591	Yes	N/A	9117575
Volatiles										
Xylenes (Total)	mg/kg	<0.11	0.11	9116074	<0.045	N/A	9116074	<0.045	0.045	9116074
F1 (C6-C10) - BTEX	mg/kg	<7.0	7.0	9116074	<7.0	N/A	9116074	<7.0	7.0	9116074
Field Preserved Volatiles										
F1 (C6-C10)	mg/kg	<7.0 (2)	7.0	9117207	<7.0 (3)	<7.0	9117207	<7.0 (3)	7.0	9117207
Surrogate Recovery (%)										
1,4-Difluorobenzene (sur.)	%	95	N/A	9117207	95	94	9117207	94	N/A	9117207
4-Bromofluorobenzene (sur.)	%	93	N/A	9117207	95	95	9117207	95	N/A	9117207
D10-o-Xylene (sur.)	%	103	N/A	9117207	105	103	9117207	100	N/A	9117207
D4-1,2-Dichloroethane (sur.)	%	96	N/A	9117207	97	100	9117207	98	N/A	9117207
O-TERPHENYL (sur.)	%	96	N/A	9117429	100	N/A	9117591	96	N/A	9117575

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable
(1) Detection limits raised due to high moisture content, sample contains => 50% moisture.
(2) Detection limits calculated based on method detection limits (MDLs) due to high moisture content, sample contains => 50% moisture.
(3) Detection limits calculated based on method detection limits (MDLs).

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

Maxxam Job #: B871860
Report Date: 2018/08/30

ARCADIS Canada Inc
Client Project #: 102012-000
Site Location: PIN-2
Sampler Initials: RF

AT1 BTEX AND F1-F4 IN SOIL (VIALS)

Maxxam ID		UD6373	UD6375		UD6376	UD6377	UD6378	UD6379		
Sampling Date		2018/08/20 08:00	2018/08/20 08:20		2018/08/20 08:30	2018/08/20 08:30	2018/08/20 09:00	2018/08/20 09:00		
COC Number		1 of 8	1 of 8		1 of 8	1 of 8	1 of 8	1 of 8		
	UNITS	P2-2B	P2-3B	QC Batch	P2-4A	P2-4B	P2-5A	P2-5B	RDL	QC Batch
Ext. Pet. Hydrocarbon										
F2 (C10-C16 Hydrocarbons)	mg/kg	<4.0	<4.0	9117410	<4.0	7.8	<4.0	<4.0	4.0	9117575
F3 (C16-C34 Hydrocarbons)	mg/kg	10	<8.0	9117410	14	10	8.4	<8.0	8.0	9117575
F4 (C34-C50 Hydrocarbons)	mg/kg	6.6	<6.0	9117410	<6.0	<6.0	<6.0	<6.0	6.0	9117575
Reached Baseline at C50	mg/kg	Yes	Yes	9117410	Yes	Yes	Yes	Yes	N/A	9117575
Volatiles										
Xylenes (Total)	mg/kg	<0.045	<0.045	9116074	<0.045	<0.045	<0.045	<0.045	0.045	9116074
F1 (C6-C10) - BTEX	mg/kg	<7.0	<7.0	9116074	<7.0	<7.0	<7.0	<7.0	7.0	9116074
Field Preserved Volatiles										
F1 (C6-C10)	mg/kg	<7.0 (1)	<7.0 (1)	9117207	<7.0 (1)	<7.0 (1)	<7.0 (1)	<7.0 (1)	7.0	9117207
Surrogate Recovery (%)										
1,4-Difluorobenzene (sur.)	%	93	95	9117207	96	94	95	94	N/A	9117207
4-Bromofluorobenzene (sur.)	%	94	94	9117207	94	95	94	96	N/A	9117207
D10-o-Xylene (sur.)	%	101	101	9117207	99	97	100	97	N/A	9117207
D4-1,2-Dichloroethane (sur.)	%	98	100	9117207	99	97	99	102	N/A	9117207
O-TERPHENYL (sur.)	%	117	105	9117410	96	106	95	94	N/A	9117575

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Detection limits calculated based on method detection limits (MDLs).

Maxxam Job #: B871860
Report Date: 2018/08/30

ARCADIS Canada Inc
Client Project #: 102012-000
Site Location: PIN-2
Sampler Initials: RF

AT1 BTEX AND F1-F4 IN SOIL (VIALS)

Maxxam ID		UD6380		UD6381		UD6392		UD6393		
Sampling Date		2018/08/20 09:15		2018/08/20 09:15		2018/08/20 09:30		2018/08/20 09:30		
COC Number		1 of 8		1 of 8		2 of 8		2 of 8		
	UNITS	P2-6A	QC Batch	P2-6B	QC Batch	P2-7A	QC Batch	P2-7B	RDL	QC Batch
Ext. Pet. Hydrocarbon										
F2 (C10-C16 Hydrocarbons)	mg/kg	<4.0	9117429	<4.0	9117575	5.6	9117203	<4.0	4.0	9117203
F3 (C16-C34 Hydrocarbons)	mg/kg	43	9117429	<8.0	9117575	95	9117203	24	8.0	9117203
F4 (C34-C50 Hydrocarbons)	mg/kg	8.7	9117429	<6.0	9117575	61	9117203	7.1	6.0	9117203
Reached Baseline at C50	mg/kg	Yes	9117429	Yes	9117575	Yes	9117203	Yes	N/A	9117203
Volatiles										
Xylenes (Total)	mg/kg	<0.045	9116074	<0.045	9116074	<0.045	9116074	<0.045	0.045	9116074
F1 (C6-C10) - BTEX	mg/kg	<7.0	9116074	<7.0	9116074	<7.0	9116074	<7.0	7.0	9116074
Field Preserved Volatiles										
F1 (C6-C10)	mg/kg	<7.0 (1)	9117207	<7.0 (1)	9117207	<7.0 (1)	9115912	<7.0 (1)	7.0	9117272
Surrogate Recovery (%)										
1,4-Difluorobenzene (sur.)	%	93	9117207	94	9117207	99	9115912	94	N/A	9117272
4-Bromofluorobenzene (sur.)	%	95	9117207	95	9117207	96	9115912	95	N/A	9117272
D10-o-Xylene (sur.)	%	100	9117207	93	9117207	81	9115912	99	N/A	9117272
D4-1,2-Dichloroethane (sur.)	%	100	9117207	102	9117207	99	9115912	102	N/A	9117272
O-TERPHENYL (sur.)	%	109	9117429	92	9117575	109	9117203	93	N/A	9117203

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Detection limits calculated based on method detection limits (MDLs).

Maxxam Job #: B871860
Report Date: 2018/08/30

ARCADIS Canada Inc
Client Project #: 102012-000
Site Location: PIN-2
Sampler Initials: RF

AT1 BTEX AND F1-F4 IN SOIL (VIALS)

Maxxam ID		UD6394	UD6394		UD6395	UD6396		UD6397		
Sampling Date		2018/08/20 09:45	2018/08/20 09:45		2018/08/20 09:45	2018/08/19 18:00		2018/08/19 18:00		
COC Number		2 of 8	2 of 8		2 of 8	2 of 8		2 of 8		
	UNITS	P2-8A	P2-8A Lab-Dup	QC Batch	P2-8B	P2-9A	QC Batch	P2-9B	RDL	QC Batch
Ext. Pet. Hydrocarbon										
F2 (C10-C16 Hydrocarbons)	mg/kg	<4.0	N/A	9117429	<4.0	6.3	9117203	4.2	4.0	9117203
F3 (C16-C34 Hydrocarbons)	mg/kg	59	N/A	9117429	20	21	9117203	15	8.0	9117203
F4 (C34-C50 Hydrocarbons)	mg/kg	19	N/A	9117429	10	240	9117203	22	6.0	9117203
Reached Baseline at C50	mg/kg	Yes	N/A	9117429	Yes	Yes	9117203	Yes	N/A	9117203
Volatiles										
Xylenes (Total)	mg/kg	<0.045	N/A	9116074	<0.045	<0.045	9116074	<0.045	0.045	9116974
F1 (C6-C10) - BTEX	mg/kg	<7.0	N/A	9116074	<7.0	<7.0	9116074	<7.0	7.0	9116974
Field Preserved Volatiles										
F1 (C6-C10)	mg/kg	<7.0 (1)	<7.0	9117272	<7.0 (1)	<7.0 (1)	9117272	<7.0 (1)	7.0	9117272
Surrogate Recovery (%)										
1,4-Difluorobenzene (sur.)	%	94	93	9117272	95	95	9117272	92	N/A	9117272
4-Bromofluorobenzene (sur.)	%	95	96	9117272	95	95	9117272	95	N/A	9117272
D10-o-Xylene (sur.)	%	95	95	9117272	99	102	9117272	97	N/A	9117272
D4-1,2-Dichloroethane (sur.)	%	104	104	9117272	105	104	9117272	104	N/A	9117272
O-TERPHENYL (sur.)	%	104	N/A	9117429	94	101	9117203	96	N/A	9117203

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable
(1) Detection limits calculated based on method detection limits (MDLs).

Maxxam Job #: B871860
Report Date: 2018/08/30

ARCADIS Canada Inc
Client Project #: 102012-000
Site Location: PIN-2
Sampler Initials: RF

AT1 BTEX AND F1-F4 IN SOIL (VIALS)

Maxxam ID		UD6398	UD6399	UD6399	UD6400	UD6401			UD6402		
Sampling Date		2018/08/19 18:15	2018/08/19 18:15	2018/08/19 18:15	2018/08/19 18:30	2018/08/19 18:30			2018/08/19 19:00		
COC Number		2 of 8	2 of 8	2 of 8	2 of 8	2 of 8			2 of 8		
	UNITS	P2-10A	P2-10B	P2-10B Lab-Dup	P2-11A	P2-11B	RDL	QC Batch	P2-12A	RDL	QC Batch
Ext. Pet. Hydrocarbon											
F2 (C10-C16 Hydrocarbons)	mg/kg	4.5	<4.0	<4.0	5.6	<4.0	4.0	9117203	<2.0 (1)	2.0	9117429
F3 (C16-C34 Hydrocarbons)	mg/kg	40	16	24	56	21	8.0	9117203	74 (1)	7.2	9117429
F4 (C34-C50 Hydrocarbons)	mg/kg	22	<6.0	<6.0	19	8.8	6.0	9117203	5.8 (1)	5.1	9117429
Reached Baseline at C50	mg/kg	Yes	Yes	Yes	Yes	Yes	N/A	9117203	Yes	N/A	9117429
Volatiles											
Xylenes (Total)	mg/kg	<0.045	<0.045	N/A	<0.045	<0.045	0.045	9116974	<0.14	0.14	9116974
F1 (C6-C10) - BTEX	mg/kg	<7.0	<7.0	N/A	<7.0	<7.0	7.0	9116974	11	7.0	9116974
Field Preserved Volatiles											
F1 (C6-C10)	mg/kg	<7.0 (2)	<7.0 (2)	N/A	<7.0 (2)	<7.0 (2)	7.0	9117272	11 (3)	7.0	9117207
Surrogate Recovery (%)											
1,4-Difluorobenzene (sur.)	%	94	94	N/A	94	93	N/A	9117272	93	N/A	9117207
4-Bromofluorobenzene (sur.)	%	96	94	N/A	95	94	N/A	9117272	94	N/A	9117207
D10-o-Xylene (sur.)	%	102	100	N/A	105	98	N/A	9117272	101	N/A	9117207
D4-1,2-Dichloroethane (sur.)	%	107	106	N/A	106	105	N/A	9117272	101	N/A	9117207
O-TERPHENYL (sur.)	%	98	95	95	94	98	N/A	9117203	101	N/A	9117429

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable
(1) Detection limits raised due to high moisture content, sample contains => 50% moisture.
(2) Detection limits calculated based on method detection limits (MDLs).
(3) Detection limits calculated based on method detection limits (MDLs) due to high moisture content, sample contains => 50% moisture.

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

Maxxam Job #: B871860
Report Date: 2018/08/30

ARCADIS Canada Inc
Client Project #: 102012-000
Site Location: PIN-2
Sampler Initials: RF

AT1 BTEX AND F1-F4 IN SOIL (VIALS)

Maxxam ID		UD6403		UD6404		UD6405		UD6406		
Sampling Date		2018/08/19 19:00		2018/08/19 19:30		2018/08/19 19:30		2018/08/19 20:00		
COC Number		2 of 8		3 of 8		3 of 8		3 of 8		
	UNITS	P2-12B	QC Batch	P2-13A	QC Batch	P2-13B	QC Batch	P2-14A	RDL	QC Batch
Ext. Pet. Hydrocarbon										
F2 (C10-C16 Hydrocarbons)	mg/kg	7.9	9117203	<4.0	9117410	<4.0	9117410	<4.0	4.0	9117410
F3 (C16-C34 Hydrocarbons)	mg/kg	64	9117203	11	9117410	<8.0	9117410	44	8.0	9117410
F4 (C34-C50 Hydrocarbons)	mg/kg	26	9117203	<6.0	9117410	<6.0	9117410	16	6.0	9117410
Reached Baseline at C50	mg/kg	Yes	9117203	Yes	9117410	Yes	9117410	Yes	N/A	9117410
Volatiles										
Xylenes (Total)	mg/kg	<0.045	9116974	<0.045	9116974	<0.045	9116974	<0.045	0.045	9116974
F1 (C6-C10) - BTEX	mg/kg	<7.0	9116974	<7.0	9116974	<7.0	9116974	<7.0	7.0	9116974
Field Preserved Volatiles										
F1 (C6-C10)	mg/kg	<7.0 (1)	9117207	<7.0 (1)	9117207	<7.0 (1)	9115912	<7.0 (1)	7.0	9117272
Surrogate Recovery (%)										
1,4-Difluorobenzene (sur.)	%	94	9117207	93	9117207	98	9115912	95	N/A	9117272
4-Bromofluorobenzene (sur.)	%	95	9117207	96	9117207	96	9115912	96	N/A	9117272
D10-o-Xylene (sur.)	%	100	9117207	103	9117207	102	9115912	94	N/A	9117272
D4-1,2-Dichloroethane (sur.)	%	102	9117207	101	9117207	98	9115912	107	N/A	9117272
O-TERPHENYL (sur.)	%	97	9117203	112	9117410	106	9117410	97	N/A	9117410

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Detection limits calculated based on method detection limits (MDLs).

Maxxam Job #: B871860
Report Date: 2018/08/30

ARCADIS Canada Inc
Client Project #: 102012-000
Site Location: PIN-2
Sampler Initials: RF

AT1 BTEX AND F1-F4 IN SOIL (VIALS)

Maxxam ID		UD6407	UD6407	UD6408		UD6409		UD6410		
Sampling Date		2018/08/19 20:00	2018/08/19 20:00	2018/08/19 19:00		2018/08/19 19:00		2018/08/19 19:15		
COC Number		3 of 8	3 of 8	3 of 8		3 of 8		3 of 8		
	UNITS	P2-14B	P2-14B Lab-Dup	P2-15A	QC Batch	P2-15B	QC Batch	P2-16A	RDL	QC Batch
Ext. Pet. Hydrocarbon										
F2 (C10-C16 Hydrocarbons)	mg/kg	<4.0	<4.0	<4.0	9117410	<4.0	9117203	<4.0	4.0	9117410
F3 (C16-C34 Hydrocarbons)	mg/kg	28	17	<8.0	9117410	14	9117203	8.1	8.0	9117410
F4 (C34-C50 Hydrocarbons)	mg/kg	7.3	<6.0	<6.0	9117410	<6.0	9117203	<6.0	6.0	9117410
Reached Baseline at C50	mg/kg	Yes	Yes	Yes	9117410	Yes	9117203	Yes	N/A	9117410
Volatiles										
Xylenes (Total)	mg/kg	<0.045	N/A	<0.045	9116974	<0.045	9116974	<0.045	0.045	9116974
F1 (C6-C10) - BTEX	mg/kg	<7.0	N/A	<7.0	9116974	<7.0	9116974	<7.0	7.0	9116974
Field Preserved Volatiles										
F1 (C6-C10)	mg/kg	<7.0 (1)	N/A	<7.0 (1)	9117272	<7.0 (1)	9117272	<7.0 (1)	7.0	9117272
Surrogate Recovery (%)										
1,4-Difluorobenzene (sur.)	%	94	N/A	95	9117272	94	9117272	94	N/A	9117272
4-Bromofluorobenzene (sur.)	%	96	N/A	97	9117272	97	9117272	96	N/A	9117272
D10-o-Xylene (sur.)	%	101	N/A	103	9117272	116	9117272	94	N/A	9117272
D4-1,2-Dichloroethane (sur.)	%	106	N/A	109	9117272	106	9117272	104	N/A	9117272
O-TERPHENYL (sur.)	%	121	99	97	9117410	94	9117203	101	N/A	9117410

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable
(1) Detection limits calculated based on method detection limits (MDLs).

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

Maxxam Job #: B871860
Report Date: 2018/08/30

ARCADIS Canada Inc
Client Project #: 102012-000
Site Location: PIN-2
Sampler Initials: RF

AT1 BTEX AND F1-F4 IN SOIL (VIALS)

Maxxam ID		UD6411	UD6412	UD6413	UD6414	UD6415	UD6417		
Sampling Date		2018/08/19 19:15	2018/08/19 13:30	2018/08/19 13:30	2018/08/19 14:00	2018/08/19 14:00	2018/08/19 14:30		
COC Number		3 of 8	3 of 8	3 of 8	3 of 8	3 of 8	4 of 8		
	UNITS	P2-16B	P2-17A	P2-17B	P2-18A	P2-18B	P2-19A	RDL	QC Batch
Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/kg	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	4.0	9117410
F3 (C16-C34 Hydrocarbons)	mg/kg	<8.0	30	15	<8.0	14	24	8.0	9117410
F4 (C34-C50 Hydrocarbons)	mg/kg	<6.0	8.3	<6.0	<6.0	8.1	7.7	6.0	9117410
Reached Baseline at C50	mg/kg	Yes	Yes	Yes	Yes	Yes	Yes	N/A	9117410
Volatiles									
Xylenes (Total)	mg/kg	<0.045	<0.045	<0.045	<0.045	<0.045	<0.045	0.045	9116974
F1 (C6-C10) - BTEX	mg/kg	<7.0	<7.0	<7.0	<7.0	<7.0	<7.0	7.0	9116974
Field Preserved Volatiles									
F1 (C6-C10)	mg/kg	<7.0 (1)	<7.0 (1)	<7.0 (1)	<7.0 (1)	<7.0 (1)	<7.0 (1)	7.0	9117272
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	94	95	95	95	95	95	N/A	9117272
4-Bromofluorobenzene (sur.)	%	98	96	97	97	97	96	N/A	9117272
D10-o-Xylene (sur.)	%	98	101	103	102	104	101	N/A	9117272
D4-1,2-Dichloroethane (sur.)	%	107	106	105	106	107	109	N/A	9117272
O-TERPHENYL (sur.)	%	100	107	109	106	102	110	N/A	9117410

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Detection limits calculated based on method detection limits (MDLs).

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ARCADIS Canada Inc
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AT1 BTEX AND F1-F4 IN SOIL (VIALS)

Maxxam ID		UD6418	UD6419	UD6419	UD6420	UD6421	UD6422		
Sampling Date		2018/08/19 15:00	2018/08/19 15:00	2018/08/19 15:00	2018/08/19 11:00	2018/08/19 11:00	2018/08/19 11:15		
COC Number		4 of 8	4 of 8	4 of 8	4 of 8	4 of 8	4 of 8		
	UNITS	P2-20A	P2-20B	P2-20B Lab-Dup	P2-21A	P2-21B	P2-22A	RDL	QC Batch
Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/kg	<4.0	<4.0	N/A	<4.0	<4.0	<4.0	4.0	9117410
F3 (C16-C34 Hydrocarbons)	mg/kg	15	19	N/A	19	12	11	8.0	9117410
F4 (C34-C50 Hydrocarbons)	mg/kg	<6.0	7.9	N/A	8.1	<6.0	<6.0	6.0	9117410
Reached Baseline at C50	mg/kg	Yes	Yes	N/A	Yes	Yes	Yes	N/A	9117410
Volatiles									
Xylenes (Total)	mg/kg	<0.045	<0.045	N/A	<0.045	<0.045	<0.045	0.045	9116974
F1 (C6-C10) - BTEX	mg/kg	<7.0	<7.0	N/A	<7.0	<7.0	<7.0	7.0	9116974
Field Preserved Volatiles									
F1 (C6-C10)	mg/kg	<7.0 (1)	<7.0 (1)	<7.0	<7.0 (1)	<7.0 (1)	<7.0 (1)	7.0	9117179
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	98	98	99	98	98	100	N/A	9117179
4-Bromofluorobenzene (sur.)	%	97	96	96	96	97	97	N/A	9117179
D10-o-Xylene (sur.)	%	105	102	102	104	99	103	N/A	9117179
D4-1,2-Dichloroethane (sur.)	%	98	100	96	99	99	97	N/A	9117179
O-TERPHENYL (sur.)	%	98	109	N/A	125	111	100	N/A	9117410

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable
(1) Detection limits calculated based on method detection limits (MDLs).

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ARCADIS Canada Inc
Client Project #: 102012-000
Site Location: PIN-2
Sampler Initials: RF

AT1 BTEX AND F1-F4 IN SOIL (VIALS)

Maxxam ID		UD6423	UD6424	UD6425	UD6426	UD6427		UD6440		
Sampling Date		2018/08/19 11:15	2018/08/19 11:30	2018/08/19 11:30	2018/08/19 11:45	2018/08/19 11:45		2018/08/19 12:00		
COC Number		4 of 8	4 of 8	4 of 8	4 of 8	4 of 8		5 of 8		
	UNITS	P2-22B	P2-23A	P2-23B	P2-24A	P2-24B	QC Batch	P2-25A	RDL	QC Batch
Ext. Pet. Hydrocarbon										
F2 (C10-C16 Hydrocarbons)	mg/kg	<4.0	<4.0	<4.0	<4.0	<4.0	9117429	6.1	4.0	9117203
F3 (C16-C34 Hydrocarbons)	mg/kg	<8.0	<8.0	<8.0	<8.0	<8.0	9117429	19	8.0	9117203
F4 (C34-C50 Hydrocarbons)	mg/kg	<6.0	<6.0	<6.0	<6.0	<6.0	9117429	9.1	6.0	9117203
Reached Baseline at C50	mg/kg	Yes	Yes	Yes	Yes	Yes	9117429	Yes	N/A	9117203
Volatiles										
Xylenes (Total)	mg/kg	<0.045	<0.045	<0.045	<0.045	<0.045	9116974	<0.045	0.045	9116974
F1 (C6-C10) - BTEX	mg/kg	<7.0	<7.0	<7.0	<7.0	<7.0	9116974	<7.0	7.0	9116974
Field Preserved Volatiles										
F1 (C6-C10)	mg/kg	<7.0 (1)	<7.0 (1)	<7.0 (1)	<7.0 (1)	<7.0 (1)	9117179	<7.0 (1)	7.0	9117180
Surrogate Recovery (%)										
1,4-Difluorobenzene (sur.)	%	99	98	100	100	100	9117179	100	N/A	9117180
4-Bromofluorobenzene (sur.)	%	95	96	96	95	96	9117179	97	N/A	9117180
D10-o-Xylene (sur.)	%	99	99	105	101	106	9117179	106	N/A	9117180
D4-1,2-Dichloroethane (sur.)	%	97	96	97	95	96	9117179	96	N/A	9117180
O-TERPHENYL (sur.)	%	94	95	96	98	96	9117429	96	N/A	9117203

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Detection limits calculated based on method detection limits (MDLs).

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Report Date: 2018/08/30

ARCADIS Canada Inc
Client Project #: 102012-000
Site Location: PIN-2
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AT1 BTEX AND F1-F4 IN SOIL (VIALS)

Maxxam ID		UD6441	UD6441	UD6442	UD6443			UD6444		
Sampling Date		2018/08/19 12:00	2018/08/19 12:00	2018/08/19 12:15	2018/08/19 12:15			2018/08/19 15:30		
COC Number		5 of 8	5 of 8	5 of 8	5 of 8			5 of 8		
	UNITS	P2-25B	P2-25B Lab-Dup	P2-26A	P2-26B	RDL	QC Batch	P2-27A	RDL	QC Batch
Ext. Pet. Hydrocarbon										
F2 (C10-C16 Hydrocarbons)	mg/kg	6.6	N/A	<4.0	4.7	4.0	9117203	<2.6 (1)	2.6	9117429
F3 (C16-C34 Hydrocarbons)	mg/kg	18	N/A	11	13	8.0	9117203	210 (1)	9.5	9117429
F4 (C34-C50 Hydrocarbons)	mg/kg	7.1	N/A	<6.0	13	6.0	9117203	34 (1)	6.6	9117429
Reached Baseline at C50	mg/kg	Yes	N/A	Yes	Yes	N/A	9117203	Yes	N/A	9117429
Volatiles										
Xylenes (Total)	mg/kg	<0.045	N/A	<0.045	<0.045	0.045	9116974	<0.14	0.14	9116974
F1 (C6-C10) - BTEX	mg/kg	<7.0	N/A	<7.0	<7.0	7.0	9116974	19	7.0	9116974
Field Preserved Volatiles										
F1 (C6-C10)	mg/kg	<7.0 (2)	<7.0 (2)	<7.0 (2)	<7.0 (2)	7.0	9117180	19 (3)	7.0	9117179
Surrogate Recovery (%)										
1,4-Difluorobenzene (sur.)	%	99	98	99	101	N/A	9117180	99	N/A	9117179
4-Bromofluorobenzene (sur.)	%	96	97	96	97	N/A	9117180	98	N/A	9117179
D10-o-Xylene (sur.)	%	101	98	102	102	N/A	9117180	90	N/A	9117179
D4-1,2-Dichloroethane (sur.)	%	95	95	96	97	N/A	9117180	99	N/A	9117179
O-TERPHENYL (sur.)	%	98	N/A	101	90	N/A	9117203	78	N/A	9117429

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable
(1) Detection limits raised due to high moisture content, sample contains => 50% moisture.
(2) Detection limits calculated based on method detection limits (MDLs).
(3) Detection limits calculated based on method detection limits (MDLs) due to high moisture content, sample contains => 50% moisture.

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ARCADIS Canada Inc
Client Project #: 102012-000
Site Location: PIN-2
Sampler Initials: RF

AT1 BTEX AND F1-F4 IN SOIL (VIALS)

Maxxam ID		UD6445			UD6446		UD6447		UD6448		
Sampling Date		2018/08/19 15:30			2018/08/19 14:00		2018/08/19 14:00		2018/08/19 14:30		
COC Number		5 of 8			5 of 8		5 of 8		5 of 8		
	UNITS	P2-27B	RDL	QC Batch	P2-28A	RDL	P2-28B	RDL	P2-29A	RDL	QC Batch
Ext. Pet. Hydrocarbon											
F2 (C10-C16 Hydrocarbons)	mg/kg	<4.0	4.0	9117429	7.2 (1)	4.0	<2.9 (1)	2.9	4.0 (1)	2.8	9117429
F3 (C16-C34 Hydrocarbons)	mg/kg	100	8.0	9117429	670 (1)	15	920 (1)	10	700 (1)	10	9117429
F4 (C34-C50 Hydrocarbons)	mg/kg	28	6.0	9117429	190 (1)	10	280 (1)	7.4	240 (1)	7.1	9117429
Reached Baseline at C50	mg/kg	Yes	N/A	9117429	Yes	N/A	Yes	N/A	Yes	N/A	9117429
Volatiles											
Xylenes (Total)	mg/kg	<0.045	0.045	9116974	<0.23	0.23	<0.19	0.19	<0.14	0.14	9116974
F1 (C6-C10) - BTEX	mg/kg	<7.0	7.0	9116974	<7.0	7.0	<7.0	7.0	<7.0	7.0	9116974
Field Preserved Volatiles											
F1 (C6-C10)	mg/kg	<7.0 (2)	7.0	9117179	<7.0 (3)	7.0	<7.0 (3)	7.0	<7.0 (3)	7.0	9117180
Surrogate Recovery (%)											
1,4-Difluorobenzene (sur.)	%	100	N/A	9117179	99	N/A	99	N/A	99	N/A	9117180
4-Bromofluorobenzene (sur.)	%	96	N/A	9117179	99	N/A	95	N/A	97	N/A	9117180
D10-o-Xylene (sur.)	%	101	N/A	9117179	99	N/A	96	N/A	94	N/A	9117180
D4-1,2-Dichloroethane (sur.)	%	96	N/A	9117179	98	N/A	96	N/A	96	N/A	9117180
O-TERPHENYL (sur.)	%	98	N/A	9117429	107	N/A	98	N/A	101	N/A	9117429

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Detection limits raised due to high moisture content, sample contains => 50% moisture.
(2) Detection limits calculated based on method detection limits (MDLs).
(3) Detection limits calculated based on method detection limits (MDLs) due to high moisture content, sample contains => 50% moisture.

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ARCADIS Canada Inc
Client Project #: 102012-000
Site Location: PIN-2
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AT1 BTEX AND F1-F4 IN SOIL (VIALS)

Maxxam ID		UD6449			UD6450	UD6451	UD6472		UD6473		
Sampling Date		2018/08/19 14:30			2018/08/19 15:00	2018/08/19 15:00	2018/08/19 18:30		2018/08/19 18:30		
COC Number		5 of 8			5 of 8	5 of 8	6 of 8		6 of 8		
	UNITS	P2-29B	RDL	QC Batch	P2-30A	P2-30B	MW-01A	QC Batch	MW-01B	RDL	QC Batch
Ext. Pet. Hydrocarbon											
F2 (C10-C16 Hydrocarbons)	mg/kg	<3.2 (1)	3.2	9117429	<4.0	<4.0	<4.0	9117429	<4.0	4.0	9117591
F3 (C16-C34 Hydrocarbons)	mg/kg	810 (1)	12	9117429	8.7	<8.0	51	9117429	28	8.0	9117591
F4 (C34-C50 Hydrocarbons)	mg/kg	260 (1)	8.1	9117429	<6.0	<6.0	10	9117429	7.2	6.0	9117591
Reached Baseline at C50	mg/kg	Yes	N/A	9117429	Yes	Yes	Yes	9117429	Yes	N/A	9117591
Volatiles											
Xylenes (Total)	mg/kg	<0.21	0.21	9116974	<0.045	<0.045	<0.045	9116975	<0.045	0.045	9116975
F1 (C6-C10) - BTEX	mg/kg	<7.0	7.0	9116974	<7.0	<7.0	7.7	9116975	<7.0	7.0	9116975
Field Preserved Volatiles											
F1 (C6-C10)	mg/kg	<7.0 (2)	7.0	9117180	<7.0 (3)	<7.0 (3)	7.7 (3)	9117180	<7.0 (3)	7.0	9117180
Surrogate Recovery (%)											
1,4-Difluorobenzene (sur.)	%	101	N/A	9117180	100	100	99	9117180	99	N/A	9117180
4-Bromofluorobenzene (sur.)	%	97	N/A	9117180	97	98	97	9117180	97	N/A	9117180
D10-o-Xylene (sur.)	%	103	N/A	9117180	104	106	122	9117180	98	N/A	9117180
D4-1,2-Dichloroethane (sur.)	%	97	N/A	9117180	96	98	97	9117180	95	N/A	9117180
O-TERPHENYL (sur.)	%	95	N/A	9117429	104	94	97	9117429	112	N/A	9117591

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Detection limits raised due to high moisture content, sample contains => 50% moisture.
(2) Detection limits calculated based on method detection limits (MDLs) due to high moisture content, sample contains => 50% moisture.
(3) Detection limits calculated based on method detection limits (MDLs) .

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ARCADIS Canada Inc
Client Project #: 102012-000
Site Location: PIN-2
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AT1 BTEX AND F1-F4 IN SOIL (VIALS)

Maxxam ID		UD6474	UD6474	UD6475		UD6476	UD6476		
Sampling Date		2018/08/19 18:00	2018/08/19 18:00	2018/08/19 18:00		2018/08/19 17:30	2018/08/19 17:30		
COC Number		6 of 8	6 of 8	6 of 8		6 of 8	6 of 8		
	UNITS	MW-02A	MW-02A Lab-Dup	MW-02B	QC Batch	MW-03A	MW-03A Lab-Dup	RDL	QC Batch
Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/kg	<4.0	<4.0	<4.0	9117429	<4.0	<4.0	4.0	9117591
F3 (C16-C34 Hydrocarbons)	mg/kg	26	18	12	9117429	25	26	8.0	9117591
F4 (C34-C50 Hydrocarbons)	mg/kg	<6.0	<6.0	<6.0	9117429	<6.0	<6.0	6.0	9117591
Reached Baseline at C50	mg/kg	Yes	Yes	Yes	9117429	Yes	Yes	N/A	9117591
Volatiles									
Xylenes (Total)	mg/kg	<0.045	N/A	<0.045	9116975	<0.045	N/A	0.045	9116975
F1 (C6-C10) - BTEX	mg/kg	<7.0	N/A	<7.0	9116975	<7.0	N/A	7.0	9116975
Field Preserved Volatiles									
F1 (C6-C10)	mg/kg	<7.0 (1)	N/A	<7.0 (1)	9117180	<7.0 (1)	N/A	7.0	9117180
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	99	N/A	99	9117180	98	N/A	N/A	9117180
4-Bromofluorobenzene (sur.)	%	97	N/A	96	9117180	96	N/A	N/A	9117180
D10-o-Xylene (sur.)	%	107	N/A	104	9117180	109	N/A	N/A	9117180
D4-1,2-Dichloroethane (sur.)	%	94	N/A	96	9117180	97	N/A	N/A	9117180
O-TERPHENYL (sur.)	%	98	99	96	9117429	98	114	N/A	9117591

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable
(1) Detection limits calculated based on method detection limits (MDLs) .

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Maxxam Job #: B871860
Report Date: 2018/08/30

ARCADIS Canada Inc
Client Project #: 102012-000
Site Location: PIN-2
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AT1 BTEX AND F1-F4 IN SOIL (VIALS)

Maxxam ID		UD6477	UD6478	UD6479	UD6480	UD6481		UD6482		
Sampling Date		2018/08/19 17:30	2018/08/19 17:00	2018/08/19 17:00	2018/08/19 13:00	2018/08/19 13:00		2018/08/19 12:30		
COC Number		6 of 8	6 of 8	6 of 8	6 of 8	6 of 8		6 of 8		
	UNITS	MW-03B	MW-04A	MW-04B	MW-05A	MW-05B	QC Batch	MW-06A	RDL	QC Batch
Ext. Pet. Hydrocarbon										
F2 (C10-C16 Hydrocarbons)	mg/kg	<4.0	<4.0	<4.0	<4.0	<4.0	9117575	<4.0	4.0	9117575
F3 (C16-C34 Hydrocarbons)	mg/kg	9.1	11	8.9	11	<8.0	9117575	22	8.0	9117575
F4 (C34-C50 Hydrocarbons)	mg/kg	<6.0	<6.0	<6.0	<6.0	<6.0	9117575	<6.0	6.0	9117575
Reached Baseline at C50	mg/kg	Yes	Yes	Yes	Yes	Yes	9117575	Yes	N/A	9117575
Volatiles										
Xylenes (Total)	mg/kg	<0.045	<0.045	<0.045	<0.045	<0.045	9116975	<0.045	0.045	9116975
F1 (C6-C10) - BTEX	mg/kg	<7.0	<7.0	<7.0	<7.0	<7.0	9116975	<7.0	7.0	9116975
Field Preserved Volatiles										
F1 (C6-C10)	mg/kg	<7.0 (1)	<7.0 (1)	<7.0 (1)	<7.0 (1)	<7.0 (1)	9117180	<7.0 (2)	7.0	9117179
Surrogate Recovery (%)										
1,4-Difluorobenzene (sur.)	%	98	100	99	100	99	9117180	98	N/A	9117179
4-Bromofluorobenzene (sur.)	%	96	98	94	96	96	9117180	97	N/A	9117179
D10-o-Xylene (sur.)	%	105	108	117	103	118	9117180	100	N/A	9117179
D4-1,2-Dichloroethane (sur.)	%	96	97	95	98	100	9117180	97	N/A	9117179
O-TERPHENYL (sur.)	%	102	88	86	91	103	9117575	95	N/A	9117575

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Detection limits calculated based on method detection limits (MDLs) .
(2) Detection limits calculated based on method detection limits (MDLs).

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Report Date: 2018/08/30

ARCADIS Canada Inc
Client Project #: 102012-000
Site Location: PIN-2
Sampler Initials: RF

AT1 BTEX AND F1-F4 IN SOIL (VIALS)

Maxxam ID		UD6483	UD6508	UD6509	UD6510	UD6511	UD6512		
Sampling Date		2018/08/19 12:30	2018/08/19 12:00	2018/08/19 12:00	2018/08/19 13:30	2018/08/19 13:30	2018/08/17		
COC Number		6 of 8	7 of 8	7 of 8	7 of 8	7 of 8	8 of 8		
	UNITS	MW-06B	MW-07A	MW-07B	MW-08A	MW-08B	DUP 1	RDL	QC Batch
Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/kg	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	4.0	9117575
F3 (C16-C34 Hydrocarbons)	mg/kg	<8.0	<8.0	8.3	<8.0	<8.0	11	8.0	9117575
F4 (C34-C50 Hydrocarbons)	mg/kg	<6.0	<6.0	<6.0	<6.0	<6.0	<6.0	6.0	9117575
Reached Baseline at C50	mg/kg	Yes	Yes	Yes	Yes	Yes	Yes	N/A	9117575
Volatiles									
Xylenes (Total)	mg/kg	<0.045	<0.045	<0.045	<0.045	<0.045	<0.045	0.045	9116975
F1 (C6-C10) - BTEX	mg/kg	<7.0	<7.0	<7.0	<7.0	<7.0	<7.0	7.0	9116975
Field Preserved Volatiles									
F1 (C6-C10)	mg/kg	<7.0 (1)	<7.0 (1)	<7.0 (1)	<7.0 (1)	<7.0 (1)	<7.0 (1)	7.0	9117179
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	101	98	99	100	98	99	N/A	9117179
4-Bromofluorobenzene (sur.)	%	97	96	96	97	95	95	N/A	9117179
D10-o-Xylene (sur.)	%	109	113	111	110	104	118	N/A	9117179
D4-1,2-Dichloroethane (sur.)	%	97	96	95	96	95	96	N/A	9117179
O-TERPHENYL (sur.)	%	96	115	106	97	98	93	N/A	9117575

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Detection limits calculated based on method detection limits (MDLs).

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ARCADIS Canada Inc
Client Project #: 102012-000
Site Location: PIN-2
Sampler Initials: RF

AT1 BTEX AND F1-F4 IN SOIL (VIALS)

Maxxam ID		UD6513		UD6514	UD6514	UD6515		UD6516		
Sampling Date		2018/08/18		2018/08/18	2018/08/18	2018/08/18		2018/08/19		
COC Number		8 of 8		8 of 8	8 of 8	8 of 8		8 of 8		
	UNITS	DUP 2	QC Batch	DUP 3	DUP 3 Lab-Dup	DUP 4	QC Batch	DUP 5	RDL	QC Batch
Ext. Pet. Hydrocarbon										
F2 (C10-C16 Hydrocarbons)	mg/kg	5.2	9117203	<4.0	<4.0	<4.0	9117575	12	4.0	9117203
F3 (C16-C34 Hydrocarbons)	mg/kg	15	9117203	8.3	<8.0	<8.0	9117575	47	8.0	9117203
F4 (C34-C50 Hydrocarbons)	mg/kg	<6.0	9117203	<6.0	<6.0	<6.0	9117575	20	6.0	9117203
Reached Baseline at C50	mg/kg	Yes	9117203	Yes	Yes	Yes	9117575	Yes	N/A	9117203
Volatiles										
Xylenes (Total)	mg/kg	<0.045	9116975	<0.045	N/A	<0.045	9116975	<0.045	0.045	9116975
F1 (C6-C10) - BTEX	mg/kg	<7.0	9116975	<7.0	N/A	<7.0	9116975	<7.0	7.0	9116975
Field Preserved Volatiles										
F1 (C6-C10)	mg/kg	<7.0 (1)	9117179	<7.0 (1)	N/A	<7.0 (1)	9117207	<7.0 (1)	7.0	9117207
Surrogate Recovery (%)										
1,4-Difluorobenzene (sur.)	%	99	9117179	93	N/A	94	9117207	94	N/A	9117207
4-Bromofluorobenzene (sur.)	%	97	9117179	95	N/A	95	9117207	96	N/A	9117207
D10-o-Xylene (sur.)	%	104	9117179	97	N/A	96	9117207	109	N/A	9117207
D4-1,2-Dichloroethane (sur.)	%	96	9117179	101	N/A	101	9117207	102	N/A	9117207
O-TERPHENYL (sur.)	%	96	9117203	107	105	94	9117575	95	N/A	9117203

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable
(1) Detection limits calculated based on method detection limits (MDLs).

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ARCADIS Canada Inc
Client Project #: 102012-000
Site Location: PIN-2
Sampler Initials: RF

AT1 BTEX AND F1-F4 IN SOIL (VIALS)

Maxxam ID		UD6517	UD6518	UD6519		
Sampling Date		2018/08/20	2018/08/20	2018/08/20		
COC Number		8 of 8	8 of 8	8 of 8		
	UNITS	DUP 6	DUP 7	DUP 8	RDL	QC Batch
Ext. Pet. Hydrocarbon						
F2 (C10-C16 Hydrocarbons)	mg/kg	5.0	12	6.2	4.0	9117203
F3 (C16-C34 Hydrocarbons)	mg/kg	22	45	17	8.0	9117203
F4 (C34-C50 Hydrocarbons)	mg/kg	9.1	23	7.5	6.0	9117203
Reached Baseline at C50	mg/kg	Yes	Yes	Yes	N/A	9117203
Volatiles						
Xylenes (Total)	mg/kg	<0.045	<0.045	<0.045	0.045	9116975
F1 (C6-C10) - BTEX	mg/kg	<7.0	<7.0	<7.0	7.0	9116975
Field Preserved Volatiles						
F1 (C6-C10)	mg/kg	<7.0 (1)	<7.0 (1)	<7.0 (1)	7.0	9117207
Surrogate Recovery (%)						
1,4-Difluorobenzene (sur.)	%	95	94	94	N/A	9117207
4-Bromofluorobenzene (sur.)	%	96	95	96	N/A	9117207
D10-o-Xylene (sur.)	%	98	101	98	N/A	9117207
D4-1,2-Dichloroethane (sur.)	%	103	103	104	N/A	9117207
O-TERPHENYL (sur.)	%	95	109	111	N/A	9117203

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Detection limits calculated based on method detection limits (MDLs).

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RESULTS OF CHEMICAL ANALYSES OF SOIL

Maxxam ID		UD6376	UD6378	UD6379	UD6411	UD6420	UD6421	UD6423	
Sampling Date		2018/08/20 08:30	2018/08/20 09:00	2018/08/20 09:00	2018/08/19 19:15	2018/08/19 11:00	2018/08/19 11:00	2018/08/19 11:15	
COC Number		1 of 8	1 of 8	1 of 8	3 of 8	4 of 8	4 of 8	4 of 8	
	UNITS	P2-4A	P2-5A	P2-5B	P2-16B	P2-21A	P2-21B	P2-22B	QC Batch
MISCELLANEOUS									
Sample Matrix	N/A	ROCK	ROCK	ROCK	ROCK	ROCK	ROCK	ROCK	ONSITE

Maxxam ID		UD6424	UD6425	UD6426	UD6427	UD6440	UD6441	UD6442	
Sampling Date		2018/08/19 11:30	2018/08/19 11:30	2018/08/19 11:45	2018/08/19 11:45	2018/08/19 12:00	2018/08/19 12:00	2018/08/19 12:15	
COC Number		4 of 8	4 of 8	4 of 8	4 of 8	5 of 8	5 of 8	5 of 8	
	UNITS	P2-23A	P2-23B	P2-24A	P2-24B	P2-25A	P2-25B	P2-26A	QC Batch
MISCELLANEOUS									
Sample Matrix	N/A	ROCK	ROCK	ROCK	ROCK	ROCK	ROCK	ROCK	ONSITE

Maxxam ID		UD6443	UD6451	UD6477	UD6509	UD6510	UD6511	UD6515	
Sampling Date		2018/08/19 12:15	2018/08/19 15:00	2018/08/19 17:30	2018/08/19 12:00	2018/08/19 13:30	2018/08/19 13:30	2018/08/18	
COC Number		5 of 8	5 of 8	6 of 8	7 of 8	7 of 8	7 of 8	8 of 8	
	UNITS	P2-26B	P2-30B	MW-03B	MW-07B	MW-08A	MW-08B	DUP 4	QC Batch
MISCELLANEOUS									
Sample Matrix	N/A	ROCK	ROCK	ROCK	ROCK	ROCK	ROCK	ROCK	ONSITE

Maxxam ID		UD6519	
Sampling Date		2018/08/20	
COC Number		8 of 8	
	UNITS	DUP 8	QC Batch
MISCELLANEOUS			
Sample Matrix	N/A	ROCK	ONSITE

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Sampler Initials: RF

POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID		UD6370		UD6371	UD6372	UD6373	UD6374	UD6374		
Sampling Date		2018/08/20 08:15		2018/08/20 08:15	2018/08/20 08:00	2018/08/20 08:00	2018/08/20 08:20	2018/08/20 08:20		
COC Number		1 of 8		1 of 8	1 of 8	1 of 8	1 of 8	1 of 8		
	UNITS	P2-1A	RDL	P2-1B	P2-2A	P2-2B	P2-3A	P2-3A Lab-Dup	RDL	QC Batch
Polychlorinated Biphenyls										
Aroclor 1016	mg/kg	<0.030	0.030	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9118042
Aroclor 1221	mg/kg	<0.030	0.030	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9118042
Aroclor 1232	mg/kg	<0.030	0.030	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9118042
Aroclor 1242	mg/kg	<0.030	0.030	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9118042
Aroclor 1248	mg/kg	<0.030	0.030	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9118042
Aroclor 1254	mg/kg	<0.030	0.030	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9118042
Aroclor 1260	mg/kg	<0.030	0.030	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9118042
Aroclor 1262	mg/kg	<0.030	0.030	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9118042
Aroclor 1268	mg/kg	<0.030	0.030	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9118042
Total PCB	mg/kg	<0.030	0.030	<0.010	<0.010	<0.010	<0.010	N/A	0.010	9115966
Surrogate Recovery (%)										
NONACHLOROBIPHENYL (sur.)	%	82	N/A	81	86	90	94	95	N/A	9118042

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
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POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID		UD6375			UD6376	UD6377		UD6378	UD6379		
Sampling Date		2018/08/20 08:20			2018/08/20 08:30	2018/08/20 08:30		2018/08/20 09:00	2018/08/20 09:00		
COC Number		1 of 8			1 of 8	1 of 8		1 of 8	1 of 8		
	UNITS	P2-3B	RDL	QC Batch	P2-4A	P2-4B	RDL	P2-5A	P2-5B	RDL	QC Batch
Polychlorinated Biphenyls											
Aroclor 1016	mg/kg	<0.010	0.010	9117540	<0.10	<0.10	0.10	<0.010	<0.010	0.010	9117536
Aroclor 1221	mg/kg	<0.010	0.010	9117540	<0.10	<0.10	0.10	<0.010	<0.010	0.010	9117536
Aroclor 1232	mg/kg	<0.010	0.010	9117540	<0.10	<0.10	0.10	<0.010	<0.010	0.010	9117536
Aroclor 1242	mg/kg	<0.010	0.010	9117540	<0.10	<0.10	0.10	<0.010	<0.010	0.010	9117536
Aroclor 1248	mg/kg	<0.010	0.010	9117540	<0.10	<0.10	0.10	<0.010	<0.010	0.010	9117536
Aroclor 1254	mg/kg	<0.010	0.010	9117540	0.35	0.39	0.10	<0.010	<0.010	0.010	9117536
Aroclor 1260	mg/kg	<0.010	0.010	9117540	<0.10	<0.10	0.10	<0.010	<0.010	0.010	9117536
Aroclor 1262	mg/kg	<0.010	0.010	9117540	<0.10	<0.10	0.10	<0.010	<0.010	0.010	9117536
Aroclor 1268	mg/kg	<0.010	0.010	9117540	<0.10	<0.10	0.10	<0.010	<0.010	0.010	9117536
Total PCB	mg/kg	<0.010	0.010	9115966	0.35	0.39	0.10	<0.010	<0.010	0.010	9115966
Surrogate Recovery (%)											
NONACHLOROBIPHENYL (sur.)	%	87	N/A	9117540	114	102	N/A	105	108	N/A	9117536

RDL = Reportable Detection Limit
N/A = Not Applicable

Maxxam Job #: B871860
Report Date: 2018/08/30

ARCADIS Canada Inc
Client Project #: 102012-000
Site Location: PIN-2
Sampler Initials: RF

POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID		UD6380		UD6381	UD6392	UD6393	UD6394	UD6395		
Sampling Date		2018/08/20 09:15		2018/08/20 09:15	2018/08/20 09:30	2018/08/20 09:30	2018/08/20 09:45	2018/08/20 09:45		
COC Number		1 of 8		1 of 8	2 of 8	2 of 8	2 of 8	2 of 8		
	UNITS	P2-6A	QC Batch	P2-6B	P2-7A	P2-7B	P2-8A	P2-8B	RDL	QC Batch
Polychlorinated Biphenyls										
Aroclor 1016	mg/kg	<0.010	9117536	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9117540
Aroclor 1221	mg/kg	<0.010	9117536	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9117540
Aroclor 1232	mg/kg	<0.010	9117536	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9117540
Aroclor 1242	mg/kg	<0.010	9117536	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9117540
Aroclor 1248	mg/kg	<0.010	9117536	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9117540
Aroclor 1254	mg/kg	<0.010	9117536	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9117540
Aroclor 1260	mg/kg	<0.010	9117536	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9117540
Aroclor 1262	mg/kg	<0.010	9117536	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9117540
Aroclor 1268	mg/kg	<0.010	9117536	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9117540
Total PCB	mg/kg	<0.010	9115966	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9115966
Surrogate Recovery (%)										
NONACHLOROBIPHENYL (sur.)	%	100	9117536	99	88	89	93	92	N/A	9117540

RDL = Reportable Detection Limit
N/A = Not Applicable

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POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID		UD6396		UD6397	UD6398	UD6399		UD6400		
Sampling Date		2018/08/19 18:00		2018/08/19 18:00	2018/08/19 18:15	2018/08/19 18:15		2018/08/19 18:30		
COC Number		2 of 8		2 of 8	2 of 8	2 of 8		2 of 8		
	UNITS	P2-9A	QC Batch	P2-9B	P2-10A	P2-10B	QC Batch	P2-11A	RDL	QC Batch
Polychlorinated Biphenyls										
Aroclor 1016	mg/kg	<0.010	9117536	<0.010	<0.010	<0.010	9117540	<0.010	0.010	9118042
Aroclor 1221	mg/kg	<0.010	9117536	<0.010	<0.010	<0.010	9117540	<0.010	0.010	9118042
Aroclor 1232	mg/kg	<0.010	9117536	<0.010	<0.010	<0.010	9117540	<0.010	0.010	9118042
Aroclor 1242	mg/kg	<0.010	9117536	<0.010	<0.010	<0.010	9117540	<0.010	0.010	9118042
Aroclor 1248	mg/kg	<0.010	9117536	<0.010	<0.010	<0.010	9117540	<0.010	0.010	9118042
Aroclor 1254	mg/kg	<0.010	9117536	<0.010	<0.010	<0.010	9117540	<0.010	0.010	9118042
Aroclor 1260	mg/kg	<0.010	9117536	<0.010	<0.010	<0.010	9117540	<0.010	0.010	9118042
Aroclor 1262	mg/kg	<0.010	9117536	<0.010	<0.010	<0.010	9117540	<0.010	0.010	9118042
Aroclor 1268	mg/kg	<0.010	9117536	<0.010	<0.010	<0.010	9117540	<0.010	0.010	9118042
Total PCB	mg/kg	<0.010	9115966	<0.010	<0.010	<0.010	9115966	<0.010	0.010	9115966
Surrogate Recovery (%)										
NONACHLOROBIPHENYL (sur.)	%	106	9117536	98	88	93	9117540	83	N/A	9118042

RDL = Reportable Detection Limit
N/A = Not Applicable

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POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID		UD6401		UD6402		UD6403	UD6404	UD6405	UD6406		
Sampling Date		2018/08/19 18:30		2018/08/19 19:00		2018/08/19 19:00	2018/08/19 19:30	2018/08/19 19:30	2018/08/19 20:00		
COC Number		2 of 8		2 of 8		2 of 8	3 of 8	3 of 8	3 of 8		
	UNITS	P2-11B	RDL	P2-12A	RDL	P2-12B	P2-13A	P2-13B	P2-14A	RDL	QC Batch
Polychlorinated Biphenyls											
Aroclor 1016	mg/kg	<0.010	0.010	<0.030	0.030	<0.010	<0.010	<0.010	<0.010	0.010	9118042
Aroclor 1221	mg/kg	<0.010	0.010	<0.030	0.030	<0.010	<0.010	<0.010	<0.010	0.010	9118042
Aroclor 1232	mg/kg	<0.010	0.010	<0.030	0.030	<0.010	<0.010	<0.010	<0.010	0.010	9118042
Aroclor 1242	mg/kg	<0.010	0.010	<0.030	0.030	<0.010	<0.010	<0.010	<0.010	0.010	9118042
Aroclor 1248	mg/kg	<0.010	0.010	<0.030	0.030	<0.010	<0.010	<0.010	<0.010	0.010	9118042
Aroclor 1254	mg/kg	<0.010	0.010	<0.030	0.030	<0.010	<0.010	<0.010	<0.010	0.010	9118042
Aroclor 1260	mg/kg	<0.010	0.010	<0.030	0.030	<0.010	<0.010	<0.010	<0.010	0.010	9118042
Aroclor 1262	mg/kg	<0.010	0.010	<0.030	0.030	<0.010	<0.010	<0.010	<0.010	0.010	9118042
Aroclor 1268	mg/kg	<0.010	0.010	<0.030	0.030	<0.010	<0.010	<0.010	<0.010	0.010	9118042
Total PCB	mg/kg	<0.010	0.010	<0.030	0.030	<0.010	<0.010	<0.010	<0.010	0.010	9115966
Surrogate Recovery (%)											
NONACHLOROBIPHENYL (sur.)	%	88	N/A	89	N/A	92	94	81	85	N/A	9118042

RDL = Reportable Detection Limit
N/A = Not Applicable

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ARCADIS Canada Inc
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POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID		UD6407	UD6408	UD6409	UD6410	UD6411	UD6412	UD6413		
Sampling Date		2018/08/19 20:00	2018/08/19 19:00	2018/08/19 19:00	2018/08/19 19:15	2018/08/19 19:15	2018/08/19 13:30	2018/08/19 13:30		
COC Number		3 of 8	3 of 8	3 of 8	3 of 8	3 of 8	3 of 8	3 of 8		
	UNITS	P2-14B	P2-15A	P2-15B	P2-16A	P2-16B	P2-17A	P2-17B	RDL	QC Batch
Polychlorinated Biphenyls										
Aroclor 1016	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9118042
Aroclor 1221	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9118042
Aroclor 1232	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9118042
Aroclor 1242	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9118042
Aroclor 1248	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9118042
Aroclor 1254	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9118042
Aroclor 1260	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9118042
Aroclor 1262	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9118042
Aroclor 1268	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9118042
Total PCB	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9115966
Surrogate Recovery (%)										
NONACHLOROBIPHENYL (sur.)	%	78	74	81	70	74	71	91	N/A	9118042

RDL = Reportable Detection Limit
N/A = Not Applicable

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Sampler Initials: RF

POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID		UD6414		UD6415	UD6417	UD6418	UD6419	UD6420		
Sampling Date		2018/08/19 14:00		2018/08/19 14:00	2018/08/19 14:30	2018/08/19 15:00	2018/08/19 15:00	2018/08/19 11:00		
COC Number		3 of 8		3 of 8	4 of 8	4 of 8	4 of 8	4 of 8		
	UNITS	P2-18A	QC Batch	P2-18B	P2-19A	P2-20A	P2-20B	P2-21A	RDL	QC Batch
Polychlorinated Biphenyls										
Aroclor 1016	mg/kg	<0.010	9118042	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9117540
Aroclor 1221	mg/kg	<0.010	9118042	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9117540
Aroclor 1232	mg/kg	<0.010	9118042	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9117540
Aroclor 1242	mg/kg	<0.010	9118042	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9117540
Aroclor 1248	mg/kg	<0.010	9118042	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9117540
Aroclor 1254	mg/kg	<0.010	9118042	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9117540
Aroclor 1260	mg/kg	<0.010	9118042	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9117540
Aroclor 1262	mg/kg	<0.010	9118042	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9117540
Aroclor 1268	mg/kg	<0.010	9118042	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9117540
Total PCB	mg/kg	<0.010	9117039	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9117039
Surrogate Recovery (%)										
NONACHLOROBIPHENYL (sur.)	%	55	9118042	95	97	92	93	99	N/A	9117540

RDL = Reportable Detection Limit
N/A = Not Applicable

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Maxxam Job #: B871860
Report Date: 2018/08/30

ARCADIS Canada Inc
Client Project #: 102012-000
Site Location: PIN-2
Sampler Initials: RF

POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID		UD6421	UD6421	UD6422	UD6423		UD6424	UD6425		
Sampling Date		2018/08/19 11:00	2018/08/19 11:00	2018/08/19 11:15	2018/08/19 11:15		2018/08/19 11:30	2018/08/19 11:30		
COC Number		4 of 8	4 of 8	4 of 8	4 of 8		4 of 8	4 of 8		
	UNITS	P2-21B	P2-21B Lab-Dup	P2-22A	P2-22B	QC Batch	P2-23A	P2-23B	RDL	QC Batch
Polychlorinated Biphenyls										
Aroclor 1016	mg/kg	<0.010	<0.010	<0.010	<0.010	9117540	<0.010	<0.010	0.010	9118070
Aroclor 1221	mg/kg	<0.010	<0.010	<0.010	<0.010	9117540	<0.010	<0.010	0.010	9118070
Aroclor 1232	mg/kg	<0.010	<0.010	<0.010	<0.010	9117540	<0.010	<0.010	0.010	9118070
Aroclor 1242	mg/kg	<0.010	<0.010	<0.010	<0.010	9117540	<0.010	<0.010	0.010	9118070
Aroclor 1248	mg/kg	<0.010	<0.010	<0.010	<0.010	9117540	<0.010	<0.010	0.010	9118070
Aroclor 1254	mg/kg	<0.010	<0.010	<0.010	<0.010	9117540	<0.010	<0.010	0.010	9118070
Aroclor 1260	mg/kg	<0.010	<0.010	<0.010	<0.010	9117540	<0.010	<0.010	0.010	9118070
Aroclor 1262	mg/kg	<0.010	<0.010	<0.010	<0.010	9117540	<0.010	<0.010	0.010	9118070
Aroclor 1268	mg/kg	<0.010	<0.010	<0.010	<0.010	9117540	<0.010	<0.010	0.010	9118070
Total PCB	mg/kg	<0.010	N/A	<0.010	<0.010	9117039	<0.010	<0.010	0.010	9117039
Surrogate Recovery (%)										
NONACHLOROBIPHENYL (sur.)	%	97	102	98	95	9117540	98	96	N/A	9118070

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

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ARCADIS Canada Inc
Client Project #: 102012-000
Site Location: PIN-2
Sampler Initials: RF

POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID		UD6426	UD6427		UD6440		UD6441	UD6442		
Sampling Date		2018/08/19 11:45	2018/08/19 11:45		2018/08/19 12:00		2018/08/19 12:00	2018/08/19 12:15		
COC Number		4 of 8	4 of 8		5 of 8		5 of 8	5 of 8		
	UNITS	P2-24A	P2-24B	QC Batch	P2-25A	QC Batch	P2-25B	P2-26A	RDL	QC Batch
Polychlorinated Biphenyls										
Aroclor 1016	mg/kg	<0.010	<0.010	9118070	<0.010	9118064	<0.010	<0.010	0.010	9117540
Aroclor 1221	mg/kg	<0.010	<0.010	9118070	<0.010	9118064	<0.010	<0.010	0.010	9117540
Aroclor 1232	mg/kg	<0.010	<0.010	9118070	<0.010	9118064	<0.010	<0.010	0.010	9117540
Aroclor 1242	mg/kg	<0.010	<0.010	9118070	<0.010	9118064	<0.010	<0.010	0.010	9117540
Aroclor 1248	mg/kg	<0.010	<0.010	9118070	<0.010	9118064	<0.010	<0.010	0.010	9117540
Aroclor 1254	mg/kg	<0.010	<0.010	9118070	<0.010	9118064	<0.010	<0.010	0.010	9117540
Aroclor 1260	mg/kg	<0.010	<0.010	9118070	<0.010	9118064	<0.010	<0.010	0.010	9117540
Aroclor 1262	mg/kg	<0.010	<0.010	9118070	<0.010	9118064	<0.010	<0.010	0.010	9117540
Aroclor 1268	mg/kg	<0.010	<0.010	9118070	<0.010	9118064	<0.010	<0.010	0.010	9117540
Total PCB	mg/kg	<0.010	<0.010	9117039	<0.010	9117039	<0.010	<0.010	0.010	9117039
Surrogate Recovery (%)										
NONACHLOROBIPHENYL (sur.)	%	96	88	9118070	107	9118064	98	95	N/A	9117540

RDL = Reportable Detection Limit
N/A = Not Applicable

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POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID		UD6443		UD6444		UD6445		UD6446	UD6446		
Sampling Date		2018/08/19 12:15		2018/08/19 15:30		2018/08/19 15:30		2018/08/19 14:00	2018/08/19 14:00		
COC Number		5 of 8		5 of 8		5 of 8		5 of 8	5 of 8		
	UNITS	P2-26B	RDL	P2-27A	RDL	P2-27B	RDL	P2-28A	P2-28A Lab-Dup	RDL	QC Batch
Polychlorinated Biphenyls											
Aroclor 1016	mg/kg	<0.010	0.010	<0.40	0.40	<0.010	0.010	<0.060	<0.060	0.060	9118064
Aroclor 1221	mg/kg	<0.010	0.010	<0.40	0.40	<0.010	0.010	<0.060	<0.060	0.060	9118064
Aroclor 1232	mg/kg	<0.010	0.010	<0.40	0.40	<0.010	0.010	<0.060	<0.060	0.060	9118064
Aroclor 1242	mg/kg	<0.010	0.010	<0.40	0.40	<0.010	0.010	<0.060	<0.060	0.060	9118064
Aroclor 1248	mg/kg	<0.010	0.010	<0.40	0.40	<0.010	0.010	<0.060	<0.060	0.060	9118064
Aroclor 1254	mg/kg	<0.010	0.010	<0.40	0.40	<0.010	0.010	<0.060	<0.060	0.060	9118064
Aroclor 1260	mg/kg	<0.010	0.010	<0.40	0.40	<0.010	0.010	<0.060	<0.060	0.060	9118064
Aroclor 1262	mg/kg	<0.010	0.010	<0.40	0.40	<0.010	0.010	<0.060	<0.060	0.060	9118064
Aroclor 1268	mg/kg	<0.010	0.010	<0.40	0.40	<0.010	0.010	<0.060	<0.060	0.060	9118064
Total PCB	mg/kg	<0.010	0.010	<0.40	0.40	<0.010	0.010	<0.060	N/A	0.060	9117039
Surrogate Recovery (%)											
NONACHLOROBIPHENYL (sur.)	%	109	N/A	79	N/A	76	N/A	91	82	N/A	9118064

RDL = Reportable Detection Limit
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POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID		UD6447	UD6447	UD6448		UD6449		UD6450	UD6451		
Sampling Date		2018/08/19 14:00	2018/08/19 14:00	2018/08/19 14:30		2018/08/19 14:30		2018/08/19 15:00	2018/08/19 15:00		
COC Number		5 of 8	5	5 of 8		5 of 8		5 of 8	5 of 8		
	UNITS	P2-28B	P2-28B Lab-Dup	P2-29A	QC Batch	P2-29B	RDL	P2-30A	P2-30B	RDL	QC Batch
Polychlorinated Biphenyls											
Aroclor 1016	mg/kg	<0.50	<0.50	<0.50	9118070	<0.50	0.50	<0.010	<0.010	0.010	9118064
Aroclor 1221	mg/kg	<0.50	<0.50	<0.50	9118070	<0.50	0.50	<0.010	<0.010	0.010	9118064
Aroclor 1232	mg/kg	<0.50	<0.50	<0.50	9118070	<0.50	0.50	<0.010	<0.010	0.010	9118064
Aroclor 1242	mg/kg	<0.50	<0.50	<0.50	9118070	<0.50	0.50	<0.010	<0.010	0.010	9118064
Aroclor 1248	mg/kg	<0.50	<0.50	<0.50	9118070	<0.50	0.50	<0.010	<0.010	0.010	9118064
Aroclor 1254	mg/kg	<0.50	<0.50	<0.50	9118070	<0.50	0.50	<0.010	<0.010	0.010	9118064
Aroclor 1260	mg/kg	<0.50	<0.50	<0.50	9118070	<0.50	0.50	<0.010	<0.010	0.010	9118064
Aroclor 1262	mg/kg	<0.50	<0.50	<0.50	9118070	<0.50	0.50	<0.010	<0.010	0.010	9118064
Aroclor 1268	mg/kg	<0.50	<0.50	<0.50	9118070	<0.50	0.50	<0.010	<0.010	0.010	9118064
Total PCB	mg/kg	<0.50	N/A	<0.50	9117039	<0.50	0.50	<0.010	<0.010	0.010	9117039
Surrogate Recovery (%)											
NONACHLOROBIPHENYL (sur.)	%	74	74	69	9118070	67	N/A	89	90	N/A	9118064

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

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POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID		UD6472	UD6473	UD6474	UD6475	UD6476		UD6477		
Sampling Date		2018/08/19 18:30	2018/08/19 18:30	2018/08/19 18:00	2018/08/19 18:00	2018/08/19 17:30		2018/08/19 17:30		
COC Number		6 of 8	6 of 8	6 of 8	6 of 8	6 of 8		6 of 8		
	UNITS	MW-01A	MW-01B	MW-02A	MW-02B	MW-03A	QC Batch	MW-03B	RDL	QC Batch
Polychlorinated Biphenyls										
Aroclor 1016	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	9118064	<0.010	0.010	9117536
Aroclor 1221	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	9118064	<0.010	0.010	9117536
Aroclor 1232	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	9118064	<0.010	0.010	9117536
Aroclor 1242	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	9118064	<0.010	0.010	9117536
Aroclor 1248	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	9118064	<0.010	0.010	9117536
Aroclor 1254	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	9118064	<0.010	0.010	9117536
Aroclor 1260	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	9118064	<0.010	0.010	9117536
Aroclor 1262	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	9118064	<0.010	0.010	9117536
Aroclor 1268	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	9118064	<0.010	0.010	9117536
Total PCB	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	9117039	<0.010	0.010	9117039
Surrogate Recovery (%)										
NONACHLOROBIPHENYL (sur.)	%	87	85	82	85	85	9118064	88	N/A	9117536

RDL = Reportable Detection Limit
N/A = Not Applicable

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Report Date: 2018/08/30

ARCADIS Canada Inc
Client Project #: 102012-000
Site Location: PIN-2
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POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID		UD6478	UD6479	UD6480	UD6481		UD6482	UD6483		
Sampling Date		2018/08/19 17:00	2018/08/19 17:00	2018/08/19 13:00	2018/08/19 13:00		2018/08/19 12:30	2018/08/19 12:30		
COC Number		6 of 8	6 of 8	6 of 8	6 of 8		6 of 8	6 of 8		
	UNITS	MW-04A	MW-04B	MW-05A	MW-05B	QC Batch	MW-06A	MW-06B	RDL	QC Batch
Polychlorinated Biphenyls										
Aroclor 1016	mg/kg	<0.010	<0.010	<0.010	<0.010	9118064	<0.010	<0.010	0.010	9117536
Aroclor 1221	mg/kg	<0.010	<0.010	<0.010	<0.010	9118064	<0.010	<0.010	0.010	9117536
Aroclor 1232	mg/kg	<0.010	<0.010	<0.010	<0.010	9118064	<0.010	<0.010	0.010	9117536
Aroclor 1242	mg/kg	<0.010	<0.010	<0.010	<0.010	9118064	<0.010	<0.010	0.010	9117536
Aroclor 1248	mg/kg	<0.010	<0.010	<0.010	<0.010	9118064	<0.010	<0.010	0.010	9117536
Aroclor 1254	mg/kg	<0.010	<0.010	<0.010	<0.010	9118064	<0.010	<0.010	0.010	9117536
Aroclor 1260	mg/kg	<0.010	<0.010	<0.010	<0.010	9118064	<0.010	<0.010	0.010	9117536
Aroclor 1262	mg/kg	<0.010	<0.010	<0.010	<0.010	9118064	<0.010	<0.010	0.010	9117536
Aroclor 1268	mg/kg	<0.010	<0.010	<0.010	<0.010	9118064	<0.010	<0.010	0.010	9117536
Total PCB	mg/kg	<0.010	<0.010	<0.010	<0.010	9117039	<0.010	<0.010	0.010	9117039
Surrogate Recovery (%)										
NONACHLOROBIPHENYL (sur.)	%	91	96	79	69	9118064	92	101	N/A	9117536

RDL = Reportable Detection Limit
N/A = Not Applicable

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POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID		UD6508		UD6509	UD6510		UD6511	UD6512		
Sampling Date		2018/08/19 12:00		2018/08/19 12:00	2018/08/19 13:30		2018/08/19 13:30	2018/08/17		
COC Number		7 of 8		7 of 8	7 of 8		7 of 8	8 of 8		
	UNITS	MW-07A	QC Batch	MW-07B	MW-08A	QC Batch	MW-08B	DUP 1	RDL	QC Batch
Polychlorinated Biphenyls										
Aroclor 1016	mg/kg	<0.010	9117536	<0.010	<0.010	9118064	<0.010	<0.010	0.010	9117536
Aroclor 1221	mg/kg	<0.010	9117536	<0.010	<0.010	9118064	<0.010	<0.010	0.010	9117536
Aroclor 1232	mg/kg	<0.010	9117536	<0.010	<0.010	9118064	<0.010	<0.010	0.010	9117536
Aroclor 1242	mg/kg	<0.010	9117536	<0.010	<0.010	9118064	<0.010	<0.010	0.010	9117536
Aroclor 1248	mg/kg	<0.010	9117536	<0.010	<0.010	9118064	<0.010	<0.010	0.010	9117536
Aroclor 1254	mg/kg	<0.010	9117536	<0.010	0.015	9118064	<0.010	<0.010	0.010	9117536
Aroclor 1260	mg/kg	<0.010	9117536	<0.010	<0.010	9118064	<0.010	<0.010	0.010	9117536
Aroclor 1262	mg/kg	<0.010	9117536	<0.010	<0.010	9118064	<0.010	<0.010	0.010	9117536
Aroclor 1268	mg/kg	<0.010	9117536	<0.010	<0.010	9118064	<0.010	<0.010	0.010	9117536
Total PCB	mg/kg	<0.010	9117039	<0.010	0.015	9117039	<0.010	<0.010	0.010	9117042
Surrogate Recovery (%)										
NONACHLOROBIPHENYL (sur.)	%	92	9117536	81	85	9118064	105	109	N/A	9117536

RDL = Reportable Detection Limit
N/A = Not Applicable

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Sampler Initials: RF

POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID		UD6513		UD6514		UD6515		UD6516		
Sampling Date		2018/08/18		2018/08/18		2018/08/18		2018/08/19		
COC Number		8 of 8		8 of 8		8 of 8		8 of 8		
	UNITS	DUP 2	RDL	DUP 3	RDL	DUP 4	QC Batch	DUP 5	RDL	QC Batch
Polychlorinated Biphenyls										
Aroclor 1016	mg/kg	<0.010	0.010	<0.050	0.050	<0.010	9117536	<0.010	0.010	9117540
Aroclor 1221	mg/kg	<0.010	0.010	<0.050	0.050	<0.010	9117536	<0.010	0.010	9117540
Aroclor 1232	mg/kg	<0.010	0.010	<0.050	0.050	<0.010	9117536	<0.010	0.010	9117540
Aroclor 1242	mg/kg	<0.010	0.010	<0.050	0.050	<0.010	9117536	<0.010	0.010	9117540
Aroclor 1248	mg/kg	<0.010	0.010	<0.050	0.050	<0.010	9117536	<0.010	0.010	9117540
Aroclor 1254	mg/kg	<0.010	0.010	0.13	0.050	<0.010	9117536	<0.010	0.010	9117540
Aroclor 1260	mg/kg	<0.010	0.010	<0.050	0.050	<0.010	9117536	<0.010	0.010	9117540
Aroclor 1262	mg/kg	<0.010	0.010	<0.050	0.050	<0.010	9117536	<0.010	0.010	9117540
Aroclor 1268	mg/kg	<0.010	0.010	<0.050	0.050	<0.010	9117536	<0.010	0.010	9117540
Total PCB	mg/kg	<0.010	0.010	0.13	0.050	<0.010	9117042	<0.010	0.010	9117042
Surrogate Recovery (%)										
NONACHLOROBIPHENYL (sur.)	%	108	N/A	106	N/A	110	9117536	98	N/A	9117540

RDL = Reportable Detection Limit
N/A = Not Applicable

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Sampler Initials: RF

POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID		UD6517	UD6518	UD6518	UD6519		
Sampling Date		2018/08/20	2018/08/20	2018/08/20	2018/08/20		
COC Number		8 of 8	8 of 8	8 of 8	8 of 8		
	UNITS	DUP 6	DUP 7	DUP 7 Lab-Dup	DUP 8	RDL	QC Batch
Polychlorinated Biphenyls							
Aroclor 1016	mg/kg	<0.010	<0.010	<0.010	<0.010	0.010	9117536
Aroclor 1221	mg/kg	<0.010	<0.010	<0.010	<0.010	0.010	9117536
Aroclor 1232	mg/kg	<0.010	<0.010	<0.010	<0.010	0.010	9117536
Aroclor 1242	mg/kg	<0.010	<0.010	<0.010	<0.010	0.010	9117536
Aroclor 1248	mg/kg	<0.010	<0.010	<0.010	<0.010	0.010	9117536
Aroclor 1254	mg/kg	<0.010	<0.010	<0.010	<0.010	0.010	9117536
Aroclor 1260	mg/kg	<0.010	<0.010	<0.010	<0.010	0.010	9117536
Aroclor 1262	mg/kg	<0.010	<0.010	<0.010	<0.010	0.010	9117536
Aroclor 1268	mg/kg	<0.010	<0.010	<0.010	<0.010	0.010	9117536
Total PCB	mg/kg	<0.010	<0.010	N/A	<0.010	0.010	9117042
Surrogate Recovery (%)							
NONACHLOROBIPHENYL (sur.)	%	107	100	109	115	N/A	9117536

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

Maxxam Job #: B871860
Report Date: 2018/08/30

ARCADIS Canada Inc
Client Project #: 102012-000
Site Location: PIN-2
Sampler Initials: RF

PHYSICAL TESTING (SOIL)

Maxxam ID		UD6370		UD6371		UD6372		UD6373	UD6375		
Sampling Date		2018/08/20 08:15		2018/08/20 08:15		2018/08/20 08:00		2018/08/20 08:00	2018/08/20 08:20		
COC Number		1 of 8		1 of 8		1 of 8		1 of 8	1 of 8		
	UNITS	P2-1A	QC Batch	P2-1B	QC Batch	P2-2A	QC Batch	P2-2B	P2-3B	RDL	QC Batch
Physical Properties											
Moisture	%	65	9117267	20	9117229	15	9117422	7.4	9.6	0.30	9117227
RDL = Reportable Detection Limit											

Maxxam ID		UD6376	UD6377	UD6378		UD6379		UD6380		
Sampling Date		2018/08/20 08:30	2018/08/20 08:30	2018/08/20 09:00		2018/08/20 09:00		2018/08/20 09:15		
COC Number		1 of 8	1 of 8	1 of 8		1 of 8		1 of 8		
	UNITS	P2-4A	P2-4B	P2-5A	QC Batch	P2-5B	QC Batch	P2-6A	RDL	QC Batch
Physical Properties										
Moisture	%	9.0	7.7	5.6	9117422	7.3	9118052	31	0.30	9117267
RDL = Reportable Detection Limit										

Maxxam ID		UD6381		UD6392	UD6393		UD6394		UD6395		
Sampling Date		2018/08/20 09:15		2018/08/20 09:30	2018/08/20 09:30		2018/08/20 09:45		2018/08/20 09:45		
COC Number		1 of 8		2 of 8	2 of 8		2 of 8		2 of 8		
	UNITS	P2-6B	QC Batch	P2-7A	P2-7B	QC Batch	P2-8A	QC Batch	P2-8B	RDL	QC Batch
Physical Properties											
Moisture	%	4.0	9117422	22	13	9117158	39	9117267	9.7	0.30	9117158
RDL = Reportable Detection Limit											

Maxxam ID		UD6396	UD6397	UD6398	UD6399	UD6399	UD6400	UD6401		
Sampling Date		2018/08/19 18:00	2018/08/19 18:00	2018/08/19 18:15	2018/08/19 18:15	2018/08/19 18:15	2018/08/19 18:30	2018/08/19 18:30		
COC Number		2 of 8	2 of 8	2 of 8	2 of 8	2 of 8	2 of 8	2 of 8		
	UNITS	P2-9A	P2-9B	P2-10A	P2-10B	P2-10B Lab-Dup	P2-11A	P2-11B	RDL	QC Batch
Physical Properties										
Moisture	%	4.9	6.3	16	12	12	25	10	0.30	9117158
RDL = Reportable Detection Limit Lab-Dup = Laboratory Initiated Duplicate										

Maxxam Job #: B871860
Report Date: 2018/08/30

ARCADIS Canada Inc
Client Project #: 102012-000
Site Location: PIN-2
Sampler Initials: RF

PHYSICAL TESTING (SOIL)

Maxxam ID		UD6402		UD6403		UD6404	UD6405	UD6406		
Sampling Date		2018/08/19 19:00		2018/08/19 19:00		2018/08/19 19:30	2018/08/19 19:30	2018/08/19 20:00		
COC Number		2 of 8		2 of 8		3 of 8	3 of 8	3 of 8		
	UNITS	P2-12A	QC Batch	P2-12B	QC Batch	P2-13A	P2-13B	P2-14A	RDL	QC Batch
Physical Properties										
Moisture	%	66	9117267	26	9117158	10	3.3	20	0.30	9117227
RDL = Reportable Detection Limit										

Maxxam ID		UD6407	UD6407	UD6408		UD6409		UD6410		
Sampling Date		2018/08/19 20:00	2018/08/19 20:00	2018/08/19 19:00		2018/08/19 19:00		2018/08/19 19:15		
COC Number		3 of 8	3 of 8	3 of 8		3 of 8		3 of 8		
	UNITS	P2-14B	P2-14B Lab-Dup	P2-15A	QC Batch	P2-15B	QC Batch	P2-16A	RDL	QC Batch
Physical Properties										
Moisture	%	7.3	7.3	5.5	9117227	5.7	9117158	8.4	0.30	9117227
RDL = Reportable Detection Limit Lab-Dup = Laboratory Initiated Duplicate										

Maxxam ID		UD6411	UD6412	UD6413	UD6414	UD6415	UD6417	UD6418		
Sampling Date		2018/08/19 19:15	2018/08/19 13:30	2018/08/19 13:30	2018/08/19 14:00	2018/08/19 14:00	2018/08/19 14:30	2018/08/19 15:00		
COC Number		3 of 8	3 of 8	3 of 8	3 of 8	3 of 8	4 of 8	4 of 8		
	UNITS	P2-16B	P2-17A	P2-17B	P2-18A	P2-18B	P2-19A	P2-20A	RDL	QC Batch
Physical Properties										
Moisture	%	5.1	15	4.8	6.4	3.8	8.5	7.6	0.30	9117227
RDL = Reportable Detection Limit										

Maxxam ID		UD6419	UD6420	UD6421	UD6422		UD6423	UD6424		
Sampling Date		2018/08/19 15:00	2018/08/19 11:00	2018/08/19 11:00	2018/08/19 11:15		2018/08/19 11:15	2018/08/19 11:30		
COC Number		4 of 8	4 of 8	4 of 8	4 of 8		4 of 8	4 of 8		
	UNITS	P2-20B	P2-21A	P2-21B	P2-22A	QC Batch	P2-22B	P2-23A	RDL	QC Batch
Physical Properties										
Moisture	%	4.7	7.4	6.4	7.4	9117227	1.9	7.2	0.30	9117267
RDL = Reportable Detection Limit										

Maxxam Job #: B871860
Report Date: 2018/08/30

ARCADIS Canada Inc
Client Project #: 102012-000
Site Location: PIN-2
Sampler Initials: RF

PHYSICAL TESTING (SOIL)

Maxxam ID		UD6425	UD6426	UD6427		UD6440	UD6441	UD6442		
Sampling Date		2018/08/19 11:30	2018/08/19 11:45	2018/08/19 11:45		2018/08/19 12:00	2018/08/19 12:00	2018/08/19 12:15		
COC Number		4 of 8	4 of 8	4 of 8		5 of 8	5 of 8	5 of 8		
	UNITS	P2-23B	P2-24A	P2-24B	QC Batch	P2-25A	P2-25B	P2-26A	RDL	QC Batch
Physical Properties										
Moisture	%	2.7	4.5	3.8	9117267	5.4	2.7	6.8	0.30	9117158
RDL = Reportable Detection Limit										

Maxxam ID		UD6443		UD6444	UD6445	UD6446	UD6447	UD6448		
Sampling Date		2018/08/19 12:15		2018/08/19 15:30	2018/08/19 15:30	2018/08/19 14:00	2018/08/19 14:00	2018/08/19 14:30		
COC Number		5 of 8		5 of 8	5 of 8	5 of 8	5 of 8	5 of 8		
	UNITS	P2-26B	QC Batch	P2-27A	P2-27B	P2-28A	P2-28B	P2-29A	RDL	QC Batch
Physical Properties										
Moisture	%	6.8	9117158	74	25	83	77	76	0.30	9117267
RDL = Reportable Detection Limit										

Maxxam ID		UD6449	UD6450	UD6451	UD6472		UD6473		
Sampling Date		2018/08/19 14:30	2018/08/19 15:00	2018/08/19 15:00	2018/08/19 18:30		2018/08/19 18:30		
COC Number		5 of 8	5 of 8	5 of 8	6 of 8		6 of 8		
	UNITS	P2-29B	P2-30A	P2-30B	MW-01A	QC Batch	MW-01B	RDL	QC Batch
Physical Properties									
Moisture	%	79	11	3.1	43	9117267	8.1	0.30	9117229
RDL = Reportable Detection Limit									

Maxxam ID		UD6474	UD6474	UD6475		UD6476		UD6477		
Sampling Date		2018/08/19 18:00	2018/08/19 18:00	2018/08/19 18:00		2018/08/19 17:30		2018/08/19 17:30		
COC Number		6 of 8	6 of 8	6 of 8		6 of 8		6 of 8		
	UNITS	MW-02A	MW-02A Lab-Dup	MW-02B	QC Batch	MW-03A	QC Batch	MW-03B	RDL	QC Batch
Physical Properties										
Moisture	%	25	27	18	9117267	20	9117229	7.7	0.30	9117422
RDL = Reportable Detection Limit Lab-Dup = Laboratory Initiated Duplicate										

Maxxam Job #: B871860
Report Date: 2018/08/30

ARCADIS Canada Inc
Client Project #: 102012-000
Site Location: PIN-2
Sampler Initials: RF

PHYSICAL TESTING (SOIL)

Maxxam ID		UD6478	UD6479	UD6480	UD6481	UD6482	UD6483	UD6508		
Sampling Date		2018/08/19 17:00	2018/08/19 17:00	2018/08/19 13:00	2018/08/19 13:00	2018/08/19 12:30	2018/08/19 12:30	2018/08/19 12:00		
COC Number		6 of 8	6 of 8	6 of 8	6 of 8	6 of 8	6 of 8	7 of 8		
	UNITS	MW-04A	MW-04B	MW-05A	MW-05B	MW-06A	MW-06B	MW-07A	RDL	QC Batch
Physical Properties										
Moisture	%	12	27	13	12	11	6.0	13	0.30	9117422
RDL = Reportable Detection Limit										

Maxxam ID		UD6509	UD6510	UD6511	UD6512		UD6513		
Sampling Date		2018/08/19 12:00	2018/08/19 13:30	2018/08/19 13:30	2018/08/17		2018/08/18		
COC Number		7 of 8	7 of 8	7 of 8	8 of 8		8 of 8		
	UNITS	MW-07B	MW-08A	MW-08B	DUP 1	QC Batch	DUP 2	RDL	QC Batch
Physical Properties									
Moisture	%	8.7	4.1	5.0	29	9117422	3.8	0.30	9117158
RDL = Reportable Detection Limit									

Maxxam ID		UD6514	UD6514	UD6515		UD6516	UD6517	UD6518		
Sampling Date		2018/08/18	2018/08/18	2018/08/18		2018/08/19	2018/08/20	2018/08/20		
COC Number		8 of 8	8 of 8	8 of 8		8 of 8	8 of 8	8 of 8		
	UNITS	DUP 3	DUP 3 Lab-Dup	DUP 4	QC Batch	DUP 5	DUP 6	DUP 7	RDL	QC Batch
Physical Properties										
Moisture	%	5.4	5.1	2.5	9117422	22	7.9	17	0.30	9117158
RDL = Reportable Detection Limit										
Lab-Dup = Laboratory Initiated Duplicate										

Maxxam ID		UD6519		
Sampling Date		2018/08/20		
COC Number		8 of 8		
	UNITS	DUP 8	RDL	QC Batch
Physical Properties				
Moisture	%	6.9	0.30	9117158
RDL = Reportable Detection Limit				

Maxxam Job #: B871860
Report Date: 2018/08/30

ARCADIS Canada Inc
Client Project #: 102012-000
Site Location: PIN-2
Sampler Initials: RF

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		UD6370		UD6371		UD6372	UD6372		UD6373		
Sampling Date		2018/08/20 08:15		2018/08/20 08:15		2018/08/20 08:00	2018/08/20 08:00		2018/08/20 08:00		
COC Number		1 of 8		1 of 8		1 of 8	1 of 8		1 of 8		
	UNITS	P2-1A	QC Batch	P2-1B	QC Batch	P2-2A	P2-2A Lab-Dup	QC Batch	P2-2B	RDL	QC Batch
Elements											
Total Arsenic (As)	mg/kg	1.6	9117232	2.0	9117234	5.6	5.2	9117232	2.6	1.0	9117396
Total Cadmium (Cd)	mg/kg	0.18	9117232	0.069	9117234	0.13	0.15	9117232	0.094	0.050	9117396
Total Chromium (Cr)	mg/kg	4.5	9117232	4.6	9117234	6.5	5.9	9117232	6.8	1.0	9117396
Total Cobalt (Co)	mg/kg	1.0	9117232	1.5	9117234	1.3	1.4	9117232	6.7	0.50	9117396
Total Copper (Cu)	mg/kg	8.8	9117232	4.7	9117234	3.2	4.7	9117232	17	1.0	9117396
Total Lead (Pb)	mg/kg	3.2	9117232	2.6	9117234	3.9	3.9	9117232	3.8	0.50	9117396
Total Nickel (Ni)	mg/kg	3.0	9117232	3.2	9117234	2.7	3.0	9117232	13	1.0	9117396
Total Zinc (Zn)	mg/kg	15	9117232	9.4 (1)	9117234	14 (1)	15 (1)	9117232	33 (1)	1.0	9117396

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
(1) Detection limits calculated based on method detection limits (MDLs) at client request.

Maxxam ID		UD6374	UD6374		UD6375	UD6375	UD6376		
Sampling Date		2018/08/20 08:20	2018/08/20 08:20		2018/08/20 08:20	2018/08/20 08:20	2018/08/20 08:30		
COC Number		1 of 8	1 of 8		1 of 8	1 of 8	1 of 8		
	UNITS	P2-3A	P2-3A Lab-Dup	QC Batch	P2-3B	P2-3B Lab-Dup	P2-4A	RDL	QC Batch
Elements									
Total Arsenic (As)	mg/kg	2.6	2.3	9117396	2.0	2.1	5.1	1.0	9117234
Total Cadmium (Cd)	mg/kg	0.088	0.089	9117396	0.081	0.066	0.12	0.050	9117234
Total Chromium (Cr)	mg/kg	3.0	3.0	9117396	4.8	5.2	24	1.0	9117234
Total Cobalt (Co)	mg/kg	1.2	1.2	9117396	2.0	2.2	1.6	0.50	9117234
Total Copper (Cu)	mg/kg	3.9	3.4	9117396	3.1	3.4	10	1.0	9117234
Total Lead (Pb)	mg/kg	2.8	2.6	9117396	2.2	2.3	36	0.50	9117234
Total Nickel (Ni)	mg/kg	2.2	2.2	9117396	3.6	4.0	9.6	1.0	9117234
Total Zinc (Zn)	mg/kg	16 (1)	16	9117396	10 (1)	12	25 (1)	1.0	9117234

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
(1) Detection limits calculated based on method detection limits (MDLs) at client request.

Maxxam Job #: B871860
Report Date: 2018/08/30

ARCADIS Canada Inc
Client Project #: 102012-000
Site Location: PIN-2
Sampler Initials: RF

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		UD6377		UD6378	UD6379		UD6380	UD6381		
Sampling Date		2018/08/20 08:30		2018/08/20 09:00	2018/08/20 09:00		2018/08/20 09:15	2018/08/20 09:15		
COC Number		1 of 8		1 of 8	1 of 8		1 of 8	1 of 8		
	UNITS	P2-4B	QC Batch	P2-5A	P2-5B	QC Batch	P2-6A	P2-6B	RDL	QC Batch
Elements										
Total Arsenic (As)	mg/kg	4.8	9117232	2.1	1.9	9117396	4.8	6.4	1.0	9117232
Total Cadmium (Cd)	mg/kg	0.11	9117232	<0.050	<0.050	9117396	0.11	0.052	0.050	9117232
Total Chromium (Cr)	mg/kg	11	9117232	2.5	2.1	9117396	6.0	4.7	1.0	9117232
Total Cobalt (Co)	mg/kg	1.8	9117232	0.95	0.70	9117396	2.4	2.1	0.50	9117232
Total Copper (Cu)	mg/kg	5.0	9117232	2.3	1.9	9117396	3.3	2.5	1.0	9117232
Total Lead (Pb)	mg/kg	16	9117232	2.0	1.9	9117396	3.8	3.5	0.50	9117232
Total Nickel (Ni)	mg/kg	5.5	9117232	1.7	1.3	9117396	4.9	5.7	1.0	9117232
Total Zinc (Zn)	mg/kg	25 (1)	9117232	8.5 (1)	8.1 (1)	9117396	18 (1)	13 (1)	1.0	9117232

RDL = Reportable Detection Limit
(1) Detection limits calculated based on method detection limits (MDLs) at client request.

Maxxam ID		UD6392		UD6393	UD6394		UD6395	UD6396		
Sampling Date		2018/08/20 09:30		2018/08/20 09:30	2018/08/20 09:45		2018/08/20 09:45	2018/08/19 18:00		
COC Number		2 of 8		2 of 8	2 of 8		2 of 8	2 of 8		
	UNITS	P2-7A	QC Batch	P2-7B	P2-8A	QC Batch	P2-8B	P2-9A	RDL	QC Batch
Elements										
Total Arsenic (As)	mg/kg	2.7	9117396	3.5	2.7	9117232	2.6	3.0	1.0	9117396
Total Cadmium (Cd)	mg/kg	0.17	9117396	0.099	0.097	9117232	0.060	0.12	0.050	9117396
Total Chromium (Cr)	mg/kg	3.2	9117396	4.1	3.5	9117232	3.2	5.6	1.0	9117396
Total Cobalt (Co)	mg/kg	1.3	9117396	2.3	1.4	9117232	1.0	2.5	0.50	9117396
Total Copper (Cu)	mg/kg	2.6	9117396	6.8	3.9	9117232	2.3	15	1.0	9117396
Total Lead (Pb)	mg/kg	3.4	9117396	3.0	3.0	9117232	2.3	7.5	0.50	9117396
Total Nickel (Ni)	mg/kg	2.2	9117396	5.4	2.8	9117232	1.8	5.5	1.0	9117396
Total Zinc (Zn)	mg/kg	23 (1)	9117396	13 (1)	15 (1)	9117232	9.9 (1)	120 (1)	1.0	9117396

RDL = Reportable Detection Limit
(1) Detection limits calculated based on method detection limits (MDLs) at client request.

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

Maxxam Job #: B871860
Report Date: 2018/08/30

ARCADIS Canada Inc
Client Project #: 102012-000
Site Location: PIN-2
Sampler Initials: RF

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		UD6397	UD6398		UD6399	UD6400		UD6401		
Sampling Date		2018/08/19 18:00	2018/08/19 18:15		2018/08/19 18:15	2018/08/19 18:30		2018/08/19 18:30		
COC Number		2 of 8	2 of 8		2 of 8	2 of 8		2 of 8		
	UNITS	P2-9B	P2-10A	QC Batch	P2-10B	P2-11A	QC Batch	P2-11B	RDL	QC Batch
Elements										
Total Arsenic (As)	mg/kg	2.8	5.4	9117234	25	1.8	9117396	2.8	1.0	9117234
Total Cadmium (Cd)	mg/kg	0.089	0.19	9117234	0.32	0.13	9117396	0.10	0.050	9117234
Total Chromium (Cr)	mg/kg	6.7	4.2	9117234	6.0	4.1	9117396	4.4	1.0	9117234
Total Cobalt (Co)	mg/kg	2.9	1.6	9117234	3.3	1.5	9117396	1.5	0.50	9117234
Total Copper (Cu)	mg/kg	10	3.4	9117234	5.9	4.6	9117396	3.9	1.0	9117234
Total Lead (Pb)	mg/kg	9.6	2.8	9117234	7.1	2.4	9117396	2.4	0.50	9117234
Total Nickel (Ni)	mg/kg	6.1	3.8	9117234	8.8	3.4	9117396	3.4	1.0	9117234
Total Zinc (Zn)	mg/kg	53 (1)	18 (1)	9117234	51 (1)	21 (1)	9117396	15 (1)	1.0	9117234

RDL = Reportable Detection Limit
(1) Detection limits calculated based on method detection limits (MDLs) at client request.

Maxxam ID		UD6402	UD6403	UD6404	UD6405	UD6406		UD6407		
Sampling Date		2018/08/19 19:00	2018/08/19 19:00	2018/08/19 19:30	2018/08/19 19:30	2018/08/19 20:00		2018/08/19 20:00		
COC Number		2 of 8	2 of 8	3 of 8	3 of 8	3 of 8		3 of 8		
	UNITS	P2-12A	P2-12B	P2-13A	P2-13B	P2-14A	QC Batch	P2-14B	RDL	QC Batch
Elements										
Total Arsenic (As)	mg/kg	<1.0	2.3	2.3	1.9	1.1	9117396	1.8	1.0	9117232
Total Cadmium (Cd)	mg/kg	0.23	0.18	0.13	0.058	0.43	9117396	0.20	0.050	9117232
Total Chromium (Cr)	mg/kg	1.7	3.8	4.7	4.8	3.0	9117396	4.9	1.0	9117232
Total Cobalt (Co)	mg/kg	0.84	1.8	1.9	2.1	0.82	9117396	1.6	0.50	9117232
Total Copper (Cu)	mg/kg	5.9	7.6	6.5	6.1	7.2	9117396	7.9	1.0	9117232
Total Lead (Pb)	mg/kg	1.1	2.4	2.7	1.9	2.8	9117396	2.3	0.50	9117232
Total Nickel (Ni)	mg/kg	2.5	5.6	3.3	3.6	3.9	9117396	4.8	1.0	9117232
Total Zinc (Zn)	mg/kg	46 (1)	38 (1)	22 (1)	9.6 (1)	19 (1)	9117396	17 (1)	1.0	9117232

RDL = Reportable Detection Limit
(1) Detection limits calculated based on method detection limits (MDLs) at client request.

Maxxam Job #: B871860
Report Date: 2018/08/30

ARCADIS Canada Inc
Client Project #: 102012-000
Site Location: PIN-2
Sampler Initials: RF

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		UD6408		UD6409	UD6410	UD6411		UD6412		
Sampling Date		2018/08/19 19:00		2018/08/19 19:00	2018/08/19 19:15	2018/08/19 19:15		2018/08/19 13:30		
COC Number		3 of 8		3 of 8	3 of 8	3 of 8		3 of 8		
	UNITS	P2-15A	QC Batch	P2-15B	P2-16A	P2-16B	QC Batch	P2-17A	RDL	QC Batch
Elements										
Total Arsenic (As)	mg/kg	3.8	9117232	3.7	3.7	2.9	9117396	1.9	1.0	9117234
Total Cadmium (Cd)	mg/kg	0.072	9117232	<0.050	0.096	0.060	9117396	0.34	0.050	9117234
Total Chromium (Cr)	mg/kg	2.5	9117232	2.2	2.7	2.8	9117396	5.3	1.0	9117234
Total Cobalt (Co)	mg/kg	0.59	9117232	0.56	1.1	1.1	9117396	2.5	0.50	9117234
Total Copper (Cu)	mg/kg	2.2	9117232	1.6	3.7	2.3	9117396	7.6	1.0	9117234
Total Lead (Pb)	mg/kg	3.1	9117232	2.7	4.1	2.7	9117396	3.2	0.50	9117234
Total Nickel (Ni)	mg/kg	1.4	9117232	1.3	2.4	1.9	9117396	4.3	1.0	9117234
Total Zinc (Zn)	mg/kg	11 (1)	9117232	8.7 (1)	25 (1)	11 (1)	9117396	24 (1)	1.0	9117234

RDL = Reportable Detection Limit
(1) Detection limits calculated based on method detection limits (MDLs) at client request.

Maxxam ID		UD6413	UD6414	UD6415	UD6417	UD6418	UD6419	UD6420		
Sampling Date		2018/08/19 13:30	2018/08/19 14:00	2018/08/19 14:00	2018/08/19 14:30	2018/08/19 15:00	2018/08/19 15:00	2018/08/19 11:00		
COC Number		3 of 8	3 of 8	3 of 8	4 of 8	4 of 8	4 of 8	4 of 8		
	UNITS	P2-17B	P2-18A	P2-18B	P2-19A	P2-20A	P2-20B	P2-21A	RDL	QC Batch
Elements										
Total Arsenic (As)	mg/kg	2.5	2.6	2.4	1.6	2.4	2.0	2.7	1.0	9117234
Total Cadmium (Cd)	mg/kg	0.080	0.055	0.066	0.099	0.13	0.073	0.091	0.050	9117234
Total Chromium (Cr)	mg/kg	4.8	7.1	7.0	4.4	4.8	6.8	2.1	1.0	9117234
Total Cobalt (Co)	mg/kg	4.0	2.8	2.4	1.1	2.2	2.5	0.56	0.50	9117234
Total Copper (Cu)	mg/kg	15	3.4	2.7	2.0	6.0	5.0	10	1.0	9117234
Total Lead (Pb)	mg/kg	1.8	3.0	2.4	2.9	2.4	2.2	4.5	0.50	9117234
Total Nickel (Ni)	mg/kg	4.0	4.7	4.4	2.1	3.3	4.5	1.1	1.0	9117234
Total Zinc (Zn)	mg/kg	15 (1)	15 (1)	18 (1)	12 (1)	15 (1)	13 (1)	10 (1)	1.0	9117234

RDL = Reportable Detection Limit
(1) Detection limits calculated based on method detection limits (MDLs) at client request.

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ARCADIS Canada Inc
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Sampler Initials: RF

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		UD6421	UD6422	UD6423		UD6424		UD6425		
Sampling Date		2018/08/19 11:00	2018/08/19 11:15	2018/08/19 11:15		2018/08/19 11:30		2018/08/19 11:30		
COC Number		4 of 8	4 of 8	4 of 8		4 of 8		4 of 8		
	UNITS	P2-21B	P2-22A	P2-22B	QC Batch	P2-23A	QC Batch	P2-23B	RDL	QC Batch
Elements										
Total Arsenic (As)	mg/kg	2.7	4.7	4.7	9117234	8.5	9117396	5.6	1.0	9117234
Total Cadmium (Cd)	mg/kg	<0.050	<0.050	<0.050	9117234	<0.050	9117396	<0.050	0.050	9117234
Total Chromium (Cr)	mg/kg	2.2	2.3	2.0	9117234	2.0	9117396	1.9	1.0	9117234
Total Cobalt (Co)	mg/kg	0.58	0.79	0.62	9117234	0.86	9117396	0.65	0.50	9117234
Total Copper (Cu)	mg/kg	2.8	2.0	2.1	9117234	3.6	9117396	2.7	1.0	9117234
Total Lead (Pb)	mg/kg	3.6	3.4	3.3	9117234	4.9	9117396	4.1	0.50	9117234
Total Nickel (Ni)	mg/kg	1.2	1.6	1.5	9117234	2.4	9117396	1.8	1.0	9117234
Total Zinc (Zn)	mg/kg	7.0 (1)	5.9 (1)	4.8 (1)	9117234	20 (1)	9117396	4.7 (1)	1.0	9117234

RDL = Reportable Detection Limit
(1) Detection limits calculated based on method detection limits (MDLs) at client request.

Maxxam ID		UD6426		UD6427		UD6440	UD6441		UD6442		
Sampling Date		2018/08/19 11:45		2018/08/19 11:45		2018/08/19 12:00	2018/08/19 12:00		2018/08/19 12:15		
COC Number		4 of 8		4 of 8		5 of 8	5 of 8		5 of 8		
	UNITS	P2-24A	QC Batch	P2-24B	QC Batch	P2-25A	P2-25B	QC Batch	P2-26A	RDL	QC Batch
Elements											
Total Arsenic (As)	mg/kg	6.0	9117234	5.4	9117396	4.4	4.9	9117427	6.6	1.0	9117232
Total Cadmium (Cd)	mg/kg	<0.050	9117234	<0.050	9117396	<0.050	<0.050	9117427	<0.050	0.050	9117232
Total Chromium (Cr)	mg/kg	1.9	9117234	1.9	9117396	2.4	2.0	9117427	2.1	1.0	9117232
Total Cobalt (Co)	mg/kg	0.57	9117234	0.59	9117396	0.67	0.61	9117427	0.82	0.50	9117232
Total Copper (Cu)	mg/kg	8.2	9117234	3.2	9117396	3.0	3.0	9117427	3.6	1.0	9117232
Total Lead (Pb)	mg/kg	4.5	9117234	3.8	9117396	4.6	4.1	9117427	4.8	0.50	9117232
Total Nickel (Ni)	mg/kg	1.6	9117234	1.5	9117396	1.6	1.4	9117427	2.2	1.0	9117232
Total Zinc (Zn)	mg/kg	11 (1)	9117234	6.6 (1)	9117396	7.9 (1)	6.4 (1)	9117427	6.6 (1)	1.0	9117232

RDL = Reportable Detection Limit
(1) Detection limits calculated based on method detection limits (MDLs) at client request.

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Maxxam Job #: B871860
Report Date: 2018/08/30

ARCADIS Canada Inc
Client Project #: 102012-000
Site Location: PIN-2
Sampler Initials: RF

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		UD6443		UD6444	UD6445	UD6446	UD6447	UD6448		
Sampling Date		2018/08/19 12:15		2018/08/19 15:30	2018/08/19 15:30	2018/08/19 14:00	2018/08/19 14:00	2018/08/19 14:30		
COC Number		5 of 8		5 of 8	5 of 8	5 of 8	5 of 8	5 of 8		
	UNITS	P2-26B	QC Batch	P2-27A	P2-27B	P2-28A	P2-28B	P2-29A	RDL	QC Batch
Elements										
Total Arsenic (As)	mg/kg	6.6	9117427	2.0	1.4	5.7	4.1	1.1	1.0	9118168
Total Cadmium (Cd)	mg/kg	<0.050	9117427	0.19	0.25	0.085	0.12	0.14	0.050	9118168
Total Chromium (Cr)	mg/kg	2.0	9117427	9.4	8.6	4.3	8.0	6.9	1.0	9118168
Total Cobalt (Co)	mg/kg	0.83	9117427	1.7	3.5	3.0	3.1	1.2	0.50	9118168
Total Copper (Cu)	mg/kg	3.9	9117427	12	10	9.2	37	9.8	1.0	9118168
Total Lead (Pb)	mg/kg	4.7	9117427	2.2	2.8	4.0	0.97	<0.50	0.50	9118168
Total Nickel (Ni)	mg/kg	2.2	9117427	9.6	8.1	8.4	15	11	1.0	9118168
Total Zinc (Zn)	mg/kg	7.2 (1)	9117427	25	15 (1)	29	8.3	8.0	1.0	9118168

RDL = Reportable Detection Limit
(1) Detection limits calculated based on method detection limits (MDLs) at client request.

Maxxam ID		UD6449		UD6450	UD6451		UD6472		UD6473		
Sampling Date		2018/08/19 14:30		2018/08/19 15:00	2018/08/19 15:00		2018/08/19 18:30		2018/08/19 18:30		
COC Number		5 of 8		5 of 8	5 of 8		6 of 8		6 of 8		
	UNITS	P2-29B	QC Batch	P2-30A	P2-30B	QC Batch	MW-01A	QC Batch	MW-01B	RDL	QC Batch
Elements											
Total Arsenic (As)	mg/kg	7.3	9118168	2.5	2.2	9117427	4.6	9121277	18	1.0	9117427
Total Cadmium (Cd)	mg/kg	0.53	9118168	0.060	<0.050	9117427	0.41	9121277	0.47	0.050	9117427
Total Chromium (Cr)	mg/kg	12	9118168	6.3	5.8	9117427	8.2	9121277	10	1.0	9117427
Total Cobalt (Co)	mg/kg	2.2	9118168	3.0	2.3	9117427	2.2	9121277	2.1	0.50	9117427
Total Copper (Cu)	mg/kg	40	9118168	6.7	4.2	9117427	9.1	9121277	5.9	1.0	9117427
Total Lead (Pb)	mg/kg	2.7	9118168	3.5	2.0	9117427	2.9	9121277	8.6	0.50	9117427
Total Nickel (Ni)	mg/kg	15	9118168	5.2	4.7	9117427	8.5	9121277	5.3	1.0	9117427
Total Zinc (Zn)	mg/kg	8.3	9118168	16 (1)	9.2 (1)	9117427	14	9121277	22 (1)	1.0	9117427

RDL = Reportable Detection Limit
(1) Detection limits calculated based on method detection limits (MDLs) at client request.

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ARCADIS Canada Inc
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Sampler Initials: RF

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		UD6474	UD6475		UD6476	UD6477	UD6477	UD6478		
Sampling Date		2018/08/19 18:00	2018/08/19 18:00		2018/08/19 17:30	2018/08/19 17:30	2018/08/19 17:30	2018/08/19 17:00		
COC Number		6 of 8	6 of 8		6 of 8	6 of 8	6 of 8	6 of 8		
	UNITS	MW-02A	MW-02B	QC Batch	MW-03A	MW-03B	MW-03B Lab-Dup	MW-04A	RDL	QC Batch
Elements										
Total Arsenic (As)	mg/kg	4.4	7.9	9117232	2.6	3.5	3.6	2.0	1.0	9117427
Total Cadmium (Cd)	mg/kg	0.15	0.15	9117232	0.15	0.060	0.064	0.11	0.050	9117427
Total Chromium (Cr)	mg/kg	6.1	6.3	9117232	5.4	4.1	4.5	4.3	1.0	9117427
Total Cobalt (Co)	mg/kg	3.1	2.3	9117232	2.0	1.3	1.3	1.4	0.50	9117427
Total Copper (Cu)	mg/kg	9.0	8.3	9117232	4.3	3.3	3.1	2.1	1.0	9117427
Total Lead (Pb)	mg/kg	2.6	3.0	9117232	2.9	2.7	2.8	2.5	0.50	9117427
Total Nickel (Ni)	mg/kg	6.6	5.4	9117232	4.1	2.9	3.0	2.7	1.0	9117427
Total Zinc (Zn)	mg/kg	22 (1)	17 (1)	9117232	17 (1)	11 (1)	10	10 (1)	1.0	9117427

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
(1) Detection limits calculated based on method detection limits (MDLs) at client request.

Maxxam ID		UD6479	UD6480	UD6481		UD6482		UD6483		
Sampling Date		2018/08/19 17:00	2018/08/19 13:00	2018/08/19 13:00		2018/08/19 12:30		2018/08/19 12:30		
COC Number		6 of 8	6 of 8	6 of 8		6 of 8		6 of 8		
	UNITS	MW-04B	MW-05A	MW-05B	QC Batch	MW-06A	QC Batch	MW-06B	RDL	QC Batch
Elements										
Total Arsenic (As)	mg/kg	3.2	1.1	1.2	9117427	3.6	9117396	15	1.0	9117232
Total Cadmium (Cd)	mg/kg	0.099	0.081	0.086	9117427	0.11	9117396	0.44	0.050	9117232
Total Chromium (Cr)	mg/kg	4.1	1.8	3.3	9117427	2.8	9117396	3.3	1.0	9117232
Total Cobalt (Co)	mg/kg	1.7	<0.50	0.78	9117427	0.89	9117396	1.4	0.50	9117232
Total Copper (Cu)	mg/kg	2.5	3.1	5.2	9117427	5.3	9117396	5.4	1.0	9117232
Total Lead (Pb)	mg/kg	2.3	1.9	2.1	9117427	2.8	9117396	5.4	0.50	9117232
Total Nickel (Ni)	mg/kg	3.1	1.6	2.8	9117427	2.8	9117396	4.1	1.0	9117232
Total Zinc (Zn)	mg/kg	12 (1)	10 (1)	15 (1)	9117427	17 (1)	9117396	62 (1)	1.0	9117232

RDL = Reportable Detection Limit
(1) Detection limits calculated based on method detection limits (MDLs) at client request.

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ARCADIS Canada Inc
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Sampler Initials: RF

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		UD6508	UD6509	UD6510		UD6511		UD6512		
Sampling Date		2018/08/19 12:00	2018/08/19 12:00	2018/08/19 13:30		2018/08/19 13:30		2018/08/17		
COC Number		7 of 8	7 of 8	7 of 8		7 of 8		8 of 8		
	UNITS	MW-07A	MW-07B	MW-08A	QC Batch	MW-08B	QC Batch	DUP 1	RDL	QC Batch
Elements										
Total Arsenic (As)	mg/kg	2.8	2.8	2.6	9117232	2.4	9117427	4.7	1.0	9121277
Total Cadmium (Cd)	mg/kg	0.076	0.054	0.059	9117232	0.058	9117427	0.40	0.050	9121277
Total Chromium (Cr)	mg/kg	3.9	3.2	2.6	9117232	3.3	9117427	6.3	1.0	9121277
Total Cobalt (Co)	mg/kg	1.4	1.2	0.95	9117232	1.5	9117427	2.2	0.50	9121277
Total Copper (Cu)	mg/kg	3.7	3.3	5.0	9117232	2.6	9117427	9.0	1.0	9121277
Total Lead (Pb)	mg/kg	2.7	2.4	2.2	9117232	2.2	9117427	2.9	0.50	9121277
Total Nickel (Ni)	mg/kg	3.1	2.4	1.9	9117232	2.4	9117427	6.6	1.0	9121277
Total Zinc (Zn)	mg/kg	17 (1)	14 (1)	11 (1)	9117232	10 (1)	9117427	16	1.0	9121277

RDL = Reportable Detection Limit
(1) Detection limits calculated based on method detection limits (MDLs) at client request.

Maxxam ID		UD6513		UD6514	UD6515		UD6516		UD6517		
Sampling Date		2018/08/18		2018/08/18	2018/08/18		2018/08/19		2018/08/20		
COC Number		8 of 8		8 of 8	8 of 8		8 of 8		8 of 8		
	UNITS	DUP 2	QC Batch	DUP 3	DUP 4	QC Batch	DUP 5	QC Batch	DUP 6	RDL	QC Batch
Elements											
Total Arsenic (As)	mg/kg	18	9117427	2.1	2.4	9117232	4.8	9117427	2.6	1.0	9117232
Total Cadmium (Cd)	mg/kg	0.45	9117427	0.078	<0.050	9117232	0.19	9117427	0.061	0.050	9117232
Total Chromium (Cr)	mg/kg	3.4	9117427	5.1	4.1	9117232	3.5	9117427	3.1	1.0	9117232
Total Cobalt (Co)	mg/kg	1.5	9117427	3.1	1.5	9117232	1.4	9117427	1.0	0.50	9117232
Total Copper (Cu)	mg/kg	6.3	9117427	9.4	3.3	9117232	2.9	9117427	2.2	1.0	9117232
Total Lead (Pb)	mg/kg	6.7	9117427	1.8	2.0	9117232	2.7	9117427	2.3	0.50	9117232
Total Nickel (Ni)	mg/kg	4.6	9117427	3.9	3.0	9117232	3.3	9117427	1.9	1.0	9117232
Total Zinc (Zn)	mg/kg	64 (1)	9117427	12 (1)	7.1 (1)	9117232	18 (1)	9117427	8.7 (1)	1.0	9117232

RDL = Reportable Detection Limit
(1) Detection limits calculated based on method detection limits (MDLs) at client request.

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ARCADIS Canada Inc
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Sampler Initials: RF

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		UD6518		UD6519		
Sampling Date		2018/08/20		2018/08/20		
COC Number		8 of 8		8 of 8		
	UNITS	DUP 7	QC Batch	DUP 8	RDL	QC Batch
Elements						
Total Arsenic (As)	mg/kg	2.1	9117232	2.4	1.0	9117427
Total Cadmium (Cd)	mg/kg	0.096	9117232	0.061	0.050	9117427
Total Chromium (Cr)	mg/kg	5.2	9117232	1.7	1.0	9117427
Total Cobalt (Co)	mg/kg	7.6	9117232	<0.50	0.50	9117427
Total Copper (Cu)	mg/kg	21	9117232	2.5	1.0	9117427
Total Lead (Pb)	mg/kg	3.8	9117232	3.5	0.50	9117427
Total Nickel (Ni)	mg/kg	14	9117232	<1.0	1.0	9117427
Total Zinc (Zn)	mg/kg	32 (1)	9117232	7.0 (1)	1.0	9117427

RDL = Reportable Detection Limit
(1) Detection limits calculated based on method detection limits (MDLs) at client request.

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GENERAL COMMENTS

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

Package 1	7.3°C
Package 2	6.0°C
Package 3	6.3°C
Package 4	5.3°C
Package 5	6.3°C
Package 6	6.0°C
Package 7	3.0°C

F24: Detection limits calculated based on method detection limits (MDLs) at client request.

Sample UD6370 [P2-1A] : Detection limits raised due to sample matrix and re-calculated based on method detection limits (MDLs) at client request. Parameters affected are Cr, Co, Cu, Pb, Ni, As, Zn, Cd.

Sample UD6374 [P2-3A] : Sample received was not in compliance with CCME sampling requirements for VOC/BTEX/F1 in soil.

Sample UD6444 [P2-27A] : Detection limits raised due to sample matrix and re-calculated based on method detection limits (MDLs) at client request. Parameters affected are Cr, Co, Cu, Pb, Ni, As, Zn, Cd.

Sample UD6446 [P2-28A] : Detection limits raised due to sample matrix and re-calculated based on method detection limits (MDLs) at client request. Parameters affected are Cr, Co, Cu, Pb, Ni, As, Zn, Cd.

Sample UD6447 [P2-28B] : Detection limits raised due to sample matrix and re-calculated based on method detection limits (MDLs) at client request. Parameters affected are Cr, Co, Cu, Pb, Ni, As, Zn, Cd.

Sample UD6448 [P2-29A] : Detection limits raised due to sample matrix and re-calculated based on method detection limits (MDLs) at client request. Parameters affected are Cr, Co, Cu, Pb, Ni, As, Zn, Cd.

Sample UD6449 [P2-29B] : Detection limits raised due to sample matrix and re-calculated based on method detection limits (MDLs) at client request. Parameters affected are Cr, Co, Cu, Pb, Ni, As, Zn, Cd.

Sample UD6472 [MW-01A] : Detection limits raised due to sample matrix and re-calculated based on method detection limits (MDLs) at client request. Parameters affected are Cr, Co, Cu, Pb, Ni, As, Zn, Cd.

Sample UD6512 [DUP 1] : Detection limits raised due to sample matrix and re-calculated based on method detection limits (MDLs) at client request. Parameters affected are Cr, Co, Cu, Pb, Ni, As, Zn, Cd.

POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL) Comments

Sample UD6370 [P2-1A] Polychlorinated Biphenyls in Soil: Detection limits raised due to high moisture content, samples contain => 50% moisture.
Sample UD6376 [P2-4A] Polychlorinated Biphenyls in Soil: Detection limits raised due to dilution to bring analyte within the calibrated range.
Sample UD6377 [P2-4B] Polychlorinated Biphenyls in Soil: Detection limits raised due to dilution to bring analyte within the calibrated range.
Sample UD6402 [P2-12A] Polychlorinated Biphenyls in Soil: Detection limits raised due to high moisture content, samples contain => 50% moisture.
Sample UD6444 [P2-27A] Polychlorinated Biphenyls in Soil: Detection limits raised due to matrix interference and high moisture content, samples contain => 50% moisture.
Sample UD6446 [P2-28A] Polychlorinated Biphenyls in Soil: Detection limits raised due to high moisture content, samples contain => 50% moisture.
Sample UD6447 [P2-28B] Polychlorinated Biphenyls in Soil: Detection limits raised due to high moisture content, samples contain => 50% moisture. Detection limits raised due to matrix interference.
Sample UD6448 [P2-29A] Polychlorinated Biphenyls in Soil: Detection limits raised due to high moisture content, samples contain => 50% moisture. Detection limits raised due to matrix interference.
Sample UD6449 [P2-29B] Polychlorinated Biphenyls in Soil: Detection limits raised due to matrix interference and high moisture content, samples contain => 50% moisture.
Sample UD6514 [DUP 3] Polychlorinated Biphenyls in Soil: Detection limits raised due to dilution to bring analyte within the calibrated range.

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Results relate only to the items tested.

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QUALITY ASSURANCE REPORT

ARCADIS Canada Inc
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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
9115806	1,4-Difluorobenzene (sur.)	2018/08/24	99	50 - 140	100	50 - 140	98	%				
9115806	4-Bromofluorobenzene (sur.)	2018/08/24	97	50 - 140	98	50 - 140	96	%				
9115806	D10-o-Xylene (sur.)	2018/08/24	101	50 - 140	97	50 - 140	97	%				
9115806	D4-1,2-Dichloroethane (sur.)	2018/08/24	99	50 - 140	100	50 - 140	99	%				
9115912	1,4-Difluorobenzene (sur.)	2018/08/24	97	50 - 140	107	50 - 140	106	%				
9115912	4-Bromofluorobenzene (sur.)	2018/08/24	94	50 - 140	94	50 - 140	93	%				
9115912	D10-o-Xylene (sur.)	2018/08/24	103	50 - 140	100	50 - 140	100	%				
9115912	D4-1,2-Dichloroethane (sur.)	2018/08/24	104	50 - 140	105	50 - 140	103	%				
9117179	1,4-Difluorobenzene (sur.)	2018/08/25	98	50 - 140	98	50 - 140	99	%				
9117179	4-Bromofluorobenzene (sur.)	2018/08/25	99	50 - 140	97	50 - 140	96	%				
9117179	D10-o-Xylene (sur.)	2018/08/25	106	50 - 140	99	50 - 140	99	%				
9117179	D4-1,2-Dichloroethane (sur.)	2018/08/25	99	50 - 140	98	50 - 140	99	%				
9117180	1,4-Difluorobenzene (sur.)	2018/08/27	98	50 - 140	101	50 - 140	95	%				
9117180	4-Bromofluorobenzene (sur.)	2018/08/27	96	50 - 140	97	50 - 140	99	%				
9117180	D10-o-Xylene (sur.)	2018/08/27	101	50 - 140	103	50 - 140	99	%				
9117180	D4-1,2-Dichloroethane (sur.)	2018/08/27	94	50 - 140	95	50 - 140	97	%				
9117203	O-TERPHENYL (sur.)	2018/08/25	89	60 - 140	96	60 - 140	98	%				
9117207	1,4-Difluorobenzene (sur.)	2018/08/25	93	50 - 140	93	50 - 140	97	%				
9117207	4-Bromofluorobenzene (sur.)	2018/08/25	96	50 - 140	94	50 - 140	94	%				
9117207	D10-o-Xylene (sur.)	2018/08/25	107	50 - 140	99	50 - 140	96	%				
9117207	D4-1,2-Dichloroethane (sur.)	2018/08/25	98	50 - 140	100	50 - 140	98	%				
9117272	1,4-Difluorobenzene (sur.)	2018/08/26	92	50 - 140	93	50 - 140	94	%				
9117272	4-Bromofluorobenzene (sur.)	2018/08/26	96	50 - 140	95	50 - 140	96	%				
9117272	D10-o-Xylene (sur.)	2018/08/26	102	50 - 140	96	50 - 140	99	%				
9117272	D4-1,2-Dichloroethane (sur.)	2018/08/26	104	50 - 140	102	50 - 140	104	%				
9117410	O-TERPHENYL (sur.)	2018/08/26	113	60 - 140	115	60 - 140	114	%				
9117429	O-TERPHENYL (sur.)	2018/08/25	103	60 - 140	95	60 - 140	99	%				
9117536	NONACHLOROBIPHENYL (sur.)	2018/08/26	111	50 - 130	91	50 - 130	110	%				
9117540	NONACHLOROBIPHENYL (sur.)	2018/08/25	98	50 - 130	104	50 - 130	95	%				
9117575	O-TERPHENYL (sur.)	2018/08/27	107	60 - 140	97	60 - 140	92	%				
9117591	O-TERPHENYL (sur.)	2018/08/25	97	60 - 140	97	60 - 140	98	%				

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QUALITY ASSURANCE REPORT(CONT'D)

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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
9118042	NONACHLOROBIPHENYL (sur.)	2018/08/26	92	50 - 130	77	50 - 130	75	%				
9118064	NONACHLOROBIPHENYL (sur.)	2018/08/28	88	50 - 130	108	50 - 130	86	%				
9118070	NONACHLOROBIPHENYL (sur.)	2018/08/27	61	50 - 130	86	50 - 130	95	%				
9115806	F1 (C6-C10)	2018/08/24	103	60 - 140	108	60 - 140	<10	mg/kg	13	40		
9115912	F1 (C6-C10)	2018/08/24	108	60 - 140	101	60 - 140	<10	mg/kg	NC	30		
9117158	Moisture	2018/08/26					<0.30	%	0	20		
9117179	F1 (C6-C10)	2018/08/25	88	60 - 140	113	60 - 140	<10	mg/kg	NC	30		
9117180	F1 (C6-C10)	2018/08/25	93	60 - 140	106	60 - 140	<10	mg/kg	NC (1)	30		
9117203	F2 (C10-C16 Hydrocarbons)	2018/08/25	90	60 - 140	97	60 - 140	<4.0 (2)	mg/kg	NC	40		
9117203	F3 (C16-C34 Hydrocarbons)	2018/08/25	89	60 - 140	98	60 - 140	<8.0 (2)	mg/kg	36	40		
9117203	F4 (C34-C50 Hydrocarbons)	2018/08/25	88	60 - 140	96	60 - 140	<6.0 (2)	mg/kg	NC	40		
9117207	F1 (C6-C10)	2018/08/25	122	60 - 140	83	60 - 140	<10	mg/kg	NC	30		
9117227	Moisture	2018/08/26					<0.30	%	0	20		
9117229	Moisture	2018/08/26					<0.30	%	0	20		
9117232	Total Arsenic (As)	2018/08/25	87	75 - 125	102	80 - 120	<1.0	mg/kg	5.8	30	105	53 - 147
9117232	Total Cadmium (Cd)	2018/08/25	89	75 - 125	99	80 - 120	<0.050	mg/kg	14	30		
9117232	Total Chromium (Cr)	2018/08/25	91	75 - 125	104	80 - 120	<1.0	mg/kg	8.8	30	88	59 - 141
9117232	Total Cobalt (Co)	2018/08/25	86	75 - 125	103	80 - 120	<0.50	mg/kg	6.5	30	97	58 - 142
9117232	Total Copper (Cu)	2018/08/25	81	75 - 125	103	80 - 120	<1.0	mg/kg	NC	30	101	83 - 117
9117232	Total Lead (Pb)	2018/08/25	83	75 - 125	102	80 - 120	<0.50	mg/kg	2.1	35	104	79 - 121
9117232	Total Nickel (Ni)	2018/08/25	82	75 - 125	101	80 - 120	<1.0	mg/kg	9.6	30	105	79 - 121
9117232	Total Zinc (Zn)	2018/08/25	80	75 - 125	101	80 - 120	<10	mg/kg	6.0 (2)	30	104	79 - 121
9117234	Total Arsenic (As)	2018/08/25	105	75 - 125	99	80 - 120	<1.0	mg/kg	7.3	30	112	53 - 147
9117234	Total Cadmium (Cd)	2018/08/25	104	75 - 125	96	80 - 120	<0.050	mg/kg	20	30		
9117234	Total Chromium (Cr)	2018/08/25	111	75 - 125	102	80 - 120	<1.0	mg/kg	7.6	30	86	59 - 141
9117234	Total Cobalt (Co)	2018/08/25	104	75 - 125	102	80 - 120	<0.50	mg/kg	9.2	30	100	58 - 142
9117234	Total Copper (Cu)	2018/08/25	99	75 - 125	101	80 - 120	<1.0	mg/kg	9.9	30	109	83 - 117
9117234	Total Lead (Pb)	2018/08/25	99	75 - 125	100	80 - 120	<0.50	mg/kg	5.3	35	110	79 - 121
9117234	Total Nickel (Ni)	2018/08/25	100	75 - 125	98	80 - 120	<1.0	mg/kg	12	30	110	79 - 121
9117234	Total Zinc (Zn)	2018/08/25	101	75 - 125	98	80 - 120	<10	mg/kg	17	30	112	79 - 121
9117267	Moisture	2018/08/26					<0.30	%	8.4	20		

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QUALITY ASSURANCE REPORT(CONT'D)

ARCADIS Canada Inc
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Site Location: PIN-2
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
9117272	F1 (C6-C10)	2018/08/26	131	60 - 140	108	60 - 140	<7.0	mg/kg	NC	30		
9117396	Total Arsenic (As)	2018/08/25	100	75 - 125	105	80 - 120	<1.0	mg/kg	9.8	30	101	53 - 147
9117396	Total Cadmium (Cd)	2018/08/25	102	75 - 125	106	80 - 120	<0.050	mg/kg	0.59	30		
9117396	Total Chromium (Cr)	2018/08/25	104	75 - 125	107	80 - 120	<1.0	mg/kg	1.1	30	81	59 - 141
9117396	Total Cobalt (Co)	2018/08/25	99	75 - 125	106	80 - 120	<0.50	mg/kg	2.0	30	92	58 - 142
9117396	Total Copper (Cu)	2018/08/25	94	75 - 125	106	80 - 120	<1.0	mg/kg	12	30	99	83 - 117
9117396	Total Lead (Pb)	2018/08/25	94	75 - 125	107	80 - 120	<0.50	mg/kg	9.9	35	101	79 - 121
9117396	Total Nickel (Ni)	2018/08/25	97	75 - 125	105	80 - 120	<1.0	mg/kg	0.25	30	102	79 - 121
9117396	Total Zinc (Zn)	2018/08/25	94	75 - 125	106	80 - 120	<1.0	mg/kg	1.6	30	101	79 - 121
9117410	F2 (C10-C16 Hydrocarbons)	2018/08/26	115	60 - 140	119	60 - 140	<4.0 (2)	mg/kg	NC	40		
9117410	F3 (C16-C34 Hydrocarbons)	2018/08/26	116	60 - 140	120	60 - 140	<8.0 (2)	mg/kg	NC	40		
9117410	F4 (C34-C50 Hydrocarbons)	2018/08/26	115	60 - 140	119	60 - 140	<6.0 (2)	mg/kg	19	40		
9117422	Moisture	2018/08/26					<0.30	%	5.7	20		
9117427	Total Arsenic (As)	2018/08/25	103	75 - 125	98	80 - 120	<1.0	mg/kg	2.1	30	98	53 - 147
9117427	Total Cadmium (Cd)	2018/08/25	105	75 - 125	98	80 - 120	<0.050	mg/kg	7.9	30		
9117427	Total Chromium (Cr)	2018/08/25	108	75 - 125	100	80 - 120	<1.0	mg/kg	7.3	30	76	59 - 141
9117427	Total Cobalt (Co)	2018/08/25	100	75 - 125	100	80 - 120	<0.50	mg/kg	4.0	30	89	58 - 142
9117427	Total Copper (Cu)	2018/08/25	96	75 - 125	99	80 - 120	<1.0	mg/kg	5.8	30	98	83 - 117
9117427	Total Lead (Pb)	2018/08/25	97	75 - 125	98	80 - 120	<0.50	mg/kg	5.4	35	97	79 - 121
9117427	Total Nickel (Ni)	2018/08/25	98	75 - 125	98	80 - 120	<1.0	mg/kg	2.3	30	99	79 - 121
9117427	Total Zinc (Zn)	2018/08/25	99	75 - 125	99	80 - 120	<10	mg/kg	3.3	30	98	79 - 121
9117429	F2 (C10-C16 Hydrocarbons)	2018/08/25	108	60 - 140	102	60 - 140	<4.0 (3)	mg/kg	NC	40		
9117429	F3 (C16-C34 Hydrocarbons)	2018/08/25	107	60 - 140	103	60 - 140	<8.0 (3)	mg/kg	38	40		
9117429	F4 (C34-C50 Hydrocarbons)	2018/08/25	106	60 - 140	100	60 - 140	<6.0 (3)	mg/kg	NC	40		
9117536	Aroclor 1016	2018/08/26					<0.010	mg/kg	NC	50		
9117536	Aroclor 1221	2018/08/26					<0.010	mg/kg	NC	50		
9117536	Aroclor 1232	2018/08/26					<0.010	mg/kg	NC	50		
9117536	Aroclor 1242	2018/08/26					<0.010	mg/kg	NC	50		
9117536	Aroclor 1248	2018/08/26					<0.010	mg/kg	NC	50		
9117536	Aroclor 1254	2018/08/26					<0.010	mg/kg	NC	50		
9117536	Aroclor 1260	2018/08/26	105	50 - 130	83	50 - 130	<0.010	mg/kg	NC	50		

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QUALITY ASSURANCE REPORT(CONT'D)

ARCADIS Canada Inc
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Site Location: PIN-2
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
9117536	Aroclor 1262	2018/08/26					<0.010	mg/kg	NC	50		
9117536	Aroclor 1268	2018/08/26					<0.010	mg/kg	NC	50		
9117540	Aroclor 1016	2018/08/25					<0.010	mg/kg	NC	50		
9117540	Aroclor 1221	2018/08/25					<0.010	mg/kg	NC	50		
9117540	Aroclor 1232	2018/08/25					<0.010	mg/kg	NC	50		
9117540	Aroclor 1242	2018/08/25					<0.010	mg/kg	NC	50		
9117540	Aroclor 1248	2018/08/25					<0.010	mg/kg	NC	50		
9117540	Aroclor 1254	2018/08/25					<0.010	mg/kg	NC	50		
9117540	Aroclor 1260	2018/08/25	83	50 - 130	100	50 - 130	<0.010	mg/kg	NC	50		
9117540	Aroclor 1262	2018/08/25					<0.010	mg/kg	NC	50		
9117540	Aroclor 1268	2018/08/25					<0.010	mg/kg	NC	50		
9117575	F2 (C10-C16 Hydrocarbons)	2018/08/27	115	60 - 140	106	60 - 140	<4.0 (3)	mg/kg	NC	40		
9117575	F3 (C16-C34 Hydrocarbons)	2018/08/27	113	60 - 140	105	60 - 140	<8.0 (3)	mg/kg	3.8	40		
9117575	F4 (C34-C50 Hydrocarbons)	2018/08/27	109	60 - 140	101	60 - 140	<6.0 (3)	mg/kg	NC	40		
9117591	F2 (C10-C16 Hydrocarbons)	2018/08/25	100	60 - 140	101	60 - 140	<4.0 (3)	mg/kg	NC	40		
9117591	F3 (C16-C34 Hydrocarbons)	2018/08/25	100	60 - 140	100	60 - 140	<8.0 (3)	mg/kg	4.3	40		
9117591	F4 (C34-C50 Hydrocarbons)	2018/08/25	99	60 - 140	98	60 - 140	<6.0 (3)	mg/kg	NC	40		
9118042	Aroclor 1016	2018/08/27					<0.010	mg/kg	NC	50		
9118042	Aroclor 1221	2018/08/27					<0.010	mg/kg	NC	50		
9118042	Aroclor 1232	2018/08/27					<0.010	mg/kg	NC	50		
9118042	Aroclor 1242	2018/08/27					<0.010	mg/kg	NC	50		
9118042	Aroclor 1248	2018/08/27					<0.010	mg/kg	NC	50		
9118042	Aroclor 1254	2018/08/27					<0.010	mg/kg	NC	50		
9118042	Aroclor 1260	2018/08/27	91	50 - 130	74	50 - 130	<0.010	mg/kg	NC	50		
9118042	Aroclor 1262	2018/08/27					<0.010	mg/kg	NC	50		
9118042	Aroclor 1268	2018/08/27					<0.010	mg/kg	NC	50		
9118052	Moisture	2018/08/26					<0.30	%	4.0	20		
9118064	Aroclor 1016	2018/08/28					<0.010	mg/kg	NC	50		
9118064	Aroclor 1221	2018/08/28					<0.010	mg/kg	NC	50		
9118064	Aroclor 1232	2018/08/28					<0.010	mg/kg	NC	50		
9118064	Aroclor 1242	2018/08/28					<0.010	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
9118064	Aroclor 1248	2018/08/28					<0.010	mg/kg	NC	50		
9118064	Aroclor 1254	2018/08/28					<0.010	mg/kg	NC	50		
9118064	Aroclor 1260	2018/08/28	99	50 - 130	105	50 - 130	<0.010	mg/kg	NC	50		
9118064	Aroclor 1262	2018/08/28					<0.010	mg/kg	NC	50		
9118064	Aroclor 1268	2018/08/28					<0.010	mg/kg	NC	50		
9118070	Aroclor 1016	2018/08/27					<0.010	mg/kg	NC	50		
9118070	Aroclor 1221	2018/08/27					<0.010	mg/kg	NC	50		
9118070	Aroclor 1232	2018/08/27					<0.010	mg/kg	NC	50		
9118070	Aroclor 1242	2018/08/27					<0.010	mg/kg	NC	50		
9118070	Aroclor 1248	2018/08/27					<0.010	mg/kg	NC	50		
9118070	Aroclor 1254	2018/08/27					<0.010	mg/kg	NC	50		
9118070	Aroclor 1260	2018/08/27	73	50 - 130	81	50 - 130	<0.010	mg/kg	NC	50		
9118070	Aroclor 1262	2018/08/27					<0.010	mg/kg	NC	50		
9118070	Aroclor 1268	2018/08/27					<0.010	mg/kg	NC	50		
9118168	Total Arsenic (As)	2018/08/28	98	75 - 125	96	80 - 120	<1.0	mg/kg	7.4	30	93	53 - 147
9118168	Total Cadmium (Cd)	2018/08/28	94	75 - 125	92	80 - 120	<0.050	mg/kg	52 (4)	30		
9118168	Total Chromium (Cr)	2018/08/28	115	75 - 125	99	80 - 120	<1.0	mg/kg	5.7	30	82	59 - 141
9118168	Total Cobalt (Co)	2018/08/28	97	75 - 125	98	80 - 120	<0.50	mg/kg	3.3	30	89	58 - 142
9118168	Total Copper (Cu)	2018/08/28	102	75 - 125	99	80 - 120	<1.0	mg/kg	8.1	30	98	83 - 117
9118168	Total Lead (Pb)	2018/08/28	89	75 - 125	95	80 - 120	<0.50	mg/kg	6.3	35	93	79 - 121
9118168	Total Nickel (Ni)	2018/08/28	102	75 - 125	97	80 - 120	<1.0	mg/kg	2.1	30	99	79 - 121
9118168	Total Zinc (Zn)	2018/08/28	NC	75 - 125	99	80 - 120	<10	mg/kg	24	30	97	79 - 121
9121277	Total Arsenic (As)	2018/08/29	94	75 - 125	96	80 - 120	<1.0	mg/kg	4.3	30	101	53 - 147
9121277	Total Cadmium (Cd)	2018/08/29	99	75 - 125	97	80 - 120	<0.050	mg/kg				
9121277	Total Chromium (Cr)	2018/08/29	111	75 - 125	98	80 - 120	<1.0	mg/kg	10	30	84	59 - 141
9121277	Total Cobalt (Co)	2018/08/29	105	75 - 125	100	80 - 120	<0.50	mg/kg			96	58 - 142
9121277	Total Copper (Cu)	2018/08/29	100	75 - 125	101	80 - 120	<1.0	mg/kg	0.38	30	98	83 - 117
9121277	Total Lead (Pb)	2018/08/29	85	75 - 125	97	80 - 120	<0.50	mg/kg	3.1	35	98	79 - 121
9121277	Total Nickel (Ni)	2018/08/29	107	75 - 125	98	80 - 120	<1.0	mg/kg	7.2	30	104	79 - 121

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QUALITY ASSURANCE REPORT(CONT'D)

ARCADIS Canada Inc
Client Project #: 102012-000
Site Location: PIN-2
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
9121277	Total Zinc (Zn)	2018/08/29	NC	75 - 125	98	80 - 120	<10	mg/kg	0.66	30	101	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 spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 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 (absolute difference <= 2x RDL).

(1) Detection limits calculated based on method detection limits (MDLs).

(2) Detection limits calculated based on method detection limits (MDLs) at client request.

(3) F24: Detection limits calculated based on method detection limits (MDLs) at client request.

(4) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

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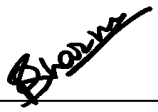
Maxxam Job #: B871860
Report Date: 2018/08/30

ARCADIS Canada Inc
Client Project #: 102012-000
Site Location: PIN-2
Sampler Initials: RF

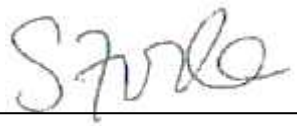
VALIDATION SIGNATURE PAGE

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

Justin Geisel, B.Sc., Organics Supervisor



Poonam Sharma, cCT, Organics Supervisor



Suwan Fock, B.Sc., QP, Inorganics Senior Analyst

Veronica Falk, B.Sc., P.Chem., QP, Scientific Specialist, Organics

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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CHAIN OF CUSTODY RECORD

Page 1 of 9

INVOICE INFORMATION:		REPORT INFORMATION (if differs from invoice):		PROJECT INFORMATION:		Laboratory Use Only
Company Name:	# 10988 ARCADIS Canada Inc.	Company Name:	Arcadis Canada Inc	Quotation #:	B80947 (2018 prices-Easten Quote B60371)	MAXXAM JOB #:
Contact Name:	Invoices Attention	Contact Name:	Ryan Fletcher/Troy Austrins	P.O. #:		B871860
Address:	1050 Morrison Drive, Suite 201	Address:	1050 Morrison Drive, Suite 201	Project #:	102012-000	PROJECT MANAGER:
	Ottawa, Ontario		Ottawa, On	Scenario:		
Phone:	613-721-0555 Fax:	Phone:	613-721-0555	Site Location:	PIN-2	Parminder Virk
Email:	invoicesottawa@arcadis.com, barb.adelman@arcadis.com	Email:	ryan.fletcher@arcadis.com/Troy.austrins@arcadis.com	Sampled By:	Ryan Fletcher	

SPECIAL INSTRUCTIONS:

Metals: olny report for As, Cd, Cr, Co, Cu, Pb, Ni, Zinc

PHCs: Only report for F1-F4 (i.e., no BTEX)

Groundwater: Metals not preserved and not field filtered. Analyse for TOTAL metals only. (do not filter or perserve in lab).

Special MDLs are required. Contact Parminder Virk if there are any questions regarding MDLs.

SAMPLES MUST BE KEPT COOL (< 10 °C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

ANALYSIS REQUESTED

	Sample Indentification	Date Sampled & Time Sampled	Matrix	F1-F4 (No BTEX)	Total As, Cd, Cr, Co, Cu, Pb, Ni, Zinc	PCB	# of Containers	Comments
1	P1-1A	Aug 20/18 0815	Soil	X	X	X	5	Sample Reception: Please notify the lab for required RDLs Refer to the attached document for required RDL.
2	P1-1B	Aug 20/18 0815		X	X	X	5	Please email the lab to not filter or preserve metals bottles
3	P1-2A	Aug 20/18 0800		X	X	X	5	
4	P1-2B	Aug 20/18 0800		X	X	X	5	
5	P1-3A	Aug 20/18 0820		X	X	X	5	
6	P1-3B	Aug 20/18 0820		X	X	X	5	
7	P1-4A	Aug 20/18 0830		X	X	X	5	
8	P1-4B	Aug 20/18 0830		X	X	X	5	
9	P2-5A	Aug 20/18 0900		X	X	X	5	
10	P2-5B	Aug 20/18 0900		X	X	X	5	
11	P2-6A	Aug 20/18 0915		X	X	X	5	
12	P2-6B	Aug 20/18 0915		X	X	X	5	

TURNAROUND TIME (TAT) REQUIRED:

PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS

Regular (Standard) TAT: ☒

Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for some tests are > 5 days - contact your Project Manager for details.

Rush TAT

Date Required: _____

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By: Jeffery.S
2018 -08- 21 10:00

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Temp: 1 1

*RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time:	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time:
Ryan Fletcher	Aug 21/2018	8am	Danielle Bosica	20180822	10:15

Laboratory Use Only
Temperature of samples on receipt (°C): 9.6 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 RESULTS IN ANALYICAL TAT DELAYS
** ALL SAMPLES ARE HELD FOR 60 DAYS AFTER SAMPLE RECEIPT, FOR SPECIAL REQUEST PLEASE CONTACT YOUR PROJECT MANAGER

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CHAIN OF CUSTODY RECORD

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Company Name:	# 10988 ARCADIS Canada Inc.	Company Name:	Arcadis Canada Inc	Quotation #:	B80947 (2018 prices-Easten Quote B60371)	MAXXAM JOB #:
Contact Name:	Invoices Attention	Contact Name:	Ryan Fletcher/Troy Austrins	P.O. #:		B871860
Address:	1050 Morrison Drive, Suite 201	Address:	1050 Morrison Drive, Suite 201	Project #:	102012-000	PROJECT MANAGER:
	Ottawa, Ontario		Ottawa, On	Scenario:		
Phone:	613-721-0555 Fax:	Phone:	613-721-0555	Site Location:	PIN-2	Parminder Virk
Email:	invoicesottawa@arcadis.com, barb.adelman@arcadis.com	Email:	ryan.fletcher@arcadis.com/Troy.austrins@arcadis.com	Sampled By:	Ryan Fletcher	

SPECIAL INSTRUCTIONS:

Metals: olny report for As, Cd, Cr, Co, Cu, Pb, Ni, Zinc

PHCs: Only report for F1-F4 (i.e., no BTEX)

Groundwater: Metals not preserved and not field filtered. Analyse for TOTAL metals only. (do not filter or perserve in lab).

Special MDLs are required. Contact Parminder Virk if there are any questions regarding MDLs.

SAMPLES MUST BE KEPT COOL (< 10 °C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

ANALYSIS REQUESTED

	Sample Indentification	Date Sampled & Time Sampled	Matrix	F1-F4 (No BTEX)	Total As, Cd, Cr, Co, Cu, Pb, Ni, Zinc	PCB	# of Containers	Comments
1	P2-7A	Aug 20/18 0930	Soil	X	X	X	5	Sample Reception: Please notify the lab for required RDLs Refer to the attached document for required RDL.
2	P2-7B	Aug 20/18 0930		X	X	X	5	Please email the lab to not filter or preserve metals bottles
3	P2-8A	Aug 20/18 0945		X	X	X	5	
4	P2-8B	Aug 20/18 0945		X	X	X	5	
5	P2-9A	Aug 19/18 1800		X	X	X	5	
6	P2-9B	Aug 19/18 1800		X	X	X	5	
7	P2-10A	Aug 19/18 1815 ~~1830~~		X	X	X	5	
8	P2-10B	Aug 19/18 1815		X	X	X	5	
9	P2-11A	Aug 19/18 1830		X	X	X	5	
10	P2-11B	Aug 19/18 1830		X	X	X	5	
11	P2-12A	Aug 19/18 1900		X	X	X	5	
12	P2-12B	Aug 19/18 1900		X	X	X	5	

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TURNAROUND TIME (TAT) REQUIRED:

PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS

Regular (Standard) TAT: ☒

Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for some tests are > 5 days - contact your Project Manager for details.

Rush TAT

Date Required: _____

*RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time:	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time:
Ryan Fletcher	Aug 21/18	8am	Danielle Fraser	20180822	10:15

Laboratory Use Only

Temperature of samples on receipt (°C): 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 RESULTS IN ANALYICAL TAT DELAYS
** ALL SAMPLES ARE HELD FOR 60 DAYS AFTER SAMPLE RECEIPT, FOR SPECIAL REQUEST PLEASE CONTACT YOUR PROJECT MANAGER

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CHAIN OF CUSTODY RECORD

INVOICE INFORMATION:		REPORT INFORMATION (if differs from invoice):		PROJECT INFORMATION:		Laboratory Use Only
Company Name:	# 10988 ARCADIS Canada Inc.	Company Name:	Arcadis Canada Inc	Quotation #:	B80947 (2018 prices-Easten Quote B60371)	MAXXAM JOB #: B871860
Contact Name:	Invoices Attention	Contact Name:	Ryan Fletcher/Troy Austrins	P.O. #:		
Address:	1050 Morrison Drive, Suite 201 Ottawa, Ontario	Address:	1050 Morrison Drive, Suite 201 Ottawa, On	Project #:	102012-000	PROJECT MANAGER: Parminder Virk
Phone:	613-721-0555 Fax:	Phone:	613-721-0555	Scenario:		
Email:	invoicesottawa@arcadis.com, barb.adelman@arcadis.com	Email:	ryan.fletcher@arcadis.com/Troy.austrins@arcadis.com	Site Location:	PIN-2	
				Sampled By:	Ryan Fletcher	

SPECIAL INSTRUCTIONS:

Metals: only report for As, Cd, Cr, Co, Cu, Pb, Ni, Zinc

PHCs: Only report for F1-F4 (i.e., no BTEX)

Groundwater: Metals not preserved and not field filtered. Analyse for TOTAL metals only. (do not filter or perserve in lab).

Special MDLs are required. Contact Parminder Virk if there are any questions regarding MDLs.

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: ☑

Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for some tests are > 5 days - contact your Project Manager for details.

Rush TAT

Date Required: _____

	Sample Indentification	Date Sampled & Time Sampled	Matrix	F1-F4 (No BTEX)	Total As, Cd, Cr, Co, Cu, Pb, Ni, Zinc	PCB	# of Containers	Comments
1	P2-13A	Aug 14/18 1930	Soil	X	X	X	5	Sample Reception: Please notify the lab for required RDLs Refer to the attached document for required RDL.
2	P2-13B	Aug 14/18 1930		X	X	X	5	Please email the lab to not filter or preserve metals bottles
3	P2-14A	Aug 19/18 2000		X	X	X	5	
4	P2-14B	Aug 19/18 2000		X	X	X	5	
5	P2-15A	Aug 19/18 1900		X	X	X	5	
6	P2-15B	Aug 19/18 1900		X	X	X	5	
7	P2-16A	Aug 19/18 1915		X	X	X	5	
8	P2-16B	Aug 19/18 1915		X	X	X	5	
9	P2-17A	Aug 18/18 1330		X	X	X	5	
10	P2-17B	Aug 18/18 1330		X	X	X	5	
11	P2-18A	Aug 18/18 1400		X	X	X	5	
12	P2-18B	Aug 18/18 1400	↓	X	X	X	5	

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*RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time:	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time:	Laboratory Use Only
Ryan Fletcher	Aug 21/18	8 am	Danielle Boston	20180822	10:15	Temperature of samples on receipt (°C): 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 RESULTS IN ANALYICAL TAT DELAYS
** ALL SAMPLES ARE HELD FOR 60 DAYS AFTER SAMPLE RECEIPT, FOR SPECIAL REQUEST PLEASE CONTACT YOUR PROJECT MANAGER

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CHAIN OF CUSTODY RECORD

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Company Name:	# 10988 ARCADIS Canada Inc.	Company Name:	Arcadis Canada Inc	Quotation #:	B80947 (2018 prices-Easten Quote B60371)	MAXXAM JOB #: B871860
Contact Name:	Invoices Attention	Contact Name:	Ryan Fletcher/Troy Austrins	P.O. #:		
Address:	1050 Morrison Drive, Suite 201	Address:	1050 Morrison Drive, Suite 201	Project #:	102012-000	
	Ottawa, Ontario		Ottawa, On	Scenario:		PROJECT MANAGER:
Phone:	613-721-0555 Fax:	Phone:	613-721-0555	Site Location:	PIN-2	Parminder Virk
Email:	invoicesottawa@arcadis.com, barb.adelman@arcadis.com	Email:	ryan.fletcher@arcadis.com/Troy.austrins@arcadis.com	Sampled By:	Ryan Fletcher	

SPECIAL INSTRUCTIONS:

Metals: only report for As, Cd, Cr, Co, Cu, Pb, Ni, Zinc

PHCs: Only report for F1-F4 (i.e., no BTEX)

Groundwater: Metals not preserved and not field filtered. Analyse for TOTAL metals only. (do not filter or perserve in lab).

Special MDLs are required. Contact Parminder Virk if there are any questions regarding MDLs.

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: [X]

Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for some tests are > 5 days - contact your Project Manager for details.

Rush TAT

Date Required: _____

	Sample Indentification	Date Sampled & Time Sampled	Matrix	F1-F4 (No BTEX)	Total As, Cd, Cr, Co, Cu, Pb, Ni, Zinc	PCB	# of Containers	Comments
1	P2-19A	Aug 18/18 1430	Soil	X	X	X	5	Sample Reception: Please notify the lab for required RDLs Refer to the attached document for required RDL.
2				XXXXXX			NBV	Please email the lab to not filter or preserve metals bottles
3	P2-20A	Aug 18/18 1500		X	X	X	5	
4	P2-20B	Aug 18/18 1500		X	X	X	5	
5	P2-21A	Aug 20/18 1100		X	X	X	5	
6	P2-21B	Aug 20/18 1100		X	X	X	5	
7	P2-22A	Aug 20/18 1115		X	X	X	5	
8	P2-22B	Aug 20/18 1115		X	X	X	5	
9	P2-23A	Aug 20/18 1130		X	X	X	5	
10	P2-23B	Aug 20/18 1130		X	X	X	5	
11	P2-24A	Aug 20/18 1145		X	X	X	5	
12	P2-24B	Aug 20/18 1145	↓	X	X	X	5	

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*RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time:	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time:	Laboratory Use Only
Ryan Fletcher	Aug 21/18	800	Danielle Boisvert	20180822	10:15	Temperature of samples on receipt (°C): See ACTR; Custody Seal intact on Cooler? ☐ Yes ☐ No

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Company Name:	# 10988 ARCADIS Canada Inc.	Company Name:	Arcadis Canada Inc	Quotation #:	B80947 (2018 prices-Easten Quote B60371)	MAXXAM JOB #: B871860
Contact Name:	Invoices Attention	Contact Name:	Ryan Fletcher/Troy Austrins	P.O. #:		
Address:	1050 Morrison Drive, Suite 201	Address:	1050 Morrison Drive, Suite 201	Project #:	102012-000	PROJECT MANAGER:
	Ottawa, Ontario		Ottawa, On	Scenario:		Parminder Virk
Phone:	613-721-0555 Fax:	Phone:	613-721-0555	Site Location:	PIN-2	
Email:	invoicesottawa@arcadis.com, barb.adelman@arcadis.com	Email:	ryan.fletcher@arcadis.com/Troy.austrins@arcadis.com	Sampled By:	Ryan Fletcher	

SPECIAL INSTRUCTIONS:

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Rush TAT

Date Required: _____

	Sample Indentification	Date Sampled & Time Sampled	Matrix	F1-F4 (No BTEX)	Total As, Cd, Cr, Co, Cu, Pb, Ni, Zinc	PCB	# of Containers	Comments
1	P2-25A	Aug 20/18 1200	Soil	X	X	X	5	Sample Reception: Please notify the lab for required RDLs Refer to the attached document for required RDL.
2	P2-25B	Aug 20/18 1200		X	X	X	5	Please email the lab to not filter or preserve metals bottles
3	P2-26A	Aug 20/18 1215		X	X	X	5	
4	P2-26B	Aug 20/18 1215		X	X	X	5	
5	P2-27A	Aug 18/18 1530		X	X	X	5	
6	P2-27B	Aug 18/18 1530		X	X	X	5	
7	P2-28A	Aug 18/18 1400		X	X	X	5	
8	P2-28B	Aug 18/18 1400		X	X	X	5	
9	P2-29A	Aug 18/18 1430		X	X	X	5	
10	P2-29B	Aug 18/18 1430		X	X	X	5	
11	P2-30A	Aug 18/18 1500		X	X	X	5	
12	P2-30B	Aug 18/18 1500	↓	X	X	X	5	

RECEIVED IN YELLOWKNIFE
By: Jeffery.S
2018-08-21 10:00

See temp Record
Temp: / /

*RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time:	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time:	Laboratory Use Only
Ryan Fletcher	Aug 21/18	8:00	Danielle Bastien	20180822	10:15	Temperature of samples on receipt (°C) 2°C ACTR; Custody Seal intact on Cooler? ☐ Yes ☐ No

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Contact Name:	Invoices Attention	Contact Name:	Ryan Fletcher/Troy Austrins	P.O. #:		B871860
Address:	1050 Morrison Drive, Suite 201	Address:	1050 Morrison Drive, Suite 201	Project #:	102012-000	PROJECT MANAGER:
	Ottawa, Ontario		Ottawa, On	Scenario:		
Phone:	613-721-0555 Fax:	Phone:	613-721-0555	Site Location:	PIN-2	Parminder Virk
Email:	invoicesottawa@arcadis.com, barb.adelman@arcadis.com	Email:	ryan.fletcher@arcadis.com/Troy.austrins@arcadis.com	Sampled By:	Ryan Fletcher	

SPECIAL INSTRUCTIONS:

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PHCs: Only report for F1-F4 (i.e., no BTEX)

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Rush TAT

Date Required: _____

	Sample Indentification	Date Sampled & Time Sampled	Matrix	F1-F4 (No BTEX)	Total As, Cd, Cr, Co, Cu, Pb, Ni, Zinc	PCB	# of Containers	Comments
1	MW-01A	Aug 17/18 1830	Soil	X	X	X	5	Sample Reception: Please notify the lab for required RDLs Refer to the attached document for required RDL.
2	MW-01B	Aug 17/18 1830		X	X	X	5	Please email the lab to not filter or preserve metals bottles
3	MW-02A	Aug 17/18 1800		X	X	X	5	
4	MW-02B	Aug 17/18 1800		X	X	X	5	
5	MW-03A	Aug 17/18 1730		X	X	X	5	
6	MW-03B	Aug 17/18 1730		X	X	X	5	
7	MW-04A	Aug 17/18 1700		X	X	X	5	
8	MW-04B	Aug 17/18 1700		X	X	X	5	
9	MW-05A	Aug 18/18 1300		X	X	X	5	
10	MW-05B	Aug 18/18 1300		X	X	X	5	
11	MW-06A	Aug 18/18 1230		X	X	X	5	
12	MW-06B	Aug 18/18 1230	↓	X	X	X	5	

RECEIVED IN YELLOWKNIFE
By: Jeffery
2018 -08- 21 10:00
See temp Record
Temp: 1 1

*RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time:	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time:	Laboratory Use Only
Ryan Fletcher	Aug 21/18	800	Danielle Boisvert	20180822	10:15	Temperature of samples on receipt (°C): 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 RESULTS IN ANALYICAL TAT DELAYS
** ALL SAMPLES ARE HELD FOR 60 DAYS AFTER SAMPLE RECEIPT, FOR SPECIAL REQUEST PLEASE CONTACT YOUR PROJECT MANAGER

White: Maxxam Yellow: Client

Maxxam Analytics International Corporation o/a Maxxam Analytics
4000 19th Street NE, Calgary, Alberta Canada T2E 6P8 Tel: (403) 291-3077, Fax: (403) 735-2240, Toll free: (800) 386-7247

CHAIN OF CUSTODY RECORD

INVOICE INFORMATION:		REPORT INFORMATION (if differs from invoice):		PROJECT INFORMATION:		Laboratory Use Only
Company Name:	# 10988 ARCADIS Canada Inc.	Company Name:	Arcadis Canada Inc	Quotation #:	B80947 (2018 prices-Easten Quote B60371)	MAXXAM JOB #:
Contact Name:	Invoices Attention	Contact Name:	Ryan Fletcher/Troy Austrins	P.O. #:		B871860
Address:	1050 Morrison Drive, Suite 201	Address:	1050 Morrison Drive, Suite 201	Project #:	102012-000	PROJECT MANAGER:
	Ottawa, Ontario		Ottawa, On	Scenario:		
Phone:	613-721-0555 Fax:	Phone:	613-721-0555	Site Location:	PIN-2	Parminder Virk
Email:	invoicesottawa@arcadis.com, barb.adelman@arcadis.com	Email:	ryan.fletcher@arcadis.com/Troy.austrins@arcadis.com	Sampled By:	Ryan Fletcher	

SPECIAL INSTRUCTIONS:

Metals: only report for As, Cd, Cr, Co, Cu, Pb, Ni, Zinc

PHCs: Only report for F1-F4 (i.e., no BTEX)

Groundwater: Metals not preserved and not field filtered. Analyse for TOTAL metals only. (do not filter or perserve in lab).

Special MDLs are required. Contact Parminder Virk if there are any questions regarding MDLs.

SAMPLES MUST BE KEPT COOL (< 10 °C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

ANALYSIS REQUESTED

	Sample Indentification	Date Sampled & Time Sampled	Matrix	F1-F4 (No BTEX)	Total As, Cd, Cr, Co, Cu, Pb, Ni, Zinc	PCB	# of Containers	Comments
1	MW-07A	Aug 18/18 1200	Soil	X	X	X	5	Sample Reception: Please notify the lab for required RDLs Refer to the attached document for required RDL.
2	MW-07B	Aug 18/18 1200	↓	X	X	X	5	Please email the lab to not filter or preserve metals bottles
3	MW-08A	Aug 18/18 1330	↓	X	X	X	5	
4	MW-08B	Aug 18/18 1330	↓	X	X	X	5	
5								
6								
7								
8								
9								
10								
11								
12								

RECEIVED IN YELLOWKNIFE
By: S. Jeffery
2018 -08- 21 10:00
Temp: See temp Record

TURNAROUND TIME (TAT) REQUIRED:

PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS

Regular (Standard) TAT: ☒

Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for some tests are > 5 days - contact your Project Manager for details.

Rush TAT

Date Required: _____

*RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time:	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time:	Laboratory Use Only
Ryan Fletcher	Aug 21/18	8:00	DANIELBOARD	20180822	10:15	Temperature of samples on receipt (°C): 3°C 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 RESULTS IN ANALYICAL TAT DELAYS
** ALL SAMPLES ARE HELD FOR 60 DAYS AFTER SAMPLE RECEIPT, FOR SPECIAL REQUEST PLEASE CONTACT YOUR PROJECT MANAGER

White: Maxxam Yellow: Client

Maxxam Analytics International Corporation o/a Maxxam Analytics
4000 19th Street NE, Calgary, Alberta Canada T2E 6P8 Tel: (403) 291-3077, Fax: (403) 735-2240, Toll free: (800) 386-7247

CHAIN OF CUSTODY RECORD

INVOICE INFORMATION:		REPORT INFORMATION (if differs from invoice):		PROJECT INFORMATION:		Laboratory Use Only
Company Name:	# 10988 ARCADIS Canada Inc.	Company Name:	Arcadis Canada Inc	Quotation #:	B80947 (2018 prices-Easten Quote B60371)	MAXXAM JOB #: B871860
Contact Name:	Invoices Attention	Contact Name:	Ryan Fletcher/Troy Austrins	P.O. #:		
Address:	1050 Morrison Drive, Suite 201	Address:	1050 Morrison Drive, Suite 201	Project #:	102012-000	PROJECT MANAGER:
	Ottawa, Ontario		Ottawa, On	Scenario:		Parminder Virk
Phone:	613-721-0555 Fax:	Phone:	613-721-0555	Site Location:	PIN-2	
Email:	invoicesottawa@arcadis.com, barb.adelman@arcadis.com	Email:	ryan.fletcher@arcadis.com/Troy.austrins@arcadis.com	Sampled By:	Ryan Fletcher	

SPECIAL INSTRUCTIONS:

Metals: olny report for As, Cd, Cr, Co, Cu, Pb, Ni, Zinc

PHCs: Only report for F1-F4 (i.e., no BTEX)

Groundwater: Metals not preserved and not field filtered. Analyse for TOTAL metals only. (do not filter or perserve in lab).

Special MDLs are required. Contact Parminder Virk if there are any questions regarding MDLs.

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: ☒

Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for some tests are > 5 days - contact your Project Manager for details.

Rush TAT

Date Required: _____

	Sample Indentification	Date Sampled &Time Sampled	Matrix	F1-F4 (No BTEX)	Total As, Cd, Cr, Co, Cu, Pb, Ni, Zinc	PCB	# of Containers	Comments
1	Dup 1	Aug 17/18	Soil	X	X	X	5	Sample Reception: Please notify the lab for required RDLs Refer to the attached document for required RDL.
2	Dup 2	Aug 18/18		X	X	X	5	Please email the lab to not filter or preserve metals bottles
3	Dup 3	Aug 18/18		X	X	X	5	
4	Dup 4	Aug 18/18		X	X	X	5	
5	Dup 5	Aug 19/18		X	X	X	5	
6	Dup 6	Aug 20/18		X	X	X	5	
7	Dup 7	Aug 20/18		X	X	X	5	
8	Dup 8	Aug 20/18		X	X	X	5	
9								
10								
11								
12								

RECEIVED IN YELLOWKNIFE
By: Jeffery S
2018 -08- 21 16:00

Temp: See Temp Record

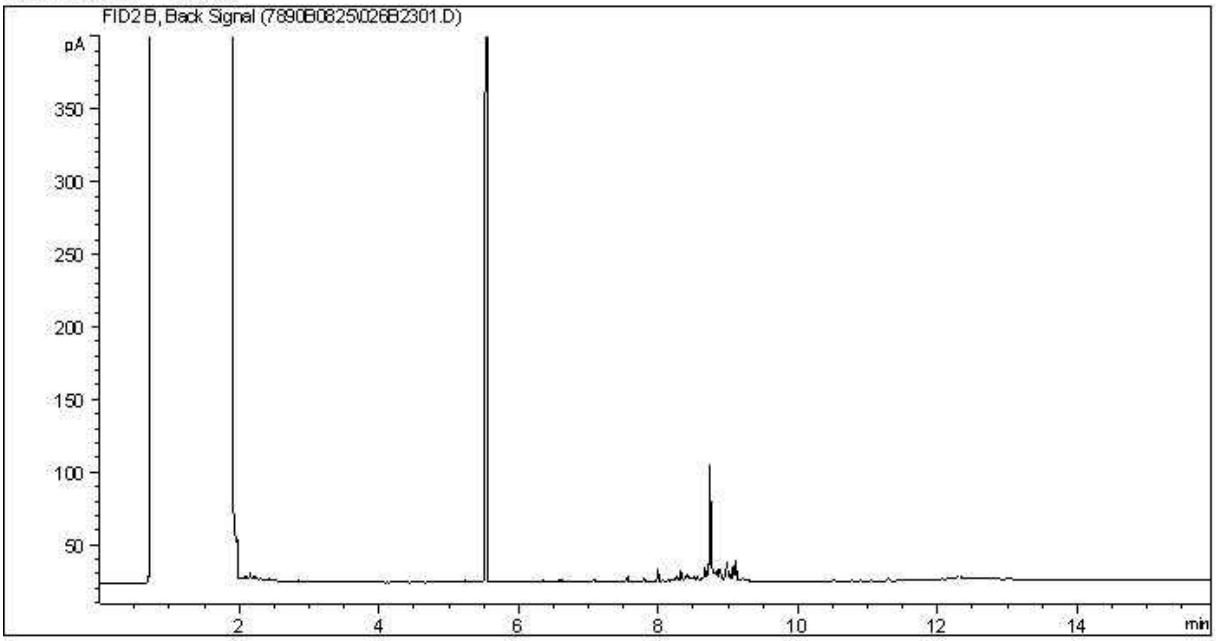
*RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time:	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time:	Laboratory Use Only: Temperature of samples on receipt (°C)	Custody Seal intact on Cooler?
Ryan Fletcher	Aug 21/18	8:00	DANIELE POIRIER	20180822	10:15	9°C ACTR	☐ Yes ☐ No

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD, AN INCOMPLETE CHAIN OF CUSTODY MAY RESULTS IN ANALYICAL TAT DELAYS
** ALL SAMPLES ARE HELD FOR 60 DAYS AFTER SAMPLE RECEIPT, FOR SPECIAL REQUEST PLEASE CONTACT YOUR PROJECT MANAGER

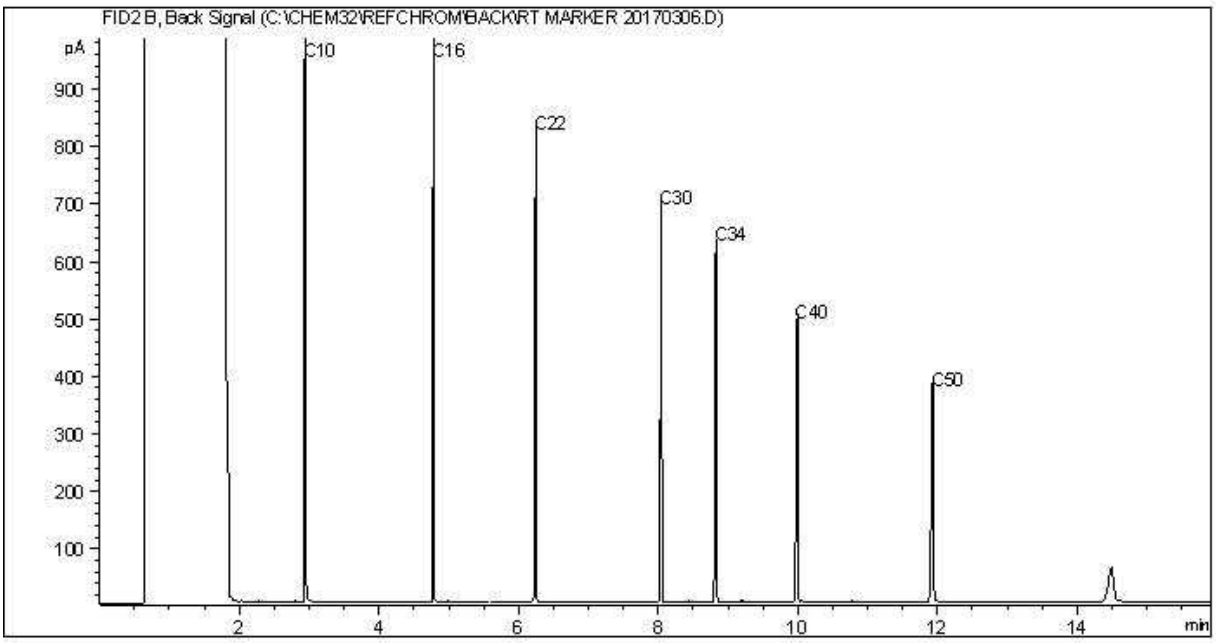
White: Maxxam Yellow: Client

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890B



Carbon Range Distribution - Reference Chromatogram



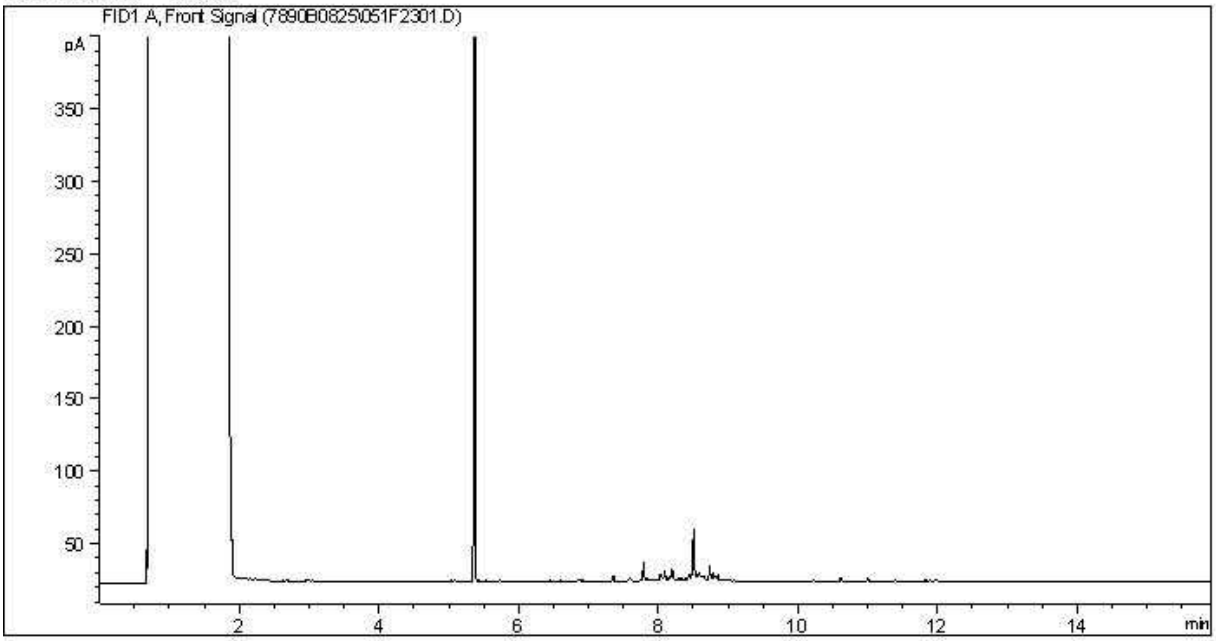
TYPICAL PRODUCT CARBON NUMBER RANGES

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

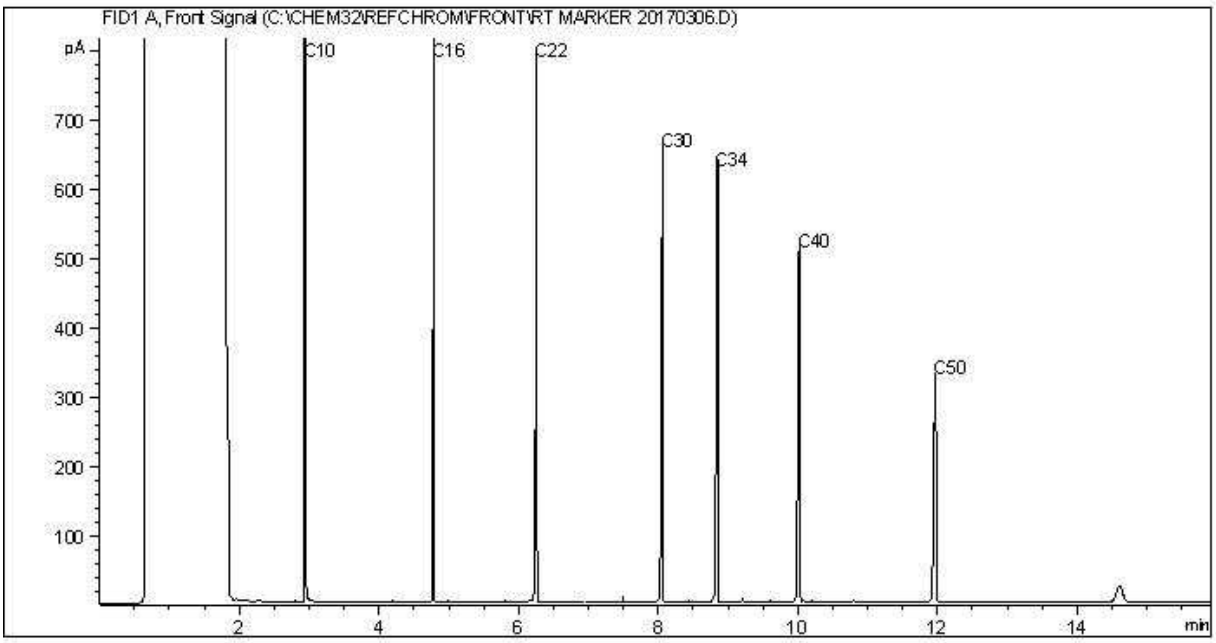
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890B



Carbon Range Distribution - Reference Chromatogram



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+

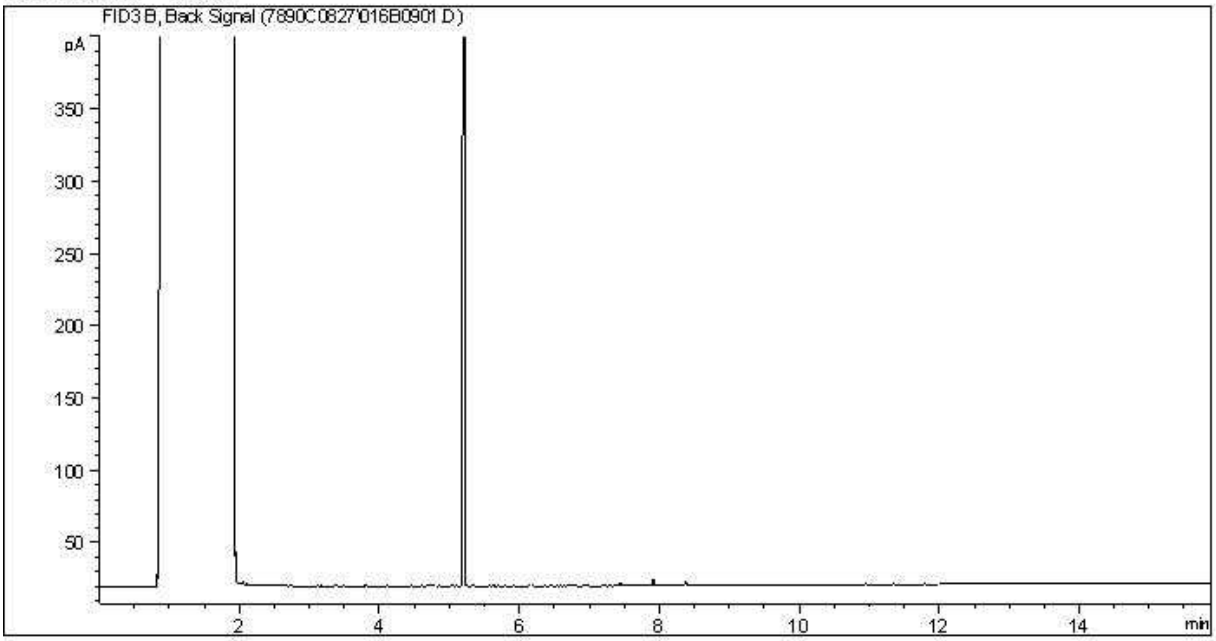
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871860
Report Date: 2018/08/30
Maxxam Sample: UD6372

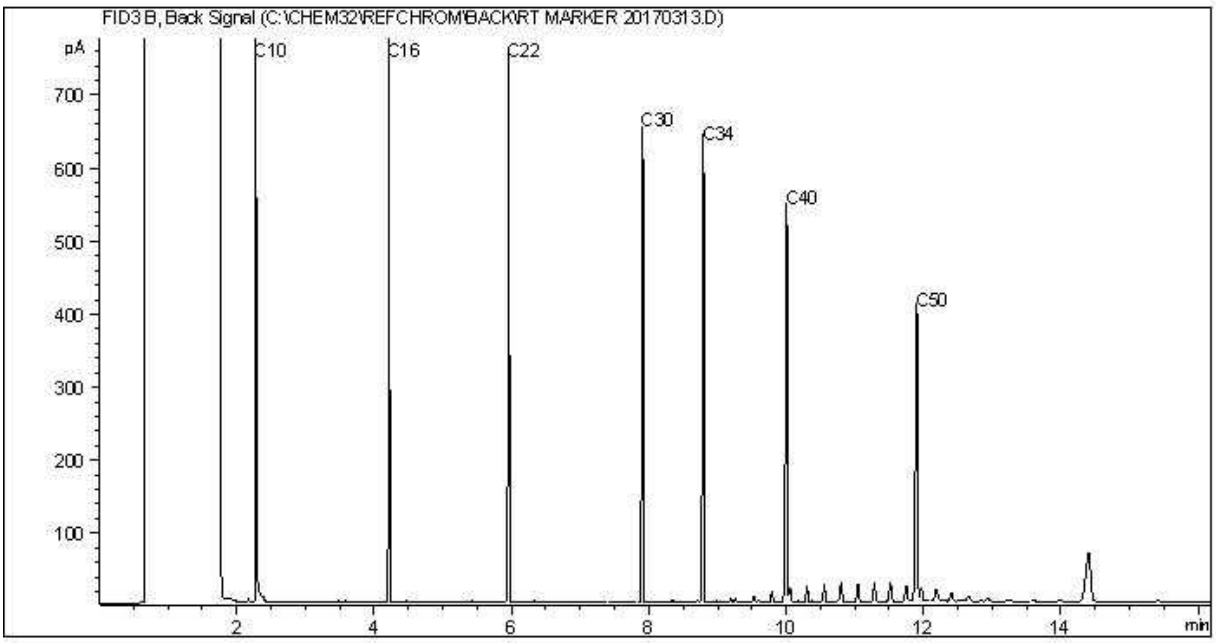
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: P2-2A

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890C



Carbon Range Distribution - Reference Chromatogram



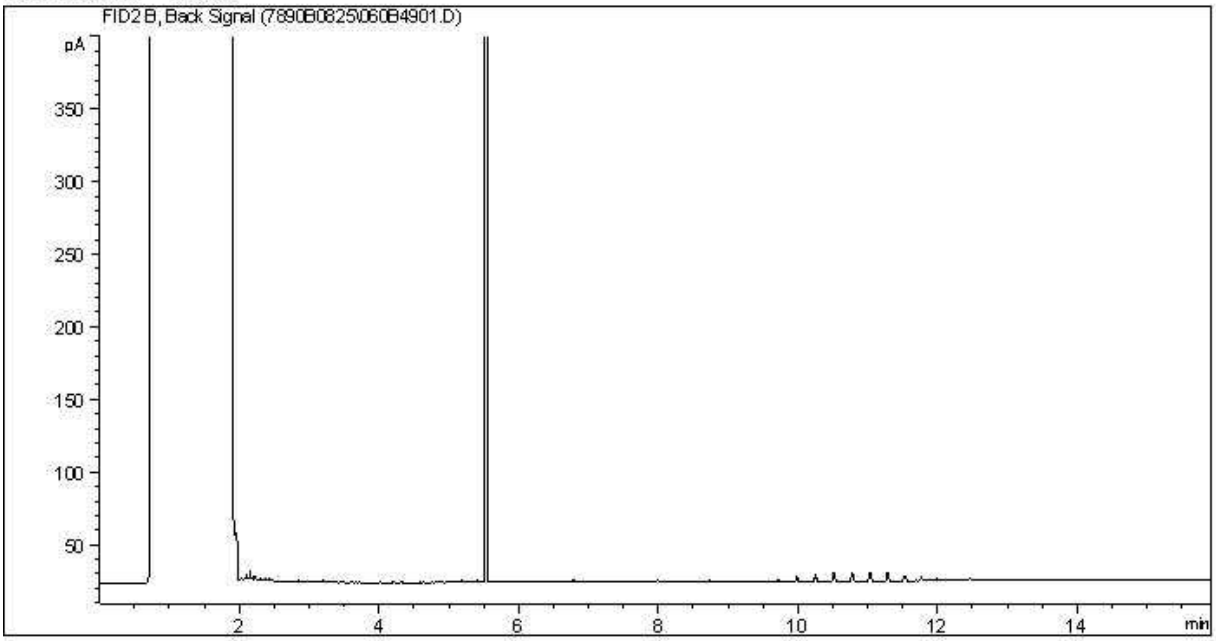
TYPICAL PRODUCT CARBON NUMBER RANGES

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

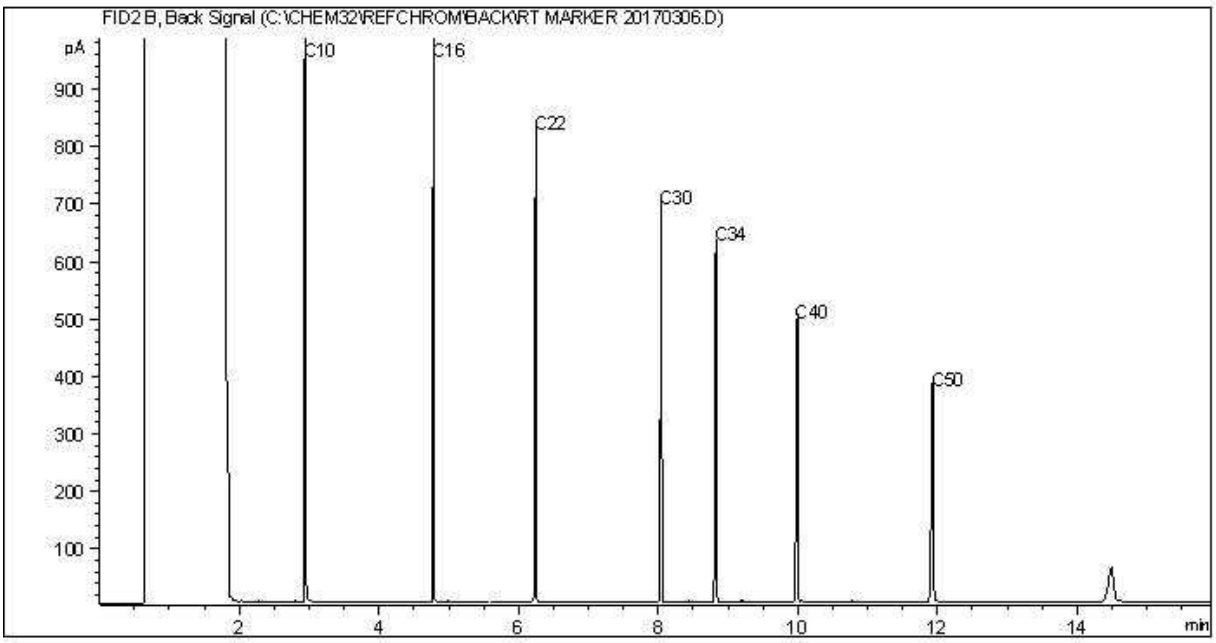
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890B



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

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

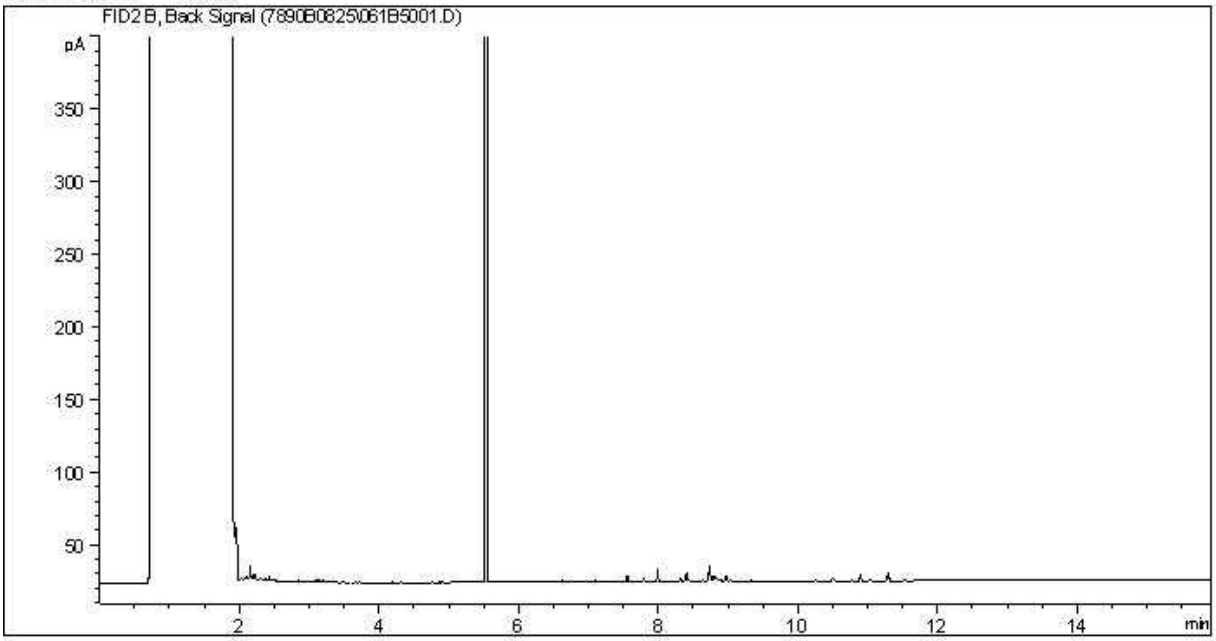
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871860
Report Date: 2018/08/30
Maxxam Sample: UD6374

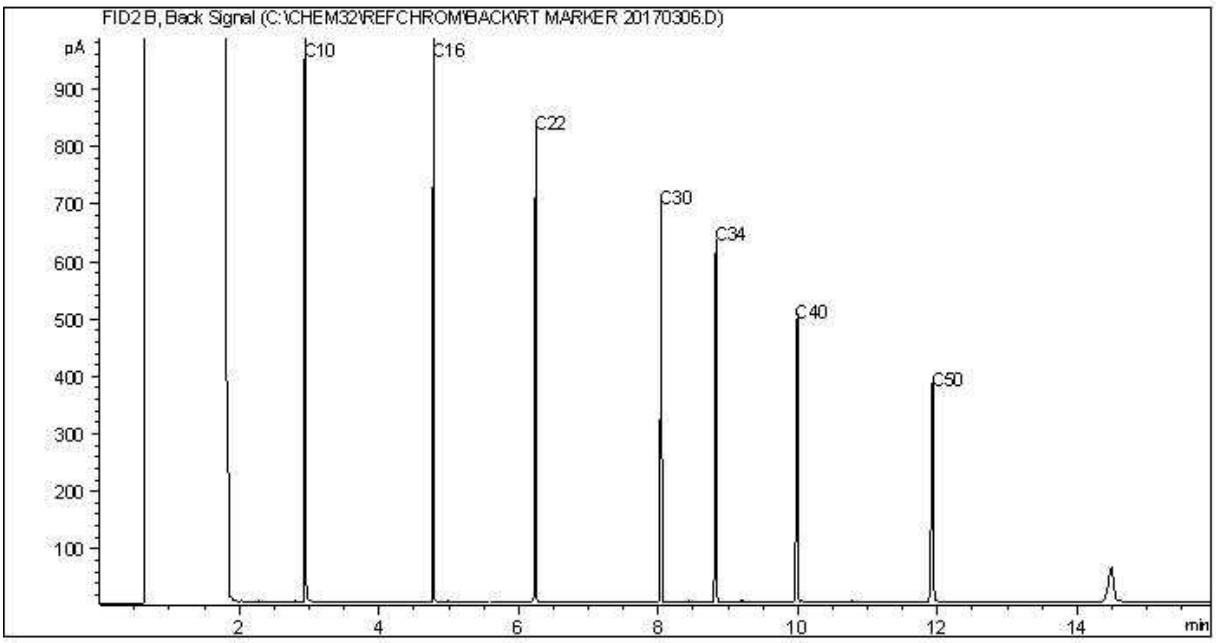
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: P2-3A

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+

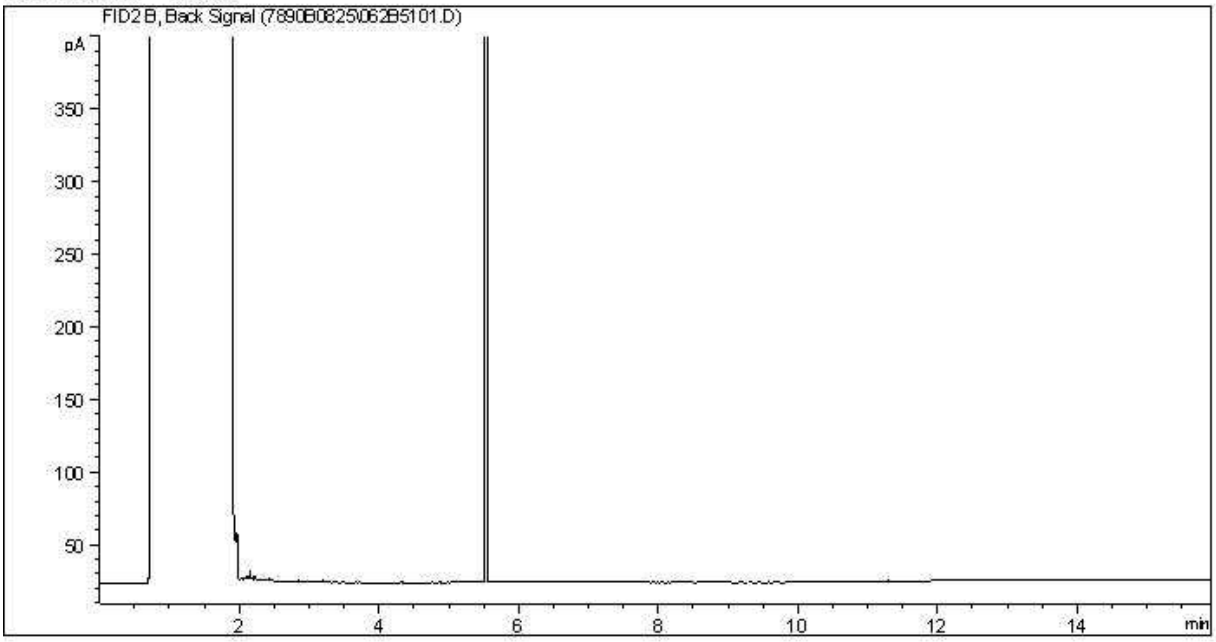
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871860
Report Date: 2018/08/30
Maxxam Sample: UD6375

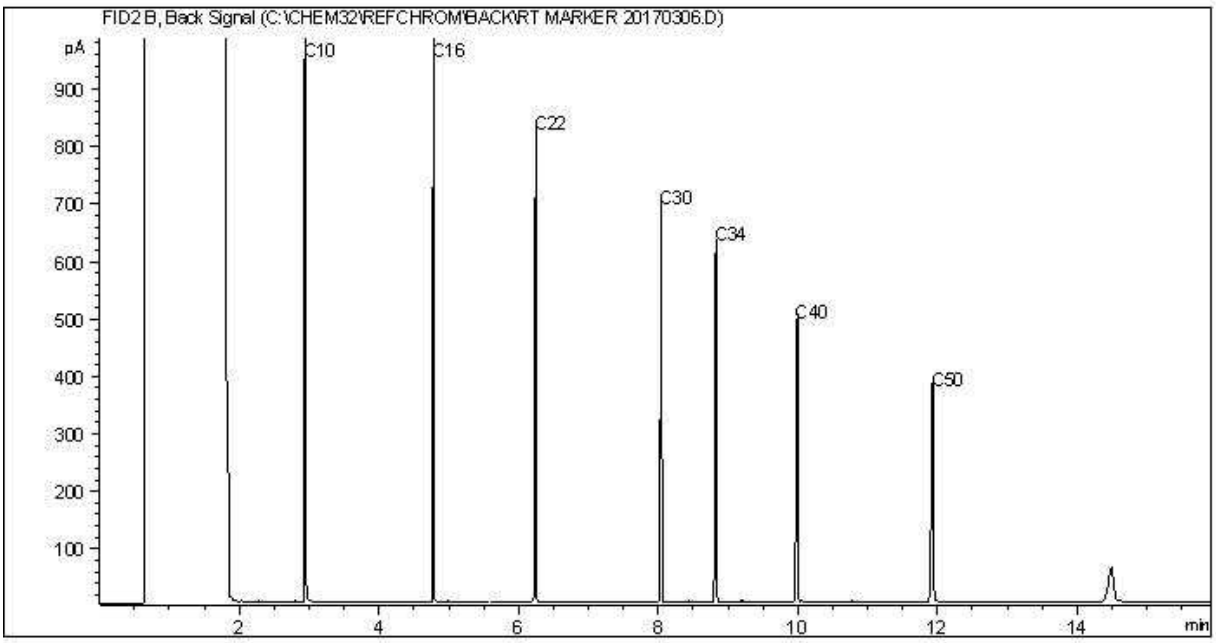
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: P2-3B

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+

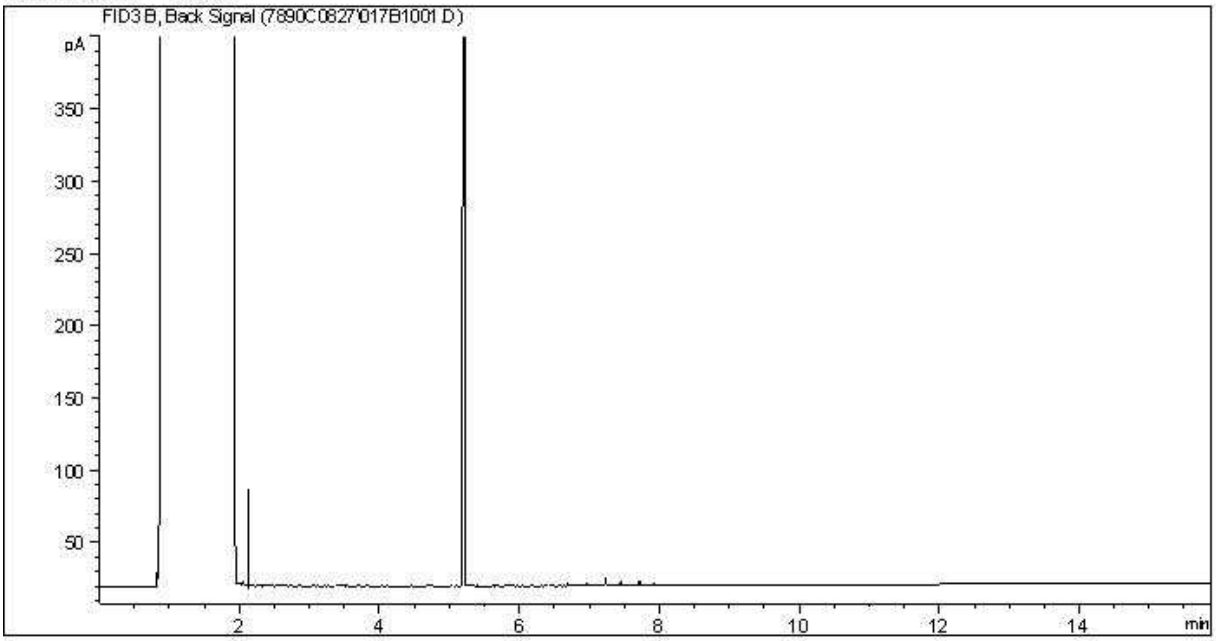
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871860
Report Date: 2018/08/30
Maxxam Sample: UD6376

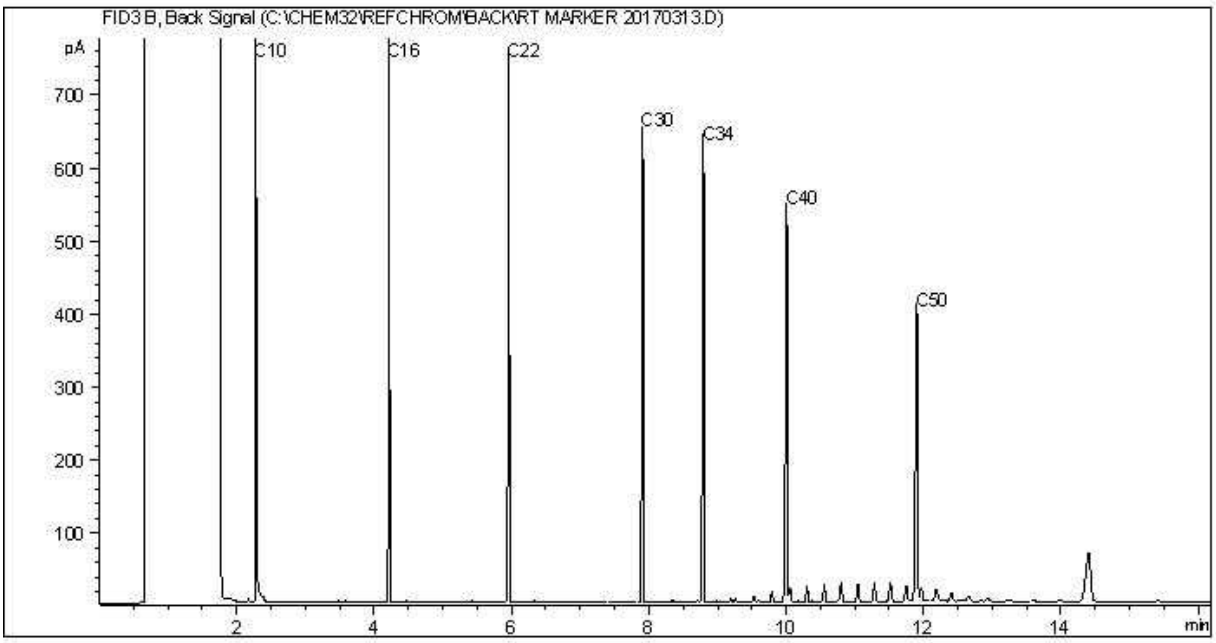
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: P2-4A

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+

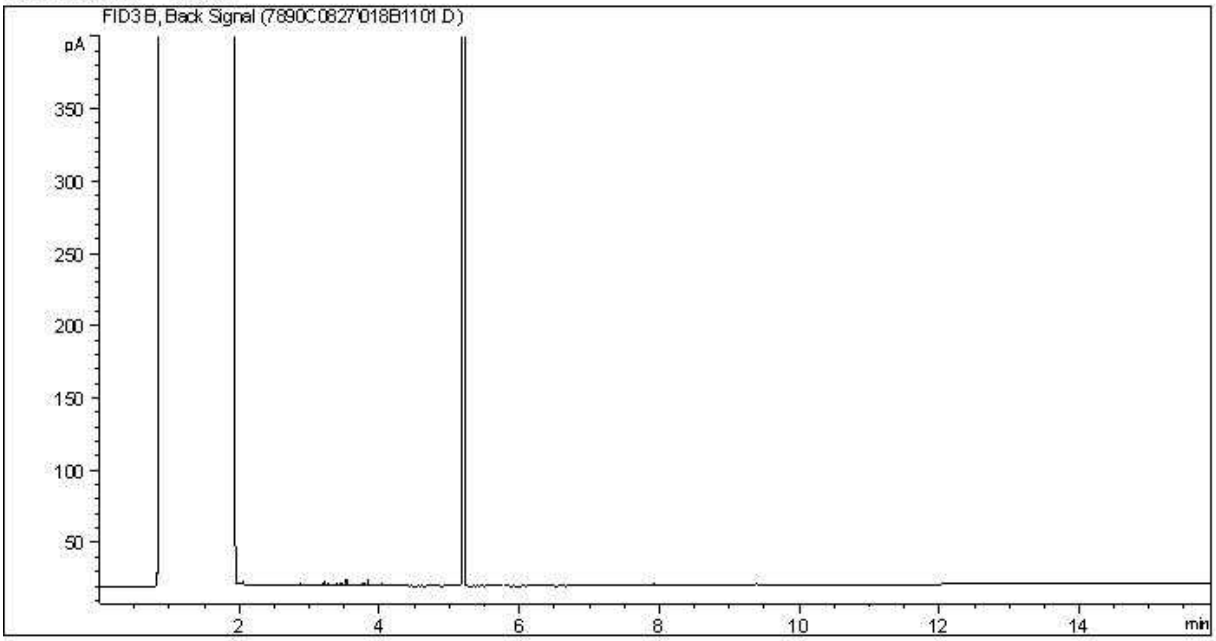
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871860
Report Date: 2018/08/30
Maxxam Sample: UD6377

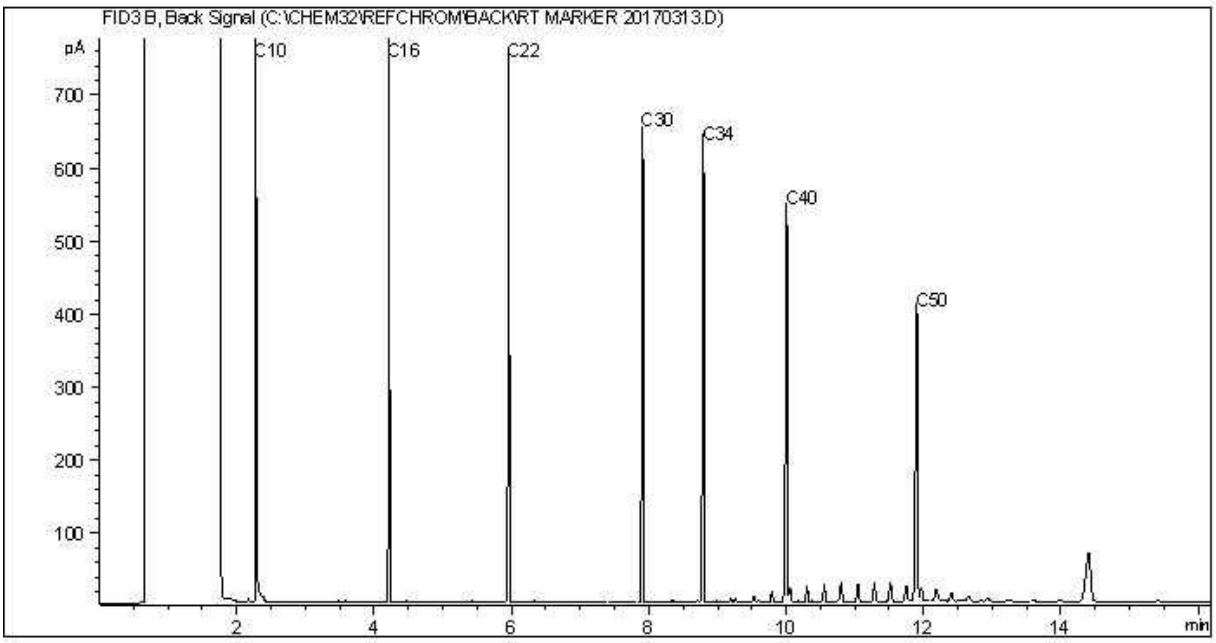
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: P2-4B

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+

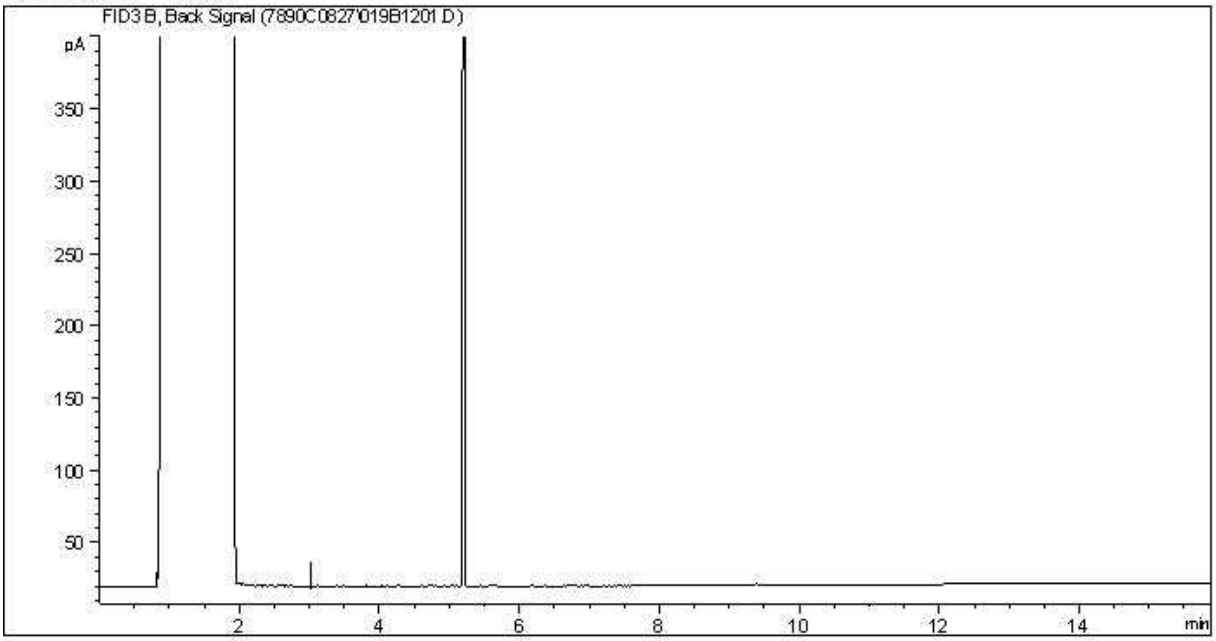
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871860
Report Date: 2018/08/30
Maxxam Sample: UD6378

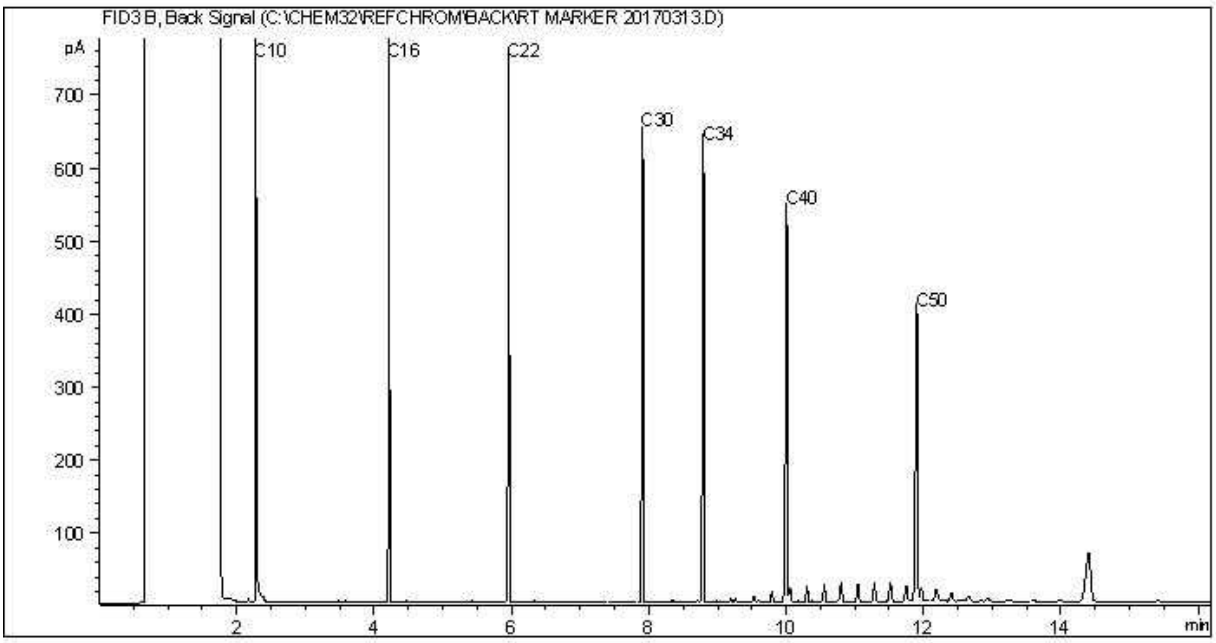
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: P2-5A

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+

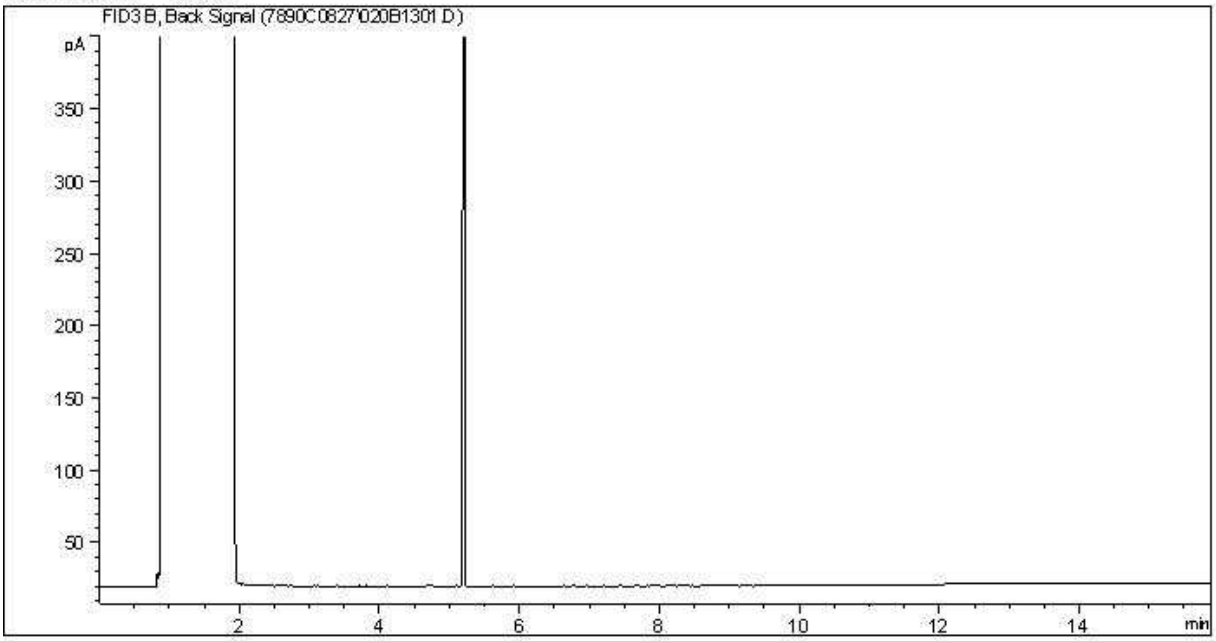
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871860
Report Date: 2018/08/30
Maxxam Sample: UD6379

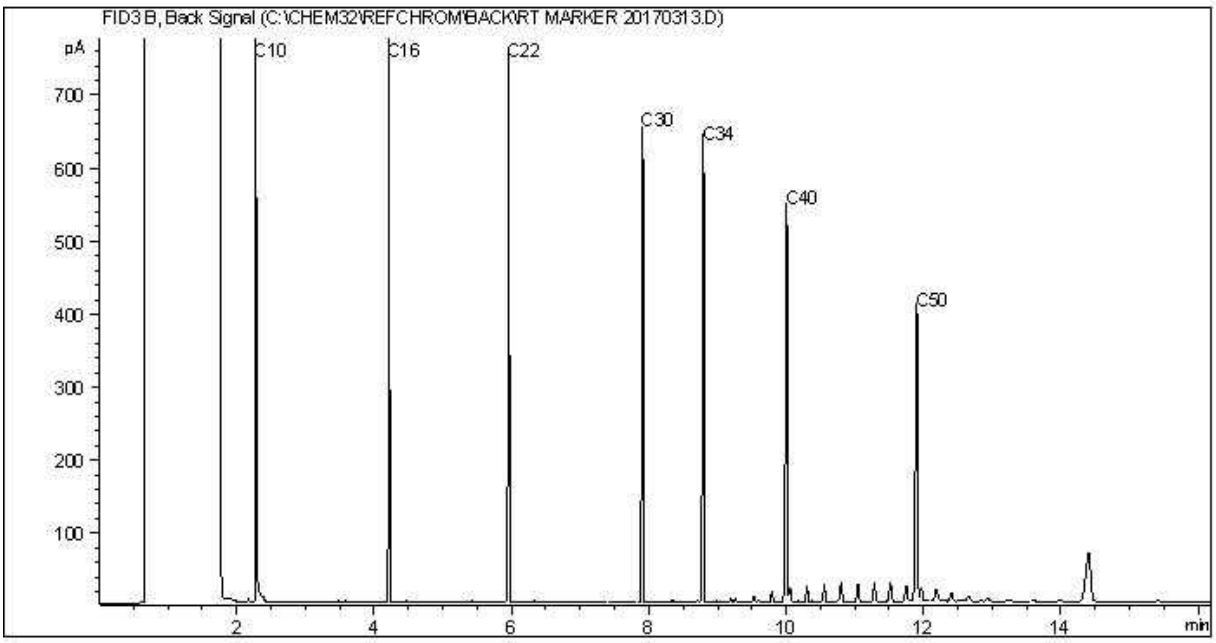
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: P2-5B

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+

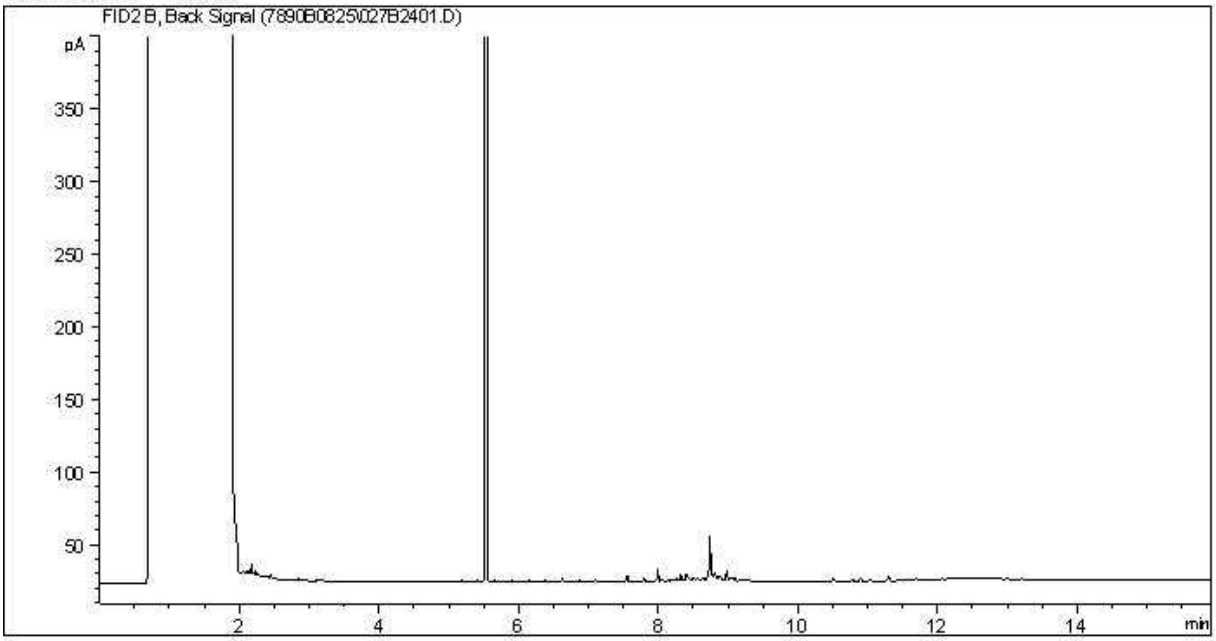
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871860
Report Date: 2018/08/30
Maxxam Sample: UD6380

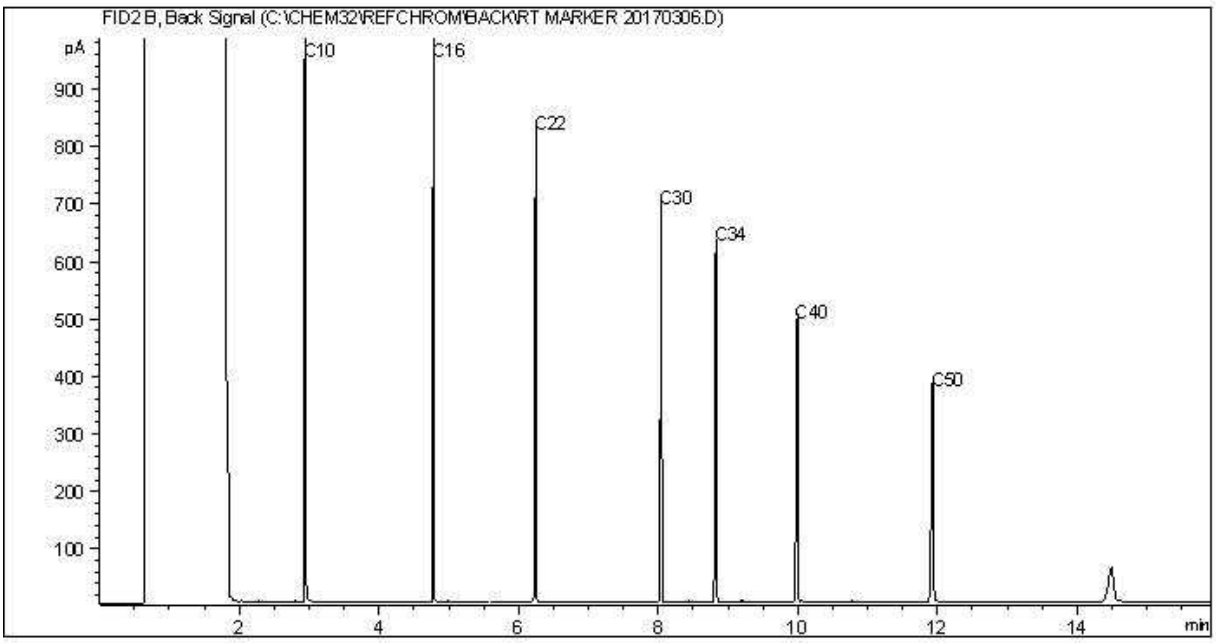
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: P2-6A

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+

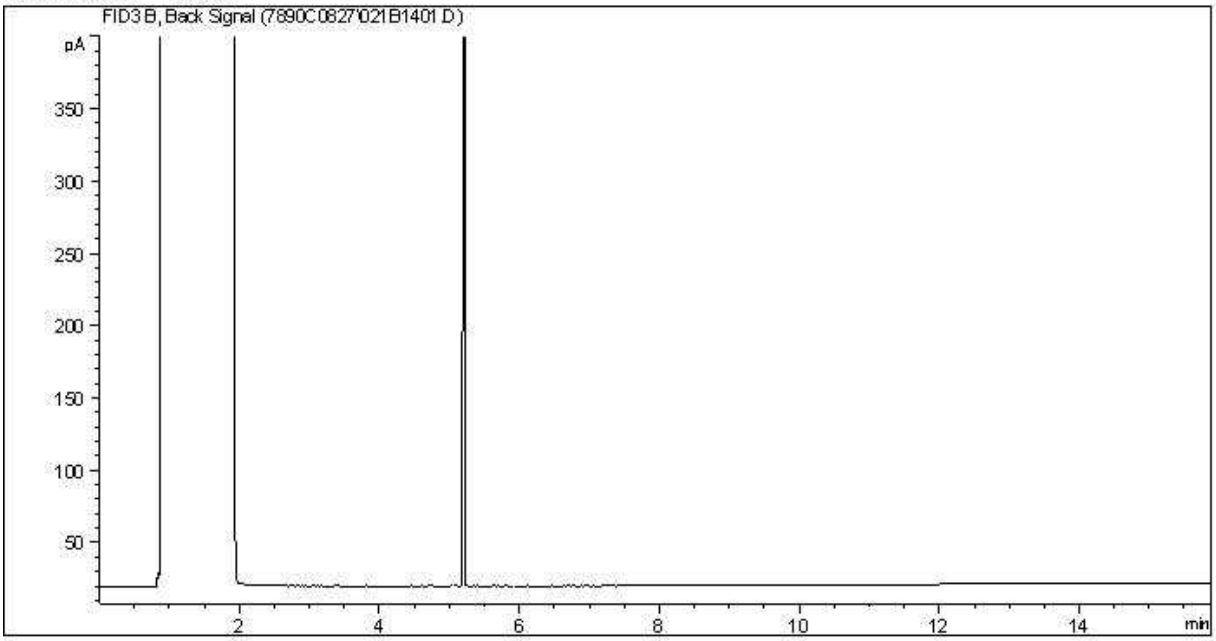
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871860
Report Date: 2018/08/30
Maxxam Sample: UD6381

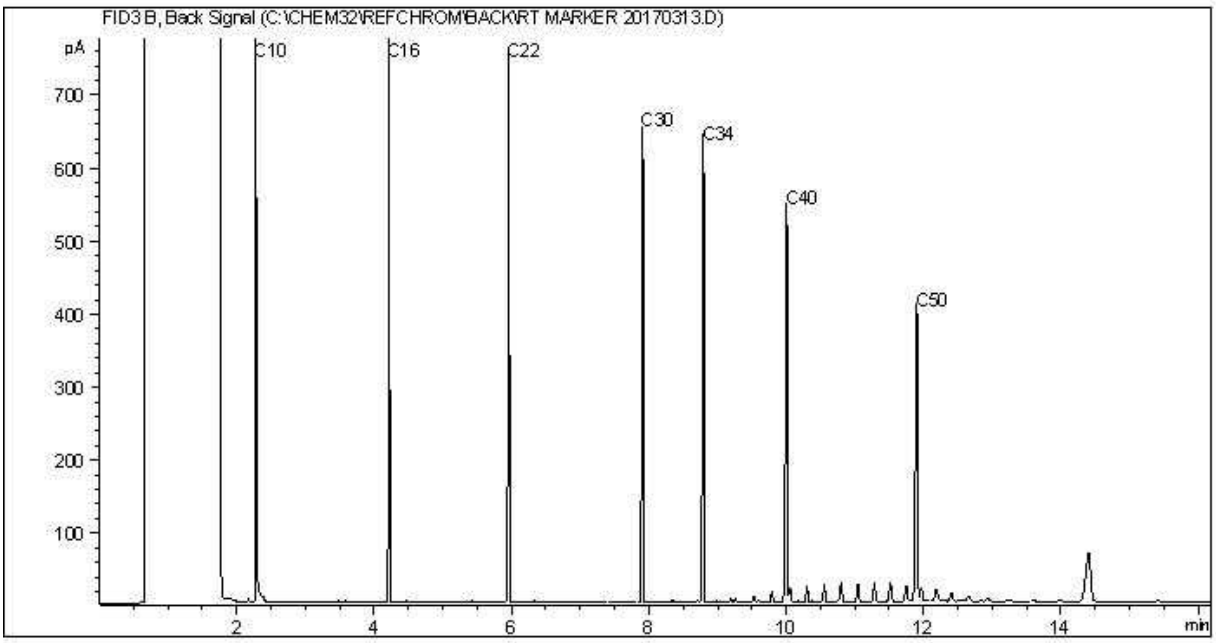
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: P2-6B

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890C



Carbon Range Distribution - Reference Chromatogram



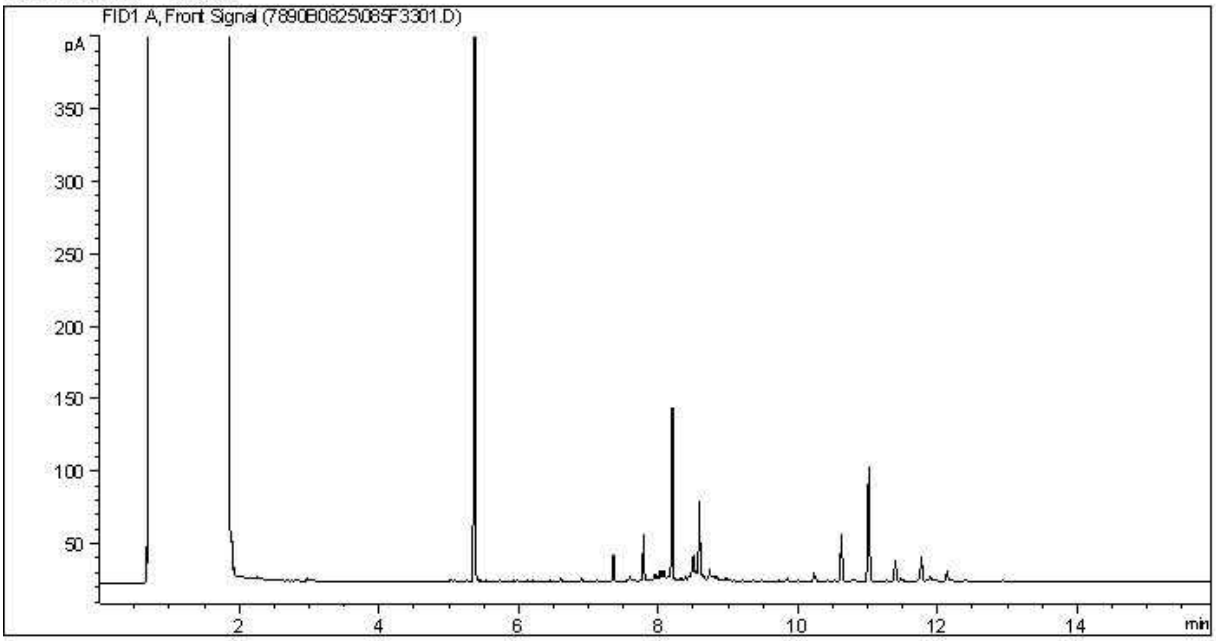
TYPICAL PRODUCT CARBON NUMBER RANGES

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

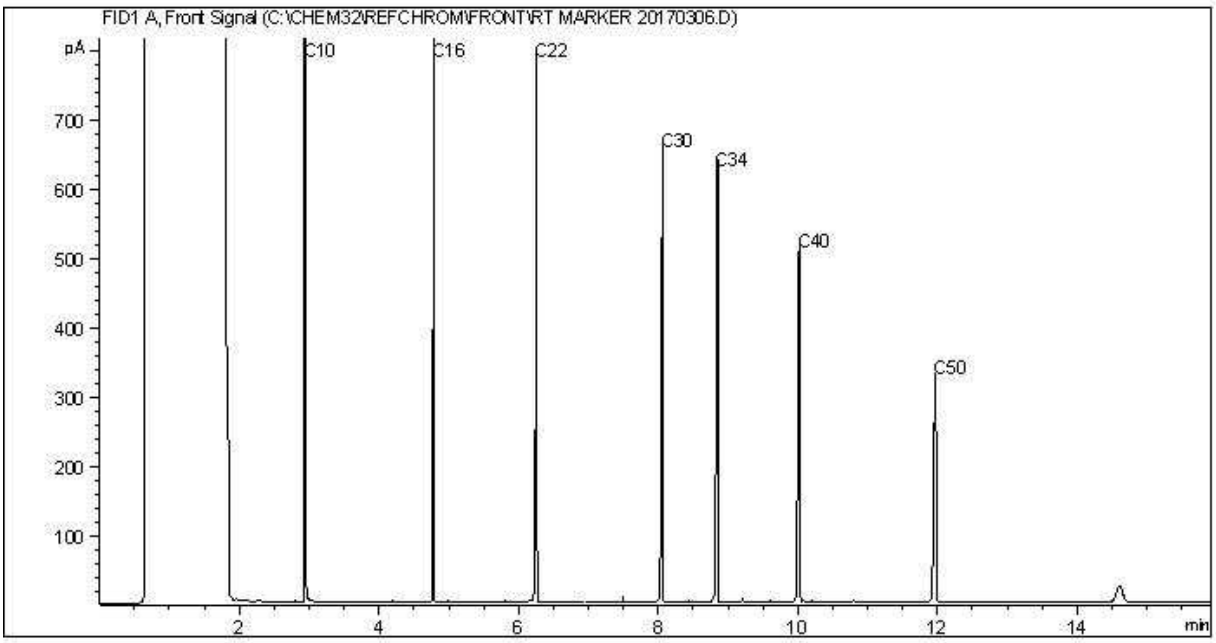
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890B



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

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

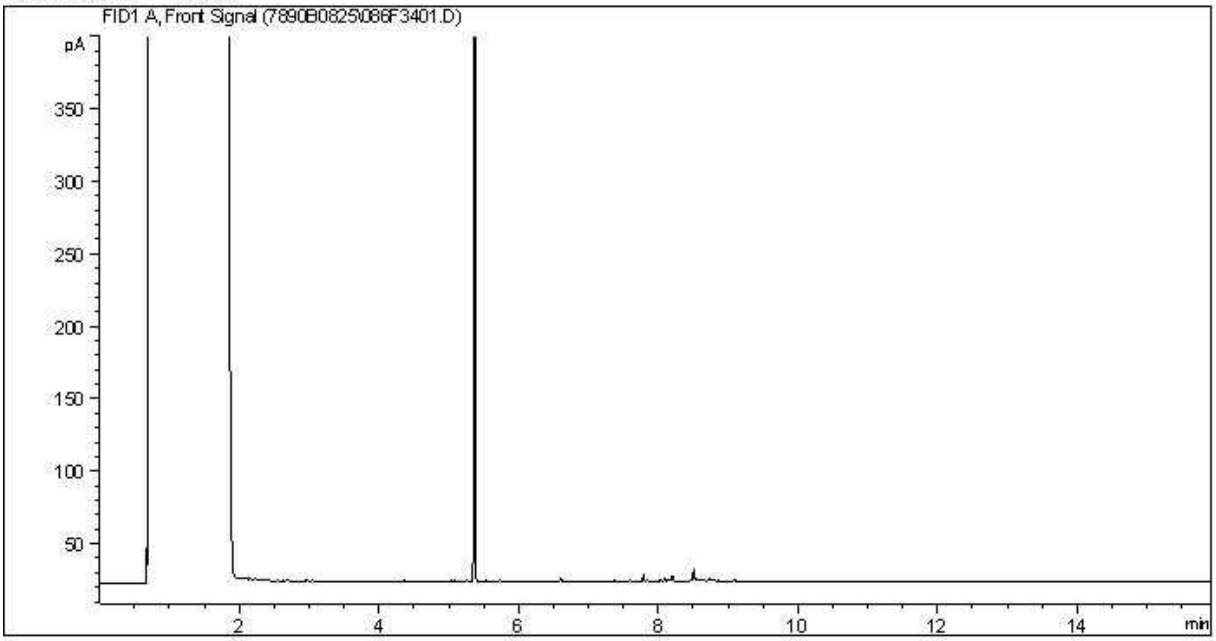
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871860
Report Date: 2018/08/30
Maxxam Sample: UD6393

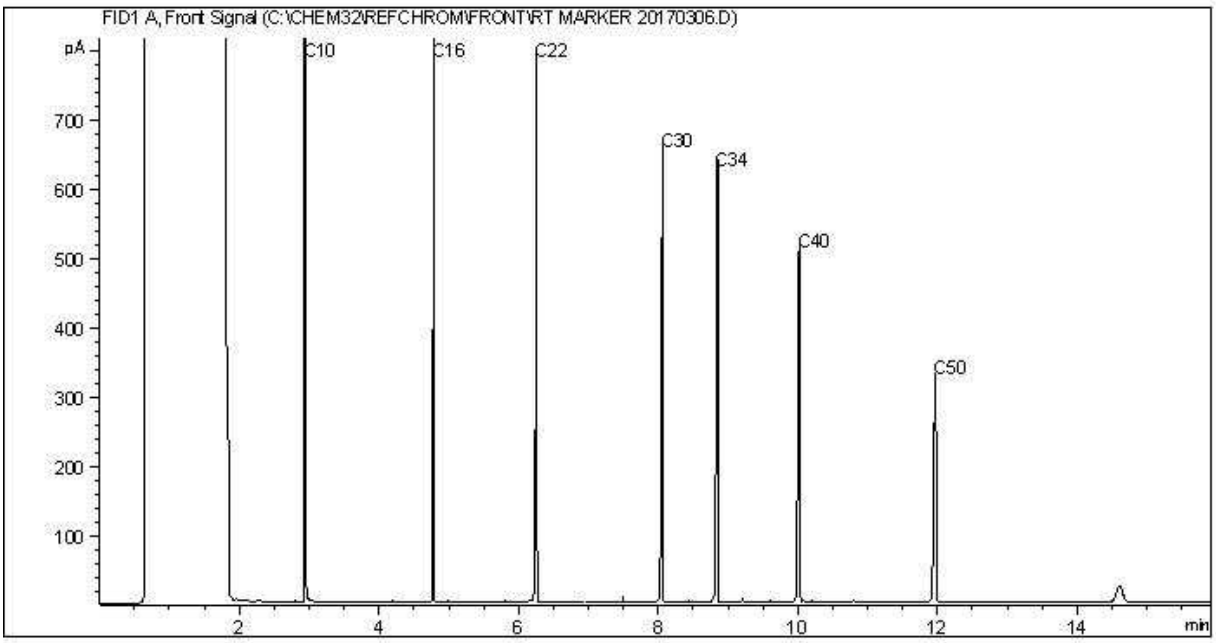
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: P2-7B

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+

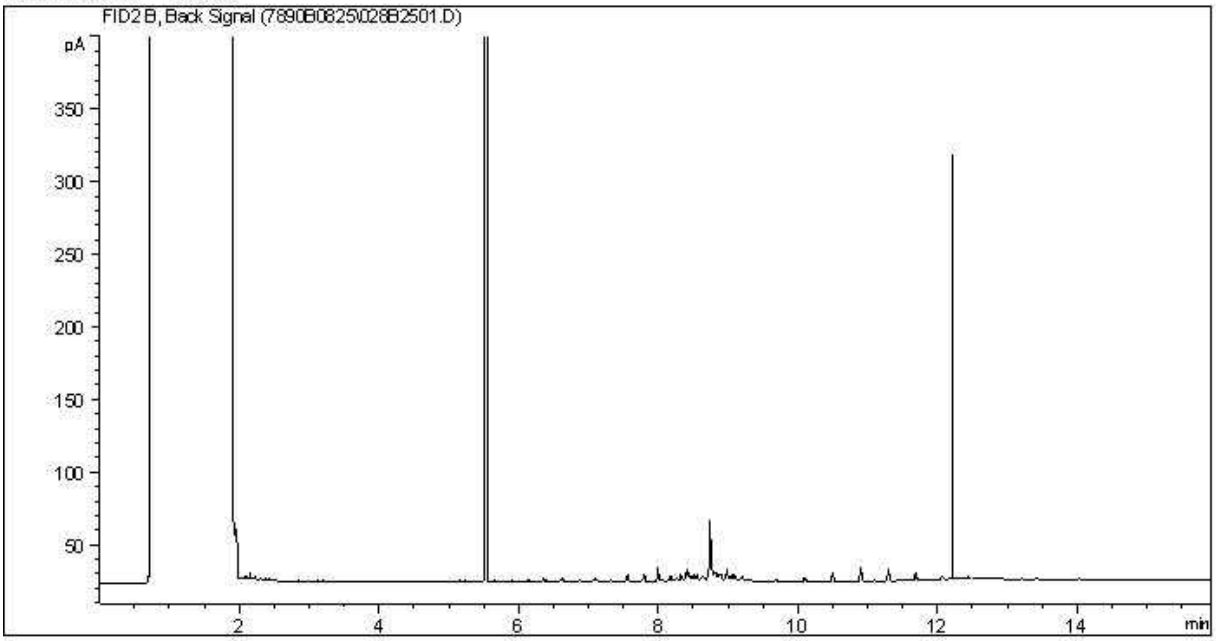
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871860
Report Date: 2018/08/30
Maxxam Sample: UD6394

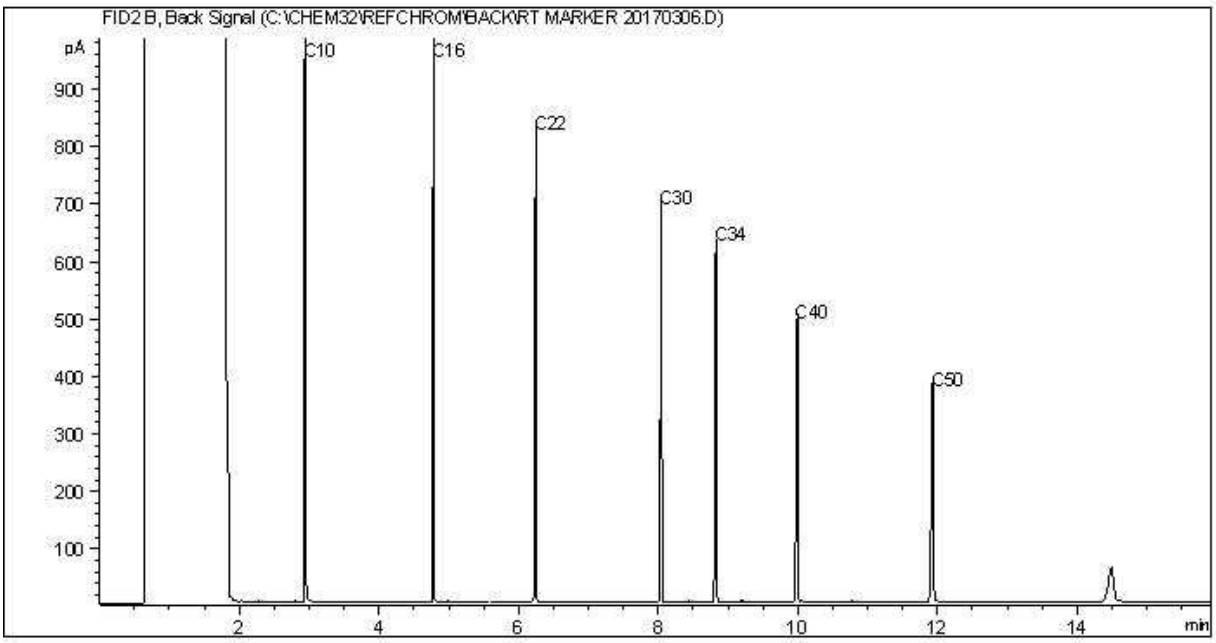
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: P2-8A

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890B



Carbon Range Distribution - Reference Chromatogram



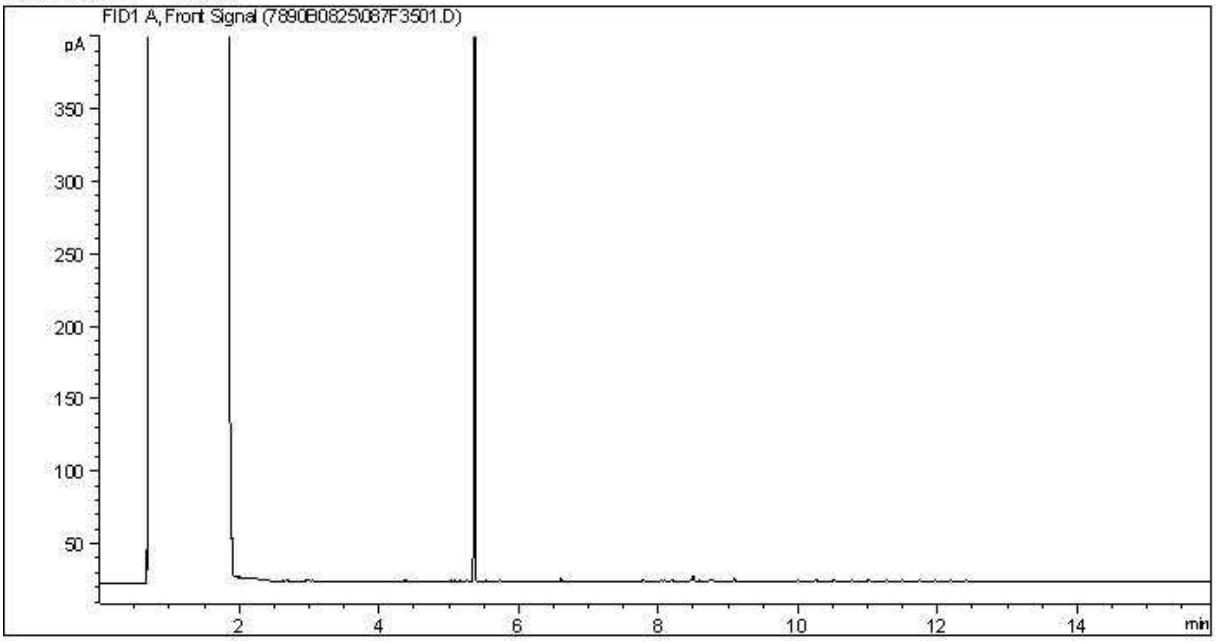
TYPICAL PRODUCT CARBON NUMBER RANGES

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

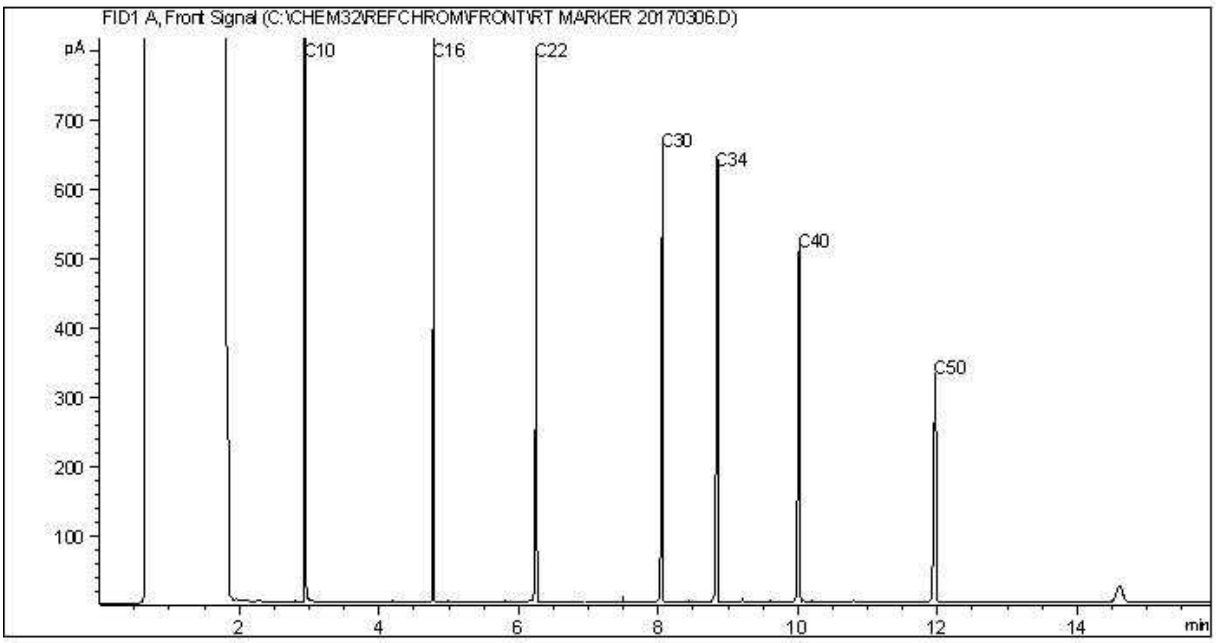
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890B



Carbon Range Distribution - Reference Chromatogram



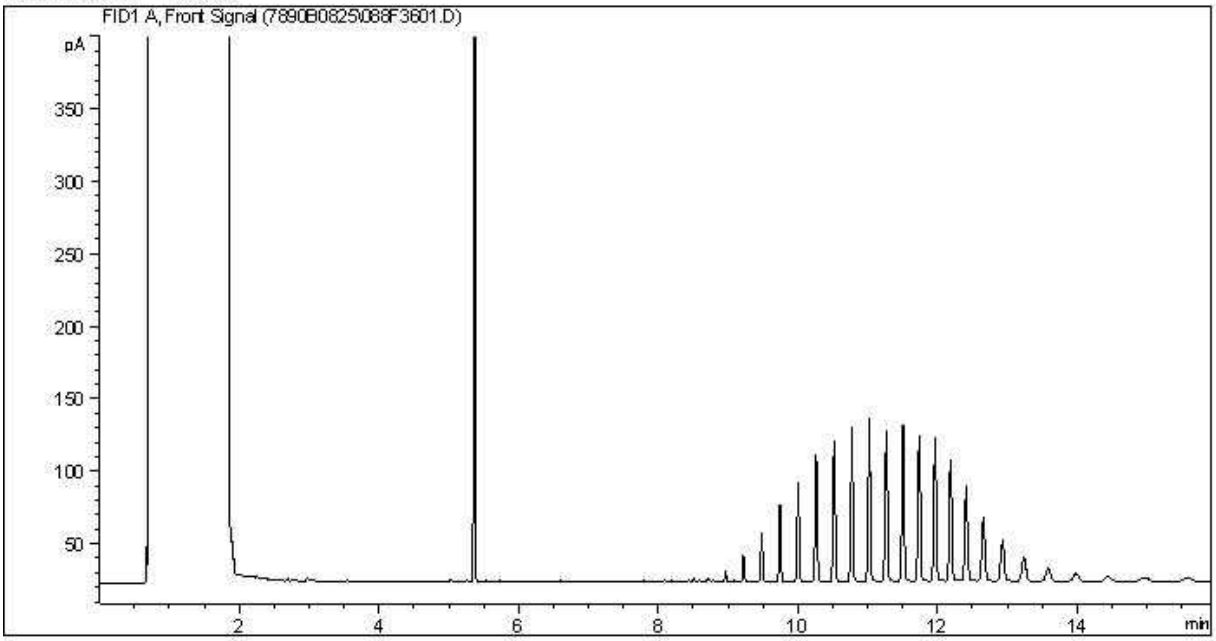
TYPICAL PRODUCT CARBON NUMBER RANGES

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

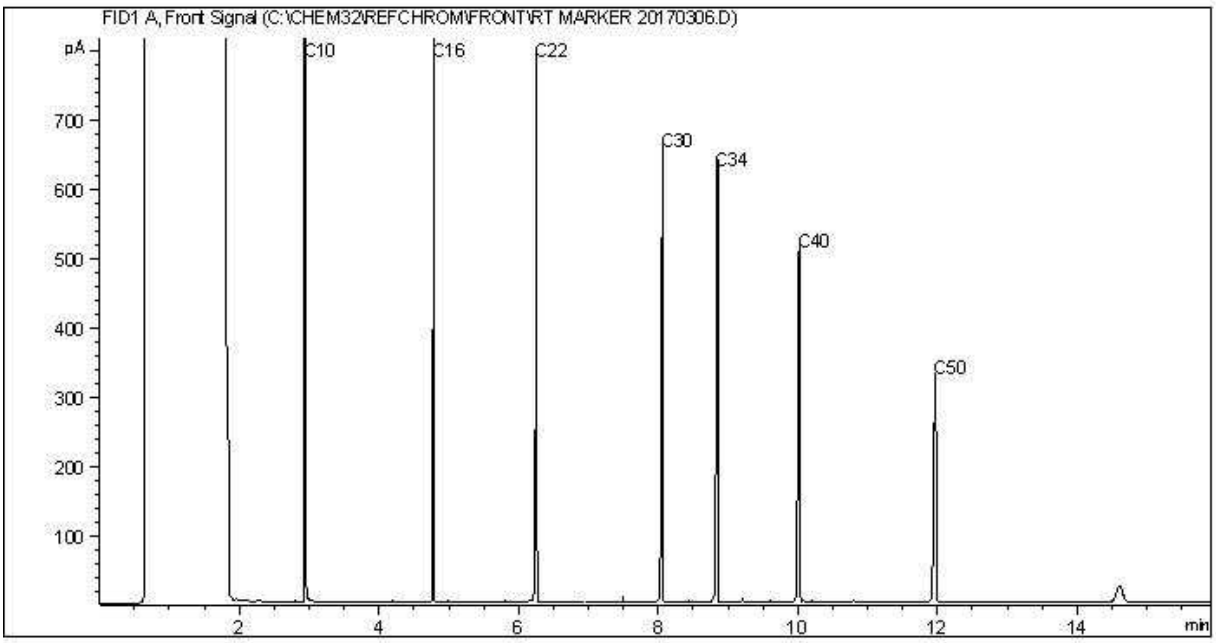
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890B



Carbon Range Distribution - Reference Chromatogram



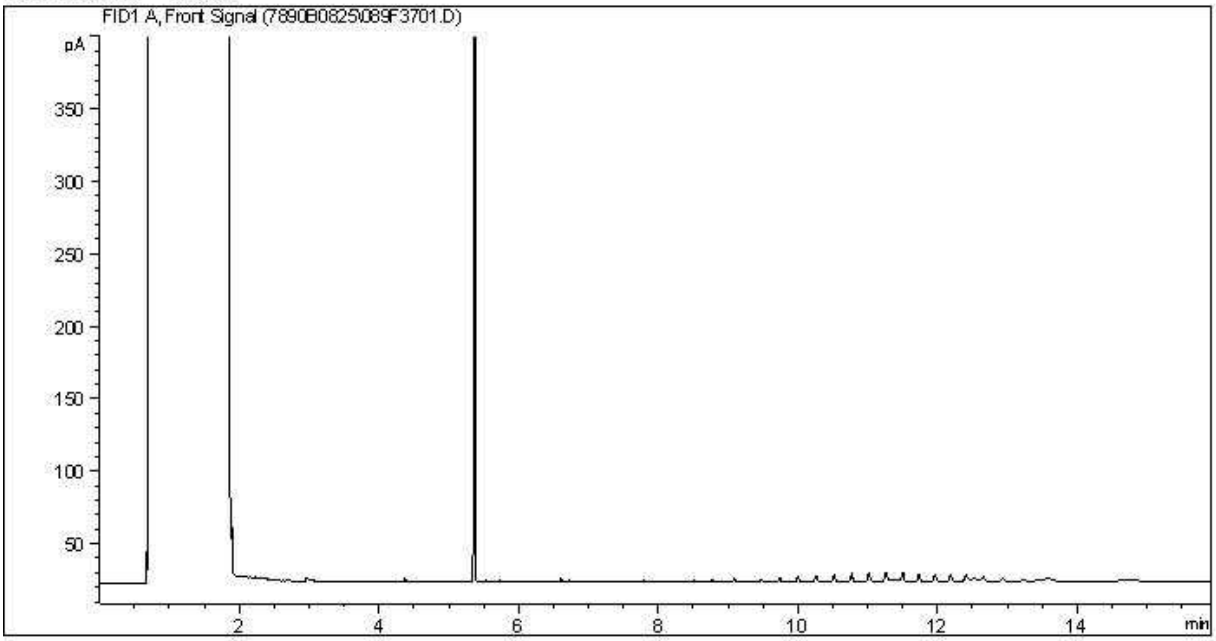
TYPICAL PRODUCT CARBON NUMBER RANGES

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

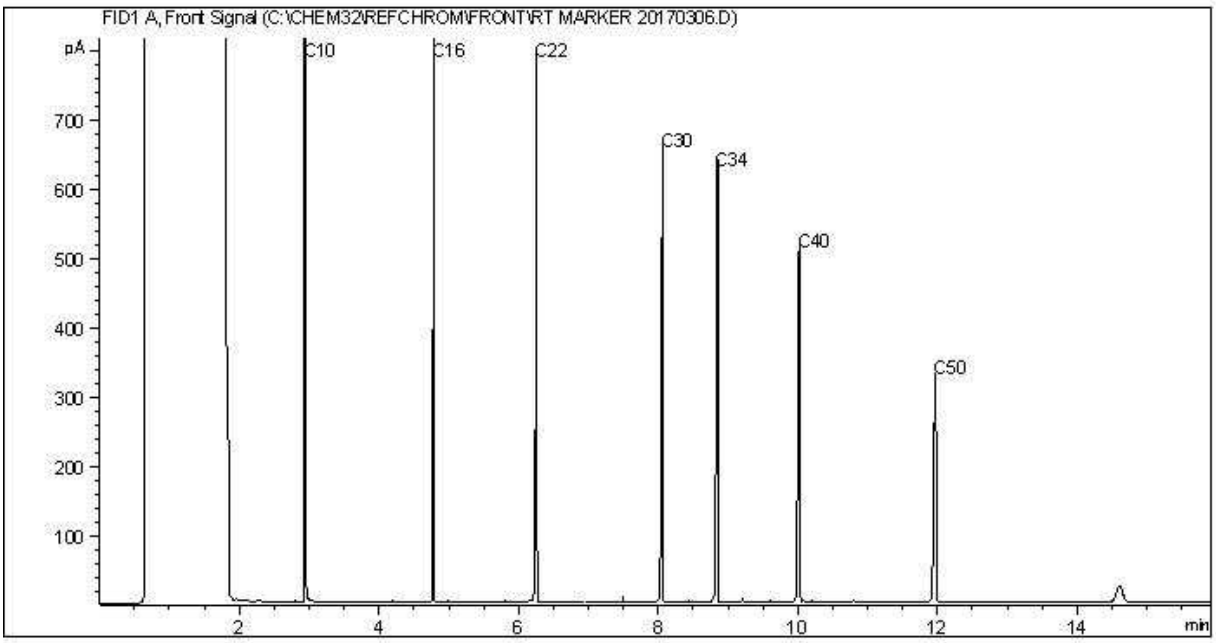
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890B



Carbon Range Distribution - Reference Chromatogram



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+

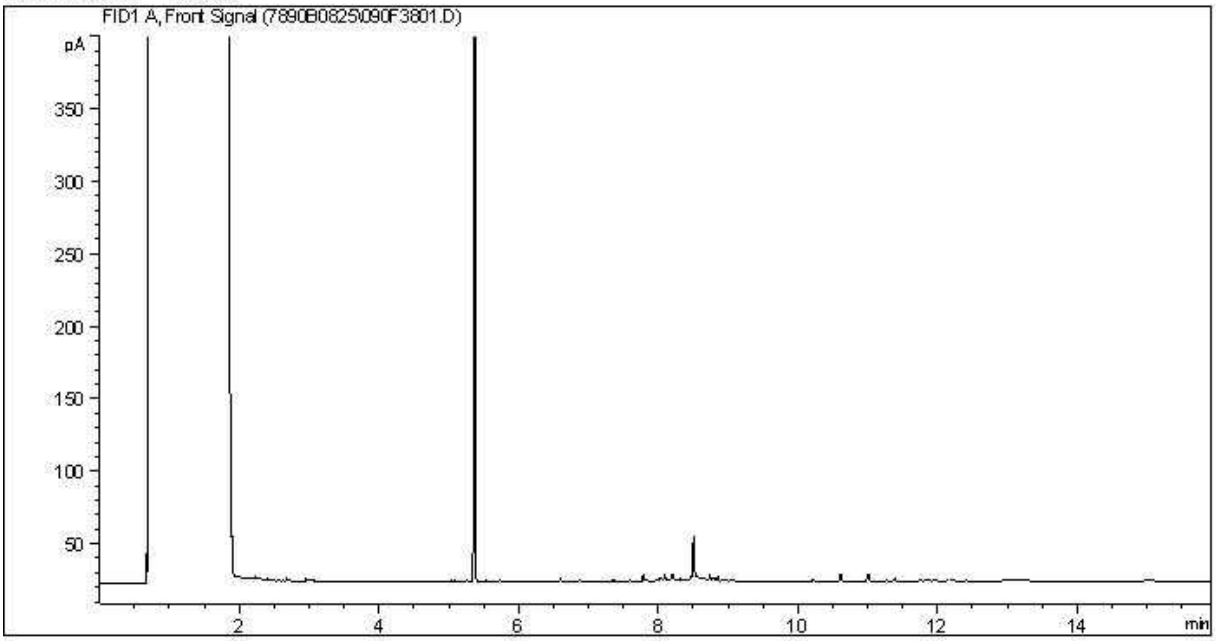
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871860
Report Date: 2018/08/30
Maxxam Sample: UD6398

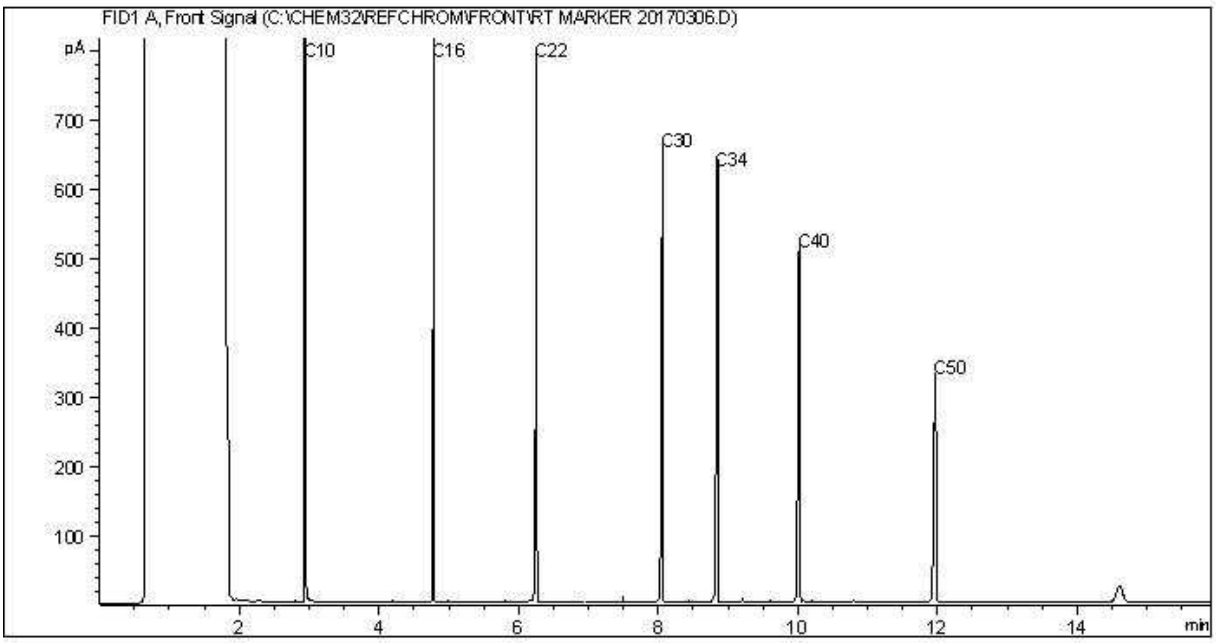
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: P2-10A

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+

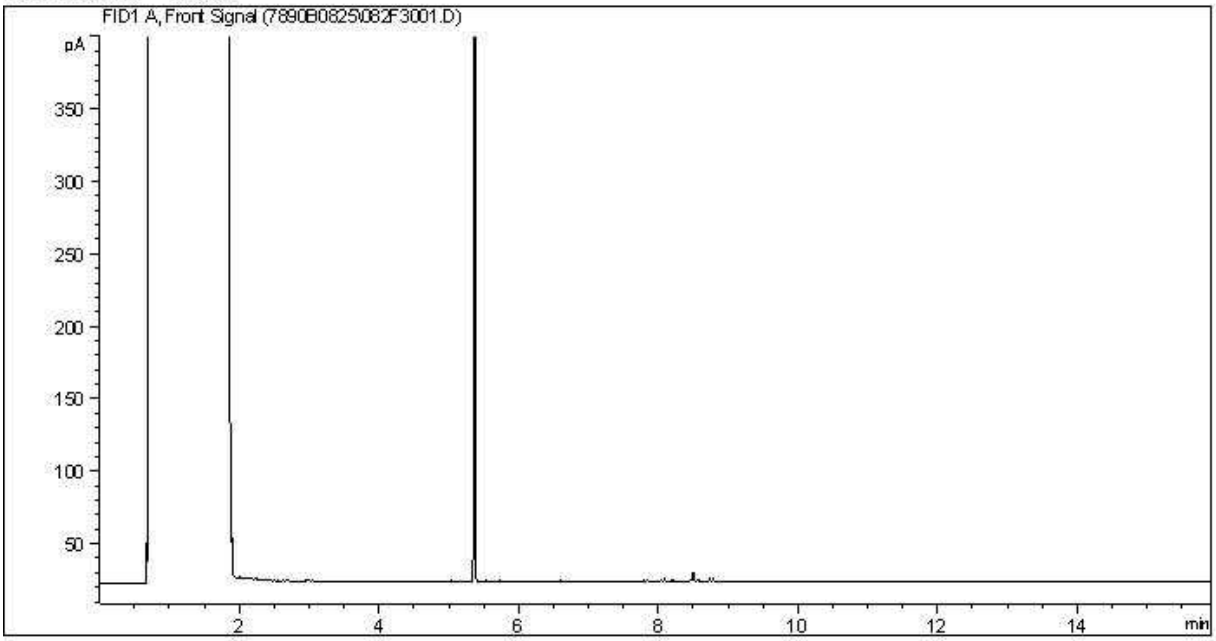
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871860
Report Date: 2018/08/30
Maxxam Sample: UD6399

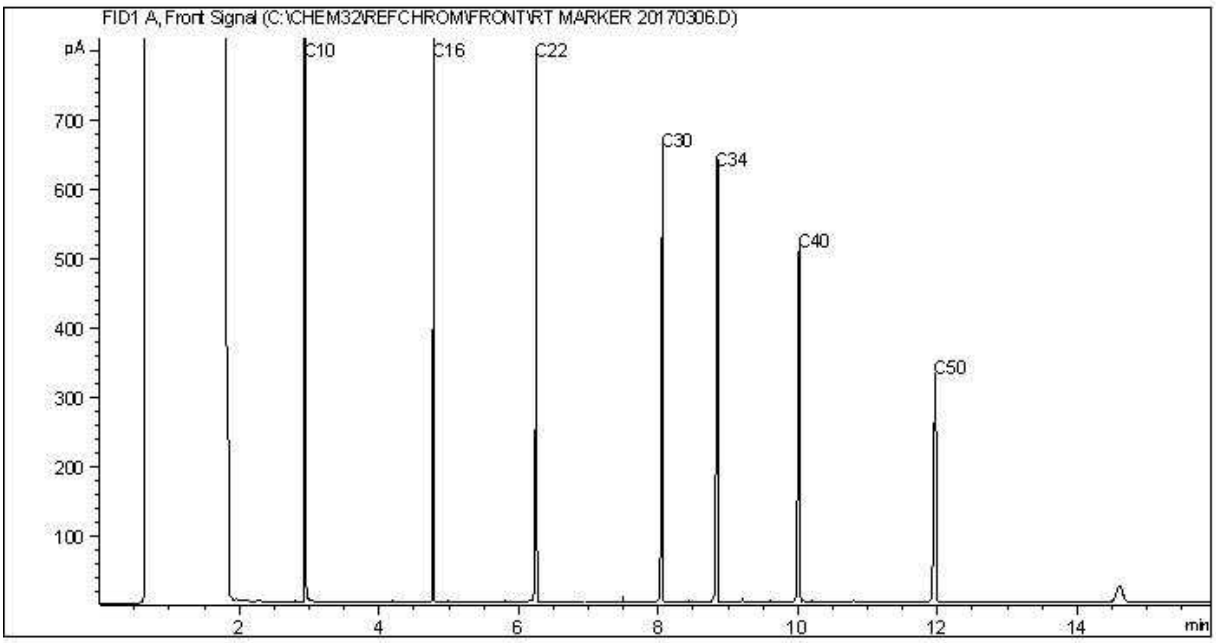
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: P2-10B

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+

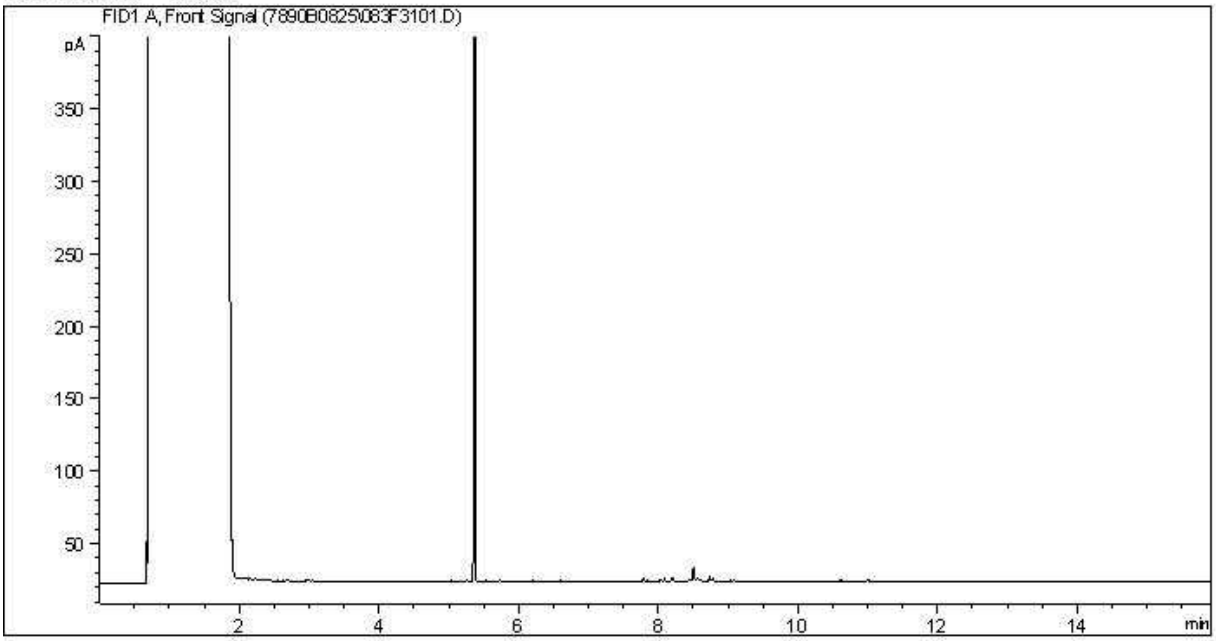
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871860
Report Date: 2018/08/30
Maxxam Sample: UD6399 Lab-Dup

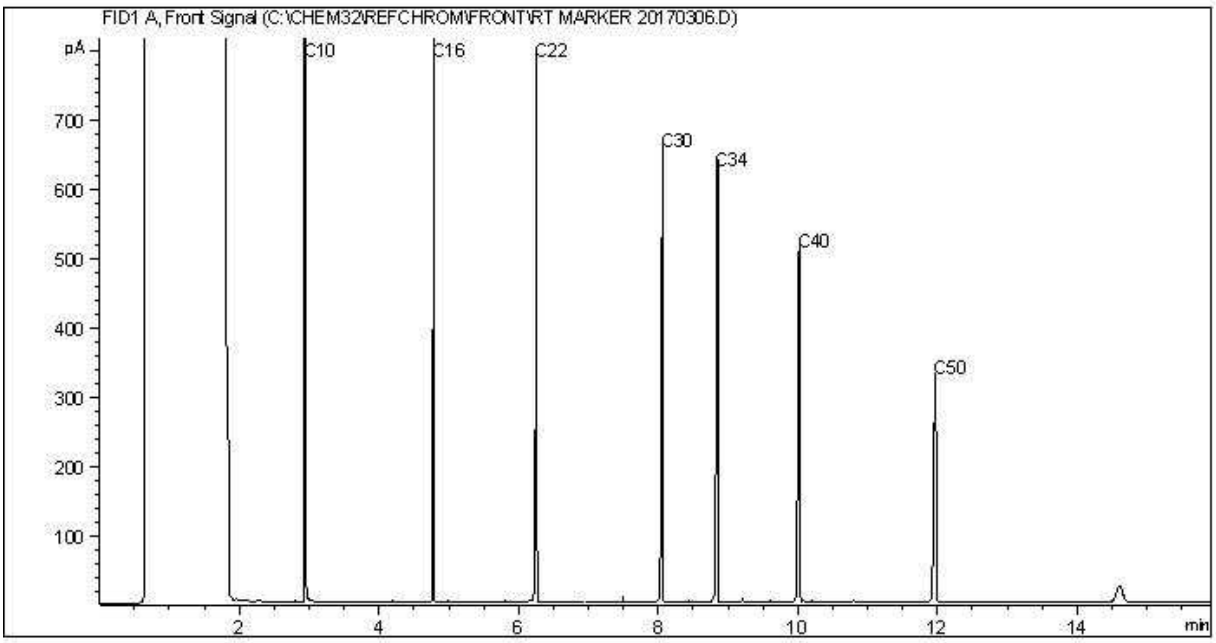
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: P2-10B

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+

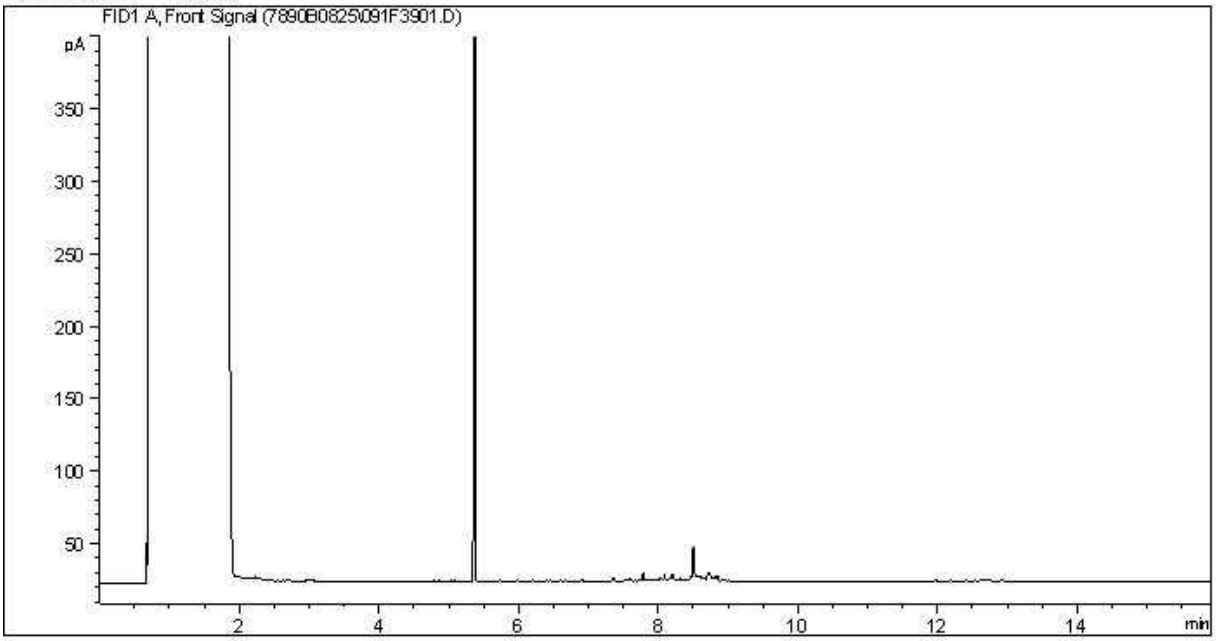
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871860
Report Date: 2018/08/30
Maxxam Sample: UD6400

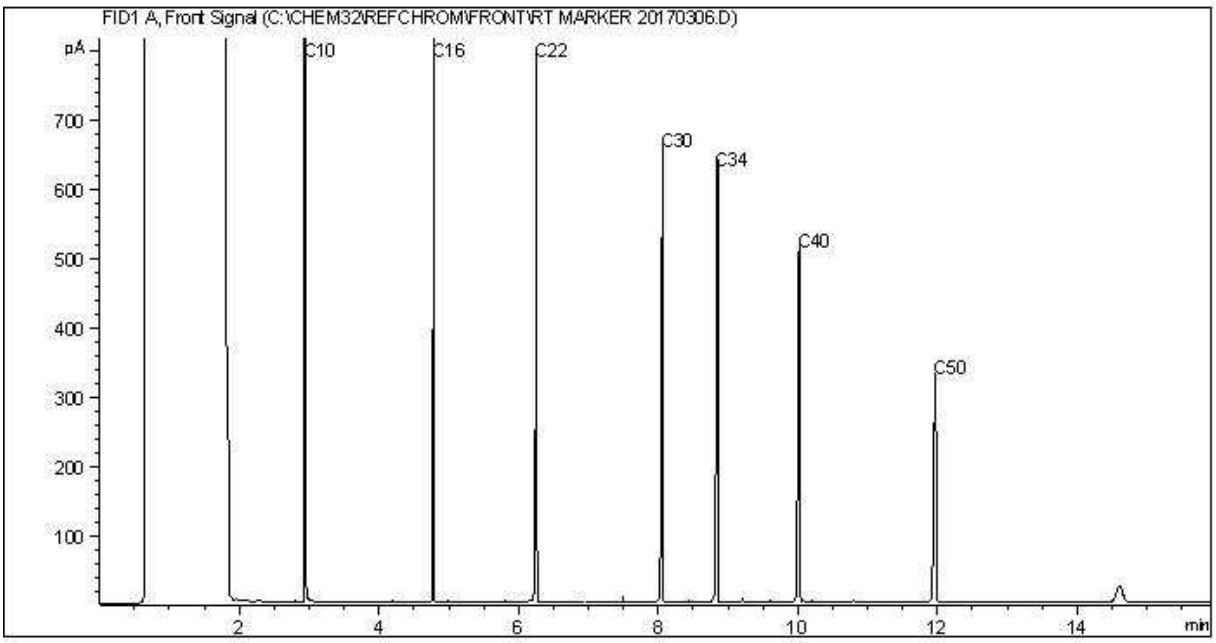
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: P2-11A

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+

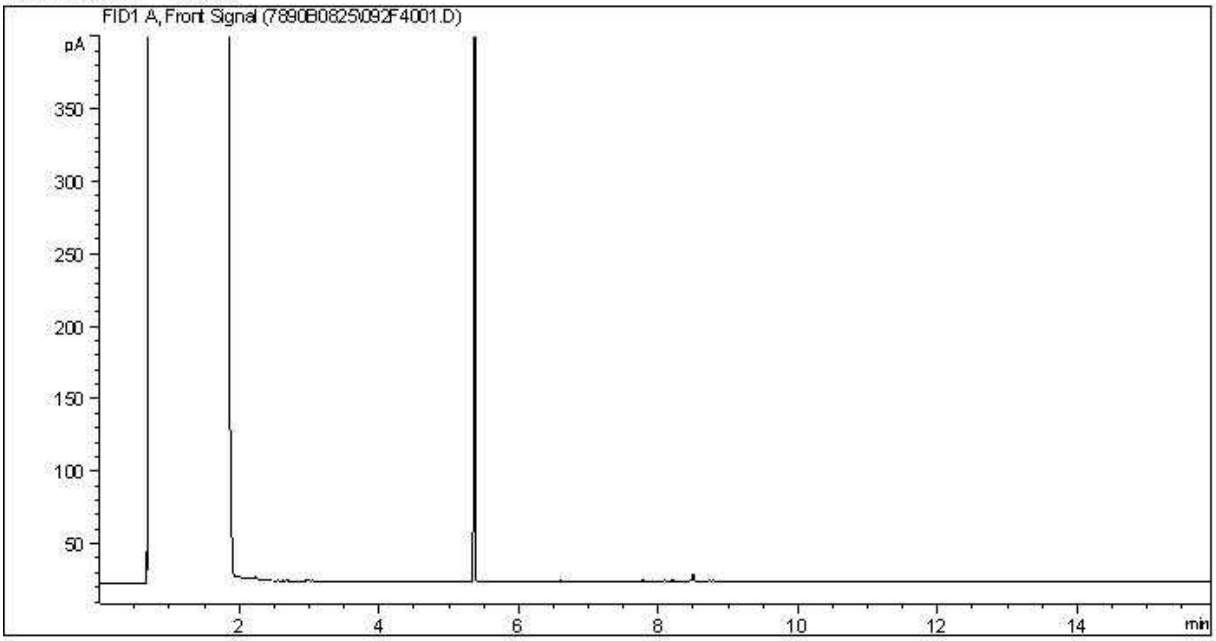
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871860
Report Date: 2018/08/30
Maxxam Sample: UD6401

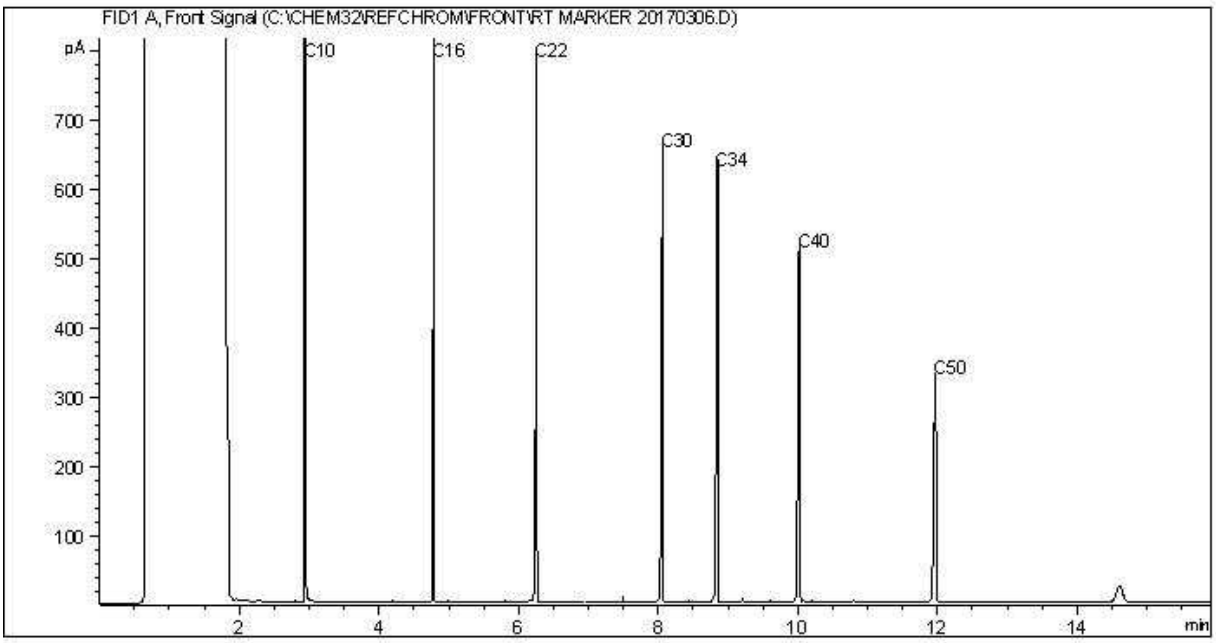
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: P2-11B

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+

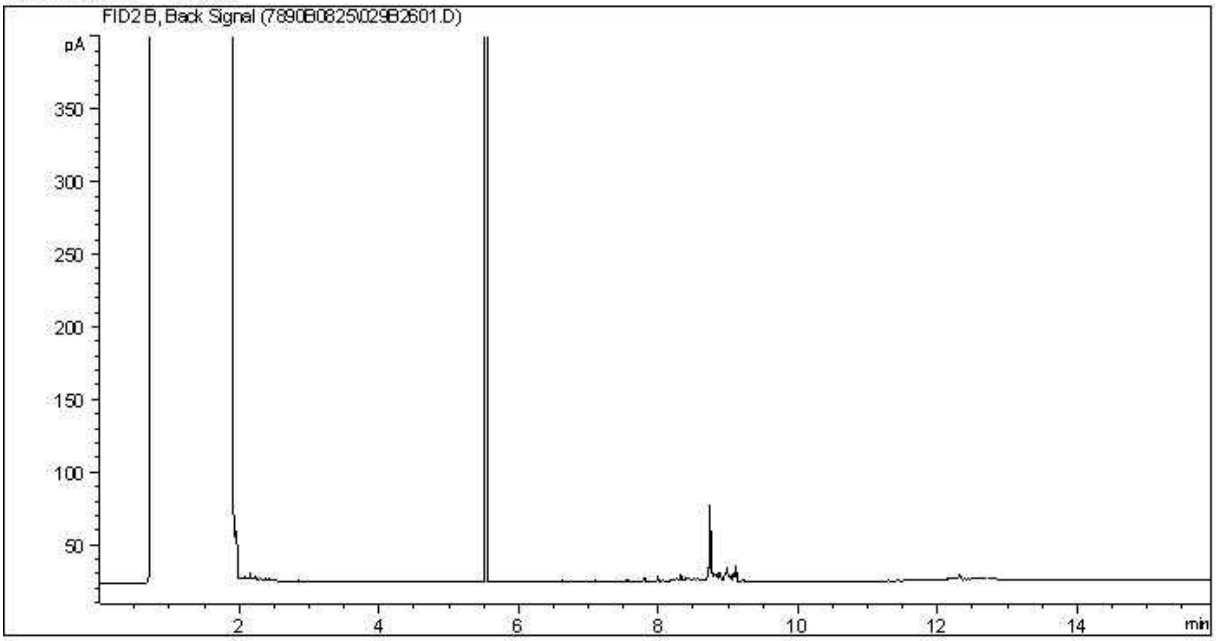
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871860
Report Date: 2018/08/30
Maxxam Sample: UD6402

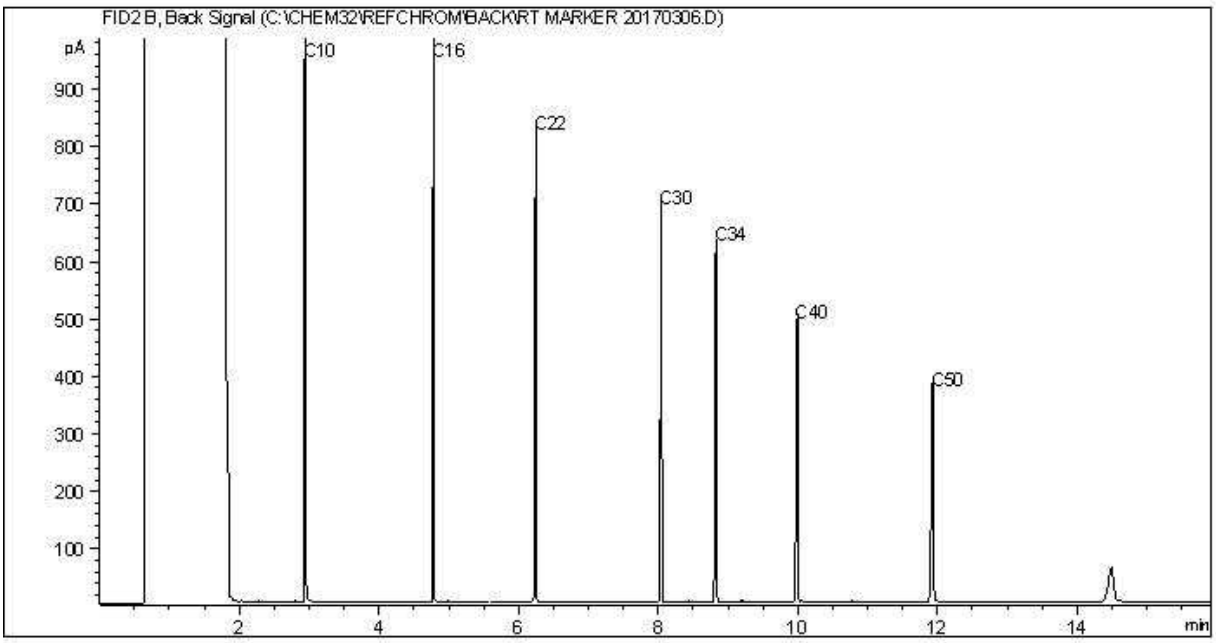
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: P2-12A

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+

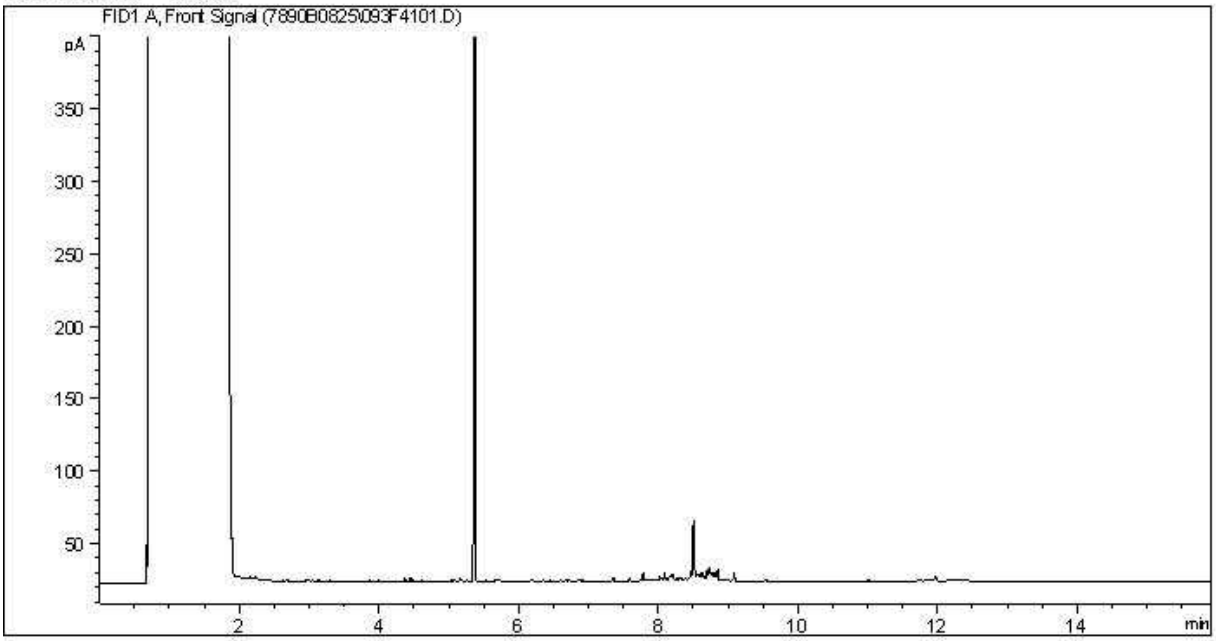
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871860
Report Date: 2018/08/30
Maxxam Sample: UD6403

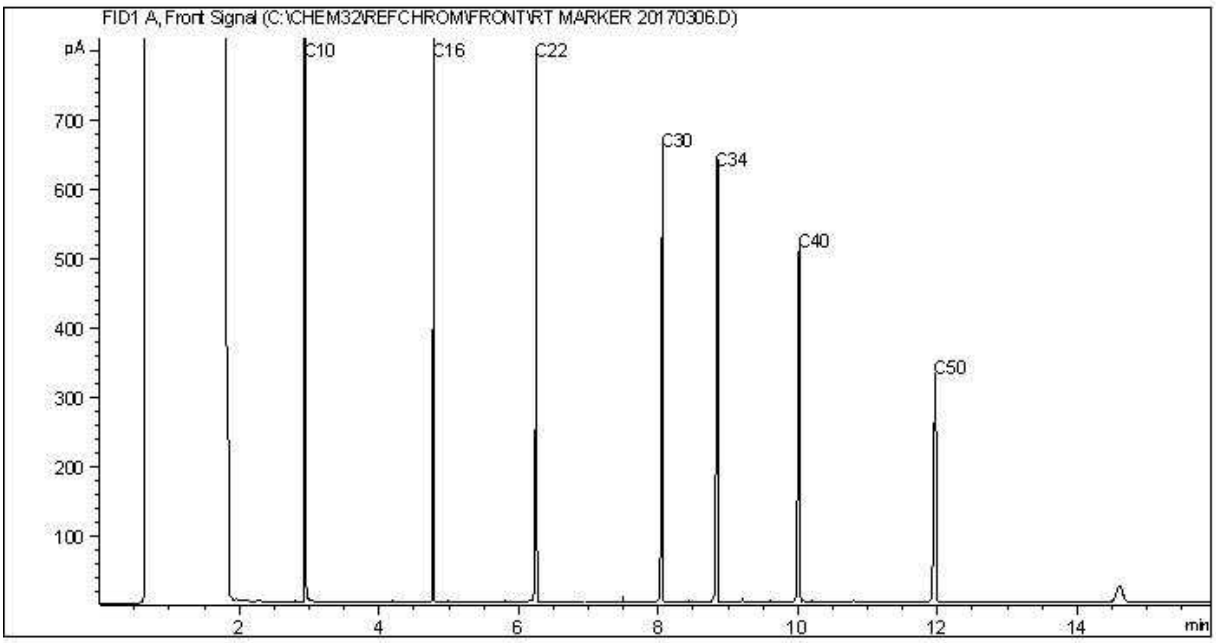
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: P2-12B

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+

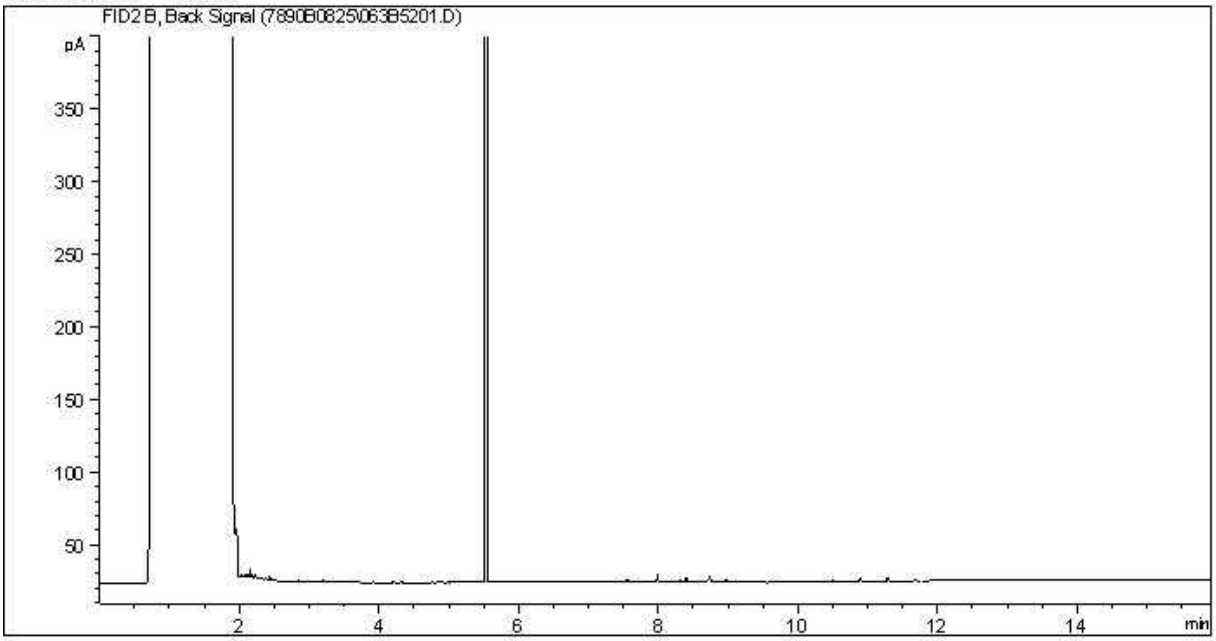
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871860
Report Date: 2018/08/30
Maxxam Sample: UD6404

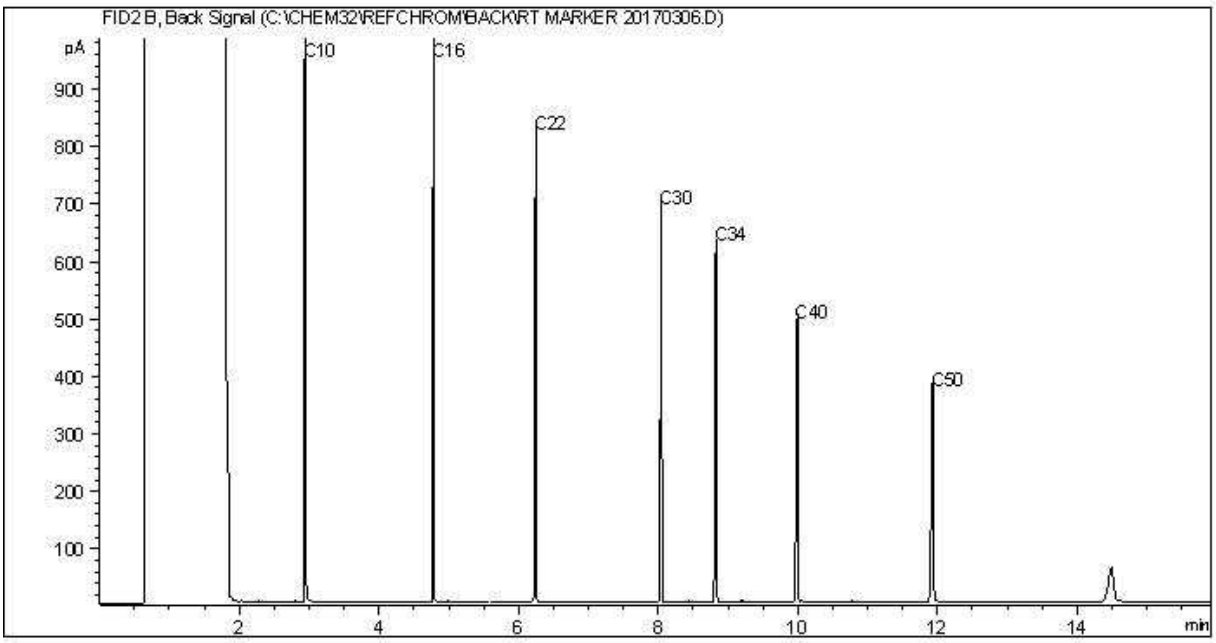
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: P2-13A

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+

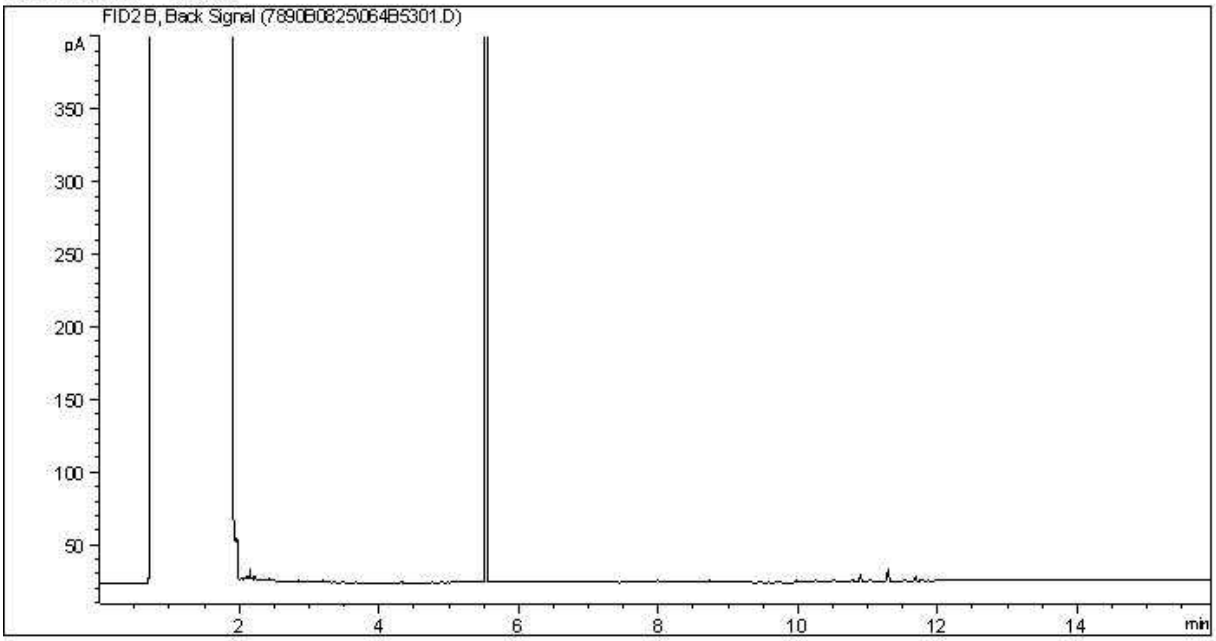
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871860
Report Date: 2018/08/30
Maxxam Sample: UD6405

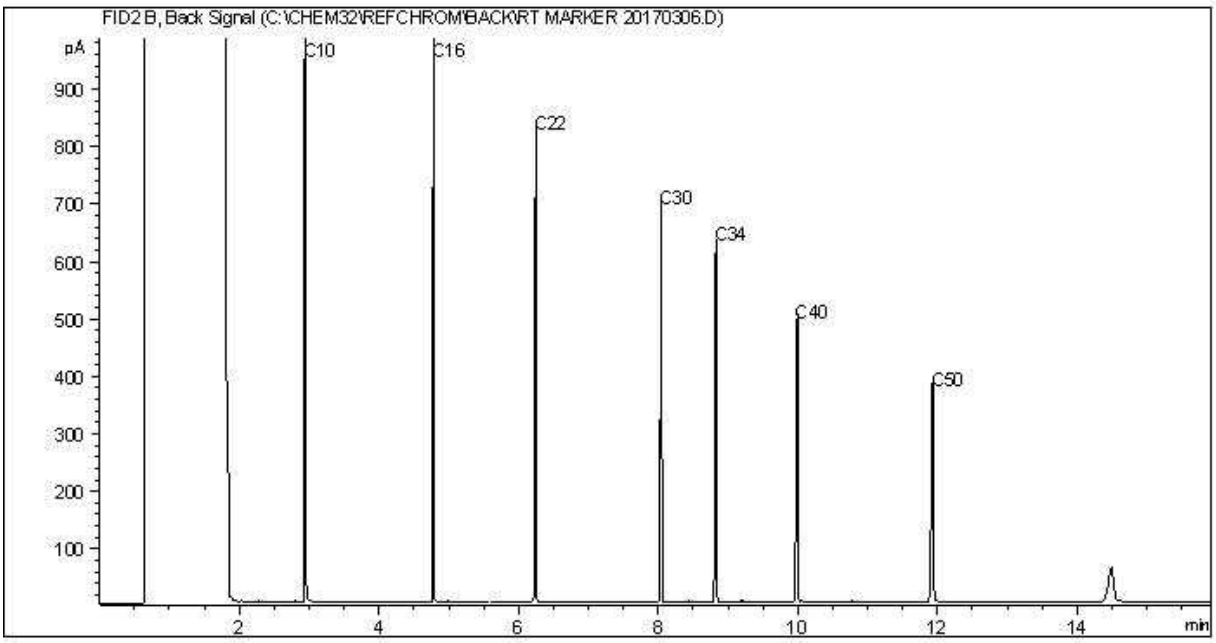
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: P2-13B

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+

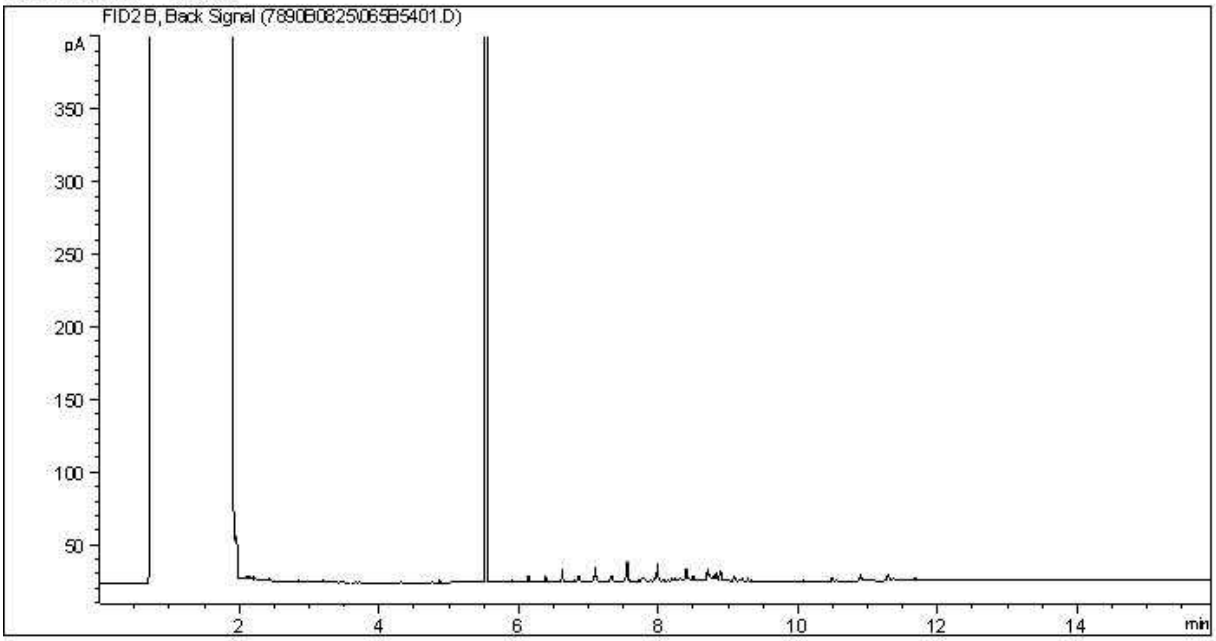
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871860
Report Date: 2018/08/30
Maxxam Sample: UD6406

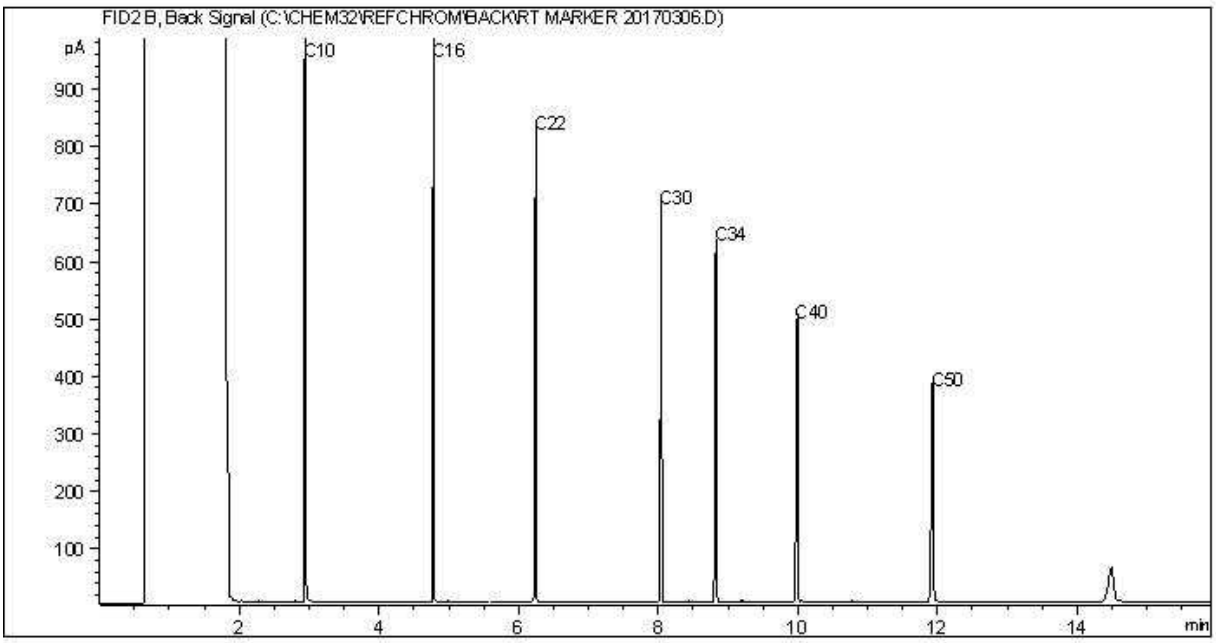
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: P2-14A

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+

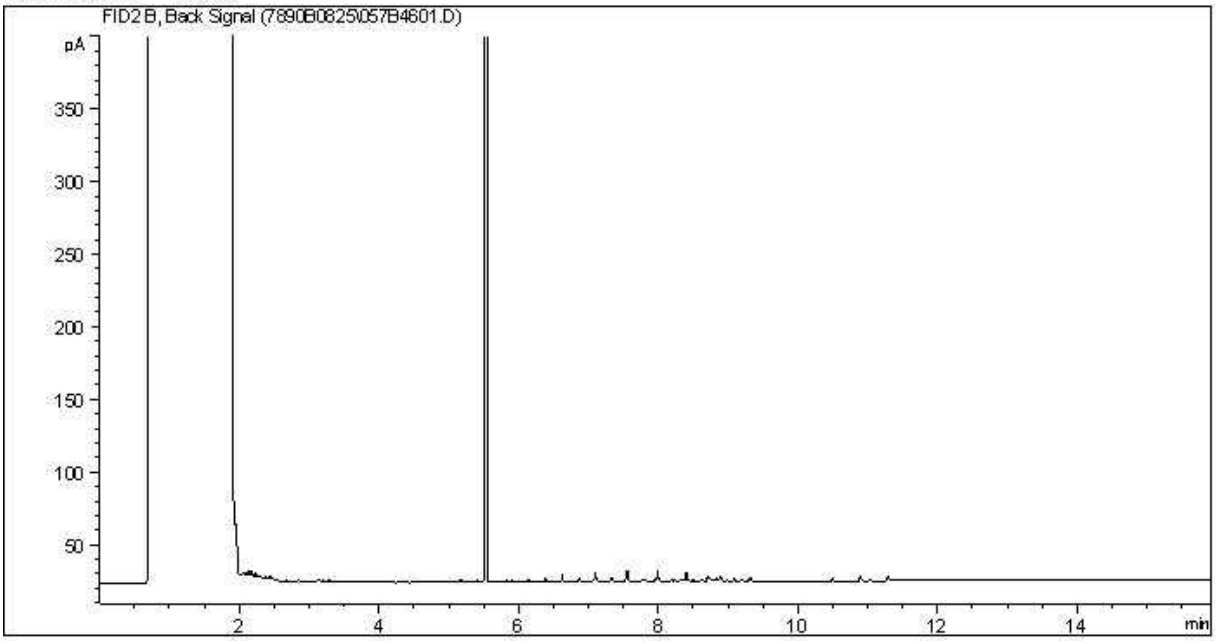
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871860
Report Date: 2018/08/30
Maxxam Sample: UD6407

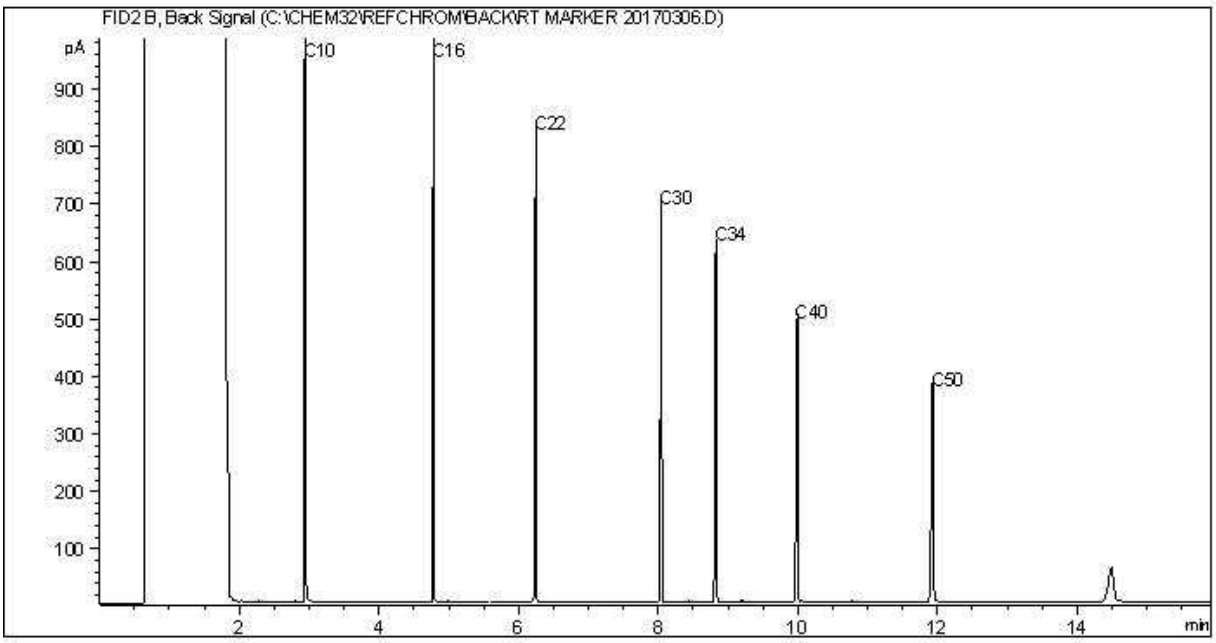
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: P2-14B

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+

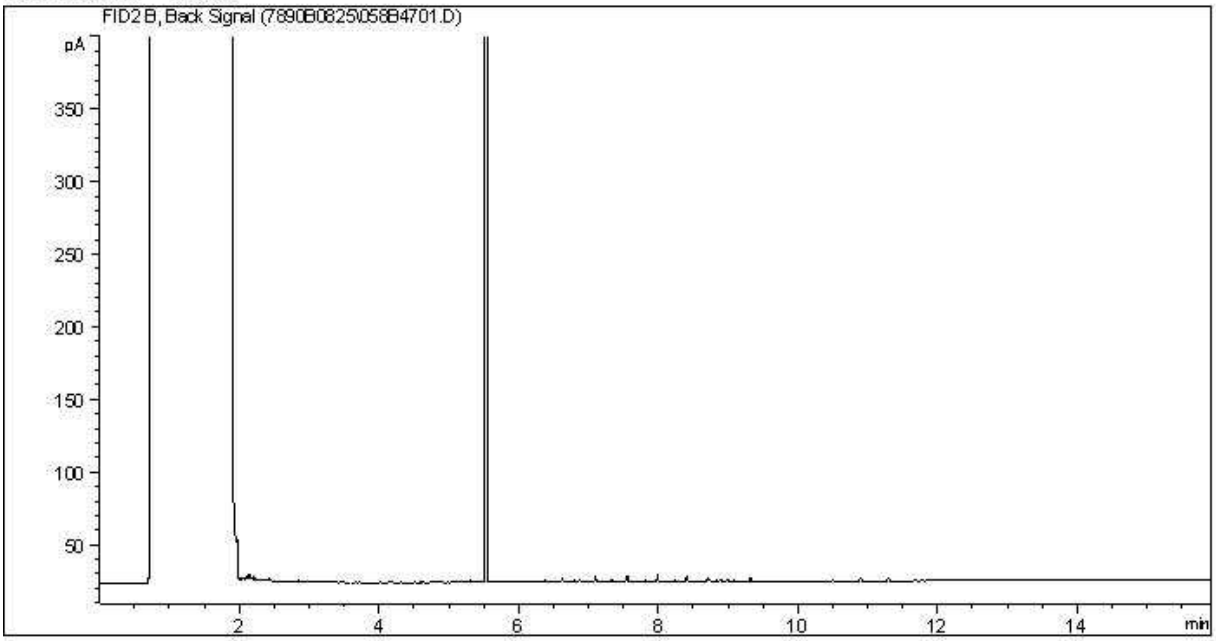
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871860
Report Date: 2018/08/30
Maxxam Sample: UD6407 Lab-Dup

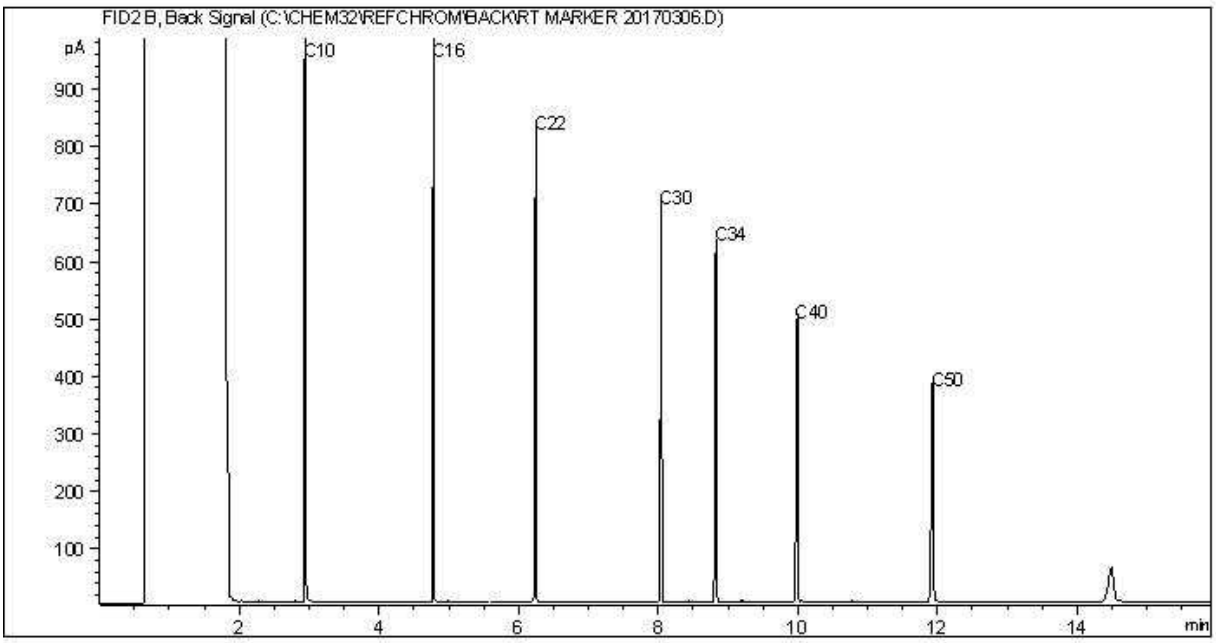
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: P2-14B

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+

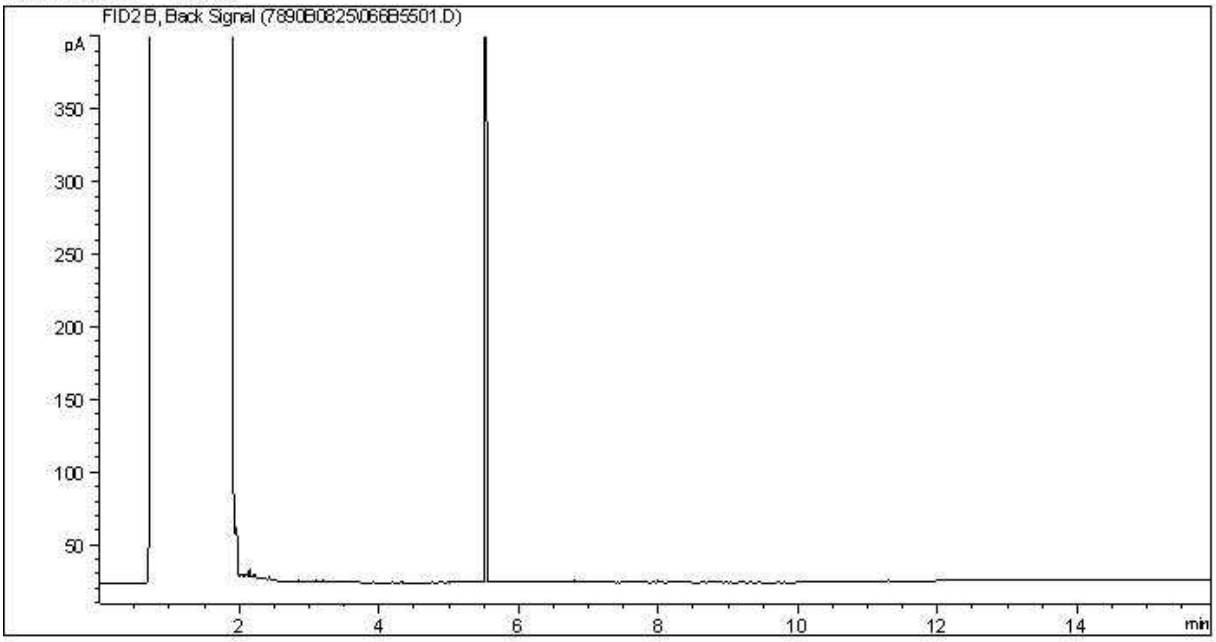
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871860
Report Date: 2018/08/30
Maxxam Sample: UD6408

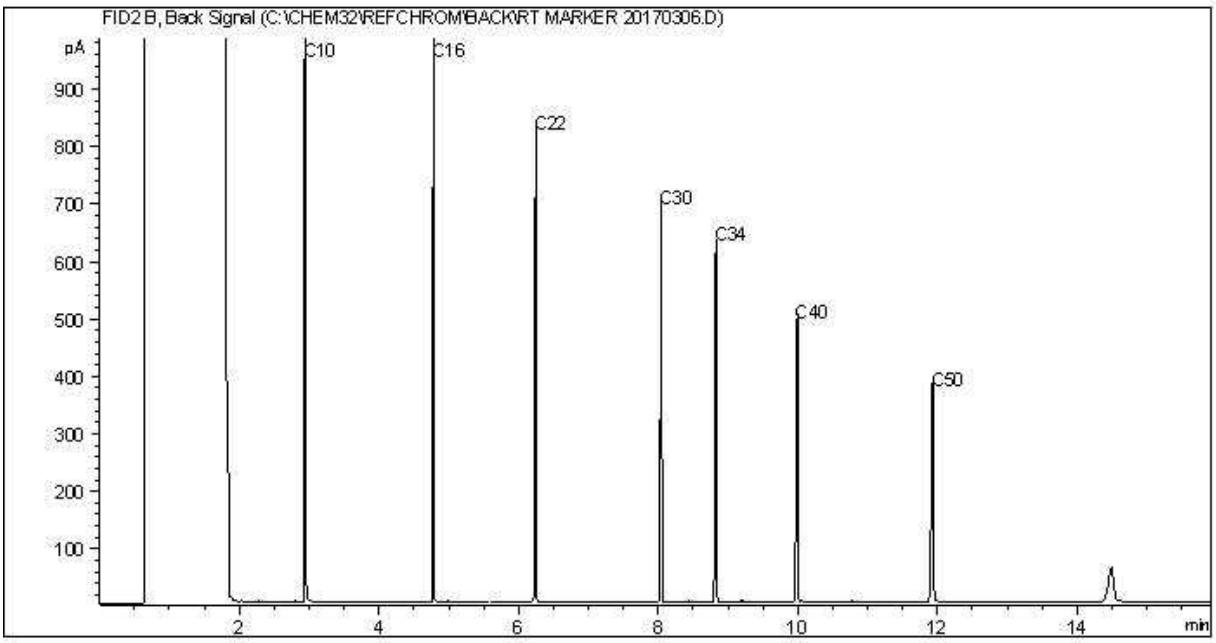
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: P2-15A

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+

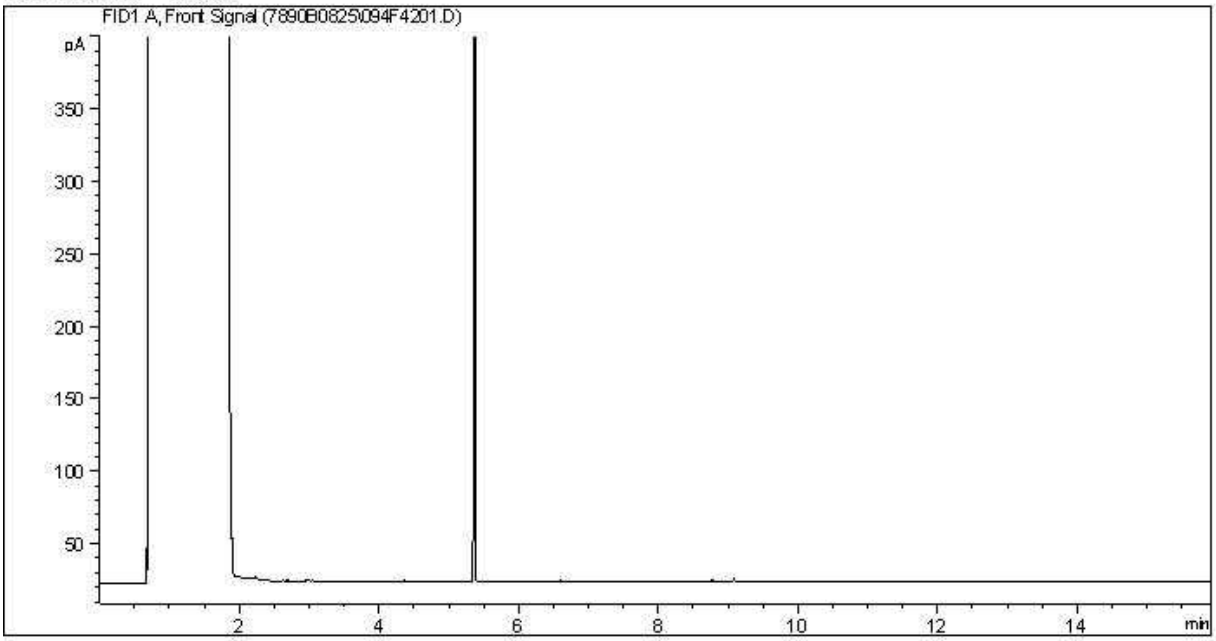
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871860
Report Date: 2018/08/30
Maxxam Sample: UD6409

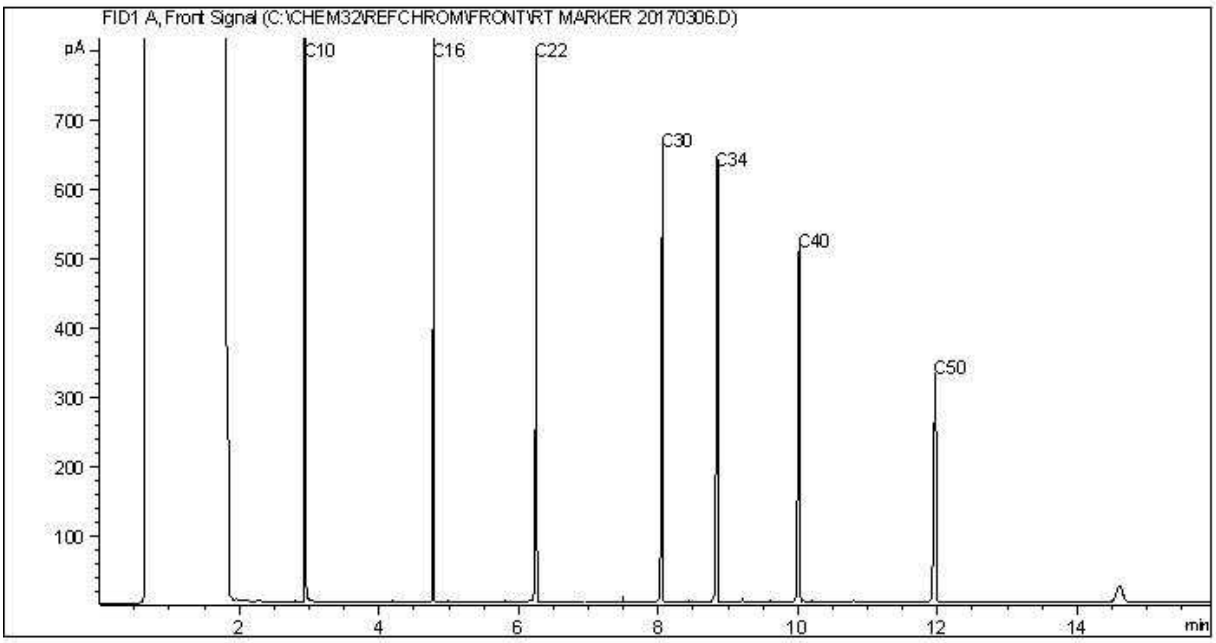
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: P2-15B

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+

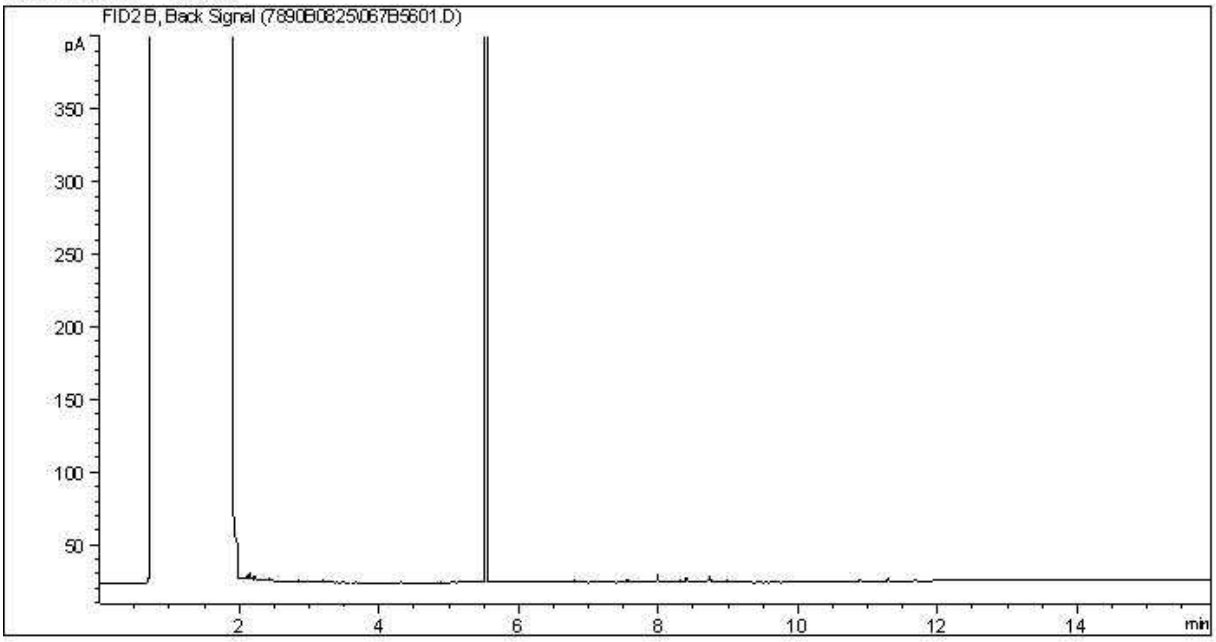
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871860
Report Date: 2018/08/30
Maxxam Sample: UD6410

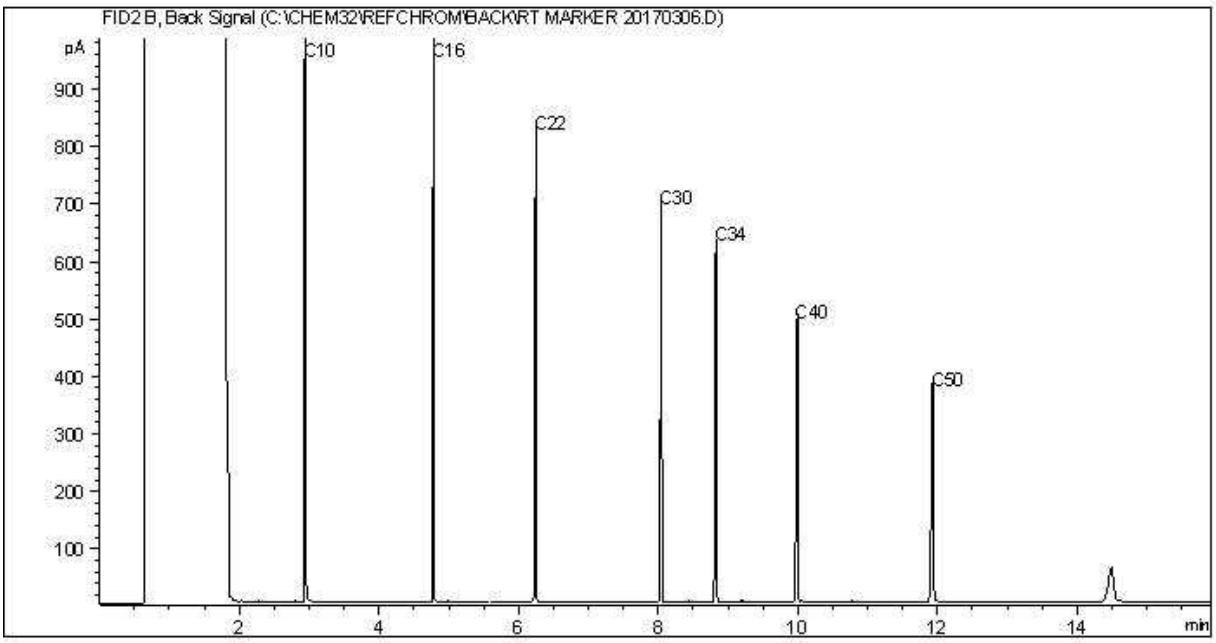
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: P2-16A

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+

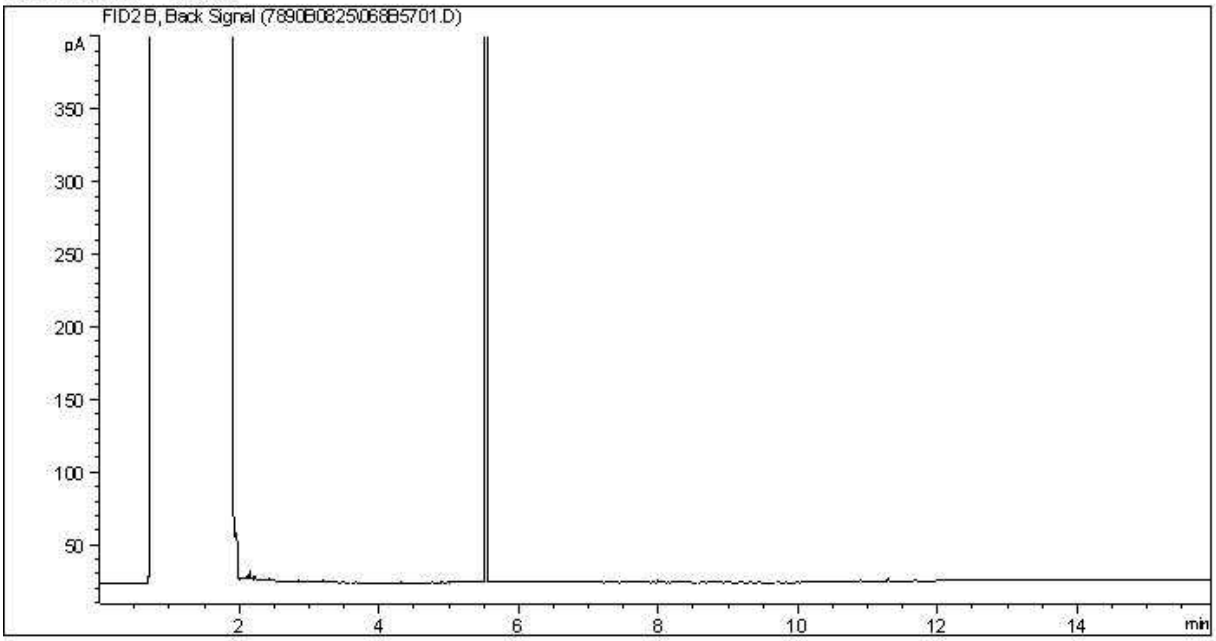
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871860
Report Date: 2018/08/30
Maxxam Sample: UD6411

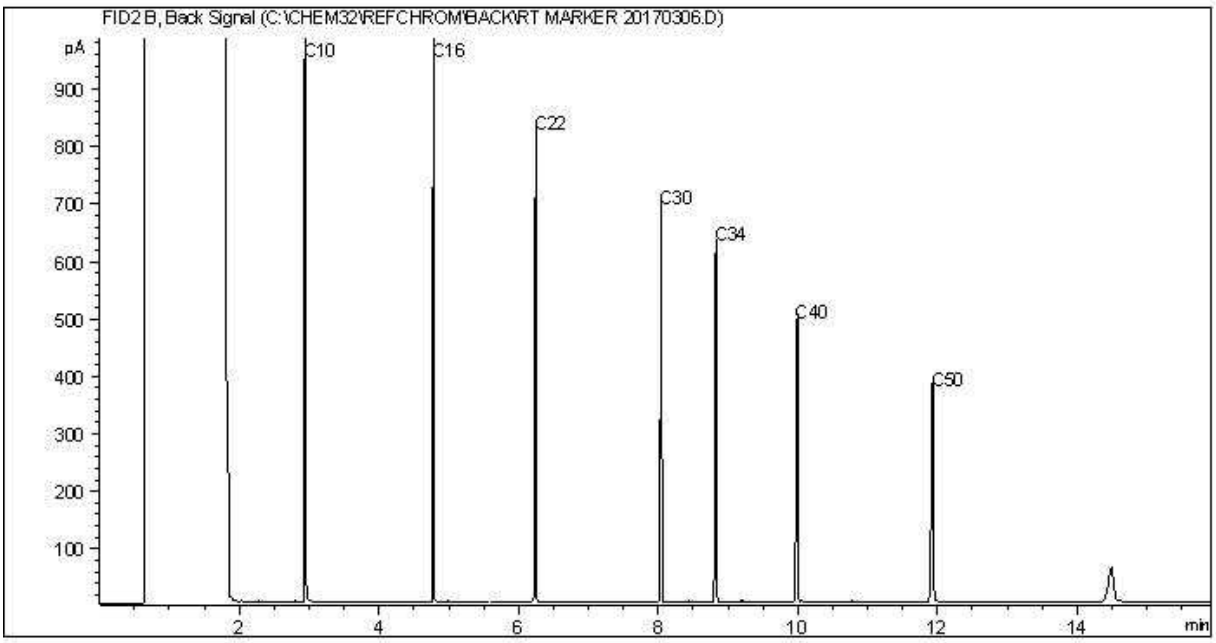
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: P2-16B

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+

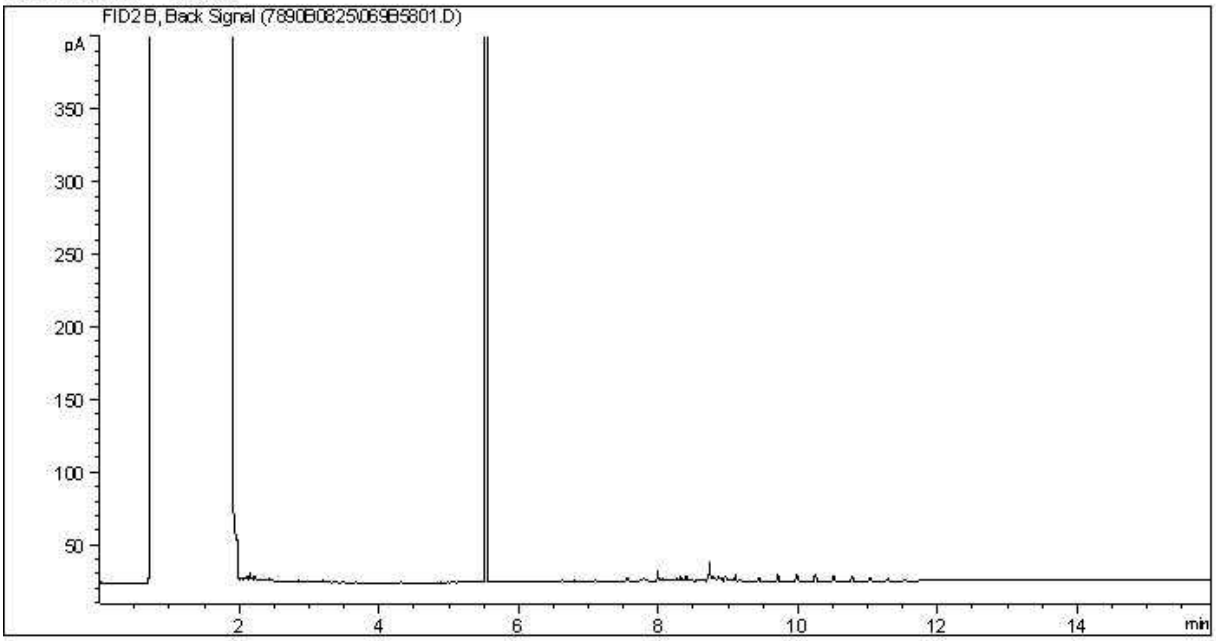
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871860
Report Date: 2018/08/30
Maxxam Sample: UD6412

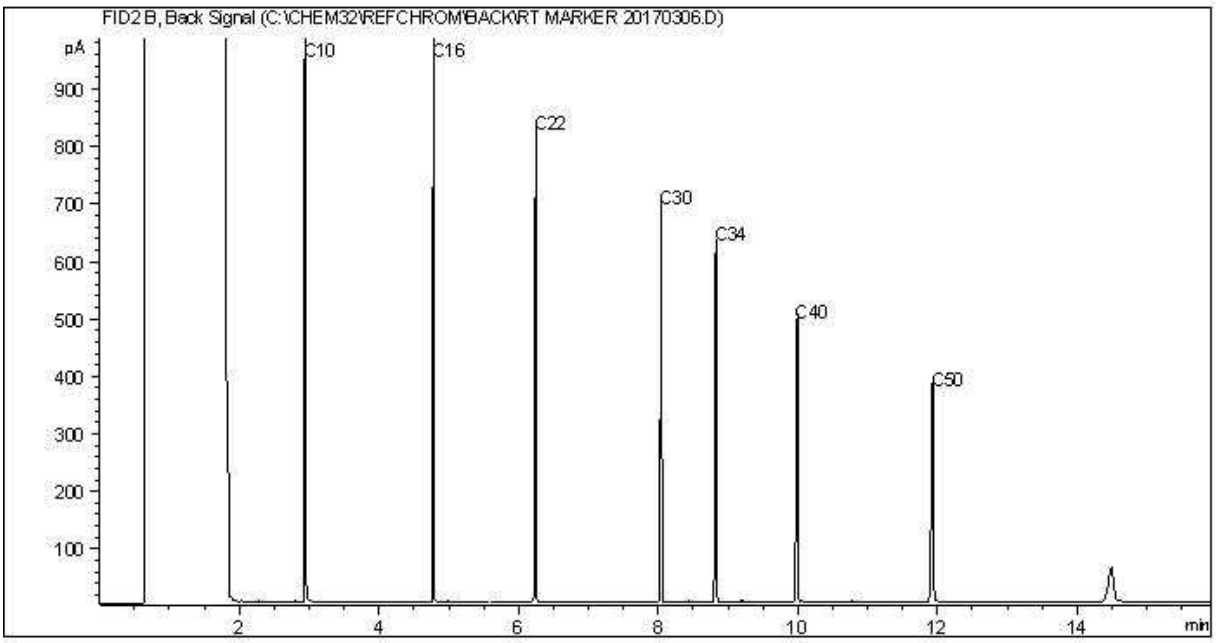
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: P2-17A

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+

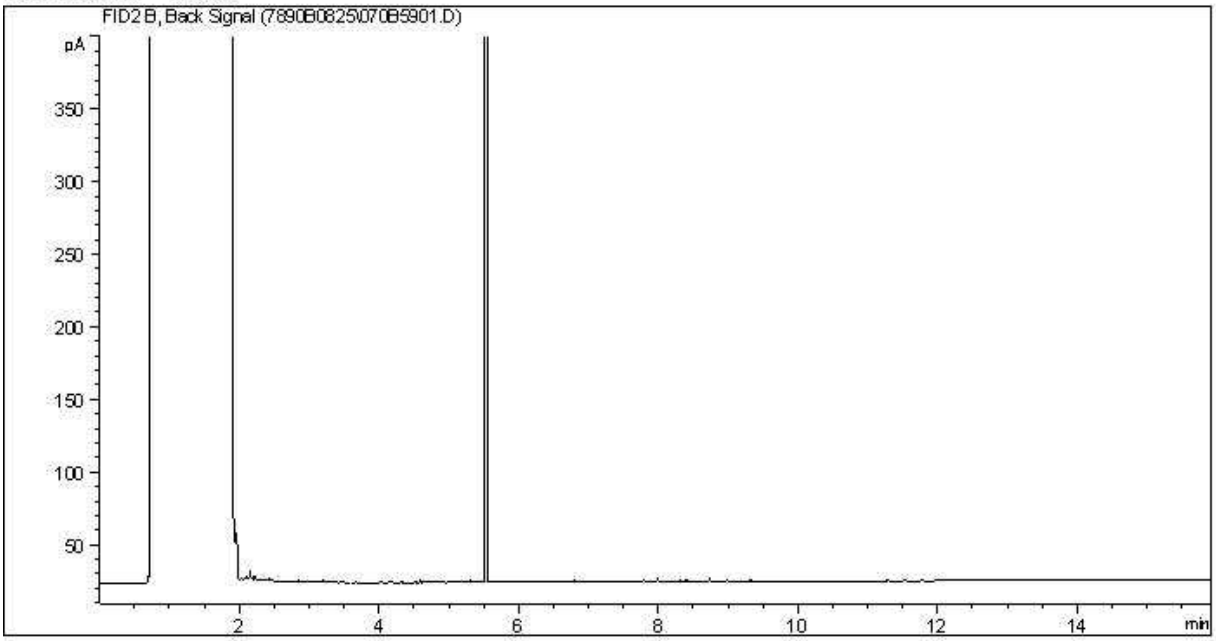
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871860
Report Date: 2018/08/30
Maxxam Sample: UD6413

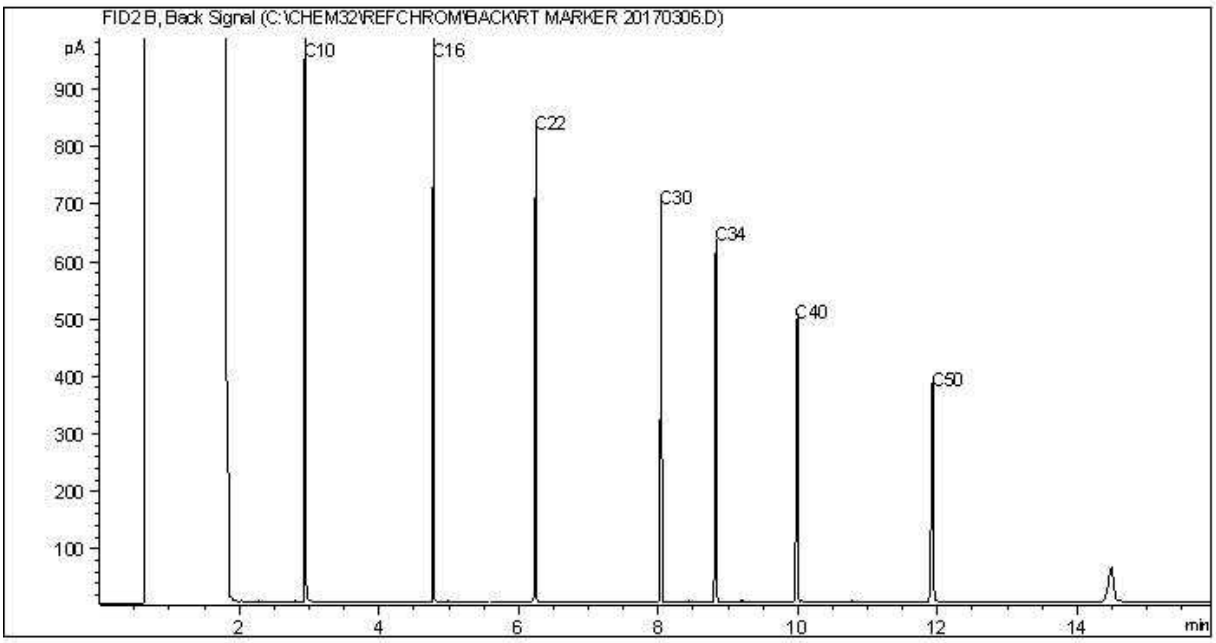
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: P2-17B

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+

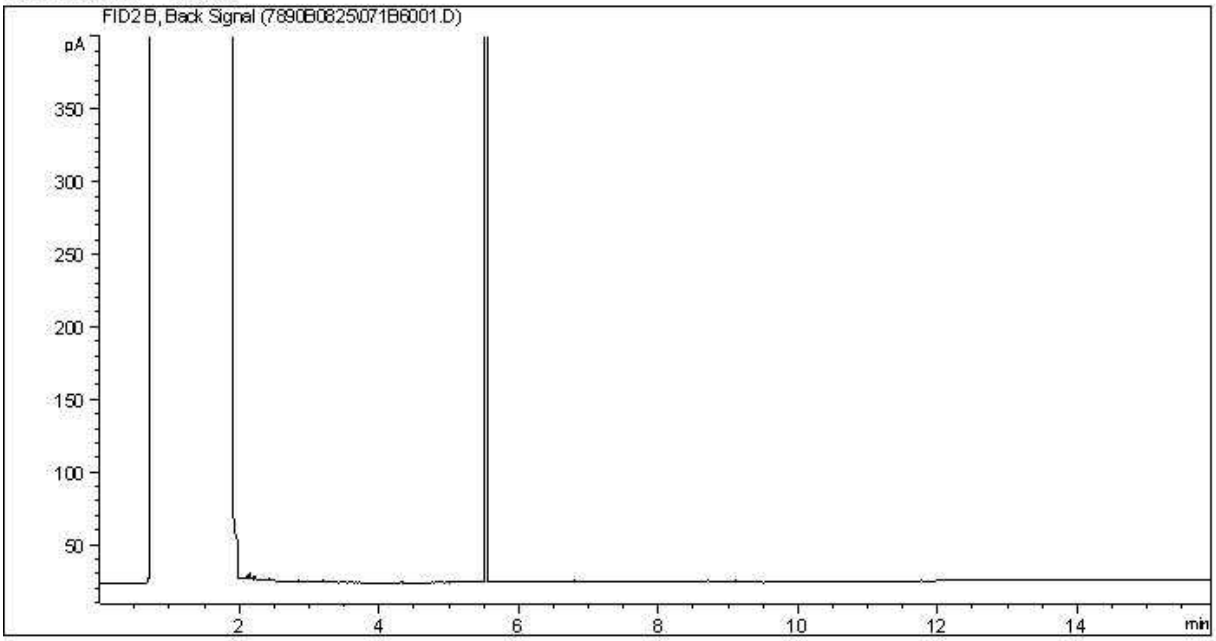
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871860
Report Date: 2018/08/30
Maxxam Sample: UD6414

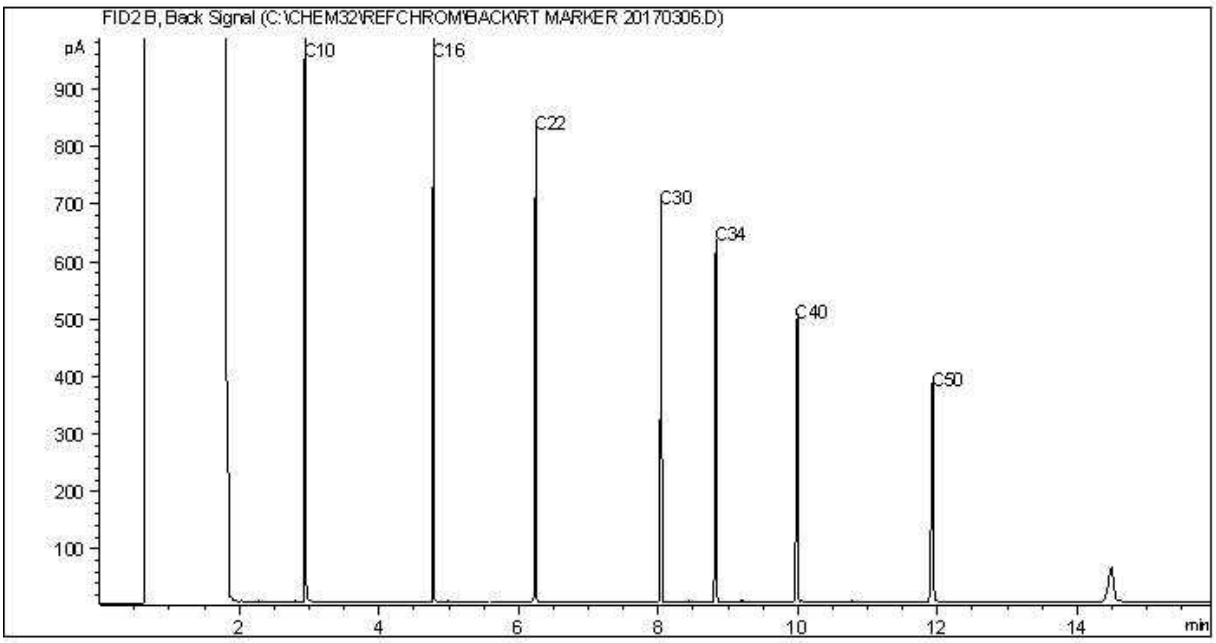
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: P2-18A

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+

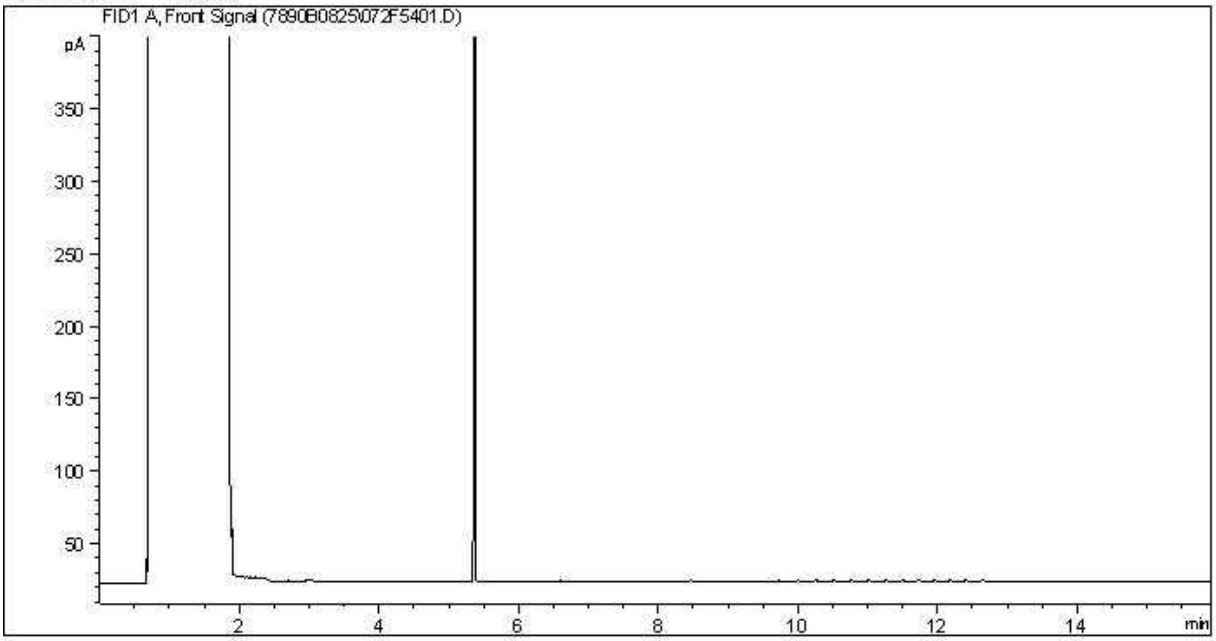
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871860
Report Date: 2018/08/30
Maxxam Sample: UD6415

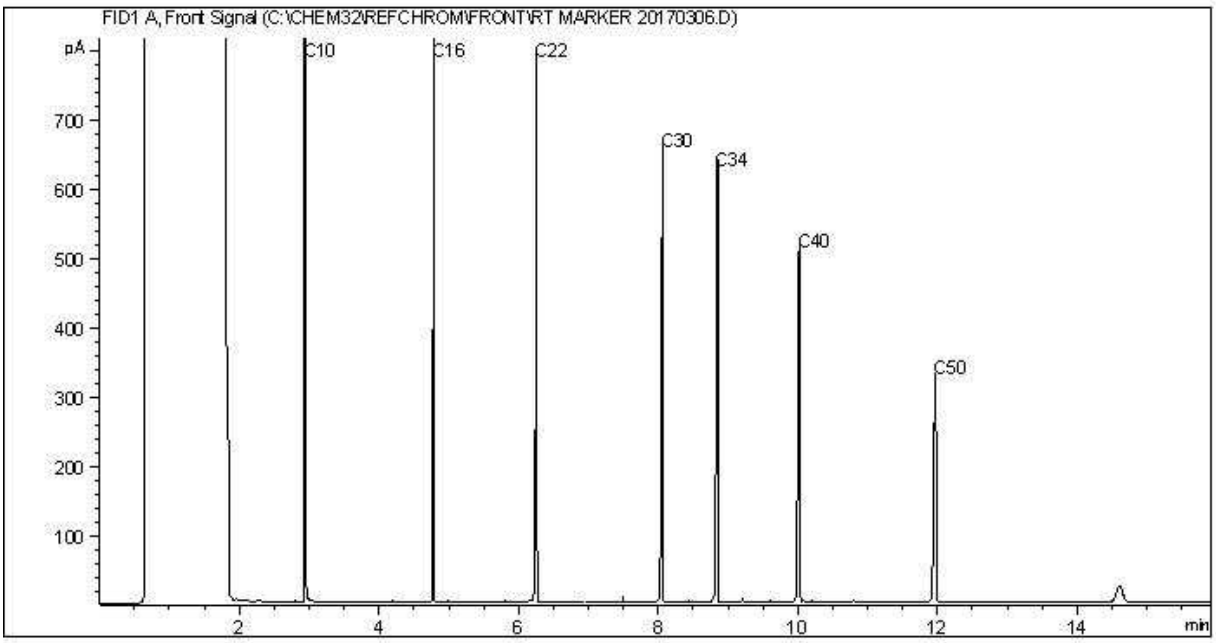
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: P2-18B

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890B



Carbon Range Distribution - Reference Chromatogram



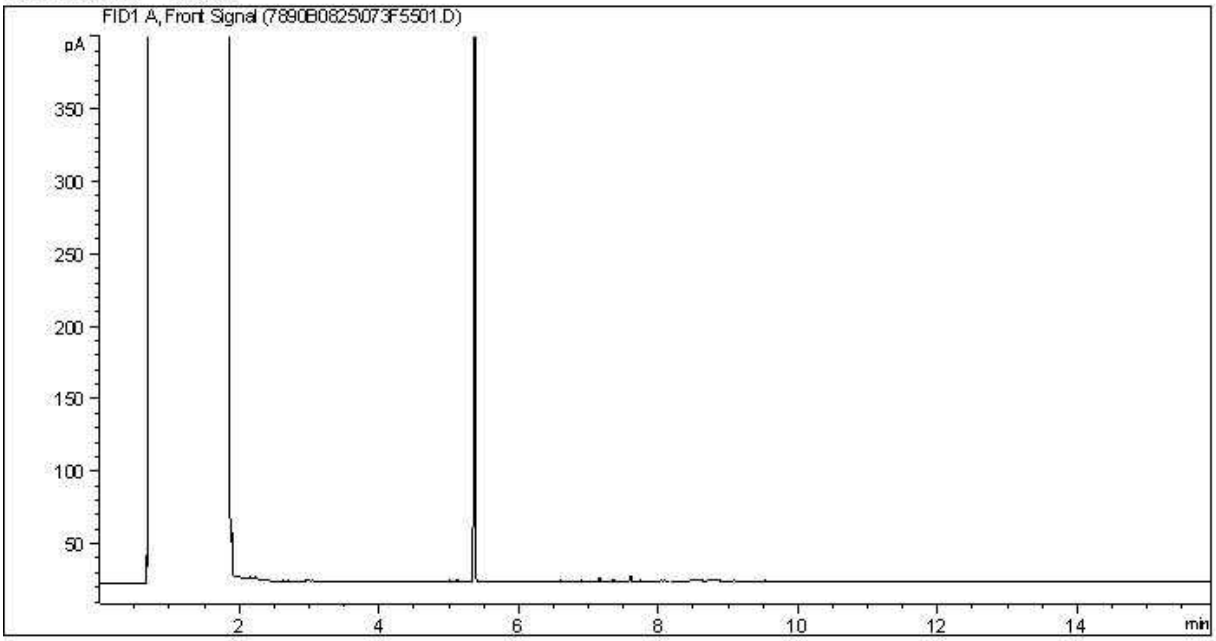
TYPICAL PRODUCT CARBON NUMBER RANGES

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

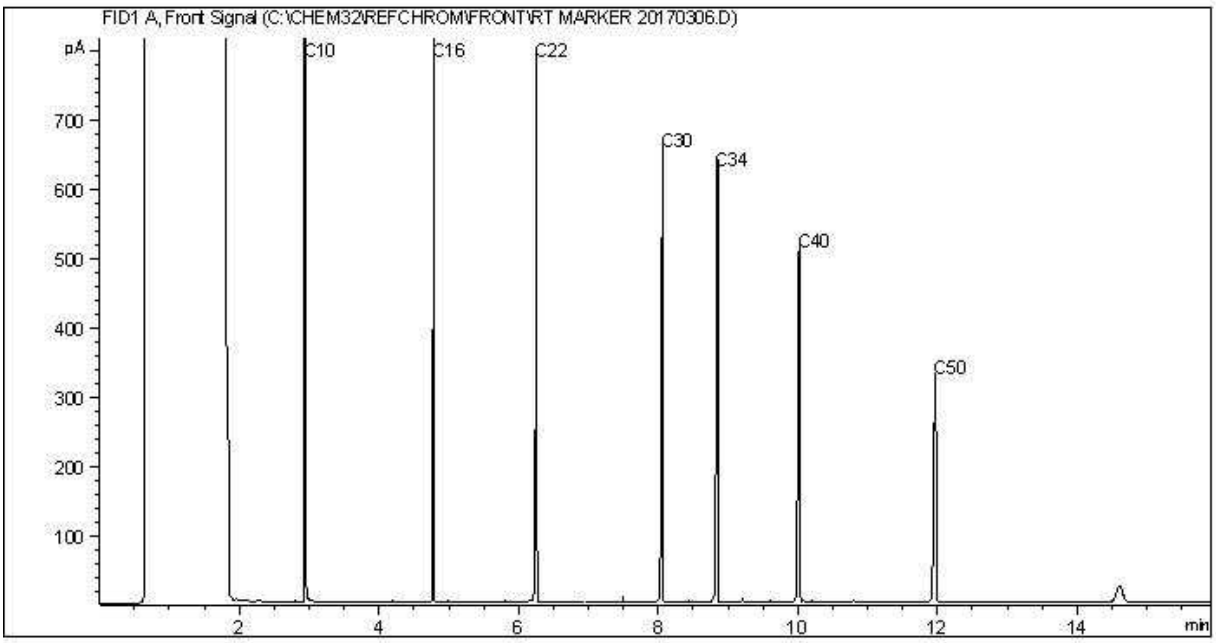
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890B



Carbon Range Distribution - Reference Chromatogram



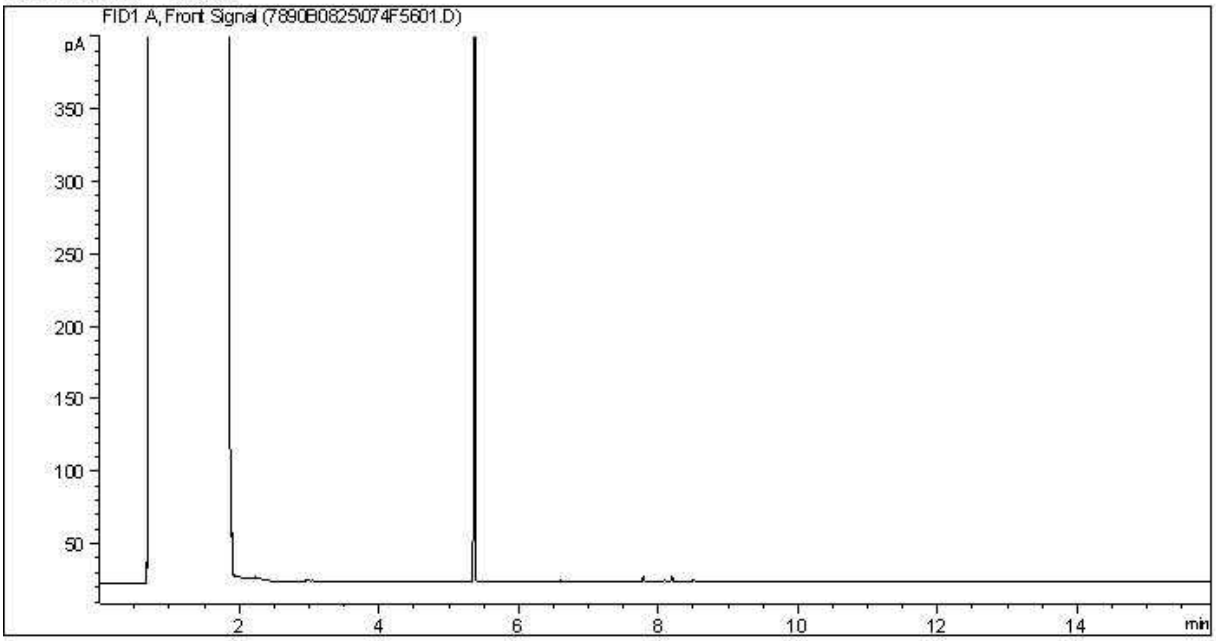
TYPICAL PRODUCT CARBON NUMBER RANGES

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

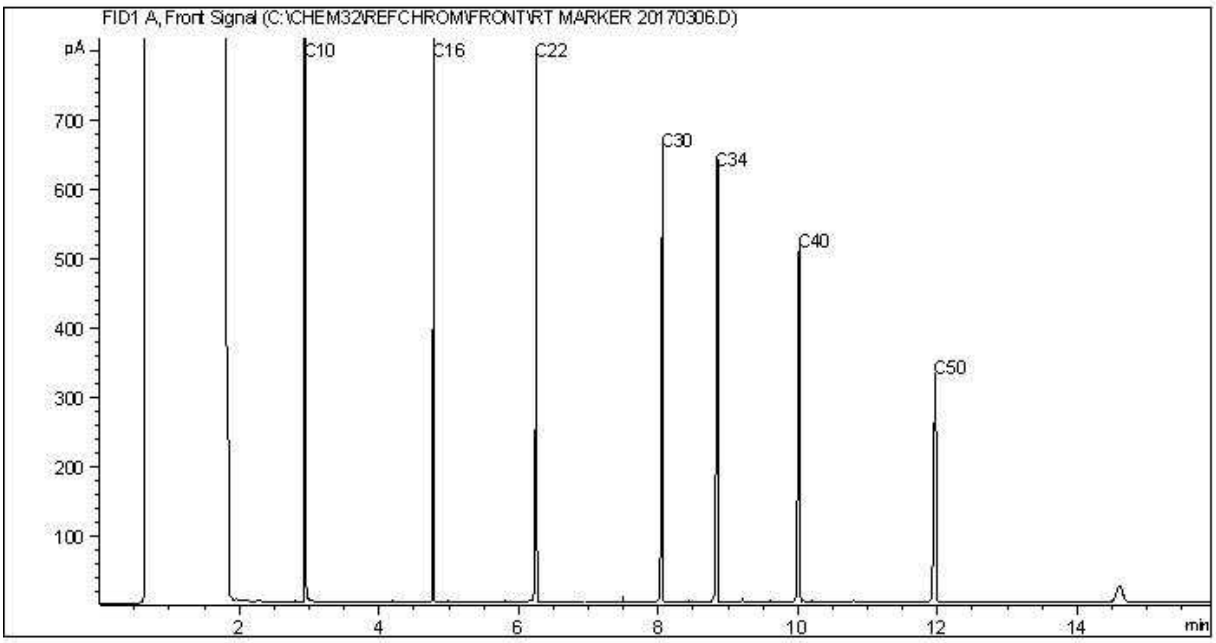
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

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+

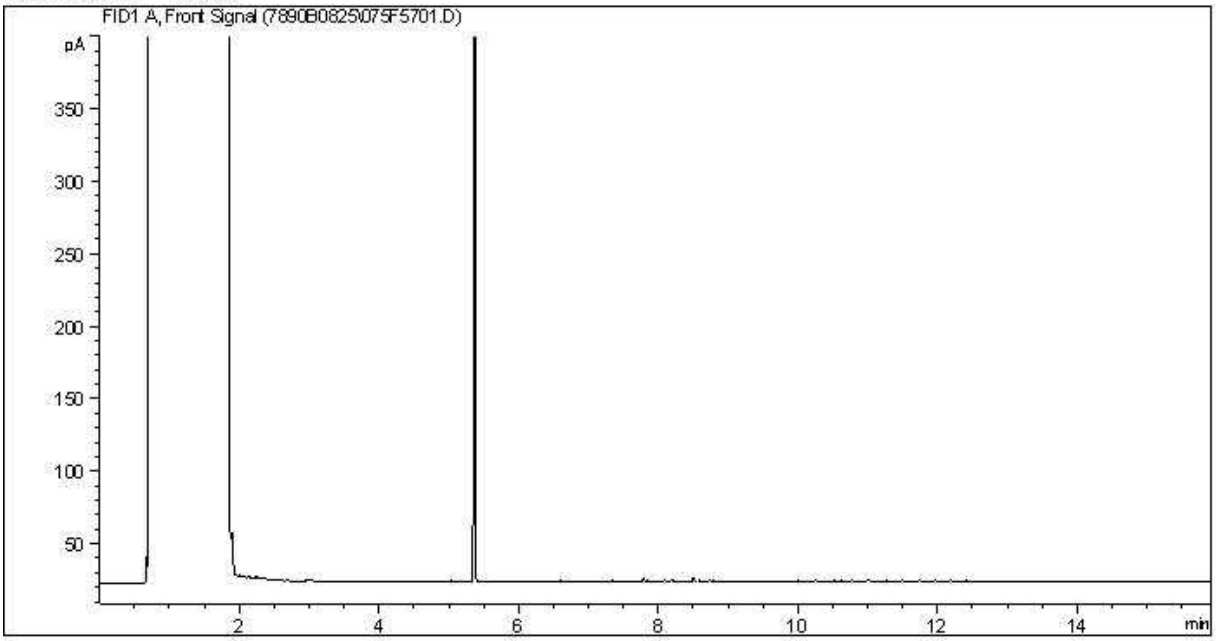
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871860
Report Date: 2018/08/30
Maxxam Sample: UD6419

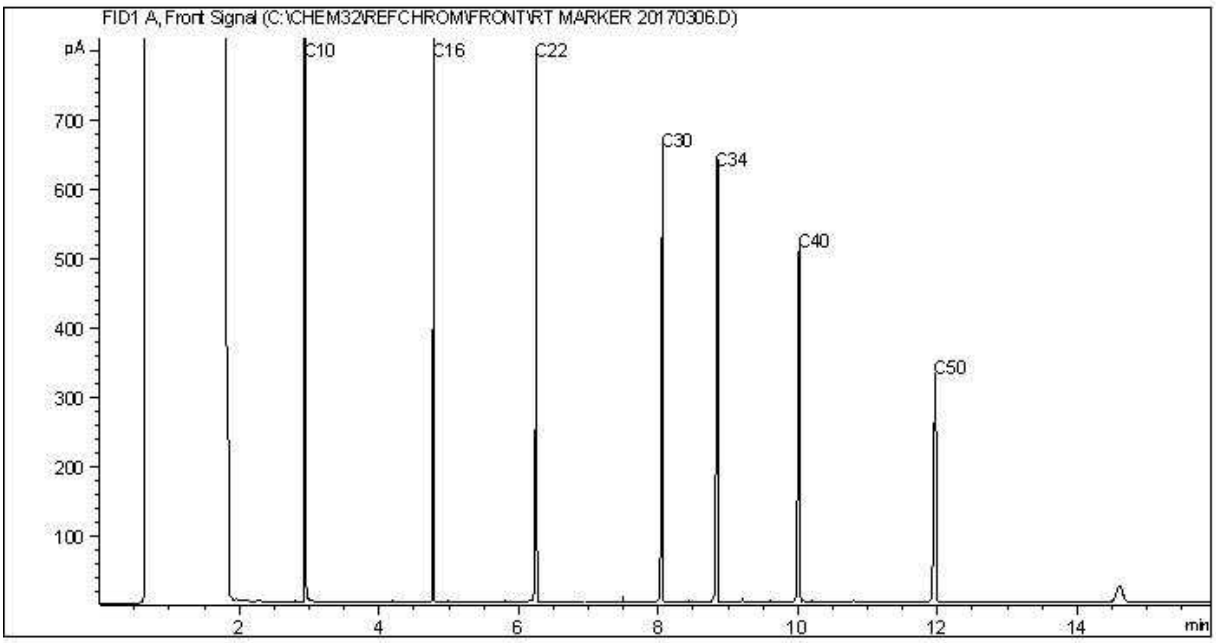
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: P2-20B

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+

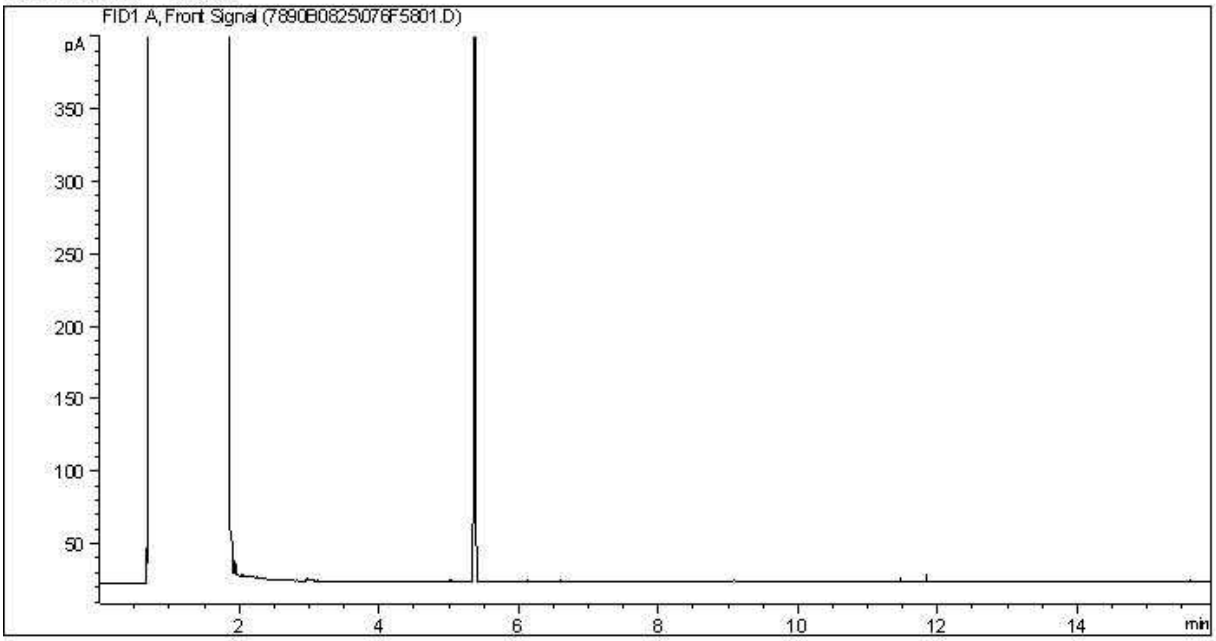
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871860
Report Date: 2018/08/30
Maxxam Sample: UD6420

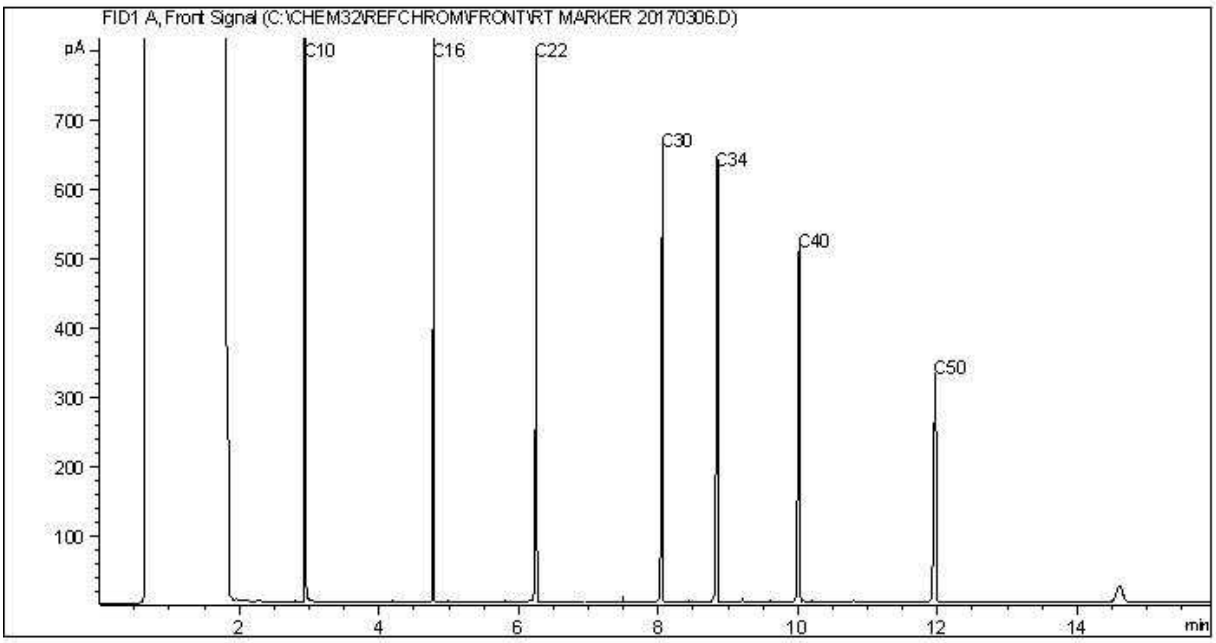
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: P2-21A

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+

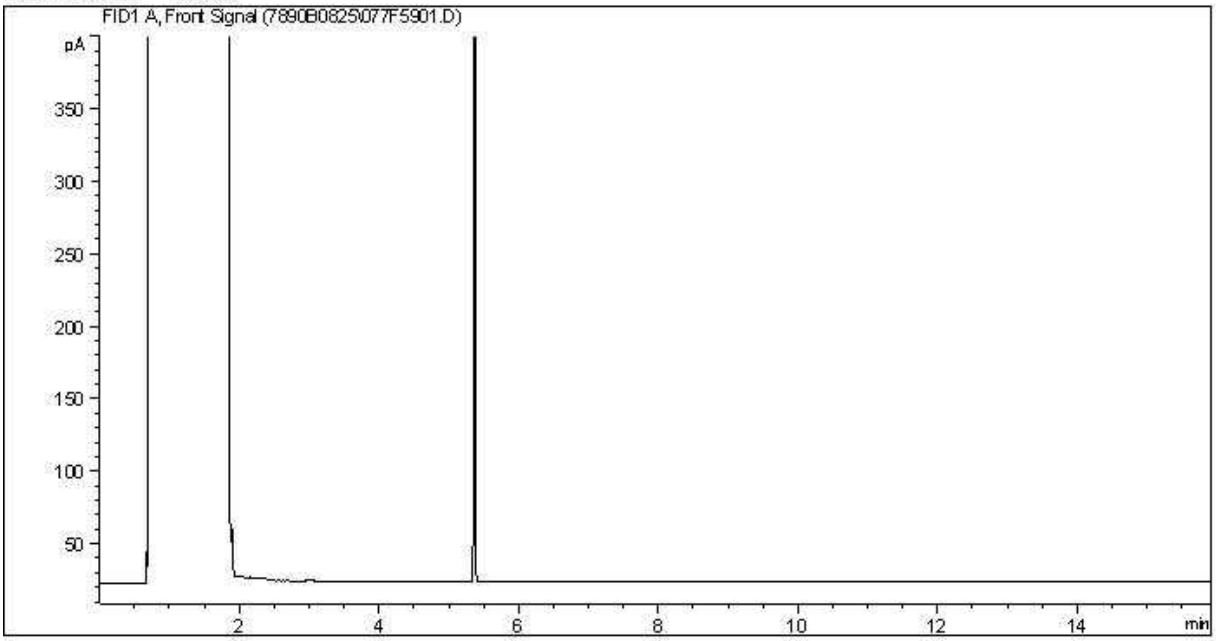
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871860
Report Date: 2018/08/30
Maxxam Sample: UD6421

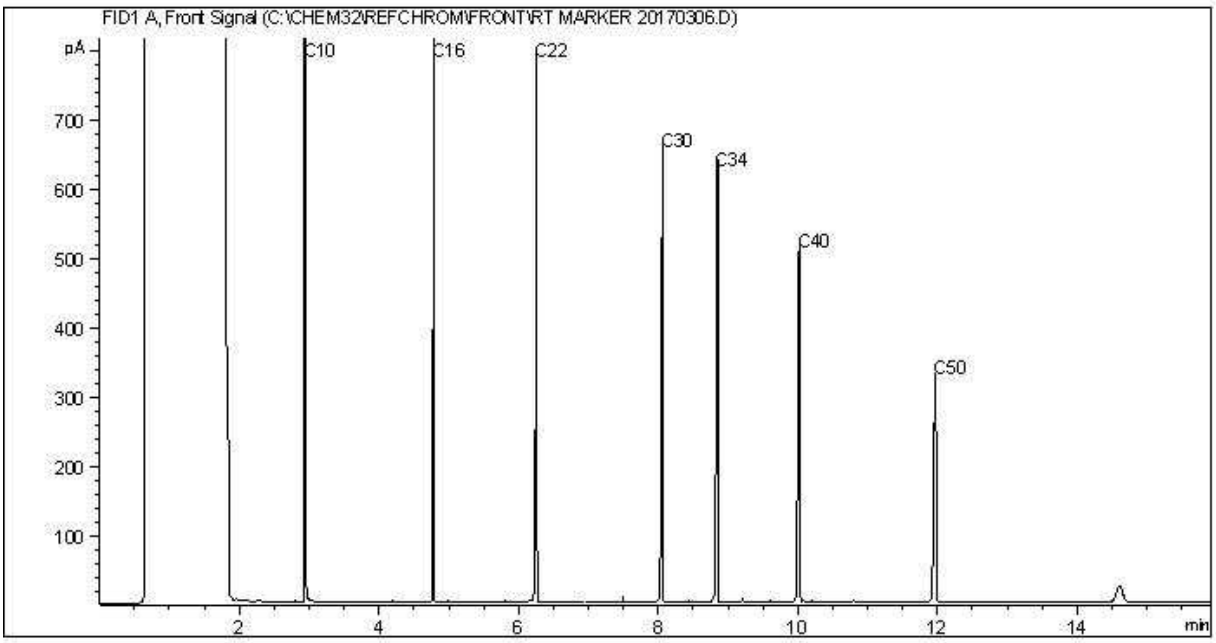
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: P2-21B

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+

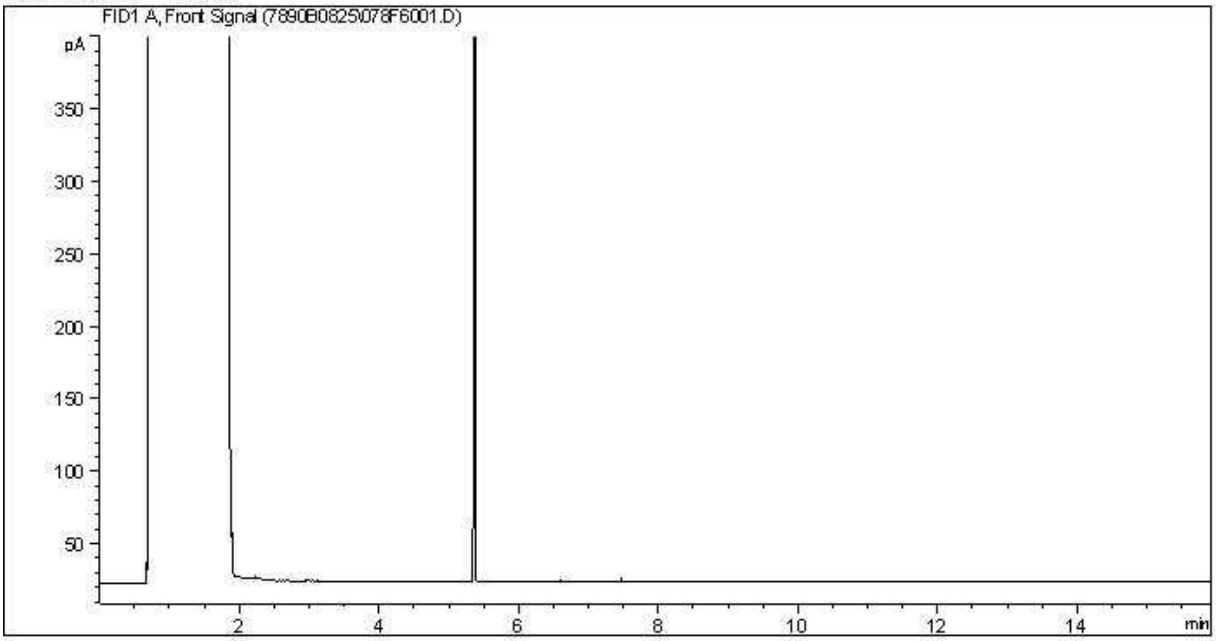
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871860
Report Date: 2018/08/30
Maxxam Sample: UD6422

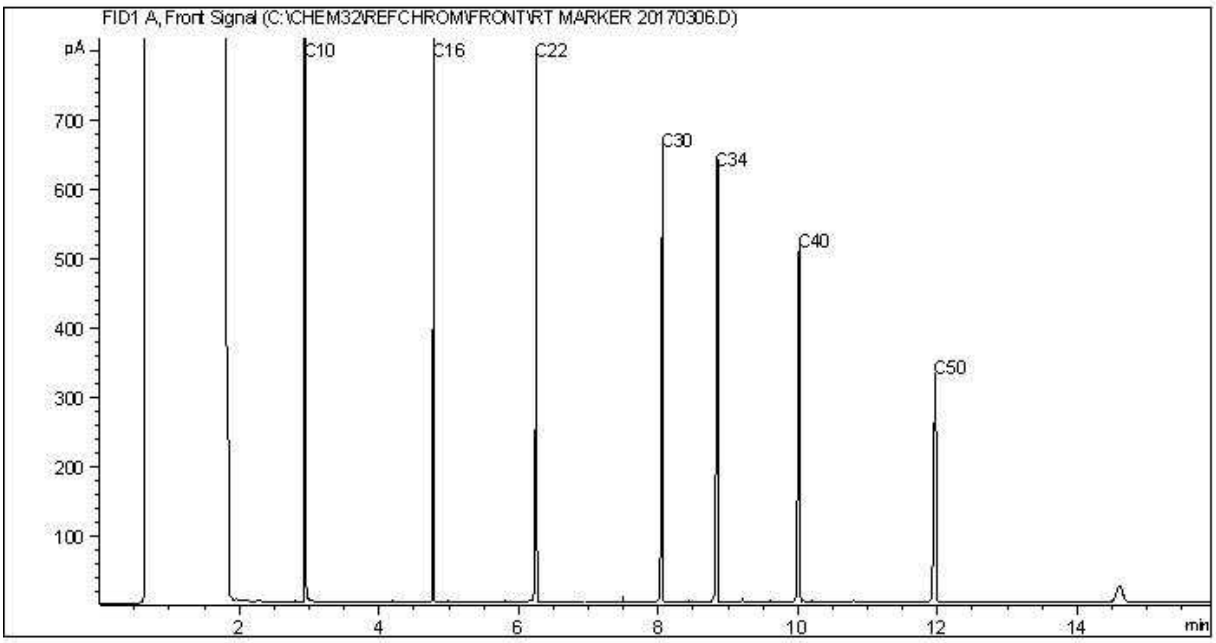
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: P2-22A

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+

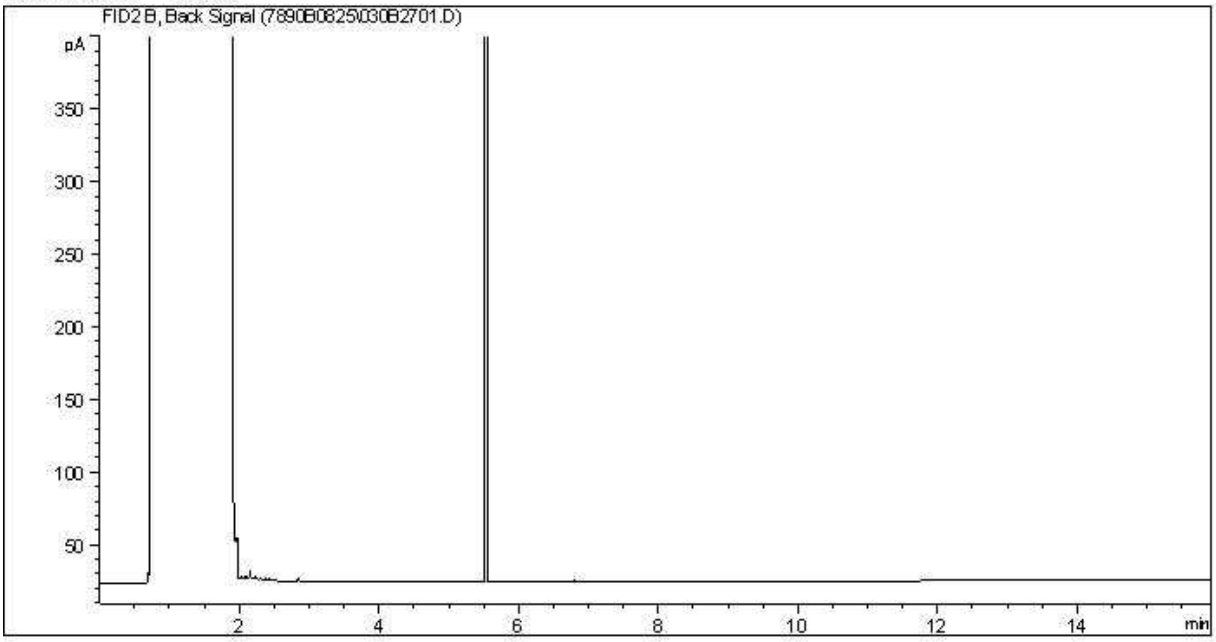
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871860
Report Date: 2018/08/30
Maxxam Sample: UD6423

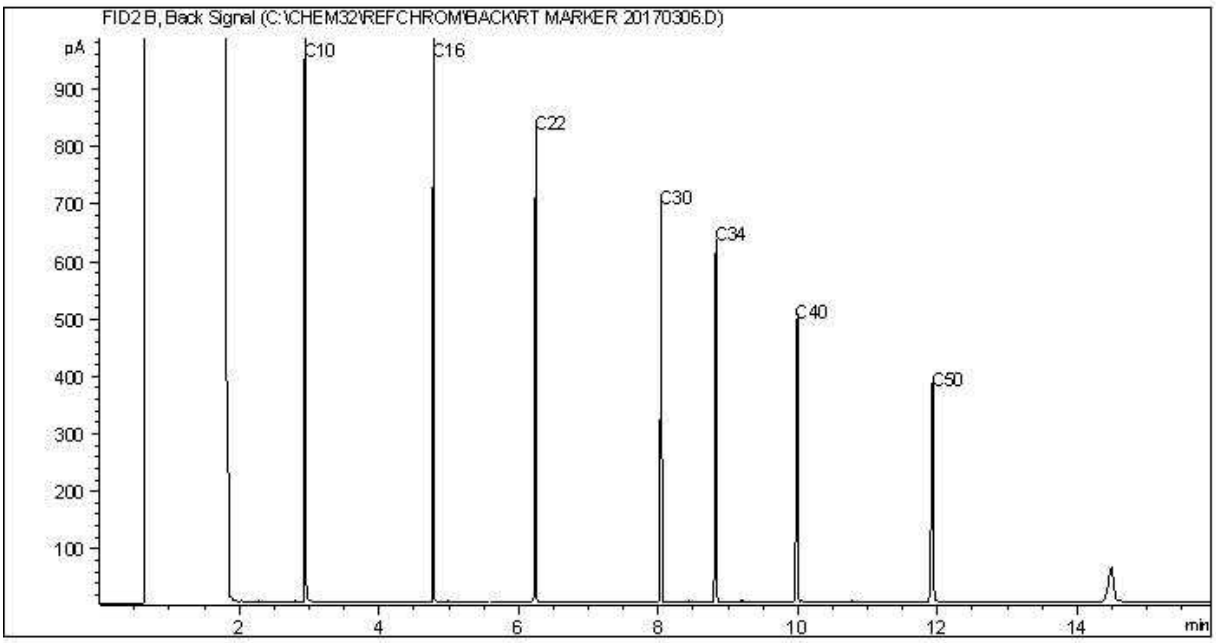
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: P2-22B

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+

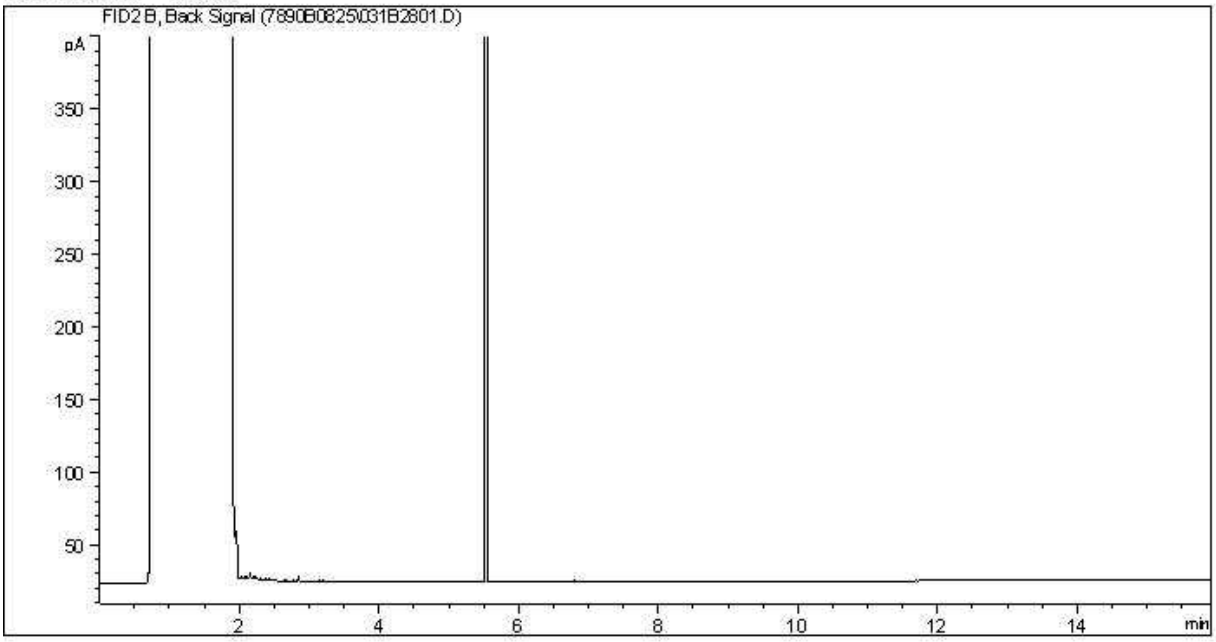
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871860
Report Date: 2018/08/30
Maxxam Sample: UD6424

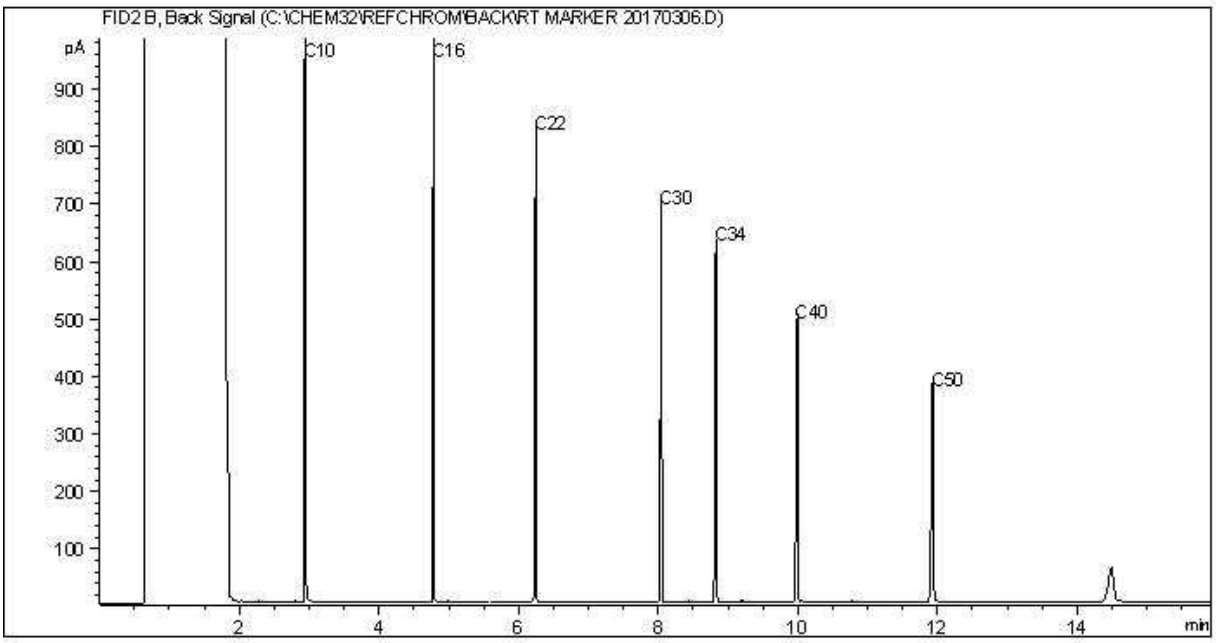
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: P2-23A

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+

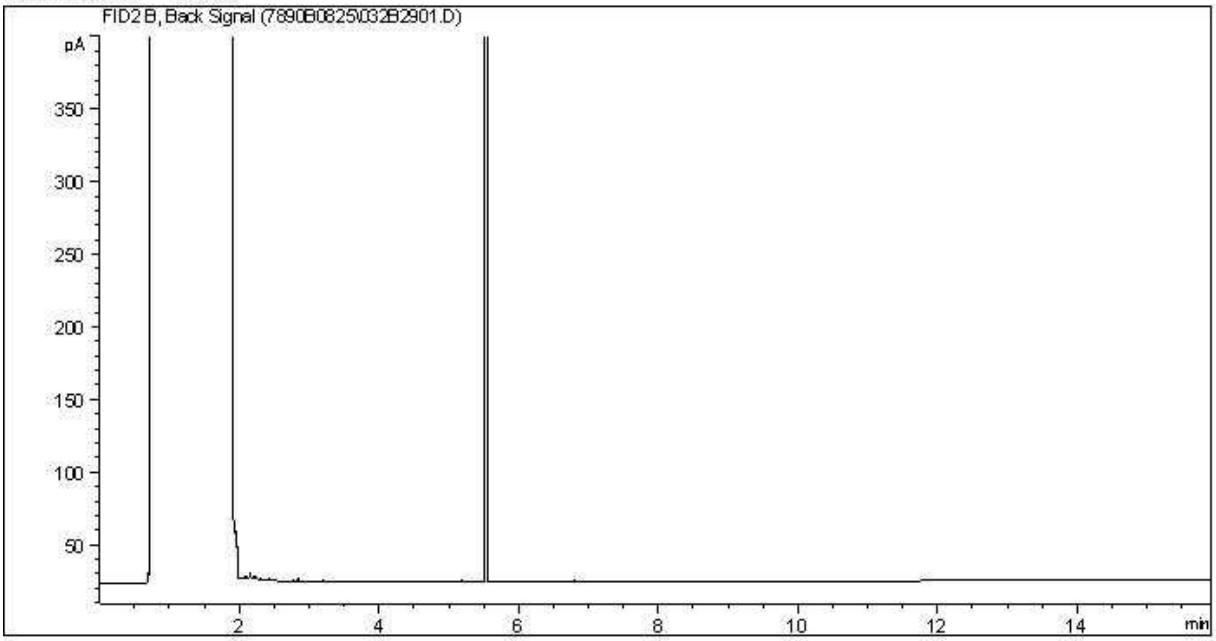
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871860
Report Date: 2018/08/30
Maxxam Sample: UD6425

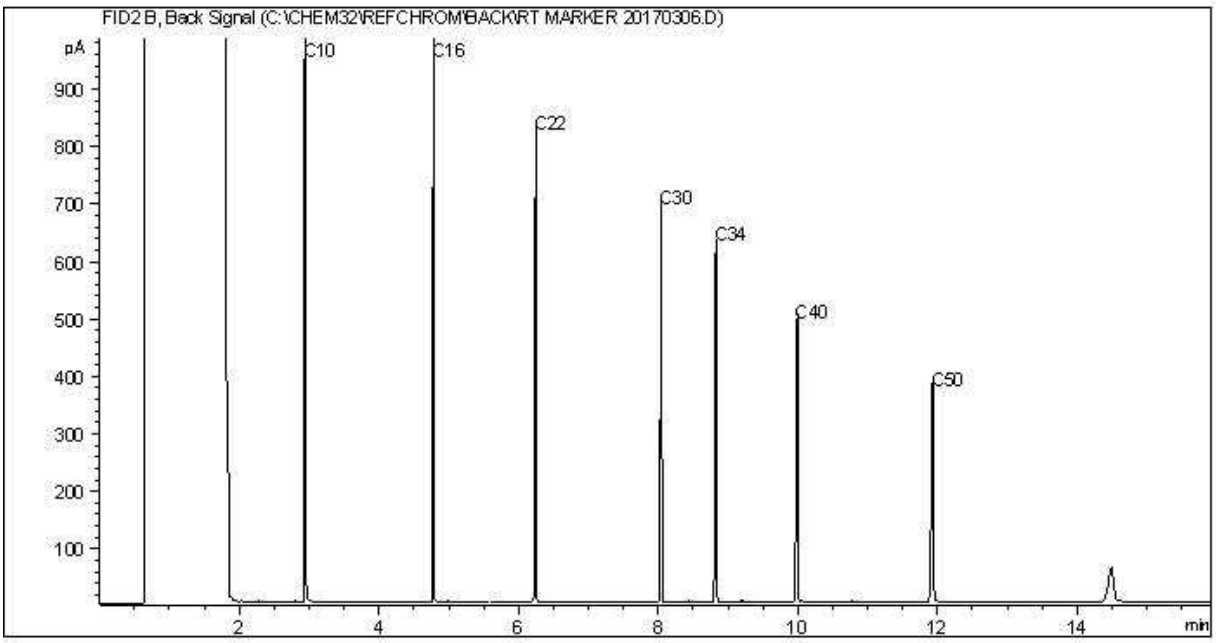
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: P2-23B

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+

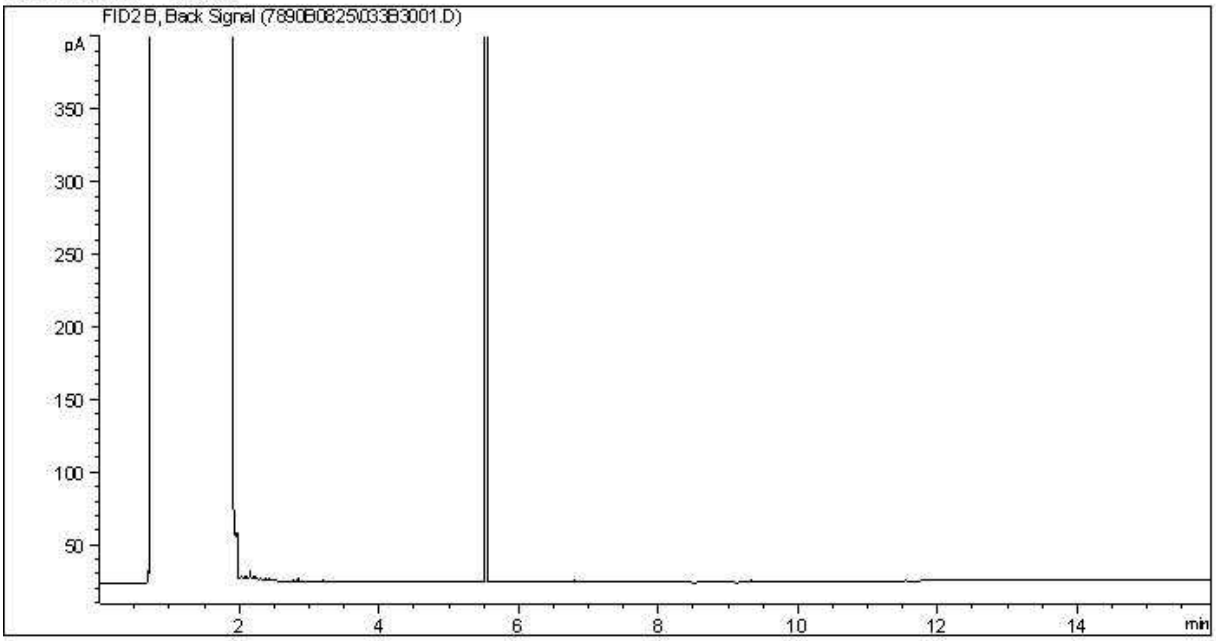
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871860
Report Date: 2018/08/30
Maxxam Sample: UD6426

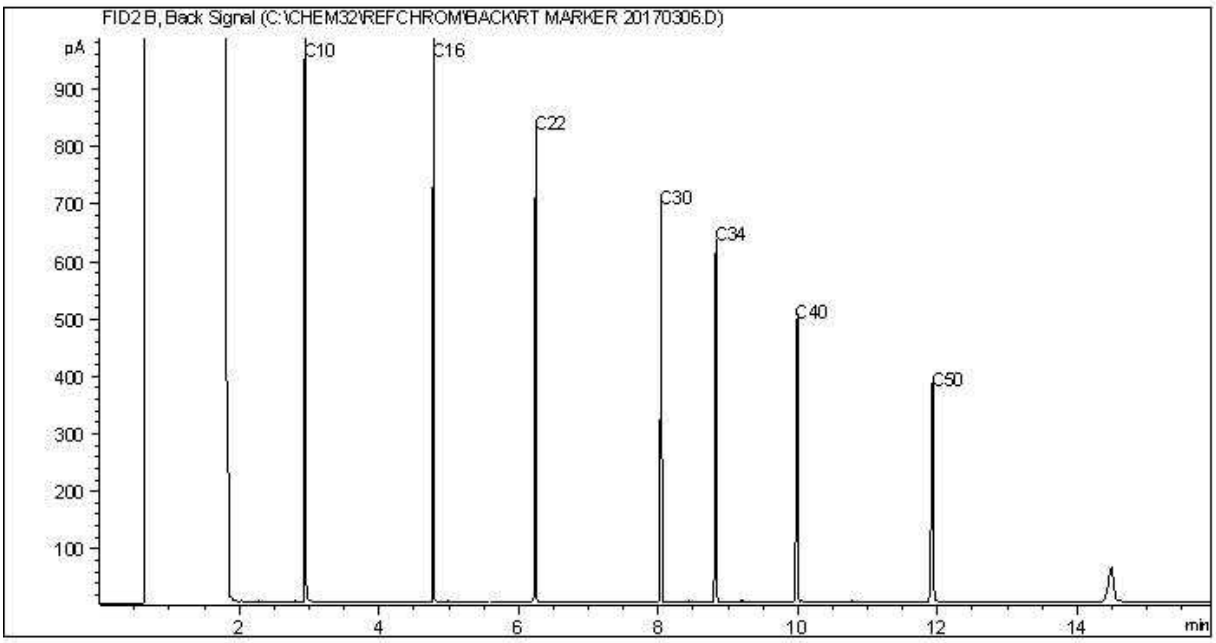
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: P2-24A

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+

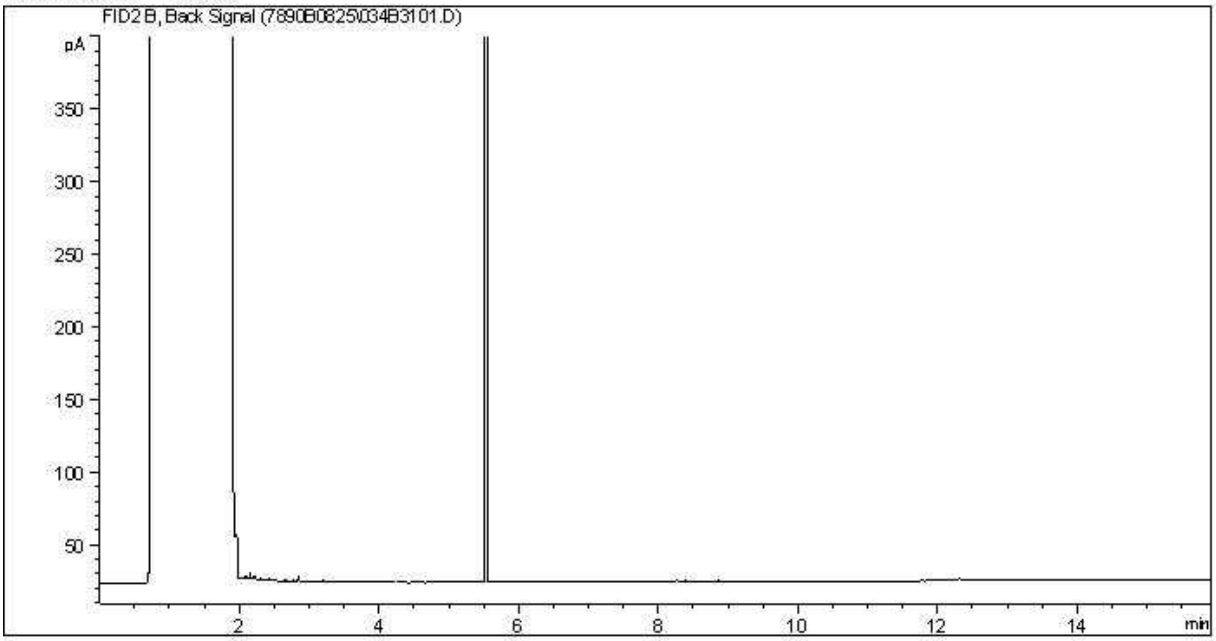
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871860
Report Date: 2018/08/30
Maxxam Sample: UD6427

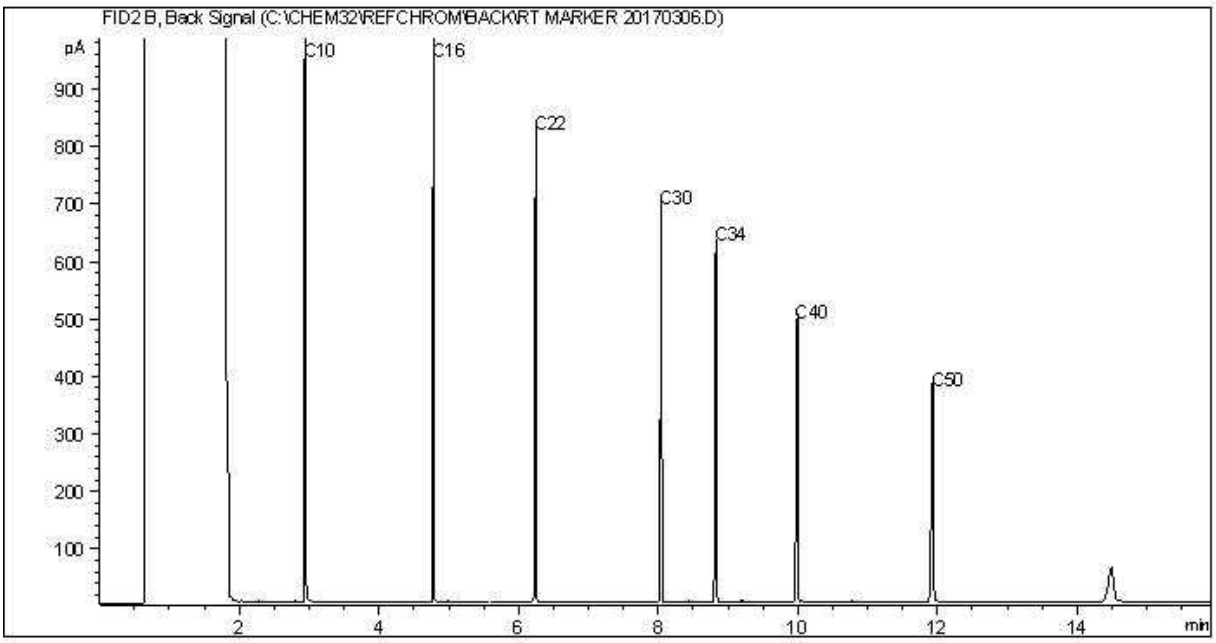
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: P2-24B

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+

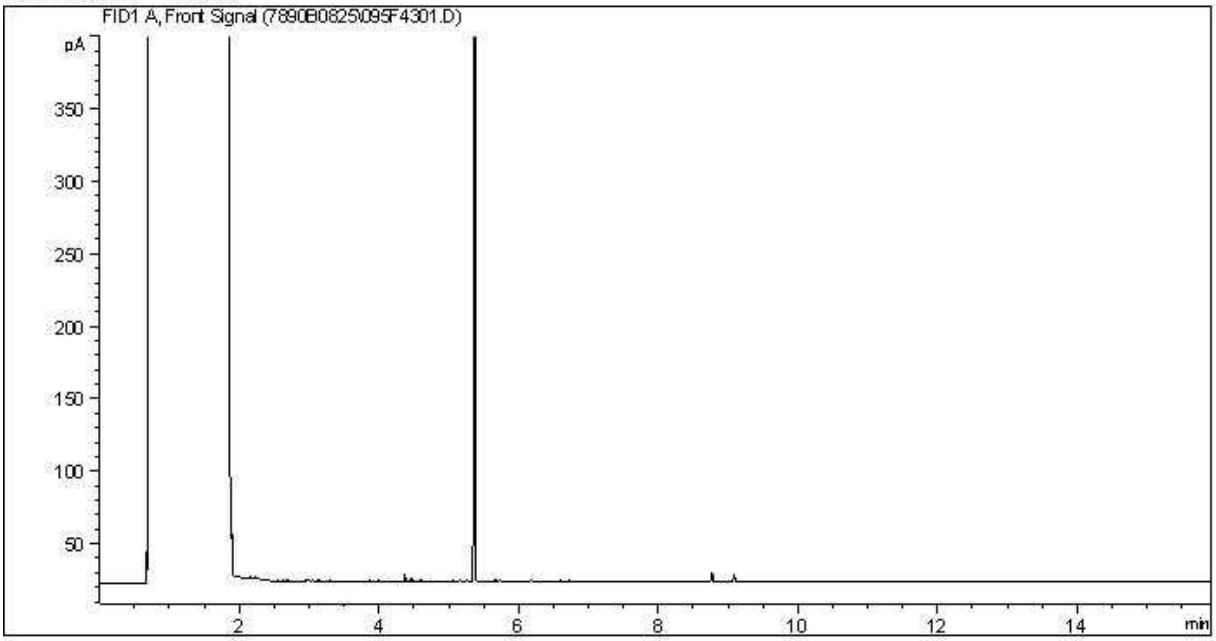
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871860
Report Date: 2018/08/30
Maxxam Sample: UD6440

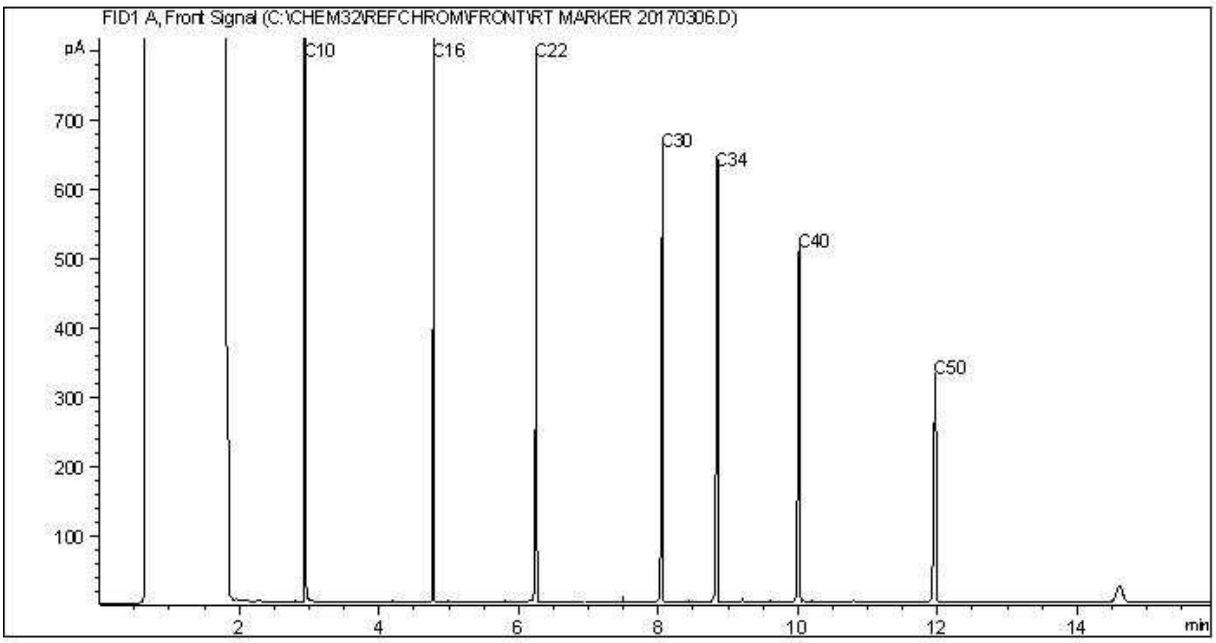
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: P2-25A

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+

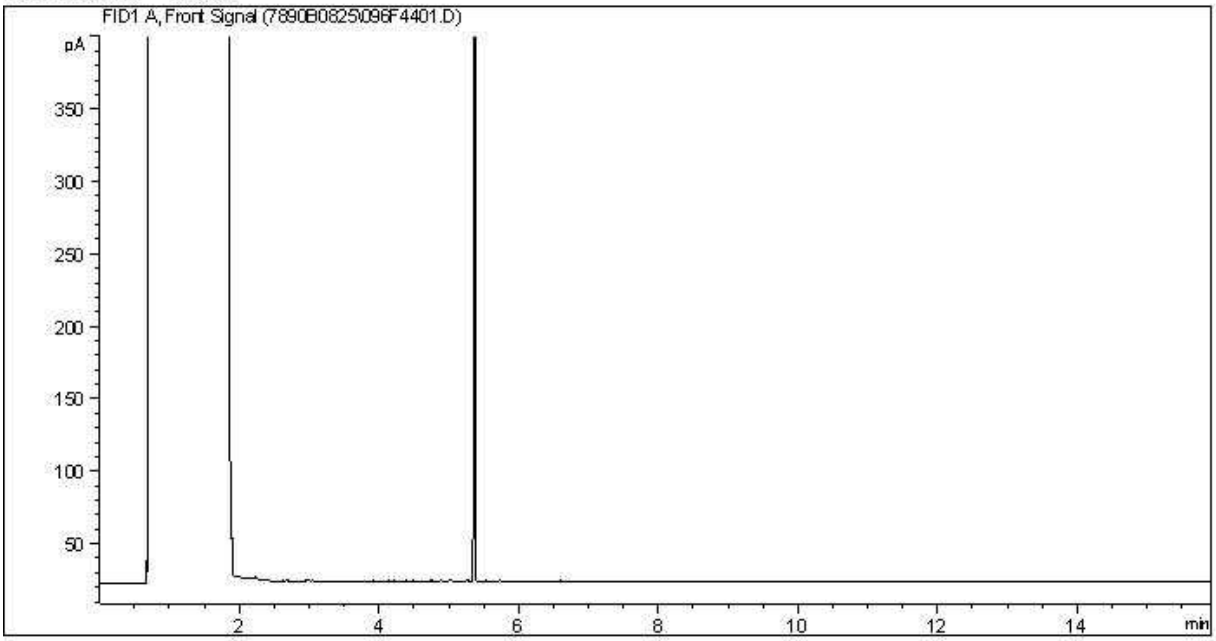
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871860
Report Date: 2018/08/30
Maxxam Sample: UD6441

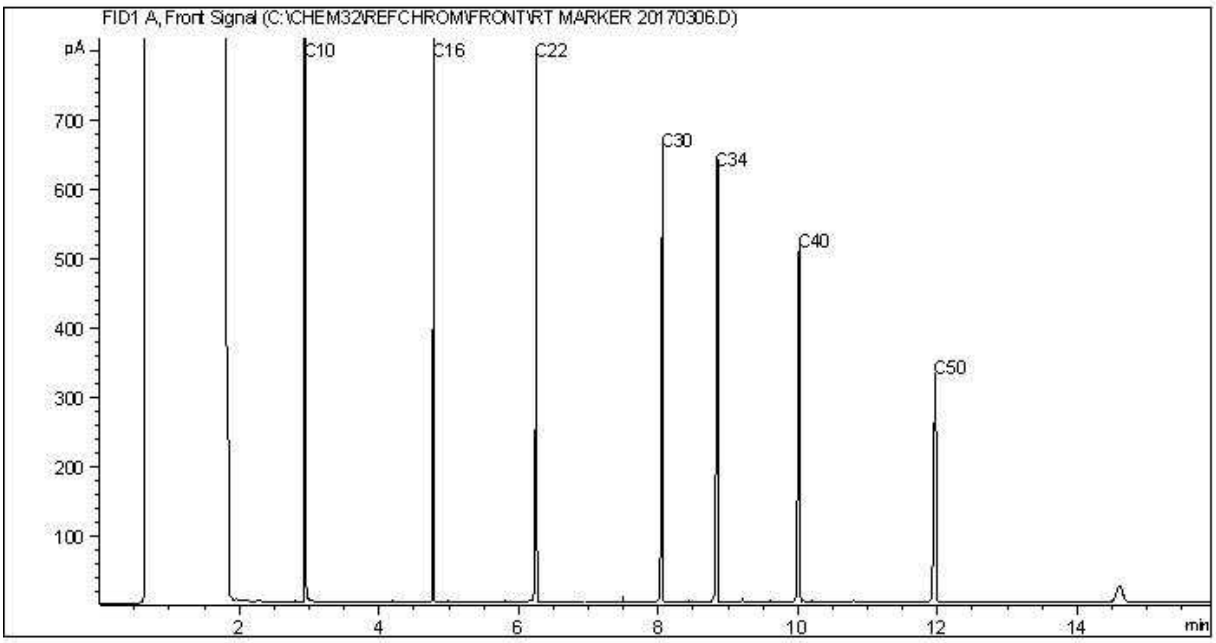
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: P2-25B

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+

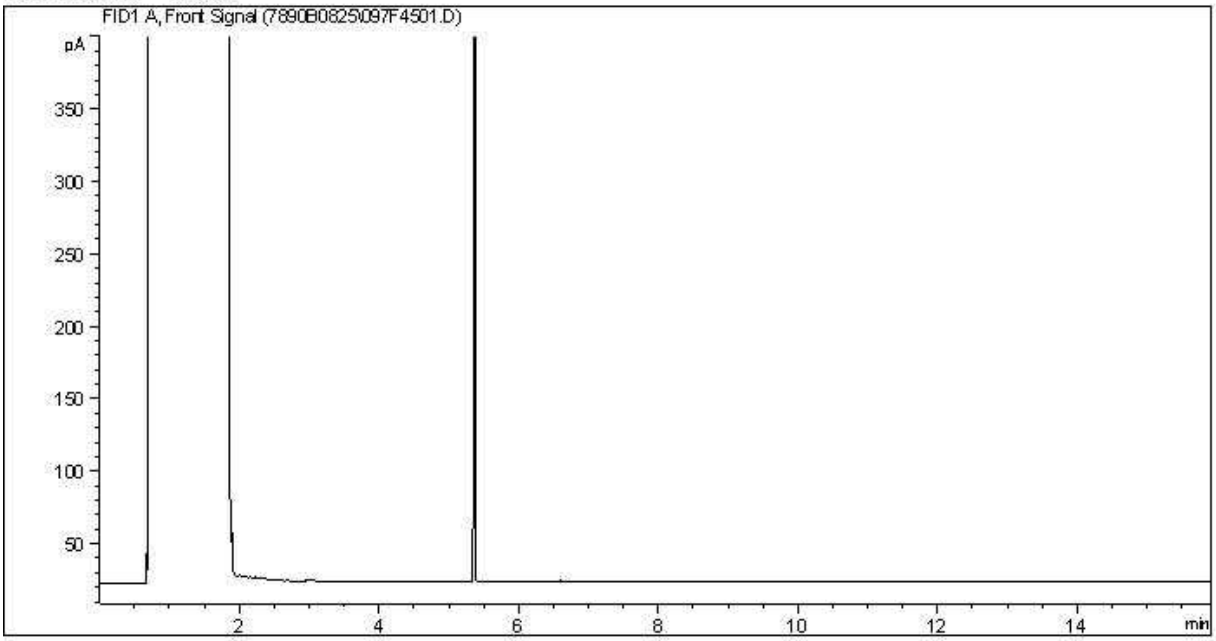
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871860
Report Date: 2018/08/30
Maxxam Sample: UD6442

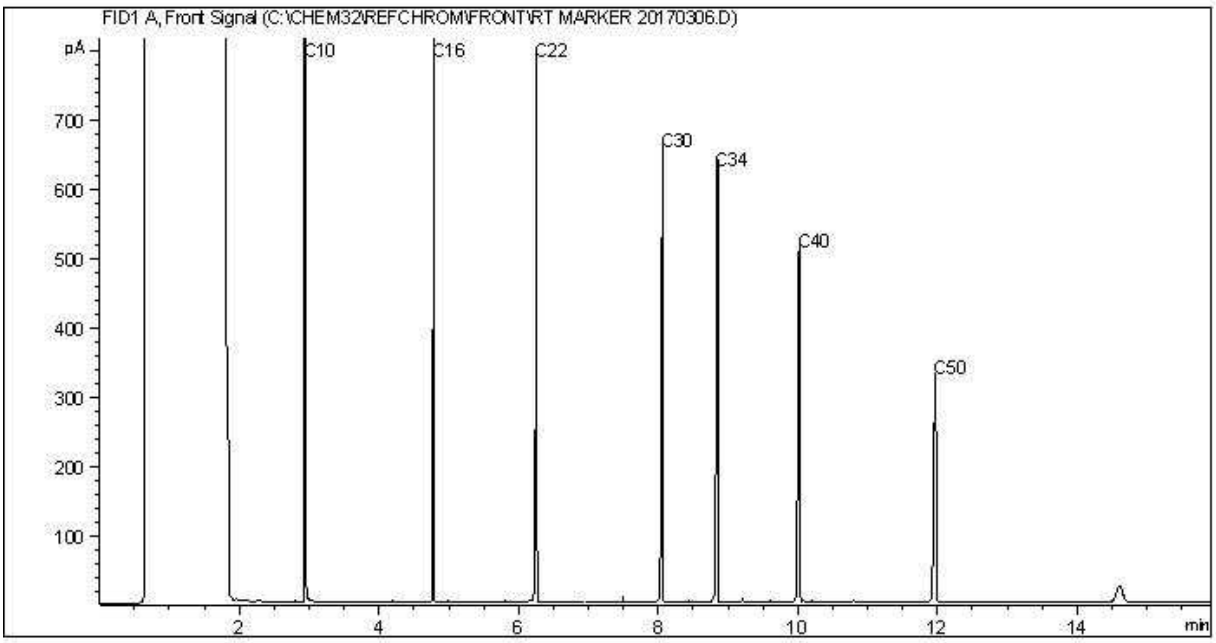
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: P2-26A

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+

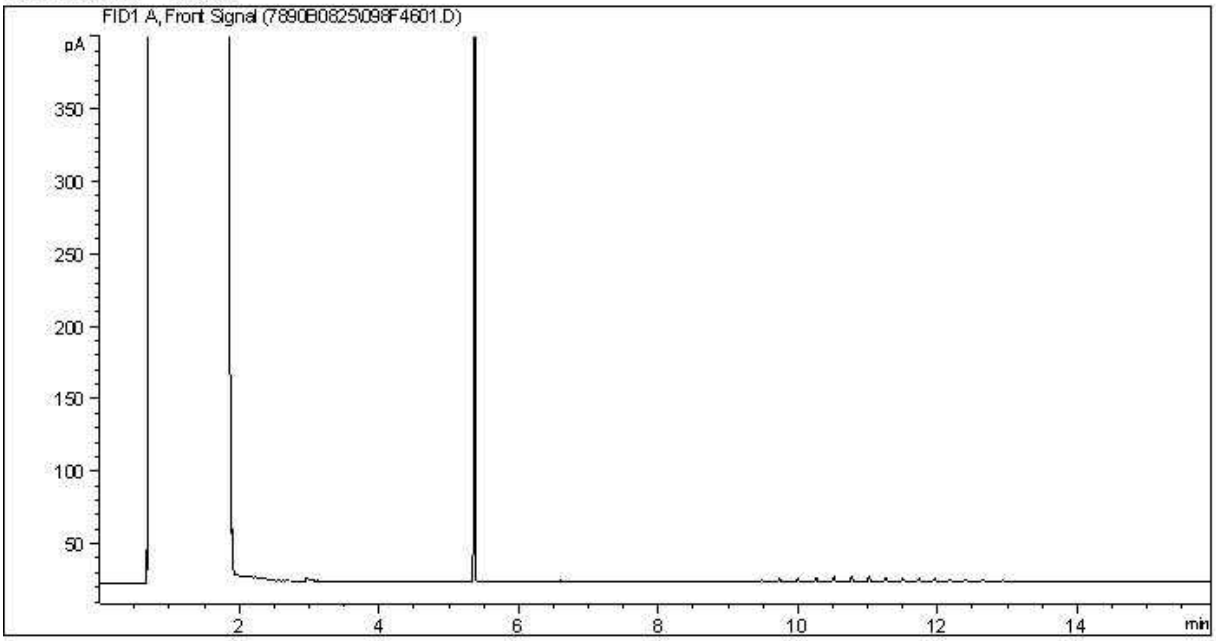
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871860
Report Date: 2018/08/30
Maxxam Sample: UD6443

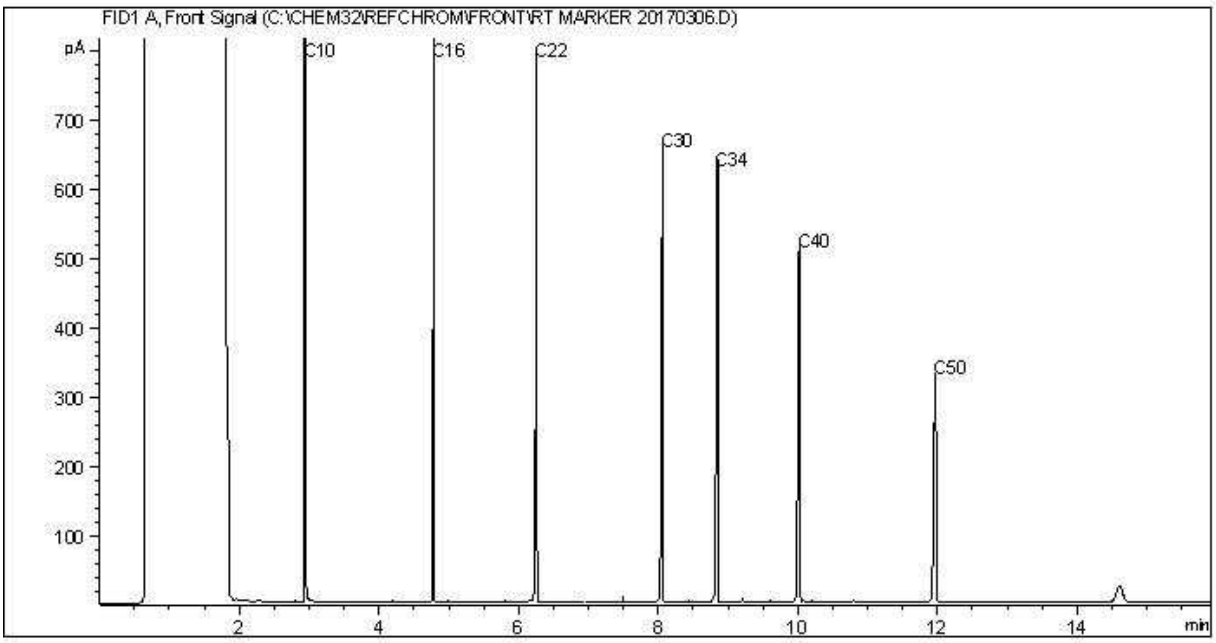
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: P2-26B

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+

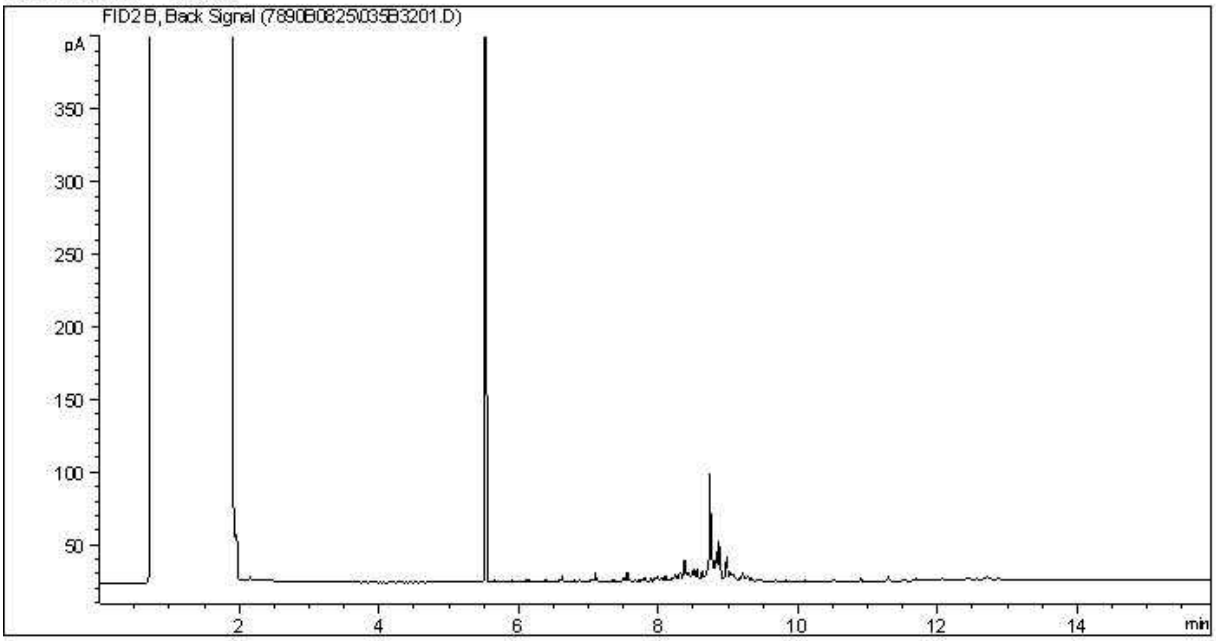
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871860
Report Date: 2018/08/30
Maxxam Sample: UD6444

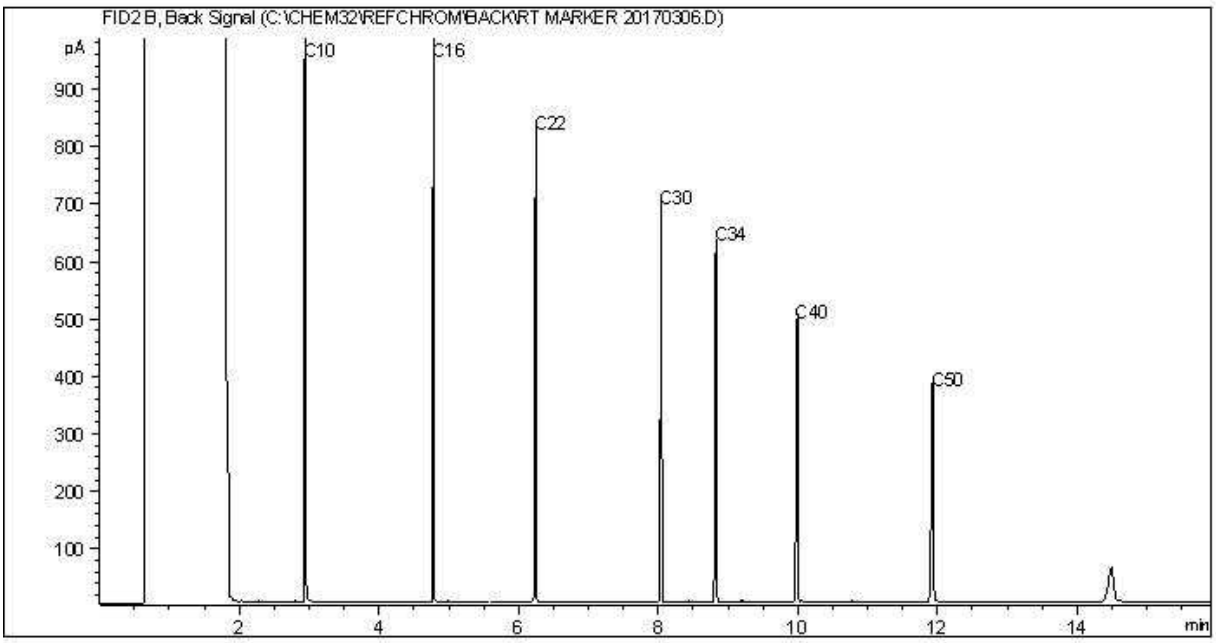
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: P2-27A

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+

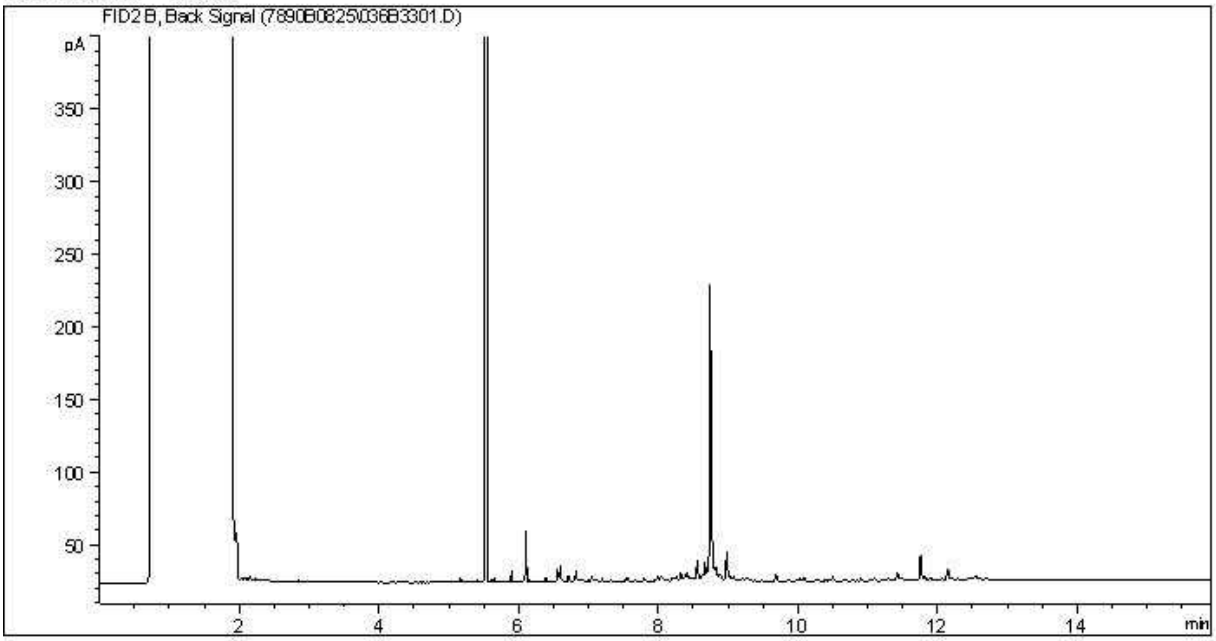
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871860
Report Date: 2018/08/30
Maxxam Sample: UD6445

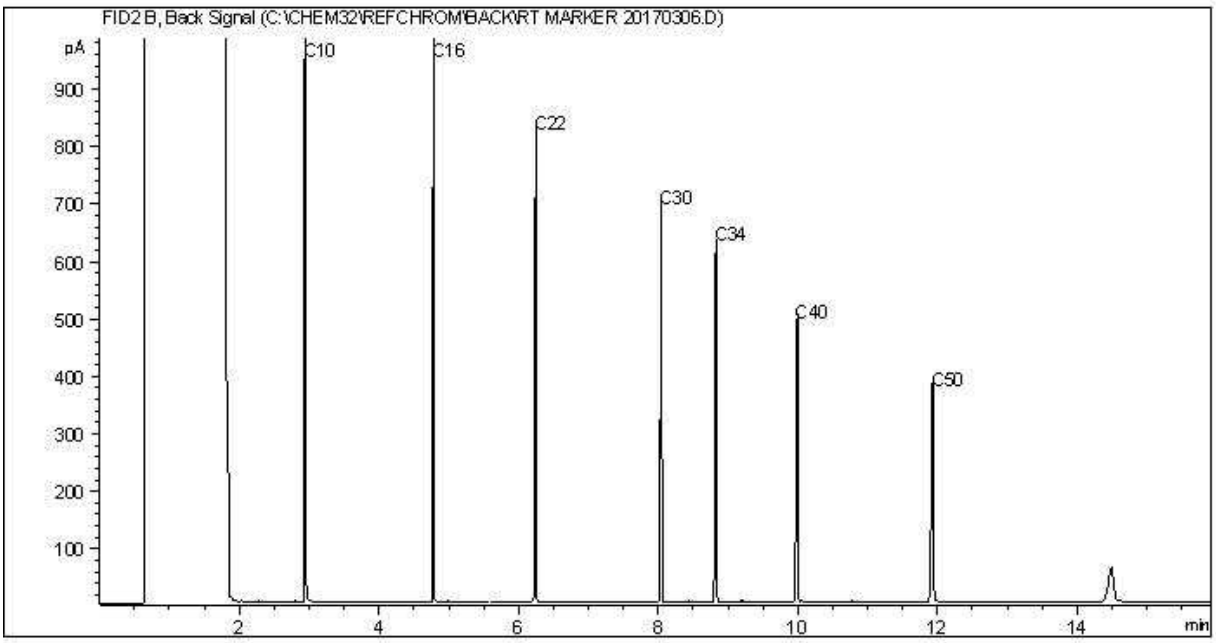
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: P2-27B

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+

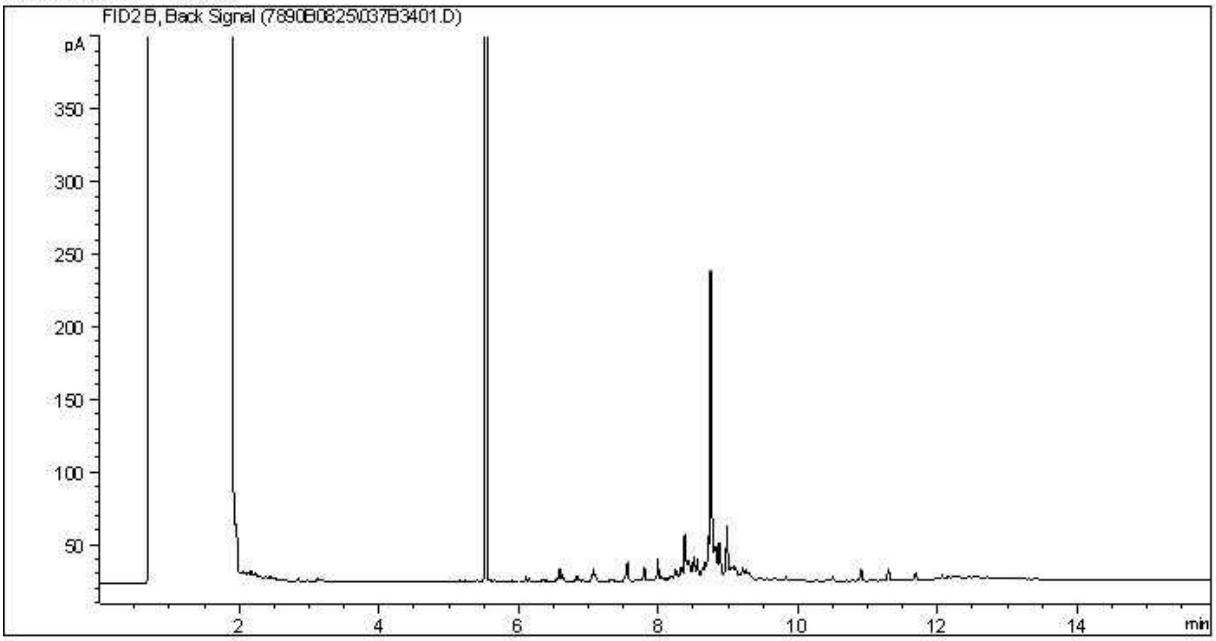
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871860
Report Date: 2018/08/30
Maxxam Sample: UD6446

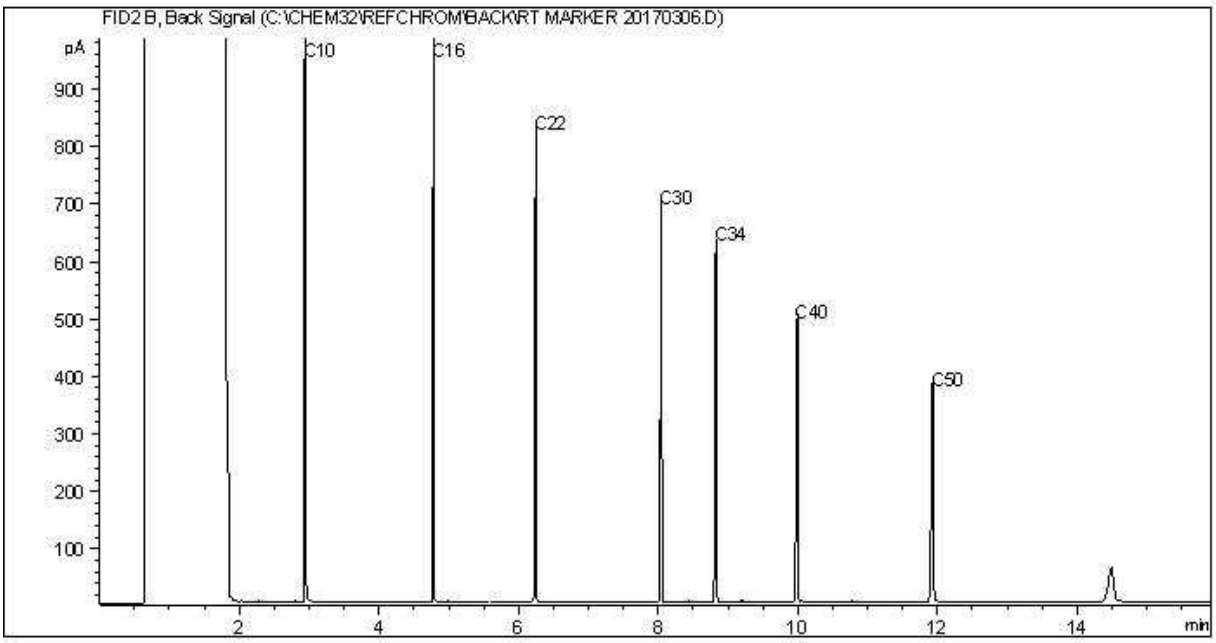
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: P2-28A

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+

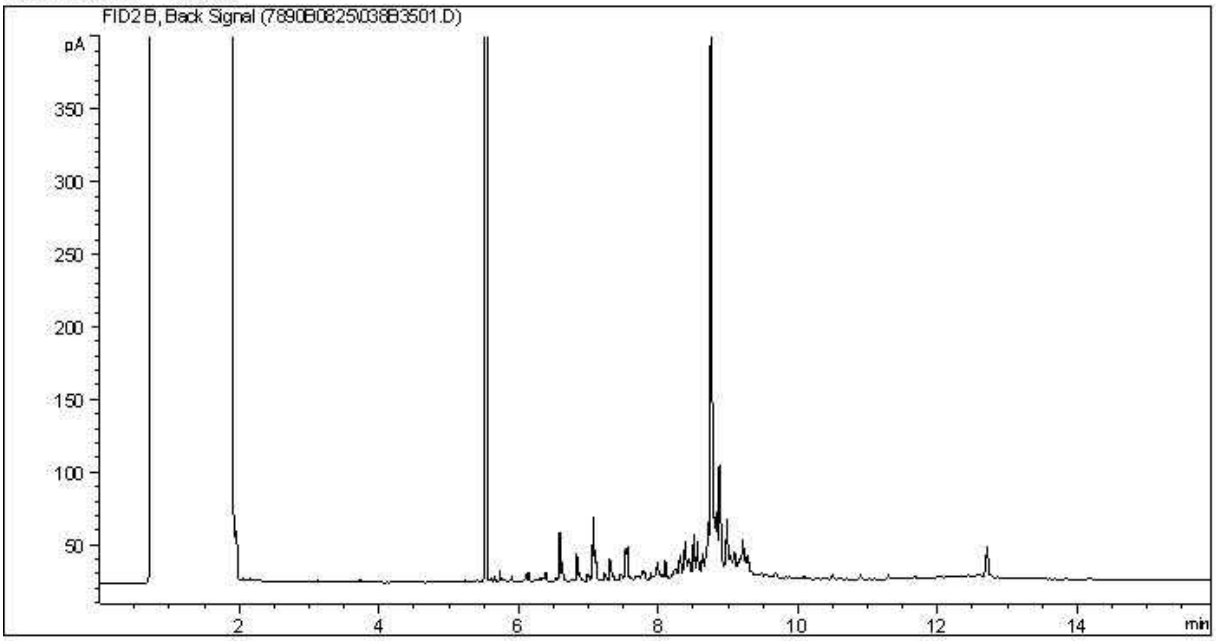
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871860
Report Date: 2018/08/30
Maxxam Sample: UD6447

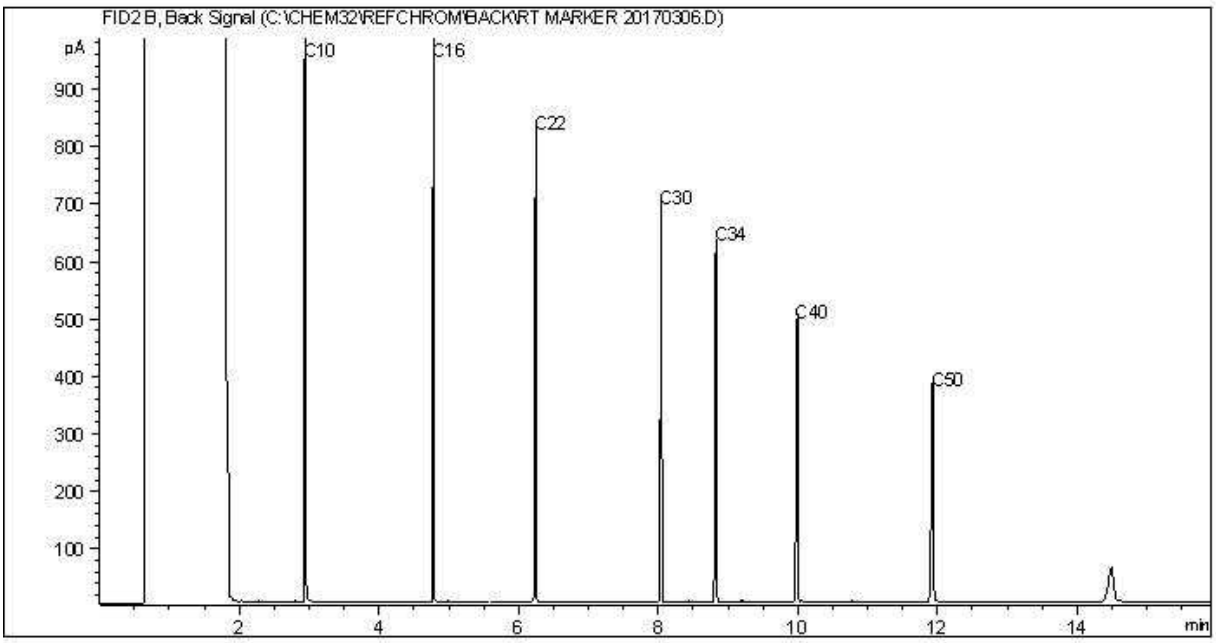
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: P2-28B

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+

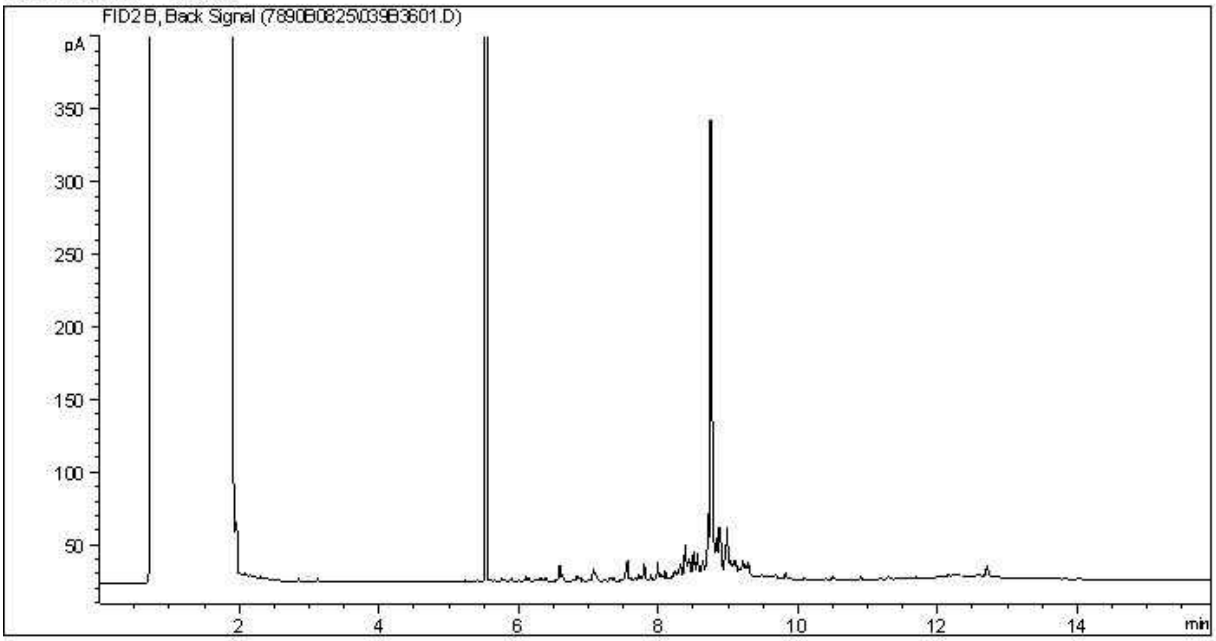
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871860
Report Date: 2018/08/30
Maxxam Sample: UD6448

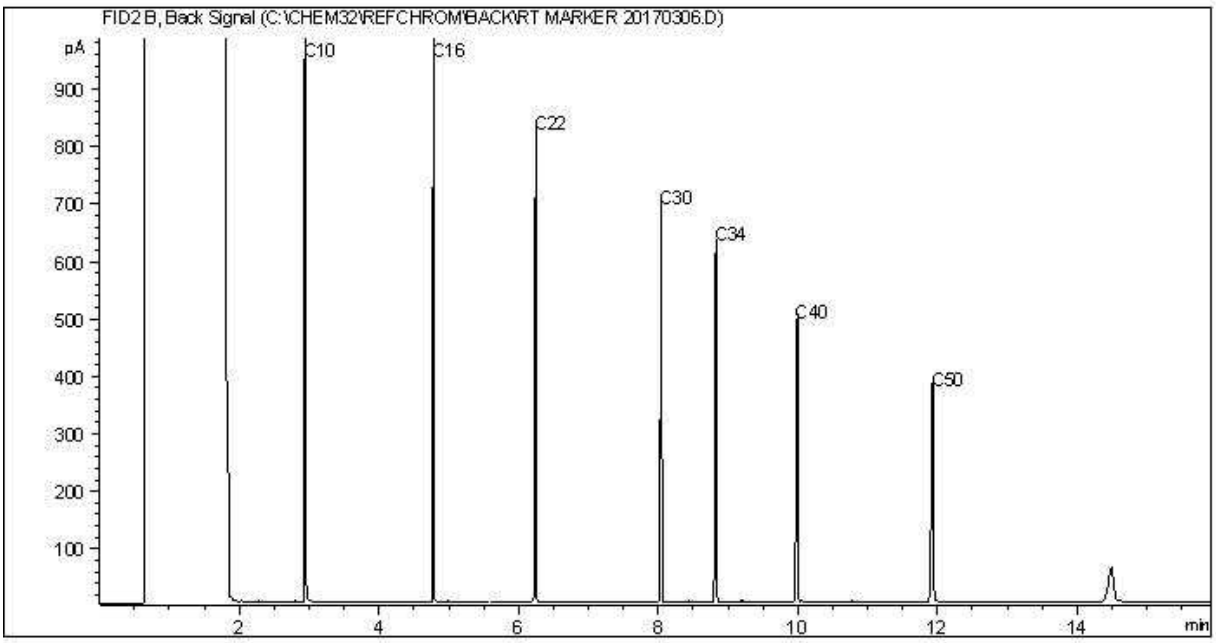
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: P2-29A

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+

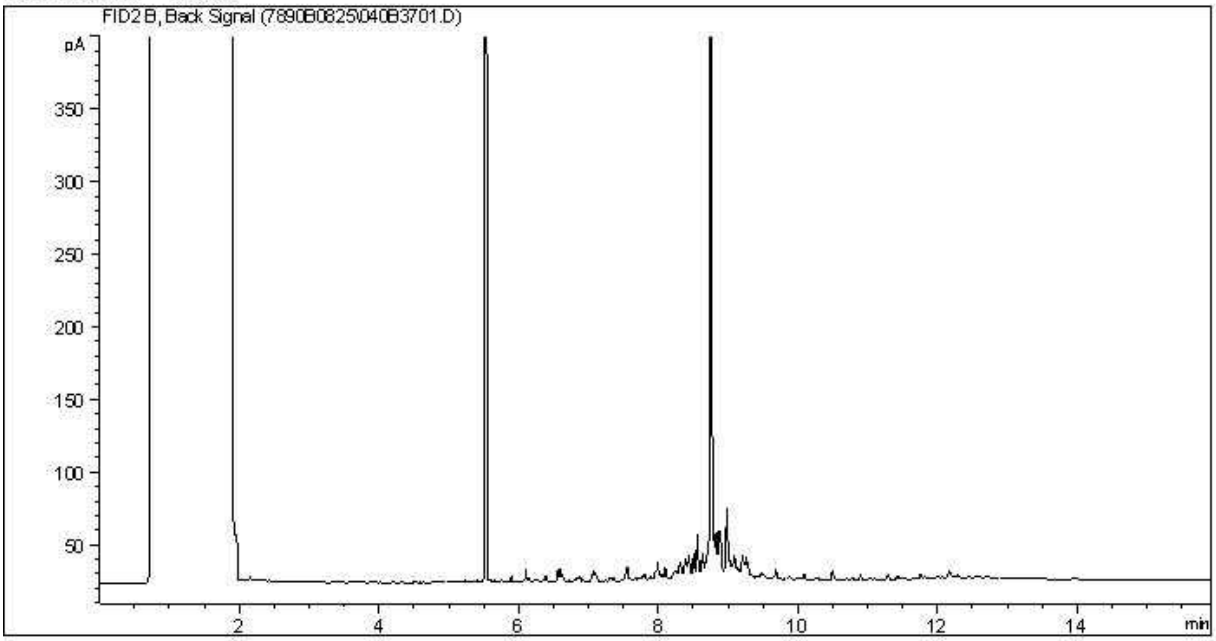
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871860
Report Date: 2018/08/30
Maxxam Sample: UD6449

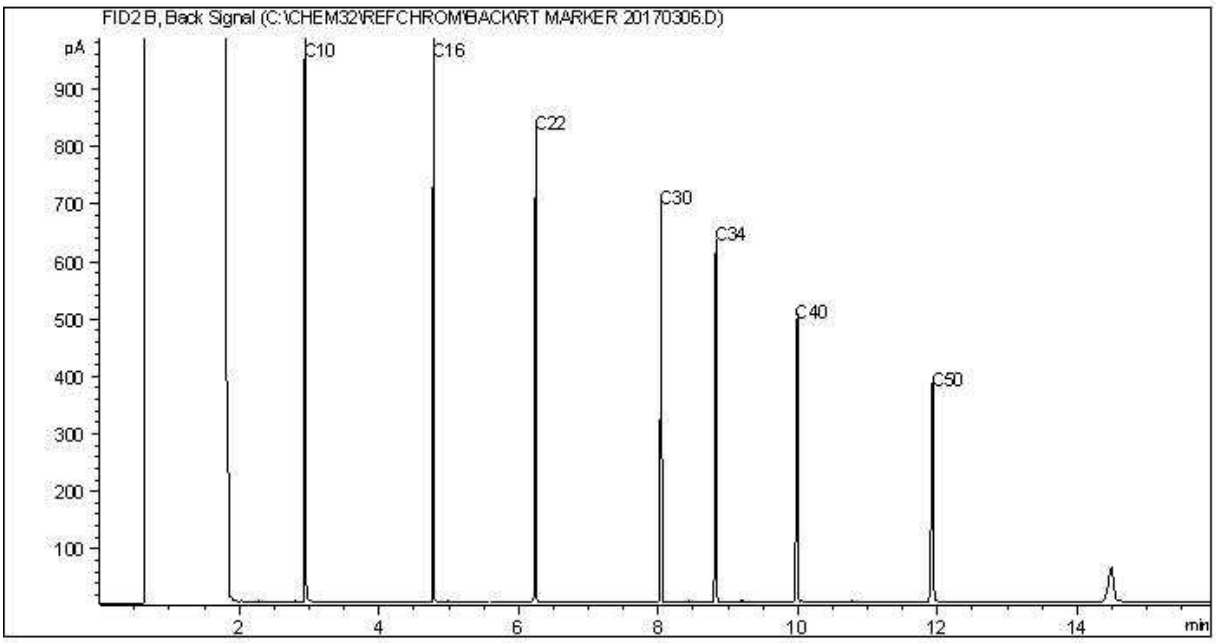
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: P2-29B

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+

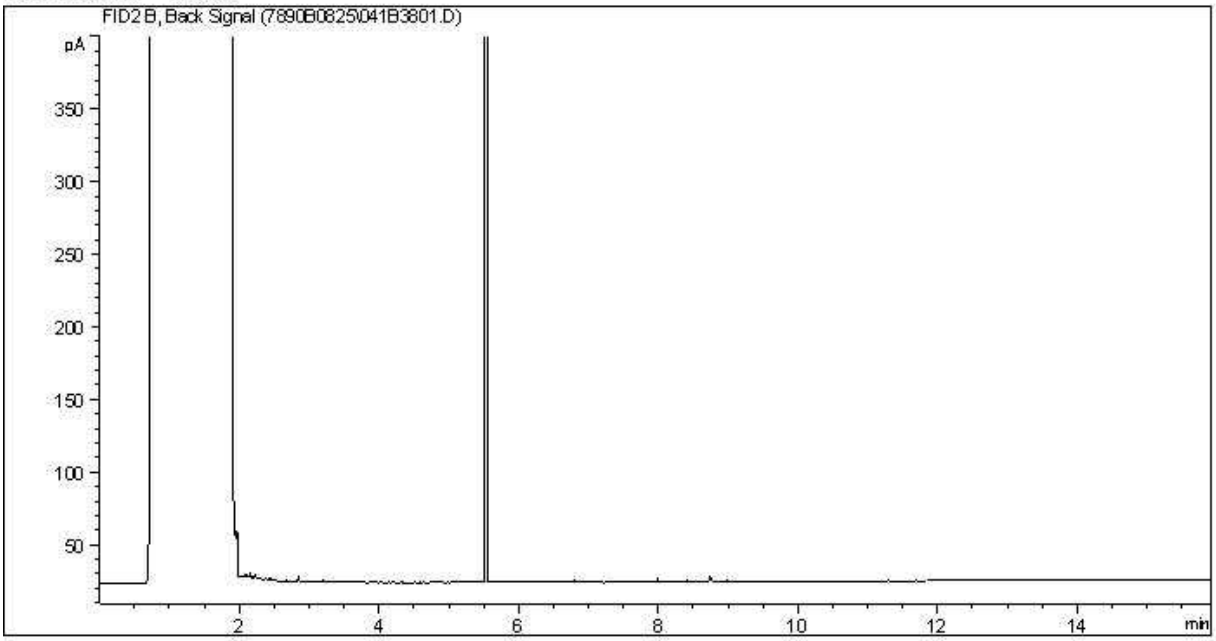
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871860
Report Date: 2018/08/30
Maxxam Sample: UD6450

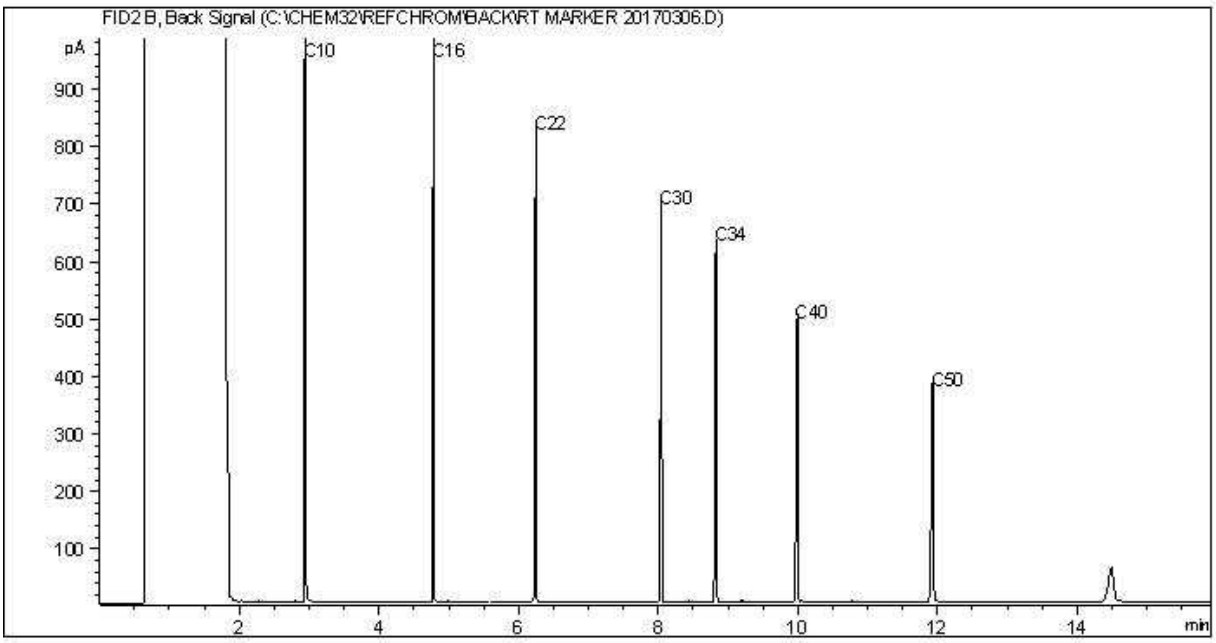
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: P2-30A

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+

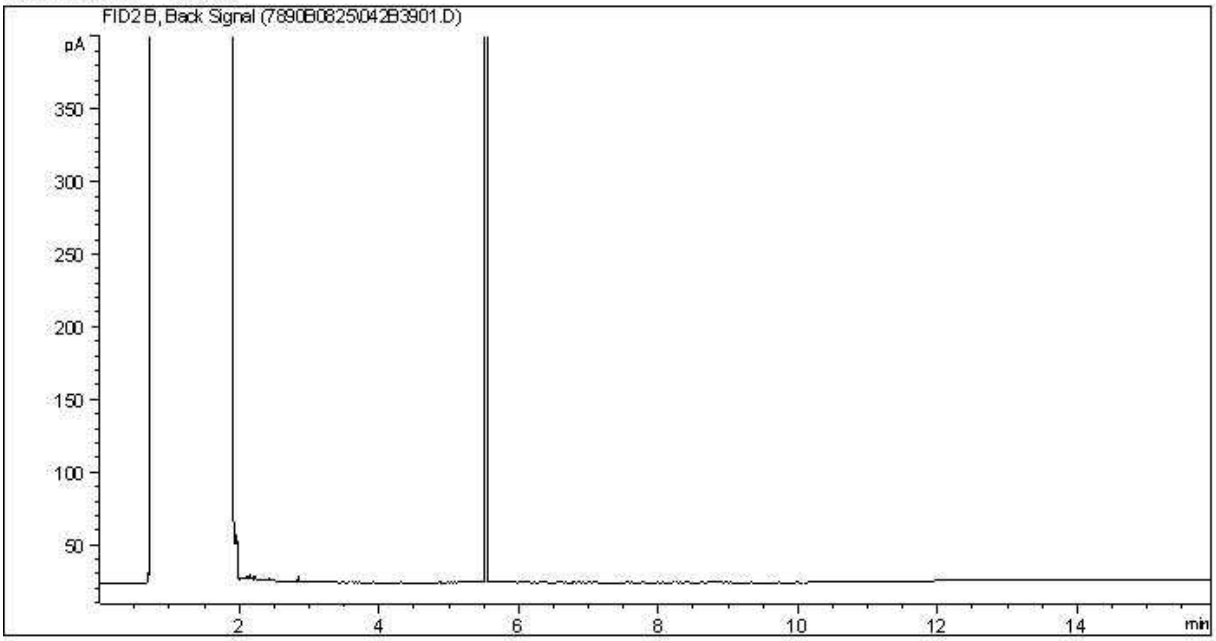
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871860
Report Date: 2018/08/30
Maxxam Sample: UD6451

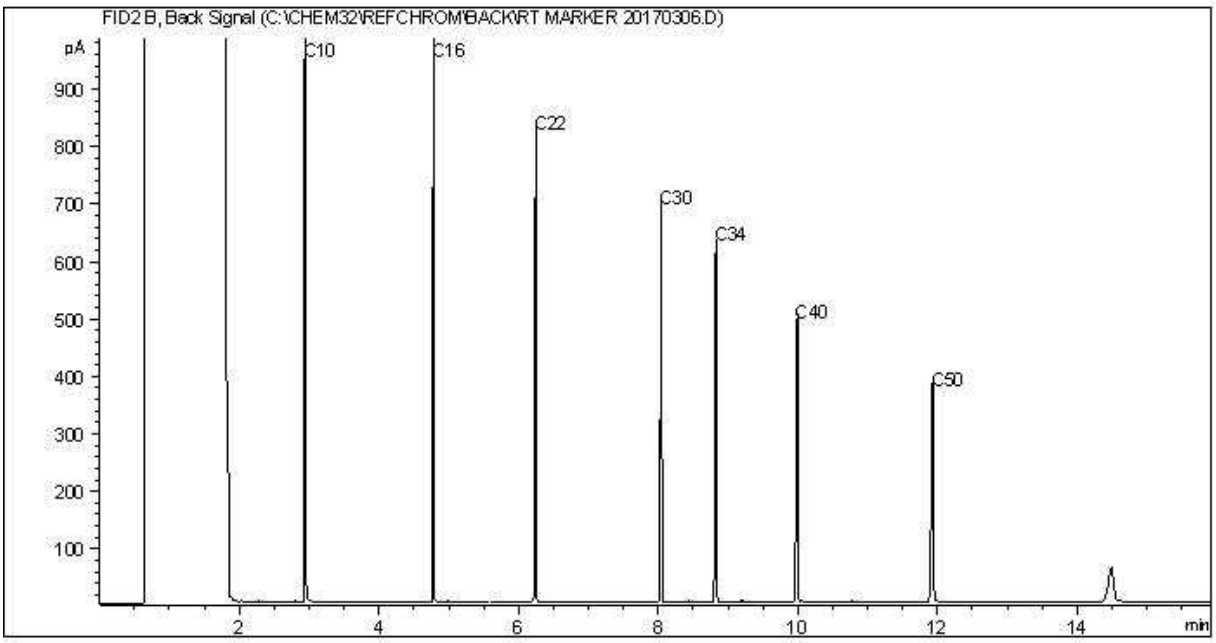
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: P2-30B

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+

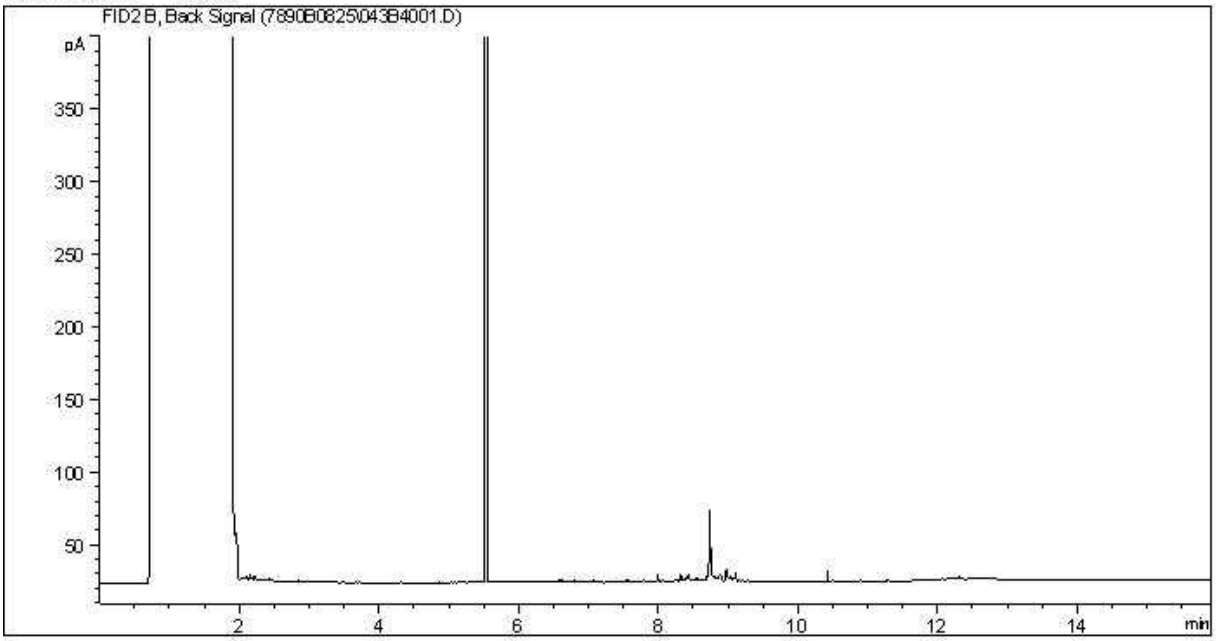
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871860
Report Date: 2018/08/30
Maxxam Sample: UD6472

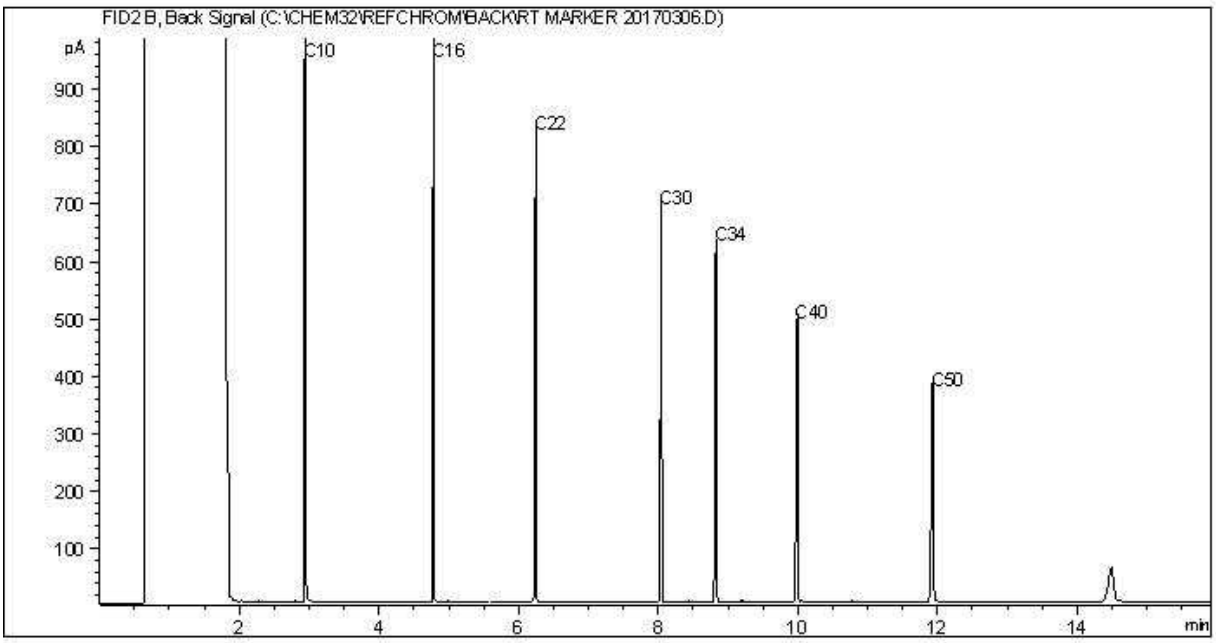
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: MW-01A

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+

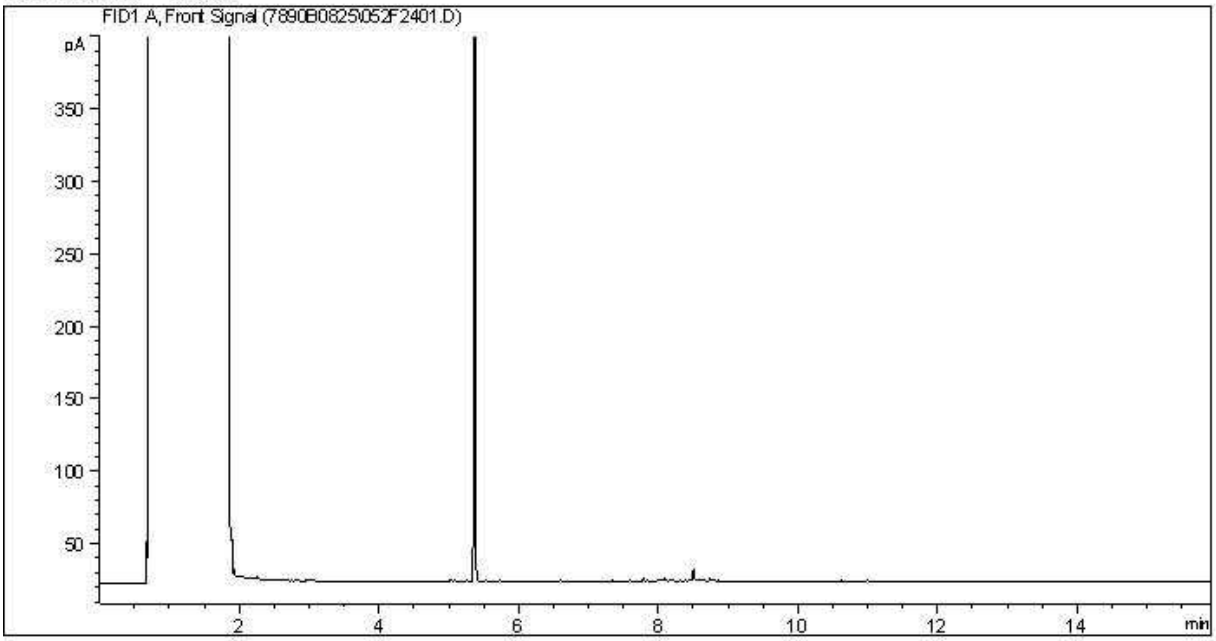
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871860
Report Date: 2018/08/30
Maxxam Sample: UD6473

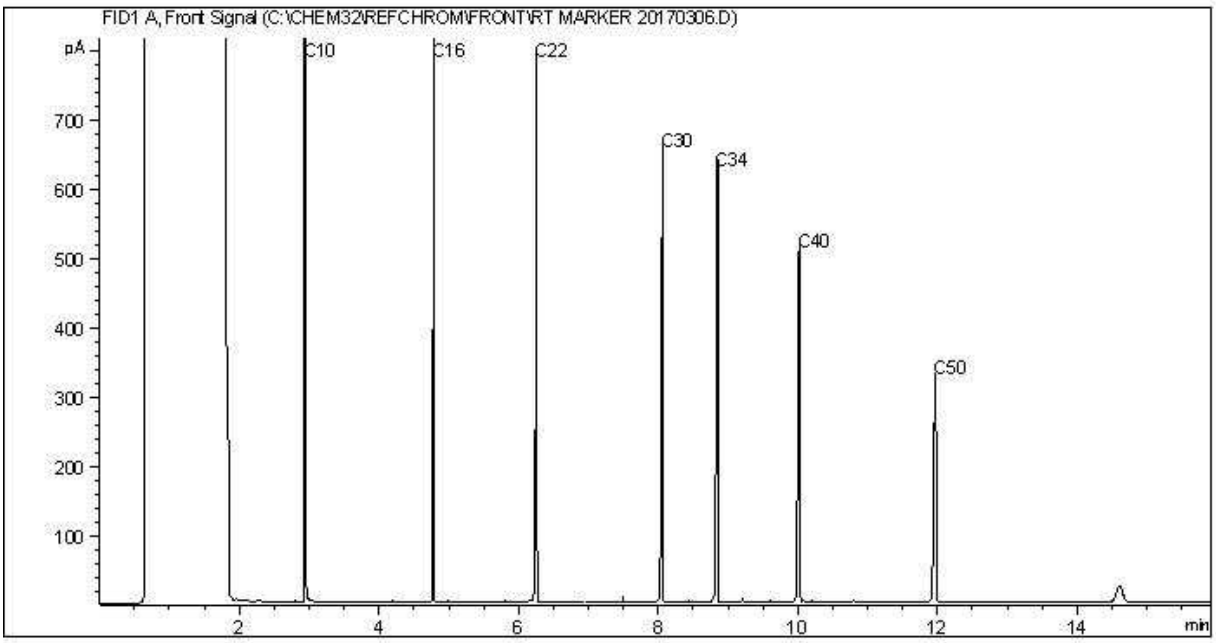
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: MW-01B

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+

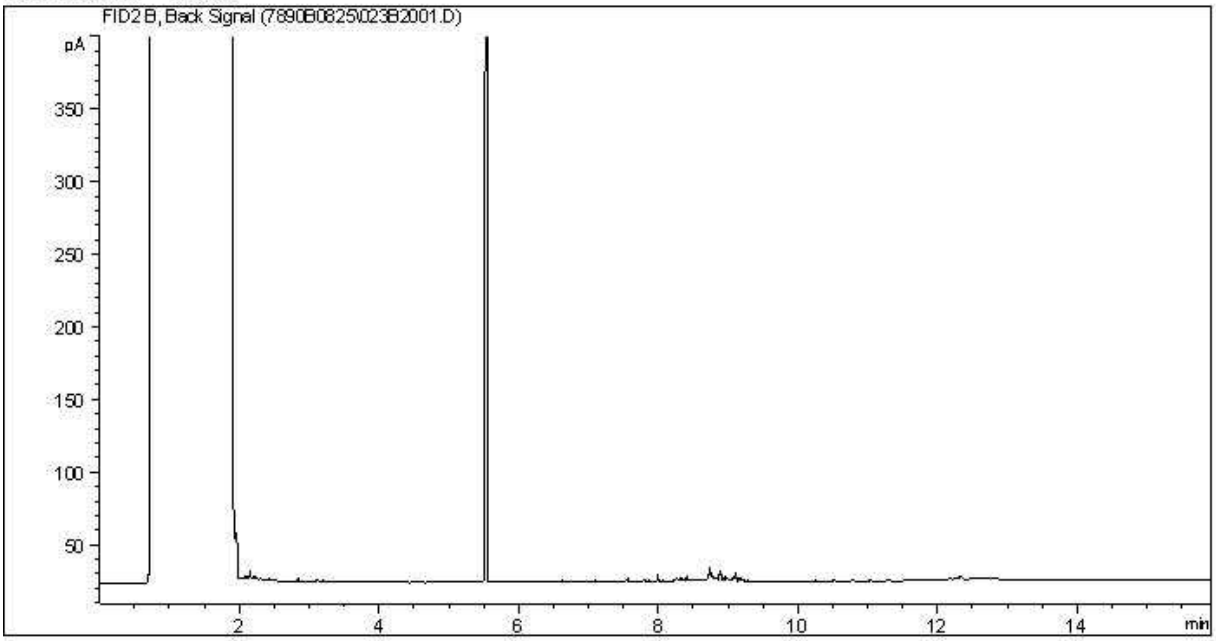
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871860
Report Date: 2018/08/30
Maxxam Sample: UD6474

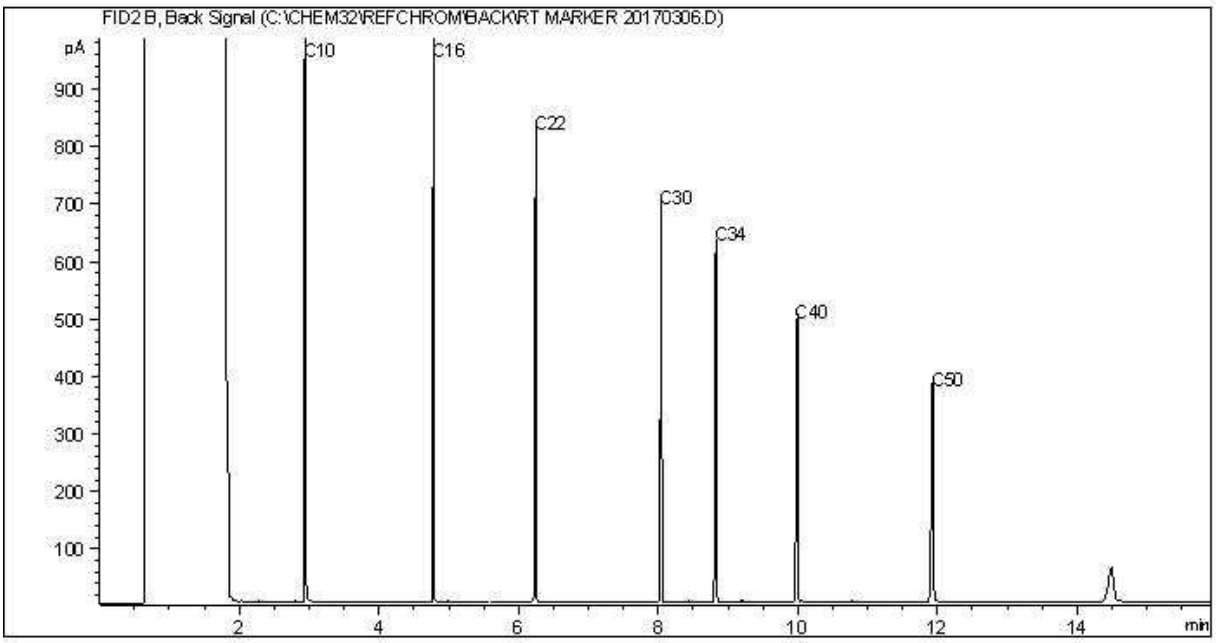
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: MW-02A

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+

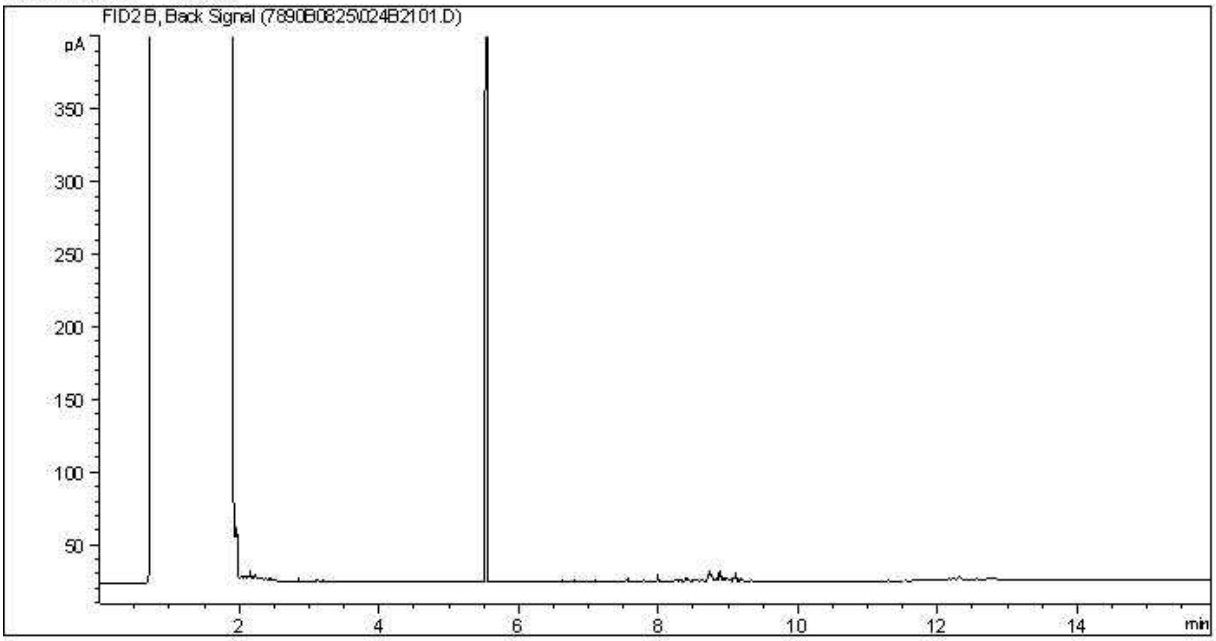
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871860
Report Date: 2018/08/30
Maxxam Sample: UD6474 Lab-Dup

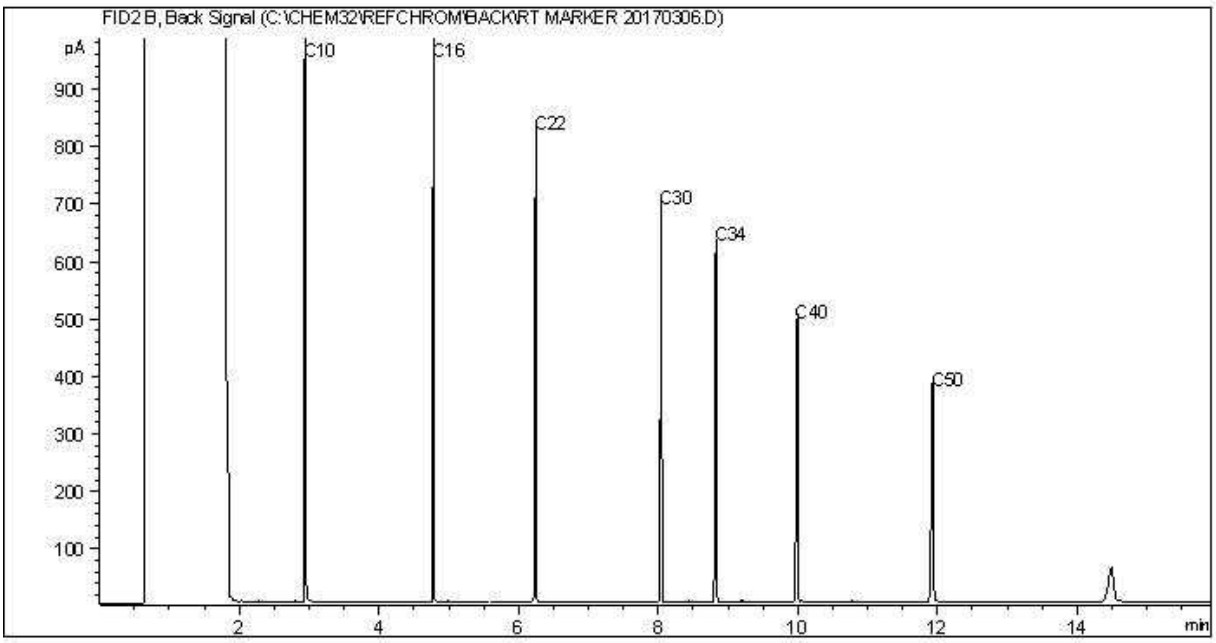
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: MW-02A

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+

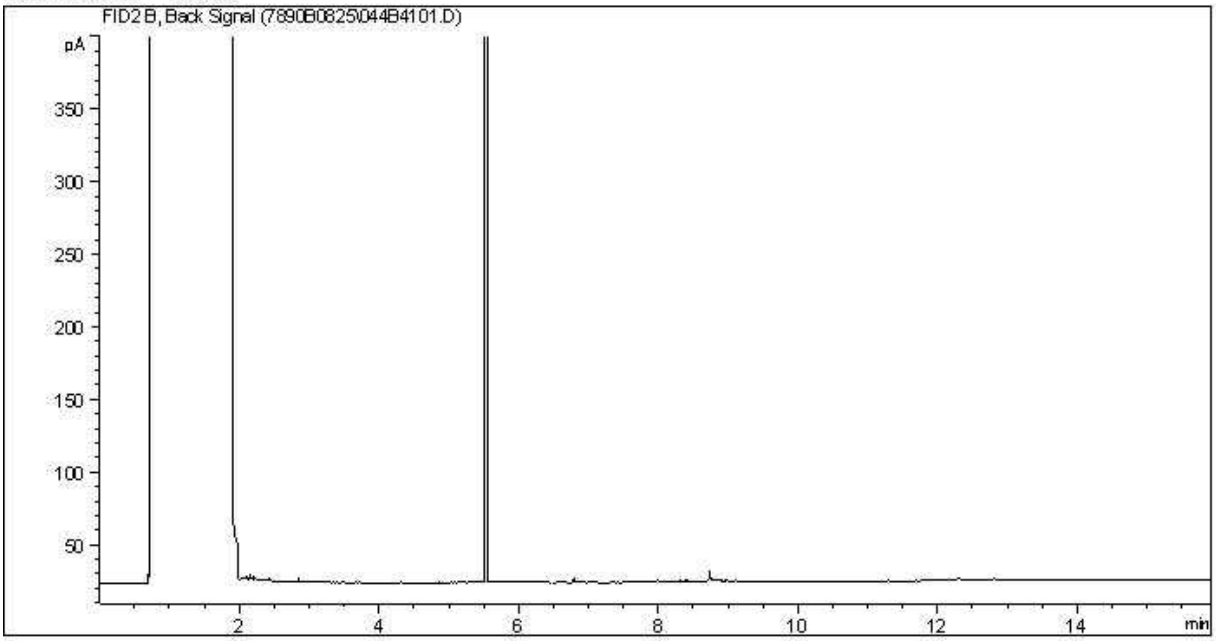
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871860
Report Date: 2018/08/30
Maxxam Sample: UD6475

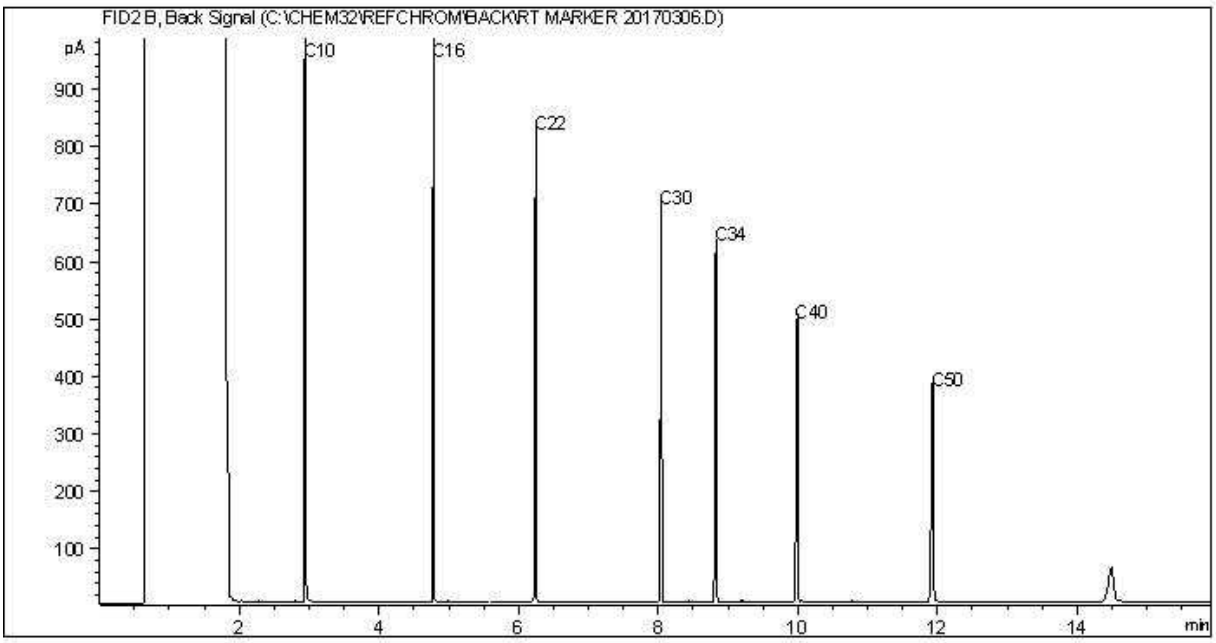
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: MW-02B

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+

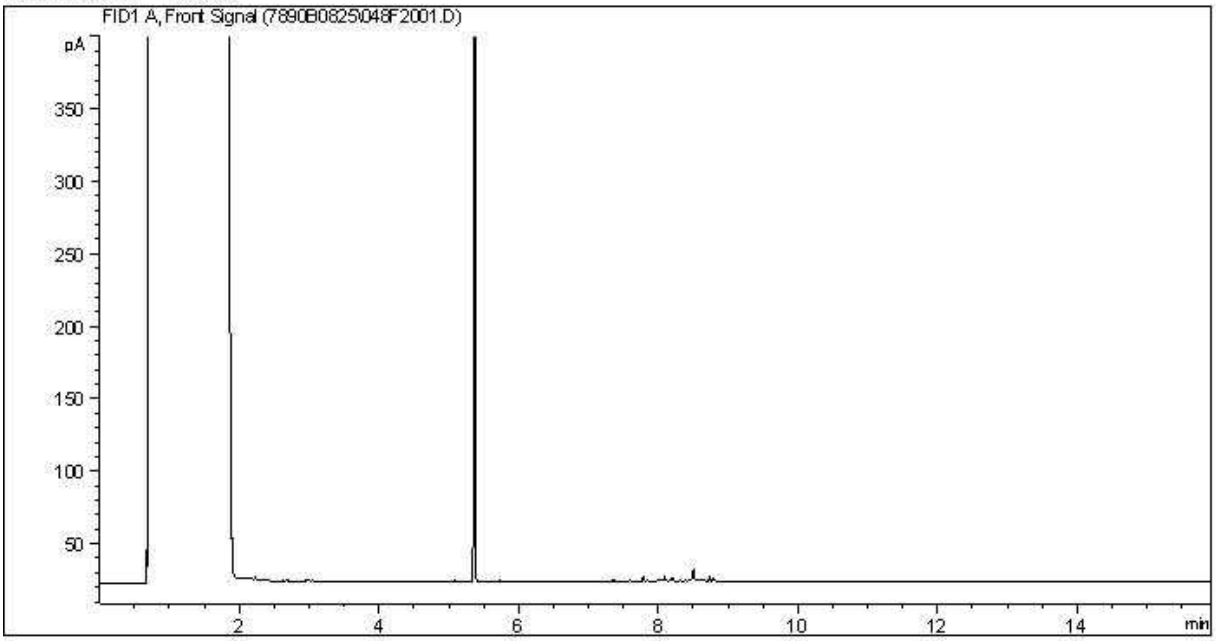
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871860
Report Date: 2018/08/30
Maxxam Sample: UD6476

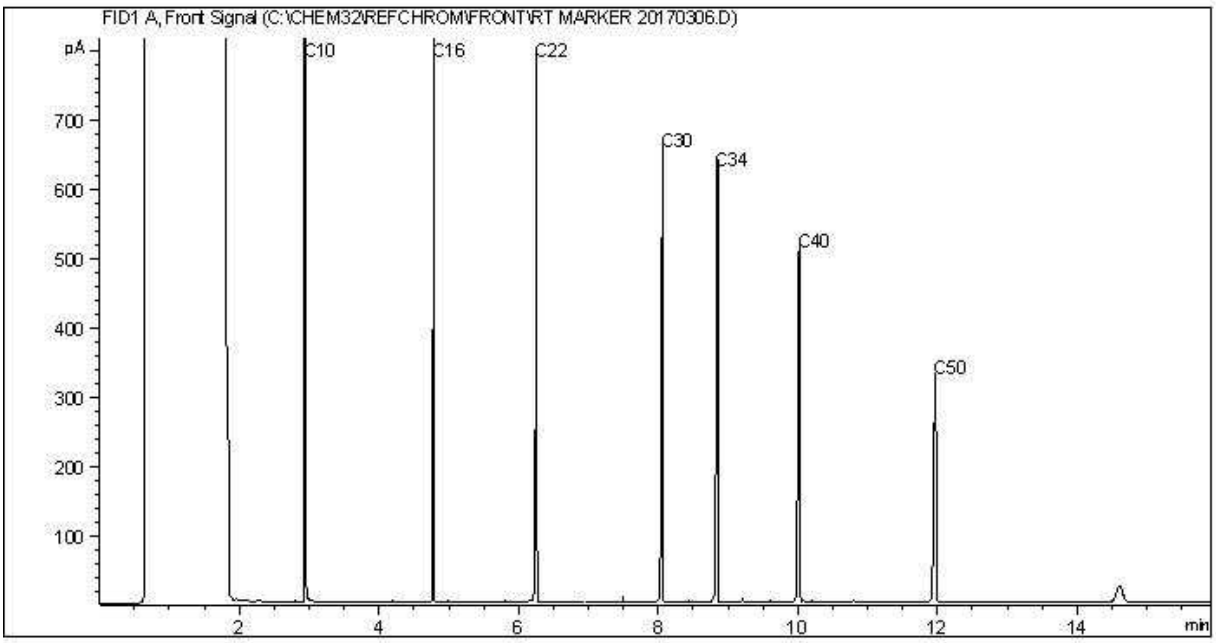
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: MW-03A

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+

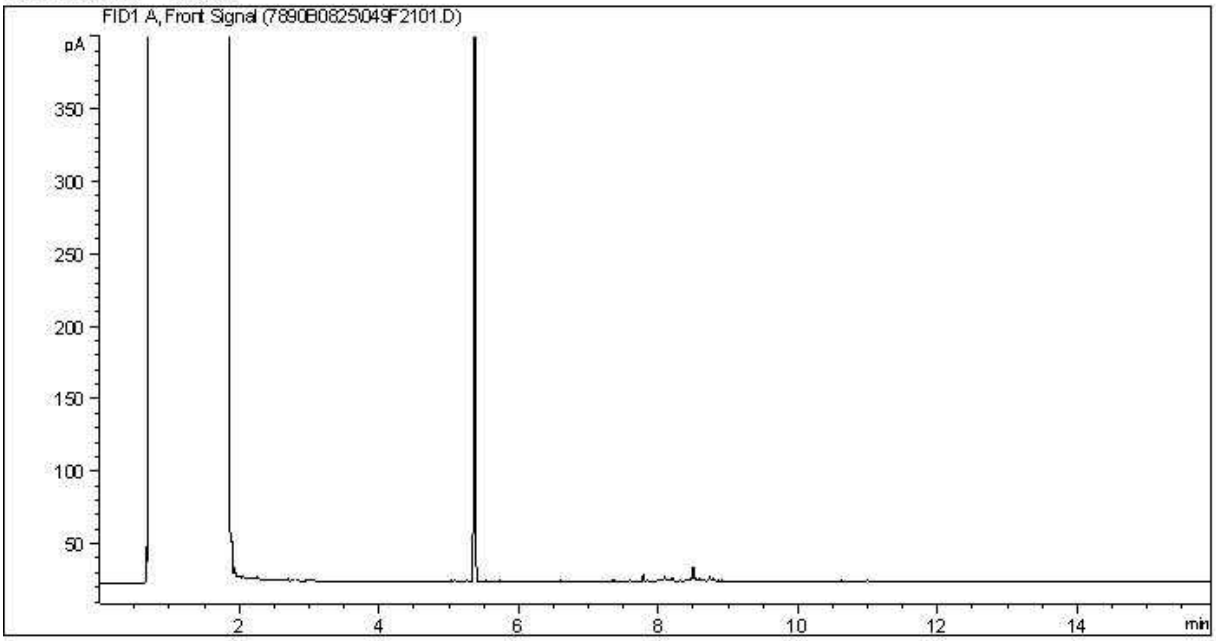
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871860
Report Date: 2018/08/30
Maxxam Sample: UD6476 Lab-Dup

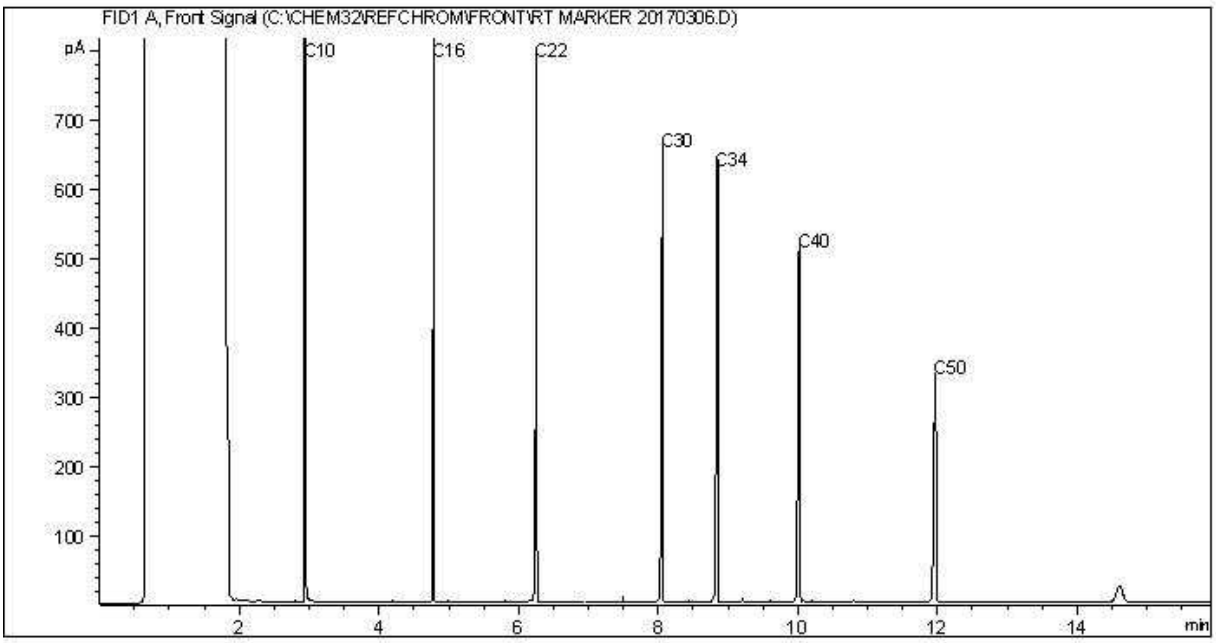
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: MW-03A

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+

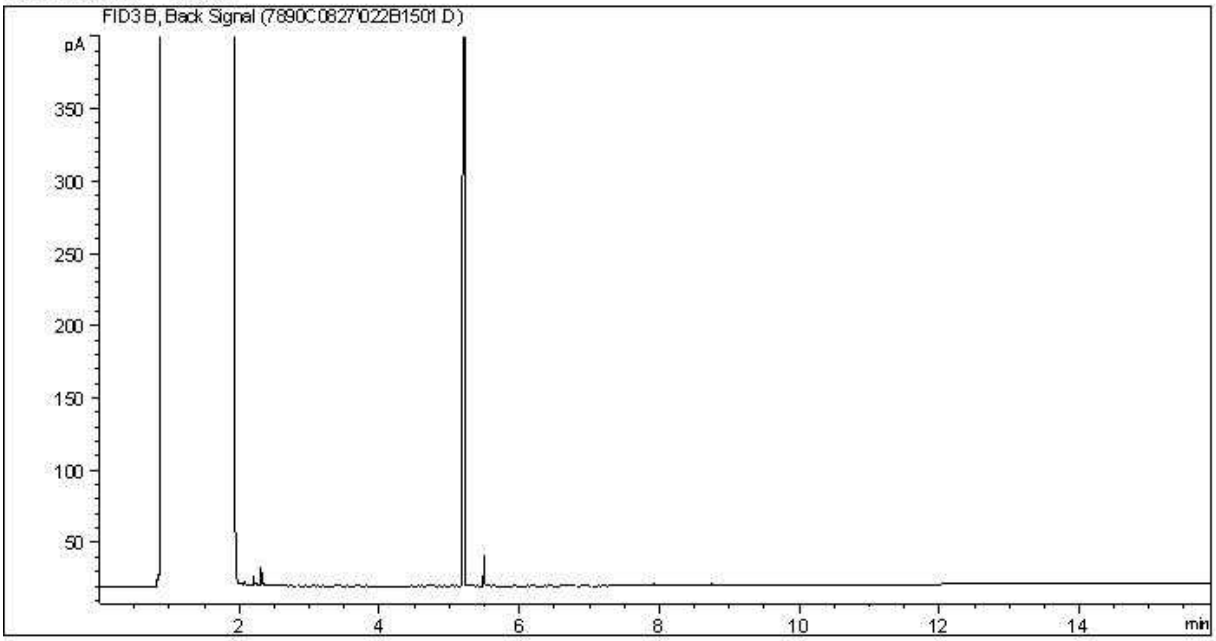
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871860
Report Date: 2018/08/30
Maxxam Sample: UD6477

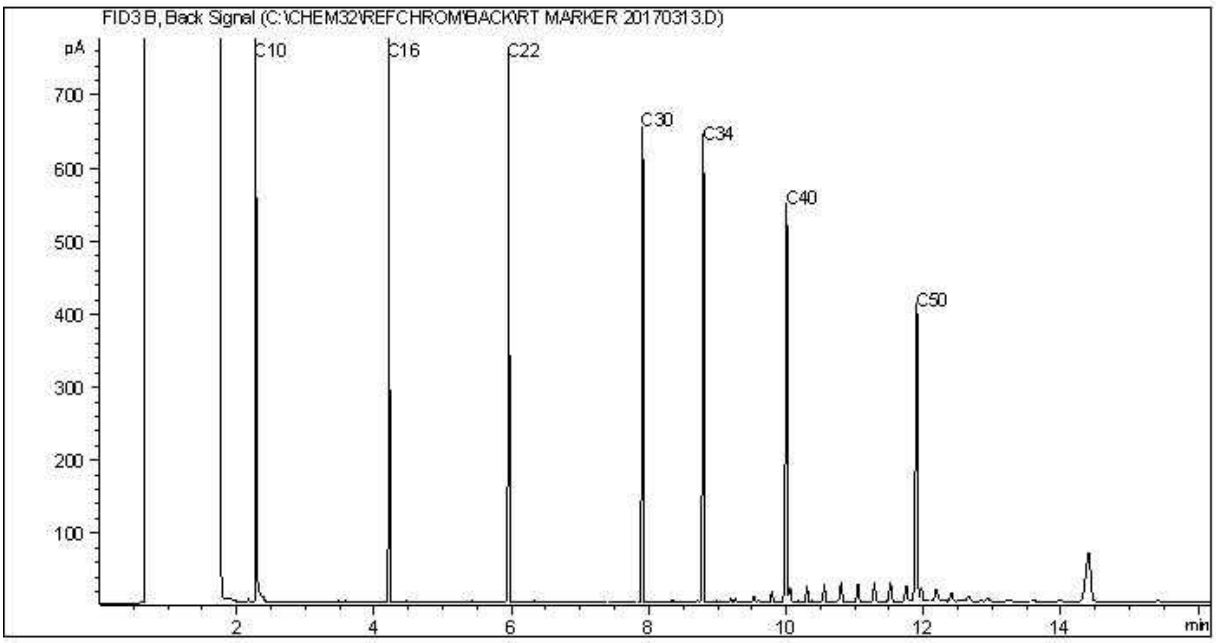
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: MW-03B

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+

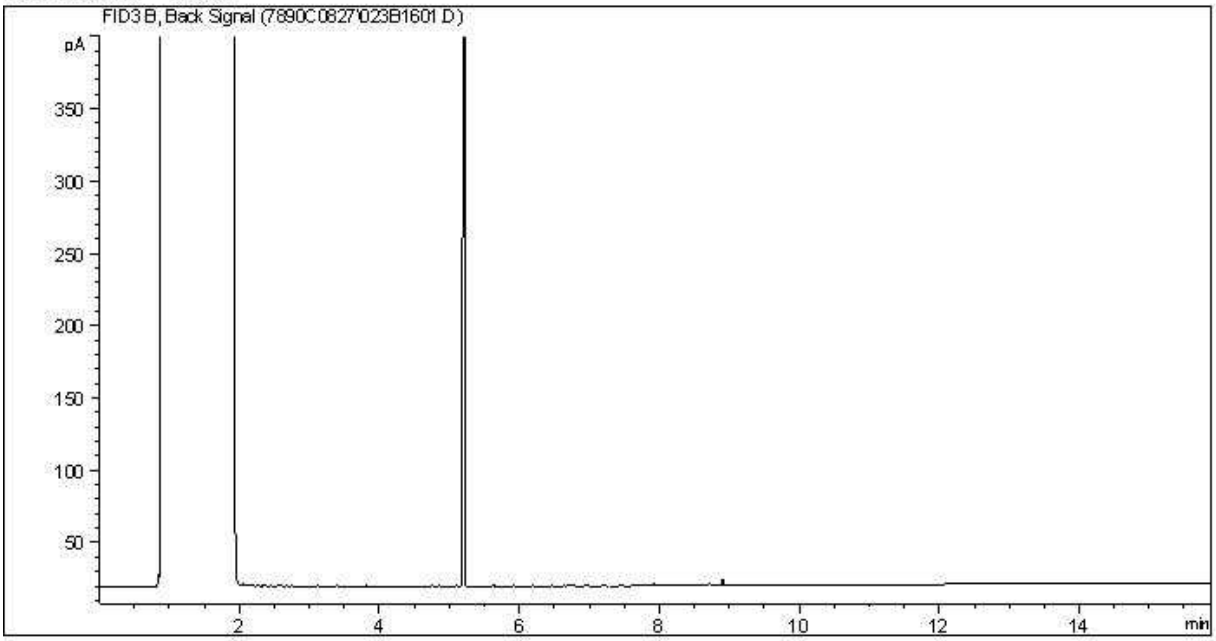
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871860
Report Date: 2018/08/30
Maxxam Sample: UD6478

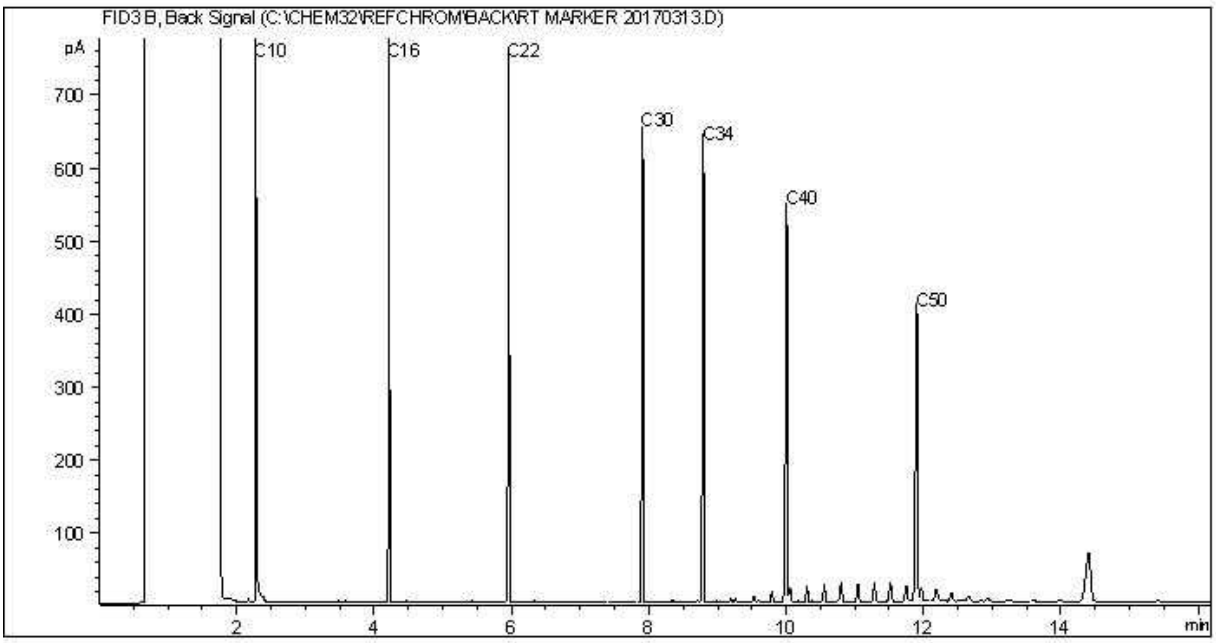
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: MW-04A

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+

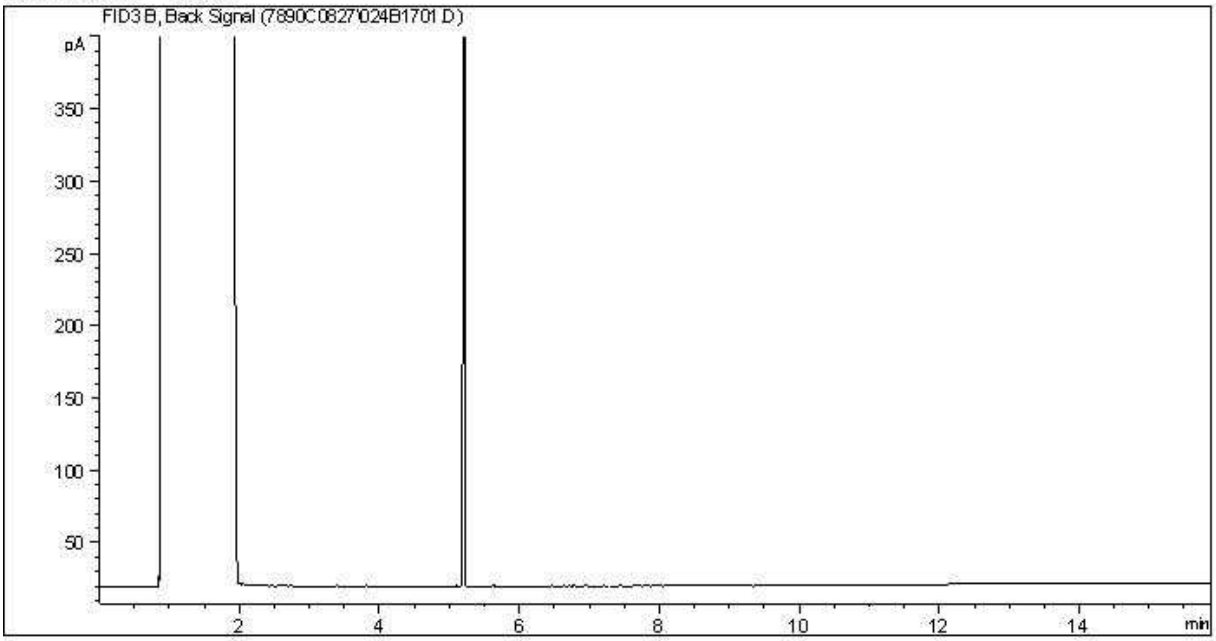
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871860
Report Date: 2018/08/30
Maxxam Sample: UD6479

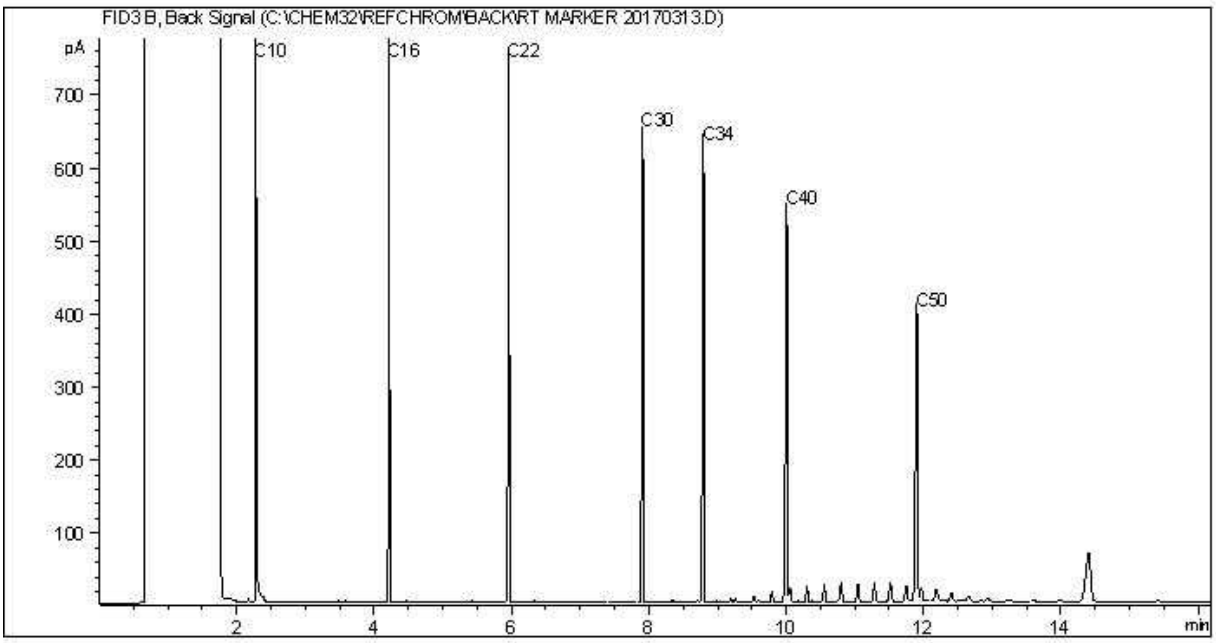
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: MW-04B

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+

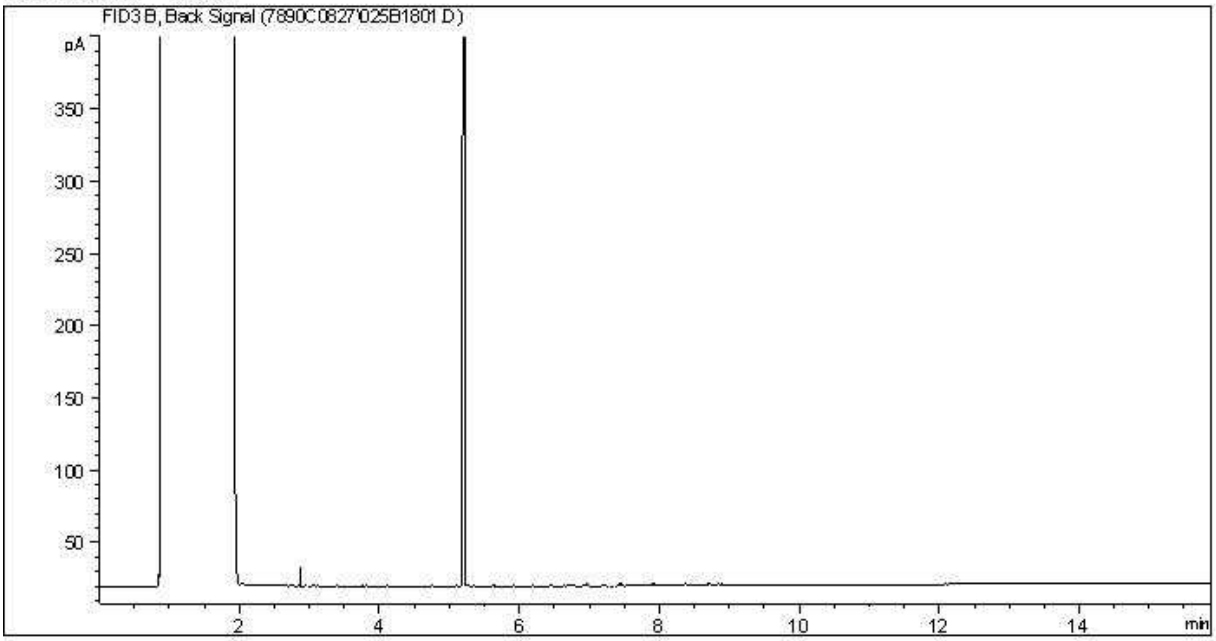
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871860
Report Date: 2018/08/30
Maxxam Sample: UD6480

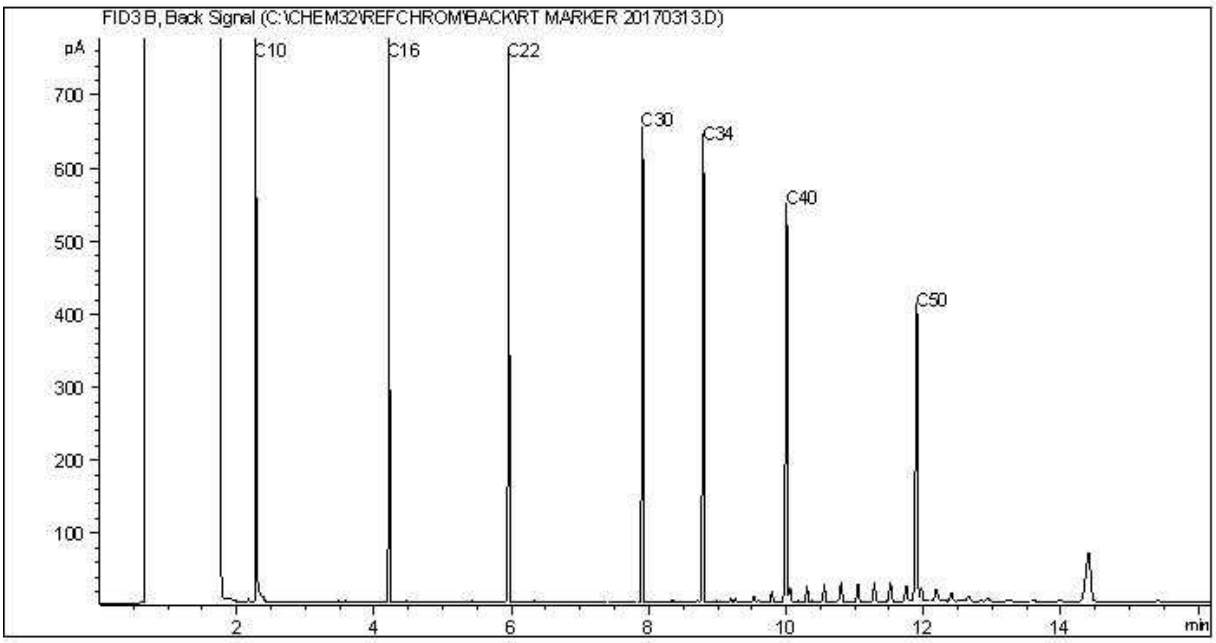
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: MW-05A

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+

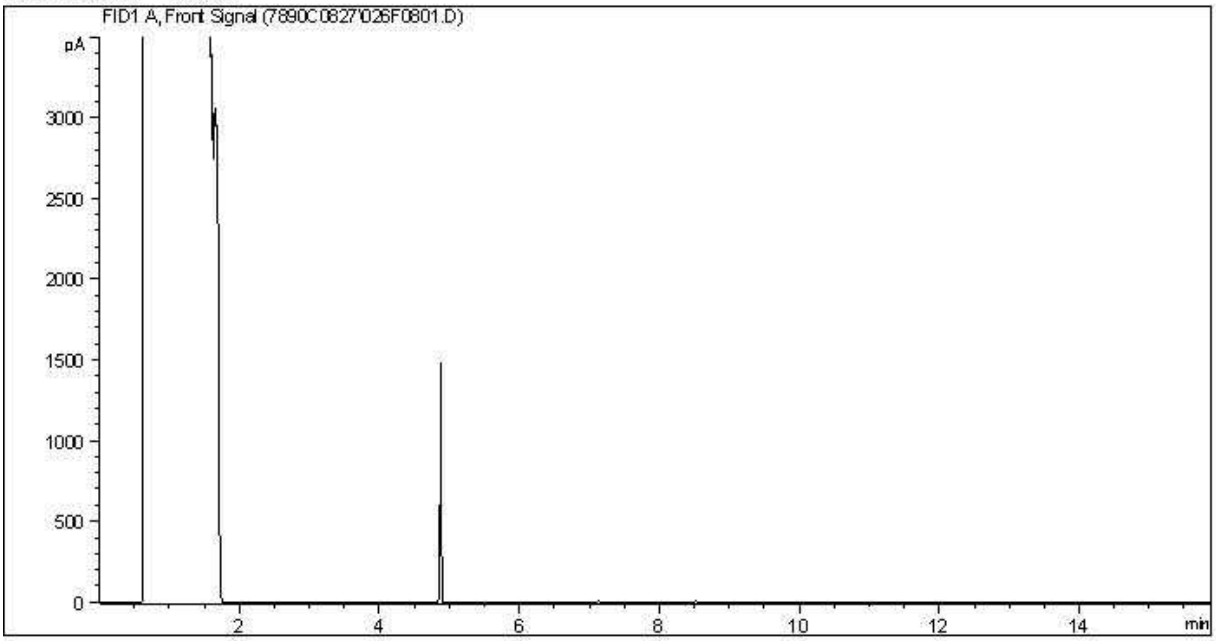
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871860
Report Date: 2018/08/30
Maxxam Sample: UD6481

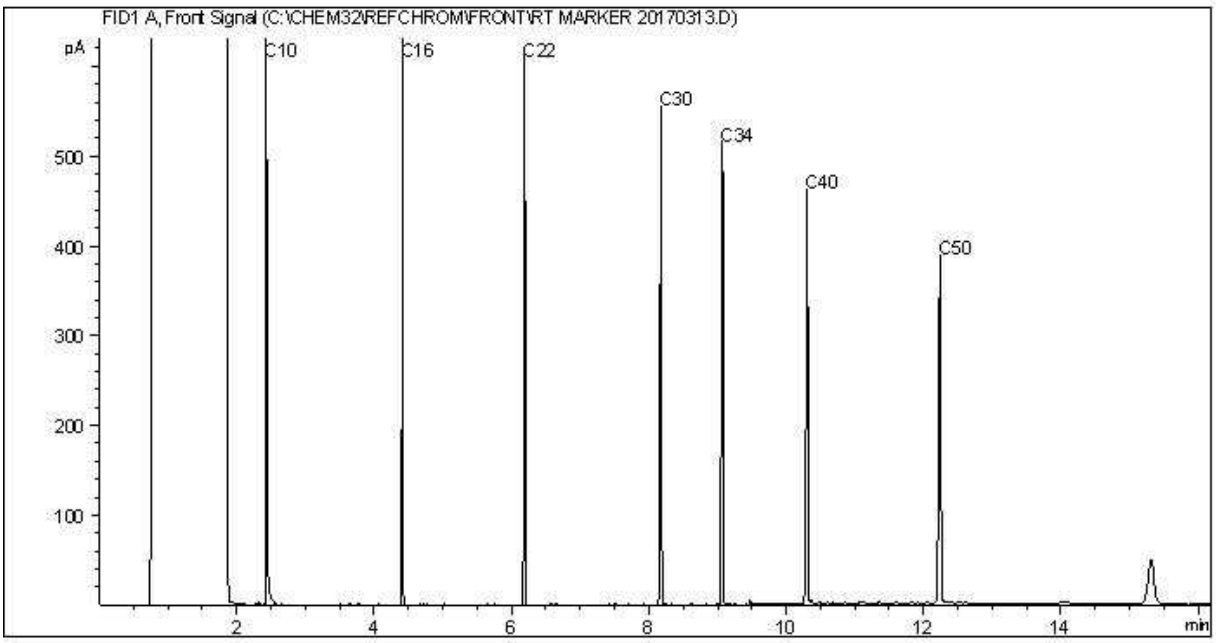
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: MW-05B

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890C



Carbon Range Distribution - Reference Chromatogram



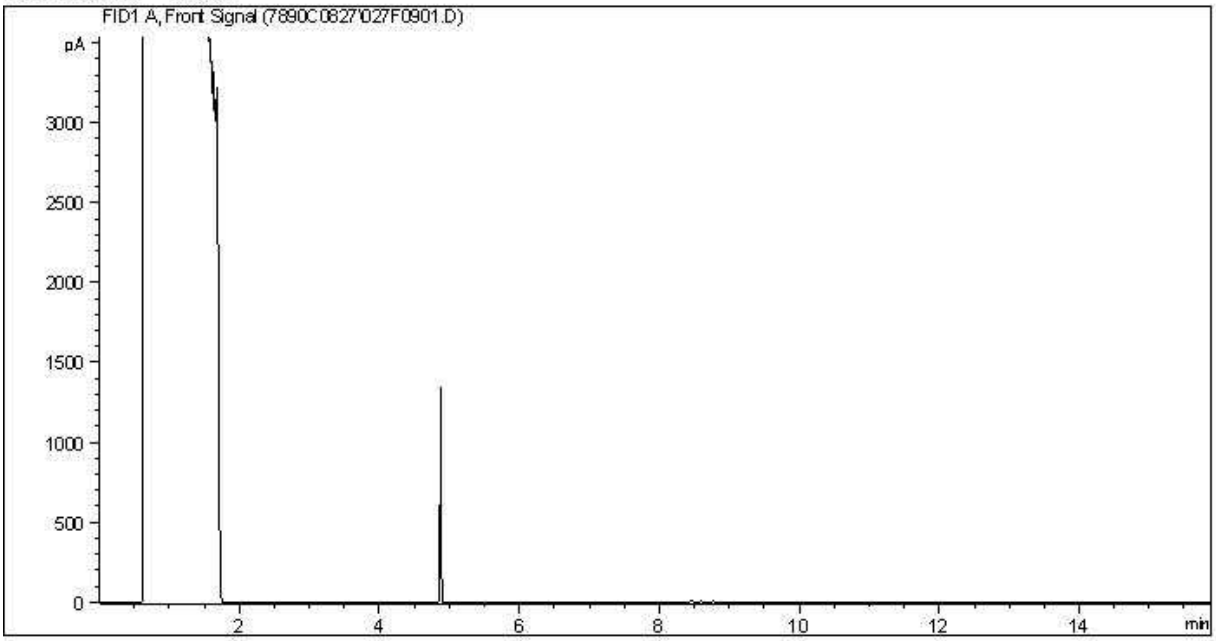
TYPICAL PRODUCT CARBON NUMBER RANGES

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

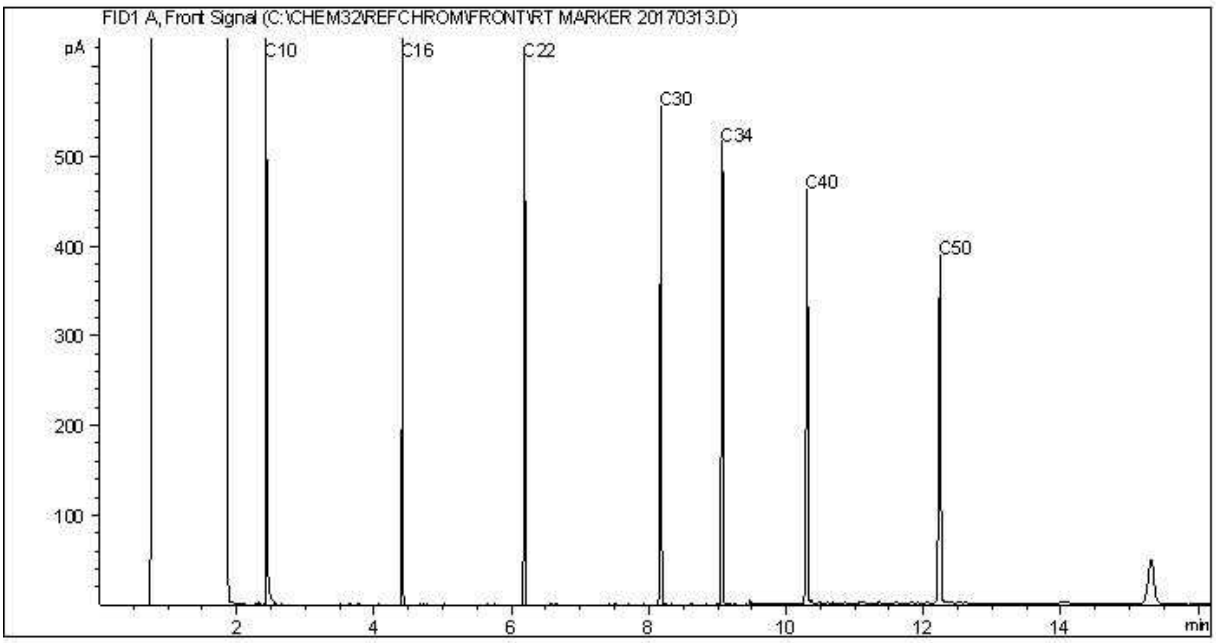
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

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+

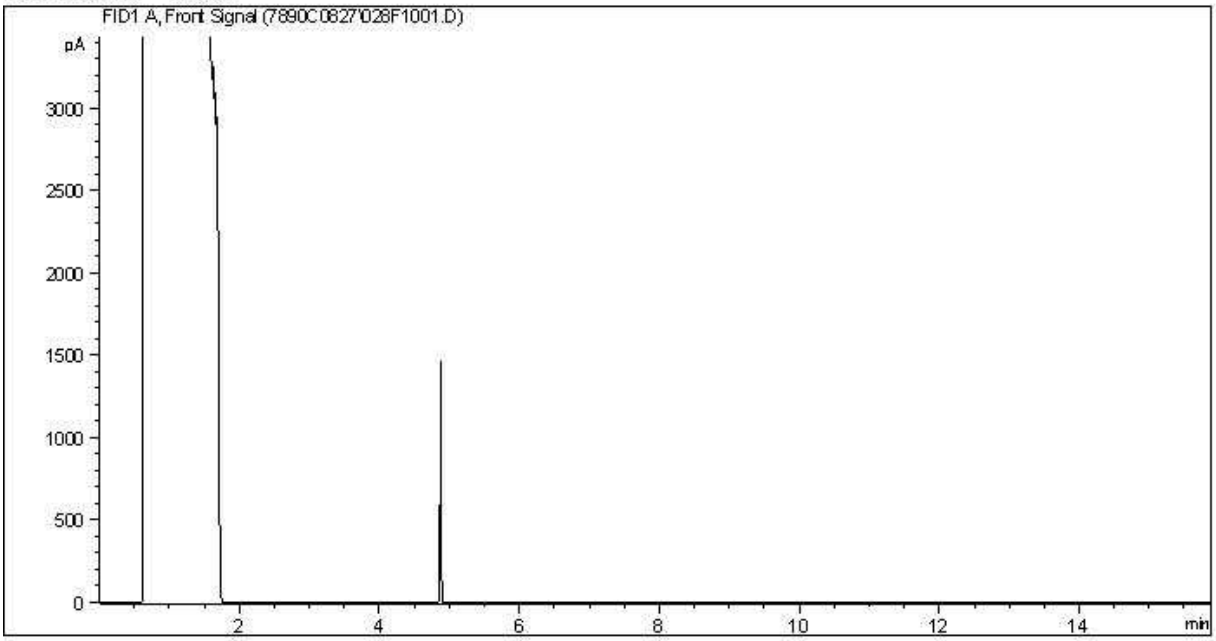
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871860
Report Date: 2018/08/30
Maxxam Sample: UD6483

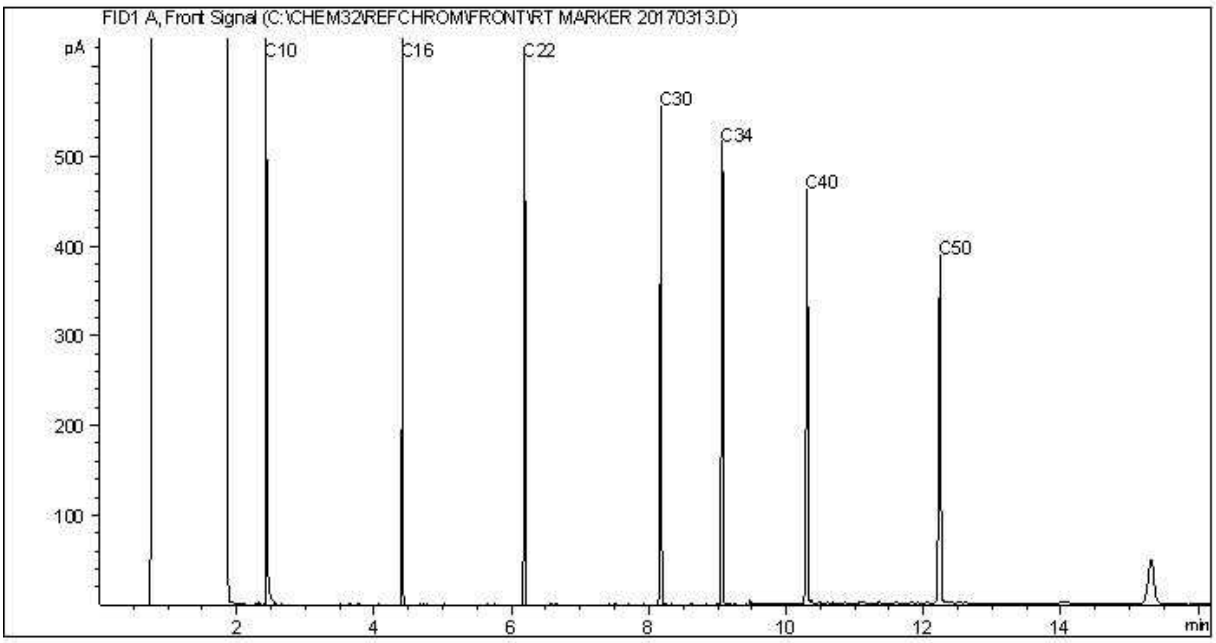
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: MW-06B

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+

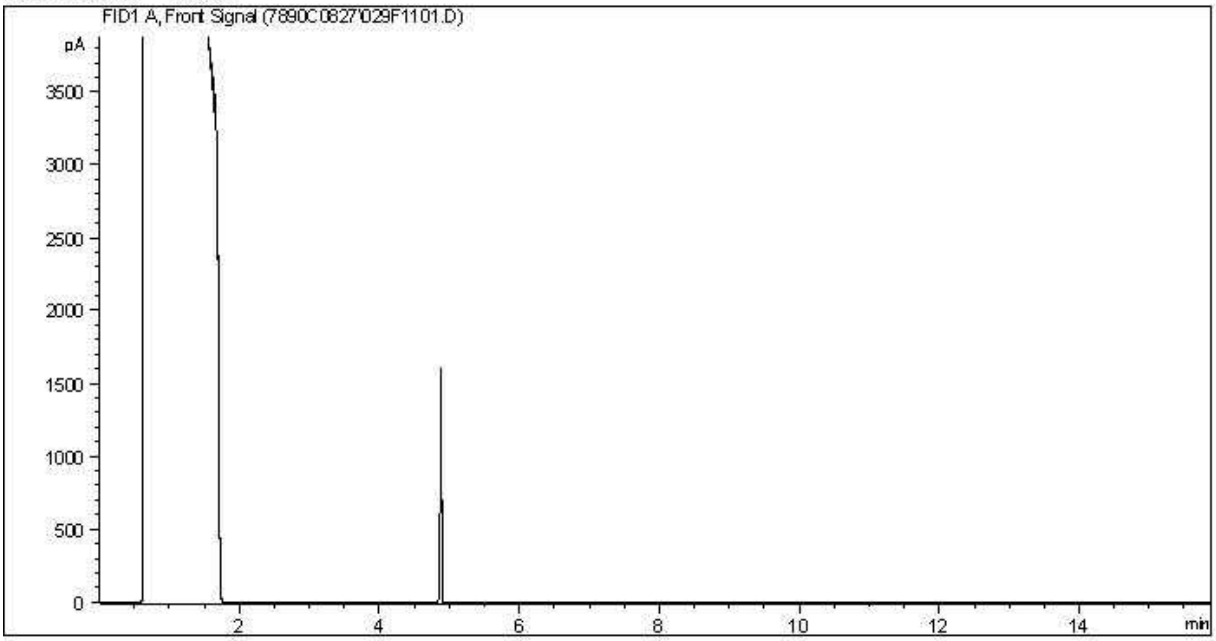
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871860
Report Date: 2018/08/30
Maxxam Sample: UD6508

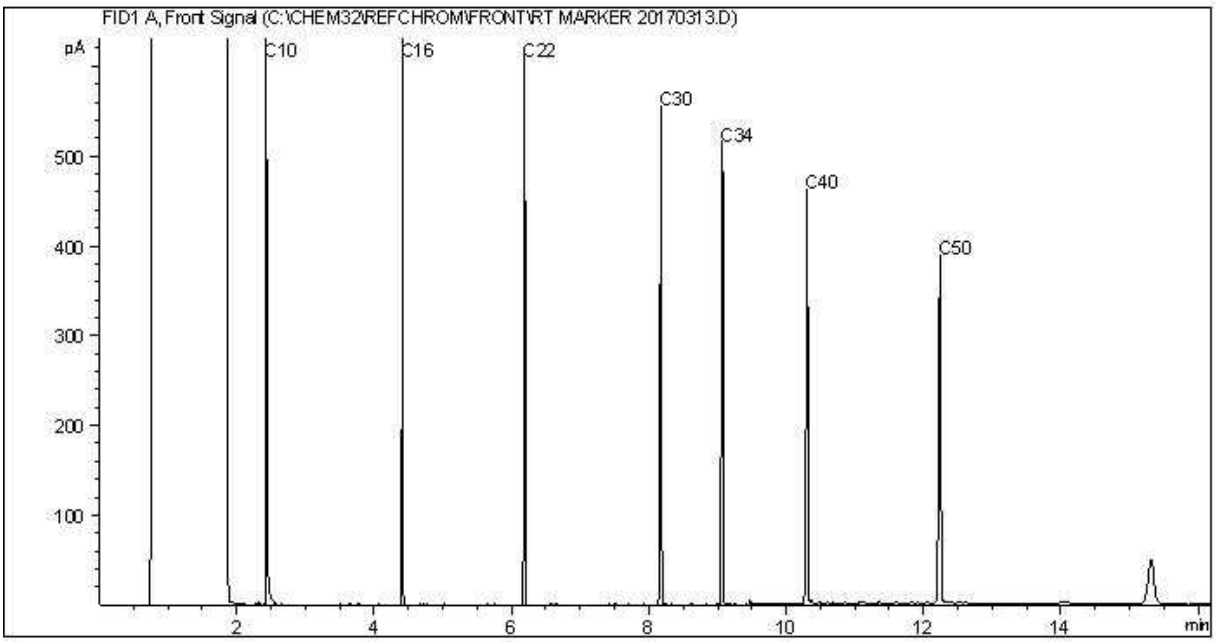
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: MW-07A

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+

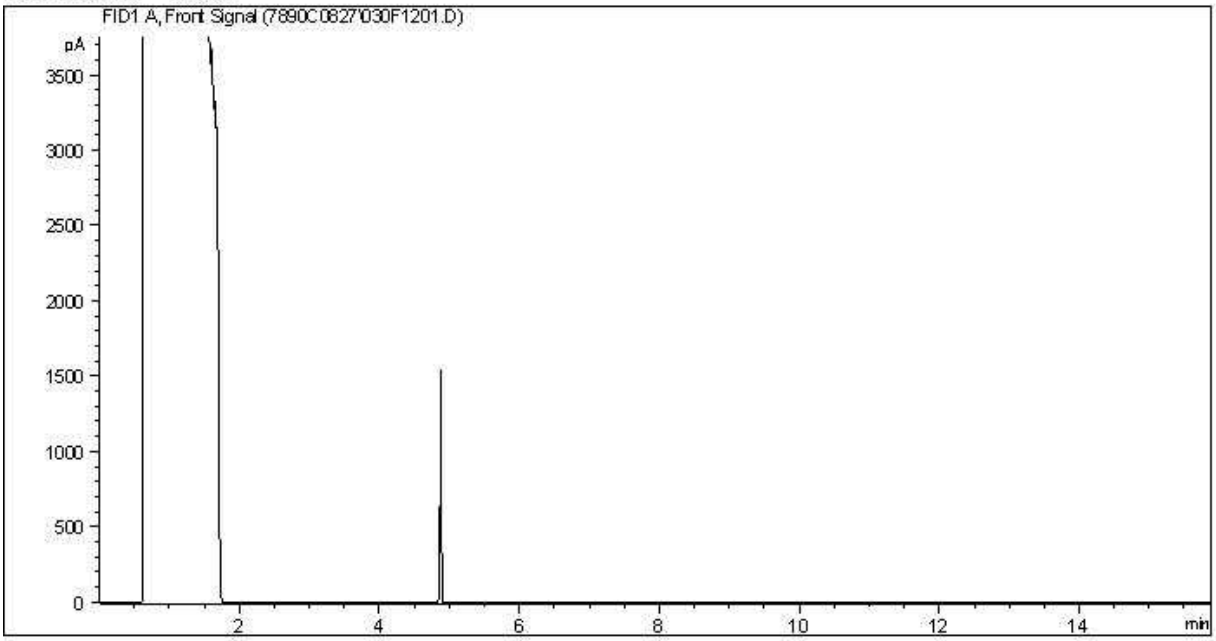
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871860
Report Date: 2018/08/30
Maxxam Sample: UD6509

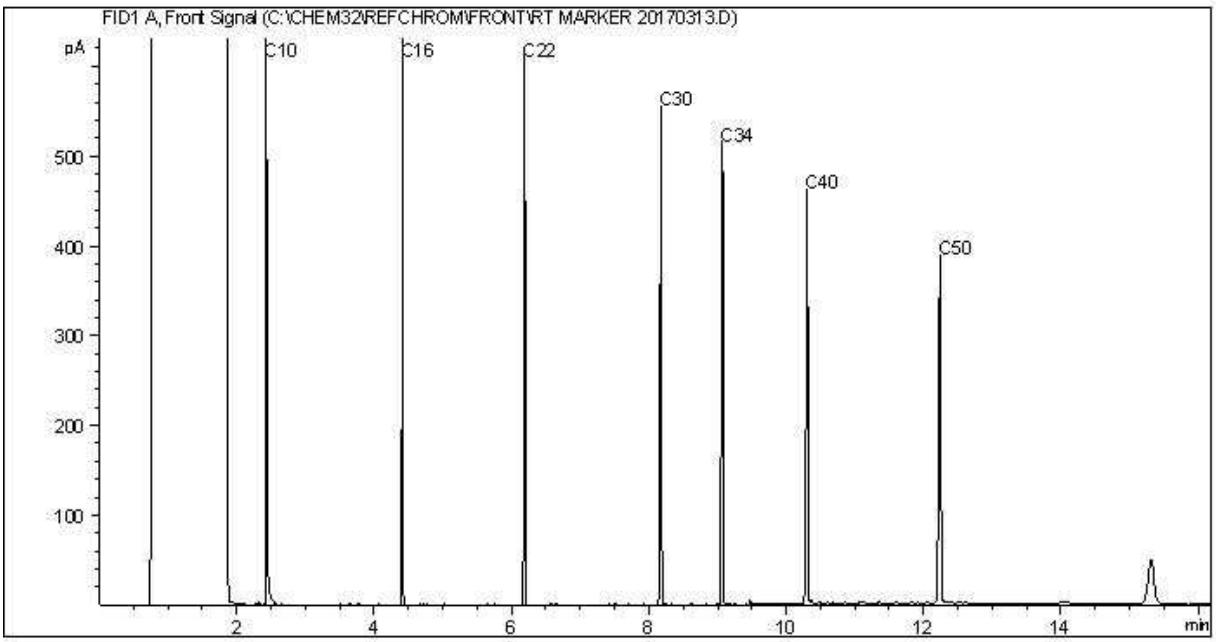
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: MW-07B

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+

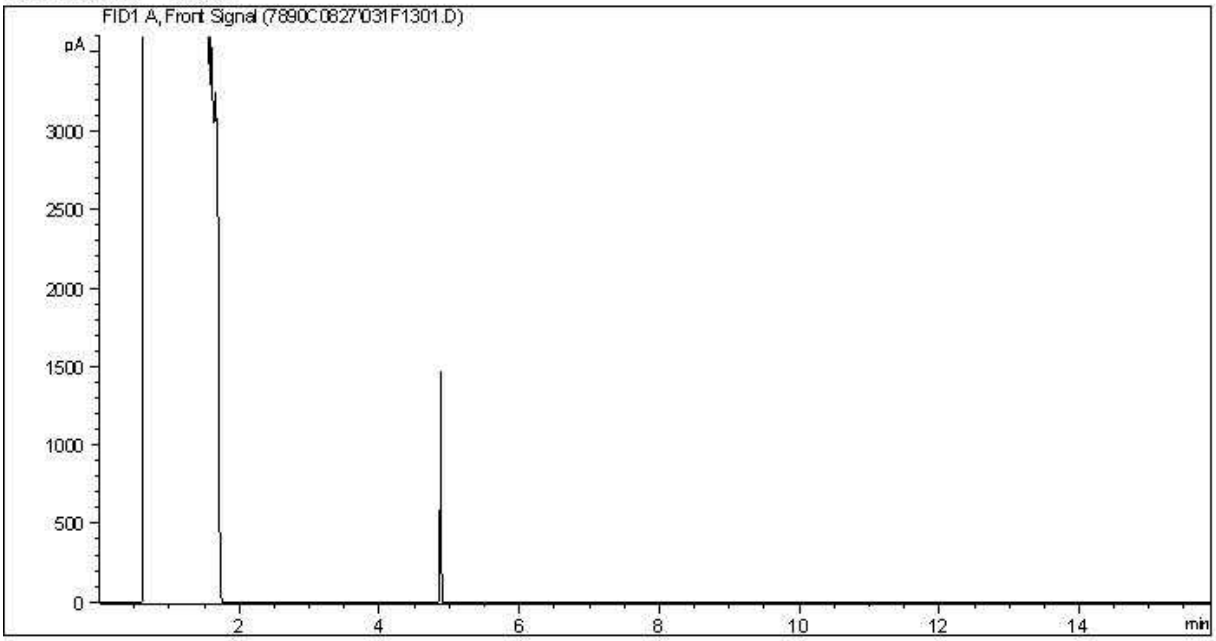
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871860
Report Date: 2018/08/30
Maxxam Sample: UD6510

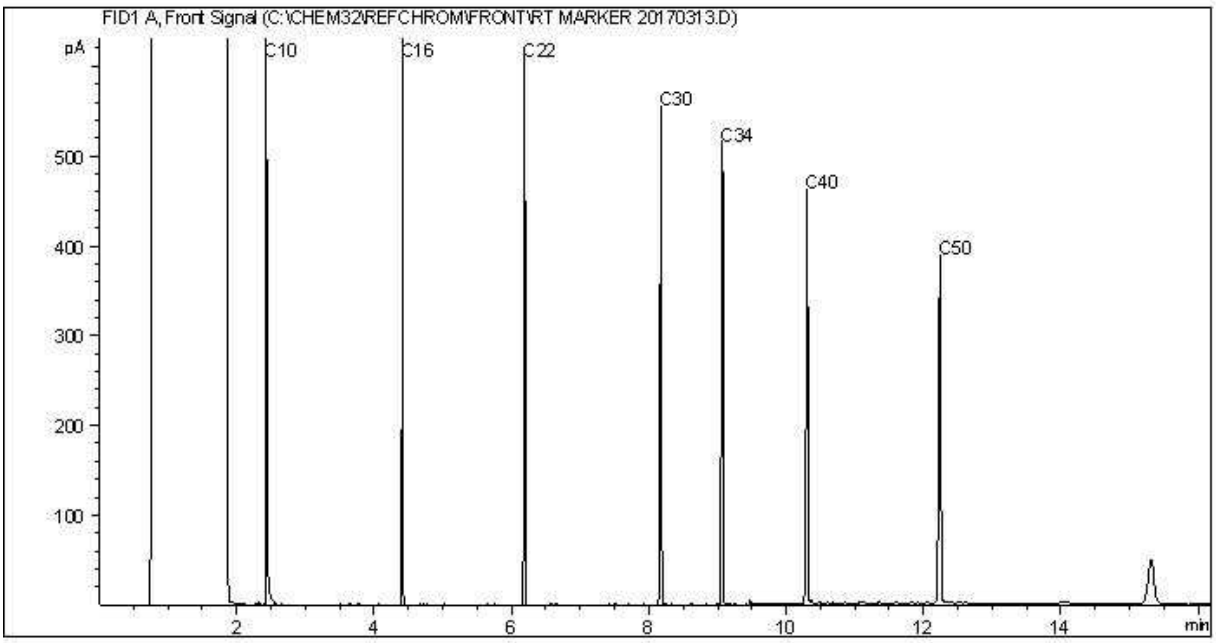
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: MW-08A

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+

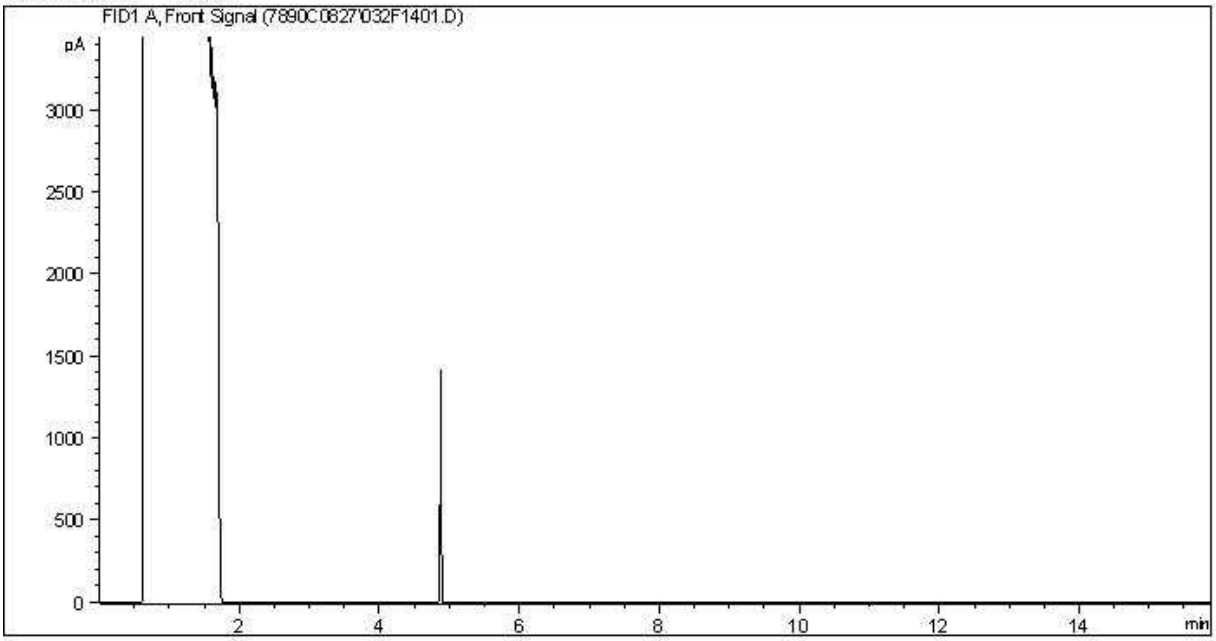
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871860
Report Date: 2018/08/30
Maxxam Sample: UD6511

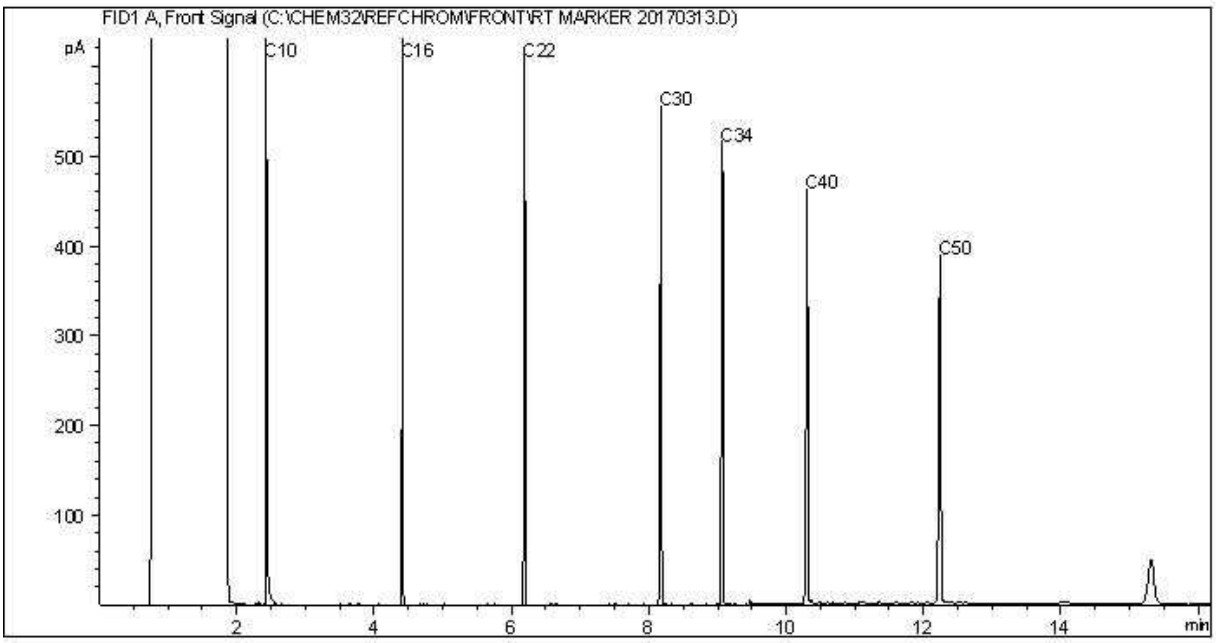
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: MW-08B

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+

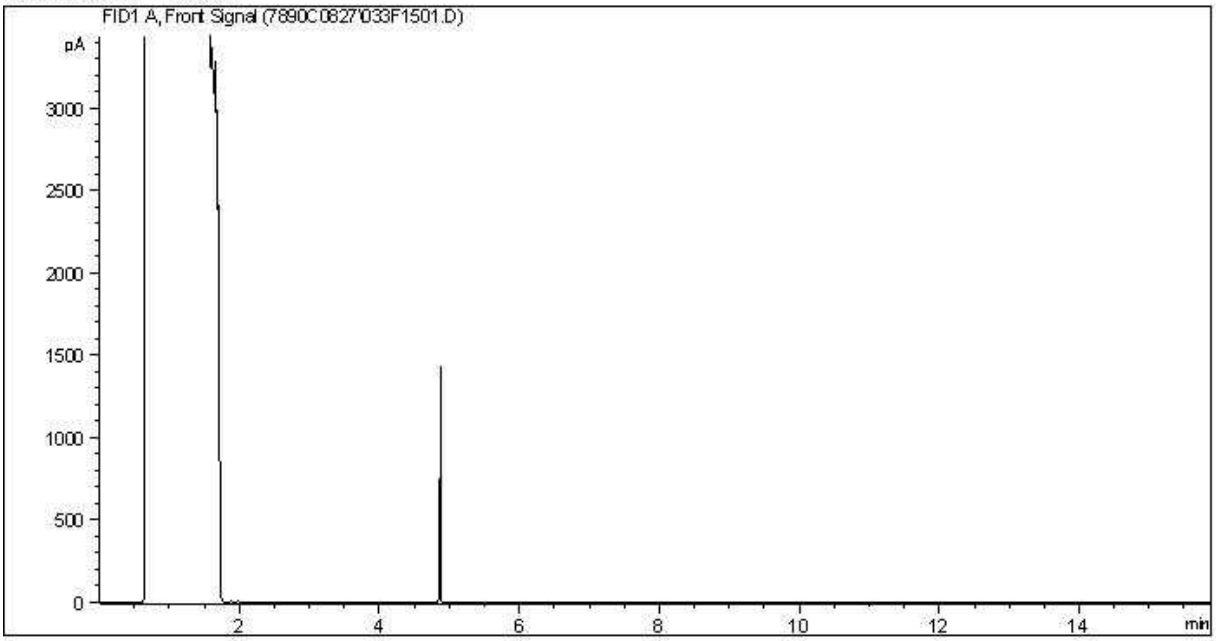
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871860
Report Date: 2018/08/30
Maxxam Sample: UD6512

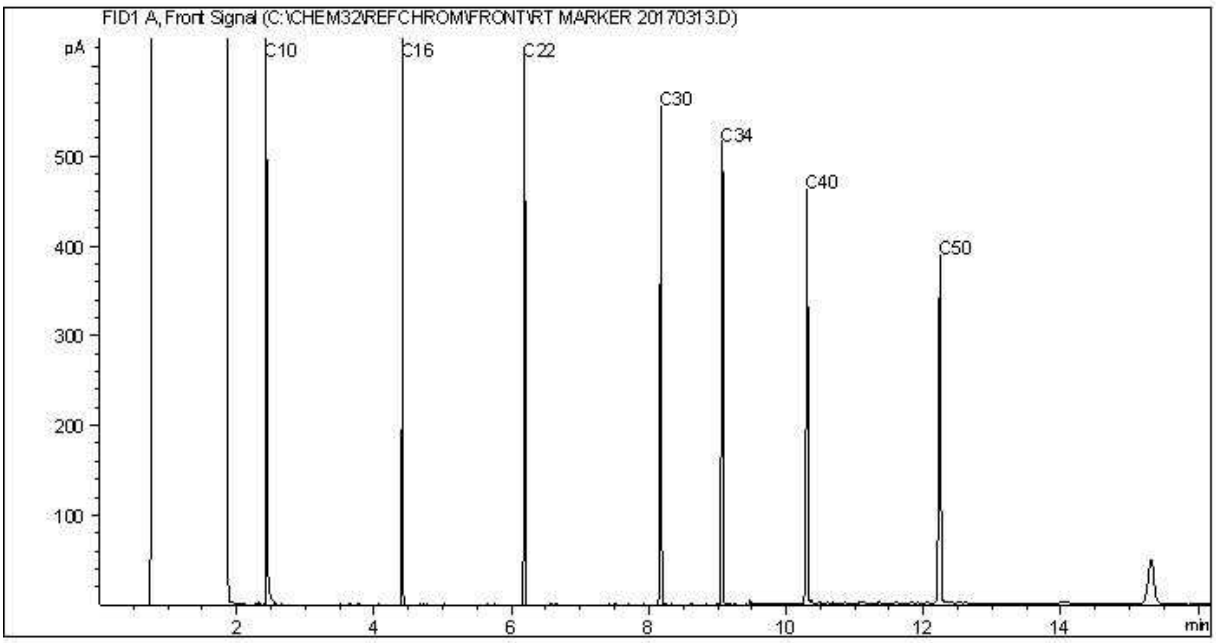
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: DUP 1

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+

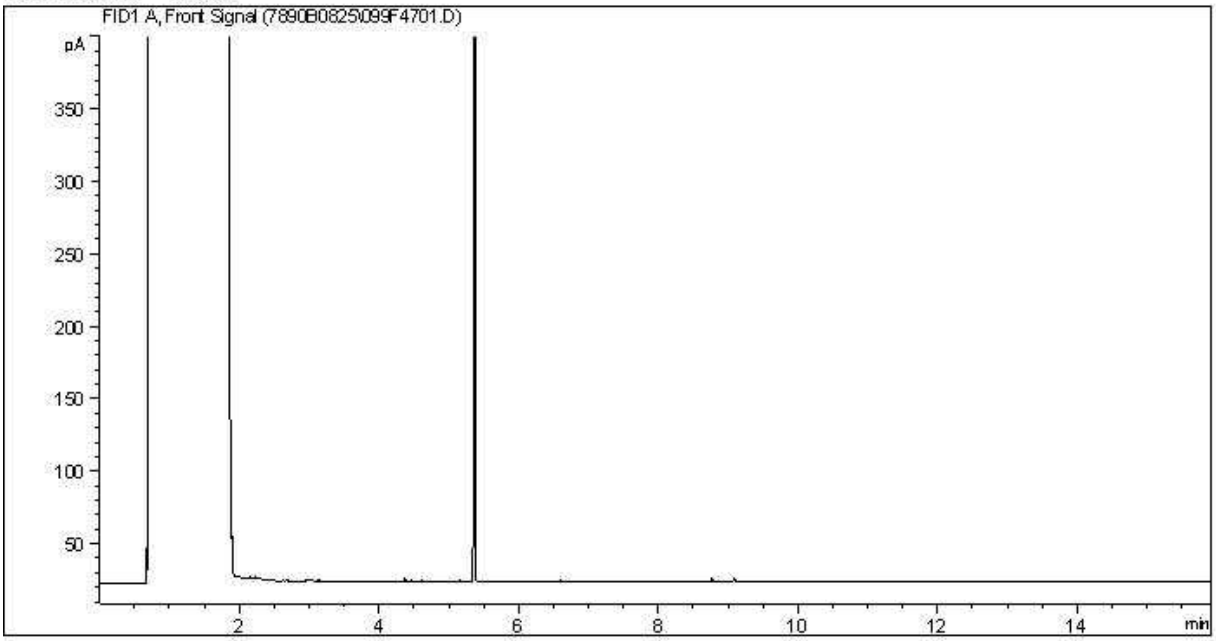
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871860
Report Date: 2018/08/30
Maxxam Sample: UD6513

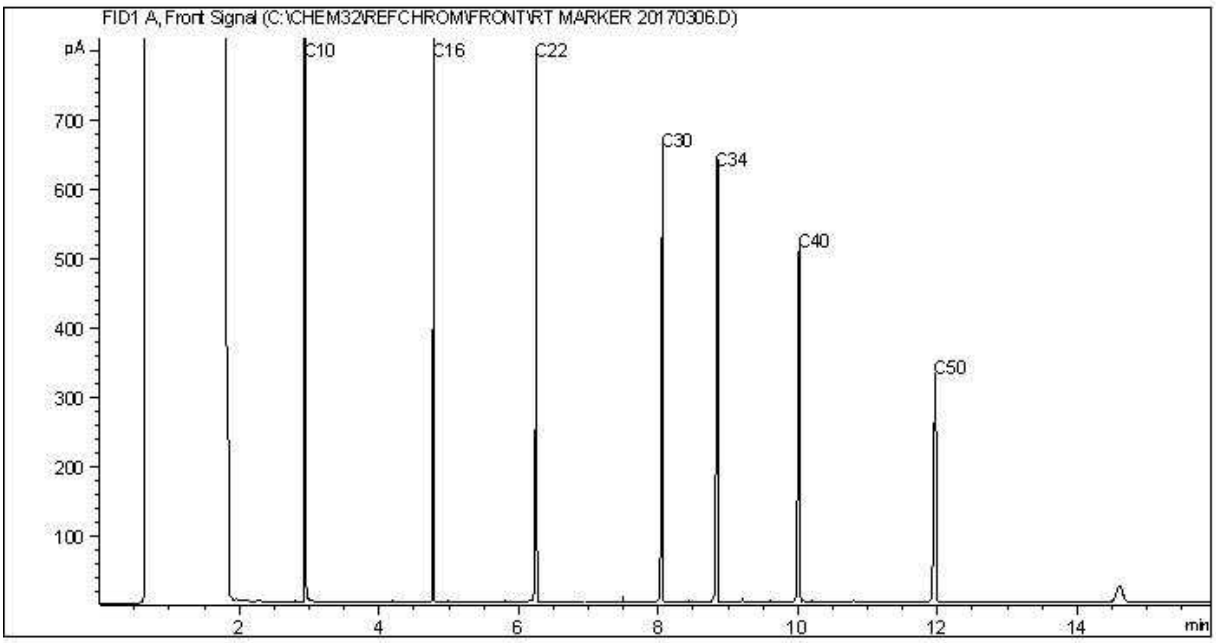
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: DUP 2

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+

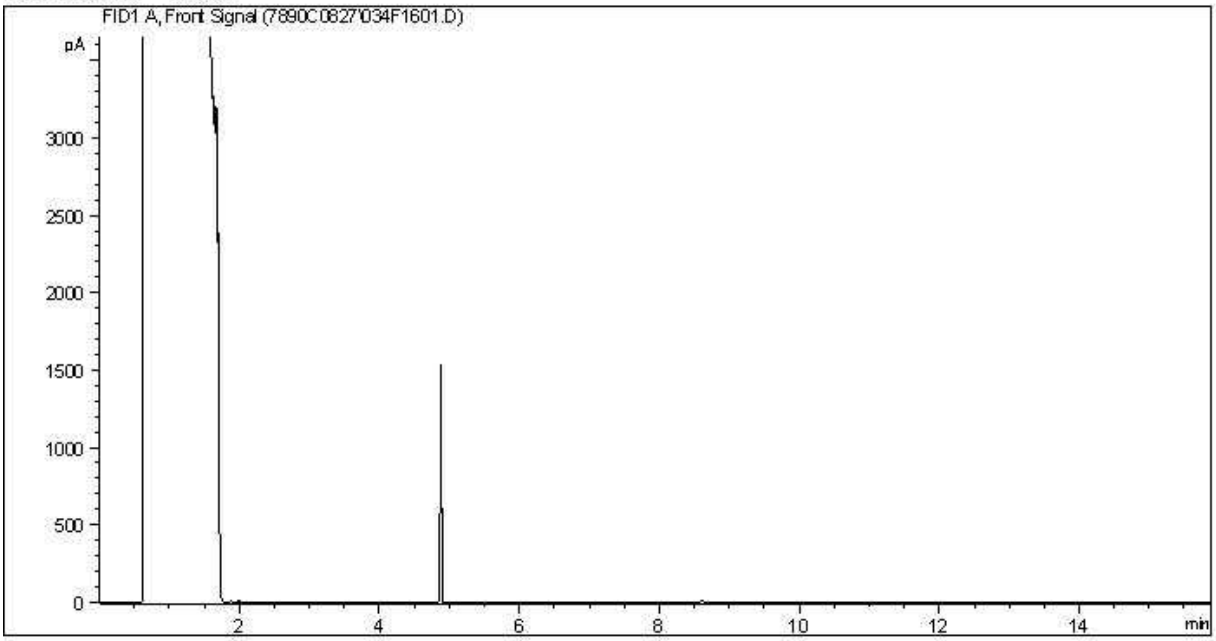
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871860
Report Date: 2018/08/30
Maxxam Sample: UD6514

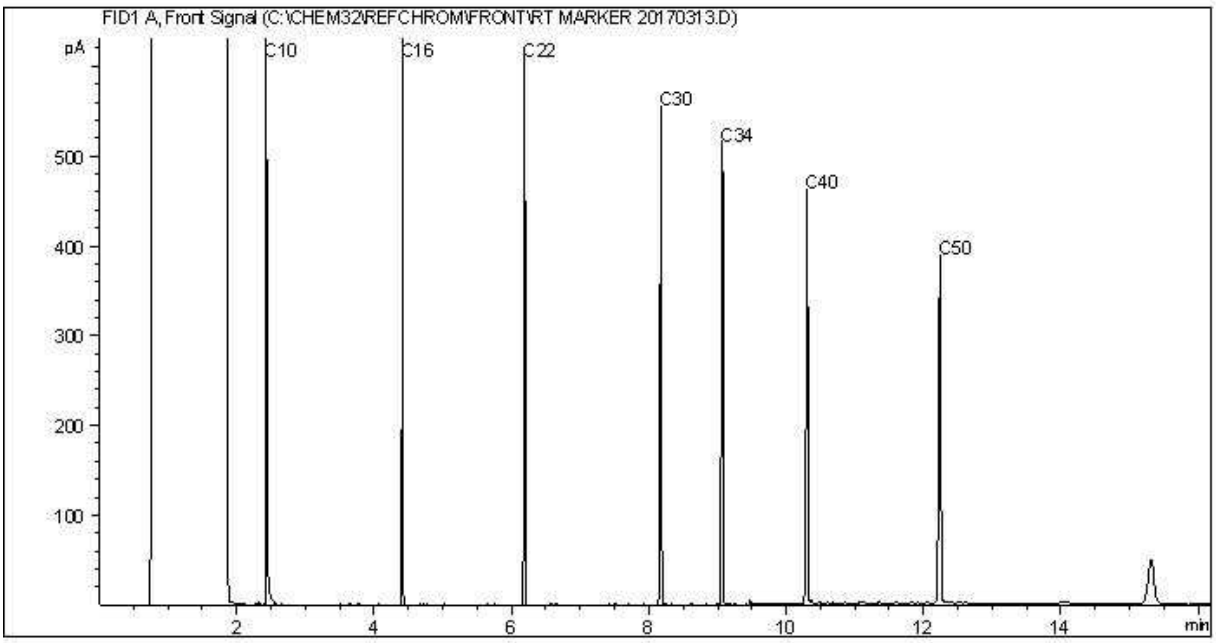
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: DUP 3

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+

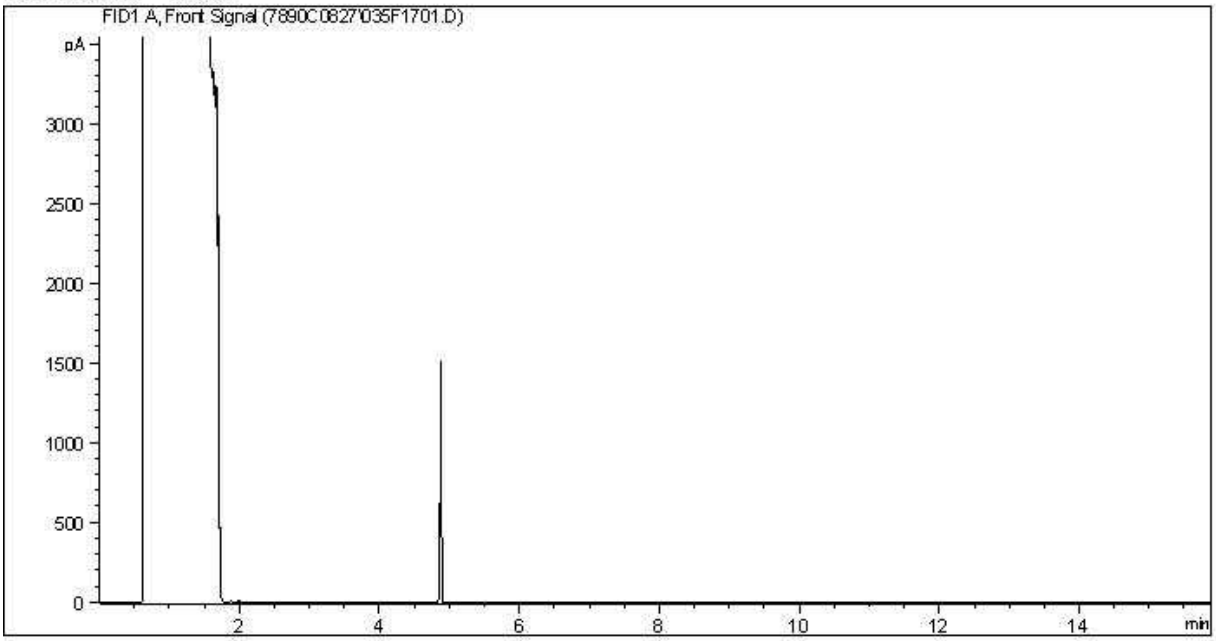
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871860
Report Date: 2018/08/30
Maxxam Sample: UD6514 Lab-Dup

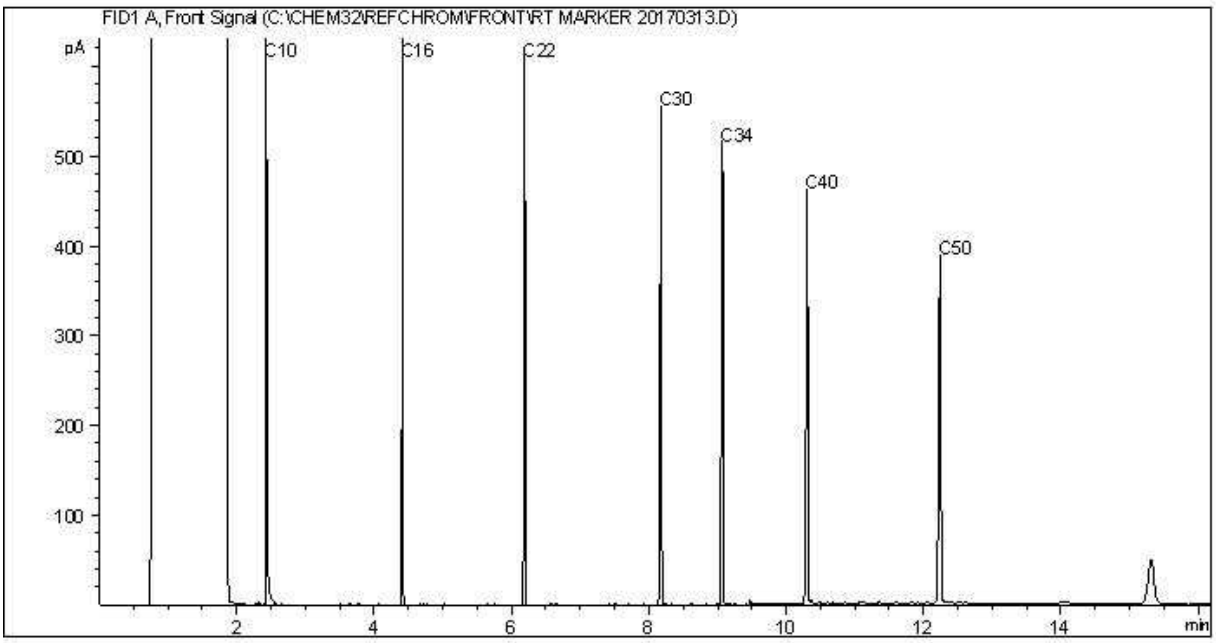
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: DUP 3

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890C



Carbon Range Distribution - Reference Chromatogram



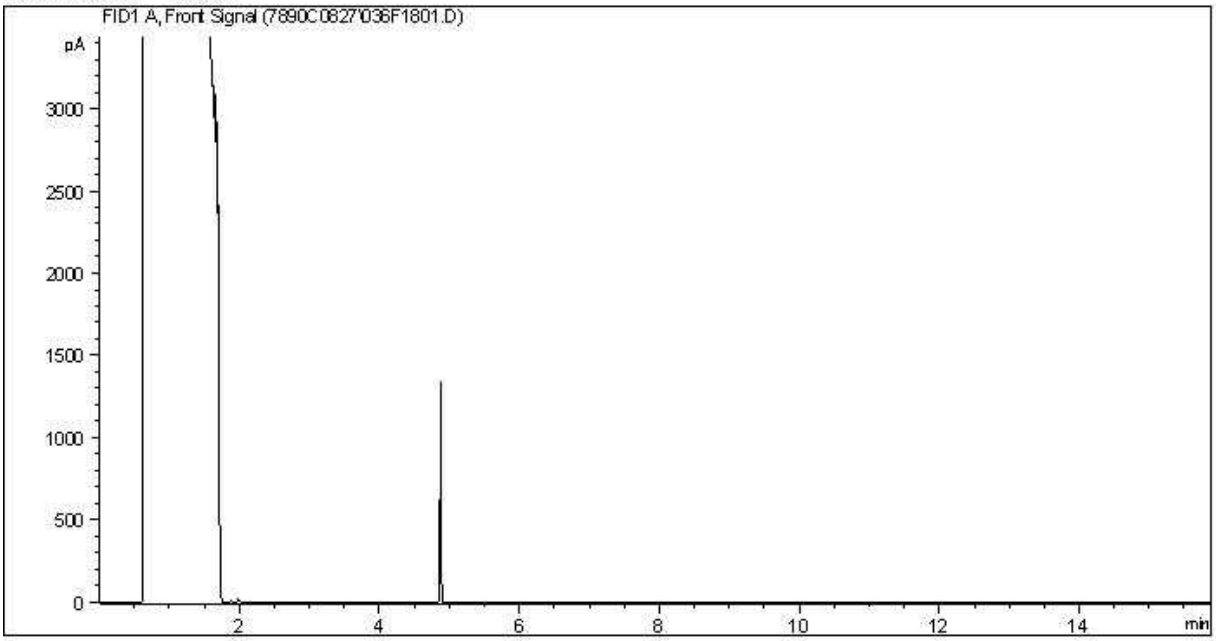
TYPICAL PRODUCT CARBON NUMBER RANGES

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

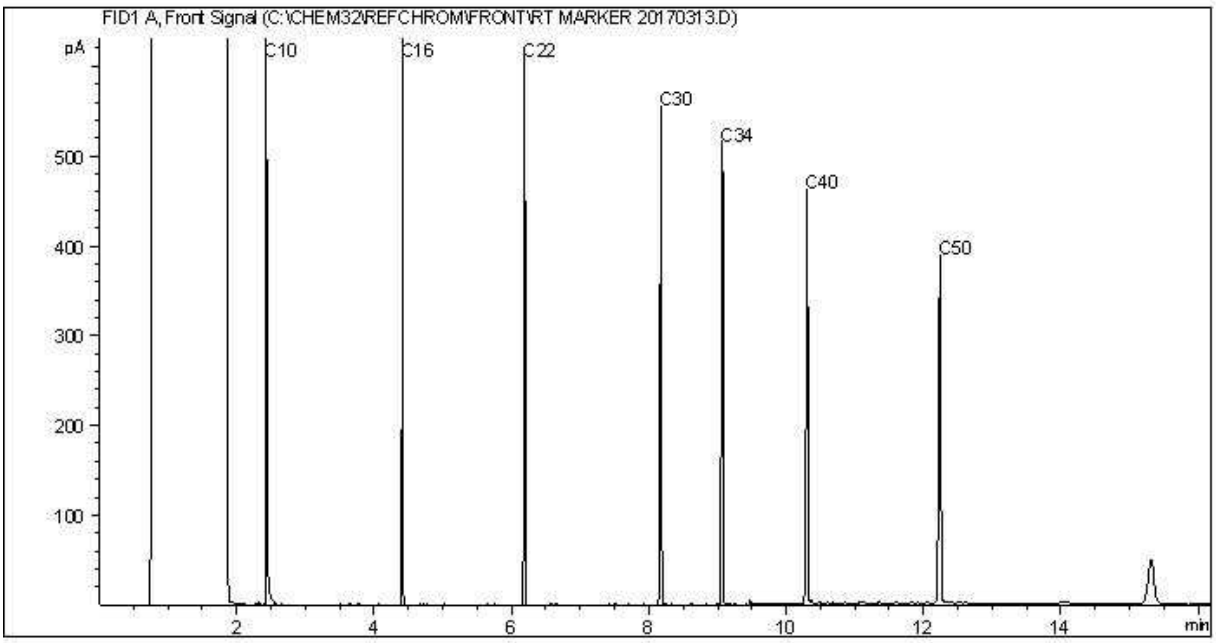
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

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+

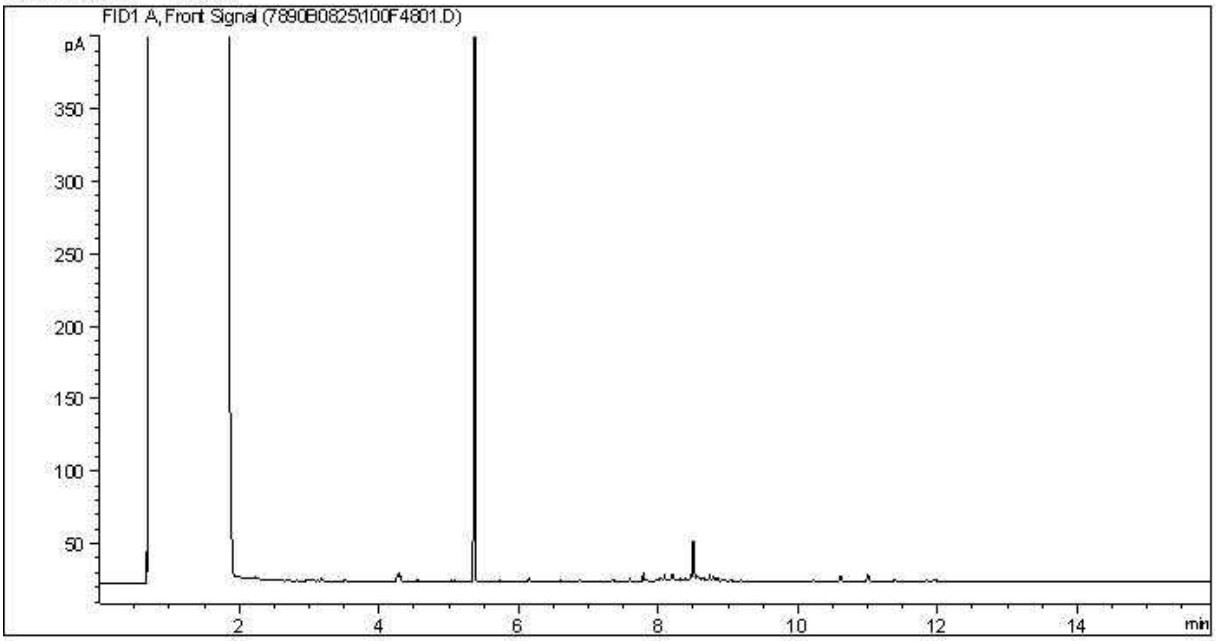
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871860
Report Date: 2018/08/30
Maxxam Sample: UD6516

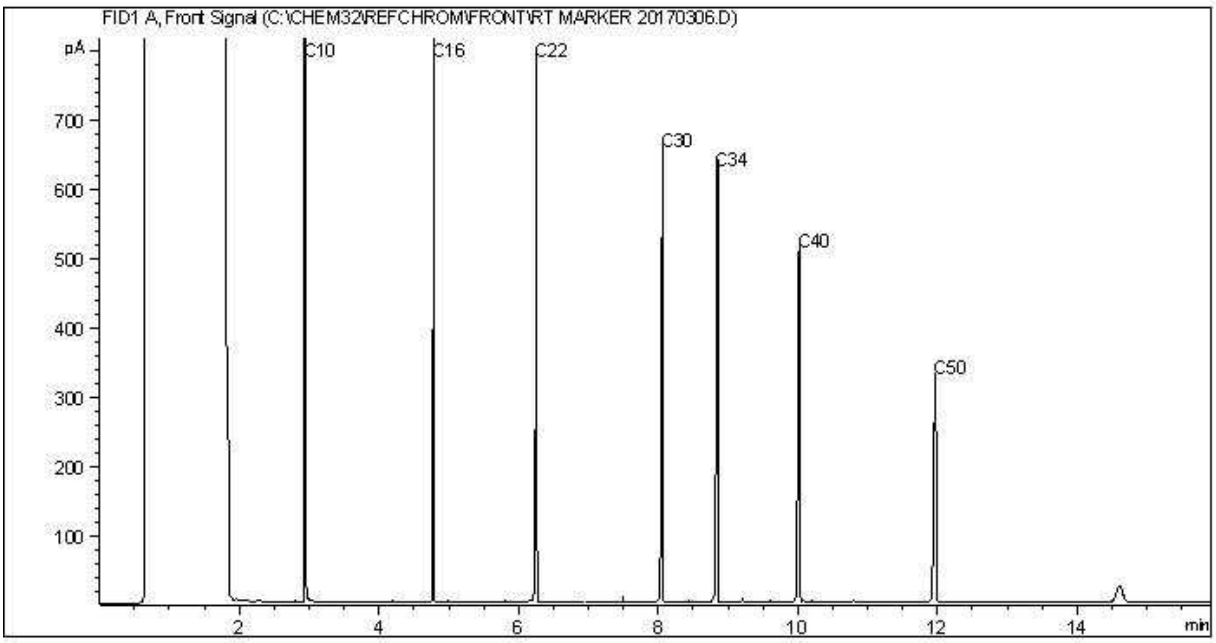
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: DUP 5

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+

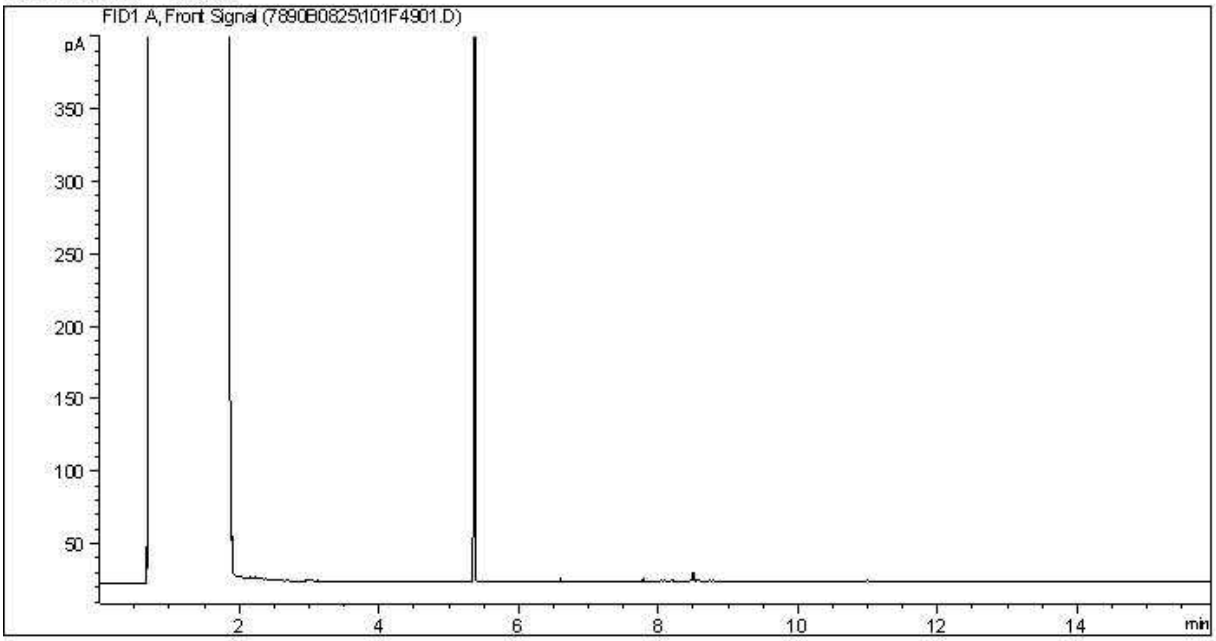
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871860
Report Date: 2018/08/30
Maxxam Sample: UD6517

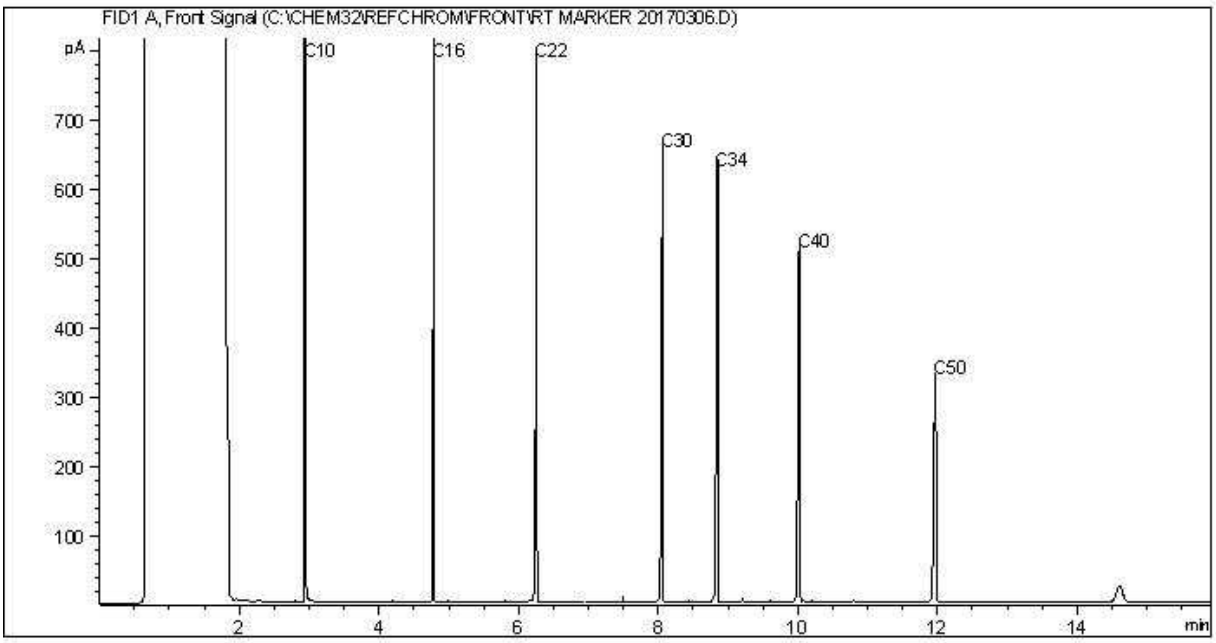
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: DUP 6

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+

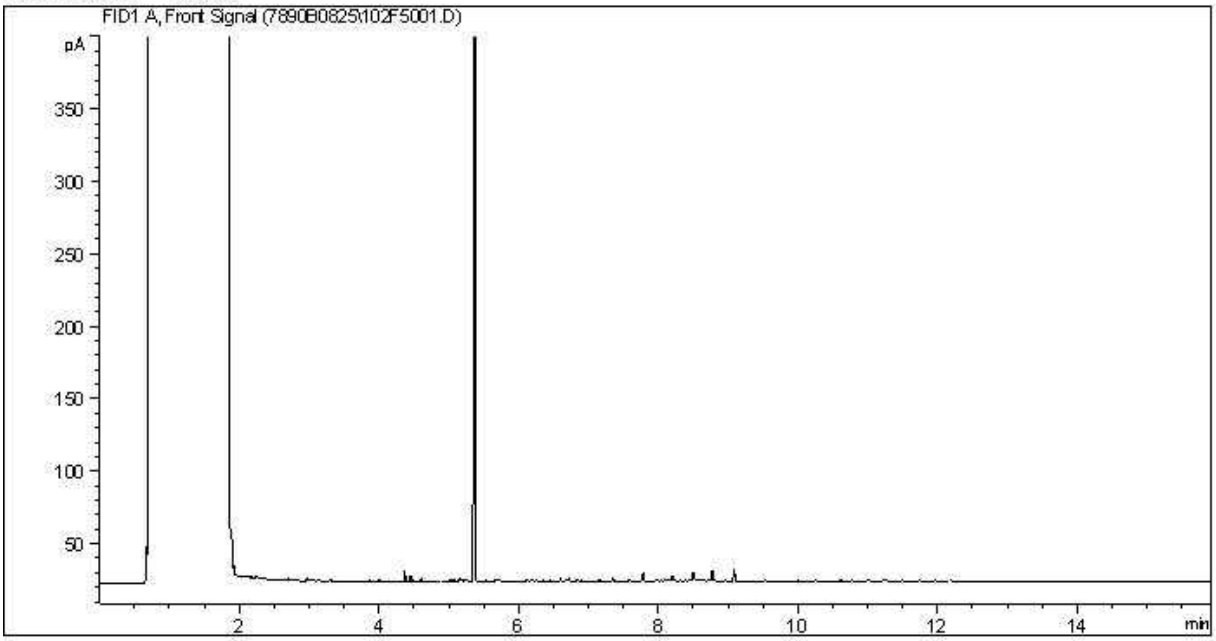
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871860
Report Date: 2018/08/30
Maxxam Sample: UD6518

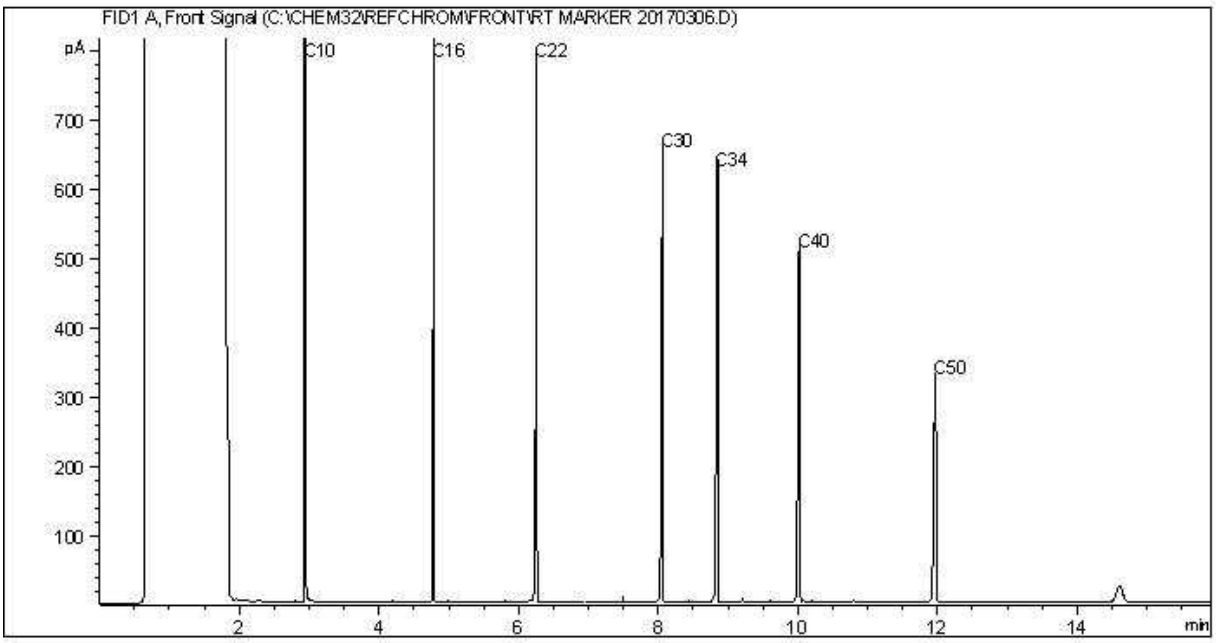
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: DUP 7

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+

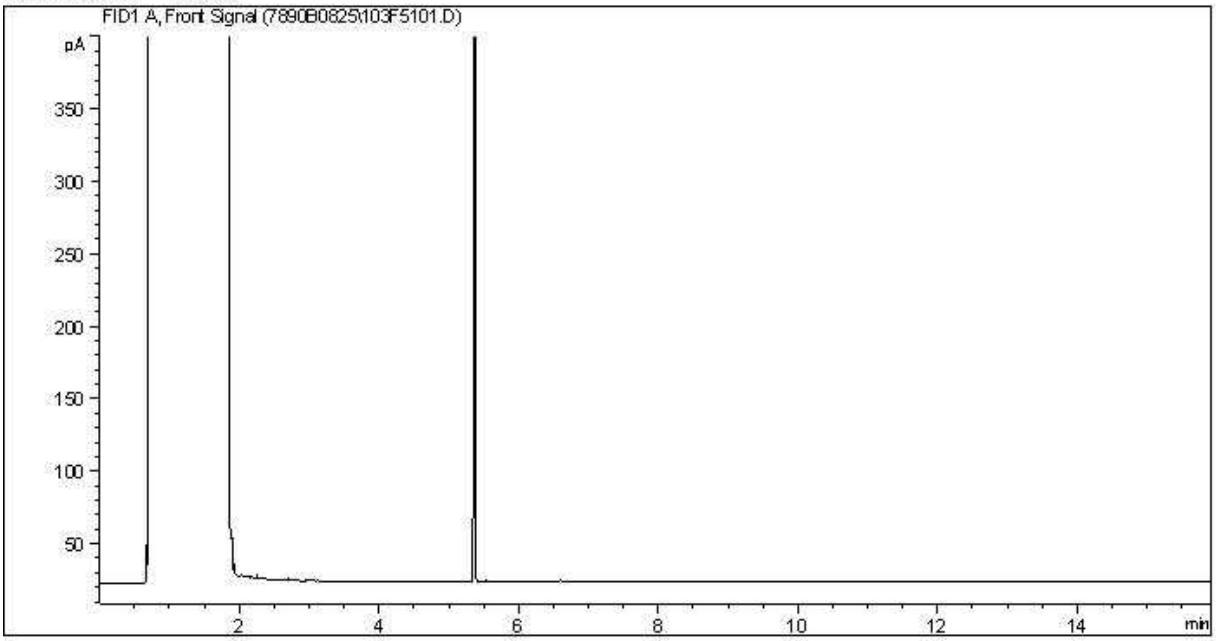
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871860
Report Date: 2018/08/30
Maxxam Sample: UD6519

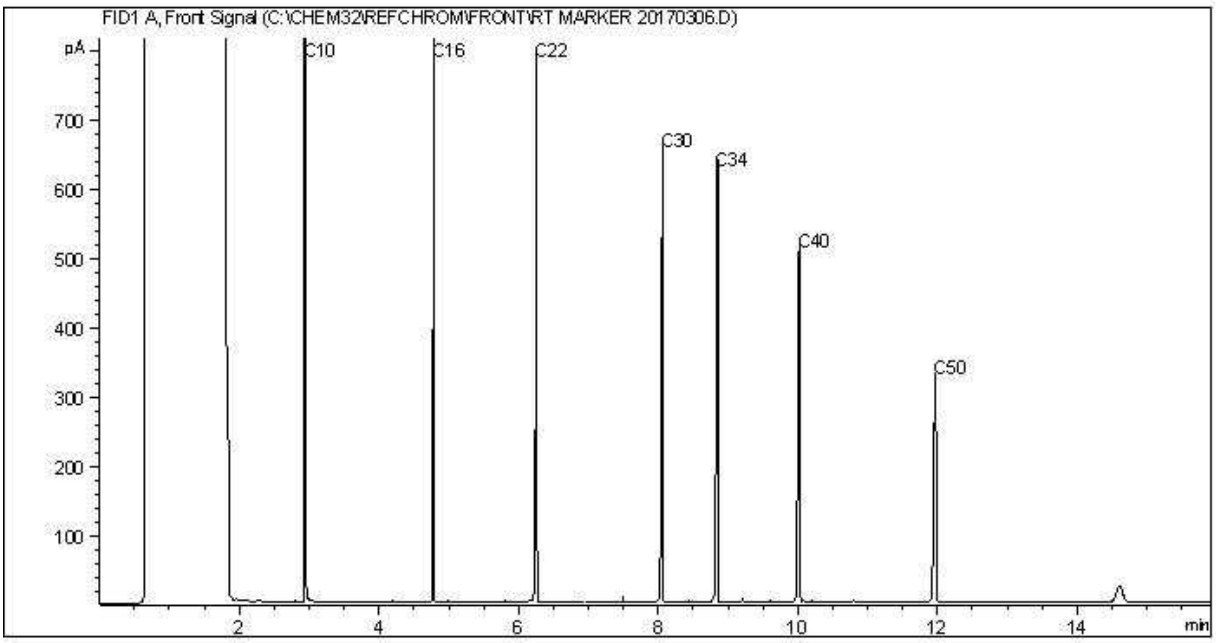
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: DUP 8

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.

Parminder Virk

From: Fletcher, Ryan <Ryan.Fletcher@arcadis.com>
Sent: Monday, August 27, 2018 6:20 AM
To: Janzen, Ryan; Parminder Virk
Subject: RE: 102012-000 PIN-2 B871860 Clarifications

Follow Up Flag: Follow up
Flag Status: Flagged

Please note, this message originated outside of the Maxxam mail system. Please use caution when opening links or attachments.
Parminder,

With regards to

“Both methanol vials for sample P1-3A are full to the top with sediment. We won’t be using these vials for analysis. Are you good to run BTEXF1 off jar? (attached image 1)”. I am certain I had re-sampled this personally. One of our field personnel was not aware of the sampling methodologies for vials. Can you please check to ensure that a duplicate set of vials was not included with the shipment for the -3A sample? I thought I had throw away those full vials, but it was incredibly busy and hectic and had some pilots helping me pack the samples last minute.

Thanks,

Ryan Fletcher, C.Tech, EP | Sr. Environmental Technician | ryan.fletcher@arcadis.com
Arcadis

1050 Morrison Drive, Suite 201, Ottawa, Ontario, K2H 8K7
Cell + 1 613 799 6624 | Direct. + 1 613 703 3122 | Office General +1 613 721 0555

Ontario Association of Certified Engineering Technicians and Technologists - #826323

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ARCADIS

Be green, leave it on the screen.

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From: Janzen, Ryan
Sent: August 24, 2018 4:08 PM
To: Parminder Virk <PVirk@maxxam.ca>; Fletcher, Ryan <Ryan.Fletcher@arcadis.com>
Subject: RE: 102012-000 PIN-2 B871860 Clarifications

I can speak to some of these, at least. My response below in orange.

Ryan Janzen | Project Specialist
T. +1 613 721 0555 | M. +1 647 989 7965

From: Parminder Virk <PVirk@maxxam.ca>
Sent: August 24, 2018 15:47
To: Fletcher, Ryan <Ryan.Fletcher@arcadis.com>; Janzen, Ryan <Ryan.Janzen@arcadis.com>
Subject: 102012-000 PIN-2 B871860 Clarifications

Hi Ryan,

There are a few questions for these soil samples received in Edmonton:

-Both methanol vials for sample P1-3A are full to the top with sediment. We won't be using these vials for analysis. Are you good to run BTEXF1 off jar? (attached image 1). Please run analysis from jar. I will be saving this photo for posterity.

- For samples P2-25A and P2-26A there is a labeling issue with the vials. For P2-25A, one vial has the ID P2-25A but it is crossed out and relabeled as P2-26A. The lid of the vial is also labeled as 26A. For sample P2-26A there is one vial with a client ID of P2-26A but the lid of the vial is labelled as 25A. (Attached images 2, 3 and 4). The vials, from left to right in Image 2, should be:

i. P2-25A (correctly labelled)
ii. P2-26A (lid correct, vial relabeled correctly)
iii. P2-25B (correctly relabeled lid and vial, though the vial is tough to make out)
iV. P2-26B (incorrectly relabeled vial and lid)

- For samples P2-26A and P2-26B both bags appear to have been labeled correctly originally but the IDs have been crossed out and changed to P2-25A and P2-25B, but both of these samples already have bags that are correctly labeled. (See attached image 5). Bags originally labelled P2-25A and P2-25B should have been relabeled with P2-26 designation. Basically, sampling locations were mis-identified in the field, and the labels had to be changed after samples were taken.

-- Samples listed on COC as P1-1A, P1-1B, P1-2A,P1-2B, P1-3A, P1-3B, P1-4A and P1-4B all have ID P2, we proceeded as per the COC.

Please advise.

Thank you

PARMINDER VIRK, M.Sc.
Project Manager, Site Assessment & Remediation
Alberta Environmental Services

Office 403.735.2235
Toll Free 800.386.7247
pvirk@maxxam.ca

4000 – 19 Street NE, Calgary, AB T2E 6P8
maxxam.ca

Maxxam
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Please Note: We will be CLOSED Monday August 6th for Heritage Day.

SUMMER HOURS START SUNDAY MAY 20, 2018.
Sample Reception Hours: Mon-Fri 8am-8pm, Sat/Sun 9am-5pm
Office Hours: Mon-Fri 9am-5pm

For urgent customer service inquiries after hours, please contact our on call project managers at 403 651 2436 for Calgary and 780 722 8050 for Edmonton.

Click here if you do not wish to receive announcements or occasional marketing updates from Maxxam.

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APPENDIX B2 Laboratory Certificates - Groundwater

Your Project #: 102012-000
Site Location: PIN-2
Your C.O.C. #: 1 of 1

Attention: Ryan Fletcher

ARCADIS Canada Inc
1050 Morrison Drive
Suite 201
Ottawa, ON
Canada K2H 8K7

Report Date: 2018/10/23
Report #: R2639067
Version: 3 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B871845
Received: 2018/08/21, 10:00

Sample Matrix: Water
Samples Received: 12

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
BTEX/F1 in Water by HS GC/MS/FID	12	N/A	2018/08/25	AB SOP-00039	CCME CWS/EPA 8260d m
F1-BTEX	12	N/A	2018/08/27	AB SOP-00039	Auto Calc
Cadmium - low level CCME (Total)	12	N/A	2018/08/30	AB WI-00065	Auto Calc
CCME Hydrocarbons (F2-F4 in water) (1)	1	2018/08/25	2018/08/25	AB SOP-00037 / AB SOP-00040	CCME PHC-CWS m
CCME Hydrocarbons (F2-F4 in water) (1)	11	2018/08/25	2018/08/26	AB SOP-00037 / AB SOP-00040	CCME PHC-CWS m
Elements by ICPMS - Total	12	2018/08/30	2018/08/30	AB SOP-00014 / AB SOP-00043	EPA 6020b R2 m

Remarks:

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

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

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

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Maxxam, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) Silica gel clean up employed.

Your Project #: 102012-000
Site Location: PIN-2
Your C.O.C. #: 1 of 1

Attention: Ryan Fletcher

ARCADIS Canada Inc
1050 Morrison Drive
Suite 201
Ottawa, ON
Canada K2H 8K7

Report Date: 2018/10/23
Report #: R2639067
Version: 3 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B871845
Received: 2018/08/21, 10:00

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Parminder Virk, Project Manager
Email: PVirk@maxxam.ca
Phone# (403)735-2235

==========

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 Job #: B871845
Report Date: 2018/10/23

ARCADIS Canada Inc
Client Project #: 102012-000
Site Location: PIN-2
Sampler Initials: RF

AT1 BTEX AND F1-F4 IN WATER (WATER)

Maxxam ID		UD6298	UD6299	UD6299	UD6300	UD6301	UD6302	UD6302		
Sampling Date		2018/08/19 11:30	2018/08/19 11:00	2018/08/19 11:00	2018/08/19 10:00	2018/08/19 13:00	2018/08/19 15:30	2018/08/19 15:30		
COC Number		1 of 1	1 of 1	1 of 1	1 of 1	1 of 1	1 of 1	1 of 1		
	UNITS	MW-1	MW-2	MW-2 Lab-Dup	MW-3	MW-4	MW-5	MW-5 Lab-Dup	RDL	QC Batch
Ext. Pet. Hydrocarbon										
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	<0.10	N/A	<0.10	<0.10	<0.10	<0.10	0.10	9117149
F3 (C16-C34 Hydrocarbons)	mg/L	<0.10	<0.10	N/A	<0.10	<0.10	<0.10	<0.10	0.10	9117149
F4 (C34-C50 Hydrocarbons)	mg/L	<0.10 (1)	<0.10 (1)	N/A	<0.10 (1)	<0.10 (1)	<0.10 (1)	<0.10	0.10	9117149
Volatiles										
F1 (C6-C10) - BTEX	ug/L	<25	<25	N/A	<25	<25	<25	N/A	25	9116075
F1 (C6-C10)	ug/L	<25 (1)	<25 (1)	<25 (1)	<25 (1)	<25 (1)	<25 (1)	N/A	25	9117173
Surrogate Recovery (%)										
1,4-Difluorobenzene (sur.)	%	112	113	112	110	111	109	N/A	N/A	9117173
4-Bromofluorobenzene (sur.)	%	103	104	103	103	103	104	N/A	N/A	9117173
D4-1,2-Dichloroethane (sur.)	%	110	116	108	108	108	108	N/A	N/A	9117173
O-TERPHENYL (sur.)	%	105	113	N/A	121	120	118	117	N/A	9117149

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable
(1) Detection limits calculated based on method detection limits (MDLs) at client request.

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

Maxxam Job #: B871845
Report Date: 2018/10/23

ARCADIS Canada Inc
Client Project #: 102012-000
Site Location: PIN-2
Sampler Initials: RF

AT1 BTEX AND F1-F4 IN WATER (WATER)

Maxxam ID		UD6303	UD6304	UD6305	UD6306		UD6307		
Sampling Date		2018/08/19 14:30	2018/08/19 14:00	2018/08/19	2018/08/19 15:30		2018/08/19		
COC Number		1 of 1	1 of 1	1 of 1	1 of 1		1 of 1		
	UNITS	MW-6	MW-7	DUP 1	FIELD BLANK	QC Batch	TRIP BLANK	RDL	QC Batch
Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	<0.10	<0.10	<0.10	9117149	<0.10	0.10	9117149
F3 (C16-C34 Hydrocarbons)	mg/L	<0.10	<0.10	<0.10	<0.10	9117149	<0.10	0.10	9117149
F4 (C34-C50 Hydrocarbons)	mg/L	<0.10 (1)	<0.10 (1)	<0.10 (1)	<0.10 (1)	9117149	<0.10 (1)	0.10	9117149
Volatiles									
F1 (C6-C10) - BTEX	ug/L	<25	<25	<25	<25	9116075	<25	25	9116764
F1 (C6-C10)	ug/L	<25 (1)	<25 (1)	<25 (1)	<25 (1)	9117173	<25 (1)	25	9117173
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	109	110	108	104	9117173	105	N/A	9117173
4-Bromofluorobenzene (sur.)	%	103	103	103	104	9117173	102	N/A	9117173
D4-1,2-Dichloroethane (sur.)	%	108	107	106	103	9117173	105	N/A	9117173
O-TERPHENYL (sur.)	%	113	119	103	101	9117149	109	N/A	9117149

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Detection limits calculated based on method detection limits (MDLs) at client request.

Maxxam Job #: B871845
Report Date: 2018/10/23

ARCADIS Canada Inc
Client Project #: 102012-000
Site Location: PIN-2
Sampler Initials: RF

AT1 BTEX AND F1-F4 IN WATER (WATER)

Maxxam ID		UD6308	UD6309		
Sampling Date		2018/08/19 17:00	2018/08/19 17:15		
COC Number		1 of 1	1 of 1		
	UNITS	EQUIPMENT BLANK 1	EQUIPMENT BLANK 2	RDL	QC Batch
Ext. Pet. Hydrocarbon					
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	<0.10	0.10	9117149
F3 (C16-C34 Hydrocarbons)	mg/L	<0.10	<0.10	0.10	9117149
F4 (C34-C50 Hydrocarbons)	mg/L	<0.10 (1)	<0.10 (1)	0.10	9117149
Volatiles					
F1 (C6-C10) - BTEX	ug/L	<25	<25	25	9116764
F1 (C6-C10)	ug/L	<25 (1)	<25 (1)	25	9117173
Surrogate Recovery (%)					
1,4-Difluorobenzene (sur.)	%	106	108	N/A	9117173
4-Bromofluorobenzene (sur.)	%	103	103	N/A	9117173
D4-1,2-Dichloroethane (sur.)	%	106	104	N/A	9117173
O-TERPHENYL (sur.)	%	109	112	N/A	9117149

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Detection limits calculated based on method detection limits (MDLs) at client request.

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Maxxam Job #: B871845
Report Date: 2018/10/23

ARCADIS Canada Inc
Client Project #: 102012-000
Site Location: PIN-2
Sampler Initials: RF

RESULTS OF CHEMICAL ANALYSES OF WATER

Maxxam ID		UD6298	UD6299	UD6300	UD6301	UD6302	UD6303	UD6304		
Sampling Date		2018/08/19 11:30	2018/08/19 11:00	2018/08/19 10:00	2018/08/19 13:00	2018/08/19 15:30	2018/08/19 14:30	2018/08/19 14:00		
COC Number		1 of 1	1 of 1	1 of 1	1 of 1	1 of 1	1 of 1	1 of 1		
	UNITS	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	RDL	QC Batch
Low Level Elements										
Total Cadmium (Cd)	ug/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	9119056
RDL = Reportable Detection Limit										

Maxxam ID		UD6305	UD6306	UD6307	UD6308	UD6309		
Sampling Date		2018/08/19	2018/08/19 15:30	2018/08/19	2018/08/19 17:00	2018/08/19 17:15		
COC Number		1 of 1	1 of 1	1 of 1	1 of 1	1 of 1		
	UNITS	DUP 1	FIELD BLANK	TRIP BLANK	EQUIPMENT BLANK 1	EQUIPMENT BLANK 2	RDL	QC Batch
Low Level Elements								
Total Cadmium (Cd)	ug/L	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	9119056
RDL = Reportable Detection Limit								

Maxxam Job #: B871845
Report Date: 2018/10/23

ARCADIS Canada Inc
Client Project #: 102012-000
Site Location: PIN-2
Sampler Initials: RF

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		UD6298	UD6298	UD6299	UD6300	UD6301	UD6302		
Sampling Date		2018/08/19 11:30	2018/08/19 11:30	2018/08/19 11:00	2018/08/19 10:00	2018/08/19 13:00	2018/08/19 15:30		
COC Number		1 of 1	1 of 1	1 of 1	1 of 1	1 of 1	1 of 1		
	UNITS	MW-1	MW-1 Lab-Dup	MW-2	MW-3	MW-4	MW-5	RDL	QC Batch
Elements									
Total Arsenic (As)	mg/L	0.0011	0.0010	0.00066	0.00051	0.00043	0.00040	0.00020	9122390
Total Chromium (Cr)	mg/L	0.0020	0.0033	<0.0010	<0.0010	<0.0010	0.0025	0.0010	9122390
Total Cobalt (Co)	mg/L	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	0.00030	9122390
Total Copper (Cu)	mg/L	0.0045	0.0044	0.0022	0.0015	0.0015	0.0014	0.00020	9122390
Total Lead (Pb)	mg/L	<0.00010 (1)	0.00015	<0.00010 (1)	<0.00010 (1)	<0.00010 (1)	<0.00010 (1)	0.00010	9122390
Total Nickel (Ni)	mg/L	0.0027	0.0035	0.0029	0.0031	0.0031	0.0021	0.00050	9122390
Total Zinc (Zn)	mg/L	0.0093	0.0095	<0.0030	0.0094	0.0060	0.022	0.0030	9122390

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
(1) Detection limits calculated based on method detection limits (MDLs) at client request.

Maxxam ID		UD6303	UD6304	UD6305	UD6306	UD6307		
Sampling Date		2018/08/19 14:30	2018/08/19 14:00	2018/08/19	2018/08/19 15:30	2018/08/19		
COC Number		1 of 1	1 of 1	1 of 1	1 of 1	1 of 1		
	UNITS	MW-6	MW-7	DUP 1	FIELD BLANK	TRIP BLANK	RDL	QC Batch
Elements								
Total Arsenic (As)	mg/L	0.00051	0.00052	0.00044	<0.00020	<0.00020	0.00020	9122390
Total Chromium (Cr)	mg/L	<0.0010	<0.0010	0.0010	<0.0010	<0.0010	0.0010	9122390
Total Cobalt (Co)	mg/L	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	0.00030	9122390
Total Copper (Cu)	mg/L	0.0026	0.0011	0.0016	<0.00020	<0.00020	0.00020	9122390
Total Lead (Pb)	mg/L	<0.00010 (1)	<0.00010 (1)	<0.00010 (1)	<0.00010 (1)	<0.00010 (1)	0.00010	9122390
Total Nickel (Ni)	mg/L	0.0029	0.0011	0.0030	<0.00050	<0.00050	0.00050	9122390
Total Zinc (Zn)	mg/L	0.12	0.0035	0.0095	<0.0030	<0.0030	0.0030	9122390

RDL = Reportable Detection Limit
(1) Detection limits calculated based on method detection limits (MDLs) at client request.

Maxxam Job #: B871845
Report Date: 2018/10/23

ARCADIS Canada Inc
Client Project #: 102012-000
Site Location: PIN-2
Sampler Initials: RF

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		UD6308	UD6309		
Sampling Date		2018/08/19 17:00	2018/08/19 17:15		
COC Number		1 of 1	1 of 1		
	UNITS	EQUIPMENT BLANK 1	EQUIPMENT BLANK 2	RDL	QC Batch
Elements					
Total Arsenic (As)	mg/L	<0.00020	<0.00020	0.00020	9122390
Total Chromium (Cr)	mg/L	<0.0010	<0.0010	0.0010	9122390
Total Cobalt (Co)	mg/L	<0.00030	<0.00030	0.00030	9122390
Total Copper (Cu)	mg/L	0.00029	<0.00020	0.00020	9122390
Total Lead (Pb)	mg/L	<0.00010 (1)	<0.00010 (1)	0.00010	9122390
Total Nickel (Ni)	mg/L	<0.00050	<0.00050	0.00050	9122390
Total Zinc (Zn)	mg/L	<0.0030	<0.0030	0.0030	9122390

RDL = Reportable Detection Limit
(1) Detection limits calculated based on method detection limits (MDLs) at client request.

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Maxxam Job #: B871845
Report Date: 2018/10/23

ARCADIS Canada Inc
Client Project #: 102012-000
Site Location: PIN-2
Sampler Initials: RF

GENERAL COMMENTS

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

Package 1	7.3°C
Package 2	6.0°C
Package 3	6.3°C
Package 4	5.3°C
Package 5	6.3°C
Package 6	6.0°C
Package 7	3.0°C

Report re-issued with updated reportable parameters to exclude total xylene on 2018.09.25.
Report re-issued with updated Detection Limits as per client request on 2018.10.23.

Results relate only to the items tested.

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Maxxam Job #: B871845
Report Date: 2018/10/23

QUALITY ASSURANCE REPORT

ARCADIS Canada Inc
Client Project #: 102012-000
Site Location: PIN-2
Sampler Initials: RF

			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
9117149	O-TERPHENYL (sur.)	2018/08/27	119	60 - 140	107	60 - 140	103	%		
9117173	1,4-Difluorobenzene (sur.)	2018/08/25	98	50 - 140	107	50 - 140	113	%		
9117173	4-Bromofluorobenzene (sur.)	2018/08/25	101	50 - 140	102	50 - 140	103	%		
9117173	D4-1,2-Dichloroethane (sur.)	2018/08/25	107	50 - 140	127	50 - 140	108	%		
9117149	F2 (C10-C16 Hydrocarbons)	2018/08/25	114	60 - 140	109	60 - 140	<0.10	mg/L	NC	30
9117149	F3 (C16-C34 Hydrocarbons)	2018/08/25	109	60 - 140	104	60 - 140	<0.10	mg/L	NC	30
9117149	F4 (C34-C50 Hydrocarbons)	2018/08/25	103	60 - 140	124	60 - 140	<0.20	mg/L	NC	30
9117173	F1 (C6-C10)	2018/08/25	100	60 - 140	106	60 - 140	<100	ug/L	NC (1)	30
9122390	Total Arsenic (As)	2018/08/30	100	80 - 120	99	80 - 120	<0.00020	mg/L	6.2	20
9122390	Total Chromium (Cr)	2018/08/30	100	80 - 120	101	80 - 120	<0.0010	mg/L	NC	20
9122390	Total Cobalt (Co)	2018/08/30	100	80 - 120	101	80 - 120	<0.00030	mg/L	NC	20
9122390	Total Copper (Cu)	2018/08/30	98	80 - 120	101	80 - 120	<0.00020	mg/L	2.7	20
9122390	Total Lead (Pb)	2018/08/30	98	80 - 120	100	80 - 120	<0.00020	mg/L	NC	20
9122390	Total Nickel (Ni)	2018/08/30	98	80 - 120	99	80 - 120	<0.00050	mg/L	NC	20
9122390	Total Zinc (Zn)	2018/08/30	98	80 - 120	101	80 - 120	<0.0030	mg/L	1.5	20

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

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

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

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

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

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

(1) Detection limits calculated based on method detection limits (MDLs) at client request.

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

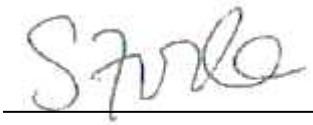
Maxxam Job #: B871845
Report Date: 2018/10/23

ARCADIS Canada Inc
Client Project #: 102012-000
Site Location: PIN-2
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).

Justin Geisel, B.Sc., Organics Supervisor



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.

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

WATER 1137 (13)

Maxxam Analytics International Corporation o/a Maxxam Analytics
4000 19th Street NE, Calgary, Alberta Canada T2E 6P8 Tel: (403) 291-3077, Fax: (403) 735-2240, Toll free: (800) 386-7247

CHAIN OF CUSTODY RECORD

Page 1 of 1

INVOICE INFORMATION:		REPORT INFORMATION (if differs from invoice):		PROJECT INFORMATION:		Laboratory Use Only
Company Name:	# 10988 ARCADIS Canada Inc.	Company Name:	Arcadis Canada Inc	Quotation #:	B80947 (2018 prices-Easten Quote B60371)	MAXXAM JOB #:
Contact Name:	Invoices Attention	Contact Name:	Ryan Fletcher/Troy Austrins	P.O. #:		B871845
Address:	1050 Morrison Drive, Suite 201	Address:	1050 Morrison Drive, Suite 201	Project #:	102012-000	PROJECT MANAGER:
	Ottawa, Ontario		Ottawa, On	Scenario:		
Phone:	613-721-0555 Fax:	Phone:	613-721-0555	Site Location:	PIN-2	Parminder Virk
Email:	invoicesottawa@arcadis.com, barb.adelman@arcadis.com	Email:	ryan.fletcher@arcadis.com/Troy.austrins@arcadis.com	Sampled By:	Ryan Fletcher	

SPECIAL INSTRUCTIONS:

Metals: only report for As, Cd, Cr, Co, Cu, Pb, Ni, Zinc

PHCs: Only report for F1-F4 (i.e., no BTEX)

Groundwater: Metals not preserved and not field filtered. Analyse for TOTAL metals only. (do not filter or perserve in lab).

Special MDLs are required. Contact Parminder Virk if there are any questions regarding MDLs.

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: [X]

Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for some tests are > 5 days - contact your Project Manager for details.

Rush TAT

Date Required: _____

	Sample Indentification	Date Sampled & Time Sampled	Matrix	F1-F4 (No BTEX)	Total As, Cd, Cr, Co, Cu, Pb, Ni, Zinc	PCB	# of Containers	Comments
1	MW-1	Aug 19/18 1130	GW	X	X		5	Sample Reception: Please notify the lab for required RDLs Refer to the attached document for required RDL.
2	MW-2	1100	GW	X	X		5	Please email the lab to not filter or preserve metals bottles
3	MW-3	1000	GW	X	X		5	
4	MW-4	1300	GW	X	X		5	
5	MW-5	1530	GW	X	X		5	
6	MW-6	1430	GW	X	X		5	
7	MW-7	1400	GW	X	X		5	
8	Dup 1	—	GW	X	X		5	
9	Field Blank	1530	W	X	X		5	
10	Trip Blank	—	W	X	X		5	
11	Equipment Blank 1	1700	W	X	X		5	
12	Equipment Blank 2	1715	W	X	X		5	

RECEIVED IN YELLOWKNIFE
By: Jeffery S
2018 -08- 21 10:00
Temp: See Temp Record

*RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time:	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time:	Laboratory Use Only: Temperature of samples on receipt (°C)	Custody Seal intact on Cooler?
Ryan Fletcher	Aug 21/18	8:00	Danielle Boorman	20180822	10:15	9°C 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 RESULTS IN ANALYICAL TAT DELAYS
** ALL SAMPLES ARE HELD FOR 60 DAYS AFTER SAMPLE RECEIPT, FOR SPECIAL REQUEST PLEASE CONTACT YOUR PROJECT MANAGER

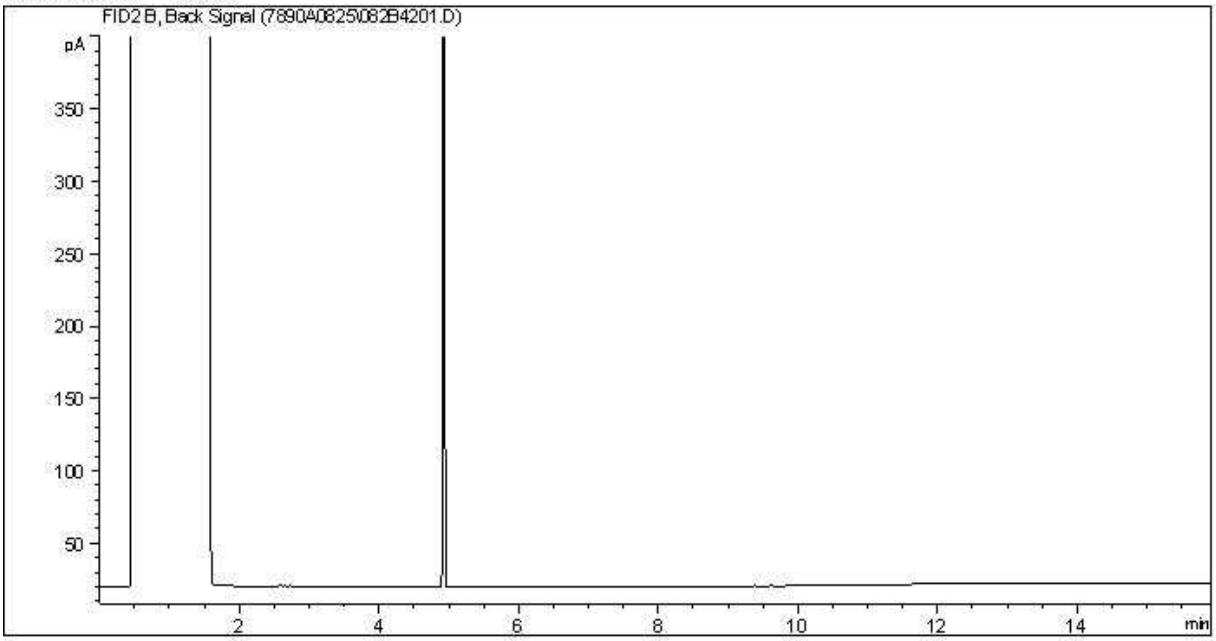
White: Maxxam Yellow: Client

Maxxam Job #: B871845
Report Date: 2018/10/23
Maxxam Sample: UD6298

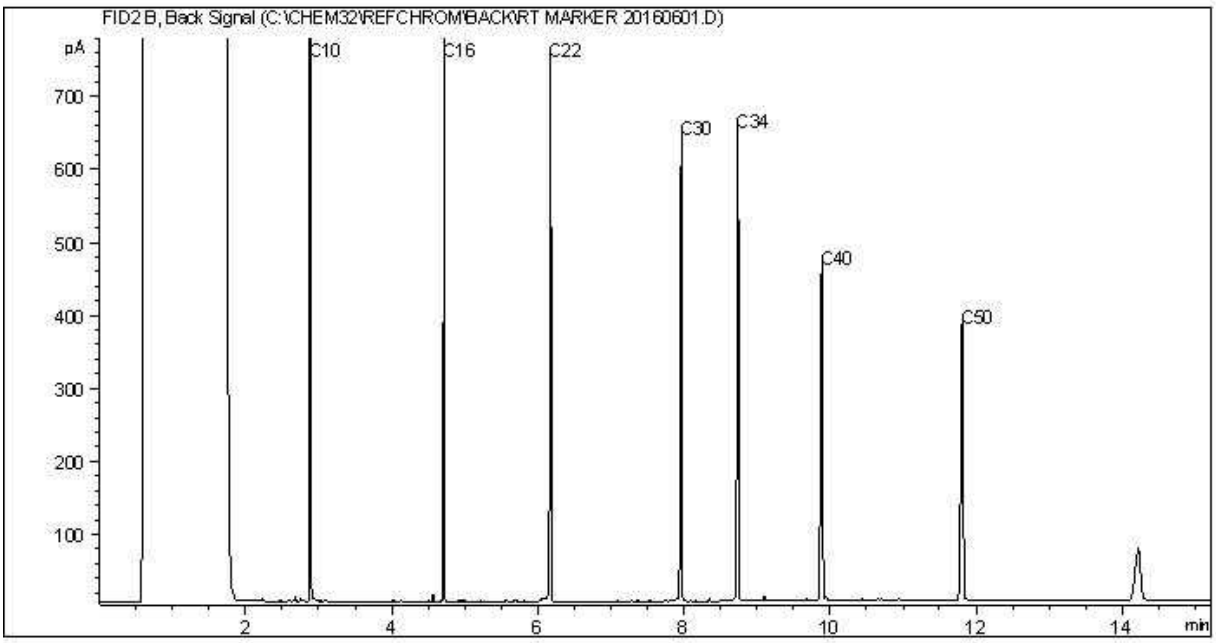
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: MW-1

CCME Hydrocarbons (F2-F4 in water) 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+

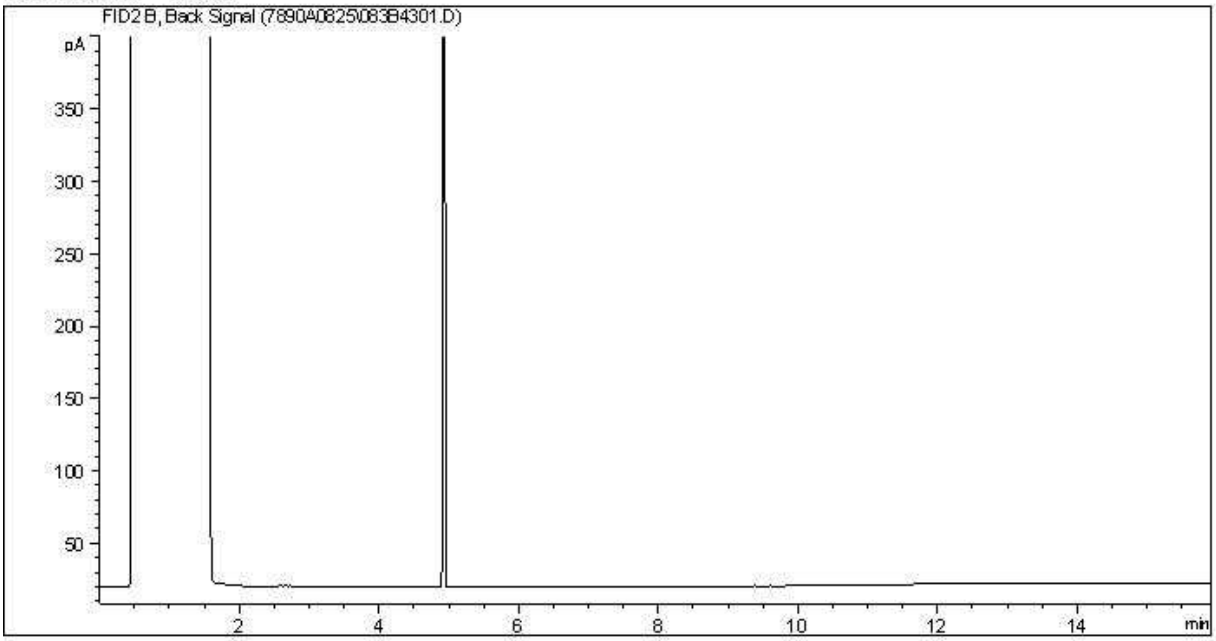
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871845
Report Date: 2018/10/23
Maxxam Sample: UD6299

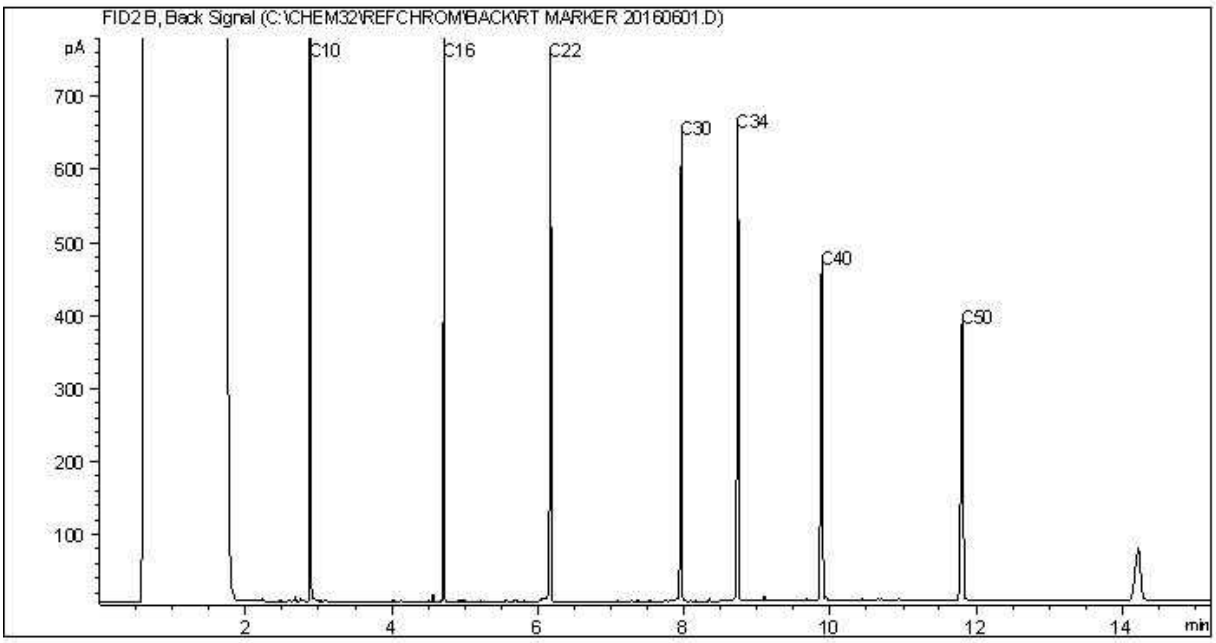
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: MW-2

CCME Hydrocarbons (F2-F4 in water) 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+

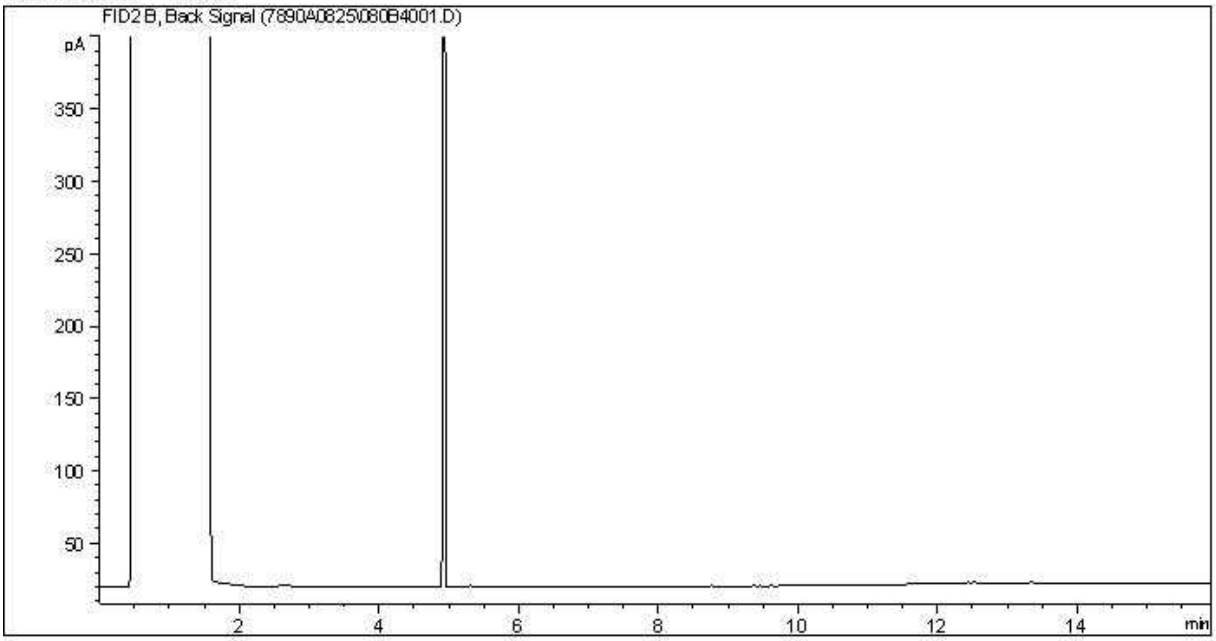
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871845
Report Date: 2018/10/23
Maxxam Sample: UD6300

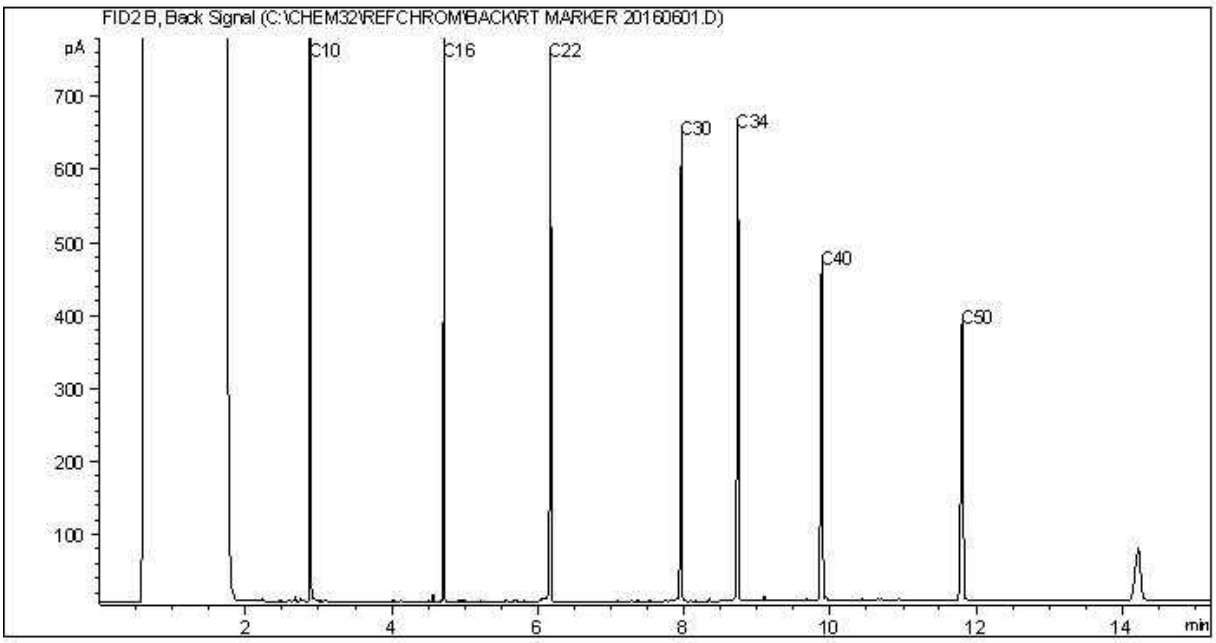
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: MW-3

CCME Hydrocarbons (F2-F4 in water) 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+

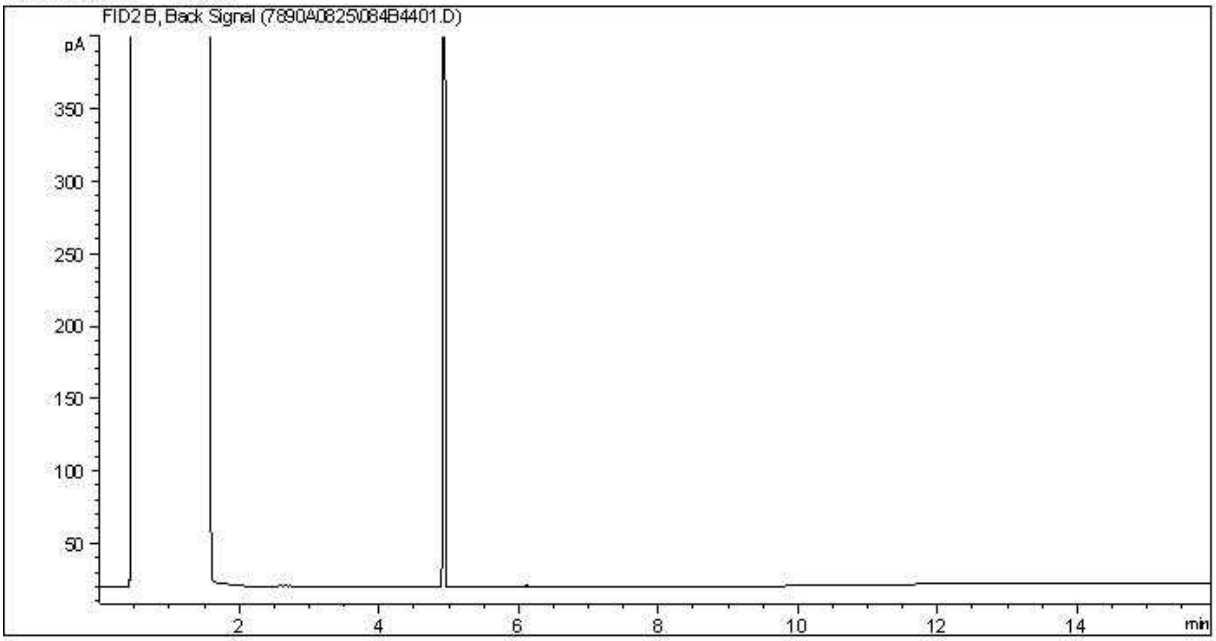
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871845
Report Date: 2018/10/23
Maxxam Sample: UD6301

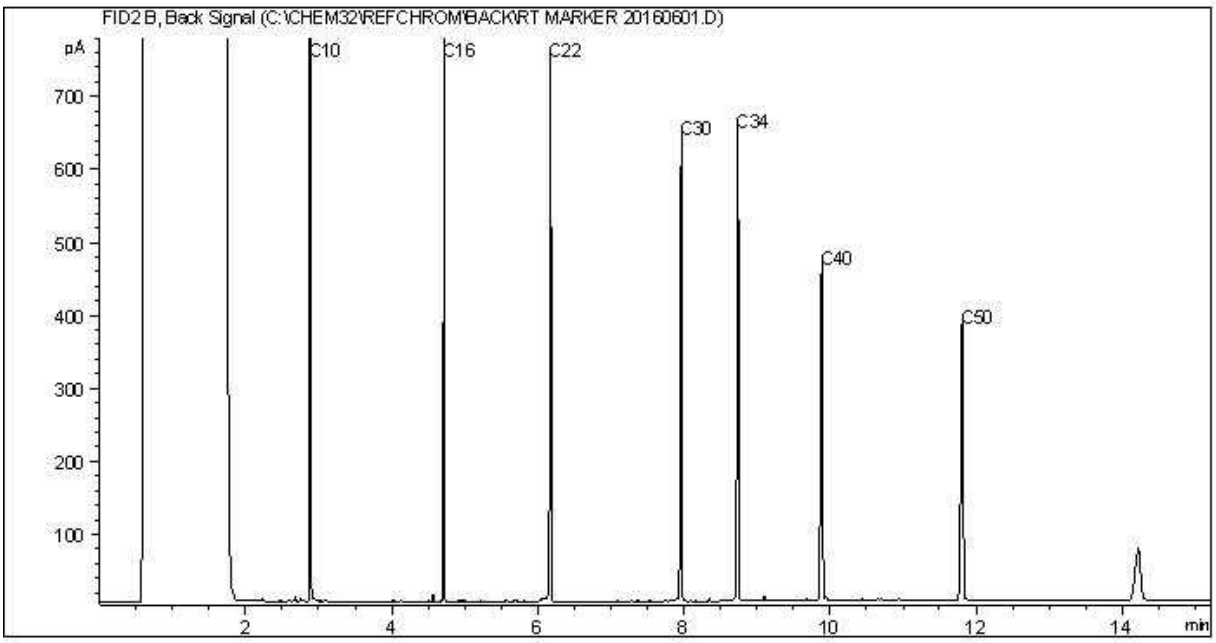
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: MW-4

CCME Hydrocarbons (F2-F4 in water) 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+

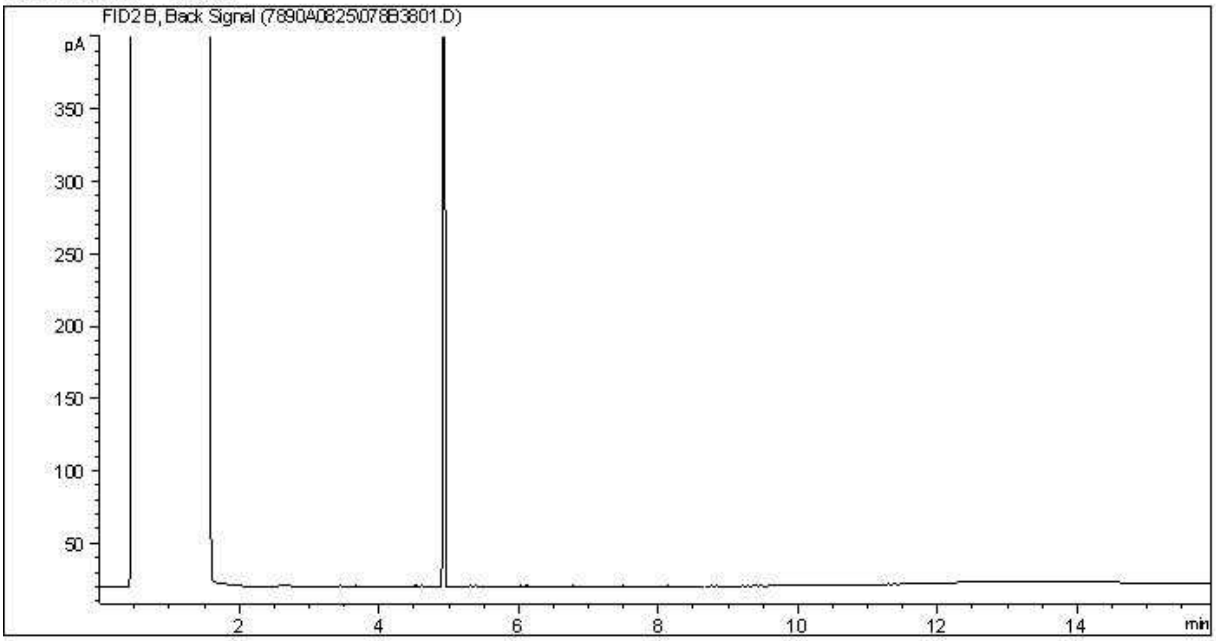
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871845
Report Date: 2018/10/23
Maxxam Sample: UD6302

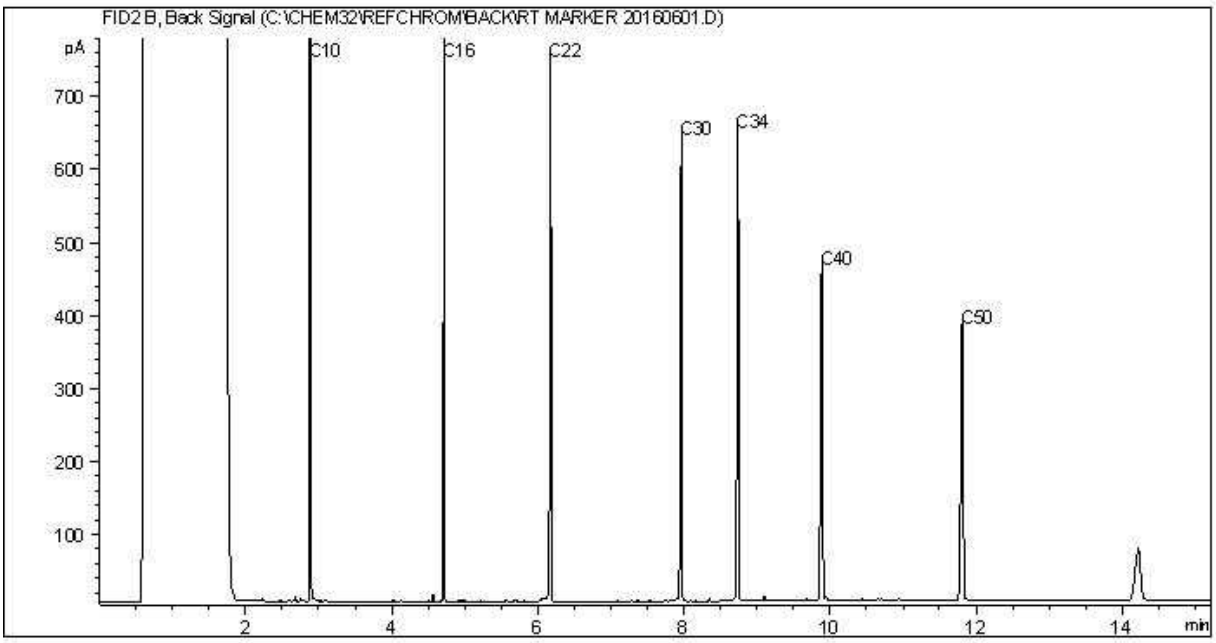
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: MW-5

CCME Hydrocarbons (F2-F4 in water) 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+

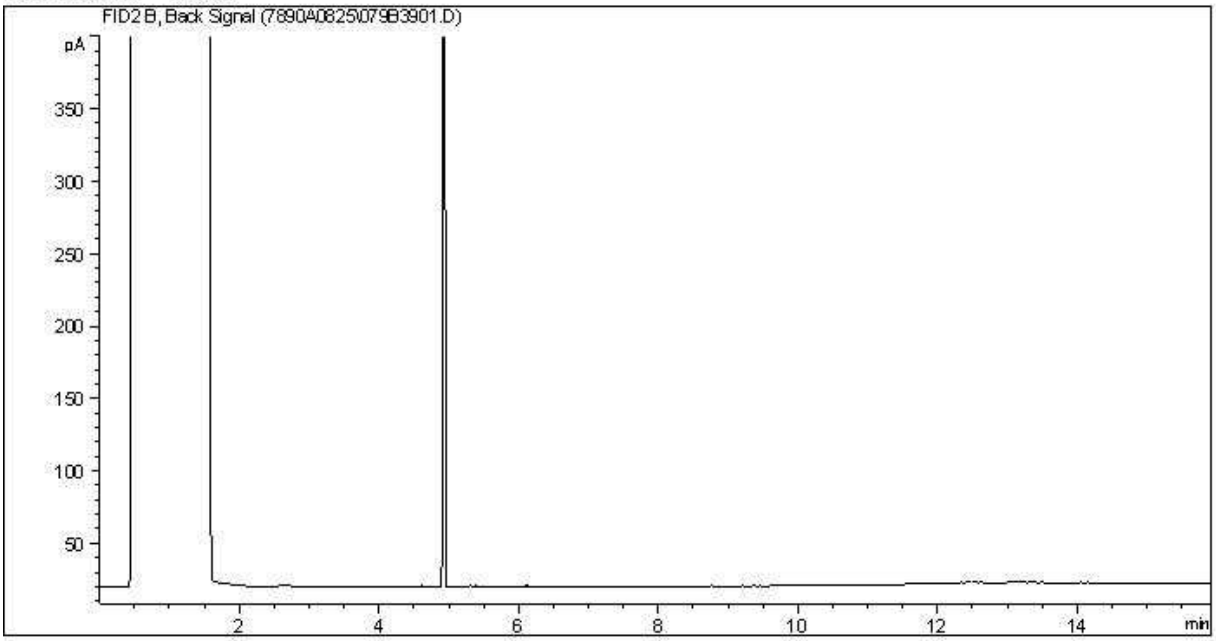
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871845
Report Date: 2018/10/23
Maxxam Sample: UD6302 Lab-Dup

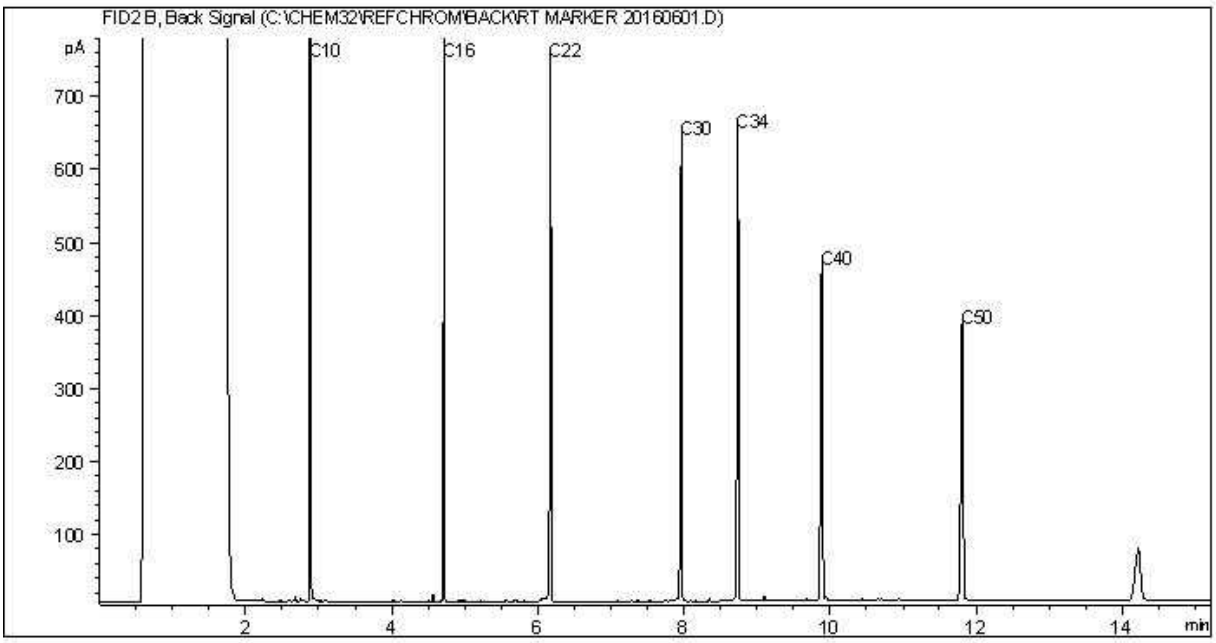
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: MW-5

CCME Hydrocarbons (F2-F4 in water) 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+

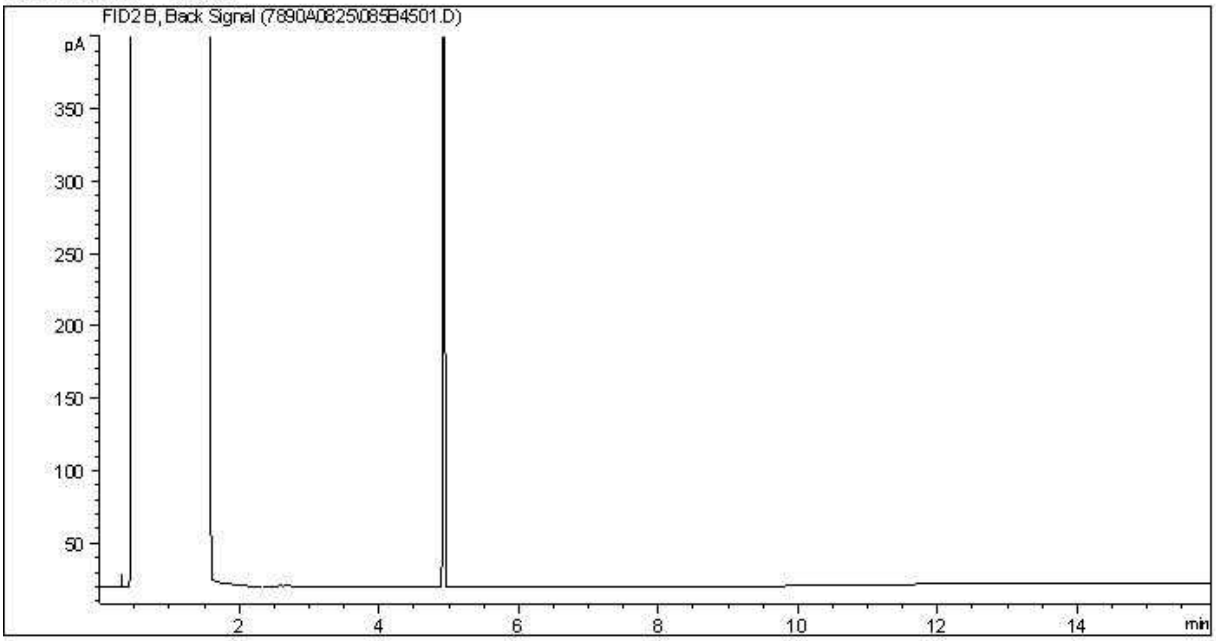
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871845
Report Date: 2018/10/23
Maxxam Sample: UD6303

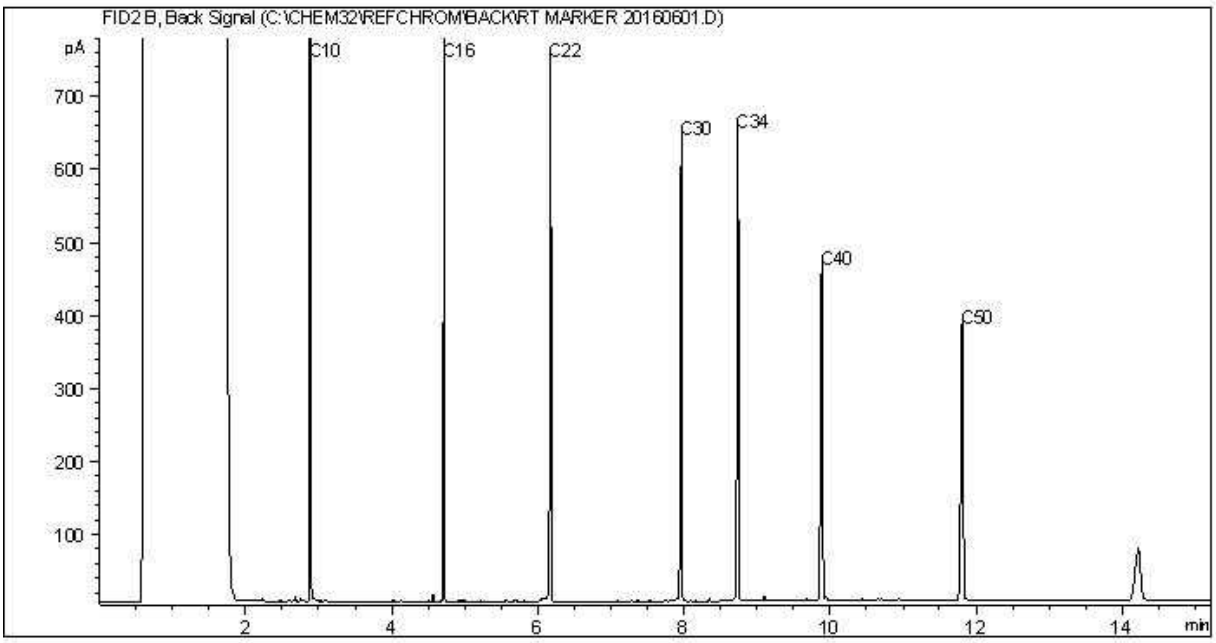
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: MW-6

CCME Hydrocarbons (F2-F4 in water) 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+

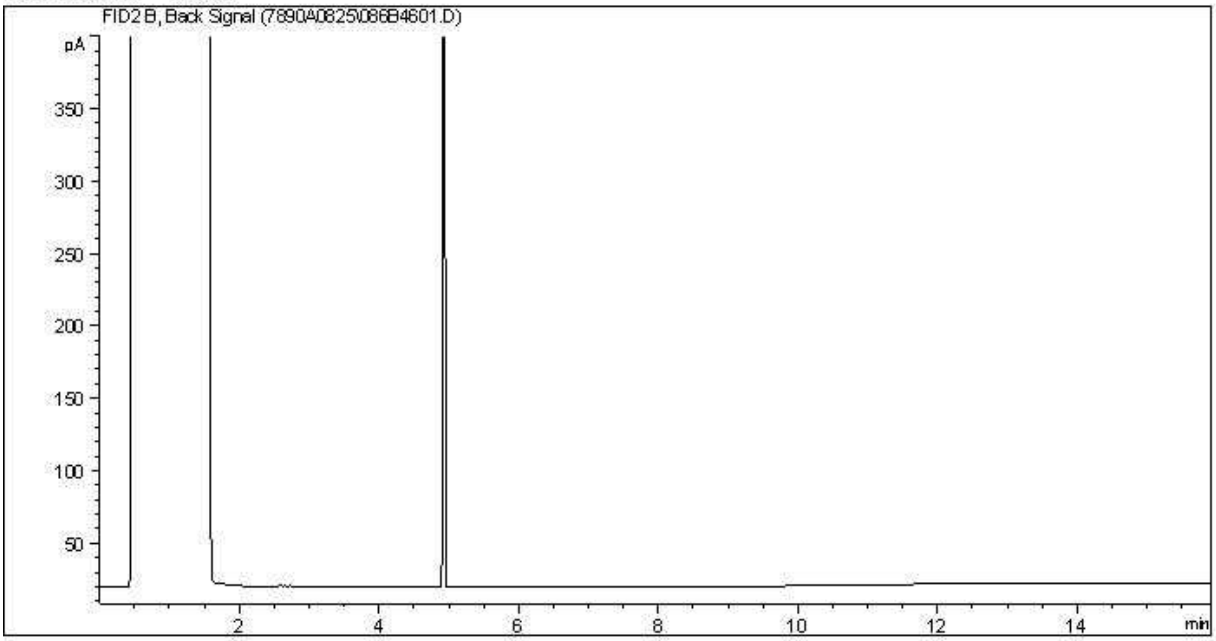
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871845
Report Date: 2018/10/23
Maxxam Sample: UD6304

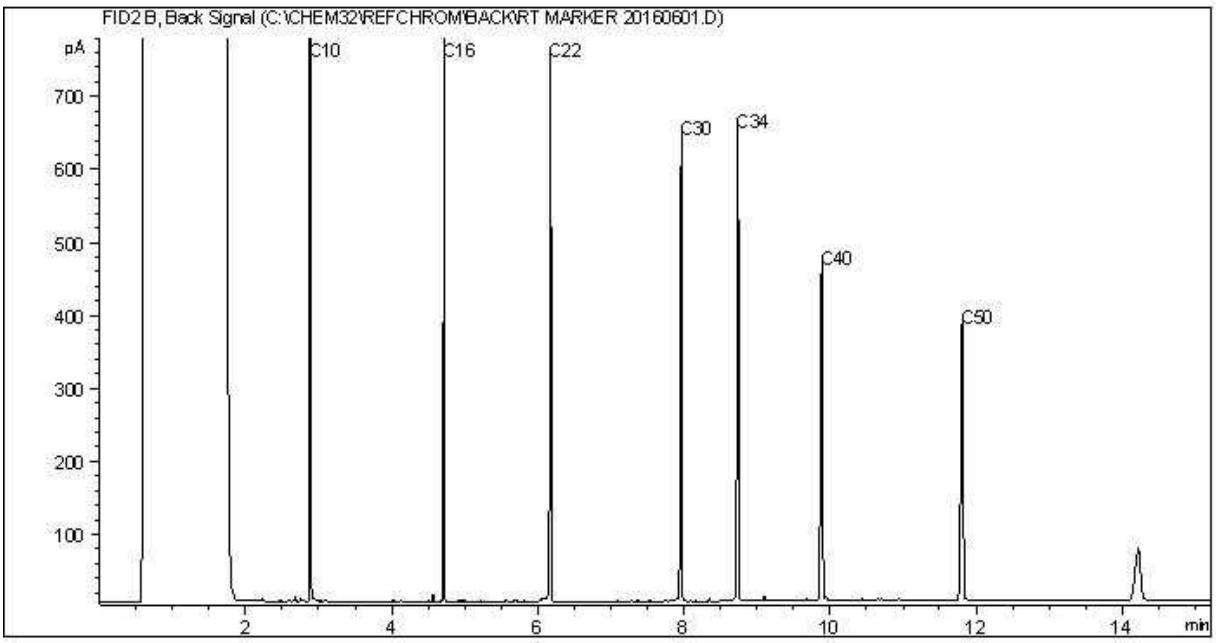
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: MW-7

CCME Hydrocarbons (F2-F4 in water) 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+

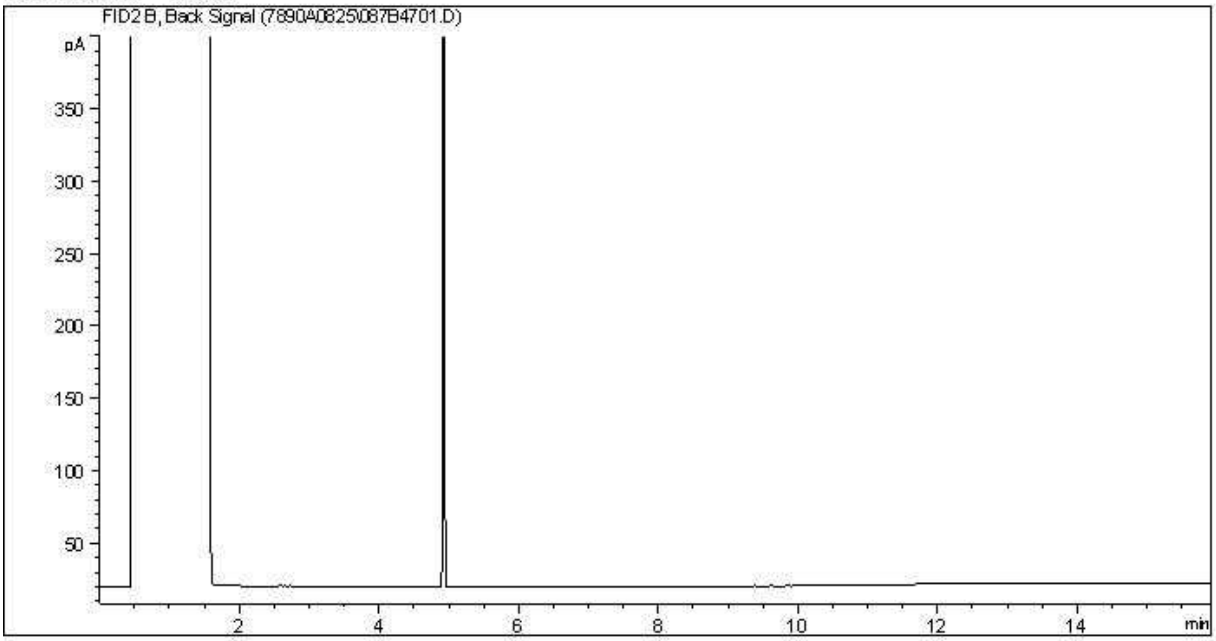
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871845
Report Date: 2018/10/23
Maxxam Sample: UD6305

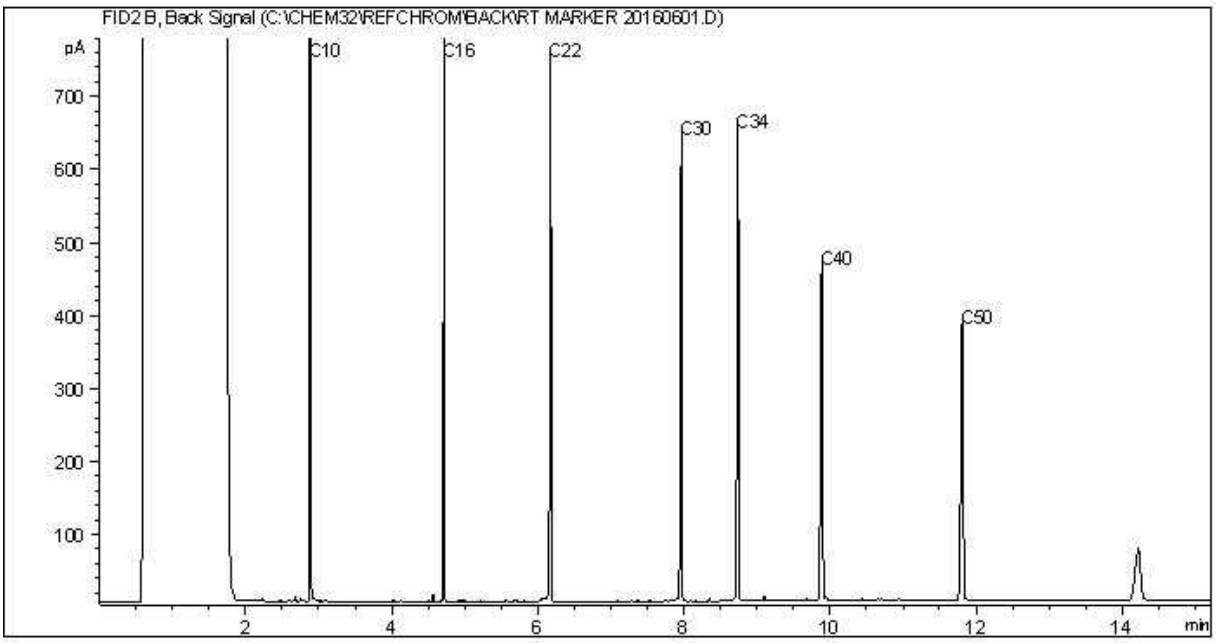
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: DUP 1

CCME Hydrocarbons (F2-F4 in water) 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+

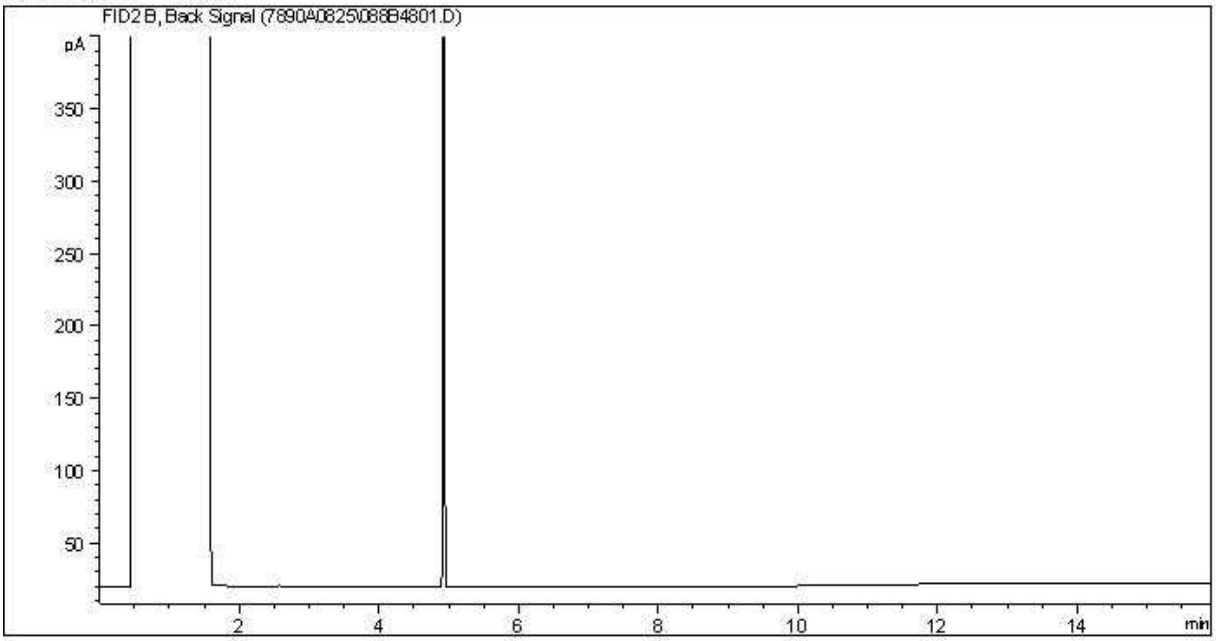
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871845
Report Date: 2018/10/23
Maxxam Sample: UD6306

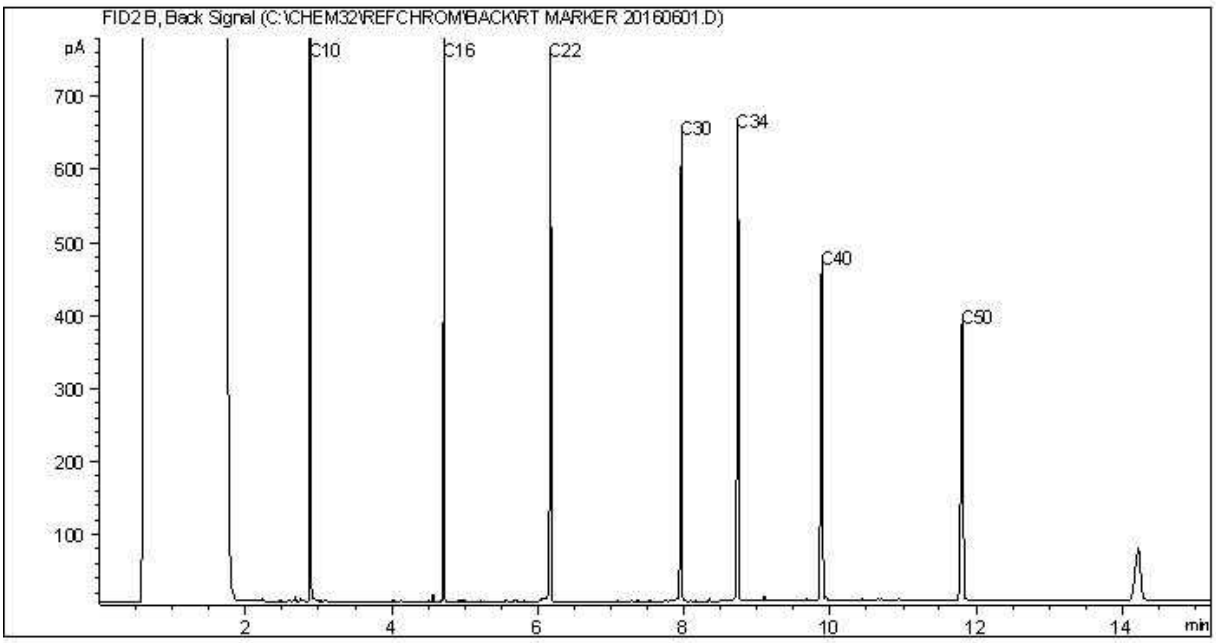
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: FIELD BLANK

CCME Hydrocarbons (F2-F4 in water) 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+

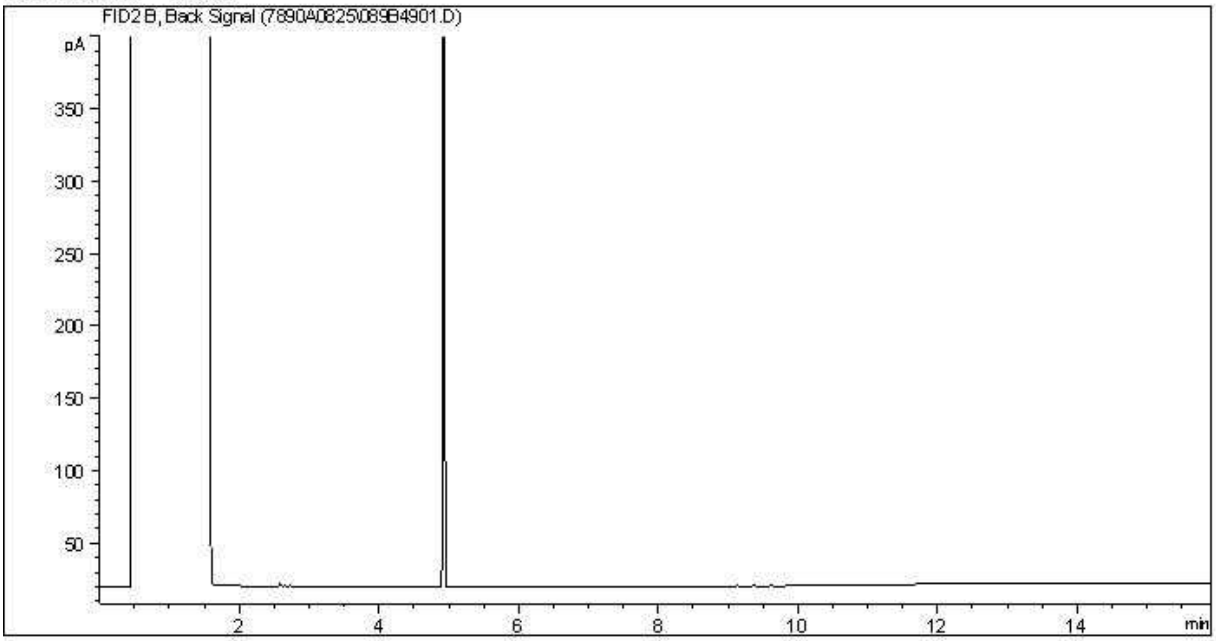
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871845
Report Date: 2018/10/23
Maxxam Sample: UD6307

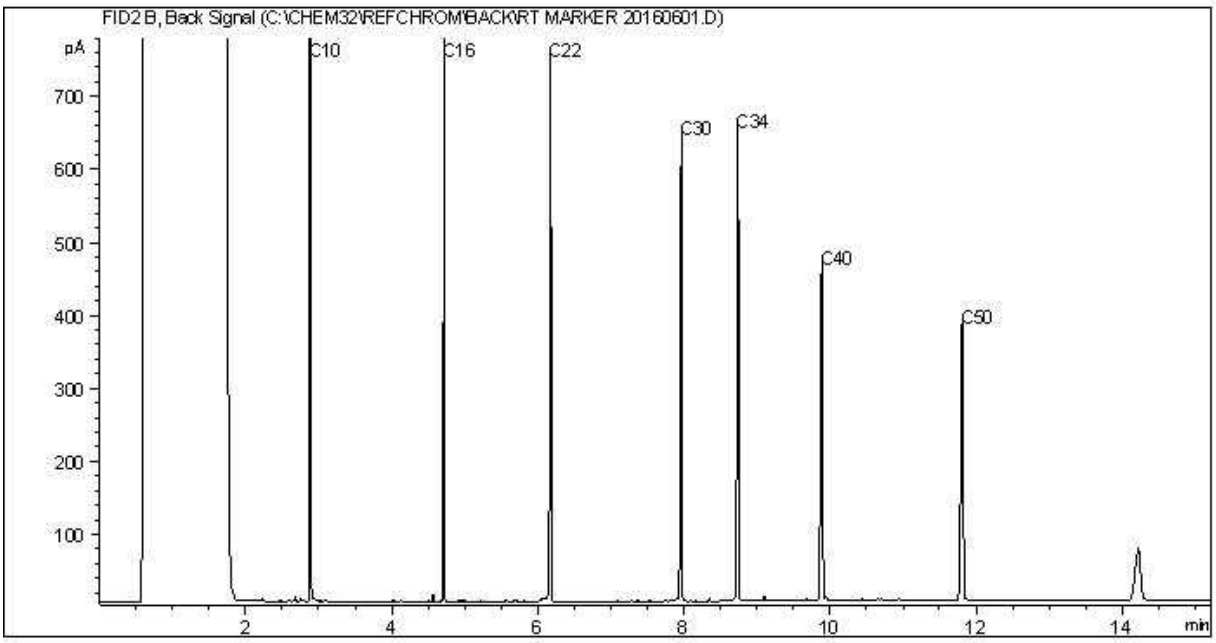
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: TRIP BLANK

CCME Hydrocarbons (F2-F4 in water) 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+

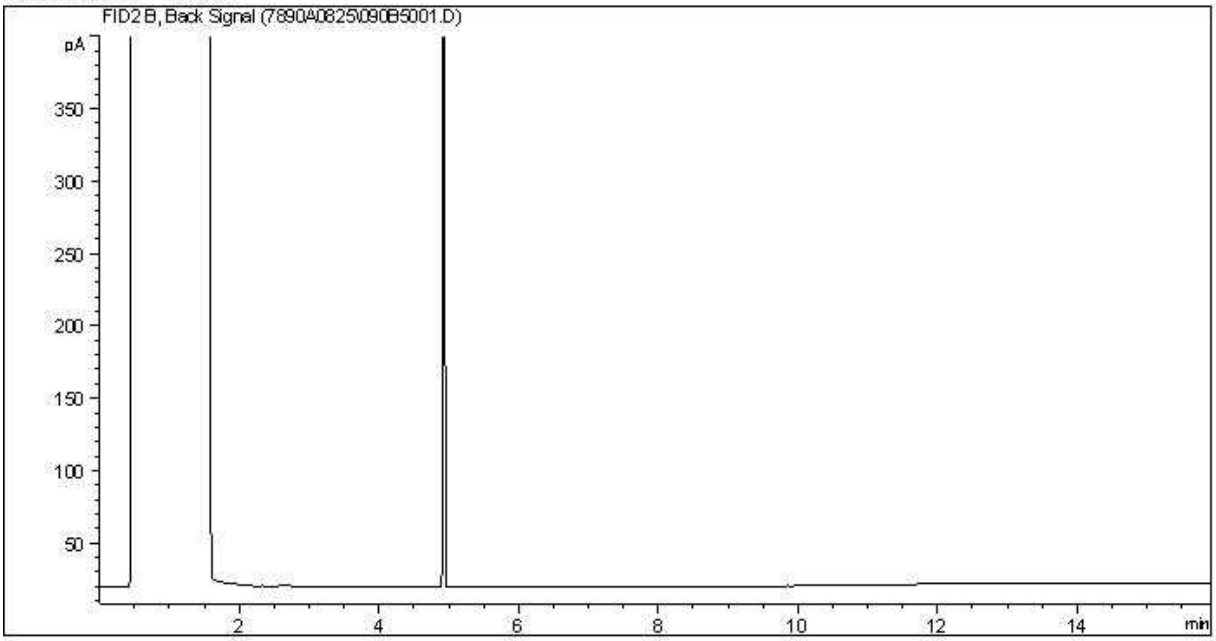
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871845
Report Date: 2018/10/23
Maxxam Sample: UD6308

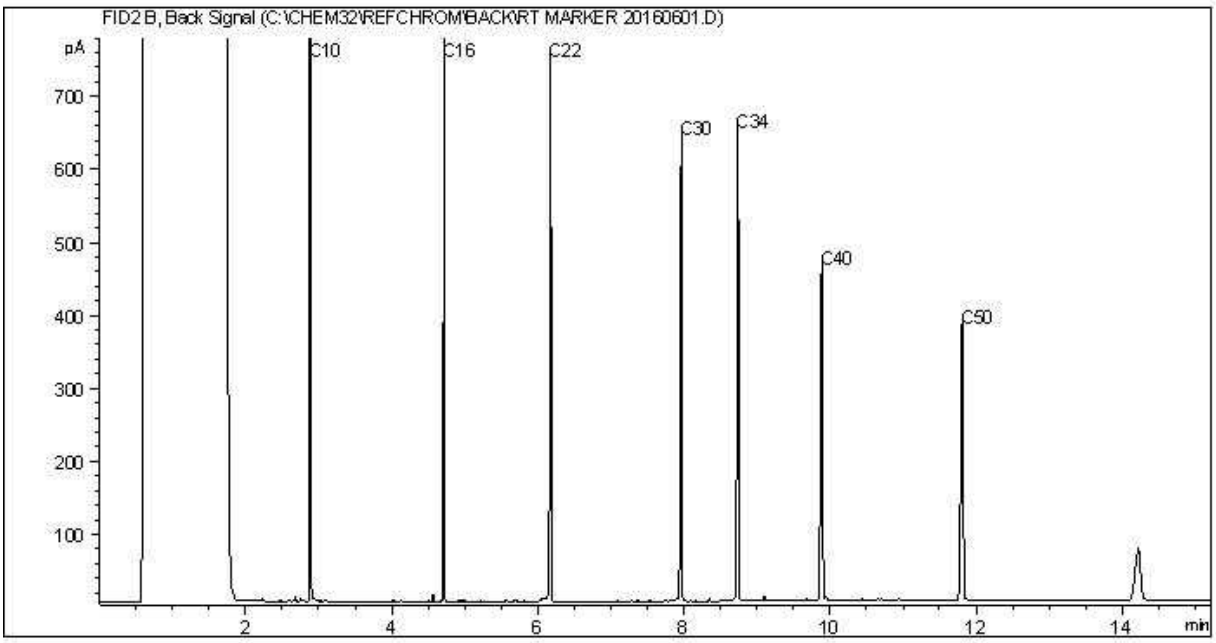
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: EQUIPMENT BLANK 1

CCME Hydrocarbons (F2-F4 in water) 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+

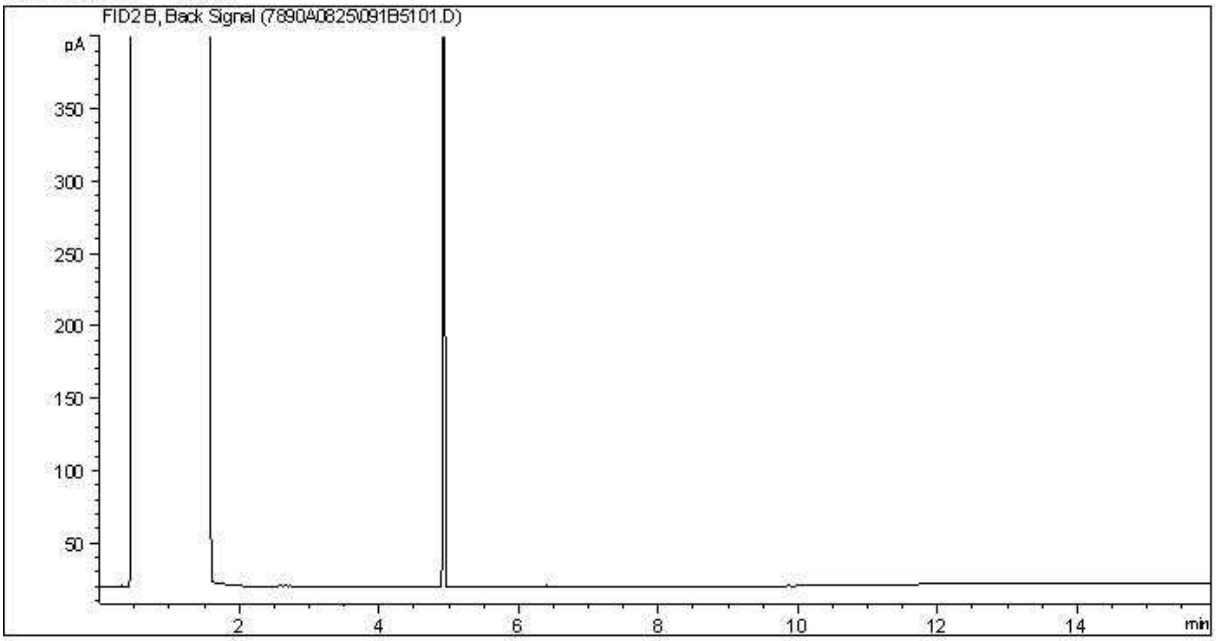
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B871845
Report Date: 2018/10/23
Maxxam Sample: UD6309

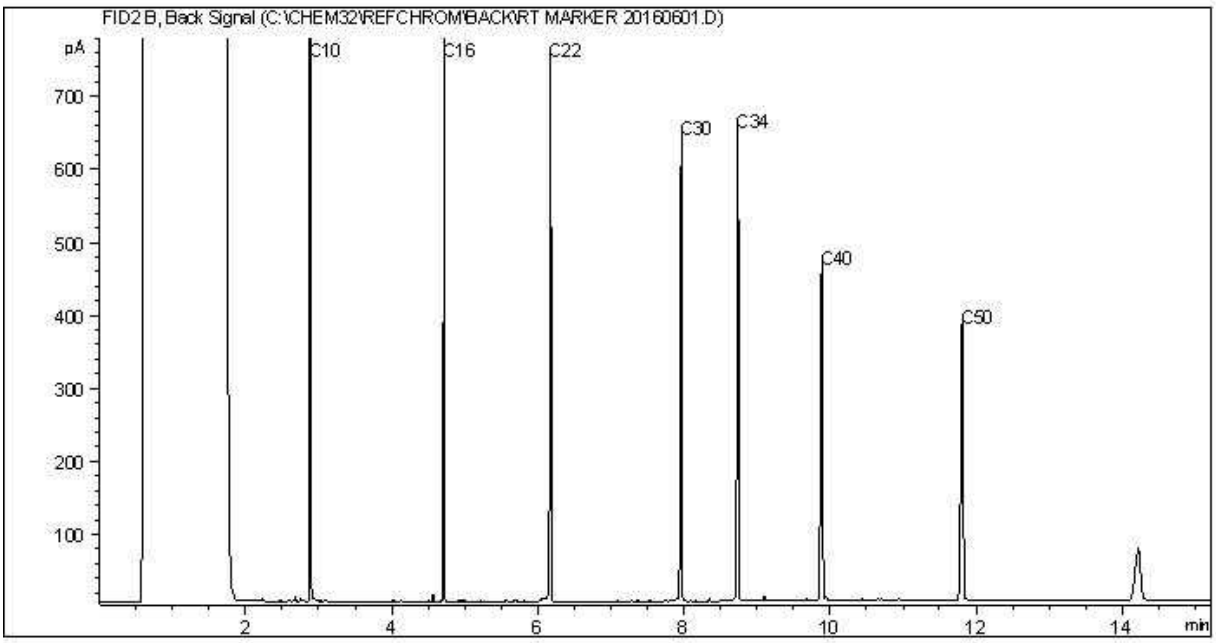
ARCADIS Canada Inc
Client Project #: 102012-000
Site Reference: PIN-2
Client ID: EQUIPMENT BLANK 2

CCME Hydrocarbons (F2-F4 in water) 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.

APPENDIX C

Thermistor Inspection Reports

ANNEX M: Thermistor Inspection Template

Inspector Name: Ryan Fletcher	Inspection Date: 17-Aug-18
Inspector Signature:	*Previous Inspection Date: 16-Aug-16

Thermistor Information

*Site Name: PIN-2		*Landfill: Tier II Disposal Facility	
*Thermistor #: **VT-1**		Inclination: ☑ Vertical	□ Inclined
*Northing: 7646281		*Easting: 502434.2	
*Installation Date: 2011		*Year 1 Monitoring Date: 11-Aug-12	
Datalogger Model #: RX-16 Revision J-C		Datalogger Cable Model: □ USB	☑ Serial Port
Datalogger Serial #: 07040010		Datalogger Cable Too Short?: □ Y	☑ N
*Elevation (masl): 19.1		Extension Cable Required (m):	☑ N/A

Thermistor Inspection

	Good	Needs Maintenance	Details
Casing Integrity	☑	□	
Cover/Lid Integrity	☑	□	
Datalogger Functionality	☑	□	
Cable Functionality	☑	□	
Bead Functionality	□	☑	beads 4, 6, 7, 8, 9, 11, &15 appear to be malfunctioning

Lock

	Yes	No	N/A	Details
Was casing found locked upon arrival?	☑	□		
Was a poorly functioning lock removed?	☑	□		
Was a new 7000PS-KA3 lock put in place?	☑	□	□	If no, model:

Batteries

		Yes	No	N/A	Details		
Batteries Found In Datalogger	Was datalogger functional upon arrival?	☑	□				
	Battery models:				Main: ULB-15	Auxiliary: ULB-1	
	Battery installation date:				17-Aug-16		
	Battery levels:				Main: 11.34v	Auxiliary: 13.58v	
	Memory battery best before date:				expiry 06/2021	(Refer to yellow label above COM plug)	
Battery Replacement	Were batteries replaced?	□	☑		If yes, models:		
	New battery levels:			☑	Main:	Auxiliary:	
	Was desiccant replaced?	☑	□				
Final Status	Expected life of batteries in datalogger:				Years: 3	Replace by:	2021
	Was datalogger functional upon departure?	☑	□		If no, brought south for repairs?	□ Y	☑ N

Computer Connectivity

	Yes	No
Does red status light on black internal data logger glow bright red when laptop attached?	☑	□

Manual Ground Temperature Readings

Bead	ohms	°C
1	13.867	3.25
2	13.686	3.52
3	14.823	1.93
4	2.269	43.94
5	16.661	-0.36
6	387.2	-52.06
7	2.403	42.48
8	2.51	41.39

Bead	ohms	°C
9	10.359	9.17
10	19.757	-3.64
11	654.3	-59.16
12	21.75	-5.47
13	22.06	-5.73
14	22.35	-5.98
15	209.9	-43.28
16	23.22	-6.69

Datalogger Programming and Maintenance

Data collection frequency: 1200 hr

Data collection time: 0000 & 1200

Maintenance requirements: Minor re-programming required. Set warm-up time from 0.035 to 0.210 and clicked "start immediately" (was un-checked). Malfunctioning beads were confirmed with the manual resistance readings and are likely not repairable without replacing the entire thermistor installation.

*Pre-populate this information before field program using previous reports

ANNEX M: Thermistor Inspection Template

Inspector Name: Ryan Fletcher	Inspection Date: 17-Aug-18
Inspector Signature:	*Previous Inspection Date: 16-Aug-16

Thermistor Information

*Site Name: PIN-2	*Landfill: Tier II Disposal Facility		
*Thermistor #: **VT-2**	Inclination: ☑ Vertical	□ Inclined	
*Northing: 7646274.2	*Easting: 502465		
*Installation Date: 2011	*Year 1 Monitoring Date: 11-Aug-12		
Datalogger Model #: RX-16 Revision J-C	Datalogger Cable Model: □ USB	☑ Serial Port	
Datalogger Serial #: 07050024	Datalogger Cable Too Short?: □ Y	☑ N	
*Elevation (masl): 19.2	Extension Cable Required (m):	☑ N/A	

Thermistor Inspection	Good	Needs Maintenance	Details
Casing Integrity	☑	□	
Cover/Lid Integrity	☑	□	Replaced with new cover in 2018
Datalogger Functionality	☑	□	
Cable Functionality	☑	□	
Bead Functionality	☑	□	

Lock	Yes	No	N/A	Details
Was casing found locked upon arrival?	☑	□		
Was a poorly functioning lock removed?	☑	□		
Was a new 7000PS-KA3 lock put in place?	☑	□	□	If no, model:

Batteries		Yes	No	N/A	Details		
Batteries Found In Datalogger	Was datalogger functional upon arrival?	☑	□				
	Battery models:				Main: ULB-15	Auxiliary: ULB-1	
	Battery installation date:				17-Aug-16		
	Battery levels:				Main: 11.34v	Auxiliary: 13.99v	
	Memory battery best before date:				expiry 06/2021	(Refer to yellow label above COM plug)	
Battery Replacement	Were batteries replaced?	□	☑		If yes, models:		
	New battery levels:			☑	Main:	Auxiliary:	
	Was desiccant replaced?	☑	□				
Final Status	Expected life of batteries in datalogger:				Years: 3	Replace by:	2021
	Was datalogger functional upon departure?	☑	□		If no, brought south for repairs?	□ Y	☑ N

Computer Connectivity	Yes	No
Does red status light on black internal data logger glow bright red when laptop attached?	☑	□

Manual Ground Temperature Readings

Bead	ohms	°C
1	14.226	2.75
2	14.201	2.78
3	13.576	3.68
4	14.953	1.76
5	16.295	0.07
6	16.539	-0.22
7	17.371	-1.17
8	18.171	-2.04

Bead	ohms	°C
9	19.243	-3.14
10	.0L	-
11	.0L	-
12	.0L	-
13	.0L	-
14	.0L	-
15	.0L	-
16	.0L	-

Datalogger Programming and Maintenance

Data collection frequency: 1200 hr
Data collection time: 0000 & 1200
Maintenance requirements: None

*Pre-populate this information before field program using previous reports

ANNEX M: Thermistor Inspection Template

Inspector Name: Ryan Fletcher	Inspection Date: 17-Aug-18
Inspector Signature:	*Previous Inspection Date: 16-Aug-16

Thermistor Information

*Site Name: PIN-2	*Landfill: Tier II Disposal Facility	
*Thermistor #: **VT-3**	Inclination: ☑ Vertical	□ Inclined
*Northing: 7646307.5	*Easting: 502460.3	
*Installation Date: 2011	*Year 1 Monitoring Date: 11-Aug-12	
Datalogger Model #: RX-16 Revision J-C	Datalogger Cable Model: □ USB	☑ Serial Port
Datalogger Serial #: 07050029	Datalogger Cable Too Short?: □ Y	☑ N
*Elevation (masl): 20	Extension Cable Required (m):	☑ N/A

Thermistor Inspection	Good	Needs Maintenance	Details
Casing Integrity	☑	□	
Cover/Lid Integrity	☑	□	
Datalogger Functionality	☑	□	
Cable Functionality	☑	□	
Bead Functionality	☑	□	

Lock	Yes	No	N/A	Details
Was casing found locked upon arrival?	☑	□		
Was a poorly functioning lock removed?	☑	□		
Was a new 7000PS-KA3 lock put in place?	☑	□	□	If no, model:

Batteries		Yes	No	N/A	Details		
Batteries Found In Datalogger	Was datalogger functional upon arrival?	☑	□				
	Battery models:				Main: ULB-15	Auxiliary: ULB-1	
	Battery installation date:				17-Aug-16		
	Battery levels:				Main: 11.34v	Auxiliary: 13.38v	
	Memory battery best before date:				expiry 06/2021	(Refer to yellow label above COM plug)	
Battery Replacement	Were batteries replaced?	□	☑		If yes, models:		
	New battery levels:			☑	Main:	Auxiliary:	
	Was desiccant replaced?	☑	□				
Final Status	Expected life of batteries in datalogger:				Years: 3	Replace by:	2021
	Was datalogger functional upon departure?	☑	□		If no, brought south for repairs?	□ Y	☑ N

Computer Connectivity	Yes	No
Does red status light on black internal data logger glow bright red when laptop attached?	☑	□

Manual Ground Temperature Readings

Bead	ohms	°C
1	12.796	4.86
2	14.067	2.97
3	15.424	1.15
4	16.495	-0.16
5	17.238	-1.02
6	17.844	-1.69
7	18.795	-2.69
8	20.14	-4.01

Bead	ohms	°C
9	21.46	-5.21
10	22.29	-5.93
11	23.07	-6.57
12	23.26	-6.73
13	.0L	-
14	.0L	-
15	.0L	-
16	.0L	-

Datalogger Programming and Maintenance

Data collection frequency: 1200 hr
Data collection time: 0000 & 1200
Maintenance requirements: None

*Pre-populate this information before field program using previous reports

ANNEX M: Thermistor Inspection Template

Inspector Name: Ryan Fletcher	Inspection Date: 17-Aug-18
Inspector Signature:	*Previous Inspection Date: 16-Aug-16

Thermistor Information

*Site Name: PIN-2		*Landfill: Tier II Disposal Facility	
*Thermistor #: **VT-4**		Inclination: ☑ Vertical	□ Inclined
*Northing: 7646284.2		*Easting: 502497.4	
*Installation Date: 2011		*Year 1 Monitoring Date: 11-Aug-12	
Datalogger Model #: RX-16 Revision J-C		Datalogger Cable Model: □ USB	☑ Serial Port
Datalogger Serial #: 07010044		Datalogger Cable Too Short?: □ Y	☑ N
*Elevation (masl): 19.9		Extension Cable Required (m):	☑ N/A

Thermistor Inspection	Good	Needs Maintenance	Details
Casing Integrity	☑	□	
Cover/Lid Integrity	☑	□	
Datalogger Functionality	☑	□	
Cable Functionality	☑	□	
Bead Functionality	□	☑	bead 1 and 9 appear to be malfunctioning

Lock	Yes	No	N/A	Details
Was casing found locked upon arrival?	☑	□		
Was a poorly functioning lock removed?	☑	□		
Was a new 7000PS-KA3 lock put in place?	☑	□	□	If no, model:

Batteries		Yes	No	N/A	Details		
Batteries Found In Datalogger	Was datalogger functional upon arrival?	☑	□				
	Battery models:				Main: ULB-15	Auxiliary: ULB-1	
	Battery installation date:				17-Aug-16		
	Battery levels:				Main: 11.34v	Auxiliary: 13.6v	
	Memory battery best before date:				expiry 06/2021		(Refer to yellow label above COM plug)
Battery Replacement	Were batteries replaced?	□	☑		If yes, models:		
	New battery levels:			☑	Main:	Auxiliary:	
	Was desiccant replaced?	☑	□				
Final Status	Expected life of batteries in datalogger:				Years: 3	Replace by:	2021
	Was datalogger functional upon departure?	☑	□		If no, brought south for repairs?	□ Y	☑ N

Computer Connectivity	Yes	No
Does red status light on black internal data logger glow bright red when laptop attached?	☑	□

Manual Ground Temperature Readings

Bead	ohms	°C
1	13.826	3.31
2	14.957	1.75
3	14.97	1.74
4	16.289	0.08
5	16.945	-0.69
6	17.828	-1.67
7	18.577	-2.46
8	19.85	-3.73

Bead	ohms	°C
9	20.56	-4.40
10	20.97	-4.78
11	21.12	-4.91
12	21.91	-5.60
13	22.03	-5.71
14	22.17	-5.83
15	22.6	-6.19
16	22.84	-6.38

Datalogger Programming and Maintenance

Data collection frequency: 1200 hr

Data collection time: 0000 & 1200

Maintenance requirements: Beads 1 and 9 report random anomolous readings from time to time. May consider trying to replace the data logger in case the issue is with the logger itself and not the bead installation.

*Pre-populate this information before field program using previous reports

APPENDIX D

Groundwater Monitoring Well Sampling Logs

PIN-2: Monitoring Well Sampling Log

Site Name: PIN-2 Landfill Name: Tier II Disposal Facility

Date: August 19, 2-18 Time: h1130

Weather: Sun & cloud, windy, 7 ° C

Monitoring Well ID: MW-1 UTM Coordinates: 7646319.6N 502402.9E

Sample #: MW-1 Duplicate #: None

Bottles Filled (by Parameter Type): ☑ PHC F1 ☑ Metals ☑ PHC F2-F4

Preservatives Used for PHC Fraction(s): ☐ Methanol ☑ Sodium Bisulfate ☐ Other: _____ ☐ None

Name(s) of Sampler(s): Ryan Fletcher

Ponded Water, Snow Depth, etc.: None

Well Condition/Repair Requirements: Good - no repairs needed

Lock Make/Model/Condition/Replaced: Replaced (G. Hjukstrom Limited, 7000PS-KA3, 40mm)

Pre-Measured Data (From Well Log)

Depth of Well (mbgs): 3.4 Diameter (cm): 4 (Pipe Diameter)

Depth to Top of Screen (mbgs): 0.4 Screen Length (m): 3

Field Measurements

Measurement Method: ☑ Interface Probe ☐ Water Level Tape ☐ Other _____

Well Stickup (Ground to Top of Pipe) (m): 0.56

Depth to Water (From Top of Pipe) (m): 2.035

Calculated Static Water Level (mbgs): 1.475

Well Refusal Depth (m): 2.27 (Measure Refusal After Sampling)

Thickness of Water Column (m): 0.235 Water Volume (L): 0.71 (Calculated)

Free Product Thickness (mm): None Sludge/Silt: ☐ Y ☑ N

Purging Information Summary

Purging/Sampling Equipment/Technique: Low Flow Peristalltic Pump

Water Quality Parameter Equipment: Horiba U-52 Calibration Details: Factory Calibrated

Maintained Purge Rate at ≤ 100 mL/min: ☑ Y ☐ N Purge Rate: ☑ < Recharge Rate ☐ > Recharge Rate

Total Volume Purged (L): 2.5 (Total Volume Over Multiple Events, if Applicable)

Time (Note Dates if Multiple Days Required)	pH	Conductivity (uS/cm)	Turbidity (NTU)	Temperature (°C)
5 minutes	7.77	0.458	15.1	2.16
10 minutes	7.75	0.457	7.1	1.95
15 minutes	7.67	0.441	4.4	1.87
20 minutes	7.66	0.438	1.4	1.67
25 minutes	7.68	0.436	0.96	1.66
Final Time: Final Values:				

Clear? ☑ Y ☐ N Colour: Clear

PHC Sheen? ☐ Y ☑ N PHC Odour? ☐ Y ☑ N

Free Product/PHC Globules? ☐ Y ☑ N Other Odour? None

Decontamination of Sampling Equipment

All Equipment Dedicated/Single Use? ☑ Y ☐ N Decon Required? ☐ Y ☑ N

Type of Decontamination Fluid(s): N/A # Washes/Rinses: N/A

Photographic Records

Photo Numbers/IDs:

Close Up/Wide Angle/Panoramic: Direction:

Scale Indicated? ☐ Y ☐ N Line of Sight:

PIN-2: Monitoring Well Sampling Log

Site Name: PIN-2 Landfill Name: Tier II Disposal Facility

Date: August 19, 2-18 Time: h1100

Weather: Sun & cloud, windy, 4 ° C

Monitoring Well ID: MW-2 UTM Coordinates: 7646239.7N 502421.9E

Sample #: MW-2 Duplicate #: None

Bottles Filled (by Parameter Type): ☑ PHC F1 ☑ Metals ☑ PHC F2-F4

Preservatives Used for PHC Fraction(s): ☐ Methanol ☑ Sodium Bisulfate ☐ Other: _____ ☐ None

Name(s) of Sampler(s): Ryan Fletcher

Ponded Water, Snow Depth, etc.: None

Well Condition/Repair Requirements: Good - no repairs needed

Lock Make/Model/Condition/Replaced: Replaced (G. Hjukstrom Limited, 7000PS-KA3, 40mm)

Pre-Measured Data (From Well Log)

Depth of Well (mbgs): 3.4 Diameter (cm): 4 (Pipe Diameter)

Depth to Top of Screen (mbgs): 0.4 Screen Length (m): 3

Field Measurements

Measurement Method: ☑ Interface Probe ☐ Water Level Tape ☐ Other _____

Well Stickup (Ground to Top of Pipe) (m): 0.54

Depth to Water (From Top of Pipe) (m): 1.38

Calculated Static Water Level (mbgs): 0.84 ``

Well Refusal Depth (m): 2.989 (Measure Refusal After Sampling)

Thickness of Water Column (m): 1.609 Water Volume (L): 4.83 (Calculated)

Free Product Thickness (mm): None Sludge/Silt: ☐ Y ☑ N

Purging Information Summary

Purging/Sampling Equipment/Technique: Low Flow Peristalltic Pump

Water Quality Parameter Equipment: Horiba U-52 Calibration Details: Factory Calibrated

Maintained Purge Rate at ≤ 100 mL/min: ☑ Y ☐ N Purge Rate: ☑ < Recharge Rate ☐ > Recharge Rate

Total Volume Purged (L): 2.85 (Total Volume Over Multiple Events, if Applicable)

Time (Note Dates if Multiple Days Required)	pH	Conductivity (uS/cm)	Turbidity (NTU)	Temperature (°C)
5 minutes	7.3	0.81	4.9	2.13
10 minutes	7.1	0.789	5.3	2.1
15 minutes	7.12	0.753	2.2	2.08
20 minutes	7.13	0.736	1.4	2.15
25 minutes	7.21	0.727	0.3	2.14
30 minutes	7.23	0.726	0	2.21
Final Time: Final Values:				

Clear? ☑ Y ☐ N Colour: Clear

PHC Sheen? ☐ Y ☑ N PHC Odour? ☐ Y ☑ N

Free Product/PHC Globules? ☐ Y ☑ N Other Odour? None

Decontamination of Sampling Equipment

All Equipment Dedicated/Single Use? ☑ Y ☐ N Decon Required? ☐ Y ☑ N

Type of Decontamination Fluid(s): N/A # Washes/Rinses: N/A

Photographic Records

Photo Numbers/IDs:

Close Up/Wide Angle/Panoramic: Direction:

Scale Indicated? ☐ Y ☐ N Line of Sight:

PIN-2: Monitoring Well Sampling Log

Site Name: PIN-2 Landfill Name: Tier II Disposal Facility

Date: August 19, 2-18 Time: h1000

Weather: Sun & cloud, windy, 7 ° C

Monitoring Well ID: MW-3 UTM Coordinates: 7646236.8N 502497.9E

Sample #: MW-3 Duplicate #: Dup 1

Bottles Filled (by Parameter Type): ☑ PHC F1 ☑ Metals ☑ PHC F2-F4

Preservatives Used for PHC Fraction(s): ☐ Methanol ☑ Sodium Bisulfate ☐ Other: _____ ☐ None

Name(s) of Sampler(s): Ryan Fletcher

Ponded Water, Snow Depth, etc.: None

Well Condition/Repair Requirements: Good - no repairs needed

Lock Make/Model/Condition/Replaced: Replaced (G. Hjukstrom Limited, 7000PS-KA3, 40mm)

Pre-Measured Data (From Well Log)

Depth of Well (mbgs): 3.4 Diameter (cm): 4 (Pipe Diameter)

Depth to Top of Screen (mbgs): 0.4 Screen Length (m): 3

Field Measurements

Measurement Method: ☑ Interface Probe ☐ Water Level Tape ☐ Other _____

Well Stickup (Ground to Top of Pipe) (m): 0.62

Depth to Water (From Top of Pipe) (m): 1.991

Calculated Static Water Level (mbgs): 1.371 ``

Well Refusal Depth (m): 2.68 (Measure Refusal After Sampling)

Thickness of Water Column (m): 0.689 Water Volume (L): 2.07 (Calculated)

Free Product Thickness (mm): None Sludge/Silt: ☐ Y ☑ N

Purging Information Summary

Purging/Sampling Equipment/Technique: Low Flow Peristalltic Pump

Water Quality Parameter Equipment: Horiba U-52 Calibration Details: Factory Calibrated

Maintained Purge Rate at ≤ 100 mL/min: ☑ Y ☐ N Purge Rate: ☑ < Recharge Rate ☐ > Recharge Rate

Total Volume Purged (L): 3.1 (Total Volume Over Multiple Events, if Applicable)

Time (Note Dates if Multiple Days Required)	pH	Conductivity (uS/cm)	Turbidity (NTU)	Temperature (°C)
5 minutes	7.8	0.749	209	2.23
10 minutes	6.92	0.773	115	1.59
15 minutes	6.74	0.754	39.1	1.49
20 minutes	7	0.75	42.2	1.4
Final Time: Final Values:				

Clear? ☑ Y ☐ N Colour: Clear

PHC Sheen? ☐ Y ☑ N PHC Odour? ☐ Y ☑ N

Free Product/PHC Globules? ☐ Y ☑ N Other Odour? None

Decontamination of Sampling Equipment

All Equipment Dedicated/Single Use? ☑ Y ☐ N Decon Required? ☐ Y ☑ N

Type of Decontamination Fluid(s): N/A # Washes/Rinses: N/A

Photographic Records

Photo Numbers/IDs:

Close Up/Wide Angle/Panoramic: Direction:

Scale Indicated? ☐ Y ☐ N Line of Sight:

PIN-2: Monitoring Well Sampling Log

Site Name: PIN-2 Landfill Name: Tier II Disposal Facility

Date: August 19, 2-18 Time: h1300

Weather: Sun & cloud, windy, 7 ° C

Monitoring Well ID: MW-4 UTM Coordinates: 7646319.8N 502549.3E

Sample #: MW-4 Duplicate #:

Bottles Filled (by Parameter Type): ☑ PHC F1 ☑ Metals ☑ PHC F2-F4

Preservatives Used for PHC Fraction(s): ☐ Methanol ☑ Sodium Bisulfate ☐ Other: _____ ☐ None

Name(s) of Sampler(s): Ryan Fletcher

Ponded Water, Snow Depth, etc.: None

Well Condition/Repair Requirements: Good - no repairs needed

Lock Make/Model/Condition/Replaced: Replaced (G. Hjukstrom Limited, 7000PS-KA3, 40mm)

Pre-Measured Data (From Well Log)

Depth of Well (mbgs): 3.4 Diameter (cm): 4 (Pipe Diameter)

Depth to Top of Screen (mbgs): 0.4 Screen Length (m): 3

Field Measurements

Measurement Method: ☑ Interface Probe ☐ Water Level Tape ☐ Other _____

Well Stickup (Ground to Top of Pipe) (m): 0.55

Depth to Water (From Top of Pipe) (m): 1.558

Calculated Static Water Level (mbgs): 1.008 ``

Well Refusal Depth (m): 2.89 (Measure Refusal After Sampling)

Thickness of Water Column (m): 1.332 Water Volume (L): 3.99 (Calculated)

Free Product Thickness (mm): None Sludge/Silt: ☐ Y ☑ N

Purging Information Summary

Purging/Sampling Equipment/Technique: Low Flow Peristalltic Pump

Water Quality Parameter Equipment: Horiba U-52 Calibration Details: Factory Calibrated

Maintained Purge Rate at ≤ 100 mL/min: ☑ Y ☐ N Purge Rate: ☑ < Recharge Rate ☐ > Recharge Rate

Total Volume Purged (L): 2.1 (Total Volume Over Multiple Events, if Applicable)

Time (Note Dates if Multiple Days Required)	pH	Conductivity (uS/cm)	Turbidity (NTU)	Temperature (°C)
5 minutes	7.75	0.694	8.3	3.92
10 minutes	7.55	0.703	6.4	3.61
15 minutes	7.45	0.704	5.7	3.48
20 minutes	7.39	0.705	5.5	3.38
Final Time: Final Values:				

Clear? ☑ Y ☐ N Colour: Clear

PHC Sheen? ☐ Y ☑ N PHC Odour? ☐ Y ☑ N

Free Product/PHC Globules? ☐ Y ☑ N Other Odour? None

Decontamination of Sampling Equipment

All Equipment Dedicated/Single Use? ☑ Y ☐ N Decon Required? ☐ Y ☑ N

Type of Decontamination Fluid(s): N/A # Washes/Rinses: N/A

Photographic Records

Photo Numbers/IDs:

Close Up/Wide Angle/Panoramic: Direction:

Scale Indicated? ☐ Y ☐ N Line of Sight:

PIN-2: Monitoring Well Sampling Log

Site Name: PIN-2 Landfill Name: NHWL

Date: August 19, 2-18 Time: 1530

Weather: Sun & cloud, windy, 7 ° C

Monitoring Well ID: MW-5 UTM Coordinates: 7645229.3N 503029.4E

Sample #: MW-5 Duplicate #: Field Blank

Bottles Filled (by Parameter Type): ☑ PHC F1 ☑ Metals ☑ PHC F2-F4

Preservatives Used for PHC Fraction(s): ☐ Methanol ☑ Sodium Bisulfate ☐ Other: _____ ☐ None

Name(s) of Sampler(s): Ryan Fletcher

Ponded Water, Snow Depth, etc.: None

Well Condition/Repair Requirements: Good - no repairs needed

Lock Make/Model/Condition/Replaced: Replaced (G. Hjukstrom Limited, 7000PS-KA3, 40mm)

Pre-Measured Data (From Well Log)

Depth of Well (mbgs): 3.4 Diameter (cm): 4 (Pipe Diameter)

Depth to Top of Screen (mbgs): 0.4 Screen Length (m): 3

Field Measurements

Measurement Method: ☑ Interface Probe ☐ Water Level Tape ☐ Other _____

Well Stickup (Ground to Top of Pipe) (m): 0.54

Depth to Water (From Top of Pipe) (m): 1.867

Calculated Static Water Level (mbgs): 1.327

Well Refusal Depth (m): 2.998 (Measure Refusal After Sampling)

Thickness of Water Column (m): 1.131 Water Volume (L): 3.39 (Calculated)

Free Product Thickness (mm): None Sludge/Silt: ☐ Y ☑ N

Purging Information Summary

Purging/Sampling Equipment/Technique: Low Flow Peristalltic Pump

Water Quality Parameter Equipment: Horiba U-52 Calibration Details: Factory Calibrated

Maintained Purge Rate at ≤ 100 mL/min: ☑ Y ☐ N Purge Rate: ☑ < Recharge Rate ☐ > Recharge Rate

Total Volume Purged (L): 2.8 (Total Volume Over Multiple Events, if Applicable)

Time (Note Dates if Multiple Days Required)	pH	Conductivity (uS/cm)	Turbidity (NTU)	Temperature (°C)
5 minutes	7.63	0.547	20.5	5.41
10 minutes	7.89	0.433	5.3	5.2
15 minutes	7.83	0.413	1.9	5.15
20 minutes	7.7	0.405	0.9	5.11
25 minutes	7.62	0.396	0	5.06
30 minutes	7.6	0.384	0.1	5.03
Final Time: Final Values:				

Clear? ☑ Y ☐ N Colour: Clear

PHC Sheen? ☐ Y ☑ N PHC Odour? ☐ Y ☑ N

Free Product/PHC Globules? ☐ Y ☑ N Other Odour? None

Decontamination of Sampling Equipment

All Equipment Dedicated/Single Use? ☑ Y ☐ N Decon Required? ☐ Y ☑ N

Type of Decontamination Fluid(s): N/A # Washes/Rinses: N/A

Photographic Records

Photo Numbers/IDs:

Close Up/Wide Angle/Panoramic: Direction:

Scale Indicated? ☐ Y ☐ N Line of Sight:

PIN-2: Monitoring Well Sampling Log

Site Name: PIN-2 Landfill Name: NHWL

Date: August 19, 2-18 Time: h1430

Weather: Sun & cloud, windy, 7 ° C

Monitoring Well ID: MW-6 UTM Coordinates: 7645297.0N 503054.2E

Sample #: MW-6 Duplicate #: None

Bottles Filled (by Parameter Type): ☑ PHC F1 ☑ Metals ☑ PHC F2-F4

Preservatives Used for PHC Fraction(s): ☐ Methanol ☑ Sodium Bisulfate ☐ Other: _____ ☐ None

Name(s) of Sampler(s): Ryan Fletcher

Ponded Water, Snow Depth, etc.: None

Well Condition/Repair Requirements: Good - no repairs needed

Lock Make/Model/Condition/Replaced: Replaced (G. Hjukstrom Limited, 7000PS-KA3, 40mm)

Pre-Measured Data (From Well Log)

Depth of Well (mbgs): 3.4 Diameter (cm): 4 (Pipe Diameter)

Depth to Top of Screen (mbgs): 0.4 Screen Length (m): 3

Field Measurements

Measurement Method: ☑ Interface Probe ☐ Water Level Tape ☐ Other _____

Well Stickup (Ground to Top of Pipe) (m): 0.58

Depth to Water (From Top of Pipe) (m): 1.991

Calculated Static Water Level (mbgs): 1.411

Well Refusal Depth (m): 2.835 (Measure Refusal After Sampling)

Thickness of Water Column (m): 0.844 Water Volume (L): 2.5 (Calculated)

Free Product Thickness (mm): None Sludge/Silt: ☐ Y ☑ N

Purging Information Summary

Purging/Sampling Equipment/Technique: Low Flow Peristalltic Pump

Water Quality Parameter Equipment: Horiba U-52 Calibration Details: Factory Calibrated

Maintained Purge Rate at ≤ 100 mL/min: ☑ Y ☐ N Purge Rate: ☑ < Recharge Rate ☐ > Recharge Rate

Total Volume Purged (L): 3.5 (Total Volume Over Multiple Events, if Applicable)

Time (Note Dates if Multiple Days Required)	pH	Conductivity (uS/cm)	Turbidity (NTU)	Temperature (°C)
5 minutes	7.8	0.4898	36.3	3.77
10 minutes	7.81	0.46	40.7	3.55
15 minutes	7.84	0.418	30.9	3.45
20 minutes	7.85	0.404	22.9	3.41
25 minutes	7.88	0.402	16.6	3.43
30 minutes	7.89	0.403	13.8	3.42
Final Time: Final Values:				

Clear? ☑ Y ☐ N Colour: Clear

PHC Sheen? ☐ Y ☑ N PHC Odour? ☐ Y ☑ N

Free Product/PHC Globules? ☐ Y ☑ N Other Odour? None

Decontamination of Sampling Equipment

All Equipment Dedicated/Single Use? ☑ Y ☐ N Decon Required? ☐ Y ☑ N

Type of Decontamination Fluid(s): N/A # Washes/Rinses: N/A

Photographic Records

Photo Numbers/IDs:

Close Up/Wide Angle/Panoramic: Direction:

Scale Indicated? ☐ Y ☐ N Line of Sight:

PIN-2: Monitoring Well Sampling Log

Site Name: PIN-2 Landfill Name: NHWL

Date: August 19, 2-18 Time: h1430

Weather: Sun & cloud, windy, 7 ° C

Monitoring Well ID: MW-7 UTM Coordinates: 7645272.0N 503102.0E

Sample #: MW-7 Duplicate #:

Bottles Filled (by Parameter Type): ☑ PHC F1 ☑ Metals ☑ PHC F2-F4

Preservatives Used for PHC Fraction(s): ☐ Methanol ☑ Sodium Bisulfate ☐ Other: _____ ☐ None

Name(s) of Sampler(s): Ryan Fletcher

Ponded Water, Snow Depth, etc.: None

Well Condition/Repair Requirements: Good - no repairs needed

Lock Make/Model/Condition/Replaced: Replaced (G. Hjukstrom Limited, 7000PS-KA3, 40mm)

Pre-Measured Data (From Well Log)

Depth of Well (mbgs): 3.4 Diameter (cm): 4 (Pipe Diameter)

Depth to Top of Screen (mbgs): 0.4 Screen Length (m): 3

Field Measurements

Measurement Method: ☑ Interface Probe ☐ Water Level Tape ☐ Other _____

Well Stickup (Ground to Top of Pipe) (m): 0.495

Depth to Water (From Top of Pipe) (m): 2.321

Calculated Static Water Level (mbgs): 1.826 ``

Well Refusal Depth (m): 2.805 (Measure Refusal After Sampling)

Thickness of Water Column (m): 0.484 Water Volume (L): 1.45 (Calculated)

Free Product Thickness (mm): None Sludge/Silt: ☐ Y ☑ N

Purging Information Summary

Purging/Sampling Equipment/Technique: Low Flow Peristalltic Pump

Water Quality Parameter Equipment: Horiba U-52 Calibration Details: Factory Calibrated

Maintained Purge Rate at ≤ 100 mL/min: ☑ Y ☐ N Purge Rate: ☑ < Recharge Rate ☐ > Recharge Rate

Total Volume Purged (L): 3.1 (Total Volume Over Multiple Events, if Applicable)

Time (Note Dates if Multiple Days Required)	pH	Conductivity (uS/cm)	Turbidity (NTU)	Temperature (°C)
5 minutes	7.81	0.433	3.2	3.53
10 minutes	8.63	0.417	0	2.97
15 minutes	7.66	0.398	0	2.8
20 minutes	7.66	0.391	0	2.75
25 minutes	7.66	0.389	0	2.68
Final Time: Final Values:				

Clear? ☑ Y ☐ N Colour: Clear

PHC Sheen? ☐ Y ☑ N PHC Odour? ☐ Y ☑ N

Free Product/PHC Globules? ☐ Y ☑ N Other Odour? None

Decontamination of Sampling Equipment

All Equipment Dedicated/Single Use? ☑ Y ☐ N Decon Required? ☐ Y ☑ N

Type of Decontamination Fluid(s): N/A # Washes/Rinses: N/A

Photographic Records

Photo Numbers/IDs:

Close Up/Wide Angle/Panoramic: Direction:

Scale Indicated? ☐ Y ☐ N Line of Sight:

PIN-2: Monitoring Well Sampling Log

Site Name: PIN-2 Landfill Name: NHWL

Date: August 19, 2-18 Time: 1530

Weather: Sun & cloud, windy, 7 ° C

Monitoring Well ID: MW-8 UTM Coordinates: 7645223.0N 503076.6E

Sample #: N/A Duplicate #: None

Bottles Filled (by Parameter Type): ☐ PHC F1 ☐ Metals ☐ PHC F2-F4

Preservatives Used for PHC Fraction(s): ☐ Methanol ☐ Sodium Bisulfate ☐ Other: _____ ☐ None

Name(s) of Sampler(s): Ryan Fletcher

Ponded Water, Snow Depth, etc.: None

Well Condition/Repair Requirements: Good - no repairs needed

Lock Make/Model/Condition/Replaced: Replaced (G. Hjukstrom Limited, 7000PS-KA3, 40mm)

Pre-Measured Data (From Well Log)

Depth of Well (mbgs): 4.4 Diameter (cm): 4 (Pipe Diameter)

Depth to Top of Screen (mbgs): 0.4 Screen Length (m): 2

Field Measurements

Measurement Method: ☑ Interface Probe ☐ Water Level Tape ☐ Other _____

Well Stickup (Ground to Top of Pipe) (m): 0.54

Depth to Water (From Top of Pipe) (m): N/A

Calculated Static Water Level (mbgs): N/A

Well Refusal Depth (m): 1.426 FROZEN (Measure Refusal After Sampling)

Thickness of Water Column (m): N/A Water Volume (L): N/A (Calculated)

Free Product Thickness (mm): None Sludge/Silt: ☐ Y ☑ N

Purging Information Summary

Purging/Sampling Equipment/Technique: N/A

Water Quality Parameter Equipment: N/A Calibration Details: N/A

Maintained Purge Rate at ≤ 100 mL/min: N/A Purge Rate: ☐ < Recharge Rate ☐ > Recharge Rate

Total Volume Purged (L): N/A (Total Volume Over Multiple Events, if Applicable)

Time (Note Dates if Multiple Days Required)	pH	Conductivity (uS/cm)	Turbidity (NTU)	Temperature (°C)
FROZEN - NO SAMPLE				
Final Time: Final Values:				

Clear? N/A Colour: N/A

PHC Sheen? N/A PHC Odour? N/A

Free Product/PHC Globules? N/A Other Odour? N/A

Decontamination of Sampling Equipment

All Equipment Dedicated/Single Use? N/A Decon Required? N/A

Type of Decontamination Fluid(s): N/A # Washes/Rinses: N/A

Photographic Records

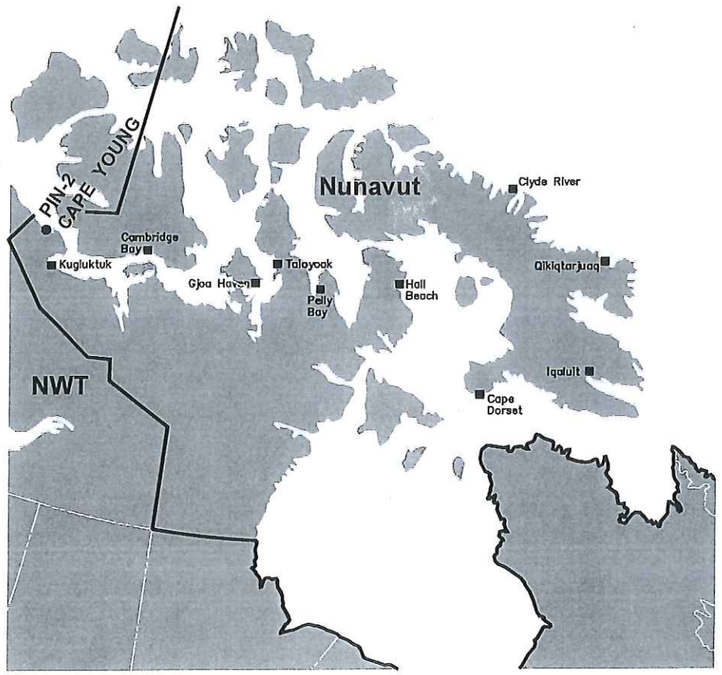
Photo Numbers/IDs:

Close Up/Wide Angle/Panoramic: Direction:

Scale Indicated? ☐ Y ☐ N Line of Sight:

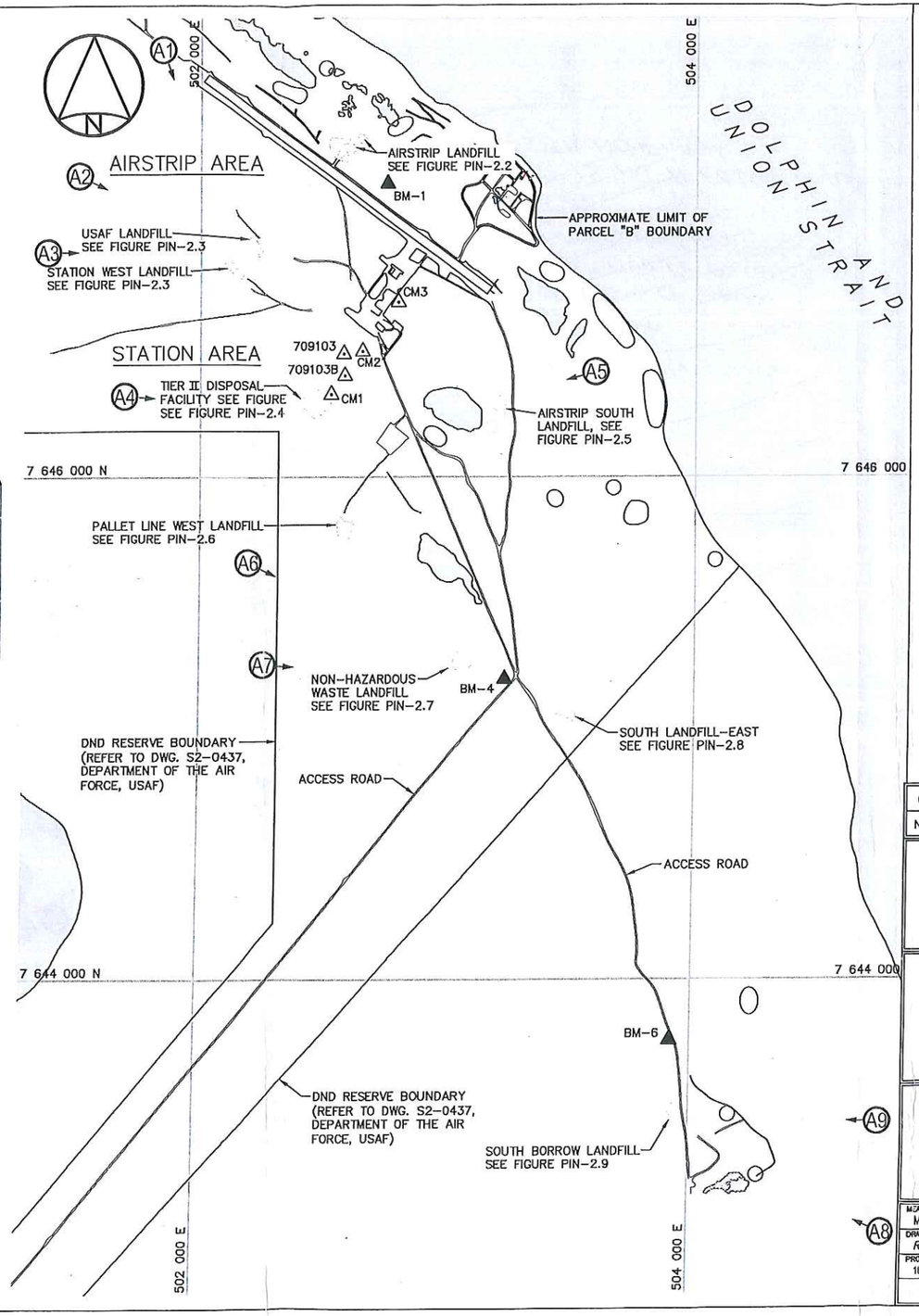
APPENDIX E

Field Notes



LOCATION OF CAPE YOUNG WITHIN NUNAVUT TERRITORY

SCALE: NTS



LEGEND

- CM1 — SURVEY CONTROL MONUMENT (5)
- BM-1 — PERMANENT BENCHMARK LOCATION (3)
- ARCHAEOLOGICAL FEATURES
- APPROXIMATE LOCATION OF PROPERTY BOUNDARY
- BODY OF WATER
- X — AERIAL PHOTOGRAPH (2016)

0m 200m 400m 600m 800m 1000m

SURVEY CONTROL MONUMENTS				
NO.	UTM COORDINATES NORTHING	UTM COORDINATES EASTING	ELEV.	DESCRIPTION
CM1	7 646 327.029	502 525.754	13.804	PIN-2 BASELINE STA. 0+00
CM2	7 646 497.473	502 653.662	13.993	PIN-2 BASELINE STA. 7+00
CM3	7 646 692.507	502 799.974	14.534	PIN-2 BASELINE STA. 15+00
709103	7 646 487.974	502 576.191	13.790	GEODETIC BENCHMARK
709103B	7 646 400.920	502 581.212	13.954	GEODETIC BENCHMARK

NOTE: BASELINE STATIONS SHOWN ARE IN IMPERIAL UNITS.

PERMANENT BENCHMARK (AS-BUILT)				
NO.	UTM COORDINATES NORTHING	UTM COORDINATES EASTING	ELEV.	DESCRIPTION
BM-1	7 647 164.203	502 754.676	14.398	25mm DIA. STEEL PIPE
BM-4	7 645 194.471	503 236.108	17.189	25mm DIA. STEEL PIPE
BM-6	7 643 756.513	503 920.587	13.296	25mm DIA. STEEL PIPE

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COLLECTION OF LANDFILL MONITORING DATA

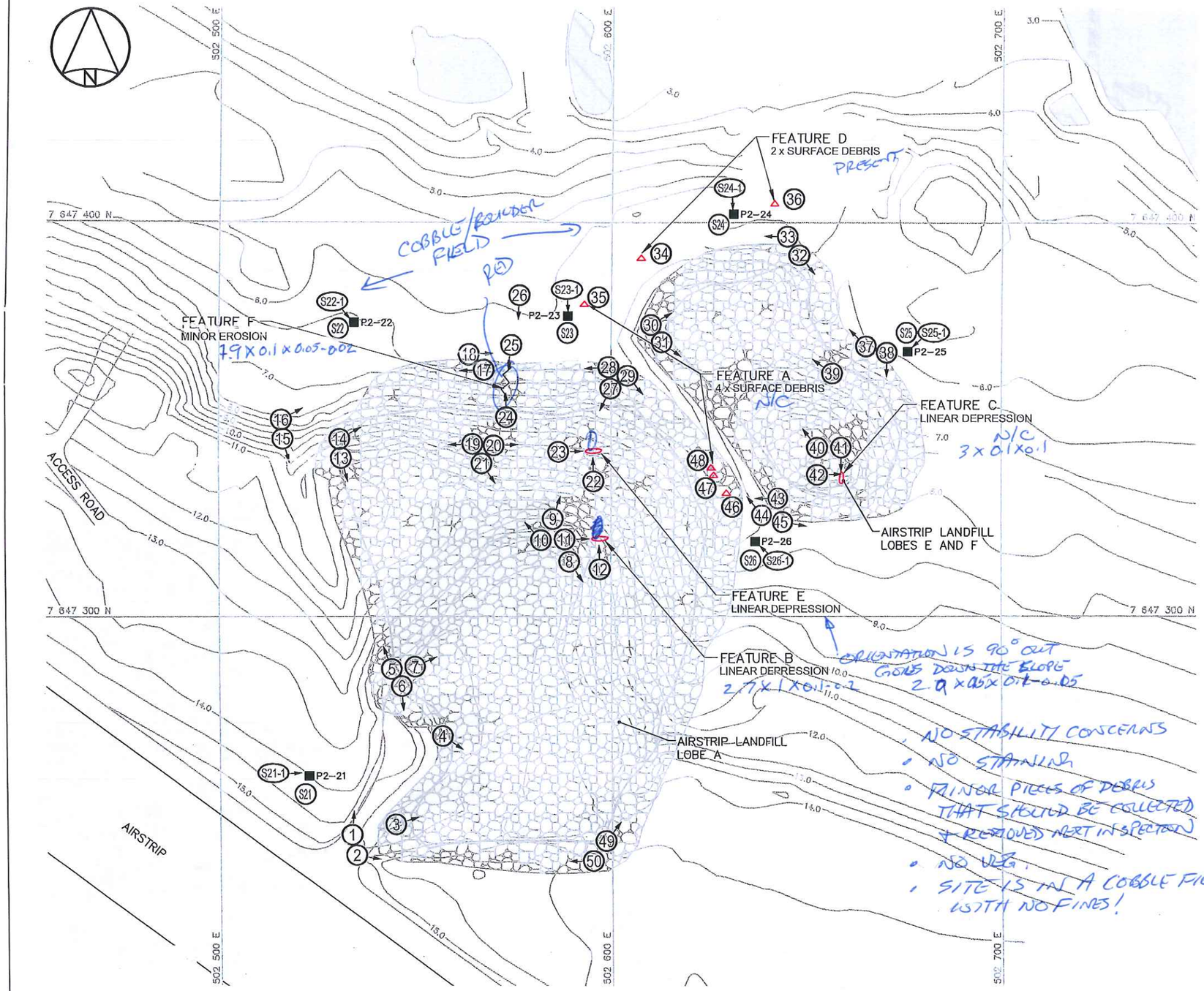
PIN-2, CAPE YOUNG, NUNAVUT

LOCATION PLAN

ARCADIS
1050 Morrison Drive, Suite 201, Ottawa, Ontario, K2H 8K7
Office General +1 613 721 0555

MEASUREMENT UNIT	SCALE:	DATE (month-year):
Metre	1 : 20,000	JUNE 2018
DRAWN BY: R. FLETCHER	VERIFIED BY: T. AUSTRINS	APPROVED BY: C. GRAVELL P. ENG
PROJECT NO: 102012-000	DRAWING NO: 102012-000-PIN-2.1	PAGE 1

FIGURE PIN-2.1



LEGEND

- MONITORING SOIL SAMPLE LOCATION (6)
- APPROX. PHOTOGRAPHIC VIEWPOINT (2016)
- BODY OF WATER
- DEBRIS (NTS)
- SETTLEMENT (NTS)
- MINOR EROSION (NTS)

INSPECTION COMPLETED BY RYAN JANZEN + CHARLES GRAVELLE 19/8/2018

0m 10m 20m 30m 40m 50m

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COLLECTION OF LANDFILL MONITORING DATA

PIN-2, CAPE YOUNG, NUNAVUT

AIRSTRIP LANDFILL

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MEASUREMENT UNIT	SCALE:	DATE (month-year):
Metre	1 : 1,000	JANUARY 2017
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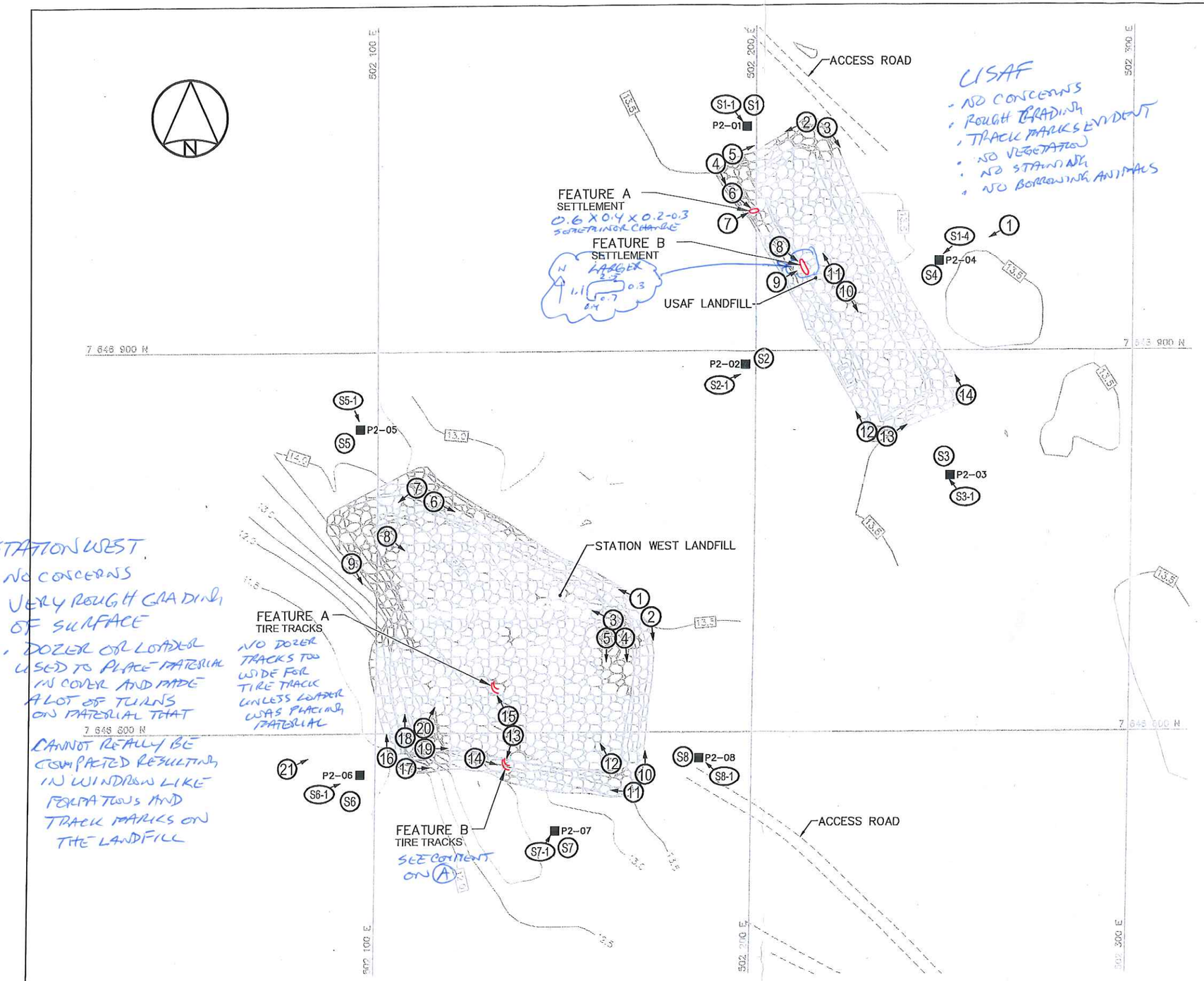
PROJECT NO: 102012-000	DRAWING NO: 102012-000-PIN-2.2	PAGE 2

FIGURE PIN-2.2



USAF
- NO CONCERNS
- ROUGH GRADING
- TRACK MARKS EVIDENT
- NO VEGETATION
- NO STAINING
- NO BURROWING ANIMALS

STATION WEST
- NO CONCERNS
- VERY ROUGH GRADING OF SURFACE
- DOZER OR LOADER USED TO PLACE MATERIAL IN COVER AND MADE A LOT OF TURNS ON MATERIAL THAT CANNOT REALLY BE COMPACTED RESULTING IN WINDROW LIKE FORMATIONS AND TRACK MARKS ON THE LANDFILL

NO DOZER TRACKS TOO WIDE FOR TIRE TRACK UNLESS LOADER WAS PLACING MATERIAL

SEE COMMENT ON (A)

LEGEND

- MONITORING SOIL SAMPLE LOCATION (8)
- APPROX. PHOTOGRAPHIC VIEWPOINT (2016)
- TIRE TRACKS NTS
- SETTLEMENT (NTS)

INSPECTION COMPLETED BY RYAN JANZEN & CHARLOT GRAVELLE

19/8/2018

0m 10m 20m 30m 40m 50m

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COLLECTION OF LANDFILL MONITORING DATA

PIN-2, CAPE YOUNG, NUNAVUT

USAF LANDFILL AND STATION WEST LANDFILL

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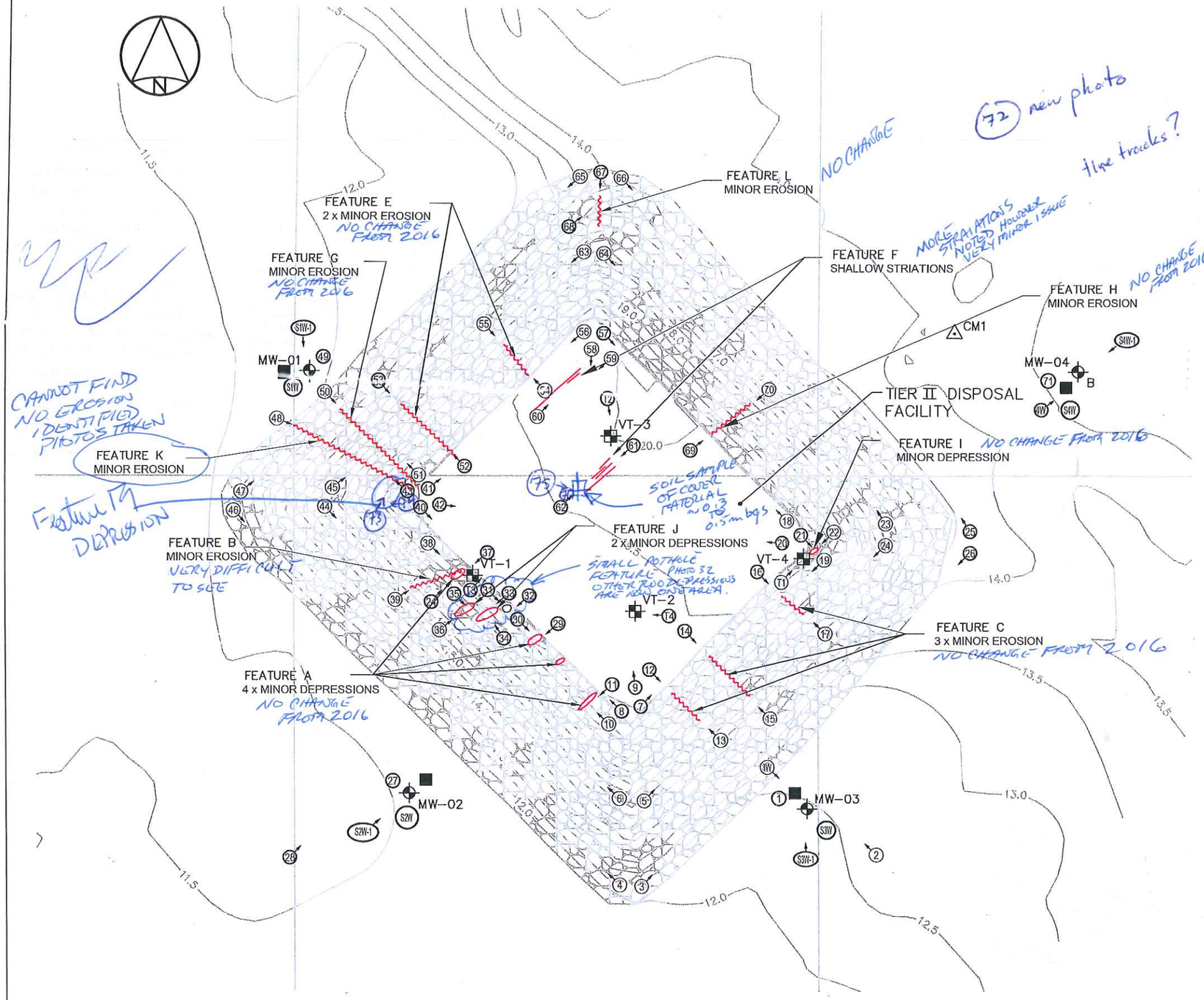
PROJECT NO: 102012-000	DRAWING NO: 102012-000-PIN-2.3	PAGE 3

FIGURE PIN-2.3



LEGEND

- MONITORING WELL LOCATION (3)
- BACKGROUND MONITORING WELL LOCATION (1)
- GROUND TEMPERATURE CABLE LOCATION (4)
- MONITORING SOIL SAMPLE LOCATION (4)
- APPROX. PHOTOGRAPHIC VIEWPOINT (2016)
- MINOR SETTLEMENT (NTS)
- MINOR EROSION (NTS)
- SHALLOW STRIATIONS (NTS)
- CONTROL MONUMENT

INSPECTION COMPLETED
17 AUG 2018
BY CHARLES GRAVEL P.ENG
& RYAN JANZEN.

NOTE
- LINEAR FEATURES SURVEYED WITH TRIMBLE SURVEY TOOL 70 TO 85 cm accuracy during measurement PERIOD.
- AREAS OF DEPRESSIONS >2m² WERE OUTLINED IN SURVEY.
- FEATURE D NOT IDENTIFIED IN 2015 OR 2016 AS SUCH COULD NOT BE CONFIRMED.

0m 7.5m 15.0m 22.5m 30.0m 37.5m

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COLLECTION OF LANDFILL MONITORING DATA

PIN-2, CAPE YOUNG, NUNAVUT

TIER II DISPOSAL FACILITY

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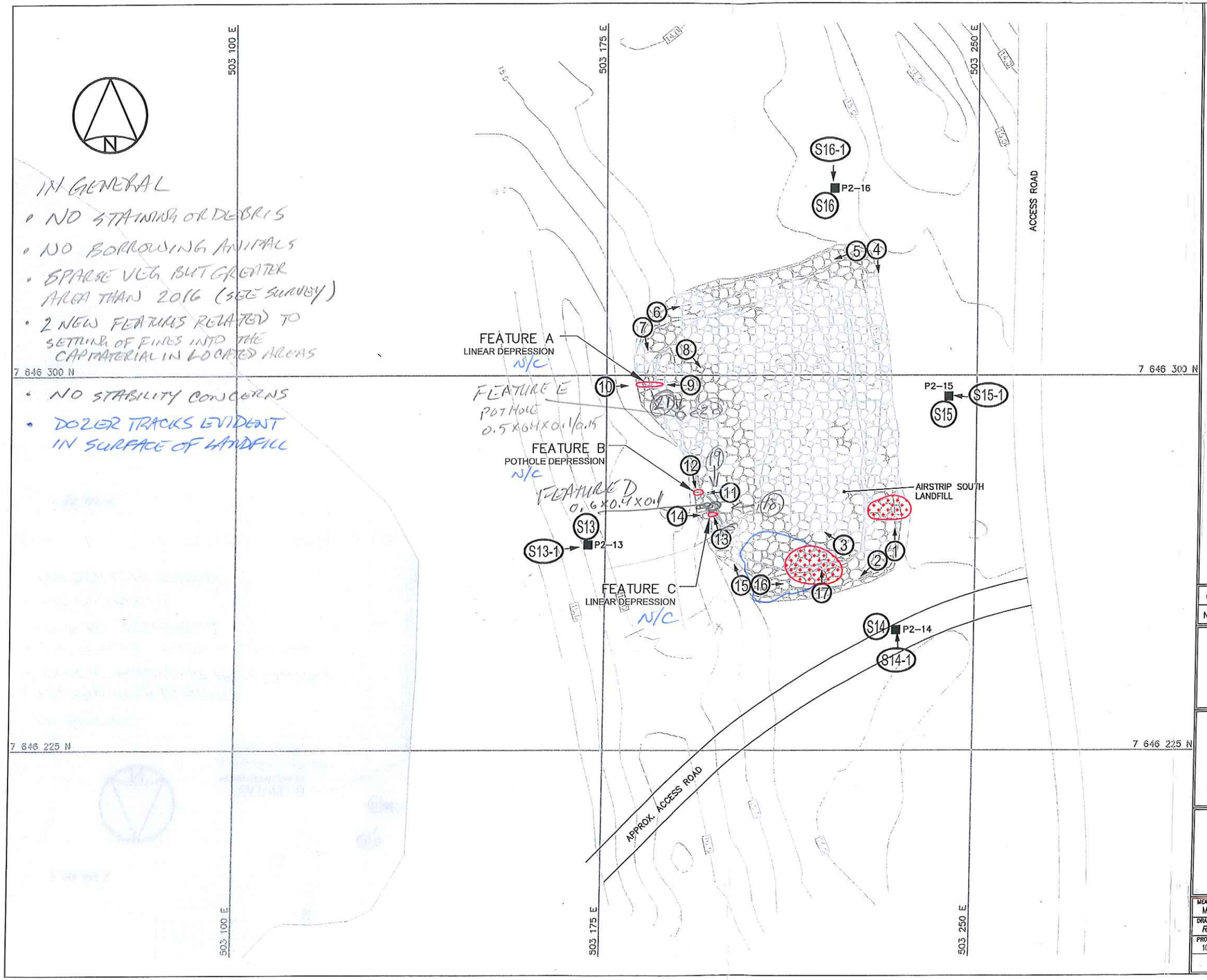
PROJECT NO: 102012-000	DRAWING NO: 102012-000-PIN-2.4	PAGE 4

FIGURE PIN-2.4



LEGEND

- MONITORING SOIL SAMPLE LOCATION (4)
- APPROX. PHOTOGRAPHIC VIEWPOINT (2016)
- BODY OF WATER
- LINEAR DEPRESSION (NTS)
- SPARSE VEGETATION (NTS)

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19/8/2018

0m 7.5m 15.0m 22.5m 30.0m 37.5m

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COLLECTION OF
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AIRSTRIP SOUTH LANDFILL

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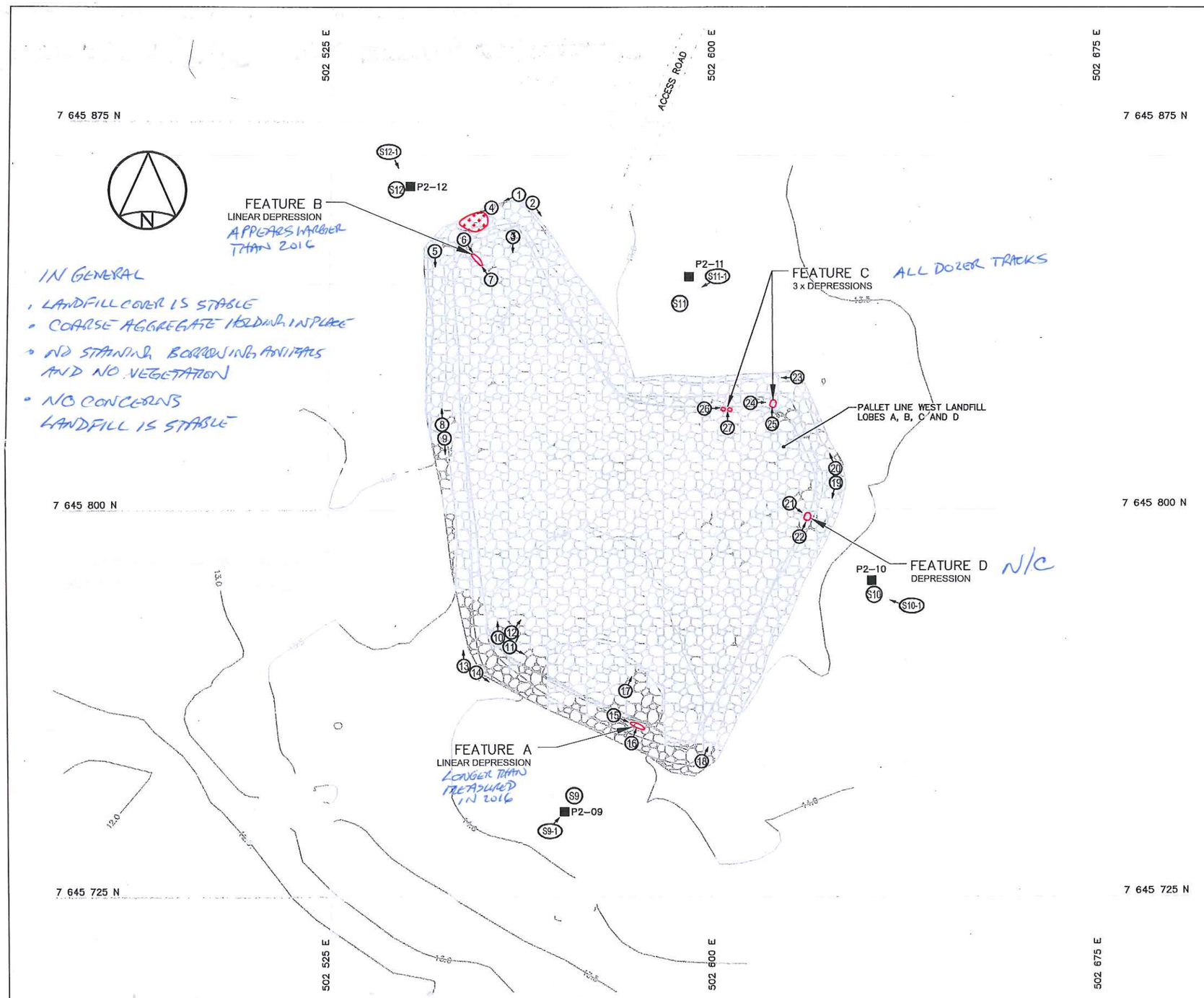
PROJECT NO: 102012-000	DRAWING NO: 102012-000- PIN-2.5	PAGE 5

FIGURE PIN-2.5



IN GENERAL

- LANDFILL COVER IS STABLE
- COARSE AGGREGATE HOLDING IN PLACE
- NO STAINING, BORROWING ANIMALS AND NO VEGETATION
- NO CONCERNS LANDFILL IS STABLE

LEGEND

- MONITORING SOIL SAMPLE LOCATION (4)
- APPROX. PHOTOGRAPHIC VIEWPOINT (2016)
- MINOR SETTLEMENT (NTS)
- SPARSE VEGETATION (NTS)

INSPECTION COMPLETED BY RYAN JANZEN & CHARLES CHAMELLE

19/8/2018

0m 7.5m 15.0m 22.5m 30.0m 37.5m

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COLLECTION OF
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PIN-2, CAPE YOUNG, NUNAVUT

PALLET LINE WEST LANDFILL

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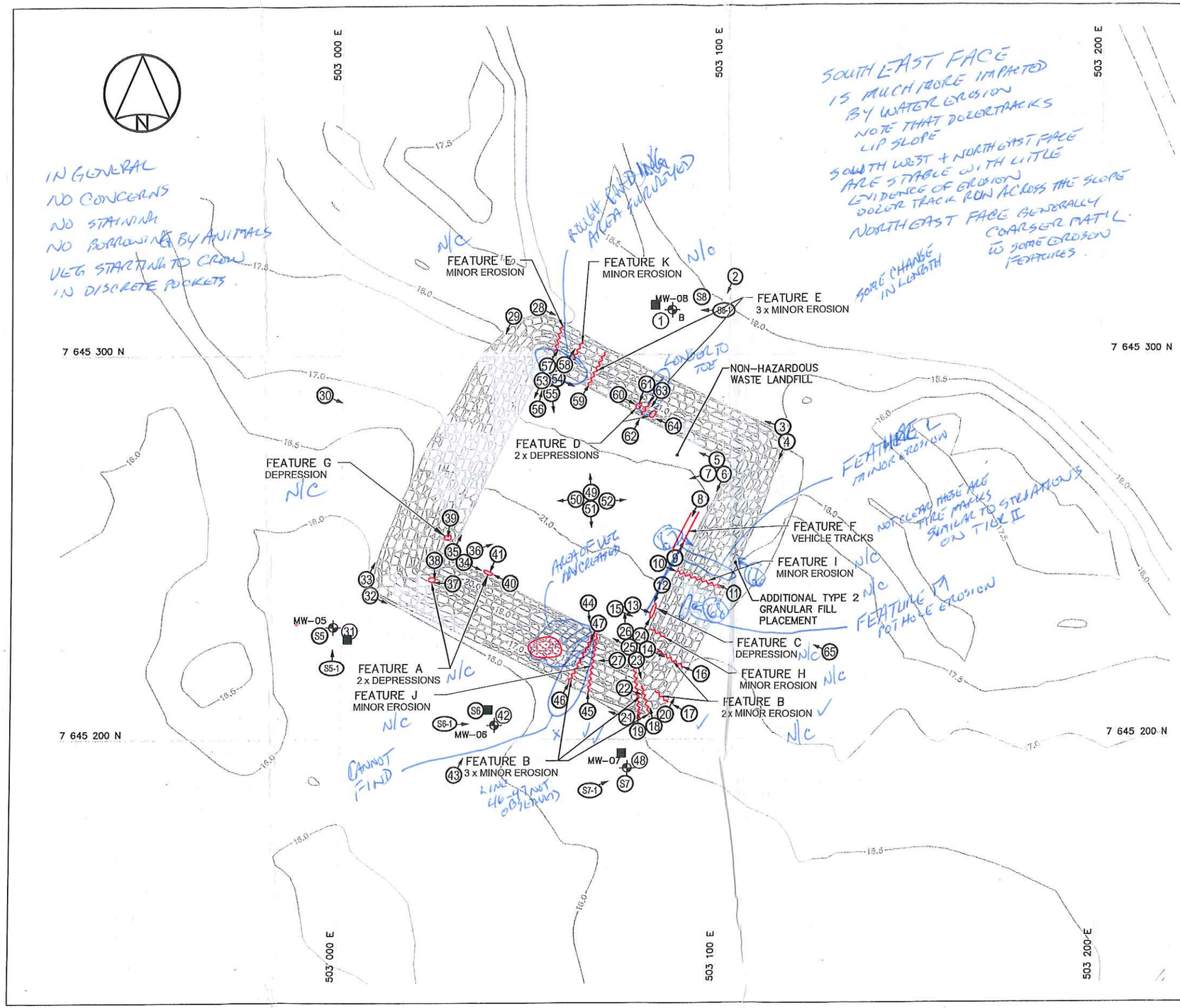
PROJECT NO: 102012-000	DRAWING NO: 102012-000-PIN-2.6	PAGE 6

FIGURE PIN-2.6



LEGEND

- MONITORING SOIL SAMPLE LOCATION (4)
- MONITORING WELL LOCATION (3)
- BACKGROUND MONITORING WELL LOCATION (1)
- APPROX. PHOTOGRAPHIC VIEWPOINT (2016)
- MINOR SETTLEMENT (NTS)
- MINOR EROSION (NTS)
- VEHICLE TRACKS (NTS)
- SPARSE VEGETATION

INSPECTION COMPLETED BY
RYAN JANZEN + CHARLES GRAVELLE

Chas Gravelle 18/8/2018

0m 10m 20m 30m 40m 50m

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COLLECTION OF LANDFILL MONITORING DATA

PIN-2, CAPE YOUNG, NUNAVUT

NON-HAZARDOUS WASTE LANDFILL

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MEASUREMENT UNIT	SCALE:	DATE (month--year):
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DRAWN BY: R. FLETCHER	VERIFIED BY: T. AUSTRINS	APPROVED BY: C. GRAVELLE P. ENG
PROJECT NO: 102012-000	DRAWING NO: 102012-000-PIN-2.7	PAGE 7

FIGURE PIN-2.7

NO STAINING
NO DEBRIS
NO BORROWING BY ANIMALS
VERY LITTLE VEGETATION
MIX OF COARSE COBBLE & GRAVEL
MADE CONTOURING DIFFICULT
SLOPES ARE STABLE BUT
DOZER BLADE CUTS +
DIFFERENCES IN
BORROW SOURCE MATERIAL
ARE EVIDENT
NO STABILITY CONCERNS

503 425 E
503 500 E
503 575 E
7 645 100 N
7 645 025 N

FEATURE C
MINOR DEPRESSION
N/C

FEATURE B
MINOR EROSION
N/C

FEATURE D
DEPRESSION
N/C

FEATURE A
LINEAR DEPRESSION
N/C

FEATURE E
MINOR DEPRESSION
↳ LOSS OF FINES IN
MATERIAL BELOW
1.8 x 0.2-0.4 x 0.05-0.2

FEATURE F
MINOR DEPRESSION
↳ LOSS OF FINES INTO UNDERLYING
MATERIAL
0.5 x 0.3 x 0.05-0.1

SOUTH LANDFILL—EAST

ACCESS ROAD

P2-18 S18-1 S18
P2-19 S19-1 S19
P2-17 S17 S17-1
P2-20 S20-1 S20

CONFIRM WITH GPS
LENGTH OF
FEATURE.
MAY HAVE
INCREASED

INSPECTION COMPLETED BY
RYAN JANZEN + CHARLES GRAVELLE
18 AUG 2018

LEGEND

- MONITORING SOIL SAMPLE LOCATION (4)
- APPROX. PHOTOGRAPHIC VIEWPOINT (2016)
- MINOR SETTLEMENT (NTS)
- MINOR EROSION (NTS)
- SPARSE VEGETATION

0m 7.5m 15.0m 22.5m 30.0m 37.5m

NO.	VERSION	DATE	BY	VERIF.	APPR.
00	PRELIMINARY	2018.06.01	R.F.	T.A.	C.G.

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COLLECTION OF
LANDFILL MONITORING DATA
PIN-2, CAPE YOUNG, NUNAVUT
SOUTH LANDFILL - EAST

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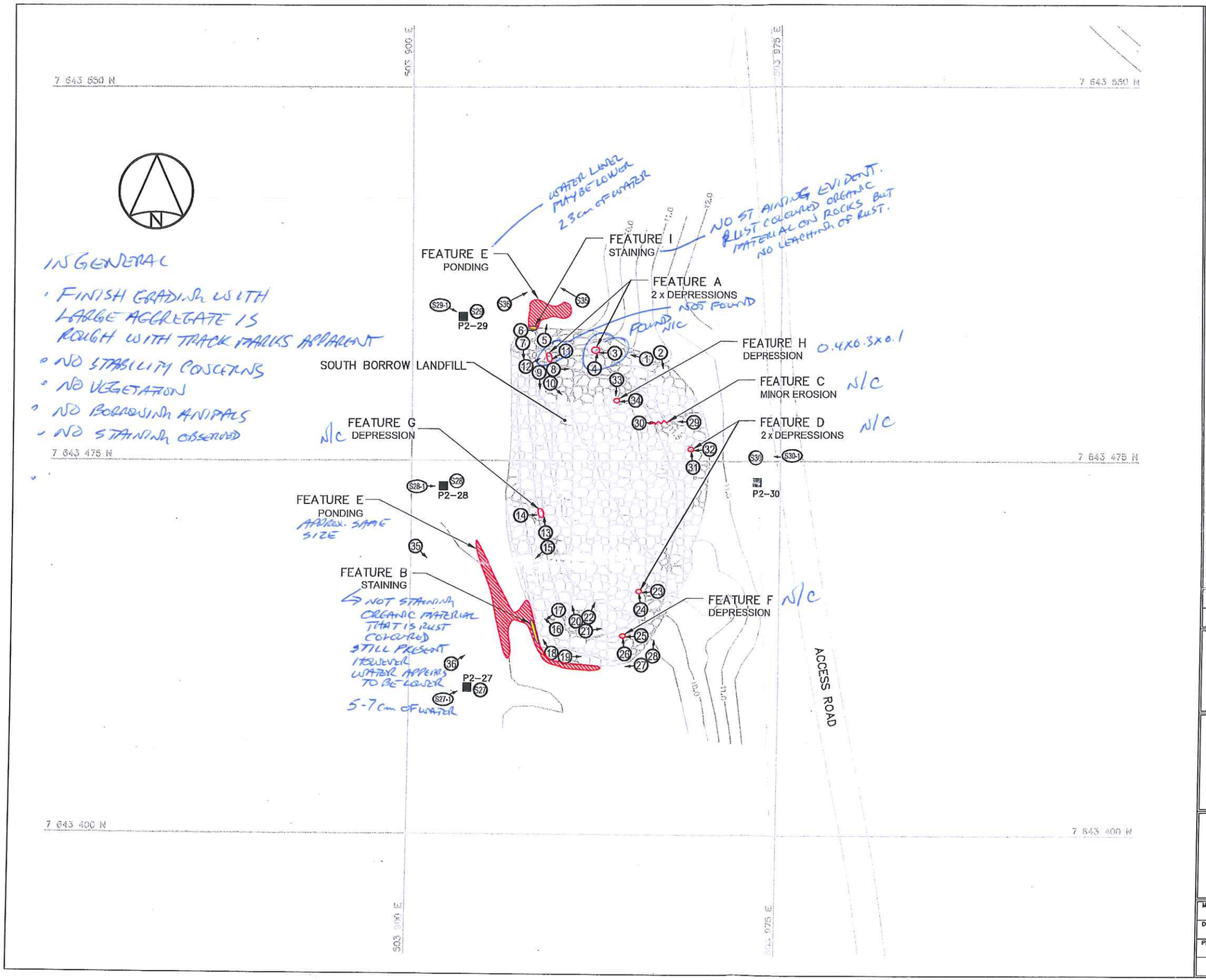
MEASUREMENT UNIT	SCALE:	DATE (month-year):
Metre	1 : 750	JUNE 2018
DRAWN BY: R. FLETCHER	VERIFIED BY: T. AUSTRINS	APPROVED BY: C. GRAVELLE P. ENG
PROJECT NO: 102012-000	DRAWING NO: 102012-000-PIN-2.8	PAGE 8

FIGURE PIN-2.8



LEGEND

- MONITORING SOIL SAMPLE LOCATION (4)
- APPROX. PHOTOGRAPHIC VIEWPOINT (2016)
- MINOR SETTLEMENT (NTS)
- STAINING (NTS)
- PONDING (NTS)
- MINOR EROSION (NTS)

N/C NO CHANGE

INSPECTION COMPLETED BY RYAN STARZEN & CHARLES GRAVELLE

18/8/2018

0m 7.5m 15.0m 22.5m 30.0m 37.5m

NO.	VERSION	DATE	BY	VERIF.	APPR.
00	PRELIMINARY	2018.06.01	R.F.	T.A.	C.G.

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COLLECTION OF
LANDFILL MONITORING DATA
PIN-2, CAPE YOUNG, NUNAVUT

SOUTH BORROW LANDFILL

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Metre	1 : 750	JUNE 2018
DRAWN BY: R. FLETCHER	VERIFIED BY: T. AUSTRINS	APPROVED BY: C. GRAVELLE P. ENG
PROJECT NO: 102012-000	DRAWING NO: 102012-000-PIN-2.9	PAGE 9

FIGURE PIN-2.9

DEW LINE CLEANUP: POST-CONSTRUCTION - LANDFILL MONITORING

VISUAL INSPECTION CHECKLIST

ANNEX J1: INSPECTION REPORT – PAGE 1 OF 3

SITE NAME:	PIN-2
LANDFILL DESIGNATION:	Airstrip Landfill
LANDFILL TYPE (regraded, leachate contained, Tier II or NH):	Regrade
DATE OF INSPECTION:	2018 08.19
WEATHER CONDITIONS:	overcast with some breaks, windy. Some precipitation.
DATE OF PREVIOUS INSPECTION:	2018.08.16
INSPECTED BY (name and signature):	Ryan Janzen and CHARLES GRAVELLE
REPORT PREPARED BY (name and signature):	Ryan Janzen and CHARLES GRAVELLE

The Inspector represents to the best of their knowledge that the following statements and observations are true and correct and that no material facts have been suppressed or misstated.

Notes:

- *All Features must have UNIQUE and consistent identifiers:*
  - *If a Feature is identified as Feature 'A' in 2013; then this same Feature 'A' must be followed up on as Feature 'A' in 2014 and all subsequent years. If it is not observed in a year, than it must be described as 'not observed'; Feature 'A' cannot be replaced to become a different Feature in later years.*
  - *If a Feature was noted in a previous year, but in the Geotechnical Engineer's opinion is not relevant; you can explain why in your opinion it is not relevant.*
  - *A new Feature must get its own unique identifier, in alphabetical order from where the previous list of Features left off; it should also be described as 'NEW' in the description column;*
  - *New Features can only be grouped together if they are very similar and located in close proximity;*
  - *Feature names must be consistent in the Tables, Figures, Photos and text; All Feature referencing must be verified for consistency.*
- *All measurements must be metric units;*
- *GPS is in UTM coordinates (NAD83).*

AIRSTRIP

VISUAL INSPECTION CHECKLIST - INSPECTION REPORT – PAGE 2 OF 3

Checklist Item	Present Yes/No	Feature Number (Feature A, B, C – Keep name from historical observations, where appropriate)	Location (Describe relative to existing monuments/ features and relative to landfill design i.e. surface, berms, toe)	GPS coordinates (Taken at each 0.5m to 1m interval, and at any significant change in direction and around circumference of feature) Also take centre of feature (where feasible, and call c) Easting/ Northing/Zone			Length	Width	Depth	Extent relative to Area of Landfill (%)	Description	Comparison with historical observations	Additional Comments	Photographic Records Photo Reference, Focal length, location, view point & direction (relative to magnetic north) Feature of note Scale
Settlement	Y	B	Lobe A, NE	logged in Trimble	logged in Trimble	11 North	2.7	1.0	0.2	<1%	linear depression	slightly larger than 2016	No stability concerns	ALF # 11-12
		C	Lobe E/F, S				3.0	0.1	0.1	<1%	linear depression	No change.		ALF # 41, 42
		E	Lobe A, N				2.9	0.5	0.1	<1%	linear depression	No change, except length		ALF # 22, 23
Erosion	Y	F	Lobe A, N				7.9	0.1	0.05	<1%	minor erosion, linear downslope	slightly smaller than 2016	No stability concerns	ALF # 24, 25
Lateral Movement	N													
Frost Action	N													
Sloughing	N													
Cracking	N													
Animal Burrows	N													

CG

AIRSTRIP

VISUAL INSPECTION CHECKLIST - INSPECTION REPORT – PAGE 3 OF 3

Checklist Item	Present Yes/No	Feature Number (Feature A, B, C – Keep name from historical observations, where appropriate)	Location (Describe relative to existing monuments/ features and relative to landfill design i.e. surface, berms, toe)	GPS coordinates (Taken at each 0.5m to 1m interval, and at any significant change in direction and around circumference of feature) Also take centre of feature (where feasible, and call c) Easting/ Northing/Zone			Length	Width	Depth	Extent relative to Area of Landfill (%)	Description	Comparison with historical observations	Additional Comments	Photographic Records Photo Reference, Focal length, location, view point & direction (relative to magnetic north) Feature of note Scale
Vegetation Establishment	N													
Staining	N													
Vegetation Stress	N													
Seepage Points (or) Ponded Water	N													
Debris and/or Liner Exposed	N													
Presence & Condition of Monitoring Instruments	N													
Features of Note/ Other Relevant Observations (e.g. signs of activity, ruts...)	Y	A	Lobe A, NE edge	logged on Trimble	logged on Trimble	ll North	0.3	0.3	–	<1%	metal debris, perforated strips	No change	should these be collected?	ALF# 35, 46-48
		D	Lobe E/F, N edge				0.15	0.1	–	<1%	metal debris	No change		ALF# 34, 36

CG

DEW LINE CLEANUP: POST-CONSTRUCTION - LANDFILL MONITORING

VISUAL INSPECTION CHECKLIST

ANNEX J1: INSPECTION REPORT – PAGE 1 OF 3

SITE NAME: PIN-2
LANDFILL DESIGNATION: USAF
LANDFILL TYPE (regraded, leachate contained, Tier II or NH): regrade
DATE OF INSPECTION: 2018 08.19
WEATHER CONDITIONS: overcast, raining and windy ~0°C
DATE OF PREVIOUS INSPECTION: 2018 08.16
INSPECTED BY (name and signature): Ryan Janzen and CHARLES GRAVELLE
REPORT PREPARED BY (name and signature): Ryan Janzen and CHARLES GRAVELLE
The inspector represents to the best of their knowledge that the following statements and observations are true and correct and that no material facts have been suppressed or misstated.

Notes:

- *All Features must have UNIQUE and consistent identifiers:*
  - *If a Feature is identified as Feature 'A' in 2013; then this same Feature 'A' must be followed up on as Feature 'A' in 2014 and all subsequent years. If it is not observed in a year, than it must be described as 'not observed'; Feature 'A' cannot be replaced to become a different Feature in later years.*
  - *If a Feature was noted in a previous year, but in the Geotechnical Engineer's opinion is not relevant; you can explain why in your opinion it is not relevant.*
  - *A new Feature must get its own unique identifier, in alphabetical order from where the previous list of Features left off; it should also be described as 'NEW' in the description column;*
  - *New Features can only be grouped together if they are very similar and located in close proximity;*
  - *Feature names must be consistent in the Tables, Figures, Photos and text; All Feature referencing must be verified for consistency.*
- *All measurements must be metric units;*
- *GPS is in UTM coordinates (NAD83).*

USAF

VISUAL INSPECTION CHECKLIST - INSPECTION REPORT – PAGE 2 OF 3

Checklist Item	Present Yes/No	Feature Number (Feature A, B, C – Keep name from historical observations, where appropriate)	Location (Describe relative to existing monuments/ features and relative to landfill design i.e. surface, berms, toe)	GPS coordinates (Taken at each 0.5m to 1m interval, and at any significant change in direction and around circumference of feature) Also take centre of feature (where feasible, and call c) Easting/ Northing/Zone			Length	Width	Depth	Extent relative to Area of Landfill (%)	Description	Comparison with historical observations	Additional Comments	Photographic Records Photo Reference, Focal length, location, view point & direction (relative to magnetic north) Feature of note Scale
Settlement	Y	A	W slope	E: Trimble	N: Trimble	11 North	0.6	0.4	0.3	<1%	minor depression	slightly larger than 2016.	No concerns	USAF #6,7
		B	top of W slope			↓	2.5	1.1	0.1	<1%	minor depression	ovoid shape – no comparison given in 2016.	See sketch on figure	USAF #8,9
Erosion	N													
Lateral Movement	N													
Frost Action	N													
Sloughing	N													
Cracking	N													
Animal Burrows	N													

USAF

VISUAL INSPECTION CHECKLIST - INSPECTION REPORT – PAGE 3 OF 3

Checklist Item	Present Yes/No	Feature Number (Feature A, B, C – Keep name from historical observations, where appropriate)	Location (Describe relative to existing monuments/ features and relative to landfill design i.e. surface, berms, toe)	GPS coordinates (Taken at each 0.5m to 1m interval, and at any significant change in direction and around circumference of feature) Also take centre of feature (where feasible, and call c) Easting/ Northing/Zone			Length	Width	Depth	Extent relative to Area of Landfill (%)	Description	Comparison with historical observations	Additional Comments	Photographic Records Photo Reference, Focal length, location, view point & direction (relative to magnetic north) Feature of note Scale
Vegetation Establishment	N													
Staining	N													
Vegetation Stress	N													
Seepage Points (or) Ponded Water	N													
Debris and/or Liner Exposed	N													
Presence & Condition of Monitoring Instruments	N													
Features of Note/ Other Relevant Observations (e.g. signs of activity, ruts...)	N													

CG

DEW LINE CLEANUP: POST-CONSTRUCTION - LANDFILL MONITORING

VISUAL INSPECTION CHECKLIST

ANNEX J1: INSPECTION REPORT – PAGE 1 OF 3

SITE NAME:	PIN-2
LANDFILL DESIGNATION:	Station West
LANDFILL TYPE (regraded, leachate contained, Tier II or NH):	regrade
DATE OF INSPECTION:	2016 08 19
WEATHER CONDITIONS:	overcast, some rain, windy.
DATE OF PREVIOUS INSPECTION:	2016 08 16
INSPECTED BY (name and signature):	Ryan Janzen and CHARLES GRAVELLE
REPORT PREPARED BY (name and signature):	Ryan Janzen and CHARLES GRAVELLE

The inspector represents to the best of their knowledge that the following statements and observations are true and correct and that no material facts have been suppressed or misstated.

Notes:

- *All Features must have UNIQUE and consistent identifiers:*
  - *If a Feature is identified as Feature 'A' in 2013; then this same Feature 'A' must be followed up on as Feature 'A' in 2014 and all subsequent years. If it is not observed in a year, than it must be described as 'not observed'; Feature 'A' cannot be replaced to become a different Feature in later years.*
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- *All measurements must be metric units;*
- *GPS is in UTM coordinates (NAD83).*

Station West

VISUAL INSPECTION CHECKLIST - INSPECTION REPORT – PAGE 2 OF 3

Checklist Item	Present Yes/No	Feature Number (Feature A, B, C – Keep name from historical observations, where appropriate)	Location (Describe relative to existing monuments/ features and relative to landfill design i.e. surface, berms, toe)	GPS coordinates (Taken at each 0.5m to 1m interval, and at any significant change in direction and around circumference of feature) Also take centre of feature (where feasible, and call c) Easting/ Northing/Zone			Length	Width	Depth	Extent relative to Area of Landfill (%)	Description	Comparison with historical observations	Additional Comments	Photographic Records Photo Reference, Focal length, location, view point & direction (relative to magnetic north) Feature of note Scale
Settlement	N													
Erosion	N													
Lateral Movement	N													
Frost Action	N													
Sloughing	N													
Cracking	N													
Animal Burrows	N													

CG

Station West

VISUAL INSPECTION CHECKLIST - INSPECTION REPORT – PAGE 3 OF 3

Checklist Item	Present Yes/No	Feature Number (Feature A, B, C – Keep name from historical observations, where appropriate)	Location (Describe relative to existing monuments/ features and relative to landfill design i.e. surface, berms, toe)	GPS coordinates (Taken at each 0.5m to 1m interval, and at any significant change in direction and around circumference of feature) Also take centre of feature (where feasible, and call c) Easting/ Northing/Zone			Length	Width	Depth	Extent relative to Area of Landfill (%)	Description	Comparison with historical observations	Additional Comments	Photographic Records Photo Reference, Focal length, location, view point & direction (relative to magnetic north) Feature of note Scale
Vegetation Establishment	N													
Staining	N													
Vegetation Stress	N													
Seepage Points (or) Ponded Water	N													
Debris and/or Liner Exposed	N													
Presence & Condition of Monitoring Instruments	N													
Features of Note/ Other Relevant Observations (e.g. signs of activity, ruts...)	Y	A1 A2 B	~~14.2~~ S central 'crest' ~~14.2~~	logged on Trimble	logged on Trimble	11 North ↓	14.2 16.7 5.	0.3 0.3 3.0	0.1 0.1 0.1	<1% <1% <1%	} Vehicle tracks, likely dozer. Too large for a truck. Maybe loader. Vehicle tracks (some).	No change, though dimensions noted are different. No change, but noted a larger area (more accurate)	For all (A+B): Rough grading at surface with cobble material. Dozer or loader made a large number of turns in this area.	SWLF #15 SWLF # 13, 14

CG

DEW LINE CLEANUP: POST-CONSTRUCTION - LANDFILL MONITORING

VISUAL INSPECTION CHECKLIST

ANNEX J1: INSPECTION REPORT – PAGE 1 OF 3

SITE NAME:	PIN-2 (Cape Young)
LANDFILL DESIGNATION:	Tier II Disposal Facility (New Landfill)
LANDFILL TYPE (regraded, leachate contained, Tier II or NH):	Tier II
DATE OF INSPECTION:	17 August 2018
WEATHER CONDITIONS:	overcast and gusting, intermittent precipitation. Clearing in the evening
DATE OF PREVIOUS INSPECTION:	16 August 2016
INSPECTED BY (name and signature):	Ryan Janzen and CHARLES GRAVELLE
REPORT PREPARED BY (name and signature):	Ryan Janzen and CHARLES GRAVELLE
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- *All measurements must be metric units;*
- *GPS is in UTM coordinates (NAD83).*

TIER II

VISUAL INSPECTION CHECKLIST - INSPECTION REPORT – PAGE 2 OF 3

Checklist Item	Present Yes/No	Feature Number (Feature A, B, C – Keep name from historical observations, where appropriate)	Location (Describe relative to existing monuments/ features and relative to landfill design i.e. surface, berms, toe)	GPS coordinates (Taken at each 0.5m to 1m interval, and at any significant change in direction and around circumference of feature) Also take centre of feature (where feasible, and call c) Easting/ Northing/Zone			Length	Width	Depth	Extent relative to Area of Landfill (%)	Description	Comparison with historical observations	Additional Comments	Photographic Records Photo Reference, Focal length, location, view point & direction (relative to magnetic north) Feature of note Scale
							J dimensions							
Settlement	Y	A	SW crest	–	–	11 North	c.4-3	c 5-c	c.1-c.15	<1%	Four minor depressions	No change	Oval shaped settlement	Tier II #10, 11, 29, 30, 37-39
	N	D	NE crest			–	–	–	–	–	Not visible. Minor depression.	Not visible in 2015, 2016, 2018	Feature not observed.	None.
	Y	I	E crest			11 North	2.5	c 4	c.c 5	<1%	Minor depression.	No change.		Tier II #21, 22
	Y	J	SW slope			11 North	3 5	2.5	c 1	<1%	Depression area.	Logical as c.w longer ones.	Uneven areas as expected.	Tier II # 31-36
Erosion Settlement (cont)	Y	M (new)	Warner on crest	Logged	Logged	11 North	c t	c.15	0.1	<1%	Small depression. New obs	New observations		Tier II # 73-74
none → Lateral Movement Erosion	Y	B	SW slope	with Trimble	with Trimble	11 North	7.7	0 15	c c5	<1%	Minor erosion. Linear feature.	No change.	very difficult to see	Tier II # 37, 39
	Y	C	SE slope				see below				3 minor erosion, linear features.	No change.	Depositional img?	Tier II # 12-17
	Y	E	NW slope				E1 13.2	E1 0.5	c1	<1%	2 minor erosion features (linear).	No change.	Depositional img?	Tier II # 52-55
	Y	G	NW slope				E2 19.8	E2 c.3 2.c	c.c5 c.c5		Minor erosion, linear feature	No change.	Depositional img?	Tier II # 50 51
none → Frost Action Erosion (cont.)	Y	H	NE slope			11 North	7.9	0 3	0 1	<1%	Minor erosion, linear feature.	No change.	Photos taken at c.w ext.	Tier II # 69-70
	Y	K	NW slope, W				–	–	–		Minor erosion, linear feature.	Not observed in 2018		Tier II # 43, 45
	Y	L	N c.w slope				5 0	c.3	c i		Minor erosion, linear feature	No change.		Tier II # 47-48
none → Sloughing	N	–	–	–	–	C1	3.4	c 1	c c5	<1%	–	–	–	–
						C2	4.6	0,1	0 c5	<1%				
						C3	10.2	0 3	c.1	<1%				
						C4/5	4.8	0.1	0 c5	<1%				
Cracking	N	–	–	–	–	–	–	–	–	–	–	–	–	–
Animal Burrows	N	–	–	–	–	–	–	–	–	–	–	–	–	–

TIER II

VISUAL INSPECTION CHECKLIST - INSPECTION REPORT – PAGE 3 OF 3

Checklist Item	Present Yes/No	Feature Number (Feature A, B, C – Keep name from historical observations, where appropriate)	Location (Describe relative to existing monuments/ features and relative to landfill design i.e. surface, berms, toe)	GPS coordinates (Taken at each 0.5m to 1m interval, and at any significant change in direction and around circumference of feature) Also take centre of feature (where feasible, and call c) Easting/ Northing/Zone			Length	Width	Depth	Extent relative to Area of Landfill (%)	Description	Comparison with historical observations	Additional Comments	Photographic Records Photo Reference, Focal length, location, view point & direction (relative to magnetic north) Feature of note Scale
Vegetation Establishment	N	–	–	–	–	–	–	–	–	–	–	–	–	–
Staining	N	–	–	–	–	–	–	–	–	–	–	–	–	–
Vegetation Stress	N	–	–	–	–	–	–	–	–	–	–	–	–	–
Seepage Points (or) Ponded Water	N	–	–	–	–	–	–	–	–	–	–	–	–	–
Debris and/or Liner Exposed	N	–	–	–	–	–	–	–	–	–	–	–	–	–
Presence & Condition of Monitoring Instruments	Y	VT-1,2,3,4 MW-1,2,3,4	landfill crests outside LF footprint	Logged with Trimble	Logged with Trimble	II North ↓	N/A	N/A	N/A	N/A	Thermistors to track temp. changes Groundwater sampling points	No change, good condition No change, good condition	Cap@ VT-2 replaced	Tier II # 37 Tier II # 1,27,49,71
Features of Note/ Other Relevant Observations (e.g. signs of activity, ruts...)	Y	F	top of LF	Logged with Trimble	Logged with Trimble	II North	F1 13.0 F2 12.4 F3 13.8 F4 4.4 F5 3.2 F6 2.0 F7 8.1	0.15 ↓	0.05 ↓	<1%	shallow striations – vehicle track	No change in severity, although it appears dimensions have changed somewhat.	No concern	Tier II # 59-62

CG

DEW LINE CLEANUP: POST-CONSTRUCTION - LANDFILL MONITORING

VISUAL INSPECTION CHECKLIST

ANNEX J1: INSPECTION REPORT – PAGE 1 OF 3

SITE NAME:	PIN-2
LANDFILL DESIGNATION:	Airstrip South
LANDFILL TYPE (regraded, leachate contained, Tier II or NH):	regrade
DATE OF INSPECTION:	2018 08 19
WEATHER CONDITIONS:	overcast, windy. Fog
DATE OF PREVIOUS INSPECTION:	2016 08 15
INSPECTED BY (name and signature):	Ryan Janzen and CHARLES GRAVELLE
REPORT PREPARED BY (name and signature):	Ryan Janzen and CHARLES GRAVELLE

The inspector represents to the best of their knowledge that the following statements and observations are true and correct and that no material facts have been suppressed or misstated.

Notes:

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AIRSTRIP SOUTH

VISUAL INSPECTION CHECKLIST - INSPECTION REPORT – PAGE 2 OF 3

Checklist Item	Present Yes/No	Feature Number (Feature A, B, C – Keep name from historical observations, where appropriate)	Location (Describe relative to existing monuments/ features and relative to landfill design i.e. surface, berms, toe)	GPS coordinates (Taken at each 0.5m to 1m interval, and at any significant change in direction and around circumference of feature) Also take centre of feature (where feasible, and call c) Easting/ Northing/Zone			Length	Width	Depth	Extent relative to Area of Landfill (%)	Description	Comparison with historical observations	Additional Comments	Photographic Records Photo Reference, Focal length, location, view point & direction (relative to magnetic north) Feature of note Scale
Settlement	Y	A	W slope	Trimble	Trimble	11 North	6	c.3	0.1	<1%	linear depression	no change		ASLF #9,10
		B	W slope				c.3	c.3	0.1		pothole depression	no change		ASLF #11,12
		C	W slope				0.8	c.3	0.15		linear depression	no change		ASLF #13,14
~~Erosion~~ Settlement II (none)	Y	D	W slope	logged on	logged on		0.6	c.4	0.1		pothole depression	new observation	due to settling of fines into cap material. Not currently a concern.	ASLF #18,19
		E	W slope				0.5	0.4	0.15		pothole depression	new observation		ASLF #20,21
Lateral Movement	N													
Frost Action	N													
Sloughing	N													
Cracking	N													
Animal Burrows	N													

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AIRSTRIP SOUTH

VISUAL INSPECTION CHECKLIST - INSPECTION REPORT – PAGE 3 OF 3

Checklist Item	Present Yes/No	Feature Number (Feature A, B, C -- Keep name from historical observations, where appropriate)	Location (Describe relative to existing monuments/ features and relative to landfill design i.e. surface, berms, toe)	GPS coordinates (Taken at each 0.5m to 1m interval, and at any significant change in direction and around circumference of feature) Also take centre of feature (where feasible, and call c) Easting/ Northing/Zone			Length	Width	Depth	Extent relative to Area of Landfill (%)	Description	Comparison with historical observations	Additional Comments	Photographic Records Photo Reference, Focal length, location, view point & direction (relative to magnetic north) Feature of note Scale
Vegetation Establishment	Y	F	S slope	c.a Trimble	c.a Trimble	1° North ↓	203 m² (gps)			~5%	revegetated area, very spirse	Noted on previous figures, but no dimensions given (for both) Appears larger.	several plant types.	ASLF # 16, 17
		G	SE corner				77 m² (gps)			~2%	revegetated area, very spirse		several plant types.	ASLF # 1
Staining	N													
Vegetation Stress	N													
Seepage Points (or) Ponded Water	N													
Debris and/or Liner Exposed	N													
Presence & Condition of Monitoring Instruments	N													
Features of Note/ Other Relevant Observations (e.g. signs of activity, ruts...)	N													

CG

DEW LINE CLEANUP: POST-CONSTRUCTION - LANDFILL MONITORING

VISUAL INSPECTION CHECKLIST

ANNEX J1: INSPECTION REPORT – PAGE 1 OF 3

SITE NAME: PIN-2
LANDFILL DESIGNATION: Pallet Line West
LANDFILL TYPE (regraded, leachate contained, Tier II or NH): regraded
DATE OF INSPECTION: 2018-08-19
WEATHER CONDITIONS: ~~2018-08~~ Sunny, windy and cool
DATE OF PREVIOUS INSPECTION: 2016-08-16
INSPECTED BY (name and signature): Ryan Janzen and CHARLES GRAVELLE
REPORT PREPARED BY (name and signature): Ryan Janzen and CHARLES GRAVELLE
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PALLET LINE WEST

VISUAL INSPECTION CHECKLIST - INSPECTION REPORT – PAGE 2 OF 3

Checklist Item	Present Yes/No	Feature Number (Feature A, B, C – Keep name from historical observations, where appropriate)	Location (Describe relative to existing monuments/ features and relative to landfill design i.e. surface, berms, toe)	GPS coordinates (Taken at each 0.5m to 1m interval, and at any significant change in direction and around circumference of feature) Also take centre of feature (where feasible, and call c) Easting/ Northing/Zone			Length	Width	Depth	Extent relative to Area of Landfill (%)	Description	Comparison with historical observations	Additional Comments	Photographic Records Photo Reference, Focal length, location, view point & direction (relative to magnetic north) Feature of note Scale
Settlement	Y	A	S crest	Trimble	Trimble	11 North	~~5-11~~ 2	0.2	0.05	<1%	linear depression	slightly longer than 2016		PLW# 15,16
		B	NW crest				~~5-11~~ 2.5	0.2	0.05	<1%	linear depression	larger than 2016.		PLW# 6,7
none → ~~Erosion~~ Settlement II	Y	C	NE crest	logged in	logged in		0.5-0.5	0.4	0.05	<1%	fortilized depression (dozer tracks)	No change	depression occurred when dozer erected ridge	PLW# 24-27
		D	E crest				0.4	0.4	0.05	<1%	pothole depression	No change		PLW# 21,22
Lateral Movement	N													
Frost Action	N													
Sloughing	N													
Cracking	N													
Animal Burrows	N													

CG

PALLET LINE WEST

VISUAL INSPECTION CHECKLIST - INSPECTION REPORT – PAGE 3 OF 3

Checklist Item	Present Yes/No	Feature Number (Feature A, B, C – Keep name from historical observations, where appropriate)	Location (Describe relative to existing monuments/ features and relative to landfill design i.e. surface; berms, toe)	GPS coordinates (Taken at each 0.5m to 1m interval, and at any significant change in direction and around circumference of feature) Also take centre of feature (where feasible, and call c) Easting/ Northing/Zone			Length	Width	Depth	Extent relative to Area of Landfill (%)	Description	Comparison with historical observations	Additional Comments	Photographic Records Photo Reference, Focal length, location, view point & direction (relative to magnetic north) Feature of note Scale
Vegetation Establishment	Y	E	SE side	Trimble	Trimble	11 North	46	5	—	~10%	sparse vegetation	No letter given previously	variety of plant types.	PLW# 15, 18–19
Staining	N													
Vegetation Stress	N													
Seepage Points (or) Ponded Water	N													
Debris and/or Liner Exposed	N													
Presence & Condition of Monitoring Instruments	N													
Features of Note/ Other Relevant Observations (e.g. signs of activity, ruts...)	N													

CG

DEW LINE CLEANUP: POST-CONSTRUCTION - LANDFILL MONITORING

VISUAL INSPECTION CHECKLIST

ANNEX J1: INSPECTION REPORT – PAGE 1 OF 3

SITE NAME:	PIN-2
LANDFILL DESIGNATION:	Non-Hazardous Waste
LANDFILL TYPE (regraded, leachate contained, Tier II or NH):	NH
DATE OF INSPECTION:	2018.08.18
WEATHER CONDITIONS:	overcast, windy. Some rain.
DATE OF PREVIOUS INSPECTION:	2016.08.16
INSPECTED BY (name and signature):	Ryan Janzen and CHARLES GRAVELLE
REPORT PREPARED BY (name and signature):	Ryan Janzen and CHARLES GRAVELLE

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Non-Haz

VISUAL INSPECTION CHECKLIST - INSPECTION REPORT – PAGE 2 OF 3

Checklist Item	Present Yes/No	Feature Number (Feature A, B, C – Keep name from historical observations, where appropriate)	Location (Describe relative to existing monuments/ features and relative to landfill design i.e. surface, berms, toe)	GPS coordinates (Taken at each 0.5m to 1m interval, and at any significant change in direction and around circumference of feature) Also take centre of feature (where feasible, and call c) Easting/ Northing/Zone	Length	Width	Depth	Extent relative to Area of Landfill (%)	Description	Comparison with historical observations	Additional Comments	Photographic Records Photo Reference, Focal length, location, view point & direction (relative to magnetic north) Feature of note Scale
Settlement	Y	A1 A2 C	W crest, corner S corner, crest	Trimble ↑ 11 North ↓	0.5 2.2 4.0	0.3 0.5 0.5	0.05 0.1 0.1	<1% ↓	minor depression minor depression minor depression	no change no change no change		NH# 37, 38, 40, 41 NH# 12, 13, 24
~~Erosion~~ Settlement II	Y	D1 D2 G	NE crest, mid-side W corner crest	~~Trimble~~ ~~logged in~~ Trimble ↑ 11 North ↓	1.6 1.7 0.6	0.9 0.8 0.4	0.05 0.05 0.1	<1% ↓	minor depression minor depression minor depression	no change no change no change		NH# 60, 61, 64 NH# 39
none → ~~Lateral Movement~~ Erosion	Y	B1 B2 B3 B4	S corner, crest to toe ↓	logged in ↓ 11 North ↓	9.8 6.0 7.5 8.5	0.5 - 0.5 0.6	0.1 0.1 0.1 0.1	<1% ↓	minor erosion, from crest to toe	previous reports given a range. Features are within that range.	S corner, SE face show more erosion than other sides	NH# 14, 16-19, 22, 23 46, 47
none → ~~Frost Action~~ Erosion II	Y	B5 E1 E2 E3	↓ N corner and NE face	↓ 11 North ↓	- 7.2 6.3 8.4	- 0.3 0.3 0.3	- 0.1 0.1 0.1	- <1% ↓	could not find minor erosion	not present (mis-numbered?) within previous range given in 2016	-	- NH# 57, 59, 62, 63
none → ~~Sloughing~~ Erosion III	Y	H I J K	SE crest SE slope SW slope NE slope	↓ 11 North ↓	2.6 9.5 4.4 7.2	0.15 0.4 0.3 0.2	0.05 0.1 0.1 0.05	<1% ↓	minor erosion ↓	no change ↓	S corner and SE are subject to more erosion than other corners/sides.	NH# 15 NH# 10, 11 NH# 44, 45 NH# 58
none → ~~Cracking~~ Erosion IV	Y ~~N~~	L M	SE slope SE slope	↓ 11 North	4.3 1.4	0.2 0.6	0.1 0.15	<1%	minor erosion pothole erosion	new observation new observation	similar to older features pothole - not linear from crest to toe like others.	NH# 66, 67 NH# 68
Animal Burrows	N											

06

Non-Haz

VISUAL INSPECTION CHECKLIST - INSPECTION REPORT – PAGE 3 OF 3

Checklist Item	Present Yes/No	Feature Number (Feature A, B, C – Keep name from historical observations, where appropriate)	Location (Describe relative to existing monuments/ features and relative to landfill design i.e. surface, berms, toe)	GPS coordinates (Taken at each 0.5m to 1m interval, and at any significant change in direction and around circumference of feature) Also take centre of feature (where feasible, and call c) Easting/ Northing/Zone			Length	Width	Depth	Extent relative to Area of Landfill (%)	Description	Comparison with historical observations	Additional Comments	Photographic Records Photo Reference, Focal length, location, view point & direction (relative to magnetic north) Feature of note Scale
Vegetation Establishment	Y	C	SW slope	logged in GPS	logged in GPS	11 North	25.5	10.8	–	~2%	sparsely vegetated area	No dimensions previously given, but appears larger than area on 2016 figure.	various vegetation types.	NH# 27, 44, 46
Staining	N													
Vegetation Stress	N													
Seepage Points (or) Ponded Water	N													
Debris and/or Liner Exposed	N													
Presence & Condition of Monitoring Instruments	N													
Features of Note/ Other Relevant Observations (e.g. signs of activity, ruts...)	Y	F1 F2 ~~N~~	top of SE slope. Narrow crest	logged in Trimble	logged in Trimble	11 North ↓	21.0 32.3	0.2 0.2	<0.5 <0.5	<1% ↓	} vehicle tracks, two parallel tire marks Roughly graded area (poor finishing)	longer than noted in 2016 report. new observation	minor depressions	NH# 8, 9 NH# 57, 58

CG

DEW LINE CLEANUP: POST-CONSTRUCTION - LANDFILL MONITORING

VISUAL INSPECTION CHECKLIST

ANNEX J1: INSPECTION REPORT – PAGE 1 OF 3

SITE NAME:	PIN-2
LANDFILL DESIGNATION:	South Landfill East
LANDFILL TYPE (regraded, leachate contained, Tier II or NH):	regrade
DATE OF INSPECTION:	2018.08.17
WEATHER CONDITIONS:	overcast, windy Some fog.
DATE OF PREVIOUS INSPECTION:	2016.08.15
INSPECTED BY (name and signature):	Ryan Janzen and CHARLES GRAVELLE
REPORT PREPARED BY (name and signature):	Ryan Janzen and CHARLES GRAVELLE

The Inspector represents to the best of their knowledge that the following statements and observations are true and correct and that no material facts have been suppressed or misstated.

Notes:

- *All Features must have UNIQUE and consistent identifiers:*
  - *If a Feature is identified as Feature 'A' in 2013; then this same Feature 'A' must be followed up on as Feature 'A' in 2014 and all subsequent years. If it is not observed in a year, than it must be described as 'not observed'; Feature 'A' cannot be replaced to become a different Feature in later years.*
  - *If a Feature was noted in a previous year, but in the Geotechnical Engineer's opinion is not relevant; you can explain why in your opinion it is not relevant.*
  - *A new Feature must get its own unique identifier, in alphabetical order from where the previous list of Features left off; it should also be described as 'NEW' in the description column;*
  - *New Features can only be grouped together if they are very similar and located in close proximity;*
  - *Feature names must be consistent in the Tables, Figures, Photos and text; All Feature referencing must be verified for consistency.*
- *All measurements must be metric units;*
- *GPS is in UTM coordinates (NAD83).*

South LF East

VISUAL INSPECTION CHECKLIST - INSPECTION REPORT – PAGE 2 OF 3

Checklist Item	Present Yes/No	Feature Number (Feature A, B, C – Keep name from historical observations, where appropriate)	Location (Describe relative to existing monuments/ features and relative to landfill design i.e. surface, berms, toe)	GPS coordinates (Taken at each 0.5m to 1m interval, and at any significant change in direction and around circumference of feature) Also take centre of feature (where feasible, and call c) Easting/ Northing/Zone			Length	Width	Depth	Extent relative to Area of Landfill (%)	Description	Comparison with historical observations	Additional Comments	Photographic Records Photo Reference, Focal length, location, view point & direction (relative to magnetic north) Feature of note Scale
Settlement	Y	A	NE corner	logged on Trimble	logged on Trimble	ll North	6.6	0.3	0.1	<1%	minor depression	no change	no concern	SLFE #9-11
		C	N slope				0.6	0.15	0.05		minor depression	no change		SLFE # 14,15
		D	top centre				0.3	0.15	0.1		minor depression	no change		SLFE # 24,25
Erosion	Y	B	top centre			ll North	9.9	0.15		<1%	minor erosion	no change		SLFE # 12,13
~~Lateral Movement~~ Settlement II	Y	E	NE slope			ll North	1.8			<1%	minor depression	new observation		SLFE # 28,29
		F	NE slope				0.3	0.3	0.1		minor depression	new observation		SLFE # 30,31
Frost Action	N													
Sloughing	N													
Cracking	N													
Animal Burrows	N													

CG

South LF East

VISUAL INSPECTION CHECKLIST - INSPECTION REPORT – PAGE 3 OF 3

Checklist Item	Present Yes/No	Feature Number (Feature A, B, C – Keep name from historical observations, where appropriate)	Location (Describe relative to existing monuments/ features and relative to landfill design i.e. surface, berms, toe)	GPS coordinates (Taken at each 0.5m to 1m interval, and at any significant change in direction and around circumference of feature) Also take centre of feature (where feasible, and call c) Easting/ Northing/Zone			Length	Width	Depth	Extent relative to Area of Landfill (%)	Description	Comparison with historical observations	Additional Comments	Photographic Records Photo Reference, Focal length, location, view point & direction (relative to magnetic north) Feature of note Scale
Vegetation Establishment	Y	G	N side	Trimble	Trimble	11 North	30	15	–	~5%	vegetated area	no dimensions given in previous report	variety of plant types	SLFE# 18
Staining	N													
Vegetation Stress	N													
Seepage Points (or) Ponded Water	N													
Debris and/or Liner Exposed	N													
Presence & Condition of Monitoring Instruments	N													
Features of Note/ Other Relevant Observations (e.g. signs of activity, ruts...)	N													

CG

DEW LINE CLEANUP: POST-CONSTRUCTION - LANDFILL MONITORING

VISUAL INSPECTION CHECKLIST

ANNEX J1: INSPECTION REPORT – PAGE 1 OF 3

SITE NAME:	PIM-2
LANDFILL DESIGNATION:	South Borrow
LANDFILL TYPE (regraded, leachate contained, Tier II or NH):	regrade
DATE OF INSPECTION:	2018.08.17
WEATHER CONDITIONS:	mixed sun and cloud, windy
DATE OF PREVIOUS INSPECTION:	2016 08 15
INSPECTED BY (name and signature):	Ryan Janzen and CHARLES GRAVELLE
REPORT PREPARED BY (name and signature):	Ryan Janzen and CHARLES GRAVELLE

The inspector represents to the best of their knowledge that the following statements and observations are true and correct and that no material facts have been suppressed or misstated.

Notes:

- *All Features must have UNIQUE and consistent identifiers:*
  - *If a Feature is identified as Feature 'A' in 2013; then this same Feature 'A' must be followed up on as Feature 'A' in 2014 and all subsequent years. If it is not observed in a year, than it must be described as 'not observed'; Feature 'A' cannot be replaced to become a different Feature in later years.*
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- *All measurements must be metric units;*
- *GPS is in UTM coordinates (NAD83).*

South Barrow

VISUAL INSPECTION CHECKLIST - INSPECTION REPORT – PAGE 2 OF 3

Checklist Item	Present Yes/No	Feature Number (Feature A, B, C – Keep name from historical observations, where appropriate)	Location (Describe relative to existing monuments/ features and relative to landfill design i.e. surface, berms, toe)	GPS coordinates (Taken at each 0.5m to 1m interval, and at any significant change in direction and around circumference of feature) Also take centre of feature (where feasible, and call c) Easting/ Northing/Zone			Length	Width	Depth	Extent relative to Area of Landfill (%)	Description	Comparison with historical observations	Additional Comments	Photographic Records Photo Reference, Focal length, location, view point & direction (relative to magnetic north) Feature of note Scale
Settlement	Y	A D F G	N slope E, SE slope" S side W side	1 ° spread in Trimble	1 ° spread in Trimble	11 North	0.8 0.8 0.3 1.7	0.5 0.6 0.3 0.3	0.1 0.15 0.05 0.05	<1%	minor depression	no change no change no change no change		SB# 3, 4, 11, 12 SB# 23, 24, 31, 32 SB# 25, 26 SB# 13, 14
~~Erosion~~ Settlement II	Y	H	N centre			11 North	0.3	0.3	0.1	<1%	minor depression	no change		SB# 33, 34
zone → ~~Lateral Movement~~ Erosion	Y	C	NE side			11 North	3.2	0.2	0.1	<1%	minor erosion	no change		SB #29, 30
Frost Action														
Sloughing														
Cracking														
Animal Burrows														

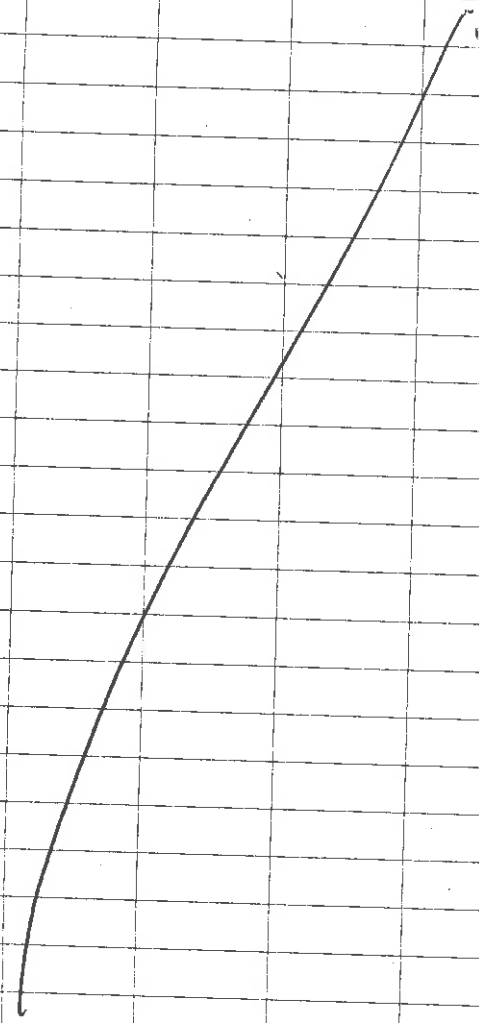
CG

South Barrow

VISUAL INSPECTION CHECKLIST - INSPECTION REPORT – PAGE 3 OF 3

Checklist Item	Present Yes/No	Feature Number (Feature A, B, C – Keep name from historical observations, where appropriate)	Location (Describe relative to existing monuments/ features and relative to landfill design i.e. surface, berms, toe)	GPS coordinates (Taken at each 0.5m to 1m interval, and at any significant change in direction and around circumference of feature) Also take centre of feature (where feasible, and call c) Easting/ Northing/Zone			Length	Width	Depth	Extent relative to Area of Landfill (%)	Description	Comparison with historical observations	Additional Comments	Photographic Records Photo Reference, Focal length, location, view point & direction (relative to magnetic north) Feature of note Scale
Vegetation Establishment	N													
Staining	Y	B I	SW toe NW toe	logged insps	logged insps	↓ North	6.3 0.5	0.8 0.2	– –	<1% <1%	Not staining - rust coloured organic material.	Water level appears to be lower than on 2016 figure.		SB* 17, 18 SB*5
Vegetation Stress	N													
Seepage Points (or) Ponded Water	Y	E1 E2	SW, NW toe	logged insps	logged insps	↓ North	4 6.3	2 0.8	0.25 0.05	<1% <1%	Ponded water in the lowlands adjacent to LF. Not due to LF design, naturally occuring.	Water level appears to be lower than on 2016 figure.		SB* 5, 15, 16, 35, 36
Debris and/or Liner Exposed	N													
Presence & Condition of Monitoring Instruments	N													
Features of Note/ Other Relevant Observations (e.g. signs of activity, ruts...)	N													

CG



102012-000 15 AUG 2018

DCC PIN-2 MONITORING PROGRAM

TRAVEL TO TO YELLOWKNIFE

7:05 DEPARTURE TO CALGARY

9:10 MT ARRIVAL AT CALGARY

10:30 MT DEPARTURE TO YELLOWKNIFE.

~~12:20~~ 1:05 MT ARRIVAL AT YELLOWKNIFE.

TO DO

✓ – CONSOLIDATE GEAR FROM LOCKUP.

– REVIEW WORK PLAN.

✓ – MAKE SURE WE HAVE SAT PHONE

– FORWARD ITINERARY TO LYNN SCOTT.

PLAN FOR 16 AUG

✓ – CHARTER TO KUGLUKTUK

– MEET CREW.

– SET UP DAY 1 TASKS.

– REVIEW WEATHER.

– ~~RE BA~~ REPACK KIT.

✓ – CONFIRM CATERER

– SET WAY POINTS FOR PHOTOS SEE TABLE VI.

– WHAT IS THE BORROW SOIL CONC? NATURALLY ELEVATED

Rite in the Rain

16 AUG 2018 PIN-2 PROG.

WEATHER
YELLOWKNIFE SUNNY W CLOUD 15°C
KUGLUKTUK. O/C RAINY 8°C

CONFIRM
• RF IS TAKING PHOTOS OF SOIL SAMPLING LOCATIONS.

CHARTER LEFT YELLOWKNIFE @ 2 PM
ARRIVED @ KUG ~ 3:45 PM

17 AUG 2018
WEATHER KUG 10°C O/C WIND CALM @ 6 °AM.
FORECAST O/C 14°C WINDS CALM BECOMES CHANCE SHOWERS AFTER 2PM

AIR CHARTER IS SUMMIT AIR
DONIER AIRCRAFT THRU ADLER AIR SERVICES.
ESTIMATED DEPARTURE TIME 8 AM - 8:30 AM

LANDFILL IDS

1. AIRSTRIP LANDFILL
2. LISAF
3. STATION WEST
✓4. TIER II (THERMISTORS)
5. AIRSTRIP SOUTH
6. PALLET LINE WEST
✓7. NON-HAZARDOUS WASTE
✓8 SOUTH LANDFILL
✓9. SOUTH BORROW

SURVEY IN CONTROL POINTS & BENCHMARK.

Rite in the Rain

AIR STRIP LAND FILL
2016 INSPECTION CONCERNS

A. SURFACE DEBRIS IN 4 LOCATIONS
B. LINEAR DEPRESSION 2.2 X0.5 X 0.15
C LINEAR DEPRESSION 3 X 0.1 X 0.1
D. SURFACE DEBRIS IN 2 LOCATIONS
E LINEAR DEPRESSION 2 X 0.5 X 0.1
F MINOR EROSION (RIVLET) 9m X 0.1m X 0.02/0.05

LOBE A

LOBE E+F NOT CLEAR IF THERE IS LOBES B, C OR D? also G, H, I, J

AS BUILTS HAS LOBES B+G NOT SURE WHY NOT IN 2016 RPT

FEATURE F WAS ONLY NEW ISSUE IN 2016 COMPARED TO 2015.

FEATURE B 2.2m X 0.5m IN 2016

FEATURE C DEPTH INCREASED 0.07 → 0.1m.

NEED TABLE IV FROM 2016 RPT

TABLE I

~~WHY MODERATE POTENTIAL FOR FAILURE?~~

GIVE MINOR NATURE OF DEBRIS

SHOULD WE COLLECT IT?

USAF
2016 INSPECTION CONCERNS

1. WHY GRAV. METALS NATURAL?
2. WHY LOW PCBs?
   SOIL SAMPLES TAKEN FROM NATIVE SOILS NOT LANDFILL

FEATURES

A SETTLEMENT 0.4 X 0.3 X 0.2
B SETTLEMENT (NEW IN 2016) 2.6 X 0.75 X 0.05/0.1

PHOTOS OF
A #6+7
B #8+9

- NO INSPECTION OF CAMP LOBES?
- AIRSTRIP SOUTH BURIED DEBRIS?
- STATION SW HAS NUMEROUS LOBES.

Rite in the Rain

STATION WEST
2016 INSPECTION CONCERNS

FEATURE
A VEHICLE TRACKS (OLD) 4-8 X 0.3 X 0.05
B VEHICLE TRACKS (NEW 2016) 5 X 0.3 X 0.3

PHOTOS
A SWLF-15
B SWLF-13, 14

PHOTO LOG TABLE XIV 21 PHOTOS. + SOIL PHOTOS.

10 2012-000

TIER II [DONE 7/8/2018]

THERMISTOR DOWNLOADS
REQ'D VT-1 HAS ISSUES W BEADS 2, 4, 6, 7, 8, 11 + 15
VT-4 BEADS 1 + 9 HAVE ISSUES

FEATURES

A SETTLEMENT 0.4/3 X 0.3/0.6 X 0.1/0.15 (4 LOC)
B EROSION 8 X 0.1/0.15 X 0.05
C EROSION 5/12 X 0.1/0.3 X 0.05/0.1 (3 LOC)
*D [NOT FOUND IN 2015 OR 2016] 0.7 X 0.3 X 0.15 SETTLEMENT ~~0.4/3 X 0.3 X 0.1/0.15~~
E EROSION 8-15 X 0.3/0.5 X 0.05/0.1 (2 LOC)
F STRIATIONS 4-9 X 0.15 X 0.02/0.05
G EROSION 16 X 0.4 X 0.05
H EROSION 10 X 0.3 X 0.1
I NEW IN 2016 SETTLEMENT 2.5 X 0.8 X 0.05
J NEW IN 2016 SETTLEMENT 1.5/2 X 0.2 X 0.05/0.07 (2 LOC)
K NEW IN 2016 EROSION 15 X 0.1/0.3 X 0.1
L EROSION 6 X 0.1/0.3 X 0.1

F ← DOZER RELATED TRACKS. @ 2 LOCATIONS OF CREST OF CAP

71 PHOTOS.

✓VT-2 ~~CAP~~ CRACK ON INSIDE OF CASING COVER? REPLACED 7/8/2018

Rite in the Rain

TIER II
VT-1

NOTE BEADS 6, 7 & 8 MAY BE OKAY
IF ORGANIC DEGRADATION IS HAPPENING
ELSE AGREE THIS MAY BE AN ISSUE
✓ CHECK CLOCK & MEMORY
✓ DOWNLOAD THE THERMAL DATA

WHAT IS BEAD SPACING?

AIRSTRIP SOUTH LANDFILL
2016 INSPECTION CONCERNS

FEATURES
A LINEAR SETTLEMENT 6 X 0.3 X 0.1
B POT HOLE NEW SINCE 2015 0.3 X 0.3 X 0.1
C LINEAR NEW SINCE 2015 0.8 X 0.3 X 0.15 NOW A
CONFIRM VEGETATION DEGRESSION
D 0.6 X 0.4 X 0.1 POTHOLE 1.3 X 1.2 X 0.05/0.1
17 PHOTOS
E 0.5 X 0.3 X 0.1 - 0.15

PALLET LINE WEST
A LIN DEP 1 X 0.2 X 0.05
B LIN DEP 1.5 X 0.1 X 0.03
C 3 DEP. 0.5/0.8 X 0.4/0.7 X 0.3/0.5
D DEP. 0.4 X 0.4 X 0.5

27 PHOTOS

WHY ONLY LOOK A, B, C & D
NOT CLEAR WHY G, H, I, J, K, L ARE NOT INSPECTED

Rite in the Rain

NON HAZ WASTE 18/8

2016 INSPECTION CONCERNS

- 65 PHOTOS

FEATURES

A DEP (2) POTHOLE 0.5/2.2 X 0.3/0.5 X 0.05/0.15 CHANGE

B EROSION (3) 3-17 X 0.1/0.6 X 0.05/0.1 CHANGED

C DEP. 4 X 0.1/0.5 X 0.1 N/C

D DEP (2) 0.4 X 0.5 X 0.05 N/C

E EROSION (4) 9-12 X 0.3 X 0.05/0.1 CHANGE SELF NUMBER

F VEHICLE TRACK 10 X 0.2 X 0.05 N/C

G DEP POTHOLE 0.6 X 0.4 X 0.1 CHANGE 2015-2016

H EROSION 3 X 0.15 X 0.05 N/C

I EROSION 10 X 0.3/04 X 0.1 NEW 2016

J EROSION 12 X 0.3 X 0.05/0.1 NEW 2016

K EROSION 10 X 0.2 X 0.05 NEW 2016

SOUTH LAND FILL - EAST 18/8

2016 INSP. CONCERNS

FEATURE

A DEP 6 X 0.2/0.3 X 0.1 N/C

B POTHOLE EROSION 0.6 X 0.15 X 0.05 INCREASED

B EROSION POTHOLE 12 X 0.15 X 0.05 INCREASE

D POTHOLE 0.3 X 0.15 X 0.07 NEW 2016

VEG AREA

27 PHOTOS

SOUTH BORROW 18/8

36 PHOTOS.

FEATURES

A 2 POTHOLE SETTLE 0.6/0.8 X 0.25/0.5 X 0.1 INC.

B STAINING 5 X 0.8 RUST N/C

C EROSION 4 X 0.2 X 0.1 INC WASHING OF FINES

D 2 POTHOLE SETTLE 0.6/0.8 X 0.45/0.6 X 0.1/0.15 N/C

E PONDED AREA 7/15 X 5 X UP TO 0.6m SMALLER THAN 2015

F POTHOLE SETTLE 0.3 X 0.3 X 0.07 N/C

G LIN DEP SETTLE 1.2 X 0.3 X 0.05 NEW 2016

H POTHOLE SETTLE 0.3 X 0.3 X 0.1 NEW 2016

I STAINING 3 X 0.5/1 RUST NEW 2016

Rite in the Rain.

DON'T FORGET ADDITIONAL WORK

- HAZ WASTE STORAGE AREA
- BEACH AREA
- FIX VT-2.

→ ALL DONE 17/8/2018 ONLY
SIGN @ HAZ WASTE TO BE REMOVED

17 Aug

ARRIVED 9:50 AM ON SITE
RAINY O/C VERY BREEZY
HIGH WINDS IN PM TEMP ↓ UNTIL SUN
FELIX, DEDRIK & JEFF FLOOR ~3PM
COMMUNITY. PRESTON ON SITE ~3PM
PILOT CHUCK, ALEX.

TIER II GEOT. INSP.
EXTRA WORK @ BEACH & HAZ
WASTE STORAGE AREA DONE
COVER (CAP) MAT'L ~~SAMPLES~~ JAKOB
OFF SITE @ 7:15 PM

ARRIVE @ KUG @ 7:45 PM

18 Aug 2018 MOVE TO 17/8/2018

- RESHOOT WELLS @ TIER 2
- SHOOT TOE'S TOP OF TIER 2
- SHOOT CONTROL POINT @ TIER 2

WEATHER
KUG O/C SUNNY PERIODS 4°C @ 7AM
LIGHT TO MOD WINDS
FORECAST 5°C O/C 20-30% POP.
WINDS 40 Km/hr GUSTS TO 50.

JEFF, DITRICK & PRESTON ON BOARD
TO SITE @ 8:30 AM
ARRIVE ON SITE @ 9 AM.

N/H LANDFILL
- EAST HAS MORE EROSION LINES (LIN + EVIDENCE OF RATHOLING OR BOULDERS SHOOED)
- TOP SIDE PARALLEL TO EAST SIDE LONGEVITY THAN PREVIOUS

FEATURE L.I.N. EROSION
FEATURE T1 1.5m X 0.3/0.5 X 0.05/0.15

Rite in the Rain.

SOUTH FACE OF N/H LF

- DOZER TRACK ACROSS THE SLOPE RATHER THAN UP + DOWN
- FEW EROSION OR DEPRESSION FEATURES
- GRASS LIKE VEG ESTABLISHED ON 30-40% OF SLOPE BUT RATHER SPARSE

- WEST FACE OF N/H LF
  - DOZER TRACKS ACROSS FACE
  - NO VEG
  - NO CONCERNS

- NORTH FACE
  - (COARSER AGGREGATE USED)

TOP OF LF IN GOOD CONDITION LITTLE TO NO WATER DAMAGE EVIDENT
NO STAINING
NO SEEPS.

FEATURE B-5 NOT FOUND.

CS-2 after PHOTO 52

@ 1.45 PM SOUTHWARD WALK-EAST SIDE ON TRIANGLE

FEATURE A N/C
B LONGER? MAYBE
C NEW RATHOLE NEAR (i.e FEATURE E)
D N/C RATHOLE.

GENERAL GRADING WAS NOT SMOOTH. SURFACE IS A MIX OF COBBLE + GRAVEL SOME SAND + BOULDER DOZER BLADE LINES EVIDENT.

NO STAINING OR SEEPAGE
NO BORROWING ANIMAL
VERY SPARSE GRASSES

PHOTO 14 & 15 ACTUALLY NEW RATHOLE NOW FEATURE F
PROPER PHOTO FOR C IS AT END OF SOUTH LANDFILL PHOTO 30 & 31
COORD FOR F+C SHOULD BE SWAPPED

Rite in the Rain.

FEATURE E 1.8 m x 0.2/0.4 x 0.05-0.2
F 0.3 x 0.3 x 0.05/0.1

SOUTH BARLOW LANDFILL

ABANDONED CAMP ON GPS
TRIMBLE.

PHOTO 5 FEATURE I NO RUST EVIDENT
PHOTO 11 of A-Z NOT FOUND
12 " " "
MAY BE VERY MINOR DEP

FEATURE H 0.4 X 0.3 X 0.1

NORTH POND 23 cm OF WATER
SOUTH POND 5-7 cm OF WATER
NEAR SHORE
>15 cm OFF SHORE

COMPLETED SOUTH BARLOW
SURVEY @ 5:00 PM

WEATHER: SUNNY PERIODS 4°C
WINDS > 50 km/h
GUSTS > 70 km/h
WINDS OUT OF N/NW

LANDED IN KUG ~ 7 PM

19 AUG 2018
WEATHER CLEAR 5°C CALM
WIND OUT OF WNW
UNLIMITED CEILING INKU.
INCIT PRESTON, FELIX & JEFF
ACI RYAN F, RYAN J & CHARLES G.

WHEELS UP 8:15 AM
* NEED TO SURVEY TIGER II LF
DONE @ 6:30 PM
WEATHER ON SITE @ 8:50 AM
O/C LOW CEILING

Rite in the Rain...

AIRSTRIP SOUTH/LANDFILL
@ 9:15 - 10:30 AM
PALLET LINE WEST LANDFILL
@ 10:45 AM
FEATURE B 2.0 X 0.1/0.15 X 0.03/0.05
(CHANGE)
FEATURE A 1.3 X 0.2 X 0.1/.2
CHANGE
FEATURE D 0.4 X 0.4 X 0.05
N/C VEG IN DEP

FEATURE C1 0.8 X 0.7 X 0.05/0.07
FEATURES C2/C3
↳ DOZER TRACK MARKS
1 X 0.6 X 0.05

STATION WEST LANDFILL
1-2 PM
FEATURES ARE RELATED TO
CONSTRUCTION VEHICLES NOT
ATVs

USAF 2 PM - 2:55 PM
FEATURE A 0.6 X 0.4 X 0.2/0.3
RAT HOLE
FEATURE B LARGER
2.5 +/-
1.1 (-0.05 TO -0.115) 0.3/0.4
0.7
0.4
NO NEW FEATURES
GRADING OF COBBLE IS NOT
SMOOTH AND EVIDENCE OF
DOZER TRACKS AT SURFACE

@ AIRSTRIP LFC @ 3:30 PM

FEATURE B 2.7 X 1.0 X 0.1-0.3
FEATURE E 2 X 0.5 X 0 N/C
ORIENTATION CHANGE
90° IN FIG
FEATURE F MINOR 9 X 0.1 X 0.05-0.02
N/C CONFIRM SURVEY
PHOTO 35 IS OF DEBRIS A/
PHOTO 35 TAKEN BEFORE PHOTO 34
PHOTO 34 IS OF DEBRIS D1

Rito in the l...

PHOTO 36 IS FEATURE D2
FEATURE C 3"-X 0.1 X 0.1

19 AUG 2018
WEATHER @ 6 PM
5°C LIGHT - MOD WIND
OUT OF WNW SUNNY W
CLOUDY PERIODS

WHEELS UP FOR KWG
@ 8:10 PM
ARRIVAL IN KWG 8:45 PM

RETAINING WORK FOR

- SOIL SAMPLES STATION WEST, USAF & AIRSTRIP
- THERMISTOR READINGS

BEACH AREA REDONE @
7 PM ON 19/8/2018

20 AUG 2018
@ KWG AIRPORT 6:50 AM
WHEELS UP 7:10 AM
ONLY RYAN F., RYAN J ORG
PILOTS CHARLES & ALEX
SUMMIT AIR

WEATHER O/C 5°C CALM
WIND OUT OF WNW
ARRIVED ON SITE @ 7:45 AM

COMPLETED STATION WEST
@ 9:00 AM
COMPLETE USAF
@ 9:35 AM
COMPLETE AIRSTRIP LF
@ 11:30 AM

TILT II THERMISTORS
DONE @ 11:10 AM

SNOW SHOWERS ~ 10 AM
RAIN EASED OFF ~ 10:30 AM

WHEELS UP @ NOON
INYK @ 1:50 PM

Rite in the Rain.

Kitik 16 - 2018 - PIN-2 Soil Sampling Logs

Site Name: PIN-2

Landfill Name: USAF Landfill

Date & Time of Sampling Event: Aug 20/18

Weather: Rain, Windy, 8°C

Name of Sampling Staff: Ryan Fletcher

Sampling equipment and decontamination methods: Stainless Steel Shovel and Alconox with Distillied Water Wash

Soil Sampling Location ID	UTM Coordinates			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...*
	North (m)	East (m)			
P2-1	7646958.9	502197.6	A	0-15	Black peat, organic, roots, no odour
			B	40-50	Gravel, some silt, no odour
P2-2	7646923.4	502248.7	A	0-15	Brown gravel, some sand, no odour
			B	~~30~~-40	Some Refusal on bedrock
P2-3	7646867.2	502251.9	A	0-15	Gravel, sand, brown/grey, no odour ~~some~~
			B	40-50	Same some silt.
P2-4	7646896.5	502197.3	A	0-15	Brown gravel, some sand, trace silt, no odour
			B	15-20	Same

Kitik 16 - 2018 - PIN-2 Soil Sampling Logs

Site Name: PIN-2

Landfill Name: Station West Landfill

Date & Time of Sampling Event: Aug 20/18

Weather: Rain, Windy 8°C

Name of Sampling Staff: Ryan Fletcher

Sampling equipment and decontamination methods: Stainless Steel Shovel and Alconox with Distillied Water Wash

Soil Sampling Location ID	UTM Coordinates			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...*	
	North (m)	East (m)				
P2-5	7646879.8	502095.4	A	0-15	Brown gravel, fine sand, no odour	900
			B	15~25	Same Refusal on bedrock	
P2-6	7646789.2	502096.1	A	0-15	Brown to black organics, roots, no odour	915
			B	40-50	Brown sand + gravel, no odour	
P2-7	7646762.2	502149.3	A	0-15	Dark brown sand + gravel, organics, no odour	930
			B	40-50	Brown/grey gravel, some sand, no odour	
P2-8	7646799.9	502200.8	A	0-15	Brown black peat, sand + gravel, no odour	945
			B	40-50	Brown sand + gravel, no odo (Dup 6)	

Note: Dup 6 = P2-8B

Kitik 16 - 2018 - PIN-2 Soil Sampling Logs

Site Name: PIN-2

Landfill Name: Pallet Line West Landfill

Date & Time of Sampling Event: Aug 19/18

Weather: Cloudy, windy, 5°C

Name of Sampling Staff: Ryan Fletcher

Sampling equipment and decontamination methods: Stainless Steel Shovel and Alconox with Distillied Water Wash

Soil Sampling Location ID	UTM Coordinates		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...*	
	North (m)	East (m)			
P2-9	7645741.6	502570.5 A	0-15	Grey brown gravel, some sand, no odour	1800
		B	40-50	Same	
P2-10	7645790.2	502630.3 A	0-15	Dark Brown Peat, organic odour, roots (Dup 5)	1815
		B	30-40	Dark Brown broken bedrock, some sand + some silt, no odour Refusal on bedrock	
P2-11	7645843.2	502590 A	0-15	Dark Brown broken bedrock, some sand, organics, no odour	1830
		B	40-50	Same, no organics, Bedrock @ bottom	
P2-12	7645861.2	502537.2 A	0-15	Organic peaty w sand, Dark brown, organic odour	1900
		B	15-30	Same - Refusal on bedrock @ 30 cm	

Note: Dup5 = RWO P2-10A

Kitik 16 - 2018 - PIN-2 Soil Sampling Logs

Site Name: PIN-2

Landfill Name: Airstrip South Landfill

Date & Time of Sampling Event: Aug 19/18

Weather: Sun + cloud, windy, 5-7°C

Name of Sampling Staff: Ryan Fletcher

Sampling equipment and decontamination methods: Stainless Steel Shovel and Alconox with Distillied Water Wash

Soil Sampling Location ID	UTM Coordinates			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...*	
	North (m)	East (m)				
P2-13	7646266.2	503171.4	A	0-15	Brown gravelly, some sand (coarse), no odour, cobbles	1930
			B	40-50	Same	
P2-14	7646247.1	503238	A	0-15	Grey sand + gravel, no odour	2050
			B	40-50	Same	
P2-15	7646292.9	503248.6	A	0-15	Grey gravel, some sand, no odour	1900
			B	40-50	Same	
P2-16	7646337.3	503220.9	A	0-15	Broken grey bedrock, some sand, no odour, organics to 5cm	1915
			B	40-50	Same	

Kitik 16 - 2018 - PIN-2 Soil Sampling Logs

August 18/2018

Site Name: PIN-2

Landfill Name: South Landfill - East

Date & Time of Sampling Event: Aug 18/18

Weather: Windy (60-80 km/h), 5°, Cloudy

Name of Sampling Staff: Ryan Fletcher

Sampling equipment and decontamination methods: Stainless Steel Shovel and Alconox with Distillied Water Wash

Soil Sampling Location ID	UTM Coordinates		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...*
	North (m)	East (m)		
P2-17	7645060	503404.5	0-15	Dark brown gravelly sand. Orgganics 0-5cm. No odour
			40-50	Same no organics Dup3
~~P2-19~~ P2-18 RF	7645111	503473.2	0-15	light brown/beige broken bedrock, some silt, no odour
~~P2-18~~ No RF			No depth sample	Refusal @ 15 cm bedrock
~~P2-19~~ P2-19 RF	7645086.7	503533	0-15	light grey broken bedrock, sand, some silt, gravelly. No odour
~~P2-19~~			20-30	Same Refusal @ 30 cm bedrock
P2-20	7645058.1	503557.1	0-15	Dark brown/black organics, no odour
			40-50	Light brown gravelly sand, no odour

Aug 18/18

1330

1400

1430

1500

Note: Dup3 = P2-17B

Kitik 16 - 2018 - PIN-2 Soil Sampling Logs

Site Name: PIN-2

Landfill Name: Airstrip Landfill

Date & Time of Sampling Event: Aug 20/18

Weather: Rain, 9°C, windy

Name of Sampling Staff: Ryan Fletcher

Sampling equipment and decontamination methods: Stainless Steel Shovel and Alconox with Distillied Water Wash

Soil Sampling Location ID	UTM Coordinates		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...*
	North (m)	East (m)		
P2-21 Dup B	7647259.4	502522.7	A 0-0.1	GREY DRY COBBLE/GRAVEL SOME TO TRACE SAND NO CONTAMINATION 1100
			B 0.4-0.5	GREY DRY COBBLE/GRAVEL SOME TO TRACE SAND NO CONTAMINATION
P2-22	7647374.4	502534.4	A 0-0.1	BROWN GREY DAMP COARSE TO MED SAND SOME GRAVEL +FINE TRACE COBBLE 1115
			B 0.5-0.6	BROWN GREY DAMP COARSE TO MED SAND SOME FINE + GRAVEL TRACE COBBLE
P2-23	7647376.1	502589	A 0-0.15	GREY GRAVEL/COBBLE NO FINES, DRY, TRACE COARSE SAND
			B 0.4-0.5	GREY GRAVEL/COBBLE NO FINES, DRY TRACE COARSE SAND 1130
P2-24	7647401.3	502630.7	A 0-0.15	GREY GRAVEL/COBBLE NO FINES DRY TRACE COARSE SAND
			B 0.4-0.5	GREY GRAVEL/COBBLE NO FINES DRY TRACE COARSE SAND 1145
P2-25	7647373.2	502649	A 0-0.15	GREY/BROWN GRAVEL/COBBLE/COARSE SAND NO FINES DRY TRACE ~~MEDIUM COARSE~~ SAND
			B 0.4-0.55	GREY/BROWN GRAVEL/COBBLE/COARSE SAND NO FINES DRY TRACE ~~COARSE~~ SAND 1240
P2-26	7647317.2	502639.7	A 0.1-0.15	GREY/BROWN GRAVEL COBBLE NO FINES DRY TRACE COARSE SAND
			B 0.4-0.5	GREY/BROWN GRAVEL COBBLE NO FINES DRY TRACE COARSE SAND 1215

Note: Dup B = P2-21B

August 18/2018

Kitik 16 - 2018 - PIN-2 Soil Sampling Logs

Site Name: PIN-2

Landfill Name: South Borrow Landfill

Date & Time of Sampling Event: Aug 18/18

Weather: Windy (40-50 km/hr), cloudy, 5°C

Name of Sampling Staff: Ryan Fletcher

Sampling equipment and decontamination methods: Stainless Steel Shovel and Alconox with Distillied Water Wash

Soil Sampling Location ID	UTM Coordinates		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...*	
	North (m)	East (m)			
P2-27 A	7643445	503881.5	0-15	Dark Brown peat, organic odour Saturated	1530
P2-27 B			40-50	Dark grey silty sand	
P2-28 A	7643474.1	503877.4	0-15	Black peat. Organic odour, Saturated	1410
P2-28 B			40-50	Same	
P2-29 A	7643506.8	503910.6	0-15	Same as P2-28	1430
P2-29 B			40-50	"	
P2-30 A	7643476.5	504053.7	0-15	Dark brown gravel, cobbles, sandy, no odour	1500
P2-30 B			40-50	Same. Dup 4	

Note: Dup 4 = P2-30B

Kitik 16 - 2018 - PIN-2 Soil Sampling Logs

Site Name: PIN-2 August 17/2018

Landfill Name: Tier II Disposal Facility

Date & Time of Sampling Event: Aug 17/18

Weather: 9° , windy , light rain

Name of Sampling Staff: Ryan Fletcher

Sampling equipment and decontamination methods: Stainless Steel Shovel and Alconox with Distillied Water Wash

Soil Sampling Location ID	UTM Coordinates		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...*	
	North (m)	East (m)			
MW-01	7646319.6	502402.9	0-15 cm	~~light~~ Dark brown, gravel, silt, some sand, no odour, organics (Dup 1)	1830
			40-50 cm	Dark brown, gravel, silty, some sand, organic, no odour	
MW-02	7646239.7	502421.9	0-15 cm	Dark brown, gravel, silty sand, organics, no odour	1800
			40-50 cm	Light to dark brown gravel, silt, some sand, no odour	
MW-03	7646236.8	502497.9	0-15 cm	Dark Brown, gravel, silt, some sand, some organics, no odour	1730
			40-50 cm	Light Brown, gravel, silty, some sand, no odour	
MW-04	7646319.8	502549.3	0-15 cm	light brown, gravel, silty, some sand, no odour	1750
			40-50 cm	same	

Note: Dup 1 = MW01A

Kitik 16 - 2018 - PIN-2 Soil Sampling Logs

August 18/2018

Site Name: PIN-2

Landfill Name: Non-Hazardous Waste Landfill

Date & Time of Sampling Event:

Weather: windy (50-70 km/h), 5°C, cloudy

Name of Sampling Staff: Ryan Fletcher

Sampling equipment and decontamination methods: Stainless Steel Shovel and Alconox with Distillied Water Wash

Soil Sampling Location ID	UTM Coordinates		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...*	
	North (m)	East (m)			
MW-05	7645229.3	503029.4	0-15cm	Grey Gravel + sand, trace silt, no odour	
			40-50cm	Same	13:00
MW-06	7645297	503054.2	0-15cm	Light brown to beige gravel + sand, some silt. No odour	
			40-50cm	Same orangy more sand (Dup2)	12:30
MW-07	7645272	503102	0-15cm	Dark brown gravel, boulders, some silty sand, no odour	
			40-50cm	Same	12:00
MW-08	7645223	503076.6	0-15cm	Grey gravel, trace sand, no odour	
			40-50cm	Same	13:30

Note: Dup2 = MW-06B

VT1

ANNEX M: Thermistor Inspection Template

Inspector Name: Ryan Fletcher	Inspection Date: Aug 17/16
Inspector Signature:	*Previous Inspection Date:

Thermistor Information

*Site Name: PIN-2	*Landfill: Tier II
*Thermistor #: VT-1	Inclination: ☐ Vertical ☐ Inclined
*Northing: 7646281.0	*Easting: 502434.2
*Installation Date:	*Year 1 Monitoring Date: Aug 1/2009
Datalogger Model #: RX-16 Revision J-C	Datalogger Cable Model: ☐ USB ☒ Serial Port
Datalogger Serial #: 07040010	Datalogger Cable Too Short?: ☐ Y ☒ N
*Elevation (masl): 191	Extension Cable Required (m): ☒ N/A

Thermistor Inspection

	Good	Needs Maintenance	Details
Casing Integrity	☒	☐	
Cover/Lid Integrity	☒	☐	
Datalogger Functionality	☒	☐	
Cable Functionality	☒	☐	
Bead Functionality	☐	☒	String 4, 6, 7, 11 appear to be malfunctioning

Lock

	Yes	No	N/A	Details
Was casing found locked upon arrival?	☒	☐		
Was a poorly functioning lock removed?	☒	☐		
Was a new 7000PS-KA3 lock put in place?	☒	☐	☐	If no, model:

Batteries

		Yes	No	N/A	Details
Batteries Found In Datalogger	Was datalogger functional upon arrival?	☒	☐		
	Battery models:				Main: UCB-15 Auxiliary: UCB-1
	Battery installation date:				
	Battery levels:				Main: 11.34 Auxiliary: 13.50
	Memory battery best before date:	expiry 06/2021			(Refer to yellow label above COM plug)
Battery Replacement	Were batteries replaced?	☐	☒		If yes, models:
	New battery levels:			☒	Main: Auxiliary:
	Was desiccant replaced?	☒	☐		
Final Status	Expected life of batteries in datalogger:				Years: ~~06~~ RE 3 Replace by: 2021
	Was datalogger functional upon departure?	☒	☐		If no, brought south for repairs? ☐ Y ☐ N

Computer Connectivity

	Yes	No
Does red status light on black internal data logger glow bright red when laptop attached?	☐	☐

Manual Ground Temperature Readings

Bead	ohms	°C
1	13,807	
2	13,666	
3	14,823	
4	2,269	
5	16,661	
6	387.2	
7	2,403	
8	2,510	

Bead	ohms	°C
9	10,359	
10	~~29~~ 19,757	
11	654.3	
12	21.75	
13	22.06	
14	22.35	
15	209.9	
16	23,22	

Datalogger Programming and Maintenance

Data collection frequency: 1200 hr
Data collection time: 00 + 1200
Maintenance requirements:

Some re-programming required (Photos taken of screen)

*Pre-populate this information before field program using previous reports

VT2

ANNEX M: Thermistor Inspection Template

Inspector Name:	Ryan Fletcher	Inspection Date:	Aug 17/18
Inspector Signature:		*Previous Inspection Date:	

Thermistor Information

*Site Name:	PIN-2	*Landfill:	
*Thermistor #:	VT2	Inclination: ☒ Vertical	☐ Inclined
*Northing:	7646274.2	*Easting:	502465.0
*Installation Date:		*Year 1 Monitoring Date:	Aug 1 / 2009
Datalogger Model #:	RX-16 Revision J-C	Datalogger Cable Model: ☐ USB	☒ Serial Port
Datalogger Serial #:	07050024	Datalogger Cable Too Short?: ☐ Y	☒ N
*Elevation (masl):	19.2	Extension Cable Required (m):	☒ N/A

Thermistor Inspection

	Good	Needs Maintenance	Details
Casing Integrity	☒	☐	
Cover/Lid Integrity	☒	☐	Replaced in new cap
Datalogger Functionality	☒	☐	
Cable Functionality	☒	☐	
Bead Functionality	☐	☐	

Lock

	Yes	No	N/A	Details
Was casing found locked upon arrival?	☒	☐		
Was a poorly functioning lock removed?	☒	☐		
Was a new 7000PS-KA3 lock put in place?	☒	☐	☐	If no, model:

Batteries

		Yes	No	N/A	Details
Batteries Found In Datalogger	Was datalogger functional upon arrival?	☒	☐		
	Battery models:				Main: VLB-15 Auxiliary: VLB-1
	Battery installation date:				
	Battery levels:				Main: 11.34v Auxiliary: 13.99
	Memory battery best before date:	expires 06/2021			(Refer to yellow label above COM plug)
Battery Replacement	Were batteries replaced?	☐	☐		If yes, models:
	New battery levels:			☐	Main: Auxiliary:
	Was desiccant replaced?	☐	☐		
Final Status	Expected life of batteries in datalogger:				Years: 3 Replace by: 06 / 2021
	Was datalogger functional upon departure?	☒	☐		If no, brought south for repairs? ☐ Y ☐ N

Computer Connectivity

	Yes	No
Does red status light on black internal data logger glow bright red when laptop attached?	☒	☐

Manual Ground Temperature Readings

Bead	ohms	°C
1	14.226	
2	14.201	
3	13.576	
4	14.953	
5	16.295	
6	16.539	
7	17.371	
8	18.171	

Bead	ohms	°C
9	19.243	
10	.OL	
11	.OL	
12	.OL	
13	.OL	
14	.OL	
15	.OL	
16	.OL	

Datalogger Programming and Maintenance

Data collection frequency: 1200

Data collection time: 00 + 1200

Maintenance requirements:

*Pre-populate this information before field program using previous reports

VT3

ANNEX M: Thermistor Inspection Template

Inspector Name:	Ryan Fletcher	Inspection Date:	Aug 17/18
Inspector Signature:		*Previous Inspection Date:	

Thermistor Information

*Site Name:	PIN-2	*Landfill:	Tier II
*Thermistor #:	VT-3	Inclination:	☒ Vertical ☐ Inclined
*Northing:	7646207.5	*Easting:	502460.5
*Installation Date:		*Year 1 Monitoring Date:	Aug 1/2009
Datalogger Model #:	RX-16 Revision J-C	Datalogger Cable Model:	☐ USB ☒ Serial Port
Datalogger Serial #:	07050029	Datalogger Cable Too Short?:	☐ Y ☒ N
*Elevation (masl):	20.0	Extension Cable Required (m):	☒ N/A

Thermistor Inspection	Good	Needs Maintenance	Details
Casing Integrity	☑	☐	
Cover/Lid Integrity	☑	☐	
Datalogger Functionality	☑	☐	
Cable Functionality	☑	☐	
Bead Functionality	☑	☐	

Lock	Yes	No	N/A	Details
Was casing found locked upon arrival?	☑	☐		
Was a poorly functioning lock removed?	☑	☐		Replaced
Was a new 7000PS-KA3 lock put in place?	☑	☐	☐	If no, model:

Batteries		Yes	No	N/A	Details
Batteries Found in Datalogger	Was datalogger functional upon arrival?	☒	☐		
	Battery models:				Main: ULB-15 Auxiliary: ULB-1
	Battery installation date:	expires	06/2021		
	Battery levels:				Main: 11.34V Auxiliary: 13.38V
	Memory battery best before date:	N/A			80% Full (Refer to yellow label above COM plug)
Battery Replacement	Were batteries replaced?	☐	☒		If yes, models:
	New battery levels:			☒	Main: Auxiliary:
	Was desiccant replaced?	☒	☐		
Final Status	Expected life of batteries in datalogger:				Years: Replace by: 2021
	Was datalogger functional upon departure?	☒	☐		If no, brought south for repairs? ☐ Y ☐ N

Computer Connectivity	Yes	No
Does red status light on black internal data logger glow bright red when laptop attached?	☒	☐

Manual Ground Temperature Readings

Bead	ohms	°C
1	12.796	
2	14.067	
3	15.424	
4	16.495	
5	17.238	
6	17.844	
7	18.795	
8	20.14	

Bead	ohms	°C
9	21.46	
10	22.29	
11	23.07	
12	23.26	
13	.OL	
14	.OL	
15	.OL	
16	.OL	

Datalogger Programming and Maintenance

Data collection frequency: 12 hr
Data collection time: 00 + 12
Maintenance requirements: None

*Pre-populate this information before field program using previous reports

VT4

ANNEX M: Thermistor Inspection Template

Inspector Name:	Ryan Fletcher	Inspection Date:	Aug 17/18
Inspector Signature:		*Previous Inspection Date:	

Thermistor Information

*Site Name:	PIN-2	*Landfill:	Tier II
*Thermistor #:	VT-4	Inclination:	☒ Vertical ☐ Inclined
*Northing:	7646284.2	*Easting:	502497.4
*Installation Date:		*Year 1 Monitoring Date:	
Datalogger Model #:	RX-16 Revision J-C	Datalogger Cable Model:	☐ USB ☒ Serial Port
Datalogger Serial #:	07010044	Datalogger Cable Too Short?:	☐ Y ☒ N
*Elevation (masl):	19.9	Extension Cable Required (m):	☒ N/A

Thermistor Inspection

	Good	Needs Maintenance	Details
Casing Integrity	☒	☐	
Cover/Lid Integrity	☒	☐	
Datalogger Functionality	☒	☐	
Cable Functionality	☒	☐	
Bead Functionality	☐	☒	String 9 not working correctly String 1 " " "

Lock

	Yes	No	N/A	Details
Was casing found locked upon arrival?	☒	☐		
Was a poorly functioning lock removed?	☒	☐		
Was a new 7000PS-KA3 lock put in place?	☒	☐	☐	If no, model:

Batteries

		Yes	No	N/A	Details
Batteries Found In Datalogger	Was datalogger functional upon arrival?	☒	☐		
	Battery models:				Main: 11.34v Auxiliary: 13.6v
	Battery installation date:	Expire	06/2021		
	Battery levels:				Main: ULB-15 Auxiliary: ULB-1
	Memory battery best before date:				(Refer to yellow label above COM plug)
Battery Replacement	Were batteries replaced?	☐	☒		If yes, models:
	New battery levels:			☒	Main: Auxiliary:
	Was desiccant replaced?	☒	☐		
Final Status	Expected life of batteries in datalogger:		RF ~~ASA~~		Years: 3 Replace by: 2021
	Was datalogger functional upon departure?	☒	☐		If no, brought south for repairs? ☐ Y ☐ N

Computer Connectivity

	Yes	No
Does red status light on black internal data logger glow bright red when laptop attached?	☒	☐

Manual Ground Temperature Readings

Bead	ohms	°C
1	13.826	
2	14.957	
3	14.970	
4	16.269	
5	16.945	
6	17.828	
7	18.577	
8	19.850	

Bead	ohms	°C
9	20.56	
10	20.97	
11	21.12	
12	21.91	
13	22.03	
14	22.17	
15	22.60	
16	22.84	

Datalogger Programming and Maintenance

Data collection frequency: 1200 hr
Data collection time: 00 + 1200
Maintenance requirements:

*Pre-populate this information before field program using previous reports

PIN-2: Monitoring Well Sampling Log

Site Name: PIN-2 Landfill Name: Tier II Disposal Facility

Date: Aug 19/16 Time: 1130

Weather: Av.

Monitoring Well ID: MW-1 UTM Coordinates: 7646319.6N 502402.9E

Sample #: MW-1 Duplicate #: N/A

Bottles Filled (by Parameter Type): ☒ PHC F1 ☒ Metals ☒ PHC F2-F4

Preservatives Used for PHC Fraction(s): ☐ Methanol ☒ Sodium Bisulfate ☐ Other: _____ ☐ None

Name(s) of Sampler(s): Ryan Fletcher

Ponded Water, Snow Depth, etc.: None

Well Condition/Repair Requirements: Good

Lock Make/Model/Condition/Replaced: Replaced (G. Hjukstrom Limited, 7000PS-KA3, 40mm)

Pre-Measured Data (From Well Log)

Depth of Well (mbgs): _____ Diameter (cm): 4 (Pipe Diameter)

Depth to Top of Screen (mbgs): 0.4 Screen Length (m): 3

Field Measurements

Measurement Method: ☑ Interface Probe ☐ Water Level Tape ☐ Other _____

Well Stickup (Ground to Top of Pipe) (m): ~ 0.56m

Depth to Water (From Top of Pipe) (m): 2.035

Calculated Static Water Level (mbgs): 1.475

Well Refusal Depth (m): 2.270 (Measure Refusal After Sampling)

Thickness of Water Column (m): 0.235 Water Volume (L): 0.71 L (Calculated)

Free Product Thickness (mm): None Sludge/Silt: ☐ Y ☒ N

Purging Information Summary

Purging/Sampling Equipment/Technique: Low Flow Peristalltic Pump

Water Quality Parameter Equipment: Horiba U-52 Calibration Details: Factory

Maintained Purge Rate at ≤ 100 mL/min: ☑ Y ☐ N Purge Rate: ☒ < Recharge Rate ☐ > Recharge Rate

Total Volume Purged (L): 2.50L (Total Volume Over Multiple Events, if Applicable)

Time (Note Dates if Multiple Days Required)	pH	Conductivity (uS/cm)	Turbidity (NTU)	Temperature (°C)
5 mins	7.77	0.458	15.1	2.16
10 mins	7.75	0.457	7.1	1.95
15 mins	7.67	0.441	4.4	1.87
20 mins	7.66	0.438	1.4	1.67
25 mins	2.68	0.436	0.9	1.66
	Sampled			
Final Time: Final Values:				

Clear? ☒ Y ☐ N Colour: clear

PHC Sheen? ☐ Y ☒ N PHC Odour? ☐ Y ☒ N

Free Product/PHC Globules? ☐ Y ☒ N Other Odour? N/A No

Decontamination of Sampling Equipment

All Equipment Dedicated/Single Use? ☑ Y ☐ N Decon Required? ☐ Y ☑ N

Type of Decontamination Fluid(s): N/A # Washes/Rinses: N/A

Photographic Records

Photo Numbers/IDs: _____

Close Up/Wide Angle/Panoramic: _____ Direction: _____

Scale Indicated? ☐ Y ☐ N Line of Sight: _____

PIN-2: Monitoring Well Sampling Log

Site Name: PIN-2 Landfill Name: Tier II Disposal Facility

Date: Aug 19 Time: 11:00

Weather: windy, clouds, 4°C

Monitoring Well ID: MW-2 UTM Coordinates: 7646239.7N 502421.9E

Sample #: MW-2 Duplicate #: N/A

Bottles Filled (by Parameter Type): ☒ PHC F1 ☒ Metals ☒ PHC F2-F4

Preservatives Used for PHC Fraction(s): ☐ Methanol ☒ Sodium Bisulfate ☐ Other: _____ ☐ None

Name(s) of Sampler(s): Ryan Fletcher

Ponded Water, Snow Depth, etc.: None

Well Condition/Repair Requirements: Good condition

Lock Make/Model/Condition/Replaced: Replaced (G. Hjukstrom Limited, 7000PS-KA3, 40mm)

Pre-Measured Data (From Well Log)

Depth of Well (mbgs): _____ Diameter (cm): 4 (Pipe Diameter)

Depth to Top of Screen (mbgs): 0.4 Screen Length (m): 3

Field Measurements

Measurement Method: ☑ Interface Probe ☐ Water Level Tape ☐ Other _____

Well Stickup (Ground to Top of Pipe) (m): ~0.54

Depth to Water (From Top of Pipe) (m): 1.380

Calculated Static Water Level (mbgs): 0.84

Well Refusal Depth (m): 2.989 (Measure Refusal After Sampling)

Thickness of Water Column (m): 1.609 Water Volume (L): 4.83 (Calculated)

Free Product Thickness (mm): None Sludge/Silt: ☐ Y ☒ N

Purging Information Summary

Purging/Sampling Equipment/Technique: Low Flow Peristalltic Pump

Water Quality Parameter Equipment: Horiba U-52 Calibration Details: Factory

Maintained Purge Rate at ≤ 100 mL/min: ☑ Y ☐ N Purge Rate: ☒ < Recharge Rate ☐ > Recharge Rate

Total Volume Purged (L): 2.85 L (Total Volume Over Multiple Events, if Applicable)

Time (Note Dates if Multiple Days Required)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Temperature (°C)
5 mins	7.30	0.810	4.9	2.13
10 mins	7.10	0.789	5.3	2.10
15 mins	7.12	0.753	2.2	2.08
20 mins	7.13	0.736	1.4	2.15
25 mins	7.21	0.727	0.3	2.14
30 mins	7.23	0.726	0.0	2.21
	Sample			
Final Time: Final Values:				

Clear? ☒ Y ☐ N Colour: clear

PHC Sheen? ☐ Y ☒ N PHC Odour? ☐ Y ☒ N

Free Product/PHC Globules? ☐ Y ☒ N Other Odour? None

Decontamination of Sampling Equipment

All Equipment Dedicated/Single Use? ☑ Y ☐ N Decon Required? ☐ Y ☑ N

Type of Decontamination Fluid(s): N/A # Washes/Rinses: N/A

Photographic Records

Photo Numbers/IDs: _____

Close Up/Wide Angle/Panoramic: _____ Direction: _____

Scale Indicated? ☐ Y ☐ N Line of Sight: _____

Dup 1

PIN-2: Monitoring Well Sampling Log

Site Name: PIN-2 Landfill Name: Tier II Disposal Facility

Date: Aug 19/18 Time: 0900

Weather: Cloudy / windy / 4°C

Monitoring Well ID: MW-3 UTM Coordinates: 7646236.8N 502497.9E

Sample #: MW-3 Duplicate #: Dup 2

Bottles Filled (by Parameter Type): ☑ PHC F1 ☑ Metals ☑ PHC F2-F4

Preservatives Used for PHC Fraction(s): ☐ Methanol ☑ Sodium Bisulfate ☐ Other: _____ ☐ None

Name(s) of Sampler(s): Ryan Fletcher

Ponded Water, Snow Depth, etc.: N/A

Well Condition/Repair Requirements: None required

Lock Make/Model/Condition/Replaced: Replaced (G. Hjukstrom Limited, 7000PS-KA3, 40mm)

Pre-Measured Data (From Well Log)

Depth of Well (mbgs): _____ Diameter (cm): 4 (Pipe Diameter)

Depth to Top of Screen (mbgs): 0.4 Screen Length (m): 3

Field Measurements

Measurement Method: ☑ Interface Probe ☐ Water Level Tape ☐ Other _____

Well Stickup (Ground to Top of Pipe) (m): 0.620 m

Depth to Water (From Top of Pipe) (m): 1.991

Calculated Static Water Level (mbgs): 1.371

Well Refusal Depth (m): 2.620 (Measure Refusal After Sampling)

Thickness of Water Column (m): 0.629 Water Volume (L): 2.07 L (Calculated)

Free Product Thickness (mm): None Sludge/Silt: ☐ Y ☑ N

Purging Information Summary

Purging/Sampling Equipment/Technique: Low Flow Peristalltic Pump

Water Quality Parameter Equipment: Horiba Calibration Details: Factory

Maintained Purge Rate at ≤ 100 mL/min: ☑ Y ☐ N Purge Rate: ☑ < Recharge Rate ☐ > Recharge Rate

Total Volume Purged (L): 43.1 L (Total Volume Over Multiple Events, if Applicable)

Time (Note Dates if Multiple Days Required)	pH	Conductivity (uS/cm)	Turbidity (NTU)	Temperature (°C)
5 mins	7.80	0.749	209	2.23
10 mins	6.92	0.773	115	1.59
15 mins	6.74	0.754	39.1	1.49
20 mins	7.86	0.750	42.2	1.40
	Sampled			
Final Time: Final Values:				

Clear? ☑ Y ☐ N Colour: clear

PHC Sheen? ☐ Y ☑ N PHC Odour? ☐ Y ☑ N

Free Product/PHC Globules? ☐ Y ☑ N Other Odour? No

Decontamination of Sampling Equipment

All Equipment Dedicated/Single Use? ☑ Y ☐ N Decon Required? ☐ Y ☑ N

Type of Decontamination Fluid(s): N/A # Washes/Rinses: N/A

Photographic Records

Photo Numbers/IDs: _____

Close Up/Wide Angle/Panoramic: _____ Direction: _____

Scale Indicated? ☐ Y ☐ N Line of Sight: _____

PIN-2: Monitoring Well Sampling Log

Site Name: PIN-2 Landfill Name: Tier II Disposal Facility

Date: Aug 19/16 Time: 1300

Weather: Cloudy, windy 5°C

Monitoring Well ID: MW-4 UTM Coordinates: 7646319.8N 502549.3E

Sample #: MW-4 Duplicate #:

Bottles Filled (by Parameter Type): ☐ PHC F1 ☒ Metals ☒ PHC F2-F4

Preservatives Used for PHC Fraction(s): ☐ Methanol ☑ Sodium Bisulfate ☐ Other: _____ ☐ None

Name(s) of Sampler(s): Ryan Fletcher

Ponded Water, Snow Depth, etc.: None

Well Condition/Repair Requirements: Good no repairs

Lock Make/Model/Condition/Replaced: Replaced (G. Hjukstrom Limited, 7000PS-KA3, 40mm)

Pre-Measured Data (From Well Log)

Depth of Well (mbgs): _____ Diameter (cm): 4 (Pipe Diameter)

Depth to Top of Screen (mbgs): 0.4 Screen Length (m): 3

Field Measurements

Measurement Method: ☑ Interface Probe ☐ Water Level Tape ☐ Other _____

Well Stickup (Ground to Top of Pipe) (m): ~ 0.55

Depth to Water (From Top of Pipe) (m): 1.558

Calculated Static Water Level (mbgs): 1.008

Well Refusal Depth (m): 2.890 (Measure Refusal After Sampling)

Thickness of Water Column (m): 1.332 Water Volume (L): 3.99 L (Calculated)

Free Product Thickness (mm): None Sludge/Silt: ☐ Y ☒ N

Purging Information Summary

Purging/Sampling Equipment/Technique: Low Flow Peristalltic Pump

Water Quality Parameter Equipment: Horiba U-52 Calibration Details: Factory

Maintained Purge Rate at ≤ 100 mL/min: ☑ Y ☐ N Purge Rate: ☒ < Recharge Rate ☐ > Recharge Rate

Total Volume Purged (L): 2.1 L (Total Volume Over Multiple Events, if Applicable)

Time (Note Dates if Multiple Days Required)	pH	Conductivity (uS/cm)	Turbidity (NTU)	Temperature (°C)
5 mins	7.75	0.694	6.3	3.92
10 mins	7.55	0.703	6.4	3.61
15 mins	7.45	0.704	5.7	3.46
20 mins	7.39	0.705	5.5	3.38
	Sampled			
Final Time: Final Values:				

Clear? ☒ Y ☐ N Colour: Clear

PHC Sheen? ☐ Y ☒ N PHC Odour? ☐ Y ☒ N

Free Product/PHC Globules? ☐ Y ☒ N Other Odour? None

Decontamination of Sampling Equipment

All Equipment Dedicated/Single Use? ☑ Y ☐ N Decon Required? ☐ Y ☑ N

Type of Decontamination Fluid(s): N/A # Washes/Rinses: N/A

Photographic Records

Photo Numbers/IDs: _____

Close Up/Wide Angle/Panoramic: _____ Direction: _____

Scale Indicated? ☐ Y ☐ N Line of Sight: _____

PIN-2: Monitoring Well Sampling Log

Site Name: PIN-2 Landfill Name: NHWL

Date: Aug 19/18 Time: 1530

Weather: Sunt cloud, windy, 7°C

Monitoring Well ID: MW-5 UTM Coordinates: 7645229.3N 503029.4E

Sample #: MW-5 Duplicate #: NO Field Blank here

Bottles Filled (by Parameter Type): ☑ PHC F1 ☑ Metals ☑ PHC F2-F4

Preservatives Used for PHC Fraction(s): ☐ Methanol ☑ Sodium Bisulfate ☐ Other: _____ ☐ None

Name(s) of Sampler(s): Ryan Fletcher

Ponded Water, Snow Depth, etc.: None

Well Condition/Repair Requirements: Good no repairs

Lock Make/Model/Condition/Replaced: Replaced (G. Hjukstrom Limited, 7000PS-KA3, 40mm)

Pre-Measured Data (From Well Log)

Depth of Well (mbgs): _____ Diameter (cm): 4 (Pipe Diameter)

Depth to Top of Screen (mbgs): 0.4 Screen Length (m): 3

Field Measurements

Measurement Method: ☑ Interface Probe ☐ Water Level Tape ☐ Other _____

Well Stickup (Ground to Top of Pipe) (m): ~ 0.154

Depth to Water (From Top of Pipe) (m): 1.867

Calculated Static Water Level (mbgs): 1.327

Well Refusal Depth (m): 2.998 (Measure Refusal After Sampling)

Thickness of Water Column (m): 1.131 Water Volume (L): 3.39 < (Calculated)

Free Product Thickness (mm): None Sludge/Silt: ☐ Y ☑ N

Purging Information Summary

Purging/Sampling Equipment/Technique: Low Flow Peristalltic Pump

Water Quality Parameter Equipment: Horiba U-52 Calibration Details: Factory

Maintained Purge Rate at ≤ 100 mL/min: ☑ Y ☐ N Purge Rate: ☑ < Recharge Rate ☐ > Recharge Rate

Total Volume Purged (L): 2.6L (Total Volume Over Multiple Events, if Applicable)

Time (Note Dates if Multiple Days Required)	pH	Conductivity (uS/cm)	Turbidity (NTU)	Temperature (°C)
5 mins	7.63	0.547	20.5	5.41
10 mins	7.89	0.433	5.3	5.20
15 mins	7.83	0.413	1.9	5.15
20 mins	7.70	0.405	0.9	5.11
25 mins	7.62	0.396	0.0	5.06
30 mins	7.60	0.394	0.1	5.03
	Sampled			
Final Time: Final Values:				

Clear? ☑ Y ☐ N Colour: clear

PHC Sheen? ☐ Y ☑ N PHC Odour? ☐ Y ☑ N

Free Product/PHC Globules? ☐ Y ☑ N Other Odour? No

Decontamination of Sampling Equipment

All Equipment Dedicated/Single Use? ☑ Y ☐ N Decon Required? ☐ Y ☑ N

Type of Decontamination Fluid(s): N/A # Washes/Rinses: N/A

Photographic Records

Photo Numbers/IDs: _____

Close Up/Wide Angle/Panoramic: _____ Direction: _____

Scale Indicated? ☐ Y ☐ N Line of Sight: _____

PIN-2: Monitoring Well Sampling Log

Site Name: PIN-2 Landfill Name: NHWL

Date: Aug 19/16 Time: 1430

Weather: windy, sun + cloud, 5°C

Monitoring Well ID: MW-6 UTM Coordinates: 7645297.0N 503054.2E

Sample #: MW-6 Duplicate #: NO

Bottles Filled (by Parameter Type): ☒ PHC F1 ☒ Metals ☒ PHC F2-F4

Preservatives Used for PHC Fraction(s): ☐ Methanol ☒ Sodium Bisulfate ☐ Other: _____ ☐ None

Name(s) of Sampler(s): Ryan Fletcher

Ponded Water, Snow Depth, etc.: None

Well Condition/Repair Requirements: Good no repairs

Lock Make/Model/Condition/Replaced: Replaced (G. Hjukstrom Limited, 7000PS-KA3, 40mm)

Pre-Measured Data (From Well Log)

Depth of Well (mbgs): _____ Diameter (cm): 4 (Pipe Diameter)

Depth to Top of Screen (mbgs): 0.4 Screen Length (m): 3

Field Measurements

Measurement Method: ☑ Interface Probe ☐ Water Level Tape ☐ Other _____

Well Stickup (Ground to Top of Pipe) (m): ~0.58

Depth to Water (From Top of Pipe) (m): 1.991

Calculated Static Water Level (mbgs): 1.411

Well Refusal Depth (m): 2.935 (Measure Refusal After Sampling)

Thickness of Water Column (m): 0.844 Water Volume (L): 2.5 L (Calculated)

Free Product Thickness (mm): None Sludge/Silt: ☐ Y ☒ N

Purging Information Summary

Purging/Sampling Equipment/Technique: Low Flow Peristalltic Pump

Water Quality Parameter Equipment: Horiba U-52 Calibration Details: Factory

Maintained Purge Rate at ≤ 100 mL/min: ☑ Y ☐ N Purge Rate: ☒ < Recharge Rate ☐ > Recharge Rate

Total Volume Purged (L): 3.5L (Total Volume Over Multiple Events, if Applicable)

Time (Note Dates if Multiple Days Required)	pH	Conductivity (uS/cm)	Turbidity (NTU)	Temperature (°C)
5 mins	8.80	0.489	36.3	3.77
10 mins	7.81	0.460	40.7	3.55
15 mins	7.84	0.418	30.9	3.45
20 mins	7.85	0.404	22.9	3.41
25 mins	7.88	0.402	16.6	3.43
30 mins	7.89	0.403	13.8	3.42
		Sampled		
Final Time: Final Values:				

Clear? ☒ Y ☐ N Colour: Clear

PHC Sheen? ☐ Y ☒ N PHC Odour? ☐ Y ☒ N

Free Product/PHC Globules? ☐ Y ☒ N Other Odour? No

Decontamination of Sampling Equipment

All Equipment Dedicated/Single Use? ☑ Y ☐ N Decon Required? ☐ Y ☑ N

Type of Decontamination Fluid(s): N/A # Washes/Rinses: N/A

Photographic Records

Photo Numbers/IDs: _____

Close Up/Wide Angle/Panoramic: _____ Direction: _____

Scale Indicated? ☐ Y ☐ N Line of Sight: _____

PIN-2: Monitoring Well Sampling Log

Site Name: PIN-2 Landfill Name: NHWL

Date: Aug 19/18 Time: 1400

Weather: Sun/cloud, 7°C, windy

Monitoring Well ID: MW-7 UTM Coordinates: 7645272.0N 503102.0E

Sample #: MW-7 Duplicate #: No

Bottles Filled (by Parameter Type): ☒ PHC F1 ☒ Metals ☒ PHC F2-F4

Preservatives Used for PHC Fraction(s): ☐ Methanol ☒ Sodium Bisulfate ☐ Other: _____ ☐ None

Name(s) of Sampler(s): Ryan Fletcher

Ponded Water, Snow Depth, etc.: None

Well Condition/Repair Requirements: Good no repairs

Lock Make/Model/Condition/Replaced: Replaced (G. Hjukstrom Limited, 7000PS-KA3, 40mm)

Pre-Measured Data (From Well Log)

Depth of Well (mbgs): _____ Diameter (cm): 4 (Pipe Diameter)

Depth to Top of Screen (mbgs): 0.4 Screen Length (m): 3

Field Measurements

Measurement Method: ☑ Interface Probe ☐ Water Level Tape ☐ Other _____

Well Stickup (Ground to Top of Pipe) (m): ~ 0.495

Depth to Water (From Top of Pipe) (m): 2.321

Calculated Static Water Level (mbgs): 1.826

Well Refusal Depth (m): 2.805 (Measure Refusal After Sampling)

Thickness of Water Column (m): 0.484 Water Volume (L): 1.45 L (Calculated)

Free Product Thickness (mm): N/A None Sludge/Silt: ☐ Y ☒ N

Purging Information Summary

Purging/Sampling Equipment/Technique: Low Flow Peristalltic Pump

Water Quality Parameter Equipment: Horiba U-52 Calibration Details: Factory

Maintained Purge Rate at ≤ 100 mL/min: ☑ Y ☐ N Purge Rate: ☒ < Recharge Rate ☐ > Recharge Rate

Total Volume Purged (L): 3.1 L (Total Volume Over Multiple Events, if Applicable)

Time (Note Dates if Multiple Days Required)	pH	Conductivity (uS/cm)	Turbidity (NTU)	Temperature (°C)
5 mins	7.81	0.433	3.2	3.53
10 mins	7.63	0.417	0.0	2.97
15 mins	7.66	0.398	0.0	2.80
20 mins	7.66	0.391	0.0	2.75
25 mins	7.66	0.389	0.0	2.68
		Sampled		
Final Time: Final Values:				

Clear? ☒ Y ☐ N Colour: Clear

PHC Sheen? ☐ Y ☒ N PHC Odour? ☐ Y ☒ N

Free Product/PHC Globules? ☐ Y ☒ N Other Odour? None

Decontamination of Sampling Equipment

All Equipment Dedicated/Single Use? ☑ Y ☐ N Decon Required? ☐ Y ☑ N

Type of Decontamination Fluid(s): N/A # Washes/Rinses: N/A

Photographic Records

Photo Numbers/IDs: _____

Close Up/Wide Angle/Panoramic: _____ Direction: _____

Scale Indicated? ☐ Y ☐ N Line of Sight: _____

PIN-2: Monitoring Well Sampling Log

Site Name: PIN-2 Landfill Name: NHWL

Date: Aug 19 Time: 1600

Weather: Cloudy, windy, 5-7°C

Monitoring Well ID: MW-8 UTM Coordinates: 7645223.0N 503076.6E

Sample #: N/A Duplicate #: No

Bottles Filled (by Parameter Type): ☐ PHC F1 ☐ Metals ☐ PHC F2-F4

Preservatives Used for PHC Fraction(s): ☐ Methanol ☐ Sodium Bisulfate ☐ Other: _____ ☐ None

Name(s) of Sampler(s): Ryan Fletcher

Ponded Water, Snow Depth, etc.: None

Well Condition/Repair Requirements: Good Condition

Lock Make/Model/Condition/Replaced: Replaced (G. Hjukstrom Limited, 7000PS-KA3, 40mm)

Pre-Measured Data (From Well Log)

Depth of Well (mbgs): _____ Diameter (cm): 4 (Pipe Diameter)

Depth to Top of Screen (mbgs): 0.4 Screen Length (m): 2

Field Measurements

Measurement Method: ☑ Interface Probe ☐ Water Level Tape ☐ Other _____

Well Stickup (Ground to Top of Pipe) (m): 0.54

Depth to Water (From Top of Pipe) (m): N/A

Calculated Static Water Level (mbgs): N/A

Well Refusal Depth (m): 1.426 Frozen (Measure Refusal After Sampling)

Thickness of Water Column (m): N/A Water Volume (L): N/A (Calculated)

Free Product Thickness (mm): None Sludge/Silt: ☐ Y ☑ N

Purging Information Summary

Purging/Sampling Equipment/Technique: Low Flow Peristalltic Pump

Water Quality Parameter Equipment: N/A Calibration Details: N/A

Maintained Purge Rate at ≤ 100 mL/min: ☑ Y N/A ☐ N Purge Rate: ☐ < Recharge Rate N/A ☐ > Recharge Rate

Total Volume Purged (L): _____ (Total Volume Over Multiple Events, if Applicable)

Time (Note Dates if Multiple Days Required)	pH	Conductivity (uS/cm)	Turbidity (NTU)	Temperature (°C)
	N/A	SAMPLE		
	Frozen			
Final Time: Final Values:				

Clear? ☐ Y ☐ N Colour: _____

PHC Sheen? ☐ Y ☐ N PHC Odour? ☐ Y ☐ N

Free Product/PHC Globules? ☐ Y ☐ N Other Odour? _____

Decontamination of Sampling Equipment

All Equipment Dedicated/Single Use? ☑ Y ☐ N Decon Required? ☐ Y ☑ N

Type of Decontamination Fluid(s): N/A # Washes/Rinses: N/A

N/A

Photographic Records

Photo Numbers/IDs: _____

Close Up/Wide Angle/Panoramic: _____ Direction: _____

Scale Indicated? ☐ Y ☐ N Line of Sight: _____

APPENDIX F

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 soil and groundwater samples were sent for analysis to Maxxam Analytics Ltd, Edmonton, Alberta. All results are presented in the table to this Appendix (Appendix F, Table 1 for soil and Table 2 for groundwater, and Table 3 for field, trip, and equipment blanks).

SHIPPING AND TRANSPORTATION

Samples were kept in coolers and dropped off in person to the Maxxam laboratories as soon as Arcadis field staff arrived back in Yellowknife and all attempts were made to expedite this procedure.

Sample Temperatures

All Maxxam cooler temperatures were within the acceptable range of less than 10 degree Celsius.

Sample Holding Times

Sample holding times were met for all samples submitted to Maxxam Analytics at the PIN-2 site.

Sample Containers

Sample all arrived in good condition and no breakages were reported. All soil and groundwater samples were collected in the sample containers both supplied and required by the project laboratory.

SAMPLING METHODOLOGIES

Soil

Samples were collected from test pits that had been manually excavated with hand tools (pickaxe and stainless-steel shovel), which were decontaminated between locations using Alconox and distilled water. Each soil sample was collected in one laboratory supplied zip-top plastic bag, one 125 mL glass jar, and two 40 mL clear glass vials with methanol for preservation. All sample containers were pre-sterilized and supplied by the laboratory.

Groundwater

The purging and sampling of each monitoring well was completed using dedicated sampling equipment consisting of 6 mm diameter high density polyethylene (HDPE) tubing. Each well was purged and sampled using dedicated tubing supplies which were removed upon completion of sampling to prevent damage due to freezing. Other sampling equipment, such as the interface probe and the Horiba U-52 multi-parameter meter, were decontaminated between monitoring events using Alconox and distilled water.

Sample Preservation

Soil samples for PHC F1 were preserved with methanol.

Groundwater samples for inorganics were not preserved and not field filtered. Groundwater samples for PHCs were preserved with sodium bisulfate.

SAMPLE METHOD DETECTION LIMITS (MDLS)

DEW Line method detection limits (MDLs), as provided in Annex I of the TOR, were not met for the following:

For soil, the MDL for PHC F4 was raised to 10 mg/kg in some instances due to matrix interference where the MDL for DEW Line monitoring criteria is set at 6 mg/kg. The DEW Line MDL was met in as many instances as possible.

Arcadis made all attempts to meet every specified DEW Line specific MDL, including contacting the contract laboratory and providing a copy of the TOR Annex I – Dew Line Clean-up for Soil and Minimum MDL Requirements during the bottle order process and again prior to the start of the program. In addition, Arcadis also included a print out of the TOR Annex I with the chains of custody in each cooler that accompanied the coolers to the contract laboratory.

In addition, a note was added to each chain of custody stating “Special MDLs are required. Contact Parmider Virk at Maxxam if there are any questions or concerns regarding MDLs”.

Raised MDLs for PCBs

Sample detection limits were raised for PCB analysis in soils for samples P2-1A, P2-4A, P2-4B, P2-12A, P2-27A, P2-28A, P2-28B, P2-29A, P2-29B, and DUP 3. Five of those samples reported raised MDLs based on high moisture content; three were raised due to dilution to bring the analyte within calibrated range, and two due to matrix interference. Three samples (P2-27A, P2-29A, and P2-29B) had detection limits above the baseline and background; therefore, it cannot be

definitively determined if an exceedance of the baseline is present at these locations. The remaining samples all had raised detection limits that were below the baseline concentrations and are not considered to negatively bias the sample results and the sample results should be considered as reliable.

Raised MDLs for Inorganics

Sample detection limits were raised for inorganic analysis in soils for samples P2-1A, P2-3A, P2-27A, P2-28A, P2-28B, P2-29A, P2-29B, MW-01A, and DUP 1. All of the soil samples reported detectable concentrations of inorganics with the exception of one sample (P2-29B), which were non-detect for lead; however, this non-detect raised MDL was well below the baseline and background concentration. Therefore, the raised MDLs for inorganics are not considered to have negatively biased the sample set and the sample results should be considered as reliable.

QA/QC SAMPLE RESULTS

Duplicate samples were collected at a frequency of 10% of submitted samples.

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.

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).

RPDs are typically calculated only when both results are greater than 5x the laboratory Reliable Detection Limit (RDL) for each sample concentration. This alert criteria results in less uncertainty for concentrations that are very close to the RDL.

Based on the Annex K – Quality Control – Quality Assurance Procedures for Analysis, DEW Line acceptable performances for duplicate samples are as follows:

- For organic analyses, all analytical duplicates are to exhibit less than 20% relative standard deviation on average, and no more than 30% for a specific set.
- For inorganic elements, all analytical duplicates must exhibit less than 15% relative standard deviation on average, and no more than 20% for a specific set.
- Analytical results for all reference materials or spiked standards must be within 10% of certified values for inorganic elements or 30% of certified values for organic compounds.
- All analytical blanks should be below the detection limits used for the analysis.

Soil samples were compared against their respective duplicate samples. The following provides a summary of the duplicate analysis.

Soil

A total of eight duplicate samples were collected and analyzed at the PIN-2 site. The samples RPDs were compared for inorganics (metals), hydrocarbons, and PCBs and some minor differences were noted for field duplicates compared to parent samples. The comparison results are presented in Table 1 of Appendix F following this text.

Inorganics

Out of the eight field duplicate samples analyzed, a total of nine analytes from five separate stations reported RPD values above the DEW Line specified 20% threshold for acceptability. The following table outlines the unacceptable results:

Parent Sample	Duplicate Sample	Analyte	RPD Value (%)	Average RPD% per sample set
MW-01A	DUP 1	chromium	26.2	16%
MW-01A	DUP 1	nickel	25.2	
MW-06B	DUP 2	lead	21.5	15%
P2-17B	DUP 3	copper	45.9	34%
P2-17B	DUP 3	zinc	22.2	
P2-30B	DUP 4	zinc	25.8	26%
P2-30B	DUP 4	chromium	34.3	
P2-2A	DUP 7	zinc	78.3	50%
P2-2A	DUP 7	chromium	22.2	
Average RPD for all Inorganics sample sets				20%

RPDs are calculated only when both values are greater than 5 x the laboratory MDL. Many of the field duplicate data points were not calculated for RPD due to results at less than 5 x MDL.

Where the field duplicate sample and the original sample had identical soil sample results, an RPD value was not assigned either.

Heterogeneity is common in surface soil samples and such surface samples often result in RPDs greater than 25%. Arcadis suspects that these discrepancies may also be a result of the use of the laboratory exaction method, which includes first drying the sample, then grinding the sample, and finally sieving the sample. The act of grinding the sample may have created disproportionate amounts of metals based on the exact rock type selected during the grinding process. The PIN-2 site is especially vulnerable to this, considering many of the collected samples were gravel with very coarse sand at best. A few selected photos are provided below as examples of the typical sample media encountered.

Photo 1 – Sample media at MW-06

Photo 2 – Sample media at P2-30

Photo 3 – Sample media at P2-17

Photo 4 – Sample media at P2-2

Large relative percent difference numbers are often a result of low concentrations being measured and variation between samples is likely due to heterogeneity of the substrate. The Arcadis field assessor alternated the placement of small amounts of sample into the primary and duplicated sampling jars; however, this does not guarantee equal allocation of sample, especially in primarily

gravel soils, making the collection of a true soil duplicate difficult. Small amounts of metal may have been collected with soil, despite the efforts to exclude debris by the field assessor.

Arcadis conducted a review of the RPD results that did not meet the DEW Line threshold and determined that the majority of the parent samples and the duplicate samples are either below or are in close range of the PIN-2 background inorganic concentrations in soil. In addition, the RPD average for all Inorganics QA/QC analyses was calculated at 20%, which is acceptable. Therefore, it is Arcadis' opinion that the overall sample set should be considered reliable.

Hydrocarbon Analyses

All duplicate analysis for organics (PHCs) reported RPD values within the accepted criteria of 30%. The data set is considered acceptable and reliable.

PCB Analyses

All soil samples were non-detect for PCBs and are considered to meet the QA/QC criteria. The data set is considered acceptable and reliable.

Groundwater

One duplicate sample was submitted for groundwater (Dup 1) at monitoring well MW-03. All analytes for the parent and duplicate groundwater sample reported RPDs within the DEW Line criteria outlined in Annex I of the TOR with one exception. The inorganic analyte of zinc reported an RPD value of 45.2%, which is above the DEW line threshold for acceptability. The analytical results are included as Table 2 in Appendix F following this text.

The concentrations for zinc were below the baseline arithmetic mean for both the parent and duplicate sample and therefore, the sample set should be considered reliable. It is Arcadis' opinion that the overall groundwater sample set should be considered reliable.

Trip, Field, and Equipment Blanks

One trip blank, one field blank, and two equipment blanks were collected as part of the 2018 QA/QC program. The analytical results are included as Table 3 in Appendix F following this text.

Two sets of equipment blanks were collected. The first set (Equipment Blank 1) was collected by pouring laboratory supplied RODI water, guaranteed to be free of any organic and inorganic contaminants (based on analysis), over the stainless-steel shovel that was used to dig the test pits and allowing the water to drain into laboratory supplied sample containers. The second set

(Equipment Blank 2) was collected by pumping laboratory supplied RODI water through new tubing from the same batch that was used to sample the groundwater wells and into laboratory supplied sample containers.

One detection was reported for copper in Equipment Blank 1 with a concentration of 0.00029 mg/L, where the detection limit was 0.0002. This very minor detection of 0.00009 mg/L is not considered significant enough to impact any of the analytical sample results; therefore, the groundwater sample results should be relied upon.

No other detections were reported in the trip blank, field blank, Equipment Blank 2, or the remaining parameters of Equipment Blank 1.

OTHER QA/QC CONSIDERATIONS

Eight soil samples were miss-labelled on the chain of custody and include:

Sample Label on COC	Corrected Sample ID
P1-1A	P2-1A
P1-1B	P2-1B
P1-2A	P2-2A
P1-2B	P2-2B
P1-3A	P2-3A
P1-3B	P2-3B
P1-4A	P2-4A
P1-4B	P2-4B

Two methanol vials were filled with too much soil media, as outlined in the attached e-mail correspondence. The F1 analysis was run from the soil jar and not from the methanol vials.

Four samples had miss-labelling due to label changes in the field and illegible sample labels. This was corrected through correspondence with the field staff and the contract laboratory, as outlined in the correspondence provided.

Groundwater turbidity did not stabilize in many of the sampled wells. Sampling in the arctic is a delicate balance of obtaining a good representative sample while not allowing the well to run "dry". A field call was made to sample based on the stability of the remaining three parameters being monitored. The turbidity not having fully stabilized should not have any significant impact on the analytical results of the sample set. It is worth noting that no exceedances of any analytes were detected during the 2018 sampling event, which is a good indication that the turbidity did not play

a role in sample bias. All samples were also noted to be clear and did not contain any indication of sedimentation or suspended particles.

LABORATORY ACCREDITATION

We attach the Scope of Accreditation certificates for both Maxxam analytical Mississauga and Edmonton laboratories (as issued by the Standards Council of Canada), which were used to analyze samples obtained following from our 2018 PIN-2 field work. Soil samples for PHCs and Inorganics were analyzed at the Edmonton Maxxam facility while PCB analyses was conducted at the Mississauga facility. Groundwater samples were analyzed at the Edmonton Maxxam facility. All are ISO 17025 certified laboratories.

DISCUSSION

Overall, the results of the quality assurance and quality control measures are considered acceptable and mostly fall within the DEW Line criteria outline in the TOR Annex K. The overall data set should be considered reliable.

A few very minor elevated MDLs are present in the data set but are; however, are not considered significant enough to affect the data set or alter the analytical results above background or baseline concentrations at any given landfill site.

One sample parent and duplicate exhibited unacceptable RPD values. Arcadis believes that the duplicate sample (Dup 7) does not represent the conditions at the sample station (P2-2 surface) and DND should consider removing it from the data set. Arcadis believes, based on the similarities in concentrations from previous monitoring years, that the parent sample is representative of the soil conditions and should be kept as part of the data set.

Some minor labelling issues occurred; however, were corrected through correspondence with the contract laboratory (see attached following the tables).

APPENDIX F1 - TABLES

Summary of 2018 Soil Duplicate Analytical Data																	
Sample ID	**Location**	**Year**	**Depth (cm)**	**As [mg/kg]**	**Cd [mg/kg]**	**Cr [mg/kg]**	**Co [mg/kg]**	**Cu [mg/kg]**	**Pb [mg/kg]**	**Ni [mg/kg]**	**Zn [mg/kg]**	**PCBs [mg/kg]**	**F1 C_6-C_{10} [mg/kg]**	**F2 C_{10}-C_{16} [mg/kg]**	**F3 C_{16}-C_{34} [mg/kg]**	**F4 C_{16}-C_{34} [mg/kg]**	
DEW Line MDLs				1	0.5	1	1.00	1	1	1	1	0.05	7	4	8	6	
MDL (Maxxam)				1	0.05	1	0.50	1	0.5	1	1	0.01	7	4	8	10	
Background				2.9	1	20	5.00	8.7	10	5	15	0.01	NA	NA	NA	NA	
	MW-01 Surface																
MW-01A	MW-01	2018	0-15	4.6	0.410	8.2	2.2	9.1	2.9	8.5	14.0	<0.010	7.7	<4.0	51.0	10.0	
Dup 1				4.7	0.400	6.3	2.2	9.0	2.9	6.6	16.0	<0.010	<7.0	<4.0	11.0	<6.0	Average
RPD (Parent and Dup)				--	--	26.2%	--	1.1%	--	25.2%	13.3%	--	--	--	--	--	16%
Aceptable (Y/N)				Y	Y	N	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	
	MW-06 Depth																
MW-06B	MW-06	2018	40-50	15.00	0.440	3.3	1.4	5.4	5.4	4.1	62.0	<0.010	<7.0	<4.0	<8.0	<6.0	
Dup 2				18.00	0.450	3.4	1.5	6.3	6.7	4.6	64.0	<0.010	<7.0	5.2	15.0	<6.0	Average
RPD (Parent and Dup)				18.2%	--	--	--	15.4%	21.5%	--	3.2%	--	--	--	--	--	15%
Aceptable (Y/N)				Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	
	P2-17 Depth																
P2-17B	P2-17	2018	40-50	2.5	0.080	4.8	4.0	15.0	1.8	4.0	15.0	<0.010	<7.0	<4.0	15.0	<6.0	
Dup 3				2.1	0.078	5.1	3.1	9.4	1.8	3.9	12.0	0.130	<7.0	<4.0	8.3	<6.0	Average
RPD (Parent and Dup)				--	--	--	--	45.9%	--	--	22.2%	--	--	--	--	--	34%
Aceptable (Y/N)				Y	Y	Y	Y	N	Y	Y	N	Y	Y	Y	Y	Y	
	P2-30 Depth																
P2-30B	P2-30	2018	0-15	2.2	<0.050	5.8	2.3	4.2	2.0	4.7	9.2	<0.010	<7.0	<4.0	<8.0	<6.0	
Dup 4				2.4	<0.050	4.1	1.5	3.3	2.0	3.0	7.1	<0.010	<7.0	<4.0	<8.0	<6.0	Average
RPD (Parent and Dup)				--	--	--	--	--	--	--	25.8%	--	--	--	--	--	26%
Aceptable (Y/N)				Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	

Summary of 2018 Soil Duplicate Analytical Data																	
Sample ID	Location	Year	Depth (cm)	As [mg/kg]	Cd [mg/kg]	Cr [mg/kg]	Co [mg/kg]	Cu [mg/kg]	Pb [mg/kg]	Ni [mg/kg]	Zn [mg/kg]	PCBs [mg/kg]	F1 C_6-C_{10} [mg/kg]	F2 C_{10}-C_{16} [mg/kg]	F3 C_{16}-C_{34} [mg/kg]	F4 C_{16}-C_{34} [mg/kg]	
DEW Line MDLs				1	0.5	1	1.00	1	1	1	1	0.05	7	4	8	6	
MDL (Maxxam)				1	0.05	1	0.50	1	0.5	1	1	0.01	7	4	8	10	
	P2-10 Surface																
P2-10A	P2-10	2018	0-15	5.4	0.190	4.2	1.6	3.4	2.8	2.8	18.0	<0.010	<7.0	4.5	40.0	22.0	
Dup 5				4.8	0.190	3.5	1.4	2.9	2.7	3.3	18.0	<0.010	<7.0	12.0	47.0	20.0	Average
RPD (Parent and Dup)				--	--	--	--	--	--	--	0.0%	--	--	--	16.1%	--	8%
Aceptable (Y/N)				Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
	P2-8 Depth																
P2-8B	P2-8	2018	40-50	2.60	0.060	3.20	1.00	2.30	2.30	1.80	9.9	<0.010	<7.0	<4.0	20.0	10.0	
Dup 6				2.60	0.061	3.10	1.00	2.20	2.30	1.90	8.7	<0.010	<7.0	5.0	22.0	9.1	Average
RPD (Parent and Dup)				--	--	--	--	--	--	--	12.9%	--	--	--	9.5%	9.4%	11%
Aceptable (Y/N)				Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
	P2-2 Surface																
P2-2A	P2-2	2018	40-50	5.6	0.130	6.5	1.30	3.2	3.90	2.7	14.0	<0.010	<7.0	<4.0	9.7	<6.0	
Dup 7				2.1	0.096	5.2	7.60	21.0	3.80	14.0	32.0	<0.010	<7.0	12.0	45.0	23.0	Average
RPD (Parent and Dup)				--	--	22.2%	--	--	--	--	78.3%	--	--	--	--	--	50%
Aceptable (Y/N)				Y	Y	N	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	
	P2-21 Depth																
P2-21B	P2-21	2018	40-50	2.70	<0.050	2.20	0.58	2.80	3.60	1.20	7.00	<0.010	<7.0	<4.0	12.0	<6.0	
Dup 8				2.40	0.061	1.70	<0.50	2.50	3.50	<1.0	7.00	<0.010	<7.0	6.2	17.0	7.5	Average
RPD (Parent and Dup)				--	--	--	--	--	--	--	0.0%	--	--	--	--	--	0%
Aceptable (Y/N)				Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	

Notes:

-- Not calculated (nc) - meets criteria (note that RPDs calculated only when both samples are greater than 5x MDL)

Y Meets Criteria (20% RPD for soil inorganics; 30% RPD for organics)

N Does not meet criteria

Average Inorgan 20%

Summary of 2018 Groundwater Duplicate Analytical Data														
Sample ID	Location	Year	As [mg/L]	Cd [mg/L]	Cr [mg/L]	Co [mg/L]	Cu [mg/L]	Pb [mg/L]	Ni [mg/L]	Zn [mg/L]	F1 C_6-C_{10} [mg/L]	F2 C_{10}-C_{16} [mg/L]	F3 C_{16}-C_{34} [mg/L]	F4 C_{16}-C_{34} [mg/L]
DEW Line MDLs			0.001	0.0001	0.001	0.0005	0.005	0.0001	0.001	0.001	0.025	0.1	0.1	0.1
MDL (Maxxam)			0.0002	0.00002	0.0003	0.0002	0.0002	0.003	0.001	0.0002	0.1	0.1	0.1	0.2
MW-03														
MW-3	MW-03	2018	0.00051	<0.000020	<0.0010	<0.00030	0.0015	<0.00010	0.0031	0.0060	<0.10	<0.10	<0.10	<0.20
Dup 1			0.00044	<0.000020	0.0010	<0.00030	0.0016	<0.00010	0.0030	0.0095	<0.10	<0.10	<0.10	<0.20
RPD (Parent and Dup)			--	--	--	--	--	--	--	45.2	--	--	--	--
Aceptable (Y/N)			Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y

Notes:

-- Not calculated - meets criteira

Y Meets Criteria

Summary of 2018 Field, Trip and Equipment Blanks													
Sample ID	Year	As [mg/L]	Cd [mg/L]	Cr [mg/L]	Co [mg/L]	Cu [mg/L]	Pb [mg/L]	Ni [mg/L]	Zn [mg/L]	F1 C_6-C_{10} [mg/L]	F2 C_{10}-C_{16} [mg/L]	F3 C_{16}-C_{34} [mg/L]	F4 C_{16}-C_{34} [mg/L]
DEW Line MDLs		0.001	0.0001	0.001	0.0005	0.005	0.0001	0.001	0.001	0.025	0.1	0.1	0.1
MDL (Maxxam)		0.0002	0.00002	0.0003	0.0002	0.0002	0.003	0.001	0.0002	0.1	0.1	0.1	0.2
Aceptable? (Y/N)		Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	N
Field, Trip and Equipment Blank Analyses- Maxxam													
Field Blank	2018	<0.0001	<0.000020	<0.0010	<0.00030	<0.00020	<0.00010	<0.0005	<0.003	<0.10	<0.10	<0.10	<0.20
Aceptable? (Y/N)		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Trip Blank		<0.0001	<0.000020	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.20
Aceptable? (Y/N)		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Equipment Blank 1		<0.0001	<0.000020	<0.0010	<0.00030	0.00029	<0.00010	<0.0005	<0.003	<0.10	<0.10	<0.10	<0.20
Aceptable? (Y/N)		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Equipment Blank 2		<0.0001	<0.000020	<0.0010	<0.00030	<0.00020	<0.00010	<0.0005	<0.003	<0.10	<0.10	<0.10	<0.20
Aceptable? (Y/N)		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Notes:

-- Not calculated - meets criteira

Y Meets Criteria

APPENDIX F2 - CHAINS OF CUSTODY

WATER 1137 (13)

Maxxam Analytics International Corporation o/a Maxxam Analytics
4000 19th Street NE, Calgary, Alberta Canada T2E 6P8 Tel: (403) 291-3077, Fax: (403) 735-2240, Toll free: (800) 386-7247

CHAIN OF CUSTODY RECORD

Page 1 of 1

INVOICE INFORMATION:		REPORT INFORMATION (if differs from invoice):		PROJECT INFORMATION:		Laboratory Use Only
Company Name:	# 10988 ARCADIS Canada Inc.	Company Name:	Arcadis Canada Inc	Quotation #:	B80947 (2018 prices-Easten Quote B60371)	MAXXAM JOB #:
Contact Name:	Invoices Attention	Contact Name:	Ryan Fletcher/Troy Austrins	P.O. #:		B871845
Address:	1050 Morrison Drive, Suite 201	Address:	1050 Morrison Drive, Suite 201	Project #:	102012-000	PROJECT MANAGER:
	Ottawa, Ontario		Ottawa, On	Scenario:		
Phone:	613-721-0555 Fax:	Phone:	613-721-0555	Site Location:	PIN-2	Parminder Virk
Email:	invoicesottawa@arcadis.com, barb.adelman@arcadis.com	Email:	ryan.fletcher@arcadis.com/Troy.austrins@arcadis.com	Sampled By:	Ryan Fletcher	

SPECIAL INSTRUCTIONS:

Metals: only report for As, Cd, Cr, Co, Cu, Pb, Ni, Zinc

PHCs: Only report for F1-F4 (i.e., no BTEX)

Groundwater: Metals not preserved and not field filtered. Analyse for TOTAL metals only. (do not filter or perserve in lab).

Special MDLs are required. Contact Parminder Virk if there are any questions regarding MDLs.

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: [X]

Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for some tests are > 5 days - contact your Project Manager for details.

Rush TAT

Date Required: _____

	Sample Indentification	Date Sampled & Time Sampled	Matrix	F1-F4 (No BTEX)	Total As, Cd, Cr, Co, Cu, Pb, Ni, Zinc	PCB	# of Containers	Comments
1	MW-1	Aug 19/18 1130	GW	X	X		5	Sample Reception: Please notify the lab for required RDLs Refer to the attached document for required RDL.
2	MW-2	1100	GW	X	X		5	Please email the lab to not filter or preserve metals bottles
3	MW-3	1000	GW	X	X		5	
4	MW-4	1300	GW	X	X		5	
5	MW-5	1530	GW	X	X		5	
6	MW-6	1430	GW	X	X		5	
7	MW-7	1400	GW	X	X		5	
8	Dup 1	—	GW	X	X		5	
9	Field Blank	1530	W	X	X		5	
10	Trip Blank	—	W	X	X		5	
11	Equipment Blank 1	1700	W	X	X		5	
12	Equipment Blank 2	1715	W	X	X		5	

RECEIVED IN YELLOWKNIFE
By: Jeffery.S
2018 -08- 21 10:00
Temp: See Temp Record

*RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time:	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time:	Laboratory Use Only: Temperature of samples on receipt (°C)	Custody Seal intact on Cooler?
Ryan Fletcher	Aug 21/18	8:00	Danielle Boorman	20180822	10:15	9°C 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 RESULTS IN ANALYICAL TAT DELAYS
** ALL SAMPLES ARE HELD FOR 60 DAYS AFTER SAMPLE RECEIPT, FOR SPECIAL REQUEST PLEASE CONTACT YOUR PROJECT MANAGER

White: Maxxam Yellow: Client

Maxxam Analytics International Corporation o/a Maxxam Analytics
4000 19th Street NE, Calgary, Alberta Canada T2E 6P8 Tel: (403) 291-3077, Fax: (403) 735-2240, Toll free: (800) 386-7247

CHAIN OF CUSTODY RECORD

INVOICE INFORMATION:		REPORT INFORMATION (if differs from invoice):		PROJECT INFORMATION:		Laboratory Use Only
Company Name:	# 10988 ARCADIS Canada Inc.	Company Name:	Arcadis Canada Inc	Quotation #:	B80947 (2018 prices-Easten Quote B60371)	MAXXAM JOB #:
Contact Name:	Invoices Attention	Contact Name:	Ryan Fletcher/Troy Austrins	P.O. #:		B871860
Address:	1050 Morrison Drive, Suite 201	Address:	1050 Morrison Drive, Suite 201	Project #:	102012-000	PROJECT MANAGER:
	Ottawa, Ontario		Ottawa, On	Scenario:		
Phone:	613-721-0555 Fax:	Phone:	613-721-0555	Site Location:	PIN-2	Parminder Virk
Email:	invoicesottawa@arcadis.com, barb.adelman@arcadis.com	Email:	ryan.fletcher@arcadis.com/Troy.austrins@arcadis.com	Sampled By:	Ryan Fletcher	

SPECIAL INSTRUCTIONS:

Metals: olny report for As, Cd, Cr, Co, Cu, Pb, Ni, Zinc

PHCs: Only report for F1-F4 (i.e., no BTEX)

Groundwater: Metals not preserved and not field filtered. Analyse for TOTAL metals only. (do not filter or perserve in lab).

Special MDLs are required. Contact Parminder Virk if there are any questions regarding MDLs.

SAMPLES MUST BE KEPT COOL (< 10 °C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

ANALYSIS REQUESTED

	Sample Indentification	Date Sampled & Time Sampled	Matrix	F1-F4 (No BTEX)	Total As, Cd, Cr, Co, Cu, Pb, Ni, Zinc	PCB	# of Containers	Comments
1	P1-1A	Aug 20/18 0815	Soil	X	X	X	5	Sample Reception: Please notify the lab for required RDLs Refer to the attached document for required RDL.
2	P1-1B	Aug 20/18 0815		X	X	X	5	Please email the lab to not filter or preserve metals bottles
3	P1-2A	Aug 20/18 0805		X	X	X	5	
4	P1-2B	Aug 20/18 0800		X	X	X	5	
5	P1-3A	Aug 20/18 0820		X	X	X	5	
6	P1-3B	Aug 20/18 0820		X	X	X	5	
7	P1-4A	Aug 20/18 0830		X	X	X	5	
8	P1-4B	Aug 20/18 0830		X	X	X	5	
9	P2-5A	Aug 20/18 0900		X	X	X	5	
10	P2-5B	Aug 20/18 0900		X	X	X	5	
11	P2-6A	Aug 20/18 0915		X	X	X	5	
12	P2-6B	Aug 20/18 0915		X	X	X	5	

RECEIVED IN YELLOWKNIFE
By: Jeffery.S
2018-08-21 10:00
See temp Record
Temp: 1 1

TURNAROUND TIME (TAT) REQUIRED:

PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS

Regular (Standard) TAT: ☑

Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for some tests are > 5 days - contact your Project Manager for details.

Rush TAT

Date Required: _____

*RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time:	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time:
Ryan Fletcher	Aug 21/2018	8am	Danielle Bosica	20180822	10:15

Laboratory Use Only
Temperature of samples on receipt (°C): 9.6 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 RESULTS IN ANALYICAL TAT DELAYS
** ALL SAMPLES ARE HELD FOR 60 DAYS AFTER SAMPLE RECEIPT, FOR SPECIAL REQUEST PLEASE CONTACT YOUR PROJECT MANAGER

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Maxxam Analytics International Corporation o/a Maxxam Analytics
4000 19th Street NE, Calgary, Alberta Canada T2E 6P8 Tel: (403) 291-3077, Fax: (403) 735-2240, Toll free: (800) 386-7247

CHAIN OF CUSTODY RECORD

INVOICE INFORMATION:		REPORT INFORMATION (if differs from invoice):		PROJECT INFORMATION:		Laboratory Use Only
Company Name:	# 10988 ARCADIS Canada Inc.	Company Name:	Arcadis Canada Inc	Quotation #:	B80947 (2018 prices-Easten Quote B60371)	MAXXAM JOB #: B871860
Contact Name:	Invoices Attention	Contact Name:	Ryan Fletcher/Troy Austrins	P.O. #:		
Address:	1050 Morrison Drive, Suite 201	Address:	1050 Morrison Drive, Suite 201	Project #:	102012-000	
	Ottawa, Ontario		Ottawa, On	Scenario:		PROJECT MANAGER:
Phone:	613-721-0555 Fax:	Phone:	613-721-0555	Site Location:	PIN-2	Parminder Virk
Email:	invoicesottawa@arcadis.com, barb.adelman@arcadis.com	Email:	ryan.fletcher@arcadis.com/Troy.austrins@arcadis.com	Sampled By:	Ryan Fletcher	

SPECIAL INSTRUCTIONS:

Metals: olny report for As, Cd, Cr, Co, Cu, Pb, Ni, Zinc

PHCs: Only report for F1-F4 (i.e., no BTEX)

Groundwater: Metals not preserved and not field filtered. Analyse for TOTAL metals only. (do not filter or perserve in lab).

Special MDLs are required. Contact Parminder Virk if there are any questions regarding MDLs.

SAMPLES MUST BE KEPT COOL (< 10 °C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

ANALYSIS REQUESTED

	Sample Indentification	Date Sampled & Time Sampled	Matrix	F1-F4 (No BTEX)	Total As, Cd, Cr, Co, Cu, Pb, Ni, Zinc	PCB	# of Containers	Comments
1	P2-7A	Aug 20/18 0930	Soil	X	X	X	5	Sample Reception: Please notify the lab for required RDLs Refer to the attached document for required RDL.
2	P2-7B	Aug 20/18 0930		X	X	X	5	Please email the lab to not filter or preserve metals bottles
3	P2-8A	Aug 20/18 0945		X	X	X	5	
4	P2-8B	Aug 20/18 0945		X	X	X	5	
5	P2-9A	Aug 19/18 1800		X	X	X	5	
6	P2-9B	Aug 19/18 1800		X	X	X	5	
7	P2-10A	Aug 19/18 1815 ~~1830~~		X	X	X	5	
8	P2-10B	Aug 19/18 1815		X	X	X	5	
9	P2-11A	Aug 19/18 1830		X	X	X	5	
10	P2-11B	Aug 19/18 1830		X	X	X	5	
11	P2-12A	Aug 19/18 1900		X	X	X	5	
12	P2-12B	Aug 19/18 1900		X	X	X	5	

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By: Jeffery S
2018 -08- 21 10:00

Temp: See temp Record / /

TURNAROUND TIME (TAT) REQUIRED:

PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS

Regular (Standard) TAT: ☒

Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for some tests are > 5 days - contact your Project Manager for details.

Rush TAT

Date Required: _____

*RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time:	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time:
Ryan Fletcher	Aug 21/18	8am	Danielle Fosero	20180822	10:15

Laboratory Use Only
Temperature of samples on receipt (°C): 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 RESULTS IN ANALYICAL TAT DELAYS
** ALL SAMPLES ARE HELD FOR 60 DAYS AFTER SAMPLE RECEIPT, FOR SPECIAL REQUEST PLEASE CONTACT YOUR PROJECT MANAGER

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CHAIN OF CUSTODY RECORD

INVOICE INFORMATION:		REPORT INFORMATION (if differs from invoice):		PROJECT INFORMATION:		Laboratory Use Only
Company Name:	# 10988 ARCADIS Canada Inc.	Company Name:	Arcadis Canada Inc	Quotation #:	B80947 (2018 prices-Easten Quote B60371)	MAXXAM JOB #: B871860
Contact Name:	Invoices Attention	Contact Name:	Ryan Fletcher/Troy Austrins	P.O. #:		
Address:	1050 Morrison Drive, Suite 201	Address:	1050 Morrison Drive, Suite 201	Project #:	102012-000	PROJECT MANAGER:
	Ottawa, Ontario		Ottawa, On	Scenario:		
Phone:	613-721-0555 Fax:	Phone:	613-721-0555	Site Location:	PIN-2	Parminder Virk
Email:	invoicesottawa@arcadis.com, barb.adelman@arcadis.com	Email:	ryan.fletcher@arcadis.com/Troy.austrins@arcadis.com	Sampled By:	Ryan Fletcher	

SPECIAL INSTRUCTIONS:

Metals: olny report for As, Cd, Cr, Co, Cu, Pb, Ni, Zinc

PHCs: Only report for F1-F4 (i.e., no BTEX)

Groundwater: Metals not preserved and not field filtered. Analyse for TOTAL metals only. (do not filter or perserve in lab).

Special MDLs are required. Contact Parminder Virk if there are any questions regarding MDLs.

SAMPLES MUST BE KEPT COOL (< 10 °C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

ANALYSIS REQUESTED

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Rush TAT

Date Required: _____

	Sample Indentification	Date Sampled & Time Sampled	Matrix	F1-F4 (No BTEX)	Total As, Cd, Cr, Co, Cu, Pb, Ni, Zinc	PCB	# of Containers	Comments
1	P2-13A	Aug 14/18 1930	Soil	X	X	X	5	Sample Reception: Please notify the lab for required RDLs Refer to the attached document for required RDL.
2	P2-13B	Aug 14/18 1930		X	X	X	5	Please email the lab to not filter or preserve metals bottles
3	P2-14A	Aug 19/18 2000		X	X	X	5	
4	P2-14B	Aug 19/18 2000		X	X	X	5	
5	P2-15A	Aug 19/18 1900		X	X	X	5	
6	P2-15B	Aug 19/18 1900		X	X	X	5	
7	P2-16A	Aug 19/18 1915		X	X	X	5	
8	P2-16B	Aug 19/18 1915		X	X	X	5	
9	P2-17A	Aug 18/18 1330		X	X	X	5	
10	P2-17B	Aug 18/18 1330		X	X	X	5	
11	P2-18A	Aug 18/18 1400		X	X	X	5	
12	P2-18B	Aug 18/18 1400		X	X	X	5	

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By: Jeffery.S
2018 -08- 21 10:00

Temp: See temp Record

*RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time:	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time:	Laboratory Use Only
Ryan Fletcher	Aug 21/18	8 am	Danielle Boston	20180822	10:15	Temperature of samples on receipt (°C): 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 RESULTS IN ANALYICAL TAT DELAYS
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CHAIN OF CUSTODY RECORD

INVOICE INFORMATION:		REPORT INFORMATION (if differs from invoice):		PROJECT INFORMATION:		Laboratory Use Only
Company Name:	# 10988 ARCADIS Canada Inc.	Company Name:	Arcadis Canada Inc	Quotation #:	B80947 (2018 prices-Easten Quote B60371)	MAXXAM JOB #:
Contact Name:	Invoices Attention	Contact Name:	Ryan Fletcher/Troy Austrins	P.O. #:		B871860
Address:	1050 Morrison Drive, Suite 201	Address:	1050 Morrison Drive, Suite 201	Project #:	102012-000	PROJECT MANAGER:
	Ottawa, Ontario		Ottawa, On	Scenario:		
Phone:	613-721-0555 Fax:	Phone:	613-721-0555	Site Location:	PIN-2	Parminder Virk
Email:	invoicesottawa@arcadis.com, barb.adelman@arcadis.com	Email:	ryan.fletcher@arcadis.com/Troy.austrins@arcadis.com	Sampled By:	Ryan Fletcher	

SPECIAL INSTRUCTIONS:

Metals: only report for As, Cd, Cr, Co, Cu, Pb, Ni, Zinc

PHCs: Only report for F1-F4 (i.e., no BTEX)

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ANALYSIS REQUESTED

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Please note: Standard TAT for some tests are > 5 days - contact your Project Manager for details.

Rush TAT

Date Required: _____

	Sample Indentification	Date Sampled & Time Sampled	Matrix	F1-F4 (No BTEX)	Total As, Cd, Cr, Co, Cu, Pb, Ni, Zinc	PCB	# of Containers	Comments
1	P2-19A	Aug 18/18 1430	Soil	X	X	X	5	Sample Reception: Please notify the lab for required RDLs Refer to the attached document for required RDL.
2				~~XXX~~			NBV	Please email the lab to not filter or preserve metals bottles
3	P2-20A	Aug 18/18 1500		X	X	X	5	
4	P2-20B	Aug 18/18 1500		X	X	X	5	
5	P2-21A	Aug 20/18 1100		X	X	X	5	
6	P2-21B	Aug 20/18 1100		X	X	X	5	
7	P2-22A	Aug 20/18 1115		X	X	X	5	
8	P2-22B	Aug 20/18 1115		X	X	X	5	
9	P2-23A	Aug 20/18 1130		X	X	X	5	
10	P2-23B	Aug 20/18 1130		X	X	X	5	
11	P2-24A	Aug 20/18 1145		X	X	X	5	
12	P2-24B	Aug 20/18 1145	↓	X	X	X	5	

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See Temp Record
Temp: / /

*RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time:	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time:	Laboratory Use Only
Ryan Fletcher	Aug 21/18	800	Danielle Boisvert	20180822	10:15	Temperature of samples on receipt (°C): 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 RESULTS IN ANALYICAL TAT DELAYS
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CHAIN OF CUSTODY RECORD

INVOICE INFORMATION:		REPORT INFORMATION (if differs from invoice):		PROJECT INFORMATION:		Laboratory Use Only
Company Name:	# 10988 ARCADIS Canada Inc.	Company Name:	Arcadis Canada Inc	Quotation #:	B80947 (2018 prices-Easten Quote B60371)	MAXXAM JOB #: B871860
Contact Name:	Invoices Attention	Contact Name:	Ryan Fletcher/Troy Austrins	P.O. #:		
Address:	1050 Morrison Drive, Suite 201	Address:	1050 Morrison Drive, Suite 201	Project #:	102012-000	PROJECT MANAGER:
	Ottawa, Ontario		Ottawa, On	Scenario:		Parminder Virk
Phone:	613-721-0555 Fax:	Phone:	613-721-0555	Site Location:	PIN-2	
Email:	invoicesottawa@arcadis.com, barb.adelman@arcadis.com	Email:	ryan.fletcher@arcadis.com/Troy.austrins@arcadis.com	Sampled By:	Ryan Fletcher	

SPECIAL INSTRUCTIONS:

Metals: only report for As, Cd, Cr, Co, Cu, Pb, Ni, Zinc

PHCs: Only report for F1-F4 (i.e., no BTEX)

Groundwater: Metals not preserved and not field filtered. Analyse for TOTAL metals only. (do not filter or perserve in lab).

Special MDLs are required. Contact Parminder Virk if there are any questions regarding MDLs.

SAMPLES MUST BE KEPT COOL (< 10 °C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

ANALYSIS REQUESTED

	Sample Indentification	Date Sampled & Time Sampled	Matrix	F1-F4 (No BTEX)	Total As, Cd, Cr, Co, Cu, Pb, Ni, Zinc	PCB	# of Containers	Comments
1	P2-25A	Aug 20/18 1200	Soil	X	X	X	5	Sample Reception: Please notify the lab for required RDLs Refer to the attached document for required RDL.
2	P2-25B	Aug 20/18 1200		X	X	X	5	Please email the lab to not filter or preserve metals bottles
3	P2-26A	Aug 20/18 1215		X	X	X	5	
4	P2-26B	Aug 20/18 1215		X	X	X	5	
5	P2-27A	Aug 18/18 1530		X	X	X	5	
6	P2-27B	Aug 18/18 1530		X	X	X	5	
7	P2-28A	Aug 18/18 1400		X	X	X	5	
8	P2-28B	Aug 18/18 1400		X	X	X	5	
9	P2-29A	Aug 18/18 1430		X	X	X	5	
10	P2-29B	Aug 18/18 1430		X	X	X	5	
11	P2-30A	Aug 18/18 1500		X	X	X	5	
12	P2-30B	Aug 18/18 1500		X	X	X	5	

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By: Jeffery.S
2018-08-21 10:00
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Temp: / /

TURNAROUND TIME (TAT) REQUIRED:

PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS

Regular (Standard) TAT: X

Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for some tests are > 5 days - contact your Project Manager for details.

Rush TAT

Date Required: _____

*RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time:	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time:	Laboratory Use Only
Ryan Fletcher	Aug 21/18	8:00	Danielle Bastien	20180822	10:15	Temperature of samples on receipt (°C) 2°C 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 RESULTS IN ANALYICAL TAT DELAYS
** ALL SAMPLES ARE HELD FOR 60 DAYS AFTER SAMPLE RECEIPT, FOR SPECIAL REQUEST PLEASE CONTACT YOUR PROJECT MANAGER

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CHAIN OF CUSTODY RECORD

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Company Name:	# 10988 ARCADIS Canada Inc.	Company Name:	Arcadis Canada Inc	Quotation #:	B80947 (2018 prices-Easten Quote B60371)	MAXXAM JOB #: B871860
Contact Name:	Invoices Attention	Contact Name:	Ryan Fletcher/Troy Austrins	P.O. #:		
Address:	1050 Morrison Drive, Suite 201	Address:	1050 Morrison Drive, Suite 201	Project #:	102012-000	PROJECT MANAGER:
	Ottawa, Ontario		Ottawa, On	Scenario:		Parminder Virk
Phone:	613-721-0555 Fax:	Phone:	613-721-0555	Site Location:	PIN-2	
Email:	invoicesottawa@arcadis.com, barb.adelman@arcadis.com	Email:	ryan.fletcher@arcadis.com/Troy.austrins@arcadis.com	Sampled By:	Ryan Fletcher	

SPECIAL INSTRUCTIONS:

Metals: olny report for As, Cd, Cr, Co, Cu, Pb, Ni, Zinc

PHCs: Only report for F1-F4 (i.e., no BTEX)

Groundwater: Metals not preserved and not field filtered. Analyse for TOTAL metals only. (do not filter or perserve in lab).

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Please note: Standard TAT for some tests are > 5 days - contact your Project Manager for details.

Rush TAT

Date Required: _____

	Sample Indentification	Date Sampled & Time Sampled	Matrix	F1-F4 (No BTEX)	Total As, Cd, Cr, Co, Cu, Pb, Ni, Zinc	PCB	# of Containers	Comments
1	MW-01A	Aug 17/18 1830	Soil	X	X	X	5	Sample Reception: Please notify the lab for required RDLs Refer to the attached document for required RDL.
2	MW-01B	Aug 17/18 1830		X	X	X	5	Please email the lab to not filter or preserve metals bottles
3	MW-02A	Aug 17/18 1800		X	X	X	5	
4	MW-02B	Aug 17/18 1800		X	X	X	5	
5	MW-03A	Aug 17/18 1730		X	X	X	5	
6	MW-03B	Aug 17/18 1730		X	X	X	5	
7	MW-04A	Aug 17/18 1700		X	X	X	5	
8	MW-04B	Aug 17/18 1700		X	X	X	5	
9	MW-05A	Aug 18/18 1300		X	X	X	5	
10	MW-05B	Aug 18/18 1300		X	X	X	5	
11	MW-06A	Aug 18/18 1230		X	X	X	5	
12	MW-06B	Aug 18/18 1230	↓	X	X	X	5	

RECEIVED IN YELLOWKNIFE
By: Jeffery
2018 -08- 21 10:00
Temp: See temp Record

*RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time:	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time:	Laboratory Use Only
Ryan Fletcher	Aug 21/18	800	Danielle Boisvert	20180822	10:15	Temperature of samples on receipt (°C): See ACTR; Custody Seal intact on Cooler? ☐ Yes ☐ No

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CHAIN OF CUSTODY RECORD

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Company Name:	# 10988 ARCADIS Canada Inc.	Company Name:	Arcadis Canada Inc	Quotation #:	B80947 (2018 prices-Easten Quote B60371)	MAXXAM JOB #:
Contact Name:	Invoices Attention	Contact Name:	Ryan Fletcher/Troy Austrins	P.O. #:		B871860
Address:	1050 Morrison Drive, Suite 201	Address:	1050 Morrison Drive, Suite 201	Project #:	102012-000	PROJECT MANAGER:
	Ottawa, Ontario		Ottawa, On	Scenario:		
Phone:	613-721-0555 Fax:	Phone:	613-721-0555	Site Location:	PIN-2	Parminder Virk
Email:	invoicesottawa@arcadis.com, barb.adelman@arcadis.com	Email:	ryan.fletcher@arcadis.com/Troy.austrins@arcadis.com	Sampled By:	Ryan Fletcher	

SPECIAL INSTRUCTIONS:

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PHCs: Only report for F1-F4 (i.e., no BTEX)

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Rush TAT

Date Required: _____

	Sample Indentification	Date Sampled & Time Sampled	Matrix	F1-F4 (No BTEX)	Total As, Cd, Cr, Co, Cu, Pb, Ni, Zinc	PCB	# of Containers	Comments
1	MW-07A	Aug 18/18 1200	Soil	X	X	X	5	Sample Reception: Please notify the lab for required RDLs Refer to the attached document for required RDL.
2	MW-07B	Aug 18/18 1200	↓	X	X	X	5	Please email the lab to not filter or preserve metals bottles
3	MW-08A	Aug 18/18 1330	↓	X	X	X	5	
4	MW-08B	Aug 18/18 1330	↓	X	X	X	5	
5								
6								
7								
8								
9								
10								
11								
12								

RECEIVED IN YELLOWKNIFE
By: Jeffery S
2018 -08- 21 10:00
Temp: See Temp Record

*RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time:	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time:	Laboratory Use Only
Ryan Fletcher	Aug 21/18	8:00	DANIEL BOARD	20180822	10:15	Temperature of samples on receipt (°C): SEE ACTR; Custody Seal intact on Cooler? ☐ Yes ☐ No

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CHAIN OF CUSTODY RECORD

Page 88 of 8

INVOICE INFORMATION:		REPORT INFORMATION (if differs from invoice):		PROJECT INFORMATION:		Laboratory Use Only
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Contact Name:	Invoices Attention	Contact Name:	Ryan Fletcher/Troy Austrins	P.O. #:		
Address:	1050 Morrison Drive, Suite 201	Address:	1050 Morrison Drive, Suite 201	Project #:	102012-000	PROJECT MANAGER:
	Ottawa, Ontario		Ottawa, On	Scenario:		Parminder Virk
Phone:	613-721-0555 Fax:	Phone:	613-721-0555	Site Location:	PIN-2	
Email:	invoicesottawa@arcadis.com, barb.adelman@arcadis.com	Email:	ryan.fletcher@arcadis.com/Troy.austrins@arcadis.com	Sampled By:	Ryan Fletcher	

SPECIAL INSTRUCTIONS:

Metals: olny report for As, Cd, Cr, Co, Cu, Pb, Ni, Zinc

PHCs: Only report for F1-F4 (i.e., no BTEX)

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Rush TAT

Date Required: _____

	Sample Indentification	Date Sampled &Time Sampled	Matrix	F1-F4 (No BTEX)	Total As, Cd, Cr, Co, Cu, Pb, Ni, Zinc	PCB	# of Containers	Comments
1	Dup 1	Aug 17/18	Soil	X	X	X	5	Sample Reception: Please notify the lab for required RDLs Refer to the attached document for required RDL.
2	Dup 2	Aug 18/18		X	X	X	5	Please email the lab to not filter or preserve metals bottles
3	Dup 3	Aug 18/18		X	X	X	5	
4	Dup 4	Aug 18/18		X	X	X	5	
5	Dup 5	Aug 19/18		X	X	X	5	
6	Dup 6	Aug 20/18		X	X	X	5	
7	Dup 7	Aug 20/18		X	X	X	5	
8	Dup 8	Aug 20/18		X	X	X	5	
9								
10								
11								
12								

RECEIVED IN YELLOWKNIFE
By: Jefferys
2018 -08- 21 16:00

Temp: See Temp Record

*RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time:	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time:
Ryan Fletcher	Aug 21/18	8:00	DANIELE POIRIER	20180822	10:15

Laboratory Use Only

Temperature of samples on receipt (°C): 9°C 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 RESULTS IN ANALYICAL TAT DELAYS
** ALL SAMPLES ARE HELD FOR 60 DAYS AFTER SAMPLE RECEIPT, FOR SPECIAL REQUEST PLEASE CONTACT YOUR PROJECT MANAGER

White: Maxxam Yellow: Client

APPENDIX F3 – CORRESPONDENCE

From:	Fletcher, Ryan
To:	PVirk@maxxam.ca
Subject:	RE: Job Confirmation Report [B871860] - Project 102012-000 - Site Location: PIN-2 - Sample Observations noted
Date:	August 27, 2018 8:12:00 AM
Attachments:	image001.png

Parminder,

Please log as follows (the CoCs were in error – the jar labels were correct)

P1-1A = P2-1A
P1-1B = P2-1B
P1-2A = P2-2A
P1-2B = P2-2B
P1-3A = P2-3A
P1-3B = P2-3B
P1-4A = P2-4A
P1-4B = P2-4B

Regards,

Ryan Fletcher, C.Tech, EP | Sr. Environmental Technician | ryan.fletcher@arcadis.com
Arcadis

1050 Morrison Drive, Suite 201, Ottawa, Ontario, K2H 8K7
Cell + 1 613 799 6624 | Direct. + 1 613 703 3122 | Office General +1 613 721 0555

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From: PVirk@maxxam.ca <PVirk@maxxam.ca>
Sent: August 24, 2018 7:53 PM
To: Fletcher, Ryan <Ryan.Fletcher@arcadis.com>

Subject: Job Confirmation Report [B871860] - Project 102012-000 - Site Location: PIN-2 - Sample Observations noted
Importance: High

Good Day,

Your samples have been received by Maxxam. Please find attached a copy of your confirmation report that summarizes the analytical requirements for this submission.

Should you have any questions or if any changes are required, please contact your Project Manager listed below. Thank you for choosing Maxxam.

Parminder Virk
(403)735-2235
PVirk@maxxam.ca

MAXXAM ANALYTICS
9331 - 48th Street
Edmonton , Alberta T6B 2R4
http://www.maxxam.ca

Parminder Virk

From: Fletcher, Ryan <Ryan.Fletcher@arcadis.com>
Sent: Monday, August 27, 2018 6:20 AM
To: Janzen, Ryan; Parminder Virk
Subject: RE: 102012-000 PIN-2 B871860 Clarifications

Follow Up Flag: Follow up
Flag Status: Flagged

Please note, this message originated outside of the Maxxam mail system. Please use caution when opening links or attachments.
Parminder,

With regards to

“Both methanol vials for sample P1-3A are full to the top with sediment. We won’t be using these vials for analysis. Are you good to run BTEXF1 off jar? (attached image 1)”. I am certain I had re-sampled this personally. One of our field personnel was not aware of the sampling methodologies for vials. Can you please check to ensure that a duplicate set of vials was not included with the shipment for the -3A sample? I thought I had throw away those full vials, but it was incredibly busy and hectic and had some pilots helping me pack the samples last minute.

Thanks,

Ryan Fletcher, C.Tech, EP | Sr. Environmental Technician | ryan.fletcher@arcadis.com
Arcadis

1050 Morrison Drive, Suite 201, Ottawa, Ontario, K2H 8K7
Cell + 1 613 799 6624 | Direct. + 1 613 703 3122 | Office General +1 613 721 0555

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From: Janzen, Ryan
Sent: August 24, 2018 4:08 PM
To: Parminder Virk <PVirk@maxxam.ca>; Fletcher, Ryan <Ryan.Fletcher@arcadis.com>
Subject: RE: 102012-000 PIN-2 B871860 Clarifications

I can speak to some of these, at least. My response below in orange.

Ryan Janzen | Project Specialist
T. +1 613 721 0555 | M. +1 647 989 7965

From: Parminder Virk <PVirk@maxxam.ca>
Sent: August 24, 2018 15:47
To: Fletcher, Ryan <Ryan.Fletcher@arcadis.com>; Janzen, Ryan <Ryan.Janzen@arcadis.com>
Subject: 102012-000 PIN-2 B871860 Clarifications

Hi Ryan,

There are a few questions for these soil samples received in Edmonton:

-Both methanol vials for sample P1-3A are full to the top with sediment. We won't be using these vials for analysis. Are you good to run BTEXF1 off jar? (attached image 1). Please run analysis from jar. I will be saving this photo for posterity.

- For samples P2-25A and P2-26A there is a labeling issue with the vials. For P2-25A, one vial has the ID P2-25A but it is crossed out and relabeled as P2-26A. The lid of the vial is also labeled as 26A. For sample P2-26A there is one vial with a client ID of P2-26A but the lid of the vial is labelled as 25A. (Attached images 2, 3 and 4). The vials, from left to right in Image 2, should be:

i. P2-25A (correctly labelled)
ii. P2-26A (lid correct, vial relabeled correctly)
iii. P2-25B (correctly relabeled lid and vial, though the vial is tough to make out)
iV. P2-26B (incorrectly relabeled vial and lid)

- For samples P2-26A and P2-26B both bags appear to have been labeled correctly originally but the IDs have been crossed out and changed to P2-25A and P2-25B, but both of these samples already have bags that are correctly labeled. (See attached image 5). Bags originally labelled P2-25A and P2-25B should have been relabeled with P2-26 designation. Basically, sampling locations were mis-identified in the field, and the labels had to be changed after samples were taken.

-- Samples listed on COC as P1-1A, P1-1B, P1-2A,P1-2B, P1-3A, P1-3B, P1-4A and P1-4B all have ID P2, we proceeded as per the COC.

Please advise.

Thank you

PARMINDER VIRK, M.Sc.
Project Manager, Site Assessment & Remediation
Alberta Environmental Services

Office 403.735.2235
Toll Free 800.386.7247
pvirk@maxxam.ca

4000 – 19 Street NE, Calgary, AB T2E 6P8
maxxam.ca

Maxxam
A Bureau Veritas Group Company

Success Through Science®

Please Note: We will be CLOSED Monday August 6th for Heritage Day.

SUMMER HOURS START SUNDAY MAY 20, 2018.
Sample Reception Hours: Mon-Fri 8am-8pm, Sat/Sun 9am-5pm
Office Hours: Mon-Fri 9am-5pm

For urgent customer service inquiries after hours, please contact our on call project managers at 403 651 2436 for Calgary and 780 722 8050 for Edmonton.

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APPENDIX F4 – MAXXAM ACCREDITATION

Standards Council of Canada

600-55 Metcalfe Street
Ottawa, ON K1P 6L5
Canada

Conseil canadien des normes

55, rue Metcalfe, bureau 600
Ottawa, ON K1P 6L5
Canada

SCOPE OF ACCREDITATION

Maxxam Analytics International Corporation
32 Colonnade Road North Unit 1000
Nepean, ON
K2E 7J6

Accredited Laboratory No. 814
(Conforms with requirements of ISO/IEC 17025:2017)

CONTACT: Salima Haniff
TEL: +1 905 817 5700
FAX: +1 905 817-5777
EMAIL: shaniff@maxxam.ca
URL: http://www.maxxam.ca

CLIENTS SERVED: All interested parties

FIELDS OF TESTING: Chemical/Physical

PROGRAM SPECIALTY AREA: Environmental

SCOPE ISSUED ON: 2018-08-29

ACCREDITATION VALID TO: 2019-10-14

ENVIRONMENTAL AND OCCUPATIONAL HEALTH AND SAFETY

Environmental

Soil/Sediment and Water		
OTT SOP-00002	Determination of CCME C6-C10 Hydrocarbons (F1), VOC and BTEX in Soil and Water by Headspace GC/MS/FID	
	1,1,1,2-Tetrachloroethane	
	1,1,1-Trichloroethane	
	1,1,2,2-Tetrachloroethane	
	1,1,2-Trichloroethane	
	1,1-Dichloroethane	
	1,1-Dichloroethylene	
	1,2-Dichlorobenzene	
	1,2-Dichloroethane	
	1,2-Dichloropropane	
	1,3-Dichlorobenzene	
	1,4-Dichlorobenzene	
	Acetone	
	Benzene	
	Bromodichloromethane	
	Bromoform	
	Bromomethane	
	Carbon tetrachloride	
	Chlorobenzene	
	Chlorodibromomethane	
	Chloroethane	
	Chloroform	
	Chloromethane	
	cis-1,2-Dichloroethylene	
	cis-1,3-Dichloropropene	
	Dichlorodifluoromethane	
	Dichloromethane	
	Ethylbenzene	
	Ethylene Dibromide	
	F1: C6-C10	
	Hexane	
	m/p-xylene	
	Methyl Ethyl Ketone	
	Methyl Isobutyl Ketone	
	Methyl t-Butyl Ether	
	o-Xylene	
	Styrene	
	Tetrachloroethylene	
	Toluene	
	trans-1,2-Dichloroethylene	

	trans-1,3-Dichloropropene	
	Trichloroethylene	
	Trichlorofluoromethane	
	Vinyl chloride	
OTT SOP-00001	Determination of CCME Extractable Petroleum Hydrocarbons (F2-4) in Water and Soil by GC-FID	
	F2: C10-C16	
	F3: C16-C34	
	F4: C34-C50	
	F4G	
OTT SOP-00011	Determination Of Polynuclear Aromatic Hydrocarbons (PAHs) In Solid And Water Samples Using Selected Ion Monitoring (SIM) GCMS	
	1-methylnaphthalene	
	2-methylnaphthalene	
	7H-Dibenzo(c,g) carbazole	
	Acenaphthene	
	Acenaphthylene	
	Anthracene	
	Benzo (g,h,i) perylene	
	Benzo(a) pyrene	
	Benzo(a)anthracene	
	Benzo(b) Fluoranthene	
	Benzo(e) pyrene	
	Benzo(j) fluoranthene	
	Benzo(k) fluoranthene	
	Biphenyl	
	Chrysene	
	Dibenzo (a,h) anthracene	
	Dibenzo (a,i) pyrene	
	Dibenzo (a,j) acridine	
	Fluoranthene	
	Fluorene	
	Indeno (1,2,3-cd)pyrene	
	Naphthalene	
	Perylene	
	Phenanthrene	
	Pyrene	
OTT SOP-00013	Polychlorinated Biphenyls (PCBs) as Aroclors	Swabs, Oil, Soil and Water
	Aroclor-1016	
	Aroclor-1221	
	Aroclor-1232	
	Aroclor-1242	

Aroclor-1248
Aroclor-1254
Aroclor-1260
Aroclor-1262
Aroclor-1268
Total PCB

Notes:

ISO/IEC 17025: 2017: General Requirements for the Competence of Testing and Calibration Laboratories

Elias Rafoul, Vice President
Accreditation Services

Date: 2018-08-29

Number of Scope Listings: 4
SCC 1003-15/1024
Partner File #0
Partner: SCC

CERTIFICATE OF ACCREDITATION

Standards Council of Canada
Conseil canadien des normes

CERTIFICAT D'ACCRÉDITATION

Maxxam Analytics International Corporation

6740 Campobello Road, Mississauga, Ontario, L5N 2L8, Canada

having been assessed by the Standards Council of Canada (SCC) and found to conform with the requirements of ISO/IEC 17025:2017 and the conditions for accreditation established by SCC is hereby recognized as an

ayant fait l'objet d'une évaluation du Conseil canadien des normes (CCN), et ayant été trouvé conforme aux exigences énoncées dans ISO/IEC 17025:2017 et aux conditions d'accréditation établies par le CCN, est de ce fait reconnu comme étant un

ACCREDITED TESTING LABORATORY

LABORATOIRE D'ESSAIS ACCRÉDITÉ

for the specific tests or types of tests listed in the scope of accreditation approved by SCC and found on the SCC website at www.scc.ca.

pour les essais ou types d'essais énumérés dans la portée d'accréditation approuvée par le CCN et figurant dans le site Web du CCN au www.ccn.ca.

Accredited laboratory number: / Numéro de laboratoire accrédité : 97

SCC file number: / Dossier du CCN n° : 15025

Initial accreditation date: / Date de la première accréditation : 1992-10-06

.....

Vice-President – Accreditation Services / Vice-président – Services d'accréditation

Issued on: / Délivré le : 2018-09-19

The validity of this certificate, including the date of last re-accreditation and its expiry can be confirmed by the accompanying Scope of Accreditation document in the Directory of Accredited Laboratories on the SCC website at www.scc.ca.

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017. The accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF communiqué dated April 2017).

Pour vérifier la validité du présent certificat, y compris la date de la dernière réaccréditation et la date d'expiration du certificat, consulter la portée d'accréditation qui se trouve dans le répertoire des laboratoires accrédités dans le site Web du CCN au www.ccn.ca.

Ce laboratoire est accrédité conformément à la Norme internationale reconnue ISO/IEC 17025:2017. Cette accréditation démontre la compétence technique d'un organisme pour une portée définie et l'exploitation d'un système de management de la qualité de laboratoire (cf. communiqué conjoint ISO-ILAC-IAF date de avril 2017).

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Canada

Standards Council of Canada

600-55 Metcalfe Street
Ottawa, ON K1P 6L5
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Conseil canadien des normes

55, rue Metcalfe, bureau 600
Ottawa, ON K1P 6L5
Canada

SCOPE OF ACCREDITATION

Maxxam Analytics International Corporation
Maxxam Analytics Calgary
2021 - 41st Avenue, N.E.
Calgary, AB
T2E 6P2

Accredited Laboratory No. 836
(Conforms with requirements of ISO/IEC 17025:2005, RG-LAB)

CONTACT: Maria Laplante
TEL: +1 (403) 735-2252
FAX: +1 (403) 291-9468
EMAIL: calgaryQAStaff@maxxam.ca
URL: http://www.maxxam.ca

CLIENTS SERVED: All interested parties

FIELDS OF TESTING: Biological, Chemical/Physical

PROGRAM SPECIALTY AREA: Environmental

SCOPE ISSUED ON: 2018-07-12

ACCREDITATION VALID TO: 2020-08-30

Air testing is performed at #1 2080-39th Avenue N.E Calgary, AB. T2E 6P7
Maxxam Analytics International Corporation 4000-19 Street N.E Calgary, AB T2E 6P8

ENVIRONMENTAL AND OCCUPATIONAL HEALTH AND SAFETY

Environmental

(Soil, Solid, Waste)

AB SOP-00045	Specific Gravity [Modified from SM 2701 F, MSSMA 2.25, and Petroleum and Natural Gas Industries- Field Testing of Drilling Fluids] [Also includes Water - Inorganic, Modified from SM 2701F-GRAVIMETRIC Specific Gravity
AB SOP-00047	Free Liquid (Paint Filter Test) [Modified from EPA 9095 B] VOLUMETRIC Free Liquid in Waste Samples
CAL SOP-00028	Flammability Test of Readily Combustible Solids [Modified from Recommendations on the Transport of Dangerous Goods: Manual of Tests and Criteria, Section 33] VISUAL Flammability
CAL SOP-00251	Sulfolane Low (Soil and Water) [Modified from EPA 8270D] GC/MSD EXTRACTION Sulfolane

(Water)

AB SOP-00011	Silica (Reactive) by Konelab - Molybdate/ANSA Reduction Method [Modified From EPA 370.1] COLORIMETRIC Reactive Silica
AB SOP-00016	Chemical Oxygen Demand (Total and Dissolved) [Modified From SM 5220 [D], COLORIMETRIC COD
AB SOP-00017	Biochemical Oxygen Demand [Modified From SM 5210 B] D.O. METER BOD (5 day) CBOD (5 day)
AB SOP-00018	Sulfate by Konelab - Automated Turbidimetry Method [Modified From SM 4500-SO4 E] TURBIDIMETRIC Sulfate
AB SOP-00024	Total Phosphorus by Konelab - Ascorbic Acid Reduction Method [Modified from SM 4500-P, A, B, F] COLORIMETRIC

	Total Phosphorus
AB SOP-00032	The Determination of Residual Chlorine in Waters [Modified from SM 4500 C1G] COLORIMETRIC
	Free Chlorine
	Total Chlorine
AB SOP-00041	Ferrous and Ferric Iron in Water-Colorimetric Determination [Modified from SM 3500-Fe A, B] COLORIMETRIC
	Ferrous Iron
AB SOP-00058	Dissolved Oxygen- Modified Winkler Method [Modified from SM 4500-O C] TITRIMETRIC
	Dissolved Oxygen
AB SOP-00060	Naphthenic Acids Modified fromNaph Acid E/Q Analysis with FTIR Syncrude research centre] IR
	Naphthenic Acids
AB SOP-00061	Total Suspended Solids, Total Fixed Solids, Total Volatile Solids [Modified from SM 2540 D, E] GRAVIMETRIC
	Total Suspended Solids
	Total Suspended Solids Fixed
	Total Suspended Solids Volatile
AB SOP-00065	Total Dissolved Solids [Modified from SM 2540 C] GRAVIMETRIC
	Total Dissolved Solids
AB SOP-00070	Naphthenic Acids [Modified from Naph Acid E/Q Analysis with FTIR Syncrude research centre] IR - DCM Extraction
	Naphthenic Acids
AB SOP-00080	Sulphide, Low level [Modified from SM 4500-S2D, A, F] COLORIMETRIC
	Sulphide
AB SOP-00082	Nitrate and Nitrite by Technicon [Modified from Nitrate and Nitrite in Water and Wastewater, Atlas Chemical Industries, September 1987, Industrial Method No. 857-871]
	COLORIMETRIC
	Nitrate
	Nitrite
CAL SOP-00007	Mercury in Water Samples by Cold Vapour Atomic Fluorescence

	[Modified from EPA 1631] COLD VAPOUR AF Mercury
CAL SOP-00040	Bromate, Chlorate, Chlorite by IC Conductivity detection [Modified from SM 4110 D] ION CHROMATOGRAPHY Bromate Chlorate Chlorite
CAL SOP-00049	Colour by Konelab [Modified from SM 2120C] SPECTROPHOTOMETRIC Apparent colour True Color
CAL SOP-00055	Volatile Organic Acids [Modified from Dionex ICE-AS6 DOC NO 34961] ION CHROMATOGRAPHY Glycolic Acid Lactic Acid
CAL SOP-00057	Iodide/Thiocyanate/Thiosulfate [Modified from DIONEX, DOC NO 034035] ION CHROMATOGRAPHY Iodide Thiocyanate Thiosulfate
CAL SOP-00063	Volatile Organic Acids [Modified from DIONEX ICE-AS1 DOC NO 031181] - Waters ION CHROMATOGRAPHY Acetic Acid Butyric Acid Formic Acid Propionic Acid
CAL SOP-00065	Oxalic Acid by Ion Chromatography - Conductivity Detection [Modified from Standard Methods for Examination of Water and Wastewater, Method 4110B] ION CHROMATOGRAPHY Oxalic Acid
CAL SOP-00071	Sulphite by IC [Modified from SM 4110 B] ION CHROMATOGRAPHY - CONDUCTIVITY DETECTOR Sulfite
CAL SOP-00074	Total Solids [Modified from SM 2540 B, E]

	GRAVIMETRIC
	Total Solids
	Total Solids Fixed
	Total Solids Volatile
CAL SOP-00076	Total Inorganic Carbon and Dissolved Inorganic Carbon Auto IR analysis [Modified from SM 5310 A, C] AUTO INFRARED Inorganic Carbon
CAL SOP-00077	Organic Carbon Technicon [Modified from Methods Manual For Chemical Analysis Of Water and Wastes, Method Code 119] COLORIMETRIC Organic Carbon
CAL SOP-00081	Turbidity Nephelometric Method [Modified from SM 2130 B] NEPHELOMETRIC Turbidity
CAL SOP-00099	Resin and Fatty Acids [Modified from AE 129.0 and EPA 8270D] GC/MS
	12,14-Dichlorodehydroabietic Acid
	12-Chlorodehydroabietic Acid
	14-Chlorodehydroabietic Acid
	9,10-Dichlorostearic Acid
	Abietic Acid
	Decanoic Acid C10
	Dehydroabietic Acid
	Docosanoic Acid C22
	Dodecanoic Acid C12
	Eicosanoic Acid C20
	Hexadecanoic Acid C16
	Isopimaric Acid
	Linolenic Acid C18:2
	Linolenic Acid C18:3
	Neoabietic Acid
	Octadecanoic Acid C18
	Oleic Acid C18:1
	Palustric Acid
	Pimaric Acid
	Sandaracopimaric Acid
	Tetradecanoic Acid
	Undecanoic Acid (C11)
CAL SOP-00236	Ammonium Water [Modified from ASTM D6919-09] ION CHROMATOGRAPHY

	Ammonia
CAL SOP-00262	Base Neutrals [Modified from EPA 8270 D] GC/MS Hexachlorobenzene

Air

AIR SOP-00009	Sorbent traps for the determination of Mercury Emissions (Field) [Modified from: Method 30B: Determination of total vapor phase mercury emissions from Coal-Fired Combustion Sources Using Carbon Sorbent Traps. US EPA Code of Regulations] SPECTROMETER - ATOMIC ABSORPTION DETECTOR Mercury (Hg)
AIR SOP-00110	Anions-Water [Modified from Methods Manual for Chemical Analysis of Atmospheric Pollutants, method 52121] ION CHROMATOGRAPHY - CONDUCTIVITY DETECTOR Chloride Fluoride Nitrate Sulfate
AIR SOP-00111	Ammonia Water [Modified from Methods Manual for Chemical Analysis of Atmospheric Pollutants, method 52626] ION CHROMATOGRAPHY - CONDUCTIVITY DETECTOR Ammonia
AIR SOP-00112	Fixed Gases - Air [Modified from Method 3, Alberta Stack Sampling Code, 1995, Publication Number: REF.89 and EPA GC/TCD CO CO2 N2 O2
AIR SOP-00113	Formaldehyde Water [Modified from Methods Manual for Chemical Analysis of Atmospheric Pollutants, method 12525] COLORIMETRIC Formaldehyde
AIR SOP-00114	Hydrocarbons - Air [Modified from AENV18] GC/FID

	Total Hydrocarbons as Methane
AIR SOP-00115	Total Particulates - Air Filter [Modified from method 5, Determination of Particulate Emissions from Stationary Sources, Alberta Stack Sampling Code, 1995, Publication Number: REF.89 GRAVIMETRIC Particulates
AIR SOP-00116	Total/Trace Reduced Sulfur - Air (Field) [Modified from AENV.TRS.P&P-1 and AENV.TRS.SGP-1] GC/PID Carbon disulfide Carbonyl Sulfide Dimethyl disulfide Dimethyl sulfide Hydrogen Sulphide Methyl mercaptan
AIR SOP-00122	Chlorine and Chlorine Dioxide Air (Field) [Modified from ALBERTA ENVIRONMENT STACK CODE, 1995, Publication Number REF 89] IODOMETRIC DETERMINATION Chlorine Chlorine Dioxide

Soil/Solid

AB SOP-00002	Moisture Content in Soil [Modified from CCME Petroleum Hydrocarbons In Soil - Tier 1 Method Section 13] GRAVIMETRIC % Moisture
AB SOP-00003	Analysis of PAH in Water, Soil, Oil and Leachates by GC/MS [Modified from EPA 8270D, Polycyclic Aromatic Hydrocarbons in Solids by GC/MS-PBM, page 223 and 229] - Soils and water 1-Methylnaphtalene 2-Methylnaphthalene Acenaphthene Acenaphthylene Acridine Anthracene Benzo (a) anthracene Benzo (a) pyrene Benzo (b, j) fluoranthene Benzo (g,h,i) perylene Benzo (k) fluoranthene

	Benzo(c)phenanthrene
	Benzo(e)pyrene
	Chrysene
	Dibenzo (a,h) anthracene
	Fluoranthene
	Fluorene
	Indeno (1,2,3 - cd) pyrene
	Naphtalene
	Perylene
	Phenanthrene
	Pyrene
	Quinoline
AB SOP-00004	Determination of Electrical Conductivity by Manual Meter [Modified From SM 2510B - Soils and waters CONDUCTIVITY METER (MANUAL) Conductivity
AB SOP-00005	Alkalinity Conductivity Fluoride and pH by PC-Titrate [Modified From SM 2510 B, SM 4500 H+B, SM 2320 B, SM 4500-F C] - Soil & Waters PC TITRATE Conductivity (25ªC) Alkalinity Fluoride pH
AB SOP-00006	pH by Manual Meter [Modified from SM 4500-H+ B] Soils and waters pH METER pH
AB SOP-00007	Ammonia-Nitrogen by Konelab - Phenate colorimetric method [Modified From 15.2 and EPA 350.1]- Soils and Waters [Modified From EPA 350.1]- Waters COLORIMETRIC Ammonia
AB SOP-00008	TKN by Konelab [Modified From EPA 351.1, EPA 351.2] - Soil and Waters COLORIMETRIC Total Kjeldahl Nitrogen
AB SOP-00012	Total Organic Carbon and Organic Matter in Soil [Modified From Methods Manual For Soil and Plant Analysis, Pages 27-30] REFLUX TITRIMETRIC Organic Matter Calculation Total Organic Carbon

AB SOP-00019	Calcium Carbonate Equivalence by pH [Modified From SSMA 20.2] pH METER Calcium Carbonate Equivalence (CCE)
AB SOP-00020	Chloride by Konelab - Automated Ferric Thiocyanate Method [Modified From SM 4500Cl-G] - Soils and waters COLORIMETRIC Chloride
AB SOP-00022	Particle Size Distribution by Sieve Analysis [Modified from ASTM D6913-04] GRAVIMETRIC/SIEVE Grain size Particle size by sieve (Special)
AB SOP-00023	Nitrite and Nitrate by Ion Chromatography [Modified from SM 4110 B] Soil and Waters ION CHROMATOGRAPHY Nitrate Nitrite
AB SOP-00025	Ortho-phosphate by Konelab - Ascorbic Acid Reduction Method [Modified from SM 4500-P , A and F] - Waters and soils COLORIMETRICAUTO COLOR Ortho-phosphate
AB SOP-00026	Chloride, Sulphate and Bromide by Ion Chromatography [Modified from SM 4110B] - Soils and waters ION CHROMATOGRAPHY Chloride Sulfate
AB SOP-00030	PSA by Hydrometer - Texture (Sand, Silt, Clay and gravel) Analysis [Modified from SSMA 55.3] HYDROMETER % clay % gravel % sand % silt
AB SOP-00033	Preparation of Saturation and Water-Soil Ratio Samples [Modified from SSMA Method 15.2] GRAVIMETRIC % Saturation
AB SOP-00039	Extraction and Analysis of BTEX/F1 by HS/GC/MS/FID Water, Soil and Oil [BTEX: Modified from EPA 8260C, GC/MS - HEADSPACE] - Soils and Waters [F1/PHC: Modified from CCME Petroleum Hydrocarbons - Tier 1 Method and EPA5021A] - Soils and Waters [BTEX TCLP: EPA 1311]

	GC/MS - HEADSPACE
	Benzene
	C5-C10
	Ethylbenzene
	F1: C6-C10
	m/p-xylene
	o-xylene
	Toluene
AB SOP-00040	Analysis of Extractable Hydrocarbons in Water and Soils by GCFID [Modified from CCME Petroleum Hydrocarbons In Soil - Tier 1 Method and Modified from EPA 8260C and EPA 5021A] Soils [Modified from EPA 3510C, GC/FID and CCME Hydrocarbons Tier 1] - Waters GC/FID F2: C10-C16 F3: C16-C34 F4: C34-C50 F4: Gravimetric (Soils only) F4:HTG>C34 (Soils only) Sheen (Waters only)
AB SOP-00042	Metals on Liquids and Solids by ICPOES [Modified EPA 200.7] -Soils and Waters ICP/OES Aluminum Barium Boron Calcium Chromium Iron Lithium Magnesium Manganese Phosphorus Potassium Silicon Sodium Strontium Sulfur Thorium
AB SOP-00043	Metals Analysis on Soils and Waters Using ICPMS [Modified from EPA 200.8] - Soils and Waters [TCLP: EPA 1311] ICP/MS

	Aluminum
	Antimony
	Arsenic
	Barium
	Beryllium
	Bismuth
	Boron
	Cadmium
	Calcium
	Chromium
	Cobalt
	Copper
	Iron
	Lead
	Lithium
	Magnesium
	Manganese
	Mercury
	Molybdenum
	Nickel
	Palladium
	Potassium
	Selenium
	Silicon
	Silver
	Sodium
	Strontium
	Sulphur
	Tellurium
	Thallium
	Tin
	Titanium
	Tungsten
	Uranium
	Vanadium
	Zinc
	Zirconium
AB SOP-00049	Particle Size Distribution by Hydrometer [Modified from ASTM D422-63] HYDROMETER Particle Size Distribution
AB SOP-00050	Dry Bulk Density and Wet Bulk Density [Modified from Mckeague and MSSMA Section 2.21]
	GRAVIMETRIC Bulk Density

AB SOP-00052	Bromide by Ion Chromatography - UV Detection [Modified from SM 4110 B] Soilsand waters ION CHROMATOGRAPHY/UV DETECTOR Bromide
AB SOP-00056	Preparation and Analysis VOC/F1 -Water and Soil by HS/GC/MS/FID [Modified from EPA8260C and EPA5021A F1: Modified from CCME Petroleum Hydrocarbons - Tier 1 Method] Soils and Waters GC/MS/FID [HEADSPACE] F1: C6-C10 1,1,1,2-Tetrachloroethane 1,1,1-Trichloroethane 1,1,2,2-Tetrachloroethane 1,1,2-Trichloroethane 1,1-Dichloroethane 1,1-dichloroethylene 1,2 dibromoethane 1,2,3-Trichlorobenzene 1,2,4-Trichlorobenzene 1,2,4-Trimethylbenzene 1,2-dichlorobenzene 1,2-dichloroethane 1,2-Dichloropropane 1,3,5 Trichlorobenzene 1,3,5-Trimethylbenzene 1,3-Dichlorobenzene 1,4-dichlorobenzene Benzene Bromodichloromethane Bromoform Bromomethane Carbon Tetrachloride Chlorobenzene Chlorodibromomethane Chloroethane Chloroform Chloromethane cis-1,2-Dichloroethylene cis-1,3-Dichloropropene Dichloromethane Ethylbenzene m/p-xylene Methyl methacrylate Methyl t-butyl ether

	o-xylene
	Styrene
	Tetrachloroethylene
	Toluene
	trans-1,2-Dichloroethylene
	trans-1,3-Dichloropropene
	Trichloroethylene
	Trichlorofluoromethane
	Vinyl Chloride
AB SOP-00062	Flashpoint by Small Scale Closed Cup Tester (Setaflash) [Modified from ASTM D3828] SETA FLASH CLOSED CUP
	Flashpoint
AB SOP-00063	Hexavalent Chromium by Konelab [Modified from SM 3500-Cr B]- Soil and water COLORIMETRIC
	Hexavalent Chromium
AB SOP-00071	Electrical Conductivity in Water and Soil by Manual Meter - Mobile Lab [Modified from SM 2510 B] Waters and soil CONDUCTIVITY METER
	Conductivity (25°C)
AB SOP-00073	Moisture in Solid Samples-Mobile Lab [Modified from CCME PHC-CWS] GRAVIMETRIC
	% Moisture
AB SOP-00074	Determination of pH in Water and Soil by Manual Meter - Mobile Laboratory) [Modified from SM 4500H+ B] Soils and waters pH METER
	pH
AB SOP-00075	Preparation of Saturation Samples - Mobile Lab [Modified from SSMA Method 15.2] GRAVIMETRIC
	% Saturation
	AB SOP-00076
AB SOP-00076	BTEX/F1 Soil and Water (Mobile lab) [BTEX: Modified from EPA 8021B] GC/PID - HEADSPACE [F1: CCME HYDROCARBONS TIER 1] - GC/FID - HEADSPACE
	Benzene
	Ethylbenzene
	F1:C6-C10
	m/p-xylene
	o-xylene

	Toluene
AB SOP-00077	Extractable Hydrocarbon Soil and Water (Mobile lab) [Modified from CCME hydrocarbons Analysis tier 1]-Soils and waters GC/FID - DIRECT INJECTION F2: C10-C16 F3: C16-C34 F4: C34-C50
AB SOP-00078	Chloride Analysis by Hach DR2800- Mobile Laboratory [Modified from SM 4500-Cl E] - Soils and waters COLORIMETRIC Chloride
AB SOP-00079	Polycyclic Aromatic Hydrocarbons (PAH) -Mobile lab [Modified from EPA 8270D] - Soils and waters GC/MS EXTRACTION 2-Methylnaphthalene Acenaphthene Acenaphthylene Acridine Anthracene Benzo (a) anthracene Benzo (a) pyrene Benzo (g,h,i) perylene Benzo (k) fluoranthene Benzo(b&j)fluoranthene Benzo(c)phenanthrene Benzo(e)pyrene Chrysene Dibenzo (a,h) anthracene Fluoranthene Fluorene Indeno (1,2,3 - cd) pyrene Naphthalene Perylene Phenanthrene Pyrene Quinoline
CAL SOP-00018	Elemental Sulfur [Modified from Canadian Journal Of Soil Science, 65. Pages 811-813, 1985] COLOUR-EXTRACTION Elemental Sulphur
CAL SOP-00019	Flashpoint in soil by Pensky-Martens closed cup tester [Modified from ASTM D93-15]

	PENSKY-MARTIENS CLOSED CUP Flashpoint
CAL SOP-00032	Spontaneous combustion (Self Heating) [Modified from Manual Tests and Criteria, TDGR 2009, sections 33.3.1.3 and 33.3.1.6]
	COMBUSTION Spontaneous Combustion
CAL SOP-00051	Cyanide WAD by Automated Pyridine Barbituric Acid Colourimetry [Modified fromEPA 335.4]- Soils and waters COLORIMETRIC - DISTILLATION
	Cyanide WAD
CAL SOP-00052	Diisopropanolamine [Modified from DIONEX PAX500 DOC #034217] - Water and soil IC -EXTRACTION
	Diisopropanolamine (DIPA)
CAL SOP-00054	Amines [Modified from DIONEX PAX500 DOC #034217] - Water and soil
	IC EXTRACTION
	Diethanolamine (DEA)
	Methyldiethanolamine (MDEA)
	Monoethanolamine (MEA)
CAL SOP-00067	Phenolics Automated 4-AAP Colorimetry [Modified from SSMA Chapter 40]-Soil [Modified from EPA 9066]-Water COLORIMETRIC DISTILLATION EXTRACTION
	Phenol
CAL SOP-00073	Cyanide (Strong Acid Dissociation) [Modified from EPA 335.4] - SOIL and water COLORIMETRIC - DISTILLATION
	Cyanide SAD
CAL SOP-00093	Glycols and Sulfolane in Water and Soil and oil by GC-FID [Modified from EPA 8015D] Soils, waters and oil GC/FID EXTRACTION
	Diethylene Glycol
	Ethylene Glycol
	Propylene Glycol
	Sulfolane
	Tetraethylene Glycol
	Triethylene Glycol
CAL SOP-00094	Herbicides [Modified from EPA 8151A and EPA 8270D] Soils and Waters

	GC/MS EXTRACTION
	2,4,5-Trichlorophenoxyacetic acid (2,4,5-T)
	2,4,5-Trichlorophenoxypropionic acid (2,4,5-TP)
	2,4-Dichlorophenoxyacetic acid (2,4-D)
	2,4-Dichlorophenoxybutyric acid (2,4-DB)
	3,5-Dichlorobenzoic Acid
	Bentazon
	Bromoxynil
	Chloramben
	Dicamba
	Dichlorprop
	Diclofop-methyl
	Dinoseb (DNBP)
	MCPA
	MCPP
	Pentachlorophenol
	Picloram
CAL SOP-00096	Total Petroleum Hydrocarbons (TPH) [Modified from SM 5520 C/F] - Soils and waters
	IR EXTRACTION
	Oil and Grease
	Total Petroleum Hydrocarbons
CAL SOP-00104	Volatile Organic Compounds (VOC) [Modified from EPA 8260C and EPA 5030 C and EPA 5035A]- Soilsand waters
	GC/MS - PT/EXTRACTION
	1,2,3-trichloropropane
	1,1,1-trichloroethane
	1,1,2,2-tetrachloroethane
	1,1,2-trichloroethane
	1,1-dichloropropene
	1,2,4-trimethylbenzene
	1,2-dibromo-3-chloropropane
	1,2-dichlorobenzene
	1,3-dichloropropane
	1,4-dichlorobenzene
	2,2-dichloropropane
	2-butanone (MEK)
	2-chlorotoluene
	2-hexanone
	2-nitropropane
	4-chlorotoluene
	4-methyl-2-pentanone (MIBK)
	Acetone

	Acetonitrile
	Acrolein
	Acrylonitrile
	Benzene
	Bromobenzene
	Bromochloromethane
	Bromodichloromethane
	Bromoform
	Carbon disulphide
	Carbon Tetrachloride
	Chlorobenzene
	Chlorodibromomethane
	Chloroform
	Cyclohexane
	Cyclohexanone
	Dibromomethane
	Dichlorodifluoromethane
	Dichloromethane
	Dicyclopentadiene
	Ethyl acetate
	Ethyl ether
	Ethyl metacrylate
	Ethylbenzene
	Hexachlorobutadiene
	Hexane
	Iodomethane
	Isopropylbenzene
	m/p-xylene
	Naphthalene
	n-Butylbenzene
	Nitrobenzene
	n-Propylbenzene
	o-xylene
	p-Isopropyltoluene
	sec-Butylbenzene
	tert-Butylbenzene
	Tetrachloroethylene
	Toluene
	Trichloroethylene
CAL SOP-00149	Polychlorinated Biphenyls (PCB) [Modified from EPA 8082A] -Soils, waters and oil

	GC/ECD - EXTRACTION
	Aroclor 1016
	Aroclor 1221
	Aroclor 1232
	Aroclor 1242
	Aroclor 1248
	Aroclor 1254
	Aroclor 1260
	Aroclor 1262
	Aroclor 1268
	Total PCB
CAL SOP-00164	Semi Volatile Phenols
	[Modified from 8270D] - Soils and waters
	GC/MS - EXTRACTION
	2,3,4,5-tetrachlorophenol
	2,3,4,6-tetrachlorophenol
	2,3,4-trichlorophenol
	2,3,5,6-tetrachlorophenol
	2,3,5-trichlorophenol
	2,3,6-trichlorophenol
	2,3-dichlorophenol
	2,4,5-trichlorophenol
	2,4,6-trichlorophenol
	2,4-dichlorophenol
	2,4-dimethylphenol
	2,4-dinitrophenol
	2,5-dichlorophenol
	2,6- dimethylphenol
	2,6-dichlorophenol
	2-chlorophenol
	2-methylphenol
	2-nitrophenol
	3&4-chlorophenol
	3&4-methylphenol
	3,4,5-trichlorophenol
	3,4-dichlorophenol
	3,4-dimethylphenol
	3,5-dichlorophenol
	4,6-dinitro-2-methylphenol
	4-chloro-3-methylphenol
	4-nitrophenol
	Pentachlorophenol
	Phenol
CAL SOP-00184	

	Aliphatic and Aromatic fractionation and analysis for >C10-C50 PHC [Modified from Atlantic RBCA Guidelines for laboratories, Tier 1 and Tier 2 Petroleum Hydrocarbon Methods] Soils and Waters GC/FID >C10-C12 Aliphatic >C10-C12 Aromatic >C12-C16 Aliphatic >C12-C16 Aromatic >C16-C21 Aliphatic >C16-C21 Aromatic >C21-C34 Aliphatic >C21-C34 Aromatic >C34 Aliphatic >C34 Aromatic
CAL SOP-00239	Extractable Petroleum Hydrocarbons (EPH) [Modified from analytical methods for contaminated sites: EPH in solids by GC/FID BCMELP]- soils and water GC/FID EPH: C10-C19 EPH: C19-C32 GC/FID
CAL SOP-00240	Volatile Petroleum Hydrocarbon (VPH) [Modified from volatile HC in soils by GC/FID and EPA method 5021A] - Soils and waters GC/FID Benzene C6-C8 C6-o-Xylene C8-C10 Aromatic Ethylbenzene m&p-xylene Methyl-tert-butylether o-xylene o-Xylene-C10 Styrene Toluene
CAL SOP-00243/CAL SOP-00263	Carbon, Nitrogen and Sulfur [Modified from LECO CORPORATION FORM NO. 203-821-170,203-821-165 and Vario El Cube No AN-A-030609, Total Organic Carbon (TOC/FOC) in soil/sediment by combustion (PBM)] - Soils IR COMBUSTION Carbon Nitrogen

	Organic Carbon
	Sulphur
CAL SOP-00250	Alkylated PAH
	[Modified from SM 8270 D and ESTD-OR-20]- Soils and waters
	GC/MS EXTRACTION
	1-Methylnaphthalene
	2-Methylnaphthalene
	Acenaphthene
	Acridine
	Anthracene
	Benzo (a) anthracene
	Benzo (a) pyrene
	Benzo (g,h,i) perylene
	Benzo (k) fluoranthene
	Benzo(b&j)fluoranthene
	Benzo(c)phenanthrene
	Benzo(e)pyrene
	Biphenyl
	C1-Acenaphthene
	C1-Benzo(bjk)fluoranthene / Benzo[a]pyrene
	C1-Biphenyl
	C1-Chrysene /benzo(a)anthracene
	C1-Dibenzothiopene
	C1-Fluorene
	C1-Naphthalene
	C1-Phenanthrene / anthracene
	C1-Pyrene/fluoranthene
	C2-Benzo(bjk)fluoranthene / Benzo[a]pyrene
	C2-Biphenyl
	C2-Chrysene /benzo(a)anthracene
	C2-Dibenzothiophene
	C2-Fluorene
	C2-Naphthalene
	C2-Phenanthrene/ anthracene
	C2-Pyrene/Fluoranthene
	C3-Chrysene /benzo(a)anthracene
	C3-Dibenzothiophene
	C3-Fluorene
	C3-Naphthalene
	C3-Phenanthrene/ anthracene
	C3-Pyrene/Fluoranthene
	C4-Chrysene /benzo(a)anthracene
	C4-Dibenzothiophene

	C4-Naphthalene
	C4-Phenanthrene/ anthracene
	C4-Pyrene/Fluoranthene
	Chrysene
	Dibenzo (a,h) anthracene
	Dibenzothiophene
	Fluoranthene
	Fluorene
	Indeno (1,2,3 - cd) pyrene
	Indeno (1,2,3-cd) fluoranthene
	Naphthalene
	Perylene
	Phenanthrene
	Pyrene
	Quinoline
	Retene
CAL SOP-00258	Liquid limit, plastic limit and plasticity index of soil [Modified from ASTM D4318] ATTERBERG LIMITS TEST Liquid limit Plastic limit Plasticity index
CAL SOP-00264	Alcohols [Modified from EPA 8015D] Soils and waters GC/FID EXTRACTION 2-Methylphenol
	3-Methylphenol
	4-Methylphenol
	Acetone (2-Propanone)
	Ethanol
	Isobutanol
	Isopropanol
	Methanol
	n-butanol
	Nitrobenzene
	n-propanol
	Pyridine
CAL SOP-00265	ICPMS Analysis for BC CSR Criteria [Modified from EPA SW846 Method 6020B]-Soils and waters ICPMS Aluminum
	Antimony

	Arsenic
	Barium
	Beryllium
	Bismuth
	Boron
	Cadmium
	Calcium
	Chromium
	Cobalt
	Copper
	Iron
	Lead
	Lithium
	Magnesium
	Manganese
	Mercury
	Molybdenum
	Nickel
	Phosphorus
	Potassium
	Selenium
	Silicon
	Silver
	Sodium
	Strontium
	Sulphur
	Thallium
	Tin
	Titanium
	Uranium
	Vanadium
	Zinc
	Zirconium
CAL SOP-00266	Free Cyanide [Modified from EPA Method 9016.0]-Water Colorimetric- Distillation Free cyanide

Water (Microbiology)

CAL SOP-00012	Heterotrophic Plate Count (HPC) [Modified from SM 9215 A, B] POUR PLATE Heterotrophic Plate Count (HPC)

CAL SOP-00013	Total and Fecal Coliforms by defined substrate technique. [Modified from SM 9223 A, B] MOST PROBABLE NUMBER (COLILERT) Escherichia coli (E. coli) Total Coliforms Fecal (Thermotolerant) Coliforms
CAL SOP-00079	Determination of Iron-Related and Sulfate Reducing Bacteria using the BART Method [Modified from Dbi Env Tech Verification Of The Irb Bart Tester For The Detection and Eval. Of Iron Bacteria In Water and Dbi Enviro Tech Verification Of The Srb Bart Tester For The Detection and Verification Of Sulphate Reducing Bacteria In Water BART™ Iron Related Bacteria (IRB) Sulfate Reducing Bacteria (SRB)

Notes:

ISO/IEC 17025: 2005: General Requirements for the Competence of Testing and Calibration Laboratories
RG-LAB: SCC Requirements and Guidance for the Accreditation of Testing Laboratories

Elias Rafoul, Vice President
Accreditation Services

Date: 2018-07-12

Number of Scope Listings: 102
SCC 1003-15/1043
Partner File #0
Partner:

Standards Council of Canada

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SCOPE OF ACCREDITATION

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CLIENTS SERVED: All interested parties

FIELDS OF TESTING: Biological, Chemical/Physical

PROGRAM SPECIALTY AREA: Agriculture Inputs, Food, Animal Health and Plant Protection (PSA-AFAP) , Environmental

SCOPE ISSUED ON: 2018-07-09

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Note: Environmental testings except for Adsorbable Organic Halides, Total Sulfide by Titration, and Air matrices are performed at
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ANIMAL AND PLANTS (AGRICULTURE)

Foods and Edible Products: (Human and Animal Consumption)

MFHPB-20	Isolation and Identification of Salmonella from Foods and Environmental Samples
MFHPB-22	Enumeration of Yeasts and Moulds in Foods and Env. surfaces
MFHPB-23	Enumeration of Clostridium perfringens in Foods
MFHPB-30	Isolation of Listeria monocytogenes and Listeria spp from Foods and Environmental Samples
MFHPB-33	Enumeration of Total Aerobic Bacteria in Food Products and Food Ingredients Using 3M™ Petrifilm™ Aerobic Count Plates
MFHPB-34	Enumeration of E. coli and Coliforms in Food Products and Food Ingredients Using 3M™ Petrifilm™ E. coli Count Plates
MFLP-09	Enumeration of Enterobacteriaceae Species in Food and Environmental Samples Using 3M™ Petrifilm™ Enterobacteriaceae Count Plates
MFLP-29	The Qualicon Bax® System Method for the Detection of Salmonella in Foods and Environmental Surface Samples
MFLP-39	Detection of Listeria spp. From Environmental Surfaces and heat processed RTE Meat and Poultry Using iQ-Check™ Listeria spp. Real-Time PCR Test Kit
MFLP-54	Detection of Listeria monocytogenes from selected foods using iQ-Check Listeria monocytogenes Real-Time PCR Test Kit
MFLP-74	Enumeration of Listeria monocytogenes in Foods

ENVIRONMENTAL AND OCCUPATIONAL HEALTH AND SAFETY

Environmental

Air

PTC SOP - 00128	VOCs by Thermal Desorption Diffusive Tube [EPA 325B] 1, 3-Butadiene Benzene Ethylbenzene m,p-Xylenes o-Xylene Toluene
PTC SOP - 00146	

	Determination of Sulfate in Carbonate Plates by IC [AMD 14547]
	Sulfide
PTC SOP - 00148	Monitoring NO2 in the Atmosphere by using All-Season Passive Samplers [SM4500-NO2-B/AWMA 91st PAPER 98-TP44.03]
	Nitrite
PTC SOP - 00149	Monitoring SO2 in the Atmosphere by using All-Season Passive Samplers [H. Tang, B. Brassard, R. Brassard and E. Peake, "A New Passive Sampling System for Monitoring SO2 in the Atmosphere" Proceedings, Clean Air '96: Second North American Conference and Exhibition, Nov. 19-22, 1996 Orlando USA] Sulfite
PTC SOP - 00150	Monitoring H2S in the Atmosphere by using All-Season Passive Samplers [Hongmao Tang "A New All-Season Passive Sampling System for Monitoring H2S in Air" The Scientific World, (2002)2, 155-168]
	Hydrogen Sulfide
PTC SOP - 00154	Analysis of Hydrogen Sulphide on Static Sample Strips [Modified from AMD 13030] Sulfide
	Sulfide
PTC SOP - 00156	Volatile Organic Compounds on Passive Samplers using GC/MS [Modified from BP 36-126-NIOSH Method 1500, Issue 2 (Aug. 15,1994) and Aromatic-NIOSH Method 1501, Issue 2 (Aug 15, 1994)]
	1,1,1-Trichloroethane
	1,1,2-Trichloroethane
	1,2,4-Trimethylbenzene
	1,2-Dichlorobenzene
	1,3,5-Trimethylbenzene
	1,4-Dichlorobenzene
	2-Hexanone
	2-methyl-4-Pentanone (MIBK)
	3-Ethyltoluene
	Benzene
	Chlorobenzene
	Chloroform
	Decane
	d-Limonene
	Dodecane
	Ethylbenzene
	Heptane
	Isopropylbenzene
	Methylcyclohexane

	Naphthalene
	Nonane
	Octane
	Styrene
	Tetrachloroethylene
	Toluene
	Trichloroethylene
	Undecane
	Xylene, Total
PTC SOP - 00157	Monitoring NH3 in the Atm by using the Ogawa Passive Samplers [ASTM D6919]
	Ammonia
PTC SOP - 00197	Monitoring O3 in the Atmosphere by using Maxxam All-Season Passive Samplers [H. Tang and T. Lau "A New All-Season Passive Sampling System for Monitoring Ozone in Air", Environmental Monitoring and Assessment, 65 (1-2) 129-137, 2000.]
	Ozone

Air Filter

PTC SOP - 00151	MASS DETERMINATION OF PARTICULATE MATTER (PM 2.5 and 10)Gravimetric [Modified from US EPA, Quality Assurance Guidance Document, 2.12: Monitoring PM2.5 in Ambient Air Using Designated Reference or Class I Equivalent Method, Nov. 1998.]
	PM10
	PM2.5
PTC SOP - 00180	DUSTFALL, Total and Fixed, Gravimetric [Modified from AMD, Appendix 4-6]
	Dustfall, Fixed
	Dustfall, Total

Soil/Solid

AB SOP-00002	Moisture Content in Soil [modified from CCME Petroleum Hydrocarbons In Soil - Tier 1 Method, Gravimetric]
	% Moisture
AB SOP-00003	Analysis of PAH in Water, Soil, Oil and Leachates by GC/MS [Modified from EPA 8270, GC/MS] Also includes Water (Organic)
	1-Methylnaphthalene
	2-Methylnaphthalene
	Acenaphthene
	Acenaphthylene
	Acridine

	Anthracene
	Benzo (a) anthracene
	Benzo (a) pyrene
	Benzo (b, j) fluoranthene
	Benzo (g,h,i) perylene
	Benzo (k) fluoranthene
	Benzo(c)phenanthrene
	Benzo(e)pyrene
	Chrysene
	Dibenzo (a,e) pyrene
	Dibenzo (a,h) anthracene
	Dibenzo(a,h)pyrene
	Dibenzo(a,i)pyrene
	Dibenzo(a,l)pyrene
	Fluoranthene
	Fluorene
	Indeno (1,2,3 - cd) pyrene
	Naphthalene
	Perylene
	Phenanthrene
	Pyrene
	Quinoline
AB SOP-00004	Determination of Electrical Conductivity by Manual Meter [Modified From SM 2510 B, Conductivity Meter (Manual)] . Also includes Water - Inorganic
	Conductivity (25°C)
AB SOP-00005	Alkalinity Conductivity Fluoride and pH by PC-Titrate [Modified From SM 2320 B, Titrimetric/PC Titrate, Modified from SM 4500-F C, Ion Selective Electrode/PC Titrate, Modified From SM 2510 B, Conductivity Meter/PC Titrate and Modified From SM 4500-H+ B, pH Meter/PC Titrate] Also includes Water- Inorganic
	Alkalinity
	Conductivity (25ºC)
	Fluoride
	pH
AB SOP-00006	pH by Manual Meter [Modified From SM 4500-H+ B, pH Meter] Also includes Water - Inorganic
	pH
AB SOP-00007	Ammonia-Nitrogen by Konelab - phenate colorimetric method [Modified From EPA 350.1] Also includes Water - Inorganic
	Ammonia

AB SOP-00008	TKN by Konelab [Modified From EPA 351.1 Colorimetric] Also includes Water - Inorganic
	Dissolved Kjeldahl Nitrogen
	Total Kjeldahl Nitrogen
AB SOP-00012	Total Organic Carbon and Organic Matter in Soil [Modified From Methods Manual For Forest and Plant Analyses, Pages 27-30, Reflux - Titrimetric]
	Organic Matter
	Total Organic Carbon
AB SOP-00019	Calcium Carbonate Equivalence by pH [Modified From SSMA 20.2, pH Meter]
	Calcium Carbonate Equivalence (CCE)
AB SOP-00020	Chloride by Konelab - Automated Ferric Thiocyanate Method [Modified From SM 4500-Cl E, Colorimetric] Also includes Water - Inorganic
	Chloride
AB SOP-00022	Particle Size Distribution by Sieve Analysis [Modified from ASTM D6913, Gravimetric]
	Particle Size by sieve (Dry)
	Particle size by sieve (Special)
AB SOP-00023	Nitrite and Nitrate by Ion Chromatography [Modified from SM 4110B, Ion Chromatography] Also includes Water - Inorganic
	Nitrate
	Nitrite
AB SOP-00025	Ortho-phosphate (Dissolved) by Konelab - Ascorbic Acid Reduction Method [Modified from SM 4500-P A, F Colorimetric] Also includes Water - Inorganic
	Ortho-phosphate
AB SOP-00026	Chloride, Sulphate and Bromide by Ion Chromatography [Modified from SM 4110B, Ion Chromatography] Also includes Water- Inorganic
	Bromide
	Chloride
	Sulfate
AB SOP-00030	PSA by Hydrometer - Texture (Sand, Silt, Clay and Gravel) Analysis [Modified from SSMA 55.3, Hydrometer]
	% clay
	% gravel
	% sand
	% silt
AB SOP-00033	Preparation of Saturation and Water-Soil Ratio Samples [Modified from SSMA Method 15.2, Gravimetric]
	% Saturation
AB SOP-00036	

	Extraction of Total Extractable Hydrocarbons and PAH in Soil by AME [CCME Petroleum Hydrocarbons In Soil - Tier 1 Method, Gravimetric]
	F4: Gravimetric
AB SOP-00039	Extraction and Analysis of BTEX/F1 by HS/GC/MS/FID Water, Soil and Oil [BTEX: Modified from EPA 8260 and EPA 5021, GC/MS Headspace and F1: Modified from CCME Petroleum Hydrocarbons In Soil - Tier 1 Method, GC/FID - Headspace] [Also includes Water - Organic, BTEX: Modified from EPA 8260 and EPA 5021, GC/MS - Headspace and F1: Modified from CCME Petroleum Hydrocarbons - Tier 1 Method and EPA 5021, GC/FID - Headspace. [Also includes Leachates - EPA SW-846 1311 and In-House Modified Method, GC/MS - Headspace]
	Benzene
	Ethylbenzene
	F1: C6-C10
	m/p-xylene
	o-xylene
	Toluene
AB SOP-00040	Analysis of Extractable Hydrocarbons in Water and Soils by GCFID [Modified from CCME Petroleum Hydrocarbons In Soil - Tier 1 Method, GC/FID [Also includes Water Organic, Modified from CCME Petroleum Hydrocarbons In Soil - Tier 1 Method, GC/FID, and Modified from Static Sheen Test (EPA Method 1617), Visual
	F2: C10-C16
	F3: C16-C34
	F4: C34-C50
	Sheen
	Total Extractable Hydrocarbons (TEH) (C11-C30)
AB SOP-00042	Metals on Liquids and Solids by ICPOES [Modified from EPA 200.7 ICP/OES] Also includes Water - Inorganic
	Aluminum
	Barium
	Boron
	Calcium
	Chromium
	Iron
	Lithium
	Magnesium
	Manganese
	Phosphorus
	Potassium
	Silicon

	Sodium
	Strontium
	Sulfur
AB SOP-00043	Metals Analysis on Soils and Waters Using ICPMS [Modified from EPA 200.8, ICP/MS] Also includes Water - Inorganic and Paint. Also includes Leachates - EPA SW-846 1311 and In-House Modified Method.
	Aluminum
	Antimony
	Arsenic
	Barium
	Beryllium
	Boron
	Cadmium
	Chromium
	Cobalt
	Copper
	Iron
	Lead
	Magnesium
	Manganese
	Mercury
	Molybdenum
	Nickel
	Selenium
	Silver
	Thallium
	Tin
	Titanium
	Uranium
	Vanadium
	Zinc
	Zirconium
AB SOP-00049	Particle Size Distribution by Hydrometer [Modified from ASTM D422, Hydrometer]
	Particle Size Distribution
AB SOP-00050	Dry Bulk Density and Wet Bulk Density [Modified from MSSMA Section 2.21, Gravimetric]
	Dry Bulk Density
AB SOP-00056	Preparation and Analysis VOC/F1 Water and Soil by HS/GC/MS/FID [Modified from EPA SW-846 8260 and EPA SW-846 5021, GC/MS - Headspace] Also includes Water - Organic
	1,1,1,2-Tetrachloroethane
	1,1,1-Trichloroethane

	1,1,2,2-Tetrachloroethane
	1,1,2-Trichloroethane
	1,1-Dichloroethane
	1,1-dichloroethylene
	1,2,3-Trichlorobenzene
	1,2,4-Trichlorobenzene
	1,2,4-Trimethylbenzene
	1,2-dichlorobenzene
	1,2-dichloroethane
	1,2-Dichloropropane
	1,3,5 Trichlorobenzene
	1,3,5-Trimethylbenzene
	1,3-Dichlorobenzene
	1,4-dichlorobenzene
	Benzene
	Bromodichloromethane
	Bromoform
	Bromomethane
	Carbon Tetrachloride
	Chlorobenzene
	Chlorodibromomethane
	Chloroethane
	Chloroform
	Chloromethane
	cis-1,2-Dichloroethylene
	cis-1,3-Dichloropropene
	Dichloromethane
	Ethylbenzene
	Ethylene Dibromide
	m/p-xylene
	Methyl methacrylate
	Methyl t-butyl ether
	o-xylene
	Styrene
	Tetrachloroethylene
	Toluene
	trans-1,2-Dichloroethylene
	trans-1,3-Dichloropropene
	Trichloroethylene
	Trichlorofluoromethane
	Vinyl Chloride
AB SOP-00062	Flashpoint by Small Scale Closed Cup Tester (Setaflash) [Modified from ASTM D3828 Method A, Seta Flash Closed Cup]

	Also includes Water Inorganic
	Flashpoint Temperature
AB SOP-00063	Hexavalent Chromium by Konelab [Modified from SM 3500-Cr B, Colorimetric] Also includes Water - Inorganic
	Hexavalent Chromium
AB SOP-00071	Electrical Conductivity in Water and Soil by Manual Meter - Mobile Lab [Modified from SSMA 15.3, Manual Meter] [Also includes Water - Inorganic, Modified from SM 2510 B, Conductivity Meter
	Conductivity (25°C)
AB SOP-00074	Determination of pH in Water and Soil by Manual Meter Mobile Laboratory [Modified from SM 4500-H+ B, pH Meter] Also includes Water - Inorganic
	pH
AB SOP-00075	Preparation of Saturation Samples - Mobile Lab [Modified from SSMA Method 15.2, Gravimetric]
	% Saturation
AB SOP-00076	BTEX/F1 in Water and Soil by GC Headspace PID/FID - Mobile Laboratory [BTEX: Modified from EPA 8021 and EPA 5021, GC/PID Headspace, and F1: CCME Hydrocarbon Tier 1, GC/FID Headspace] [Also includes Water Organic BTEX: Modified from EPA 8021 and EPA 5021, GC/PID Headspace and, F1: Modified from CCME Hydrocarbon Tier 1, GC/FID - Headspace]
	Benzene
	Ethylbenzene
	F1: C6-C10
	m/p-xylene
	o-xylene
	Toluene
AB SOP-00077	Extractable Hydrocarbon in Water and Soil - Mobile Laboratory [CCME Petroleum Hydrocarbons In Soil - Tier 1 Method, GC/FID] [Also includes Water Organic, Modified from CCME Petroleum Hydrocarbons In Soil - Tier 1 Method, GC/FID]
	F2: C10-C16
	F3: C16-C34
	F4: C34-C50
AB SOP-00078	Chloride Analysis by Hach DR2800- Mobile Laboratory [Modified from SM 4500-Cl E, Colorimetric] Also includes Water - Inorganic
	Chloride
AB SOP-00079	

	Determination of PAH in Water and Soil - Mobile Laboratory [Modified from EPA 8270, GC/MS] Also includes Water - Organic
	2-Methylnaphthalene
	Acenaphthene
	Acenaphthylene
	Acridine
	Anthracene
	Benz[a]anthracene
	Benzo[a]pyrene
	Benzo[b+j]fluoranthene
	Benzo[c]phenanthrene
	Benzo[e]pyrene
	Benzo[ghi]perylene
	Benzo[k]fluoranthene
	Chrysene
	Dibenz[a,h]anthracene
	Fluoranthene
	Fluorene
	Indeno[1,2,3-cd]pyrene
	Naphthalene
	Perylene
	Phenanthrene
	Pyrene
	Quinoline
EENVSOP-00061	Phenols Technicon [Modified from Methods Manual For Chemical Analysis Of Water and Wastes, Updated, Alberta Enviro. Centre, Phenolics, Method Code 154 EPA 9066, SSMA 40, Colorimetric] Also includes Waters - Inorganic
	Phenols
EENVSOP-00062	The Determination of Cyanide by Technicon [Modified from SM 4500-CN, Colorimetric] Also includes Water - Inorganic
	Cyanide (SAD)
	Cyanide (WAD)
	Total Cyanide
	Water soluble Cyanide
EENVSOP-00069	Elemental Sulfur [Modified from Canadian Journal Of Soil Science, 65, Pp 811-813, Colorimetric]
	Elemental Sulphur
EENVSOP-00077	Determination of Grain Size of Soils [Modified from SSMA 55.4, Sieve Analysis - Wet]

	% grain size > 75 um
	% grain size < 75 um

Soil/Solid Industrial Waste

AB SOP-00045	Specific Gravity [Modified from SM 2701 F, Petroleum and Natural Gas Industries- Field Testing of Drilling Fluids, Specific Gravity] Also includes Water - Inorganic Specific Gravity
AB SOP-00047	Free Liquid (Paint Filter Test) [Modified from EPA 9095, Volumetric]
	Free Liquid in Waste Samples

Water (Inorganic)

AB SOP-00011	Silica (Reactive) by Konelab - Molybdate/ANSA Reduction Method [Modified From EPA 370.1, Colorimetric]
	Reactive Silica
AB SOP-00016	Chemical Oxygen Demand (Total and Dissolved) [Modified From SM 5220 D, Colorimetric]
	COD
AB SOP-00017	Biochemical Oxygen Demand [Modified From SM 5210 B, D.O. Meter]
	BOD (5 day)
	CBOD (5 day)
AB SOP-00018	Sulfate by Konelab - Automated Turbidimetry Method [Modified From SM 4500-SO4 E, Turbidimetric]
	Sulfate
AB SOP-00024	Total Phosphorus by Konelab - Ascorbic Acid Reduction Method [EPA 365.1 and SM 4500-P A, B, F, Colorimetric]
	Total Phosphorus
AB SOP-00032	The Determination of Residual Chlorine in Waters [Modified from SM 4500-Cl G, Colorimetric]
	Free Chlorine
	Total Chlorine
AB SOP-00041	Ferrous and Ferric Iron in Water-Colorimetric Determination [Modified from SM 3500-Fe A, B, Colorimetric]
	Ferrous Iron
AB SOP-00052	Bromide by Ion Chromatography - UV Detection [Modified from SM 4110 B, Ion Chromatography]
	Bromide
AB SOP-00058	Dissolved Oxygen- Modified Winkler Method [Modified from SM 4500-O C, Titrimetric]
	Dissolved Oxygen
AB SOP-00061	

	Total Suspended Solids, Total Fixed Solids, and Total Volatile Solids [Modified from SM 2540 C, D, E, Gravimetric]
	Fixed Solids
	Total Suspended Solids
	Volatile Suspended Solids
AB SOP-00065	Total Dissolved Solids (TDS) [Modified from SM 2540 C, D, E, Gravimetric]
	Total Dissolved Solids
AB SOP-00080	Low Level Sulfide [Modified from SM 4500-S2 D, Colorimetric]
	Sulfide
EENVSOP-00031	Mercury in Water Samples by Cold Vapour Atomic Absorption Spectrometry [Modified from EPA 245.1 and EPA 1631, Cold Vapour AA] Mercury
EENVSOP-00060	Organic Carbon Technicon [Modified from Methods Manual For Chemical Analysis Of Water and Wastes, Updated, Alberta Enviro. Centre, Method Code 119, Colorimetric]
	Organic Carbon
EENVSOP-00065	True Colour [Modified from SM 2120 C, Colorimetric]
	True Colour
EENVSOP-00066	Turbidity - Nephelometric Method [Modified from SM 2130 B, Nephelometric]
	Turbidity
EENVSOP-00093	Oil and Grease Water Analysis by Gravimetric Hexane Extraction Method [Modified from SM 5520 B, Gravimetric]
	Total Oil and Grease
	Total Petroleum Hydrocarbons (TPH)
EENVSOP-00146	Manganese Divalent Species in Water and Wastewaters [Modified from Hach Method 8149, Colorimetric]
	Divalent Manganese
EENVSOP-00159	pH by Manual Meter [Modified From SM 4500-H+ B, pH Meter]
	pH
PTC SOP -00173	Sulphide - Total, Titration Method [SM 4500-S2 F]

Water (Microbiology)

EENVSOP-00157	Fecal Coliforms by Membrane Filtration [Modified from SM 9222, D, Membrane Filtration]
	Fecal (Thermotolerant) Coliforms
EENVSOP-00162	Total Coliforms and Escherichia Coli (E. Coli) by DST [Modified from SM 9223 A, B, Most Probable Number (Colilert)]

	Escherichia coli (E. coli)
	Total Coliforms
EENVSOP-00163	Heterotrophic Plate Count [Modified from SM 9215 A, B, Pour Plate]
	Heterotrophic Plate Count (HPC)
EENVSOP-00173	Determination of Iron-Related Bacteria using the IRB-BART Method [Modified from Dbi Env Tech Verification Of The IRB-Bart Tester For The Detection and Eval. Of Iron Bacteria In Water, Dbi Bio Activity Reaction Test Bart User Manual, Bart]
	Iron Related Bacteria (IRB)
EENVSOP-00174	Determination of Sulfate Reducing Bacteria by using BART [Modified from Dbi Enviro Tech Verification Of The Srb-Bart Tester For The Detection and Verification Of Sulfate Reducing Bacteria In Water, Dbi Bio Activity Reaction Test Bart User Manual, Bart]
	Sulfate Reducing Bacteria (SRB)

Water (Organic)

(Adsorbable Organic Halides - Water [028])

PTC SOP - 00056	Adsorbable Organic Halides [AE128.1 March 1992/ ASTM D4744]
	Colormetric Titration

Water (Toxicology)

EENVSOP-00154	48-Hr Acute Static Bioassay using Daphnia magna [EPS 1/Rm/11 and EPS 1/RM/14, Acute Lethality (Survival)]
	Daphnia LC50 (48 h)
	Daphnia Single Concentration (48h)
EENVSOP-00155	Ceriodaphnia dubia Reproduction Inhibition and 7-Day Survival Chronic [EPS 1/RM/21, Survival and Reproduction Inhibition]
	Ceriodaphnia dubia (7d)
EENVSOP-00156	Fathead Minnow Larval Growth and Survival 7 Day Chronic Test [EPS 1/RM/22, Survival and Growth Inhibition]
	Fathead Minnow (7d)
EENVSOP-00158	15 min. Microtox BioAssay using Vibrio fischeri [EPS 1/RM/24, Bioluminescence]
	Microtox IC50 (15 min)
EENVSOP-00160	96-Hour Acute Static Bioassay using Rainbow Trout [EPS 1/RM/9 and EPS 1/RM/13, Acute Lethality (Survival)]
	Trout LC50 (96 h)
	Trout Single Concentration (96h)

NON METALLIC MINERALS AND PRODUCTS

Petroleum Refinery Products: (Including asphalt materials; petrochemicals; fuels and lubricants)

Fuels and Lubricants

PTC SOP-00010	Determination of Water in Lubricating Oil by the Visual Crackle Test [Fitch, J. C., The Lubrication Field Test and Inspection Guide, Noria Publishing, Booklet, 2000]
PTC SOP-00011	Additives, Wear Metals and Contaminants in Lubricating Oils by ICPOES [ASTM D5185]
PTC SOP-00012	Kinematic Viscosity of Lubricating Oils [ASTM D7279]
PTC SOP-00013	Oxidation, Nitration, Sulphation and Soot of Engine oils by FTIR [ASTM D7418]
PTC SOP-00014	Determination of Fuel Dilution for In-Service Engine Oils by GC [ASTM D7593]
PTC SOP-00015	Determination of Glycol Contamination for In-Service Engine Oils by GC [ASTM D7922]
PTC SOP-00016	Acid Number of Lubricating Oils by Potentiometric Titration [ASTM D664]
PTC SOP-00017	Base Number of Lubricating Oils by Potentiometric Titration [D4739]
PTC SOP-00018	Water Content in Lubricating Oils by Coulometric KF Titration [ASTM D6304]
PTC SOP-00020	ISO Particle Count of Lubricating Oils Using an Optical Particle Counter [ISO 11500:2008]
PTC SOP-00027	Soot Percentage of Diesel Engine Oil by Wilks Soot Meter
PTC SOP-00028	PQ Index of Lubricating Oil
PTC SOP-00029	Analysis of Hydrocarbon Condensates by Heated Flash [GPA 2177, 2186, 2103, 2261]
PTC SOP-00033	Calibration and Analysis of Trace Sulfur Compounds in Petroleum Products [ASTM D5623]
PTC SOP-00039	Boiling Range Distribution by ASTM D7900

PTC SOP-00057	Total Base Number of Lubricating Oils by Potentiometric Titration [ASTM D2896]
PTC SOP-00030	Analysis of C4 Components in Condensate [GPA 2177]
PTC SOP-00031	Calibration and Analysis of Trace Sulfur Compounds in Petroleum Products [ASTM D-5504 Modified]
PTC SOP-00035	Analysis of Elemental and Polysulphide Sulphur ["Quantitative Determination of Elemental Sulphur in Hydrocarbons, Soils, and Other Materials", Journal of Chromatographic Science, Vol. 27, May 1989 by P.D. Clarke & K.L. Lesage]
PTC SOP-00036	Hydrocarbon C30 Analysis by Gas Chromatography [ASTM D2887/CAN/CGSB 3.0, No.14.3]
PTC SOP-00037	Density of Light Hydrocarbons (condensate) by Digital Densitometer [ASTM D4052/ ASTM D5002]
PTC SOP-00038	Trace Methanol by Gas Chromatography [UOP 569 (modified)]
PTC SOP-00040	Hydrogen Sulphide Determination by Tutweiler [Adapted from UOP 9-59 and C-1 of the GPA Plant Operations Test Manual]
PTC SOP-00041	H2S Content in Hydrogen Gas or Air by Stain Detection Tubes [GPA 2377]
PTC SOP-00044	Analysis of LPG/NGL to C15+ (Extended) [GPA 2186]
PTC SOP-00045	Ponau Analysis [CAN/CGSB 3.0 No. 14.3]
PTC SOP-00048	Hydrocarbon C100 Analysis by Gas Chromatography [ASTM D6352]
PTC SOP-00049	Component Analysis of Glycols, Amines, and Sulfinols by GC [UOP 523 modified]
PTC SOP-00050	Total Organic Halogens and Organic Chlorides [modified ASTM D4929]
PTC SOP-00051	Boiling Range Distribution of Petroleum Fractions by Gas Chromatography [ASTM D2887]
PTC SOP-00052	High Pressure Density [ASTM D4052/5002]
PTC SOP-00054	Extractable Organic Halogens [U.S EPA 9023]
PTC SOP-00055	Boiling Range Distribution by ASTM D6352
PTC SOP-00058	Molecular Weight by Freezing Point Depression [Cryette Instrument Manual]
PTC SOP-00062	

	Analysis of Hydrocarbon Gas [GPA 2286]
PTC SOP-00067	Measurement of Viscosity by Cannon - Fenske Opaque Viscometer [ASTM D445;D446]
PTC SOP-00068	Pour Point Analysis of Petroleum Products [ASTM D97; D5853]
PTC SOP-00071	Distillation of Petroleum Products at Atmospheric Pressure [ASTM D86]
PTC SOP-00072	Reid Vapour Pressure of Petroleum Products [ASTM D323A]
PTC SOP-00082	Flash-Point by Pensky-Martens Closed Cup Tester [ASTM D93]
PTC SOP-00083	Detection of Copper Corrosion from Petroleum Products by the Copper Strip [ASTM D130]
PTC SOP-00084	Water and Sediment in Crude by the Centrifuge Method (Laboratory Procedure) [ASTM D4007]
PTC SOP-00089	Aniline Point of Petroleum Products [ASTM D611]
PTC SOP-00091	Electrical Conductivity of Aviation and Distillate Fuels [ASTM D2624]
PTC SOP-00092	Free Water and Particulate Contamination in Distillate Fuels (Visual Inspection Procedures) [ASTM D4176]
PTC SOP-00093	Filterability of Diesel Fuels by Low Temperature Flow Test (LTFT) [ASTM D4539]
PTC SOP-00099	Density and Relative Density of Liquids by Digital Density Meter [ASTM D4052]
PTC SOP-00100	Density and Relative Density of Crude Oils by Digital Density Analyzer [ASTM D5002]
PTC SOP-00103	Total Acid Number of Petroleum Products by Potentiometric Titration [ASTM D664]
PTC SOP-00105	Water in Petroleum Products by Coulometric Karl Fischer Titration [ASTM D4928]
PTC SOP-00107	Standard Test Method for Determination of Carbon Residue (Micro Method) [ASTM D4530]
PTC SOP-00108	Particulate Contamination in Middle Distillate Fuels by Laboratory Filtration [ASTM D6217]
PTC SOP-00111	Total Nitrogen Sulphur in Hydrocarbons by boat-inlet Antek [ASTM D5453-S, ASTM D5762 N_2, ASTM D4629 Trace Nitrogen]

PTC SOP-00115	Sediment in Oil by Membrane Filtration [ASTM D4807]
PTC SOP-00116	Sulfur in Petroleum Products by Energy-Dispersive X-Ray Fluorescence Spectroscopy [ASTM D4294]
PTC SOP-00120	Cetane Number of Diesel Fuel Oil [ASTM D613]
PTC SOP-00121	Heat of Combustion of Liquid Hydrocarbon Fuels by Bomb Calorimeter [ASTM D240]
PTC SOP-00122	Lubricity of Diesel Fuels by High Frequency Reciprocating Rig [ASTM D6079]
PTC SOP-00126	Acid Number by Color-Indicator Titration [ASTM D974]
PTC SOP-00175	Ash Content [ASTM D482]
PTC SOP-00204	High Temperature Stability of Distillate Fuels [ASTM D6468]
PTC SOP-00206	Metals Analysis in Organics by ICPOES [ASTM D5708]
PTC SOP-00209	Trace Hydrocarbon Analysis by GC
PTC SOP-00211	Light End Analysis in Stabilized Hydrocarbon Liquids
PTC SOP-00218	Boiling Range distribution by ASTM D7169
PTC SOP-00221	Oxidation Stability of FAME (Accelerated Oxidation Test) [EN14 112]
PTC SOP-00222	Water and Sediment in Fuel Oils by Centrifuge Method [ASTM D1796]
PTC SOP-00223	Water and Sediment in Middle Distillates by Centrifuge Method [ASTM D2709]
PTC SOP-00241	Ultimate Analysis of Coal and Coke (including Sulfur) [ASTM D3176 / ASTM D4239]
PTC SOP-00242	Proximate Analysis of Coal and Coke and Loss on Ignition Determination [ASTM D7582 / ASTM D7348]
PTC SOP-00250	Preparation of Coal Samples and Determination of Moisture in Coal [ASTM D2013 / ASTM D3302]
PTC SOP-00254	Heating Value of Coal and Coke by Bomb Calorimeter [ASTM D5865]
PTC SOP-00267	Viscosity by Stabinger [ASTM D7042]
PTC SOP-00275	Particle Size Distribution by Beckman Coulter Laser Analyzer
PTC SOP-00279	Total Mercury in Coal and Coal Combustion Residues [ASTM D6722]

Notes:

ASTM: American Society for Testing and Materials

ISO/IEC 17025: 2005: General Requirements for the Competence of Testing and Calibration Laboratories

RG-LAB: SCC Requirements and Guidance for the Accreditation of Testing Laboratories
RG-ONSITE: SCC Requirements and Guidance for the Accreditation of Testing and Calibration Laboratories Performing On-Site Testing and Calibrations
MSSMA: McKeague, Manual on Soil Sampling and Methods of Analysis

OATM: Octel America Test Methods
SSMA: Carter, Soil Sampling and Methods of Analysis

USEPA: United States Environmental Protection Agency

XXX##: Subject Laboratory In-House Test Methods

Elias Rafoul, Vice President
Accreditation Services

Date: 2018-07-09

Number of Scope Listings: 167
SCC 1003-15/229
Partner File #0
Partner: SCC

APPENDIX G

Soil Trend Analysis Graphs

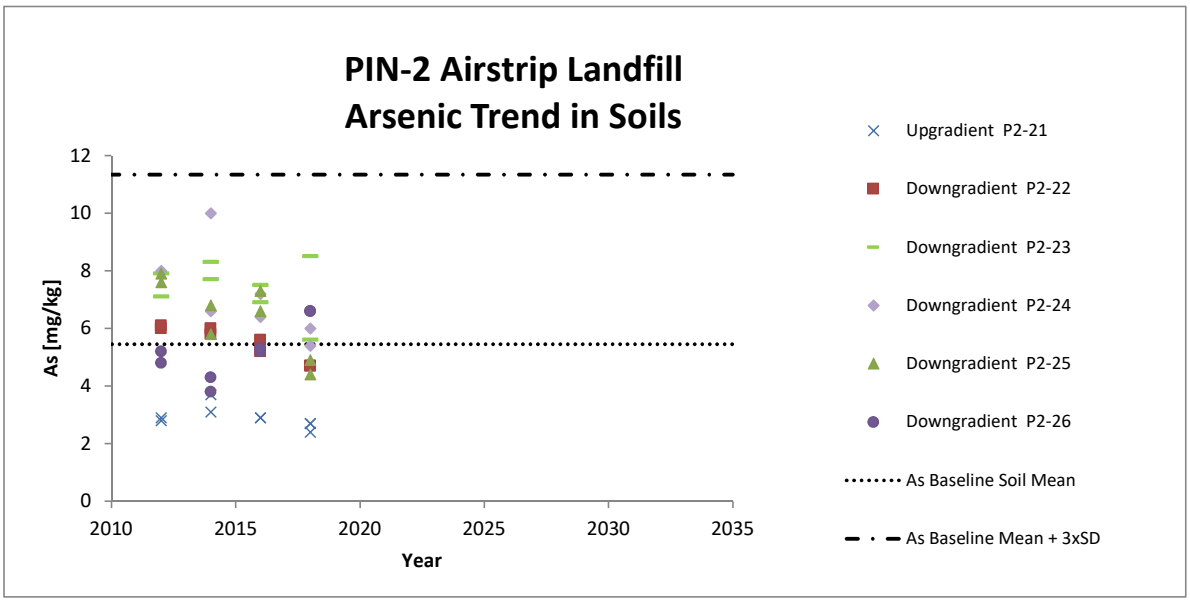
APPENDIX G1

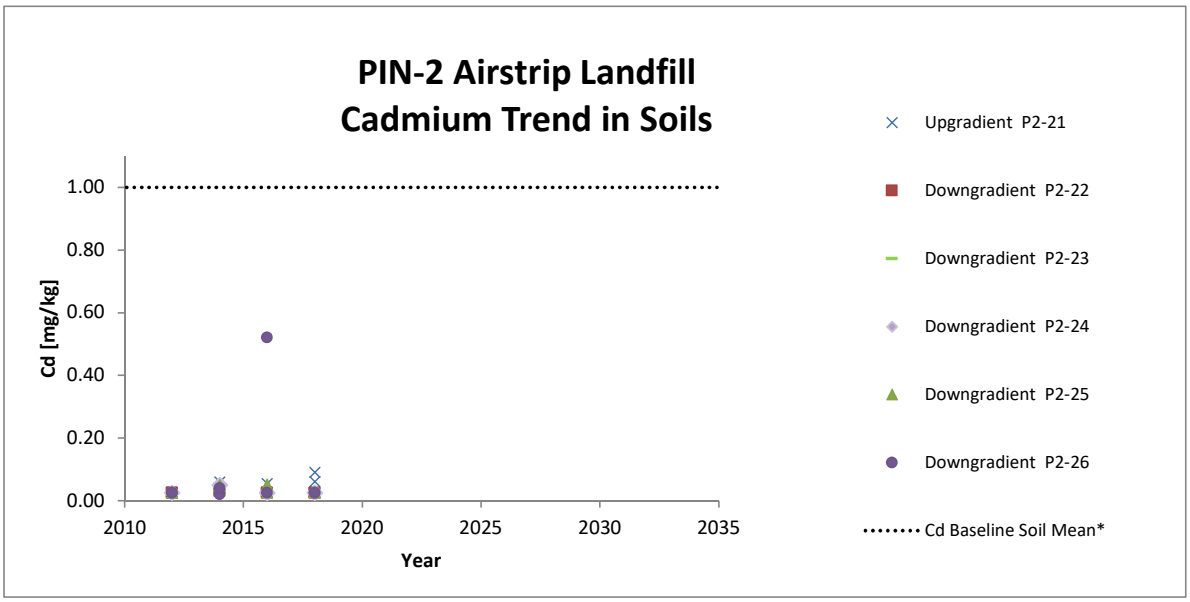
PIN-2 Airstrip Landfill- Trends in Soil Inorganics, PCBs and PHCs

PIN-2 Airstrip Landfill Trends in Soil Inorganics, PCBs and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.





* Cd baseline arithmetic mean is equal to the baseline detection limit
* Cd baseline standard deviation = 0

PIN-2 Airstrip Landfill Trends in Soil Inorganics, PCBs and PHCs

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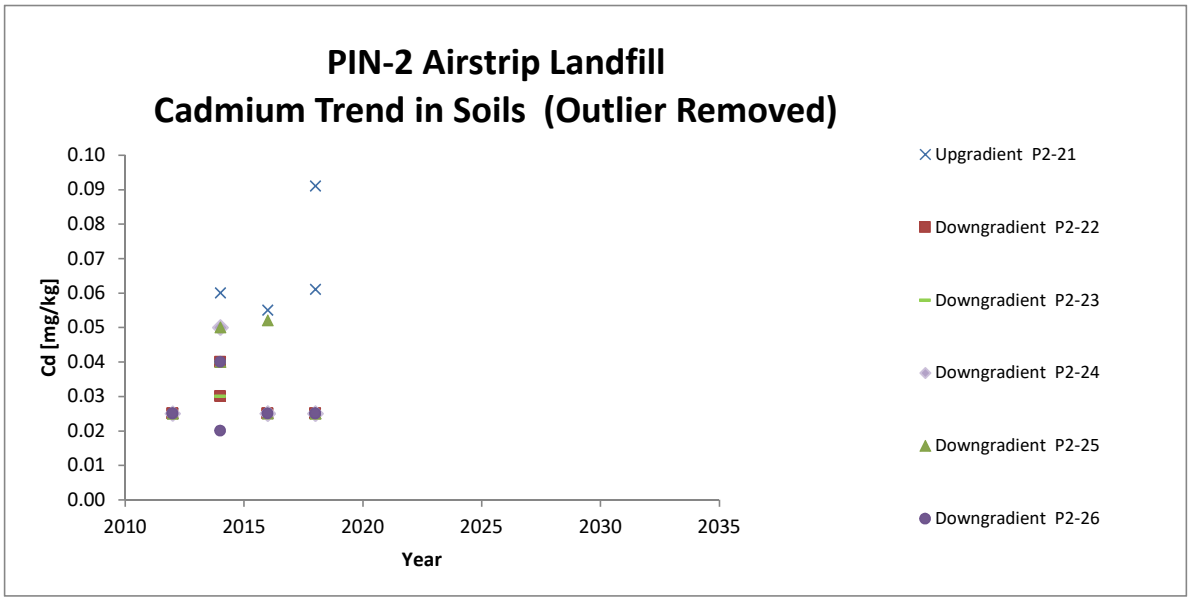
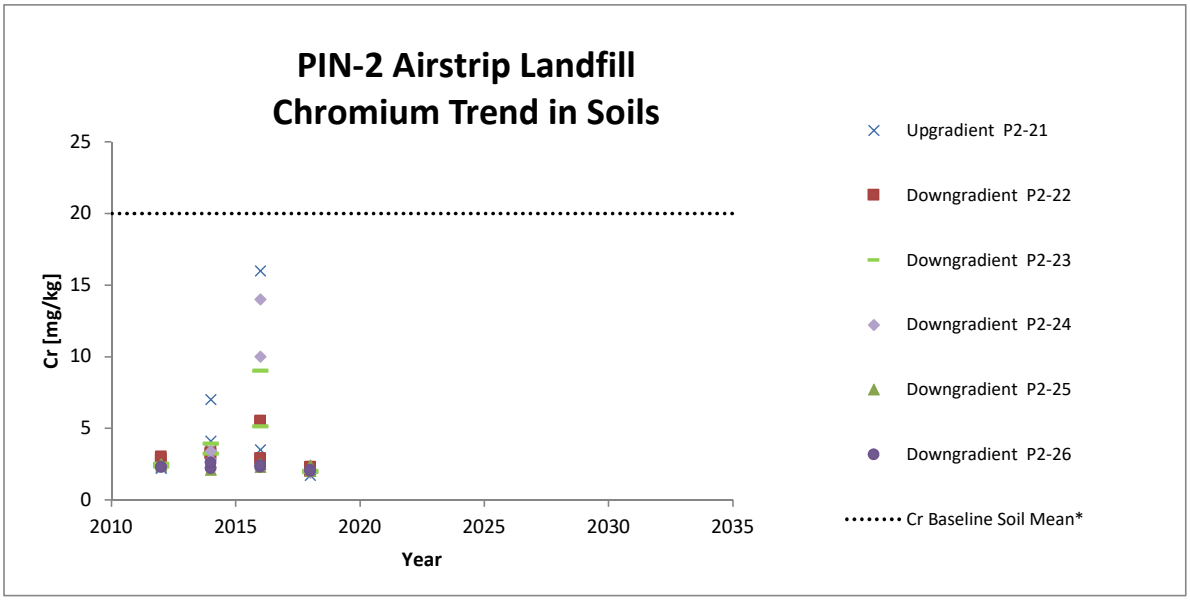
Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



Cd result from downgradient location P2-26 in 2016 and the baseline mean line are not shown on this chart



* Cr baseline arithmetic mean is equal to the baseline detection limit
* Cr baseline standard deviation = 0

PIN-2 Airstrip Landfill Trends in Soil Inorganics, PCBs and PHCs

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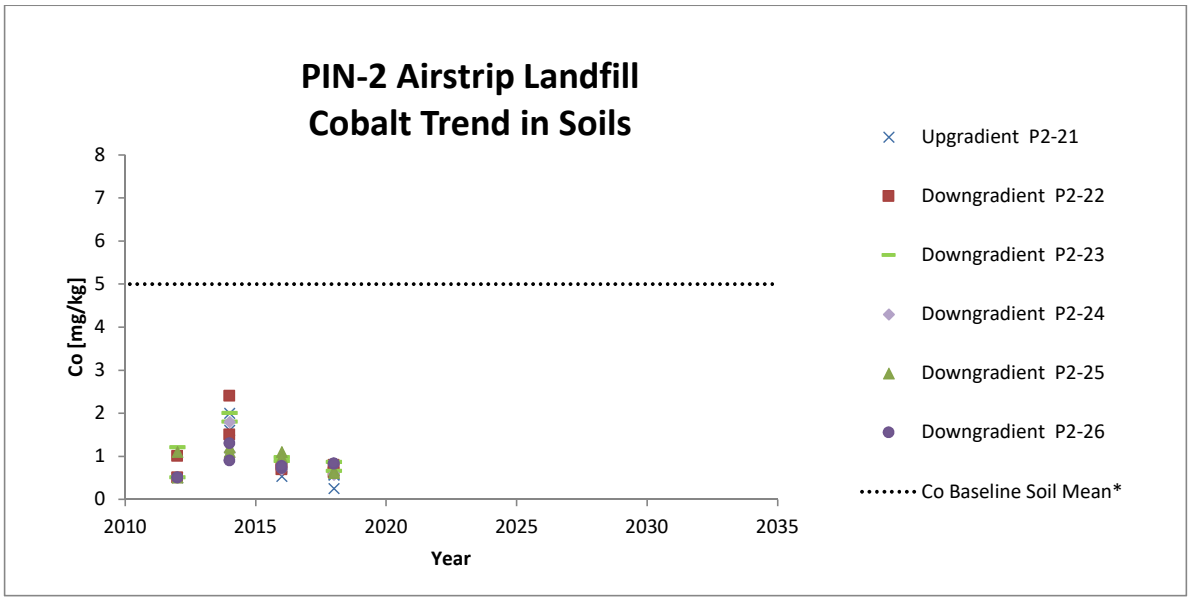
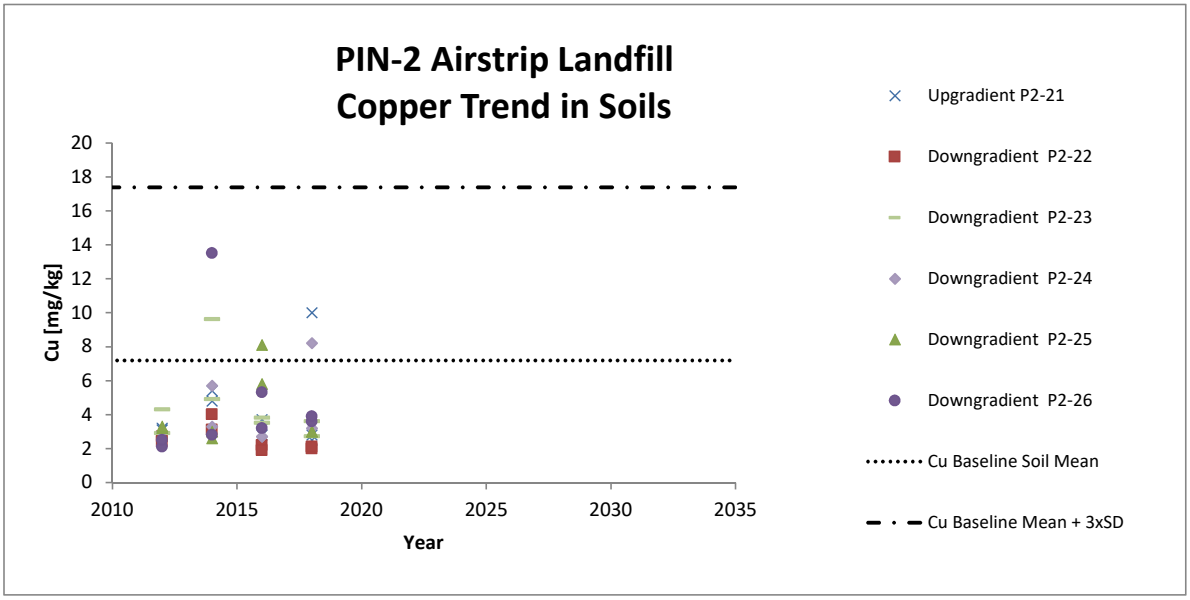
Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



* Co baseline arithmetic mean is equal to the baseline detection limit
* Co baseline standard deviation = 0



PIN-2 Airstrip Landfill Trends in Soil Inorganics, PCBs and PHCs

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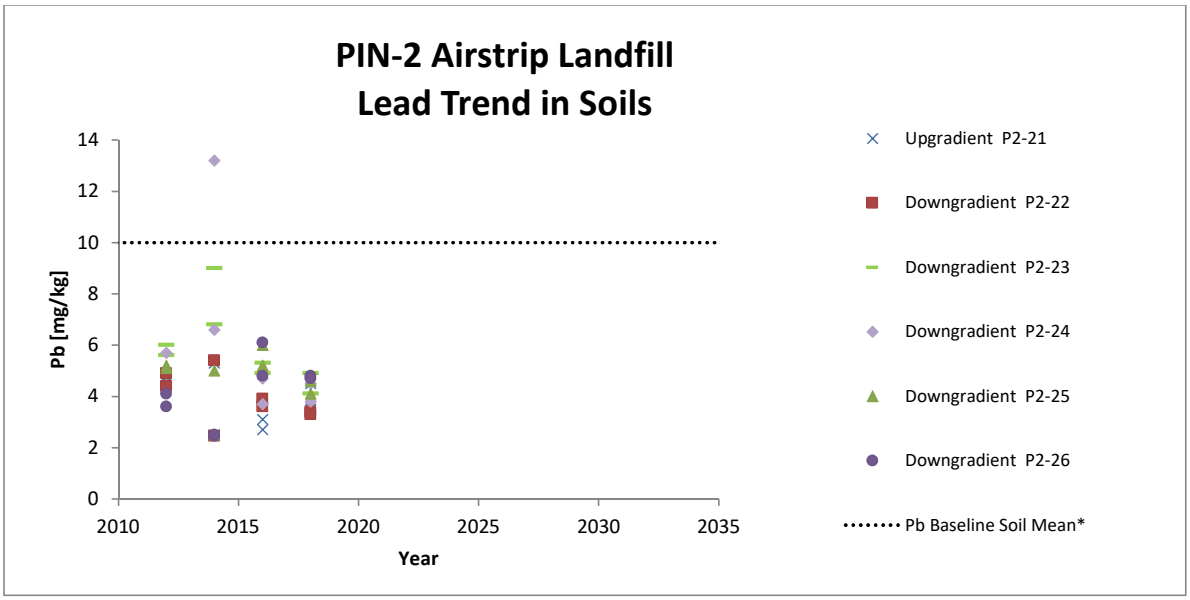
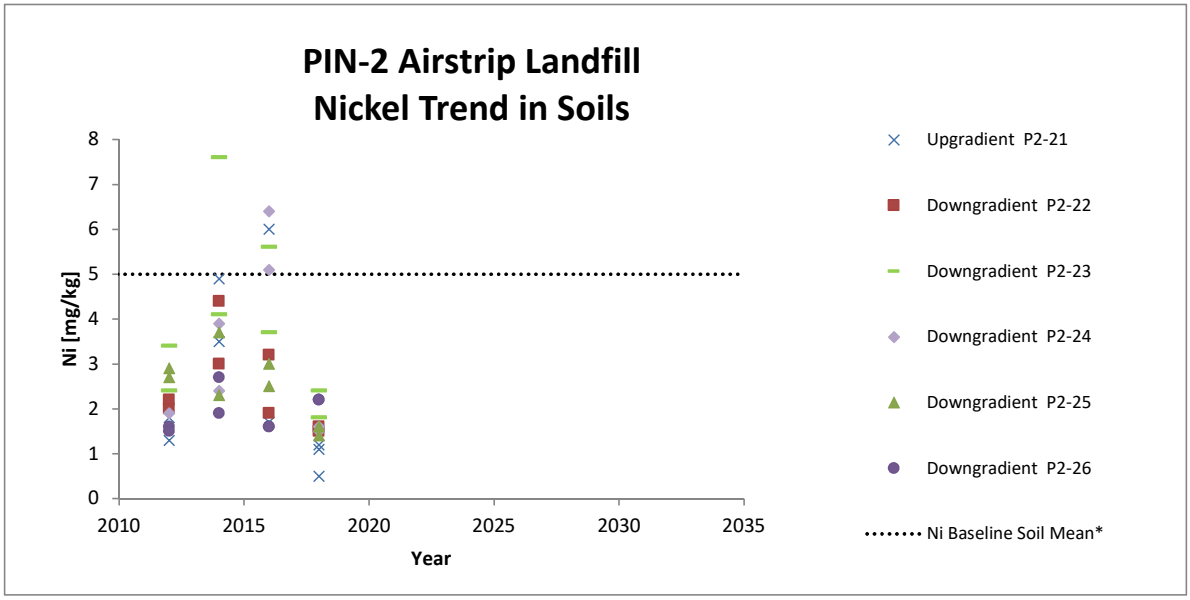
Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



* Pb baseline arithmetic mean is equal to the baseline detection limit
* Pb baseline standard deviation = 0



* Ni baseline arithmetic mean is equal to the baseline detection limit
* Ni baseline standard deviation = 0

PIN-2 Airstrip Landfill Trends in Soil Inorganics, PCBs and PHCs

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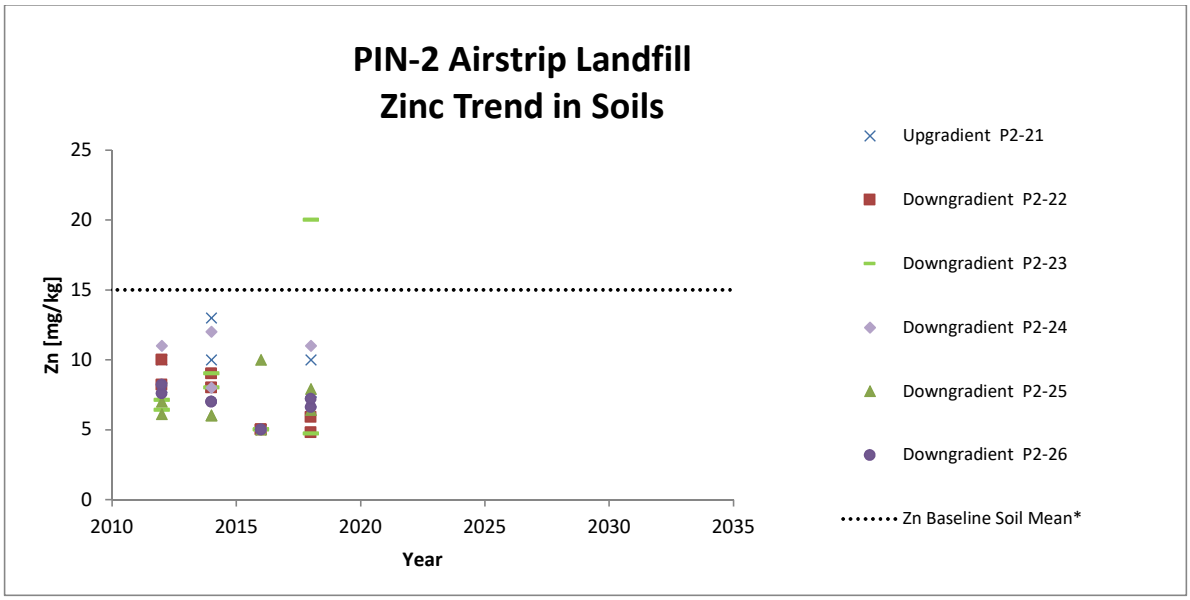
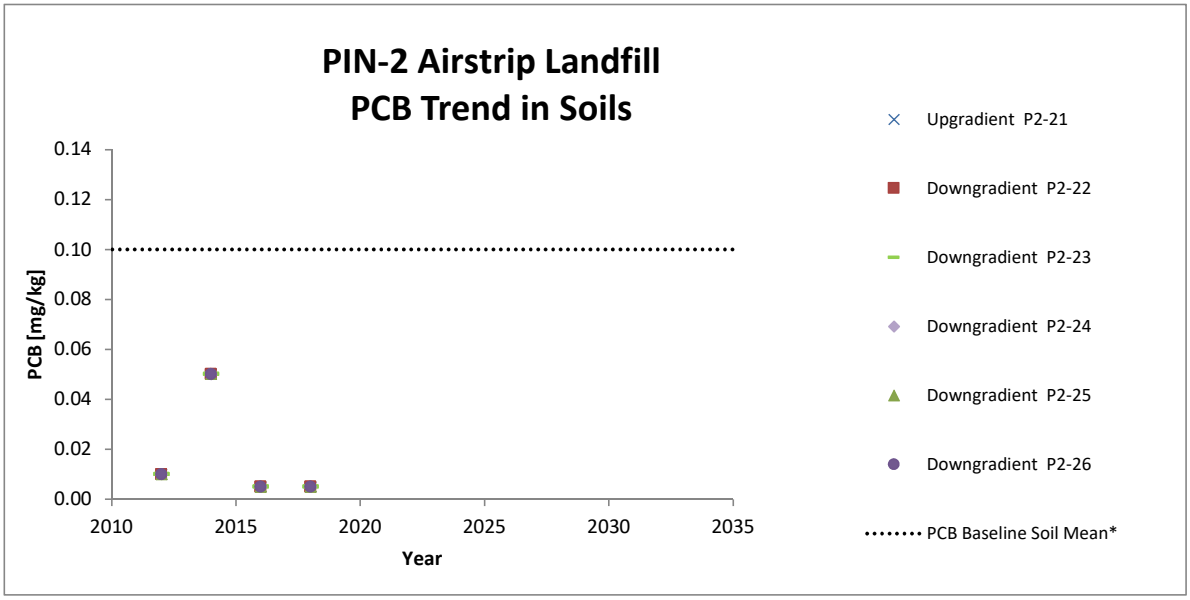
Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



* Zn baseline arithmetic mean is equal to the baseline detection limit
* Zn baseline standard deviation = 0

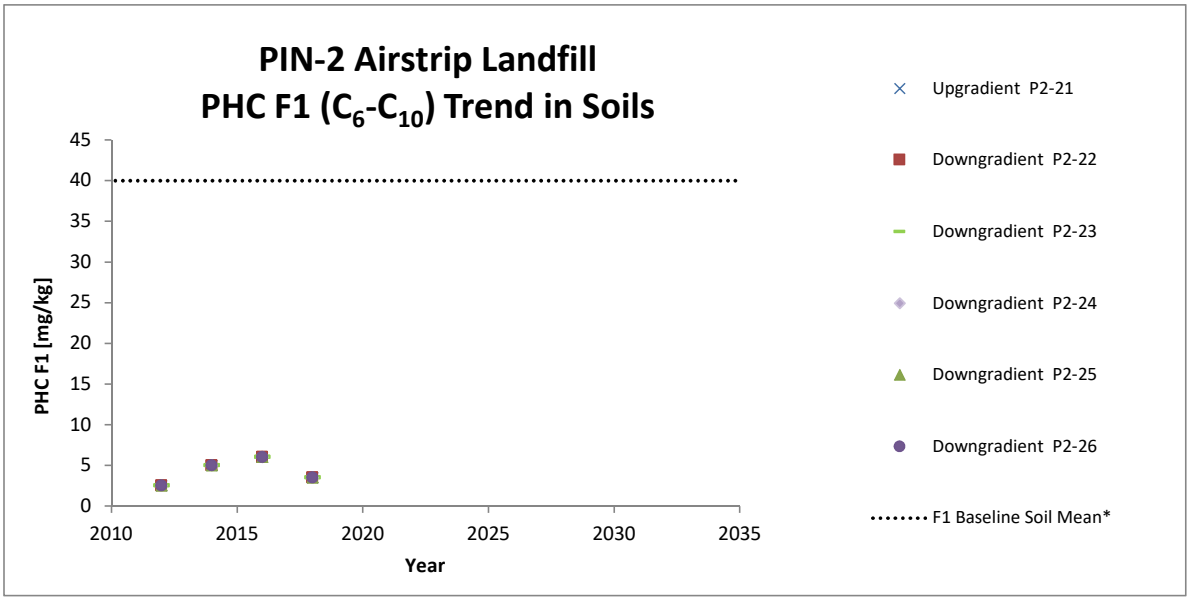


* PCB baseline arithmetic mean is equal to the baseline detection limit
* PCB baseline standard deviation = 0
Note: variations seen to 2018 are an indication of changing detection limits; all results at or below detection limits

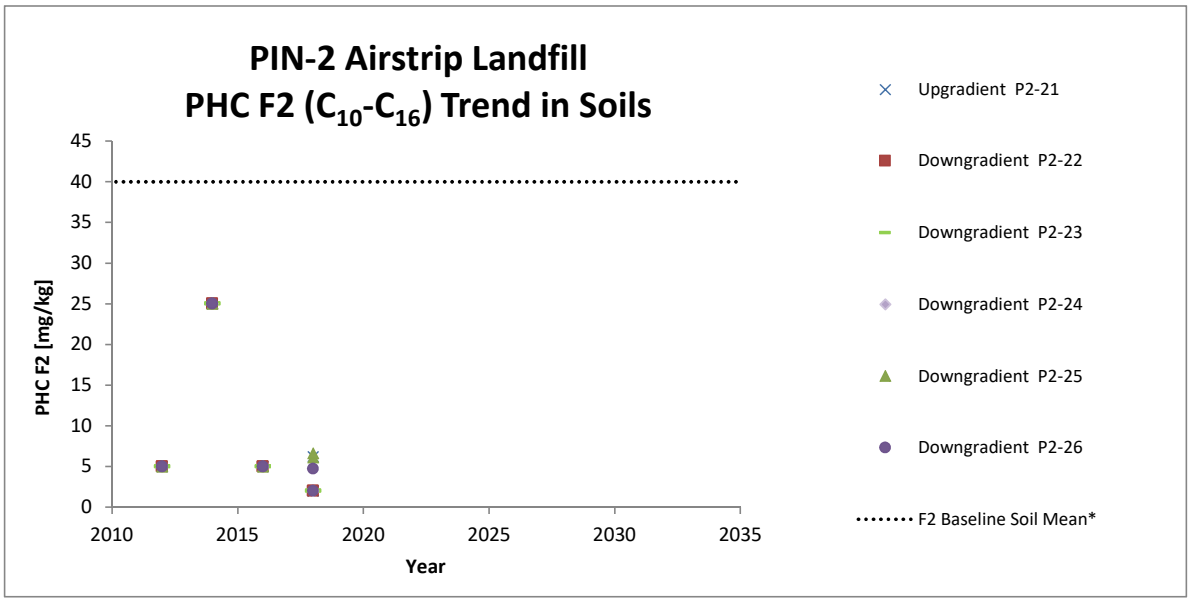
PIN-2 Airstrip Landfill Trends in Soil Inorganics, PCBs and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



* F1 baseline arithmetic mean is equal to the detection limit of 40 mg/kg for TPH
* F1 baseline standard deviation = 0
Note: variations seen to 2018 are an indication of changing detection limits; all results at or below detection limits



* F2 baseline arithmetic mean is equal to the detection limit of 40 mg/kg for TPH
* F2 baseline standard deviation = 0
Note: variations seen to 2016 are an indication of changing detection limits; all results prior to 2018 were at or below detection limits

PIN-2 Airstrip Landfill Trends in Soil Inorganics, PCBs and PHCs

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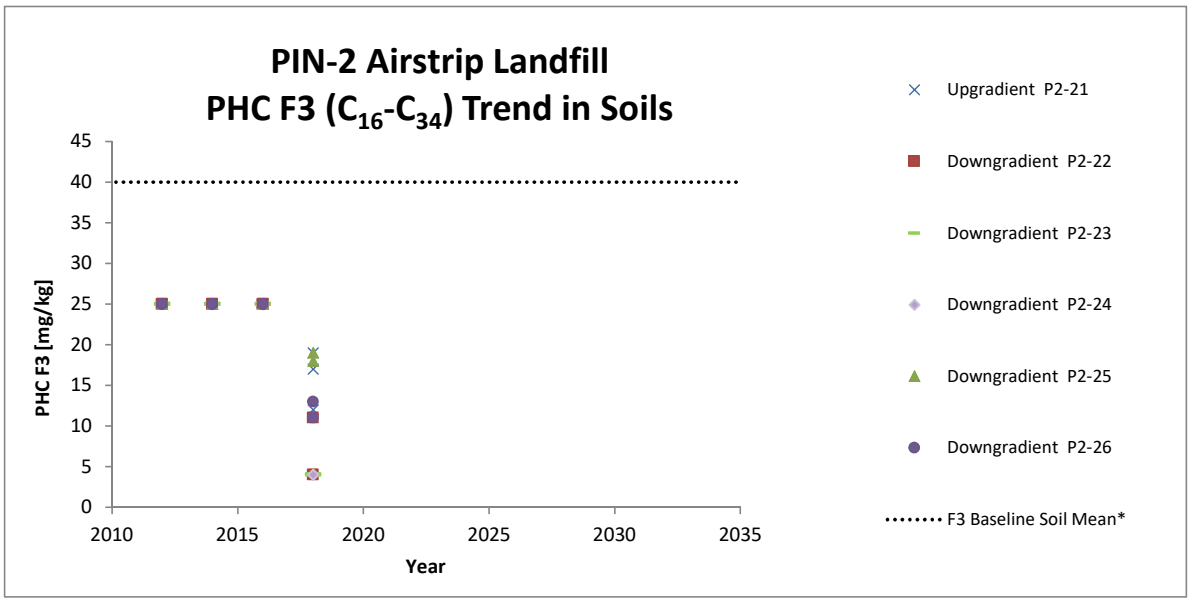
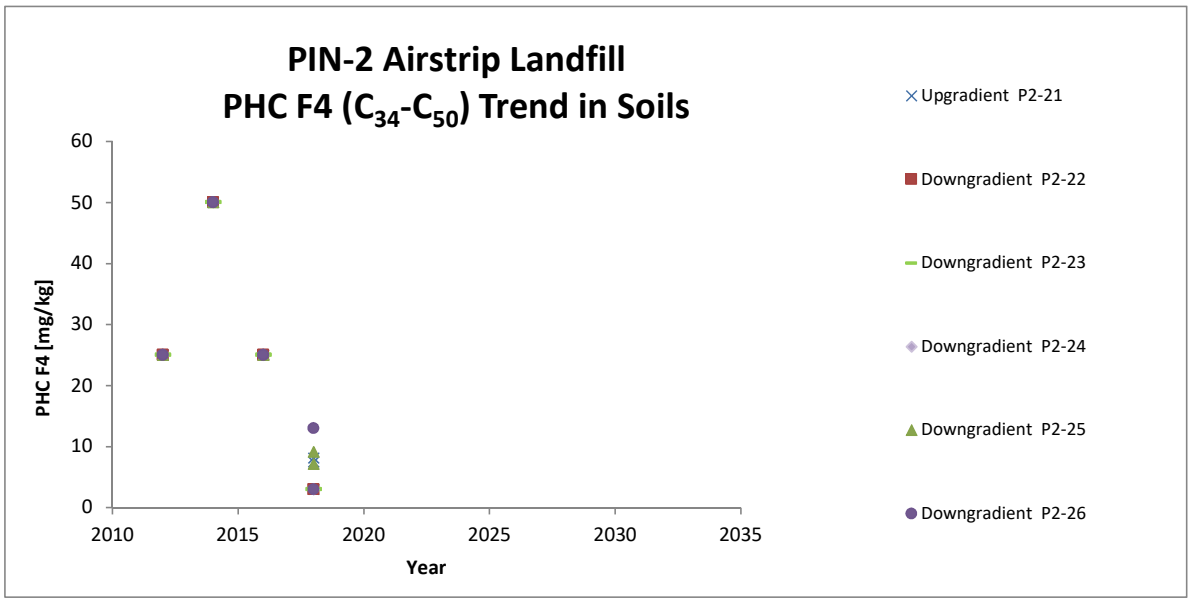
Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



* F3 baseline arithmetic mean is equal to the detection limit of 40 mg/kg for TPH
* F3 baseline standard deviation = 0



* F4 does not have a baseline mean as all baseline data was TPH, which does not include fraction F4
Note: variations seen to 2016 are an indication of changing detection limits; all results prior to 2018 were at or below detection limits

APPENDIX G2

PIN-2 USAF Landfill- Trends in Soil Inorganics, PCBs and PHCs

Appendix G2:

PIN-2 USAF Landfill Trends in Soil Inorganics, PCBs and PHCs

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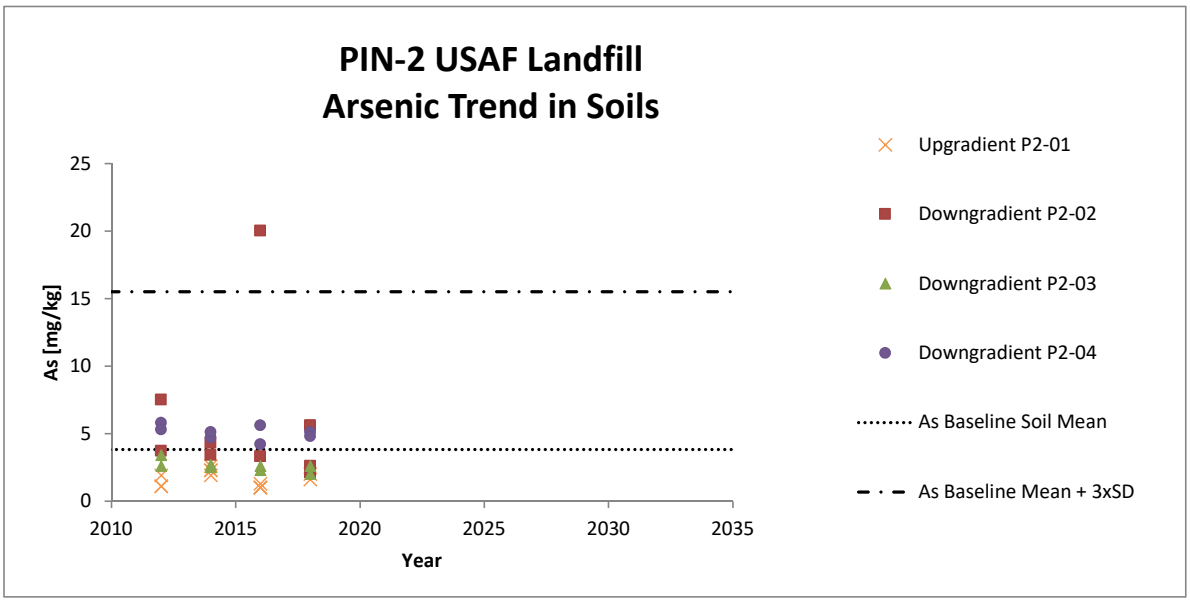
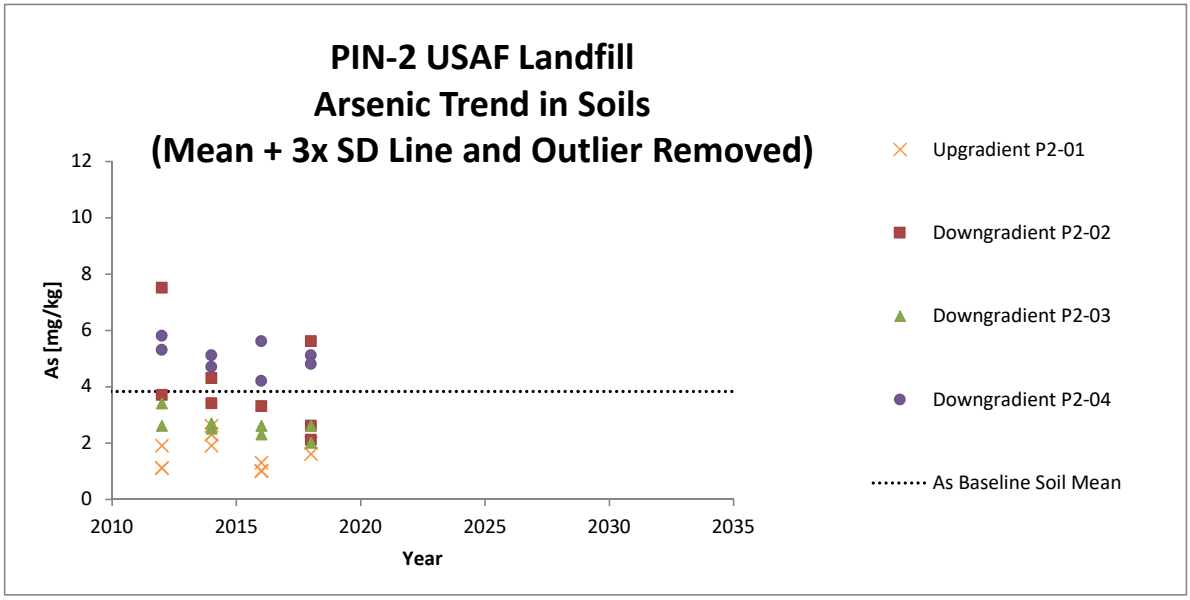
Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.





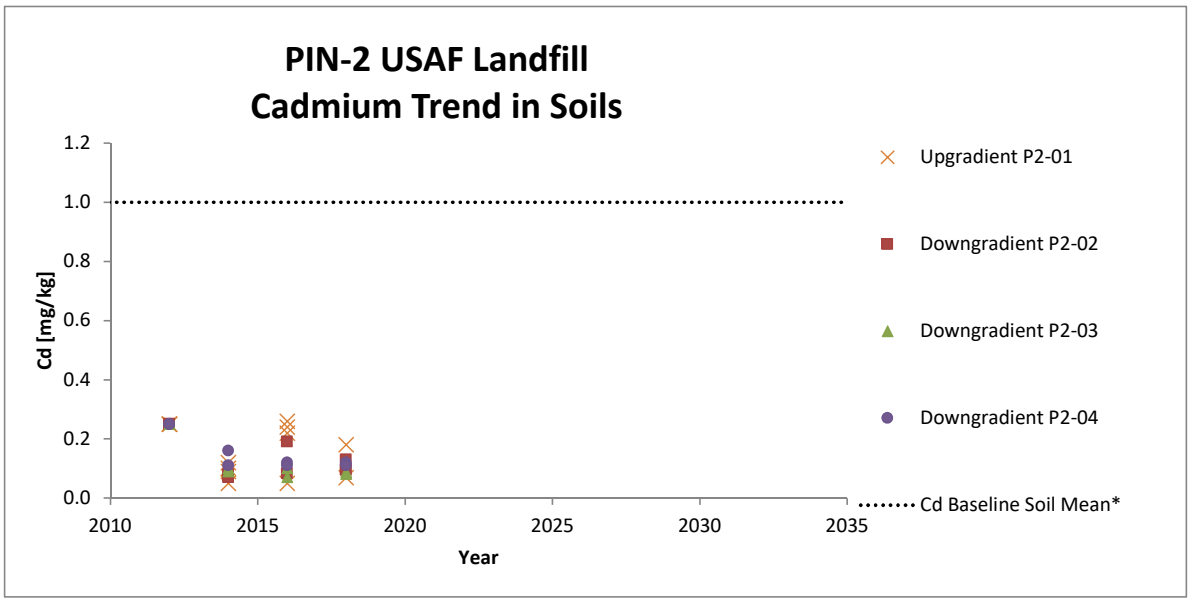
Y-axis maximum value decreased to show data distribution; baseline mean + 3x SD not shown
As results from downgradient location P2-02 (depth) in 2016 are not shown on this chart

Appendix G2:

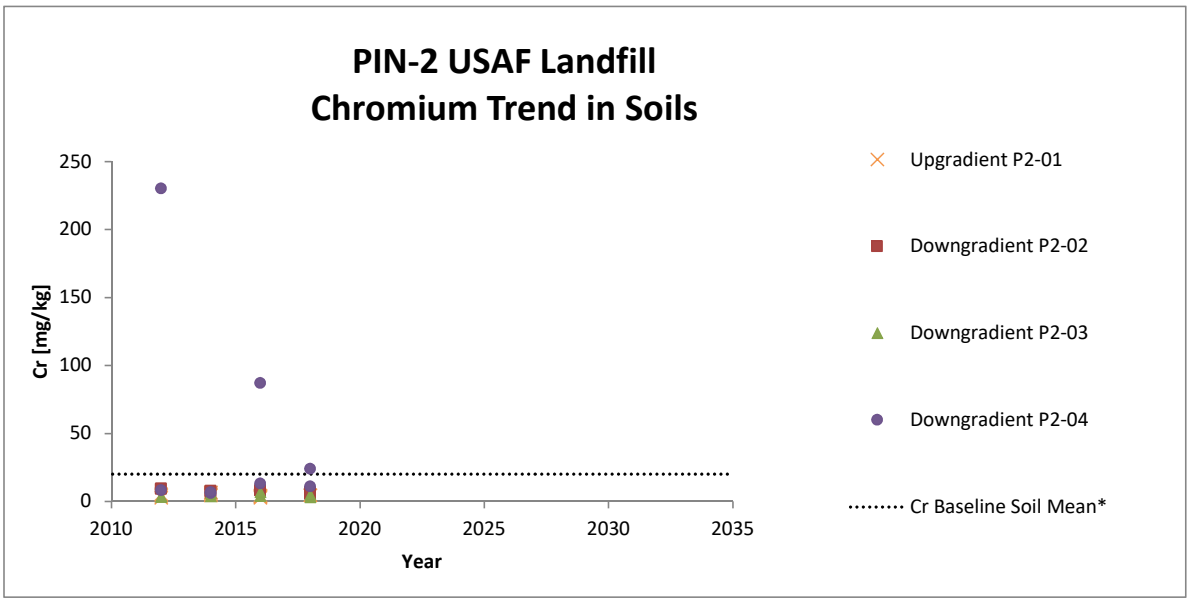
PIN-2 USAF Landfill Trends in Soil Inorganics, PCBs and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



* Cd baseline arithmetic mean is equal to the baseline detection limit
* Cd baseline standard deviation = 0



* Cr baseline arithmetic mean is equal to the baseline detection limit
* Cr baseline standard deviation = 0

PIN-2 USAF Landfill Trends in Soil Inorganics, PCBs and PHCs

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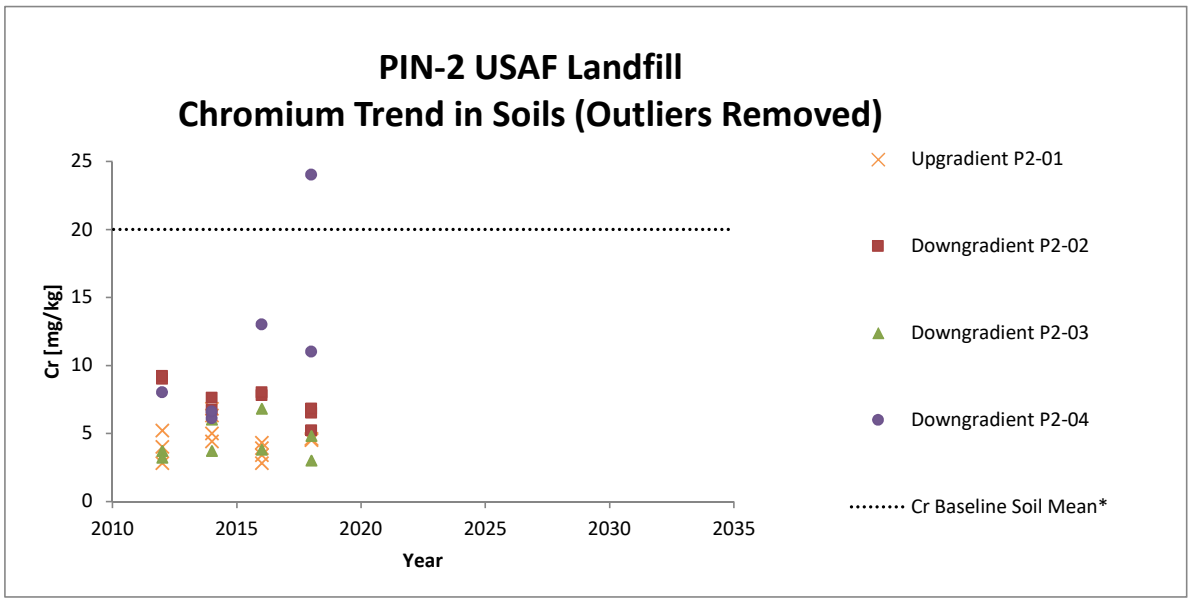
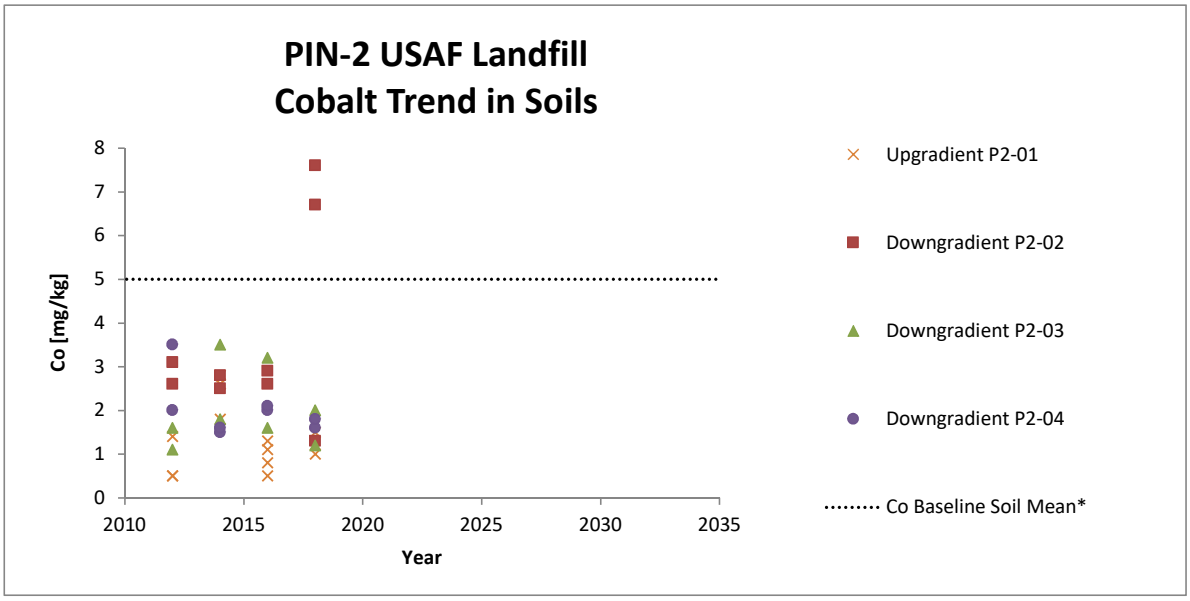
Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



Cr results from downgradient location P2-04 in 2012 and 2016 are not shown on this chart



* Co baseline arithmetic mean is equal to the baseline detection limit
* Co baseline standard deviation = 0

Appendix G2:

PIN-2 USAF Landfill Trends in Soil Inorganics, PCBs and PHCs

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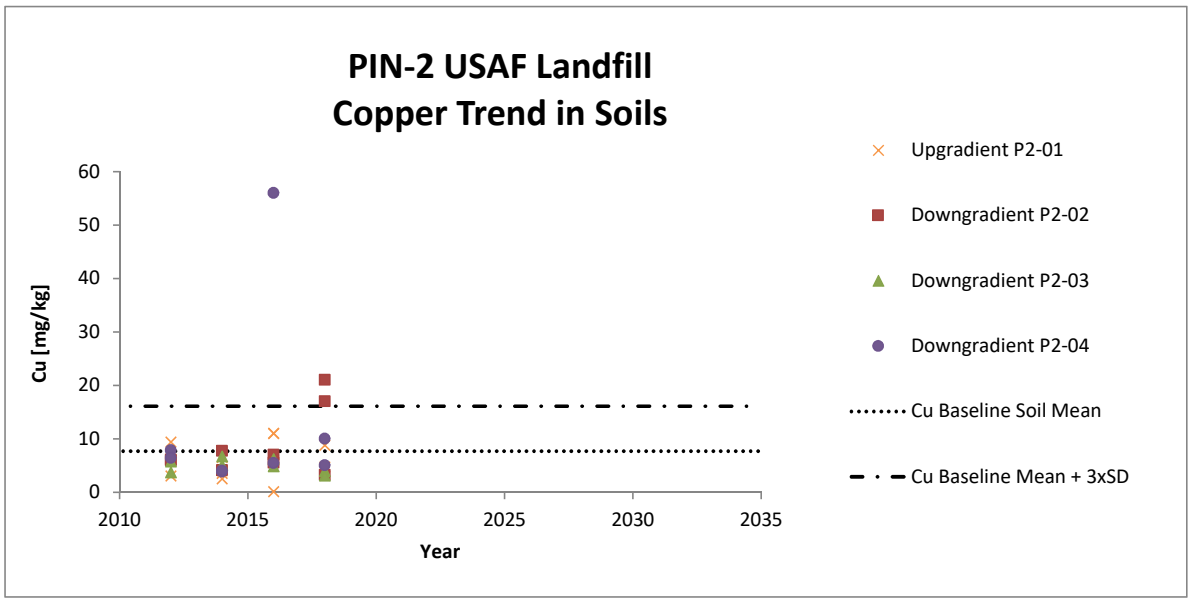
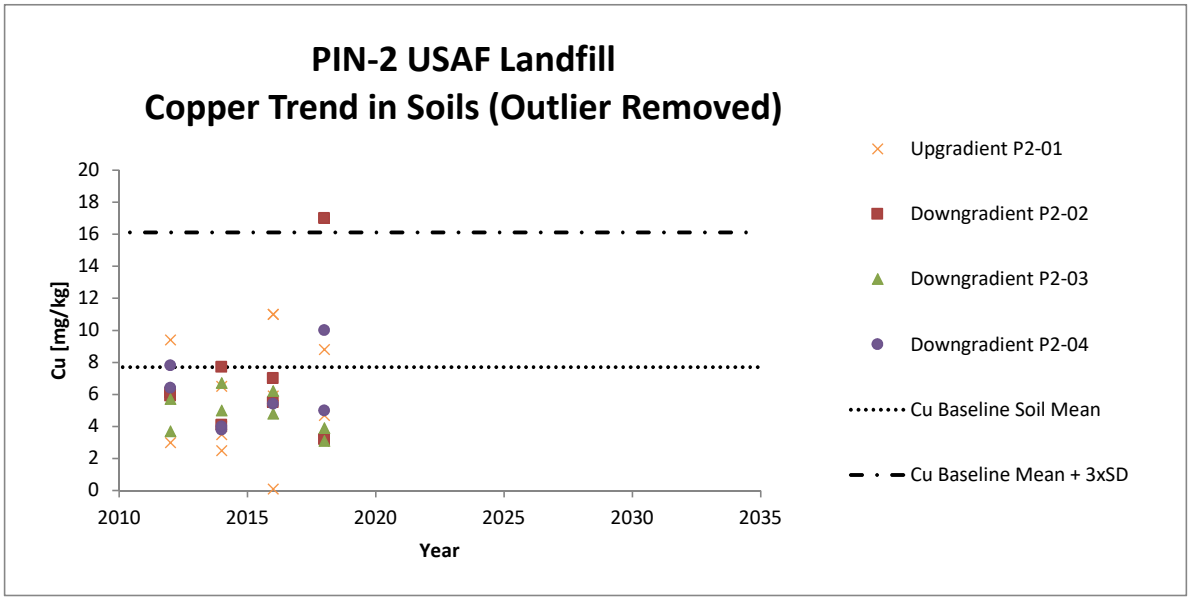
Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.





Cu result from downgradient location P2-04 in 2016 is not shown on this chart

PIN-2 USAF Landfill Trends in Soil Inorganics, PCBs and PHCs

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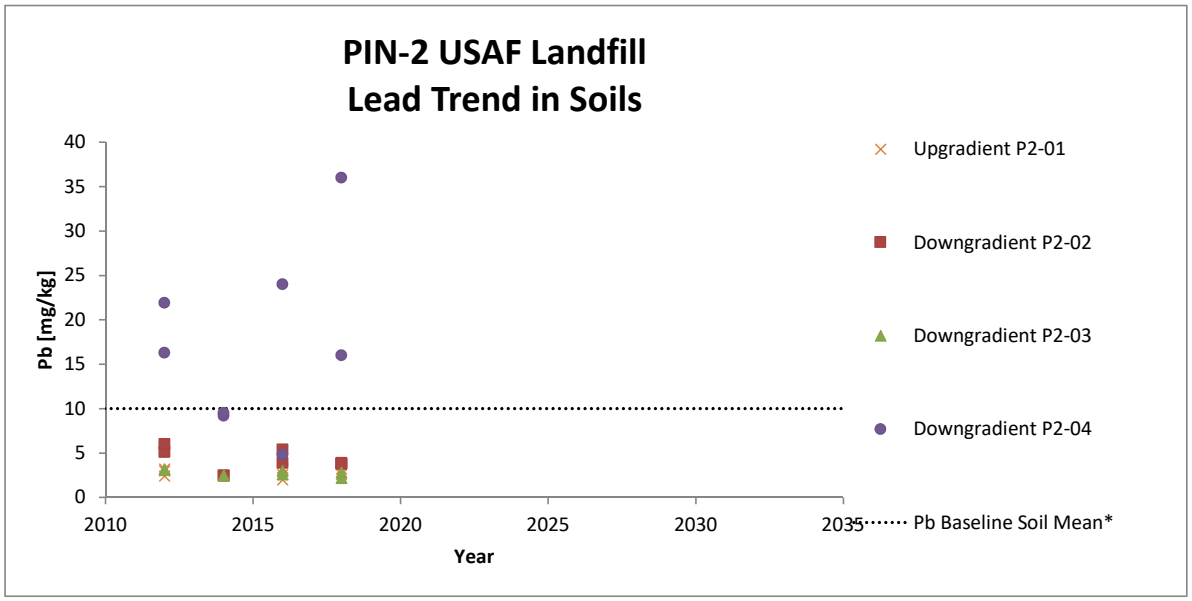
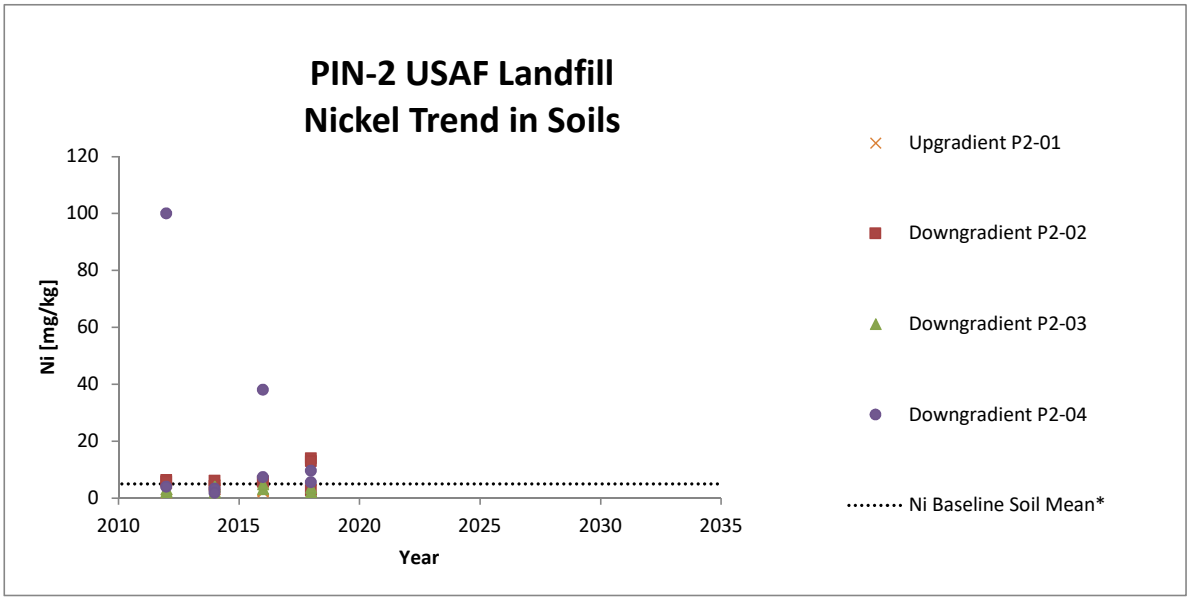
Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



* Pb baseline arithmetic mean is equal to the baseline detection limit
* Pb baseline standard deviation = 0



* Ni baseline arithmetic mean is equal to the baseline detection limit
* Ni baseline standard deviation = 0

Appendix G2:

PIN-2 USAF Landfill Trends in Soil Inorganics, PCBs and PHCs

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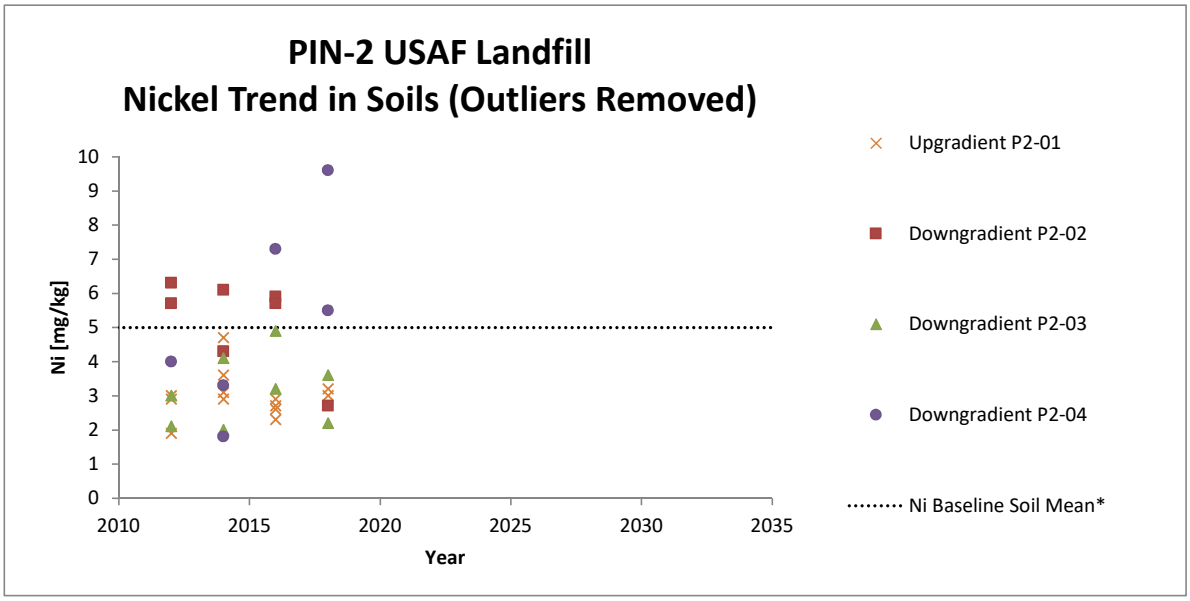
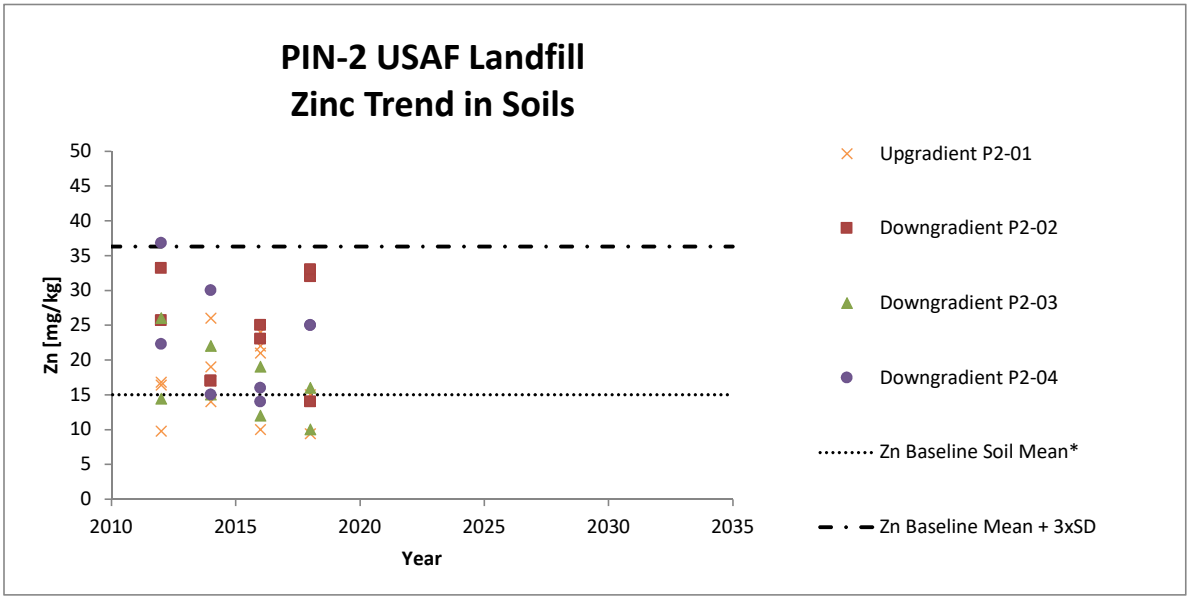
Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



Ni results from downgradient location P2-04 in 2012 and 2016 are not shown on this chart

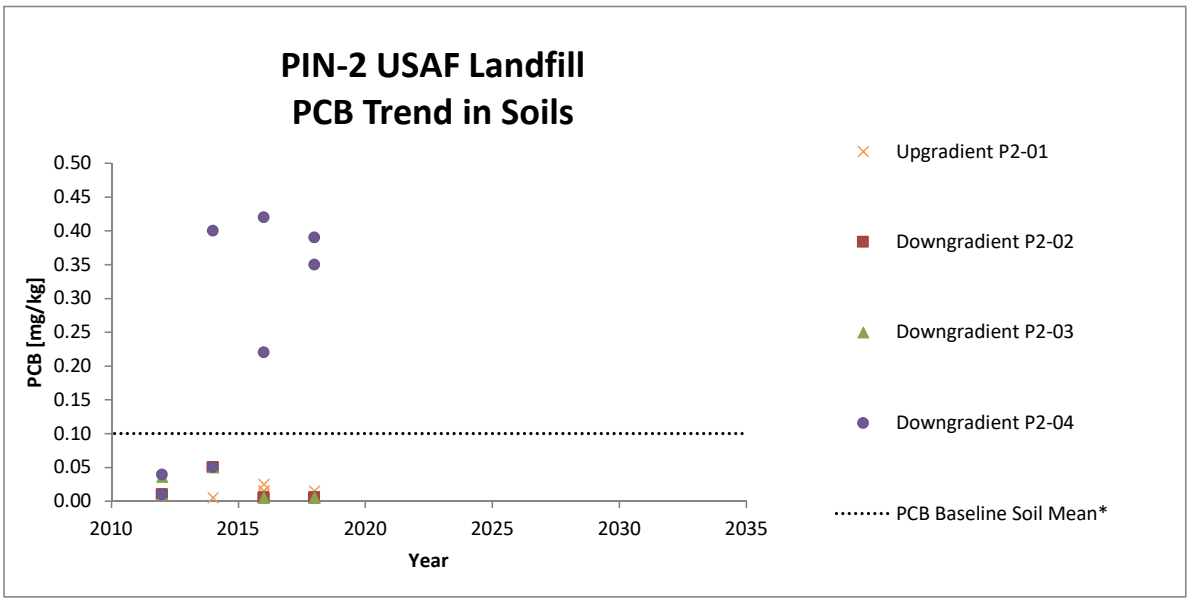


* Zn baseline arithmetic mean is equal to the baseline detection limit

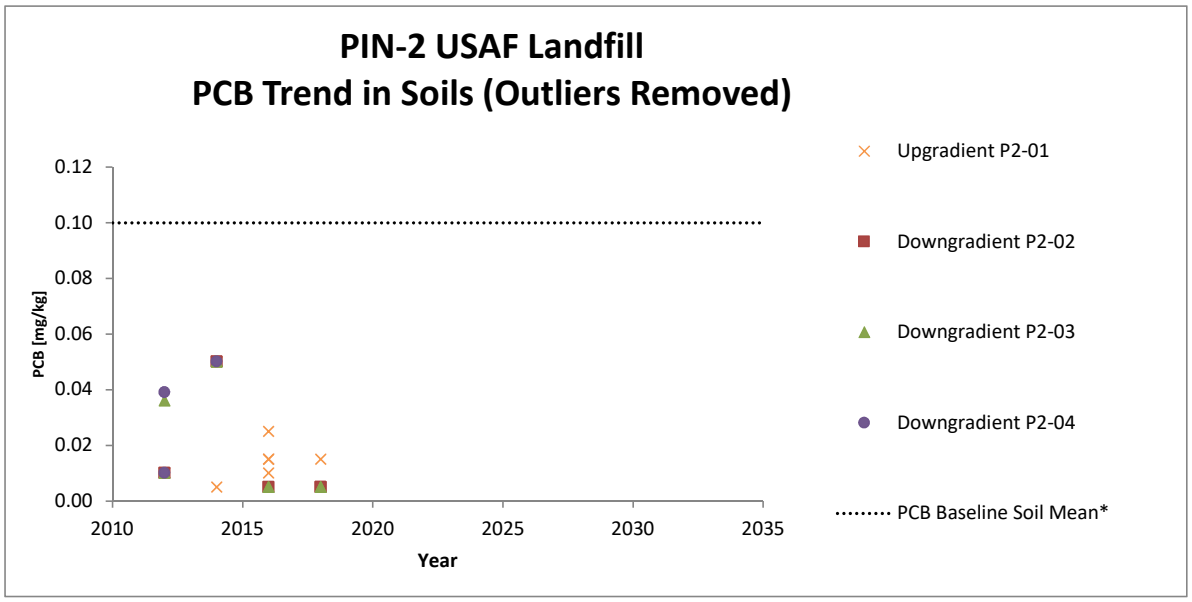
PIN-2 USAF Landfill Trends in Soil Inorganics, PCBs and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



* PCB baseline arithmetic mean is equal to the baseline detection limit
* PCB baseline standard deviation = 0



PCB results from downgradient location P2-04 in 2014 and 2016 are not shown on this chart

PIN-2 USAF Landfill Trends in Soil Inorganics, PCBs and PHCs

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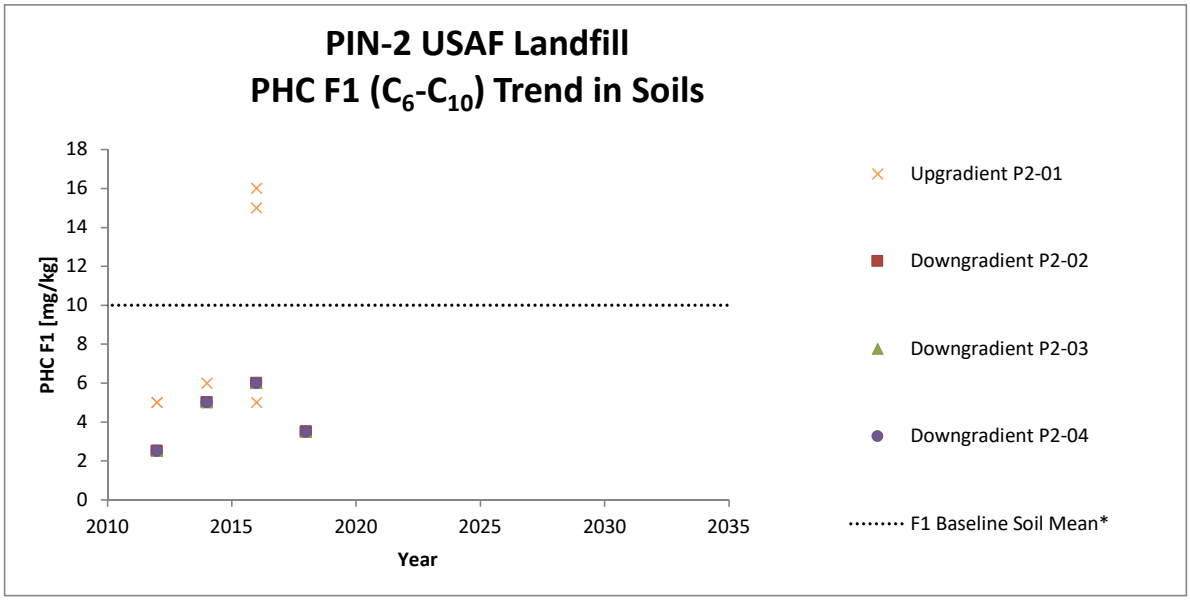
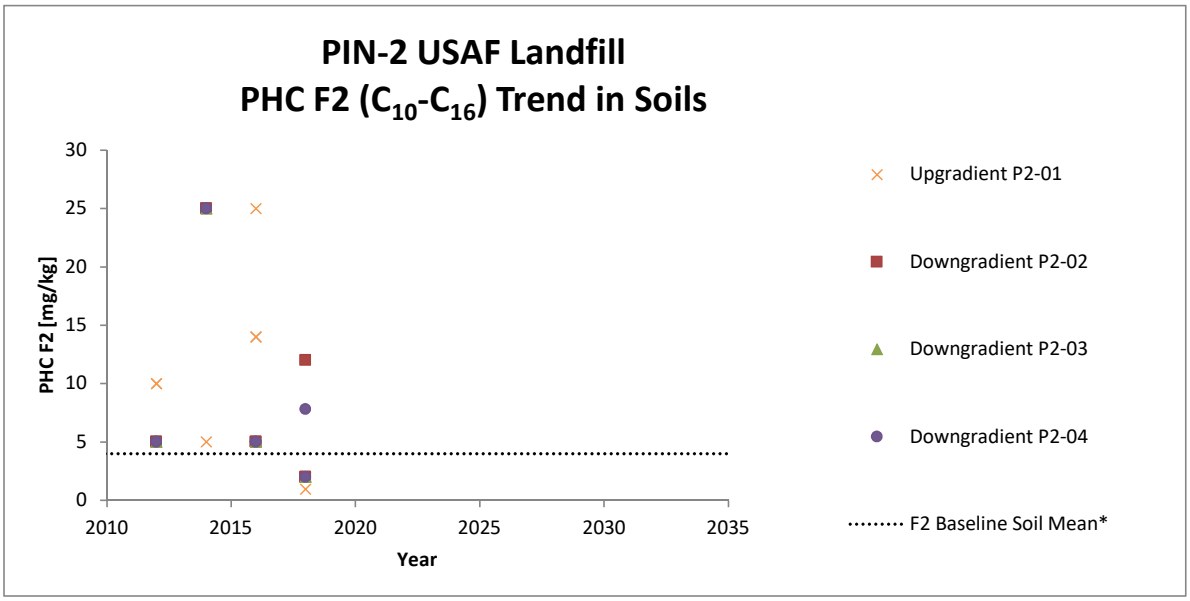
Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



* F1 baseline arithmetic mean is equal to the detection limit
* F1 baseline standard deviation = 0
Note: variations seen to 2018 are an indication of changing detection limits; all results at or below detection limits



* F2 baseline arithmetic mean is equal to the detection limit
* F2 baseline standard deviation = 0
Note: variations seen to 2016 are an indication of changing detection limits; all results prior to 2018 were at or below detection limits

PIN-2 USAF Landfill Trends in Soil Inorganics, PCBs and PHCs

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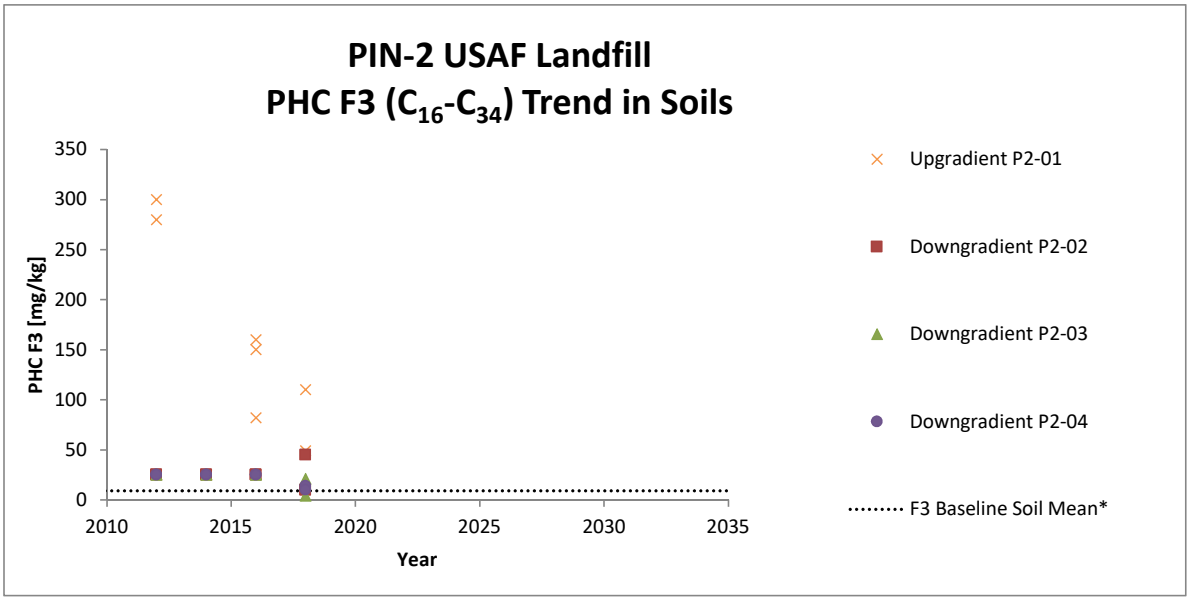
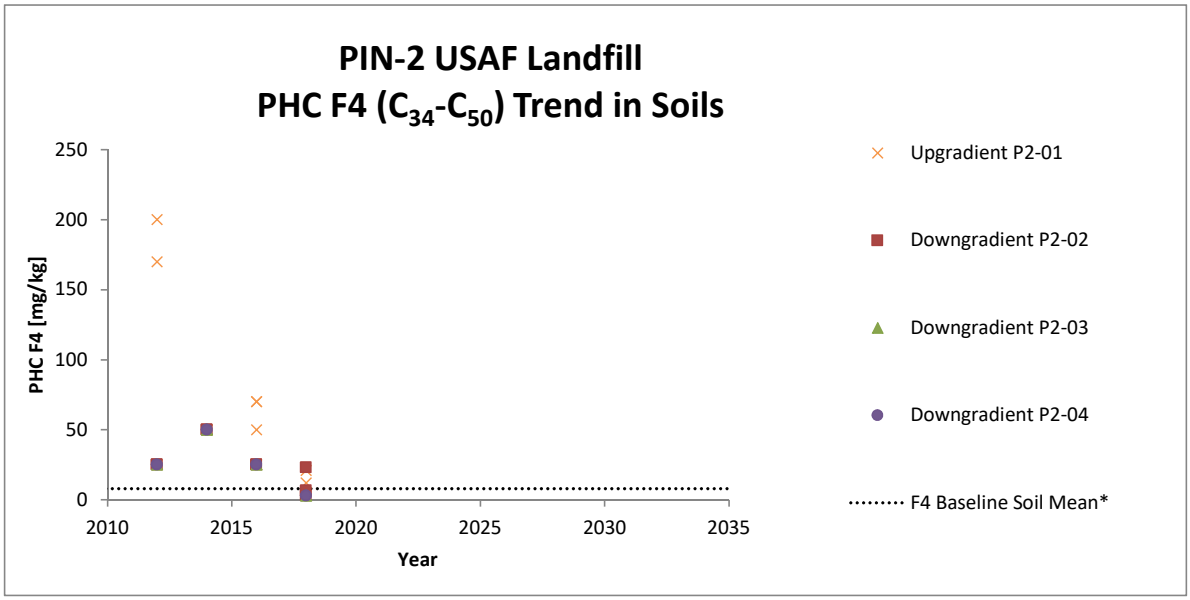
Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



* F3 baseline arithmetic mean is equal to the detection limit
* F3 baseline standard deviation = 0



* F4 baseline arithmetic mean is equal to the detection limit
* F4 baseline standard deviation = 0

APPENDIX G3

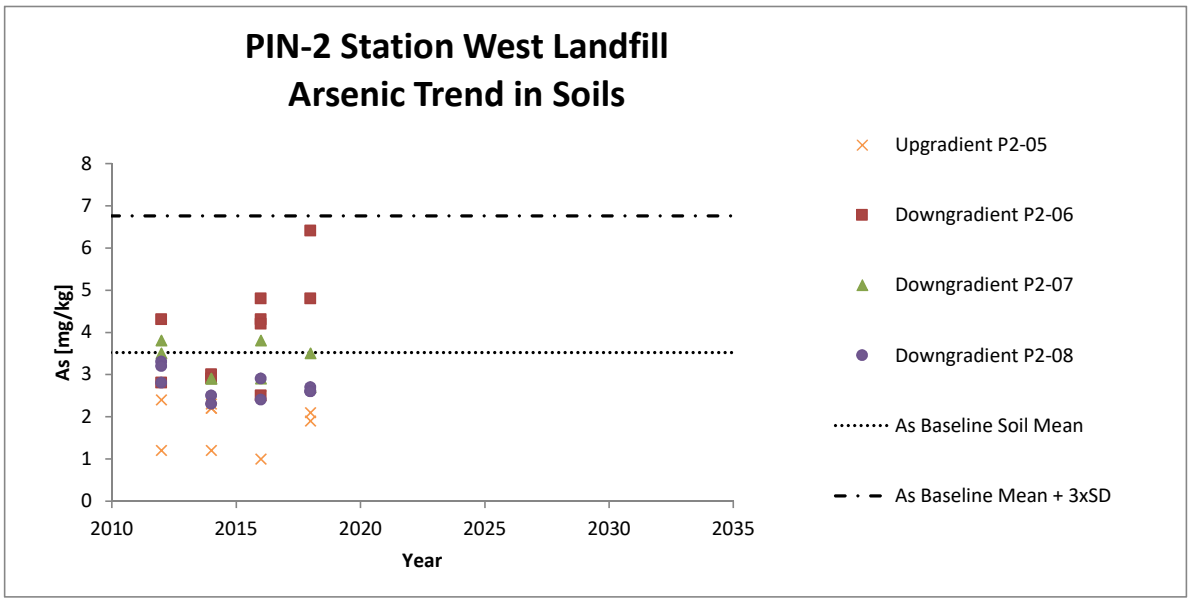
PIN-2 Station West Landfill - Trends in Soil Inorganics, PCBs and PHCs

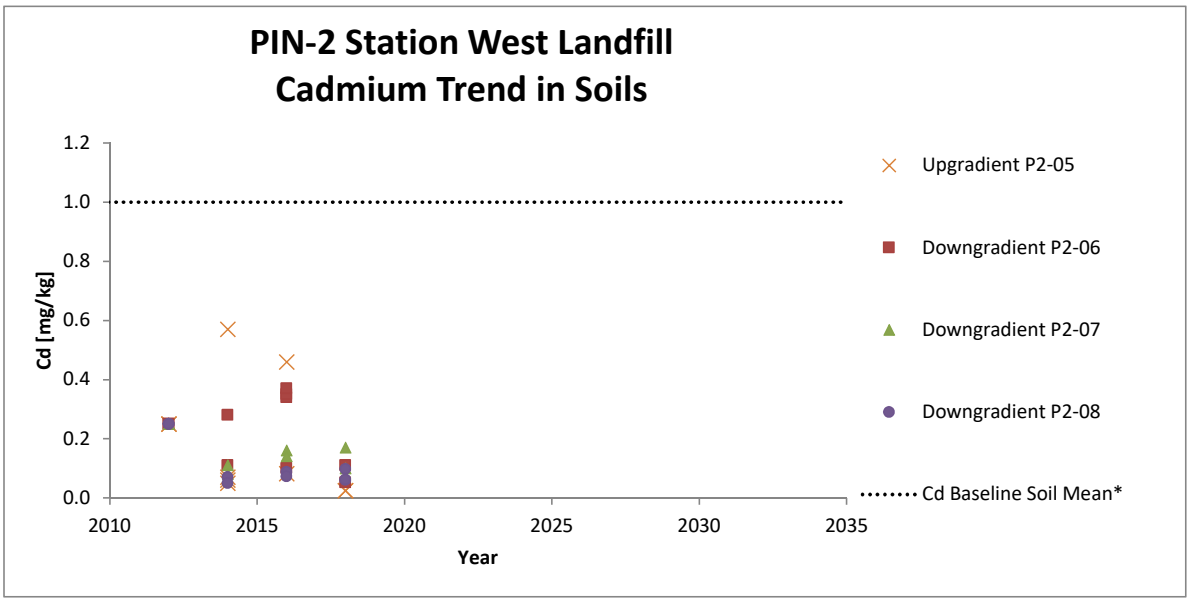
Appendix G3:

PIN-2 Station West Landfill Trends in Soil Inorganics, PCBs and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



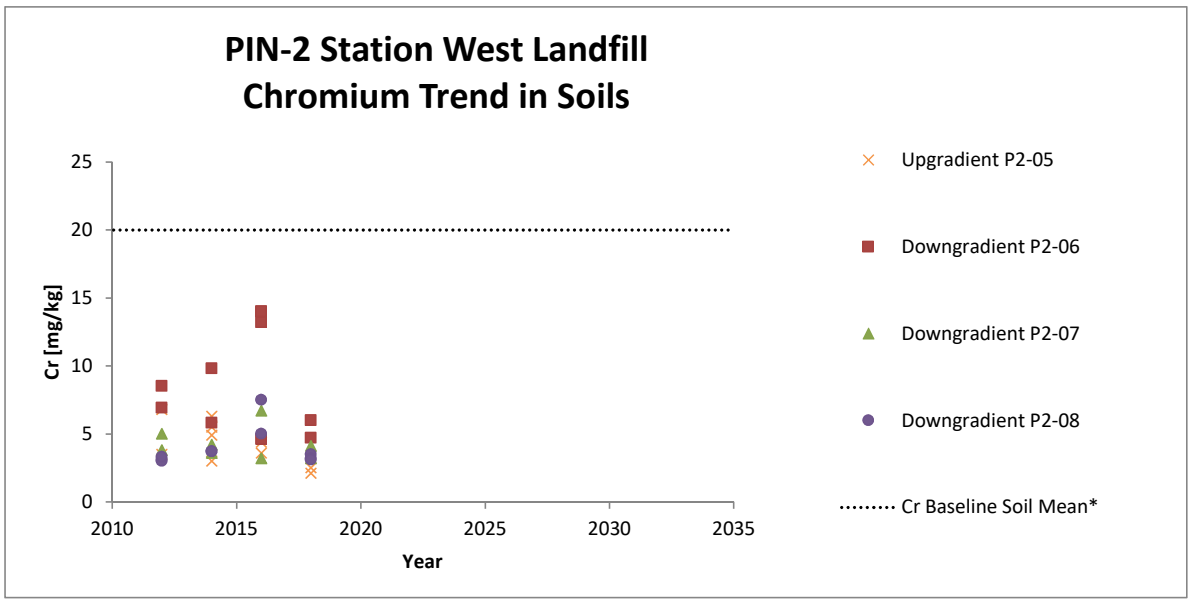


* Cd baseline arithmetic mean is equal to the baseline detection limit
* Cd baseline standard deviation = 0

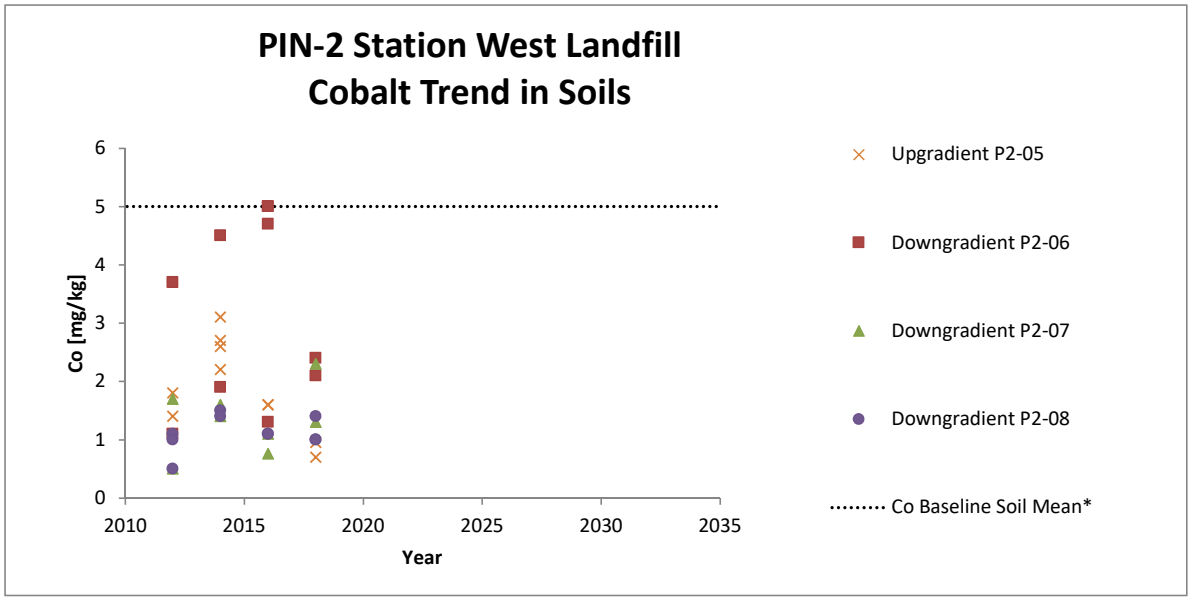
PIN-2 Station West Landfill Trends in Soil Inorganics, PCBs and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



* Cr baseline arithmetic mean is equal to the baseline detection limit
* Cr baseline standard deviation = 0



* Co baseline arithmetic mean is equal to the baseline detection limit
* Co baseline standard deviation = 0

PIN-2 Station West Landfill Trends in Soil Inorganics, PCBs and PHCs

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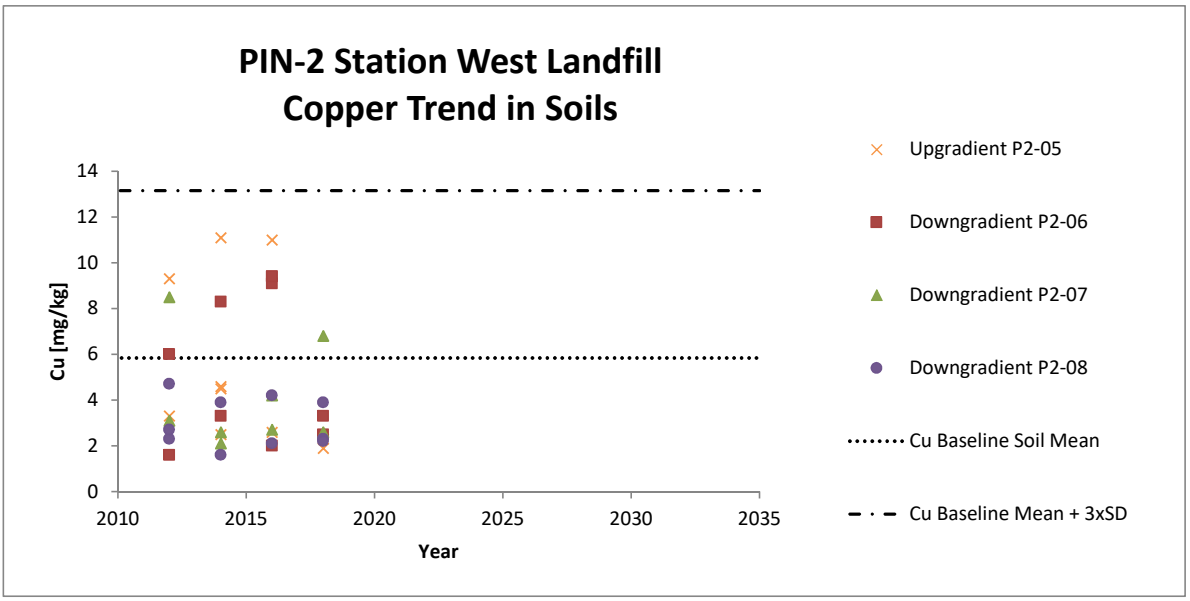
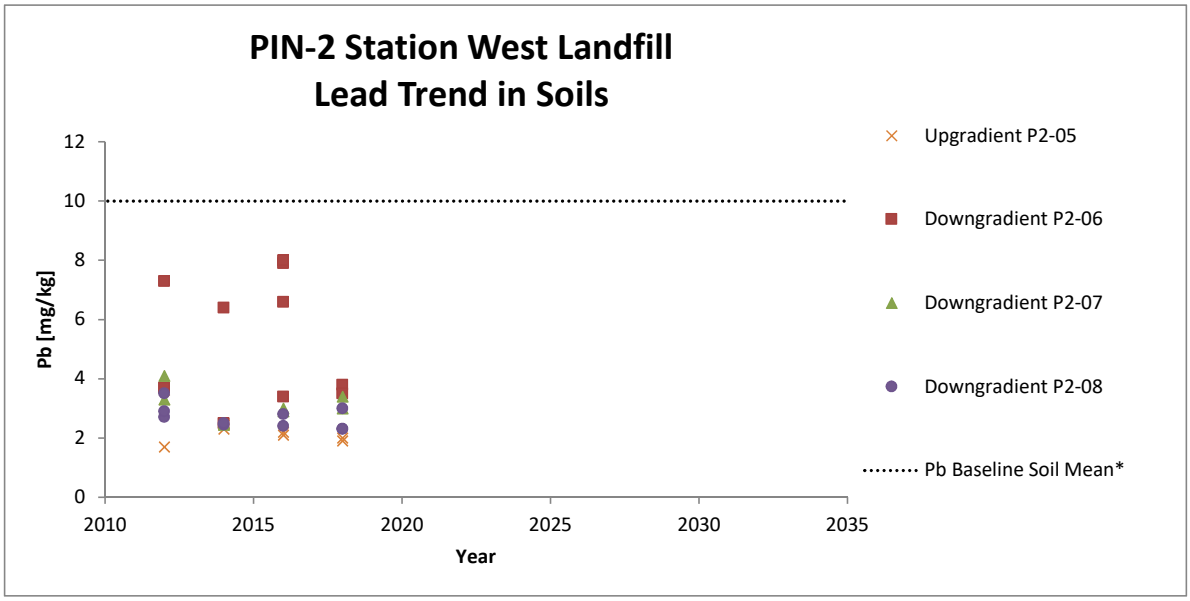
Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



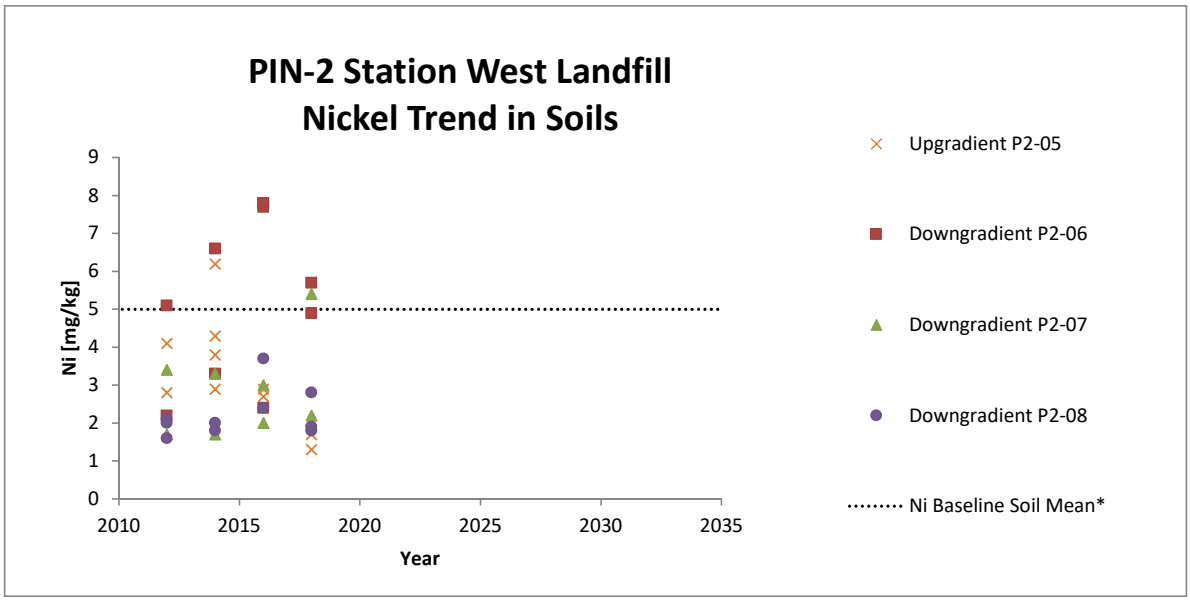


* Pb baseline arithmetic mean is equal to the baseline detection limit
* Pb baseline standard deviation = 0

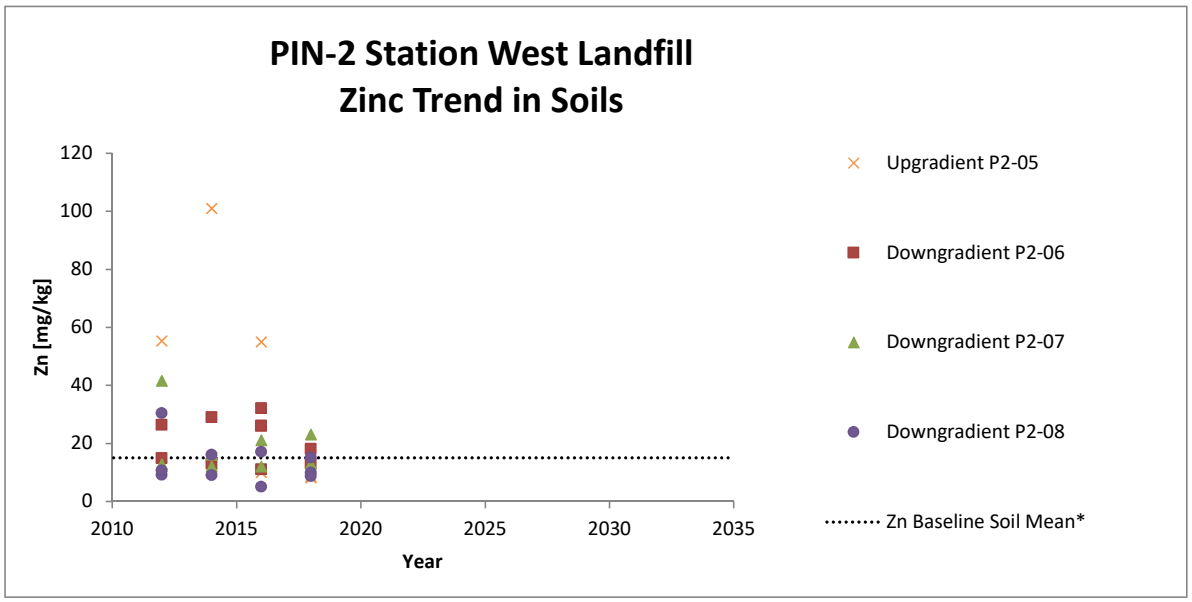
PIN-2 Station West Landfill Trends in Soil Inorganics, PCBs and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



* Ni baseline arithmetic mean is equal to the baseline detection limit
* Ni baseline standard deviation = 0

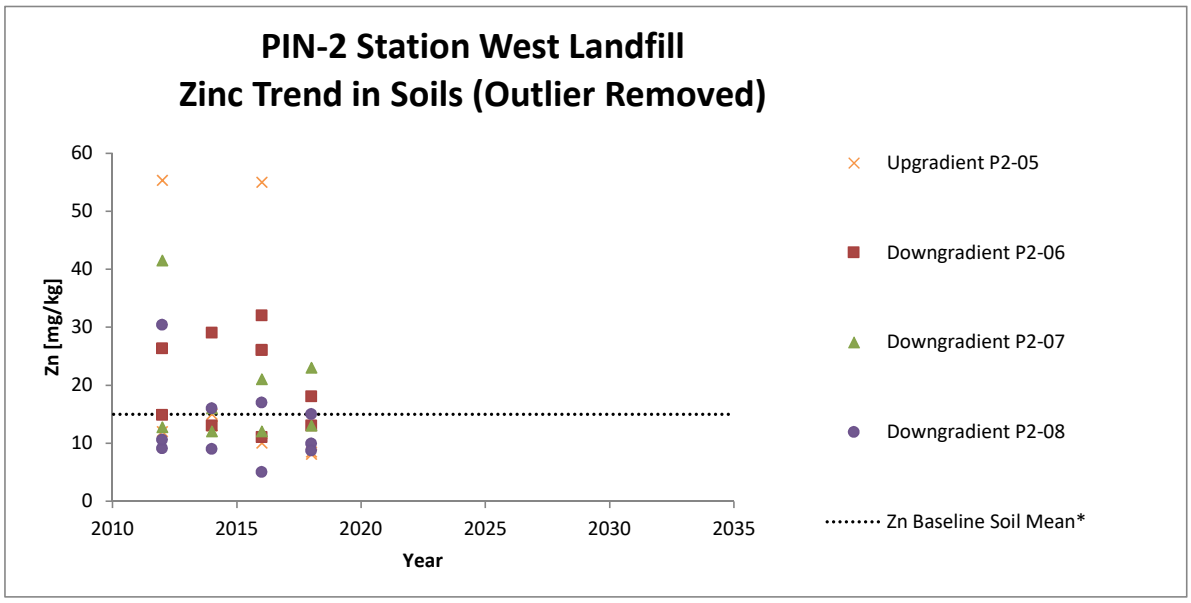


* Zn baseline arithmetic mean is equal to the baseline detection limit
* Zn baseline standard deviation = 0

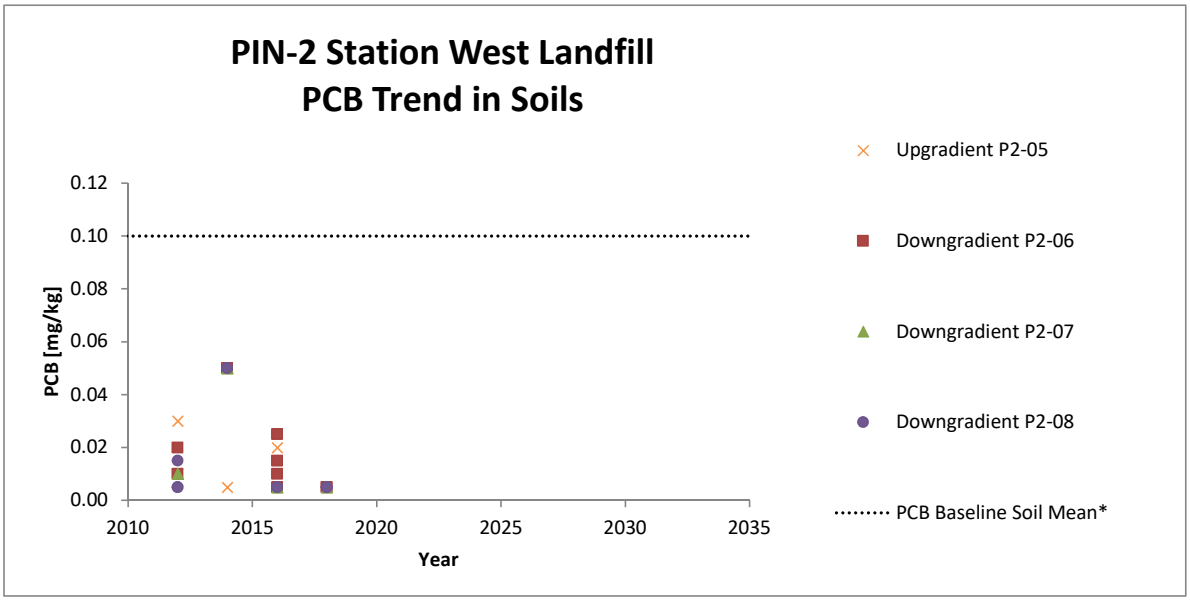
PIN-2 Station West Landfill Trends in Soil Inorganics, PCBs and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



Zn result from upgradient location P2-05 in 2014 is not shown in this chart

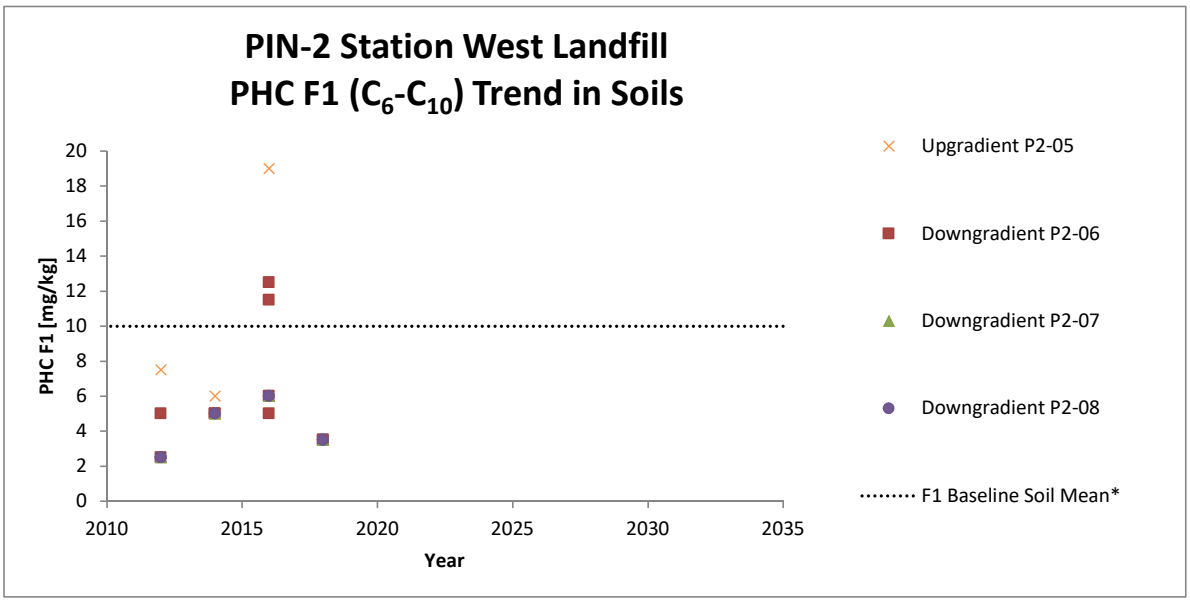


* PCB baseline arithmetic mean is equal to the baseline detection limit
* PCB baseline standard deviation = 0
Note: variations seen to 2018 are an indication of changing detection limits; all results at or below detection limits

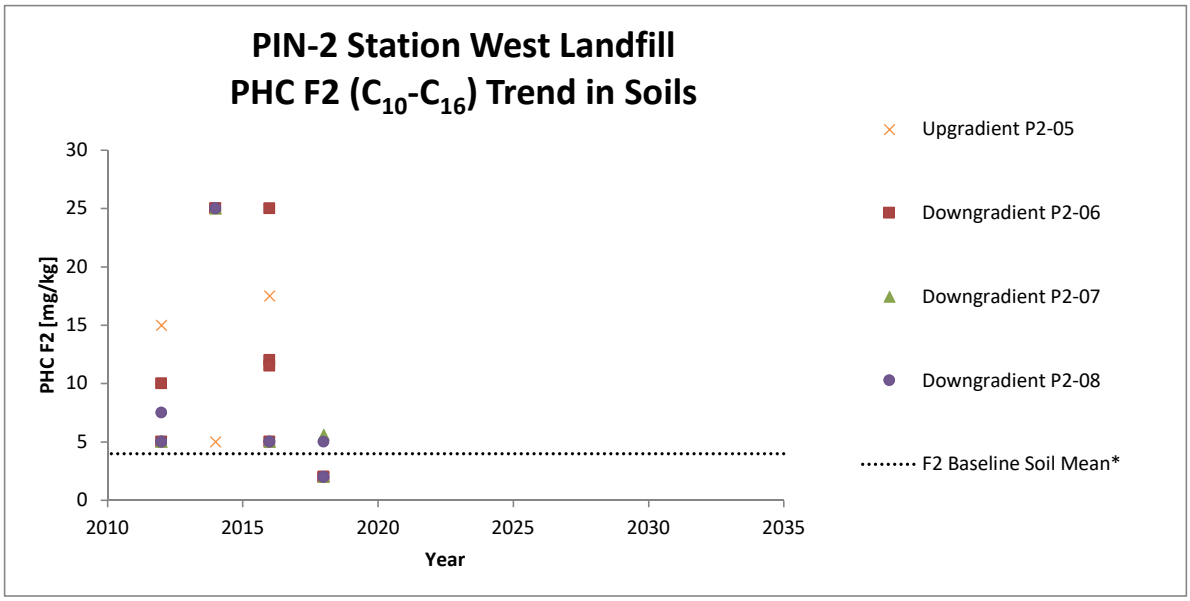
PIN-2 Station West Landfill Trends in Soil Inorganics, PCBs and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



* F1 baseline arithmetic mean is equal to the detection limit
* F1 baseline standard deviation = 0
Note: variations seen to 2018 are an indication of changing detection limits; all results at or below detection limits



* F2 baseline arithmetic mean is equal to the detection limit
* F2 baseline standard deviation = 0
Note: variations seen to 2016 are an indication of changing detection limits; all results prior to 2018 were at or below detection limits

PIN-2 Station West Landfill Trends in Soil Inorganics, PCBs and PHCs

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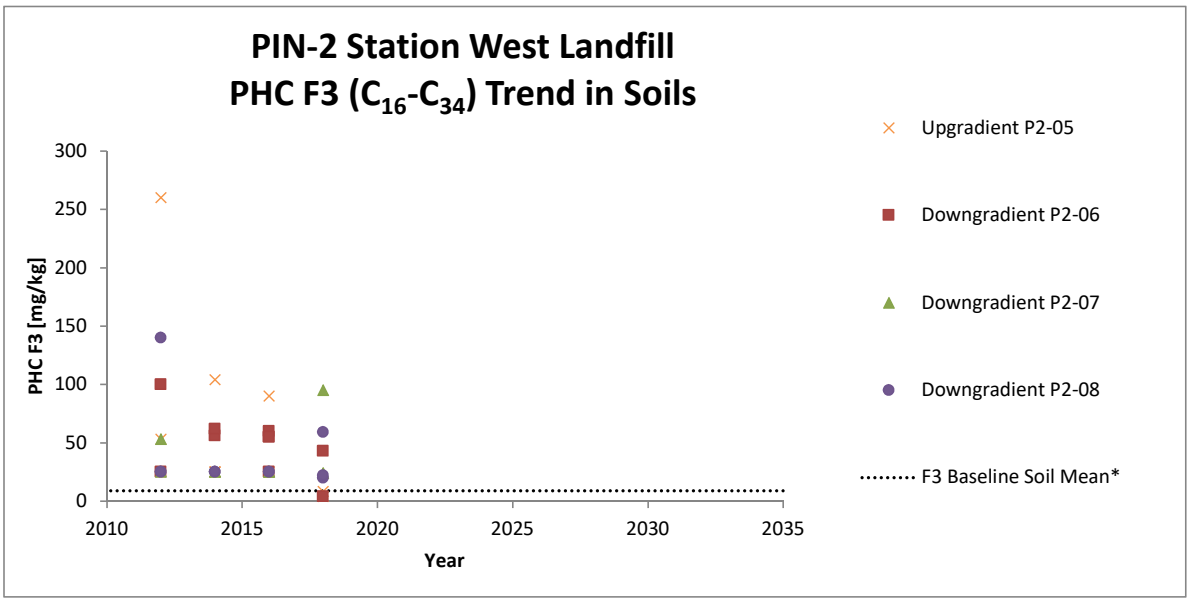
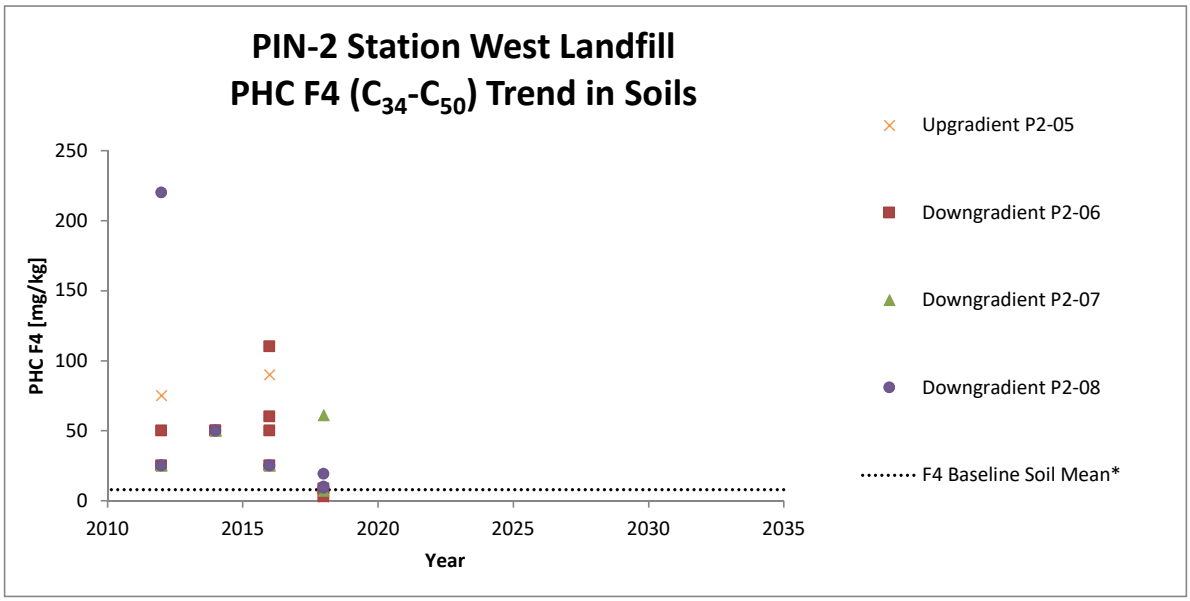
Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



* F3 baseline arithmetic mean is equal to the detection limit
* F3 baseline standard deviation = 0



* F4 baseline arithmetic mean is equal to the detection limit
* F4 baseline standard deviation = 0

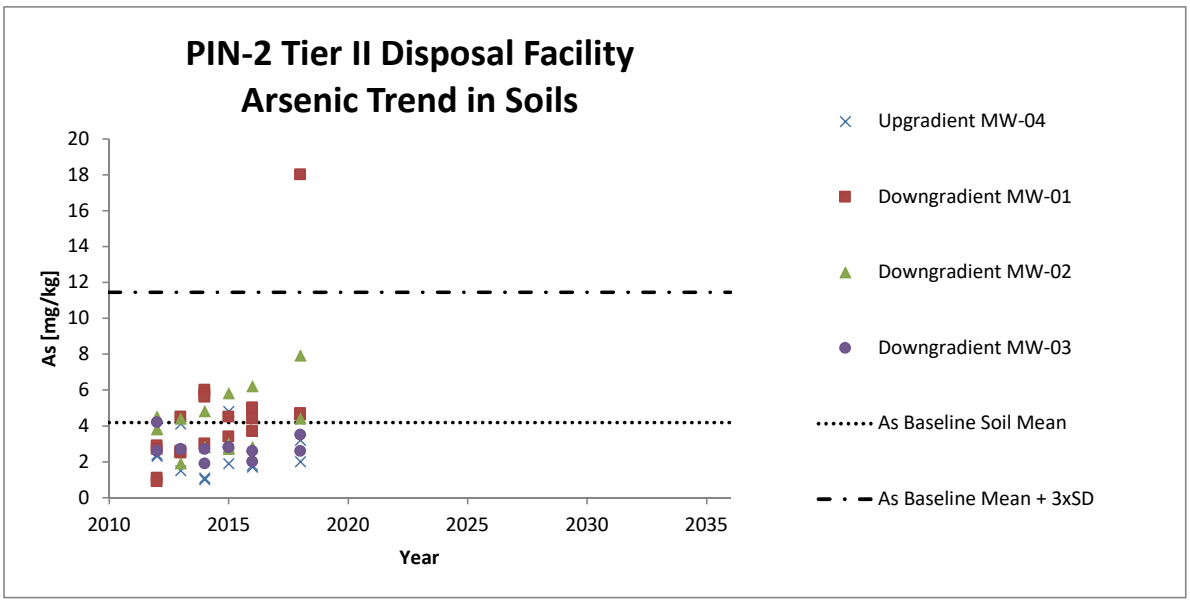
APPENDIX G4

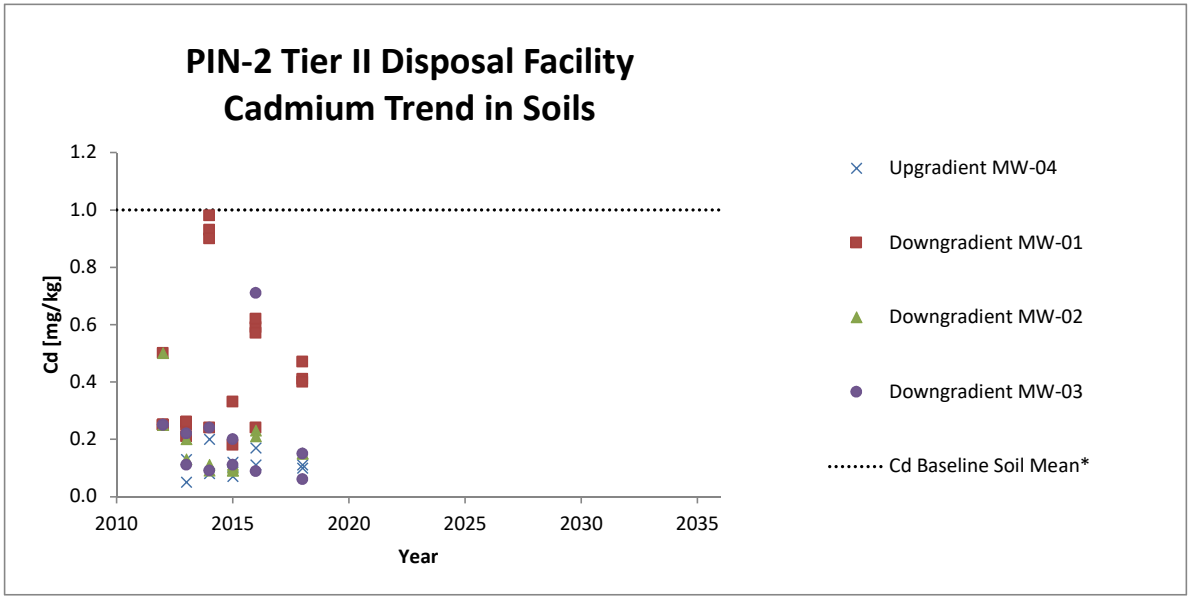
PIN-2 Tier II Soil Disposal Facility - Trends in Soil Inorganics, PCBs and PHCs

PIN-2 Tier II Disposal Facility Trends in Soil Inorganics, PCBs and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



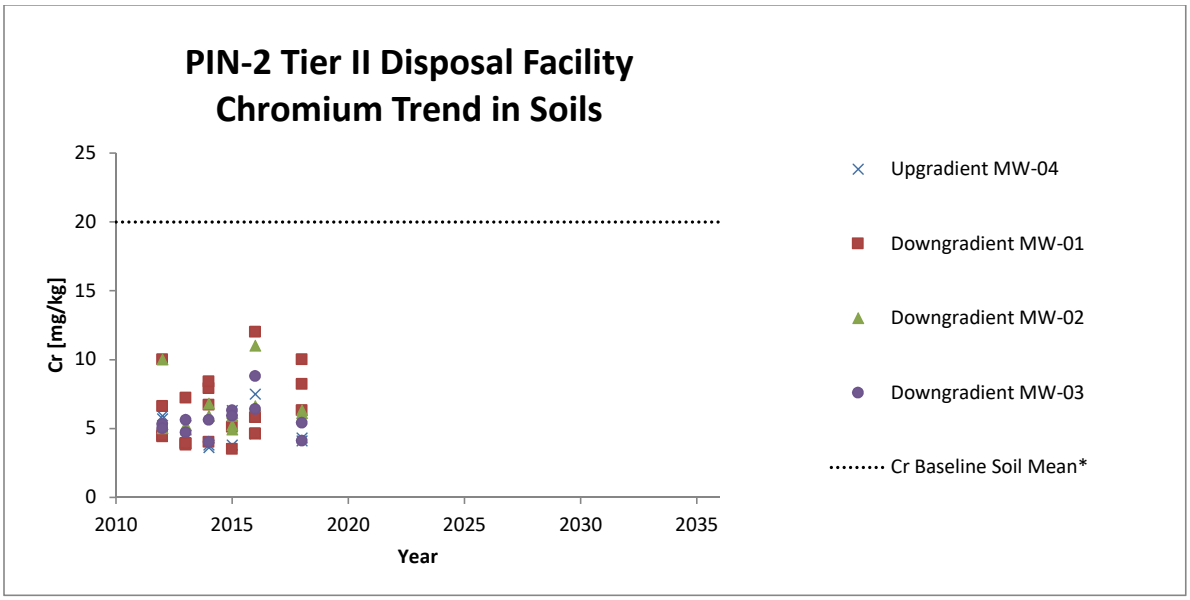


* Cd baseline arithmetic mean is equal to the baseline detection limit
* Cd baseline standard deviation = 0

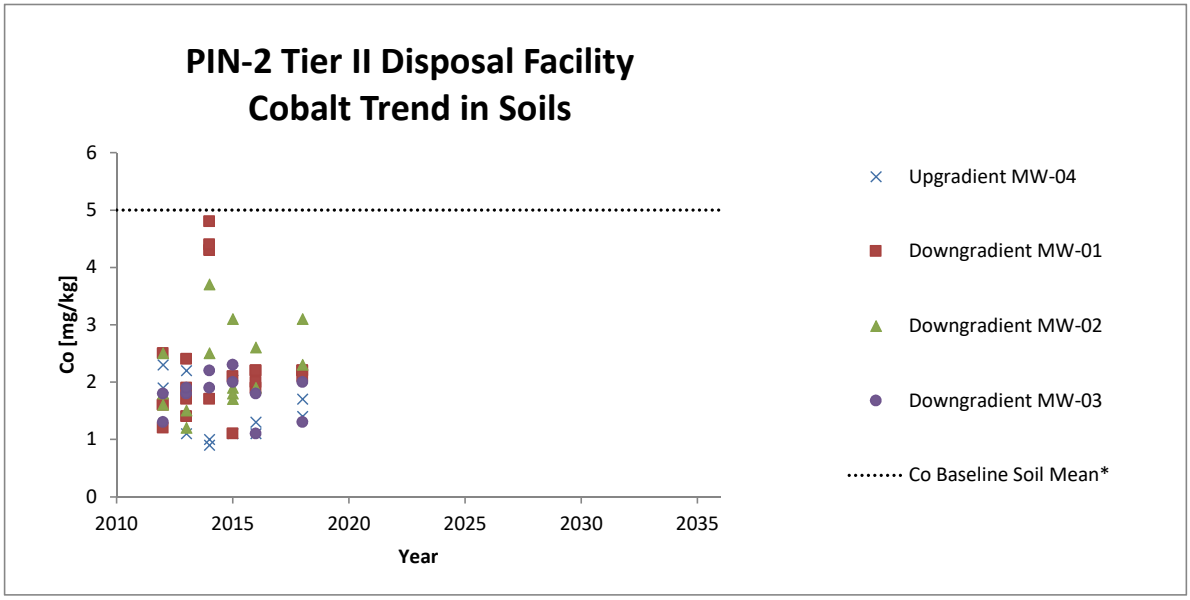
PIN-2 Tier II Disposal Facility Trends in Soil Inorganics, PCBs and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



* Cr baseline arithmetic mean is equal to the baseline detection limit
* Cr baseline standard deviation = 0



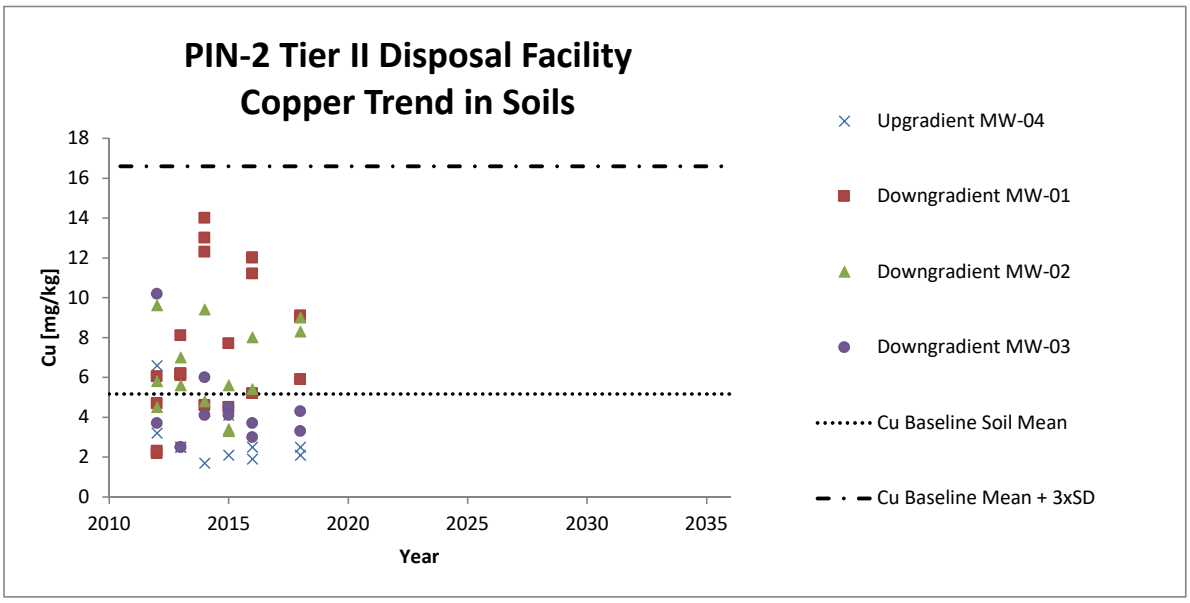
* Co baseline arithmetic mean is equal to the baseline detection limit
* Co baseline standard deviation = 0

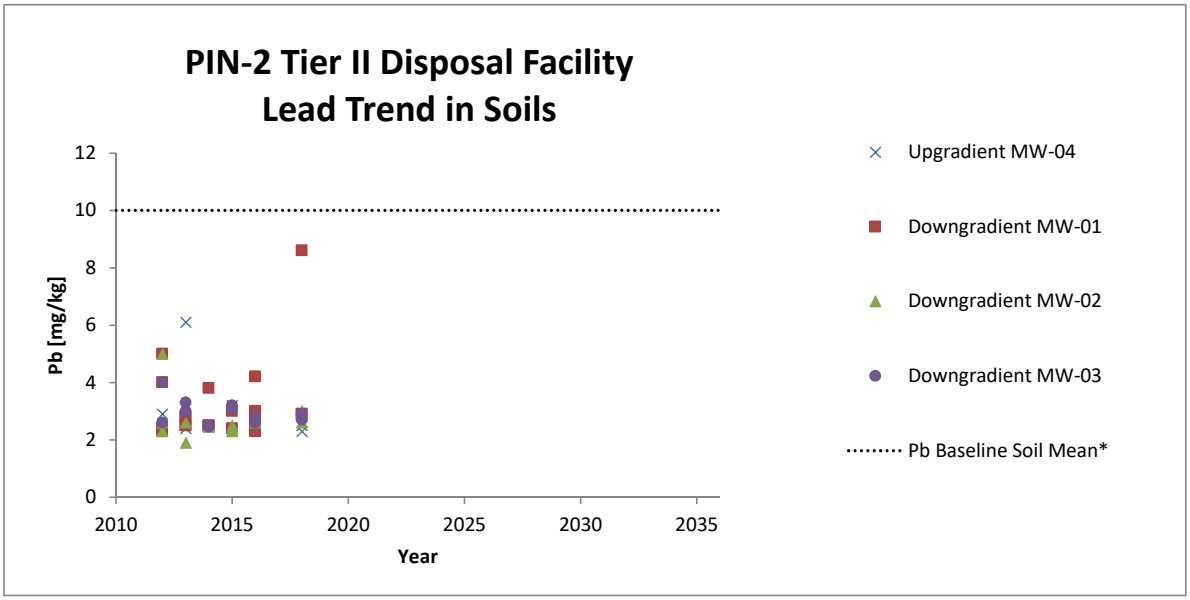
Appendix G4:

PIN-2 Tier II Disposal Facility Trends in Soil Inorganics, PCBs and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



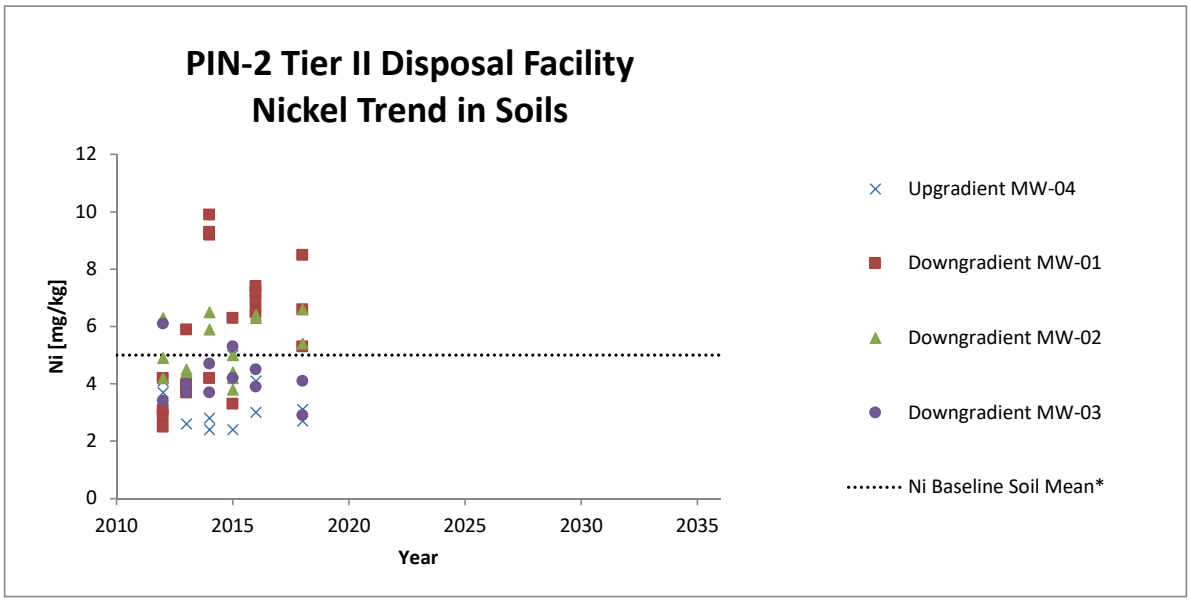


* Pb baseline arithmetic mean is equal to the baseline detection limit
* Pb baseline standard deviation = 0

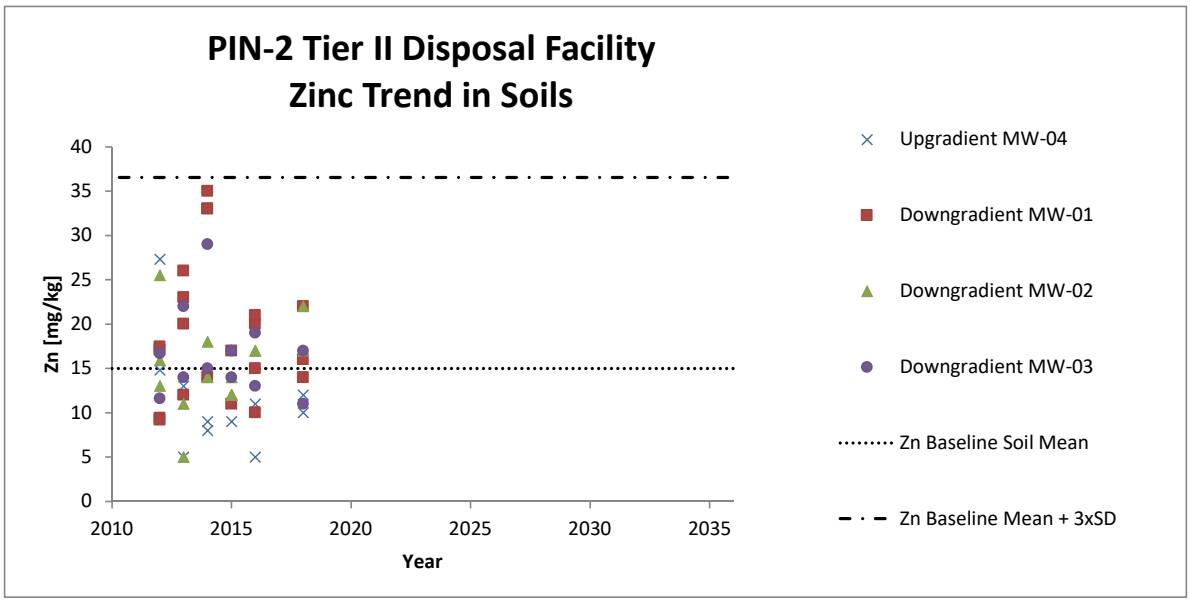
PIN-2 Tier II Disposal Facility Trends in Soil Inorganics, PCBs and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



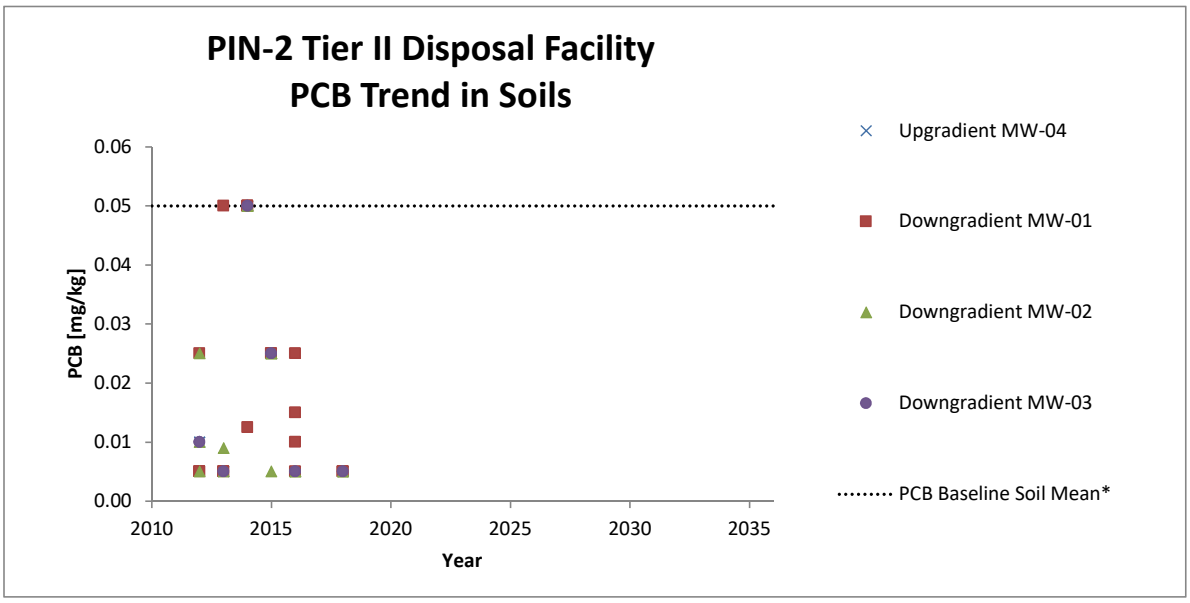
* Ni baseline arithmetic mean is equal to the baseline detection limit
* Ni baseline standard deviation = 0



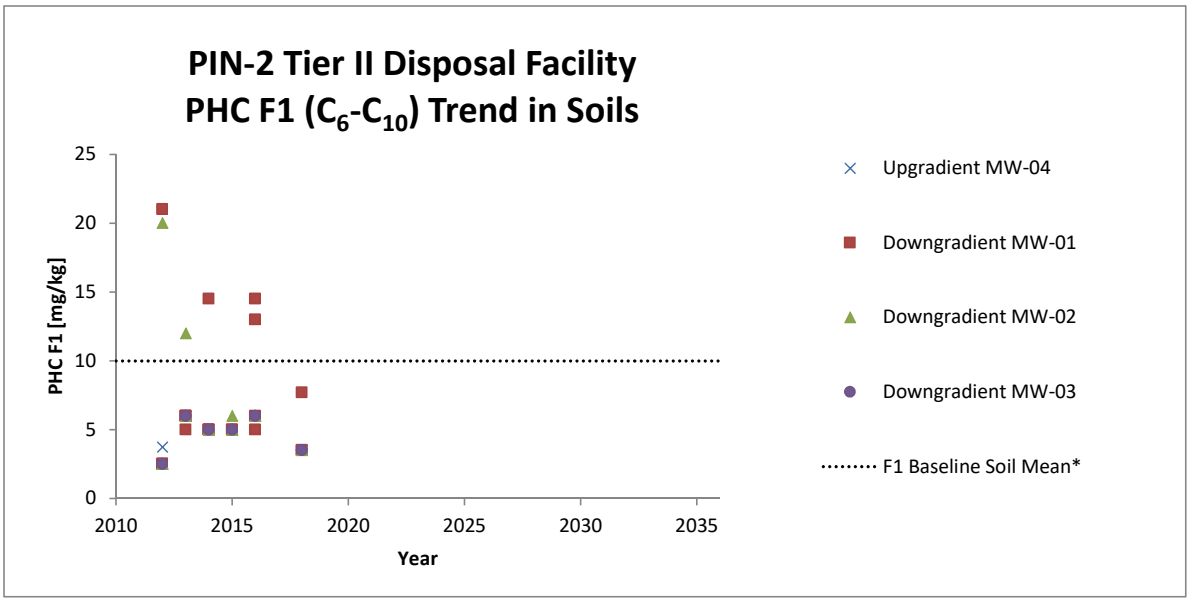
PIN-2 Tier II Disposal Facility Trends in Soil Inorganics, PCBs and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



* PCB baseline arithmetic mean is equal to the baseline detection limit
* PCB baseline standard deviation = 0
Note: variations seen to 2018 are an indication of changing detection limits; all results at or below detection limits

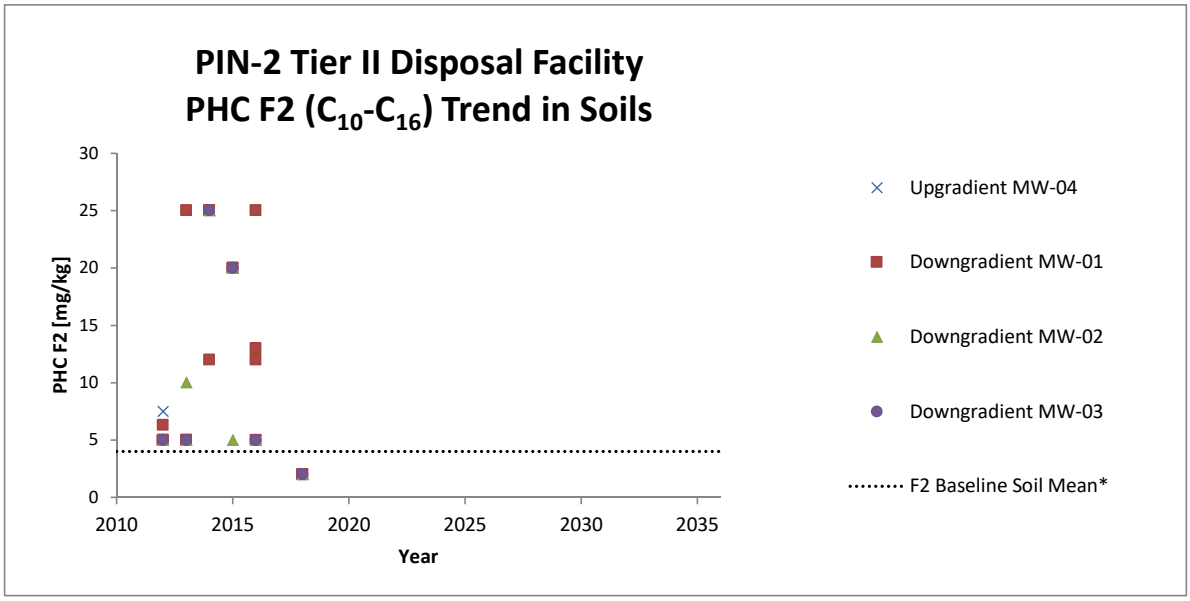


* F1 baseline arithmetic mean is equal to the detection limit
* F1 baseline standard deviation = 0

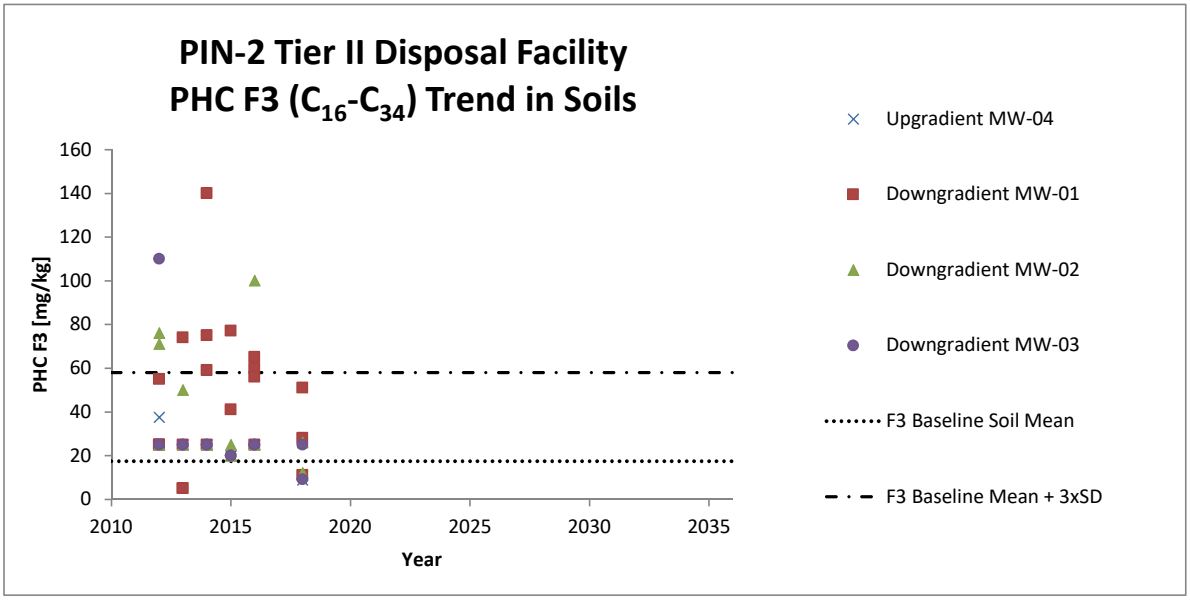
PIN-2 Tier II Disposal Facility Trends in Soil Inorganics, PCBs and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



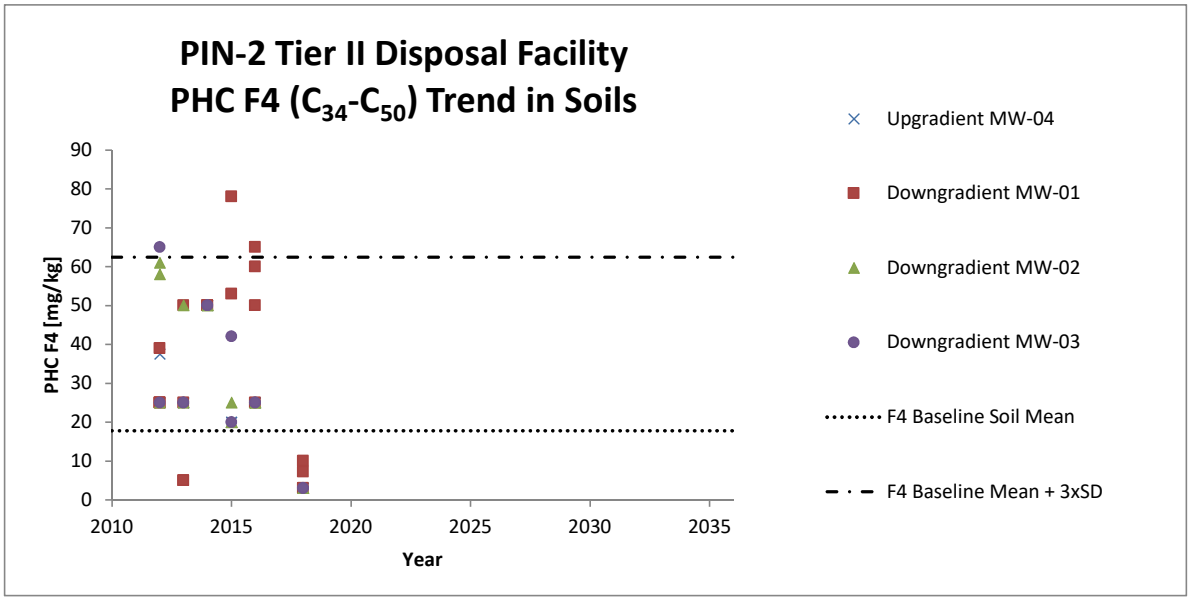
* F2 baseline arithmetic mean is equal to the detection limit
* F2 baseline standard deviation = 0



PIN-2 Tier II Disposal Facility Trends in Soil Inorganics, PCBs and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



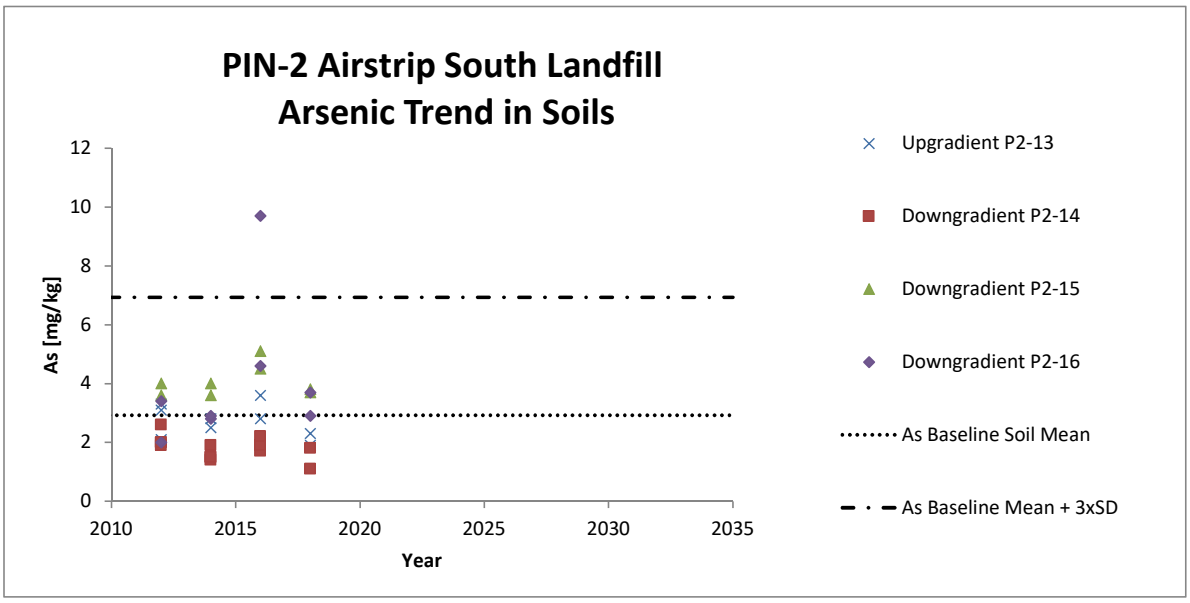
APPENDIX G5

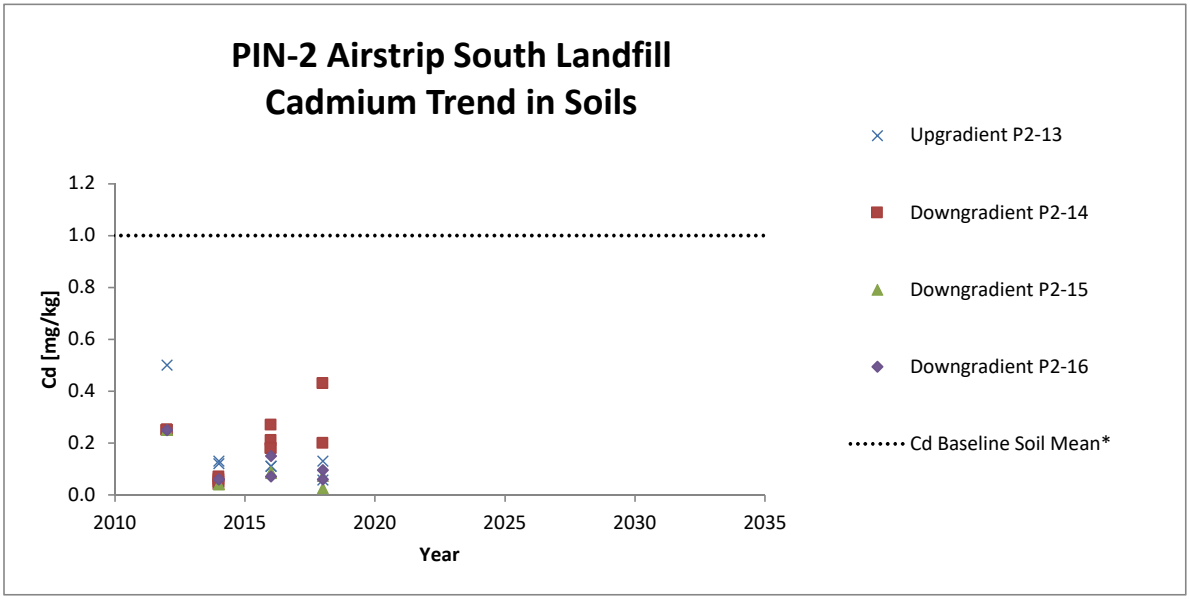
PIN-2 Airstrip South Landfill - Trends in Soil Inorganics, PCBs and PHCs

PIN-2 Airstrip South Landfill Trends in Soil Inorganics, PCBs and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



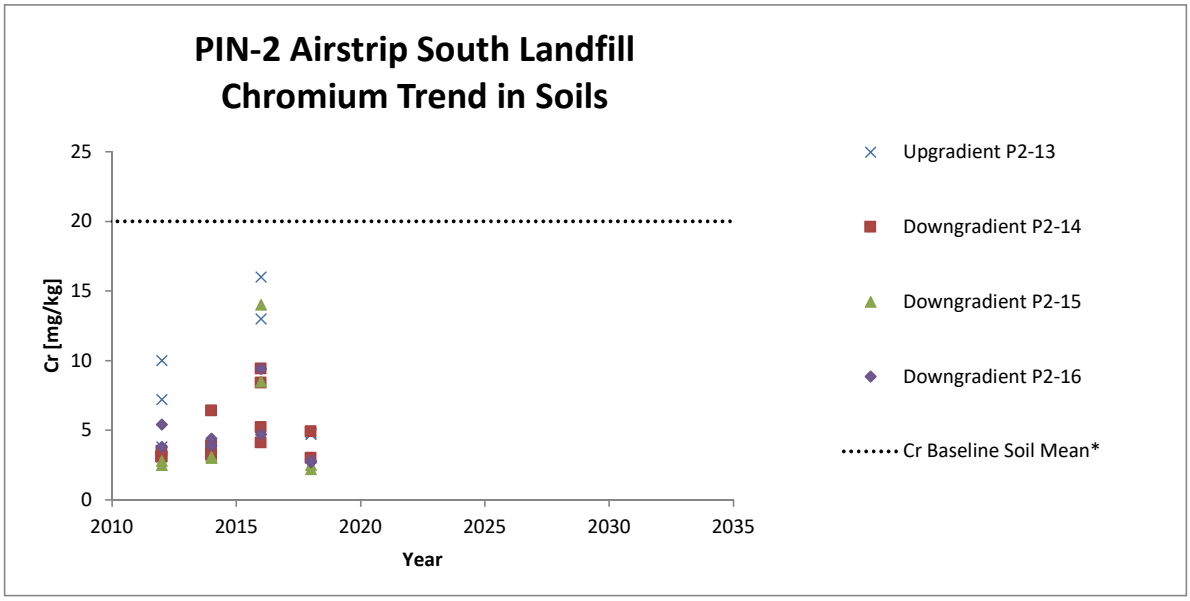


* Cd baseline arithmetic mean is equal to the baseline detection limit
* Cd baseline standard deviation = 0

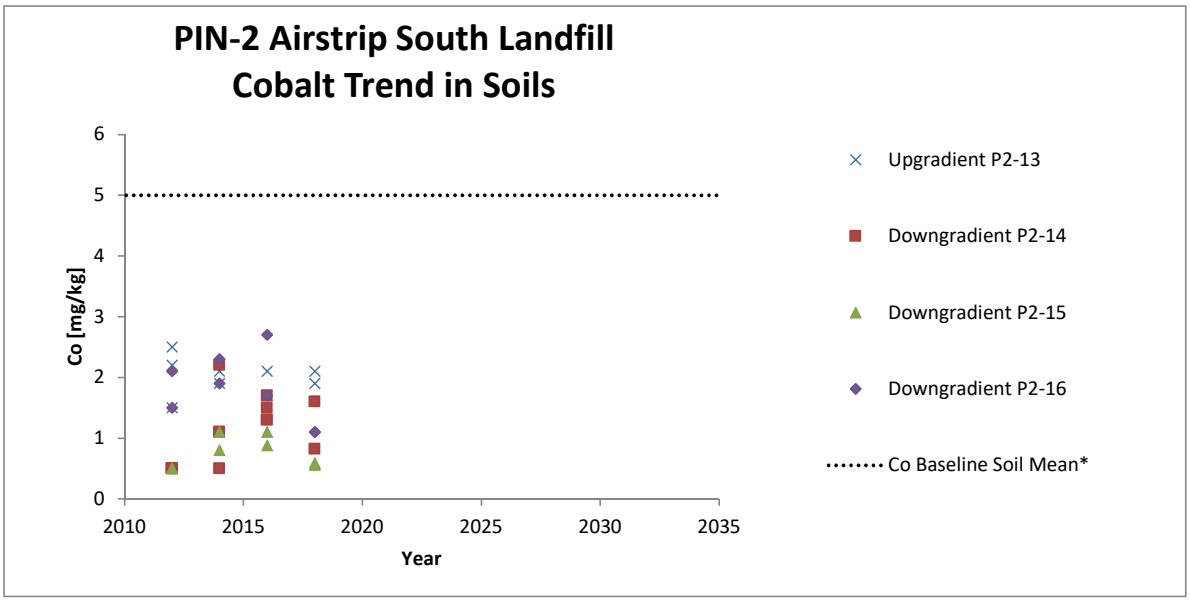
PIN-2 Airstrip South Landfill Trends in Soil Inorganics, PCBs and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



* Cr baseline arithmetic mean is equal to the baseline detection limit
* Cr baseline standard deviation = 0

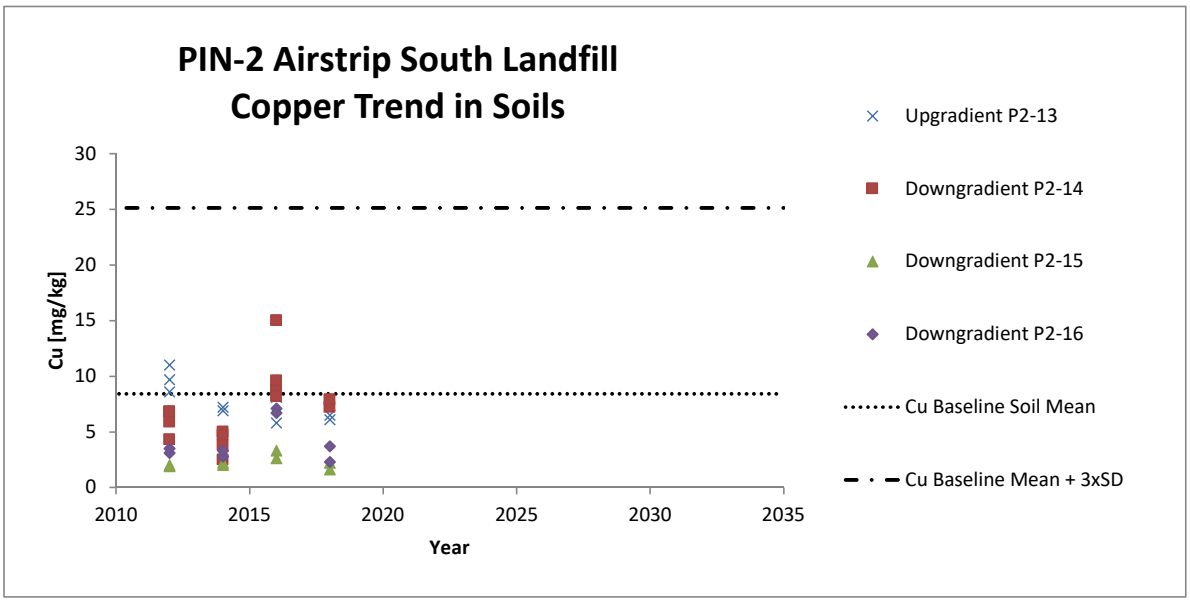


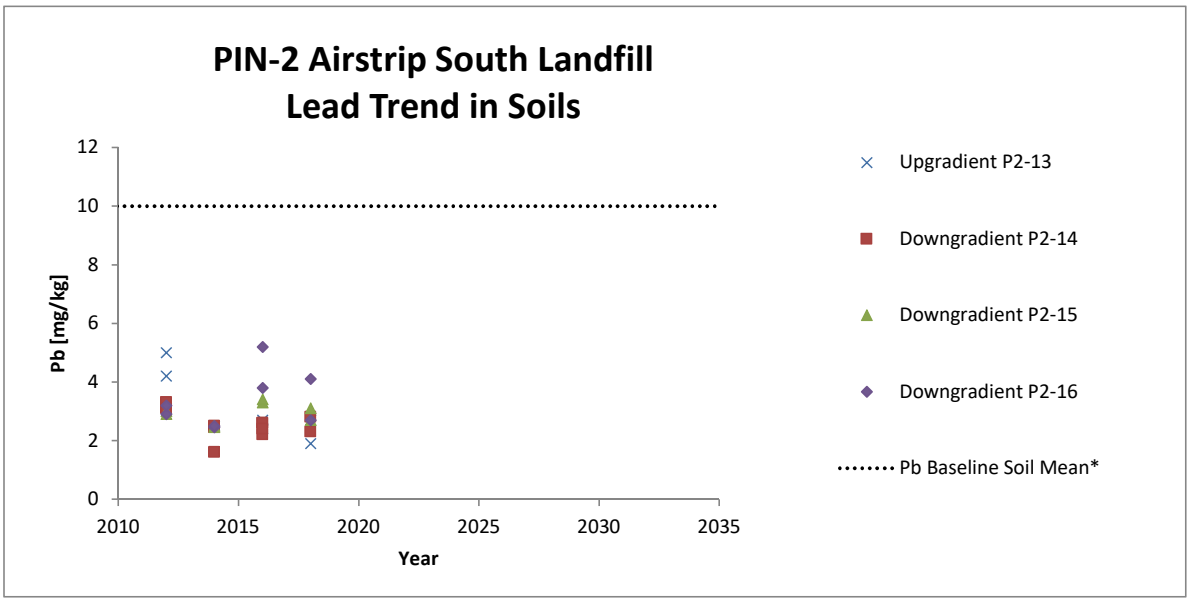
* Co baseline arithmetic mean is equal to the baseline detection limit
* Co baseline standard deviation = 0

PIN-2 Airstrip South Landfill Trends in Soil Inorganics, PCBs and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



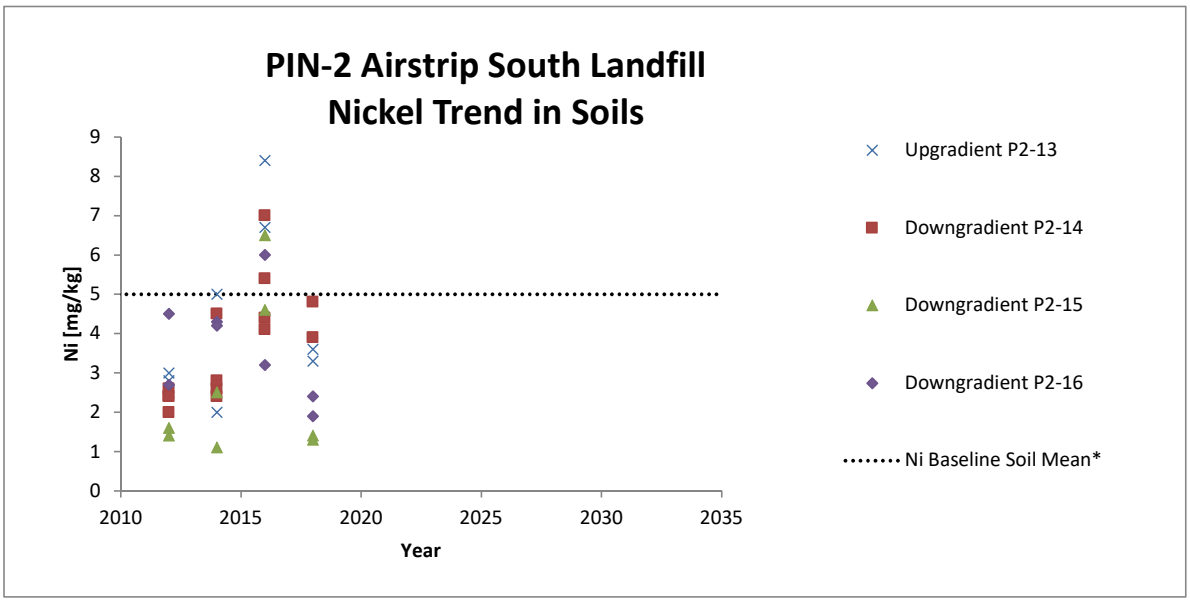


* Pb baseline arithmetic mean is equal to the baseline detection limit
* Pb baseline standard deviation = 0

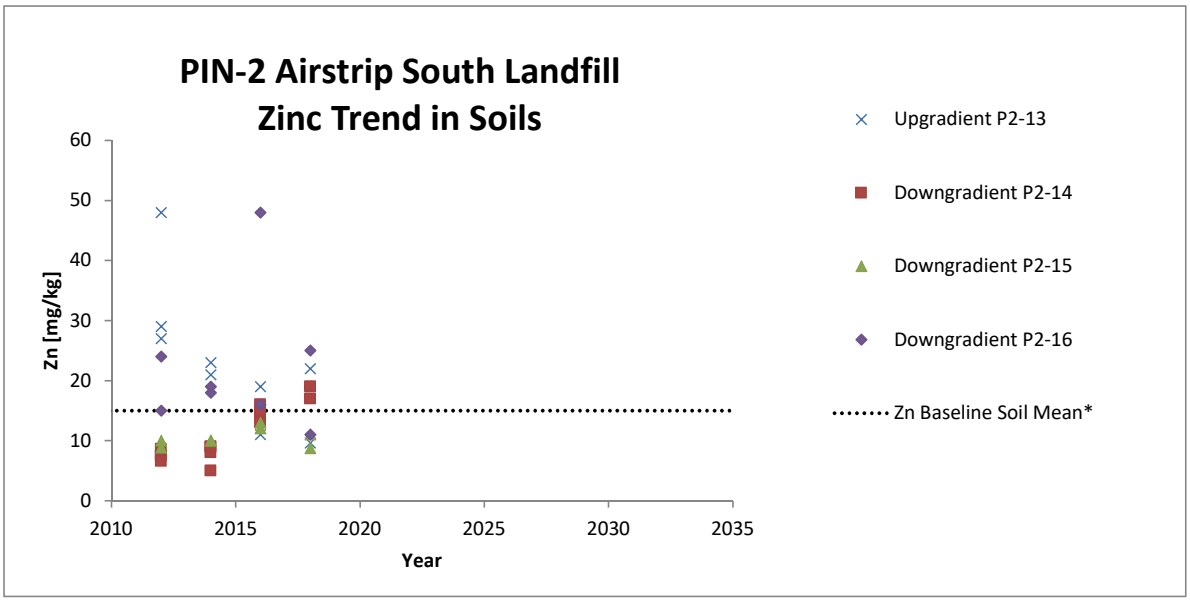
PIN-2 Airstrip South Landfill Trends in Soil Inorganics, PCBs and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



* Ni baseline arithmetic mean is equal to the baseline detection limit
* Ni baseline standard deviation = 0

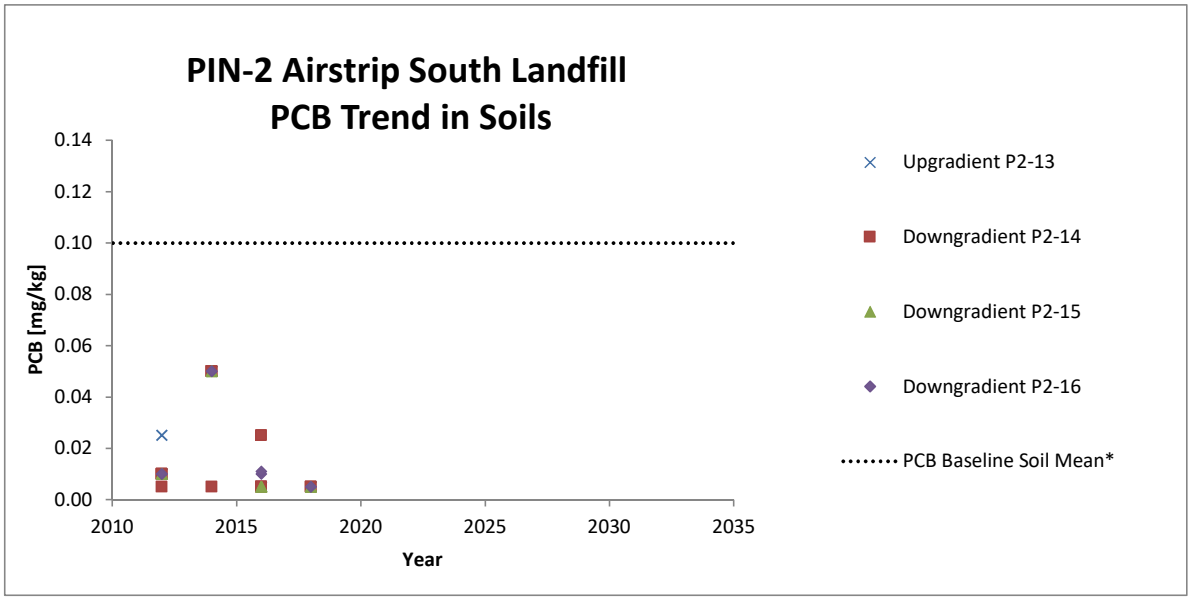


* Zn baseline arithmetic mean is equal to the baseline detection limit
* Zn baseline standard deviation = 0

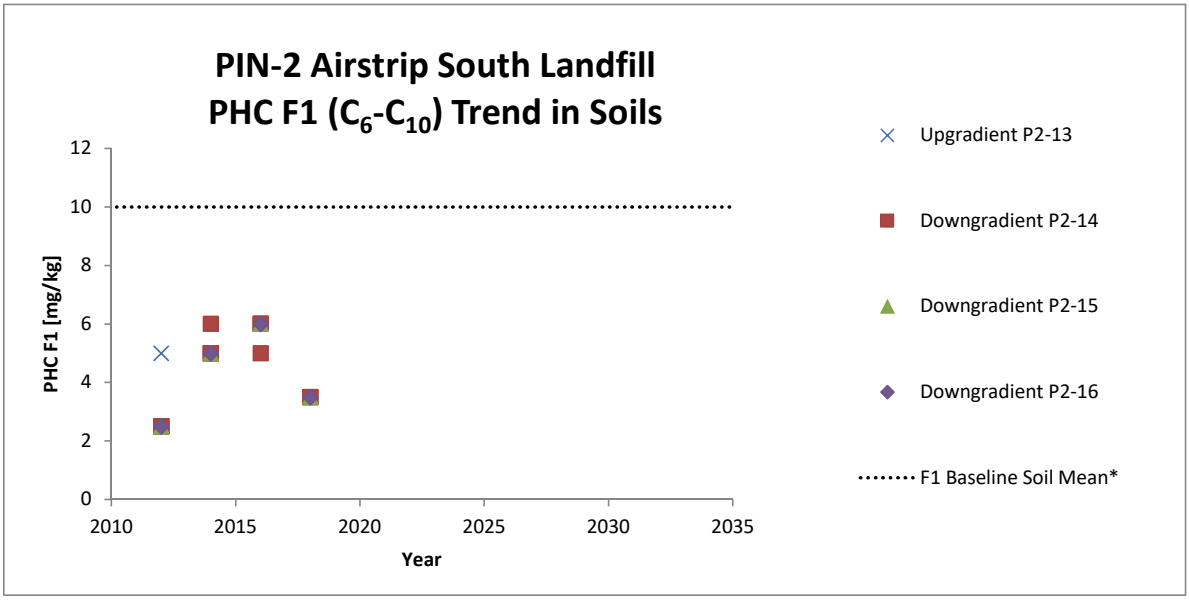
PIN-2 Airstrip South Landfill Trends in Soil Inorganics, PCBs and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



* PCB baseline arithmetic mean is equal to the baseline detection limit
* PCB baseline standard deviation = 0

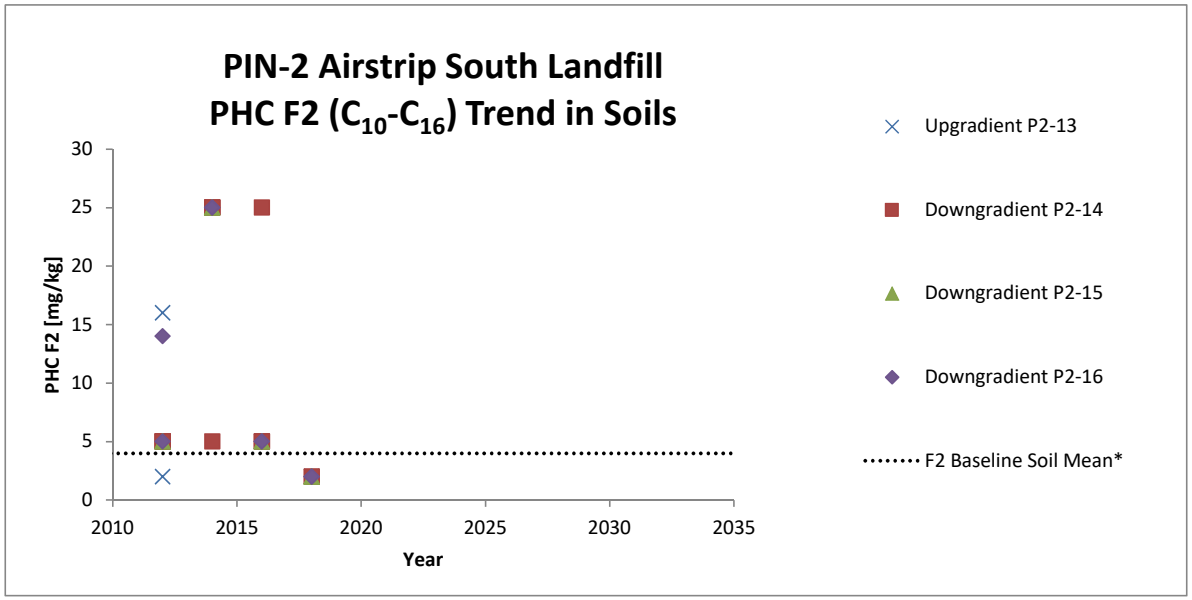


* F1 baseline arithmetic mean is equal to the detection limit
* F1 baseline standard deviation = 0
Note: variations seen to 2018 are an indication of changing detection limits; all results at or below detection limits

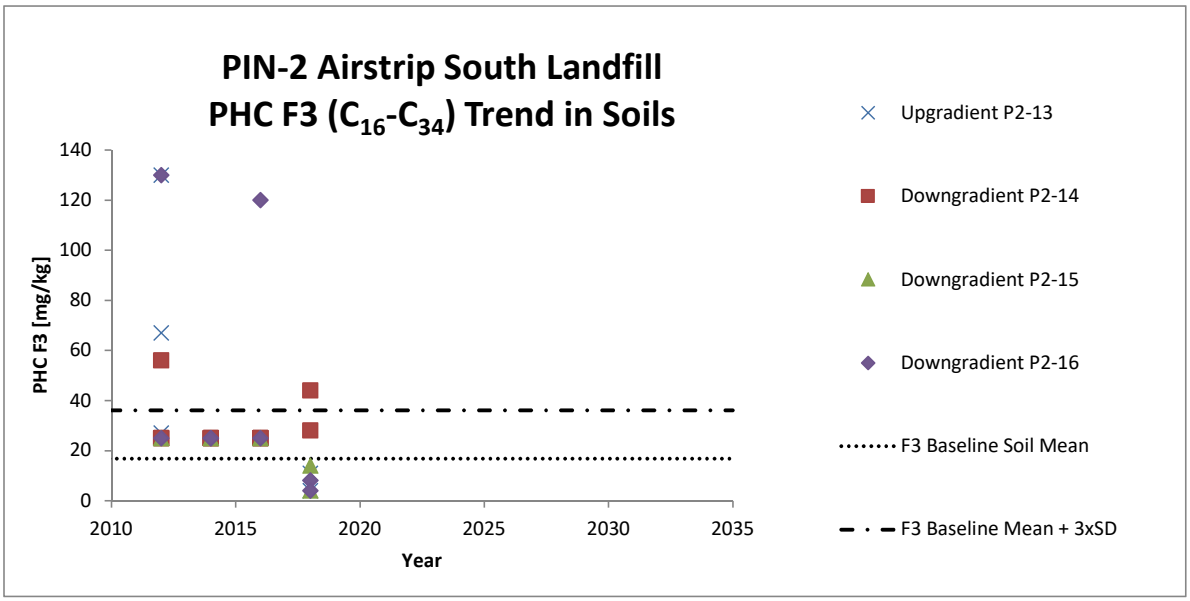
PIN-2 Airstrip South Landfill Trends in Soil Inorganics, PCBs and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



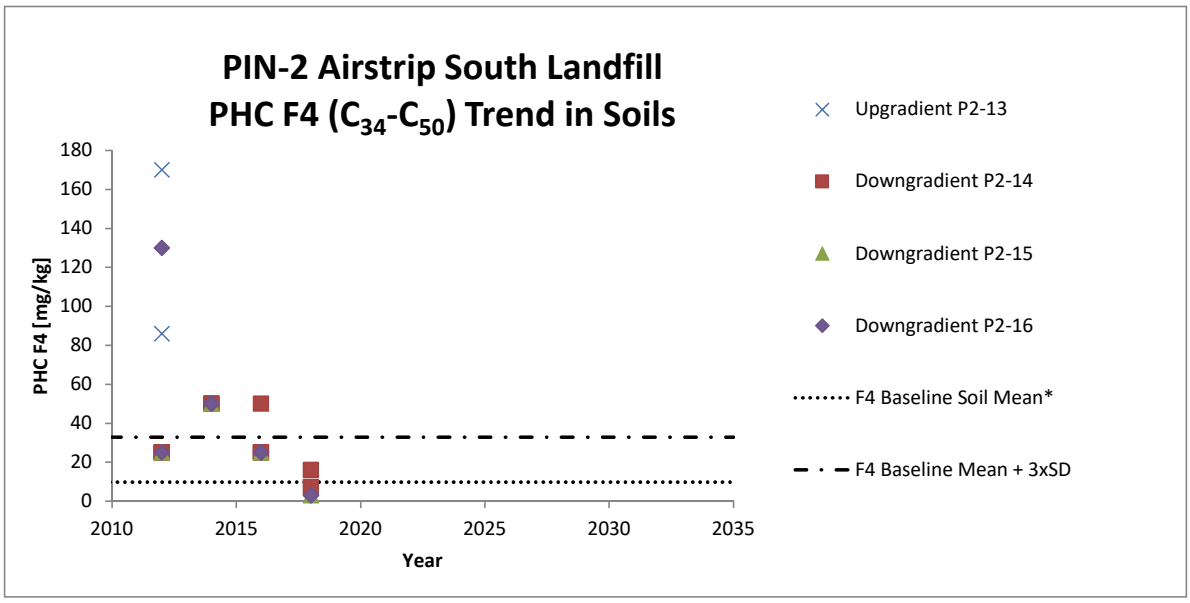
* F2 baseline arithmetic mean is equal to the detection limit
* F2 baseline standard deviation = 0



PIN-2 Airstrip South Landfill Trends in Soil Inorganics, PCBs and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



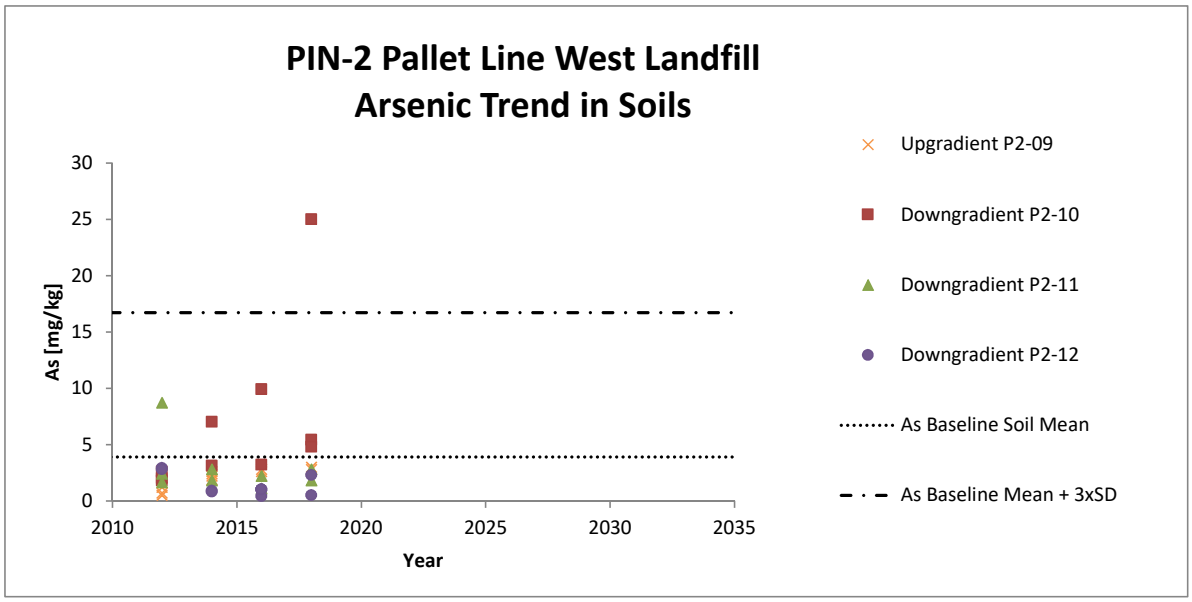
APPENDIX G6

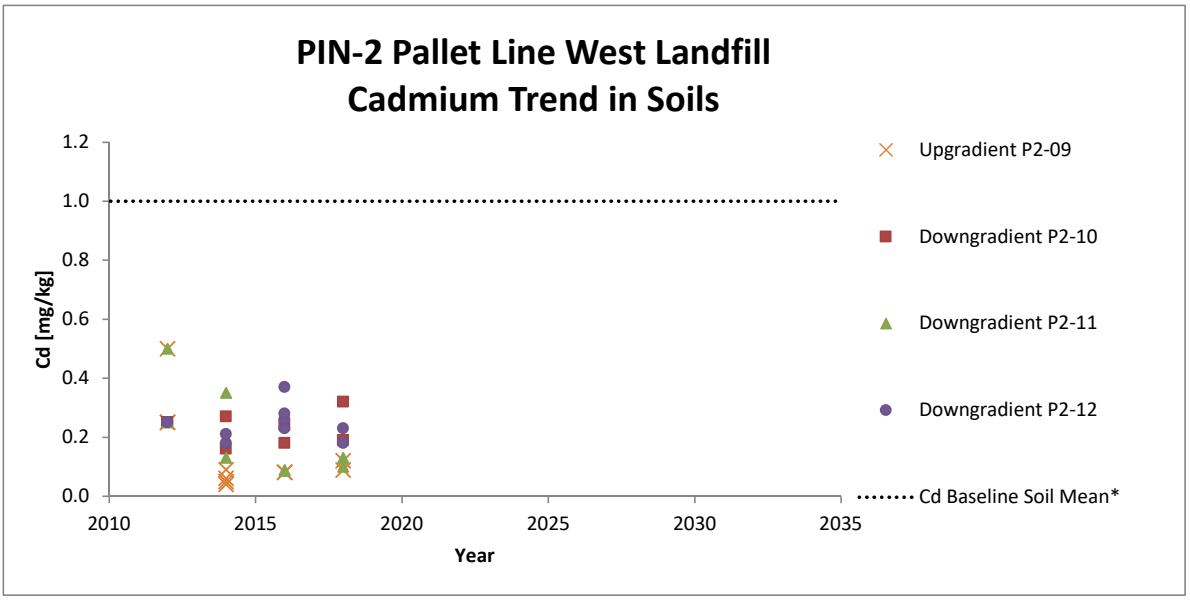
PIN-2 Pallet Line West - Trends in Soil Inorganics, PCBs and PHCs

PIN-2 Pallet Line West Landfill Trends in Soil Inorganics, PCBs and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



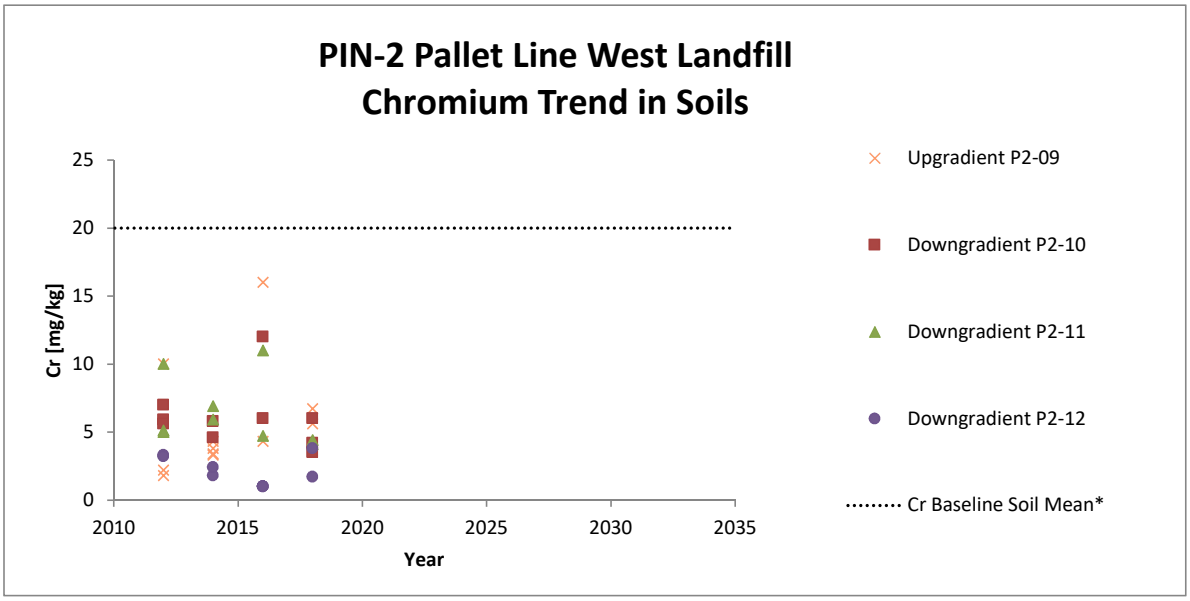


* Cd baseline arithmetic mean is equal to the baseline detection limit
* Cd baseline standard deviation = 0

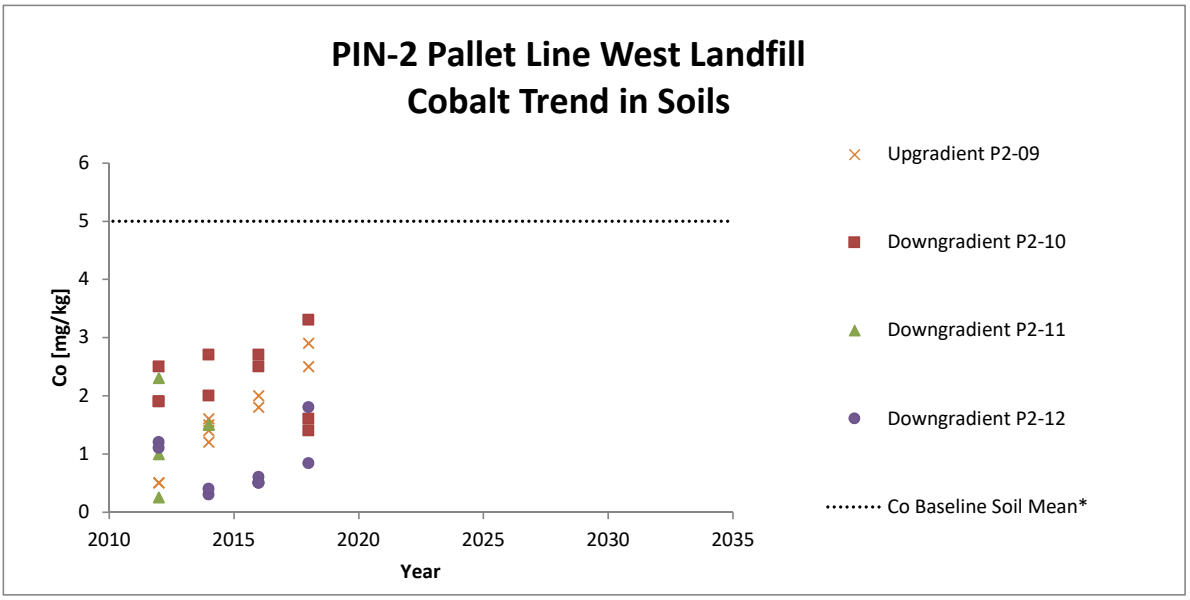
PIN-2 Pallet Line West Landfill Trends in Soil Inorganics, PCBs and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



* Cr baseline arithmetic mean is equal to the baseline detection limit
* Cr baseline standard deviation = 0

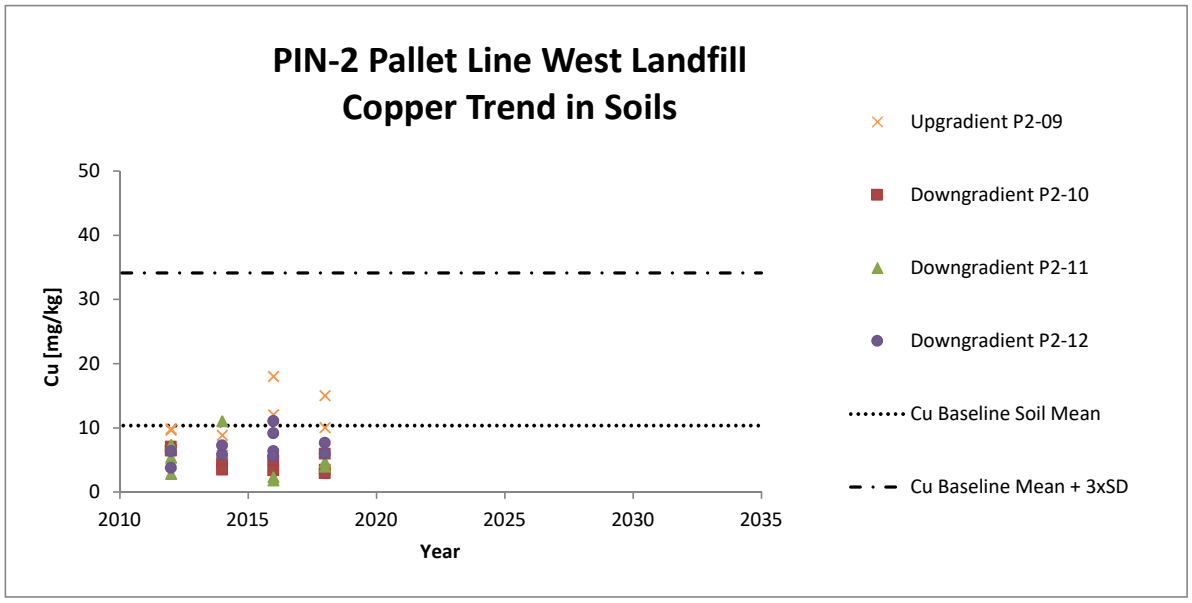


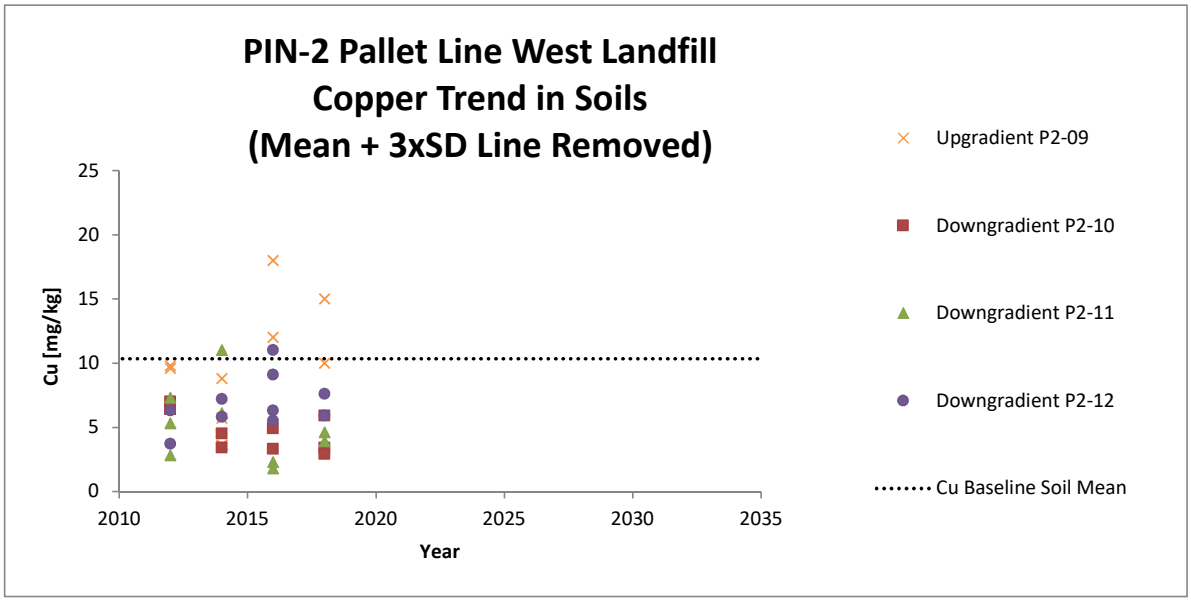
* Co baseline arithmetic mean is equal to the baseline detection limit
* Co baseline standard deviation = 0

PIN-2 Pallet Line West Landfill Trends in Soil Inorganics, PCBs and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



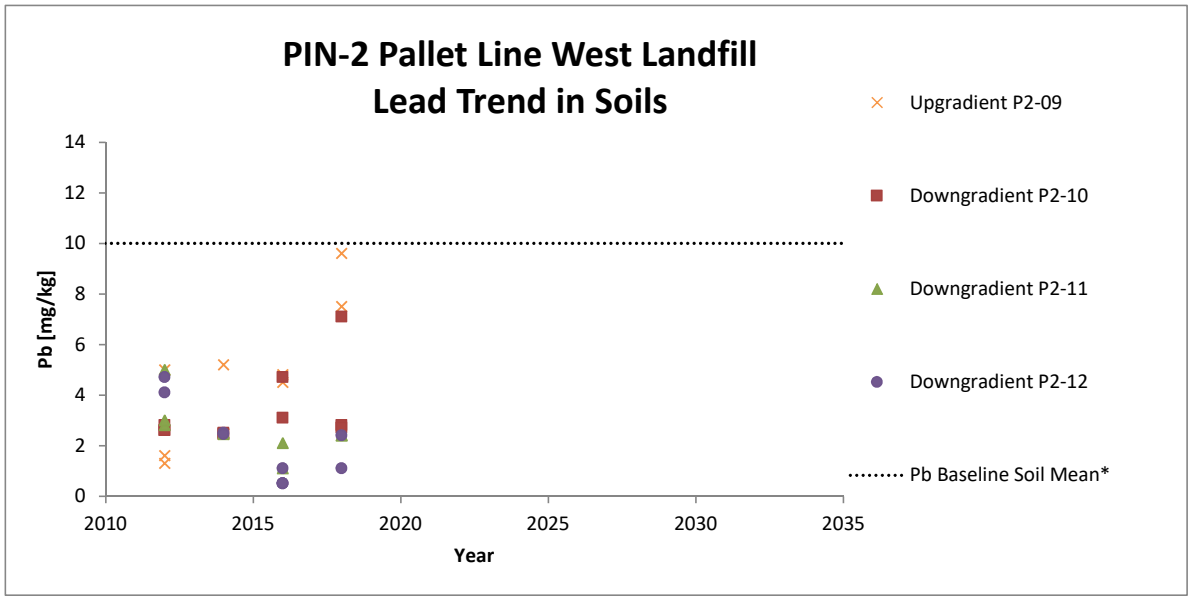


Y-axis maximum value decreased to show data distribution; baseline mean + 3 x SD not shown

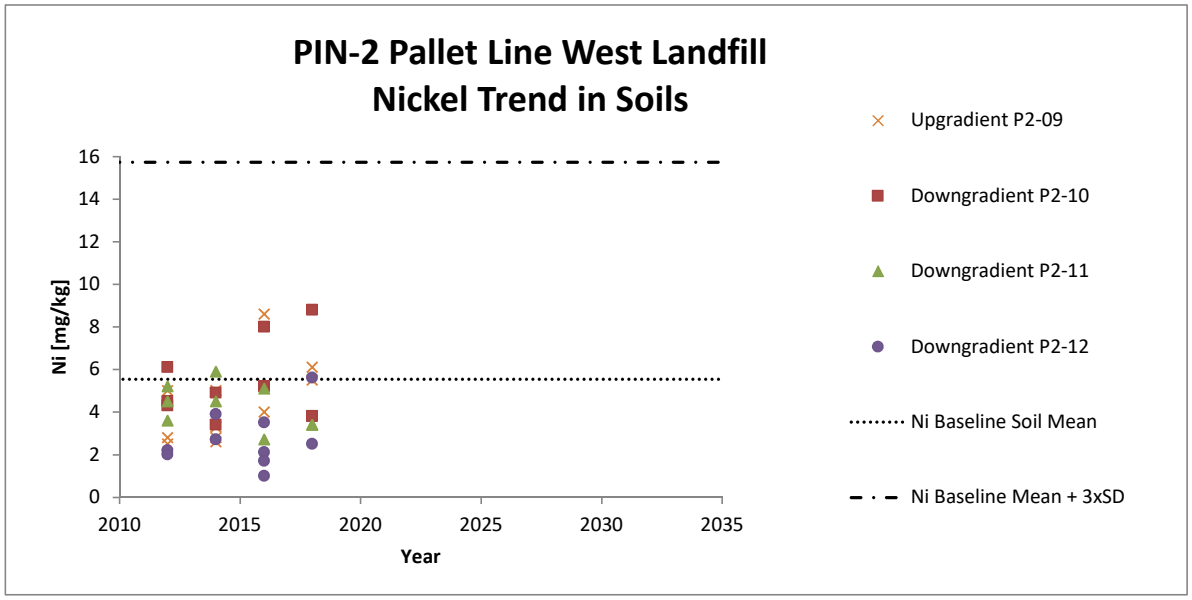
PIN-2 Pallet Line West Landfill Trends in Soil Inorganics, PCBs and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



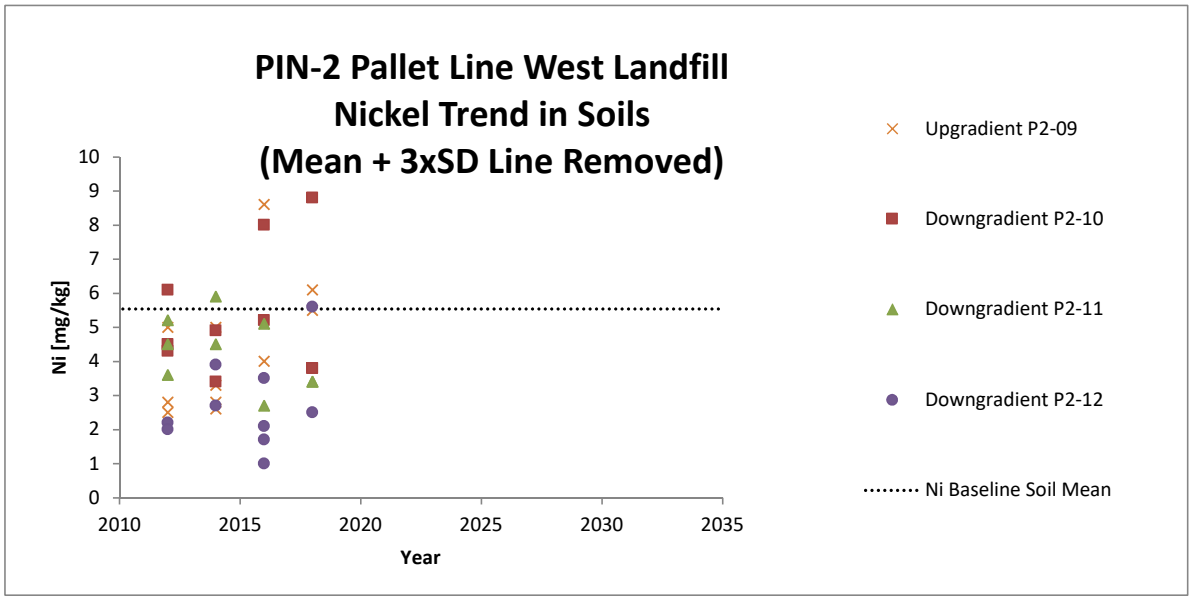
* Pb baseline arithmetic mean is equal to the baseline detection limit
* Pb baseline standard deviation = 0



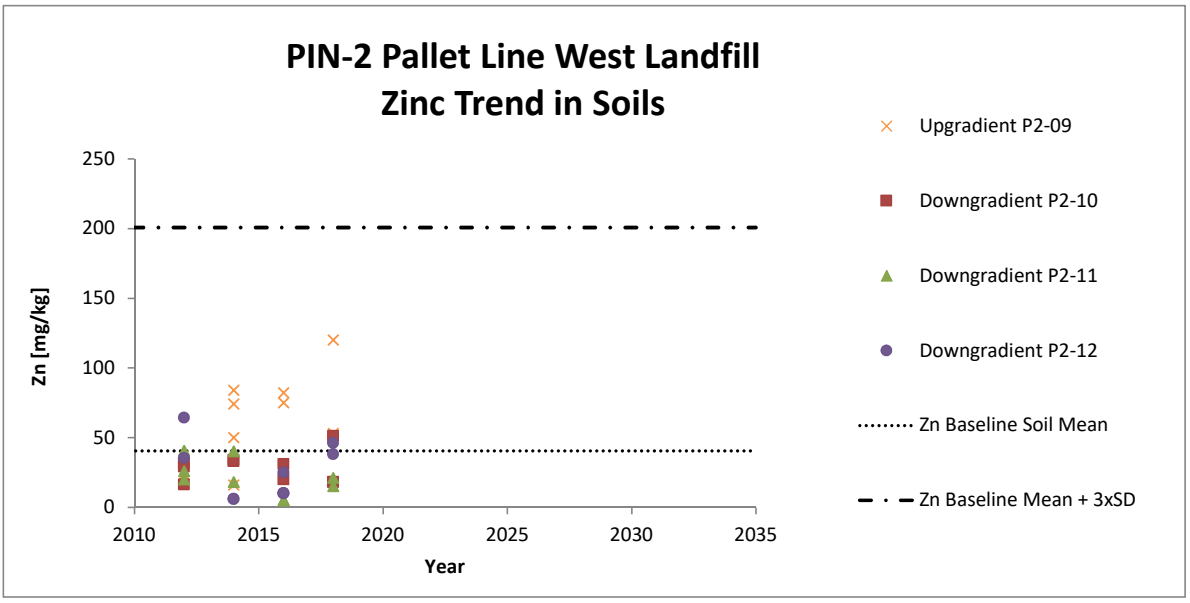
PIN-2 Pallet Line West Landfill Trends in Soil Inorganics, PCBs and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



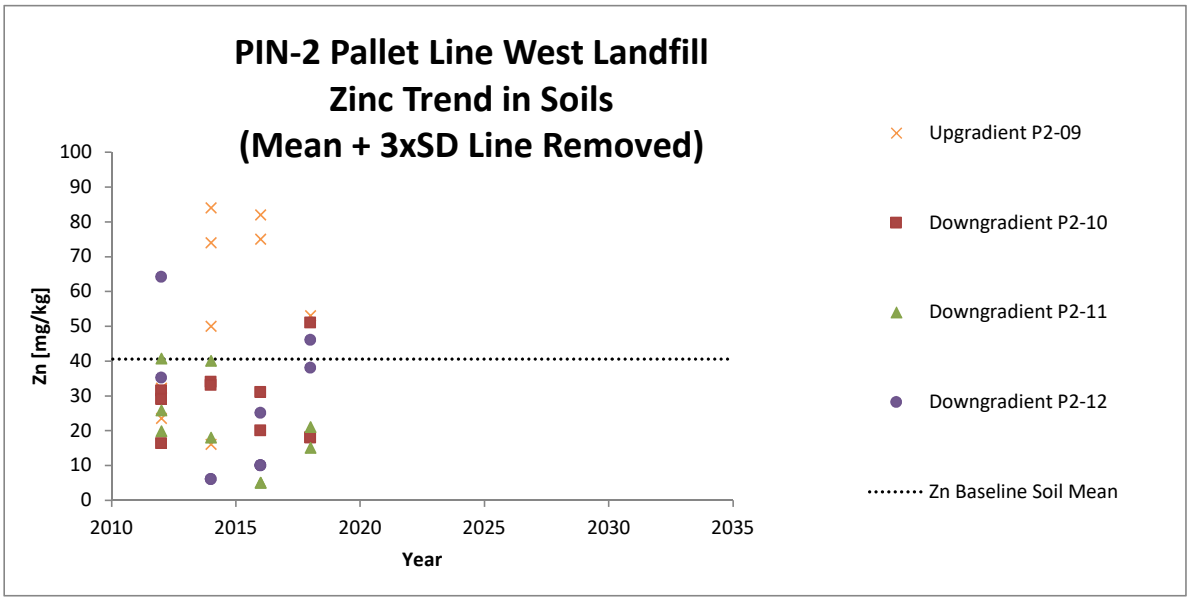
Y-axis maximum value decreased to show data distribution; baseline mean + 3 x SD not shown



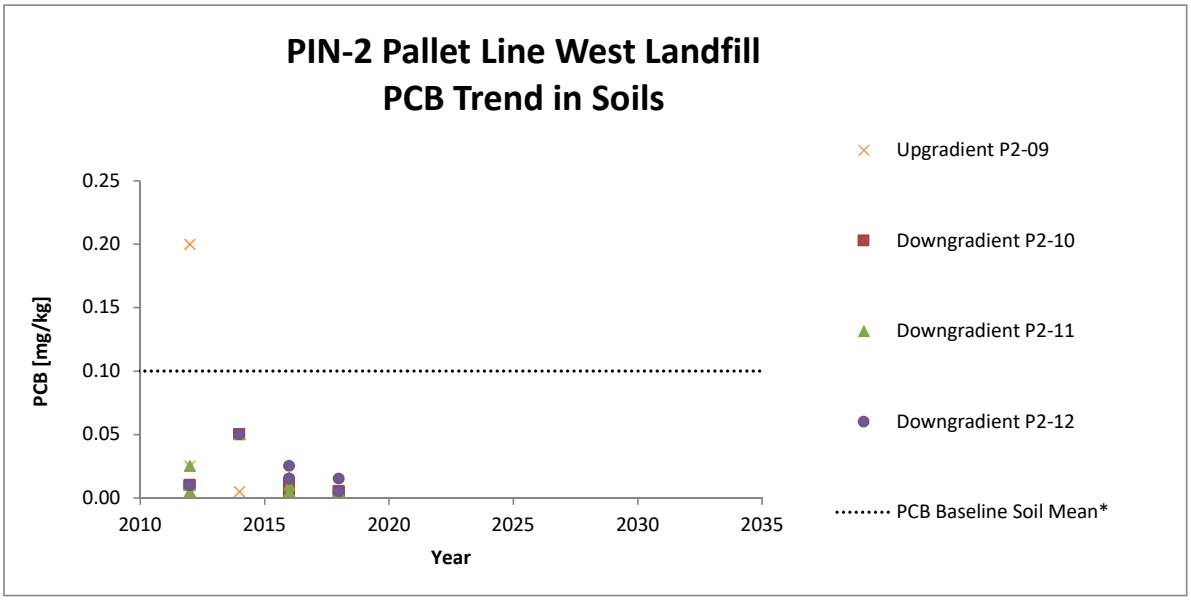
PIN-2 Pallet Line West Landfill Trends in Soil Inorganics, PCBs and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



Y-axis maximum value decreased to show data distribution; baseline mean + 3 x SD not shown

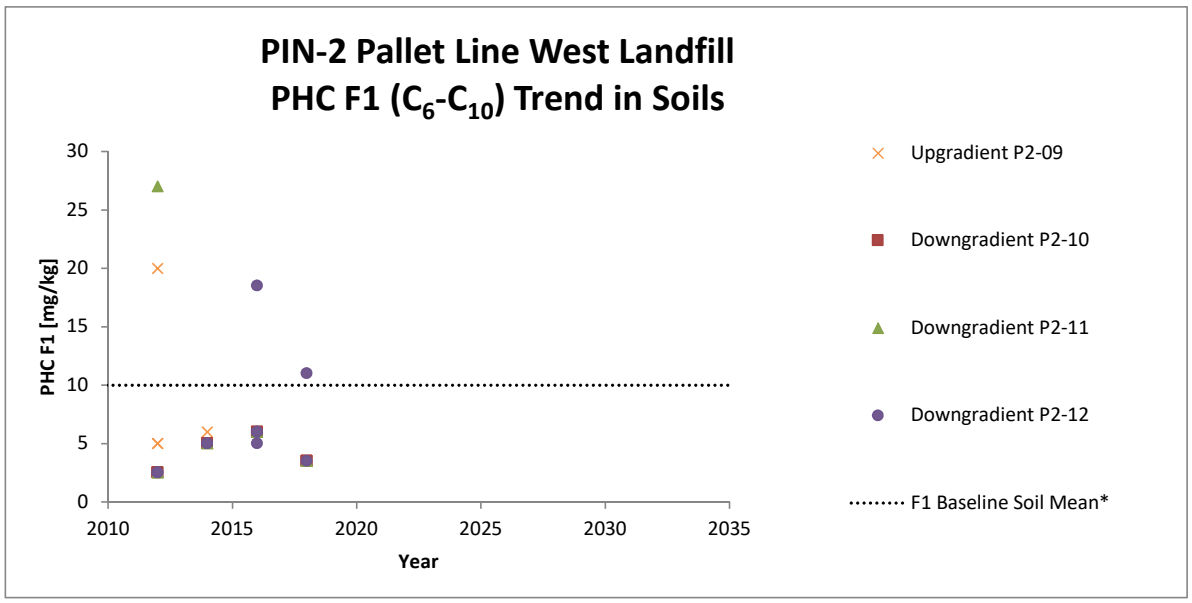


* PCB baseline arithmetic mean is equal to the baseline detection limit
* PCB baseline standard deviation = 0
Note: variations seen to 2018 are an indication of changing detection limits; all results at or below detection limits

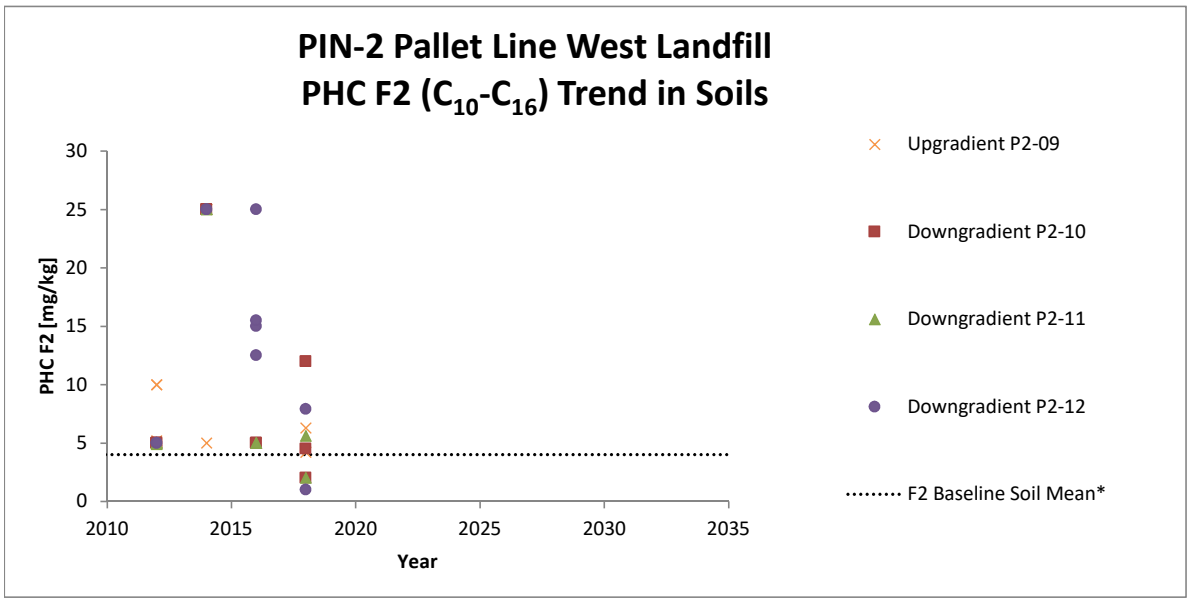
PIN-2 Pallet Line West Landfill Trends in Soil Inorganics, PCBs and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



* F1 baseline arithmetic mean is equal to the detection limit
* F1 baseline standard deviation = 0



* F2 baseline arithmetic mean is equal to the detection limit
* F2 baseline standard deviation = 0

PIN-2 Pallet Line West Landfill Trends in Soil Inorganics, PCBs and PHCs

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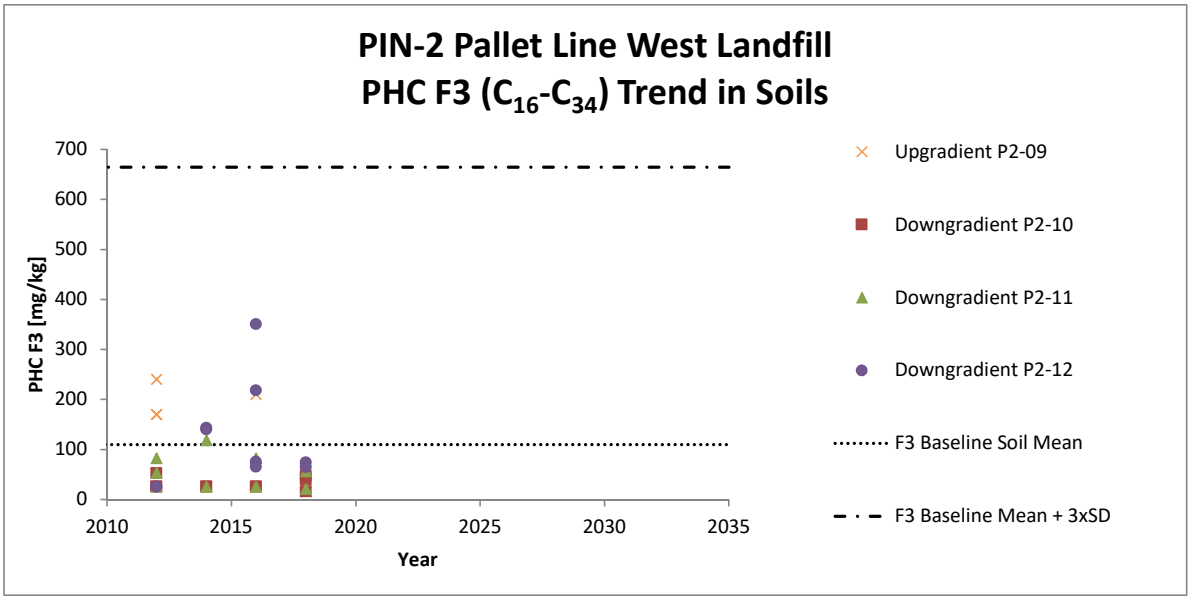
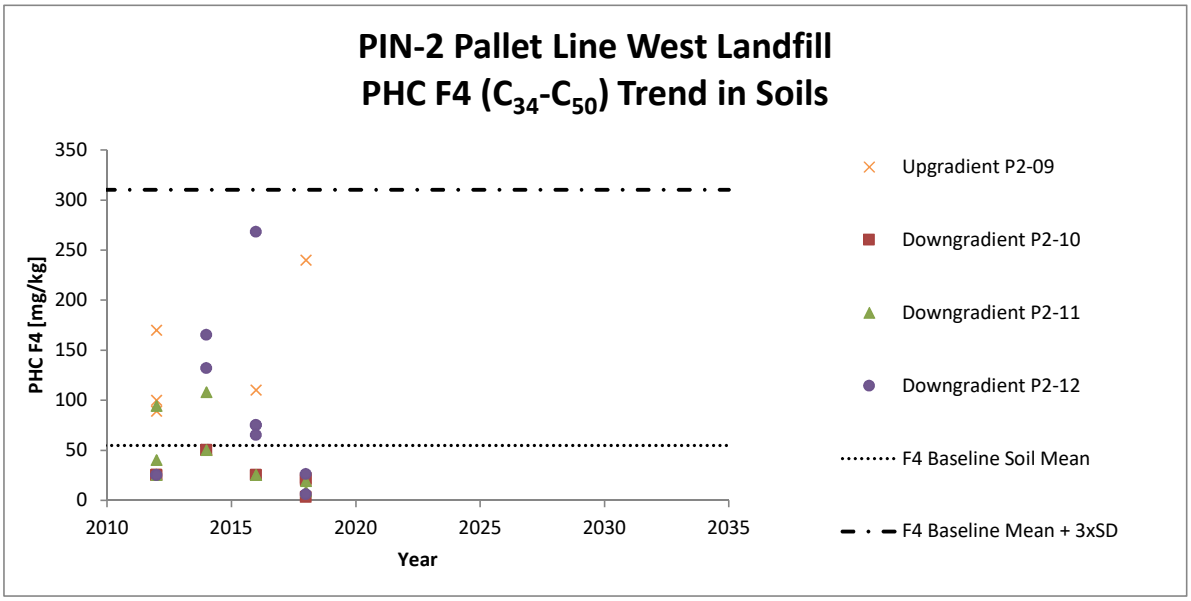
Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.





APPENDIX G7

PIN-2 Non-Hazardous Waste Landfill - Trends in Soil Inorganics, PCBs and PHCs

Appendix G7:

PIN-2 Non-Hazardous Waste Landfill Trends in Soil Inorganics, PCBs and PHCs

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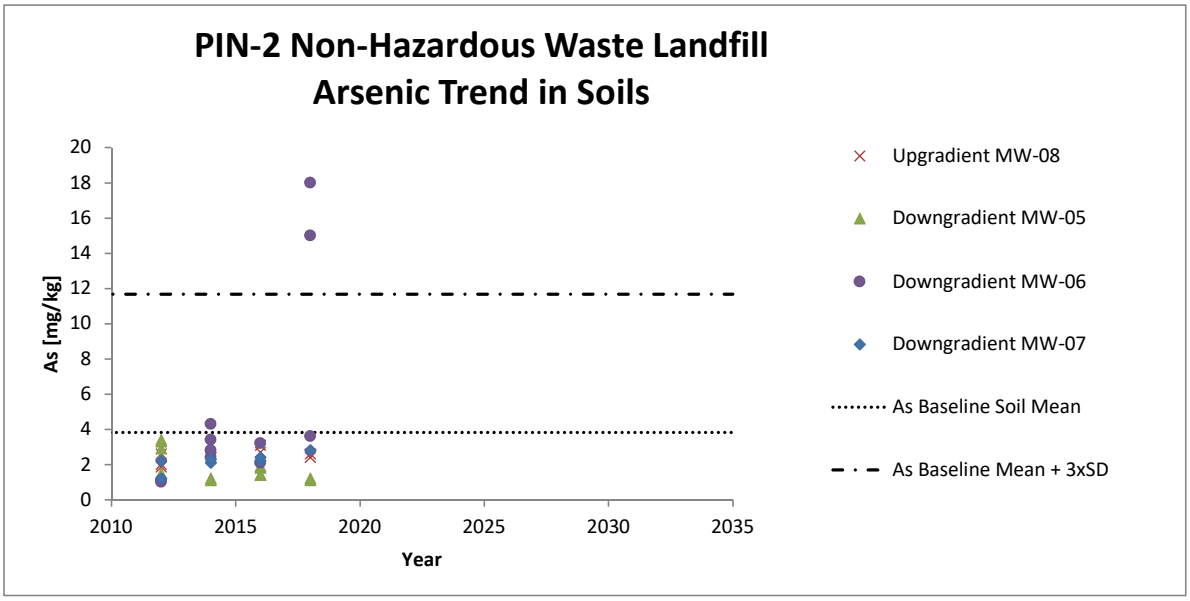
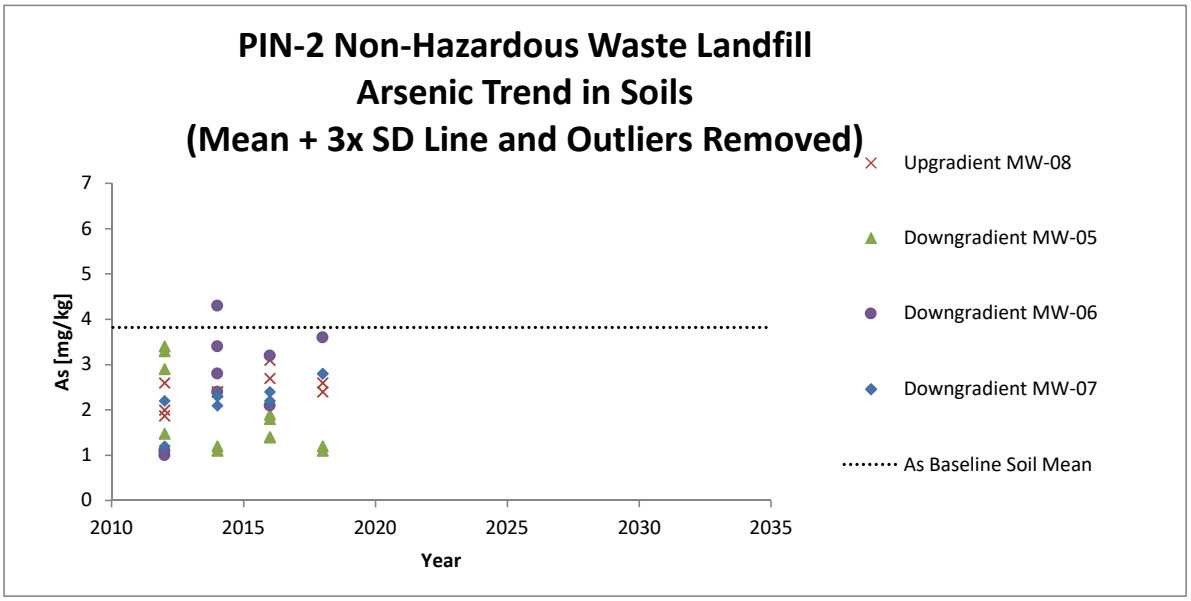
Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



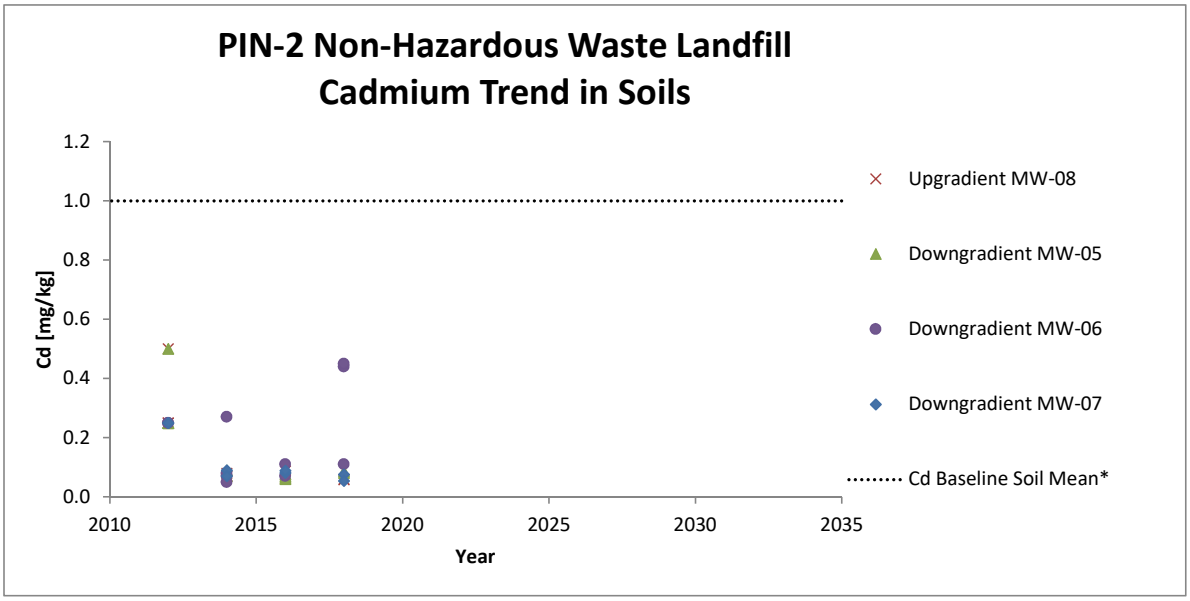


Y-axis maximum value decreased to show data distribution; baseline mean + 3x SD not shown
As results from upgradient location MW-06 in 2018 are not shown in this chart

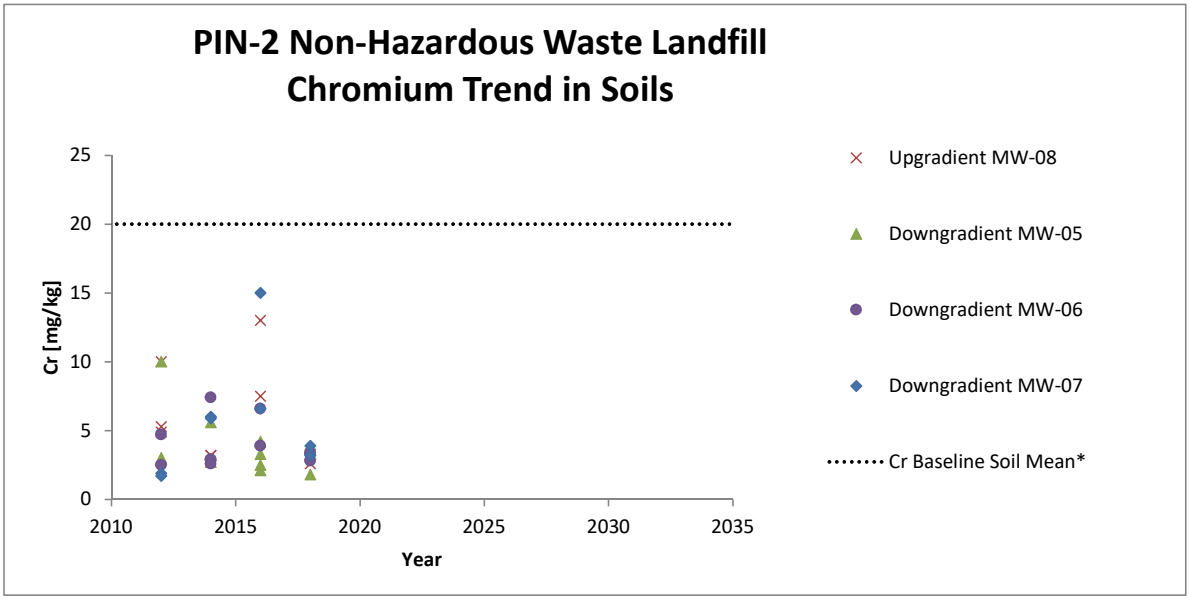
PIN-2 Non-Hazardous Waste Landfill Trends in Soil Inorganics, PCBs and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



* Cd baseline arithmetic mean is equal to the baseline detection limit
* Cd baseline standard deviation = 0



* Cr baseline arithmetic mean is equal to the baseline detection limit
* Cr baseline standard deviation = 0

PIN-2 Non-Hazardous Waste Landfill Trends in Soil Inorganics, PCBs and PHCs

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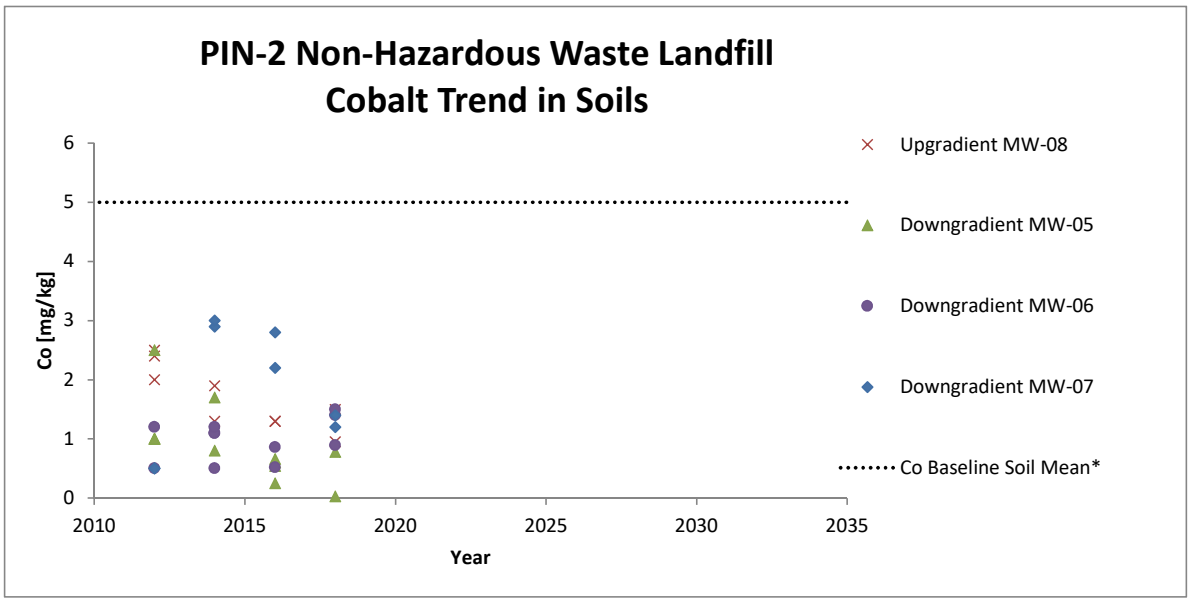
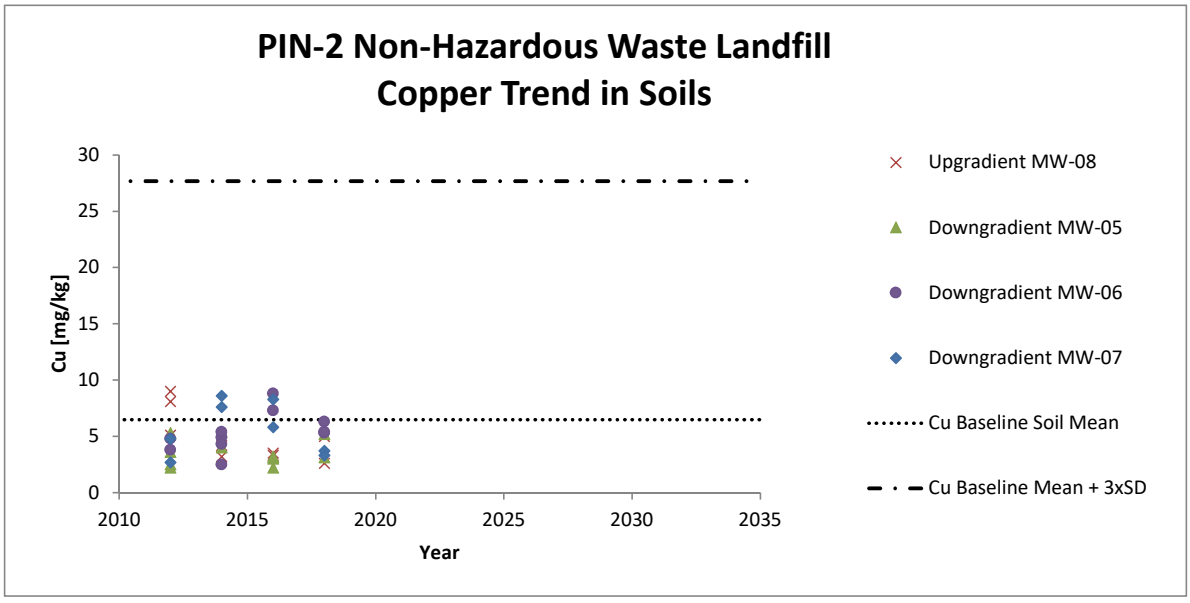
Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



* Co baseline arithmetic mean is equal to the baseline detection limit
* Co baseline standard deviation = 0



PIN-2 Non-Hazardous Waste Landfill Trends in Soil Inorganics, PCBs and PHCs

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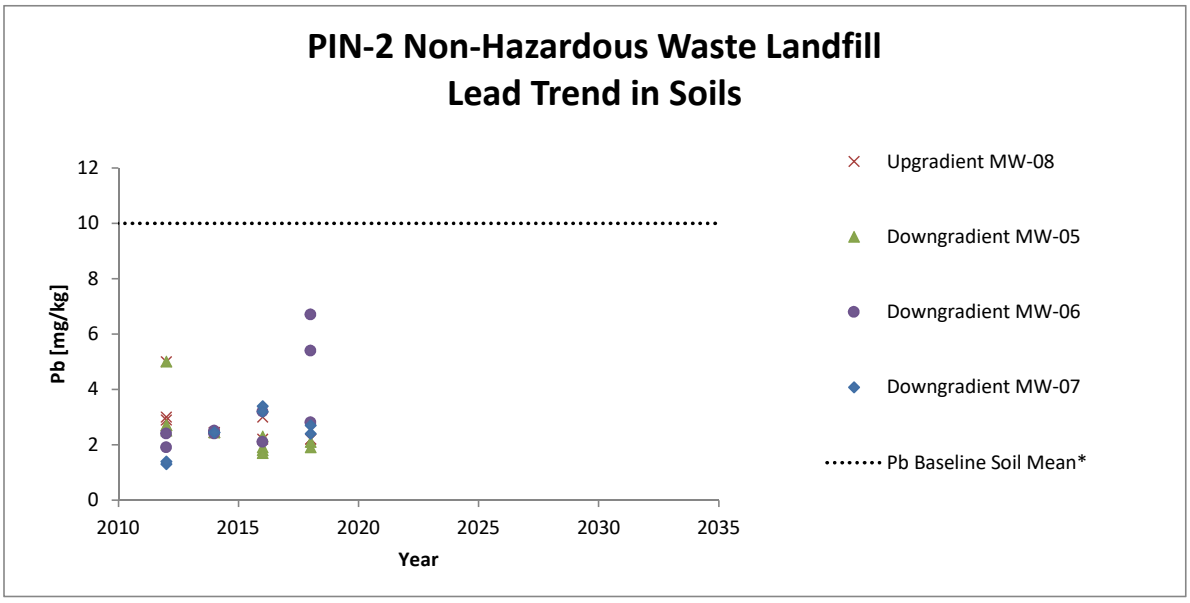
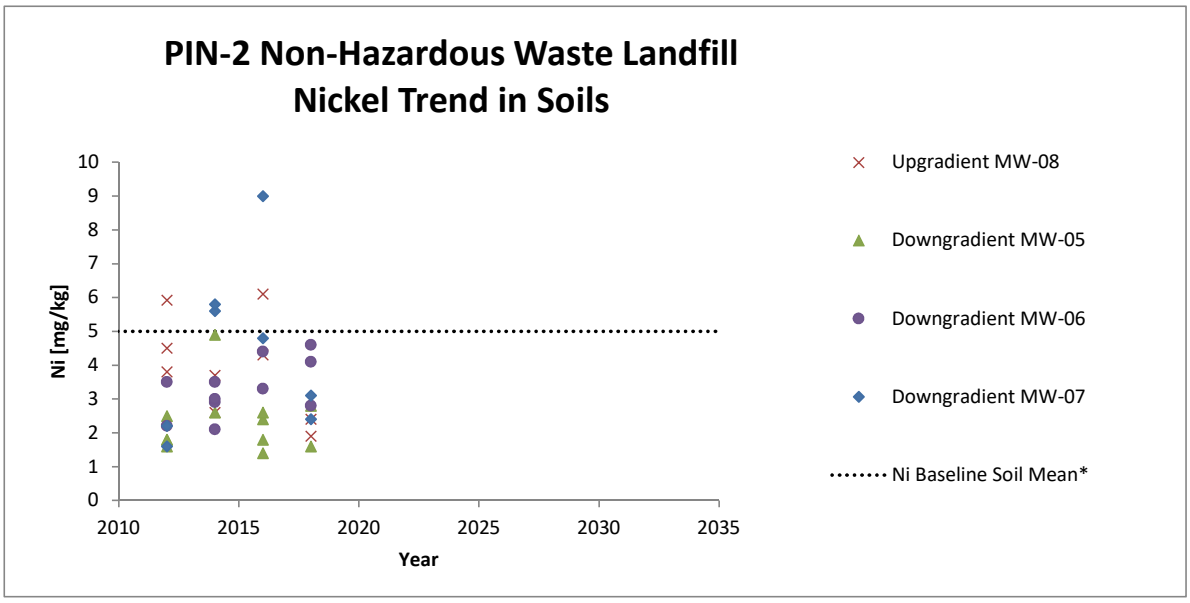
Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



* Pb baseline arithmetic mean is equal to the baseline detection limit
* Pb baseline standard deviation = 0



* Ni baseline arithmetic mean is equal to the baseline detection limit
* Ni baseline standard deviation = 0

PIN-2 Non-Hazardous Waste Landfill Trends in Soil Inorganics, PCBs and PHCs

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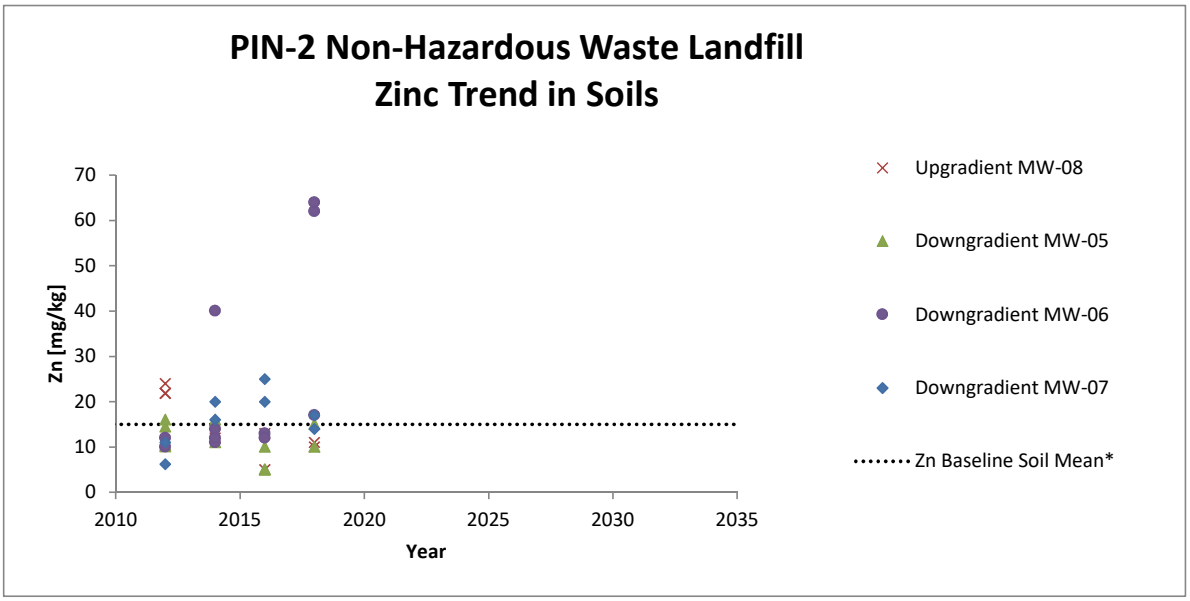
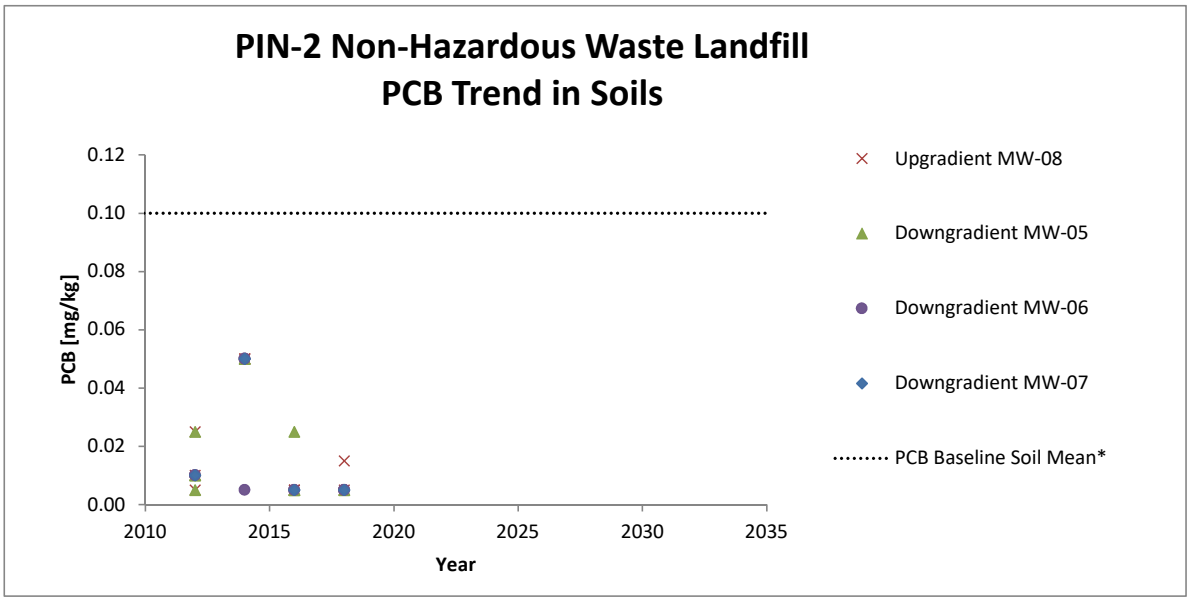
Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



* Zn baseline arithmetic mean is equal to the baseline detection limit
* Zn baseline standard deviation = 0



* PCB baseline arithmetic mean is equal to the baseline detection limit
* PCB baseline standard deviation = 0
Note: variations seen to 2016 are an indication of changing detection limits; all results prior to 2018 were at or below detection limits

PIN-2 Non-Hazardous Waste Landfill Trends in Soil Inorganics, PCBs and PHCs

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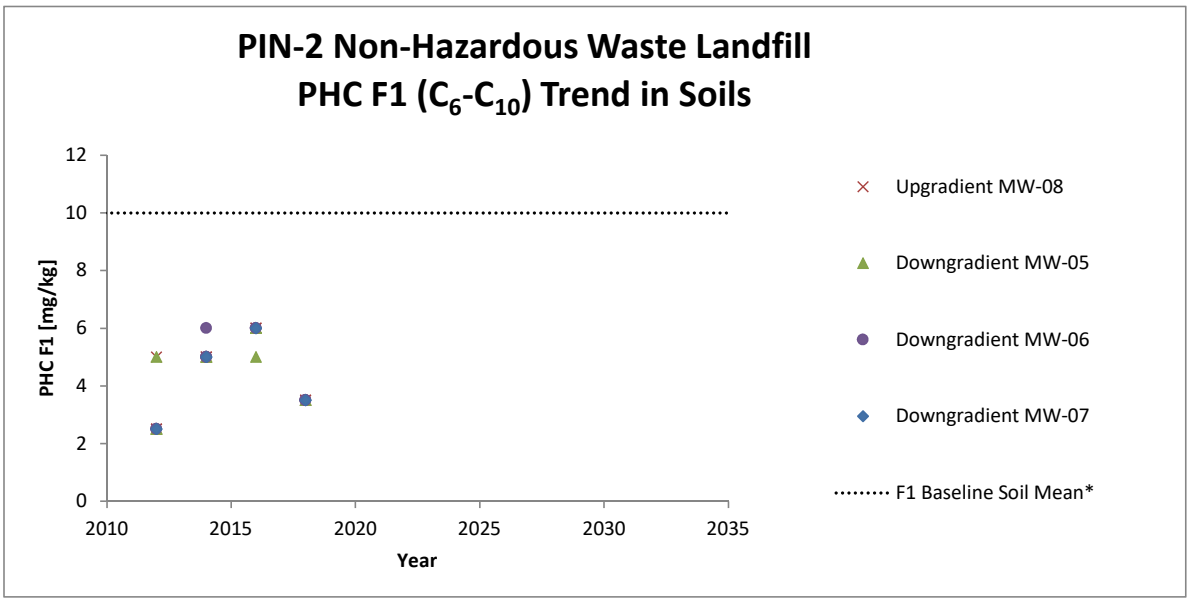
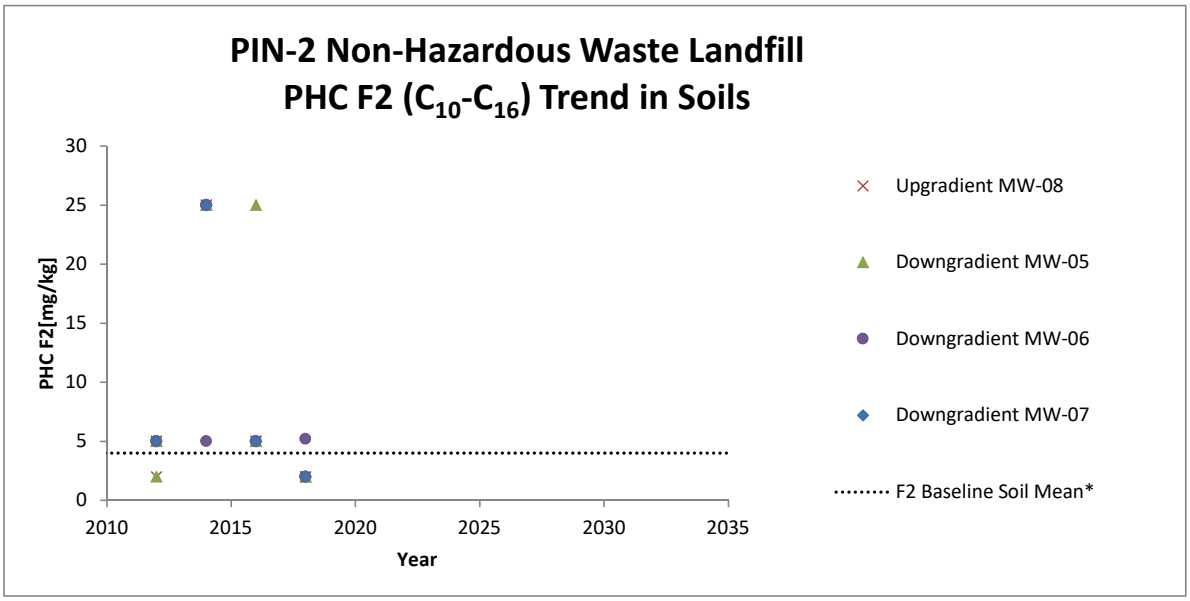
Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



* F1 baseline arithmetic mean is equal to the detection limit
* F1 baseline standard deviation = 0
Note: variations seen to 2018 are an indication of changing detection limits; all results at or below detection limits



* F2 baseline arithmetic mean is equal to the detection limit
* F2 baseline standard deviation = 0
Note: variations seen to 2016 are an indication of changing detection limits; all results prior to 2018 were at or below detection limits

PIN-2 Non-Hazardous Waste Landfill Trends in Soil Inorganics, PCBs and PHCs

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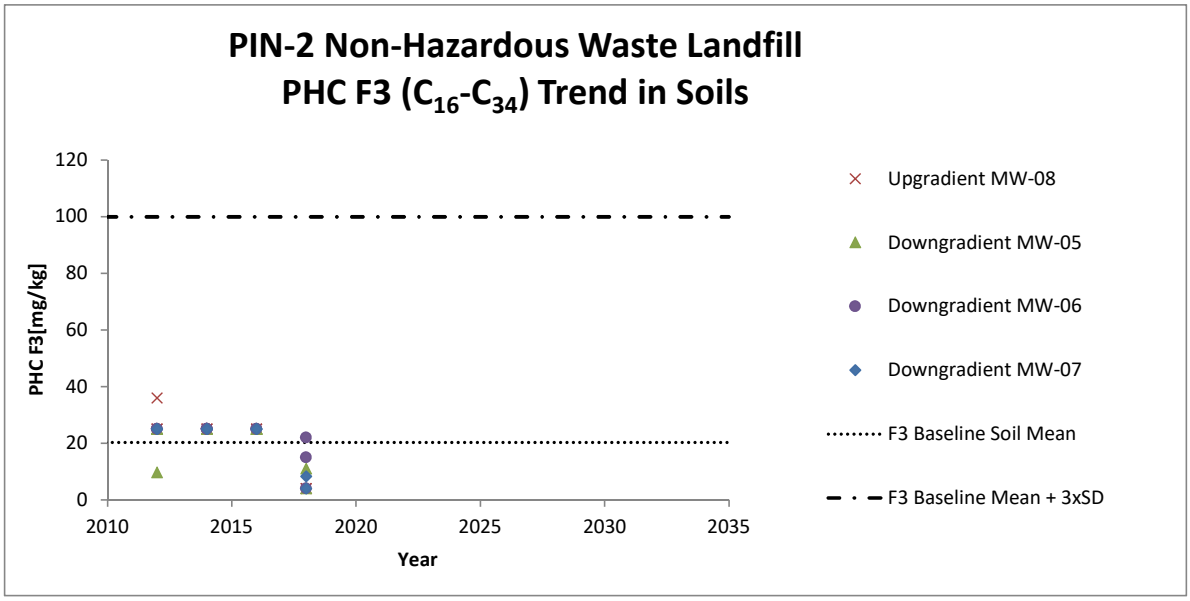
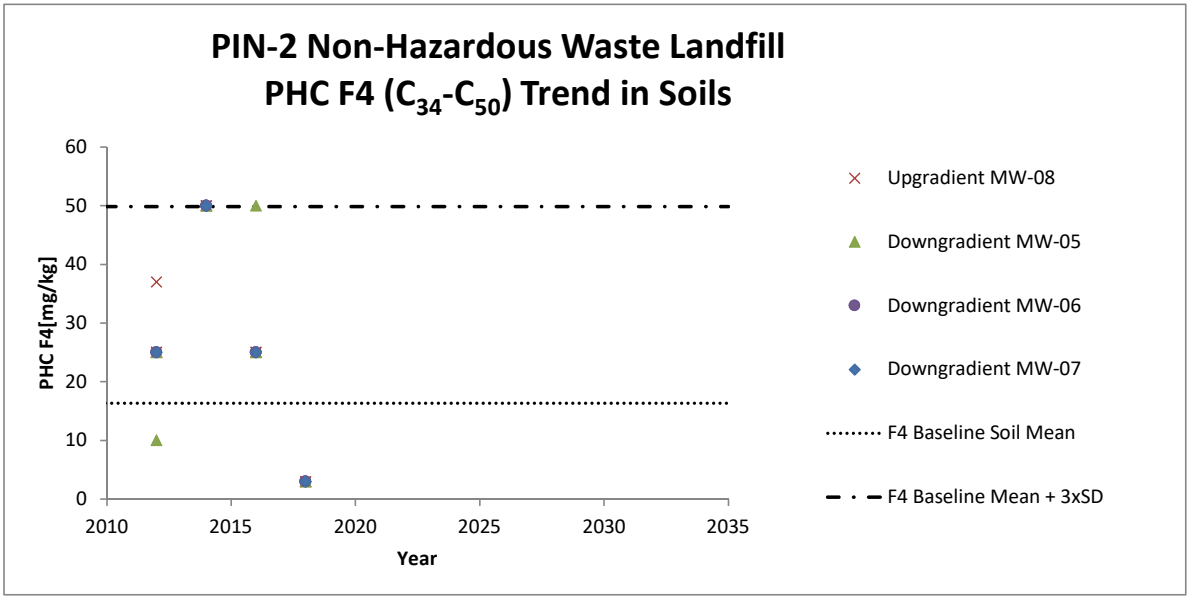
Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.





APPENDIX G8

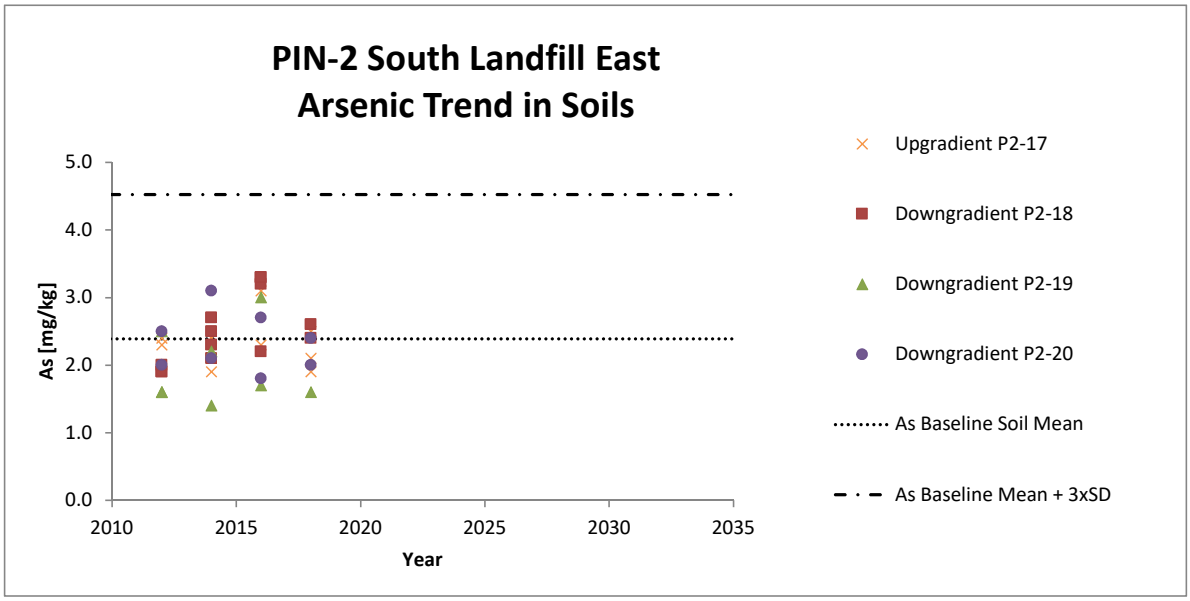
PIN-2 South Landfill East - Trends in Soil Inorganics, PCBs and PHCs

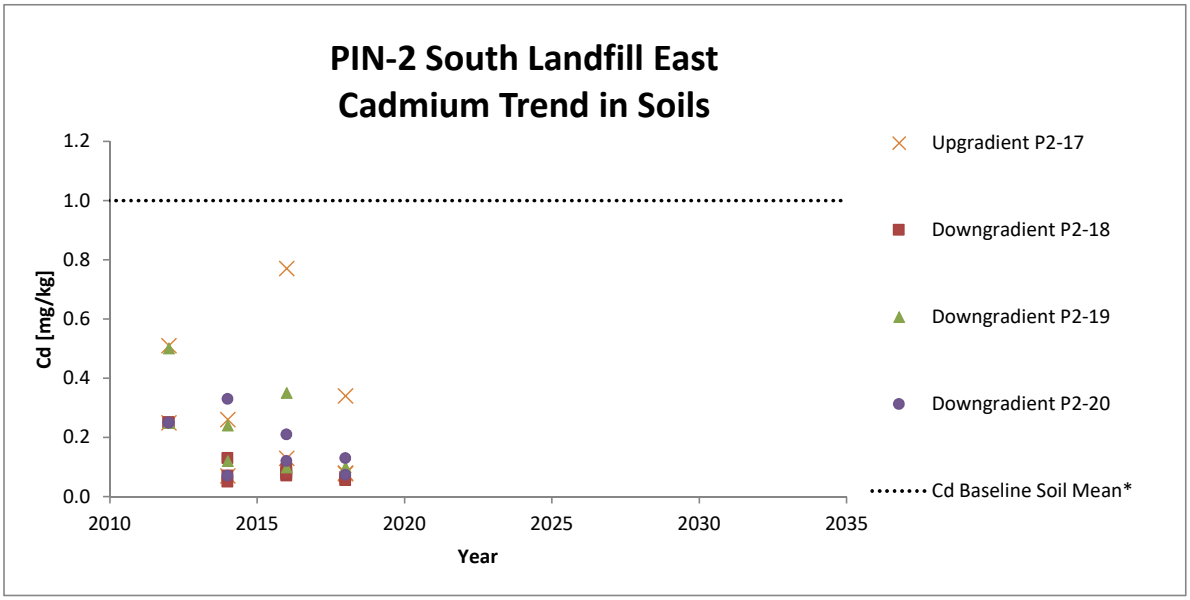
Appendix G8:

PIN-2 South Landfill East Trends in Soil Inorganics, PCBs and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



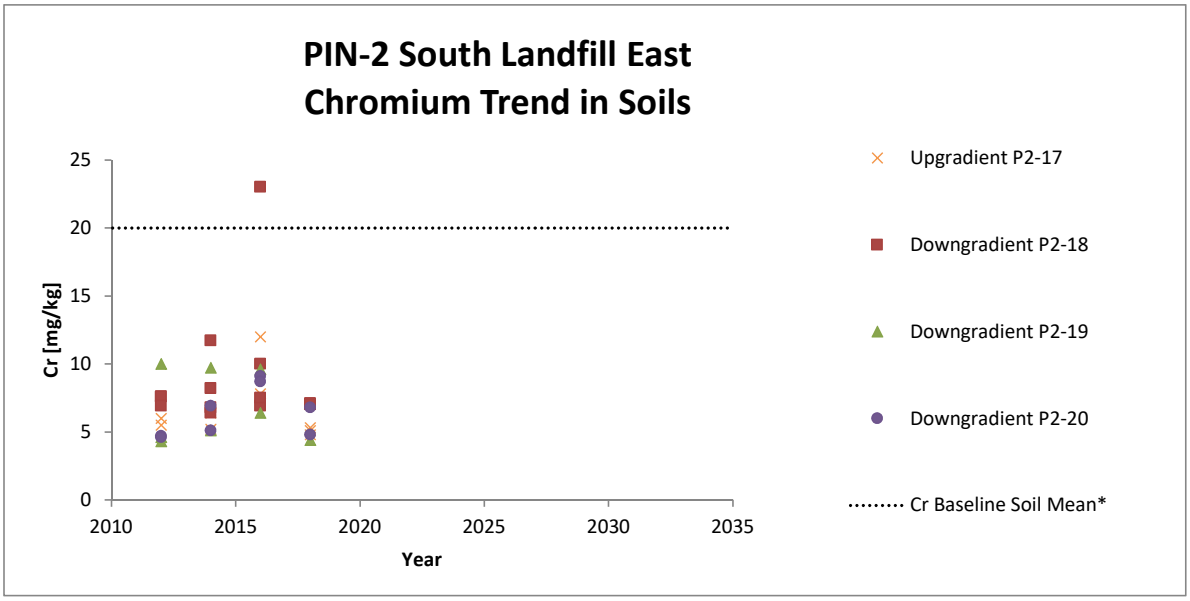


* Cd baseline arithmetic mean is equal to the baseline detection limit
* Cd baseline standard deviation = 0

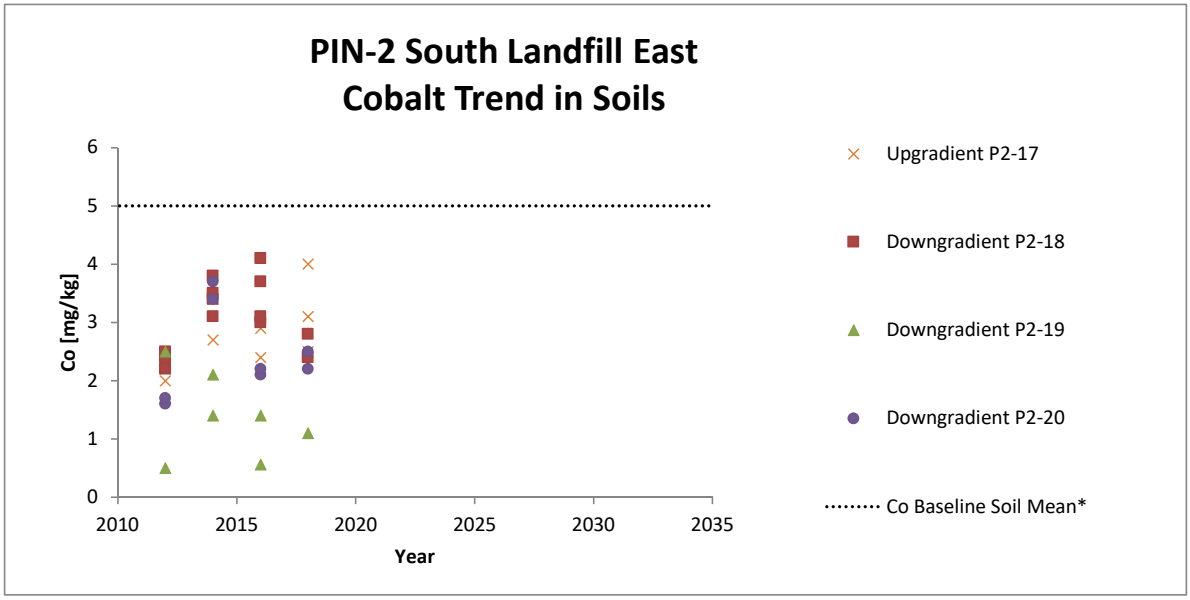
PIN-2 South Landfill East Trends in Soil Inorganics, PCBs and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



* Cr baseline arithmetic mean is equal to the baseline detection limit
* Cr baseline standard deviation = 0



* Co baseline arithmetic mean is equal to the baseline detection limit
* Co baseline standard deviation = 0

PIN-2 South Landfill East Trends in Soil Inorganics, PCBs and PHCs

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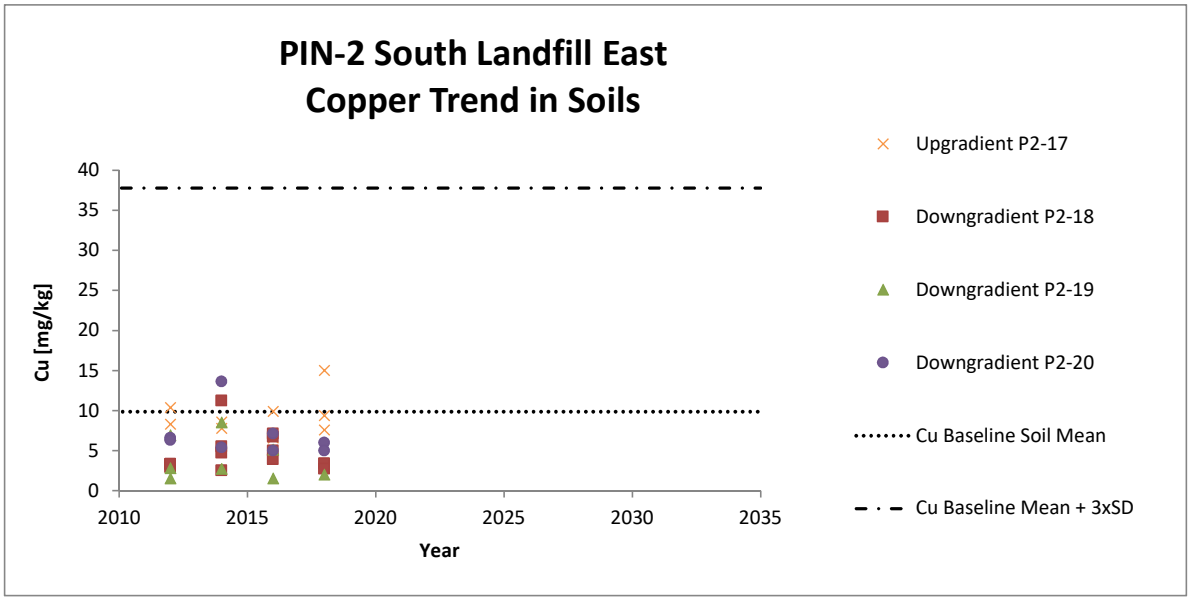
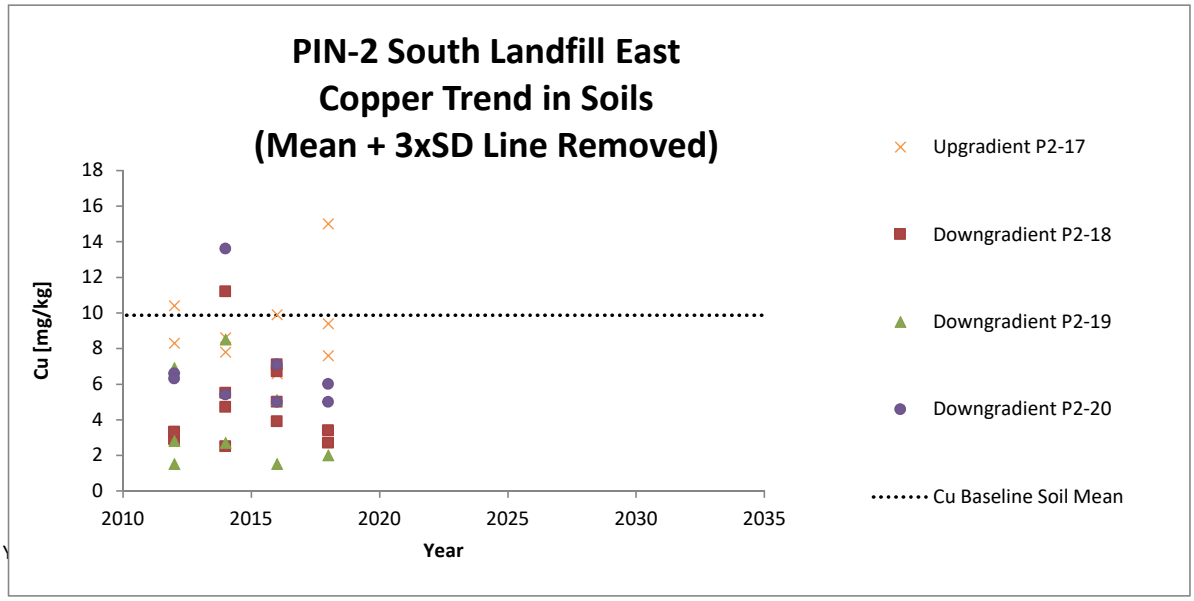
Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



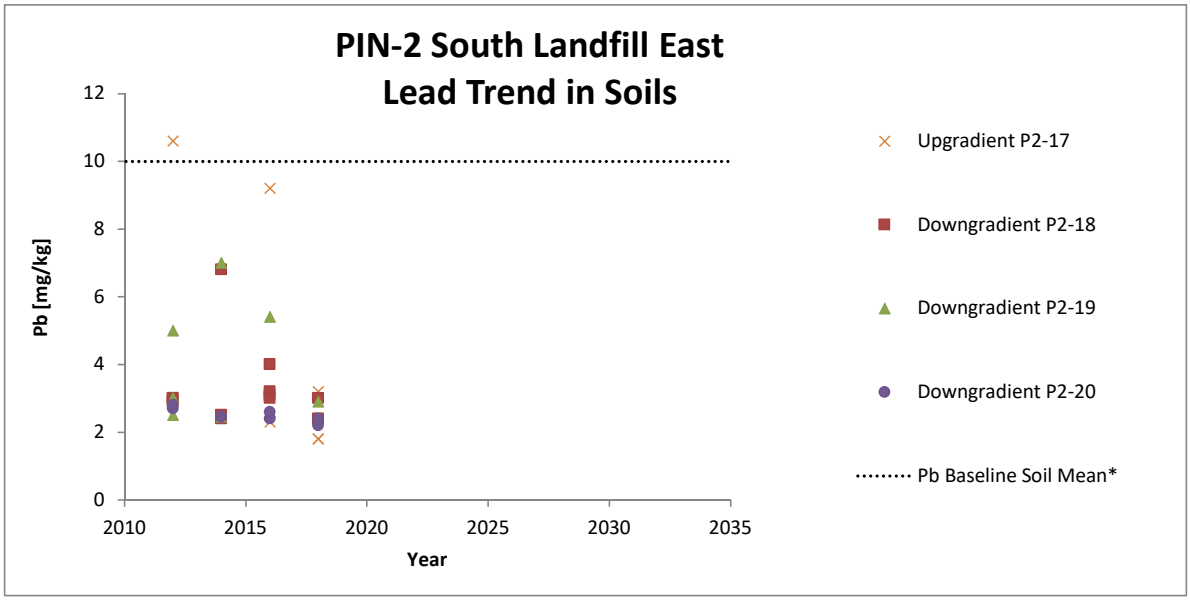


Y-axis maximum value decreased to show data distribution; baseline mean + 3 x SD not shown

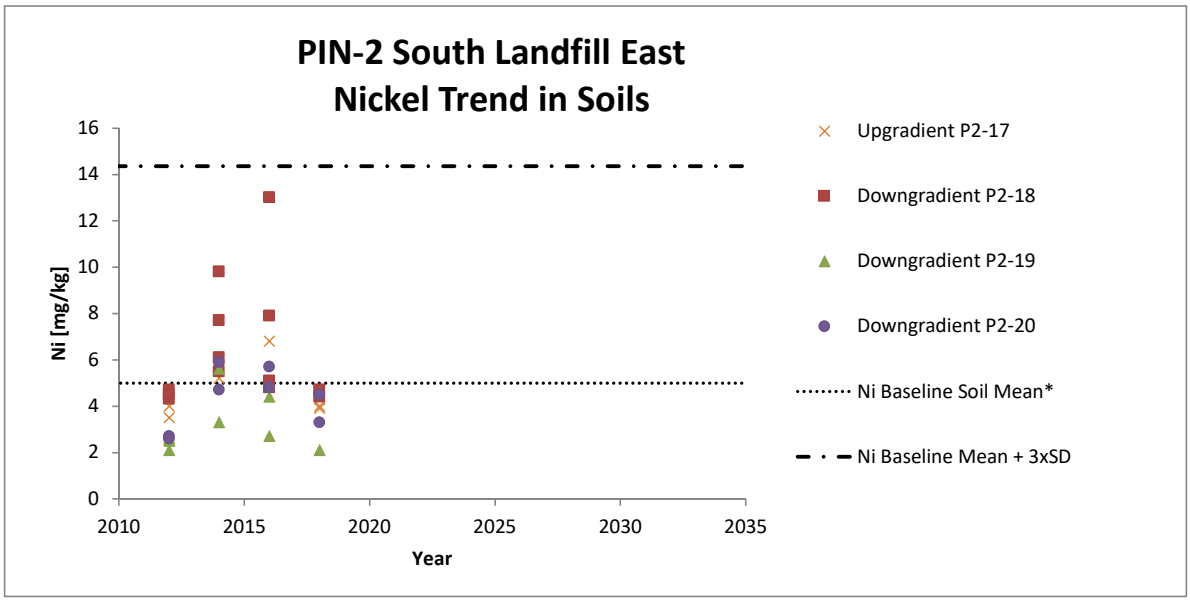
PIN-2 South Landfill East Trends in Soil Inorganics, PCBs and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



* Pb baseline arithmetic mean is equal to the baseline detection limit
* Pb baseline standard deviation = 0



* Ni baseline arithmetic mean is equal to the baseline detection limit

PIN-2 South Landfill East Trends in Soil Inorganics, PCBs and PHCs

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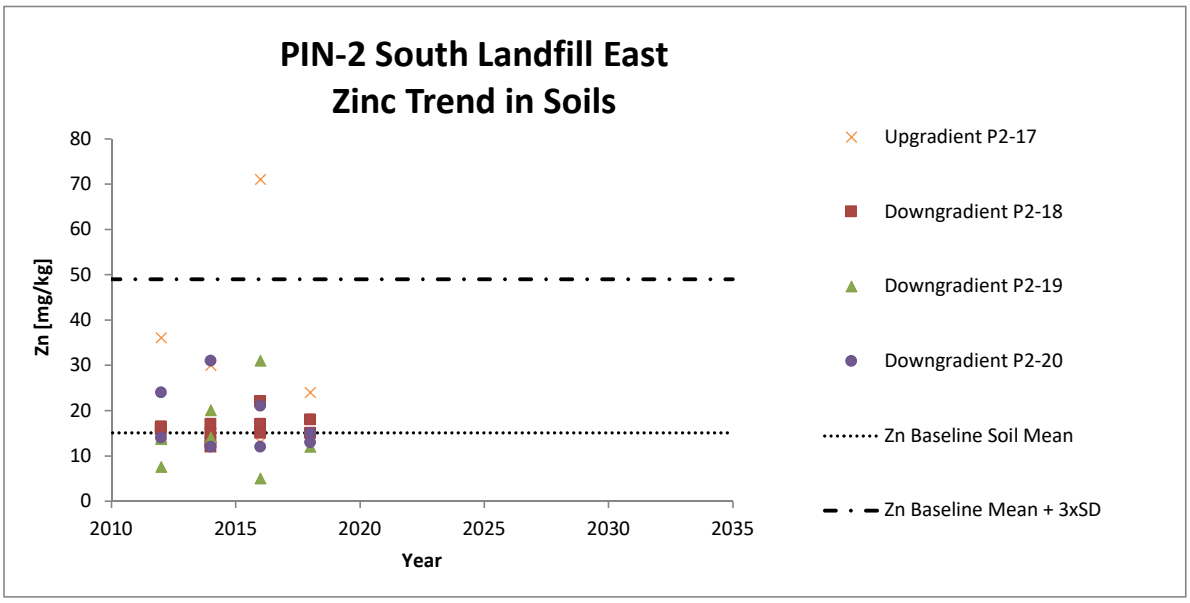
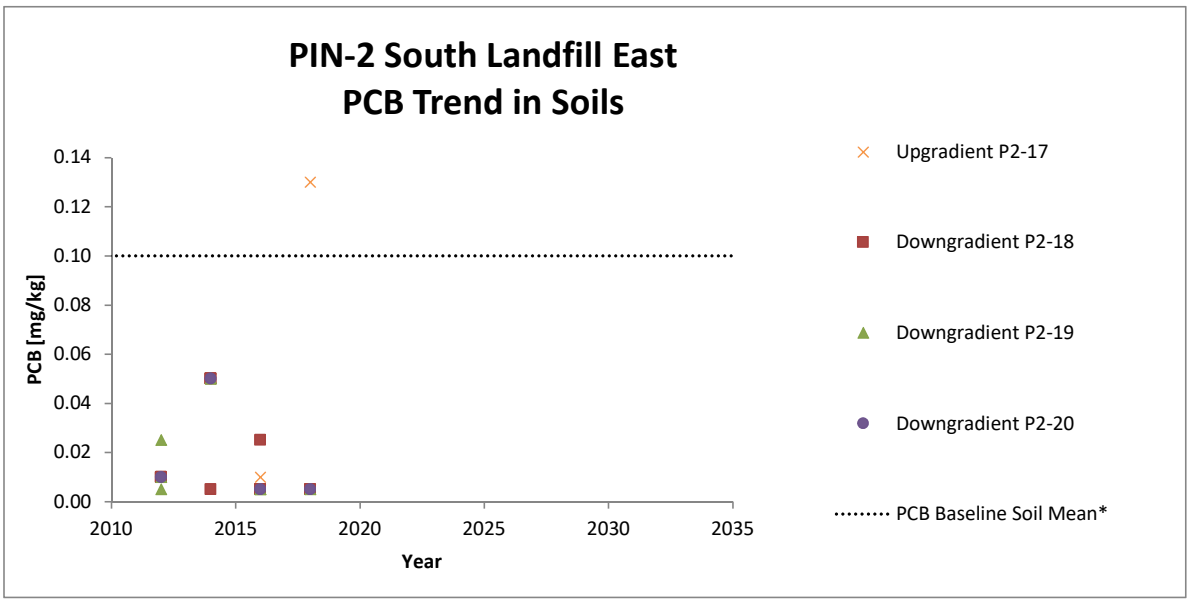
Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



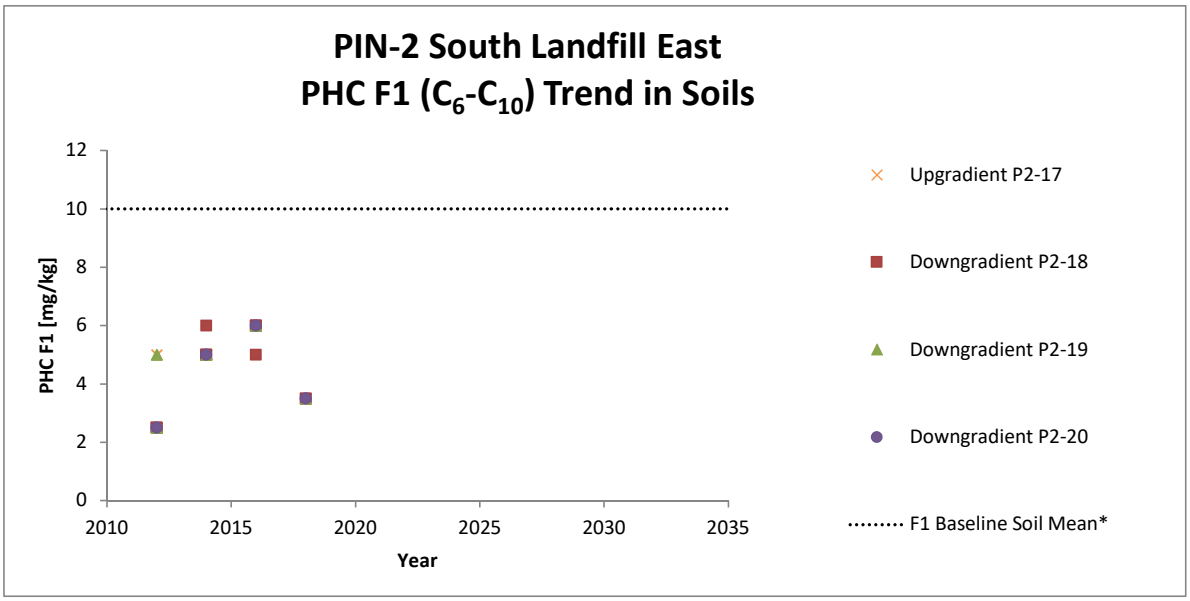


* PCB baseline arithmetic mean is equal to the baseline detection limit
* PCB baseline standard deviation = 0
Note: variations seen to 2016 are an indication of changing detection limits; all results prior to 2018 were at or below detection limits

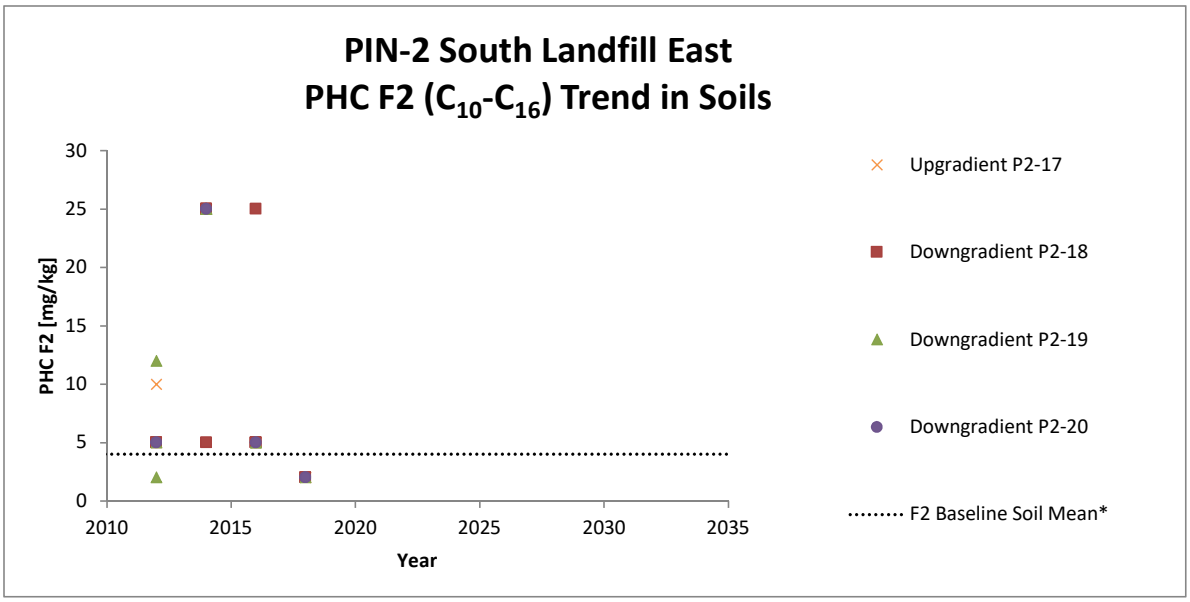
PIN-2 South Landfill East Trends in Soil Inorganics, PCBs and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



* F1 baseline arithmetic mean is equal to the detection limit
* F1 baseline standard deviation = 0
Note: variations seen to 2018 are an indication of changing detection limits; all results at or below detection limits

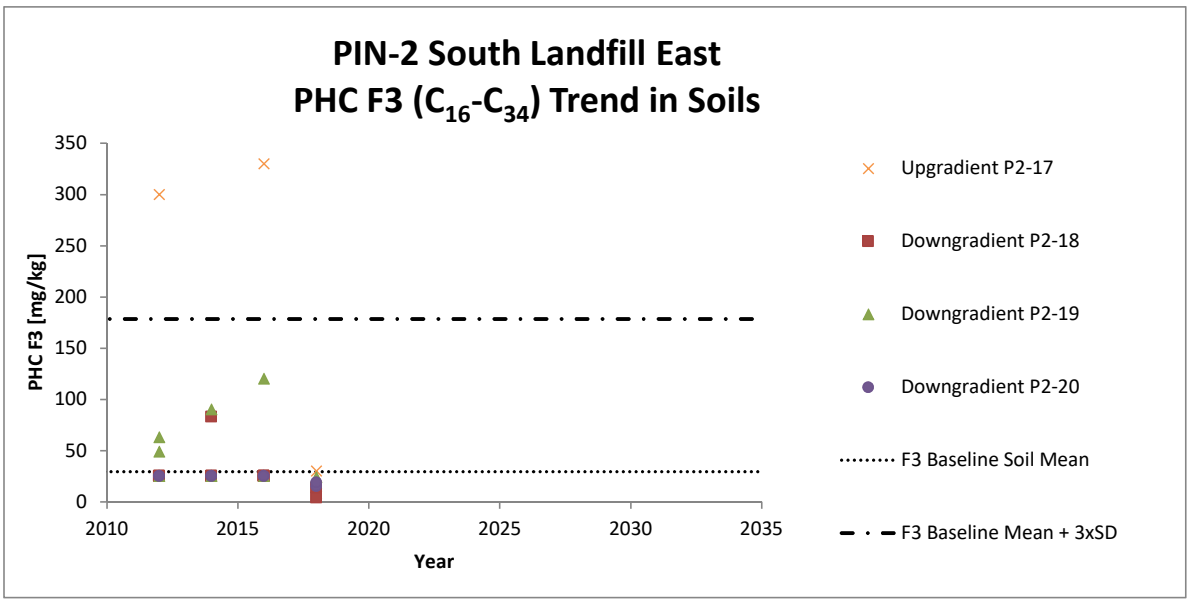


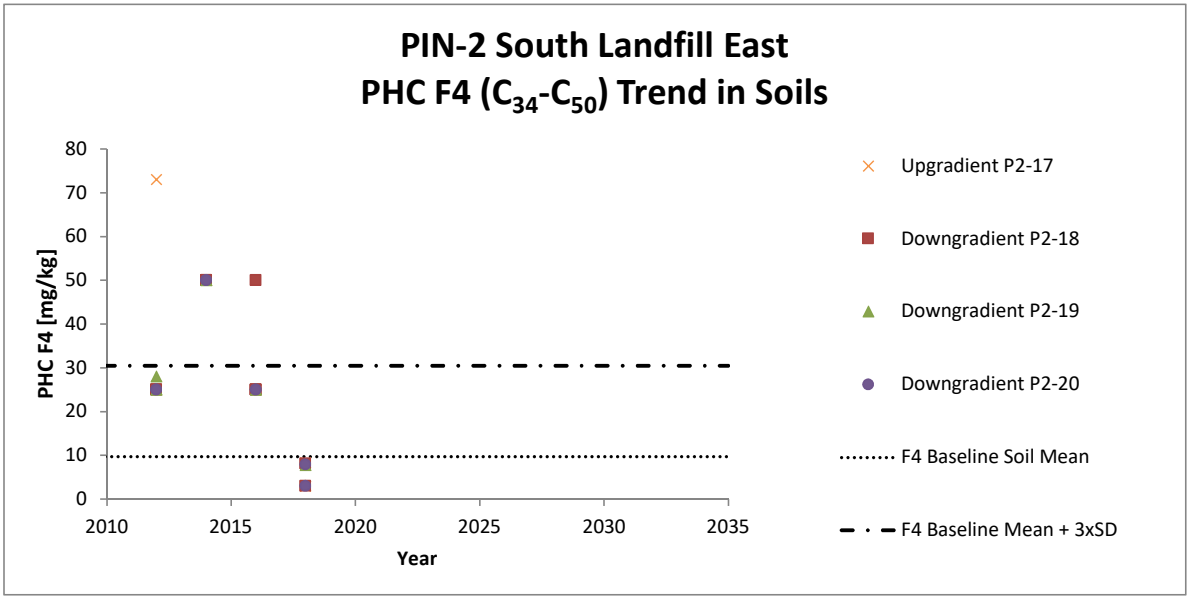
* F2 baseline arithmetic mean is equal to the detection limit
* F2 baseline standard deviation = 0

PIN-2 South Landfill East Trends in Soil Inorganics, PCBs and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.





APPENDIX G9

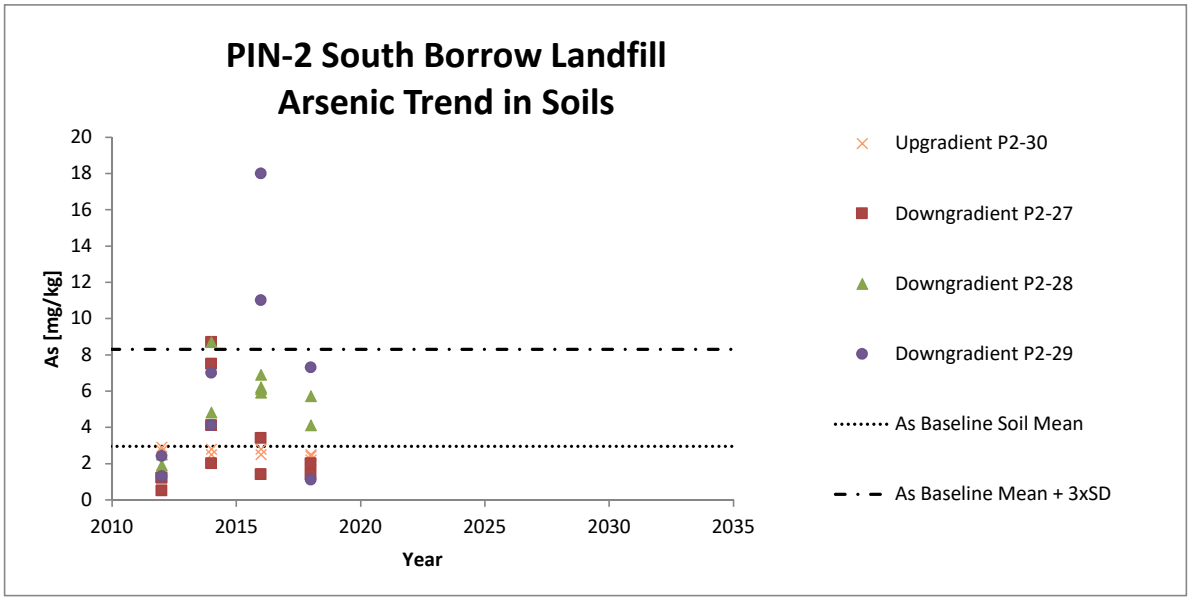
PIN-2 South Borrow Landfill - Trends in Soil Inorganics, PCBs and PHCs

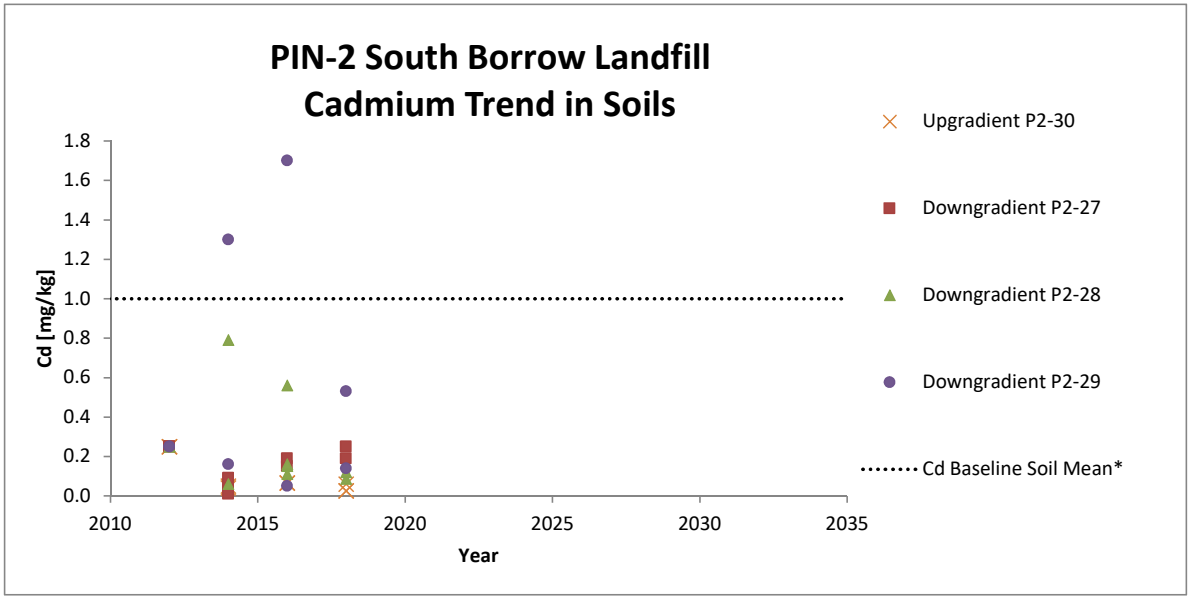
Appendix G9:

PIN-2 South Borrow Landfill Trends in Soil Inorganics, PCBs and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



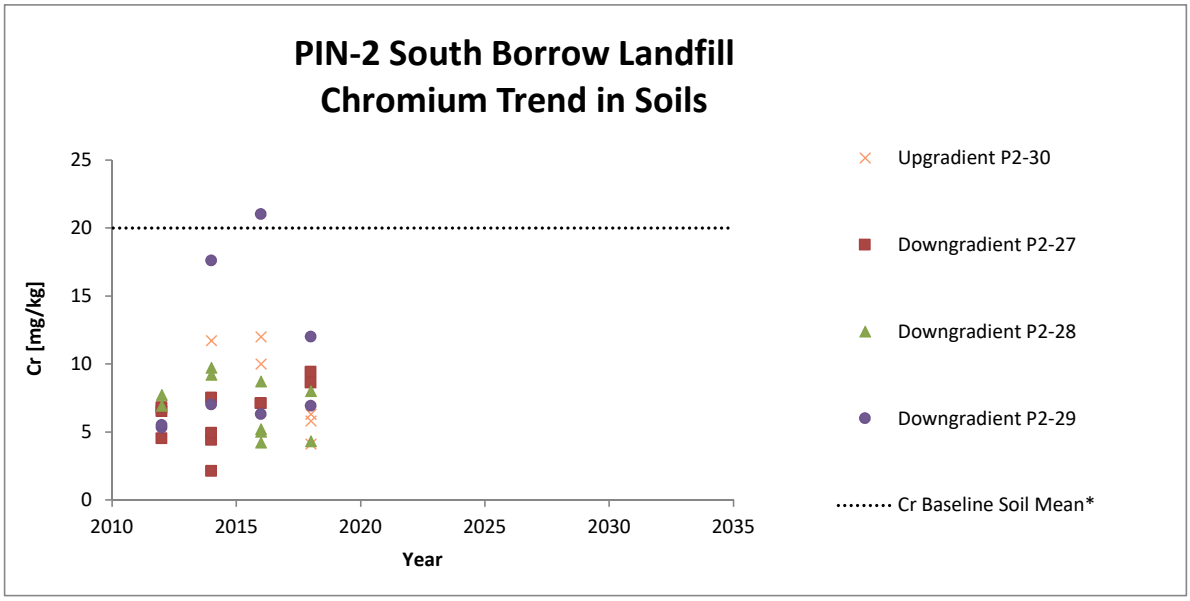


* Cd baseline arithmetic mean is equal to the baseline detection limit
* Cd baseline standard deviation = 0

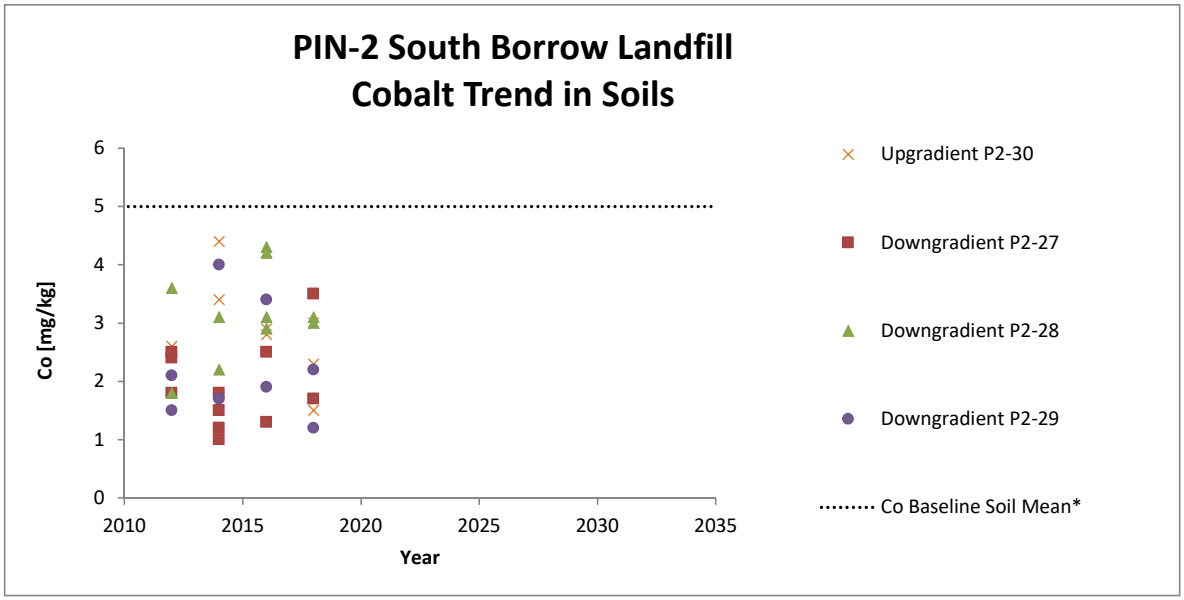
PIN-2 South Borrow Landfill Trends in Soil Inorganics, PCBs and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



* Cr baseline arithmetic mean is equal to the baseline detection limit
* Cr baseline standard deviation = 0

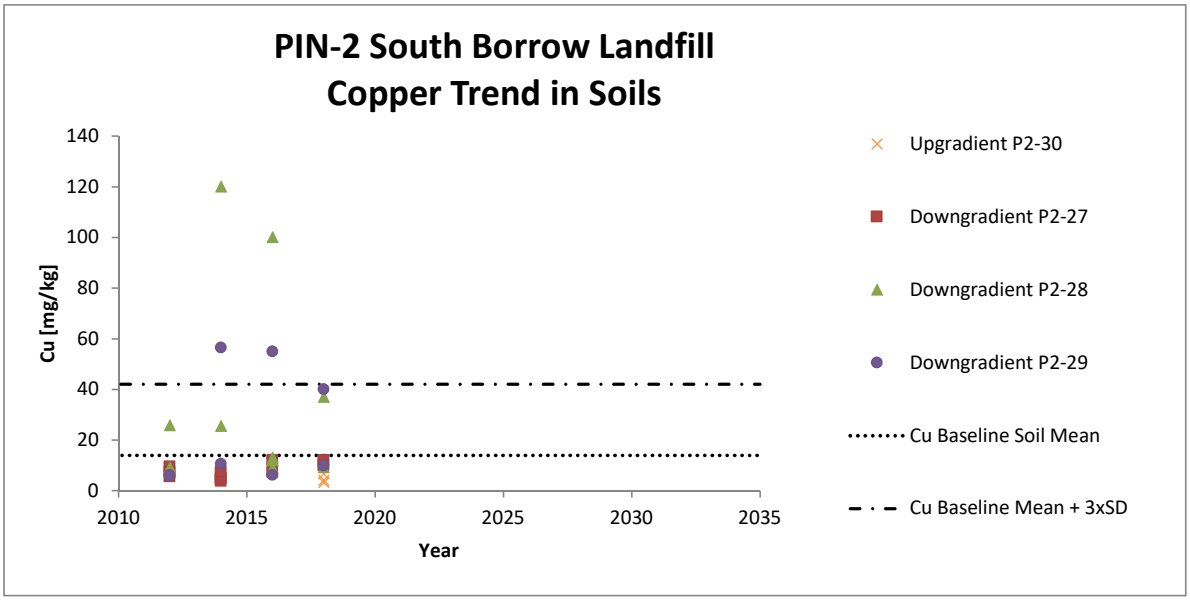


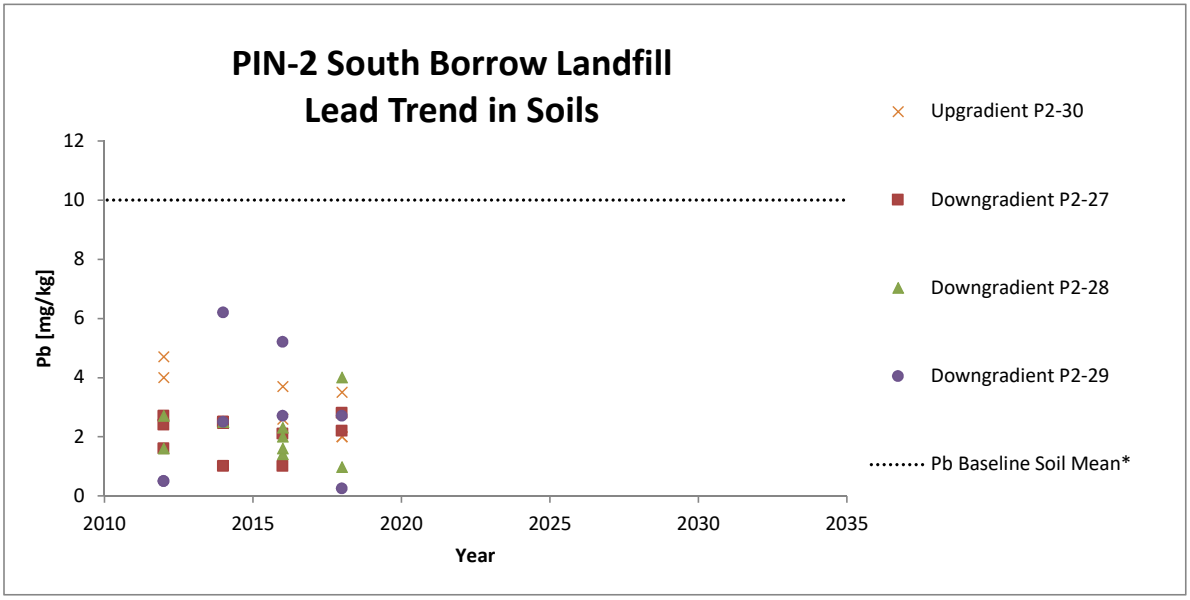
* Co baseline arithmetic mean is equal to the baseline detection limit
* Co baseline standard deviation = 0

PIN-2 South Borrow Landfill Trends in Soil Inorganics, PCBs and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



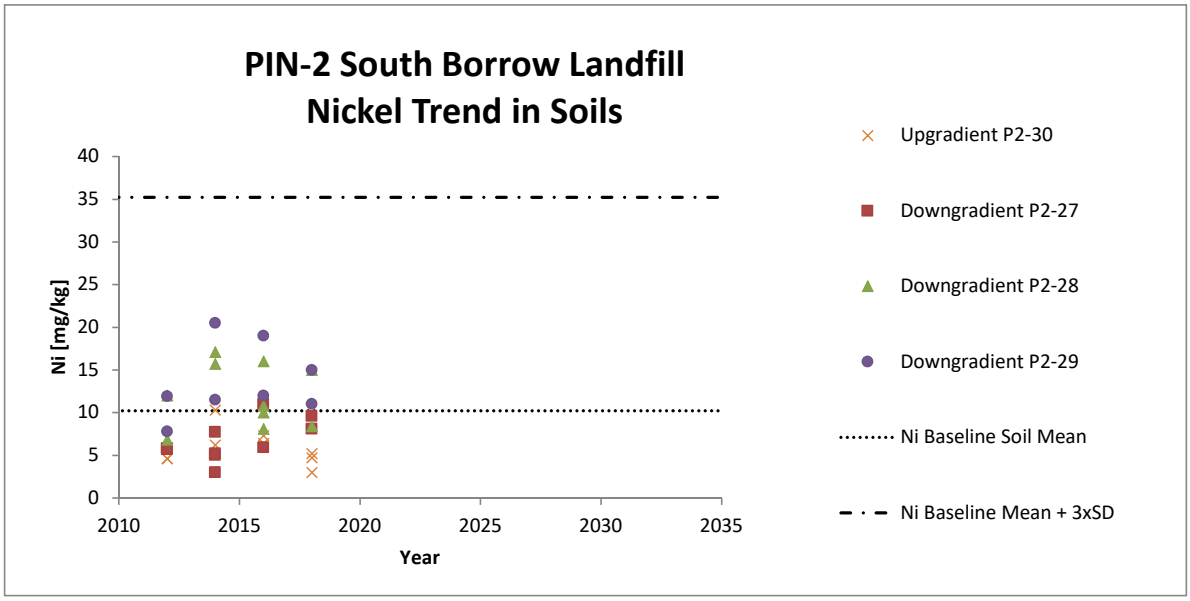


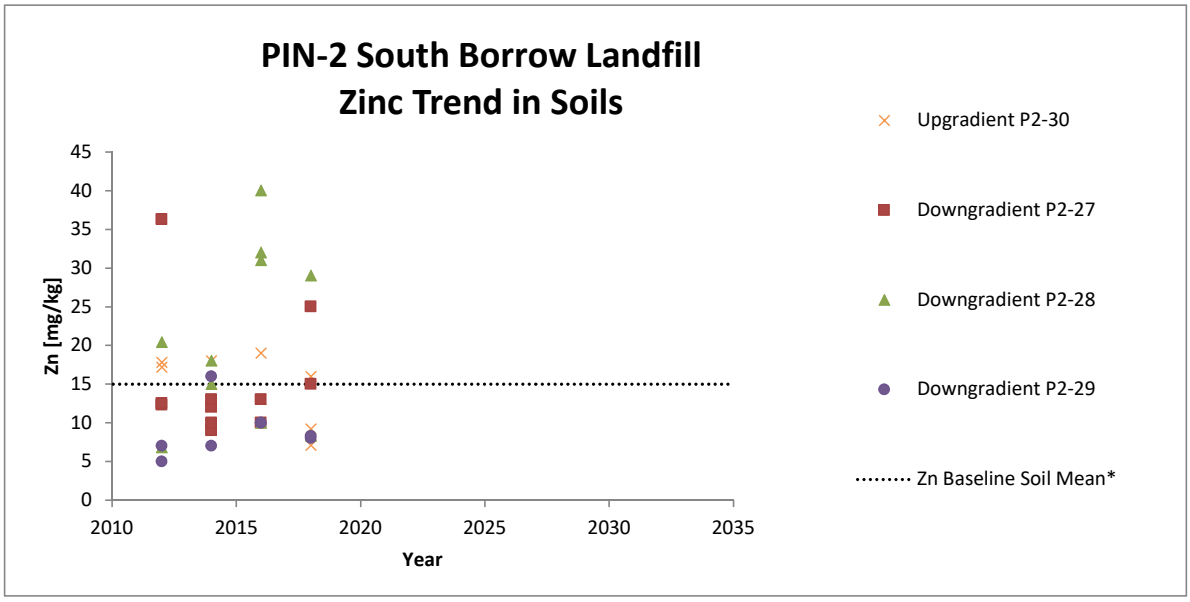
* Pb baseline arithmetic mean is equal to the baseline detection limit
* Pb baseline standard deviation = 0

PIN-2 South Borrow Landfill Trends in Soil Inorganics, PCBs and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



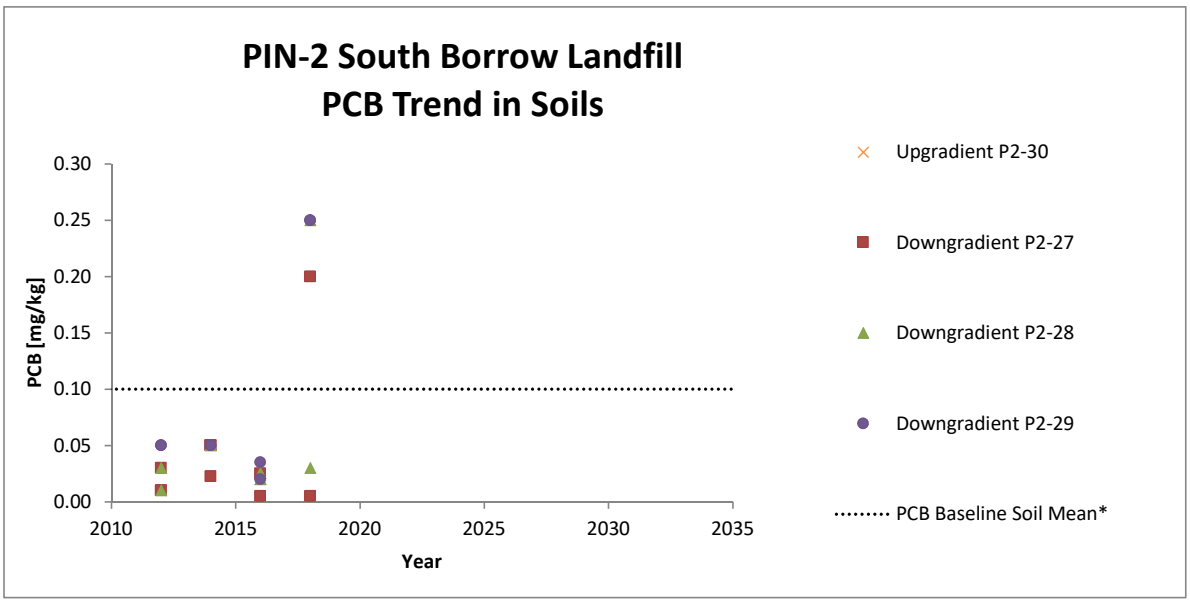


* Zn baseline arithmetic mean is equal to the baseline detection limit
* Zn baseline standard deviation = 0

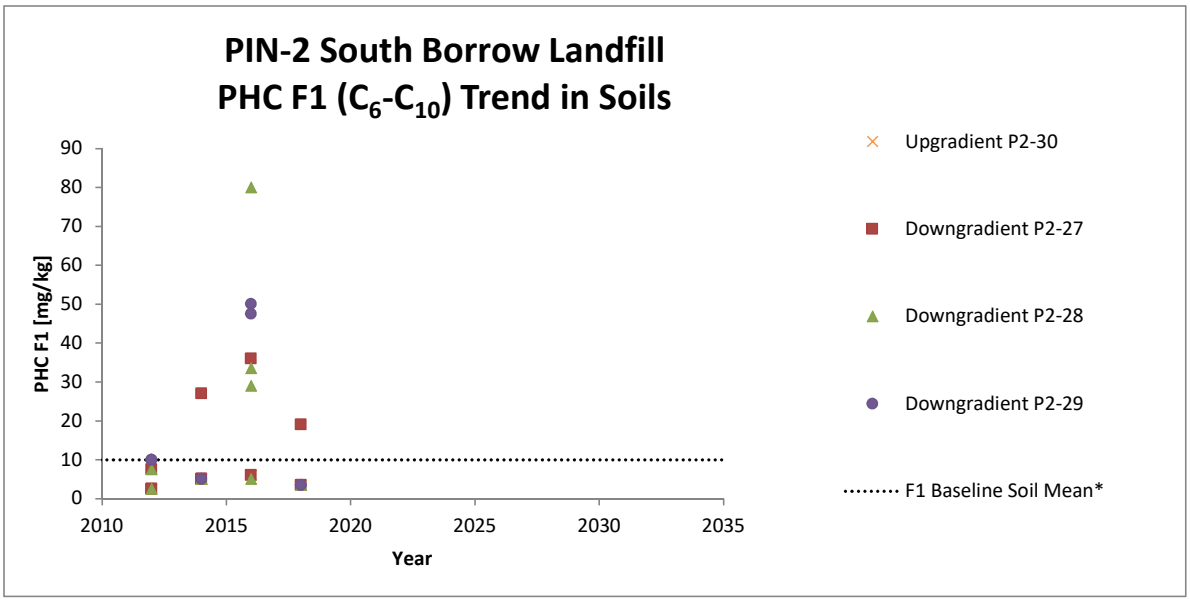
PIN-2 South Borrow Landfill Trends in Soil Inorganics, PCBs and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



* PCB baseline arithmetic mean is equal to the baseline detection limit
* PCB baseline standard deviation = 0
Note: variations seen to 2018 are an indication of changing detection limits; all results at or below detection limits

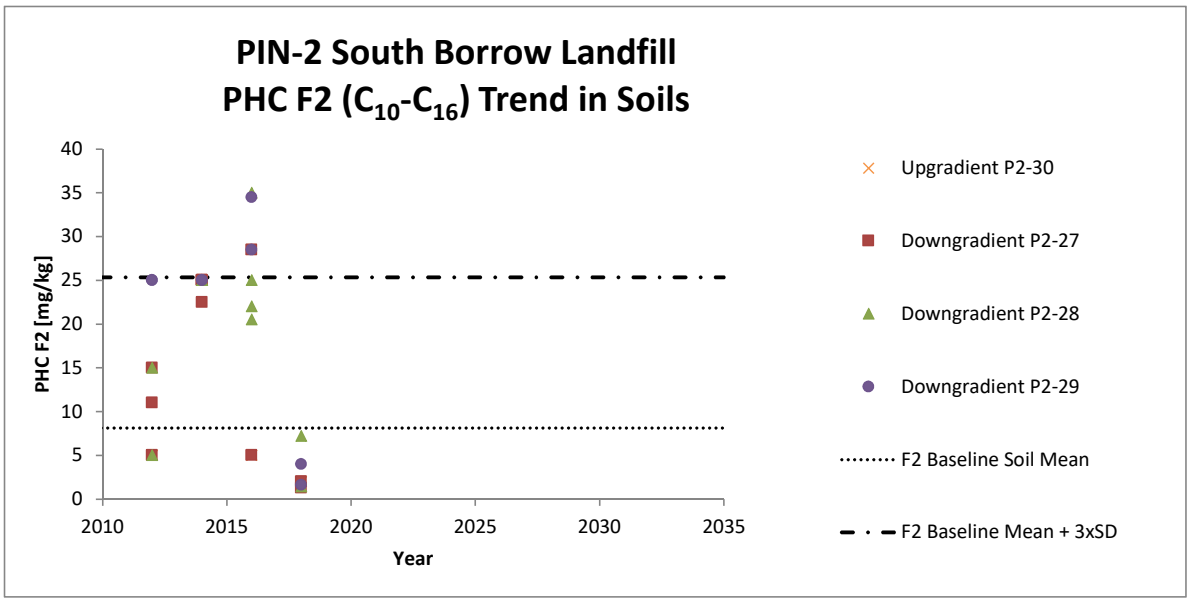


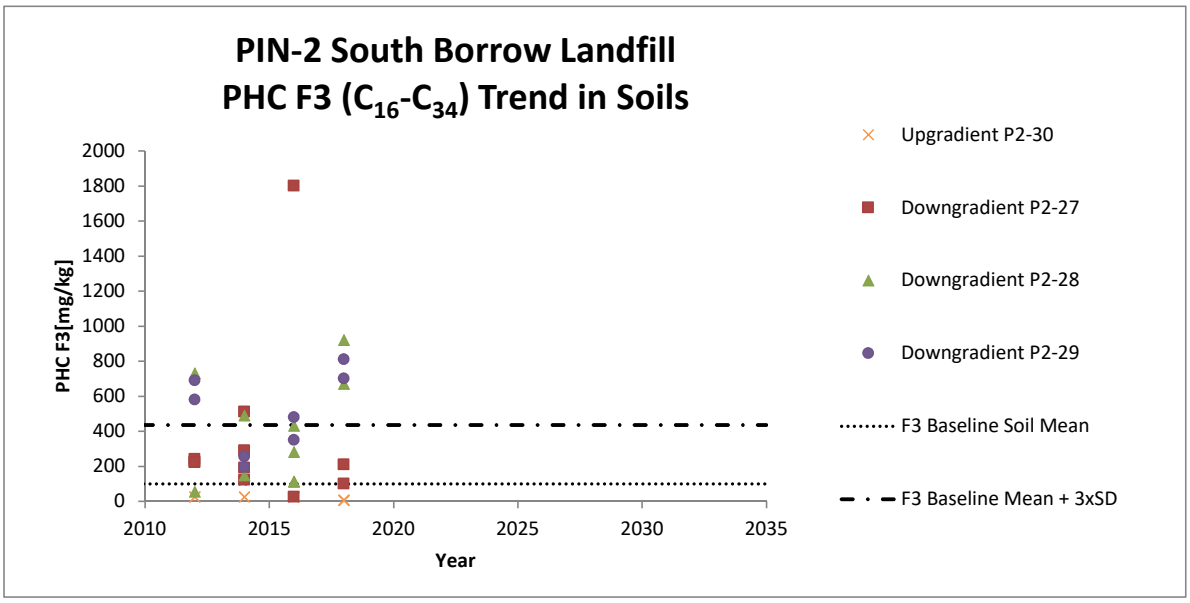
* F1 baseline arithmetic mean is equal to the detection limit
* F1 baseline standard deviation = 0
Note: variations seen to 2016 are an indication of changing detection limits; all results prior to 2018 were at or below detection limits

PIN-2 South Borrow Landfill Trends in Soil Inorganics, PCBs and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.

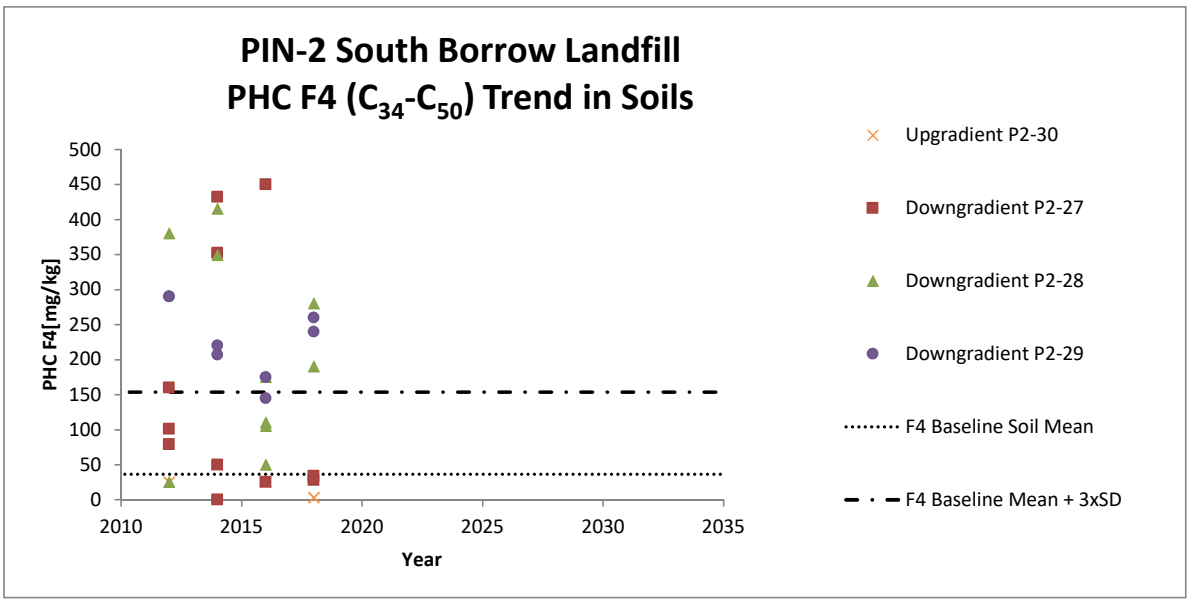




PIN-2 South Borrow Landfill Trends in Soil Inorganics, PCBs and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



APPENDIX H

Groundwater Trend Analysis Graphs

APPENDIX H1

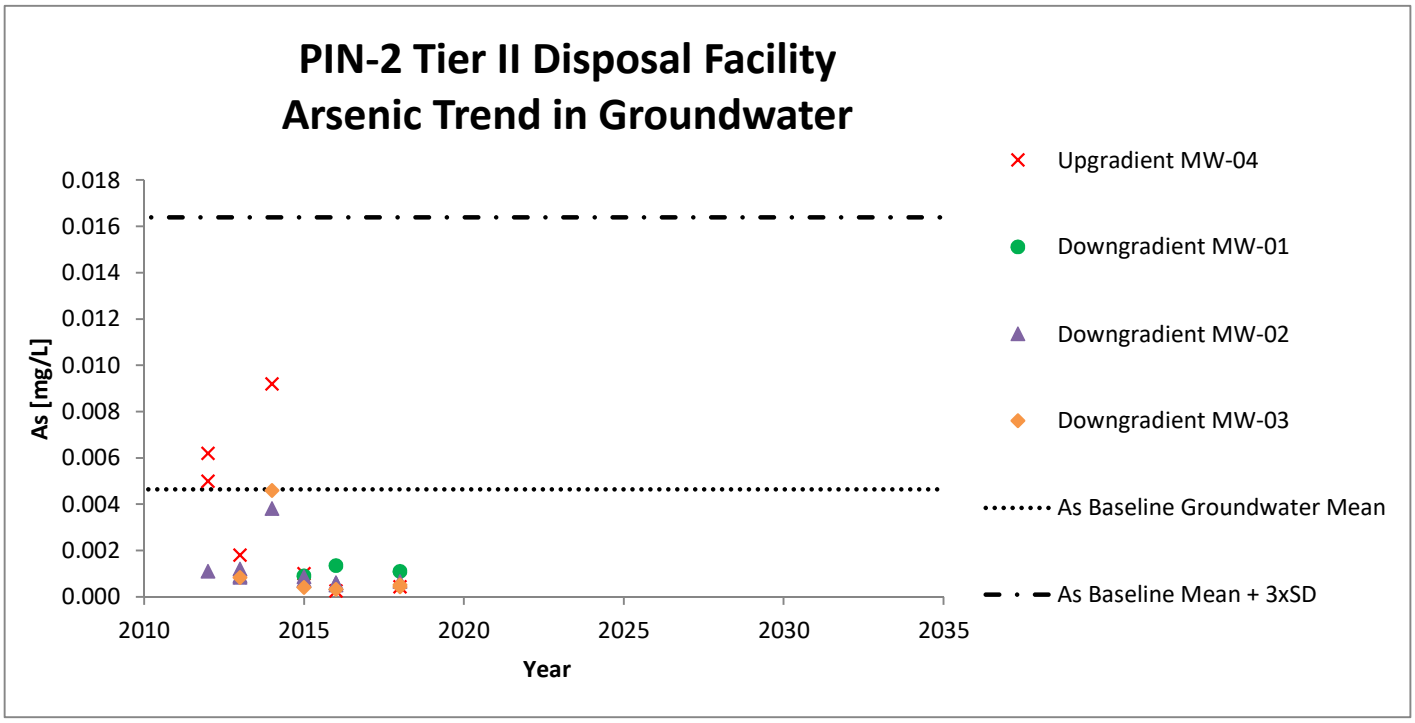
Tier II Soil Disposal Facility – Groundwater Trend Analysis Graphs

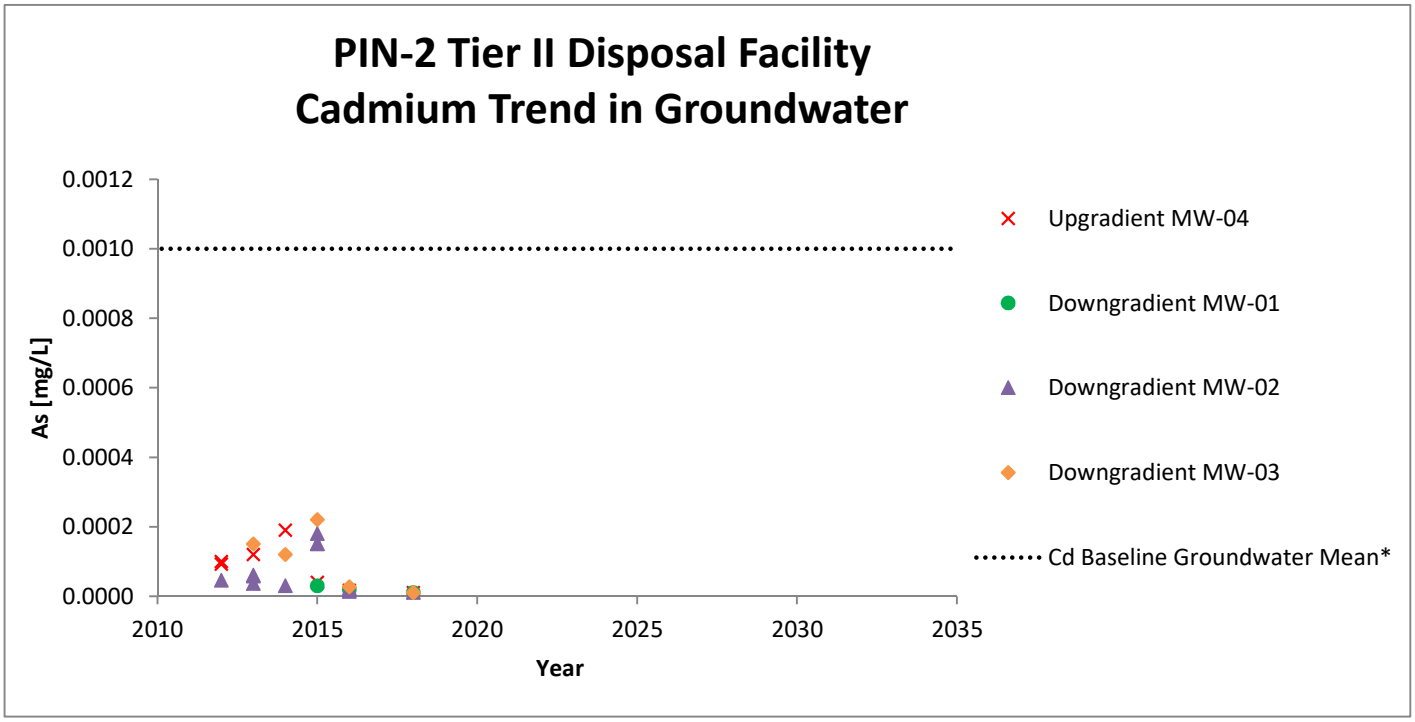
Appendix H1:

PIN-2 Tier II Disposal Facility Trends Groundwater Inorganics Elements and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.





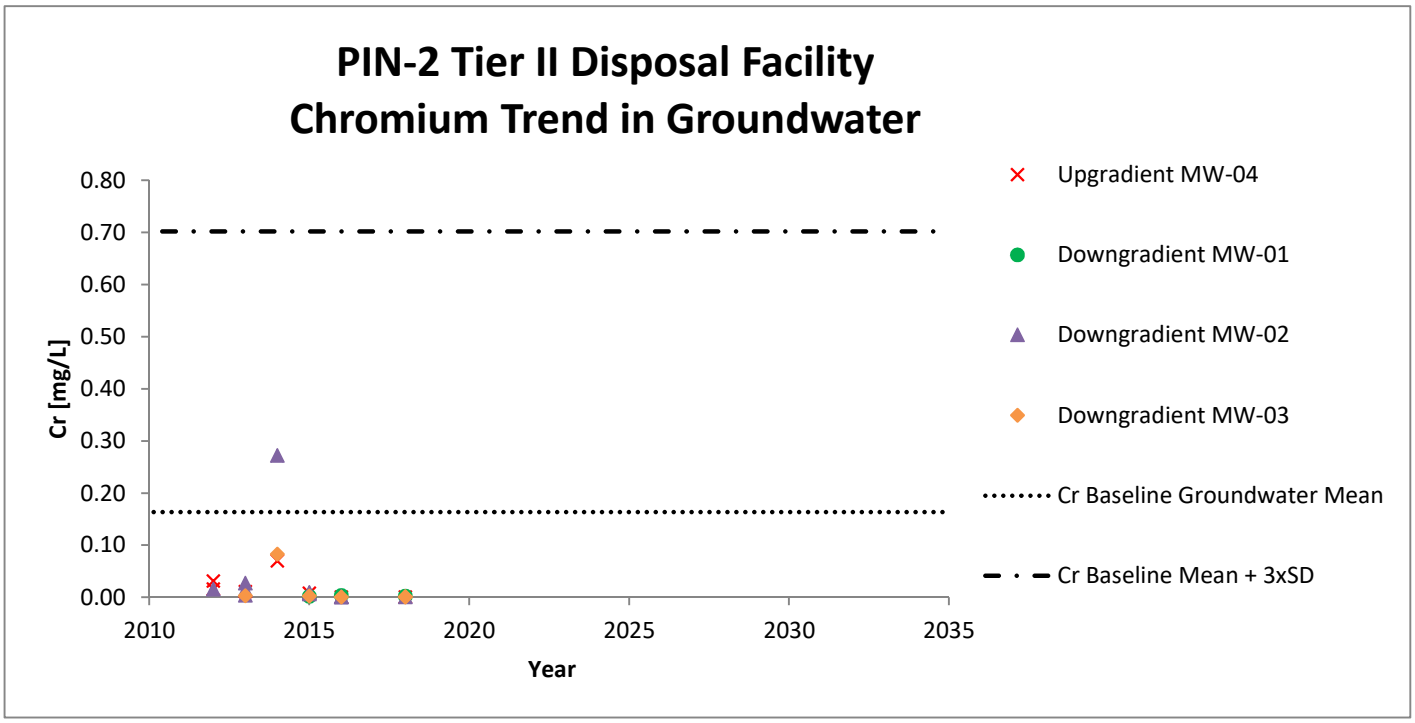
* Cd baseline arithmetic mean is equal to the baseline detection limit
* Cd baseline standard deviation = 0

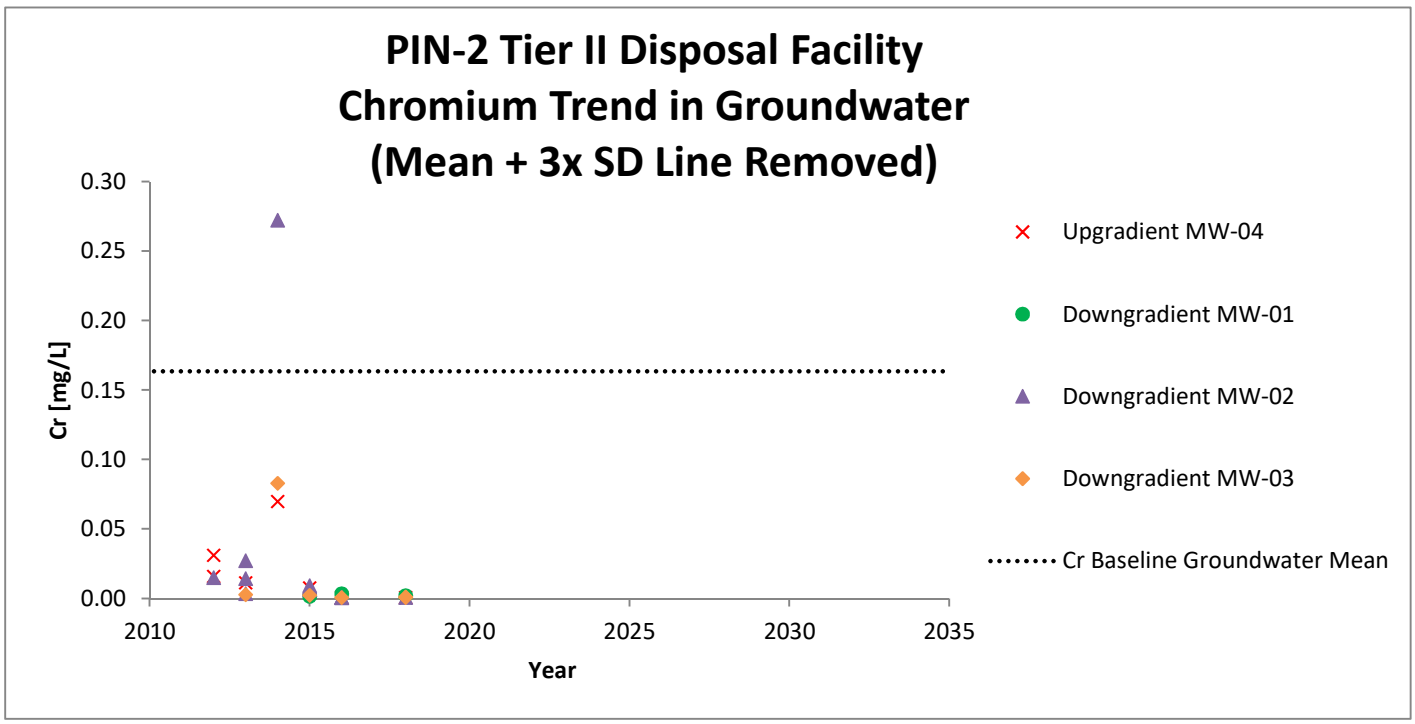
Appendix H1:

PIN-2 Tier II Disposal Facility Trends Groundwater Inorganics Elements and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.





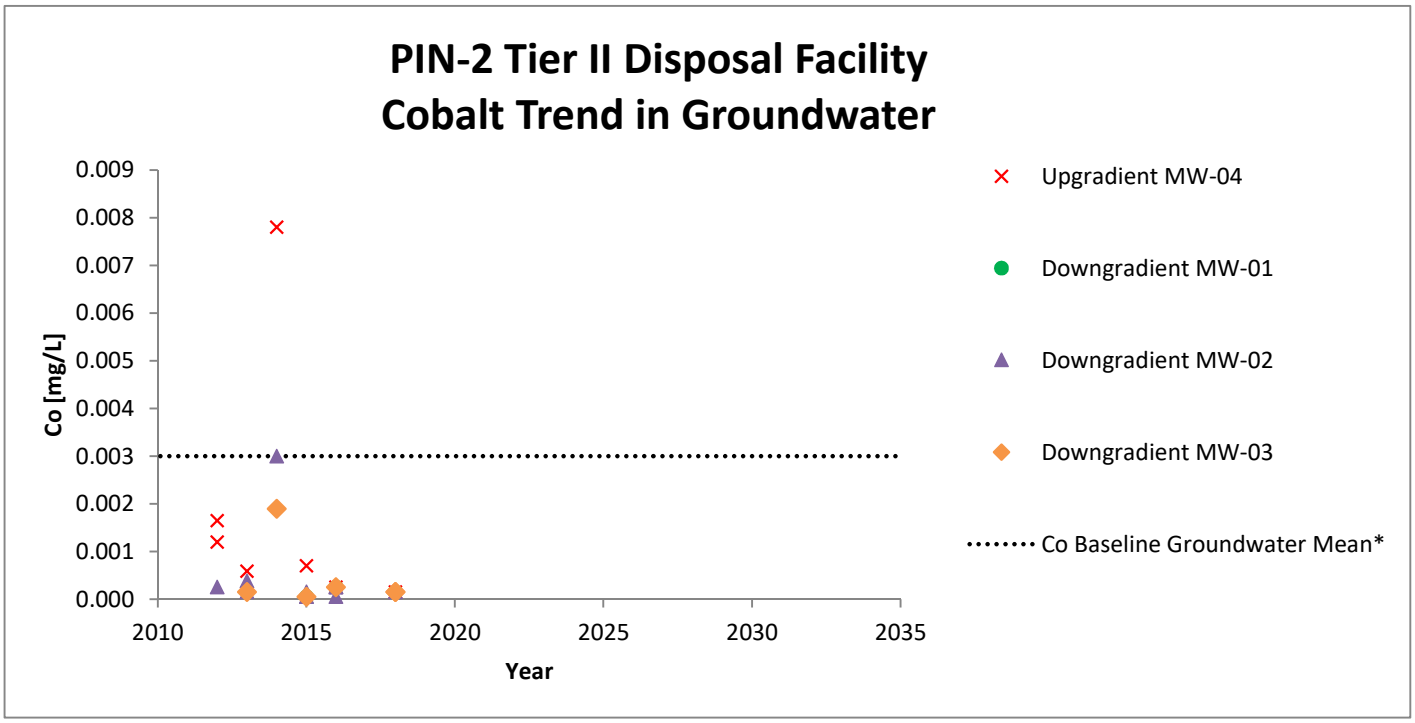
Y-axis maximum value decreased to show data distribution; baseline mean + 3x SD not shown

Appendix H1:

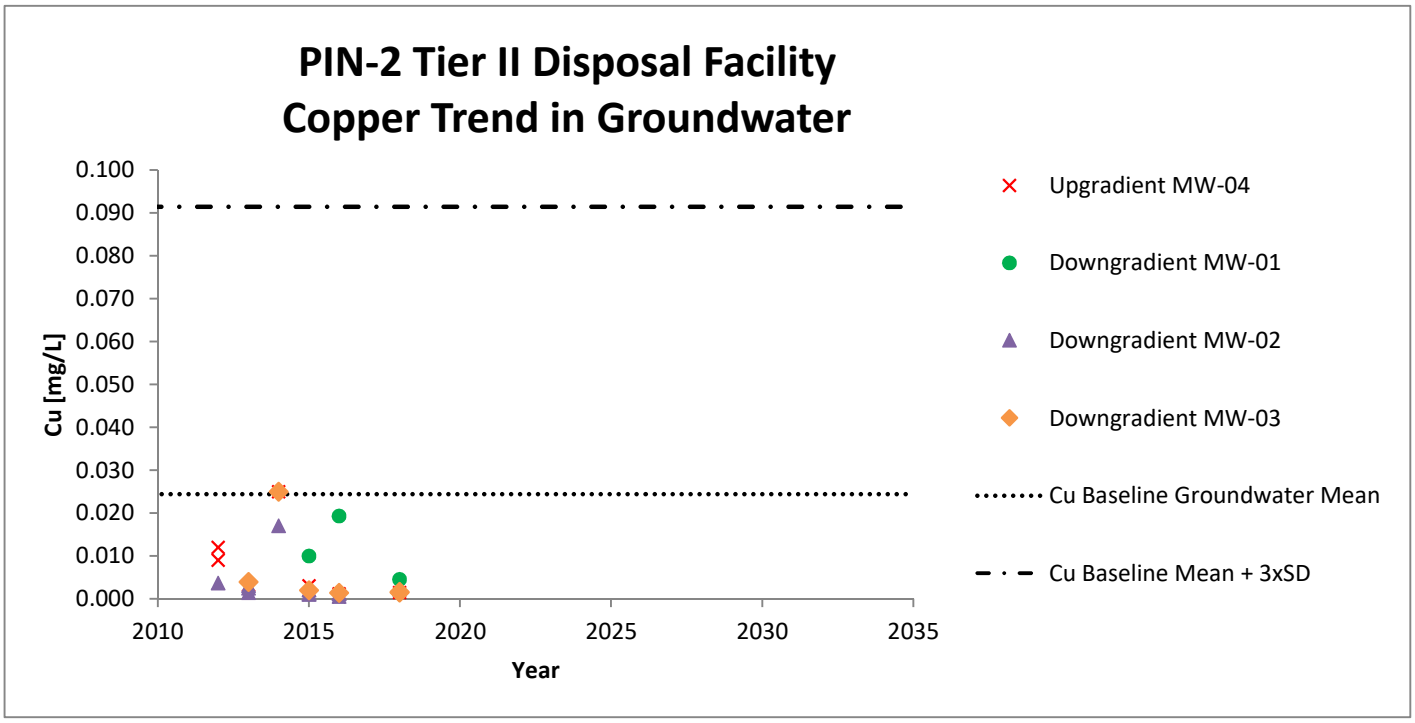
PIN-2 Tier II Disposal Facility Trends Groundwater Inorganics Elements and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



* Co baseline arithmetic mean is equal to the baseline detection limit
* Co baseline standard deviation = 0

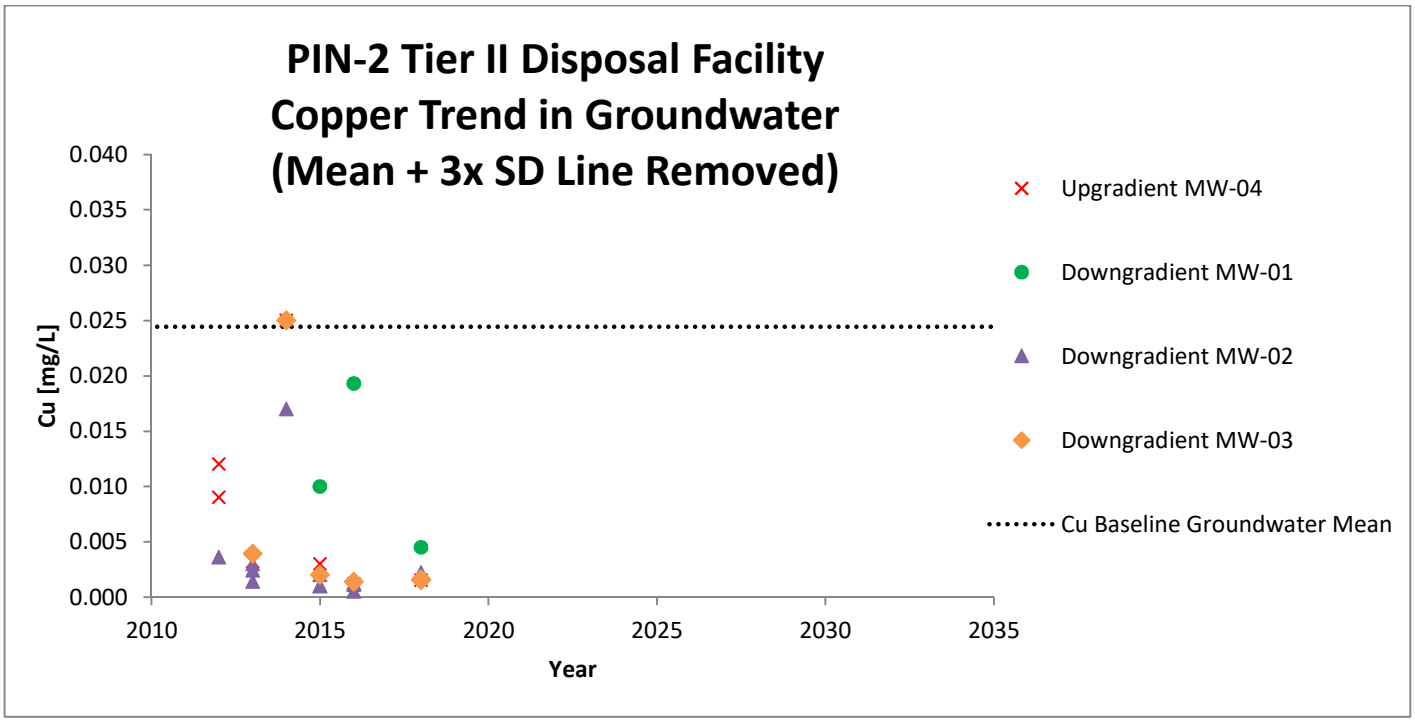


Appendix H1:

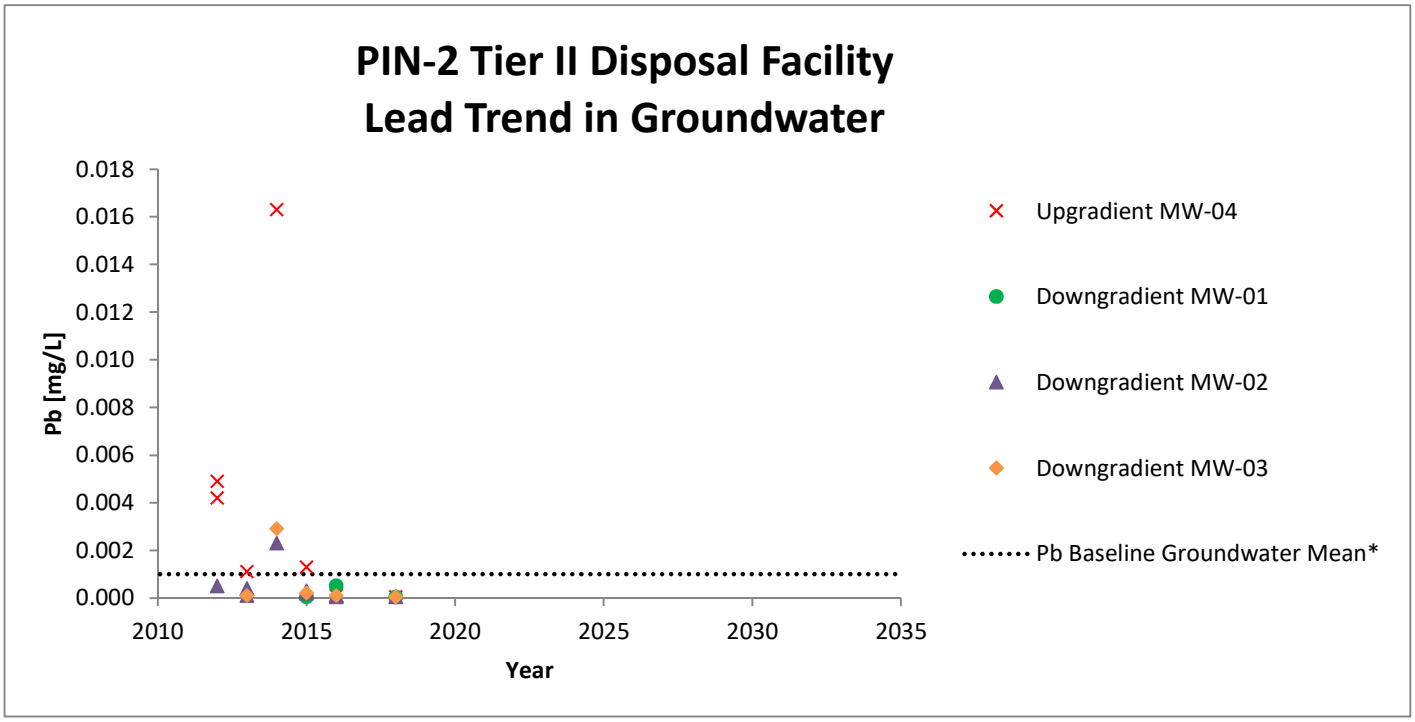
PIN-2 Tier II Disposal Facility Trends Groundwater Inorganics Elements and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



Y-axis maximum value decreased to show data distribution; baseline mean + 3x SD not shown



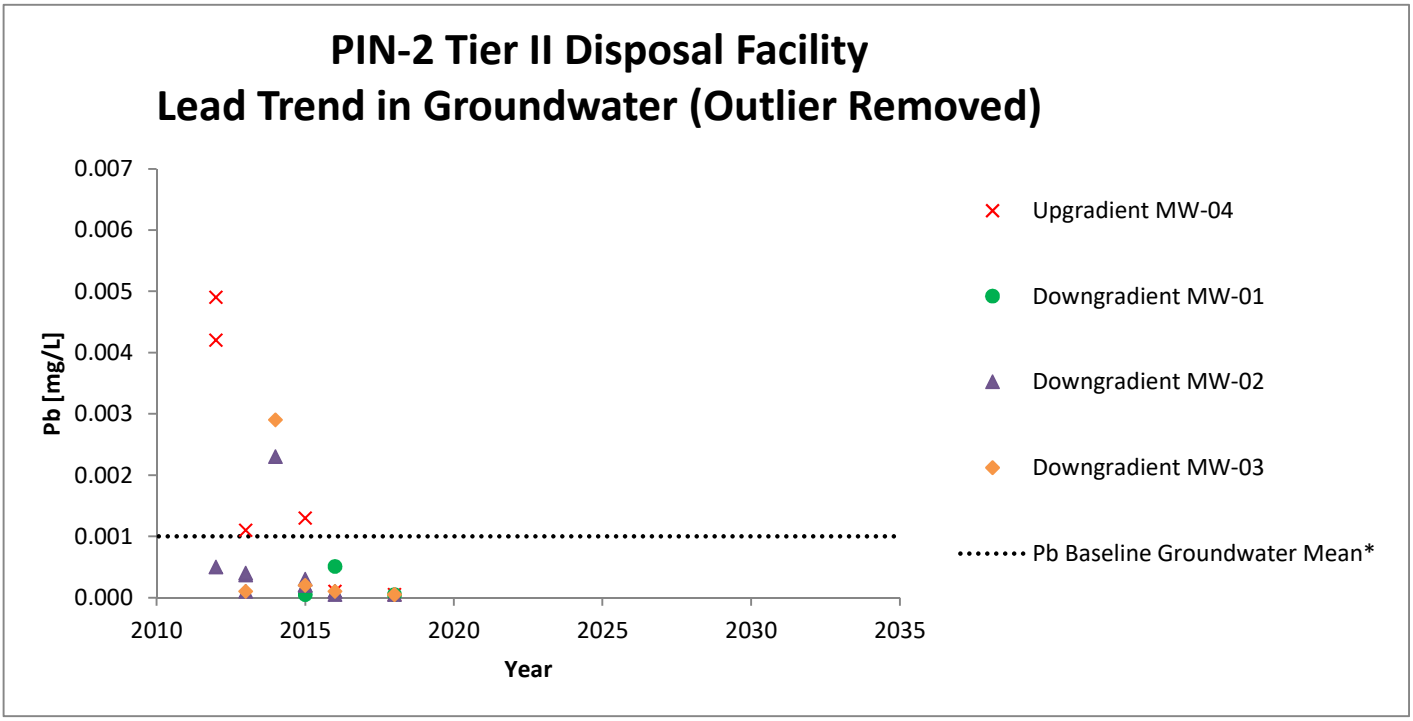
* Pb baseline arithmetic mean is equal to the baseline detection limit
* Pb baseline standard deviation = 0

Appendix H1:

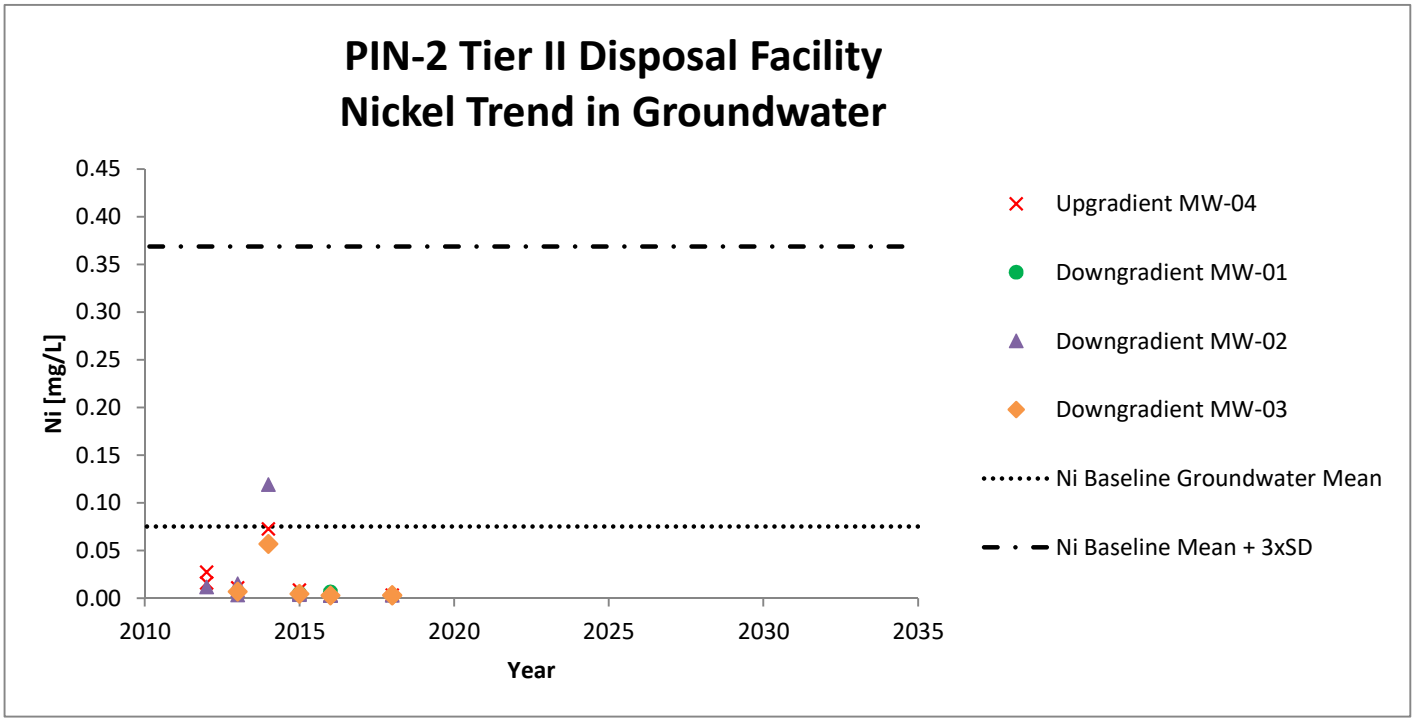
PIN-2 Tier II Disposal Facility Trends Groundwater Inorganics Elements and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



Pb result from upgradient MW-04 in 2014 is not shown on this chart

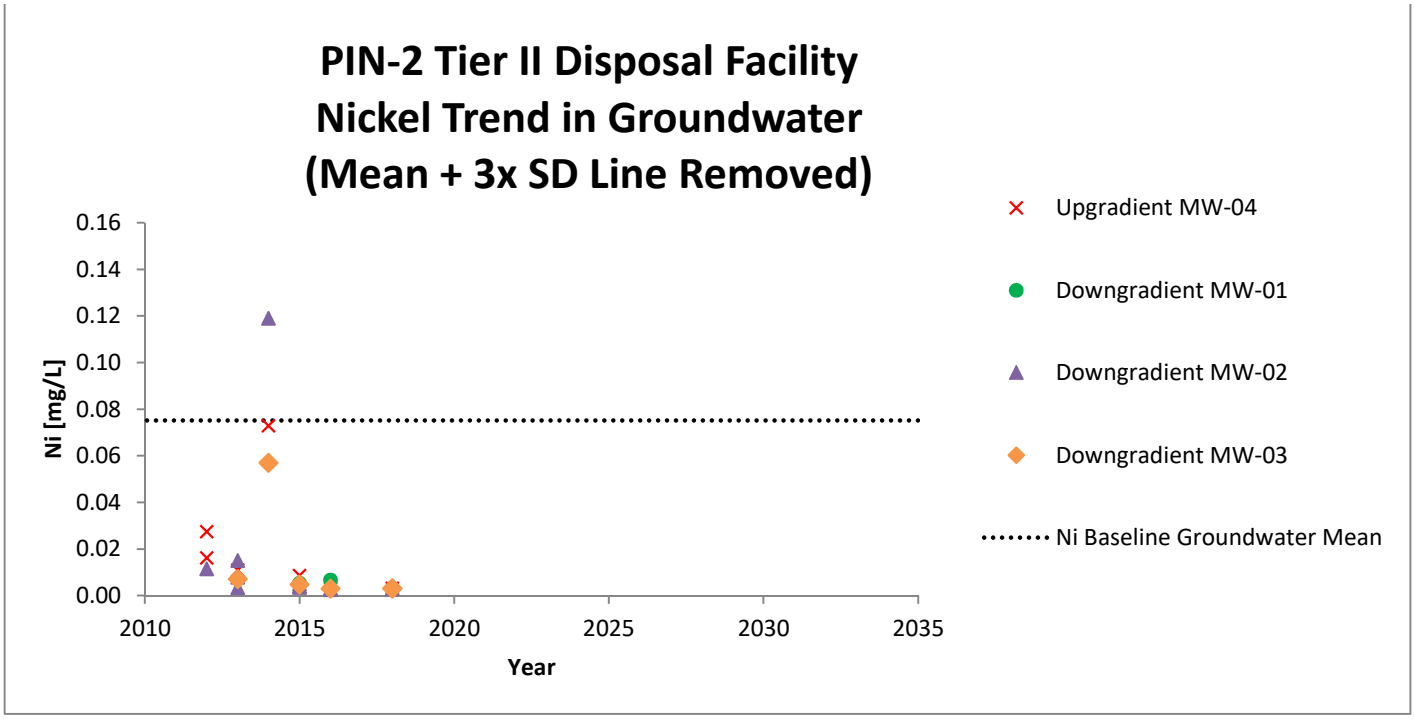


Appendix H1:

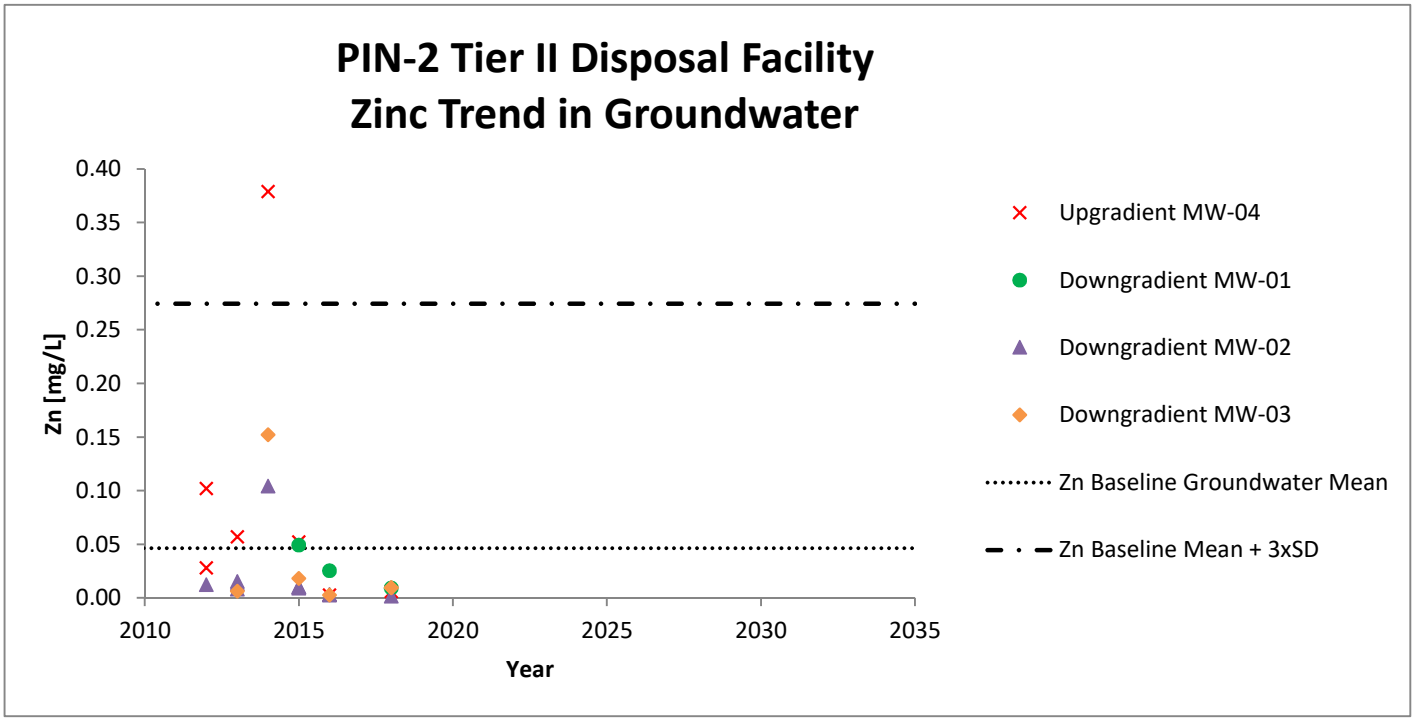
PIN-2 Tier II Disposal Facility Trends Groundwater Inorganics Elements and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



Y-axis maximum value decreased to show data distribution; baseline mean + 3x SD not shown

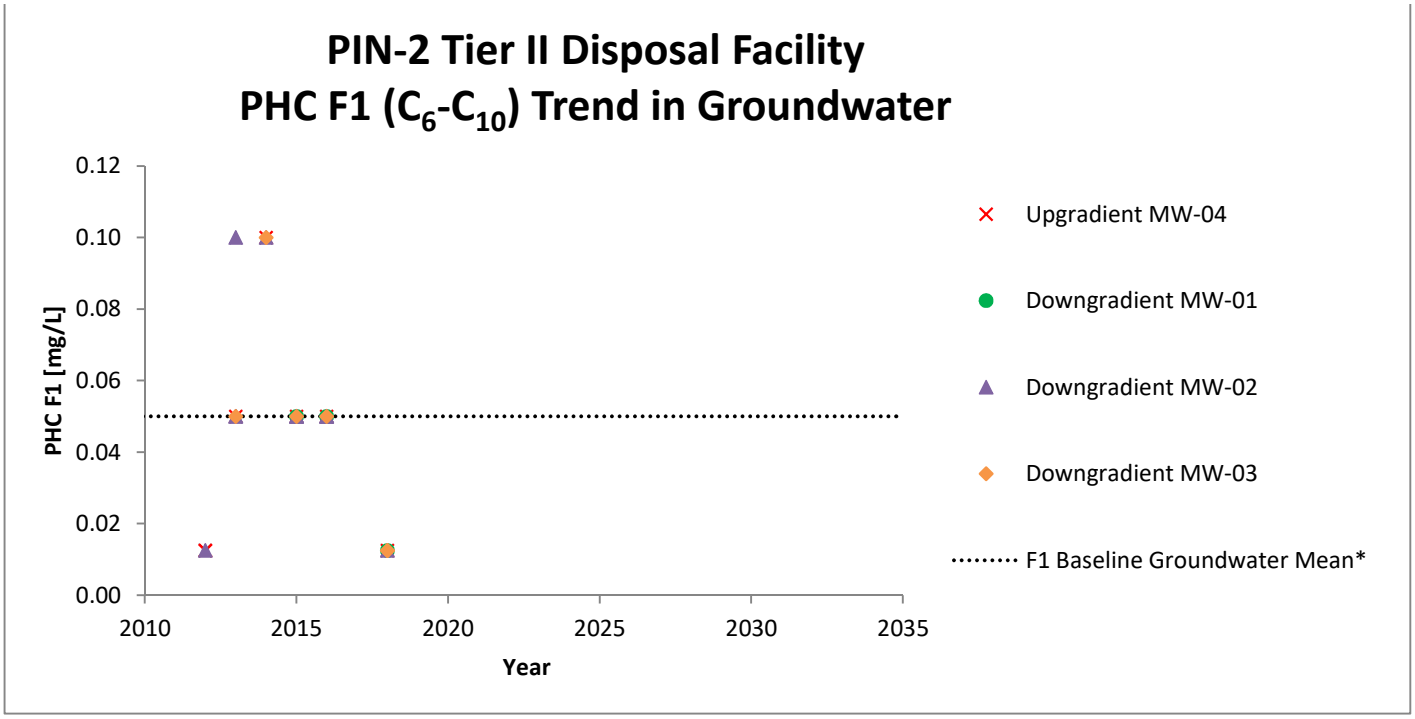


Appendix H1:

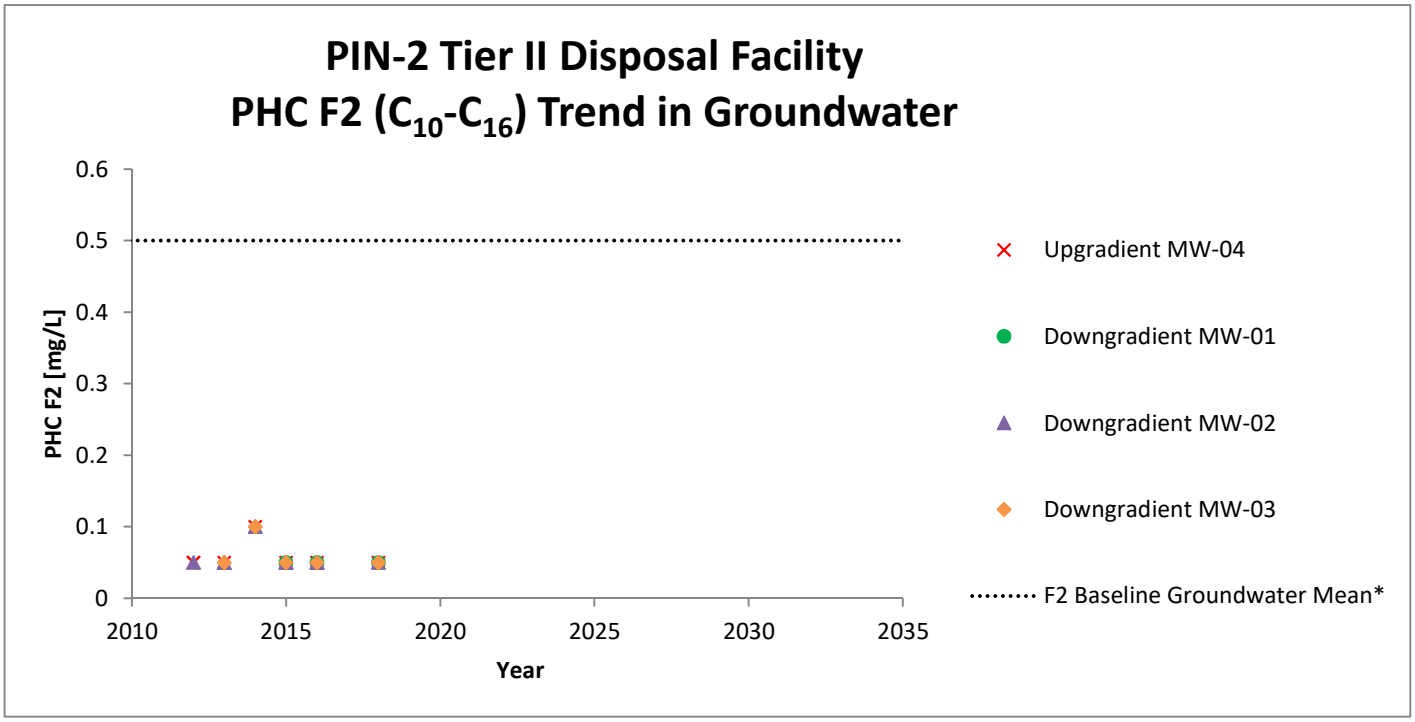
PIN-2 Tier II Disposal Facility Trends Groundwater Inorganics Elements and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



* F1 baseline arithmetic mean is equal to the detection limit
* F1 baseline standard deviation = 0



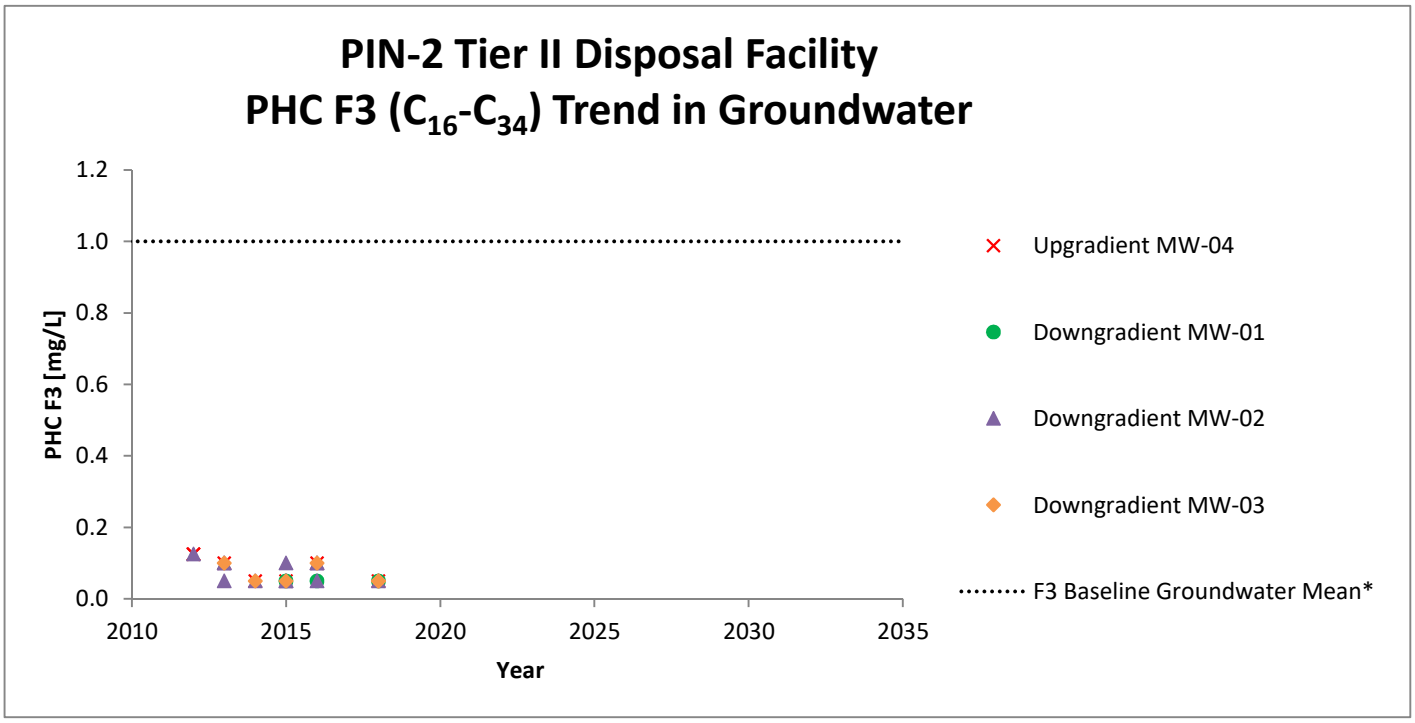
* F2 baseline arithmetic mean is equal to the detection limit
* F2 baseline standard deviation = 0

Appendix H1:

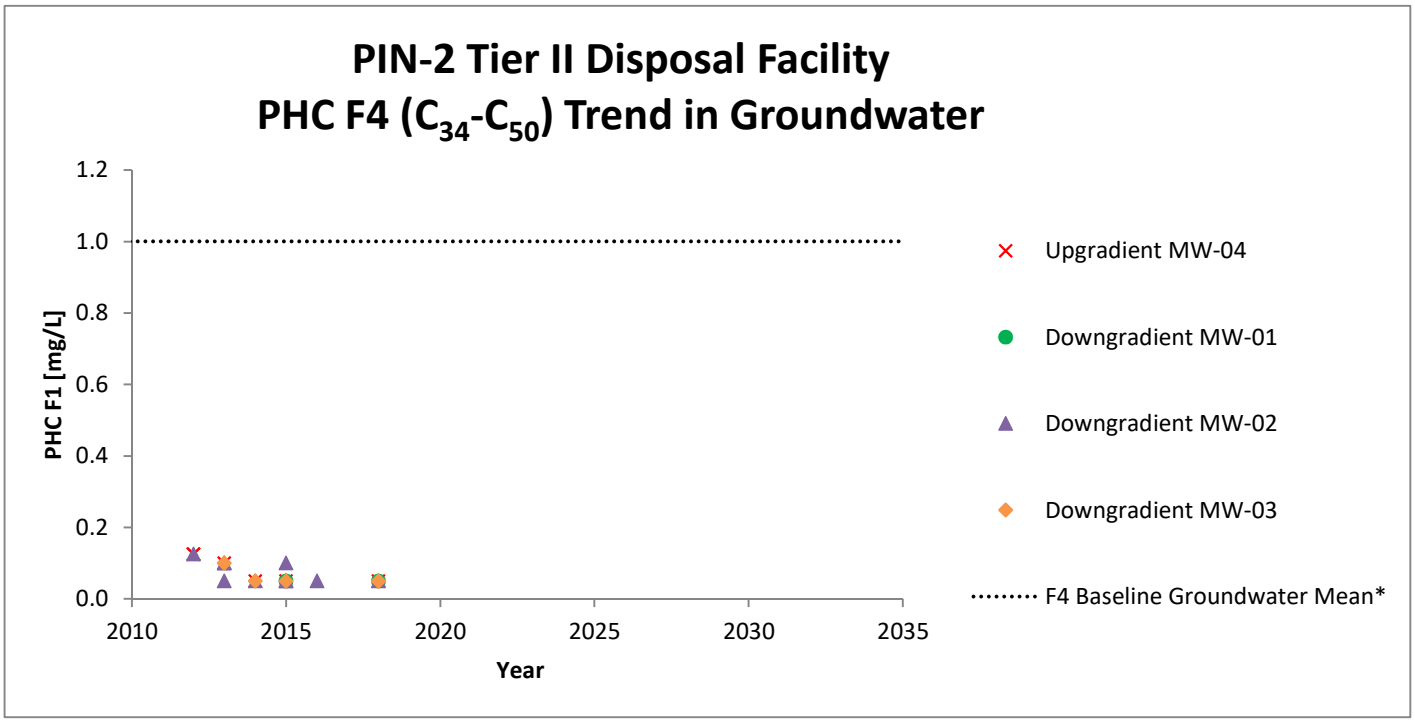
PIN-2 Tier II Disposal Facility Trends Groundwater Inorganics Elements and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



* F3 baseline arithmetic mean is equal to the detection limit
* F3 baseline standard deviation = 0



* F4 baseline arithmetic mean is equal to the detection limit
* F4 baseline standard deviation = 0

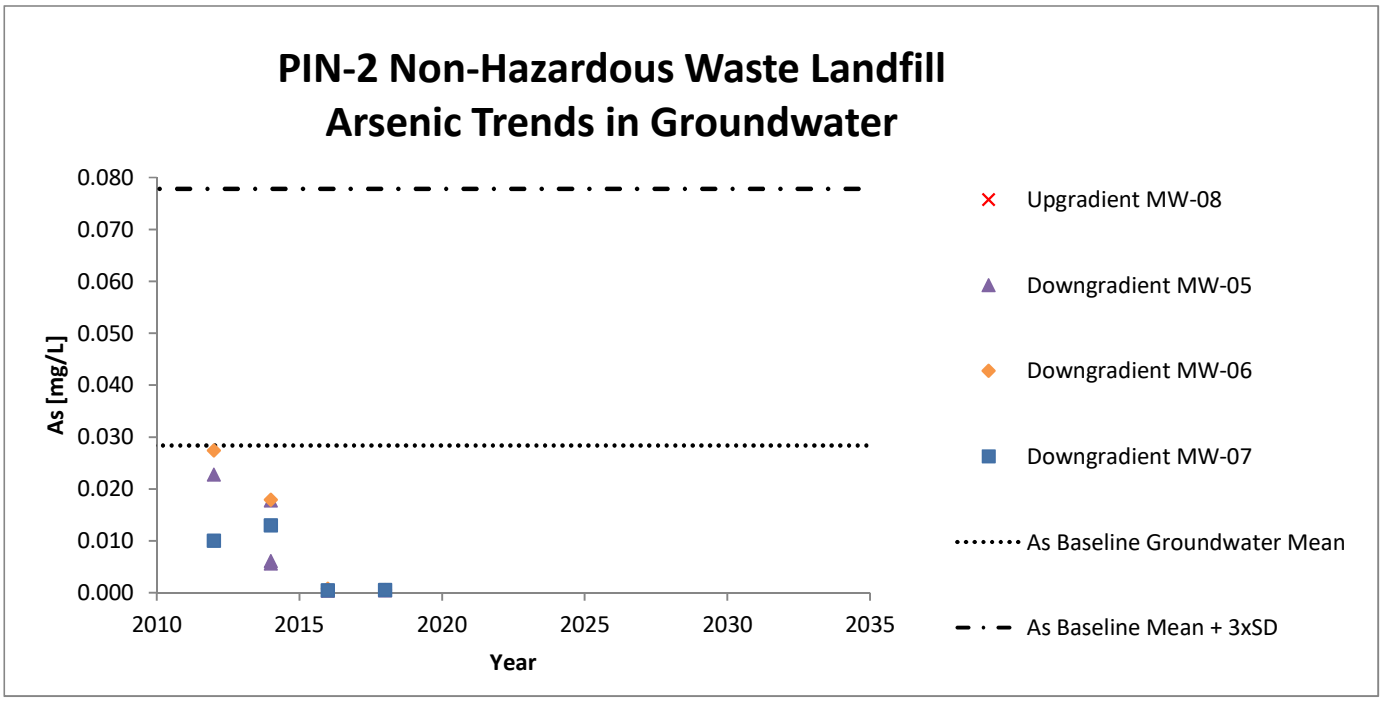
APPENDIX H2

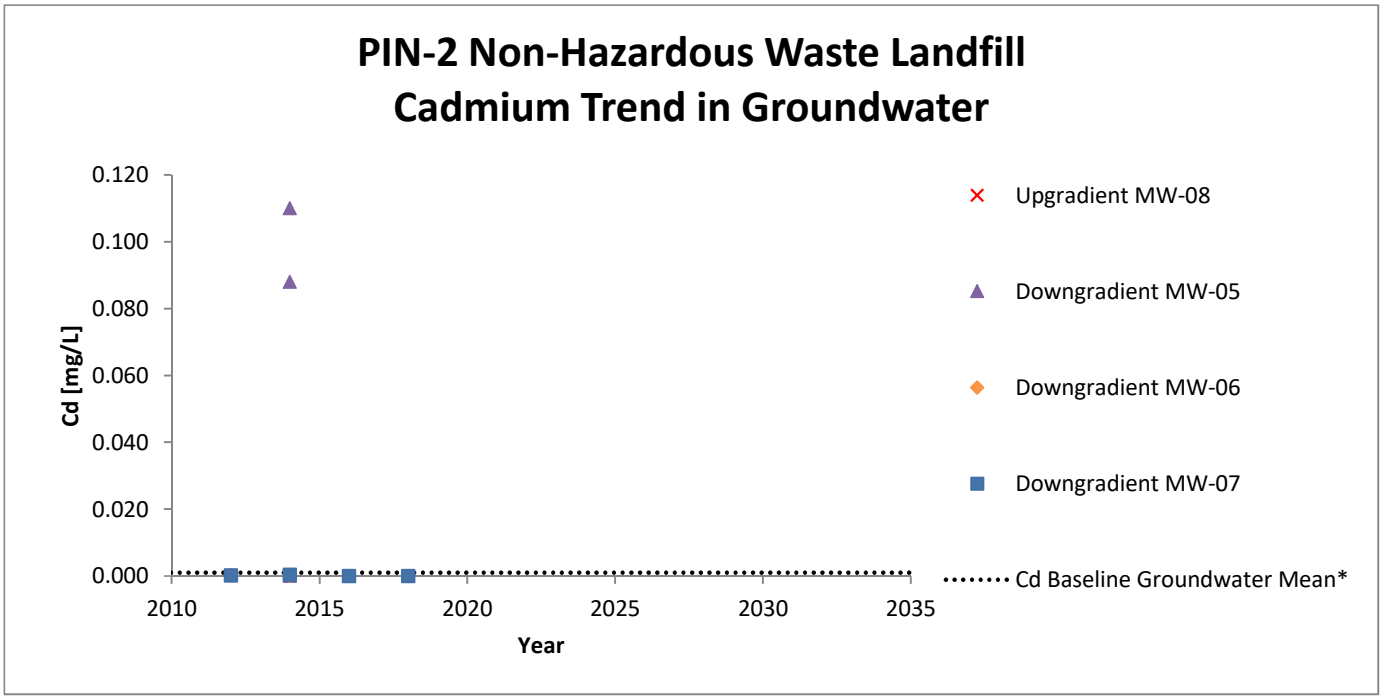
Non-Hazardous Waste Landfill – Groundwater Trend Analysis Graphs

PIN-2 Non-Hazardous Waste Landfill Trends in Groundwater Inorganics and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



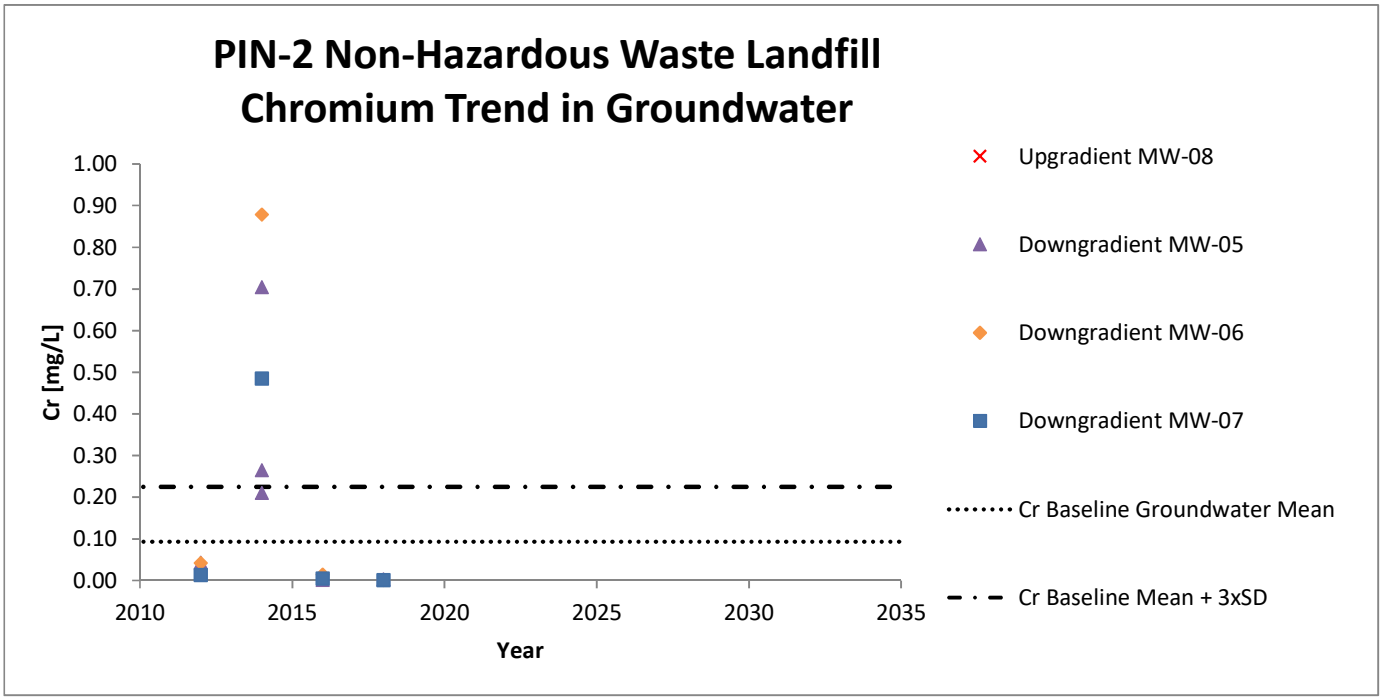


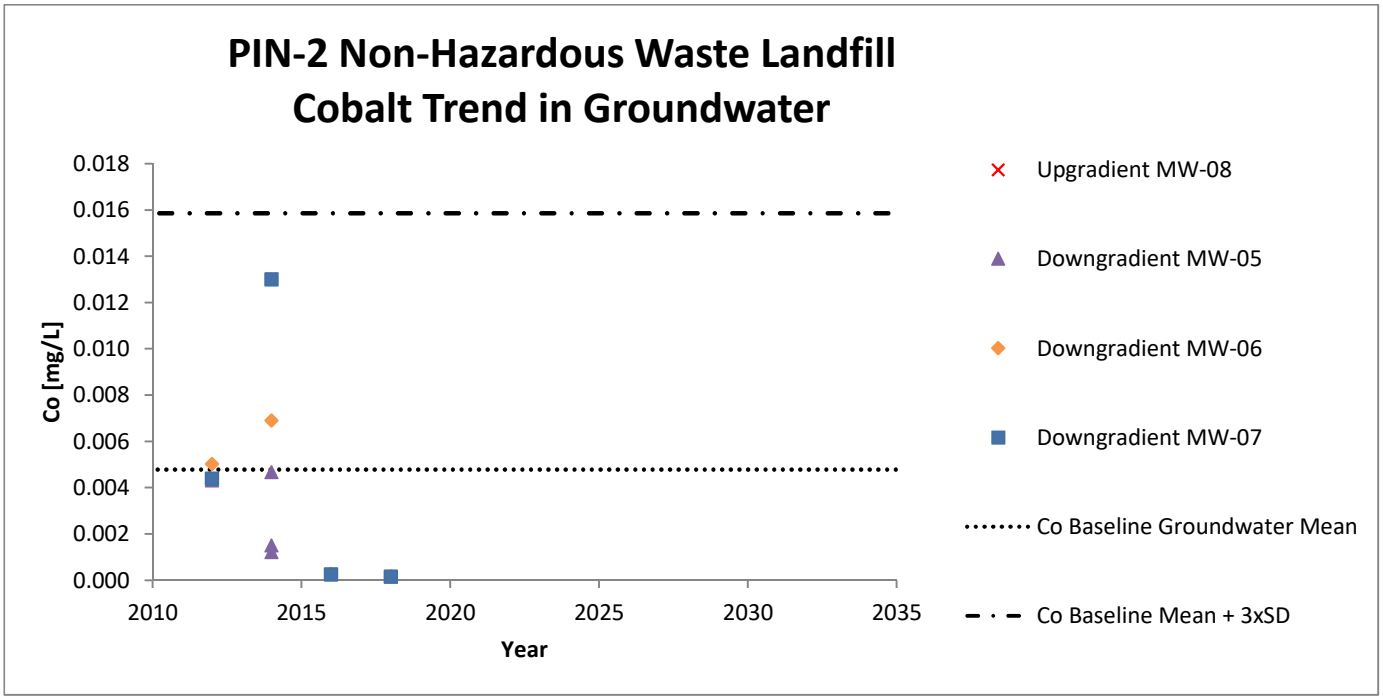
* Cd baseline arithmetic mean is equal to the baseline detection limit
* Cd baseline standard deviation = 0

PIN-2 Non-Hazardous Waste Landfill Trends in Groundwater Inorganics and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.

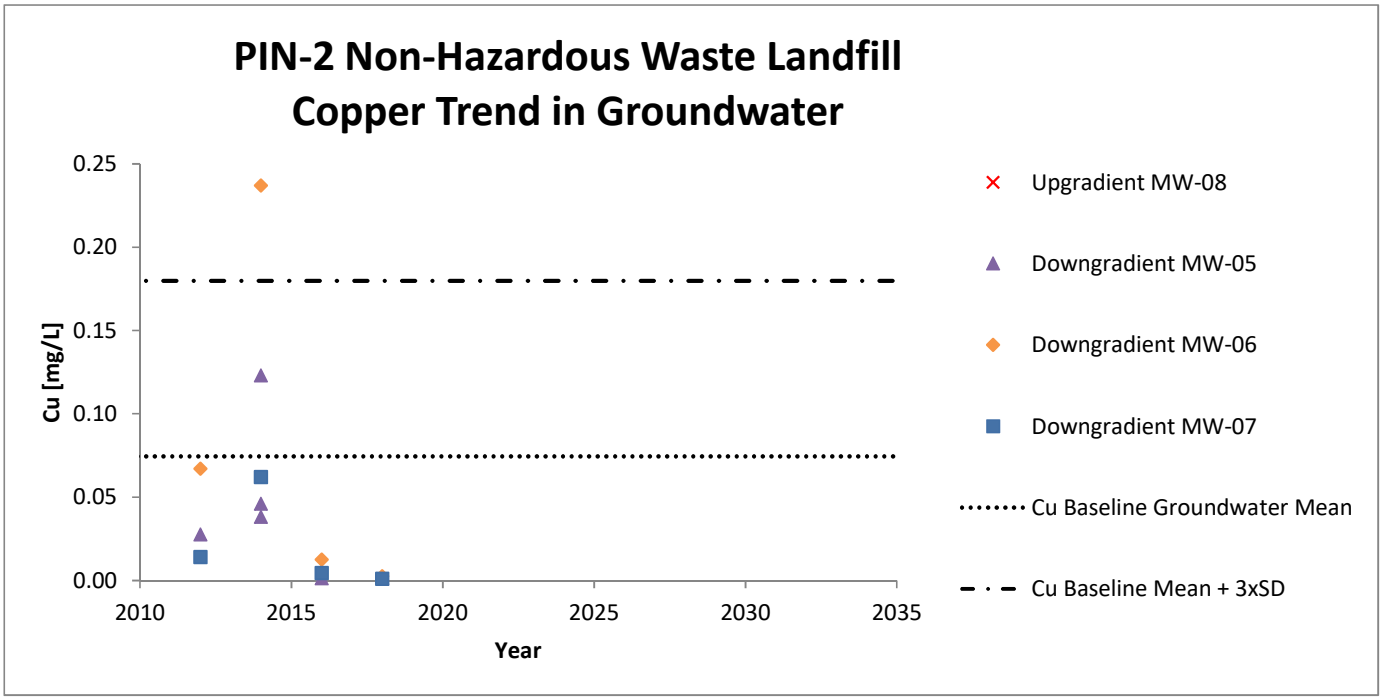


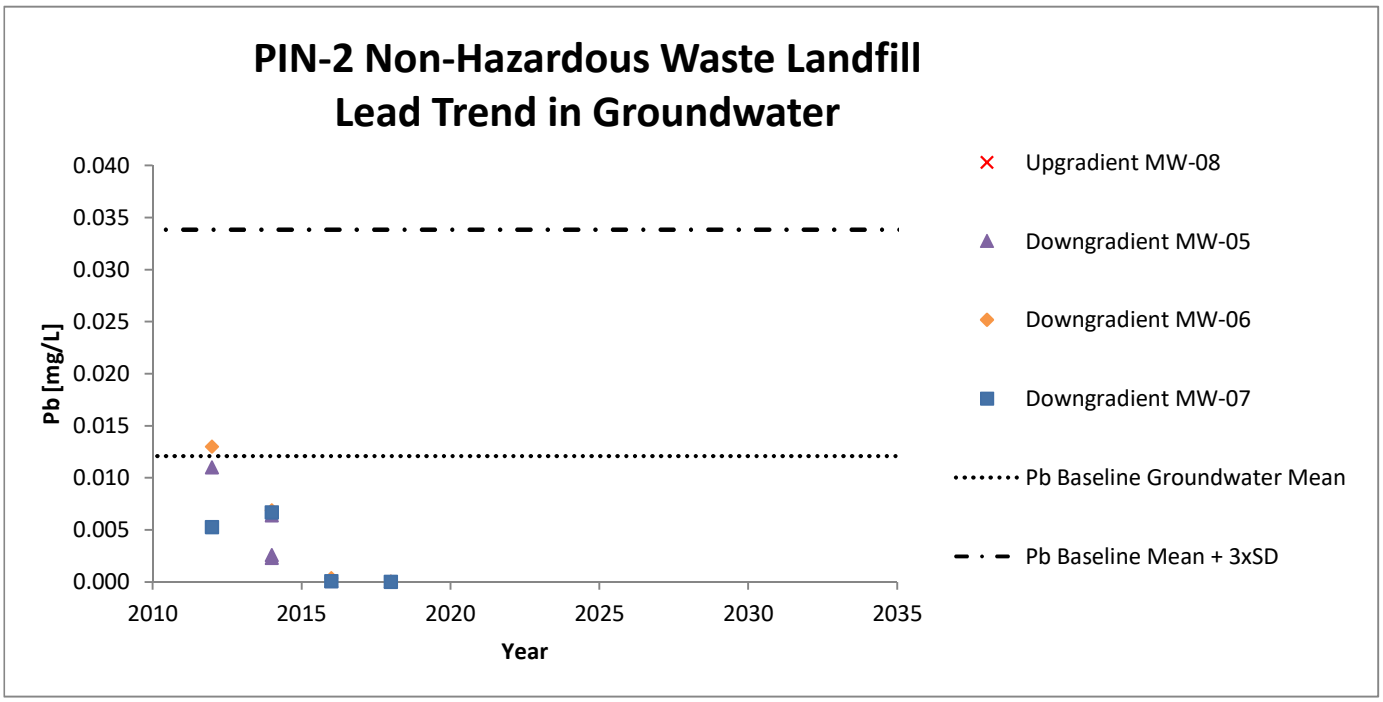


PIN-2 Non-Hazardous Waste Landfill Trends in Groundwater Inorganics and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.

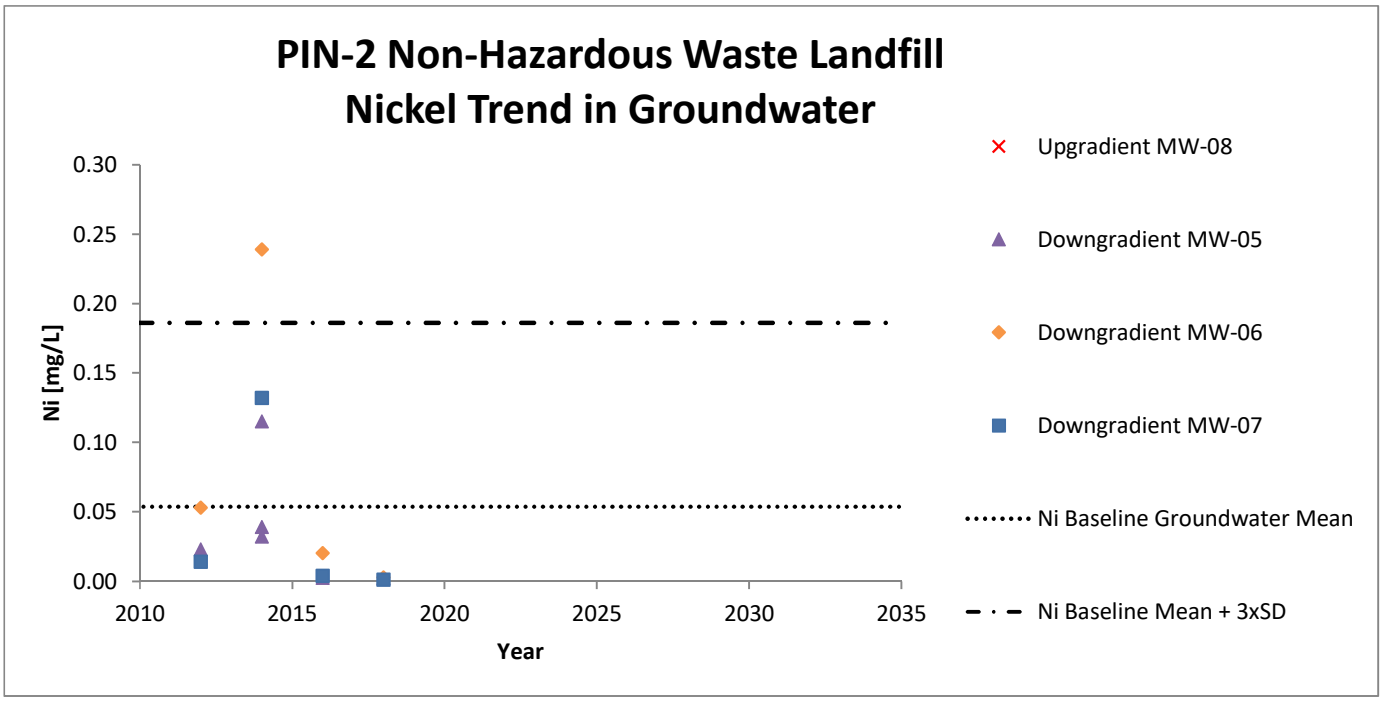


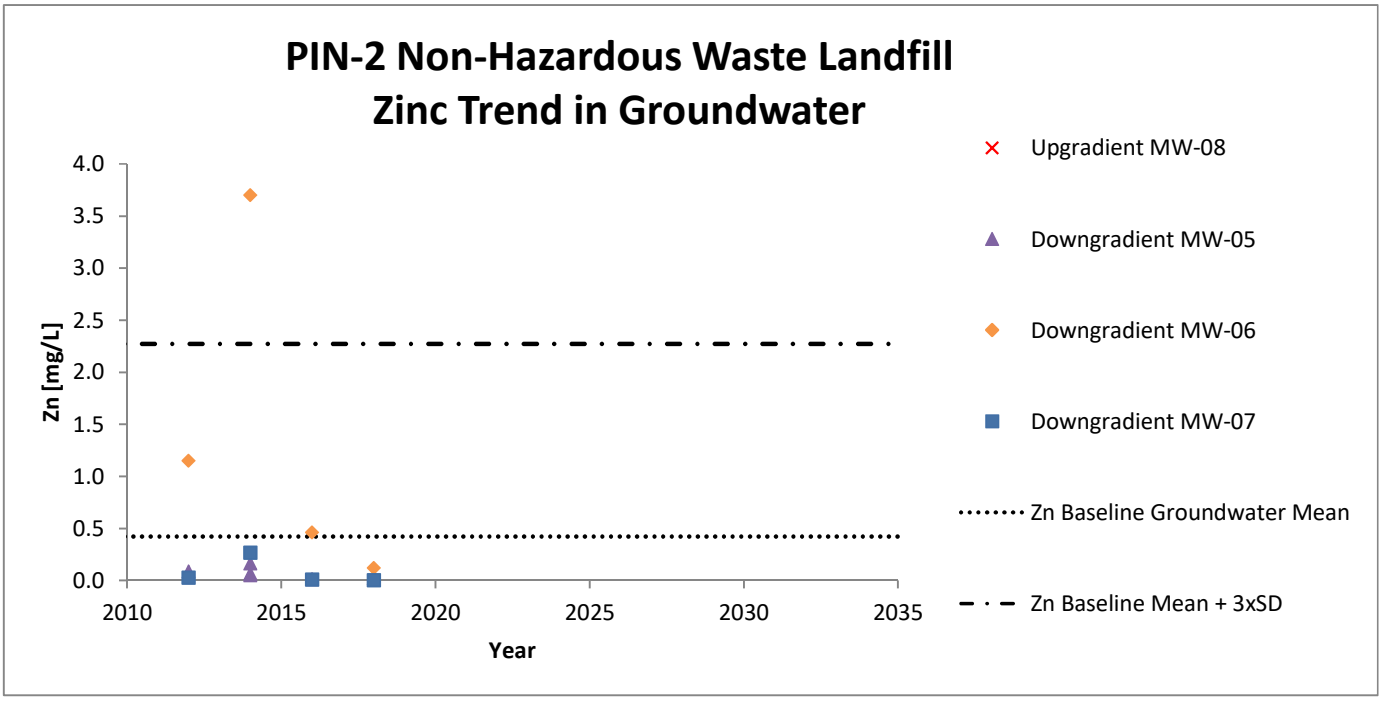


PIN-2 Non-Hazardous Waste Landfill Trends in Groundwater Inorganics and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.

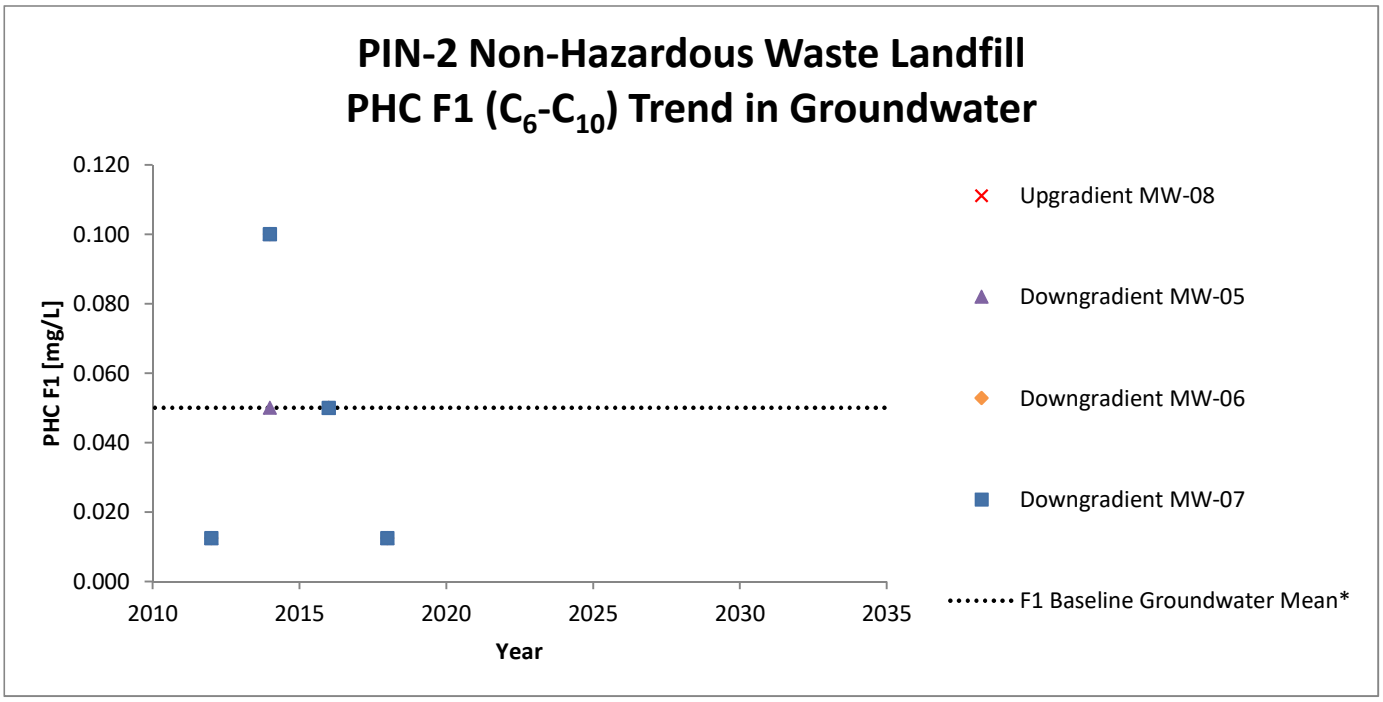




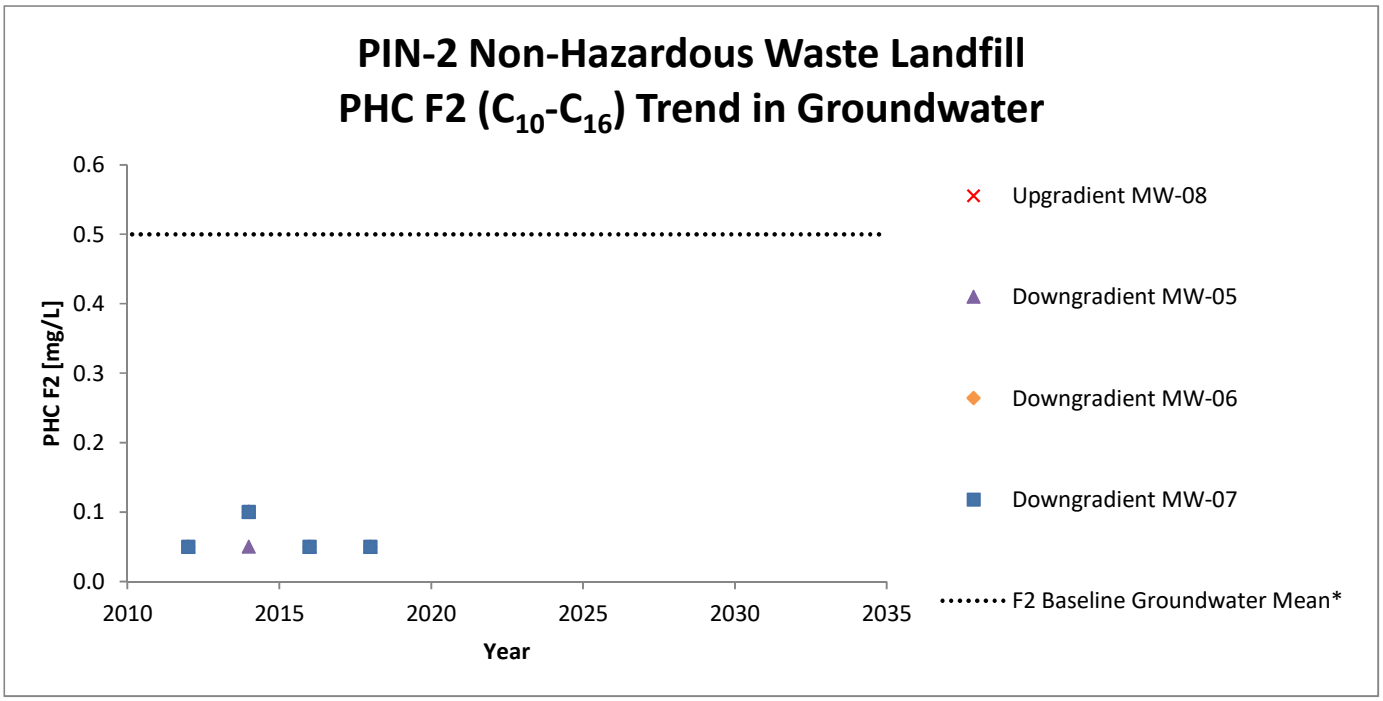
PIN-2 Non-Hazardous Waste Landfill Trends in Groundwater Inorganics and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



* F1 baseline arithmetic mean is equal to the detection limit
* F1 baseline standard deviation = 0

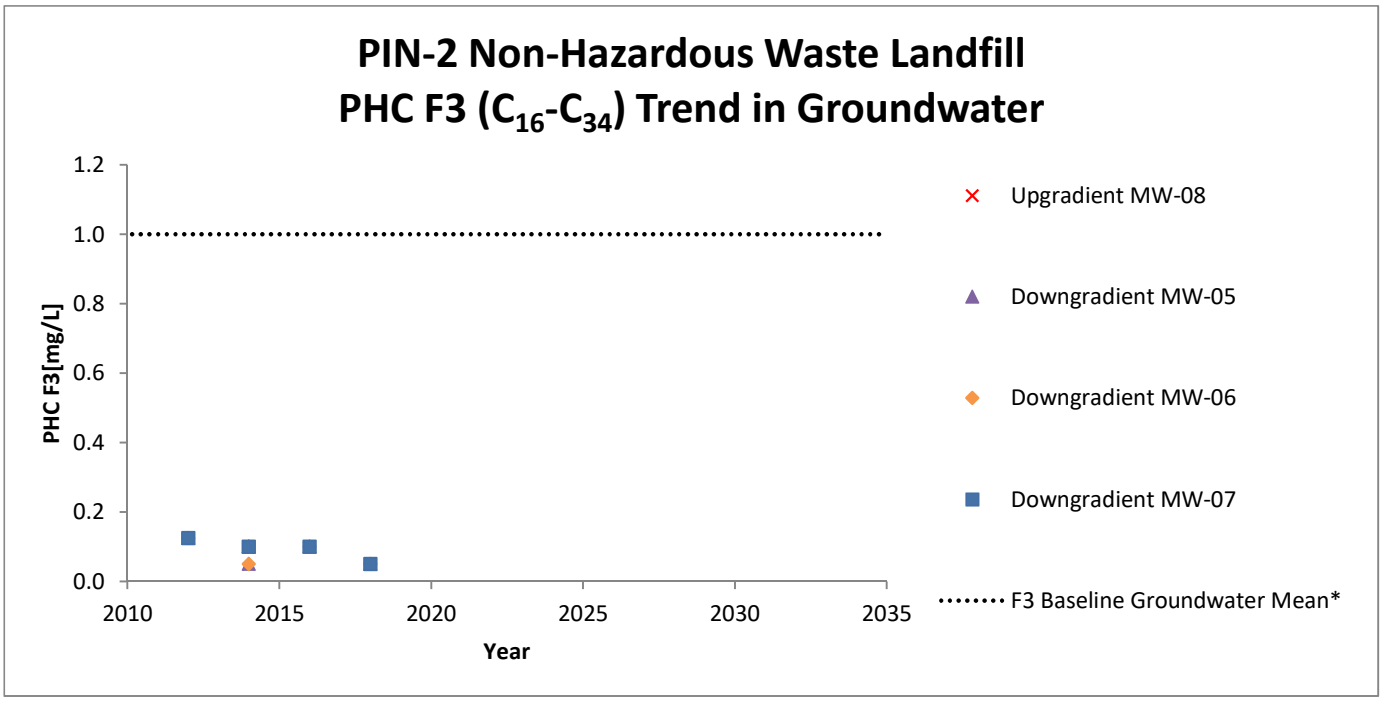


* F2 baseline arithmetic mean is equal to the detection limit
* F2 baseline standard deviation = 0

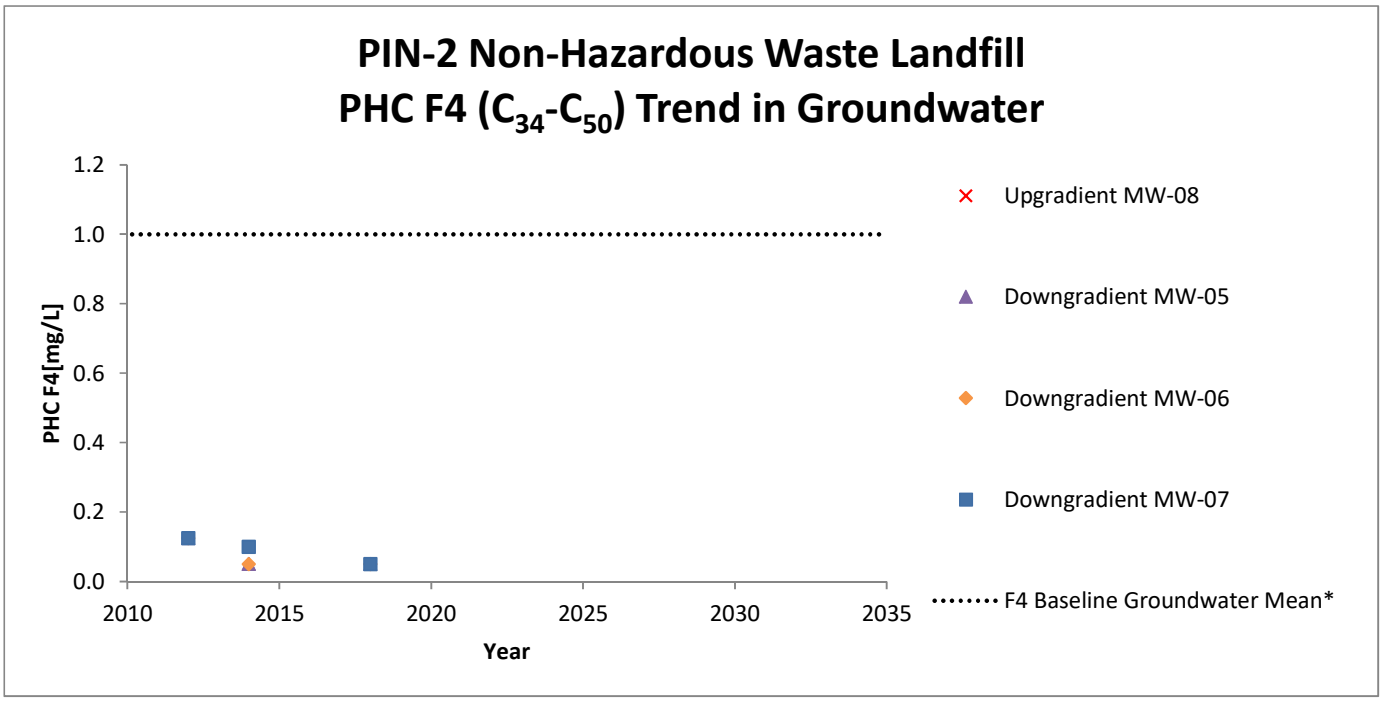
PIN-2 Non-Hazardous Waste Landfill Trends in Groundwater Inorganics and PHCs

Link to: Table of Contents

Where results are below detection, half of the detection limit has been used in the charts for the sample points.
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



* F3 baseline arithmetic mean is equal to the detection limit
* F3 baseline standard deviation = 0



* F4 baseline arithmetic mean is equal to the detection limit
* F4 baseline standard deviation = 0

APPENDIX I

Selected Site Photographs and Photographic Log

SELECTED PHOTOGRAPHS

Project Photographs

PIN-2 Select Site Photographs
Airstrip Landfill- 19 August 2018

Photo: PIN-2 ALF-7

Date:
19 August 2018

Description:
Main body of Lobe A, shows condition of cover material

Photo: PIN-2 ALF-10

Date:
19 August 2018

Description:
View down main slope of Lobe A, secondary plateau and general grade

Project Photographs

PIN-2 Select Site Photographs
Airstrip Landfill- 19 August 2018

Photo: PIN-2 ALF-11

Date:
19 August 2018

Description:
Detail of Feature B.

Photo: PIN-2 ALF-24

Date:
19 August 2018

Description:
Detail of Feature F.

Project Photographs

PIN-2 Select Site Photographs
Airstrip Landfill- 19 August 2018

Photo: PIN-2 ALF-23

Date:
19 August 2018

Description:
Detail of Feature E.

Photo: PIN-2 ALF-46

Date:
19 August 2018

Description:
Detail of Feature A – example of the surface debris found on site.

Project Photographs

PIN-2 Select Site Photographs
Airstrip Landfill- 19 August 2018

Photo: PIN-2 ALF-14

Date:
19 August 2018

Description:
View along the toe of the main slope of Lobe A

Photo: PIN-2 ALF-26

Date:
19 August 2018

Description:
View up the main slope of Lobe A

Project Photographs

PIN-2 Select Site Photographs
Airstrip Landfill- 19 August 2018

Photo: PIN-2 ALF-30

Date:
19 August 2018

Description:
View across toe of slope of Lobe E/F

Photo: PIN-2 ALF-40

Date:
19 August 2018

Description:
View from peak of Lobe E/F, down the main slope

Project Photographs

PIN-2 Select Site Photographs
Airstrip Landfill- 19 August 2018

Photo: PIN-2 ALF-44

Date:
19 August 2018

Description:
Area between Lobe A and Lobe E/F

Project Photographs

PIN-2 Select Site Photographs
USAF Landfill- 19 August 2018

Photo: PIN-2 USAF-1

Date:
19 August 2018

Description:
View of the entire landfill extent from the NE

Photo: PIN-2 USAF-9

Date:
19 August 2018

Description:
Detail of settlement Feature B

Project Photographs

PIN-2 Select Site Photographs
USAF Landfill- 19 August 2018

Photo: PIN-2 USAF-14

Date:
19 August 2018

Description:
View NW along the E edge of the landfill.

Photo: PIN-2 USAF-6

Date:
19 August 2018

Description:
Detail of settlement Feature A

Project Photographs

PIN-2 Select Site Photographs
Station West Landfill- 19 August 2018

Photo: PIN-2 SW-6

Date:
19 August 2018

Description:
Showing N slope of the landfill, typical condition of all sides

Photo: PIN-2 SW-8

Date:
19 August 2018

Description:
View of top of the landfill; across the main body

Project Photographs

PIN-2 Select Site Photographs
Station West Landfill- 19 August 2018

Photo: PIN-2 SW-5

Date:
19 August 2018

Description:
View across the landfill facing SW

Photo: PIN-2 SW-13

Date:
19 August 2018

Description:
Detail of Feature B, with access road in the background

Project Photographs

PIN-2 Select Site Photographs
Station West Landfill- 19 August 2018

Photo: PIN-2 SW-15

Date:
19 August 2018

Description:
Detail of Feature A

Project Photographs

PIN-2 Select Site Photographs
Tier II Landfill- 17 August 2018

Photo: PIN-2 TierII-2

Date:
17 August 2018

Description:
View up slope of SE side

Photo: PIN-2 TierII- 6

Date:
17 August 2018

Description:
View along SW slope

Project Photographs

PIN-2 Select Site Photographs
Tier II Landfill- 17 August 2018

Photo: PIN-2 TierII- 9

Date:
17 August 2018

Description:
Looking across the top of landfill

Photo: PIN-2 TierII- 15

Date:
17 August 2018

Description:
View up slope, detail of feature C2. Typical of minor erosion features

Project Photographs

PIN-2 Select Site Photographs
Tier II Landfill- 17 August 2018

Photo: PIN-2 TierII-22

Date:
17 August 2018

Description:
Detail of Feature I, typical minor depression.

Photo: PIN-2 Tier II-36

Date:
17 August 2018

Description:
View up slope, detail of Feature J. Relatively large depressed, uneven area.

Project Photographs

PIN-2 Select Site Photographs
Tier II Landfill- 17 August 2018

Photo: PIN-2 TierII-30

Date:
17 August 2018

Description:
Detail of Feature A, typical

Photo: PIN-2 TierII- 38

Date:
17 August 2018

Description:
Detail of Feature B, T1 is also visible in photo

Project Photographs

PIN-2 Select Site Photographs
Tier II Landfill- 17 August 2018

Photo: PIN-2 TierII-48

Date:
17 August 2018

Description:
Detail of Feature K

Photo: PIN-2 TierII- 51

Date:
17 August 2018

Description:
Detail of Feature G

Project Photographs

PIN-2 Select Site Photographs
Tier II Landfill- 17 August 2018

Photo: PIN-2 TierII-53

Date:
17 August 2018

Description:
Detail of Feature E, typical of minor erosion features

Photo: PIN-2 TierII- 60

Date:
17 August 2018

Description:
Detail of Feature F

Project Photographs

PIN-2 Select Site Photographs
Tier II Landfill- 17 August 2018

Photo: PIN-2 TierII- 67

Date:
17 August 2018

Description:
View up slope of N corner, detail of Feature L (minor erosion)

Photo: PIN-2 TierII- 72

Date:
17 August 2018

Description:
View of landfill full extent, NE side

Project Photographs

PIN-2 Select Site Photographs
Tier II Landfill- 17 August 2018

Photo: PIN-2 TierII-70

Date:
17 August 2018

Description:
Detail of Feature H

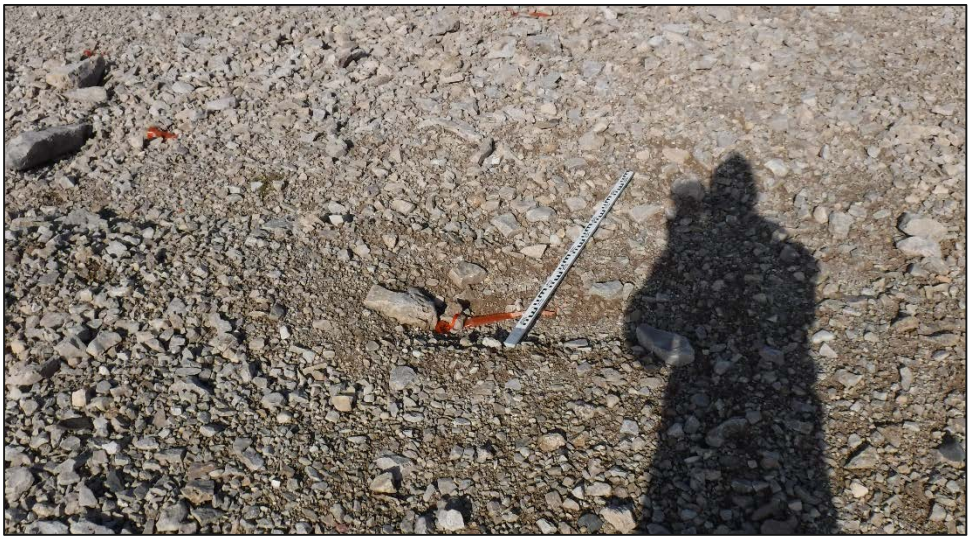


Photo: PIN-2 TierII- 74

Date:
17 August 2018

Description:
Detail of Feature M

Project Photographs

PIN-2 Select Site Photographs
Tier II Landfill- 17 August 2018

Photo: PIN-2 TierII-T1

Date:
17 August 2018

Description:
Detail of T1 – good condition

Photo: PIN-2 TierII- T2

Date:
17 August 2018

Description:
Detail of T2 – good condition

The white lid (misshapen with holes at the thermistor base) is being replaced with the grey lid present in the left of the frame

Project Photographs

PIN-2 Select Site Photographs
Tier II Landfill- 17 August 2018

Photo: PIN-2 TierII-T3

Date:
17 August 2018

Description:
Detail of T3 – good condition

Photo: PIN-2 TierII- T4

Date:
17 August 2018

Description:
Detail of T4 – good condition

Project Photographs

PIN-2 Select Site Photographs
Airstrip South Landfill- 19 August 2018

Photo: PIN-2 ASLF-1

Date:
19 August 2018

Description:
View along E side of landfill, vegetation in foreground

Photo: PIN-2 ASLF-7

Date:
19 August 2018

Description:
View along the W side of the landfill

Project Photographs

PIN-2 Select Site Photographs
Airstrip South Landfill- 19 August 2018

Photo: PIN-2 ASLF-10

Date:
19 August 2018

Description:
Detailed view of Feature A, linear depression

Photo: PIN-2 ASLF-12

Date:
19 August 2018

Description:
Detailed view of Feature B, depression

Project Photographs

PIN-2 Select Site Photographs
Airstrip South Landfill- 19 August 2018

Photo: PIN-2 ASLF-8

Date:
19 August 2018

Description:
View across main body of landfill

Photo: PIN-2 ASLF-17

Date:
19 August 2018

Description:
Detailed view of Feature F, vegetation

Project Photographs

PIN-2 Select Site Photographs
Pallet Line West Landfill- 19 August 2018

Photo: PIN-2 PLW-3

Date:
19 August 2018

Description:
Looking south along body of landfill. Typical cap material and condition

Photo: PIN-2 PLW-5

Date:
19 August 2018

Description:
View along the W slope of the landfill. Typical grade

Project Photographs

PIN-2 Select Site Photographs
Pallet Line West Landfill- 19 August 2018

Photo: PIN-2 PLW-6

Date:
19 August 2018

Description:
Detail of Feature B, typical of depressions observed

Photo: PIN-2 PLW-19

Date:
19 August 2018

Description:
Looking S along E edge of landfill.

Project Photographs

PIN-2 Select Site Photographs
Pallet Line West Landfill- 19 August 2018

Photo: PIN-2 PLW-16

Date:
19 August 2018

Description:
Detail of Feature A

Photo: PIN-2 PLW-21

Date:
19 August 2018

Description:
Detail of Feature D

Project Photographs

PIN-2 Select Site Photographs
Pallet Line West Landfill- 19 August 2018

Photo: PIN-2 PLW-27

Date:
19 August 2018

Description:
Detail of Feature C, track marks as equipment crested the slope

Project Photographs

PIN-2 Select Site Photographs
NHW Landfill- 18 August 2018

Photo: PIN-2 NHW-2

Date:
18 August 2018

Description:
View of the landfill NE slope, typical profile

Photo: PIN-2 NHW-4

Date:
18 August 2018

Description:
View along SE side of Landfill- slope profile.

Project Photographs

PIN-2 Select Site Photographs
NHW Landfill- 18 August 2018

Photo: PIN-2 NHW-7

Date:
18 August 2018

Description:
View across the top of the landfill, also shows cap material and grading

Photo: PIN-2 NHW-8

Date:
18 August 2018

Description:
Detail of feature F (tire tracks) also shows SE crest profile

Project Photographs

PIN-2 Select Site Photographs
NHW Landfill- 18 August 2018

Photo: PIN-2 NHW-37

Date:
18 August 2018

Description:
Detail of Feature A, typical of depression features

Photo: PIN-2 NHW-14

Date:
18 August 2018

Description:
Detail of Feature B1, typical of B set

Project Photographs

PIN-2 Select Site Photographs
NHW Landfill- 18 August 2018

Photo: PIN-2 NHW-12

Date:
18 August 2018

Description:
Detail of Feature C

Photo: PIN-2 NHW-61

Date:
18 August 2018

Description:
Detail of Feature D

Project Photographs

PIN-2 Select Site Photographs
NHW Landfill- 18 August 2018

Photo: PIN-2 NHW-64

Date:
18 August 2018

Description:
Detail of Feature E1, E2 and E3 visible in background

Photo: PIN-2 NHW-39

Date:
18 August 2018

Description:
Detail of Feature G

Project Photographs

PIN-2 Select Site Photographs
NHW Landfill- 18 August 2018

Photo: PIN-2 NHW-15

Date:
18 August 2018

Description:
Detail of Feature H

Photo: PIN-2 NHW-11

Date:
18 August 2018

Description:
Detail of Feature I

Project Photographs

PIN-2 Select Site Photographs
NHW Landfill- 18 August 2018

Photo: PIN-2 NHW-45

Date:
18 August 2018

Description:
Detail of Feature J

Photo: PIN-2 NHW-58

Date:
18 August 2018

Description:
Detail of Feature K

Project Photographs

PIN-2 Select Site Photographs
NHW Landfill- 18 August 2018

Photo: PIN-2 NHW-

Date:
18 August 2018

Description:
Detail of Feature L

Photo: PIN-2 NHW-68

Date:
18 August 2018

Description:
Detail of erosion (Feature M) due to fines infiltrating into the cap

Project Photographs

PIN-2 Select Site Photographs
South Landfill East- 17 August 2018

Photo: PIN-2 SLFE-1

Date:
17 August 2018

Description:
Profile of landfill, looking NE

Photo: PIN-2 SLFE-13

Date:
17 August 2018

Description:
Detail of Feature B, erosion feature

Project Photographs

PIN-2 Select Site Photographs
South Landfill East- 17 August 2018

Photo: PIN-2 SLFE-15

Date:
17 August 2018

Description:
Detail of Feature F, typical depression feature

Photo: PIN-2 SLFE-18

Date:
17 August 2018

Description:
Detail of Feature G, sparse vegetation on NW slope

Project Photographs

PIN-2 Select Site Photographs
South Landfill East- 17 August 2018

Photo: PIN-2 SLFE-9

Date:
17 August 2018

Description:
Detail of Feature A

Photo: PIN-2 SLFE-24

Date:
17 August 2018

Description:
Detail of Feature D

Project Photographs

PIN-2 Select Site Photographs
South Landfill East- 17 August 2018

Photo: PIN-2 SLFE-30

Date:
17 August 2018

Description:
Detail of Feature C

Photo: PIN-2 SLFE-29

Date:
17 August 2018

Description:
Detail of Feature E

Project Photographs

PIN-2 Select Site Photographs
South Landfill East- 17 August 2018

Photo: PIN-2 SLFE-23

Date:
17 August 2018

Description:
Profile of landfill, looking SE

Project Photographs

PIN-2 Select Site Photographs
South Borrow Landfill -17 August 2018

Photo: PIN-2 SB-1

Date:
17 August 2018

Description:
View of landfill N edge, and surrounding terrain

Photo: PIN-2 SB-5

Date:
17 August 2018

Description:
Detail of Feature E

Project Photographs

PIN-2 Select Site Photographs
South Borrow Landfill -17 August 2018

Photo: PIN-2 SB-10

Date:
17 August 2018

Description:
View S down the length of the landfill shows cap material and grading

Photo: PIN-2 SB-11

Date:
17 August 2018

Description:
Detail of Feature A

Project Photographs

PIN-2 Select Site Photographs
South Borrow Landfill -17 August 2018

Photo: PIN-2 SB-13

Date:
17 August 2018

Description:
Detail of Feature G

Photo: PIN-2 SB-17

Date:
17 August 2018

Description:
Detail of Feature B, ponded water and rust coloured organic material

Project Photographs

PIN-2 Select Site Photographs
South Borrow Landfill -17 August 2018

Photo: PIN-2 SB-24

Date:
17 August 2018

Description:
Detail of Feature D1

Photo: PIN-2 SB-25

Date:
17 August 2018

Description:
Detail of Feature F

Project Photographs

PIN-2 Select Site Photographs
South Borrow Landfill -17 August 2018

Photo: PIN-2 SB-30

Date:
17 August 2018

Description:
Detail of Feature C

Photo: PIN-2 SB-34

Date:
17 August 2018

Description:
Detail of Feature H

Project Photographs

PIN-2 Select Site Photographs
South Borrow Landfill -17 August 2018

Photo: PIN-2 SB-35

Date:
17 August 2018

Description:
Looking SE, showing ponding to the SW of landfill

PHOTOGRAPHIC LOG – AERIAL PHOTOGRAPHS

Photo Identification	Figure ID	View Direction	Feature Identification	Feature of Note	UTM		Photo Size KB	Date of Photo	Camera Information
					Northing	Easting			
Aerial Photographs									
A1	2.1	south southwest	A1	Airstrip Landfill	502664.3993	7647552.795	2380	2018-08-18	Fuji Film Pinepix XP70, F3.9, Ration 4:3, 16 MPcmos sensor
A2	2.1	northeast	A2	Station West and USAF Landfill	501967.1215	7646691.934	2634	2018-08-18	Fuji Film Pinepix XP70, F3.9, Ration 4:3, 16 MPcmos sensor
A3	2.1	northeast	A3	Tier II Soil Disposal Facility	502316.4636	7646091.924	3292	2018-08-18	Fuji Film Pinepix XP70, F3.9, Ration 4:3, 16 MPcmos sensor
A4	2.1	northeast	A4	Pallet Line West Landfill	502501.7869	7645636.409	3233	2018-08-18	Fuji Film Pinepix XP70, F3.9, Ration 4:3, 16 MPcmos sensor
A5	2.1	northeast	A5	Airstrip South Landfill	502573.51	7645498.455	2850	2018-08-18	Fuji Film Pinepix XP70, F3.9, Ration 4:3, 16 MPcmos sensor
A6	2.1	southwest	A6	Airstrip South Landfill	503462.7784	7646433.006	683	2018-08-18	Fuji Film Pinepix XP70, F3.9, Ration 4:3, 16 MPcmos sensor
A7	2.1	east northeast	A7	Non-Hazardous Waste Landfill	502788.8797	7645200.809	2751	2018-08-18	Fuji Film Pinepix XP70, F3.9, Ration 4:3, 16 MPcmos sensor
A8	2.1	southwest	A8	South Landfill East	503747.6057	7645333.562	1739	2018-08-18	Fuji Film Pinepix XP70, F3.9, Ration 4:3, 16 MPcmos sensor
A9	2.1	north northwest	A9	South Borrow Landfill	504080.2738	7643082.889	3022	2018-08-18	Fuji Film Pinepix XP70, F3.9, Ration 4:3, 16 MPcmos sensor

PHOTOGRAPHIC LOG – SAMPLE STATION PHOTOGRAPHS

Photo Identification	Figure ID	View Direction	Photo Location and Direction	Feature Identification	Feature of Note	Other Comments	UTM		Photo Size KB	Date of Photo	Camera Information
							Northing	Easting			
Sample Station Photographs - Airstrip											
P2-21-1	S21	NA	Sample station P2-21	P2-21		Close-up of test pit	502514.96	7647259.78	3954	2018-08-20	Fuji Film Pinepix XP70, F3.9, Ration 4:3, 16 MPcmos sensor
P2-21-2		East				Test pit location			3983	2018-08-20	
P2-21-3		East Northeast				Test pit backfilled			3919	2018-08-20	
P2-22-1	S22	NA	Sample station P2-22	P2-22		Close-up of test pit	502528.8982	7647379.082	4030	2018-08-20	Fuji Film Pinepix XP70, F3.9, Ration 4:3, 16 MPcmos sensor
P2-22-2		Southeast				Test pit location			4006	2018-08-20	
P2-22-3		NA				Test pit backfilled			4014	2018-08-20	
P2-23-1	S23	NA	Sample station P2-23	P2-23		Close-up of test pit	502588.7391	7647382.729	3991	2018-08-20	Fuji Film Pinepix XP70, F3.9, Ration 4:3, 16 MPcmos sensor
P2-23-2		South				Test pit location			3991	2018-08-20	
P2-23-3		South Southwest				Test pit backfilled			3990	2018-08-20	
P2-24-1	S24	NA	Sample station P2-24	P2-24		Close-up of test pit	502630.4861	7647408.663	397	2018-08-20	Fuji Film Pinepix XP70, F3.9, Ration 4:3, 16 MPcmos sensor
P2-24-2		South				Test pit location			4058	2018-08-20	
P2-24-3		South				Test pit backfilled			4015	2018-08-20	
P2-25-1	S25	NA	Sample station P2-25	P2-25		Close-up of test pit	502681.5283	7647372.353	3989	2018-08-20	Fuji Film Pinepix XP70, F3.9, Ration 4:3, 16 MPcmos sensor
P2-25-2		Southwest				Test pit location			4024	2018-08-20	
P2-25-3		Southwest				Test pit backfilled			4008	2018-08-20	
P2-26-1	S26	NA	Sample station P2-26	P2-26		Close-up of test pit	502642.4024	7647313.795	4070	2018-08-20	Fuji Film Pinepix XP70, F3.9, Ration 4:3, 16 MPcmos sensor
P2-26-2		Northeast				Test pit location			4039	2018-08-20	
P2-26-3		Northeast				Test pit backfilled			4041	2018-08-20	

Photo Identification	Figure ID	View Direction	Photo Location and Direction	Feature Identification	Feature of Note	Other Comments	UTM		Photo Size KB	Date of Photo	Camera Information
							Northing	Easting			
Sample Station Photographs - USAF											
P2-1-1	S1	Southeast	Sample Station P2-1	P2-1		Test pit location	502193.3903	7646964.729	3959	2018-08-20	Fuji Film Pinepix XP70, F3.9, Ration 4:3, 16 MPcmos sensor
P2-1-2		NA				Close-up of test pit			4074	2018-08-20	
P2-1-3		Southeast				Test pit backfilled			3974	2018-08-20	
P2-2-1	S2	NA	Sample Station P2-2	P2-2		Close-up of test pit	502191.7313	7646890.387	4015	2018-08-20	Fuji Film Pinepix XP70, F3.9, Ration 4:3, 16 MPcmos sensor
P2-2-2		Northeast				Test pit location			4026	2018-08-20	
P2-2-3		Northeast				Test pit backfilled			4024	2018-08-20	
P2-3-1	S3	NA	Sample Station P2-3	P2-3		Close-up of test pit	502254.9399	7646861.389	4033	2018-08-20	Fuji Film Pinepix XP70, F3.9, Ration 4:3, 16 MPcmos sensor
P2-3-2		North Northwest				Test pit location			3967	2018-08-20	
P2-3-3		North Northwest				Test pit backfilled			4056	2018-08-20	
P2-4-1	S4	NA	Sample Station P2-4	P2-4		Close-up of test pit	502254.0427	7646928.75	3965	2018-08-20	Fuji Film Pinepix XP70, F3.9, Ration 4:3, 16 MPcmos sensor
P2-4-2		West Southwest				Test pit location			4037	2018-08-20	
P2-4-3		West Southwest				Test pit backfilled			4000	2018-08-20	

Photo Identification	Figure ID	View Direction	Photo Location and Direction	Feature Identification	Feature of Note	Other Comments	UTM		Photo Size KB	Date of Photo	Camera Information
							Northing	Easting			
Sample Station Photographs - Station West											
P2-5-1	S5	NA	Sample Station P2-5	P2-5		Soil Type	502090.4781	7646886.183	4040	2018-08-20	Fuji Film Pinepix XP70, F3.9, Ration 4:3, 16 MPcmos sensor
P2-5-2		NA				Close-up of test pit			4012	2018-08-20	
P2-5-3		Southeast				Test pit location			4073	2018-08-20	
P2-5-4		Southeast				Test pit backfilled			4023	2018-08-20	
P2-6-1	S6	NA	Sample Station P2-6	P2-6		Close-up of test pit	502090.1036	7646782.509	4002	2018-08-20	Fuji Film Pinepix XP70, F3.9, Ration 4:3, 16 MPcmos sensor
P2-6-2		Northeast				Test pit location			3955	2018-08-20	
P2-6-3		Northeast				Test pit backfilled			4016	2018-08-20	
P2-7-1	S7	NA	Sample Station P2-7	P2-7		Close-up of test pit	502144.302	7646768.595	3971	2018-08-20	Fuji Film Pinepix XP70, F3.9, Ration 4:3, 16 MPcmos sensor
P2-7-2		North Northeast				Test pit location			4002	2018-08-20	
P2-7-3		North Northeast				Test pit backfilled			3955	2018-08-20	
P2-8-1	S8	NA	Sample Station P2-8	P2-8		Close-up of test pit	502192.4605	7646788.508	4098	2018-08-20	Fuji Film Pinepix XP70, F3.9, Ration 4:3, 16 MPcmos sensor
P2-8-2		Northwest				Test pit location			4021	2018-08-20	
P2-8-3		Northwest				Test pit backfilled			4038	2018-08-20	

Photo Identification	Figure ID	View Direction	Photo Location and Direction	Feature Identification	Feature of Note	Other Comments	UTM		Photo Size KB	Date of Photo	Camera Information
							Northing	Easting			
Sample Station Photographs - Tier II											
MW-01-1	S1W	NA	Sample Station MW-01	MW-01		Soil Type	502391.6387	7646319.339	1028	2018-08-17	Fuji Film Pinepix XP70, F3.9, Ration 4:3, 16 MPcmos sensor
MW-01-2		NA				Close-up of test pit			4021	2018-08-18	
MW-01-3		East				Test pit location			3996	2018-08-19	
MW-01-4		East				Test pit backfilled			4001	2018-08-20	
MW-02-1	S2W	NA	Sample Station MW-02	MW-02		Soil Type	502415.0339	7646235.513	4028	2018-08-20	Fuji Film Pinepix XP70, F3.9, Ration 4:3, 16 MPcmos sensor
MW-02-2		NA				Close-up of test pit			4038	2018-08-21	
MW-02-3		Northeast				Test pit location			4061	2018-08-22	
MW-02-4		Northeast				Test pit backfilled			4028	2018-08-23	
MW-03-1	S3W	NA	Sample Station MW-03	MW-03		Soil Type	502502.5219	7646231.969	4040	2018-08-17	Fuji Film Pinepix XP70, F3.9, Ration 4:3, 16 MPcmos sensor
MW-03-2		NA				Close-up of test pit			4016	2018-08-18	
MW-03-3		Northwest				Test pit location			3994	2018-08-19	
MW-03-4		Northwest				Test pit backfilled			4014	2018-08-20	
MW-04-1	S4W	NA	Sample Station MW-04	MW-04		Soil Type	502557.7271	7646317.982	3980	2018-08-20	Fuji Film Pinepix XP70, F3.9, Ration 4:3, 16 MPcmos sensor
MW-04-2		NA				Close-up of test pit			4017	2018-08-21	
MW-04-3		West				Test pit location			4020	2018-08-22	
MW-04-4		West				Test pit backfilled			4020	2018-08-23	

Photo Identification	Figure ID	View Direction	Photo Location and Direction	Feature Identification	Feature of Note	Other Comments	UTM		Photo Size KB	Date of Photo	Camera Information
							Northing	Easting			
Sample Station Photographs - Airstrip South											
P2-13-1	S13	NA	Sample Station P2-13	P2-13		Close-up of test pit	503164.0984	7646265.073	4060	2018-08-19	Fuji Film Pinepix XP70, F3.9, Ration 4:3, 16 MPcmos sensor
P2-13-2		East				Test pit location			4048	2018-08-20	
P2-13-3		East				Test pit backfilled			4019*	2018-08-21	
P2-14-1	S14	NA	Sample Station P2-14	P2-14		Close-up of test pit	503242.139	7646248.468	4027	2018-08-22	Fuji Film Pinepix XP70, F3.9, Ration 4:3, 16 MPcmos sensor
P2-14-2		West				Test pit location			3990	2018-08-23	
P2-14-3		West				Test pit backfilled			3970	2018-08-24	
P2-15-1	S15	NA	Sample Station P2-15	P2-15		Close-up of test pit	503250.9927	7646295.307	3938	2018-08-25	Fuji Film Pinepix XP70, F3.9, Ration 4:3, 16 MPcmos sensor
P2-15-2		West Northwest				Test pit location			4013	2018-08-26	
P2-15-3		West Northwest				Test pit backfilled			4048	2018-08-27	
P2-16-1	S16	NA	Sample Station P2-16	P2-16		Close-up of test pit	503226.3527	7646343.053	3936	2018-08-28	Fuji Film Pinepix XP70, F3.9, Ration 4:3, 16 MPcmos sensor
P2-16-2		Southwest				Test pit location			3999	2018-08-29	
P2-16-3		Southwest				Test pit backfilled			4040	2018-08-30	

Photo Identification	Figure ID	View Direction	Photo Location and Direction	Feature Identification	Feature of Note	Other Comments	UTM		Photo Size KB	Date of Photo	Camera Information
							Northing	Easting			
Sample Station Photographs - Pallet Line West											
P2-9-1	S9	NA	Sample Station P2-9	P2-9		Soil Type	502567.3624	7645737.882	4052	2018-08-19	Fuji Film Pinepix XP70, F3.9, Ration 4:3, 16 MPcmos sensor
P2-9-2		NA				Close-up of test pit			4025	2018-08-19	
P2-9-3		Northeast				Test pit location			3995	2018-08-19	
P2-9-4		Northeast				Test pit backfilled			4021	2018-08-19	
P2-10-1	S10	NA	Sample Station P2-10	P2-10		Close-up of test pit	502637.3713	7645782.491	4032	2018-08-19	Fuji Film Pinepix XP70, F3.9, Ration 4:3, 16 MPcmos sensor
P2-10-2		Northwest				Test pit location			4000	2018-08-19	
P2-10-3		Northwest				Test pit backfilled			4008	2018-08-19	
P2-11-1	S11	NA	Sample Station P2-11	P2-11		Close-up of test pit	502600.272	7645849.105	4072	2018-08-19	Fuji Film Pinepix XP70, F3.9, Ration 4:3, 16 MPcmos sensor
P2-11-2		West Southwest				Test pit location			4088	2018-08-19	
P2-11-3		West Southwest				Test pit backfilled			4032	2018-08-19	
P2-12-1	S12	NA	Sample Station P2-12	P2-12		Close-up of test pit	502535.9705	7645868.531	3955	2018-08-19	Fuji Film Pinepix XP70, F3.9, Ration 4:3, 16 MPcmos sensor
P2-12-2		NA				Bedrock			4038	2018-08-19	
P2-12-3		Southeast				Test pit backfilled			4014	2018-08-19	

Photo Identification	Figure ID	View Direction	Photo Location and Direction	Feature Identification	Feature of Note	Other Comments	UTM		Photo Size KB	Date of Photo	Camera Information
							Northing	Easting			
Sample Station Photographs - Non-Hazardous											
MW-05-1	S5W	NA	Sample Station MW-05	MW-05		Soil Type	502998.0773	7645218.36	4029	201808-18	Fuji Film Pinepix XP70, F3.9, Ration 4:3, 16 MPcmos sensor
MW-05-2		NA				Close-up of test pit			4014	201808-18	
MW-05-3		North				Test pit location			4031	201808-18	
MW-05-4		North				Test pit backfilled			4042	201808-18	
MW-06-1	S6W	NA	Sample Station MW-06	MW-06		Soil Type	503030.3446	7645196.855	4077	201808-18	Fuji Film Pinepix XP70, F3.9, Ration 4:3, 16 MPcmos sensor
MW-06-2		NA				Close-up of test pit			3996	201808-18	
MW-06-3		North Northeast				Test pit location			3999	201808-18	
MW-06-4		North Northeast				Test pit backfilled			4057	201808-18	
MW-07-1	S7W	NA	Sample Station MW-07	MW-07		Soil Type	503067.6529	7645185.601	3999	201808-18	Fuji Film Pinepix XP70, F3.9, Ration 4:3, 16 MPcmos sensor
MW-07-2		NA				Close-up of test pit			4008	201808-18	
MW-07-3		North Northeast				Test pit location			3989	201808-18	
MW-07-4		North Northeast				Test pit backfilled			4009	201808-18	
MW-08-1	S8W	NA	Sample Station MW-08	MW-08		Soil Type	503099.2925	7645311.397	4021	201808-18	Fuji Film Pinepix XP70, F3.9, Ration 4:3, 16 MPcmos sensor
MW-08-2		NA				Close-up of test pit			3973	201808-18	
MW-08-3		West				Test pit location			4003	201808-18	
MW-08-4		West				Test pit backfilled			3957	201808-18	

Photo Identification	Figure ID	View Direction	Photo Location and Direction	Feature Identification	Feature of Note	Other Comments	UTM		Photo Size KB	Date of Photo	Camera Information
							Northing	Easting			
Sample Station Photographs - South Landfill East											
P2-17-1	S17	NA	Sample Station P2-17	P2-17		Soil Type	503442.6382	7645047.644	4018	2018-08-18	Fuji Film Pinepix XP70, F3.9, Ration 4:3, 16 MPcmos sensor
P2-17-2		NA				Close-up of test pit			4043	2018-08-18	
P2-17-3		Northeast				Test pit location			3993	2018-08-18	
P2-17-4		Northeast				Test pit backfilled			4016	2018-08-18	
P2-18-1	S18	NA	Sample Station P2-18	P2-18		Soil Type	503468.968	7645119.111	4045	2018-08-18	Fuji Film Pinepix XP70, F3.9, Ration 4:3, 16 MPcmos sensor
P2-18-2		NA				Close-up of test pit			4030	2018-08-18	
P2-18-3		South				Test pit location			4041	2018-08-18	
P2-18-4		South				Test pit backfilled			4028	2018-08-18	
P2-19-1	S19	NA	Sample Station P2-19	P2-19		Soil Type - bedrock	503518.9752	7645102.37	4011	2018-08-18	Fuji Film Pinepix XP70, F3.9, Ration 4:3, 16 MPcmos sensor
P2-19-2		NA				Close-up of test pit - Bedrock			4031	2018-08-18	
P2-19-3		West Southwest				Test pit location			4030	2018-08-18	
P2-19-4		West Southwest				Test pit backfilled			4010	2018-08-18	
P2-20-1	S20	NA	Sample Station P2-20	P2-20		Close-up of test pit	503542.8545	7645026.268	3976	2018-08-18	Fuji Film Pinepix XP70, F3.9, Ration 4:3, 16 MPcmos sensor
P2-20-2		NA				Soil Type			4049	2018-08-18	
P2-20-3		Northwest				Test pit location			4021	2018-08-18	
P2-20-4		Northwest				Test pit backfilled			4015	2018-08-18	

Photo Identification	Figure ID	View Direction	Photo Location and Direction	Feature Identification	Feature of Note	Other Comments	UTM		Photo Size KB	Date of Photo	Camera Information
							Northing	Easting			
Sample Station Photographs - South Borrow											
P2-27-1	S27	NA	Sample Station P2-27	P2-27		Close-up of test pit	503907.203	7643427.041	4025	2018-08-18	Fuji Film Pinepix XP70, F3.9, Ration 4:3, 16 MPcmos sensor
P2-27-2		NA				Soil Type			4036	2018-08-18	
P2-27-3		Northeast				Test pit location			3980	2018-08-18	
P2-27-4		Northeast				Test pit backfilled			4006	2018-08-18	
P2-29-1	S29	NA	Sample Station P2-29	P2-29		Close-up of test pit	503906.3776	7643506.395	4028	2018-08-18	Fuji Film Pinepix XP70, F3.9, Ration 4:3, 16 MPcmos sensor
P2-29-2		Southeast				Test pit location			4050	2018-08-18	
P2-29-3		Southeast				Test pit backfilled			4007	2018-08-18	
P2-30-1	S30	NA	Sample Station P2-30	P2-30		Close-up of test pit	503976.7752	7643470.702	4006	2018-08-18	Fuji Film Pinepix XP70, F3.9, Ration 4:3, 16 MPcmos sensor
P2-30-2		West				Soil Type			4039	2018-08-18	
P2-30-3		West				Test pit location			4025	2018-08-18	

PHOTOGRAPHIC LOG – VISUAL INSPECTION PHOTOGRAPHS

Photo Identification	Figure ID	View Direction	Photo Location	Feature ID	Feature of Note	Caption	UTM		Photo Size KB	Date of Photo	Camera Information
							Northing	Easting			
Airstrip Landfill											
ALF_1	1	N	SW corner of Lobe A	-	Landfill edge	Looking N along W side of Lobe A	502524.966	7647242.805	3892	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
ALF_2	2	E	SW corner of Lobe A	-	Landfill edge	Looking E along S side of Lobe A	502526.33	7647240.603	3892	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
ALF_3	3	NE	SW corner of Lobe A	-	Landfill structure	Looking NE across Lobe A	502536.484	7647246.977	3289	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
ALF_4	4	SE	SW quadrant of Lobe A	-	Landfill structure	Looking SE across S edge of Lobe A	502549.24	7647272.285	3688	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
ALF_5	5	N	SW quadrant of Lobe A	-	Landfill edge	Looking N along W side of Lobe A	502533.21	7647278.845	4151	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
ALF_6	6	S	SW quadrant of Lobe A		Landfill edge	Looking S along W side of Lobe A	502544.591	7647286.161	4161	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
ALF_7	7	NE	SW quadrant of Lobe A	-	Landfill structure	Looking NE across body of Lobe A	502544.602	7647285.974	4206	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
ALF_8	8	SE	Centre of Lobe A	-	Landfill structure	Looking SE across body of Lobe A	502580.205	7647315.158	4024	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
ALF_9	9	N	Centre of Lobe A	-	Landfill structure	Looking N down Lobe A main slope	502580.043	7647314.83	3992	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
ALF_10	10	NW	Centre of Lobe A	-	Landfill structure	Looking NW down Lobe A main slope	502580.134	7647314.738	3974	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
ALF_11	11	E	Centre of Lobe A	B	Settlement: linear depression	Detail of feature B, looking NE down Lobe A main slope	502590.455	7647311.788	4213	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
ALF_12	12	N	Centre of Lobe A	B	Settlement: linear depression	Detail of feature B	502595.177	7647310.101	4104	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
ALF_13	13	SE	NW corner of Lobe A	-	Landfill edge	Looking S along W edge of Lobe A	502520.532	7647341.065	4290	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
ALF_14	14	NE	NW corner of Lobe A	-	Landfill edge	Looking E along Lobe A main slope (N edge of Lobe A)	502520.601	7647340.97	3976	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
ALF_15	15	SE	NW corner of Lobe A	-	Landfill edge	Looking S along W edge of Lobe A	502515.399	7647346.447	4225	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
ALF_16	16	NE	NW corner of Lobe A	-	Landfill edge	Looking E along tow of Lobe A main slope (N edge of Lobe A)	502513.5	7647348.384	3896	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel

Photo Identification	Figure ID	View Direction	Photo Location	Feature ID	Feature of Note	Caption	UTM		Photo Size KB	Date of Photo	Camera Information
							Northing	Easting			
ALF_17	17	W	Midpoint of N edge Lobe A	-	Landfill edge	Looking W along toe of Lobe A main slope (N edge of Lobe A)	502558.085	7647363.991	4056	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
ALF_18	18	E	Midpoint of N edge Lobe A	-	Landfill edge	Looking E along toe of Lobe A main slope (N edge of Lobe A)	502557.465	7647363.709	4342	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
ALF_19	19	W	Midpoint of Lobe A main slope	-	Landfill structure	Looking W along mid-level of Lobe A main slope	502554.613	7647343.544	4320	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
ALF_20	20	E	Midpoint of Lobe A main slope	-	Landfill structure	Looking E along mid-level of Lobe A main slope	502554.012	7647343.863	4079	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
ALF_21	21	SE	Midpoint of Lobe A main slope	-	Landfill structure	Looking SE up Lobe A main slope, body of Lobe A	502554.325	7647343.014	4064	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
ALF_22	22	N	Midpoint of Lobe A main slope	E	Settlement: linear depression	Feature E detail	502593.878	7647336.873	4178	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
ALF_23	23	E	Midpoint of Lobe A main slope	E	Settlement: linear depression	Feature E detail	502590.451	7647341.087	4279	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
ALF_24	24	N	Toe of Lobe A main slope	F	Erosion: linear channel	Feature F detail	502570.976	7647347.737	4285	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
ALF_26	26	S	Flat plateau N of Lobe A	F	Landfill structure	Looking S up the main slope of Lobe A (Feature F present as well)	502573.672	7647363.4	4030	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
ALF_27	27	SW	NE corner of Lobe A, at toe of main slope	-	Landfill structure	Looking SW up the main slope of Lobe A	502576.087	7647380.097	4119	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
ALF_28	28	W	NE corner of Lobe A, at toe of main slope	-	Landfill edge	Looking W along the toe of Lobe A main slope (N edge)	502601.943	7647359.348	4002	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
ALF_29	29	SE	NE corner of Lobe A, at toe of main slope	-	Landfill edge	Looking SE along the toe of Lobe A main slope (N edge), view between Lobe A and E/F	502601.076	7647362.304	4027	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
ALF_30	30	NE	NW corner of Lobe E/F	-	Landfill edge	Looking NE along NW edge of Lobe E/F	502603.408	7647361.58	3771	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
ALF_31	31	SE	NW corner of Lobe E/F	-	Landfill edge	Looking SE along SW edge of Lobe E/F	502610.288	7647373.507	3887	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
ALF_32	32	SE	NE corner of Lobe E/F	-	Landfill edge	Looking SE along NE edge of Lobe E/F	502610.301	7647373.938	3929	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
ALF_33	33	SW	NE corner of Lobe E/F	-	Landfill edge	Looking SW along NW edge of Lobe E/F	502649.517	7647392.894	4328	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
ALF_34	34	-	NW of Lobe E/F	D	Metal debris	Detail of feature D	502646.077	7647393.516	4342	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel

Photo Identification	Figure ID	View Direction	Photo Location	Feature ID	Feature of Note	Caption	UTM		Photo Size KB	Date of Photo	Camera Information
							Northing	Easting			
ALF_35	35	-	NW of Lobe E/F	A	Metal debris	Detail of feature A	502588.924	7647379.928	4185	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
ALF_36	36	-	NW of Lobe E/F	D	Metal debris	Detail of feature D	502606.895	7647389.413	4247	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
ALF_37	37	NW	Toe of NE slope of Lobe E/F	-	Landfill edge	Looking NW along NE edge of Lobe E/F	502642.801	7647404.738	4158	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
ALF_38	38	S	Toe of NE slope of Lobe E/F	-	Landfill edge	Looking SE along NE edge of Lobe E/F	502668.38	7647364.142	4097	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
ALF_39	39	NW	Crest of NE slope of Lobe E/F	-	Landfill structure	Looking NW across the body of Lobe E/F	502669.057	7647369.116	3924	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
ALF_40	40	NW	Peak of Lobe E/F	-	Landfill structure	Looking NW across the body of Lobe E/F	502655.526	7647358.495	3984	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
ALF_41	41	S	Peak of Lobe E/F	C	Settlement: linear depression	Detail of feature C	502655.569	7647338.521	4136	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
ALF_42	42	E	Peak of Lobe E/F	C	Settlement: linear depression	Detail of feature C	502659.044	7647338.106	4343	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
ALF_43	43	W	SW corner of Lobe E/F, between Lobe A and Lobe E/F	-	Landfill structure	Looking W at the body of Lobe A	502654.209	7647337.66	3930	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
ALF_44	44	NW	SW corner of Lobe E/F, between Lobe A and Lobe E/F	-	Landfill edge	Looking NW along the SW edge of Lobe E/F	502640.982	7647329.456	4137	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
ALF_45	45	E	SW corner of Lobe E/F, between Lobe A and Lobe E/F	-	Landfill edge	Looking NE along the SE edge of Lobe E/F	502639.765	7647326.921	3830	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
ALF_46	46	-	Between Lobe A and Lobe E/F	A	Metal debris	Detail of feature A	502643.239	7647324.52	4268	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
ALF_47	47	-	Between Lobe A and Lobe E/F	A	Metal debris	Detail of feature A	502628.168	7647323.654	4117	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
ALF_48	48	-	Between Lobe A and Lobe E/F	A	Metal debris	Detail of feature A	502632.77	7647333.71	4218	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
ALF_49	49	NE	SE corner of Lobe A	-	Landfill edge	Looking NE along SE edge of Lobe A	502629.475	7647336.074	3872	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
ALF_50	50	W	SE corner of Lobe A	-	Landfill edge	Looking W along S edge of Lobe A	502608.206	7647240.93	4046	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel

Photo Identification	Figure ID	View Direction	Photo Location	Feature ID	Feature of Note	Caption	UTM		Photo Size KB	Date of Photo	Camera Information
							Northing	Easting			
USAF Landfill											
USAF_1	1	SW	NE of landfill	-	Landfill structure	Looking SW at the full extent of the NE side of the landfill	502268.775	7646930.973	3867	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
USAF_2	2	SW	NE corner of landfill	-	Landfill edge	Looking SW along the NW edge of the landfill	502213.601	7646958.682	4334	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
USAF_3	3	SE	NE corner of landfill	-	Landfill edge	Looking SE along the NE edge of the landfill	502218.389	7646958.254	4283	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
USAF_4	4	SE	NW corner of landfill	-	Landfill edge	Looking SE along the SW edge of the landfill	502189.697	7646948.073	4184	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
USAF_5	5	NE	NW corner of landfill	-	Landfill edge	Looking NE along the NW edge of the landfill	502193.09	7646950.335	3955	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
USAF_6	6	SE	SW slope of landfill	A	Settlement: minor depression	Feature A detail	502196.025	7646939.442	4187	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
USAF_7	7	NE	SW slope of landfill	A	Settlement: minor depression	Feature A detail	502195.356	7646935.902	4319	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
USAF_8	8	SE	SW slope of landfill	B	Settlement: minor depression	Feature B detail	502208.068	7646926.492	4317	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
USAF_9	9	NE	SW slope of landfill	B	Settlement: minor depression	Feature B detail	502206.526	7646922.041	4067	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
USAF_10	10	SE	Middle of landfill	-	Landfill structure	Looking SE across the body of the landfill	502222.909	7646916.323	4255	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
USAF_11	11	NW	Middle of landfill	-	Landfill structure	Looking NW across the body of the landfill	502223.349	7646916.101	4261	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
USAF_12	12	NW	SW corner of landfill	-	Landfill edge	Looking NW along the SW edge of the landfill	502231.233	7646878.57	3944	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
USAF_13	13	NE	SW corner of landfill	-	Landfill edge	Looking NE along the SE edge of the landfill	502232.704	7646878.245	3931	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
USAF_14	14	NW	SE corner of landfill	-	Landfill edge	Looking NW along the NE edge of the landfill	502255.025	7646888.975	3908	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel

Photo Identification	Figure ID	View Direction	Photo Location	Feature ID	Feature of Note	Caption	UTM		Photo Size KB	Date of Photo	Camera Information
							Northing	Easting			
Station West Landfill											
SW_1	1	NW	NE corner of landfill, at toe of slope	-	Landfill edge	Looking NW along NE edge of landfill	502169.931	7646834.984	4153	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SW_2	2	S	NE corner of landfill, at toe of slope	-	Landfill edge	Looking S along E edge of landfill	502172.679	7646831.795	4017	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SW_3	3	NW	NE corner of landfill, at crest of slope	-	Landfill edge	Looking NW along NE crest of landfill	502164.425	7646828.288	4096	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SW_4	4	S	NE corner of landfill, at crest of slope	-	Landfill edge	Looking S along E crest of landfill	502164.447	7646827.774	4047	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SW_5	5	SW	NE corner of landfill, at crest of slope	-	Landfill edge	Looking SW across the body of landfill	502162.656	7646826.294	4112	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SW_6	6	SE	Northernmost point of landfill	-	Landfill edge	Looking SE along NW edge of landfill	502108.661	7646868.014	3958	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SW_7	7	SW	Northernmost point of landfill	-	Landfill edge	Looking SW along NE edge of landfill	502108.647	7646868.375	4202	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SW_8	8	SE	N crest of landfill	-	Landfill structure	Looking SE across the main body of landfill	502101.481	7646852.571	4056	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SW_9	9	S	NW corner of landfill	-	Landfill edge	Looking S along W edge of landfill	502094.132	7646846.378	4095	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SW_10	10	N	SE corner of landfill	-	Landfill edge	Looking N along the E edge of landfill	502171.002	7646786.472	3886	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SW_11	11	W	SE corner of landfill	-	Landfill edge	Looking W along the S edge of landfill	502169.525	7646784.021	4117	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SW_12	12	NW	SE corner of landfill	-	Landfill structure	Looking NW across the body of the landfill	502162.674	7646792.109	3920	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SW_13	13	S	Midpoint of S edge	B	Tire tracks	Feature B detail	502136.389	7646798.101	4343	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SW_14	14	E	Midpoint of S edge	B	Tire tracks	Feature B detail	502129.792	7646791.821	4132	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SW_15	15	NW	Midpoint of S edge, top of slope	A	Tire tracks	Feature A detail	502136.78	7646803.074	4229	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SW_16	16	N	SW corner of landfill, base of slope	-	Landfill edge	Looking N along W edge of landfill	502102.748	7646792.387	4292	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SW_17	17	E	SW corner of landfill, base of slope	-	Landfill edge	Looking W along S edge of landfill	502107.395	7646791.491	4026	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SW_18	18	N	SW corner of landfill, top of slope	-	Landfill structure	Looking N along W crest of landfill	502115.681	7646799.555	3889	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SW_19	19	E	SW corner of landfill, top of slope	-	Landfill structure	Looking W along S crest of landfill	502113.048	7646796.329	3920	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SW_20	20	NE	SW corner of landfill, top of slope	-	Landfill structure	Looking NE across the body of landfill	502119.889	7646799.587	4124	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SW_21	21	NE	SW of landfill	-	Landfill structure	Looking NE at the SW point of landfill	502077.058	7646791.103	4231	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel

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							Northing	Easting			
Tier II Landfill											
Tier II_1	1	-	SW of landfill	MW-03	Monitoring well	Detail of MW-03	502495.46	7646234.221	4275	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
Tier II_2	2	NW	SW of landfill	-	Landfill structure	Looking NW at the SE slope of landfill	502511.421	7646228.055	3656	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
Tier II_3	3	NE	S corner of landfill, toe	-	Landfill edge	Looking NE along SE edge of landfill	502465.405	7646223.364	4210	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
Tier II_4	4	NW	S corner of landfill, toe	-	Landfill edge	Looking NW along SW edge of landfill	502462.568	7646223.594	4033	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
Tier II_5	5	NE	S corner of landfill, midpoint	-	Landfill slope	Looking NE along SE slope of landfill	502465.139	7646239.189	3980	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
Tier II_6	6	NW	S corner of landfill, midpoint	-	Landfill slope	Looking NW along SW slope of landfill	502461.848	7646239.236	3987	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
Tier II_7	7	NE	S corner of landfill, crest	-	Landfill crest	Looking NE along SW crest of landfill	502460.005	7646249.476	4251	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
Tier II_8	8	NW	S corner of landfill, crest	-	Landfill crest	Looking NW along SE crest of landfill	502461.118	7646249.518	3881	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
Tier II_9	9	N	S corner of landfill, crest	-	Landfill structure	Looking N across body of landfill	502460.282	7646251.043	3587	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
Tier II_10	10	NW	S corner of landfill, crest	A	Minor depression	Detail of feature A	502457.412	7646251.29	4317	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
Tier II_11	11	SW	S corner of landfill, crest	A	Minor depression	Detail of feature A	502458.272	7646254.892	4117	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
Tier II_12	12	SE	SE crest of landfill	C	Minor erosion	Detail of feature C1	502467.681	7646257.385	4183	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
Tier II_13	13	NW	SE crest of landfill	C	Minor erosion	Detail of feature C1	502473.8	7646249.678	4192	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
Tier II_14	14	SE	SE crest of landfill	C	Minor erosion	Detail of feature C2	502477.798	7646268.316	4143	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
Tier II_15	15	NW	SE crest of landfill	C	Minor erosion	Detail of feature C2	502486.824	7646257.964	4251	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
Tier II_16	16	SE	SE crest of landfill	C	Minor erosion	Detail of feature C3	502488.317	7646280.393	4245	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
Tier II_17	17	NW	SE crest of landfill	C	Minor erosion	Detail of feature C3	502494.368	7646273.696	4347	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel

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							Northing	Easting			
Tier II_18	18	NW	NE corner of landfill, crest	-	Landfill crest	Looking NW along NE crest of landfill	502498.674	7646288.948	3859	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
Tier II_19	19	SW	NE corner of landfill, crest	-	Landfill crest	Looking SW along SE crest of landfill	502500.117	7646288.115	3996	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
Tier II_20	20	W	NE corner of landfill, crest	-	Landfill structure	Looking W across body of landfill	502494.752	7646288.733	4068	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
Tier II_21	21	SE	NE corner of landfill, crest	I	Minor depression	Detail of feature I	502496.552	7646288.824	4208	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
Tier II_22	22	SW	NE corner of landfill, crest	I	Minor depression	Detail of feature I	502500.146	7646288.524	4156	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
Tier II_23	23	NW	NE corner of landfill, midpoint	-	Landfill slope	Looking NW along NE slope of landfill	502505.549	7646289.168	4005	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
Tier II_24	24	SW	NE corner of landfill, midpoint	-	Landfill slope	Looking SW along SE slope of landfill	502508.975	7646287.139	3856	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
Tier II_25	25	NW	NE corner of landfill, toe	-	Landfill toe	Looking NW along NE toe of landfill	502528.392	7646289.044	3635	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
Tier II_26	26	SW	NE corner of landfill, toe	-	Landfill toe	Looking SW along SE toe of landfill	502528.914	7646286.15	4087	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
Tier II_27	27	-	SW of landfill	MW-02	Monitoring well	Detail of MW-02	502420.476	7646239.997	3615	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
Tier II_28	28	NE	SW of landfill	-	Landfill structure	Looking NE at SW slope of landfill	502400.095	7646228.312	3800	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
Tier II_29	29	SW	SW crest of landfill	A	Minor depression	Detail of feature A	502445.206	7646271.139	4124	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
Tier II_30	30	SE	SW crest of landfill	A	Minor depression	Detail of feature A	502442.813	7646271.328	4305	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
Tier II_31	31	SE	SW crest of landfill	J	Depressed area	Detail of feature J	502437.266	7646275.425	4341	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
Tier II_32	32	SW	SW crest of landfill	J	Depressed area	Detail of feature J	502440.148	7646275.22	4281	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
Tier II_33	33	SW	SW crest of landfill	J	Depressed area	Detail of feature J	502441.011	7646273.817	4106	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
Tier II_34	34	NW	SW crest of landfill	J	Depressed area	Detail of feature J	502440.295	7646269.584	4168	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
Tier II_35	35	SE	SW crest of landfill	J	Depressed area	Detail of feature J	502434.597	7646275.166	4091	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
Tier II_36	36	NE	SW slope of landfill	J	Depressed area	Detail of feature J	502433.523	7646270.352	4038	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
Tier II_37	37	SW	SW crest of landfill	A	Minor depression	Detail of feature A	502434.251	7646282.653	4164	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel

Photo Identification	Figure ID	View Direction	Photo Location	Feature ID	Feature of Note	Caption	UTM		Photo Size KB	Date of Photo	Camera Information
							Northing	Easting			
Tier II_38	38	SE	SW crest of landfill	A	Minor depression	Detail of feature A	502428.281	7646284.005	3755	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
Tier II_39	39	NE	SW slope of landfill	B	Minor erosion	Detail of feature B	502420.564	7646275.947	3824	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
Tier II_40	40	SE	W corner of landfill, crest	-	Landfill crest	Looking SE along SW crest of landfill	502417.066	7646294.79	4060	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
Tier II_41	41	NE	W corner of landfill, crest	-	Landfill crest	Looking NE along NW crest of landfill	502416.308	7646296.332	4059	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
Tier II_42	42	E	W corner of landfill, crest	-	Landfill structure	Looking E across body of landfill	502416.782	7646296.315	4043	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
Tier II_43	43	NW	W corner of landfill, crest	K	Minor erosion	Feature not observed, photo taken at co-ordinates given	502421.643	7646297.156	4322	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
Tier II_44	44	SE	W corner of landfill, midpoint	-	Landfill slope	Looking SE along SW slope of landfill	502407.246	7646293.376	4064	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
Tier II_45	45	NE	W corner of landfill, midpoint	-	Landfill slope	Looking NE along NW slope of landfill	502406.624	7646296.761	4105	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
Tier II_46	46	SE	W corner of landfill, toe	-	Landfill toe	Looking SE along SW toe of landfill	502388.12	7646294.397	3870	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
Tier II_47	47	NE	W corner of landfill, toe	-	Landfill toe	Looking NE along NW toe of landfill	502390.709	7646296.147	4188	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
Tier II_48	48	SE	NW toe of landfill	K	Minor erosion	Feature not observed, photo taken at co-ordinates given	502397.32	7646310.195	4045	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
Tier II_49	49	-	NW of landfill	MW-01	Monitoring well	Detail of MW-01	502402.92	7646322.762	3581	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
Tier II_50	50	SE	NW toe of landfill	G	Minor erosion	Detail of feature G	502407.561	7646314.401	4130	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
Tier II_51	51	NW	NW crest of landfill	G	Minor erosion	Detail of feature G	502422.733	7646300.837	4306	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
Tier II_52	52	NW	NW slope midpoint of landfill	E1	Minor erosion	Detail of feature E1	502429.521	7646304.598	4123	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
Tier II_53	53	SE	NW crest of landfill	E1	Minor erosion	Detail of feature E1	502417.867	7646318.417	3885	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
Tier II_54	54	NW	NW slope midpoint of landfill	E2	Minor erosion	Detail of feature E2	502446.018	7646321.101	4339	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
Tier II_55	55	SE	NW crest of landfill	E2	Minor erosion	Detail of feature E2	502437.661	7646331.353	4114	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
Tier II_56	56	SW	N corner of landfill, crest	-	Landfill crest	Looking SW along NW crest of landfill	502456.367	7646333.297	4199	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
Tier II_57	57	SE	N corner of landfill, crest	-	Landfill crest	Looking SE along NE crest of landfill	502455.89	7646331.659	4085	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel

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							Northing	Easting			
Tier II_58	58	S	N corner of landfill, crest	-	Landfill structure	Looking S across landfill body	502457.203	7646331.27	3886	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
Tier II_59	59	SW	N corner of landfill, crest	F1-F3	Shallow striation	Detail of feature F1-F3 (first set)	502462.018	7646325.633	4228	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
Tier II_60	60	NE	NW crest of landfill	F1-F3	Shallow striation	Detail of feature F1-F3 (first set)	502447.988	7646318.033	4221	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
Tier II_61	61	SW	Top of landfill, middle	F4-F7	Shallow striation	Detail of feature F4-F7 (second set)	502464.403	7646306.011	4243	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
Tier II_62	62	NE	Top of landfill, middle	F4-F7	Shallow striation	Detail of feature F4-F7 (second set)	502453.471	7646289.628	4155	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
Tier II_63	63	SW	N corner of landfill, slope midpoint	-	Landfill slope	Looking SW along NW slope of landfill	502457.054	7646347.725	4069	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
Tier II_64	64	SE	N corner of landfill, slope midpoint	-	Landfill slope	Looking SE along NE slope of landfill	502459.145	7646347.218	4012	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
Tier II_65	65	SW	N corner of landfill, toe	-	Landfill toe	Looking SW along NW toe of landfill	502455.107	7646359.093	4169	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
Tier II_66	66	SE	N corner of landfill, toe	-	Landfill toe	Looking SE along NE toe of landfill	502459.587	7646356.559	4166	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
Tier II_67	67	S	N corner of landfill, toe	L	Minor erosion	Detail of feature L	502455.581	7646354.547	4346	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
Tier II_68	68	NE	N corner of landfill, slope midpoint	L	Minor erosion	Detail of feature L	502451.225	7646347.458	3994	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
Tier II_69	69	NE	NE crest of landfill	H	Minor erosion	Looking downslope, detail of feature H	502480.391	7646308.628	4345	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
Tier II_70	70	SW	NE slope of landfill, midpoint	H	Minor erosion	Looking upslope, detail of feature H	502488.7	7646317.675	4051	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
Tier II_71	71	-	NE of landfill	MW-04	Monitoring well	Detail of MW-04	502547.416	7646323.267	4265	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
Tier II_72	72	SW	NE of landfill	-	Landfill structure	Looking SW at the full extent of NE side of landfill	502386.651	7646361.598	3580	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
Tier II_73	73	W	W corner of landfill, crest	M	Minor depression	Detail of feature M	502421.325	7646299.498	3529	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
Tier II_74	74	NE	W corner of landfill, crest	M	Minor depression	Detail of feature M	502418.02	7646299.808	4232	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
T1	T1	SW	Thermistor VT1	-	Thermistor VT1	Thermistor VT1	502438.3221	7646280.957	3995	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
T2	T2	S	Thermistor VT2	-	Thermistor VT2	Thermistor VT2	502464.5932	7646278.799	3973	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
T3	T3	NW	Thermistor VT3	-	Thermistor VT3	Thermistor VT3	502459.6949	7646313.204	3987	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
T4	T4	SE	Thermistor VT4	-	Thermistor VT4	Thermistor VT4	502492.3825	7646285.284	3989	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel

Photo Identification	Figure ID	View Direction	Photo Location	Feature ID	Feature of Note	Caption	UTM		Photo Size KB	Date of Photo	Camera Information
							Northing	Easting			
Airstrip South											
ASLF_1	1	N	SE corner of landfill	-	Landfill edge	Looking N along E edge of landfill	503234.55	7646264.298	4196	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
ASLF_2	2	SW	SE corner of landfill	-	Landfill edge	Looking W along S edge of landfill	503230.997	7646263.062	4056	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
ASLF_3	3	NW	SE corner of landfill	-	Landfill structure	Looking NW across landfill body	503224.852	7646267.075	3896	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
ASLF_4	4	S	NE corner of landfill	-	Landfill edge	Looking S along E edge of landfill	503228.954	7646325.643	3966	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
ASLF_5	5	SW	NE corner of landfill	-	Landfill edge	Looking W along N edge of landfill	503226.294	7646324.519	3893	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
ASLF_6	6	E	NW corner of landfill	-	Landfill edge	Looking E along N edge of landfill	503184.963	7646313.002	3914	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
ASLF_7	7	S	NW corner of landfill	-	Landfill edge	Looking S along W edge of landfill	503181.835	7646309.18	3890	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
ASLF_8	8	SE	NW corner of landfill	-	Landfill structure	Looking SE across landfill body	503190.772	7646304.385	3949	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
ASLF_9	9	W	NW corner of landfill	A	Minor depression	Detail of feature A	503188.742	7646299.393	4176	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
ASLF_10	10	E	NW corner of landfill	A	Minor depression	Detail of feature A	503177.134	7646297.619	4284	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
ASLF_11	11	W	W edge of landfill	B	Minor depression	Detail of feature B	503198.033	7646276.79	4212	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
ASLF_12	12	S	W edge of landfill	B	Minor depression	Detail of feature B	503195.028	7646278.03	3976	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
ASLF_13	13	N	W edge of landfill	C	Minor depression	Detail of feature C	503198.005	7646271.357	4323	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
ASLF_14	14	E	W edge of landfill	C	Minor depression	Detail of feature C	503192.735	7646271.983	4035	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
ASLF_15	15	N	SW corner of landfill	-	Landfill edge	Looking N along W edge of landfill	503206.146	7646258.535	3885	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
ASLF_16	16	E	SW corner of landfill	-	Landfill edge	Looking E along S edge of landfill	503206.349	7646257.247	4112	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
ASLF_17	17	N	S edge of landfill	F	Vegetation	Looking N across the main body of landfill, feature F in the foreground	503219.259	7646256.233	4092	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
ASLF_18	18	W	W edge of landfill	D	Minor depression	Detail of feature D	503197.907	7646276.223	4343	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
ASLF_19	19	S	W edge of landfill	D	Minor depression	Detail of feature D	503195.353	7646277.772	4256	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
ASLF_20	20	W	W edge of landfill	E	Minor depression	Detail of feature E	503190.258	7646293.1	4095	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
ASLF_21	21	S	W edge of landfill	E	Minor depression	Detail of feature E	503187.966	7646295.124	4044	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel

Photo Identification	Figure ID	View Direction	Photo Location	Feature ID	Feature of Note	Caption	UTM		Photo Size KB	Date of Photo	Camera Information
							Northing	Easting			
Pallet Line West Landfill											
PLW-1	1	SW	Northernmost point on landfill edge	-	Landfill edge	Looking SW along NW edge of landfill	502561.843	7645860.378	3941	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
PLW-2	2	SE	Northernmost point on landfill edge	-	Landfill edge	Looking SE along NE edge of landfill	502562.823	7645858.961	3899	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
PLW-3	3	S	Northernmost point on landfill edge	-	Landfill structure	Looking S across the landfill body	502559.969	7645854.316	3786	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
PLW-4	4	SW	Northernmost point on landfill edge	-	Landfill edge	Looking SW along NE edge of landfill, vegetation in foreground	502555.077	7645858.639	3904	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
PLW-5	5	S	NW corner of landfill	-	Landfill edge	Looking S along W edge of landfill	502545.163	7645850.446	3690	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
PLW-6	6	SE	NW corner of landfill	B	Linear depression	Detail of feature B	502550.961	7645854.713	4314	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
PLW-7	7	NW	NW corner of landfill	B	Linear depression	Detail of feature B	502553.188	7645847.439	4024	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
PLW-8	8	N	W edge of landfill	-	Landfill edge	Looking N along W edge of landfill	502548.014	7645816.181	3966	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
PLW-9	9	S	W edge of landfill	-	Landfill edge	Looking S along W edge of landfill	502547.921	7645817.957	4234	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
PLW-10	10	N	SW corner of landfill, crest	-	Landfill edge	Looking N along W edge of landfill	502557.088	7645774.903	4035	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
PLW-11	11	SE	SW corner of landfill, crest	-	Landfill edge	Looking E along S edge of landfill	502556.77	7645774.399	4103	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
PLW-12	12	NE	SW corner of landfill, crest	-	Landfill structure	Looking NE across the landfill body	502557.386	7645774.481	4060	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
PLW-13	13	N	SW corner of landfill, toe	-	Landfill edge	Looking N along W edge of landfill	502552.283	7645769.028	4017	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
PLW-14	14	SE	SW corner of landfill, toe	-	Landfill edge	Looking E along S edge of landfill	502551.955	7645769.373	3894	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel

Photo Identification	Figure ID	View Direction	Photo Location	Feature ID	Feature of Note	Caption	UTM		Photo Size KB	Date of Photo	Camera Information
							Northing	Easting			
PLW-15	15	SE	S crest of landfill	A	Linear depression	Detail of feature A	502580.631	7645762.408	4306	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
PLW-16	16	N	S crest of landfill	A	Linear depression	Detail of feature A	502581.249	7645758.868	4088	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
PLW-17	17	NE	S crest of landfill	-	Landfill structure	Looking N across the body of landfill, feature F vegetation in foreground	502582.57	7645765.256	3843	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
PLW-18	18	NE	SE corner of landfill	-	Landfill edge	Looking N along E edge of landfill	502596.125	7645751.33	4239	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
PLW-19	19	S	E side of landfill	-	Landfill edge	Looking S along E edge of landfill	502624.05	7645806.308	4132	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
PLW-20	20	NW	E side of landfill	-	Landfill edge	Looking N along E edge of landfill	502623.934	7645805.827	3986	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
PLW-21	21	SE	E side of landfill	D	Circular depression	Detail of feature D	502616.261	7645800.59	4109	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
PLW-22	22	NE	E side of landfill	D	Circular depression	Detail of feature D	502618.254	7645796.735	4318	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
PLW-23	23	W	NE corner of landfill	-	Landfill edge	Looking NW along NE edge of landfill	502615.353	7645826.575	3913	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
PLW-24	24	E	NE corner of landfill, crest	C	Localized depression	Detail of feature C	502607.732	7645821.259	4104	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
PLW-25	25	N	NE corner of landfill, crest	C	Localized depression	Detail of feature C	502611.697	7645819.875	4009	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
PLW-26	26	E	NE corner of landfill, crest	C	Localized depression	Detail of feature C	502597.182	7645820.4	3968	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
PLW-27	27	N	NE corner of landfill, crest	C	Localized depression	Detail of feature C	502601.885	7645817.127	4338	2018.08.19	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel

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							Northing	Easting			
Non-Hazardous Landfill											
NHW_1	1	-	NE of landfill	MW-08	Monitoring well	Detail of MW-08	503082.896	7645308.979	4267	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
NHW_2	2	SW	NE of landfill	-	Landfill structure	Looking SW at NE side of landfill	503103.581	7645319.999	4116	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
NHW_3	3	NW	NE corner of landfill, toe	-	Landfill edge	Looking SW along SE toe of landfill	503117.792	7645279.824	3894	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
NHW_4	4	SW	NE corner of landfill, toe	-	Landfill edge	Looking NW along NE toe of landfill	503117.076	7645278.619	4200	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
NHW_5	5	NW	NE corner of landfill, crest	-	Landfill edge	Looking NW along NE crest of landfill	503100.234	7645271.414	4248	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
NHW_6	6	SW	NE corner of landfill, crest	-	Landfill edge	Looking SW along SE crest of landfill	503100.263	7645270.614	4222	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
NHW_7	7	SW	NE corner of landfill, crest	-	Landfill structure	Looking W across landfill body	503097.641	7645270.427	3614	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
NHW_8	8	SW	SE crest	F	Tire tracks	Detail of feature F	503099.986	7645273.074	3860	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
NHW_9	9	NE	SE crest	F	Tire tracks	Detail of feature F	503084.666	7645242	4045	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
NHW_10	10	SE	SE slope	I	Minor erosion	Detail of feature I	503085.358	7645244.802	4228	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
NHW_11	11	NW	SE slope	I	Minor erosion	Detail of feature I	503103.5388	7645237.804	4097	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
NHW_12	12	SW	SE crest	C	Minor depression	Detail of feature C	503083.208	7645234.861	4049	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
NHW_13	13	SE	SE crest	C	Minor depression	Detail of feature C	503078.731	7645233.253	3827	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
NHW_14	14	SE	S corner	B1	Minor erosion	Detail of feature B1	503079.328	7645224.18	4236	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
NHW_15	15	SE	S corner	H	Minor erosion	Detail of feature H	503078.673	7645228.401	4127	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
NHW_16	16	NW	S corner	B1	Minor erosion	Detail of feature B1	503090.8	7645217.175	3810	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel

Photo Identification	Figure ID	View Direction	Photo Location	Feature ID	Feature of Note	Caption	UTM		Photo Size KB	Date of Photo	Camera Information
							Northing	Easting			
NHW_17	17	NW	S corner	B2	Minor erosion	Detail of feature B2	503085.859	7645206.435	4067	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
NHW_18	18	NW	S corner	B3	Minor erosion	Detail of feature B3	503082.673	7645204.154	3821	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
NHW_19	19	N	S corner	B4	Minor erosion	Detail of feature B4	503079.156	7645204.345	4323	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
NHW_20	20	NE	S corner	-	Landfill edge	Looking NE along SE toe of landfill	503084.449	7645206.419	4108	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
NHW_21	21	NW	S corner	-	Landfill edge	Looking NW along SW toe of landfill	503080.534	7645204.126	4270	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
NHW_22	22	SE	S corner	B2	Minor erosion	Detail of feature B3	503076.366	7645214.627	4349	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
NHW_23	23	SE	S corner	B3	Minor erosion	Detail of feature B4	503077.297	7645220.988	4003	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
NHW_24	24	NE	S corner	-	Landfill edge	Looking NE along SE crest of landfill	503078.259	7645225.197	4076	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
NHW_25	25	NW	S corner	-	Landfill edge	Looking NW along SW crest of landfill	503076.123	7645224.342	3849	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
NHW_26	26	N	S corner	-	Landfill structure	Looking N across body of landfill	503075.618	7645227.917	4066	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
NHW_27	27	W	S corner	O	Vegetation	Detail of feature O	503073.678	7645220.826	4051	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
NHW_28	28	SE	N corner	-	Landfill edge	Looking SE along NE toe of landfill	503049.095	7645313.304	4224	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
NHW_29	29	SW	N corner	-	Landfill edge	Looking SW along NW toe of landfill	503046.164	7645310.984	3780	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
NHW_30	30	SE	NW of landfill	-	Landfill structure	Looking SE towards NW side of landfill	502989.507	7645296.464	3675	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
NHW_31	31	-	W of landfill	MW-05	Monitoring well	Detail of MW-05	502998.501	7645229.374	4133	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
NHW_32	32	SE	W corner	-	Landfill edge	Looking SE along SW toe of landfill	503008.48	7645238.683	4092	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
NHW_33	33	NE	W corner	-	Landfill edge	Looking NE along NW toe of landfill	503006.489	7645241.149	4217	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
NHW_34	34	SE	W corner, crest	-	Landfill edge	Looking SE along SW crest of landfill	503025.479	7645248.287	4063	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel

Photo Identification	Figure ID	View Direction	Photo Location	Feature ID	Feature of Note	Caption	UTM		Photo Size KB	Date of Photo	Camera Information
							Northing	Easting			
NHW_35	35	NE	W corner, crest	-	Landfill edge	Looking NE along NW crest of landfill	503024.781	7645249.661	3971	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
NHW_36	36	NE	W corner, crest	-	Landfill structure	Looking E across body of landfill	503032.702	7645249.785	4349	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
NHW_37	37	W	W corner, crest	A	Minor depression	Detail of feature A	503024.883	7645244.058	4278	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
NHW_38	38	S	W corner, crest	A	Minor depression	Detail of feature A	503022.779	7645247.131	4331	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
NHW_39	39	S	W corner, crest	G	Minor depression	Detail of feature G	503022.228	7645255.392	4194	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
NHW_40	40	NW	W corner, crest	A	Minor depression	Detail of feature A	503032.16	7645244.465	4146	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
NHW_41	41	SW	W corner, crest	A	Minor depression	Detail of feature A	503029.636	7645248.581	4176	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
NHW_42	42	-	SW of landfill	MW-06	Monitoring well	Detail of MW-06	503042.106	7645206.374	4058	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
NHW_43	43	NE	SW of landfill	-	Landfill structure	Looking NE toward SW side of landfill	503024.334	7645178.951	4008	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
NHW_44	44	S	SW slope	J	Minor erosion	Detail of feature J	503065.113	7645234.715	4070	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
NHW_45	45	N	SW slope	J	Minor erosion	Detail of feature J	503072.377	7645207.652	4194	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
NHW_46	46	NE	SW slope	B5	Minor erosion	Feature not found, photo taken at co-ordinates given	503067.537	7645210.18	4280	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
NHW_47	47	SW	SW slope	B5	Minor erosion	Feature not found, photo taken at co-ordinates given	503072.108	7645224.379	4258	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
NHW_48	48	-	S of landfill	MW-07	Monitoring well	Detail of MW-07.	503074.001	7645195.846	3962	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
NHW_49	49	N	Middle of landfill, top	-	Landfill structure	Looking N from middle across landfill body to N corner	503066.378	7645260.749	3961	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
NHW_50	50	W	Middle of landfill, top	-	Landfill structure	Looking W from middle across landfill body to W corner	503061.6985	7645262.384	3889	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
NHW_51	51	S	Middle of landfill, top	-	Landfill structure	Looking S from middle across landfill body to S corner	503065.582	7645259.923	3864	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel

Photo Identification	Figure ID	View Direction	Photo Location	Feature ID	Feature of Note	Caption	UTM		Photo Size KB	Date of Photo	Camera Information
							Northing	Easting			
NHW_52	52	E	Middle of landfill, top	-	Landfill structure	Looking E from middle across landfill body to E corner	503069.8443	7645261.911	4268	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
NHW_53	53	SW	N corner, crest	-	Landfill edge	Looking SW along NW crest of landfill	503051.902	7645294.52	3993	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
NHW_54	54	SE	N corner, crest	-	Landfill edge	Looking SE along NE crest of landfill	503053.153	7645297.185	3936	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
NHW_55	55	S	N corner, crest	-	Landfill structure	Looking S across landfill body	503053.115	7645295.91	3963	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
NHW_56	56	N	N corner, crest	N	Rough grading	Detail of feature N	503051.217	7645288.615	3983	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
NHW_57	57	NE	N corner, crest	E1	Minor erosion	Detail of feature E1	503054.61	7645298.425	4257	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
NHW_58	58	NE	N corner, crest	K	Minor erosion	Detail of feature K	503058.012	7645296.674	4283	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
NHW_59	59	NE	N corner, crest	E2	Minor erosion	Detail of feature E2	503062.783	7645293.43	4270	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
NHW_60	60	SE	N crest	D1	Minor depression	Detail of feature D1	503075.081	7645289.739	4350	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
NHW_61	61	SW	N crest	D1	Minor depression	Detail of feature D1	503079.253	7645291.031	3606	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
NHW_62	62	NE	N crest	E3	Minor erosion	Detail of feature E3	503077.809	7645285.403	4249	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
NHW_63	63	SW	N crest	E3	Minor erosion	Detail of feature E3	503083.907	7645297.471	4105	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
NHW_64	64	NW	N crest	D2	Minor depression	Detail of feature D2	503083.081	7645287.612	4042	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
NHW_65	65	NW	SE of landfill	-	Landfill structure	Looking NW at SE slope of landfill	503139.276	7645213.891	4159	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
NHW_66	66	NW	SE toe	L	Minor erosion	Detail of feature L	503096.787	7645239.307	4059	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
NHW_67	67	SE	SE crest	L	Minor erosion	Detail of feature L	503088.094	7645244.576	4219	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
NHW_68	68	NW	SE slope	M	Circular erosion	Detail of feature M	503091.997	7645239.109	4222	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel

Photo Identification	Figure ID	View Direction	Photo Location	Feature ID	Feature of Note	Caption	UTM		Photo Size KB	Date of Photo	Camera Information
							Northing	Easting			
South Landfill East											
SLFE_1	1	NE	SW of landfill	-	Landfill structure	Looking N at SW side of landfill	503449.74	7645037.271	3899	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SLFE_2	2	NE	SW of landfill	-	Landfill structure	Looking E at SE side of landfill	503450.594	7645037.03	3675	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SLFE_3	3	NE	S corner	-	Landfill edge	Looking NE along SE toe of landfill	503516.437	7645029.56	3939	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SLFE_4	4	NW	S corner	-	Landfill edge	Looking NW along SW toe of landfill	503514.87	7645028.645	4232	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SLFE_5	5	NW	S corner	-	Landfill structure	Looking N across body of landfill	503514.833	7645031.993	4288	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SLFE_6	6	NW	E corner	-	Landfill edge	Looking NW along NE toe of landfill	503529.518	7645056.161	3947	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SLFE_7	7	SW	E corner	-	Landfill edge	Looking SW along SE toe of landfill	503528.553	7645053.99	4029	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SLFE_8	8	W	E corner	-	Landfill structure	Looking W across body of landfill	503524.059	7645054.383	4039	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SLFE_9	9	NW	E corner	A	Linear depression	Detail of feature A	503532.739	7645050.768	4275	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SLFE_10	10	SW	E corner	A	Linear depression	Detail of feature A	503528.262	7645058.698	4186	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SLFE_11	11	SE	E corner	A	Linear depression	Detail of feature A	503520.252	7645058.872	4147	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SLFE_12	12	NW	Middle of landfill	B	Minor erosion	Detail of feature B	503495.312	7645057.289	4090	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SLFE_13	13	SE	Middle of landfill	B	Minor erosion	Detail of feature B	503482.618	7645066.243	4250	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SLFE_14	14	SE	N corner, crest	C	Minor depression	Detail of feature C	503496.458	7645074.68	4115	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SLFE_15	15	NE	N corner, crest	C	Minor depression	Detail of feature C	503496.48	7645070.926	4351	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel

Photo Identification	Figure ID	View Direction	Photo Location	Feature ID	Feature of Note	Caption	UTM		Photo Size KB	Date of Photo	Camera Information
							Northing	Easting			
SLFE_16	16	SW	N corner, toe	-	Landfill edge	Looking SW along NE edge of landfill	503484.41	7645101.474	3988	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SLFE_17	17	SE	N corner, toe	-	Landfill edge	Looking SE along NE edge of landfill	503486.924	7645102.337	4072	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SLFE_18	18	W	NW toe	G	Sparse vegetation	Detail of feature G	503472.11	7645097.052	4159	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SLFE_19	19	SE	N corner, crest	-	Landfill edge	Looking SE along NE crest of landfill	503483.042	7645088.43	4242	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SLFE_20	20	SW	N corner, crest	-	Landfill edge	Looking SW along NW crest of landfill	503482.925	7645089.767	4041	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SLFE_21	21	SE	W corner, toe	-	Landfill edge	Looking SE along SW toe of landfill	503439.838	7645082.57	4063	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SLFE_22	22	NE	W corner, toe	-	Landfill edge	Looking NE along NW toe of landfill	503441.782	7645086.474	3869	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SLFE_23	23	SE	W corner, crest	-	Landfill edge	Looking SE along SW crest of landfill, covers landfill body as well	503455.543	7645077.29	4271	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SLFE_24	24	NE	Middle, top	D	Minor depression	Detail of feature D	503483.097	7645068.62	4082	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SLFE_25	25	SE	Middle, top	D	Minor depression	Detail of feature D	503479.958	7645069.524	4272	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SLFE_26	26	SE	Middle, top	-	Landfill structure	Looking SE from the middle of landfill out along long axis	503486.532	7645059.499	4015	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SLFE_27	27	NW	Middle, top	-	Landfill structure	Looking NW from the middle of landfill out along long axis	503484.91	7645060.985	3916	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SLFE_28	28	E	NE slope	F	Minor depression	Detail of feature F	503491.64	7645080.585	4112	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SLFE_29	29	N	NE slope	F	Minor depression	Detail of feature F	503493.295	7645077.464	4164	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SLFE_30	30	E	NE slope	E	Minor depression	Detail of feature E	503494.768	7645090.773	4239	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SLFE_31	31	N	NE slope	E	Minor depression	Detail of feature E	503494.601	7645088.119	4323	2018.08.18	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel

Photo Identification	Figure ID	View Direction	Photo Location	Feature ID	Feature of Note	Caption	UTM		Photo Size KB	Date of Photo	Camera Information
							Northing	Easting			
South Borrow Landfill											
SB_1	1	W	NE corner	-	Landfill edge	Looking W along N landfill edge	503949.454	7643496.368	3908	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SB_2	2	S	NE corner	-	Landfill edge	Looking S along W landfill edge	503950.51	7643498.513	4012	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SB_3	3	W	NE corner	A	Minor depression	Detail of feature A	503939.929	7643496.406	4271	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SB_4	4	N	NE corner	A	Minor depression	Detail of feature A	503936.547	7643495.468	4256	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SB_5	5	N	NW corner	-	Ponding	Looking N at ponded water adjacent landfill	503926.925	7643501.187	4101	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SB_6	6	E	NW corner	-	Landfill edge	Looking E at N toe of landfill	503921.881	7643501.083	3882	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SB_7	7	S	NW corner	-	Landfill edge	Looking S at W toe of landfill	503921.844	7643499.531	3941	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SB_8	8	E	NW corner	-	Landfill edge	Looking E at N crest of landfill	503928.201	7643493.404	4068	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SB_9	9	S	NW corner	-	Landfill edge	Looking S at W crest of landfill	503928.548	7643493.564	4022	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SB_10	10	SE	NW corner	-	Landfill structure	Looking SE across body of landfill	503928.785	7643492.669	3913	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SB_11	11	SW	NW corner	A	Minor depression	Detail of feature A	503927.007	7643495.946	4224	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SB_12	12	NE	NW corner	A	Minor depression	Detail of feature A	503922.687	7643494.826	4105	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SB_13	13	N	W slope	G	Minor depression	Detail of feature G	503926.712	7643462.582	4264	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SB_14	14	E	W slope	G	Minor depression	Detail of feature G	503922.667	7643466.478	4327	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SB_15	15	SW	W slope	E2	Ponded water	Looking SW at ponded water adjacent landfill	503924.56	7643464.649	3881	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SB_16	16	NW	SW corner	E2	Ponded water	Looking NW at ponded water adjacent landfill	503929.381	7643441.925	3851	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel

Photo Identification	Figure ID	View Direction	Photo Location	Feature ID	Feature of Note	Caption	UTM		Photo Size KB	Date of Photo	Camera Information
							Northing	Easting			
SB_17	17	SW	SW corner	E2	Ponded water	Looking SW at ponded water adjacent landfill	503929.108	7643443.022	3725	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SB_18	18	NW	SW corner, toe	-	Landfill edge	Looking N along W toe of landfill	503925.181	7643436.063	3948	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SB_19	19	E	SW corner, toe	-	Landfill edge	Looking E along S toe of landfill	503924.698	7643435.7	4037	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SB_20	20	N	SW corner	-	Landfill edge	Looking N along W crest of landfill	503934.092	7643443.058	3862	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SB_21	21	E	SW corner	-	Landfill edge	Looking E along S crest of landfill	503933.793	7643443.286	3967	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SB_22	22	NE	SW corner	-	Landfill structure	Looking NE across landfill body	503934.431	7643444.467	3841	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SB_23	23	W	SE corner	D	Minor depression	Detail of feature D	503947.129	7643448.892	4276	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SB_24	24	N	SE corner	D	Minor depression	Detail of feature D	503947.385	7643445.713	3390	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SB_25	25	W	SE corner	F	Minor depression	Detail of feature F	503945.379	7643446.095	4292	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SB_26	26	N	SE corner	F	Minor depression	Detail of feature F	503946.035	7643443.43	3747	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SB_27	27	W	SE corner	-	Landfill edge	Looking W along S toe of landfill	503950.477	7643436.806	4009	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SB_28	28	N	SE corner	-	Landfill edge	Looking N along E toe of landfill	503952.868	7643442.018	4309	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SB_29	29	W	E slope	C	Minor erosion	Detail of feature C	503957.073	7643483.67	3473	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SB_30	30	E	E slope	C	Minor erosion	Detail of feature C	503949.709	7643481.643	4182	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SB_31	31	N	E slope	D	Minor depression	Detail of feature D	503953.891	7643475.607	4211	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SB_32	32	W	E slope	D	Minor depression	Detail of feature D	503956.421	7643478.461	3395	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SB_33	33	S	N middle	H	Minor depression	Detail of feature H	503938.304	7643491.93	3459	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SB_34	34	W	N middle	H	Minor depression	Detail of feature H	503940.458	7643490.082	3340	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SB_35	35	SE	S and E of landfill	E2	Ponded water	Looking SE at ponded water adjacent landfill	503902.548	7643456.688	4144	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel
SB_36	36	NE	S and E of landfill	E2	Ponded water	Looking SE at ponded water adjacent landfill	503910.398	7643434.201	3629	2018.08.17	Fujifilm Finepix XP70 Ratio 4:3, Focal Length 5.0mm 16.4 Mpixel

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