Nunavut Baffin Region
2014 DEW Line Landfill Monitoring Program
FOX-4 Cape Hooper
Final Monitoring Report

Prepared for:

Public Works and Government Services Canada

Prepared by:

SENES Consultants
AN ARCADIS COMPANY

121 Granton Drive, Suite 12
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March 2015

350600-515-002

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350600-515-002

3 March 2015

Public Works and Government Services Canada
Western Region – Environmental Services
5th Floor, 10025 Jasper Avenue
ATB Financial Plaza North Tower
Edmonton, AB, T5J 1S6

Attention: Ms. Liana Smith
Project Manager

RE: Final Monitoring Report
Baffin Region Nunavut DEW LINE Landfill Monitoring Program
Fox-4 Cape Hooper, NU
DND Project #: DLCLFMP2 (QIKIQ14)

Dear Ms. Smith:

Please find enclosed the Final Monitoring Report for the 2014 Landfill Monitoring Program at the former FOX-4 DEW Line site located at Cape Hooper in Nunavut.

Regards,

SENES Consultants

Stephen J. Borcsok, P.Eng.
Environmental Engineer

Charles F. Gravelle, M.Sc.E., P.Eng.
Senior Geotechnical Engineer

REGISTERED PROFESSIONAL ENGINEER
C.F. GRAVELLE
LICENSEE
NWT/NU

EXECUTIVE SUMMARY

SENES Consultants (SENES) was retained by Public Works and Government Services Canada (PWGSC) on behalf of the Department of National Defence (DND) to complete the 2014 landfill monitoring at the former FOX-4 DEW Line Site. This site is located on the east coast of Baffin Island, approximately midway between the communities of Qikiqtarjuaq and Clyde River.

The former DEW Line site comprised facilities at the summit of Cape Hooper consisting of communications, accommodations, and maintenance facilities, and an airstrip, fuel storage and maintenance facilities near the coast. These areas are referred to as the Upper Site and Lower Site, respectively. A North Warning System (NWS) Short Range Radar station has been constructed and is operating in the vicinity of the Upper Site.

The initial environmental cleanup and demolition of old facilities at the FOX-4 site took place between 1996 and 1999, prior to finalization of the Cooperation Agreement between DND and Nunavut Tunngavik Inc. (NTI) that outlined general requirements for DEW Line site cleanup . A second round of environmental cleanup and maintenance was completed between 2011 and 2013 to address certain elements of the Cooperation Agreement that were not addressed during the initial FOX-4 cleanup.

Five landfills remain at the site as a result of these works:

- Non-Hazardous Waste Landfill and Tier II Disposal Facility;
- Helipad West Landfill;
- Station Area Landfill;
- Pallet Line Landfill; and
- Tanner Bay Landfill.

The DEW Line landfill monitoring program is divided into three phases: Phase I (yearly for five years following the completion of remediation activities at the site), Phase II (years 7, 10, 15, and 25 following completion of remediation activities), and Phase III (to be determined when Phase II is completed). As a second round of maintenance was completed at the FOX-4 site between 2011 and 2013, the site is temporarily following a modified landfill monitoring schedule, with additional monitoring scheduled for 2016, 2018, and 2023.

The scope of monitoring work at each landfill noted above included:

- A visual inspection of the landfill;
- Collection of soil samples from selected locations at each landfill;

- Collection of groundwater samples from each landfill where monitoring wells are present (Non-Hazardous Waste Landfill and Tier II Disposal Facility, Helipad West Landfill, Station Area Landfill); and
- Collection of thermal data from vertical thermistor installations at each landfill where vertical thermistors are present (Non-Hazardous Waste Landfill and Tier II Disposal Facility).

The performance of each landfill was assessed using the results of this inspection and comparison of these results to those of previous monitoring events. Trends in concentrations of selected parameters in soil and groundwater over time, where available, were analyzed to determine if each landfill is performing as designed and what, if any, remedial actions are required. Of note – since the most recent remediation work was completed last year no trends in visual observations at the site landfills are available for this monitoring event. The 2014 monitoring program will provide the baseline conditions for future monitoring events.

Performance of each landfill was assessed and rated as acceptable, marginal, significant, or unacceptable. These ratings indicate the potential for failure of the landfill, with acceptable representing no failure potential, marginal representing low to moderate failure potential, significant representing imminent failure potential, and unacceptable representing failure of the landfill has already occurred.

The results of this monitoring program indicate:

1. the performance of the Non-Hazardous Waste Landfill and Tier II Disposal Facility is acceptable. Regular scheduled monitoring of this landfill should be continued. Thermistor data collected during this monitoring event was inconclusive and could not be analyzed to determine the thermal profile of this landfill. This may have been caused by movement of dataloggers between thermistor installations during the 2011-2013 maintenance work. Maintenance of the thermistor installations at this landfill is required to ensure that thermistors are programmed properly and collecting usable temperature data.

2. the performance of the Helipad West Landfill is acceptable. Regular scheduled monitoring of this landfill should be continued. Erosion channels and sinkholes were observed at this landfill and while they are not currently of concern, these features should be monitored to ascertain whether they increase in number and/or size and threaten the future stability of the landfill. No remedial actions are required at this time.

3. the performance of the Station Area Landfill is acceptable. Regular scheduled monitoring of this landfill should be continued. Sinkholes were observed on the south

side of this landfill and while they are not currently of concern, these features should be monitored to ascertain whether they increase in number and/or size and threaten the future stability of the landfill. No remedial actions are required at this time.

4. the performance of the Pallet Line Landfill is acceptable. Regular scheduled monitoring of this landfill should be continued. No remedial actions are required at this time.

5. the performance of the Tanner Bay Landfill is acceptable. Regular scheduled monitoring of this landfill should be continued. No remedial actions are required at this time.

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1.0 BACKGROUND

SENES Consultants (SENES) was retained by Public Works and Government Services Canada (PWGSC) on behalf of the Department of National Defence (DND) to complete landfill monitoring at the former FOX-4 DEW Line Site. This site is located on the east coast of Baffin Island, approximately midway between the communities of Qikiqtarjuaq and Clyde River, at 68°26' north latitude and 66°44' west longitude.

The former DEW Line site comprised facilities at the summit of Cape Hooper consisting of communications, accommodations, and maintenance facilities, and an airstrip, fuel storage and maintenance facilities near the coast. These areas are referred to as the Upper Site and Lower Site, respectively. A North Warning System (NWS) Short Range Radar station has been constructed and is operating in the vicinity of the Upper Site.

The initial environmental cleanup and demolition of old facilities at the FOX-4 site took place between 1996 and 1999, prior to finalization of the Cooperation Agreement between DND and Nunavut Tunngavik Inc. (NTI) that outlined general requirements for DEW Line site cleanup . A second round of environmental cleanup and maintenance was completed between 2011 and 2013 to address certain elements of the Cooperation Agreement that were not addressed during the initial FOX-4 cleanup.

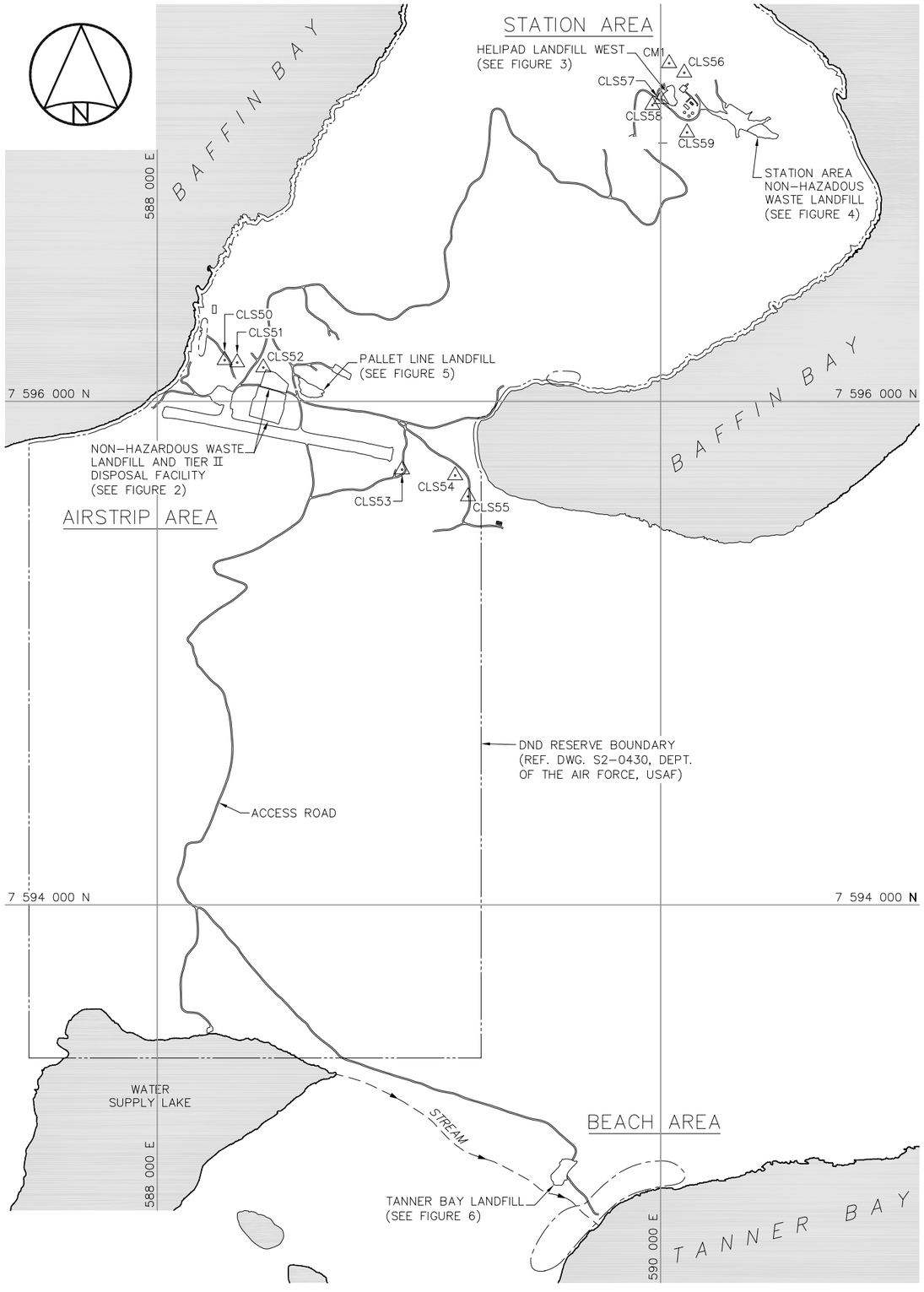
Five landfills remain at the site as a result of these works:

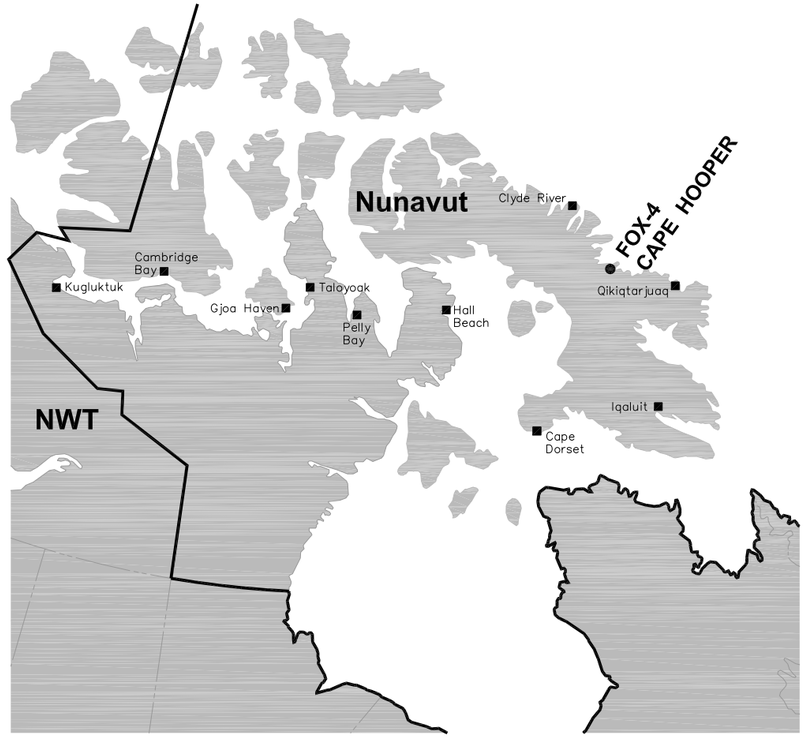
- Non-Hazardous Waste Landfill and Tier II Disposal Facility;
- Helipad West Landfill;
- Station Area Landfill;
- Pallet Line Landfill; and
- Tanner Bay Landfill.

The location of the FOX-4 site and the landfills at the site is shown on Figure 1.

1.1 OBJECTIVE OF STUDY

The objective of this study was to collect and analyze post-closure landfill monitoring data for five landfills located at the FOX-4 DEW Line site located at Cape Hooper, Nunavut.





LOCATION OF CAPE HOOPER WITHIN NUNAVUT TERRITORY

SCALE: NTS

SURVEY CONTROL MONUMENTS				
NO.	UTM COORDINATES		ELEV.	DESCRIPTION
	NORTHING	EASTING		
CM1	7 597 342.901	590 033.350	388.309	LEAD PLUG IN ROCK
CLS50	7 596 163.812	588 267.720	12.131	19mm DIA. REBAR AND CAP
CLS51	7 596 154.292	588 317.374	17.038	19mm DIA. REBAR AND CAP
CLS52	7 596 134.413	588 421.327	19.969	19mm DIA. REBAR AND CAP
CLS53	7 595 729.011	588 972.572	5.664	19mm DIA. REBAR AND CAP
CLS54	7 595 705.706	589 183.429	2.043	19mm DIA. REBAR AND CAP
CLS55	7 595 622.365	589 234.457	10.231	19mm DIA. REBAR AND CAP
CLS56	7 597 305.287	590 093.442	379.717	19mm DIA. REBAR AND CAP
CLS57	7 597 199.807	590 001.415	366.177	19mm DIA. REBAR AND CAP
CLS58	7 597 176.541	589 966.724	361.512	19mm DIA. REBAR AND CAP
CLS59	7 597 067.880	590 104.590	372.086	19mm DIA. REBAR AND CAP

LEGEND:

- CM1 — SURVEY CONTROL MONUMENT
- ARCHAEOLOGICAL FEATURES
- APPROXIMATE LOCATION OF PROPERTY BOUNDARY
- LIMIT OF LANDFILLS
- BODY OF WATER

NOTES:

1. ALL COORDINATES ARE REFERENCED TO NAD83 (CSRS), UTM ZONE 19N.
2. ALL ELEVATIONS REFER TO GEODETIC DATUM.
3. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.

REVISIONS:

No.	Date:	By:	Revisions

REFERENCE:

AECOM, FILE No.: FOX-4.1 Year 1 LF MON.dwg, Mar. 2014

0 400 800 metres

SCALE 1:20,000

SENES Consultants
AN ARCADIS COMPANY

PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

2014 DEW LINE MONITORING PROGRAM

FOX-4 CAPE HOOPER, NUNAVUT

SITE OVERVIEW

Drawn By:	Approved By:	Project No:
I.S.Z.	C.F.G.	350600-515-2
Date: FEB. 2015	Scale: 1:20,000	Drawing No: FIGURE 1

1.2 SCOPE OF WORK

The scope of work for this project has been detailed in the *Terms of Reference* for DND Project # DLCLFMP2 (QIKIQ14), dated June 2014. The scope of work completed at each landfill includes:

- A visual inspection of the landfill;
- Collection of soil samples from specified locations at each landfill (see Table 3);
- Collection of groundwater samples from five monitoring wells at the Non-Hazardous Waste Landfill and Tier II Disposal Facility, from four monitoring wells at the Helipad West Landfill, and from three monitoring wells at the Station Area Landfill; and
- Collection of thermal data from nine vertical thermistor installations at the Tier II Disposal Facility.

1.3 SITE GEOLOGY, HYDROGEOLOGY AND HYDROLOGY

Cape Hooper is located within the Canadian Shield, in the Rae Domain of the Churchill Province. Bedrock in the area is composed of Paleoproterozoic granulite-facies paragneiss. The edge of the Laurentide ice sheet was present in this area during the Pleistocene epoch It is in an area of continuous permafrost with low ground ice content. Local surficial geologic conditions were observed to generally consist of coarse weathered rock and deposits of marine origin.

Groundwater flow is seasonal, occurring mainly in the summer period of maximum active layer thaw. Groundwater is located at shallow depths and is highly affected by local permafrost conditions. Average annual precipitation at Cape Hooper is 278 mm, of which over 80% consists of snow. Surface water in the area drains to Baffin Bay located around Cape Hooper. Based on the local topography, the Non-Hazardous Waste Landfill and Tier II Disposal Facility and the Pallet Line Landfill generally drain to the west, the Helipad West and Station Area Landfills generally drain to the northwest, and the Tanner Bay Landfill generally drains to the south.

1.4 SITE LAND-USE DESCRIPTION

The unmanned FOX-4 North Warning System (NWS) Short Range Radar (SRR) station is located in the vicinity of the former DEW Line site at the Upper Site. Two landfills, the Helipad West Landfill and Station Area Landfill are located near this station at the high point of the area. The Lower Site consists of an airstrip and a fuel storage area for the SRR, and at the time of inspection the remnants of the camp from the 2013 cleanup and maintenance works remained at the site. Two landfills, the Non-Hazardous Waste Landfill and Tier II Disposal Facility, and the Pallet Line Landfill are located at the Lower Site. The Tanner Bay Landfill is located south of

the Lower Site on Tanner Bay at the original beach landing area for the DEW Line site. Aside from the SRR station and a seasonal hunting camp east of the airstrip, the Cape Hooper area consists of open tundra and is uninhabited.

1.5 FIELD PROGRAM STAFF AND FIELD SCHEDULE

The DEW Line landfill monitoring program is divided into three phases: Phase I (yearly for five years following the completion of remediation activities at the site), Phase II (years 7, 10, 15, and 25 following completion of remediation activities), and Phase III (to be determined when Phase II is completed). As a second round of maintenance was completed at the FOX-4 site between 2011 and 2013, the site is temporarily following a modified landfill monitoring schedule, with additional monitoring scheduled for 2016, 2018, and 2023. The monitoring program for this site is detailed in Table 1.1.

The 2014 monitoring program was completed by Messrs. Jason Mauchan and Stephen Borcsok of SENES Consultants from 24-26 August 2014. Due to poor weather conditions in the Eastern Arctic area, the field team remained at Cape Hooper until 28 August 2014.

Table 1.1: Summary of Multi-Year Monitoring Program

No. of Years After Construction	Monitoring Event Number	Year
Prior to and during	Baseline	1996-1999
1	1	1999
2	2	2000
3	3	2001
4	4	2002
5	5	2003
7	6	2005
8	7	2006
9	8	2007
10	9	2008
12	10	2010
16	**11**	**2014***
18	12	2016
20	13	2018
25	14	2023

* - the FOX-4 site underwent rehabilitation and maintenance between 2011 and 2013 which changed the configuration of the landfills. The 2014 monitoring event is the first to occur after this work.

1.6 WEATHER CONDITIONS

Weather conditions during the site inspection are described below in Table 2.

Table 1.2: Weather Conditions by Site

Date	Weather Conditions	Landfills Monitored
24 August 2014	Sunny, 8°C, light winds from west	Non-Hazardous Waste Landfill and Tier II Disposal Facility, Tanner Bay Landfill
25 August 2014	Partly cloudy, 10°C, strong winds gusting from northeast	Non-Hazardous Waste Landfill and Tier II Disposal Facility, Station Area Landfill, Helipad West Landfill
26 August 2014	Foggy, 5 °C, light winds from north	Non-Hazardous Waste Landfill and Tier II Disposal Facility, Station Area Landfill, Helipad West Landfill
27 August 2014	Foggy, 5 °C, calm	On standby at Cape Hooper due to weather conditions
28 August 2014	Foggy to partly sunny, 6°C, light winds from west	On standby at Cape Hooper due to weather conditions

1.7 PROJECT REFERENCES

"Terms of Reference. DEW Line Landfill Monitoring Program. DEW Line Sites Nunavut Baffin Region, DND Project #: DLCLFMP2 (QIKIQ14)." Prepared by Environmental Services, Public Works & Government Services Canada, Western Region, Edmonton, AB on behalf of The Department of National Defence of Canada, dated June 2014.

"Site Specific Health and Safety Plan for 2014 Nunavut Baffin Region DEW Line Landfill Monitoring Program, FOX-M Hall Beach, NU, FOX-4 Cape Hooper, NU, FOX-5 Broughton Island, NU. Prepared by SENES Consultants, dated July 2014.

"Logistics & Work Plan. Prepared for: 2014 Nunavut Baffin Region DEW Line Landfill Monitoring Program, FOX-M Hall Beach, NU, FOX-4 Cape Hooper, NU, FOX-5 Broughton Island, NU." Prepared by SENES Consultants, dated July 2014.

"FOX-4, Cape Hooper Nunavut. 2013 Geotechncial Quality Assurance Summary." Prepared by AECOM for Defence Construction Canada, dated November 2013.

"FOX-4, Cape Hooper Nunavut. Site Summary Report, 2013." Prepared by Environmental Sciences Group, Royal Military College, Kingston, Ontario, dated November 2013.

1.8 REPORT STRUCTURE

A general overview of the approach and methodology taken during the site inspection is provided in Section 2.0 while detailed results of the monitoring program for each of the five landfills at FOX-4 are presented in Sections 3.0 through 7.0.

2.0 APPROACH & METHODOLOGY (GENERAL)

2.1 SUMMARY OF WORK

2.1.1 Health and Safety

A Site Specific Health and Safety Plan was prepared for the 2014 site inspection by SENES Consultants and reviewed by PWGSC and DND prior to the commencement of field work. The field work component of this work was completed in accordance with this site specific health and safety plan. No health and safety incidents occurred during the site inspection.

2.1.2 Field Program

The scope of the monitoring program is shown in Table 3 below. The number of locations where monitoring was to take place are shown in parentheses. The following deviations from the work plan took place:

- The Station Area Landfill had four monitoring locations for soil and groundwater listed in the project Terms of Reference, however one location (MW-8) was determined to not be present at this landfill.
- The Non-Hazardous Waste Landfill and Tier II Disposal Facility had ten vertical thermistor installations listed for thermal monitoring, however eight locations were identified on the provided site drawing. The site inspection identified nine locations at this landfill.

Table 2.1: Summary of Monitoring Program/Requirements (by Landfill)

Landfill	Visual Inspection	Soil Monitoring*	Groundwater Monitoring	Temperature Monitoring Locations
Non-Hazardous Waste Landfill and Tier II Disposal Facility	√	√ (8)	√ (8)	√ (9)
Helipad West Landfill	√	√ (4)	√ (4)	NA
Station Area Landfill	√	√ (3)	√ (3)	NA
Pallet Line Landfill	√	√ (5)	NA	NA
Tanner Bay Landfill	√	√ (3)	NA	NA

* - two soil samples were collected at each monitoring location: one surface sample from 0-15 cm, and one subsurface sample from 40-50 cm

NA – Not applicable as there are no thermistors/monitoring wells installed at this location.

2.1.3 Visual Inspection

As part of the monitoring program a visual inspection of each landfill was to be conducted and a visual inspection checklist completed for each landfill site. Inspection information including Landfill Designation, Landfill Type, Date, Monitoring Event Number, Weather Conditions, and the Name of the Inspector was recorded for each landfill. The following information was recorded for each of the respective landfill locations:

- Settlement;
- Erosion;
- Lateral movement;
- Sloughing of slopes;
- Cracks;
- Frost action;
- Animal burrows;
- Vegetation re-establishment on surface;
- Vegetation stress;
- Staining;
- Seepage points or ponded water;
- Debris or liner exposure;
- Condition of monitoring points; and
- Other relevant observations.

The presence of the above conditions was recorded along with their location, dimensions, extent, and description.

Photographic records were taken to document the general condition of the landfill. All photographs were referenced to existing monuments, and include a visual reference to indicate the scale of the photograph. A detailed figure of each landfill showing the results of the inspection has been created, as well as a photo log showing the condition of the landfill during the inspection.

Historical features and conditions have been noted during previous monitoring events. Existing features were compared to these features noted in the most recent monitoring report and comparative analysis is included in this monitoring report.

2.1.4 Soil Sampling

Two soil samples were collected at each sampling location: one sample from 0-15 cm depth, and one sample from 40-50 cm depth. Samples were collected from test pits manually excavated

with hand tools (pick/shovel). Each soil sample was collected in one single use zip-top plastic bag and one 60 mL glass jar, which was filled with soil such that no headspace remained in the jar. Hand tools were rinsed with water between sampling locations. During sample collection, soil that had come into contact with the hand tools was discarded and not collected as part of each sample.

All soil sampling locations were backfilled after each monitoring event. All locations were photographed during sampling and after backfilling was completed, with these photographs included in the applicable photograph record for each landfill.

Soil samples were analyzed for the following parameters:

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

Analyses were carried out by Maxxam Analytics, an ISO 17025 certified laboratory in Nepean, Ontario, and Calgary, Alberta. Duplicate sample analyses were carried out by AGAT Laboratories of Mississauga, Ontario, an ISO 17025 certified laboratory.

2.1.5 Groundwater Sampling

Groundwater samples were collected from each well where enough water was present to collect a sample. Wells were monitored to determine the water level and depth to bottom, and purged prior to sampling, with pH, conductivity, and temperature being measured during purging until values for these parameters have stabilized.

Wells were purged and sampled using new dedicated sampling equipment consisting of high density polyethylene (HDPE) tubing with an HDPE foot valve. No significant issues with turbidity were encountered during sampling. All tubing and foot valves were only used at one monitoring well location, and were removed from the site following sampling to prevent damage due to freezing.

Groundwater samples were analyzed for the following parameters. In cases where insufficient water was present, sampling was prioritized in the order presented below. Metals were not filtered.

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

Groundwater samples were collected in the following sampling containers:

- Metals – 120 mL plastic bottle preserved with nitric acid;
- Mercury – 100 mL clear glass bottle preserved with hydrochloric acid;
- PHC F1 fraction and BTEX – 3 x 40 mL clear glass vials;
- PHC F2-F4 fractions – 2 x 500 mL glass bottle preserved with sodium bisulphate;
- Polychlorinated Biphenyls – 500 mL glass bottle with no preservative;

Analyses were carried out by Maxxam Analytics, an ISO 17025 certified laboratory in Nepean, Ontario, and Calgary, Alberta. Duplicate sample analyses were carried out by AGAT Laboratories of Mississauga, Ontario, an ISO 17025 certified laboratory.

Soil and groundwater samples were kept cool and shipped in insulated coolers with ice or ice packs when possible. Samples were shipped under chain-of-custody protocols and coolers were sealed with custody seals by SENES staff prior to shipment. No issues with sample temperature were reported by the laboratories upon receipt of samples. Sample hold times were met for all samples.

2.1.6 Comparison of Soil and Groundwater Monitoring Data

Soil and groundwater monitoring data collected during the 2014 monitoring program has been compared to data collected during previous monitoring events, as well as background concentrations (soil only), baseline average concentrations (soil and groundwater), and DEW Line Cleanup Criteria (soil only).

Background chemical concentrations were determined from soil sampling conducted by Environmental Science Group (ESG) in 1984 and 1990, and represent soil chemical conditions in the area that have not been impacted by site activities.

Baseline average concentrations (BAC) represent existing soil and groundwater chemistry at the landfill areas prior to and during remediation.

The DEW Line Cleanup Criteria were developed as part of the DEW Line Cleanup Protocol to provide a consistent approach across all DEW Line sites that is generally protective of the Arctic ecosystem. The Cleanup Criteria differentiates between Tier I and Tier II soils. Soil containing parameters at concentrations above the Tier I Criteria but below the Tier II Criteria was acceptable for placement in a non-hazardous waste landfill, while soil containing parameters at concentrations above the Tier II Criteria are to be treated/disposed of in a manner that precludes contact with the Arctic ecosystem. Note that due to high naturally-occurring concentrations of arsenic in geologic units in the area of Cape Hooper, a site-specific criteria for arsenic of 130 ug/g was used during remediation activities for all landfills except the Tanner Bay Landfill.

Comparison to background, baseline, and Tier I/II DEW Line Cleanup Criteria have been included in the summary chemical tables in this report. Parameter concentrations in soil exceeding background levels are not discussed in this report as their presence does not necessarily indicate that contaminant migration from a landfill was or is occurring. Concentrations above background levels may be as a result of site activities conducted prior to the construction of the landfill. However baseline concentrations account for site activities that occurred prior to and during construction of the landfill, and parameter concentrations above these levels may indicate contaminant migration is occurring.

2.1.7 Thermal Monitoring

Thermal monitoring and thermal data downloading was completed at the Non-Hazardous Waste Landfill and Tier II Disposal Facility. No thermal monitoring was completed at the other landfills as they do not have thermistor installations. 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 using a personal computer equipped with the appropriate software (ProLog) to retrieve the data at each location (data was reviewed in the field to ensure completeness);
- Collection of manual readings of Thermistors using ProLog software;
- Measurement of the distance of each thermistor cable above the ground;
- Replacement of batteries (following retrieval of ground temperature data) in dataloggers. The following batteries are required for each datalogger:
    - 1 Ultra-Logger Lithium Battery – 5.2 amp 12 volt, Lakewood model identification ULB-15;
    - 1 Ultra-Logger Lithium Battery – 9 volt, Lakewood model identification ULB-1; and

- Resetting datalogger memory to zero and restarting readings. The system was monitored using the personal computer to ensure that the dataloggers were functioning and temperatures were being recorded.

Following the site inspection, the downloaded data was forwarded to DND to be analyzed by Tetra Tech EBA. The results of these analyses have been summarized in this report.

2.2 FIELD NOTES AND DATA

Field notes for each landfill monitored as part of this program are included in Appendix B. The checklist templates were included in the Terms of Reference for the program and copies were provided by DND staff prior to use during the monitoring program.

2.3 QA/QC

Intra-laboratory comparison of soil and groundwater analytical results has been completed by Maxxam Analytics as part of their standard internal QA/QC procedures, and are provided in the Certificates of Analysis in Appendix A. Blind duplicates were collected for approximately 10% of the soil and groundwater samples collected, and were submitted to a second laboratory, AGAT Laboratories of Mississauga, Ontario, an ISO 17025 certified laboratory, for inter-laboratory comparison of results. Each duplicate sample was also sent to the ESG Ops Centre in Kingston, Ontario for archiving.

The relative percent difference (RPD) was calculated for the analytical results of duplicate samples submitted for inter-laboratory comparison. The RPD is calculated to assess the precision of duplicate measurements. RPD values under 30% are considered acceptable levels of precision for this program as specified in the Terms of Reference for the program. A discussion of the results for duplicate samples and RPD values are provided with the analytical results for each landfill.

3.0 NON-HAZARDOUS WASTE LANDFILL AND TIER II DISPOSAL FACILITY

3.1 LANDFILL DESCRIPTION

The Non-Hazardous Waste Landfill and Tier II Disposal Facility are located north of the west end of the Cape Hooper airstrip. The Non-Hazardous Waste Landfill and Tier II Disposal Facility have approximate areas of 4,000 m^2 and 10,000 m^2, respectively. The Non-Hazardous Waste Landfill was constructed for disposal of non-hazardous demolition and site wastes, while the Tier II Disposal Facility was constructed for disposal of Tier II soil excavated at the FOX-4 site. A detailed drawing of this landfill is provided in Figure 2. The historical chemical results for soil samples collected at this landfill are shown in plan on Figure 2A. The historical chemical results for groundwater samples collected at this landfill are shown in plan on Figure 2B.

3.2 SUMMARY OF WORK CONDUCTED

3.2.1 Visual Inspection

The visual inspection of the landfill was completed with no deviations from the visual inspection work plan.

3.2.2 Soil Sampling

Soil samples were collected at eight (8) locations as shown on Figure 2. Surface and subsurface samples were collected at each location. There were no deviations from the soil sampling work plan. One duplicate soil sample was collected from subsurface soil at sample location MW12-08. Soil sampling completed at the landfill is summarized in Table 3.1.

LEGEND:

- CLS50 — SURVEY CONTROL MONUMENT (1)
- 510 — COORDINATE POINT
- MONITORING WELL LOCATION (8)
- VERTICAL GROUND TEMPERATURE CABLE LOCATION (10)
- MONITORING SOIL SAMPLE LOCATION (8)
- TYPE 1 GRANULAR FILL
- BODY OF WATER
- 24 — PHOTOGRAPH VIEWPOINT
- 22m — CONTOURS IN 0.5m INTERVALS
- OVERLAND FLOW DIRECTION
- VEHICLE TRACKS/RUTS
- PONDED WATER
- EXPOSED DEBRIS
- AREA OF SETTLEMENT
- EROSION CHANNEL

NOTES:

1. LOCATIONS AND SCALE OF FEATURES ARE APPROXIMATE AND SHOWN FOR ILLUSTRATIVE PURPOSES ONLY.
2. PHOTOGRAPHS TAKEN AUG. 26, 2014.
3. ALL COORDINATES ARE REFERENCED TO NAD83 (CSRS), UTM ZONE 19N.
4. ALL ELEVATIONS REFER TO GEODETIC DATUM.
5. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.

REVISIONS:

No.	Date:	By:	Revisions

REFERENCE:

AECOM, FILE No.: FOX-4.4 Year 1 LF MON.dwg, Mar. 2014

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SCALE 1:1000

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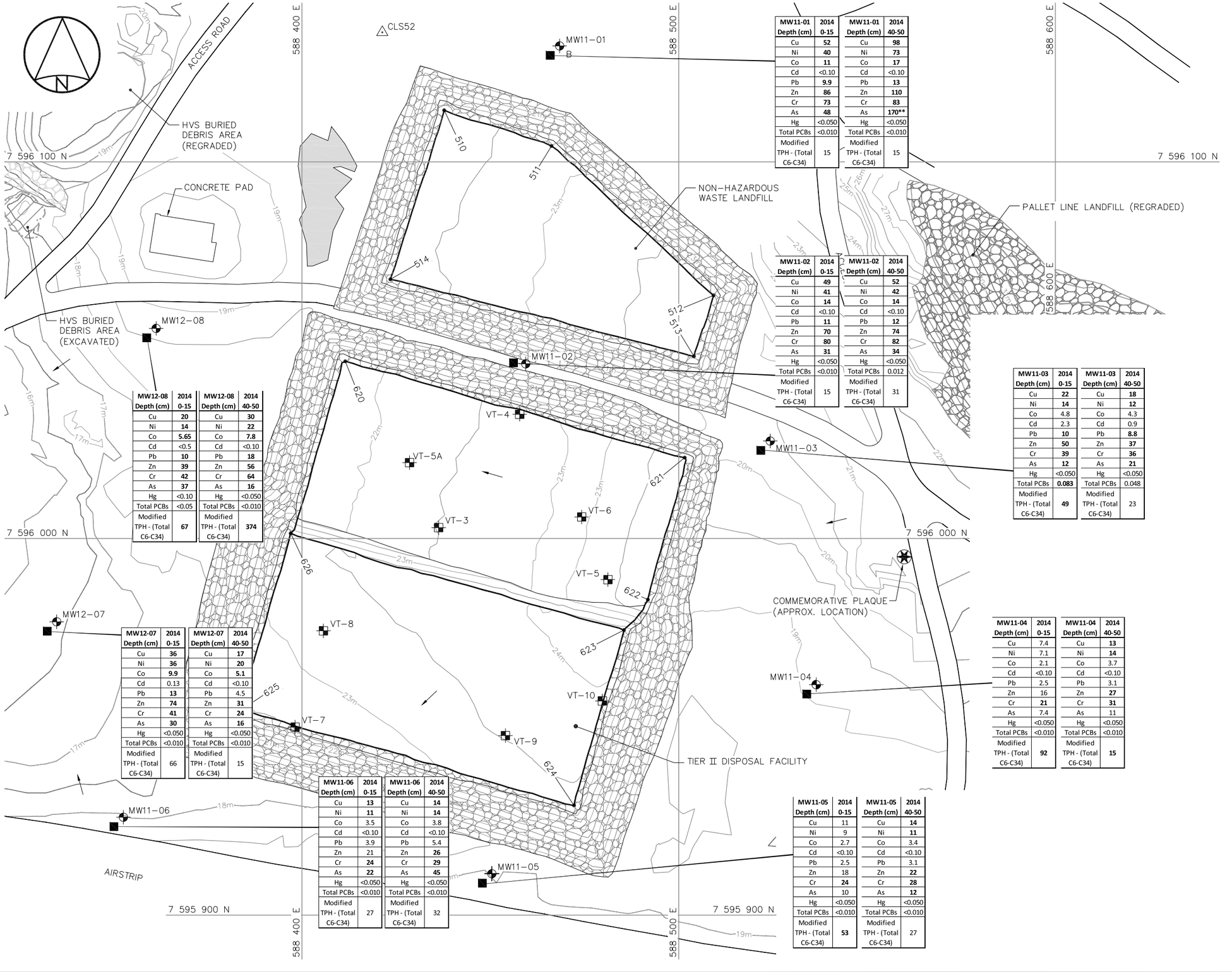
PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

2014 DEW LINE MONITORING PROGRAM

FOX-4 CAPE HOOPER, NUNAVUT
AIRSTRIP AREA
NON-HAZARDOUS WASTE LANDFILL AND TIER II DISPOSAL FACILITY

Drawn By: I.S.Z.	Approved By: C.F.G.	Project No: 350600-515-2
Date: FEB. 2015	Scale: 1:1000	Drawing No: FIGURE 2

Sheet Size: 11 x 17 (432mm x 279mm)
PLOT: March-02-15 4:56:40 PM
Saved by: Izabela Ziba
SENES FILE NO.: 350600-515-2 FOX-4_Fig 2 - Airstrip Area_Non-Haz Land_Tier II Disp.dwg



MW11-01 Depth (cm)	2014 0-15
Cu	52
Ni	40
Co	11
Cd	<0.10
Pb	9.9
Zn	86
Cr	73
As	48
Hg	<0.050
Total PCBs	<0.010
Modified TPH - (Total C6-C34)	15

MW11-01 Depth (cm)	2014 40-50
Cu	98
Ni	73
Co	17
Cd	<0.10
Pb	13
Zn	110
Cr	83
As	170**
Hg	<0.050
Total PCBs	<0.010
Modified TPH - (Total C6-C34)	15

MW11-02 Depth (cm)	2014 0-15
Cu	49
Ni	41
Co	14
Cd	<0.10
Pb	11
Zn	70
Cr	80
As	31
Hg	<0.050
Total PCBs	<0.010
Modified TPH - (Total C6-C34)	15

MW11-02 Depth (cm)	2014 40-50
Cu	52
Ni	42
Co	14
Cd	<0.10
Pb	12
Zn	74
Cr	82
As	34
Hg	<0.050
Total PCBs	0.012
Modified TPH - (Total C6-C34)	31

MW11-03 Depth (cm)	2014 0-15
Cu	22
Ni	14
Co	4.8
Cd	2.3
Pb	10
Zn	50
Cr	39
As	12
Hg	<0.050
Total PCBs	0.083
Modified TPH - (Total C6-C34)	49

MW11-03 Depth (cm)	2014 40-50
Cu	18
Ni	12
Co	4.3
Cd	0.9
Pb	8.8
Zn	37
Cr	36
As	21
Hg	<0.050
Total PCBs	0.048
Modified TPH - (Total C6-C34)	23

MW12-08 Depth (cm)	2014 0-15
Cu	20
Ni	14
Co	5.65
Cd	<0.5
Pb	10
Zn	39
Cr	42
As	37
Hg	<0.10
Total PCBs	<0.05
Modified TPH - (Total C6-C34)	67

MW12-08 Depth (cm)	2014 40-50
Cu	30
Ni	22
Co	7.8
Cd	<0.10
Pb	18
Zn	56
Cr	64
As	16
Hg	<0.050
Total PCBs	<0.010
Modified TPH - (Total C6-C34)	374

MW12-07 Depth (cm)	2014 0-15
Cu	36
Ni	36
Co	9.9
Cd	0.13
Pb	13
Zn	74
Cr	41
As	30
Hg	<0.050
Total PCBs	<0.010
Modified TPH - (Total C6-C34)	66

MW12-07 Depth (cm)	2014 40-50
Cu	17
Ni	20
Co	5.1
Cd	<0.10
Pb	4.5
Zn	31
Cr	24
As	16
Hg	<0.050
Total PCBs	<0.010
Modified TPH - (Total C6-C34)	15

MW11-04 Depth (cm)	2014 0-15
Cu	7.4
Ni	7.1
Co	2.1
Cd	<0.10
Pb	2.5
Zn	16
Cr	21
As	7.4
Hg	<0.050
Total PCBs	<0.010
Modified TPH - (Total C6-C34)	92

MW11-04 Depth (cm)	2014 40-50
Cu	13
Ni	14
Co	3.7
Cd	<0.10
Pb	3.1
Zn	27
Cr	31
As	11
Hg	<0.050
Total PCBs	<0.010
Modified TPH - (Total C6-C34)	15

MW11-06 Depth (cm)	2014 0-15
Cu	13
Ni	11
Co	3.5
Cd	<0.10
Pb	3.9
Zn	21
Cr	24
As	22
Hg	<0.050
Total PCBs	<0.010
Modified TPH - (Total C6-C34)	27

MW11-06 Depth (cm)	2014 40-50
Cu	14
Ni	14
Co	3.8
Cd	<0.10
Pb	5.4
Zn	26
Cr	29
As	45
Hg	<0.050
Total PCBs	<0.010
Modified TPH - (Total C6-C34)	32

MW11-05 Depth (cm)	2014 0-15
Cu	11
Ni	9
Co	2.7
Cd	<0.10
Pb	2.5
Zn	18
Cr	24
As	10
Hg	<0.050
Total PCBs	<0.010
Modified TPH - (Total C6-C34)	53

MW11-05 Depth (cm)	2014 40-50
Cu	14
Ni	11
Co	3.4
Cd	<0.10
Pb	3.1
Zn	22
Cr	28
As	12
Hg	<0.050
Total PCBs	<0.010
Modified TPH - (Total C6-C34)	27

LEGEND:

- CLS50 — SURVEY CONTROL MONUMENT (1)
- 510 — COORDINATE POINT
- MONITORING WELL LOCATION (8)
- VERTICAL GROUND TEMPERATURE CABLE LOCATION (10)
- MONITORING SOIL SAMPLE LOCATION (8)
- TYPE 1 GRANULAR FILL
- BODY OF WATER
- 22m — CONTOURS IN 0.5m INTERVALS
- OVERLAND FLOW DIRECTION

Parameter	Baseline Average Concentration	DEW Line Tier I Cleanup Criteria	DEW Line Tier II Cleanup Criteria
Cu	13	N/A	100
Ni	10	N/A	100
Co	5.0	N/A	50
Cd	1.0	N/A	5
Pb	5.6	200	500
Zn	22	N/A	500
Cr	21	N/A	250
As	12	N/A	130
Hg	0.100	N/A	2.0
Total PCB	0.050	1	5
Modified TPH - (Total C6-C34)	41	N/A	2500

All Concentrations in mg/kg

Bold — Concentration is Equal to or Exceeds Baseline Average Concentration

* — Concentration Exceeds DEW Line Tier I Cleanup Criteria

** — Concentration Exceeds DEW Line Tier II Cleanup Criteria

\- — No Concentration Reported

N/A — Not Applicable

NOTES:

1. LOCATIONS AND SCALE OF FEATURES ARE APPROXIMATE AND SHOWN FOR ILLUSTRATIVE PURPOSES ONLY.
2. ALL COORDINATES ARE REFERENCED TO NAD83 (CSRS), UTM ZONE 19N.
3. ALL ELEVATIONS REFER TO GEODETIC DATUM.
4. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.

REFERENCE:

AECOM, FILE No.: FOX-4.4 Year 1 LF MON.dwg, Mar. 2014

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SENES Consultants AN ARCADIS COMPANY

PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

2014 DEW LINE MONITORING PROGRAM

FOX-4 CAPE HOOPER, NUNAVUT
AIRSTRIP AREA
NON-HAZARDOUS WASTE LANDFILL AND
TIER II DISPOSAL FACILITY

SOIL CONTAMINANT DISTRIBUTION PLAN

Drawn By:	Approved By:	Project No:
I.S.Z.	C.F.G.	350600-515-2
Date: FEB. 2015	Scale: 1:1000	Drawing No: FIGURE 2A

Sheet Size: 11 x 17 (432mm x 279mm)
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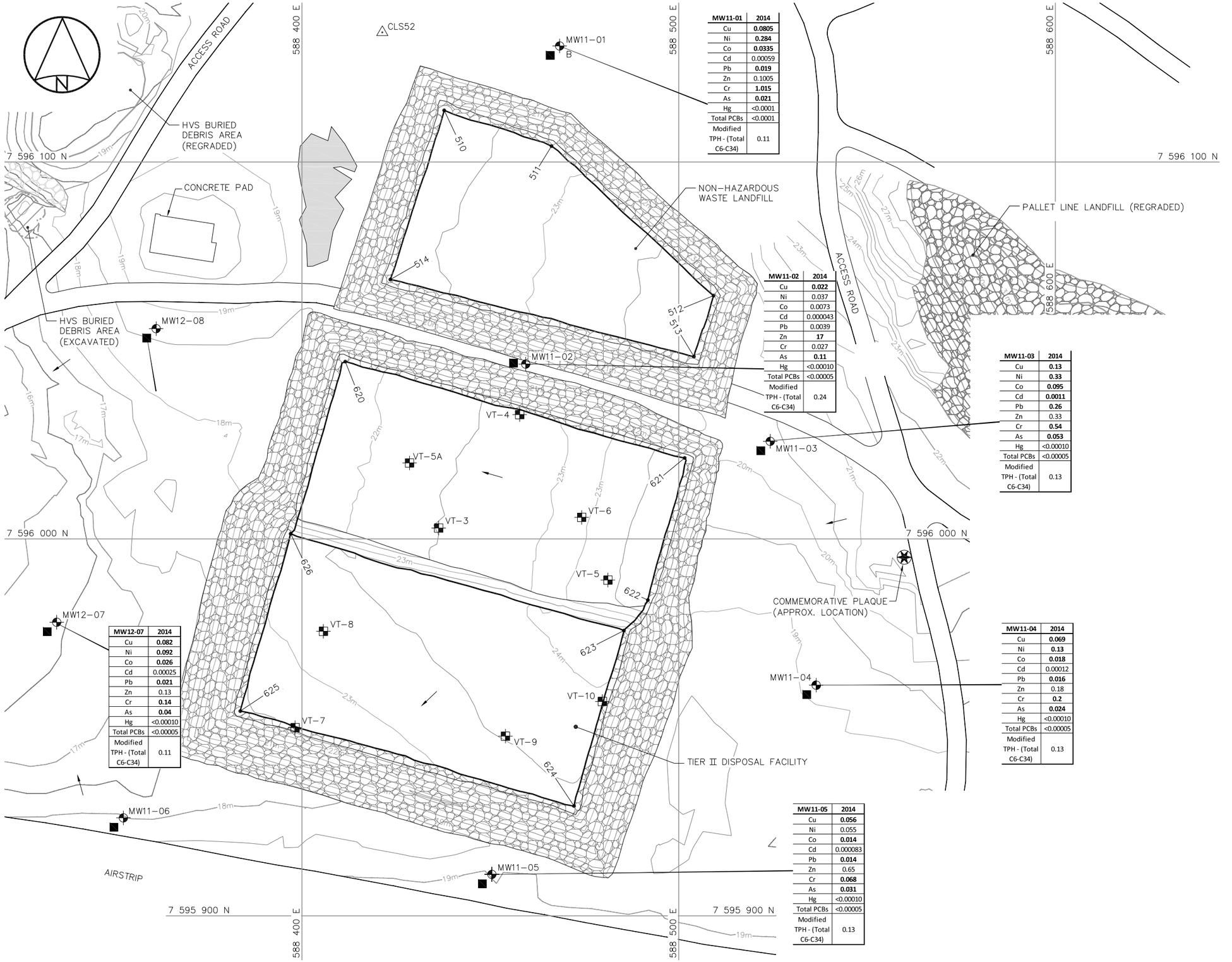
Saved by: Izabela Ziba
SENES FILE NO.: 350600-515-2 FOX-4_Fig 2 - Airstrip Area_Non-Haz Land_Tier II Disp.dwg



MW11-01	2014
Cu	**0.0805**
Ni	**0.284**
Co	**0.0335**
Cd	0.00059
Pb	**0.019**
Zn	0.1005
Cr	**1.015**
As	**0.021**
Hg	<0.0001
Total PCBs	<0.0001
Modified TPH - (Total C6-C34)	0.11

MW11-02	2014
Cu	**0.022**
Ni	0.037
Co	0.0073
Cd	0.000043
Pb	0.0039
Zn	**17**
Cr	0.027
As	**0.11**
Hg	<0.00010
Total PCBs	<0.00005
Modified TPH - (Total C6-C34)	0.24

MW11-03	2014
Cu	**0.13**
Ni	**0.33**
Co	**0.095**
Cd	**0.0011**
Pb	**0.26**
Zn	0.33
Cr	**0.54**
As	**0.053**
Hg	<0.00010
Total PCBs	<0.00005
Modified TPH - (Total C6-C34)	0.13

MW11-04	2014
Cu	**0.069**
Ni	**0.13**
Co	**0.018**
Cd	0.00012
Pb	**0.016**
Zn	0.18
Cr	**0.2**
As	**0.024**
Hg	<0.00010
Total PCBs	<0.00005
Modified TPH - (Total C6-C34)	0.13

MW11-05	2014
Cu	**0.056**
Ni	0.055
Co	**0.014**
Cd	0.000083
Pb	**0.014**
Zn	0.65
Cr	**0.068**
As	**0.031**
Hg	<0.00010
Total PCBs	<0.00005
Modified TPH - (Total C6-C34)	0.13

MW12-07	2014
Cu	**0.082**
Ni	**0.092**
Co	**0.026**
Cd	0.00025
Pb	**0.021**
Zn	0.13
Cr	**0.14**
As	**0.04**
Hg	<0.00010
Total PCBs	<0.00005
Modified TPH - (Total C6-C34)	0.11

LEGEND:

- CLS50 — SURVEY CONTROL MONUMENT (1)
- 510 — COORDINATE POINT
- MONITORING WELL LOCATION (8)
- VERTICAL GROUND TEMPERATURE CABLE LOCATION (10)
- MONITORING SOIL SAMPLE LOCATION (8)
- TYPE 1 GRANULAR FILL
- BODY OF WATER
- 22m — CONTOURS IN 0.5m INTERVALS
- OVERLAND FLOW DIRECTION

Parameter	Baseline Average Concentration
Cu	0.010
Ni	0.057
Co	0.0087
Cd	0.0010
Pb	0.0071
Zn	0.84
Cr	0.0306
As	0.0183
Hg	0.0006
Total PCB	0.0001
Modified TPH - (Total C6-C34)	0.65

All Concentrations in mg/L

Bold — Concentration is Equal to or Exceeds Baseline Average Concentration

\- — No Concentration Reported

N/A — Not Applicable

NOTES:

1. LOCATIONS AND SCALE OF FEATURES ARE APPROXIMATE AND SHOWN FOR ILLUSTRATIVE PURPOSES ONLY.
2. ALL COORDINATES ARE REFERENCED TO NAD83 (CSRS), UTM ZONE 19N.
3. ALL ELEVATIONS REFER TO GEODETIC DATUM.
4. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.

REFERENCE:

AECOM, FILE No.: FOX-4.4 Year 1 LF MON.dwg, Mar. 2014

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SCALE 1:1000

SENES Consultants AN ARCADIS COMPANY

PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

2014 DEW LINE MONITORING PROGRAM

FOX-4 CAPE HOOPER, NUNAVUT

AIRSTRIP AREA - NON-HAZARDOUS WASTE LANDFILL AND TIER II DISPOSAL FACILITY

GROUNDWATER CONTAMINANT DISTRIBUTION PLAN

Drawn By: I.S.Z.	Approved By: C.F.G.	Project No: 350600-515-2
Date: FEB. 2015	Scale: 1:1000	Drawing No: FIGURE 2B

Table 3.1: Summary of Work Conducted by Soil Sampling Location (Non-Hazardous Waste Landfill and Tier II Disposal Facility)

Location	Surface Soil Sample Collected	Subsurface Soil Sample Collected
F4-NH-MW11-01	√	√
F4-NH-MW11-02	√	√
F4-NH-MW11-03	√	√
F4-NH-MW11-04	√	√
F4-NH-MW11-05	√	√
F4-NH-MW11-06	√	√
F4-NH-MW12-07	√	√
F4-NH-MW12-08	√[D]	√

D = duplicate sample collected
√ - sample collected
X – no sample collected

3.2.3 Groundwater Sampling

Groundwater monitoring was completed at eight monitoring wells as shown on Figure 2. Inspection of the groundwater monitoring wells and groundwater sampling at the Non-Hazardous Waste Landfill and Tier II Disposal Facility was generally completed as per the work plan. No samples were collected from monitoring wells MW11-06 and MW12-08 as these locations as these wells were dry during this monitoring event. One duplicate groundwater sample was collected from monitoring well MW11-01. Groundwater sampling completed at the landfill is summarized in Table 3.2

Table 3.2: Summary of Work Conducted by Groundwater Sampling Location (Non-Hazardous Waste Landfill and Tier II Disposal Facility)

Location	Visual Inspection/ Groundwater Monitoring	Sample collected for PCB analysis	Sample collected for metals analysis	Sample collected for PHCs F1-F4 analysis
F4-NH-MW11-01	√	√[D]	√[D]	√[D]
F4-NH-MW11-02	√	√	√	√
F4-NH-MW11-03	√	√	√	√
F4-NH-MW11-04	√	√	√	√
F4-NH-MW11-05	√	√	√	√
F4-NH-MW11-06	√	X[N]	X[N]	X[N]
F4-NH-MW12-07	√	√	√	√
F4-NH-MW12-08	√	X[N]	X[N]	X[N]

D = duplicate sample collected
√ - sample collected
X – no sample collected
N – no water in well (well was dry)
I – insufficient water in well to collect sample

3.2.4 Thermal Monitoring

Thermal monitoring was completed at the nine vertical thermistor locations at the Non-Hazardous Waste Landfill and Tier II Disposal Facility. A summary of thermistor work completed at this landfill is provided in Table 3.3. Replacement of datalogger batteries at this landfill was not part of the scope of work.

Table 3.3: Summary of Work Conducted by Thermistor Location (Non-Hazardous Waste Landfill and Tier II Disposal Facility)

Location	Realtime Data	Data Downloaded	Batteries Replaced
F4-VT-3	√	√	X
F4-VT-4	√	√	X
F4-VT-5	√	√	X
F4-VT-6	√	√	X
F4-VT-7	√	√	X
F4-VT-8	X	X	X
F4-VT-9	X	X	X
F4-VT-10	√	√	X
VT-5A	√	√	X

3.3 RESULTS OF THE MONITORING PROGRAM

3.3.1 Visual Inspection

The visual inspection at the Non-Hazardous Waste Landfill and Tier II Disposal Facility was completed on 26 August 2014. The results of the visual inspection are detailed in Table 3.4 and shown on Figure 2 and in the photo log Table 3.7.

Table 3.4: Visual Inspection Results (Non-Hazardous Waste Landfill and Tier II Disposal Facility)

Item	Description
Settlement	Minor settlement in the form of a small depression was observed on the northeast corner of the Non-Hazardous Waste Landfill (Feature I).
Erosion	Small erosion channels were noted on the west and east sides of the Tier II Disposal Facility, on the small slope between the north and south cells (Feature C, D).
Frost Action	None observed.
Sloughing and Cracking	None observed.
Animal Burrows	None observed.
Vegetation	None observed.
Staining	Natural red staining was observed on ponded water located between the Non-Hazardous Waste Landfill and the Tier II Disposal Facility (Feature F).
Vegetation Stress	None observed.
Seepage Points	No active seepage points were observed.
Debris Exposed	Two instances of small metal debris were noted on the south side of the Non-Hazardous Waste Landfill. These pieces of debris did not originate within the landfill (Feature G, H).
Presence/Condition of Monitoring Instruments	Nine vertical thermistor installations and eight monitoring well installations were observed at the landfill. These monitoring installations were found to be in good condition.
Other Features of Note	Vehicle tracks/ruts were observed on the west and east sides of the Tier II Disposal Facility (Feature A). Ponded water was located around and in between the landfill cells (Feature B, E, F, J).

3.3.1.1 Inspection Checklist

The visual inspection checklist completed during the site inspection is provided in Table 3.5.

3.3.1.2 Stability Assessment

Details on the preliminary stability assessment completed during the inspection of the Non-Hazardous Waste Landfill and Tier II Disposal Facility are provided in Table 3.6.

TABLE 3.5 - VISUAL INSPECTION CHECKLIST

DEW LINE CLEANUP: POST-CONSTRUCTION - LANDFILL MONITORING
INSPECTION REPORT – PAGE 1 OF 2

SITE NAME: FOX-4
LANDFILL DESIGNATION: Non-Hazardous Waste Landfill and Tier II Disposal Facility
DATE OF INSPECTION: 25-26 August 2014
DATE OF PREVIOUS INSPECTION: N/A
INSPECTED BY: J. Mauchan/S. Borcsok
REPORT PREPARED BY: S. Borcsok
The inspector/reporter represents to the best of their knowledge, the following statements and observations are true and correct and to the best of the preparer's actual knowledge, no material facts have been suppressed or misstated.

TABLE 3.5 - VISUAL INSPECTION CHECKLIST - INSPECTION REPORT – PAGE 2 OF 2

Checklist Item	Present Yes/No	Location (Describe relative to existing monuments/features and relative to landfill design i.e. surface, berms, toe)	Length	Width	Depth	Extent relative to Area of Landfill (%)	Description	Photographic Records Focal length, location, view point & direction (relative to magnetic north) Feature of note Scale	Additional Comments
Settlement	YES	NE Corner of NonHaz Landfill (Feature I)	0.3	0.3	0.2	<1%	Small depression	15.4, 15.5	
Erosion	YES	West and east sides of slope between north and south cells of Tier II Disp. Facility (Feature C, D)	3	2	0.2	<1%	Small erosion channels	22.1	
Frost Action	NO								
Sloughing and Cracking	NO								
Animal Burrows	NO								
Vegetation	YES								
Staining	YES	In ponded water in channel between NH Landfill and Tier II Disposal Facility (Feature F)							
Vegetation Stress	NO								
Seepage Points	NO								
Debris Exposed	YES	South berm of Non-Hazardous Waste Landfill (Feature G, H)				<1%	Small metal debris	18.1, 67.1	
Presence/Condition – Monitoring Instruments	YES	Nine thermistor installations and eight monitoring wells							One thermistor not on provided drawings
Features of Note.	YES	Vehicle tracks/ruts on east/west sides of Tier II Disposal Facility (Feature A), ponded water around landfill (Feature B, E, F, J)				<1%	Tire ruts	22.2, 22.3	

Table 3.6: Preliminary Stability Assessment - FOX-4 NonHaz Landfill/Tier II Disposal

Feature	Severity Rating	Extent
Settlement	Acceptable	Isolated
Erosion	Acceptable	Occasional
Frost Action	None	None
Staining	Acceptable	Isolated
Vegetation Stress	None	None
Seepage/Ponded Water	Acceptable	Occasional
Debris exposure	Acceptable	Occasional
Overall Landfill Performance: ACCEPTABLE		

Performance/ Severity Rating	Description
Acceptable	Noted features are of little consequence. The landfill is performing as designed. Minor deviations in environmental or physical performance may be observed, such as isolated areas of erosion, settlement.
Marginal	Physical/environmental performance appears to be deteriorating with time. Observations may include an increase in size or number of features of note, such as differential settlement, erosion or cracking. No significant impact on landfill stability to date, but potential for failure is assessed as low or moderate.
Significant	Significant or potentially significant changes affecting landfill stability, such as significant changes in slope geometry, significant erosion or differential settlement; scarp development. The potential for failure is assessed as imminent.
Unacceptable	Stability of landfill is compromised to the extent that ability to contain waste materials is compromised. Examples may include: - Debris exposed in erosion channels or areas of differential settlement. - Liner exposed. - Slope failure.

Extent	Description
Isolated	Singular feature
Occasional	Features of note occurring at irregular intervals/locations
Numerous	Many features of note, impacted less than 50% of the surface area of the landfill
Extensive	Impacting greater than 50% of the surface area of the landfill

3.3.1.3 Photographic Records

The photograph log for Non-Hazardous Waste Landfill and Tier II Disposal Facility provided in Table 3.7.

3.3.1.4 Trend Analysis

The Non-Hazardous Waste Landfill and Tier II Disposal Facility were newly constructed between 2011 and 2013. The 2014 monitoring event is the first monitoring event at this landfill, so no trends can be established until another monitoring event occurs.

3.3.1.5 Discussion of Results/Trends

The results of the visual inspection indicate that the performance of the landfill is acceptable. All identified issues were minor and of no consequence to the performance of the landfill.

3.3.2 Soil Sampling

Soil sampling at the Non-Hazardous Waste Landfill and Tier II Disposal Facility was completed on 24 August 2014. As previously reported a total of seventeen samples including one duplicate sample were procured from eight locations as shown in plan on Figure 2.

3.3.2.1 Laboratory Analytical Results

The analytical results for soil samples collected at the Non-Hazardous Waste Landfill and Tier II Disposal Facility are presented in Table 3.8.

A duplicate soil sample was collected from surficial soils at sample location MW12-08 and was submitted to AGAT, a secondary laboratory for QA/QC purposes. The RPDs for the duplicate sample results were above 30% for seven of eleven parameters. In these cases, parameter concentrations were very low and small differences in reported concentrations resulted in large RPD values. The duplicate sample results are believed to be consistent.

3.3.2.2 Discussion of Results – Comparison to Baseline/Background

A discussion of the results for each parameter analyzed in soil at the Non-Hazardous Waste Landfill and Tier II Disposal Facility is provided in Table 3.9. The discussion includes a comparison of results from upgradient (MW11-01) and downgradient (MW11-02, MW11-03, MW11-04, MW11-05, MW11-06, MW12-07, MW12-08) soil sampling locations to the baseline average concentrations (BAC) that have been determined for each landfill from soil chemistry at the landfill area prior to and during remediation. Upgradient locations are those near the landfill that are not influenced by migration of contaminants through the landfill, and downgradient locations are at the toe of the landfill or from areas of preferential drainage.

TABLE 3.7: LANDFILL VISUAL INSPECTION PHOTO LOG (NON-HAZARDOUS WASTE LANDFILL AND TIER II DISPOSAL FACILITY)

FOX-4 Non-Hazardous Waste Landfill and Tier II Disposal Facility (see Figure 2)

Photo 1.1 (FOX-4 NHT2 P-1 east.jpg)	Photo 1.2 (FOX-4 NHT2 P-1 north.jpg)
Description: View east looking down corridor between the Non-Hazardous Landfill on the left and the Tier II Disposal Facility on the right.	Description: View north along western slope of the Non-Hazardous Waste Facility.
	
Date: August 26, 2014	Date: August 26, 2014

TABLE 3.7: LANDFILL VISUAL INSPECTION PHOTO LOG (NON-HAZARDOUS WASTE LANDFILL AND TIER II DISPOSAL FACILITY)

Photo 1.3 (FOX-4 NHT2 P-1 south.jpg)	Photo 2.1 (FOX-4 NHT2 P-2 east.jpg)
Description: View south along western slope of Tier II Disposal Facility.	Description: View east along northern slope of the Non-Hazardous Waste Landfill.
	
Date: August 26, 2014	Date: August 26, 2014

TABLE 3.7: LANDFILL VISUAL INSPECTION PHOTO LOG (NON-HAZARDOUS WASTE LANDFILL AND TIER II DISPOSAL FACILITY)

Photo 2.2 (FOX-4 NHT2 P-2 south.jpg)	Photo 3.1 (FOX-4 NHT2 P-3 se.jpg)
Description: View south along western slope of the Non-Hazardous Waste Landfill.	Description: View southeast along the northeastern slope of the Non-Hazardous Waste Landfill.
	
Date: August 26, 2014	Date: August 26, 2014

TABLE 3.7: LANDFILL VISUAL INSPECTION PHOTO LOG (NON-HAZARDOUS WASTE LANDFILL AND TIER II DISPOSAL FACILITY)

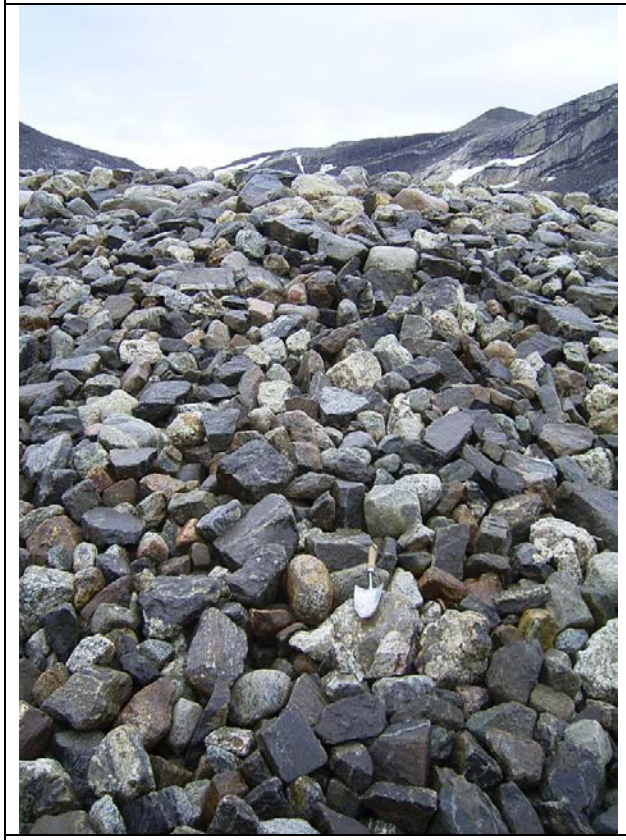
Photo 3.2 (FOX-4 NHT2 P-3 south.jpg)	Photo 3.3 (FOX-4 NHT2 P-3 west.jpg)
Description: View of the northern slope of the Non-Hazardous Waste Landfill	Description: View west along the northern slope of the Non-Hazardous Waste Landfill.
	
Date: August 26, 2014	Date: August 26, 2014

TABLE 3.7: LANDFILL VISUAL INSPECTION PHOTO LOG (NON-HAZARDOUS WASTE LANDFILL AND TIER II DISPOSAL FACILITY)

Photo 4.1 (FOX-4 NHT2 P-4 south.jpg)	Photo 4.2 (FOX-4 NHT2 P-4 west.jpg)
Description: View south along eastern slope of the Non-Hazardous Waste Landfill.	Description: View west of the northeastern slope of the Non-Hazardous Waste Landfill.
	
Date: August 26, 2014	Date: August 26, 2014

TABLE 3.7: LANDFILL VISUAL INSPECTION PHOTO LOG (NON-HAZARDOUS WASTE LANDFILL AND TIER II DISPOSAL FACILITY)

Photo 5.1 (FOX-4 NHT2 P-5 north.jpg)	Photo 5.2 (FOX-4 NHT2 P-5 nw.jpg)
Description: View north of the eastern slope of the Non-Hazardous Waste Landfill.	Description: View of the southeastern corner of the Non-Hazardous Waste Landfill.
	
Date: August 26, 2014	Date: August 26, 2014

TABLE 3.7: LANDFILL VISUAL INSPECTION PHOTO LOG (NON-HAZARDOUS WASTE LANDFILL AND TIER II DISPOSAL FACILITY)

Photo 5.3 (FOX-4 NHT2 P-5 south.jpg)	Photo 5.4 (FOX-4 NHT2 P-5 sw.jpg)
Description: View south of the eastern slope of the Tier II Disposal Facility.	Description: View of northern slope of Tier II Disposal Facility.
	
Date: August 26, 2014	Date: August 26, 2014

TABLE 3.7: LANDFILL VISUAL INSPECTION PHOTO LOG (NON-HAZARDOUS WASTE LANDFILL AND TIER II DISPOSAL FACILITY)

Photo 5.5 (FOX-4 NHT2 P-5 west.jpg)	Photo 6.1 (FOX-4 NHT2 P-6 north.jpg)
Description: View east along corridor between the Tier II Disposal Facility (left) and the Non-Hazardous Waste Landfill (right).	Description: View north of the eastern slope of the Tier II Disposal Facility.
	
Date: August 26, 2014	Date: August 26, 2014

TABLE 3.7: LANDFILL VISUAL INSPECTION PHOTO LOG (NON-HAZARDOUS WASTE LANDFILL AND TIER II DISPOSAL FACILITY)

Photo 6.2 (FOX-4 NHT2 P-6 south.jpg)	Photo 7.1 (FOX-4 NHT2 P-7 north.jpg)
Description: View south of the eastern slope of the Tier II Disposal Facility	Description: The eastern slope of the Tier II Disposal Facility. VT-10 seen at top of slope.
	
Date: August 26, 2014	Date: August 26, 2014

TABLE 3.7: LANDFILL VISUAL INSPECTION PHOTO LOG (NON-HAZARDOUS WASTE LANDFILL AND TIER II DISPOSAL FACILITY)

Photo 7.2 (FOX-4 NHT2 P-7 nw.jpg)	Photo 7.3 (FOX-4 NHT2 P-7 west.jpg)
Description: The southeastern corner of the Tier II Disposal Facility	Description: The southern slope of the Tier II Disposal Facility.
	
Date: August 26, 2014	Date: August 26, 2014

TABLE 3.7: LANDFILL VISUAL INSPECTION PHOTO LOG (NON-HAZARDOUS WASTE LANDFILL AND TIER II DISPOSAL FACILITY)

Photo 8.1 (FOX-4 NHT2 P-8 east.jpg)	Photo 8.2 (FOX-4 NHT2 P-8 north.jpg)
Description: View east along the southern slope of the Tier II Disposal Facility.	Description: The southern slope of the Tier II Disposal Facility.
	
Date: August 26, 2014	Date: August 26, 2014

TABLE 3.7: LANDFILL VISUAL INSPECTION PHOTO LOG (NON-HAZARDOUS WASTE LANDFILL AND TIER II DISPOSAL FACILITY)

Photo 8.3 (FOX-4 NHT2 P-8 west.jpg)	Photo 9.1 (FOX-4 NHT2 P-9 nw.jpg)
Description: View east over ponded water at the toe of the southern slope of the Tier II Disposal Facility. **(FEATURE B)**	Description: View of the western part of the southern slope of the Tier II Disposal Facility. Ponded water observed at toe. **(FEATURE B)**
	
Date: August 26, 2014	Date: August 26, 2014

TABLE 3.7: LANDFILL VISUAL INSPECTION PHOTO LOG (NON-HAZARDOUS WASTE LANDFILL AND TIER II DISPOSAL FACILITY)

Photo 9.2 (FOX-4 NHT2 P-9 west.jpg)	Photo 10.1 (FOX-4 NHT2 P-10 east.jpg)
Description: Ponded water at the toe of the southern slope of the Tier II Disposal Facility. **(FEATURE B)**	Description: View east from southwestern corner of the Tier II Disposal Facility.
	
Date: August 26, 2014	Date: August 26, 2014

TABLE 3.7: LANDFILL VISUAL INSPECTION PHOTO LOG (NON-HAZARDOUS WASTE LANDFILL AND TIER II DISPOSAL FACILITY)

Photo 10.2 (FOX-4 NHT2 P-10 ne.jpg)	Photo 10.3 (FOX-4 NHT2 P-10 north.jpg)
Description: The southwestern corner of the Tier II Disposal Facility.	Description: View north along the western slope of the Tier II Disposal Facility.
	
Date: August 26, 2014	Date: August 26, 2014

TABLE 3.7: LANDFILL VISUAL INSPECTION PHOTO LOG (NON-HAZARDOUS WASTE LANDFILL AND TIER II DISPOSAL FACILITY)

Photo 11.1 (FOX-4 NHT2 P-11 east.jpg)	Photo 11.2 (FOX-4 NHT2 P-11 north.jpg)
Description: The western slope of the Tier II Disposal Facility.	Description: View north along western slope of the Tier II Disposal Facility.
	
Date: August 26, 2014	Date: August 26, 2014

TABLE 3.7: LANDFILL VISUAL INSPECTION PHOTO LOG (NON-HAZARDOUS WASTE LANDFILL AND TIER II DISPOSAL FACILITY)

Photo 11.3 (FOX-4 NHT2 P-11 south.jpg)	Photo 12.1 (FOX-4 NHT2 P-12 east.jpg)
Description: View south of the western slope of the Tier II Disposal Facility.	Description: View east along Non-Hazardous Waste Landfill cap. Corridor adjacent to the Tier II Disposal Facility is seen on the left hand side. The stakes in the corridor demarcate the MW11-02 location.
	
Date: August 26, 2014	Date: August 26, 2014

TABLE 3.7: LANDFILL VISUAL INSPECTION PHOTO LOG (NON-HAZARDOUS WASTE LANDFILL AND TIER II DISPOSAL FACILITY)

Photo 12.2 (FOX-4 NHT2 P-12 ne.jpg)	Photo 12.3 (FOX-4 NHT2 P-12 north.jpg)
Description: View of the Non-Hazardous Waste Landfill cap from the southwest corner.	Description: The western part of the cap of the Non-Hazardous Waste Landfill.
	
Date: August 26, 2014	Date: August 26, 2014

TABLE 3.7: LANDFILL VISUAL INSPECTION PHOTO LOG (NON-HAZARDOUS WASTE LANDFILL AND TIER II DISPOSAL FACILITY)

Photo 13.1 (FOX-4 NHT2 P-13 east.jpg)	Photo 13.2 (FOX-4 NHT2 P-13 se.jpg)
Description: View east of the northern part of the Non-Hazardous Waste Landfill.	Description: View of the Non-Hazardous Waste Landfill cap from the northwest corner.
	
Date: August 26, 2014	Date: August 26, 2014

TABLE 3.7: LANDFILL VISUAL INSPECTION PHOTO LOG (NON-HAZARDOUS WASTE LANDFILL AND TIER II DISPOSAL FACILITY)

Photo 13.3 (FOX-4 NHT2 P-13 sw.jpg)	Photo 14.1 (FOX-4 NHT2 P-14 se.jpg)
Description: View of the western part of the Non-Hazardous Waste Landfill.	Description: View along top of northern slope of the Non-Hazardous Waste Landfill.
	
Date: August 26, 2014	Date: August 26, 2014

TABLE 3.7: LANDFILL VISUAL INSPECTION PHOTO LOG (NON-HAZARDOUS WASTE LANDFILL AND TIER II DISPOSAL FACILITY)

Photo 14.2 (FOX-4 NHT2 P-14 south.jpg)	Photo 14.3 (FOX-4 NHT2 P-14 west.jpg)
Description: View south across Non-Hazardous Waste Landfill cap.	Description: View west along top of northern slope.
	
Date: August 26, 2014	Date: August 26, 2014

TABLE 3.7: LANDFILL VISUAL INSPECTION PHOTO LOG (NON-HAZARDOUS WASTE LANDFILL AND TIER II DISPOSAL FACILITY)

Photo 15.1 (FOX-4 NHT2 P-15 nw.jpg)	Photo 15.2 (FOX-4 NHT2 P-15 south.jpg)
Description: View west along top of slope from the northeast corner of the Non-Hazardous Waste Landfill.	Description: The eastern top of slope of the Non-Hazardous Waste Landfill.
	
Date: August 26, 2014	Date: August 26, 2014

TABLE 3.7: LANDFILL VISUAL INSPECTION PHOTO LOG (NON-HAZARDOUS WASTE LANDFILL AND TIER II DISPOSAL FACILITY)

Photo 15.3 (FOX-4 NHT2 P-15 sw.jpg)	Photo 15.4 (FOX-4 NHT2 P-15 north.jpg)
Description: The Non-Hazardous Waste Landfill cap from the northeast corner.	Description: Small area of settlement at northeast corner of Non-Hazardous Waste Landfill. **(FEATURE I)**
	
Date: August 26, 2014	Date: August 26, 2014

TABLE 3.7: LANDFILL VISUAL INSPECTION PHOTO LOG (NON-HAZARDOUS WASTE LANDFILL AND TIER II DISPOSAL FACILITY)

Photo 15.5 (FOX-4 NHT2 P-15 closeup.jpg)	Photo 16.1 (FOX-4 NHT2 P-16 north.jpg)
Description: Minor settlement at northeast corner of Non-Hazardous Waste Landfill. **(FEATURE I)**	Description: The eastern top of slope of the Non-Hazardous Waste Landfill.
	
Date: August 26, 2014	

TABLE 3.7: LANDFILL VISUAL INSPECTION PHOTO LOG (NON-HAZARDOUS WASTE LANDFILL AND TIER II DISPOSAL FACILITY)

Photo 16.2 (FOX-4 NHT2 P-16 nw.jpg)	Photo 16.3 (FOX-4 NHT2 P-16 west.jpg)
Description: The Non-Hazardous Waste Landfill from the southeastern corner of the cap.	Description: The southern top of slope of the Non-Hazardous Waste Landfill. Northern slope of the Tier II Disposal Facility can be seen on the left.
	
Date: August 26, 2014	Date: August 26, 2014

TABLE 3.7: LANDFILL VISUAL INSPECTION PHOTO LOG (NON-HAZARDOUS WASTE LANDFILL AND TIER II DISPOSAL FACILITY)

Photo 17.1 (FOX-4 NHT2 P-17 east.jpg)	Photo 17.2 (FOX-4 NHT2 P-17 north.jpg)
Description: View of the Non-Hazardous Waste Landfill cap from the approximate centre.	Description: View of the Non-Hazardous Waste Landfill cap from the approximate centre.
	
Date: August 26, 2014	Date: August 26, 2014

TABLE 3.7: LANDFILL VISUAL INSPECTION PHOTO LOG (NON-HAZARDOUS WASTE LANDFILL AND TIER II DISPOSAL FACILITY)

Photo 17.3 (FOX-4 NHT2 P-17 south.jpg)	Photo 17.4 (FOX-4 NHT2 P-17 west.jpg)
Description: View of the Non-Hazardous Waste Landfill cap from the approximate centre.	Description: View of the Non-Hazardous Waste Landfill cap from the approximate centre.
	
Date: August 26, 2014	Date: August 26, 2014

TABLE 3.7: LANDFILL VISUAL INSPECTION PHOTO LOG (NON-HAZARDOUS WASTE LANDFILL AND TIER II DISPOSAL FACILITY)

Photo 18.1 (FOX-4 NHT2 P-18.jpg)	Photo 19.1 (FOX-4 NHT2 P-19 east.jpg)
Description: Minor debris (metal strapping) observed on the southern slope of the Non-Hazardous Waste Landfill. **(FEATURE H)**	Description: The top of the northern slope of the Tier II Disposal Facility.
	
Date: August 26, 2014	Date: August 26, 2014

TABLE 3.7: LANDFILL VISUAL INSPECTION PHOTO LOG (NON-HAZARDOUS WASTE LANDFILL AND TIER II DISPOSAL FACILITY)

Photo 19.2 (FOX-4 NHT2 P-19 se.jpg)	Photo 19.3 (FOX-4 NHT2 P-19 south.jpg)
Description: View southeast from the northwest corner of the Tier II Disposal Facility cap. VT-5A (foreground) and VT-3 (background) can be seen.	Description: The western top of slope of the Tier II Disposal Facility..
	
Date: August 26, 2014	Date: August 26, 2014

TABLE 3.7: LANDFILL VISUAL INSPECTION PHOTO LOG (NON-HAZARDOUS WASTE LANDFILL AND TIER II DISPOSAL FACILITY)

Photo 20.1 (FOX-4 NHT2 P-20 east.jpg)	Photo 20.2 (FOX-4 NHT2 P-20 south.jpg)
Description: View east toward northeastern corner of the Tier II Disposal Facility.	Description: View south over the Tier II Disposal Facility cap.
	
Date: August 26, 2014	Date: August 26, 2014

TABLE 3.7: LANDFILL VISUAL INSPECTION PHOTO LOG (NON-HAZARDOUS WASTE LANDFILL AND TIER II DISPOSAL FACILITY)

Photo 20.3 (FOX-4 NHT2 P-20 sw.jpg)	Photo 20.4 (FOX-4 NHT2 P-20 west.jpg)
Description: View southwest across Tier II Disposal Facility cap.	Description: The northern slope of the Tier II Disposal Facility. View west, toward VT-4.
	
Date: August 26, 2014	Date: August 26, 2014

TABLE 3.7: LANDFILL VISUAL INSPECTION PHOTO LOG (NON-HAZARDOUS WASTE LANDFILL AND TIER II DISPOSAL FACILITY)

Photo 21.1 (FOX-4 NHT2 P-21 south.jpg)	Photo 21.2 (FOX-4 NHT2 P-21 sw.jpg)
Description: The eastern top of slope of the Tier II Disposal Facility.	Description: The Tier II Disposal Facility cap from the northeastern corner.
	
Date: August 26, 2014	Date: August 26, 2014

TABLE 3.7: LANDFILL VISUAL INSPECTION PHOTO LOG (NON-HAZARDOUS WASTE LANDFILL AND TIER II DISPOSAL FACILITY)

Photo 21.3 (FOX-4 NHT2 P-21 west.jpg)	Photo 22.1 (FOX-4 NHT2 P-22 north.jpg)
Description: The northern top of slope of the Tier II Disposal Facility.	Description: The eastern top of slope of the Tier II Disposal Facility.
	
Date: August 26, 2014	Date: August 26, 2014

TABLE 3.7: LANDFILL VISUAL INSPECTION PHOTO LOG (NON-HAZARDOUS WASTE LANDFILL AND TIER II DISPOSAL FACILITY)

Photo 22.2 (FOX-4 NHT2 P-22 nw.jpg)	Photo 22.3 (FOX-4 NHT2 P-22 west.jpg)
Description: Vehicle tracks/ruts near VT-5. **(FEATURE A)**	Description: Vehicle tracks/ruts near VT-5. View west along middle slope of the Tier II Disposal Facility. **(FEATURE A)**
	
Date: August 26, 2014	Date: August 26, 2014

TABLE 3.7: LANDFILL VISUAL INSPECTION PHOTO LOG (NON-HAZARDOUS WASTE LANDFILL AND TIER II DISPOSAL FACILITY)

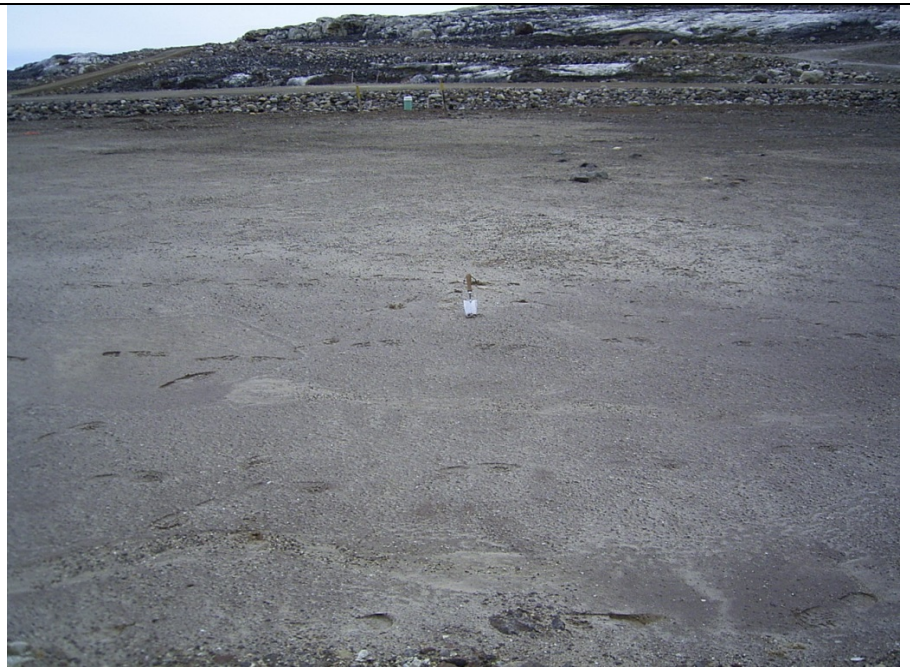
Photo 23.1 (FOX-4 NHT2 P-23 east.jpg)	Photo 23.2 (FOX-4 NHT2 P-23 north.jpg)
Description: View east along the middle slope which divides the northern and southern caps of the Tier II Disposal Facility.	Description: The northern cap of the Tier II Disposal Facility.
	
Date: August 26, 2014	Date: August 26, 2014

TABLE 3.7: LANDFILL VISUAL INSPECTION PHOTO LOG (NON-HAZARDOUS WASTE LANDFILL AND TIER II DISPOSAL FACILITY)

Photo 23.3 (FOX-4 NHT2 P-23 south.jpg)	Photo 23.4 (FOX-4 NHT2 P-23 west.jpg)
Description: The southern cap of the Tier II Disposal Facility.	Description: View west along middle slope of the Tier II Disposal Facility.
	
Date: August 26, 2014	Date: August 26, 2014

TABLE 3.7: LANDFILL VISUAL INSPECTION PHOTO LOG (NON-HAZARDOUS WASTE LANDFILL AND TIER II DISPOSAL FACILITY)

Photo 24.1 (FOX-4 NHT2 P-24 east.jpg)	Photo 24.2 (FOX-4 NHT2 P-24 ne.jpg)
Description: View east along middle slope of the Tier II Disposal Faciltiy.	Description: View northeast across the northern cap of the Tier II Disposal Facility.
	
Date: August 26, 2014	Date: August 26, 2014

TABLE 3.7: LANDFILL VISUAL INSPECTION PHOTO LOG (NON-HAZARDOUS WASTE LANDFILL AND TIER II DISPOSAL FACILITY)

Photo 24.3 (FOX-4 NHT2 P-24 north.jpg)	Photo 25.1 (FOX-4 NHT2 P-25 east.jpg)
Description: The western top of slope of the northern half of the Tier II Disposal Facilty.	Description: View east along top of middle slope of the Tier II Disposal Facility cap.
	
Date: August 26, 2014	Date: August 26, 2014

TABLE 3.7: LANDFILL VISUAL INSPECTION PHOTO LOG (NON-HAZARDOUS WASTE LANDFILL AND TIER II DISPOSAL FACILITY)

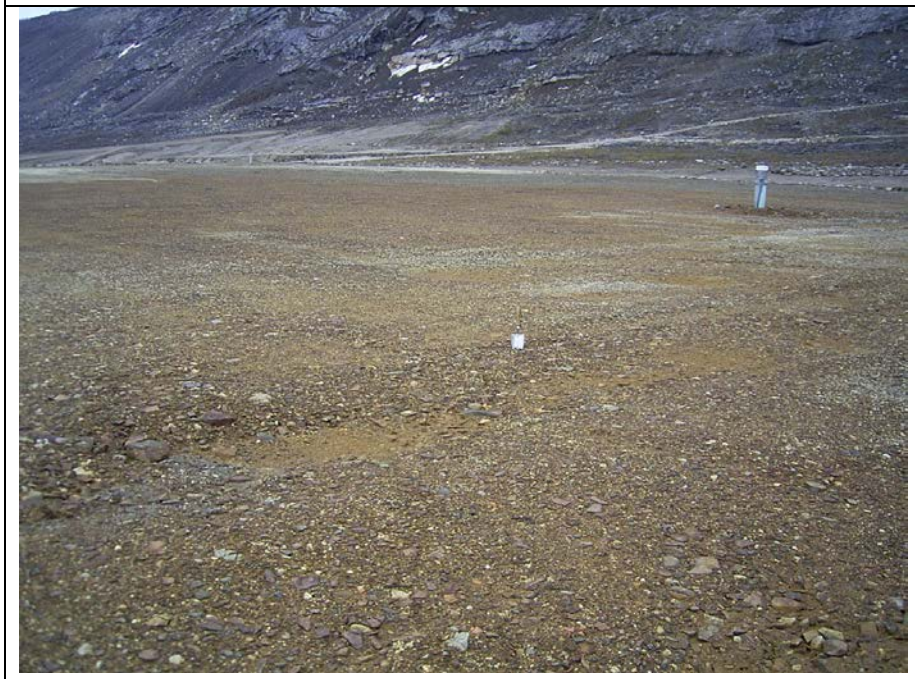
Photo 25.2 (FOX-4 NHT2 P-25 se.jpg)	Photo 25.3 (FOX-4 NHT2 P-25 south.jpg)
Description: View across the southern Tier II Disposal Facility cap.	Description: The top of the western slope of the Tier II Disposal Facility.
	
Date: August 26, 2014	Date: August 26, 2014

TABLE 3.7: LANDFILL VISUAL INSPECTION PHOTO LOG (NON-HAZARDOUS WASTE LANDFILL AND TIER II DISPOSAL FACILITY)

Photo 26.1 (FOX-4 NHT2 P-26 east.jpg)	Photo 26.2 (FOX-4 NHT2 P-26 south.jpg)
Description: View east along the top of the middle slope which divides the northern and southern halves of the Tier II Disposal Facility cap.	Description: View across the southern half of the Tier II Disposal Facility cap.
	
Date: August 26, 2014	Date: August 26, 2014

TABLE 3.7: LANDFILL VISUAL INSPECTION PHOTO LOG (NON-HAZARDOUS WASTE LANDFILL AND TIER II DISPOSAL FACILITY)

Photo 26.3 (FOX-4 NHT2 P-26 west.jpg)	Photo 27.1 (FOX-4 NHT2 P-27 south.jpg)
Description: View west along the middle slope of the Tier II Disposal Facility cap.	Description: The eastern top of slope of the Tier II Disposal Facility cap. VT-10 can be seen.
	
Date: August 26, 2014	Date: August 26, 2014

TABLE 3.7: LANDFILL VISUAL INSPECTION PHOTO LOG (NON-HAZARDOUS WASTE LANDFILL AND TIER II DISPOSAL FACILITY)

Photo 27.2 (FOX-4 NHT2 P-27 sw.jpg)	Photo 27.3 (FOX-4 NHT2 P-27 west.jpg)
Description: The southern half of the Tier II Disposal Facility cap.	Description: View west along middle slope of the Tier II Disposal Facility cap.
	
Date: August 26, 2014	Date: August 26, 2014

TABLE 3.7: LANDFILL VISUAL INSPECTION PHOTO LOG (NON-HAZARDOUS WASTE LANDFILL AND TIER II DISPOSAL FACILITY)

Photo 28.1 (FOX-4 NHT2 P-28 south.jpg)	Photo 28.2 (FOX-4 NHT2 P-28 west.jpg)
Description: View toward the southeastern corner of the Tier II Disposal Facility.	Description: The southern half of the Tier II Disposal Facility cap. Photo taken from adjacent to VT-10.
	
Date: August 26, 2014	Date: August 26, 2014

TABLE 3.7: LANDFILL VISUAL INSPECTION PHOTO LOG (NON-HAZARDOUS WASTE LANDFILL AND TIER II DISPOSAL FACILITY)

Photo 29.1 (FOX-4 NHT2 P-29 north.jpg)	Photo 29.2 (FOX-4 NHT2 P-29 nw.jpg)
Description: The eastern top of slope of the Tier II Disposal Facility.	Description: The southern half of the Tier II Disposal Facility cap. Photo taken from southeastern corner.
	
Date: August 26, 2014	Date: August 26, 2014

TABLE 3.7: LANDFILL VISUAL INSPECTION PHOTO LOG (NON-HAZARDOUS WASTE LANDFILL AND TIER II DISPOSAL FACILITY)

Photo 29.3 (FOX-4 NHT2 P-29 se.jpg)	Photo 29.4 (FOX-4 NHT2 P-29 west.jpg)
Description: View downslope of the southeastern corner of the Tier II Disposal Facility.	Description: The southern top of slope of the Tier II Disposal Facility.
	
Date: August 26, 2014	Date: August 26, 2014

TABLE 3.7: LANDFILL VISUAL INSPECTION PHOTO LOG (NON-HAZARDOUS WASTE LANDFILL AND TIER II DISPOSAL FACILITY)

Photo 30.1 (FOX-4 NHT2 P-30 east.jpg)	Photo 30.2 (FOX-4 NHT2 P-30 north.jpg)
Description: The southern top of slope of the Tier II Disposal Facility.	Description: The southern half of the Tier II Disposal Facility cap. Photo taken from the southern top of slope.
	
Date: August 26, 2014	Date: August 26, 2014

TABLE 3.7: LANDFILL VISUAL INSPECTION PHOTO LOG (NON-HAZARDOUS WASTE LANDFILL AND TIER II DISPOSAL FACILITY)

Photo 30.3 (FOX-4 NHT2 P-30 west.jpg)	Photo 31.1 (FOX-4 NHT2 P-31 east.jpg)
Description: The western top of slope of the Tier II Disposal Facility.	Description: View toward VT-7 along the southern top of slope of the Tier II Disposal Facility.
	
Date: August 26, 2014	Date: August 26, 2014

TABLE 3.7: LANDFILL VISUAL INSPECTION PHOTO LOG (NON-HAZARDOUS WASTE LANDFILL AND TIER II DISPOSAL FACILITY)

Photo 31.2 (FOX-4 NHT2 P-31 ne.jpg)	Photo 31.3 (FOX-4 NHT2 P-31 north.jpg)
Description: View across the southern half of the Tier II Disposal Facility from the southwestern corner.	Description: The western top of slope of the Tier II Disposal Facility.
	
Date: August 26, 2014	Date: August 26, 2014

TABLE 3.7: LANDFILL VISUAL INSPECTION PHOTO LOG (NON-HAZARDOUS WASTE LANDFILL AND TIER II DISPOSAL FACILITY)

Photo 32.1 (FOX-4 NHT2 P-32 south.jpg)	Photo 33.1 (FOX-4 NHT2 P-33.jpg)
Description: View south toward MW11-01 and the Non-Hazardous Waste Landfill.	Description: Soil sample collection of F4-NH-MW11-01.
	
Date: August 26, 2014	Date: August 26, 2014

TABLE 3.7: LANDFILL VISUAL INSPECTION PHOTO LOG (NON-HAZARDOUS WASTE LANDFILL AND TIER II DISPOSAL FACILITY)

Photo 34.1 (FOX-4 NHT2 P-34.jpg)	Photo 35.1 (FOX-4 NHT2 P-35.jpg)
Description: After sample collection and backfill of F4-NH-MW11-01.	Description: Ponded water at MW11-02. **(FEATURE F)**
	
Date: August 26, 2014	Date: August 26, 2014

TABLE 3.7: LANDFILL VISUAL INSPECTION PHOTO LOG (NON-HAZARDOUS WASTE LANDFILL AND TIER II DISPOSAL FACILITY)

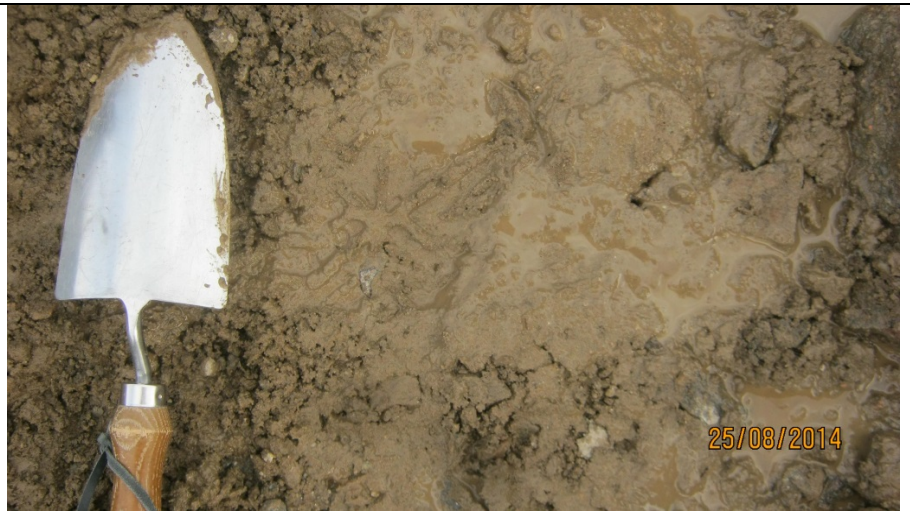
Photo 36.1 (FOX-4 NHT2 P-36.jpg)	Photo 37.1 (FOX-4 NHT2 P-37.jpg)
Description: Sample collection of F4-NH-MW11-02.	Description: After collection and backfill of F4-NH-MW11-02..
	
Date: August 26, 2014	Date: August 26, 2014

TABLE 3.7: LANDFILL VISUAL INSPECTION PHOTO LOG (NON-HAZARDOUS WASTE LANDFILL AND TIER II DISPOSAL FACILITY)

Photo 38.1 (FOX-4 NHT2 P-38 sw.jpg)	Photo 39.1 (FOX-4 NHT2 P-39.jpg)
Description: View toward MW11-03 and the Tier II Disposal Facility.	Description: Sample collection of F4-NH-MW11-03.
	
Date: August 26, 2014	Date: August 26, 2014

TABLE 3.7: LANDFILL VISUAL INSPECTION PHOTO LOG (NON-HAZARDOUS WASTE LANDFILL AND TIER II DISPOSAL FACILITY)

Photo 40.1 (FOX-4 NHT2 P-40.jpg)	Photo 41.1 (FOX-4 NHT2 P-41.jpg)
Description: After collection and backfill of F4-NH-MW11-03.	Description: View from MW11-04 toward the Tier II Disposal Facility.
	
Date: August 26, 2014	Date: August 26, 2014

TABLE 3.7: LANDFILL VISUAL INSPECTION PHOTO LOG (NON-HAZARDOUS WASTE LANDFILL AND TIER II DISPOSAL FACILITY)

Photo 42.1 (FOX-4 NHT2 P-42.jpg)	Photo 43.1 (FOX-4 NHT2 P-43.jpg)
Description: F4-NH-MW11-04 during soil sample collection.	Description: After collection and backfill of F4-NH-MW11-04.
	
Date: August 26, 2014	Date: August 26, 2014

TABLE 3.7: LANDFILL VISUAL INSPECTION PHOTO LOG (NON-HAZARDOUS WASTE LANDFILL AND TIER II DISPOSAL FACILITY)

Photo 44.1 (FOX-4 NHT2 P-44 north.jpg)	Photo 45.1 (FOX-4 NHT2 P-45.jpg)
Description: Ponded water at MW11-05. View looking toward southern slope of the Tier II Disposal Facility. **(FEATURE B)**	Description: F4-NH-MW11-05 during soil sample collection..
	
Date: August 26, 2014	Date: August 26, 2014

TABLE 3.7: LANDFILL VISUAL INSPECTION PHOTO LOG (NON-HAZARDOUS WASTE LANDFILL AND TIER II DISPOSAL FACILITY)

Photo 46.1 (FOX-4 NHT2 P-46.jpg)	Photo 47.1 (FOX-4 NHT2 P-47 ne.jpg)
Description: After collection and backfill of F4-NH-MW11-05.	Description: View toward the Tier II Disposal Facility from MW11-06.
	
Date: August 26, 2014	Date: August 26, 2014

TABLE 3.7: LANDFILL VISUAL INSPECTION PHOTO LOG (NON-HAZARDOUS WASTE LANDFILL AND TIER II DISPOSAL FACILITY)

Photo 48.1 (FOX-4 NHT2 P-48.jpg)	Photo 49.1 (FOX-4 NHT2 P-49.jpg)
Description: F4-NH-MW11-06 during soil sample collection.	Description: After collection and backfill of F4-NH-MW11-06.
	
Date: August 26, 2014	Date: August 26, 2014

TABLE 3.7: LANDFILL VISUAL INSPECTION PHOTO LOG (NON-HAZARDOUS WASTE LANDFILL AND TIER II DISPOSAL FACILITY)

Photo 50.1 (FOX-4 NHT2 P-50.jpg)	Photo 51.1 (FOX-4 NHT2 P-51.jpg)
Description: View toward the Tier II Disposal Facility from MW11-07.	Description: F4-NH-MW11-07 during soil sample collection.
	
Date: August 26, 2014	Date: August 26, 2014

TABLE 3.7: LANDFILL VISUAL INSPECTION PHOTO LOG (NON-HAZARDOUS WASTE LANDFILL AND TIER II DISPOSAL FACILITY)

Photo 52.1 (FOX-4 NHT2 P-52.jpg)	Photo 53.1 (FOX-4 NHT2 P-53 east.jpg)
Description: After collection and backfill of F4-NH-MW12-07. .	Description: View of western slope of Tier II Disposal Facility (right hand side) and Non-Hazardous Waste Landfill (left hand side) from MW12-08.
	
Date: August 26, 2014	Date: August 26, 2014

TABLE 3.7: LANDFILL VISUAL INSPECTION PHOTO LOG (NON-HAZARDOUS WASTE LANDFILL AND TIER II DISPOSAL FACILITY)

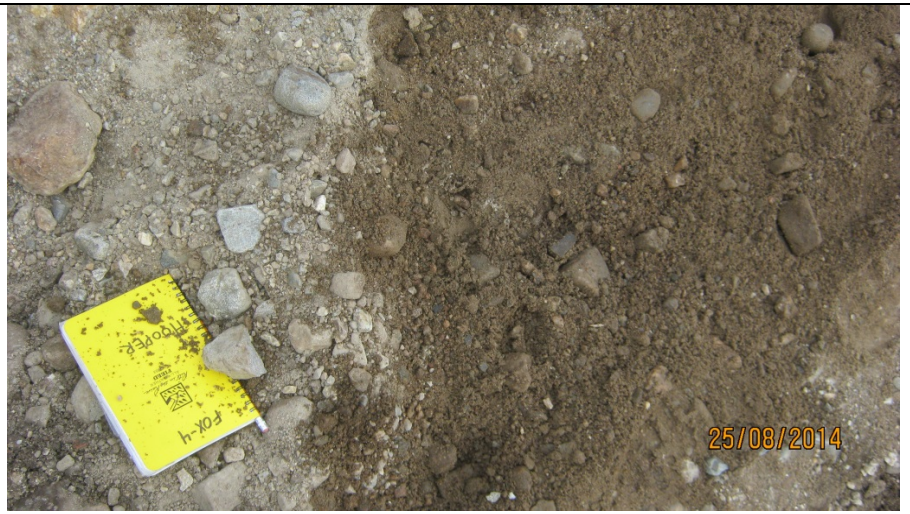
Photo 54.1 (FOX-4 NHT2 P-54.jpg)	Photo 55.1 (FOX-4 NHT2 P-55.jpg)
Description: F4-NH-MW12-08 during soil sample collection.	Description: After collection and backfill of F4-NH-M12-08.
	
Date: August 26, 2014	Date: August 26, 2014

TABLE 3.7: LANDFILL VISUAL INSPECTION PHOTO LOG (NON-HAZARDOUS WASTE LANDFILL AND TIER II DISPOSAL FACILITY)

Photo 56.1 (FOX-4 NHT2 P-56 se.jpg)	Photo 57.1 (FOX-4 NHT2 P-57 north.jpg)
Description: Vertical thermistor VT-3.	Description: Vertical thermistor VT-4.
	
Date: August 26, 2014	Date: August 26, 2014

TABLE 3.7: LANDFILL VISUAL INSPECTION PHOTO LOG (NON-HAZARDOUS WASTE LANDFILL AND TIER II DISPOSAL FACILITY)

Photo 58.1 (FOX-4 NHT2 P-58 west.jpg)	Photo 59.1 (FOX-4 NHT2 P-59.jpg)
Description: Vertical thermistor VT-5	Description: Vertical thermistor VT-6.
	
Date: August 26, 2014	Date: August 26, 2014

TABLE 3.7: LANDFILL VISUAL INSPECTION PHOTO LOG (NON-HAZARDOUS WASTE LANDFILL AND TIER II DISPOSAL FACILITY)

Photo 60.1 (FOX-4 NHT2 P-60 east.jpg)	Photo 61.1 (FOX-4 NHT2 P-61 north.jpg)
Description: Vertical thermistor VT-7.	Description: Vertical thermistor VT-8.
	
Date: August 26, 2014	Date: August 26, 2014

TABLE 3.7: LANDFILL VISUAL INSPECTION PHOTO LOG (NON-HAZARDOUS WASTE LANDFILL AND TIER II DISPOSAL FACILITY)

Photo 62.1 (FOX-4 NHT2 P-62 west.jpg)	Photo 63.1 (FOX-4 NHT2 P-63 east.jpg)
Description: Vertical thermistor VT-9.	Description: Vertical thermistor VT-10.
	
Date: August 26, 2014	Date: August 26, 2014

TABLE 3.7: LANDFILL VISUAL INSPECTION PHOTO LOG (NON-HAZARDOUS WASTE LANDFILL AND TIER II DISPOSAL FACILITY)

Photo 64.1 (FOX-4 NHT2 P-64 nw.jpg)	Photo 65.1 (FOX-4 NHT2 P-65 west.jpg)
Description: Vertical thermistor VT-5A.	Description: The Non-Hazardous Waste Landfill. View looking west from the Pallet Line Landfill.
	
Date: August 26, 2014	Date: August 28, 2014

TABLE 3.7: LANDFILL VISUAL INSPECTION PHOTO LOG (NON-HAZARDOUS WASTE LANDFILL AND TIER II DISPOSAL FACILITY)

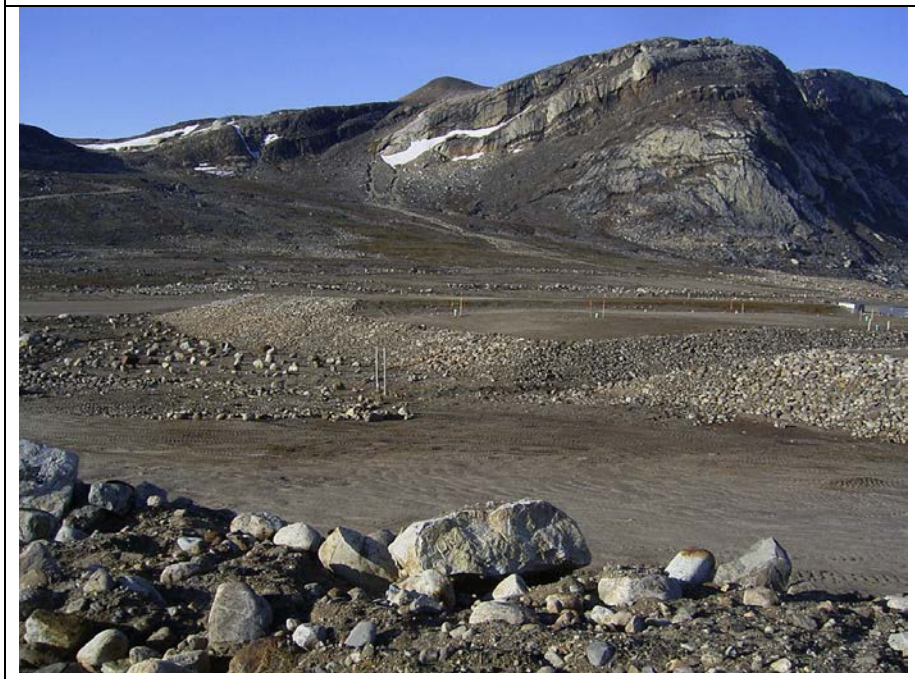
Photo 66.1 (FOX-4 NHT2 P-66 south.jpg)	Photo 67.1 (FOX-4 NHT2 P-67 north.jpg)
Description: The Tier II Disposal Facility. View south from the Pallet Line Landfill.	Description: Metal debris at southeast corner of Non-Hazardous Waste Landfill. **(FEATURE G)**
	
Date: August 28, 2014	

TABLE 3.7: LANDFILL VISUAL INSPECTION PHOTO LOG (NON-HAZARDOUS WASTE LANDFILL AND TIER II DISPOSAL FACILITY)

Photo 68.1 (FOX-4 NHT2 P-68 north.jpg)	
Description: View of Non-Hazardous Waste Landfill and Tier II Disposal Facility from south.	
	

TABLE 3.8

RESULTS OF ANALYSIS FOR PARAMETERS IN SOIL AT NON-HAZARDOUS WASTE LANDFILL AND TIER II DISPOSAL FACILITY

PARAMETERS	Background Concentration (_)	Baseline Average Concentration (+)	DEW Line Cleanup Tier I Criteria (*)	DEW Line Cleanup Tier II Criteria (**)	F4-NH-MW11-01-S 24-Aug-14 0-15cm	F4-NH-MW11-01-D 24-Aug-14 40-50cm	F4-NH-MW11-02-S 24-Aug-14 0-15cm	F4-NH-MW11-02-D 24-Aug-14 40-50cm	F4-NH-MW11-03-S 24-Aug-14 0-15cm	F4-NH-MW11-03-D 24-Aug-14 40-50cm	F4-NH-MW11-04-S 24-Aug-14 0-15cm	F4-NH-MW11-04-D 24-Aug-14 40-50cm	F4-NH-MW11-05-S 24-Aug-14 0-15cm
Copper	**30**	**13**	-	**100**	**52+**	**98+**	**49+**	**52+**	**22+**	**18+**	7.4	13	11
Nickel	**24**	**10**	-	**100**	**40+**	**73+**	**41+**	**42+**	**14+**	**12+**	7.1	**14+**	9
Cobalt	**9**	**5.0**	-	**50**	**11+**	**17+**	**14+**	**14+**	4.8	4.3	2.1	3.7	2.7
Cadmium	**1.0**	**1.0**	-	**5**	<0.10	<0.10	<0.10	<0.10	**2.3+**	0.9	<0.10	<0.10	<0.10
Lead	**10**	**5.6**	**200**	**500**	**9.9+**	**13+**	**11+**	**12+**	**10+**	**8.8+**	2.5	3.1	2.5
Zinc	**41**	**22**	-	**500**	**86+**	**110+**	**70+**	**74+**	**50+**	**37+**	16	**27**	18
Chromium	**41**	**21**	-	**250**	**73+**	**83+**	**80+**	**82+**	**39+**	**36+**	21	**31+**	**24+**
Arsenic	**29**	**12**	-	**30**	**48+**	**170+**	**31+**	**34+**	12	**21+**	7.4	11	10
Mercury	-	**0.100**	-	**2**	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Total PCBs	-	**0.050**	**1**	**5**	<0.010	<0.010	<0.010	0.012	**0.083+**	0.048	<0.010	<0.010	<0.010
PHC F1 (C6-C10)	-	-	-	-	<10	<10	<10	<10	<10	<10	<10	<10	<10
PHC F2 (C10-C16)	-	-	-	-	<10	<10	<10	<10	<10	<10	<10	<10	<10
PHC F3 (C16-C34)	-	-	-	-	<10	<10	<10	21	39	13	82	<10	43
PHC F4 (C34-C50)	-	-	-	-	<10	<10	<10	<10	<10	<10	14	<10	<10
Modifed TPH (Total C6-C34)	-	**41**	-	**2500**	15	15	15	15	**49+**	23	**92+**	15	**53+**

NOTES:

All parameter values in µg/g (ppm) unless otherwise indicated.

_ Exceeds FOX-4 Non-Hazardous Waste Landfill and Tier II Disposal Facility Background Concentration.
\+ Exceeds FOX-4 Non-Hazardous Waste Landfill and Tier II Disposal Facility Baseline Average Concentration.
* Exceeds DEW Line Cleanup Tier I Criteria.
** Exceeds DEW Line Cleanup Tier II Criteria.

(DUP) Duplicate sample analyzed by AGAT Laboratories for QA/QC purposes.
(AVG) Average concentration of duplicate samples.
< Not detected.
\- No concentration reported.

TABLE 3.8

RESULTS OF ANALYSIS FOR PARAMETERS IN SOIL AT NON-HAZARDOUS WASTE LANDFILL AND TIER II DISPOSAL FACILITY

PARAMETERS	Background Concentration (_)	Baseline Average Concentration (+)	DEW Line Cleanup Tier I Criteria (*)	DEW Line Cleanup Tier II Criteria (**)	F4-NH-MW11-05-D 24-Aug-14 40-50cm	F4-NH-MW11-06-S 24-Aug-14 0-15cm	F4-NH-MW11-06-D 24-Aug-14 40-50cm	F4-NH-MW12-07-S 24-Aug-14 0-15cm	F4-NH-MW12-07-D 24-Aug-14 40-50cm	F4-NH-MW12-08-S 24-Aug-14 0-15cm	F4-NH-MW12-08-S (DUP) 24-Aug-14 0-15cm	F4-NH-MW12-08-S (AVG) 24-Aug-14 0-15cm	F4-NH-MW12-08-D 24-Aug-14 40-50cm
Copper	**30**	**13**	-	**100**	**14+**	13	**14+**	**36+**	**17+**	**24+**	**16+**	**20+**	**30+**
Nickel	**24**	**10**	-	**100**	**11+**	**11+**	**14+**	**36+**	**20+**	**19+**	9	**14+**	**22+**
Cobalt	**9**	**5.0**	-	**50**	3.4	3.5	3.8	**9.9+**	**5.1+**	**6.9+**	4.4	**5.65+**	**7.8+**
Cadmium	**1.0**	**1.0**	-	**5**	<0.10	<0.10	<0.10	0.13	<0.10	<0.10	<0.5	<0.5	<0.10
Lead	**10**	**5.6**	**200**	**500**	3.1	3.9	5.4	**13+**	4.5	**15+**	5	**10+**	**18+**
Zinc	**41**	**22**	-	**500**	22	21	26	**74+**	**31+**	**53+**	**25+**	**39+**	**56+**
Chromium	**41**	**21**	-	**250**	**28+**	**24+**	**29+**	**41+**	**24+**	**52+**	**32+**	**42+**	**64+**
Arsenic	**29**	**12**	-	**30**	12	**22+**	**45+**	**30+**	**16+**	**59+**	**15+**	**37+**	**16+**
Mercury	-	**0.100**	-	**2**	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.10	<0.10	<0.050
Total PCBs	-	**0.050**	**1**	**5**	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.05	<0.05	<0.010
PHC F1 (C6-C10)	-	-	-	-	<10	<10	<10	<10	<10	<10	<5	<10	<10
PHC F2 (C10-C16)	-	-	-	-	<10	<10	<10	<10	<10	34	48	41	320
PHC F3 (C16-C34)	-	-	-	-	17	17	22	56	<10	21	<50	21	49
PHC F4 (C34-C50)	-	-	-	-	<10	<10	<10	<10	<10	<10			<10
Modifed TPH (Total C6-C34)	-	**41**	-	**2500**	27	27	32	**66+**	15	**60+**	**75.5+**	**75.5+**	**374+**

NOTES:

All parameter values in µg/g (ppm) unless otherwise indicated.

_ Exceeds FOX-4 Non-Hazardous Waste Landfill and Tier II Disposal Facility Background Concentration.
\+ Exceeds FOX-4 Non-Hazardous Waste Landfill and Tier II Disposal Facility Baseline Average Concentration.
* Exceeds DEW Line Cleanup Tier I Criteria.
** Exceeds DEW Line Cleanup Tier II Criteria.

(DUP) Duplicate sample analyzed by AGAT Laboratories for QA/QC purposes.
(AVG) Average concentration of duplicate samples.
< Not detected.
\- No concentration reported.

Table 3.9: Evaluation of 2014 Soil Analytical Data (Non-Hazardous Waste Landfill and Tier II Disposal Facility)

Parameter	Baseline Average Concentration (ug/g)	2014 Results
Copper	13	Detectable concentrations ranged between 52 and 98 ug/g for upgradient samples and between 7.4 and 52 ug/g for downgradient samples, with the highest concentration reported in the subsurface sample collected from the MW11-01 sample location while the lowest concentration was reported within the surficial sample at the MW11-04 sample location. Twelve of seventeen samples reported concentrations above the BAC.
Nickel	10	Detectable concentrations ranged between 40 and 73 ug/g for upgradient samples and between 7.1 and 42 ug/g for downgradient samples, with the highest concentration reported in the subsurface sample collected from the MW11-01 sample location while the lowest concentration was reported within the surficial sample at the MW11-04 sample location. Fourteen of seventeen samples reported concentrations above the BAC.
Cobalt	5.0	Detectable concentrations ranged between 11 and 17 ug/g for upgradient samples and between 2.1 and 14 ug/g for downgradient samples, with the highest concentration reported in the subsurface sample collected from the MW11-01 sample location while the lowest concentration was reported within the surficial sample at the MW11-04 sample location. Eight of seventeen samples reported concentrations above the BAC.
Cadmium	1.0	No detectable concentrations were reported in upgradient samples. Detectable concentrations ranged between 0.13 and 2.3 ug/g, with the highest concentration reported in the surface sample collected from the MW11-03 sample location while the lowest concentration was reported within the surficial sample at the MW12-07 sample location. Fourteen of the seventeen samples reported values below the laboratory detection limit, and one sample reported a concentration above the BAC.
Lead	5.6	Detectable concentrations ranged between 9.9 and 13 ug/g for upgradient samples and between 2.5 and 18 ug/g for downgradient samples, with the highest concentration reported in the subsurface sample collected from the MW12-08 sample location while the lowest concentration was reported within the surficial samples at the MW11-04 and MW11-05 sample locations. Nine of seventeen samples reported concentrations above the BAC.
Zinc	22	Detectable concentrations ranged between 86 and 110 ug/g for upgradient samples and between 16 and 74 ug/g for downgradient samples, with the highest concentration reported in the subsurface sample collected from the MW11-01 sample location while the lowest concentration was reported within the surficial sample at the MW11-04 sample location. Twelve of seventeen samples reported concentrations above the BAC.

Parameter	Baseline Average Concentration (ug/g)	2014 Results
Chromium	21	Detectable concentrations ranged between 73 and 83 ug/g for upgradient samples and between 21 and 82 ug/g for downgradient samples, with the highest concentration reported in the subsurface sample collected from the MW11-01 sample location while the lowest concentration was reported within the surficial sample at the MW11-04 sample location. Sixteen of seventeen samples reported concentrations above the BAC.
Arsenic	12	Detectable concentrations ranged between 48 and 170 ug/g for upgradient samples and between 7.4 and 59 ug/g for downgradient samples, with the highest concentration reported in the subsurface sample collected from the MW11-01 sample location while the lowest concentration was reported within the surficial sample at the MW11-04 sample location. Seven of the seventeen samples reported concentrations above the DEW Line Cleanup Tier II Criteria (30 ug/g) however only one sample exceeds the site-specific arsenic criteria of 130 ug/g.
Mercury	0.100	All seventeen samples reported concentrations less than the laboratory detection limit (0.050 ug/g and 0.10 ug/g for the duplicate sample submitted to the secondary laboratory).
PCBs	0.050	Detectable concentrations of 0.012 and 0.083 ug/g were reported in the subsurface and surface samples collected from the downgradient MW11-03 sample location, respectively. Fifteen of the seventeen samples reported concentrations less than the laboratory detection limit.
TPH	41	Modified TPH concentrations were 15 ug/g for upgradient samples and ranged between 15 and 374 ug/g, with the highest concentration reported in the subsurface sample at the MW12-08 sample location and the lowest concentration in six of seventeen samples. Seven of seventeen samples reported concentrations above the BAC.

3.3.2.3 Soil Trend Analysis by Parameter and Discussion of Trends

New soil monitoring locations were identified near newly installed monitoring wells at the Non-Hazardous Waste Landfill and Tier II Disposal Facility during the 2011-2013 cleanup and maintenance works. The 2014 monitoring event is the first monitoring event where soil samples have been collected from these monitoring locations, so no trends are available for soil chemistry results at these locations.

3.3.3 Groundwater Sampling

Groundwater sampling was completed at the Non-Hazardous Waste Landfill and Tier II Disposal Facility on 24 and 25 August 2014. As previously reported a total of seven samples including one duplicate sample were procured from six monitoring wells as shown in plan on Figure 2.

3.3.3.1 Monitoring Well Sampling/Inspection Logs

Monitoring well sampling/inspection logs are provided following this page on Monitoring Well Sampling Records 1 through 8.

3.3.3.2 Water Levels/Groundwater Flow

Water levels were measured at the Non-Hazardous Waste Landfill and Tier II Disposal Facility on 24 August 2014. The groundwater levels measured are shown below in Table 3.10. Based on the measured groundwater levels, groundwater flow is expected to be towards the southwest, however groundwater flow will be highly affected by freeze/thaw cycles and permafrost.

Table 3.10: Groundwater Levels (Non-Hazardous Waste Landfill and Tier II Disposal Facility)

Monitoring Well	Date	Ground Surface Elevation (m)	Water Level (m bgs)	Water Level Elevation (m)	Depth to Bottom (m bgs)	Bottom Elevation (m)
MW11-01	24-Aug-14	21.0	1.06	19.94	3.38	17.62
MW11-02	24-Aug-14	19.5	0.11	19.39	1.43	18.07
MW11-03	24-Aug-14	20.3	0.48	19.82	2.39	17.91
MW11-04	24-Aug-14	19.2	0.47	18.73	1.63	17.57
MW11-05	24-Aug-14	18.6	0.59	18.01	1.77	16.83
MW11-06	24-Aug-14	18.0	Dry	N/A	0.48	17.52
MW12-07	24-Aug-14	16.4	0.31	16.09	1.58	14.82
MW12-08	24-Aug-14	18.7	Dry	N/A	0.52	18.18

N/A – data not available due to lack of available groundwater.

Monitoring wells MW11-06 and MW12-08 were reported to contain water as of monitoring completed from August to September 2013. It is recommended that all monitoring wells be monitored during future monitoring events.

3.3.3.3 Laboratory Analytical Results

The analytical results for groundwater samples collected at the Non-Hazardous Waste Landfill and Tier II Disposal Facility are presented in Table 3.11. One duplicate groundwater sample was collected at the Non-Hazardous Waste Landfill and Tier II Disposal Facility from monitoring well MW11-01. The RPDs for the duplicate sample results were above 30% for two of eleven parameters. In these cases, parameter concentrations were very low and small differences in

Monitoring Well Sampling Record 1

Site Name:	FOX-4	NonHaz/Tier II Disposal	
Date of Sampling Event:	24-Aug-14	Time:	7pm
Names of Samplers:		S.Borcsok	
		J.Mauchan	
Landfill Name:	NH/T2	Samples Collected:	YES
Monitoring Well ID:	MW11-01	PHC F1	YES
Sample Number:		Inorganic Elements	YES
Condition of Well:	OK	PHC F2-F4	YES
		PCBs	YES
Measured Data		Duplicate Collected?	YES
Well pipe height above ground (cm)=	70	Sample ID:	F4-NH-MW11-01
Diameter of well (cm)=	5		
Depth of well installation (cm)= (from ground surface)			
Length screened section (cm)=			
Depth to top of screen (cm)= (from ground surface)			
Depth to water surface (cm)= (from top of pipe)	176	Measurement method: (meter, tape, etc)	Interface meter
Static water level (cm)= (below ground surface)	106		
Measured well refusal depth (cm)= (i.e. depth to frozen ground)	408	Evidence of sludge or siltation:	NO
Measured well refusal depth from ground surface	338		
Thickness of water column	232		
Static volume of water in well	4.71		
Free product thickness (mm)=	0	Measurement method:	IM
Purging: (Y/N)	Y	Purging/Sampling Equipment:	Waterra
Volume Purged Water=	20L		tubing/
Decontamination required: (Y/N)	N		footvalve
Number washes:			
Number rinses:			
Final pH=	7.77		
Final Conductivity (uS/cm)=	160.3		
Final Temperature (degC)=	3.1		

Monitoring Well Sampling Record 2

Site Name:	FOX-4	NonHaz/Tier II Disposal	
Date of Sampling Event:	24-Aug-14	Time:	620pm
Names of Samplers:		S.Borcsok	
		J.Mauchan	
Landfill Name:	NH/T2	Samples Collected:	YES
Monitoring Well ID:	MW11-02	PHC F1	YES
Sample Number:		Inorganic Elements	YES
Condition of Well:	OK	PHC F2-F4	YES
ponded water at well location		PCBs	YES
Measured Data		Duplicate Collected?	NO
Well pipe height above ground (cm)=	55	Sample ID:	F4-NH-MW11-02
Diameter of well (cm)=	5		
Depth of well installation (cm)= (from ground surface)		Monitored on 24-Aug-14 Sampled on 25-Aug-14	
Length screened section (cm)=			
Depth to top of screen (cm)= (from ground surface)			
Depth to water surface (cm)= (from top of pipe)	46	Measurement method: (meter, tape, etc)	Interface meter
Static water level (cm)= (below ground surface)	-9		
Measured well refusal depth (cm)= (i.e. depth to frozen ground)	178	Evidence of sludge or siltation:	NO
Measured well refusal depth from ground surface	123		
Thickness of water column	132		
Static volume of water in well	2.68		
Free product thickness (mm)=	0	Measurement method:	IM
Purging: (Y/N)	Y	Purging/Sampling Equipment:	Waterra
Volume Purged Water=	9L		tubing/
Decontamination required: (Y/N)	N		footvalve
Number washes:			
Number rinses:			
Final pH=	7.45		
Final Conductivity (uS/cm)=	170.2		
Final Temperature (degC)=	3		

Monitoring Well Sampling Record 3

Site Name:	FOX-4	NonHaz/Tier II Disposal	
Date of Sampling Event:	24-Aug-14	Time:	610pm
Names of Samplers:		S.Borcsok	
		J.Mauchan	
Landfill Name:	NH/T2	Samples Collected:	YES
Monitoring Well ID:	MW11-03	PHC F1	YES
Sample Number:		Inorganic Elements	YES
Condition of Well:	OK	PHC F2-F4	YES
		PCBs	YES
Measured Data		Duplicate Collected?	NO
Well pipe height above ground (cm)=	35	Sample ID:	F4-NH-MW11-03
Diameter of well (cm)=	5		
Depth of well installation (cm)= (from ground surface)		Monitored on 24-Aug-14 Sampled on 25-Aug-14	
Length screened section (cm)=			
Depth to top of screen (cm)= (from ground surface)			
Depth to water surface (cm)= (from top of pipe)	83	Measurement method: (meter, tape, etc)	Interface meter
Static water level (cm)= (below ground surface)	48		
Measured well refusal depth (cm)= (i.e. depth to frozen ground)	274	Evidence of sludge or siltation:	NO
Measured well refusal depth from ground surface	239		
Thickness of water column	191		
Static volume of water in well	3.88		
Free product thickness (mm)=	0	Measurement method:	IM
Purging: (Y/N)	Y	Purging/Sampling Equipment:	Waterra
Volume Purged Water=	12L		tubing/
Decontamination required: (Y/N)	N		footvalve
Number washes:			
Number rinses:			
Final pH=	7.81		
Final Conductivity (uS/cm)=	159		
Final Temperature (degC)=	2.9		

Monitoring Well Sampling Record 4

Site Name:	FOX-4	NonHaz/Tier II Disposal	
Date of Sampling Event:	24-Aug-14	Time:	600pm
Names of Samplers:		S.Borcsok	
		J.Mauchan	
Landfill Name:	NH/T2	Samples Collected:	YES
Monitoring Well ID:	MW11-04	PHC F1	YES
Sample Number:		Inorganic Elements	YES
Condition of Well:	OK	PHC F2-F4	YES
		PCBs	YES
Measured Data		Duplicate Collected?	NO
Well pipe height above ground (cm)=	33	Sample ID:	F4-NH-MW11-04
Diameter of well (cm)=	5		
Depth of well installation (cm)= (from ground surface)		Monitored on 24-Aug-14 Sampled on 25-Aug-14	
Length screened section (cm)=			
Depth to top of screen (cm)= (from ground surface)			
Depth to water surface (cm)= (from top of pipe)	80	Measurement method: (meter, tape, etc)	Interface meter
Static water level (cm)= (below ground surface)	47		
Measured well refusal depth (cm)= (i.e. depth to frozen ground)	196	Evidence of sludge or siltation:	NO
Measured well refusal depth from ground surface	163		
Thickness of water column	116		
Static volume of water in well	2.35		
Free product thickness (mm)=	0	Measurement method:	IM
Purging: (Y/N)	Y	Purging/Sampling Equipment:	Waterra
Volume Purged Water=	10L		tubing/
Decontamination required: (Y/N)	N		footvalve
Number washes:			
Number rinses:			
Final pH=	7.5		
Final Conductivity (uS/cm)=	163.6		
Final Temperature (degC)=	2.9		

Monitoring Well Sampling Record 5

Site Name:	FOX-4	NonHaz/Tier II Disposal	
Date of Sampling Event:	24-Aug-14	Time:	550
Names of Samplers:		S.Borcsok	
		J.Mauchan	
Landfill Name:	NH/T2	Samples Collected:	YES
Monitoring Well ID:	MW11-05	PHC F1	YES
Sample Number:		Inorganic Elements	YES
Condition of Well:	OK	PHC F2-F4	YES
water ponded above well		PCBs	YES
Measured Data		Duplicate Collected?	NO
Well pipe height above ground (cm)=	36	Sample ID:	F4-NH-MW11-05
Diameter of well (cm)=	5		
Depth of well installation (cm)= (from ground surface)			
Length screened section (cm)=			
Depth to top of screen (cm)= (from ground surface)			
Depth to water surface (cm)= (from top of pipe)	95	Measurement method: (meter, tape, etc)	Interface meter
Static water level (cm)= (below ground surface)	59		
Measured well refusal depth (cm)= (i.e. depth to frozen ground)	213	Evidence of sludge or siltation:	NO
Measured well refusal depth from ground surface	177		
Thickness of water column	118		
Static volume of water in well	2.40		
Free product thickness (mm)=	0	Measurement method:	IM
Purging: (Y/N)	Y	Purging/Sampling Equipment:	Waterra
Volume Purged Water=	9L		tubing/
Decontamination required: (Y/N)	N		footvalve
Number washes:			
Number rinses:			
Final pH=	7.71		
Final Conductivity (uS/cm)=	146.4		
Final Temperature (degC)=	2.7		

Monitoring Well Sampling Record 6

Site Name:	FOX-4	NonHaz/Tier II Disposal	
Date of Sampling Event:	24-Aug-14	Time:	540pm
Names of Samplers:		S.Borcsok	
		J.Mauchan	
Landfill Name:	NH/T2	Samples Collected:	NO
Monitoring Well ID:	MW11-06	PHC F1	
Sample Number:		Inorganic Elements	
Condition of Well:	OK	PHC F2-F4	
		PCBs	
Measured Data		Duplicate Collected?	
Well pipe height above ground (cm)=	50	Sample ID:	
Diameter of well (cm)=	5		
Depth of well installation (cm)= (from ground surface)			
Length screened section (cm)=			
Depth to top of screen (cm)= (from ground surface)			
Depth to water surface (cm)= (from top of pipe)	N/A (well was dry or frozen)	Measurement method: (meter, tape, etc)	Interface meter
Static water level (cm)= (below ground surface)			
Measured well refusal depth (cm)= (i.e. depth to frozen ground)	98	Evidence of sludge or siltation:	Bottom felt sandy
Measured well refusal depth from ground surface	48		
Thickness of water column	0		
Static volume of water in well	0		
Free product thickness (mm)=	0	Measurement method:	IM
Purging: (Y/N)	N	Purging/Sampling Equipment:	N/A
Volume Purged Water=			
Decontamination required: (Y/N)	N		
Number washes:			
Number rinses:			
Final pH=			
Final Conductivity (uS/cm)=			
Final Temperature (degC)=			

Monitoring Well Sampling Record 7

Site Name:	FOX-4	NonHaz/Tier II Disposal	
Date of Sampling Event:	24-Aug-14	Time:	530pm
Names of Samplers:		S.Borcsok	
		J.Mauchan	
Landfill Name:	NH/T2	Samples Collected:	YES
Monitoring Well ID:	MW12-07	PHC F1	YES
Sample Number:		Inorganic Elements	YES
Condition of Well:		PHC F2-F4	YES
		PCBs	YES
Measured Data		Duplicate Collected?	NO
Well pipe height above ground (cm)=	44	Sample ID:	F4-NH-MW12-07
Diameter of well (cm)=	5		
Depth of well installation (cm)= (from ground surface)			
Length screened section (cm)=			
Depth to top of screen (cm)= (from ground surface)			
Depth to water surface (cm)= (from top of pipe)	75	Measurement method: (meter, tape, etc)	Interface meter
Static water level (cm)= (below ground surface)	31		
Measured well refusal depth (cm)= (i.e. depth to frozen ground)	202	Evidence of sludge or siltation:	NO
Measured well refusal depth from ground surface	158		
Thickness of water column	127		
Static volume of water in well	2.58		
Free product thickness (mm)=	0	Measurement method:	IM
Purging: (Y/N)	Y	Purging/Sampling Equipment:	Waterra
Volume Purged Water=	9L		tubing/
Decontamination required: (Y/N)	N		footvalve
Number washes:			
Number rinses:			
Final pH=	7.48		
Final Conductivity (uS/cm)=	175.7		
Final Temperature (degC)=	3.1		

Monitoring Well Sampling Record 8

Site Name:	FOX-4	NonHaz/Tier II Disposal	
Date of Sampling Event:	24-Aug-14	Time:	640pm
Names of Samplers:		S.Borcsok	
		J.Mauchan	
Landfill Name:	NH/T2	Samples Collected:	NO
Monitoring Well ID:	MW12-08	PHC F1	
Sample Number:		Inorganic Elements	
Condition of Well:		PHC F2-F4	
		PCBs	
Measured Data		Duplicate Collected?	
Well pipe height above ground (cm)=	58	Sample ID:	
Diameter of well (cm)=	5		
Depth of well installation (cm)= (from ground surface)			
Length screened section (cm)=			
Depth to top of screen (cm)= (from ground surface)			
Depth to water surface (cm)= (from top of pipe)	N/A (well was dry or frozen)	Measurement method: (meter, tape, etc)	Interface meter
Static water level (cm)= (below ground surface)			
Measured well refusal depth (cm)= (i.e. depth to frozen ground)	110	Evidence of sludge or siltation:	NO
Measured well refusal depth from ground surface	52		
Thickness of water column	0		
Static volume of water in well	0		
Free product thickness (mm)=	0	Measurement method:	IM
Purging: (Y/N)	N	Purging/Sampling Equipment:	N/A
Volume Purged Water=			
Decontamination required: (Y/N)	N		
Number washes:			
Number rinses:			
Final pH=			
Final Conductivity (uS/cm)=			
Final Temperature (degC)=			

TABLE 3.11

RESULTS OF ANALYSIS FOR PARAMETERS IN GROUNDWATER AT NON-HAZARDOUS WASTE LANDFILL AND TIER II DISPOSAL FACILITY

PARAMETERS	Baseline Average Concentration (+)	F4-NH-MW11-01 24-Aug-14	F4-NH-MW11-01 (DUP) 24-Aug-14	F4-NH-MW11-01 (AVG) 24-Aug-14	F4-NH-MW11-02 25-Aug-14	F4-NH-MW11-03 25-Aug-14	F4-NH-MW11-04 25-Aug-14	F4-NH-MW11-05 24-Aug-14	F4-NH-MW12-07 24-Aug-14
Copper	**0.010**	**0.056+**	**0.105+**	**0.0805+**	**0.022+**	**0.13+**	**0.069+**	**0.056+**	**0.082+**
Nickel	**0.057**	**0.3+**	**0.268+**	**0.284+**	0.037	**0.33+**	**0.13+**	0.055	**0.092+**
Cobalt	**0.0087**	**0.031+**	**0.036+**	**0.0335+**	0.0073	**0.095+**	**0.018+**	**0.014+**	**0.026+**
Cadmium	**0.0010**	0.00059	<0.002	0.00059	0.000043	**0.0011+**	0.00012	0.000083	0.00025
Lead	**0.0071**	**0.018+**	**0.02+**	**0.019+**	0.0039	**0.26+**	**0.016+**	**0.014+**	**0.021+**
Zinc	**0.84**	0.094	0.107	0.1005	**17+**	0.33	0.18	0.65	0.13
Chromium	**0.0306**	**0.96+**	**1.07+**	**1.015+**	0.027	**0.54+**	**0.2+**	**0.068+**	**0.14+**
Arsenic	**0.0183**	**0.033+**	0.009	**0.021+**	**0.11+**	**0.053+**	**0.024+**	**0.031+**	**0.04+**
Mercury	**0.0006**	<0.00010	<0.0001	<0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Total PCBs	**0.0001**	<0.00005	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
PHC F1 (C6-C10)	-	<0.025	<0.025	<0.025	0.072	0.028	0.031	0.033	<0.025
PHC F2 (C10-C16)	-	<0.100	<0.100	<0.100	0.12	<0.100	<0.100	<0.100	<0.100
PHC F3 (C16-C34)	-	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
PHC F4 (C34-C50)	-	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Modifed TPH (Total C6-C34)	**0.65**	0.113	0.113	0.113	0.242	0.128	0.131	0.133	0.113

NOTES:

All parameter values in mg/L (ppm) unless otherwise indicated.

\+ Exceeds Non-Hazardous Waste Landfill and Tier II Disposal Facility Baseline Average Concentration.

(DUP) Duplicate sample analyzed by AGAT Laboratories for QA/QC purposes.
RDL Reportable Detection Limit.
< Not detected.
\- No concentration reported.

reported concentrations resulted in large RPD values. The duplicate sample results are believed to be consistent.

3.3.3.4 Discussion of Results by Parameter

A discussion of the results for each parameter analyzed in groundwater at the Non-Hazardous Waste Landfill and Tier II Disposal Facility is provided in Table 3.12. The discussion includes a comparison of results from upgradient (MW11-01) and downgradient (MW11-02, MW11-03, MW11-04, MW11-05, MW11-06, MW12-07, MW12-08) locations to the baseline average concentrations that have been determined for each landfill from groundwater chemistry at the landfill area prior to and during remediation.

Table 3.12: Evaluation of Groundwater Analytical Results (Non-Hazardous Waste Landfill and Tier II Disposal Facility)

Parameter	Baseline Average Concentration (mg/L)	2014 Results
Copper	0.010	Detectable concentrations were 0.0805 mg/L for the upgradient well and ranged between 0.022 and 0.13 mg/L for downgradient wells, with the highest concentration recorded at monitoring well MW11-03 and the lowest concentration recorded at monitoring well MW11-02. All seven samples reported concentrations above the BAC.
Nickel	0.057	Detectable concentrations were 0.284 mg/L for the upgradient well and ranged between 0.037 and 0.33 mg/L for downgradient wells, with the highest concentration recorded at monitoring well MW11-03 and the lowest concentration recorded at monitoring well MW11-02. Five of seven samples reported concentrations above the BAC.
Cobalt	0.0087	Detectable concentrations were 0.0335 mg/L for the upgradient well and ranged between 0.0073 and 0.095 mg/L for downgradient wells, with the highest concentration recorded at monitoring well MW11-03 and the lowest concentration recorded at monitoring well MW11-02. Six of seven samples reported concentrations above the BAC.
Cadmium	0.0010	Detectable concentrations were 0.00059 mg/L for the upgradient well and ranged between 0.000043 and 0.0011 mg/L for downgradient wells, with the highest concentration recorded at monitoring well MW11-03 and the lowest concentration recorded at monitoring well MW11-02. One of seven samples reported concentrations above the BAC.
Lead	0.0071	Detectable concentrations were 0.019 mg/L for the upgradient well and ranged between 0.0039 and 0.26 mg/L for downgradient wells, with the highest concentration recorded at monitoring well MW11-03 and the lowest concentration recorded at monitoring well MW11-02. Six of seven samples reported concentrations above the BAC.

Parameter	Baseline Average Concentration (mg/L)	2014 Results
Zinc	0.84	Detectable concentrations were 0.1005 mg/L for the upgradient well and ranged between 0.13 and 17 mg/L for downgradient wells, with the highest concentration recorded at monitoring well MW11-02 and the lowest concentration recorded at monitoring well MW11-01. One of seven samples reported concentrations above the BAC.
Chromium	0.0306	Detectable concentrations were 1.015 mg/L for the upgradient well and ranged between 0.027 and 1.015 mg/L for the downgradient wells, with the highest concentration recorded at monitoring well MW11-01 and the lowest concentration recorded at monitoring well MW11-02. Six of seven samples reported concentrations above the BAC.
Arsenic	0.0183	Detectable concentrations were 0.021 mg/L for the upgradient well and ranged between 0.024 and 0.11 mg/L for the downgradient wells, with the highest concentration recorded at monitoring well MW11-02 and the lowest concentration recorded at monitoring well MW11-01. Six of seven samples reported concentrations above the BAC.
Mercury	0.0006	All seven samples reported concentrations below the laboratory detection limit of 0.0001 mg/L.
PCBs	0.0001	All seven samples reported concentrations below the laboratory detection limit of 0.00005 mg/L (0.0001 mg/L for the duplicate sample submitted to the secondary laboratory).
TPH	0.65	Detectable concentrations of PHC fractions F1, F2, and F3 were reported in four of seven samples, resulting in modified TPH concentrations for the seven samples ranging from 0.113 to 0.242 mg/L. No detectable concentrations were reported in upgradient samples.

3.3.3.5 Groundwater Trend Analysis by Parameter & Discussion of Trends

New groundwater monitoring wells were installed at the Non-Hazardous Waste Landfill and Tier II Disposal Facility during the 2011-2013 cleanup and maintenance works. Previously existing monitoring wells in this area were decommissioned during this period. The 2014 monitoring event is the first monitoring event where samples have been collected from these monitoring wells, so no trends are available for groundwater results at these locations.

3.3.4 Thermal Monitoring

Thermal monitoring was completed at this landfill on 25 August 2014. A total of nine thermistors were inspected as part of the monitoring program at this landfill location.

3.3.4.1 Thermistor Annual Maintenance Reports

The thermistor annual maintenance reports completed during the site inspection are provided following this page in Thermistor Annual Maintenance Reports 1-9.

3.3.4.2 Summary of Findings from Annual DEW Line Thermal Reports

The results of the analysis of thermistor data collected during this monitoring program were inconclusive. No thermistor report was completed for the thermistors installed at this landfill.

3.4 CONCLUSIONS/OVERALL PERFORMANCE OF THE LANDFILL

Based on the findings of the 2014 landfill monitoring program, the performance of the landfill is considered to be acceptable.

3.5 RECOMMENDATIONS/NEXT STEPS

Regular monitoring of this landfill as per the monitoring schedule shown in Table 1.1 should be continued. No remedial work is necessary at this time.

Thermistor Annual Maintenance Report 1

Contractor Name:	SENES	Inspection Date:	25-Aug-14
Prepared By:	S. Borcsok		

Thermistor Information

Site Name:	**FOX-4**	Thermistor Location	Non-Hazardous Waste and Tier II Disposal
Thermistor Number: VT-3		Inclination: Vertical	
Install Date:		First Date Event	Last Date Event
Coordinates and Elevation	N	E	Elev
Length of Cable (m)	Cable Lead Above Ground (m)	Nodal Points	
Datalogger Serial # 707259		Cable Serial Number	
Thermistor Type: UL16			

Thermistor Inspection

	Good	Needs Maintenance
Casing	□X	□
Cover	□X	□
Data Logger	□X	□
Cable	□X	□
Beads	□	□X 1, 2, 6, 7 not working
Battery Installation Date	Unknown	
Battery Levels	Main 11.34	Aux 13.38

Manual Ground Temperature Readings

Bead	Volts	Degrees C
1	0.0000	381.0742
2	0.0000	-101.4553
3	1.3253	12.6434
4	1.3241	13.1899
5	1.3583	13.7501
6	0.0000	-90.1096
7	0.0000	381.0742
8	1.2111	8.8153

Bead	Volts	Degrees C

Observations and Proposed Maintenance

Dessicant needs to be replaced
4 beads not working
Clock behind 2:32:53
Manual readings do not make sense

Thermistor Annual Maintenance Report 2

Contractor Name:	SENES	Inspection Date:	25-Aug-14
Prepared By:	S. Borcsok		

Thermistor Information

Site Name:	**FOX-4**	Thermistor Location	Non-Hazardous Waste and Tier II Disposal
Thermistor Number: VT-4		Inclination: Vertical	
Install Date:		First Date Event	Last Date Event
Coordinates and Elevation	N	E	Elev
Length of Cable (m)	Cable Lead Above Ground (m)	Nodal Points	
Datalogger Serial # 707255		Cable Serial Number	
Thermistor Type: UL16			

Thermistor Inspection

	Good	Needs Maintenance	
Casing	□X	□	
Cover	□X	□	
Data Logger	□X	□	
Cable	□X	□	
Beads	□X	□	
Battery Installation Date	Unknown		
Battery Levels	Main 11.34	Aux	12.17

Manual Ground Temperature Readings

Bead	Volts	Degrees C
1	1.4353	16.3765
2	1.4121	15.6102
3	1.3870	14.7373
4	1.3625	13.8939
5	1.3430	13.2291
6	0.0000	381.0742
7	0.0000	381.0742
8	0.0000	381.0742

Bead	Volts	Degrees C

Observations and Proposed Maintenance

Dessicant needs to be replaced

Clock behind 2:21:17

Manual readings do not make sense

Thermistor Annual Maintenance Report 3

Contractor Name:	SENES	Inspection Date:	25-Aug-14
Prepared By:	S. Borcsok		

Thermistor Information

Site Name:	**FOX-4**	Thermistor Location	Non-Hazardous Waste and Tier II Disposal
Thermistor Number: VT-5		Inclination: Vertical	
Install Date:		First Date Event	Last Date Event
Coordinates and Elevation	N	E	Elev
Length of Cable (m)	Cable Lead Above Ground (m)	Nodal Points	
Datalogger Serial # 707257		Cable Serial Number	
Thermistor Type: UL16			

Thermistor Inspection

	Good	Needs Maintenance	
Casing	□X	□	
Cover	□X	□	
Data Logger	□X	□	
Cable	□X	□	
Beads	□X	□	
Battery Installation Date			
Battery Levels	Main	11.34	Aux 13.14

Manual Ground Temperature Readings

Bead	Volts	Degrees C
1	1.5004	18.7062
2	1.4412	16.6138
3	1.4158	15.7596
4	1.4002	15.1952
5	1.3784	14.4395
6	1.3595	13.8102
7	0.0000	381.0742
8	0.0000	381.0742

Bead	Volts	Degrees C

Observations and Proposed Maintenance

Dessicant needs to be replaced
Datalogger was on 1 hour measurement, memory was wrapped
Changed to 12 hour measurement
Clock behind 2 days 1:10:01, manual readings do not make sense
Datalogger identifed as VT-5 on drawing, datalogger box said VT-2

Thermistor Annual Maintenance Report 4

Contractor Name:	SENES	Inspection Date:	25-Aug-14
Prepared By:	S. Borcsok		

Thermistor Information

Site Name:	**FOX-4**	Thermistor Location	Non-Hazardous Waste and Tier II Disposal
Thermistor Number: VT-5A		Inclination: Vertical	
Install Date:		First Date Event	Last Date Event
Coordinates and Elevation	N	E	Elev
Length of Cable (m)	Cable Lead Above Ground (m)	Nodal Points	
Datalogger Serial # 808003		Cable Serial Number	
Thermistor Type: UL16			

Thermistor Inspection

	Good	Needs Maintenance	
Casing	□X	□	
Cover	□X	□	
Data Logger	□X	□	
Cable	□X	□	
Beads	□	□	Bead 4 fluctuates wildly
Battery Installation Date	Unknown		
Battery Levels	Main	Aux	

Manual Ground Temperature Readings

Bead	Volts	Degrees C
1	1.4596	17.2894
2	1.4230	15.9924
3	1.3990	15.1554
4	1.3101	12.1123
5	1.3735	14.2713
6	0.0000	381.0742
7	0.0000	381.0742
8	0.0000	381.0742

Bead	Volts	Degrees C

Observations and Proposed Maintenance

Dessicant needs to be replaced
Clock behind 2:20:09
Thermistor was not identified on drawing provided before start of field program
Datalogger identified as VT-5
Manual readings do not make sense

Thermistor Annual Maintenance Report 5

Contractor Name:	SENES	Inspection Date:	25-Aug-14
Prepared By:	S. Borcsok		

Thermistor Information

Site Name:	**FOX-4**	Thermistor Location	Non-Hazardous Waste and Tier II Disposal
Thermistor Number: VT-6		Inclination: Vertical	
Install Date:		First Date Event	Last Date Event
Coordinates and Elevation	N	E	Elev
Length of Cable (m)	Cable Lead Above Ground (m)	Nodal Points	
Datalogger Serial # 707258		Cable Serial Number	
Thermistor Type: UL16			

Thermistor Inspection

	Good	Needs Maintenance	
Casing	□X	□	
Cover	□X	□	
Data Logger	□X	□	
Cable	□X	□	
Beads	□X	□	
Battery Installation Date	Unknown		
Battery Levels	Main	11.34	Aux 12.77

Manual Ground Temperature Readings

Bead	Volts	Degrees C
1	1.4602	17.3085
2	1.4296	16.2259
3	1.4053	15.3731
4	1.3815	14.5474
5	1.3566	13.6926
6	1.3357	12.9799
7	0.0000	381.0742
8	0.0000	381.0742

Bead	Volts	Degrees C

Observations and Proposed Maintenance

Dessicant needs to be replaced

Datalogger identifed as VT-6 on drawing, datalogger box said VT-1

Clock behind 2:20:45

Manual readings do not make sense

Thermistor Annual Maintenance Report 6

Contractor Name:	SENES	Inspection Date:	25-Aug-14
Prepared By:	S. Borcsok		

Thermistor Information

Site Name: **FOX-4**		Thermistor Location	Non-Hazardous Waste and Tier II Disposal
Thermistor Number: VT-7		Inclination: Vertical	
Install Date:		First Date Event	Last Date Event
Coordinates and Elevation	N	E	Elev
Length of Cable (m)	Cable Lead Above Ground (m)	Nodal Points	
Datalogger Serial # 07110044		Cable Serial Number	
Thermistor Type: UL16			

Thermistor Inspection

	Good	Needs Maintenance	
Casing	□X	□	
Cover	□X	□	
Data Logger	□X	□	
Cable	□X	□	
Beads	□X	□	
Battery Installation Date	Unknown		
Battery Levels	Main 7.68	Aux 5.60	

Manual Ground Temperature Readings

Bead	Volts	Degrees C
1	1.2141	8.9135
2	1.1885	8.0689
3	1.0889	4.8072
4	1.0489	3.4992
5	1.0144	2.3660
6	0.9807	1.2587
7	0.9465	0.1278
8	0.9268	-0.5295

Bead	Volts	Degrees C
9	0.9095	-1.1055
10	0.8972	-1.5200
11	0.8858	-1.9026
12	0.8786	-2.1446
13	0.0000	381.0742
14	0.0000	381.0742
15	0.0000	381.0742
16	0.0000	381.0742

Observations and Proposed Maintenance

Dessicant needs to be replaced
Clock behind 2:11:42

Thermistor Annual Maintenance Report 7

Contractor Name:	SENES	Inspection Date:	25-Aug-14
Prepared By:	S. Borcsok		

Thermistor Information

Site Name:	**FOX-4**	Thermistor Location	Non-Hazardous Waste and Tier II Disposal
Thermistor Number: VT-8		Inclination	Inclination: Vertical
Install Date:		First Date Event	Last Date Event
Coordinates and Elevation	N	E	Elev
Length of Cable (m)	Cable Lead Above Ground (m)	Nodal Points	
Datalogger Serial # 07110047		Cable Serial Number	
Thermistor Type: UL16			

Thermistor Inspection

	Good	Needs Maintenance
Casing	□X	□
Cover	□	□X Gasket on thermistor cover removed
Data Logger	□	□X
Cable	□	□X
Beads	□	□X
Battery Installation Date	Unknown	
Battery Levels	Main	Aux

Manual Ground Temperature Readings

Bead	Volts	Degrees C

Bead	Volts	Degrees C

Observations and Proposed Maintenance

Dessicant needs to be replaced
Communications error trying to read the configuration from the datalogger. Could not connect to the datalogger and download data.

Thermistor Annual Maintenance Report 8

Contractor Name:	SENES	Inspection Date:	25-Aug-14
Prepared By:	S. Borcsok		

Thermistor Information

Site Name: **FOX-4**		Thermistor Location	Non-Hazardous Waste and Tier II Disposal
Thermistor Number: VT-9		Inclination: Vertical	
Install Date:		First Date Event	Last Date Event
Coordinates and Elevation	N	E	Elev
Length of Cable (m)	Cable Lead Above Ground (m)	Nodal Points	
Datalogger Serial # 0711082		Cable Serial Number	
Thermistor Type: UL16			

Thermistor Inspection

	Good	Needs Maintenance	
Casing	□X	□	
Cover	□X	□	
Data Logger	□	□X	
Cable	□	□X	
Beads	□	□X	
Battery Installation Date			
Battery Levels	Main	Aux	

Manual Ground Temperature Readings

Bead	Volts	Degrees C

Bead	Volts	Degrees C

Observations and Proposed Maintenance

Dessicant needs to be replaced

Tried to download data and received error message "Invalid argument to time encode"

Thermistor Annual Maintenance Report 9

Contractor Name:	SENES	Inspection Date:	25-Aug-14
Prepared By:	S. Borcsok		

Thermistor Information

Site Name: **FOX-4**		Thermistor Location	Non-Hazardous Waste and Tier II Disposal
Thermistor Number: VT-10		Inclination: Vertical	
Install Date:		First Date Event	Last Date Event
Coordinates and Elevation	N	E	Elev
Length of Cable (m)	Cable Lead Above Ground (m)	Nodal Points	
Datalogger Serial # 07110049		Cable Serial Number	
Thermistor Type: UL16			

Thermistor Inspection

	Good	Needs Maintenance
Casing	□X	□
Cover	□	□X Cover to tight to get back on fully
Data Logger	□X	□
Cable	□X	□
Beads	□X	□
Battery Installation Date		
Battery Levels	Main 11.34	Aux 2.43

Manual Ground Temperature Readings

Bead	Volts	Degrees C
1	1.2214	9.1555
2	1.1331	6.2521
3	1.0755	4.3706
4	1.0402	3.2144
5	1.0030	1.9924
6	0.9657	0.7623
7	0.9391	-0.1205
8	0.9200	-0.7560

Bead	Volts	Degrees C
9	0.9073	-1.1796
10	0.8960	-1.5585
11	0.8863	-1.8846
12	0.8803	-2.0879
13	0.8748	-2.2735
14	0.8705	-2.4181
15	0.0000	381.0742
16	0.0000	381.0742

Observations and Proposed Maintenance

Dessicant needs to be replaced
Clock behind 63 days 23:58:17

4.0 HELIPAD WEST LANDFILL

4.1 LANDFILL DESCRIPTION

The Helipad West Landfill is located at the Upper Site to the west of the SRR facilities, and has an approximate area of 3,000 m^2. This landfill was built during the construction of the SRR site, before the cleanup of the FOX-4 site. It is understood to contain waste materials from the module train, garage, communication dishes, and other miscellaneous wastes. A detailed drawing of this landfill is provided in Figure 3. The historical chemical results for soil samples collected at this landfill are shown in plan on Figure 3A. The historical chemical results for groundwater samples collected at this landfill are shown in plan on Figure 3B.

4.2 SUMMARY OF WORK CONDUCTED

4.2.1 Visual Inspection

The visual inspection of the landfill was completed with no deviations from the visual inspection work plan.

4.2.2 Soil Sampling

Soil samples were collected at four (4) locations as shown on Figure 3. Surface and subsurface samples were collected at each location. There were no deviations from the soil sampling plan. One duplicate sample was collected from surficial soil at sample location MW98-02. Soil sampling completed at the landfill is summarized in Table 4.1.

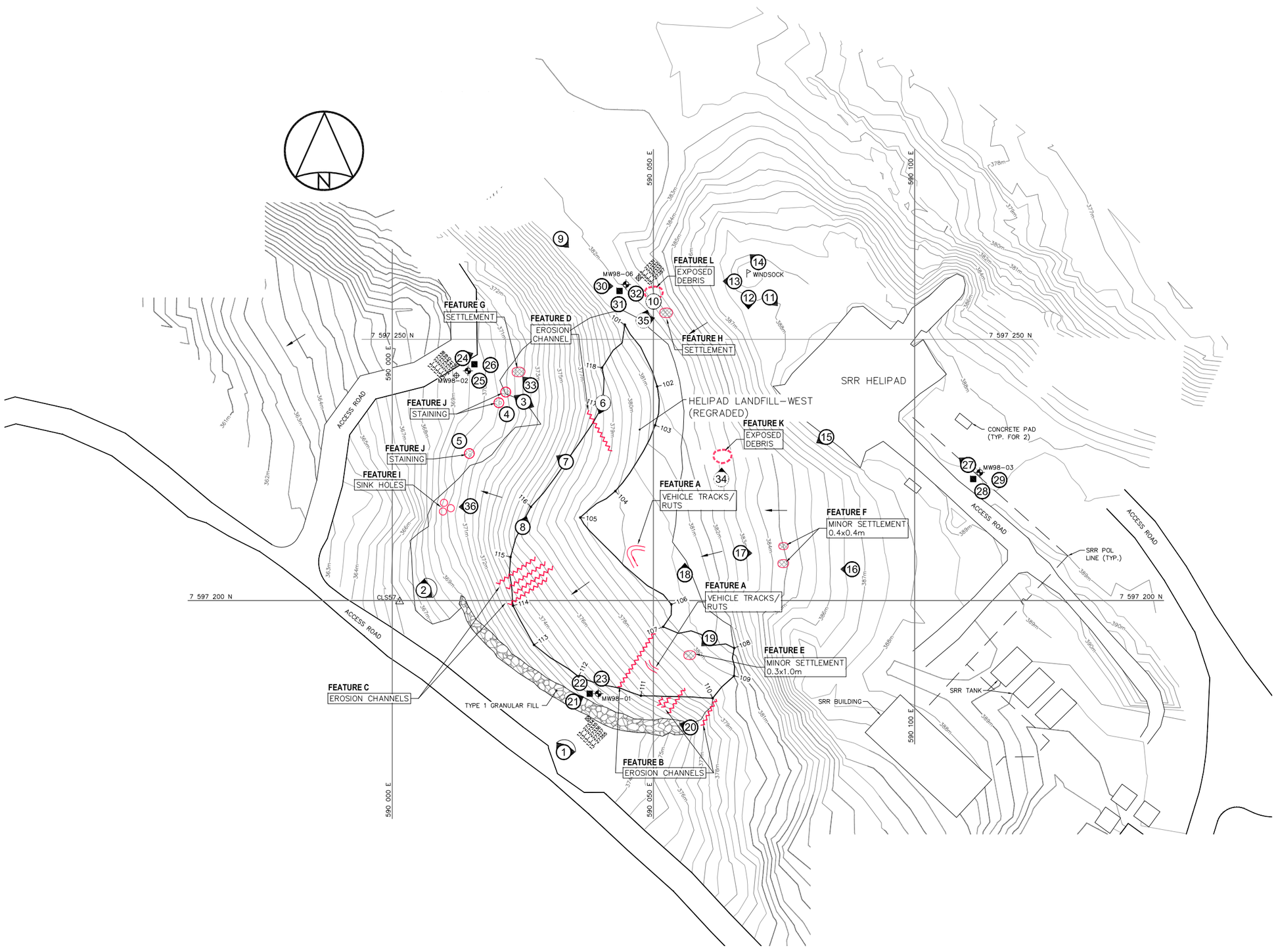
Table 4.1: Summary of Work Conducted by Soil Sampling Location (Helipad West Landfill)

Location	Surface Soil Sample Collected	Subsurface Soil Sample Collected
F4-HEL-MW98-01	√	√
F4-HEL-MW98-02	√[D]	√
F4-HEL-MW98-03	√	√
F4-HEL-MW98-06	√	√

D = duplicate sample collected
√ - sample collected
X – no sample collected

4.2.3 Groundwater Sampling

Groundwater monitoring was completed at four monitoring wells as shown on Figure 3. Groundwater monitoring and sampling at this landfill was generally completed as per the work plan. As indicated in Table 4.2, groundwater samples were not collected from one of four



LEGEND:

- CLS55 — SURVEY CONTROL MONUMENT (1)
- 101 — COORDINATE POINT
- MONITORING WELL LOCATION (4)
- MONITORING SOIL SAMPLE LOCATION (4)
- 13-27531 — SOIL SAMPLE TAG LOCATION TYPE 1
- GRANULAR FILL
- 24 — PHOTOGRAPH VIEWPOINT
- 388m — CONTOURS IN 0.5m INTERVALS
- OVERLAND FLOW DIRECTION
- EROSION CHANNEL
- AREA OF SETTLEMENT
- VEHICLE TRACKS/RUTS
- NATURAL STAINING
- EXPOSED DEBRIS
- SINK HOLE

NOTES:

1. LOCATIONS AND SCALE OF FEATURES ARE APPROXIMATE AND SHOWN FOR ILLUSTRATIVE PURPOSES ONLY.
2. PHOTOGRAPHS TAKEN AUG. 25, 2014.
3. ALL COORDINATES ARE REFERENCED TO NAD83 (CSRS), UTM ZONE 19N.
4. ALL ELEVATIONS REFER TO GEODETIC DATUM.
5. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.

REVISIONS:

No.	Date:	By:	Revisions

REFERENCE:

AECOM, FILE No.: FOX-4.2 Year 1 LF MON.dwg, Mar. 2014

0 15 30 metres

SCALE 1:750

SENES Consultants AN ARCADIS COMPANY

PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

2014 DEW LINE MONITORING PROGRAM

FOX-4 CAPE HOOPER, NUNAVUT

STATION AREA

HELIPAD LANDFILL WEST

Drawn By:	Approved By:	Project No:
I.S.Z.	C.F.G.	350600-515-2
Date: FEB. 2015	Scale: 1:750	Drawing No: FIGURE 3

Sheet Size: 11 x 17 (432mm x 279mm)

PLOT: March-02-15 5:00:25 PM Saved by: Izabela Zlba

SENES FILE NO.: 350600-515-2 FOX-4_Fig 3 - Station Area_Helipad Landfill.dwg

MW-06 Depth (cm)	2013 0-10	2014 0-15
Cu	**17**	**20**
Ni	14	**20**
Co	<5.0	**6.7**
Cd	<1.0	0.14
Pb	<1.0	7.1
Zn	35	**77**
Cr	**39**	**51**
As	**77**	**40**
Hg	<0.10	<0.050
Total PCBs	<0.050	<0.010
Modified TPH - (Total C6-C34)	7	28

MW-06 Depth (cm)	2013 30-40	2014 40-50
Cu	**17**	**41**
Ni	14	**21**
Co	<5.0	**6.2**
Cd	<1.0	0.11
Pb	<1.0	6.1
Zn	32	**52**
Cr	**41**	**40**
As	**39**	**66**
Hg	<0.10	<0.050
Total PCBs	<0.050	<0.010
Modified TPH - (Total C6-C34)	19.8	111

MW-03 Depth (cm)	1999 0	2000 0-15	2001 0-15	2003 0-15	2006 0-15	2007 0-15	2008 0-15	2010 0-10	2014 0-15
Cu	13	10	9.9	13	**18**	13	**21**	**26**	14
Ni	11	10	12	10	7.0	10	**19**	**17**	13
Co	<5.0	2.6	3.9	4.0	2.0	3.0	**6.0**	**14**	4.4
Cd	<1.0	<0.10	<0.10	<1.0	<1.0	0.9	<0.50	<1.0	<0.10
Pb	<1.0	4.0	3.0	<1.0	<1.0	<1.0	7.0	<10	4.2
Zn	26	18	25	23	16	25	23	**52**	32
Cr	28	16	23	24	16	25	**48**	**43**	32
As	12	17	12	**95**	8.4	10	**49**	13	31
Hg	<0.10	<0.050	<0.050	<0.040	<0.040	<0.040	<0.10	<0.1	<0.050
Total PCBs	**0.015**	<0.0030	<0.010	<0.0040	<0.10	<0.10	<0.050	<0.003	<0.010
Modified TPH - (Total C6-C34)	<40	<100	<20	110	66	26	19	37	15

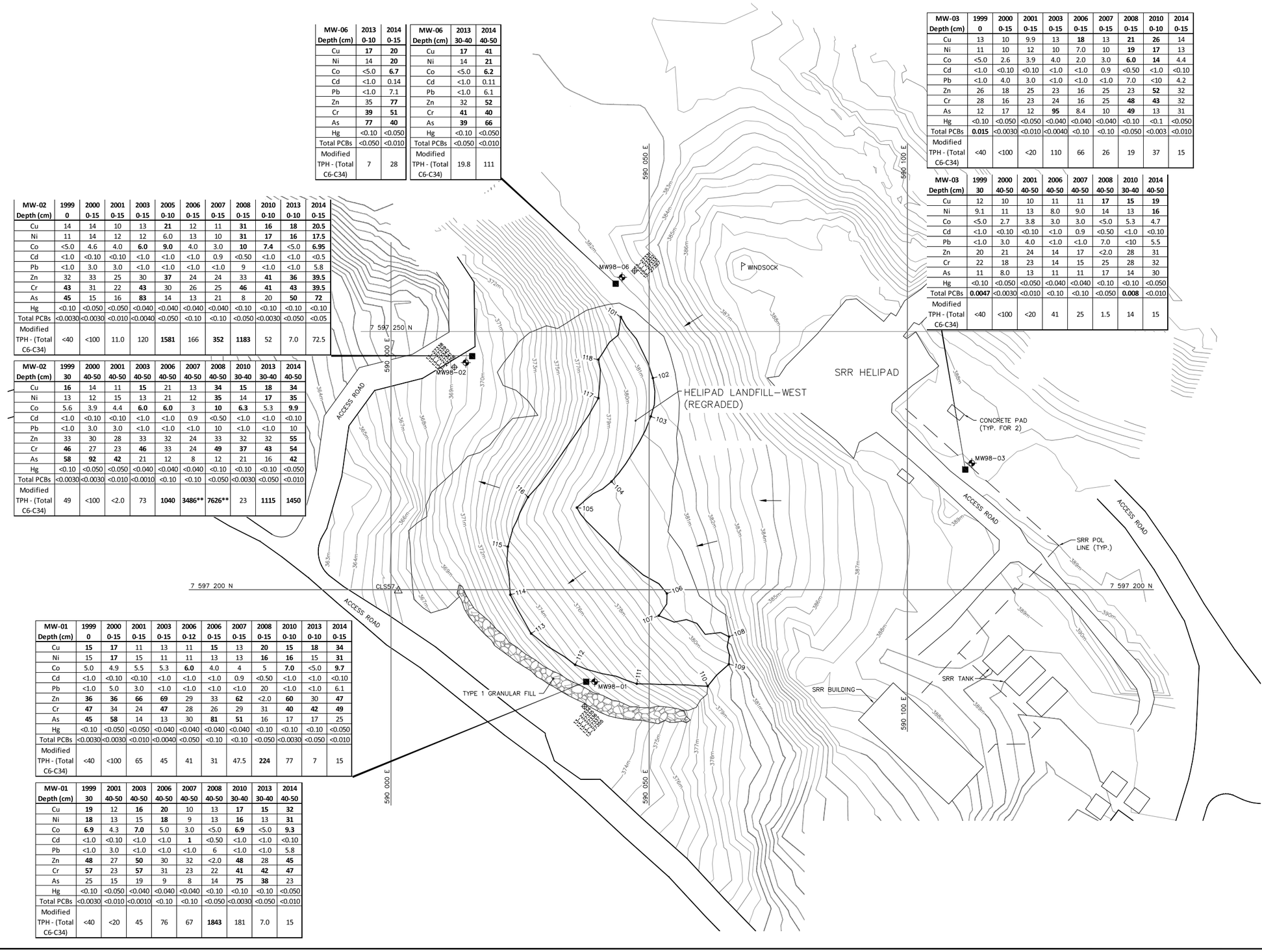
MW-03 Depth (cm)	1999 30	2000 40-50	2001 40-50	2006 40-50	2007 40-50	2008 40-50	2010 30-40	2014 40-50
Cu	12	10	10	11	11	**17**	**15**	**19**
Ni	9.1	11	13	8.0	9.0	14	13	**16**
Co	<5.0	2.7	3.8	3.0	3.0	<5.0	5.3	4.7
Cd	<1.0	<0.10	<0.10	<1.0	0.9	<0.50	<1.0	<0.10
Pb	<1.0	3.0	4.0	<1.0	<1.0	7.0	<10	5.5
Zn	20	21	24	14	17	<2.0	28	31
Cr	22	18	23	14	15	25	28	32
As	11	8.0	13	11	11	17	14	30
Hg	<0.10	<0.050	<0.050	<0.040	<0.040	<0.10	<0.10	<0.050
Total PCBs	**0.0047**	<0.0030	<0.010	<0.10	<0.10	<0.050	**0.008**	<0.010
Modified TPH - (Total C6-C34)	<40	<100	<20	41	25	1.5	14	15

MW-02 Depth (cm)	1999 0	2000 0-15	2001 0-15	2003 0-15	2005 0-10	2006 0-15	2007 0-15	2008 0-15	2010 0-10	2013 0-10	2014 0-15
Cu	14	14	10	13	**21**	12	11	**31**	**16**	**18**	**20.5**
Ni	11	14	12	12	6.0	13	10	**31**	**17**	**16**	**17.5**
Co	<5.0	4.6	4.0	**6.0**	**9.0**	4.0	3.0	**10**	**7.4**	<5.0	**6.95**
Cd	<1.0	<0.10	<0.10	<1.0	<1.0	<1.0	0.9	<0.50	<1.0	<1.0	<0.5
Pb	<1.0	3.0	3.0	<1.0	<1.0	<1.0	<1.0	9	<1.0	<1.0	5.8
Zn	32	33	25	30	**37**	24	24	33	**41**	**36**	**39.5**
Cr	**43**	31	22	**43**	30	26	25	**46**	**41**	**43**	**39.5**
As	**45**	15	16	**83**	14	13	21	8	20	**50**	**72**
Hg	<0.10	<0.050	<0.050	<0.040	<0.040	<0.040	<0.040	<0.10	<0.10	<0.10	<0.10
Total PCBs	<0.0030	<0.0030	<0.010	<0.0040	<0.050	<0.10	<0.10	<0.050	<0.0030	<0.050	<0.05
Modified TPH - (Total C6-C34)	<40	<100	11.0	120	**1581**	166	**352**	**1183**	52	7.0	72.5

MW-02 Depth (cm)	1999 30	2000 40-50	2001 40-50	2003 40-50	2006 40-50	2007 40-50	2008 40-50	2010 30-40	2013 30-40	2014 40-50
Cu	**16**	14	11	**15**	21	13	**34**	**15**	**18**	**34**
Ni	13	12	15	13	21	12	**35**	14	**17**	**35**
Co	5.6	3.9	4.4	**6.0**	**6.0**	3	**10**	**6.3**	5.3	**9.9**
Cd	<1.0	<0.10	<0.10	<1.0	<1.0	<1.0	0.9	<0.50	<1.0	<1.0	<0.10
Pb	<1.0	3.0	3.0	<1.0	<1.0	<1.0	10	<1.0	<1.0	<1.0	10
Zn	33	30	28	33	32	24	33	32	32	**55**
Cr	**46**	27	23	**46**	33	24	**49**	**37**	**43**	**54**
As	**58**	**92**	**42**	21	12	8	12	21	16	**42**
Hg	<0.10	<0.050	<0.050	<0.040	<0.040	<0.040	<0.10	<0.10	<0.10	<0.050
Total PCBs	<0.0030	<0.0030	<0.010	<0.0010	<0.10	<0.10	<0.050	<0.0030	<0.050	<0.010
Modified TPH - (Total C6-C34)	49	<100	<2.0	73	**1040**	**3486****	**7626****	23	**1115**	**1450**

MW-01 Depth (cm)	1999 0	2000 0-15	2001 0-15	2003 0-15	2006 0-12	2006 0-15	2007 0-15	2008 0-15	2010 0-10	2013 0-10	2014 0-15
Cu	**15**	**17**	11	13	11	**15**	13	**20**	**15**	**18**	**34**
Ni	15	**17**	15	11	11	13	13	**16**	**16**	15	**31**
Co	5.0	4.9	5.5	5.3	**6.0**	4.0	4	5	**7.0**	<5.0	**9.7**
Cd	<1.0	<0.10	<0.10	<1.0	<1.0	<1.0	0.9	<0.50	<1.0	<1.0	<0.10
Pb	<1.0	5.0	3.0	<1.0	<1.0	<1.0	<1.0	20	<1.0	<1.0	6.1
Zn	**36**	**36**	**66**	**69**	29	33	**62**	<2.0	**60**	30	**47**
Cr	**47**	34	24	**47**	28	26	29	31	**40**	**42**	**49**
As	**45**	**58**	14	13	30	**81**	**51**	16	17	17	25
Hg	<0.10	<0.050	<0.050	<0.040	<0.040	<0.040	<0.040	<0.10	<0.10	<0.10	<0.050
Total PCBs	<0.0030	<0.0030	<0.010	<0.0040	<0.050	<0.10	<0.10	<0.050	<0.0030	<0.050	<0.010
Modified TPH - (Total C6-C34)	<40	<100	65	45	41	31	47.5	**224**	77	7	15

MW-01 Depth (cm)	1999 30	2001 40-50	2003 40-50	2006 40-50	2007 40-50	2008 40-50	2010 30-40	2013 30-40	2014 40-50
Cu	**19**	12	**16**	**20**	10	13	**17**	**15**	**32**
Ni	**18**	13	15	**18**	9	13	**16**	13	**31**
Co	**6.9**	4.3	**7.0**	5.0	3.0	<5.0	**6.9**	<5.0	**9.3**
Cd	<1.0	<0.10	<1.0	<1.0	**1**	<0.50	<1.0	<1.0	<0.10
Pb	<1.0	3.0	<1.0	<1.0	<1.0	6	<1.0	<1.0	5.8
Zn	**48**	27	**50**	30	32	<2.0	**48**	28	**45**
Cr	**57**	23	**57**	31	23	22	**41**	**42**	**47**
As	25	15	19	9	8	14	**75**	**38**	23
Hg	<0.10	<0.050	<0.040	<0.040	<0.040	<0.10	<0.10	<0.10	<0.050
Total PCBs	<0.0030	<0.010	<0.0010	<0.10	<0.10	<0.050	<0.0030	<0.050	<0.010
Modified TPH - (Total C6-C34)	<40	<20	45	76	67	**1843**	181	7.0	15



LEGEND:

- CLS55 — SURVEY CONTROL MONUMENT (1)
- 101 — COORDINATE POINT
- MONITORING WELL LOCATION (4)
- MONITORING SOIL SAMPLE LOCATION (4)
- 13-27531 — SOIL SAMPLE TAG LOCATION TYPE 1
- GRANULAR FILL
- 388m — CONTOURS IN 0.5m INTERVALS
- OVERLAND FLOW DIRECTION

Parameter	Baseline Average Concentration	DEW Line Tier I Cleanup Criteria	DEW Line Tier II Cleanup Criteria
Cu	15	N/A	100
Ni	16	N/A	100
Co	5.9	N/A	50
Cd	1.0	N/A	5
Pb	24	200	500
Zn	36	N/A	500
Cr	35	N/A	250
As	34	N/A	130
Hg	-	N/A	2.0
Total PCB	0.001	1	5
Modified TPH - (Total C6-C34)	222	N/A	2500

All Concentrations in mg/kg

Bold Concentration is Equal to or Exceeds Baseline Average Concentration

* Concentration Exceeds DEW Line Tier I Cleanup Criteria

** Concentration Exceeds DEW Line Tier II Cleanup Criteria

\- No Concentration Reported

N/A Not Applicable

NOTES:

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3. ALL ELEVATIONS REFER TO GEODETIC DATUM.
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REFERENCE:

AECOM, FILE No.: FOX-4.2 Year 1 LF MON.dwg, Mar. 2014

0 15 30 metres

SCALE 1:750

SENES Consultants AN ARCADIS COMPANY

PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

2014 DEW LINE MONITORING PROGRAM

FOX-4 CAPE HOOPER, NUNAVUT

STATION AREA - HELIPAD LANDFILL WEST

SOIL CONTAMINANT DISTRIBUTION PLAN

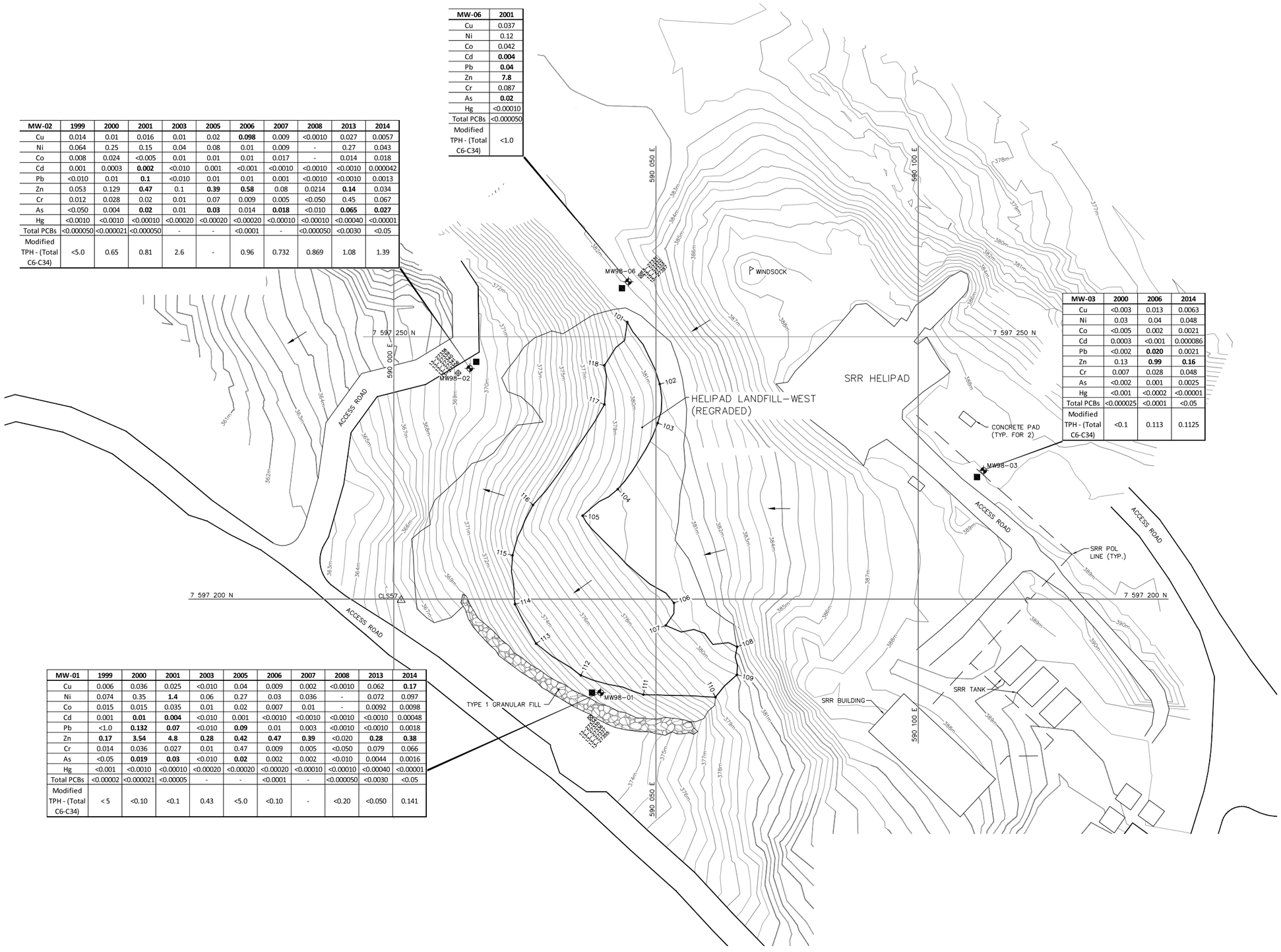
Drawn By:	Approved By:	Project No:
I.S.Z.	C.F.G.	350600-515-2
Date: FEB. 2015	Scale: 1:750	Drawing No: FIGURE 3A

MW-02	1999	2000	2001	2003	2005	2006	2007	2008	2013	2014
Cu	0.014	0.01	0.016	0.01	0.02	**0.098**	0.009	<0.0010	0.027	0.0057
Ni	0.064	0.25	0.15	0.04	0.08	0.01	0.009	-	0.27	0.043
Co	0.008	0.024	<0.005	0.01	0.01	0.01	0.017	-	0.014	0.018
Cd	0.001	0.0003	**0.002**	<0.010	0.001	<0.001	<0.0010	<0.0010	<0.0010	0.000042
Pb	<0.010	0.01	**0.1**	<0.010	0.01	0.01	0.001	<0.0010	<0.0010	0.0013
Zn	0.053	0.129	**0.47**	0.1	**0.39**	**0.58**	0.08	0.0214	**0.14**	0.034
Cr	0.012	0.028	0.02	0.01	0.07	0.009	0.005	<0.050	0.45	0.067
As	<0.050	0.004	**0.02**	0.01	**0.03**	0.014	**0.018**	<0.010	**0.065**	**0.027**
Hg	<0.0010	<0.0010	<0.00010	<0.00020	<0.00020	<0.00020	<0.00010	<0.00010	<0.00040	<0.00001
Total PCBs	<0.000050	<0.000021	<0.000050	-	-	<0.0001	-	<0.000050	<0.0030	<0.05
Modified TPH - (Total C6-C34)	<5.0	0.65	0.81	2.6	-	0.96	0.732	0.869	1.08	1.39

MW-06	2001
Cu	0.037
Ni	0.12
Co	0.042
Cd	**0.004**
Pb	**0.04**
Zn	**7.8**
Cr	0.087
As	**0.02**
Hg	<0.00010
Total PCBs	<0.000050
Modified TPH - (Total C6-C34)	<1.0

MW-03	2000	2006	2014
Cu	<0.003	0.013	0.0063
Ni	0.03	0.04	0.048
Co	<0.005	0.002	0.0021
Cd	0.0003	<0.001	0.000086
Pb	<0.002	**0.020**	0.0021
Zn	0.13	**0.99**	**0.16**
Cr	0.007	0.028	0.048
As	<0.002	0.001	0.0025
Hg	<0.001	<0.0002	<0.00001
Total PCBs	<0.000025	<0.0001	<0.05
Modified TPH - (Total C6-C34)	<0.1	0.113	0.1125

MW-01	1999	2000	2001	2003	2005	2006	2007	2008	2013	2014
Cu	0.006	0.036	0.025	<0.010	0.04	0.009	0.002	<0.0010	0.062	**0.17**
Ni	0.074	0.35	**1.4**	0.06	0.27	0.03	0.036	-	0.072	0.097
Co	0.015	0.015	0.035	0.01	0.02	0.007	0.01	-	0.0092	0.0098
Cd	0.001	**0.01**	**0.004**	<0.010	0.001	<0.0010	<0.0010	<0.0010	<0.0010	0.00048
Pb	<1.0	**0.132**	**0.07**	<0.010	**0.09**	0.01	0.003	<0.0010	<0.0010	0.0018
Zn	**0.17**	**3.54**	**4.8**	**0.28**	**0.42**	**0.47**	**0.39**	<0.020	**0.28**	**0.38**
Cr	0.014	0.036	0.027	0.01	0.47	0.009	0.005	<0.050	0.079	0.066
As	<0.05	**0.019**	**0.03**	<0.010	**0.02**	0.002	0.002	<0.010	0.0044	0.0016
Hg	<0.001	<0.0010	<0.00010	<0.00020	<0.00020	<0.00020	<0.00010	<0.00010	<0.00040	<0.00001
Total PCBs	<0.00002	<0.000021	<0.00005	-	-	<0.0001	-	<0.000050	<0.0030	<0.05
Modified TPH - (Total C6-C34)	< 5	<0.10	<0.1	0.43	<5.0	<0.10	-	<0.20	<0.050	0.141



LEGEND:

- CLS55 — SURVEY CONTROL MONUMENT (1)
- 101 — COORDINATE POINT
- MONITORING WELL LOCATION (4)
- MONITORING SOIL SAMPLE LOCATION (4)
- 13-27531 — SOIL SAMPLE TAG LOCATION TYPE 1
- GRANULAR FILL
- 388m — CONTOURS IN 0.5m INTERVALS
- OVERLAND FLOW DIRECTION

Parameter	Baseline Average Concentration
Cu	0.072
Ni	1.03
Co	0.044
Cd	0.0018
Pb	0.016
Zn	0.14
Cr	1.27
As	0.015
Hg	-
Total PCB	0.000026
Modified TPH - (Total C6-C34)	7.2

All Concentrations in mg/L

Bold — Concentration is Equal to or Exceeds Baseline Average Concentration

\- — No Concentration Reported

N/A — Not Applicable

NOTES:

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REFERENCE:

AECOM, FILE No.: FOX-4.2 Year 1 LF MON.dwg, Mar. 2014

0 15 30 metres

SCALE 1:750

SENES Consultants AN ARCADIS COMPANY

PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

2014 DEW LINE MONITORING PROGRAM

FOX-4 CAPE HOOPER, NUNAVUT

STATION AREA - HELIPAD LANDFILL WEST

GROUNDWATER CONTAMINANT DISTRIBUTION PLAN

Drawn By:	Approved By:	Project No:
I.S.Z.	C.F.G.	350600-515-2
Date: FEB. 2015	Scale: 1:750	Drawing No: FIGURE 3B

monitoring wells at this landfill as the well was dry during this monitoring program. No duplicate groundwater samples were collected during this monitoring program.

Table 4.2: Summary of Work Conducted by Groundwater Sampling Location (Helipad West Landfill)

Location	Visual Inspection/ Groundwater Monitoring	Sample collected for PCB analysis	Sample collected for metals analysis	Sample collected for PHCs F1-F4 analysis
F4-HEL-MW98-01	√	√	√	√
F4-HEL-MW98-02	√	√	√	√
F4-HEL-MW98-03	√	√	√	√
F4-HEL-MW98-06	√	X^N	X^N	X^N

D - duplicate sample collected
√ - sample collected
X – no sample collected
N – no water in well (well was dry)
I – insufficient water in well to collect sample

4.2.4 Thermal Monitoring

No thermal monitoring was completed at this landfill as no vertical thermistors have been installed at this landfill.

4.3 RESULTS OF THE MONITORING PROGRAM

4.3.1 Visual Inspection

The visual inspection at the Helipad West Landfill was completed on 25 and 26 August 2014. The results of the visual inspection are detailed in Table 4.3 and shown on Figure 3 and in the photo log Table 4.6.

Table 4.3: Visual Inspection Results (Helipad West Landfill)

Item	Description
Settlement	Settlement was noted in the form of small sinkholes directly above boulders that had been placed at the bottom of landfill slopes (Feature E, F, G, H, I).
Erosion	Erosion channels were noted on multiple steep landfill slopes (Feature B, C, D).
Frost Action	None observed.
Sloughing and Cracking	None observed.
Animal Burrows	None observed.
Vegetation	No vegetation was observed at this landfill.
Staining	Red oxidation staining was observed east of MW98-02. (Feature J)
Vegetation Stress	None observed.
Seepage Points	No active seepage points were observed.
Debris Exposed	Occasional small pieces of metal debris were observed at the landfill. This debris is not believed to originate within the landfill. (Feature K)
Presence/Condition of Monitoring Instruments	Four monitoring well installations were observed at this landfill. During monitoring of the wells it was observed that wet bentonite clay had heaved up and filled the space in the top of the well casing.
Other Features of Note	Vehicle tracks were observed in two locations at the landfill. (Feature A)

4.3.1.1 Inspection Check List

The visual inspection checklist completed during the site inspection is provided in Table 4.4.

4.3.1.2 Stability Assessment

The preliminary stability assessment completed during the site inspection of this landfill is provided in Table 4.5.

4.3.1.3 Photographic Records

The photographic records for the Helipad West Landfill are provided in Table 4.6.

4.3.1.4 Trend Analysis

No trends in visual observations at this landfill can be observed as 2014 is the first year of monitoring at this landfill following re-grading of the landfill area during the 2011-2013 maintenance.

4.3.1.5 Discussion of Results/Trends

Based on the results of the 2014 visual inspection, the performance of this landfill is acceptable. Two issues described below should be closely monitored in the future to ensure that landfill performance is not degrading.

A significant number of erosion channels have been noted at the Helipad West Landfill. Given the steep slopes present at this landfill, the presence of erosion channels should be expected. The

TABLE 4.4 - VISUAL INSPECTION CHECKLIST

DEW LINE CLEANUP: POST-CONSTRUCTION - LANDFILL MONITORING

INSPECTION REPORT – PAGE 1 OF 2

SITE NAME: FOX-4
LANDFILL DESIGNATION: Helipad West Landfill
DATE OF INSPECTION: 25-26 August 2014
DATE OF PREVIOUS INSPECTION: N/A
INSPECTED BY: J. Mauchan/S. Borcsok
REPORT PREPARED BY: S. Borcsok
The inspector/reporter represents to the best of their knowledge, the following statements and observations are true and correct and to the best of the preparer's actual knowledge, no material facts have been suppressed or misstated.

TABLE 4.4 - VISUAL INSPECTION CHECKLIST - INSPECTION REPORT – PAGE 2 OF 2

Checklist Item	Present Yes/No	Location (Describe relative to existing monuments/features and relative to landfill design i.e. surface, berms, toe)	Length	Width	Depth	Extent relative to Area of Landfill (%)	Description	Photographic Records Focal length, location, view point & direction (relative to magnetic north) Feature of note Scale	Additional Comments
Settlement	YES	At bottom of slopes above large boulders (Feature E, F, G, H, I)	0.3	0.3	0.3	<1%	Sinkholes	19.1, 33.1, 35.1, 35.2, 36.1	Potentially caused by infilling of voids around boulders
Erosion	YES	Downhill on steep landfill slopes (Feature B, C, D)				1-2%	Erosion channels	1.1, 1.2, 2.1, 6.1	
Frost Action	NO								
Sloughing and Cracking	NO								
Animal Burrows	NO								
Vegetation	NO								
Staining	YES	East of MW98-02 (Feature J)				<1%	Ox. staining in erosion channel	4.1, 5.1	
Vegetation Stress	NO								
Seepage Points	NO								
Debris Exposed	YES	On northeast corner of landfill (Feature K)				<1%	Small metal debris	10.1, 34.1	
Presence/Condition – Monitoring Instruments	YES	4 monitoring wells							
Features of Note.	YES	Vehicle tracks/ruts on east side of landfill (Feature A)				<1%	Tire ruts	15.1	

Table 4.5: Preliminary Stability Assessment - FOX-4 Helipad West Landfill

Feature	Severity Rating	Extent
Settlement	Acceptable	Occasional
Erosion	Acceptable	Occasional
Frost Action	None	None
Staining	Acceptable	Occasional
Vegetation Stress	None	None
Seepage/Ponded Water	None	None
Debris exposure	Acceptable	Occasional
Overall Landfill Performance: ACCEPTABLE		

Performance/ Severity Rating	Description
Acceptable	Noted features are of little consequence. The landfill is performing as designed. Minor deviations in environmental or physical performance may be observed, such as isolated areas of erosion, settlement.
Marginal	Physical/environmental performance appears to be deteriorating with time. Observations may include an increase in size or number of features of note, such as differential settlement, erosion or cracking. No significant impact on landfill stability to date, but potential for failure is assessed as low or moderate.
Significant	Significant or potentially significant changes affecting landfill stability, such as significant changes in slope geometry, significant erosion or differential settlement; scarp development. The potential for failure is assessed as imminent.
Unacceptable	Stability of landfill is compromised to the extent that ability to contain waste materials is compromised. Examples may include: - Debris exposed in erosion channels or areas of differential settlement. - Liner exposed. - Slope failure.

Extent	Description
Isolated	Singular feature
Occasional	Features of note occurring at irregular intervals/locations
Numerous	Many features of note, impacted less than 50% of the surface area of the landfill
Extensive	Impacting greater than 50% of the surface area of the landfill

TABLE 4.6: LANDFILL VISUAL INSPECTION PHOTO LOG (HELIPAD WEST LANDFILL)

FOX-4 Station Area Helipad Landfill West (see Figure 3)

Photo 1.1 (FOX-4 HEL P-1 east.jpg)	Photo 1.2 (FOX-4 HEL P-1 ne.jpg)
Description: View looking east from access road near MW98-01. Erosion channels noted on landfill slope. **(FEATURE B)**	Description: View looking northeast toward MW98-01. Erosion channel observed on the slope to the right of the monitoring well. **(FEATURE C)**
	
Date: August 25, 2014	Date: August 25, 2014

TABLE 4.6: LANDFILL VISUAL INSPECTION PHOTO LOG (HELIPAD WEST LANDFILL)

Photo 1.3 (FOX-4 HEL P-1 nw.jpg)	Photo 2.1 (FOX-4 HEL P-2 east.jpg)
Description: View northwest from access road near MW98-01.	Description: View east looking up slope toward erosion channels. **(FEATURE C)**
	
Date: August 25, 2014	Date: August 25, 2014

TABLE 4.6: LANDFILL VISUAL INSPECTION PHOTO LOG (HELIPAD WEST LANDFILL)

Photo 2.2 (FOX-4 HEL P-2 ne.jpg)	Photo 2.3 (FOX-4 HEL P-2 se.jpg)
Description: View northeast toward the western portion of the helipad landfill.	Description: View southeast along toe of the landfill.
	
Date: August 25, 2014	Date: August 25, 2014

TABLE 4.6: LANDFILL VISUAL INSPECTION PHOTO LOG (HELIPAD WEST LANDFILL)

Photo 3.1 (FOX-4 HEL P-3 nw.jpg)	Photo 3.2 (FOX-4 HEL P-3 se.jpg)
Description: View northwest toward MW98-02.	Description: View southeast looking up slope from east of MW98-02.
	
Date: August 25, 2014	Date: August 25, 2014

TABLE 4.6: LANDFILL VISUAL INSPECTION PHOTO LOG (HELIPAD WEST LANDFILL)

Photo 4.1 (FOX-4 HEL P-4.jpg)	Photo 5.1 (FOX-4 HEL P-5.jpg)
Description: View of stain southeast of MW98-02. **(FEATURE J)**	Description: Stain south of MW98-02. **(FEATURE J)**
	
Date: August 25, 2014	Date: August 25, 2014

TABLE 4.6: LANDFILL VISUAL INSPECTION PHOTO LOG (HELIPAD WEST LANDFILL)

Photo 6.1 (FOX-4 HEL P-6 south.jpg)	Photo 7.1 (FOX-4 HEL P-7 nw.jpg)
Description: Erosion channel east of MW98-02. **(FEATURE D)**	Description: View looking down slope toward MW98-02.
	
Date: August 25, 2014	Date: August 25, 2014

TABLE 4.6: LANDFILL VISUAL INSPECTION PHOTO LOG (HELIPAD WEST LANDFILL)

Photo 8.1 (FOX-4 HEL P-8 ne.jpg)	Photo 9.1 (FOX-4 HEL P-9 se.jpg)
Description: View north along top of landfill slope. Stakes marking MW98-06 can be seen in the background, left of the wildlife monitor.	Description: View southeast toward MW98-06 (stake in centre of photo). Wildlife monitor standing at the windsock.
	
Date: August 25, 2014	Date: August 25, 2014

TABLE 4.6: LANDFILL VISUAL INSPECTION PHOTO LOG (HELIPAD WEST LANDFILL)

Photo 10.1 (FOX-4 HEL P-10.jpg)	Photo 11.1 (FOX-4 HEL P-11 se.jpg)
Description: Exposed old pipe east of MW98-06. **(FEATURE L)**	Description: View southeast across helipad from windsock.
	
Date: August 25, 2014	Date: August 25, 2014

TABLE 4.6: LANDFILL VISUAL INSPECTION PHOTO LOG (HELIPAD WEST LANDFILL)

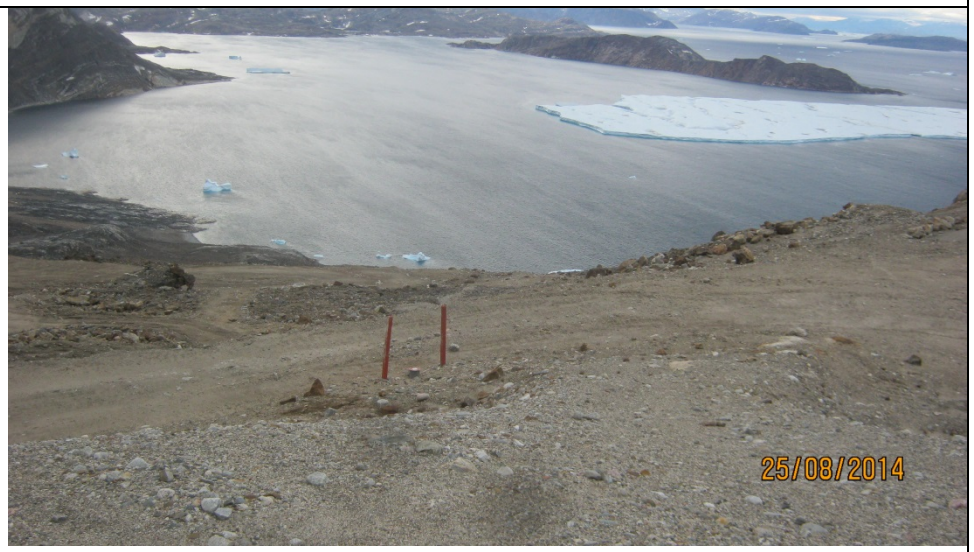
Photo 12.1 (FOX-4 HEL P-12 south.jpg)	Photo 13.1 (FOX-4 HEL P-13 west.jpg)
Description: View south from windsock.	Description: View east from windsock looking downhill toward MW98-06.
	
Date: August 25, 2014	Date: August 25, 2014

TABLE 4.6: LANDFILL VISUAL INSPECTION PHOTO LOG (HELIPAD WEST LANDFILL)

Photo 14.1 (FOX-4 HEL P-14 nw.jpg)	Photo 15.1 (FOX-4 HEL P-15 west.jpg)
Description: View northwest from windsock.	Description: View downslope from helipad. Vehicle tracks/ruts can be seen on the flatter part of the slope (centre of photo). **(FEATURE A)**
	
Date: August 25, 2014	Date: August 25, 2014

TABLE 4.6: LANDFILL VISUAL INSPECTION PHOTO LOG (HELIPAD WEST LANDFILL)

Photo 16.1 (FOX-4 HEL P-16 west.jpg)	Photo 17.1 (FOX-4 HEL P-17 east.jpg)
Description: View west looking downslope.	Description: View east looking upslope toward helipad access road.
	
Date: August 25, 2014	Date: August 25, 2014

TABLE 4.6: LANDFILL VISUAL INSPECTION PHOTO LOG (HELIPAD WEST LANDFILL)

Photo 18.1 (FOX-4 HEL P-18 north.jpg)	Photo 19.1 (FOX-4 HEL P-19 sw.jpg)
Description: View north of flatter section of helipad landfill west.	Description: View downhill towards MW98-01 location (not seen in photo). Minor settlement located at trowel. **(FEATURE E)**
	
Date: August 25, 2014	Date: August 25, 2014

TABLE 4.6: LANDFILL VISUAL INSPECTION PHOTO LOG (HELIPAD WEST LANDFILL)

Photo 20.1 (FOX-4 HEL P-20 west.jpg)	Photo 21.1 (FOX-4 HEL P-21 east.jpg)
Description: View west along toe of landfill. MW98-01 is visible.	Description: MW98-01.
	
Date: August 25, 2014	Date: August 25, 2014

TABLE 4.6: LANDFILL VISUAL INSPECTION PHOTO LOG (HELIPAD WEST LANDFILL)

Photo 22.1 (FOX-4 HEL P-22.jpg)	Photo 23.1 (FOX-4 HEL P-23.jpg)
Description: Soil sample collection of F4-HEL-MW98-01.	Description: After collection and backfill of F4-HEL-MW98-01.
	
Date: August 25, 2014	Date: August 25, 2014

TABLE 4.6: LANDFILL VISUAL INSPECTION PHOTO LOG (HELIPAD WEST LANDFILL)

Photo 24.1 (FOX-4 HEL P-24 ne.jpg)	Photo 25.1 (FOX-4 HEL P-25.jpg)
Description: View northeast from MW98-02.	Description: Soil sample collection of F4-HEL-MW98-02.
	
Date: August 25, 2014	Date: August 25, 2014

TABLE 4.6: LANDFILL VISUAL INSPECTION PHOTO LOG (HELIPAD WEST LANDFILL)

Photo 26.1 (FOX-4 HEL P-26.jpg)	Photo 27.1 (FOX-4 HEL P-27 nw.jpg)
Description: After collection and backfill of F4-HEL-MW98-02.	Description: View across helipad toward windsock from MW98-03.
	
Date: August 25, 2014	Date: August 25, 2014

TABLE 4.6: LANDFILL VISUAL INSPECTION PHOTO LOG (HELIPAD WEST LANDFILL)

Photo 28.1 (FOX-4 HEL P-28.jpg)	Photo 29.1 (FOX-4 HEL P-29.jpg)
Description: Soil sample collection of F4-HEL-MW98-03.	Description: After collection and backfill of F4-HEL-MW98-03.
	
Date: August 25, 2014	Date: August 25, 2014

TABLE 4.6: LANDFILL VISUAL INSPECTION PHOTO LOG (HELIPAD WEST LANDFILL)

Photo 30.1 (FOX-4 HEL P-30 east.jpg)	Photo 31.1 (FOX-4 HEL P-31.jpg)
Description: View east toward MW98-06. Windsock pole is seen at the top of the slope.	Description: Soil sample collection of F4-HEL-MW98-06.
	
Date: August 25, 2014	Date: August 25, 2014

TABLE 4.6: LANDFILL VISUAL INSPECTION PHOTO LOG (HELIPAD WEST LANDFILL)

Photo 32.1 (FOX-4 HEL P-32.jpg)	Photo 33.1 (FOX-4 HEL P-33.jpg)
Description: After collection and backfill of F4-HEL-MW98-06.	Description: Settlement on landfill slope. **(FEATURE G)**
	
Date: August 25, 2014	Date: August 26, 2014

TABLE 4.6: LANDFILL VISUAL INSPECTION PHOTO LOG (HELIPAD WEST LANDFILL)

Photo 34.1 (FOX-4 HEL P-34.jpg)	Photo 35.1 (FOX-4 HEL P-35.jpg)
Description: Debris (wires) within landfill slope. **(FEATURE K)**	Description: Sinkholes in landfill slope. **(FEATURE H)**
	
Date: August 26, 2014	Date: August 26, 2014

TABLE 4.6: LANDFILL VISUAL INSPECTION PHOTO LOG (HELIPAD WEST LANDFILL)

Photo 35.2 (FOX-4 HEL P-35 n.jpg)	Photo 36.1 (FOX-4 HEL P-36.jpg)
Description: Location of sinkholes east of MW98-06 near red mark on right side of picture. **(FEATURE H)**	Description: Sinkholes above boulders at base of slope. **(FEATURE I)**
	
Date: August 26, 2014	Date: August 26, 2014

steep slopes may result in the erosion channels becoming much larger with time, so it is important that these features be monitored.

Large boulders have been placed at the bottom of some of the slopes at this landfill. Some sinkholes have been noted above these large boulders. This is likely a result of infilling of void spaces around these large boulders with fine material from above, resulting in sinkholes due to loss of material. These areas should be closely monitored to ensure that large sinkholes are not developing that could result in failures of the slopes above these areas.

4.3.2 Soil Sampling

Soil sampling was completed at the Helipad West Landfill on 25 August 2014. As previously reported a total of nine samples including one duplicate sample were procured from four locations as shown in plan on Figure 3.

4.3.2.1 Laboratory Analytical Results

The analytical results for soil samples collected at the Helipad West Landfill are presented in Table 4.7.

A duplicate soil sample was collected from surficial soil at sample location MW98-02 and was submitted to AGAT, a secondary laboratory for QA/QC purposes. The RPDs for the duplicate sample results were below 30%, except for arsenic which was well above 30%. However previous investigations have determined that elevated arsenic concentrations exist in soil at this landfill. It is reasonable to assume that elevated arsenic concentrations may only be present in some areas of soil. The duplicate results are believed to be representative of the soil conditions at this site.

4.3.2.2 Discussion of Results – Comparison to Baseline/Background

A discussion of the results for each parameter analyzed in soil at the Helipad West Landfill is provided in Table 4.8. The discussion includes a comparison of results from upgradient (MW98-03, MW98-06) and downgradient (MW98-01, MW98-02) locations to the baseline average concentrations that have been determined for each landfill from soil chemistry at the landfill area prior to and during remediation. Upgradient locations are those near the landfill that are not influenced by migration of contaminants through the landfill, and downgradient locations are at the toe of the landfill or from areas of preferential drainage.

TABLE 4.7

RESULTS OF ANALYSIS FOR PARAMETERS IN SOIL AT HELIPAD WEST LANDFILL

PARAMETERS	Background Concentration	Baseline Average Concentration	DEW Line Cleanup Tier I Criteria	DEW Line Cleanup Tier II Criteria	F4-HEL-MW98-01-S	F4-HEL-MW98-01-D	F4-HEL-MW98-02-S	F4-HEL-MW98-02-S (DUP)	F4-HEL-MW98-02-S (AVG)	F4-HEL-MW98-02-D	F4-HEL-MW98-03-S	F4-HEL-MW98-03-D	F4-HEL-MW98-06-S	F4-HEL-MW98-06-D
					25-Aug-14	25-Aug-14	25-Aug-14	25-Aug-14	25-Aug-14	25-Aug-14	25-Aug-14	25-Aug-14	25-Aug-14	25-Aug-14
	(_)	(+)	(*)	(**)	0-15cm	40-50cm	0-15cm	0-15cm	0-15cm	40-50cm	0-15cm	40-50cm	0-15cm	40-50cm
Copper	**30**	**15**	-	**100**	**34+**	**32+**	**19+**	**22+**	**20.5+**	**34+**	14	**19+**	**20+**	**41+**
Nickel	**24**	**16**	-	**100**	**31+**	**31+**	**19+**	16	**17.5+**	**35+**	13	16	**20+**	**21+**
Cobalt	**8.8**	**5.9**	-	**50**	**9.7+**	**9.3+**	**6.5+**	**7.4+**	**6.95+**	**9.9+**	4.4	4.7	**6.7+**	**6.2+**
Cadmium	**1.0**	**1.0**	-	**5**	<0.10	<0.10	<0.10	<0.5	<0.5	<0.10	<0.10	<0.10	0.14	0.11
Lead	**10**	**24**	**200**	**500**	6.1	5.8	5.6	6	5.8	10	4.2	5.5	7.1	6.1
Zinc	**41**	**36**	-	**500**	**47+**	**45+**	**38+**	**41+**	**39.5+**	**55+**	32	31	**77+**	**52+**
Chromium	**41**	**35**	-	**250**	**49+**	**47+**	**40+**	**39+**	**39.5+**	**54+**	32	32	**51+**	**40+**
Arsenic	**29**	**34**	-	**30**	25	23	**130+****	14	**72+**	**42+**	**31**	**30**	**40+**	**66+**
Mercury	-	-	-	**2**	<0.050	<0.050	<0.050	<0.10	<0.10	<0.050	<0.050	<0.050	<0.050	<0.050
Total PCBs	-	**0.001**	**1**	**5**	<0.010	<0.010	<0.010	<0.05	<0.05	<0.010	<0.010	<0.010	<0.010	<0.010
PHC F1 (C6-C10)	-	-	-	-	<10	<10	<10	<5	<10	100	<10	<10	<10	<10
PHC F2 (C10-C16)	-	-	-	-	<10	<10	26	20	23	1100	<10	<10	<10	<10
PHC F3 (C16-C34)	-	-	-	-	<10	<10	35	54	44.5	250	<10	<10	18	100
PHC F4 (C34-C50)	-	-	-	-	<10	<10	<10	<50	<50	<10	<10	<10	<10	23
Modifed TPH (Total C6-C34)	-	**222**	-	**2500**	15	15	66	76.5	71.25	**1450+**	15	15	28	110

NOTES:

All parameter values in µg/g (ppm) unless otherwise indicated.

_ Exceeds FOX-4 Helipad West Landfill Background Concentration.
\+ Exceeds FOX-4 Helipad West Landfill Baseline Average Concentration.
* Exceeds DEW Line Cleanup Tier I Criteria.
** Exceeds DEW Line Cleanup Tier II Criteria.

(DUP) Duplicate sample analyzed by AGAT Laboratories for QA/QC purposes.
(AVG) Average concentration of duplicate samples.
< Not detected.
\- No concentration reported.

Table 4.8: Evaluation of 2014 Soil Analytical Data (Helipad West Landfill)

Parameter	Baseline Average Concentration (ug/g)	2014 Results
Copper	15	Detectable concentrations ranged between 14 and 41 ug/g for upgradient samples and between 19 and 34 ug/g for downgradient samples, with the highest concentration reported in the subsurface sample collected from the MW98-06 sample location while the lowest concentration was reported within the surficial sample at the MW98-03 sample location. Eight of nine samples reported concentrations above the BAC.
Nickel	16	Detectable concentrations ranged between 20 and 21 ug/g for upgradient samples and between 13 and 35 ug/g for downgradient samples, with the highest concentration reported in the subsurface sample collected from the MW98-02 sample location while the lowest concentration was reported within the surficial sample at the MW98-03 sample location. Seven of nine samples reported concentrations above the BAC.
Cobalt	5.9	Detectable concentrations ranged between 4.4 and 6.7 ug/g for upgradient samples and between 6.95 and 9.9 ug/g for downgradient samples, with the highest concentration reported in the subsurface sample collected from the MW98-02 sample location while the lowest concentration was reported within the surficial sample at the MW98-03 sample location. Seven of nine samples reported concentrations above the BAC.
Cadmium	1.0	Detectable concentrations of 0.11 and 0.14 ug/g were reported in the subsurface and surface samples collected from the upgradient MW98-06 sample location, respectively. Seven of the nine samples reported concentrations less than the laboratory detection limit. All samples reported concentrations below the BAC.
Lead	24	Detectable concentrations ranged between 4.2 and 7.1 ug/g for upgradient samples and between 5.8 and 10 ug/g for downgradient samples, with the highest concentration reported in the subsurface sample collected from the MW98-02 sample location while the lowest concentration was reported within the surficial sample at the MW98-03 sample location. All samples reported concentrations below the BAC.
Zinc	36	Detectable concentrations ranged between 31 and 77 ug/g for upgradient samples and between 39.5 and 55 ug/g for downgradient locations, with the highest concentration reported in the surface sample collected from the MW98-06 sample location while the lowest concentration was reported within the subsurface sample at the MW98-03 sample location. Seven of nine samples reported concentrations above the BAC.
Chromium	35	Detectable concentrations ranged between 32 and 51 ug/g for upgradient samples and between 39.5 and 54 ug/g for downgradient samples, with the highest concentration reported in the subsurface sample collected from the MW98-02 sample location while the lowest concentration was reported within the surficial and subsurface samples at the MW98-03 sample location. Seven of nine samples reported concentrations above the BAC.

Parameter	Baseline Average Concentration (ug/g)	2014 Results
Arsenic	34	Detectable concentrations ranged between 30 and 66 ug/g for upgradient samples and between 23 and 72 ug/g for downgradient samples, with the highest concentration reported in the subsurface sample collected from the MW98-02 sample location while the lowest concentration was reported within the surficial sample at the MW98-03 sample location. Five of nine samples reported concentrations above the BAC and above the Tier II Cleanup Criteria (30 ug/g), however all samples reported concentrations below the site-specific criteria for arsenic of 130 ug/g.
Mercury	-	All nine samples reported concentrations less than the laboratory detection limit (0.050 ug/g and 0.10 ug/g for the duplicate sample submitted to the secondary laboratory).
PCBs	0.001	All nine samples reported concentrations less than the laboratory detection limit (0.010 ug/g and 0.05 ug/g for the duplicate sample submitted to the secondary laboratory).
TPH	222	Modified TPH concentrations ranged between 15 and 110 ug/g for upgradient samples and between 15 and 1450 ug/g, with the highest concentration reported in the subsurface sample at the MW98-02 sample location and the lowest concentration in four of nine samples. One of nine samples reported concentrations above the BAC.

4.3.2.3 Soil Trend Analysis by Parameter and Discussion of Trends

A discussion of the trends observed for parameter concentrations in soil from 1999 to 2014 are presented in Table 4.9. Trends have been analyzed for upgradient and downgradient locations.

Table 4.9: Evaluation of Soil Result Trends (Helipad West Landfill)

Parameter	2014 Results
Copper	Concentrations show a relatively stable trend for upgradient soil location and a slight upward trend for downgradient soil locations.
Nickel	Concentrations show an upward trend for upgradient and downgradient soil locations.
Cobalt	Concentrations show a slight upward trend for upgradient and downgradient soil locations.
Cadmium	Concentrations show a relatively stable trend for upgradient and downgradient soil locations.
Lead	Concentrations show a slight upward trend for upgradient and downgradient soil locations.
Zinc	Concentrations show an upward trend for upgradient soil locations and a relatively stable trend for downgradient soil locations.
Chromium	Concentrations show a slight upward trend for upgradient soil locations and an upward trend for downgradient soil locations.
Arsenic	Concentrations show a slight upward trend for upgradient soil locations and a relatively stable trend for downgradient soil locations.
Mercury	Concentrations show a stable trend for upgradient and downgradient soil locations as all results

Parameter	2014 Results
	have been below laboratory detection limits for all monitoring events.
PCBs	Concentrations show an upward trend for upgradient and downgradient soil locations.
TPH	Concentrations show a relatively stable trend for upgradient soil locations and an upward trend for downgradient soil locations.

4.3.3 Groundwater Sampling

Groundwater sampling at the Helipad West Landfill was completed on 25 August 2014. As previously reported a total of three samples were collected from three monitoring wells as shown in plan on Figure 3.

4.3.3.1 Monitoring Well Sampling/Inspection Logs

Monitoring well sampling/inspection logs are provided following this page on Monitoring Well Sampling Records 9 through 12.

4.3.3.2 Water Levels/Groundwater Flow

Water levels were measured at the Helipad West Landfill on 15 August 2014. The groundwater levels measured are shown below in Table 4.10. Groundwater levels were measured in two of the four monitoring wells, with one of the four wells being dry at the time of monitoring, and one well containing water, but with the level not able to be measured due to the presence of bentonite clay in the standpipe of the well. Groundwater flow direction cannot be determined from the two measured groundwater levels. However given the topography of the landfill groundwater flow is generally expected to be towards the southwest.

Table 4.10: Groundwater Levels (Helipad West Landfill)

Monitoring Well	Date	Ground Surface Elevation (m)	Water Level (m bgs)	Water Level Elevation (m)	Depth to Bottom (m bgs)	Bottom Elevation (m)
MW98-01	25-Aug-14	372.6	1.21	371.39	1.87	370.73
MW98-02	25-Aug-14	369.5	0.62	368.88	1.35	368.15
MW98-03	25-Aug-14	*	NM	*	1.14	*
MW98-06	25-Aug-14	382.1	Dry	N/A	0.92	381.18

* - the ground surface elevation for this monitoring well was identified as TBD in the project *Terms of Reference*

N/A – Not analysed due to the lack of available groundwater.

NM – groundwater was present in the monitoring well however saturated bentonite clay had heaved upward into the casing and into the standpipe and prevented the water level instrument from measuring the water level accurately

Monitoring Well Sampling Record 9

Site Name:	FOX-4	Helipad West Landfill	
Date of Sampling Event:	25-Aug-14	Time:	930am
Names of Samplers:		S.Borcsok	
		J.Mauchan	
Landfill Name:	Helipad	Samples Collected:	YES
Monitoring Well ID:	MW98-01	PHC F1	YES
Sample Number:		Inorganic Elements	YES
Condition of Well:	*	PHC F2-F4	YES
		PCBs	YES
Measured Data		Duplicate Collected?	NO
Well pipe height above ground (cm)=	45	Sample ID:	F4-HEL-MW98-01
Diameter of well (cm)=	5		
Depth of well installation (cm)= (from ground surface)		* - no bolts or lock on casing, no cap on standpipe in casing	
Length screened section (cm)=			
Depth to top of screen (cm)= (from ground surface)			
Depth to water surface (cm)= (from top of pipe)	116	Measurement method: (meter, tape, etc)	Interface meter
Static water level (cm)= (below ground surface)			
Measured well refusal depth (cm)= (i.e. depth to frozen ground)	232	Evidence of sludge or siltation:	NO
Measured well refusal depth from ground surface	187		
Thickness of water column	116		
Static volume of water in well	2.35		
Free product thickness (mm)=	0	Measurement method:	IM
Purging: (Y/N)	N	Purging/Sampling Equipment:	Waterra
Volume Purged Water=	9L		tubing/
Decontamination required: (Y/N)	N		footvalve
Number washes:			
Number rinses:			
Final pH=	6.9		
Final Conductivity (uS/cm)=	180.2		
Final Temperature (degC)=	2.2		

Monitoring Well Sampling Record 10

Site Name:	FOX-4	Helipad West Landfill	
Date of Sampling Event:	25-Aug-14	Time:	1130am
Names of Samplers:		S.Borcsok	
		J.Mauchan	
Landfill Name:	Helipad	Samples Collected:	YES
Monitoring Well ID:	MW98-02	PHC F1	YES
Sample Number:		Inorganic Elements	YES
Condition of Well:	*	PHC F2-F4	YES
		PCBs	YES
Measured Data		Duplicate Collected?	NO
Well pipe height above ground (cm)=	25	Sample ID:	F4-HEL-MW98-02
Diameter of well (cm)=	5		
Depth of well installation (cm)= (from ground surface)		* - casing filled with wet bentonite clay	
Length screened section (cm)=			
Depth to top of screen (cm)= (from ground surface)			
Depth to water surface (cm)= (from top of pipe)	87	Measurement method: (meter, tape, etc)	Interface meter
Static water level (cm)= (below ground surface)			
Measured well refusal depth (cm)= (i.e. depth to frozen ground)	160	Evidence of sludge or siltation:	NO
Measured well refusal depth from ground surface	135		
Thickness of water column	73		
Static volume of water in well	1.48		
Free product thickness (mm)=	0	Measurement method:	IM
Purging: (Y/N)	N	Purging/Sampling Equipment:	Waterra
Volume Purged Water=	6L		tubing/
Decontamination required: (Y/N)	N		footvalve
Number washes:			
Number rinses:			
Final pH=	6.6		
Final Conductivity (uS/cm)=	320		
Final Temperature (degC)=	2.5		

Monitoring Well Sampling Record 11

Site Name:	FOX-4	Helipad West Landfill	
Date of Sampling Event:	25-Aug-14	Time:	10am
Names of Samplers:		S.Borcsok	
		J.Mauchan	
Landfill Name:	Helipad	Samples Collected:	YES
Monitoring Well ID:	MW98-03	PHC F1	YES
Sample Number:		Inorganic Elements	YES
Condition of Well:	*	PHC F2-F4	YES
		PCBs	YES
Measured Data		Duplicate Collected?	NO
Well pipe height above ground (cm)=	30	Sample ID:	F4-HEL-MW98-03
Diameter of well (cm)=	5		
Depth of well installation (cm)=		* - broken lock, casing full of wet bentonite clay	
(from ground surface)			
Length screened section (cm)=		** - water level could not be measured due to bentonite in standpipe	
Depth to top of screen (cm)=			
(from ground surface)			
Depth to water surface (cm)=	**	Measurement method: (meter, tape, etc)	Interface meter
(from top of pipe)			
Static water level (cm)=			
(below ground surface)			
Measured well refusal depth (cm)=	212	Evidence of sludge or siltation:	NO
(i.e. depth to frozen ground)			
Measured well refusal depth from ground surface	182		
Thickness of water column			
Static volume of water in well			
Free product thickness (mm)=	0	Measurement method:	IM
Purging: (Y/N)	N	Purging/Sampling Equipment:	Waterra
Volume Purged Water=	6L		tubing/
Decontamination required: (Y/N)	N		footvalve
Number washes:			
Number rinses:			
Final pH=	6.6		
Final Conductivity (uS/cm)=	120.1		
Final Temperature (degC)=	1.6		

Monitoring Well Sampling Record 12

Site Name:	FOX-4	Helipad West Landfill	
Date of Sampling Event:	25-Aug-14	Time:	10am
Names of Samplers:		S.Borcsok	
		J.Mauchan	
Landfill Name:	Helipad	Samples Collected:	NO
Monitoring Well ID:	MW98-06	PHC F1	
Sample Number:		Inorganic Elements	
Condition of Well:	*	PHC F2-F4	
		PCBs	
Measured Data		Duplicate Collected?	
Well pipe height above ground (cm)=	25	Sample ID:	
Diameter of well (cm)=	5		
Depth of well installation (cm)=		* - casing full of wet bentonite clay, no j-plug, bentonite in standpipe	
(from ground surface)			
Length screened section (cm)=			
Depth to top of screen (cm)=			
(from ground surface)			
Depth to water surface (cm)=	N/A (well was dry or frozen)	Measurement method: (meter, tape, etc)	Interface meter
(from top of pipe)			
Static water level (cm)=			
(below ground surface)			
Measured well refusal depth (cm)=	212	Evidence of sludge or siltation:	NO
(i.e. depth to frozen ground)			
Measured well refusal depth from ground surface	187		
Thickness of water column	0		
Static volume of water in well	0.00		
Free product thickness (mm)=	0	Measurement method:	IM
Purging: (Y/N)	N	Purging/Sampling Equipment:	N/A
Volume Purged Water=			
Decontamination required: (Y/N)	N		
Number washes:			
Number rinses:			
Final pH=			
Final Conductivity (uS/cm)=			
Final Temperature (degC)=			

MW98-06 was reported to be dry as of August 8 to September 2, 2013. It is recommended that all monitoring wells be monitored during future monitoring events.

4.3.3.3 Laboratory Analytical Results

The analytical results for groundwater analyses at the Helipad West Landfill are presented in Table 4.11. No duplicate groundwater samples were collected at this landfill.

4.3.3.4 Discussion of Results by Parameter

A discussion of the results for each parameter analyzed in groundwater at the Helipad West Landfill is provided in Table 4.12. No baseline average or background concentrations have been determined for groundwater in this area. The discussion includes a comparison of results from upgradient (MW98-03) and downgradient (MW98-01, MW98-02) locations to the baseline average concentrations that have been determined for each landfill from groundwater chemistry at the landfill area prior to and during remediation. No groundwater sample was collected from upgradient well MW98-06 during this monitoring program.

Table 4.12: Evaluation of Groundwater Analytical Results (Helipad West Landfill)

Parameter	Baseline Average Concentration (mg/L)	2014 Results
Copper	0.072	Detectable concentrations were 0.0063 mg/L for the upgradient well and ranged between 0.0057 and 0.17 mg/L for downgradient wells, with the highest concentration recorded at monitoring well MW98-01 and the lowest concentration recorded at monitoring well MW98-02. One of three samples reported a concentration above the BAC.
Nickel	1.03	Detectable concentrations were 0.048 mg/L for the upgradient well and ranged between 0.043 and 0.097 mg/L for downgradient wells, with the highest concentration recorded at monitoring well MW98-01 and the lowest concentration recorded at monitoring well MW98-02. All samples reported concentrations below the BAC.
Cobalt	0.044	Detectable concentrations were 0.0021 mg/L for the upgradient well and ranged between 0.0098 and 0.018 mg/L for downgradient wells, with the highest concentration recorded at monitoring well MW98-02 and the lowest concentration recorded at monitoring well MW98-03. All samples reported concentrations below the BAC.
Cadmium	0.0018	Detectable concentrations were 0.000086 mg/L for upgradient wells and ranged between 0.000042 and 0.00048 mg/L for downgradient wells, with the highest concentration recorded at monitoring well MW98-01 and the lowest concentration recorded at monitoring well MW98-02. All samples reported concentrations below the BAC.

TABLE 4.11

RESULTS OF ANALYSIS FOR PARAMETERS IN GROUNDWATER AT HELIPAD WEST LANDFILL

PARAMETERS	Baseline Average Concentration (+)	F4-HEL-MW98-01 25-Aug-14	F4-HEL-MW98-02 25-Aug-14	F4-HEL-MW98-03 25-Aug-14
Copper	**0.072**	**0.17+**	0.0057	0.0063
Nickel	**1.03**	0.097	0.043	0.048
Cobalt	**0.044**	0.0098	0.018	0.0021
Cadmium	**0.0018**	0.00048	0.000042	0.000086
Lead	**0.016**	0.0018	0.0013	0.0021
Zinc	**0.14**	**0.38+**	0.034	**0.16+**
Chromium	**1.27**	0.066	0.067	0.048
Arsenic	**0.015**	0.0016	**0.027+**	0.0025
Mercury	**-**	<0.00001	<0.00001	<0.00001
Total PCBs	**0.000026**	<0.05	<0.05	<0.05
PHC F1 (C6-C10)	**-**	0.041	0.4	<0.025
PHC F2 (C10-C16)	**-**	<0.100	0.94	<0.100
PHC F3 (C16-C34)	**-**	<0.100	<0.100	<0.100
PHC F4 (C34-C50)	**-**	<0.100	<0.100	<0.100
Modifed TPH (Total C6-C34)	**7.2**	0.141	1.390	0.113

NOTES:

All parameter values in mg/L (ppm) unless otherwise indicated.

+	Exceeds Helipad West Landfill Baseline Average Concentration.
(DUP)	Duplicate sample analyzed by AGAT Laboratories for QA/QC purposes.
RDL	Reportable Detection Limit.
<	Not detected.
-	No concentration reported.

Parameter	Baseline Average Concentration (mg/L)	2014 Results
Lead	0.016	Detectable concentrations were 0.0021 mg/L for the upgradient well and ranged between 0.0013 and 0.0018 mg/L for downgradient wells, with the highest concentration recorded at monitoring well MW98-03 and the lowest concentration recorded at monitoring well MW98-02. All samples reported concentrations below the BAC.
Zinc	0.14	Detectable concentrations were 0.16 mg/L for the upgradient well and ranged between 0.034 and 0.38 mg/L for downgradient wells, with the highest concentration recorded at monitoring well MW98-01 and the lowest concentration recorded at monitoring well MW98-02. Two of three samples reported a concentration above the BAC.
Chromium	1.27	Detectable concentrations were 0.048 mg/L for the upgradient well and ranged between 0.034 and 0.38 mg/L for downgradient wells, with the highest concentration recorded at monitoring well MW98-01 and the lowest concentration recorded at monitoring well MW98-02. All samples reported concentrations below the BAC.
Arsenic	0.015	Detectable concentrations were 0.0025 mg/L for the upgradient well and ranged between 0.0016 and 0.027 mg/L for downgradient wells, with the highest concentration recorded at monitoring well MW98-01 and the lowest concentration recorded at monitoring well MW98-02. One of three samples reported a concentration above the BAC.
Mercury	-	Three samples reported concentrations below the laboratory DL of 0.00001 mg/L.
PCBs	0.000026	Three samples reported concentrations below the laboratory DL of 0.05 mg/L.
TPH	7.2	Detectable concentrations of PHC fractions F1, F2, and F3 were reported in the two downgradient samples, resulting in modified TPH concentrations for the three samples ranging from 0.113 to 1.39 mg/L. All samples reported concentrations below the BAC.

4.3.3.5 Groundwater Trend Analysis by Parameter & Discussion of Trends

A discussion of the trends observed for parameter concentrations in groundwater from 1999 to 2014 are presented in Table 4.13. Trends have been analyzed for and downgradient locations.

Table 4.13: Evaluation of Groundwater Result Trends (Helipad West Landfill)

Parameter	2014 Results
Copper	Concentrations show a slight upward trend for upgradient wells and an upward trend for downgradient wells.
Nickel	Concentrations show a slight downward trend for upgradient wells and a downard trend for downgradient wells.
Cobalt	Concentrations show a slight downward trend for upgradient and an upward trend for downgradient

Parameter	2014 Results
	wells.
Cadmium	Concentrations show a slight upward trend for upgradient and a downward trend for downgradient wells.
Lead	Concentrations show a slight upward trend for upgradient and a downward trend for downgradient wells.
Zinc	Concentrations show an upward trend for upgradient and a slight downward trend for downgradient wells.
Chromium	Concentrations show a slight upward trend for upgradient and downgradient wells.
Arsenic	Concentrations show a slight upward trend for upgradient and a slight downward trend for downgradient wells.
Mercury	Concentrations show a stable trend for upgradient and downgradient wells as all concentrations are below the laboratory detection limit for mercury for all sampling events.
PCBs	Concentrations show a stable trend for upgradient and downgradient wells as all concentrations are below the laboratory detection limit for mercury for all sampling events.
TPH	Concentrations show a slight upward trend for upgradient and a slight downward trend for downgradient wells.

4.4 CONCLUSIONS/OVERALL PERFORMANCE OF THE LANDFILL

Based on the findings of the 2014 landfill monitoring program, the performance of the Helipad West Landfill is considered to be acceptable.

4.5 RECOMMENDATIONS/NEXT STEPS

Regular monitoring of this landfill as per the monitoring schedule shown in Table 1.1 should be continued. No remedial work is necessary at this time. Erosion channels and sinkhole features should be monitored to gauge whether they are worsening and represent an issue for the future stability of the landfill.

5.0 STATION AREA LANDFILL

5.1 LANDFILL DESCRIPTION

The Station Area Landfill is located east of the Short Range Radar (SRR) station facilities at the Upper Site, and has an approximate area of 2,000 m^2. This landfill was constructed for disposal of demolition and site wastes generated during cleanup activities. A detailed drawing of this landfill is provided in Figure 4. The historical chemical results for soil samples collected at this landfill are shown in plan on Figure 4A. The historical chemical results for groundwater samples collected at this landfill are shown in plan on Figure 4B.

5.2 SUMMARY OF WORK CONDUCTED

5.2.1 Visual Inspection

The visual inspection of the landfill was completed with no deviations from the visual inspection work plan.

5.2.2 Soil Sampling

Soil samples were collected at three (3) locations as shown on the site plan. Surface and subsurface samples were collected at each location. There were no deviations from the soil sampling work plan. Soil sampling completed at the landfill is summarized in Table 5.1.

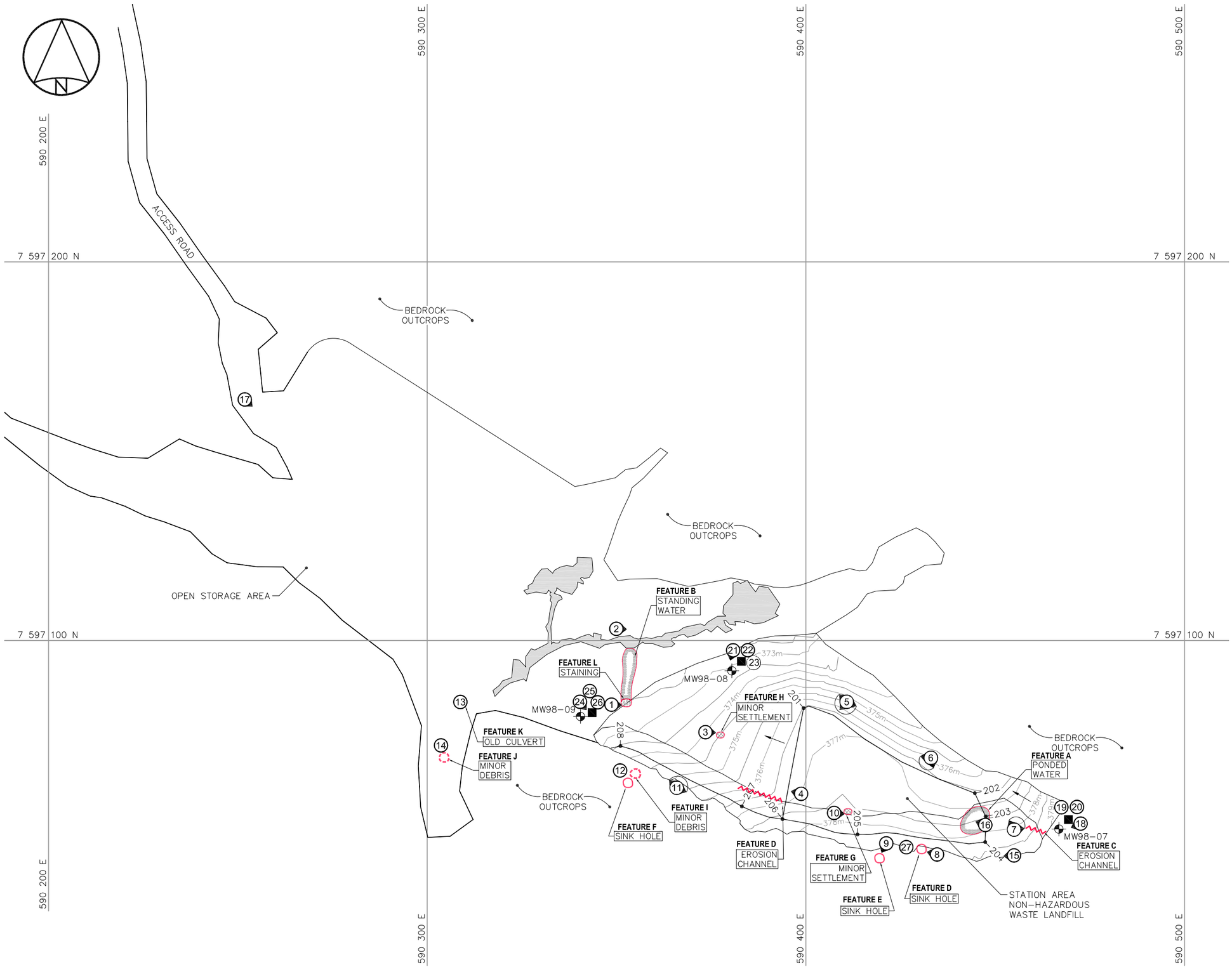
Table 5.1: Summary of Work Conducted by Soil Sampling Location (Station Area Landfill)

Location	Surface Soil Sample Collected	Subsurface Soil Sample Collected
F4-STA-MW98-07	√	√[D]
F4-STA-MW98-08	√	√
F4-STA-MW98-09	√	√

D = duplicate sample collected
√ - sample collected
X – no sample collected

5.2.3 Groundwater Sampling

Groundwater monitoring was completed at three monitoring wells as shown on Figure 4. Groundwater monitoring and sampling at the Station Area Landfill was generally completed as per the work plan. As indicated in Table 5.2, groundwater samples were not collected from two of three monitoring wells at this landfill as the wells had insufficient water. No duplicate groundwater samples were collected at this landfill.



LEGEND:

- 301 — COORDINATE POINT
- MONITORING WELL LOCATION (3)
- MONITORING SOIL SAMPLE LOCATION (3)
- BODY OF WATER
- 24 — PHOTOGRAPH VIEWPOINT
- 377m — CONTOURS IN 0.5m INTERVALS
- OVERLAND FLOW DIRECTION
- EROSION CHANNEL
- AREA OF SETTLEMENT
- PONDED WATER
- NATURAL STAINING
- SINK HOLE
- EXPOSED DEBRIS

NOTES:

1. LOCATIONS AND SCALE OF FEATURES ARE APPROXIMATE AND SHOWN FOR ILLUSTRATIVE PURPOSES ONLY.
2. PHOTOGRAPHS TAKEN AUG. 25, 2014.
3. ALL COORDINATES ARE REFERENCED TO NAD83 (CSRS), UTM ZONE 19N.
4. ALL ELEVATIONS REFER TO GEODETIC DATUM.
5. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.

REVISIONS:

No.	Date:	By:	Revisions

REFERENCE:

AECOM, FILE No.: FOX-4.3 Year 1 LF MON.dwg, Mar. 2014

0 20 40 metres

SCALE 1:1000

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PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

2014 DEW LINE MONITORING PROGRAM

FOX-4 CAPE HOOPER, NUNAVUT

STATION AREA
NON-HAZARDOUS WASTE LANDFILL

Drawn By: I.S.Z.	Approved By: C.F.G.	Project No: 350600-515-2	
Date: FEB. 2015	Scale: 1:1000	Drawing No: FIGURE 4	

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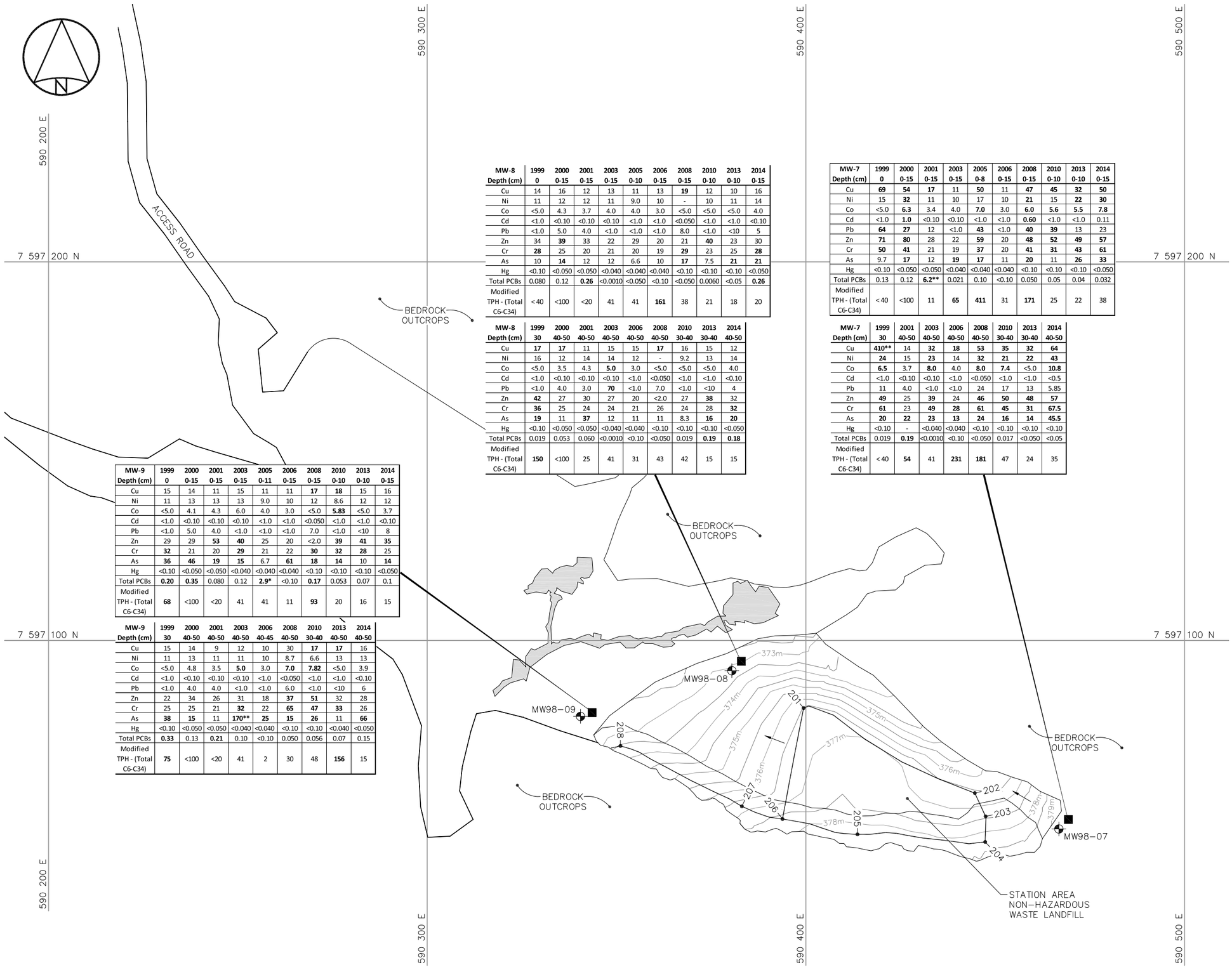
Saved by: Izabela Ziba
SENES FILE NO.: 350600-515-2 FOX-4_Fig 4 - Station Area_Non-Haz Landfill.dwg



MW-8 Depth (cm)	1999 0	2000 0-15	2001 0-15	2003 0-15	2005 0-10	2006 0-15	2008 0-15	2010 0-10	2013 0-10	2014 0-15
Cu	14	16	12	13	11	13	**19**	12	10	16
Ni	11	12	12	11	9.0	10	-	10	11	14
Co	<5.0	4.3	3.7	4.0	4.0	3.0	<5.0	<5.0	<5.0	4.0
Cd	<1.0	<0.10	<0.10	<0.10	<1.0	<1.0	<0.050	<1.0	<1.0	<0.10
Pb	<1.0	5.0	4.0	<1.0	<1.0	<1.0	8.0	<1.0	<10	5
Zn	34	**39**	33	22	29	20	21	**40**	23	30
Cr	**28**	25	20	21	20	19	**29**	23	25	**28**
As	10	**14**	12	12	6.6	10	**17**	7.5	**21**	**21**
Hg	<0.10	<0.050	<0.050	<0.040	<0.040	<0.040	<0.10	<0.10	<0.10	<0.050
Total PCBs	0.080	0.12	**0.26**	<0.0010	<0.050	<0.10	<0.050	0.0060	<0.05	**0.26**
Modified TPH - (Total C6-C34)	< 40	<100	<20	41	41	**161**	38	21	18	20

MW-8 Depth (cm)	1999 30	2000 40-50	2001 40-50	2003 40-50	2006 40-50	2008 40-50	2010 30-40	2013 30-40	2014 40-50
Cu	**17**	**17**	11	15	15	**17**	16	15	12
Ni	16	12	14	14	12	-	9.2	13	14
Co	<5.0	3.5	4.3	**5.0**	3.0	<5.0	<5.0	<5.0	4.0
Cd	<1.0	<0.10	<0.10	<0.10	<1.0	<0.050	<1.0	<1.0	<0.10
Pb	<1.0	4.0	3.0	**70**	<1.0	7.0	<1.0	<10	4
Zn	**42**	27	30	27	20	<2.0	27	**38**	32
Cr	**36**	25	24	24	21	26	24	28	**32**
As	**19**	11	**37**	12	11	11	8.3	**16**	**20**
Hg	<0.10	<0.050	<0.050	<0.040	<0.040	<0.10	<0.10	<0.10	<0.050
Total PCBs	0.019	0.053	0.060	<0.0010	<0.10	<0.050	0.019	**0.19**	**0.18**
Modified TPH - (Total C6-C34)	**150**	<100	25	41	31	43	42	15	15

MW-7 Depth (cm)	1999 0	2000 0-15	2001 0-15	2003 0-15	2005 0-8	2006 0-15	2008 0-15	2010 0-10	2013 0-10	2014 0-15
Cu	**69**	**54**	**17**	11	**50**	11	**47**	**45**	**32**	**50**
Ni	15	**32**	11	10	17	10	**21**	15	**22**	**30**
Co	<5.0	**6.3**	3.4	4.0	**7.0**	3.0	**6.0**	**5.6**	**5.5**	**7.8**
Cd	<1.0	**1.0**	<0.10	<0.10	<1.0	<1.0	**0.60**	<1.0	<1.0	0.11
Pb	**64**	**27**	12	<1.0	**43**	<1.0	**40**	**39**	13	23
Zn	**71**	**80**	28	22	**59**	20	**48**	**52**	**49**	**57**
Cr	**50**	**41**	21	19	**37**	20	**41**	**31**	**43**	**61**
As	9.7	**17**	12	**19**	**17**	11	**20**	11	**26**	**33**
Hg	<0.10	<0.050	<0.050	<0.040	<0.040	<0.040	<0.10	<0.10	<0.10	<0.050
Total PCBs	0.13	0.12	**6.2****	0.021	0.10	<0.10	0.050	0.05	0.04	0.032
Modified TPH - (Total C6-C34)	< 40	<100	11	**65**	**411**	31	**171**	25	22	38

MW-7 Depth (cm)	1999 30	2001 40-50	2003 40-50	2006 40-50	2008 40-50	2010 30-40	2013 30-40	2014 40-50
Cu	**410****	14	**32**	**18**	**53**	**35**	**32**	**64**
Ni	**24**	15	**23**	14	**32**	**21**	**22**	**43**
Co	**6.5**	3.7	**8.0**	4.0	**8.0**	**7.4**	<5.0	**10.8**
Cd	<1.0	<0.10	<0.10	<1.0	<0.050	<1.0	<1.0	<0.5
Pb	11	4.0	<1.0	<1.0	24	17	13	5.85
Zn	**49**	25	**39**	24	**46**	**50**	**48**	**57**
Cr	**61**	23	**49**	**28**	**61**	**45**	**31**	**67.5**
As	**20**	**22**	**23**	**13**	**24**	**16**	**14**	**45.5**
Hg	<0.10	-	<0.040	<0.040	<0.10	<0.10	<0.10	<0.10
Total PCBs	0.019	**0.19**	<0.0010	<0.10	<0.050	0.017	<0.050	<0.05
Modified TPH - (Total C6-C34)	< 40	**54**	41	**231**	**181**	47	24	35

MW-9 Depth (cm)	1999 0	2000 0-15	2001 0-15	2003 0-15	2005 0-11	2006 0-15	2008 0-15	2010 0-10	2013 0-10	2014 0-15
Cu	15	14	11	15	11	11	**17**	**18**	15	16
Ni	11	13	13	13	9.0	10	12	8.6	12	12
Co	<5.0	4.1	4.3	6.0	4.0	3.0	<5.0	**5.83**	<5.0	3.7
Cd	<1.0	<0.10	<0.10	<0.10	<1.0	<1.0	<0.050	<1.0	<1.0	<0.10
Pb	<1.0	5.0	4.0	<1.0	<1.0	<1.0	7.0	<1.0	<10	8
Zn	29	29	**53**	**40**	25	20	<2.0	**39**	**41**	**35**
Cr	**32**	21	20	**29**	21	22	**30**	**32**	**28**	25
As	**36**	**46**	**19**	**15**	6.7	**61**	**18**	**14**	10	**14**
Hg	<0.10	<0.050	<0.050	<0.040	<0.040	<0.040	<0.10	<0.10	<0.10	<0.050
Total PCBs	**0.20**	**0.35**	0.080	0.12	**2.9***	<0.10	**0.17**	0.053	0.07	0.1
Modified TPH - (Total C6-C34)	**68**	<100	<20	41	41	11	**93**	20	16	15

MW-9 Depth (cm)	1999 30	2000 40-50	2001 40-50	2003 40-50	2006 40-45	2008 40-50	2010 30-40	2013 40-50	2014 40-50
Cu	15	14	9	12	10	30	**17**	**17**	16
Ni	11	13	11	11	10	8.7	6.6	13	13
Co	<5.0	4.8	3.5	**5.0**	3.0	**7.0**	**7.82**	<5.0	3.9
Cd	<1.0	<0.10	<0.10	<0.10	<1.0	<0.050	<1.0	<1.0	<0.10
Pb	<1.0	4.0	4.0	<1.0	<1.0	6.0	<1.0	<10	6
Zn	22	34	26	31	18	**37**	**51**	32	28
Cr	25	25	21	**32**	22	**65**	**47**	**33**	26
As	**38**	**15**	11	**170****	**25**	**15**	**26**	11	**66**
Hg	<0.10	<0.050	<0.050	<0.040	<0.040	<0.10	<0.10	<0.040	<0.050
Total PCBs	**0.33**	0.13	**0.21**	0.10	<0.10	0.050	0.056	0.07	0.15
Modified TPH - (Total C6-C34)	**75**	<100	<20	41	2	30	48	**156**	15

LEGEND:

- 301 — COORDINATE POINT
- MONITORING WELL LOCATION (3)
- MONITORING SOIL SAMPLE LOCATION (3)
- BODY OF WATER
- 377m — CONTOURS IN 0.5m INTERVALS
- OVERLAND FLOW DIRECTION

Parameter	Baseline Average Concentration	DEW Line Tier I Cleanup Criteria	DEW Line Tier II Cleanup Criteria
Cu	17	N/A	100
Ni	20	N/A	100
Co	5	N/A	50
Cd	0.12	N/A	5
Pb	26	200	500
Zn	35	N/A	500
Cr	28	N/A	250
As	13	N/A	130
Hg	-	N/A	2.0
Total PCB	0.16	1	5
Modified TPH - (Total C6-C34)	53	N/A	2500

All Concentrations in mg/kg

Bold Concentration is Equal to or Exceeds Baseline Average Concentration

* Concentration Exceeds DEW Line Tier I Cleanup Criteria

** Concentration Exceeds DEW Line Tier II Cleanup Criteria

\- No Concentration Reported

N/A Not Applicable

NOTES:

1. LOCATIONS AND SCALE OF FEATURES ARE APPROXIMATE AND SHOWN FOR ILLUSTRATIVE PURPOSES ONLY.
2. ALL COORDINATES ARE REFERENCED TO NAD83 (CSRS), UTM ZONE 19N.
3. ALL ELEVATIONS REFER TO GEODETIC DATUM.
4. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.

REFERENCE:

AECOM, FILE No.: FOX-4.3 Year 1 LF MON.dwg, Mar. 2014

0 20 40 metres

SCALE 1:1000

SENES Consultants AN ARCADIS COMPANY

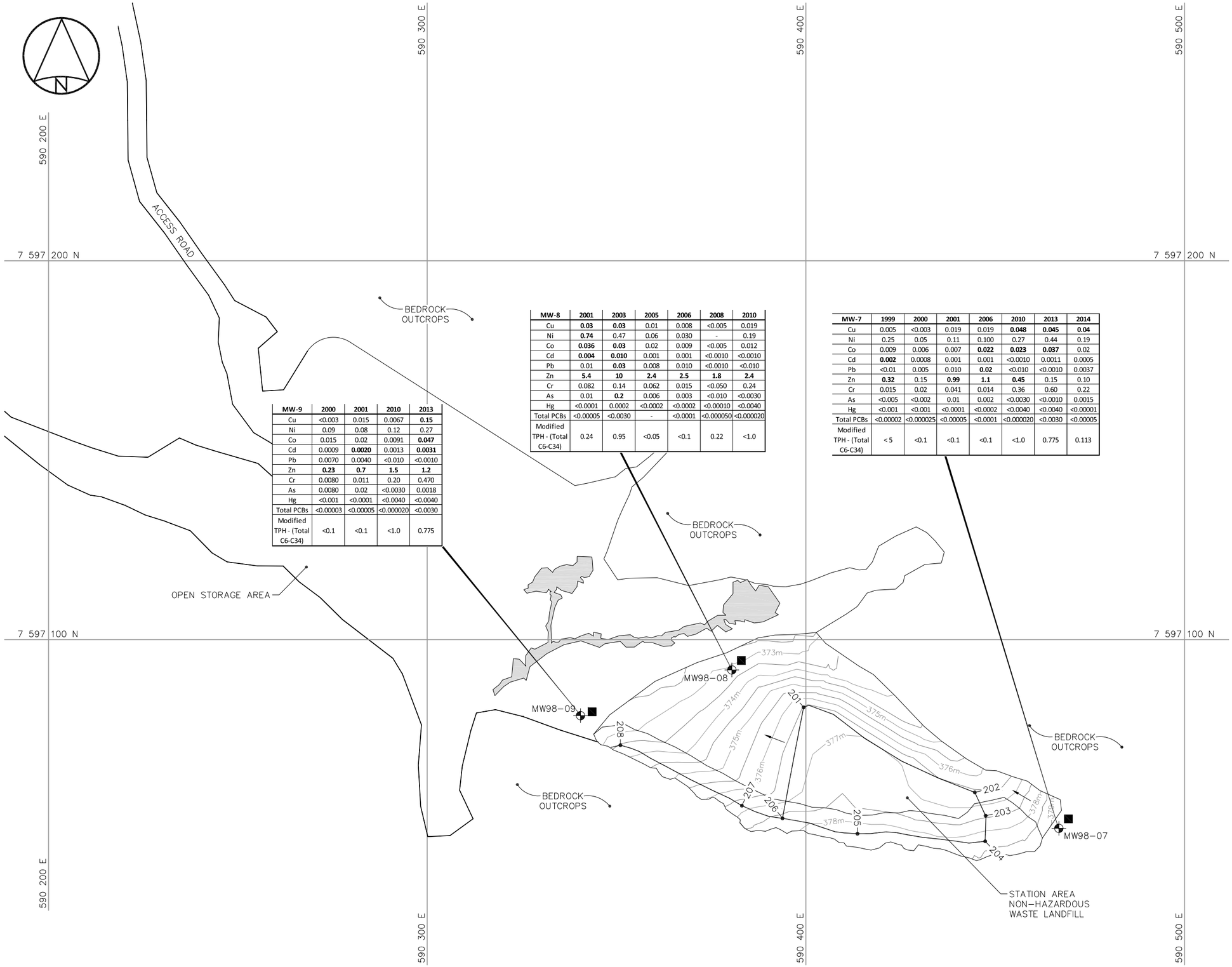
PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

2014 DEW LINE MONITORING PROGRAM

FOX-4 CAPE HOOPER, NUNAVUT
STATION AREA
NON-HAZARDOUS WASTE LANDFILL

SOIL CONTAMINANT DISTRIBUTION PLAN

Drawn By: I.S.Z.	Approved By: C.F.G.	Project No: 350600-515-2
Date: FEB. 2015	Scale: 1:1000	Drawing No: FIGURE 4A



MW-9	2000	2001	2010	2013
Cu	<0.003	0.015	0.0067	**0.15**
Ni	0.09	0.08	0.12	0.27
Co	0.015	0.02	0.0091	**0.047**
Cd	0.0009	**0.0020**	0.0013	**0.0031**
Pb	0.0070	0.0040	<0.010	<0.0010
Zn	**0.23**	**0.7**	**1.5**	**1.2**
Cr	0.0080	0.011	0.20	0.470
As	0.0080	0.02	<0.0030	0.0018
Hg	<0.001	<0.0001	<0.0040	<0.0040
Total PCBs	<0.00003	<0.00005	<0.000020	<0.0030
Modified TPH - (Total C6-C34)	<0.1	<0.1	<1.0	0.775

MW-8	2001	2003	2005	2006	2008	2010
Cu	**0.03**	**0.03**	0.01	0.008	<0.005	0.019
Ni	**0.74**	0.47	0.06	0.030	-	0.19
Co	**0.036**	**0.03**	0.02	0.009	<0.005	0.012
Cd	**0.004**	**0.010**	0.001	0.001	<0.0010	<0.0010
Pb	0.01	**0.03**	0.008	0.010	<0.0010	<0.010
Zn	**5.4**	**10**	**2.4**	**2.5**	**1.8**	**2.4**
Cr	0.082	0.14	0.062	0.015	<0.050	0.24
As	0.01	**0.2**	0.006	0.003	<0.010	<0.0030
Hg	<0.0001	0.0002	<0.0002	<0.0002	<0.00010	<0.0040
Total PCBs	<0.00005	<0.0030	-	<0.0001	<0.000050	<0.000020
Modified TPH - (Total C6-C34)	0.24	0.95	<0.05	<0.1	0.22	<1.0

MW-7	1999	2000	2001	2006	2010	2013	2014
Cu	0.005	<0.003	0.019	0.019	**0.048**	**0.045**	**0.04**
Ni	0.25	0.05	0.11	0.100	0.27	0.44	0.19
Co	0.009	0.006	0.007	**0.022**	**0.023**	**0.037**	0.02
Cd	**0.002**	0.0008	0.001	0.001	<0.0010	0.0011	0.0005
Pb	<0.01	0.005	0.010	**0.02**	<0.010	<0.0010	0.0037
Zn	**0.32**	0.15	**0.99**	**1.1**	**0.45**	0.15	0.10
Cr	0.015	0.02	0.041	0.014	0.36	0.60	0.22
As	<0.005	<0.002	0.01	0.002	<0.0030	<0.0010	0.0015
Hg	<0.001	<0.001	<0.0001	<0.0002	<0.0040	<0.0040	<0.00001
Total PCBs	<0.00002	<0.000025	<0.00005	<0.0001	<0.000020	<0.0030	<0.00005
Modified TPH - (Total C6-C34)	< 5	<0.1	<0.1	<0.1	<1.0	0.775	0.113

LEGEND:

- COORDINATE POINT (301)
- MONITORING WELL LOCATION (3)
- MONITORING SOIL SAMPLE LOCATION (3)
- BODY OF WATER
- CONTOURS IN 0.5m INTERVALS (377m)
- OVERLAND FLOW DIRECTION

Parameter	Baseline Average Concentration
Cu	0.025
Ni	0.65
Co	0.022
Cd	0.0016
Pb	0.016
Zn	0.2
Cr	0.56
As	0.050
Hg	0.001
Total PCB	0.00002
Modified TPH - (Total C6-C34)	5.0

All Concentrations in mg/L

Bold Concentration is Equal to or Exceeds Baseline Average Concentration

\- No Concentration Reported

N/A Not Applicable

NOTES:

1. LOCATIONS AND SCALE OF FEATURES ARE APPROXIMATE AND SHOWN FOR ILLUSTRATIVE PURPOSES ONLY.
2. ALL COORDINATES ARE REFERENCED TO NAD83 (CSRS), UTM ZONE 19N.
3. ALL ELEVATIONS REFER TO GEODETIC DATUM.
4. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.

REFERENCE:

AECOM, FILE No.: FOX-4.3 Year 1 LF MON.dwg, Mar. 2014

0 20 40 metres

SCALE 1:1000

SENES Consultants AN ARCADIS COMPANY

PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

2014 DEW LINE MONITORING PROGRAM

FOX-4 CAPE HOOPER, NUNAVUT

STATION AREA

NON-HAZARDOUS WASTE LANDFILL

GROUNDWATER CONTAMINANT DISTRIBUTION PLAN

Drawn By: I.S.Z.	Approved By: C.F.G.	Project No: 350600-515-2
Date: FEB. 2015	Scale: 1:1000	Drawing No: FIGURE 4B

Table 5.2: Summary of Work Conducted by Groundwater Sampling Location (Station Area Landfill)

Location	Visual Inspection/ Groundwater Monitoring	Sample collected for PCB analysis	Sample collected for metals analysis	Sample collected for PHCs F1-F4 analysis
F4-STA-MW98-07	√	√	√	√
F4-STA-MW98-08	√	X[I]	X[I]	X[I]
F4-STA-MW98-09	√	X[I]	X[I]	X[I]

D - duplicate sample collected
√ - sample collected
X – no sample collected
N – no water in well (well was dry)
I – insufficient water in well to collect sample

5.2.4 Thermal Monitoring

No thermal monitoring was completed at this landfill as no thermal monitoring installations have been installed at this landfill.

5.3 RESULTS OF THE MONITORING PROGRAM

5.3.1 Visual Inspection

The visual inspection at the Station Area Landfill was completed on 25 and 26 August 2014. The results of the visual inspection are detailed in Table 5.3 and shown on Figure 4 and in the photo log Table 5.6.

Table 5.3: Visual Inspection Results (Station Area Landfill)

Item	Description
Settlement	Minor settlement was observed in two locations on the landfill (Feature H, G). Three sinkholes were observed on the south side of the landfill. Two were small, approximately 0.3m in diameter (Feature E, F), while one was large and approximately 1 m in diameter (Feature D).
Erosion	Two minor erosion channels were observed on the south and east sides of the landfill (Feature C, D).
Frost Action	None observed.
Sloughing and Cracking	None observed.
Animal Burrows	None observed.
Vegetation	None observed.
Staining	Red staining was observed around standing water on the west side of the landfill. This staining is suspected to be due to iron-rich aggregate sources used in the

Item	Description
	construction of the landfill (Feature L).
Vegetation Stress	None observed.
Seepage Points	None observed.
Debris Exposed	Small pieces of metal and plastic debris as well as a partially buried culvert were observed on the west side of the landfill (Feature I, J, K).
Presence/Condition of Monitoring Instruments	Three monitoring wells were observed at the landfill. During monitoring of the wells it was observed that wet bentonite clay had heaved up and filled the space in the top of the well casing.
Other Features of Note	Ponded water was observed on the east and west sides of the landfill (Feature A, B).

5.3.1.1 Inspection Check List

The visual inspection checklist completed during the site inspection at this landfill location is provided in Table 5.4.

5.3.1.2 Stability Assessment

The preliminary stability assessment completed for this landfill location during the recent site inspection is provided in Table 5.5.

5.3.1.3 Photographic Records

The photograph log for the site is provided in Table 5.6.

5.3.1.4 Trend Analysis

No trends in visual observations at this landfill can be observed as 2014 is the first year of monitoring at this landfill following re-grading of the landfill area during the 2011-2013 maintenance.

5.3.1.5 Discussion of Results/Trends

The results of the visual inspection indicate that the performance of the landfill is acceptable. All identified issues were minor and of no consequence to the performance of the landfill.

The presence of three sinkholes along the south side of the landfill is not currently a cause for concern, however this area should continue to be monitored for additional sinkholes or settlement.

TABLE 5.4 - VISUAL INSPECTION CHECKLIST

DEW LINE CLEANUP: POST-CONSTRUCTION - LANDFILL MONITORING

INSPECTION REPORT – PAGE 1 OF 2

SITE NAME: FOX-4
LANDFILL DESIGNATION: Station Area Landfill
DATE OF INSPECTION: 25-26 August 2014
DATE OF PREVIOUS INSPECTION: N/A
INSPECTED BY: J. Mauchan/S. Borcsok
REPORT PREPARED BY: S. Borcsok
The inspector/reporter represents to the best of their knowledge, the following statements and observations are true and correct and to the best of the preparer's actual knowledge, no material facts have been suppressed or misstated.

TABLE 5.4 - VISUAL INSPECTION CHECKLIST - INSPECTION REPORT – PAGE 2 OF 2

Checklist Item	Present Yes/No	Location (Describe relative to existing monuments/features and relative to landfill design i.e. surface, berms, toe)	Length	Width	Depth	Extent relative to Area of Landfill (%)	Description	Photographic Records Focal length, location, view point & direction (relative to magnetic north) Feature of note Scale	Additional Comments
Settlement	YES	South edge of landfill (Feature E, D, G) West side of landfill (Feature F, H)	1.0m, 0.3m	1.0m, 0.3m	0.3m, 0.3m	<1%	Sinkholes Small depression	3.1, 8.1, 9.1, 9.2, 10.1	
Erosion	YES	West of MW98-07 (Feature C, D)	5	0.3m	0.05m	<1%	Small erosion channel	4.1, 7.1,	
Frost Action	NO								
Sloughing and Cracking	NO								
Animal Burrows	NO								
Vegetation	YES						Sparse grasses/moss		
Staining	YES	NE of MW98-09 (Feature L)					Red ox. Staining in ponded water	1.1, 2.1,	
Vegetation Stress	NO								
Seepage Points	NO								
Debris Exposed	YES	West side of landfill (Feature I, J, K)					Metal, plastic, partially buried culvert	12.1, 13.1, 14.1	
Presence/Condition – Monitoring Instruments	YES	3 Monitoring Wells, see Figure 4				<1%	Monitoring Wells	18.1, 21.1, 24.1	Well casings filled with wet bentonite clay
Features of Note.	YES	Ponded water east and northwest of landfill (Feature A, B)					Ponded water	16.1	

Table 5.5: Preliminary Stability Assessment - FOX-4 Station Area Landfill

Feature	Severity Rating	Extent
Settlement	Acceptable	Occasional
Erosion	Acceptable	Occasional
Frost Action	None	None
Staining	Acceptable	Occasional
Vegetation Stress	None	None
Seepage/Ponded Water	Acceptable	Occasional
Debris exposure	Acceptable	Occasional
Overall Landfill Performance: ACCEPTABLE		

Performance/ Severity Rating	Description
Acceptable	Noted features are of little consequence. The landfill is performing as designed. Minor deviations in environmental or physical performance may be observed, such as isolated areas of erosion, settlement.
Marginal	Physical/environmental performance appears to be deteriorating with time. Observations may include an increase in size or number of features of note, such as differential settlement, erosion or cracking. No significant impact on landfill stability to date, but potential for failure is assessed as low or moderate.
Significant	Significant or potentially significant changes affecting landfill stability, such as significant changes in slope geometry, significant erosion or differential settlement; scarp development. The potential for failure is assessed as imminent.
Unacceptable	Stability of landfill is compromised to the extent that ability to contain waste materials is compromised. Examples may include: - Debris exposed in erosion channels or areas of differential settlement. - Liner exposed. - Slope failure.

Extent	Description
Isolated	Singular feature
Occasional	Features of note occurring at irregular intervals/locations
Numerous	Many features of note, impacted less than 50% of the surface area of the landfill
Extensive	Impacting greater than 50% of the surface area of the landfill

TABLE 5.6: LANDFILL VISUAL INSPECTION PHOTO LOG (STATION AREA LANDFILL)

FOX-4 Station Area Landfill (see Figure 4)

Photo 1.1 (FOX-4 STA P-1 east.jpg)	Photo 2.1 (FOX-4 STA P-2 east.jpg)
Description: View looking east from east of MW98-09. Staining observed at standing water near trowel. **(FEATURE B, L)**	Description: View looking east toward MW98-08 over standing water, oxidation staining visible in water. **(FEATURE B, L)**
	
Date: August 25, 2014	Date: August 25, 2014

TABLE 5.6: LANDFILL VISUAL INSPECTION PHOTO LOG (STATION AREA LANDFILL)

Photo 3.1 (FOX-4 STA P-3 east.jpg)	Photo 4.1 (FOX-4 STA P-4 east.jpg)
Description: View east looking up the slope of the Station Area Non-hazardous landfill. Minor settlement observed at trowel location. **(FEATURE H)**	Description: View west looking downslope along erosion channel. **(FEATURE D)**
	
Date: August 25, 2014	Date: August 25, 2014

TABLE 5.6: LANDFILL VISUAL INSPECTION PHOTO LOG (STATION AREA LANDFILL)

Photo 5.1 (FOX-4 STA P-5 nw.jpg)	Photo 5.2 (FOX-4 STA P-5 se.jpg)
Description: View northwest toward MW98-08.	Description: View southeast along slope.
	
Date: August 25, 2014	Date: August 25, 2014

TABLE 5.6: LANDFILL VISUAL INSPECTION PHOTO LOG (STATION AREA LANDFILL)

Photo 5.3 (FOX-4 STA P-5 sw.jpg)	Photo 6.1 (FOX-4 STA P-6 south.jpg)
Description: View southwest over landfill cap.	Description: View south over landfill cap.
	
Date: August 25, 2014	Date: August 25, 2014

TABLE 5.6: LANDFILL VISUAL INSPECTION PHOTO LOG (STATION AREA LANDFILL)

Photo 6.2 (FOX-4 STA P-6 west.jpg)	Photo 7.1 (FOX-4 STA P-7 east.jpg)
Description: View west from northeastern slope of landfill towards station.	Description: View east, looking upslope toward MW98-07 (located between wooden stakes). Erosion channel visible left of trowel. **(FEATURE C)**
	
Date: August 25, 2014	Date: August 25, 2014

TABLE 5.6: LANDFILL VISUAL INSPECTION PHOTO LOG (STATION AREA LANDFILL)

Photo 7.2 (FOX-4 STA P-7 north.jpg)	Photo 8.1 (FOX-4 STA P-8 nw.jpg)
Description: View looking north, upslope, in the vicinity of MW98-07.	Description: View looking west, toward station, of sink hole. The sink hole measured approximately 1 m in diameter. **(FEATURE D)**
	
Date: August 25, 2014	Date: August 25, 2014

TABLE 5.6: LANDFILL VISUAL INSPECTION PHOTO LOG (STATION AREA LANDFILL)

Photo 9.1 (FOX-4 STA P-9 west.jpg)	Photo 10.1 (FOX-4 STA P-10 east.jpg)
Description: View of small sinkhole, measuring approximately 0.3 m diameter, on southern edge of landfill. **(FEATURE E)**	Description: View of minor settlement, measuring 0.3 m x 0.2 m, at trowel. MW98-07 is in the distance. **(FEATURE G)**
	
Date: August 25, 2014	Date: August 25, 2014

TABLE 5.6: LANDFILL VISUAL INSPECTION PHOTO LOG (STATION AREA LANDFILL)

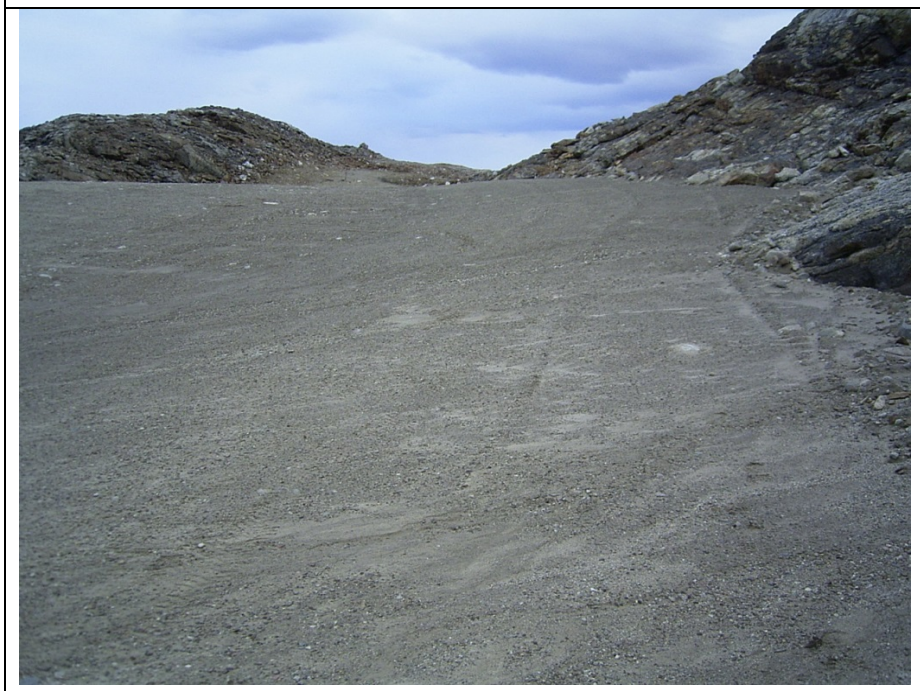
Photo 11.1 (FOX-4 STA P-11 east.jpg)	Photo 11.2 (FOX-4 STA P-11 ne.jpg)
Description: View of landfill from southwestern edge, looking east.	Description: View of landfill from southwestern edge, looking northeast.
	
Date: August 25, 2014	Date: August 25, 2014

TABLE 5.6: LANDFILL VISUAL INSPECTION PHOTO LOG (STATION AREA LANDFILL)

Photo 11.3 (FOX-4 STA P-11 north.jpg)	Photo 12.1 (FOX-4 STA P-12.jpg)
Description: View of landfill from southwestern edge, looking north.	Description: Minor debris (metal strapping) adjacent to small sinkhole. **(FEATURE I)**
	
Date: August 25, 2014	Date: August 25, 2014

TABLE 5.6: LANDFILL VISUAL INSPECTION PHOTO LOG (STATION AREA LANDFILL)

Photo 13.1 (FOX-4 STA P-13.jpg)	Photo 14.1 (FOX-4 STA P-14.jpg)
Description: Old culvert west of the landfill. **(FEATURE K)**	Description: Minor debris such as plastic and scrap wood observed west of landfill. **(FEATURE J)**
	
Date: August 25, 2014	Date: August 25, 2014

TABLE 5.6: LANDFILL VISUAL INSPECTION PHOTO LOG (STATION AREA LANDFILL)

Photo 15.1 (FOX-4 STA P-15 west.jpg)	Photo 16.1 (FOX-4 STA P-16 west.jpg)
Description: View of southern edge of landfill, looking west toward station.	Description: View of ponded water at eastern end of landfill, west of MW98-07. **(FEATURE A)**
	
Date: August 25, 2014	Date: August 25, 2014

TABLE 5.6: LANDFILL VISUAL INSPECTION PHOTO LOG (STATION AREA LANDFILL)

Photo 17.1 (FOX-4 STA P-17.jpg)	Photo 18.1 (FOX-4 STA P-18 west.jpg)
Description: View of Station Area Non-Hazardous Landfill from the station access road. View looking southeast.	Description: View of landfill from MW98-07.
	
Date: August 25, 2014	Date: August 25, 2014

TABLE 5.6: LANDFILL VISUAL INSPECTION PHOTO LOG (STATION AREA LANDFILL)

Photo 19.1 (FOX-4 STA P-19.jpg)	Photo 20.1 (FOX-4 STA P-20.jpg)
Description: F4-STA-MW98-07 sample collection.	Description: F4-STA-Mw98-07 after sample collection and backfill.
	
Date: August 25, 2014	Date: August 25, 2014

TABLE 5.6: LANDFILL VISUAL INSPECTION PHOTO LOG (STATION AREA LANDFILL)

Photo 21.1 (FOX-4 STA P-21 south.jpg)	Photo 22.1 (FOX-4 STA P-22.jpg)
Description: View south of landfill from MW98-08.	Description: F4-STA-MW98-08 soil sample collection.
	
Date: August 25, 2014	Date: August 25, 2014

TABLE 5.6: LANDFILL VISUAL INSPECTION PHOTO LOG (STATION AREA LANDFILL)

Photo 23.1 (FOX-4 STA P-23.jpg)	Photo 24.1 (FOX-4 STA P-24 se.jpg)
Description: After collection and backfill of F4-STA-MW98-08.	Description: View of landfill from MW98-09.
	
Date: August 25, 2014	Date: August 25, 2014

TABLE 5.6: LANDFILL VISUAL INSPECTION PHOTO LOG (STATION AREA LANDFILL)

Photo 25.1 (FOX-4 STA P-25.jpg)	Photo 26.1 (FOX-4 STA P-26.jpg)
Description: F4-STA-MW98-09 during soil sample collection.	Description: After collection and backfill of F4-STA-MW98-09.
	
Date: August 25, 2014	Date: August 25, 2014

TABLE 5.6: LANDFILL VISUAL INSPECTION PHOTO LOG (STATION AREA LANDFILL)

Photo 27.1 (FOX-4 STA P-27.jpg)	
Description: Closeup of sinkhole. **(FEATURE D)**	
	
Date: August 26, 2014	

5.3.2 Soil Sampling

Soil sampling at the Station Area Landfill was completed on 25 August 2014. As previously reported a total of seven samples including one duplicate sample were procured from three locations as shown in plan on Figure 2.

5.3.2.1 Laboratory Analytical Results

The laboratory analytical results for soil samples collected at the Station Area Landfill during the 2014 monitoring event are provided in Table 5.7. A duplicate soil sample was collected from subsurface soil at sample location MW98-07 and was submitted to AGAT, a secondary laboratory for QA/QC purposes. The RPDs for the duplicate sample results were below 30%, indicating good consistency between duplicate results.

5.3.2.2 Discussion of Results – Comparison to Baseline/Background

A discussion of the analytical results for soil samples collected at the Station Area Landfill during the 2014 monitoring event are provided in Table 5.8. The discussion includes a comparison of results from upgradient (MW98-07) and downgradient (MW98-08, MW98-09) soil sampling locations to the baseline average concentrations (BAC) that have been determined for each landfill from soil chemistry at the landfill area prior to and during remediation. Upgradient locations are those near the landfill that are not influenced by migration of contaminants through the landfill, and downgradient locations are at the toe of the landfill or from areas of preferential drainage.

Table 5.8: Evaluation of 2014 Soil Analytical Data (Station Area Landfill)

Parameter	Baseline Average Concentration (ug/g)	2014 Results
Copper	17	Detectable concentrations ranged between 50 and 64 ug/g for upgradient samples and between 12 and 16 ug/g for downgradient samples, with the highest concentration recorded in the subsurface sample at the MW98-07 sample location and the lowest concentration recorded in the subsurface sample at the MW98-08 sample location. Three of seven samples reported concentrations above the BAC.
Nickel	20	Detectable concentrations ranged between 30 and 43 ug/g for upgradient samples and between 12 and 14 ug/g for downgradient samples, with the highest concentration recorded in the subsurface sample at the MW98-07 sample location and the lowest concentration recorded in the surface sample at the MW98-09 sample location. Three of seven samples reported concentrations above the BAC.

TABLE 5.7

RESULTS OF ANALYSIS FOR PARAMETERS IN SOIL AT STATION AREA NON-HAZARDOUS LANDFILL

PARAMETERS	Background Concentration (_)	Baseline Average Concentration (+)	DEW Line Cleanup Tier I Criteria (*)	DEW Line Cleanup Tier II Criteria (**)	F4-STA-MW98-07-S 25-Aug-14 0-15cm	F4-STA-MW98-07-D 25-Aug-14 40-50cm	F4-STA-MW98-07-D (DUP) 25-Aug-14 40-50cm	F4-STA-MW98-07-D (AVG) 25-Aug-14 40-50cm	F4-STA-MW98-08-S 25-Aug-14 0-15cm	F4-STA-MW98-08-D 25-Aug-14 40-50cm	F4-STA-MW98-09-S 25-Aug-14 0-15cm	F4-STA-MW98-09-D 25-Aug-14 40-50cm
Copper	**30**	**17**	-	**100**	**50+**	**63+**	**65+**	**64+**	16	12	16	16
Nickel	**24**	**20**	-	**100**	**30+**	**47+**	**39+**	**43+**	14	14	12	13
Cobalt	**8.8**	**5**	-	**50**	**7.8+**	**11+**	**10.5+**	**10.75+**	4	4	3.7	3.9
Cadmium	**1.00**	**0.12**	-	**5**	0.11	<0.10	<0.5	<0.5	<0.10	<0.10	<0.10	<0.10
Lead	**10**	**26**	**200**	**500**	**23**	5.7	6	5.85	5.4	3.7	7.5	5.7
Zinc	**41**	**35**	-	**500**	**57+**	**56+**	**58+**	**57+**	30	32	35	28
Chromium	**41**	**28**	-	**250**	**61+**	**67+**	**68+**	**67.5+**	28	**32+**	25	26
Arsenic	**28.6**	**13**	-	**30**	**33+**	**48+**	**43+**	**45.5+**	**21+**	**20+**	**14+**	**66+**
Mercury	-	-	-	**2**	<0.050	<0.050	<0.10	<0.10	<0.050	<0.050	<0.050	<0.050
Total PCBs	-	**0.16**	**1**	**5**	0.032	<0.010	<0.05	<0.05	**0.26+**	**0.18+**	0.1	0.15
PHC F1 (C6-C10)	-	-	-	-	<10	<10	<5	<10	<10	<10	<10	<10
PHC F2 (C10-C16)	-	-	-	-	<10	<10	<10	<10	10	<10	<10	<10
PHC F3 (C16-C34)	-	-	-	-	28	<50	<50	<50	<10	<10	<10	<10
PHC F4 (C34-C50)	-	-	-	-	<10	<50	<50	<50	<10	<10	<10	<10
Modifed TPH (Total C6-C34)	-	**53**	-	**2500**	38	35	32.5	33.75	20	15	15	15

NOTES:

All parameter values in µg/g (ppm) unless otherwise indicated.

_ Exceeds FOX-4 Station Area Non-Hazardous Landfill Background Concentration.
\+ Exceeds FOX-4 Station Area Non-Hazardous Landfill Baseline Average Concentration.
* Exceeds DEW Line Cleanup Tier I Criteria.
** Exceeds DEW Line Cleanup Tier II Criteria.

(DUP) Duplicate sample analyzed by AGAT Laboratories for QA/QC purposes.
(AVG) Average concentration of duplicate samples.
< Not detected.
\- No concentration reported.

Parameter	Baseline Average Concentration (ug/g)	2014 Results
Cobalt	5	Detectable concentrations ranged between 7.8 and 10.75 ug/g for upgradient samples and between 3.7 and 4 ug/g for downgradient samples, with the highest concentration recorded in the subsurface sample at the MW98-07 sample location and the lowest concentration recorded in the surface sample at the MW98-09 sample location. Three of seven samples reported concentrations above the BAC.
Cadmium	0.12	A detectable concentration of 0.11 ug/g was reported in the surface sample at the upgradient MW98-07 sample location (below the BAC). The remaining six of seven samples reported concentrations below the laboratory detection limit.
Lead	26	Detectable concentrations ranged between 5.7 and 23 ug/g for upgradient samples and between 3.7 and 7.5 ug/g for downgradient samples, with the highest concentration recorded in the surface sample at the MW98-07 sample location and the lowest concentration recorded in the subsurface sample at the MW98-08 sample location. All samples reported concentrations below the BAC.
Zinc	35	Detectable concentrations were 57 ug/g for upgradient samples and ranged between 28 and 35 ug/g for downgradient samples, with the highest concentration recorded in the surface and subsurface samples at the MW98-07 sample location and the lowest concentration recorded in the subsurface sample at the MW98-09 sample location. Three of seven samples reported concentrations above the BAC.
Chromium	28	Detectable concentrations ranged between 61 and 67.5 ug/g for upgradient samples and between 25 and 32 ug/g for downgradient samples, with the highest concentration recorded in the subsurface sample at the MW98-07 sample location and the lowest concentration recorded in the surface sample at the MW98-09 sample location. Four of seven samples reported concentrations above the BAC.
Arsenic	13	Detectable concentrations ranged between 33 and 45.5 ug/g for upgradient samples and between 14 and 66 ug/g for downgradient samples, with the highest concentration recorded in the subsurface sample at the MW98-09 sample location and the lowest concentration recorded in the surface sample at the MW98-09 sample location. All seven samples reported concentrations above the BAC.
Mercury	-	All results were below the laboratory detection limit of 0.050 ug/g (and 0.10 ug/g for the duplicate sample submitted to the secondary laboratory)
PCBs	0.16	A detectable concentration of 0.032 ug/g was reported for one upgradient sample. Detectable concentrations ranged between 0.1 and 0.26 ug/g for downgradient samples, with the highest concentration recorded in the subsurface sample at the MW98-08 sample location and the lowest concentration recorded in the surface sample at the MW98-07 sample location. Two of seven samples reported concentrations above the BAC.

Parameter	Baseline Average Concentration (ug/g)	2014 Results
TPH	53	Modified TPH concentrations ranged between 33.75 and 38 ug/g for upgradient samples and between 15 and 20 ug/g for downgradient samples, with the highest concentration reported in the subsurface sample at the MW98-07 sample location and the lowest concentration in the surface and subsurface samples at the MW98-09 sample location and the subsurface sample at the MW98-08 sample location. All samples reported concentrations below the BAC.

5.3.2.3 Soil Trend Analysis by Parameter and Discussion of Trends

A discussion of the trends observed for parameter concentrations in soil from 1999 to 2014 are presented in Table 5.9. Trends have been analyzed for upgradient and downgradient locations.

Table 5.9: Evaluation of Soil Result Trends (Station Area Landfill)

Parameter	2014 Results
Copper	Concentrations show a downward trend for the upgradient soil location and a relatively stable trend for downgradient soil locations.
Nickel	Concentrations show an upward trend for the upgradient soil location and a slight downward trend for downgradient soil locations.
Cobalt	Concentrations show an upward trend for the upgradient soil location and a relatively stable trend for downgradient soil locations.
Cadmium	Concentrations show a downward trend for the upgradient soil location and a relatively stable trend for downgradient soil locations.
Lead	Concentrations show a relatively stable trend for upgradient and downgradient soil locations.
Zinc	Concentrations show a slight upward trend for the upgradient soil location and a slight downward trend for downgradient soil locations.
Chromium	Concentrations show an upward trend for the upgradient soil location and a slight upward trend for downgradient soil locations.
Arsenic	Concentrations show a slight upward trend for the upgradient soil location and a slight downard trend for downgradient soil locations.
Mercury	Concentrations show a stable trend for upgradient and downgradient soil locations as concentrations are below laboratory detection limits for all sample locations during all sampling events.
PCBs	Concentrations show a downward trend for the upgradient soil location and a relatively stable trend for downgradient soil locations.
TPH	Concentrations show an upward trend for the upgradient soil location and a slight downward trend for downgradient soil locations.

5.3.3 Groundwater Sampling

Groundwater sampling at the Station Area Landfill was completed on 25 August 2014. As previously reported, one groundwater sample was procured from one monitoring well (MW98-07) as shown in plan on Figure 4.

5.3.3.1 Monitoring Well Sampling/Inspection Logs

Monitoring well sampling/inspection logs are provided following this page on Monitoring Well Sampling Records 13 through 15.

5.3.3.2 Water Levels/Groundwater Flow

Water levels were measured at the Station Area Landfill on 25 August 2014. The groundwater levels measured are shown below in Table 5.10. Based on the measured groundwater levels, groundwater flow is expected to be towards the northwest.

Table 5.10: Groundwater Levels (Station Area Landfill)

Monitoring Well	Date	Ground Surface Elevation (m)	Water Level (m bgs)	Water Level Elevation (m)	Depth to Bottom (m bgs)	Bottom Elevation (m)
MW98-07	25-Aug-14	379.4	0.9	378.5	1.9	377.5
MW98-08	25-Aug-14	373.2	0.75	372.45	0.95	372.25
MW98-09	25-Aug-14	372.4	0.98	371.42	1.19	371.21

5.3.3.3 Laboratory Analytical Results

Laboratory analytical results for groundwater at the Station Area Landfill are presented in Table 5.11. No duplicate groundwater samples were collected at the Station Area Landfill.

5.3.3.4 Discussion of Results by Parameter

An evaluation of the groundwater analytical results at the Station Area Landfill is presented in Table 5.12. The discussion includes a comparison of results from the upgradient location MW98-07 to the baseline average concentrations (BAC) that have been determined for each landfill from groundwater chemistry at the landfill area prior to and during remediation. No groundwater samples were collected from downgradient wells during this monitoring event.

TABLE 5.11

RESULTS OF ANALYSIS FOR PARAMETERS IN GROUNDWATER AT STATION AREA LANDFILL

PARAMETERS	Baseline Average Concentration (+)	F4-STA-MW98-07 25-Aug-14
Copper	**0.025**	**0.035+**
Nickel	**0.65**	0.19
Cobalt	**0.022**	0.02
Cadmium	**0.0016**	0.00052
Lead	**0.016**	0.0037
Zinc	**0.2**	0.1
Chromium	**0.56**	0.22
Arsenic	**0.050**	0.0015
Mercury	**0.001**	<0.00001
Total PCBs	**0.00002**	<0.00005
PHC F1 (C6-C10)	**-**	<0.025
PHC F2 (C10-C16)	**-**	<0.100
PHC F3 (C16-C34)	**-**	<0.100
PHC F4 (C34-C50)	**-**	<0.100
Modifed TPH (Total C6-C34)	**5.0**	0.113

NOTES:

All parameter values in mg/L (ppm) unless otherwise indicated.

+	Exceeds Station Area Landfill Baseline Average Concentration.
(DUP)	Duplicate sample analyzed by AGAT Laboratories for QA/QC purposes.
RDL	Reportable Detection Limit.
<	Not detected.
-	No concentration reported.

Table 5.12: Evaluation of Groundwater Analytical Results (Station Area Landfill)

Parameter	Baseline Average Concentration (mg/L)	2014 Results
Copper	0.025	A detectable concentration of 0.035 mg/L was reported at monitoring well MW98-07, above the BAC.
Nickel	0.65	A detectable concentration of 0.19 mg/L was reported at monitoring well MW98-07, below the BAC.
Cobalt	0.022	A detectable concentration of 0.02 mg/L was reported at monitoring well MW98-07, below the BAC.
Cadmium	0.0016	A detectable concentration of 0.00052 mg/L was reported at monitoring well MW98-07, below the BAC.
Lead	0.016	A detectable concentration of 0.0037 mg/L was reported at monitoring well MW98-07, below the BAC.
Zinc	0.2	A detectable concentration of 0.1 mg/L was reported at monitoring well MW98-07, below the BAC.
Chromium	0.56	A detectable concentration of 0.22 mg/L was reported at monitoring well MW98-07, below the BAC.
Arsenic	0.050	A detectable concentration of 0.0015 mg/L was reported at monitoring well MW98-07, below the BAC.
Mercury	0.001	No detectable concentration was reported at monitoring well MW98-07. The concentration reported was below the laboratory detection limit of 0.00001 mg/L.
PCBs	0.00002	No detectable concentration was reported at monitoring well MW98-07. The concentration reported was below the laboratory detection limit of 0.00005 mg/L.
TPH	5.0	No detectable concentrations for PHC fractions F1, F2 or F3 were reported at monitoring well MW98-07. The modified TPH concentration at this location was calculated to be 0.113 mg/L, below the BAC.

5.3.3.5 Groundwater Trend Analysis by Parameter & Discussion of Trends

A discussion of the trends observed for parameter concentrations in groundwater from 1999 to 2014 are presented in Table 5.13. Trends have been analyzed for upgradient (MW98-07) and downgradient (MW98-08/09) locations, where upgradient locations are those near the landfill that are not influenced by migration of contaminants through the landfill, and downgradient locations are at the toe of the landfill or from areas of preferential drainage.

Table 5.13: Evaluation of Groundwater Result Trends (Station Area Landfill)

Parameter	2014 Results
Copper	Concentrations show a relatively stable trend for upgradient & downgradient wells.
Nickel	Concentrations show a relatively stable trend for upgradient & downgradient wells.

Parameter	2014 Results
Cobalt	Concentrations show an upward trend for upgradient & downgradient wells.
Cadmium	Concentrations show a relatively stable trend for upgradient & downgradient wells.
Lead	Concentrations show a relatively stable trend for upgradient & downgradient wells.
Zinc	Concentrations show a downward trend for upgradient wells & an upward trend for downgradient wells.
Chromium	Concentrations show a slight upward trend for upgradient & downgradient wells.
Arsenic	Concentrations show a relatively stable trend for upgradient & downgradient wells.
Mercury	Concentrations show a relatively stable trend for upgradient & downgradient wells as all results have been below laboratory detection limits for all sampling events.
PCBs	Concentrations show a relatively stable trend for upgradient & downgradient wells as all results have been below laboratory detection limits for all sampling events.
TPH	Concentrations show a relatively stable trend for upgradient & downgradient wells.

5.4 CONCLUSIONS/OVERALL PERFORMANCE OF THE LANDFILL

Based on the results of the 2014 monitoring program, the performance of the Station Area Landfill is acceptable.

5.5 RECOMMENDATIONS/NEXT STEPS

Three sinkholes were noted along the southern edge of the Station Area Landfill. These features are not a cause for immediate concern, however future monitoring events should monitor these sinkholes to assess if they increase in size and/or number. If sinkholes do increase it may ibe indicative of a condition that can worsen and threaten the future performance of the landfill. Regular monitoring of this landfill as per the monitoring schedule shown in Table 1.1 should be continued. No remedial work is necessary at this time.

6.0 PALLET LINE LANDFILL

6.1 LANDFILL DESCRIPTION

The Pallet Line Landfill is located at the Lower Site, north of the airstrip and east of the Non-Hazardous Waste Landfill, and has an approximate area of 2,000 m^2. This landfill was an existing landfill at the site. A detailed drawing of this landfill is provided in Figure 5. The historical chemical results for soil samples collected at this landfill are shown in plan on Figure 5A.

6.2 SUMMARY OF WORK CONDUCTED

6.2.1 Visual Inspection

The visual inspection of the landfill was completed with no deviations from the visual inspection work plan.

6.2.2 Soil Sampling

Soil samples were collected at five (5) locations as shown on the site plan. Surface and subsurface samples were collected at each location. There were no deviations from the soil sampling work plan. One duplicate soil sample was collected from surface soil at the PAL-27 sample location. Soil sampling completed at the landfill is summarized in Table 6.1.

Table 6.1: Summary of Work Conducted by Soil Sampling Location (Pallet Line Landfill)

Location	Surface Soil Sample Collected	Subsurface Soil Sample Collected
F4-PAL-25	√	√
F4-PAL-26	√	√
F4-PAL-27	√ D	√
F4-PAL-28	√	√
F4-PAL-29	√	√

D = duplicate sample collected
√ - sample collected
X – no sample collected

6.2.3 Groundwater Sampling

No groundwater monitoring wells are present at this landfill.

LEGEND:

- 310 — COORDINATE POINT
- MONITORING SOIL SAMPLE LOCATION (5)
- TYPE 1 GRANULAR FILL
- 24 — PHOTOGRAPH VIEWPOINT
- 25m — CONTOURS IN 0.5m INTERVALS
- OVERLAND FLOW DIRECTION
- PONDED WATER

NOTES:

1. LOCATIONS AND SCALE OF FEATURES ARE APPROXIMATE AND SHOWN FOR ILLUSTRATIVE PURPOSES ONLY.
2. PHOTOGRAPHS TAKEN AUG. 28, 2014.
3. ALL COORDINATES ARE REFERENCED TO NAD83 (CSRS), UTM ZONE 19N.
4. ALL ELEVATIONS REFER TO GEODETIC DATUM.
5. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.

REVISIONS:

No.	Date:	By:	Revisions

REFERENCE:

AECOM, FILE No.: FOX-4.5 Year 1 LF MON.dwg, Mar. 2014

0 10 20 metres

SCALE 1:500

SENES Consultants
AN ARCADIS COMPANY

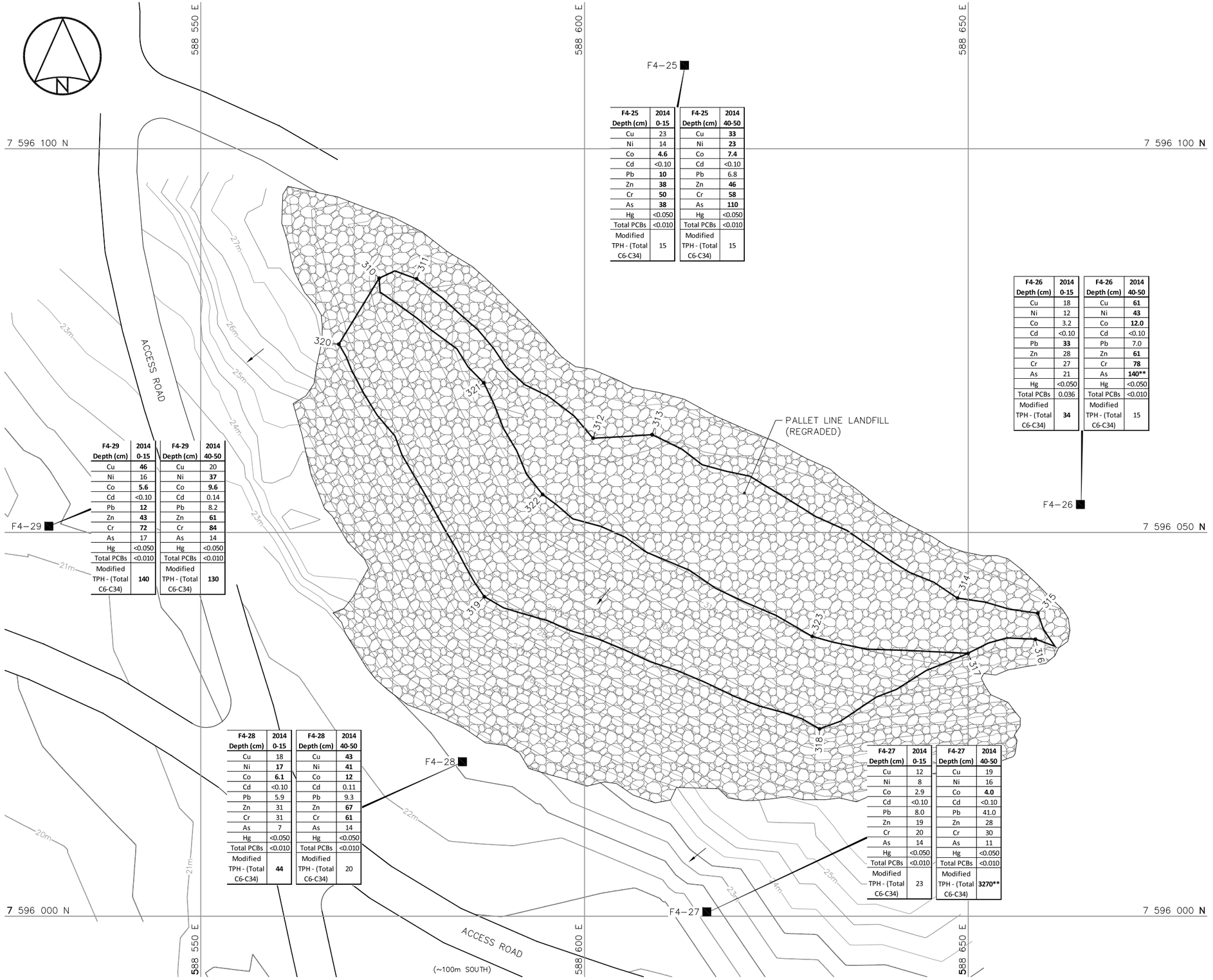
PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

2014 DEW LINE MONITORING PROGRAM

FOX-4 CAPE HOOPER, NUNAVUT

AIRSTRIP AREA
PALLET LINE LANDFILL

Drawn By: I.S.Z.	Approved By: C.F.G.	Project No: 350600-515-2
Date: FEB. 2015	Scale: 1:500	Drawing No: FIGURE 5



F4-25 Depth (cm)	2014 0-15
Cu	23
Ni	14
Co	**4.6**
Cd	<0.10
Pb	**10**
Zn	**38**
Cr	**50**
As	**38**
Hg	<0.050
Total PCBs	<0.010
Modified TPH - (Total C6-C34)	15

F4-25 Depth (cm)	2014 40-50
Cu	**33**
Ni	**23**
Co	**7.4**
Cd	<0.10
Pb	6.8
Zn	**46**
Cr	**58**
As	**110**
Hg	<0.050
Total PCBs	<0.010
Modified TPH - (Total C6-C34)	15

F4-26 Depth (cm)	2014 0-15
Cu	18
Ni	12
Co	3.2
Cd	<0.10
Pb	**33**
Zn	28
Cr	27
As	21
Hg	<0.050
Total PCBs	0.036
Modified TPH - (Total C6-C34)	**34**

F4-26 Depth (cm)	2014 40-50
Cu	**61**
Ni	**43**
Co	**12.0**
Cd	<0.10
Pb	7.0
Zn	**61**
Cr	**78**
As	**140****
Hg	<0.050
Total PCBs	<0.010
Modified TPH - (Total C6-C34)	15

F4-29 Depth (cm)	2014 0-15
Cu	**46**
Ni	16
Co	**5.6**
Cd	<0.10
Pb	**12**
Zn	**43**
Cr	**72**
As	17
Hg	<0.050
Total PCBs	<0.010
Modified TPH - (Total C6-C34)	**140**

F4-29 Depth (cm)	2014 40-50
Cu	20
Ni	**37**
Co	**9.6**
Cd	0.14
Pb	8.2
Zn	**61**
Cr	**84**
As	14
Hg	<0.050
Total PCBs	<0.010
Modified TPH - (Total C6-C34)	**130**

F4-28 Depth (cm)	2014 0-15
Cu	18
Ni	**17**
Co	**6.1**
Cd	<0.10
Pb	5.9
Zn	31
Cr	31
As	7
Hg	<0.050
Total PCBs	<0.010
Modified TPH - (Total C6-C34)	**44**

F4-28 Depth (cm)	2014 40-50
Cu	**43**
Ni	**41**
Co	**12**
Cd	0.11
Pb	9.3
Zn	**67**
Cr	**61**
As	14
Hg	<0.050
Total PCBs	<0.010
Modified TPH - (Total C6-C34)	20

F4-27 Depth (cm)	2014 0-15
Cu	12
Ni	8
Co	2.9
Cd	<0.10
Pb	8.0
Zn	19
Cr	20
As	14
Hg	<0.050
Total PCBs	<0.010
Modified TPH - (Total C6-C34)	23

F4-27 Depth (cm)	2014 40-50
Cu	19
Ni	16
Co	**4.0**
Cd	<0.10
Pb	41.0
Zn	28
Cr	30
As	11
Hg	<0.050
Total PCBs	<0.010
Modified TPH - (Total C6-C34)	**3270****

LEGEND:

- 310 — COORDINATE POINT
- ■ — MONITORING SOIL SAMPLE LOCATION (5)
- TYPE 1 GRANULAR FILL
- 25m — CONTOURS IN 0.5m INTERVALS
- OVERLAND FLOW DIRECTION

Parameter	Baseline Average Concentration	DEW Line Tier I Cleanup Criteria	DEW Line Tier II Cleanup Criteria
Cu	27	N/A	100
Ni	17	N/A	100
Co	4	N/A	50
Cd	1.00	N/A	5
Pb	10	200	500
Zn	37	N/A	500
Cr	39	N/A	250
As	37	N/A	130
Hg	0.100	N/A	2.0
Total PCB	0.050	1	5
Modified TPH - (Total C6-C34)	26	N/A	2500

All Concentrations in mg/kg

Bold — Concentration is Equal to or Exceeds Baseline Average Concentration

* — Concentration Exceeds DEW Line Tier I Cleanup Criteria

** — Concentration Exceeds DEW Line Tier II Cleanup Criteria

\- — No Concentration Reported

N/A — Not Applicable

NOTES:

1. LOCATIONS AND SCALE OF FEATURES ARE APPROXIMATE AND SHOWN FOR ILLUSTRATIVE PURPOSES ONLY.
2. ALL COORDINATES ARE REFERENCED TO NAD83 (CSRS), UTM ZONE 19N.
3. ALL ELEVATIONS REFER TO GEODETIC DATUM.
4. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.

REFERENCE:

AECOM, FILE No.: FOX-4.5 Year 1 LF MON.dwg, Mar. 2014

0 10 20 metres

SCALE 1:500

SENES Consultants
AN ARCADIS COMPANY

PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

2014 DEW LINE MONITORING PROGRAM

FOX-4 CAPE HOOPER, NUNAVUT

AIRSTRIP AREA - PALLET LINE LANDFILL

SOIL CONTAMINANT DISTRIBUTION PLAN

Drawn By: I.S.Z.	Approved By: C.F.G.	Project No: 350600-515-2
Date: FEB. 2015	Scale: 1:500	Drawing No: FIGURE 5A

Sheet Size: 11 x 17 (432mm x 279mm)
PLOT: February-27-15 2:41:40 PM Saved by: Izabela Ziba
SENES FILE NO.: 350600-515-2 FOX-4_Fig 5 - Airstrip Area_Pallet Line Landfill.dwg

6.2.4 Thermal Monitoring

No thermistor installations are present at this landfill.

6.3 RESULTS OF THE MONITORING PROGRAM

6.3.1 Visual Inspection

The visual inspection at the Pallet Line Landfill was completed on 25 and 26 August 2014. The results of the visual inspection are detailed in Table 6.2 and shown on Figure 5 and in the photo log Table 6.5.

Table 6.2: Visual Inspection Results (Pallet Line Landfill)

Item	Description
Settlement	None observed.
Erosion	None observed.
Frost Action	None observed.
Sloughing and Cracking	None observed.
Animal Burrows	None observed.
Vegetation	None observed.
Staining	None observed.
Vegetation Stress	None observed.
Seepage Points	None observed.
Debris Exposed	None observed.
Presence/Condition of Monitoring Instruments	No monitoring instruments are present at this landfill.
Other Features of Note	Ponded water northeast of the landfill. (Feature A)

6.3.1.1 Inspection Checklist

The visual inspection checklist completed for this landfill during the site inspection is provided in Table 6.3.

6.3.1.2 Stability Assessment

The preliminary stability assessment completed during the site inspection is provided in Table 6.4.

6.3.1.3 Photographic Records

The photograph log for the site is provided in Table 6.5.

TABLE 6.3 - VISUAL INSPECTION CHECKLIST

DEW LINE CLEANUP: POST-CONSTRUCTION - LANDFILL MONITORING

INSPECTION REPORT – PAGE 1 OF 2

SITE NAME: FOX-4
LANDFILL DESIGNATION: Pallet Line Landfill
DATE OF INSPECTION: 25 and 26 August 2014
DATE OF PREVIOUS INSPECTION: N/A
INSPECTED BY: S. Borcsok, J. Mauchan
REPORT PREPARED BY: S. Borcsok
The inspector/reporter represents to the best of their knowledge, the following statements and observations are true and correct and to the best of the preparer's actual knowledge, no material facts have been suppressed or misstated.

TABLE 6.3 - VISUAL INSPECTION CHECKLIST - INSPECTION REPORT – PAGE 2 OF 2

Checklist Item	Present Yes/No	Location (Describe relative to existing monuments/features and relative to landfill design i.e. surface, berms, toe)	Length	Width	Depth	Extent relative to Area of Landfill (%)	Description	Photographic Records Focal length, location, view point & direction (relative to magnetic north) Feature of note Scale	Additional Comments
Settlement	NO								
Erosion	NO								
Frost Action	NO								
Sloughing and Cracking	NO								
Animal Burrows	NO								
Vegetation	NO								
Staining	NO								
Vegetation Stress	NO								
Seepage Points	NO								
Debris Exposed	NO								
Presence/Condition – Monitoring Instruments	NO								
Features of Note.	YES	Ponded water northeast of landfill (Feature A).				<1%		17.1	

Table 6.4: Preliminary Stability Assessment - FOX-4 Pallet Landfill

Feature	Severity Rating	Extent
Settlement	None	None
Erosion	None	None
Frost Action	None	None
Staining	None	None
Vegetation Stress	None	None
Seepage/Ponded Water	Acceptable	Isolated
Debris exposure	None	None
Overall Landfill Performance: ACCEPTABLE		

Performance/ Severity Rating	Description
Acceptable	Noted features are of little consequence. The landfill is performing as designed. Minor deviations in environmental or physical performance may be observed, such as isolated areas of erosion, settlement.
Marginal	Physical/environmental performance appears to be deteriorating with time. Observations may include an increase in size or number of features of note, such as differential settlement, erosion or cracking. No significant impact on landfill stability to date, but potential for failure is assessed as low or moderate.
Significant	Significant or potentially significant changes affecting landfill stability, such as significant changes in slope geometry, significant erosion or differential settlement; scarp development. The potential for failure is assessed as imminent.
Unacceptable	Stability of landfill is compromised to the extent that ability to contain waste materials is compromised. Examples may include: - Debris exposed in erosion channels or areas of differential settlement. - Liner exposed. - Slope failure.

Extent	Description
Isolated	Singular feature
Occasional	Features of note occurring at irregular intervals/locations
Numerous	Many features of note, impacted less than 50% of the surface area of the landfill
Extensive	Impacting greater than 50% of the surface area of the landfill

TABLE 6.5: LANDFILL VISUAL INSPECTION PHOTO LOG (PALLET LINE LANDFILL)

FOX-4 Pallet Line Landfill (see Figure 5)

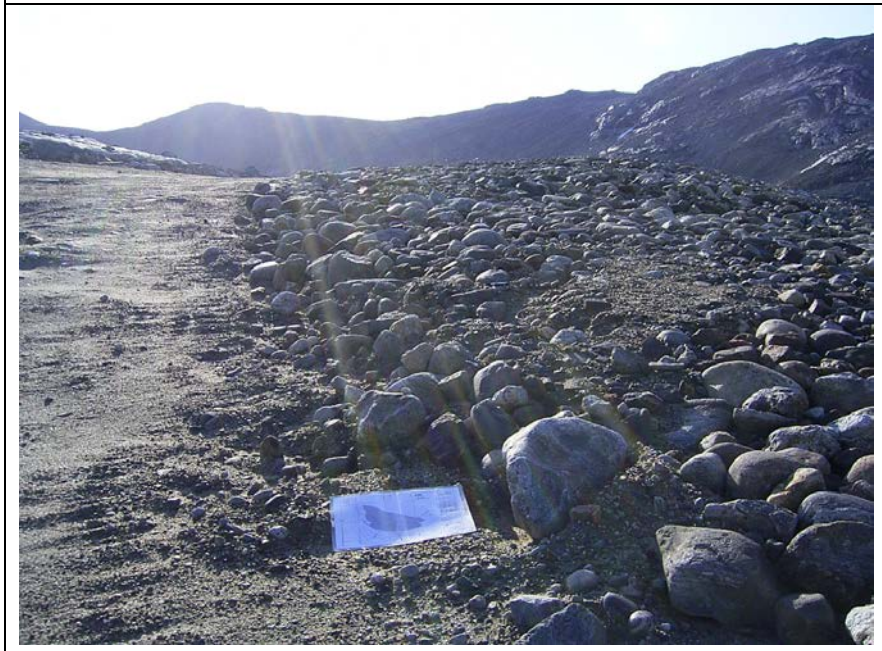
Photo 1.1 (FOX-4 PAL P-1 east.jpg)	Photo 1.2 (FOX-4 PAL P-1 south.jpg)
Description: View east along the northern limit of the Pallet Line Landfill.	Description: View south across the Pallet Line Landfill.
	
Date: August 28, 2014	Date: August 28, 2014

TABLE 6.5: LANDFILL VISUAL INSPECTION PHOTO LOG (PALLET LINE LANDFILL)

Photo 2.1 (FOX-4 PAL P-2 east.jpg)	Photo 2.2 (FOX-4 PAL P-2 south.jpg)
Description: View east along northern limit of Pallet Line Landfill.	Description: View south across landfill.
	
Date: August 28, 2014	Date: August 28, 2014

TABLE 6.5: LANDFILL VISUAL INSPECTION PHOTO LOG (PALLET LINE LANDFILL)

Photo 2.3 (FOX-4 PAL P-2 west.jpg)	Photo 3.1 (FOX-4 PAL P-3 west.jpg)
Description: View west along northern limit of landfill. Access road seen on right.	Description: View across landfill from northeast corner.
	
Date: August 28, 2014	Date: August 28, 2014

TABLE 6.5: LANDFILL VISUAL INSPECTION PHOTO LOG (PALLET LINE LANDFILL)

Photo 4.1 (FOX-4 PAL P-4 south.jpg)	Photo 5.1 (FOX-4 PAL P-5 west.jpg)
Description: The northeast corner of the landfill.	Description: View west across landfill.
	
Date: August 28, 2014	Date: August 28, 2014

TABLE 6.5: LANDFILL VISUAL INSPECTION PHOTO LOG (PALLET LINE LANDFILL)

Photo 6.1 (FOX-4 PAL P-6 nw.jpg)	Photo 7.1 (FOX-4 PAL P-7 west.jpg)
Description: View uphill of landfill from the southeastern corner.	Description: View east of the southern toe of the landfill.
	
Date: August 28, 2014	Date: August 28, 2014

TABLE 6.5: LANDFILL VISUAL INSPECTION PHOTO LOG (PALLET LINE LANDFILL)

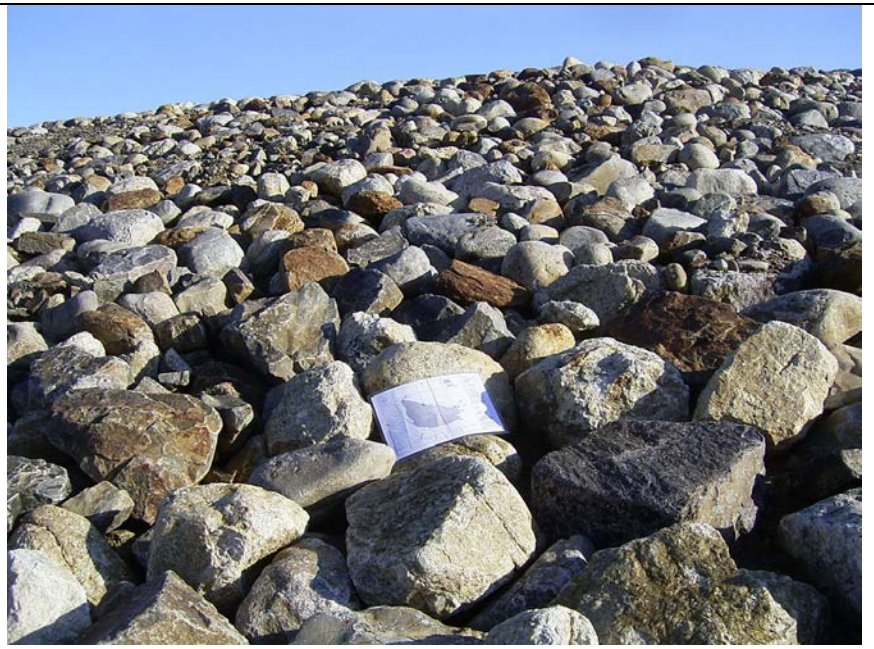
Photo 8.1 (FOX-4 PAL P-8 east.jpg)	Photo 8.2 (FOX-4 PAL P-8 north.jpg)
Description: The southeastern slope of the landfill.	Description: View uphill from southern edge of landfill.
	
Date: August 28, 2014	Date: August 28, 2014

TABLE 6.5: LANDFILL VISUAL INSPECTION PHOTO LOG (PALLET LINE LANDFILL)

Photo 8.3 (FOX-4 PAL P-8 west.jpg)	Photo 9.1 (FOX-4 PAL P-9 ne.jpg)
Description: The southern slope of the landfill.	Description: View uphill of southern slope.
	
Date: August 28, 2014	Date: August 28, 2014

TABLE 6.5: LANDFILL VISUAL INSPECTION PHOTO LOG (PALLET LINE LANDFILL)

Photo 9.2 (FOX-4 PAL P-9 south.jpg)	Photo 9.3 (FOX-4 PAL P-9 west.jpg)
Description: View downhill toward F4-28.	Description: The southern slope of the landfill near F4-28.
	
Date: August 28, 2014	Date: August 28, 2014

TABLE 6.5: LANDFILL VISUAL INSPECTION PHOTO LOG (PALLET LINE LANDFILL)

Photo 10.1 (FOX-4 PAL P-10 ne.jpg)	Photo 10.2 (FOX-4 PAL P-10 north.jpg)
Description: View uphill from southwestern corner of landfill.	Description: View north, looking uphill from southwestern corner of landfill.
	
Date: August 28, 2014	Date: August 28, 2014

TABLE 6.5: LANDFILL VISUAL INSPECTION PHOTO LOG (PALLET LINE LANDFILL)

Photo 10.3 (FOX-4 PAL P-10 se.jpg)	Photo 11.1 (FOX-4 PAL P-11 north.jpg)
Description: View of southern toe of landfill, looking toward F4-28	Description: View toward the northwestern corner of the landfill.
	
Date: August 28, 2014	Date: August 28, 2014

TABLE 6.5: LANDFILL VISUAL INSPECTION PHOTO LOG (PALLET LINE LANDFILL)

Photo 11.2 (FOX-4 PAL P-11 south.jpg)	Photo 12.1 (FOX-4 PAL P-12 east.jpg)
Description: View looking along eastern slope of the landfill.	Description: The relatively flat terrain of the northern part of the landfill.
	
Date: August 28, 2014	Date: August 28, 2014

TABLE 6.5: LANDFILL VISUAL INSPECTION PHOTO LOG (PALLET LINE LANDFILL)

Photo 12.2 (FOX-4 PAL P-12 nw.jpg)	Photo 12.3 (FOX-4 PAL P-12 sw.jpg)
Description: View toward northwest corner of the landfill.	Description: View from Pallet Line Landfill toward access roads. Monument is on the right hand side.
	
Date: August 28, 2014	Date: August 28, 2014

TABLE 6.5: LANDFILL VISUAL INSPECTION PHOTO LOG (PALLET LINE LANDFILL)

Photo 13.1 (FOX-4 PAL P-13 north.jpg)	Photo 13.2 (FOX-4 PAL P-13 nw.jpg)
Description: The relatively flat terrain of the northeastern part of the landfill.	Description: View northwest along landfill.
	
Date: August 28, 2014	Date: August 28, 2014

TABLE 6.5: LANDFILL VISUAL INSPECTION PHOTO LOG (PALLET LINE LANDFILL)

Photo 13.3 (FOX-4 PAL P-13 se.jpg)	Photo 13.4 (FOX-4 PAL P-13 west.jpg)
Description: View toward eastern extents of the landfill.	Description: View along landfill looking west.
	
Date: August 28, 2014	Date: August 28, 2014

TABLE 6.5: LANDFILL VISUAL INSPECTION PHOTO LOG (PALLET LINE LANDFILL)

Photo 14.1 (FOX-4 PAL P-14 sw.jpg)	Photo 15.1 (FOX-4 PAL P-15.jpg)
Description: View of Pallet Line Landfill across the access road from near F4-25.	Description: F4-PAL-25 during sample collection.
	
Date: August 28, 2014	Date: August 28, 2014

TABLE 6.5: LANDFILL VISUAL INSPECTION PHOTO LOG (PALLET LINE LANDFILL)

Photo 16.1 (FOX-4 PAL P-16.jpg)	Photo 17.1 (FOX-4 PAL P-17 sw.jpg)
Description: F4-PAL-25 after sample collection and backfill.	Description: Ponded water at the northeast corner of the landfill. View from F4-PAL-26. **(FEATURE A)**
	
Date: August 28, 2014	Date: August 28, 2014

TABLE 6.5: LANDFILL VISUAL INSPECTION PHOTO LOG (PALLET LINE LANDFILL)

Photo 18.1 (FOX-4 PAL P-18.jpg)	Photo 19.1 (FOX-4 PAL P-19.jpg)
Description: Sample collection of F4-PAL-26.	Description: After sample collection and backfill of F4-PAL-26.
	
Date: August 28, 2014	Date: August 28, 2014

TABLE 6.5: LANDFILL VISUAL INSPECTION PHOTO LOG (PALLET LINE LANDFILL)

Photo 20.1 (FOX-4 PAL P-20 north.jpg)	Photo 21.1 (FOX-4 PAL P-21.jpg)
Description: View north toward landfill from F4-PAL-27.	Description: F4-PAL-27 during sample collection.
	
Date: August 28, 2014	Date: August 28, 2014

TABLE 6.5: LANDFILL VISUAL INSPECTION PHOTO LOG (PALLET LINE LANDFILL)

Photo 22.1 (FOX-4 PAL P-22.jpg)	Photo 23.1 (FOX-4 PAL P-23 ne.jpg)
Description: After sample collection and backfill of F4-PAL-27.	Description: View toward Pallet Line Landfill from near F4-PAL-28.
	
Date: August 28, 2014	Date: August 28, 2014

TABLE 6.5: LANDFILL VISUAL INSPECTION PHOTO LOG (PALLET LINE LANDFILL)

Photo 24.1 (FOX-4 PAL P-24.jpg)	Photo 25.1 (FOX-4 PAL P-25.jpg)
Description: F4-PAL-28 during sample collection.	Description: After sample collection and backfill of F4-PAL-28.
	
Date: August 28, 2014	Date: August 28, 2014

TABLE 6.5: LANDFILL VISUAL INSPECTION PHOTO LOG (PALLET LINE LANDFILL)

Photo 26.1 (FOX-4 PAL P-26 east.jpg)	Photo 27.1 (FOX-4 PAL P-27.jpg)
Description: View across access road toward Pallet Line Landfill from near F4-PAL-29.	Description: Sample collection of F4-PAL-29.
	
Date: August 28, 2014	Date: August 28, 2014

TABLE 6.5: LANDFILL VISUAL INSPECTION PHOTO LOG (PALLET LINE LANDFILL)

Photo 28.1 (FOX-4 PAL P-28.jpg)	Photo 29.1 (FOX-4 PAL P-29.jpg)
Description: After sample collection and backfill of F4-PAL-29.	Description: View of Pallet Line Landfill from high ground to the south.
	
Date: August 28, 2014	

6.3.1.4 Trend Analysis

No trends in visual observations at this landfill can be completed as 2014 is the first year of monitoring at this landfill.

6.3.1.5 Discussion of Results/Trends

The 2014 visual inspection of the Pallet Line Landfill did not identify any items of concern. Ponded water was noted northeast of the landfill however this is not expected to represent an issue at the present time.

6.3.2 Soil Sampling

Soil sampling at the Pallet Line Landfill was completed on 26 August 2014. As previously reported a total of eleven samples including one duplicate sample were procured from five locations as shown in plan on Figure 5.

6.3.2.1 Laboratory Analytical Results

The analytical results for soil samples collected at the Pallet Line Landfill are presented in Table 6.6.

A duplicate soil sample was collected from surface soil at the PAL-27 sample location and was submitted to AGAT, a secondary laboratory for QA/QC purposes. The RPDs for the duplicate sample results were above 30% for four of eleven parameters. In these cases, parameter concentrations were very low and small differences in reported concentrations resulted in large RPD values. The duplicate sample results are believed to be consistent.

6.3.2.2 Discussion of Results – Comparison to Baseline/Background

A discussion of the results for each parameter analyzed in soil at the Pallet Line Landfill is provided in Table 6.7. The discussion includes a comparison of results from upgradient (PAL-25, PAL-26) and downgradient (PAL-27, PAL-28, PAL-29) soil sampling locations to the baseline average concentrations (BAC) that have been determined for each landfill from soil chemistry at the landfill area prior to and during remediation. Upgradient locations are those near the landfill that are not influenced by migration of contaminants through the landfill, and downgradient locations are at the toe of the landfill or from areas of preferential drainage.

TABLE 6.6

RESULTS OF ANALYSIS FOR PARAMETERS IN SOIL AT PALLET LINE LANDFILL

PARAMETERS	Background Concentration (_)	Baseline Average Concentration (+)	DEW Line Cleanup Tier I Criteria (*)	DEW Line Cleanup Tier II Criteria (**)	F4-PAL-25-S 25-Aug-14 0-15cm	F4-PAL-25-D 25-Aug-14 40-50cm	F4-PAL-26-S 25-Aug-14 0-15cm	F4-PAL-26-D 25-Aug-14 40-50cm	F4-PAL-27-S 25-Aug-14 0-15cm	F4-PAL-27-S (DUP) 25-Aug-14 0-15cm	F4-PAL-27-S (AVG) 25-Aug-14 0-15cm	F4-PAL-27-D 25-Aug-14 40-50cm	F4-PAL-28-S 25-Aug-14 0-15cm	F4-PAL-28-D 25-Aug-14 40-50cm	F4-PAL-29-S 25-Aug-14 0-15cm	F4-PAL-29-D 25-Aug-14 40-50cm
Copper	**30**	**27**	-	**100**	23	**33+**	18	**61+**	12	11	11.5	19	18	**43+**	**46+**	20
Nickel	**24**	**17**	-	**100**	14	**23+**	12	**43+**	8.4	3	5.7	16	17	**41+**	16	**37+**
Cobalt	**9**	**3.9**	-	**50**	**4.6+**	**7.4+**	3.2	**12+**	2.9	2.8	2.85	**4+**	**6.1+**	**12+**	**5.6+**	**9.6+**
Cadmium	**0.62**	**1.0**	-	**5**	<0.10	<0.10	<0.10	<0.10	<0.10	<0.5	<0.5	<0.10	<0.10	0.11	<0.10	0.14
Lead	**6**	**10**	**200**	**500**	10	6.8	**33+**	**7**	**8**	**13+**	**10.5+**	**41+**	5.9	**9.3**	**12+**	**8.2**
Zinc	**41**	**37**	-	**500**	**38+**	**46+**	28	**61+**	19	19	19	28	31	**67+**	**43+**	**61+**
Chromium	**41**	**39**	-	**250**	**50+**	**58+**	27	**78+**	20	20	20	30	31	**61+**	**72+**	**84+**
Arsenic	**29**	**37**	-	**30**	**38+**	**110+**	21	**140+**	14	9	11.5	11	7	14	17	14
Mercury	-	**0.10**	-	**2**	<0.050	<0.050	<0.050	<0.050	<0.050	<0.10	<0.10	<0.050	<0.050	<0.050	<0.050	<0.050
Total PCBs	-	**0.050**	**1**	**5**	<0.010	<0.010	0.036	<0.010	<0.010	<0.05	<0.05	<0.010	<0.010	<0.010	<0.010	<0.010
PHC F1 (C6-C10)	-	-	-	-	<10	<10	<10	<10	<10	<5	<10	190	<10	<10	<10	<10
PHC F2 (C10-C16)	-	-	-	-	<10	<10	<10	<10	<10	16	16	2700	<10	<10	<10	<10
PHC F3 (C16-C34)	-	-	-	-	<10	<10	24	<10	13	52	32.5	380	34	10	130	120
PHC F4 (C34-C50)	-	-	-	-	<10	<10	<10	<10	<10	<50	<50	<10	34	<10	19	<10
Modifed TPH (Total C6-C34)	-	**26**	-	**2500**	15	15	**34+**	15	23	**70.5+**	**46.75+**	**3270+****	**44+**	20	**140+**	**130+**

NOTES:

All parameter values in µg/g (ppm) unless otherwise indicated.

_ Exceeds FOX-4 Pallet Line Landfill Background Concentration.
\+ Exceeds FOX-4 Pallet Line Landfill Baseline Average Concentration.
* Exceeds DEW Line Cleanup Tier I Criteria.
** Exceeds DEW Line Cleanup Tier II Criteria.

(DUP) Duplicate sample analyzed by AGAT Laboratories for QA/QC purposes.
(AVG) Average concentration of duplicate samples.
< Not detected.
\- No concentration reported.

Table 6.7: Evaluation of 2014 Soil Analytical Data (Pallet Line Landfill)

Parameter	Baseline Average Concentration (ug/g)	2014 Results
Copper	27	Detectable concentrations ranged between 18 and 61 ug/g for upgradient samples and between 11.5 and 46 ug/g for downgradient samples, with the highest concentration reported in the subsurface sample collected from the PAL-26 sample location while the lowest concentration was reported within the surface sample at the PAL-27 sample location. Four of eleven samples reported concentrations above the BAC.
Nickel	17	Detectable concentrations ranged between 12 and 43 ug/g for upgradient samples and between 5.7 and 41 ug/g for downgradient samples, with the highest concentration reported in the subsurface sample collected from the PAL-26 sample location while the lowest concentration was reported in the subsurface sample at the PAL-27 sample location. Four of eleven samples reported concentrations above the BAC.
Cobalt	3.9	Detectable concentrations ranged between 3.2 and 12 ug/g for upgradient samples and between 2.85 and 12 ug/g for downgradient samples, with the highest concentration reported in the subsurface sample collected from the PAL-26 sample location while the lowest concentration was reported in the subsurface sample at the PAL-27 sample location. Eight of eleven samples reported concentrations above the BAC.
Cadmium	1.0	No detectable concentrations were reported in upgradient samples. Detectable concentrations ranged between 0.11 and 0.14 ug/g in downgradient samples, with the highest concentration reported in the subsurface sample at the PAL-29 sample location while the lowest concentration was reported in the subsurface sample at the PAL-28 sample location. The remaining nine of eleven samples reported concentrations below the laboratory detection limit (DL). All eleven samples reported concentrations below the BAC.
Lead	10	Detectable concentrations ranged between 6.8 and 33 ug/g for upgradient samples and between 5.9 and 41 ug/g for downgradient samples, with the highest concentration reported in the subsurface sample at the PAL-27 sample location and the lowest concentration in the surface sample at the PAL-28 sample location. Five of eleven samples reported concentrations above the BAC.
Zinc	37	Detectable concentrations ranged between 28 and 61 ug/g for upgradient samples and between 19 and 67 ug/g for downgradient samples, with the highest concentration reported in the subsurface sample at the PAL-28 sample location and the lowest concentration within the surface sample at the PAL-27 sample location. Six of eleven samples reported concentrations above the BAC.
Chromium	39	Detectable concentrations ranged between 27 and 78 ug/g for upgradient samples and between 20 and 84 ug/g for downgradient samples, with the highest concentration reported in the subsurface sample at the PAL-29 sample location and the lowest concentration in the surface sample at the PAL-27

Parameter	Baseline Average Concentration (ug/g)	2014 Results
		sample location. Six of eleven samples reported concentrations above the BAC.
Arsenic	37	Detectable concentrations ranged between 21 and 140 ug/g for upgradient samples and between 7 and 17 ug/g for downgradient samples, with the highest concentration reported in the subsurface sample at the PAL-26 sample location and the lowest concentration in the surface sample at the PAL-28 sample location. Three of eleven samples reported concentrations above the BAC and DEW Line Cleanup Tier II Criteria of 30 ug/g, however only one concentration exceeds the site-specific arsenic criteria of 130 ug/g.
Mercury	0.10	All eleven samples reported concentrations less than the laboratory DL (0.050 ug/g and 0.10 ug/g for the duplicate sample submitted to the secondary laboratory).
PCBs	0.050	One detectable concentration of 0.036 ug/g was reported in the surface soil sample collected at the upgradient PAL-26 sample location. The remaining ten of eleven samples reported concentrations less than the laboratory DL (0.010 ug/g and 0.05 ug/g for the duplicate sample submitted to the secondary laboratory). All samples reported concentrations below the BAC.
TPH	26	Modified TPH concentrations ranged between 15 and 34 ug/g for upgradient samples and between 15 and 3270 ug/g for downgradient samples, with the highest concentration reported in the subsurface sample at the PAL-27 sample location and the lowest concentration in the surface and subsurface samples at the PAL-25 sample location and the subsurface sample at the PAL-26 sample location. One sample (the subsurface sample at PAL-27) reported a concentration above the DEW Line Cleanup Tier II Criteria of 2500 ug/g. Seven of eleven samples reported concentrations above the BAC.

Results for arsenic and TPH reported concentrations above the applicable DEW Line Cleanup Tier II Criteria for these parameters. Natural levels of arsenic above these criteria are known to occur in soil in the vicinity of this landfill, however one sample concentration exceeds the site-specific arsenic criteria of 130 ug/g for the site. The location where TPH concentrations were reported above the Tier II Criteria (location PAL-27) is downgradient of the landfill, however it is unclear whether this result is due to contaminant migration from the landfill.

6.3.2.3 Soil Trend Analysis by Parameter and Discussion of Trends

No trends are available for soil results at the Pallet Line Landfill as 2014 represents the first year of monitoring at this landfill.

6.4 CONCLUSIONS/OVERALL PERFORMANCE OF THE LANDFILL

Based on the findings of the 2014 landfill monitoring program, the performance of the landfill is considered to be acceptable. One soil sample collected at this landfill reported a TPH concentration above the DEW Line Cleanup Tier II Criteria. It is unclear whether this exceedance is due to contaminant migration from the landfill or was caused by another source such as a fuel spill.

6.5 RECOMMENDATIONS/NEXT STEPS

During the next monitoring event at the site, it is recommended that additional soil samples be collected in the vicinity of the TPH exceedance at PAL-27 to horizontally delineate the extent of contamination and provide insight into whether this result is due to contaminant migration from the landfill. Regular monitoring of this landfill as per the monitoring schedule shown in Table 1.1 should be continued, however no remedial work is necessary at this time.

7.0 TANNER BAY LANDFILL

7.1 LANDFILL DESCRIPTION

The Tanner Bay Landfill is located at the original beach landing area for the site along Tanner Bay, and has an approximate area of 2,000 m^2. This landfill was an existing landfill at the site prior to the cleanup. A detailed drawing of this landfill is provided in Figure 6. The historical chemical results for soil samples collected at this landfill are shown in plan on Figure 6A.

7.2 SUMMARY OF WORK CONDUCTED

7.2.1 Visual Inspection

The visual inspection of the landfill was completed with no deviations from the visual inspection work plan.

7.2.2 Soil Sampling

Soil samples were collected at three (3) locations as shown on the site plan. Surface and subsurface samples were collected at each location. There were no deviations from the soil sampling work plan. One duplicate soil sample was collected from surficial soils at sample location TAN-11. Soil sampling completed at the landfill is summarized in Table 7.1.

Table 7.1: Summary of Work Conducted by Soil Sampling Location (Tanner Bay Landfill)

Location	Surface Soil Sample Collected	Subsurface Soil Sample Collected
F4-TAN-11	√ D	√
F4-TAN-12	√	√
F4-TAN-13	√	√

D = duplicate sample collected
√ - sample collected
X – no sample collected

7.2.3 Groundwater Sampling

No groundwater monitoring wells are present at this landfill

7.2.4 Thermal Monitoring

No thermistor installations are present at this landfill.

589 550 E
589 600 E
589 650 E
7 592 950 N
7 592 900 N
(~100m NORTH)
22
23
401
408
407
406
405
404
403
402
29m
30m
25m
24m
23m
22m
21m
20m
19m
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
F4–13
F4–11
F4–12
FEATURE A
MINOR SETTLEMENT
1.5x1.0x0.05m
FEATURE B
EROSION CHANNEL
TANNER BAY LANDFILL
(REGRADED)
TYPE 1 GRANULAR FILL
ACCESS ROAD

LEGEND:

- 401 — COORDINATE POINT
- ■ — MONITORING SOIL SAMPLE LOCATION (3)
- TYPE 1 GRANULAR FILL
- 19 — PHOTOGRAPH VIEWPOINT
- 30m — CONTOURS IN 0.5m INTERVALS
- OVERLAND FLOW DIRECTION
- EROSION CHANNEL
- AREA OF SETTLEMENT

NOTES:

1. LOCATIONS AND SCALE OF FEATURES ARE APPROXIMATE AND SHOWN FOR ILLUSTRATIVE PURPOSES ONLY.
2. PHOTOGRAPHS TAKEN AUG. 24, 2014.
3. ALL COORDINATES ARE REFERENCED TO NAD83 (CSRS), UTM ZONE 19N.
4. ALL ELEVATIONS REFER TO GEODETIC DATUM.
5. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.

REVISIONS:

No.	Date:	By:	Revisions

REFERENCE:

AECOM, FILE No.: FOX-4.6 Year 1 LF MON.dwg, Mar. 2014

0 10 20 metres

SCALE 1:500

SENES Consultants
AN ARCADIS COMPANY

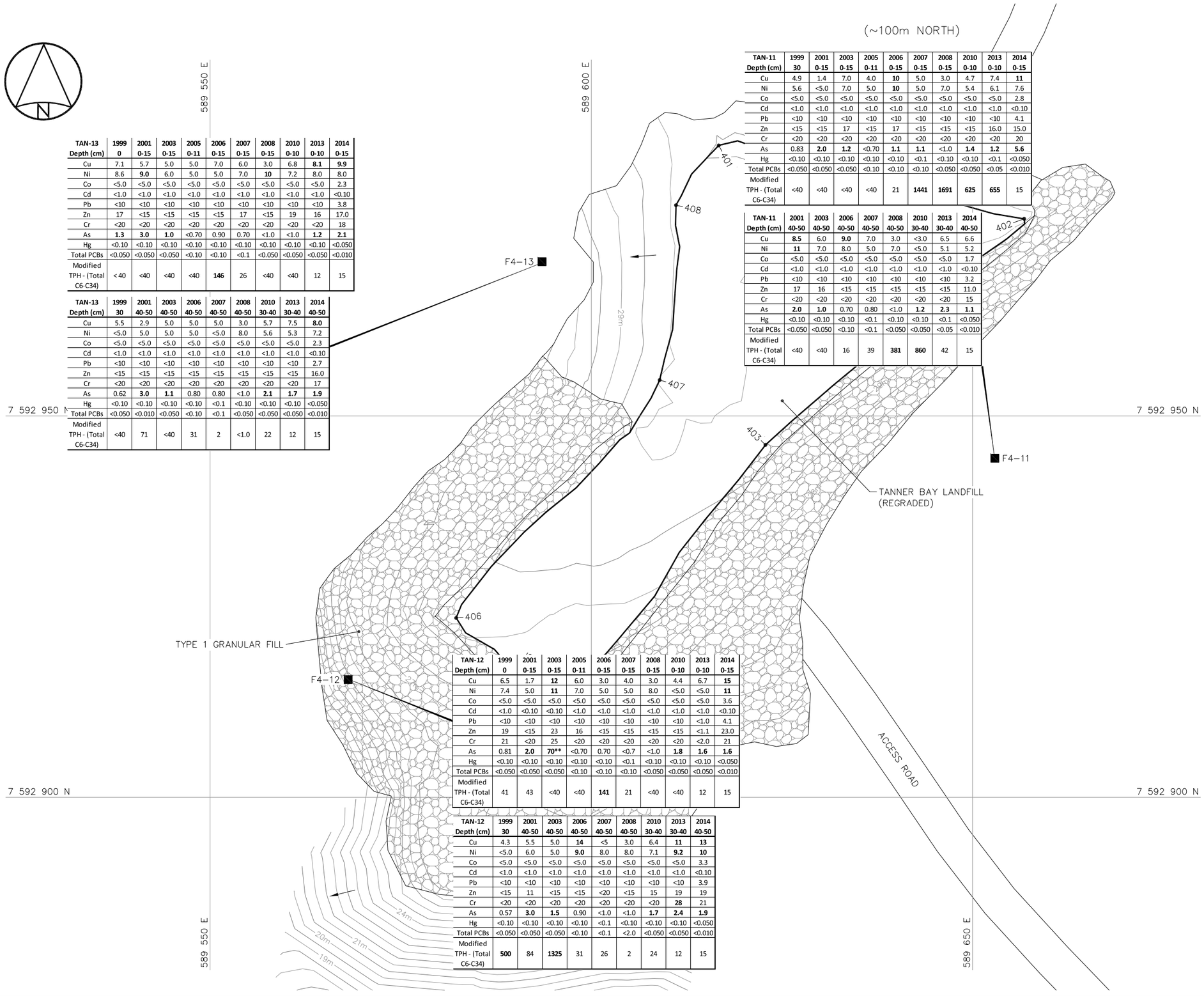
PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

2014 DEW LINE MONITORING PROGRAM

FOX-4 CAPE HOOPER, NUNAVUT

BEACH AREA
TANNER BAY LANDFILL

Drawn By:	Approved By:	Project No:
I.S.Z.	C.F.G.	350600-515-2
Date: FEB. 2015	Scale: 1:500	Drawing No: FIGURE 6



TAN-13 Depth (cm)	1999 0	2001 0-15	2003 0-15	2005 0-11	2006 0-15	2007 0-15	2008 0-15	2010 0-10	2013 0-10	2014 0-15
Cu	7.1	5.7	5.0	5.0	7.0	6.0	3.0	6.8	**8.1**	**9.9**
Ni	8.6	**9.0**	6.0	5.0	5.0	7.0	**10**	7.2	8.0	8.0
Co	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	2.3
Cd	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.10
Pb	<10	<10	<10	<10	<10	<10	<10	<10	<10	3.8
Zn	17	<15	<15	<15	<15	17	<15	19	16	17.0
Cr	<20	<20	<20	<20	<20	<20	<20	<20	<20	18
As	**1.3**	**3.0**	**1.0**	<0.70	0.90	0.70	<1.0	<1.0	**1.2**	**2.1**
Hg	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.050
Total PCBs	<0.050	<0.050	<0.050	<0.10	<0.10	<0.1	<0.050	<0.050	<0.050	<0.010
Modified TPH - (Total C6-C34)	< 40	<40	<40	<40	**146**	26	<40	<40	12	15

TAN-13 Depth (cm)	1999 30	2001 40-50	2003 40-50	2006 40-50	2007 40-50	2008 40-50	2010 30-40	2013 30-40	2014 40-50
Cu	5.5	2.9	5.0	5.0	5.0	3.0	5.7	7.5	**8.0**
Ni	<5.0	5.0	5.0	5.0	<5.0	8.0	5.6	5.3	7.2
Co	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	2.3
Cd	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.10
Pb	<10	<10	<10	<10	<10	<10	<10	<10	2.7
Zn	<15	<15	<15	<15	<15	<15	<15	<15	16.0
Cr	<20	<20	<20	<20	<20	<20	<20	<20	17
As	0.62	**3.0**	**1.1**	0.80	0.80	<1.0	**2.1**	**1.7**	**1.9**
Hg	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.050
Total PCBs	<0.050	<0.010	<0.050	<0.10	<0.1	<0.050	<0.050	<0.050	<0.010
Modified TPH - (Total C6-C34)	<40	71	<40	31	2	<1.0	22	12	15

TAN-11 Depth (cm)	1999 30	2001 0-15	2003 0-15	2005 0-11	2006 0-15	2007 0-15	2008 0-15	2010 0-10	2013 0-10	2014 0-15
Cu	4.9	1.4	7.0	4.0	**10**	5.0	3.0	4.7	7.4	**11**
Ni	5.6	<5.0	7.0	5.0	**10**	5.0	7.0	5.4	6.1	7.6
Co	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	2.8
Cd	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.10
Pb	<10	<10	<10	<10	<10	<10	<10	<10	<10	4.1
Zn	<15	<15	17	<15	17	<15	<15	<15	16.0	15.0
Cr	<20	<20	<20	<20	<20	<20	<20	<20	<20	20
As	0.83	**2.0**	**1.2**	<0.70	**1.1**	**1.1**	<1.0	**1.4**	**1.2**	**5.6**
Hg	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.1	<0.050
Total PCBs	<0.050	<0.050	<0.050	<0.10	<0.10	<0.10	<0.050	<0.050	<0.05	<0.010
Modified TPH - (Total C6-C34)	<40	<40	<40	<40	21	**1441**	**1691**	**625**	**655**	15

TAN-11 Depth (cm)	2001 40-50	2003 40-50	2006 40-50	2007 40-50	2008 40-50	2010 30-40	2013 30-40	2014 40-50
Cu	**8.5**	6.0	**9.0**	7.0	3.0	<3.0	6.5	6.6
Ni	**11**	7.0	8.0	5.0	7.0	<5.0	5.1	5.2
Co	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	1.7
Cd	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.10
Pb	<10	<10	<10	<10	<10	<10	<10	3.2
Zn	17	16	<15	<15	<15	<15	<15	11.0
Cr	<20	<20	<20	<20	<20	<20	<20	15
As	**2.0**	**1.0**	0.70	0.80	<1.0	**1.2**	**2.3**	**1.1**
Hg	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.1	<0.050
Total PCBs	<0.050	<0.050	<0.10	<0.1	<0.050	<0.050	<0.05	<0.010
Modified TPH - (Total C6-C34)	<40	<40	16	39	**381**	**860**	42	15

TAN-12 Depth (cm)	1999 0	2001 0-15	2003 0-15	2005 0-11	2006 0-15	2007 0-15	2008 0-15	2010 0-10	2013 0-10	2014 0-15
Cu	6.5	1.7	**12**	6.0	3.0	4.0	3.0	4.4	6.7	**15**
Ni	7.4	5.0	**11**	7.0	5.0	5.0	8.0	<5.0	<5.0	**11**
Co	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	3.6
Cd	<1.0	<0.10	<0.10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.10
Pb	<10	<10	<10	<10	<10	<10	<10	<10	<1.0	4.1
Zn	19	<15	23	16	<15	<15	<15	<15	<1.1	23.0
Cr	21	<20	25	<20	<20	<20	<20	<20	<2.0	21
As	0.81	**2.0**	**70****	<0.70	0.70	<0.7	<1.0	**1.8**	**1.6**	**1.6**
Hg	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.050
Total PCBs	<0.050	<0.050	<0.050	<0.10	<0.10	<0.10	<0.050	<0.050	<0.050	<0.010
Modified TPH - (Total C6-C34)	41	43	<40	<40	**141**	21	<40	<40	12	15

TAN-12 Depth (cm)	1999 30	2001 40-50	2003 40-50	2006 40-50	2007 40-50	2008 40-50	2010 30-40	2013 30-40	2014 40-50
Cu	4.3	5.5	5.0	**14**	<5	3.0	6.4	**11**	**13**
Ni	<5.0	6.0	5.0	**9.0**	8.0	8.0	7.1	**9.2**	**10**
Co	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	3.3
Cd	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.10
Pb	<10	<10	<10	<10	<10	<10	<10	<10	3.9
Zn	<15	11	<15	<15	<20	<15	15	19	19
Cr	<20	<20	<20	<20	<20	<20	<20	**28**	21
As	0.57	**3.0**	**1.5**	0.90	<1.0	<1.0	**1.7**	**2.4**	**1.9**
Hg	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.050
Total PCBs	<0.050	<0.050	<0.050	<0.10	<0.1	<2.0	<0.050	<0.050	<0.010
Modified TPH - (Total C6-C34)	**500**	84	**1325**	31	26	2	24	12	15

LEGEND:

- 401 — COORDINATE POINT
- ■ — MONITORING SOIL SAMPLE LOCATION (3)
- TYPE 1 GRANULAR FILL
- 19 — PHOTOGRAPH VIEWPOINT
- 30m — CONTOURS IN 0.5m INTERVALS
- OVERLAND FLOW DIRECTION
- EROSION CHANNEL
- AREA OF SETTLEMENT

Parameter	Baseline Average Concentration	DEW Line Tier I Cleanup Criteria	DEW Line Tier II Cleanup Criteria
Cu	8	N/A	100
Ni	9	N/A	100
Co	5	N/A	50
Cd	1.0	N/A	5
Pb	28	200	500
Zn	27	N/A	500
Cr	23	N/A	250
As	1	N/A	130
Hg	-	N/A	2.0
Total PCB	0.05	1	5
Modified TPH - (Total C6-C34)	128	N/A	2500

All Concentrations in mg/kg

Bold — Concentration is Equal to or Exceeds Baseline Average Concentration

* — Concentration Exceeds DEW Line Tier I Cleanup Criteria

** — Concentration Exceeds DEW Line Tier II Cleanup Criteria

\- — No Concentration Reported

N/A — Not Applicable

NOTES:

1. LOCATIONS AND SCALE OF FEATURES ARE APPROXIMATE AND SHOWN FOR ILLUSTRATIVE PURPOSES ONLY.
2. ALL COORDINATES ARE REFERENCED TO NAD83 (CSRS), UTM ZONE 19N.
3. ALL ELEVATIONS REFER TO GEODETIC DATUM.
4. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.

REFERENCE:

AECOM, FILE No.: FOX-4.6 Year 1 LF MON.dwg, Mar. 2014

0 10 20 metres

SCALE 1:500

SENES Consultants AN ARCADIS COMPANY

PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

2014 DEW LINE MONITORING PROGRAM

FOX-4 CAPE HOOPER, NUNAVUT

BEACH AREA - TANNER BAY LANDFILL

SOIL CONTAMINANT DISTRIBUTION PLAN

Drawn By:	Approved By:	Project No:
I.S.Z.	C.F.G.	350600-515-2
Date: FEB. 2015	Scale: 1:500	Drawing No: FIGURE 6A

7.3 RESULTS OF THE MONITORING PROGRAM

7.3.1 Visual Inspection

The visual inspection at the Tanner Bay Landfill was completed on 24 August 2014. The results of the visual inspection are detailed in Table 7.2 and shown on Figure 6 and in the photo log Table 7.5.

Table 7.2: Visual Inspection Results (Tanner Bay Landfill)

Item	Description
Settlement	Minor settlement was observed at one location at the southwest end of the landfill cap. (Feature A)
Erosion	One small erosion channel was observed on the northeast corner of the landfill. (Feature B)
Frost Action	None observed.
Sloughing and Cracking	None observed.
Animal Burrows	None observed.
Vegetation	No vegetation was observed on the landfill.
Staining	Natural reddish staining was observed on the north end of the southeast berm of the landfill.
Vegetation Stress	No vegetation was observed on the landfill.
Seepage Points	No active seepage points were observed.
Debris Exposed	A small pile of debris consisting of wood and metal scraps was observed approximately 100 m north of the landfill. This debris did not originate within the landfill.
Presence/Condition of Monitoring Instruments	No monitoring instruments were present at this landfill.
Other Features of Note	Tire ruts and an area of previously ponded water were observed on the top of the landfill.

7.3.1.1 Inspection Checklist

The visual inspection checklist completed during the site inspection is provided in Table 7.3.

7.3.1.2 Stability Assessment

The preliminary stability assessment completed during the site inspection is provided in Table 7.4.

7.3.1.3 Photographic Records

The photograph log for the site is provided in Table 7.5.

TABLE 7.3 - VISUAL INSPECTION CHECKLIST

DEW LINE CLEANUP: POST-CONSTRUCTION - LANDFILL MONITORING

INSPECTION REPORT – PAGE 1 OF 2

SITE NAME: FOX-4
LANDFILL DESIGNATION: Tanner Bay Landfill
DATE OF INSPECTION: 24 August 2014
DATE OF PREVIOUS INSPECTION: N/A
INSPECTED BY: J. Mauchan
REPORT PREPARED BY: S. Borcsok
The inspector/reporter represents to the best of their knowledge, the following statements and observations are true and correct and to the best of the preparer's actual knowledge, no material facts have been suppressed or misstated.

TABLE 7.3 - VISUAL INSPECTION CHECKLIST - INSPECTION REPORT – PAGE 2 OF 2

Checklist Item	Present Yes/No	Location (Describe relative to existing monuments/features and relative to landfill design i.e. surface, berms, toe)	Length	Width	Depth	Extent relative to Area of Landfill (%)	Description	Photographic Records Focal length, location, view point & direction (relative to magnetic north) Feature of note Scale	Additional Comments
Settlement	YES	Southwest end of cap (Feature A)	1.5	1.0	0.05	<1%	Minor settlement	11.2	
Erosion	YES	NE corner of landfill (Feature B)	2.0	0.8	0.05	<1%	Erosion channel	1.1, 2.1	
Frost Action	NO								
Sloughing and Cracking	NO								
Animal Burrows	NO								
Vegetation	NO								
Staining	NO								
Vegetation Stress	NO								
Seepage Points	NO								
Debris Exposed	YES	Approx. 100 m north of landfill					Tin cans, metal strap, wood	23.1	Minor debris not associated with landfill
Presence/Condition – Monitoring Instruments	NO								
Features of Note.	YES	Former ponded water at north end of landfill Tire ruts on landfill cap				<1%		12.1, 11.1	

Table 7.4: Preliminary Stability Assessment - FOX-4 Tanner Bay Landfill

Feature	Severity Rating	Extent
Settlement	Acceptable	Isolated
Erosion	Acceptable	Isolated
Frost Action	None	None
Staining	None	None
Vegetation Stress	None	None
Seepage/Ponded Water	None	None
Debris exposure	None	None
Overall Landfill Performance: ACCEPTABLE		

Performance/ Severity Rating	Description
Acceptable	Noted features are of little consequence. The landfill is performing as designed. Minor deviations in environmental or physical performance may be observed, such as isolated areas of erosion, settlement.
Marginal	Physical/environmental performance appears to be deteriorating with time. Observations may include an increase in size or number of features of note, such as differential settlement, erosion or cracking. No significant impact on landfill stability to date, but potential for failure is assessed as low or moderate.
Significant	Significant or potentially significant changes affecting landfill stability, such as significant changes in slope geometry, significant erosion or differential settlement; scarp development. The potential for failure is assessed as imminent.
Unacceptable	Stability of landfill is compromised to the extent that ability to contain waste materials is compromised. Examples may include: - Debris exposed in erosion channels or areas of differential settlement. - Liner exposed. - Slope failure.

Extent	Description
Isolated	Singular feature
Occasional	Features of note occurring at irregular intervals/locations
Numerous	Many features of note, impacted less than 50% of the surface area of the landfill
Extensive	Impacting greater than 50% of the surface area of the landfill

TABLE 7.5: LANDFILL VISUAL INSPECTION PHOTO LOG (TANNER BAY LANDFILL)

FOX-4 Tanner Bay Landfill (see Figure 6)

Photo 1.1 (FOX-4 TAN P-1 sw.jpg)	Photo 2.1 (FOX-4 TAN P-2 south.jpg)
Description: View from the northeastern corner of the Tanner Bay Landfill. View looking southwest along the slope. Erosion channel at field book location. **(FEATURE B)**	Description: View of erosion channel on slope near northeastern corner of landfill. **(FEATURE B)**
	
Date: August 24, 2014	Date: August 24, 2014

TABLE 7.5: LANDFILL VISUAL INSPECTION PHOTO LOG (TANNER BAY LANDFILL)

Photo 3.1 (FOX-4 TAN P-3 ne.jpg)	Photo 3.2 (FOX-4 TAN P-3 nw.jpg)
Description: View looking along eastern slope of Tanner Bay Landfill.	Description: View looking upslope from the toe of the slope near F4-TAN-11.
	
Date: August 24, 2014	Date: August 24, 2014

TABLE 7.5: LANDFILL VISUAL INSPECTION PHOTO LOG (TANNER BAY LANDFILL)

Photo 3.3 (FOX-4 TAN P-3 sw.jpg)	Photo 4.1 (FOX-4 TAN P-4 ne.jpg)
Description: View along the eastern slope of the Tanner Bay Landfill.	Description: View along the top of the slope, looking toward the northeast corner of the landfill.
	
Date: August 24, 2014	Date: August 24, 2014

TABLE 7.5: LANDFILL VISUAL INSPECTION PHOTO LOG (TANNER BAY LANDFILL)

Photo 4.2 (FOX-4 TAN P-4 se.jpg)	Photo 4.3 (FOX-4 TAN P-4 sw.jpg)
Description: View looking downhill of the eastern slope of the Tanner Bay Landfill.	Description: The top of the slope along southeast portion of the Tanner Bay Landfill.
	
Date: August 24, 2014	Date: August 24, 2014

TABLE 7.5: LANDFILL VISUAL INSPECTION PHOTO LOG (TANNER BAY LANDFILL)

Photo 5.1 (FOX-4 TAN P-5 north.jpg)	Photo 5.2 (FOX-4 TAN P-5 ne.jpg)
Description: View across the landfill cap from the southeastern corner of the landfill.	Description: View of the top of the eastern slope of the landfill.
	
Date: August 24, 2014	Date: August 24, 2014

TABLE 7.5: LANDFILL VISUAL INSPECTION PHOTO LOG (TANNER BAY LANDFILL)

Photo 5.3 (FOX-4 TAN P-5 nw.jpg)	Photo 5.4 (FOX-4 TAN P-5 south.jpg)
Description: View from the southeastern corner toward the southwestern corner. View along the top of the slope.	Description: View downhill of landfill slope from southeastern corner of cap.
	
Date: August 24, 2014	Date: August 24, 2014

TABLE 7.5: LANDFILL VISUAL INSPECTION PHOTO LOG (TANNER BAY LANDFILL)

Photo 6.1 (FOX-4 TAN P-6 north.jpg)	Photo 6.2 (FOX-4 TAN P-6 south.jpg)
Description: View looking uphill from toe of Tanner Bay Landfill.	Description: View looking downhill from toe of the landfill.
	
Date: August 24, 2014	Date: August 24, 2014

TABLE 7.5: LANDFILL VISUAL INSPECTION PHOTO LOG (TANNER BAY LANDFILL)

Photo 7.1 (FOX-4 TAN P-7 east.jpg)	Photo 7.2 (FOX-4 TAN P-7 north.jpg)
Description: The sloped terrain downhill of the Tanner Bay Landfill.	Description: The sloped terrain downhill of the Tanner Bay Landfill. Wildlife monitor seen on the landfill.
	
Date: August 24, 2014	Date: August 24, 2014

TABLE 7.5: LANDFILL VISUAL INSPECTION PHOTO LOG (TANNER BAY LANDFILL)

Photo 8.1 (FOX-4 TAN P-8 ne.jpg)	Photo 9.1 (FOX-4 TAN P-9 ne.jpg)
Description: View toward the Tanner Bay Landfill from adjacent to the southwestern toe.	Description: View along western slope of the Tanner Bay Landfill.
	
Date: August 24, 2014	Date: August 24, 2014

TABLE 7.5: LANDFILL VISUAL INSPECTION PHOTO LOG (TANNER BAY LANDFILL)

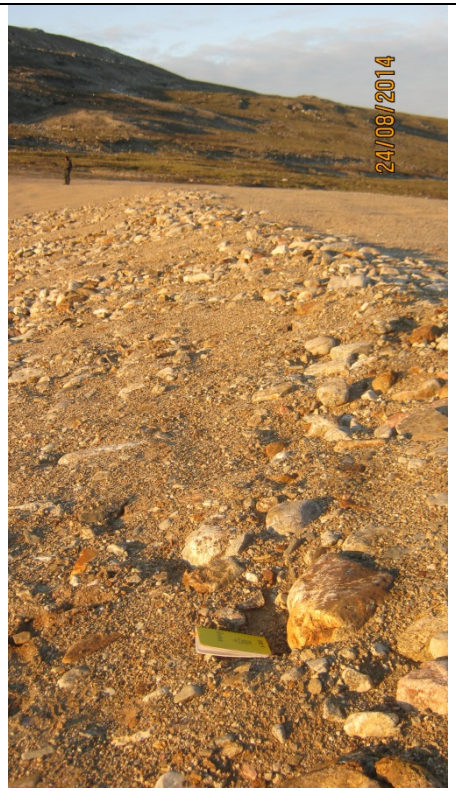
Photo 9.2 (FOX-4 TAN P-9 se.jpg)	Photo 10.1 (FOX-4 TAN P-10 ne.jpg)
Description: The southern portion of the landfill cap.	Description: The western slope of the Tanner Bay Landfill. View from the southwestern corner of the cap.
	
Date: August 24, 2014	Date: August 24, 2014

TABLE 7.5: LANDFILL VISUAL INSPECTION PHOTO LOG (TANNER BAY LANDFILL)

Photo 10.2 (FOX-4 TAN P-10 south.jpg)	Photo 11.1 (FOX-4 TAN P-11 ne.jpg)
Description: View looking downhill from the southwestern corner of the landfill cap.	Description: The Tanner Bay Landfill cap. Tire ruts visible north of field book.
	
Date: August 24, 2014	Date: August 24, 2014

TABLE 7.5: LANDFILL VISUAL INSPECTION PHOTO LOG (TANNER BAY LANDFILL)

Photo 11.2 (FOX-4 TAN P-11 north.jpg)	Photo 11.3 (FOX-4 TAN P-11 se.jpg)
Description: Minor settlement observed on landfill cap measured 1.5 m x 1.0 m x 0.05 m. Minor settlement located in photo at white paper on ground. **(FEATURE A)**	Description: The southern portion of the landfill cap and the southern slope toward Tanner Bay.
	
Date: August 24, 2014	Date: August 24, 2014

TABLE 7.5: LANDFILL VISUAL INSPECTION PHOTO LOG (TANNER BAY LANDFILL)

Photo 11.4 (FOX-4 TAN P-11 sw.jpg)	Photo 12.1 (FOX-4 TAN P-12 se.jpg)
Description: The southern portion of the cap.	Description: The northern portion of the cap, looking toward Tanner Bay. Area of former ponded water in foreground.
	
Date: August 24, 2014	Date: August 24, 2014

TABLE 7.5: LANDFILL VISUAL INSPECTION PHOTO LOG (TANNER BAY LANDFILL)

Photo 13.1 (FOX-4 TAN P-13 nw.jpg)	Photo 14.1 (FOX-4 TAN P-14.jpg)
Description: The eastern slope of the Tanner Bay Landfill from F4-TAN-11.	Description: Sample collection at F4-TAN-11.
	
Date: August 24, 2014	Date: August 24, 2014

TABLE 7.5: LANDFILL VISUAL INSPECTION PHOTO LOG (TANNER BAY LANDFILL)

Photo 15.1 (FOX-4 TAN P-15jpg)	Photo 16.1 (FOX-4 TAN P-16 ne.jpg)
Description: After sample collection and backfill at F4-TAN-11.	Description: View up the slope of the Tanner Bay Landfill from adjacent to F4-TAN-12.
	
Date: August 24, 2014	Date: August 24, 2014

TABLE 7.5: LANDFILL VISUAL INSPECTION PHOTO LOG (TANNER BAY LANDFILL)

Photo 17.1 (FOX-4 TAN P-17.jpg)	Photo 18.1 (FOX-4 TAN P-18.jpg)
Description: Sample collection of F4-TAN-12	Description: After sample collection and backfill of F4-TAN-12.
	
Date: August 24, 2014	Date: August 24, 2014

TABLE 7.5: LANDFILL VISUAL INSPECTION PHOTO LOG (TANNER BAY LANDFILL)

Photo 19.1 (FOX-4 TAN P-19 se.jpg)	Photo 20.1 (FOX-4 TAN P-20.jpg)
Description: The Tanner Bay Landfill view from F4-TAN-13.	Description: Sample collection of F4-TAN-13.
	
Date: August 24, 2014	Date: August 24, 2014

TABLE 7.5: LANDFILL VISUAL INSPECTION PHOTO LOG (TANNER BAY LANDFILL)

Photo 21.1 (FOX-4 TAN P-21.jpg)	Photo 22.1 (FOX-4 TAN P-22 se.jpg)
Description: After sample collection and backfill of F4-TAN-13.	Description: View looking toward the Tanner Bay Landfill from the access road.
	
Date: August 24, 2014	Date: August 24, 2014

TABLE 7.5: LANDFILL VISUAL INSPECTION PHOTO LOG (TANNER BAY LANDFILL)

Photo 23.1 (FOX-4 TAN P-23.jpg)	Photo 23.1 (FOX-4 TAN P-23.jpg)
Description: Debris pile located approximately 100m north of landfill.	
	
Date: August 24, 2014	Date: August 24, 2014

7.3.1.4 Trend Analysis

No trends in visual observations at this landfill can be observed as 2014 is the first year of monitoring at this landfill following re-grading of the landfill area during the 2011-2013 maintenance.

7.3.1.5 Discussion of Results/Trends

The results of the visual inspection indicate that the performance of the landfill is acceptable. All identified issues were minor and of no consequence to the performance of the landfill.

7.3.2 Soil Sampling

Soil sampling at the Tanner Bay Landfill was completed on 24 August 2014. As previously reported a total of seven samples including one duplicate sample were procured from four locations as shown in plan on Figure 6.

7.3.2.1 Laboratory Analytical Results

The analytical results for soil samples collected at the Tanner Bay Landfill are presented in Table 7.6.

A duplicate soil sample was collected from surface soil at sample location TAN-11 and was submitted to AGAT, a secondary laboratory for QA/QC purposes. The RPDs for the duplicate sample results were above 30% for three of eleven parameters. In these cases, parameter concentrations were very low and small differences in reported concentrations resulted in large RPD values. The duplicate sample results are believed to be consistent.

7.3.2.2 Discussion of Results – Comparison to Baseline/Background

A discussion of the results for each parameter analyzed in soil at the Tanner Bay Landfill is provided in Table 7.7. The discussion includes a comparison of results from upgradient (TAN-11) and downgradient (TAN-12, TAN-13) soil sampling locations to the baseline average concentrations (BAC) that have been determined for each landfill from soil chemistry at the landfill area prior to and during remediation. Upgradient locations are those near the landfill that are not influenced by migration of contaminants through the landfill, and downgradient locations are at the toe of the landfill or from areas of preferential drainage.

TABLE 7.6

RESULTS OF ANALYSIS FOR PARAMETERS IN SOIL AT TANNER BAY LANDFILL

PARAMETERS	Background Concentration	Baseline Average Concentration	DEW Line Cleanup Tier I Criteria	DEW Line Cleanup Tier II Criteria	F4-TAN-11-S	F4-TAN-11-S (DUP)	F4-TAN-11-S (AVG)	F4-TAN-11-D	F4-TAN-12-S	F4-TAN-12-D	F4-TAN-13-S	F4-TAN-13-D
	(_)	(+)	(*)	(**)	24-Aug-14 0-15 cm	24-Aug-14 0-15 cm	24-Aug-14 0-15 cm	24-Aug-14 40-50 cm	24-Aug-14 0-15 cm	24-Aug-14 40-50 cm	24-Aug-14 0-15 cm	24-Aug-14 40-50 cm
Copper	**19**	**8.0**	-	**100**	**11+**	**12+**	**11.5+**	6.6	**15+**	**13+**	**9.9+**	8
Nickel	**19**	**9.3**	-	**100**	7.6	2	4.8	5.2	**11+**	**10+**	8	7.2
Cobalt	**7.9**	**5.0**	-	**50**	2.8	2.4	2.6	1.7	3.6	3.3	2.3	2.3
Cadmium	**1.0**	**1.0**	-	**5**	<0.10	<0.5	<0.5	<0.10	<0.10	<0.10	<0.10	<0.10
Lead	**10**	**28**	**200**	**500**	4.1	4	4.05	3.2	4.1	3.9	3.8	2.7
Zinc	**34**	**27**	-	**500**	15	12	13.5	11	23	19	17	16
Chromium	**31**	**23**	-	**250**	20	13	16.5	15	21	21	18	17
Arsenic	**5.5**	**1.1**	-	**30**	**5.6+**	**6+**	**5.8+**	1.1	**1.6+**	**1.9+**	**2.1+**	**1.9+**
Mercury	-	-	-	**2**	<0.050	<0.10	<0.10	<0.050	<0.050	<0.050	<0.050	<0.050
Total PCBs	**0.00035**	**0.050**	**1**	**5**	<0.010	<0.05	<0.05	<0.010	<0.010	<0.010	<0.010	<0.010
PHC F1 (C6-C10)	-	-	-	-	<10	<5	<10	<10	<10	<10	<10	<10
PHC F2 (C10-C16)	-	-	-	-	<10	<10	<10	<10	<10	<10	<10	<10
PHC F3 (C16-C34)	-	-	-	-	<10	<50	<50	<10	<10	<10	<10	<10
PHC F4 (C34-C50)	-	-	-	-	<10	<50	<50	<10	<10	<10	<10	<10
Modifed TPH (Total C6-C34)	-	**128**	-	**2500**	15	32.5	23.75	15	15	15	15	15

NOTES:

All parameter values in µg/g (ppm) unless otherwise indicated.

_ Exceeds FOX-4 Tanner Bay Landfill Background Concentration.
\+ Exceeds FOX-4 Tanner Bay Landfill Baseline Average Concentration.
* Exceeds DEW Line Cleanup Tier I Criteria.
** Exceeds DEW Line Cleanup Tier II Criteria.

(DUP) Duplicate sample analyzed by AGAT Laboratories for QA/QC purposes.
(AVG) Average concentration of duplicate samples.
< Not detected.
\- No concentration reported.

Table 7.7: Evaluation of 2014 Soil Analytical Data (Tanner Bay Landfill)

Parameter	Baseline Average Concentration (ug/g)	2014 Results
Copper	8.0	Detectable concentrations ranged between 6.6 and 11.5 ug/g for upgradient samples and between 8 and 15 ug/g for downgradient samples, with the highest concentration reported in the surface sample collected from the TAN-12 sample location while the lowest concentration was reported within the subsurface sample at the TAN-11 sample location. Five of seven samples reported concentrations above the BAC.
Nickel	9.3	Detectable concentrations ranged between 4.8 and 5.2 ug/g for upgradient samples and between 7.2 and 11 ug/g for downgradient samples, with the highest concentration reported in the surface sample collected from the TAN-12 sample location while the lowest concentration was reported within the surface sample at the TAN-11 sample location. Two of seven samples reported concentrations above the BAC.
Cobalt	5.0	Detectable concentrations ranged between 1.7 and 2.6 ug/g for upgradient samples and between 2.3 and 3.6 ug/g for downgradient samples, with the highest concentration reported in the surface sample collected from the TAN-12 sample location while the lowest concentration was reported within the subsurface sample at the TAN-11 sample location. All samples reported concentrations below the BAC.
Cadmium	1.0	All seven reported concentrations were less than the laboratory DL (0.10 ug/g and 0.5 ug/g for the duplicate sample submitted to the secondary laboratory). All samples reported concentrations below the BAC.
Lead	28	Detectable concentrations ranged between 3.2 and 4.05 ug/g for upgradient samples and between 2.7 and 4.1 ug/g for downgradient samples, with the highest concentration reported in the surface sample collected from the TAN-12 sample location while the lowest concentration was reported within the subsurface sample at the TAN-13 sample location. All samples reported concentrations below the BAC.
Zinc	27	Detectable concentrations ranged between 11 and 13.5 ug/g for upgradient samples and between 16 and 23 ug/g for downgradient samples, with the highest concentration reported in the surface sample collected from the TAN-12 sample location while the lowest concentration was reported within the subsurface sample at the TAN-11 sample location. All samples reported concentrations below the BAC.
Chromium	23	Detectable concentrations ranged between 15 and 16.5 ug/g for upgradient samples and between 17 and 21 ug/g for downgradient samples, with the highest concentration reported in the surface sample collected from the TAN-12 sample location while the lowest concentration was reported within the subsurface sample at the TAN-11 sample location. All samples reported concentrations below the BAC.

Parameter	Baseline Average Concentration (ug/g)	2014 Results
Arsenic	1.1	Detectable concentrations ranged between 1.1 and 5.8 ug/g for upgradient samples and between 1.6 and 2.1 ug/g for downgradient samples, with the highest concentration reported in the surface sample collected from the TAN-11 sample location while the lowest concentration was reported within the subsurface sample at the TAN-11 sample location. Six of seven samples reported concentrations above the BAC.
Mercury	-	All seven samples reported concentrations less than the laboratory DL (0.050 ug/g and 0.10 ug/g for the duplicate sample submitted to the secondary laboratory).
PCBs	0.050	All seven samples reported concentrations less than the laboratory DL (0.010 ug/g and 0.05 ug/g for the duplicate sample submitted to the secondary laboratory).
TPH	128	No detectable concentrations for PHC fractions F1, F2 and F3 were detected in the seven samples. Variable detection limits resulted in modified TPH concentrations between 15 and 32.5 ug/g.

7.3.2.3 Soil Trend Analysis by Parameter and Discussion of Trends

A discussion of the trends observed for parameter concentrations in soil from 1994 to 2014 are presented in Table 7.8. Trends have been analyzed for upgradient (TAN-11) and downgradient (TAN-12, TAN-13) locations.

Table 7.8: Evaluation of Soil Result Trends (Tanner Bay Landfill)

Parameter	Trends
Copper	Concentrations show an upward trend for upgradient soil locations and a slight upward trend for downgradient soil locations.
Nickel	Concentrations show an upward trend for upgradient soil locations and a slight downward trend for downgradient soil locations.
Cobalt	Concentrations show a relatively stable trend for upgradient and downgradient soil locations.
Cadmium	Concentrations show a slight downward trend for upgradient and downgradient soil locations.
Lead	Concentrations show a slight downward trend for upgradient and downgradient soil locations.
Zinc	Concentrations show an upward trend for upgradient soil locations and a slight downward trend for downgradient soil locations.
Chromium	Concentrations show a slight upward trend for upgradient and downgradient soil locations.
Arsenic	Concentrations show a slight upward trend for upgradient soil locations and a slight downward trend for downgradient soil locations.
Mercury	Concentrations show a relatively stable trend for upgradient and downgradient soil locations as all results have been below the laboratory detection limit for all sampling events.
PCBs	Concentrations show a relatively stable trend for upgradient and downgradient soil locations as all

Parameter	Trends
	results have been below the laboratory detection limit for all sampling events.
TPH	Concentrations show an upward trend for upgradient soil locations and a slight downward trend for downgradient soil locations.

7.4 CONCLUSIONS/OVERALL PERFORMANCE OF THE LANDFILL

Based on the findings of the 2014 landfill monitoring program, the performance of the landfill is considered to be acceptable.

7.5 RECOMMENDATIONS/NEXT STEPS

Regular monitoring of this landfill as per the monitoring schedule shown in Table 1.1 should be continued. No remedial work is necessary at this time.

APPENDIX A

RANGE OF THE REPORT AND LIMITATION OF RESPONSIBILITIES

RANGE OF THE REPORT AND LIMITATION OF RESPONSIBILITIES

This landfill monitoring program was commissioned as part of an ongoing program assessing the performance of landfills present at the subject site. The visual observations, test data, chemical analyses and conclusions given in this landfill monitoring report are considered to provide a fair representation of the surface and subsurface conditions within or adjacent to each landfill subject to monitoring. It should be noted, however, that any conclusions regarding the performance of these landfills are based on interpretation of conditions observed during the landfill monitoring program and at specific locations and sampling depths.

This monitoring report, prepared for Public Works and Government Services (PWGSC) and the Department of National Defence (DND), does not provide certification or warranty, expressed or implied, that the monitoring program uncovered all potential issues of environmental or geotechnical concern at the landfills inspected. The material in the report reflects SENES' best judgement in light of the information available at the time of report preparation in November 2014. Changes to soil and/or groundwater quality in the areas investigated can occur following the date of testing. Any use which a third party makes of, or any reliance on, or decisions based on this report or of parts thereof made by them, is the sole responsibility of such third parties unless otherwise agreed-to by duly authorized representatives from SENES, PWGSC and DND.

APPENDIX B

FIELD NOTES

APPENDIX B.1 – Thermistor Inspection Reports
APPENDIX B.2 – Monitoring Well Inspection Reports
APPENDIX B.3 – Visual Inspection Reports

Thermistor Annual Maintenance Report

Contractor Name: SENES	Inspection Date: 25 Aug 14
Prepared By: S. Borcsok	

Thermistor Information

Site Name: FOX-4	Thermistor Location NON-HAZARDOUS TIER II DISP FACILITY		
Thermistor Number: VT.3	Inclination VERT		
Install Date:	First Date Event		Last Date Event
Coordinates and Elevation	N	E	Elev
Length of Cable (m)	Cable Lead Above Ground (m)	Nodal Points	
Datalogger Serial # 707259		Cable Serial Number	
Thermistor Type DL16			

Thermistor Inspection

	Good	Needs Maintenance	
Casing	☑	☐	
Cover	☑	☐	
Data Logger	☑	☐	
Cable	☑	☐	
Beads	☐	☑	1, 2, 6, 7 not working
Battery Installation Date			
Battery Levels	Main 11.34	Aux 13.38	

Manual Ground Temperature Readings

Bead	~~ohms~~ V	Degrees C
1	0	381.0742
2	0	-101.4553
3	1.3253	12.6934
4	1.3241	13.1849
5	1.3583	13.7501
6	0	-98.1096
7	0	381.0742
8	1.2111	8.8153

Bead	~~ohms~~ V	Degrees C

Observations and Proposed Maintenance

clock -2:32:53

Dessicant needs replacing

Thermistor Annual Maintenance Report

Contractor Name: SENES	Inspection Date: 25 Aug 114
Prepared By: S. Borcsok	

Thermistor Information

Site Name: FOX-4	Thermistor Location Non-Hazardous / Tier II Dup Facility		
Thermistor Number: VT-4	Inclination VERT		
Install Date:	First Date Event		Last Date Event
Coordinates and Elevation	N	E	Elev
Length of Cable (m)	Cable Lead Above Ground (m)	Nodal Points	
Datalogger Serial # 67703 (Box) 707255		Cable Serial Number	
Thermistor Type UL16			

Thermistor Inspection

	Good	Needs Maintenance	
Casing	☑	☐	
Cover	☑	☐	
Data Logger	☑	☐	
Cable	☑	☐	
Beads	☑	☐	
Battery Installation Date	?		
Battery Levels	Main 11.34	Aux 12.17	

Manual Ground Temperature Readings

Bead	~~ohms~~ V	Degrees C
1	1.4353	16.3765
2	1.4121	15.6102
3	1.3870	14.7373
4	1.3625	13.8939
5	1.3430	13.2291
6	0	381.0742
7	0	↓
8	0	

Bead	ohms	Degrees C

Observations and Proposed Maintenance

clock -2:21:17
Dessicant needs replacing

Thermistor Annual Maintenance Report

Contractor Name: SENES	Inspection Date: 25 Aug/14
Prepared By: S. Borcsok	

Thermistor Information

Site Name: FOX-4	Thermistor Location NON-HAZARDOUS / TIER II DISPOSAL FACILITY		
Thermistor Number: VT-5	Inclination VERT		
Install Date:	First Date Event		Last Date Event
Coordinates and Elevation	N	E	Elev
Length of Cable (m)	Cable Lead Above Ground (m)	Nodal Points	
Datalogger Serial # 707257		Cable Serial Number	
Thermistor Type UL16			

VT-2 on logger VT-5 on dwg

Percent Fall - WRAPPED

Thermistor Inspection

	Good	Needs Maintenance
Casing	☑	☐
Cover	☑	☐
Data Logger	☑	☐
Cable	☑	☐
Beads	☑	☐
Battery Installation Date	?	
Battery Levels	Main 11.34	Aux 13.14

Manual Ground Temperature Readings

Bead	ohms	Degrees C
1	1.5804	18.7602
2	1.4912	16.6138
3	1.4158	15.1796
4	1.4002	15.1752
5	1.3784	14.4375
6	1.3595	13.8102
7	0	381.0742
8	0	381.0742

Bead	ohms	Degrees C

Observations and Proposed Maintenance

clock -2 days 1:10:01 was on 1 hour measurement Changed to 12 hour Dessicant needs replacement

Datalogger labelled VT-2, location on drawing is VT-5

Thermistor Annual Maintenance Report

Contractor Name: SENES	Inspection Date: 25 Aug 14
Prepared By: S. Borcsok	

Thermistor Information

Site Name: FOX-4	Thermistor Location Non-Hazardous Tier II Disposal Facility		
Thermistor Number: VT-5A	Inclination VERT		
Install Date:	First Date Event		Last Date Event
Coordinates and Elevation	N	E	Elev
Length of Cable (m)	Cable Lead Above Ground (m)	Nodal Points	
Datalogger Serial #808003		Cable Serial Number	
Thermistor Type UL16			

Thermistor Inspection

	Good	Needs Maintenance	
Casing	☑	☐	
Cover	☑	☐	
Data Logger	☑	☐	
Cable	☑	☐	
Beads	☐	☑	Bead 4 fluctuates wildly
Battery Installation Date			
Battery Levels	Main 11.34	Aux 13.28	

19% memory

Manual Ground Temperature Readings

Bead	ohms ✓	Degrees C
1	1.4596	17.2894
2	1.4230	15.9924
3	1.3998	15.1554
4	1.3101	12.1123
5	1.3735	14.2713
6	0	381.0742
7	0	↓
8	0	

Bead	ohms	Degrees C

Observations and Proposed Maintenance

clock - 2:20:09
This thermistor is not on drawings
Dessicant needs replacing

Thermistor Annual Maintenance Report

Contractor Name: SENES	Inspection Date: 25 Aug/14
Prepared By: S. Borcsok	

Thermistor Information

Site Name: FOX-4	Thermistor Location NON-HAZARDOUS/TIER II DISP FACILITY		
Thermistor Number: VT-6	Inclination VERT		
Install Date:	First Date Event		Last Date Event
Coordinates and Elevation	N	E	Elev
Length of Cable (m)	Cable Lead Above Ground (m)	Nodal Points	
Datalogger Serial # 707258		Cable Serial Number	
Thermistor Type UL16			

VT-1 on logger VT-6 on dws

Percent ~~Ret~~ ~~-W~~ ~~AGREED~~

Thermistor Inspection

	Good	Needs Maintenance	
Casing	☑	☐	
Cover	☑	☐	
Data Logger	☑	☐	
Cable	☑	☐	
Beads	☑	☐	

Battery Installation Date ?

Battery Levels Main 11.34 Aux 12.77

Manual Ground Temperature Readings

Bead	~~ohms~~ V	Degrees C
1	1.4602	17.3085
2	1.4296	16.2259
3	1.4053	15.3721
4	1.3815	14.5474
5	1.3566	13.6926
6	1.3357	12.9799
7	0	381.0742
8	0	↓

Bead	ohms	Degrees C

Observations and Proposed Maintenance

clock -2:20:45
Datalogger labelled VT-1, on drawing this is VT-6
Dessicant needs replacing

Thermistor Annual Maintenance Report

Contractor Name: SENES	Inspection Date: 25 Aug 14
Prepared By: S. Borcsok	

Thermistor Information

Site Name: FOX-4	Thermistor Location NON-HAZARDOUS TIER II DISPOSAL FACILITY		
Thermistor Number: VT-7	Inclination VERT		
Install Date:	First Date Event		Last Date Event
Coordinates and Elevation	N	E	Elev
Length of Cable (m)	Cable Lead Above Ground (m)	Nodal Points	
Datalogger Serial # 07110074		Cable Serial Number	
Thermistor Type VL16			

Thermistor Inspection

	Good	Needs Maintenance	
Casing	☑	☐	
Cover	☑	☐	
Data Logger	☑	☐	
Cable	☑	☐	
Beads	☑	☐	
Battery Installation Date	?		
Battery Levels	Main 7.68	Aux 5.60	

Manual Ground Temperature Readings

Bead	ohms	Degrees C
1	1.2141	8.9135
2	1.1885	8.0689
3	1.0889	4.8072
4	1.0489	3.4992
5	1.0144	2.3660
6	0.9807	1.2587
7	0.9465	0.1278
8	0.9268	-0.5295

Bead	ohms	Degrees C
9	0.9095	-1.1055
10	0.8972	-1.5200
11	0.8858	-1.9026
12	0.8786	-2.1446
13	0	381.0742
14	0	
15	0	
16	0	

Observations and Proposed Maintenance

clock -2:11:42
Desiccant needs replacing

Thermistor Annual Maintenance Report

Contractor Name: SENES	Inspection Date: 25 Aug 14
Prepared By: S. Borcsak	

Thermistor Information

Site Name: WT-8 ✓	Thermistor Location NON-HAZARDOUS / TIER II DISPOSAL FACILITY		
Thermistor Number:	Inclination VERT		
Install Date:	First Date Event		Last Date Event
Coordinates and Elevation	N	E	Elev
Length of Cable (m)	Cable Lead Above Ground (m)	Nodal Points	
Datalogger Serial # 0711 0047		Cable Serial Number	
Thermistor Type UL16			

Thermistor Inspection

	Good	Needs Maintenance	
Casing	☑	☐	
Cover	☑	☐	Gasket on cover removed
Data Logger	☐	☑	
Cable	☑	☐	
Beads	☑	☐	
Battery Installation Date	?		
Battery Levels	Main	Aux	

Manual Ground Temperature Readings

Bead	ohms	Degrees C

Bead	ohms	Degrees C

Observations and Proposed Maintenance

Communications error trying to read the configuration from the data logger. Could not download. Data logger removed from site
Dessicant needs replacement.

Thermistor Annual Maintenance Report

Contractor Name: SENES	Inspection Date: 25 Aug 14
Prepared By: S. Borcsok	

Thermistor Information

Site Name: FOX-4	Thermistor Location NON-HAZARDOUS/TIER II DISPOSAL FACILITY		
Thermistor Number: VT-9	Inclination VERT		
Install Date:	First Date Event		Last Date Event
Coordinates and Elevation	N	E	Elev
Length of Cable (m)	Cable Lead Above Ground (m)	Nodal Points	
Datalogger Serial # 0711082		Cable Serial Number	
Thermistor Type UL16			

Thermistor Inspection

	Good	Needs Maintenance	
Casing	☑	☐	
Cover	☑	☐	
Data Logger	☐	☒	
Cable	☐	☒	
Beads	☐	☒	
Battery Installation Date	?		
Battery Levels	Main	Aux	

Manual Ground Temperature Readings

Bead	ohms	Degrees C

Bead	ohms	Degrees C

Observations and Proposed Maintenance

Tried to download, got message "Invalid argument to time encode"

Datalogger removed from site.
Desiccant needs replacement

Thermistor Annual Maintenance Report

Contractor Name: SENES	Inspection Date: 25 Aug 14
Prepared By: S. Borcsok	

Thermistor Information

Site Name: FOX-4	Thermistor Location NON-HAZARDOUS / TIER II DISPOSAL FACILITY		
Thermistor Number: VT-10	Inclination		
Install Date:	First Date Event		Last Date Event
Coordinates and Elevation	N	E	Elev
Length of Cable (m)	Cable Lead Above Ground (m)	Nodal Points	
Datalogger Serial #		Cable Serial Number	
Thermistor Type			

Thermistor Inspection

	Good	Needs Maintenance	
Casing	☑	☐	
Cover	☑	☑	Cover was too tight to get back on fully
Data Logger	☑	☐	
Cable	☑	☐	
Beads	☑	☐	
Battery Installation Date	?		
Battery Levels	Main 11.34	Aux 2.43	

Batt sent to 11/05

Manual Ground Temperature Readings

Bead	ohms V	Degrees C
1	1.2214	9.1555
2	1.1331	6.2521
3	1.0755	4.3706
4	1.0402	3.2144
5	1.0030	1.9924
6	0.9657	0.7623
7	0.9391	-0.1205
8	0.9200	-0.7560

Bead	ohms V	Degrees C
9	0.9073	-1.1796
10	0.8960	-1.5585
11	0.8867	-1.8846
12	0.8803	-2.0879
13	0.8748	-2.2735
14	0.8705	-2.4181
15	0	381.0742
16	0	↓

Observations and Proposed Maintenance

clock -63 days 23:58:17
Dessicant needs replacing

Monitoring Well Sampling Record

Site Name:	FOX-4		
Date of Sampling Event:	29 Aug/14	Time:	7pm
Names of Samplers:	JM/SB		
Landfill Name:	NH/TIER II	Samples Collected:	YES
Monitoring Well ID:	MW11-01	PHC F1	✓
Sample Number:	F4-NH-MW11-01	Inorganic Elements	✓
Condition of Well:	OK	PHC F2-F4	✓
		PCBs	✓
Measured Data		Duplicate Collected?	✓
Well pipe height above ground (cm)=	70		
Diameter of well (cm)=	5		
Depth of well installation (cm)= (from ground surface)			
Length screened section (cm)=			
Depth to top of screen (cm)= (from ground surface)			
Depth to water surface (cm)= (from top of pipe)	176	Measurement method: (meter, tape, etc)	Interface Meter
Static water level (cm)= (below ground surface)	106		
Measured well refusal depth (cm)= (i.e. depth to frozen ground)	408	Evidence of sludge or siltation:	NO
Thickness of water column	232		
Static volume of water in well	4.71		
Free product thickness (mm)=	0	Measurement method:	IM
Purging: (Y/N)	Y	Purging/Sampling Equipment:	Waterra
Volume Purged Water=	20L		Tubing/
Decontamination required: (Y/N)	N		Footvalve
Number washes:			
Number rinses:			
Final pH=	7.77		
Final Conductivity (uS/cm)=	160.3		
Final Temperature (degC)=	3.1		

Monitoring Well Sampling Record

Site Name:	FOX-4		
Date of Sampling Event:	25 Aug/14 *	Time:	620pm
Names of Samplers:	JM/SB		
Landfill Name:	NH/TIERII	Samples Collected:	✓
Monitoring Well ID:	MW14-02	PHC F1	✓
Sample Number:	F4-NH-MW14-02	Inorganic Elements	✓
Condition of Well:	OK, ponded water at location	PHC F2-F4	✓
		PCBs	✓
Measured Data		Duplicate Collected?	NO
Well pipe height above ground (cm)=	55		
Diameter of well (cm)=	5		
Depth of well installation (cm)= (from ground surface)		* Monitored 24-Aug/14 Sampled 25-Aug/14	
Length screened section (cm)=			
Depth to top of screen (cm)= (from ground surface)			
Depth to water surface (cm)= (from top of pipe)	0.46m	Measurement method: (meter, tape, etc)	Interface Meter
Static water level (cm)= (below ground surface)	-9cm		
Measured well refusal depth (cm)= (i.e. depth to frozen ground)	1.78m	Evidence of sludge or siltation:	NO
Thickness of water column	1.32m		
Static volume of water in well	2.65L		
Free product thickness (mm)=	0	Measurement method:	JM
Purging: (Y/N)	Y	Purging/Sampling Equipment:	Waterra
Volume Purged Water=	9L		Tubing/
Decontamination required: (Y/N)	N		Footvalve
Number washes:			
Number rinses:			
Final pH=	7.45		
Final Conductivity (uS/cm)=	170.2		
Final Temperature (degC)=	3.0		

Monitoring Well Sampling Record

Site Name:	Fox-4		
Date of Sampling Event:	25 Aug/14 *	Time:	6:10pm
Names of Samplers:	JM/SB		
Landfill Name:	NH/TIER II	Samples Collected:	✓
Monitoring Well ID:	MW11-03	PHC F1	✓
Sample Number:	F4-NH-MW11-03	Inorganic Elements	✓
Condition of Well:	OK	PHC F2-F4	✓
		PCBs	✓
Measured Data		Duplicate Collected?	NO
Well pipe height above ground (cm)=	35		
Diameter of well (cm)=	5		
Depth of well installation (cm)= (from ground surface)		* Monitored 24 Aug/14 Sampled 25 Aug/14	
Length screened section (cm)=			
Depth to top of screen (cm)= (from ground surface)			
Depth to water surface (cm)= (from top of pipe)	83	Measurement method: (meter, tape, etc)	Interface Meter
Static water level (cm)= (below ground surface)			
Measured well refusal depth (cm)= (i.e. depth to frozen ground)	274	Evidence of sludge or siltation:	NO
Thickness of water column	1.91m		
Static volume of water in well	3.84		
Free product thickness (mm)=	0	Measurement method:	IM
Purging: (Y/N)	Y	Purging/Sampling Equipment:	Waterra
Volume Purged Water=	12L		Tubing /
Decontamination required: (Y/N)	N		Footvalve
Number washes:			
Number rinses:			
Final pH=	7.81		
Final Conductivity (uS/cm)=	159.0		
Final Temperature (degC)=	2.9		

Monitoring Well Sampling Record

Site Name:	FOX-4		
Date of Sampling Event:	25-Aug/14 *	Time:	600pm
Names of Samplers:	JM/SB		
Landfill Name:	NH/TIER II	Samples Collected:	✓
Monitoring Well ID:	MW11-04	PHC F1	✓
Sample Number:	F4-NH-MW11-04	Inorganic Elements	✓
Condition of Well:	OK	PHC F2-F4	✓
		PCBs	✓
Measured Data		Duplicate Collected?	NO
Well pipe height above ground (cm)=	33		
Diameter of well (cm)=	5		
Depth of well installation (cm)= (from ground surface)		* Monitored 24 Aug/14 Sampled 25 Aug/14	
Length screened section (cm)=			
Depth to top of screen (cm)= (from ground surface)			
Depth to water surface (cm)= (from top of pipe)	80	Measurement method: (meter, tape, etc)	Interface Meter
Static water level (cm)= (below ground surface)			
Measured well refusal depth (cm)= (i.e. depth to frozen ground)	196	Evidence of sludge or siltation:	NO
Thickness of water column	1.16m		
Static volume of water in well	2.33L		
Free product thickness (mm)=	0	Measurement method:	IM
Purging: (Y/N)	Y	Purging/Sampling Equipment:	Waterra
Volume Purged Water=	10L		Tubing /
Decontamination required: (Y/N)	N		Footvalve
Number washes:			
Number rinses:			
Final pH=	7.50		
Final Conductivity (uS/cm)=	146.9		
Final Temperature (degC)=	2.7		

Monitoring Well Sampling Record

Site Name:	FOX-4		
Date of Sampling Event:	24Aug/14	Time:	550pm
Names of Samplers:	JM/SB		
Landfill Name:	NH/TIER II	Samples Collected:	✓
Monitoring Well ID:	MW11-05	PHC F1	✓
Sample Number:	F4-NH-MW11-05	Inorganic Elements	✓
Condition of Well:	OK, water ponded around well	PHC F2-F4	✓
		PCBs	✓
Measured Data		Duplicate Collected?	No
Well pipe height above ground (cm)=	36		
Diameter of well (cm)=	5		
Depth of well installation (cm)= (from ground surface)			
Length screened section (cm)=			
Depth to top of screen (cm)= (from ground surface)			
Depth to water surface (cm)= (from top of pipe)	95	Measurement method: (meter, tape, etc)	Interface Meter
Static water level (cm)= (below ground surface)			
Measured well refusal depth (cm)= (i.e. depth to frozen ground)	213	Evidence of sludge or siltation:	NO
Thickness of water column	1.18m		
Static volume of water in well	2.40		
Free product thickness (mm)=	0	Measurement method:	IM
Purging: (Y/N)	Y	Purging/Sampling Equipment:	Waterra
Volume Purged Water=	9L		Tubing /
Decontamination required: (Y/N)	N		Footvalve
Number washes:			
Number rinses:			
Final pH=	7.71		
Final Conductivity (uS/cm)=	146.4		
Final Temperature (degC)=	2.7		

Monitoring Well Sampling Record

Site Name:	FOX-4		
Date of Sampling Event:	24 Aug/14	Time:	540pm
Names of Samplers:	JM/SB		
Landfill Name:	NH/TIER II	Samples Collected:	NO
Monitoring Well ID:	MW11-06	PHC F1	
Sample Number:	N/A	Inorganic Elements	
Condition of Well:	OK	PHC F2-F4	
		PCBs	
Measured Data		Duplicate Collected?	
Well pipe height above ground (cm)=	50		
Diameter of well (cm)=			
Depth of well installation (cm)= (from ground surface)			
Length screened section (cm)=			
Depth to top of screen (cm)= (from ground surface)			
Depth to water surface (cm)= (from top of pipe)	N/A (Dry)	Measurement method: (meter, tape, etc)	Interface Meter
Static water level (cm)= (below ground surface)			
Measured well refusal depth (cm)= (i.e. depth to frozen ground)	98	Evidence of sludge or siltation:	Both
Thickness of water column	0		
Static volume of water in well	0		
Free product thickness (mm)=	0	Measurement method:	IM
Purging: (Y/N)	N	Purging/Sampling Equipment:	~~Waterra~~ ~~Tubing~~ N/A ~~Foot Valve~~
Volume Purged Water=			
Decontamination required: (Y/N)	N		
Number washes:			
Number rinses:			
Final pH=			
Final Conductivity (uS/cm)=			
Final Temperature (degC)=			

Monitoring Well Sampling Record

Site Name:	FOX-4		
Date of Sampling Event:	29 Aug/14	Time:	530pm
Names of Samplers:	JM/SB		
Landfill Name:	NH/TIER II	Samples Collected:	YES
Monitoring Well ID:	MW12-07	PHC F1	✓
Sample Number:	FX-NH-MW12-07	Inorganic Elements	✓
Condition of Well:	lock broken	PHC F2-F4	✓
	broken j-plug	PCBs	✓
Measured Data		Duplicate Collected?	
Well pipe height above ground (cm)=	44		
Diameter of well (cm)=			
Depth of well installation (cm)= (from ground surface)			
Length screened section (cm)=			
Depth to top of screen (cm)= (from ground surface)	~~[illegible]~~		
Depth to water surface (cm)= (from top of pipe)	275	Measurement method: (meter, tape, etc)	Interface Meter
Static water level (cm)= (below ground surface)			
Measured well refusal depth (cm)= (i.e. depth to frozen ground)	202	Evidence of sludge or siltation:	NO
Thickness of water column	1.27m		
Static volume of water in well	2.58L		
Free product thickness (mm)=	0	Measurement method:	IM
Purging: (Y/N)	Y	Purging/Sampling Equipment:	Waterra
Volume Purged Water=	9L		Tubing/
Decontamination required: (Y/N)	N		Footvalve
Number washes:			
Number rinses:			
Final pH=	7.48		
Final Conductivity (uS/cm)=	175.7		
Final Temperature (degC)=	3.1		

Monitoring Well Sampling Record

Site Name:	FOX-4		
Date of Sampling Event:	29 Aug/14	Time:	640pm
Names of Samplers:	JM/SB		
Landfill Name:	NH/TIER II	Samples Collected:	NO
Monitoring Well ID:	MW14-08	PHC F1	
Sample Number:	N/A	Inorganic Elements	
Condition of Well:	OK	PHC F2-F4	
		PCBs	
Measured Data		Duplicate Collected?	
Well pipe height above ground (cm)=	58		
Diameter of well (cm)=			
Depth of well installation (cm)= (from ground surface)			
Length screened section (cm)=			
Depth to top of screen (cm)= (from ground surface)			
Depth to water surface (cm)= (from top of pipe)	N/A (Dry)	Measurement method: (meter, tape, etc)	Interface Meter
Static water level (cm)= (below ground surface)			
Measured well refusal depth (cm)= (i.e. depth to frozen ground)	1.10m	Evidence of sludge or siltation:	NO
Thickness of water column	0		
Static volume of water in well	0		
Free product thickness (mm)=	0	Measurement method:	IM
Purging: (Y/N)	N	Purging/Sampling Equipment:	Waterra Tubing N/A Footvalve
Volume Purged Water=			
Decontamination required: (Y/N)			
Number washes:			
Number rinses:			
Final pH=			
Final Conductivity (uS/cm)=			
Final Temperature (degC)=			

Monitoring Well Sampling Record

Site Name:	FOX -4		
Date of Sampling Event:	25 Aug/14	Time:	10am
Names of Samplers:	SM/SB		
Landfill Name:	STATION	Samples Collected:	YES
Monitoring Well ID:	MW98-07	PHC F1	✓
Sample Number:		Inorganic Elements	✓
Condition of Well:	Casing full of bentonite	PHC F2-F4	✓
lock rusted and broken off		PCBs	✓
Measured Data		Duplicate Collected?	NO
Well pipe height above ground (cm)=	22		
Diameter of well (cm)=	5		
Depth of well installation (cm)= (from ground surface)			
Length screened section (cm)=			
Depth to top of screen (cm)= (from ground surface)			
Depth to water surface (cm)= (from top of pipe)	1.12m	Measurement method: (meter, tape, etc)	Interface Meter
Static water level (cm)= (below ground surface)			
Measured well refusal depth (cm)= (i.e. depth to frozen ground)	212	Evidence of sludge or siltation:	NO
Thickness of water column	100		
Static volume of water in well	2.03		
Free product thickness (mm)=	0	Measurement method:	IM
Purging: (Y/N)	Y	Purging/Sampling Equipment:	Waterra
Volume Purged Water=	7L		Tubing /
Decontamination required: (Y/N)	N		Foot Valve
Number washes:			
Number rinses:			
Final pH=	7.90		
Final Conductivity (uS/cm)=	190.0		
Final Temperature (degC)=	3.2		

Monitoring Well Sampling Record

Site Name:	FOX-4		
Date of Sampling Event:	25 Aug/14	Time:	1010am
Names of Samplers:	SB/JM		
Landfill Name:	STATION	Samples Collected:	NO
Monitoring Well ID:	MW98-08	PHC F1	
Sample Number:		Inorganic Elements	
Condition of Well:	Standing water and bentonite	PHC F2-F4	
Filled casing		PCBs	
Measured Data		Duplicate Collected?	
Well pipe height above ground (cm)=	25		
Diameter of well (cm)=			
Depth of well installation (cm)= (from ground surface)			
Length screened section (cm)=			
Depth to top of screen (cm)= (from ground surface)			
Depth to water surface (cm)= (from top of pipe)	100	Measurement method: (meter, tape, etc)	Interface Meter
Static water level (cm)= (below ground surface)			
Measured well refusal depth (cm)= (i.e. depth to frozen ground)	120	Evidence of sludge or siltation:	NO
Thickness of water column	20		
Static volume of water in well	0.41 L		
Free product thickness (mm)=	0	Measurement method:	IM
Purging: (Y/N)	N	Purging/Sampling Equipment:	Waterra Tubing / Foot Valve
Volume Purged Water=			
Decontamination required: (Y/N)			
Number washes:			N/A
Number rinses:			
Final pH=			
Final Conductivity (uS/cm)=			
Final Temperature (degC)=			

Monitoring Well Sampling Record

Site Name:	FOX-4		
Date of Sampling Event:	25 Aug/14	Time:	1005 am
Names of Samplers:	JM/SB		
Landfill Name:	STATION	Samples Collected:	NO
Monitoring Well ID:	MW98-09	PHC F1	
Sample Number:		Inorganic Elements	
Condition of Well:	Standing water in casing over	PHC F2-F4	
3-plug this water fell into	standpipe, this is water in well	PCBs	
Measured Data		Duplicate Collected?	
Well pipe height above ground (cm)=	19		
Diameter of well (cm)=	5		
Depth of well installation (cm)= (from ground surface)			
Length screened section (cm)=			
Depth to top of screen (cm)= (from ground surface)			
Depth to water surface (cm)= (from top of pipe)	109	Measurement method: (meter, tape, etc)	Interface Meter
Static water level (cm)= (below ground surface)			
Measured well refusal depth (cm)= (i.e. depth to frozen ground)	130	Evidence of sludge or siltation:	No
Thickness of water column	21		
Static volume of water in well	0.43L		
Free product thickness (mm)=	0	Measurement method:	IM
Purging: (Y/N)	N	Purging/Sampling Equipment:	N/A
Volume Purged Water=			
Decontamination required: (Y/N)			
Number washes:			
Number rinses:			
Final pH=			
Final Conductivity (uS/cm)=			
Final Temperature (degC)=			

Monitoring Well Sampling Record

Site Name:	FOX-4		
Date of Sampling Event:	25Aug/14	Time:	930am
Names of Samplers:	SM/SB		
Landfill Name:	Helipad	West Samples Collected:	YES
Monitoring Well ID:	MW98-01	PHC F1	✓
Sample Number:		Inorganic Elements	✓
Condition of Well:	OK, no bolts or locks,	PHC F2-F4	✓
	no cap on	standpipe PCBs	✓
Measured Data		Duplicate Collected?	NO
Well pipe height above ground (cm)=	45	FH-HEL-MW98-01	
Diameter of well (cm)=	5		
Depth of well installation (cm)= (from ground surface)			
Length screened section (cm)=			
Depth to top of screen (cm)= (from ground surface)			
Depth to water surface (cm)= (from top of pipe)	166	Measurement method: (meter, tape, etc)	Interface Meter
Static water level (cm)= (below ground surface)			
Measured well refusal depth (cm)= (i.e. depth to frozen ground)	232	Evidence of sludge or siltation:	NO
Thickness of water column	116		
Static volume of water in well	2.35		
Free product thickness (mm)=	0	Measurement method:	IM
Purging: (Y/N)	Y	Purging/Sampling Equipment:	Waterra
Volume Purged Water=	9L		Tubing/
Decontamination required: (Y/N)	N		Footvalve
Number washes:			
Number rinses:			
Final pH=	6.90		
Final Conductivity (uS/cm)=	180.2		
Final Temperature (degC)=	2.2		

Monitoring Well Sampling Record

Site Name:	FOX-4		
Date of Sampling Event:	25 Aug 14	Time:	1130am
Names of Samplers:	JM/SB		
Landfill Name:	HELIPAD	WEST Samples Collected:	/
Monitoring Well ID:	MW98-02	PHC F1	/
Sample Number:		Inorganic Elements	/
Condition of Well:	Heaved bentonite filled all	PHC F2-F4	/
	of casing	PCBs	/
Measured Data		Duplicate Collected?	
Well pipe height above ground (cm)=	25	FY-HEL-MW98-02	
Diameter of well (cm)=	5		
Depth of well installation (cm)= (from ground surface)			
Length screened section (cm)=			
Depth to top of screen (cm)= (from ground surface)			
Depth to water surface (cm)= (from top of pipe)	87	Measurement method: (meter, tape, etc)	Interface Meter
Static water level (cm)= (below ground surface)			
Measured well refusal depth (cm)= (i.e. depth to frozen ground)	160	Evidence of sludge or siltation:	NO
Thickness of water column	73		
Static volume of water in well	1.48		
Free product thickness (mm)=	0	Measurement method:	IM
Purging: (Y/N)	Y	Purging/Sampling Equipment:	Waterra
Volume Purged Water=	6L		Tubing /
Decontamination required: (Y/N)			Footvalve
Number washes:			
Number rinses:			
Final pH=	6.60		
Final Conductivity (uS/cm)=	320.0		
Final Temperature (degC)=	2.5		

Monitoring Well Sampling Record

Site Name:	FOX-4		
Date of Sampling Event:	25 Aug/14	Time:	1140 pm
Names of Samplers:	JM/SB		
Landfill Name:	HELIPAD	WEST Samples Collected:	✓
Monitoring Well ID:	MW98-03	PHC F1	✓
Sample Number:		Inorganic Elements	✓
Condition of Well:	lock broken off	PHC F2-F4	✓
	casing filled w bentonite	PCBs	✓
Measured Data		Duplicate Collected?	
Well pipe height above ground (cm)=	30		F4-HEL -MW98-03
Diameter of well (cm)=	5"		
Depth of well installation (cm)= (from ground surface)			
Length screened section (cm)=			
Depth to top of screen (cm)= (from ground surface)		could not be determined as probe became covered in bentonite	
Depth to water surface (cm)= (from top of pipe)	Water in well, but level	Measurement method: (meter, tape, etc)	Interface Meter
Static water level (cm)= (below ground surface)			
Measured well refusal depth (cm)= (i.e. depth to frozen ground)	1.44	Evidence of sludge or siltation:	Some bent. in standpipe
Thickness of water column			
Static volume of water in well			
Free product thickness (mm)=	0	Measurement method:	IM
Purging: (Y/N)		Purging/Sampling Equipment:	Waterra
Volume Purged Water=			Tubing and
Decontamination required: (Y/N)			Footvalve
Number washes:			
Number rinses:			
Final pH=	6.60		
Final Conductivity (uS/cm)=	120.1		
Final Temperature (degC)=	1.6		

Monitoring Well Sampling Record

Site Name:	FOX-4		
Date of Sampling Event:	25Aug/14	Time:	1145pm
Names of Samplers:	JM/SB		
Landfill Name:	HELIPAD WEST	Samples Collected:	NO
Monitoring Well ID:	MW98-06	PHC F1	
Sample Number:		Inorganic Elements	
Condition of Well:	Bentonite filled all of	PHC F2-F4	
casing, no j plug, bent	instandpipe	PCBs	
Measured Data		Duplicate Collected?	
Well pipe height above ground (cm)=	25		
Diameter of well (cm)=	5		
Depth of well installation (cm)= (from ground surface)			
Length screened section (cm)=			
Depth to top of screen (cm)= (from ground surface)			
Depth to water surface (cm)= (from top of pipe)	N/A (Dry)	Measurement method: (meter, tape, etc)	Interface Meter
Static water level (cm)= (below ground surface)			
Measured well refusal depth (cm)= (i.e. depth to frozen ground)	117	Evidence of sludge or siltation:	NO
Thickness of water column	0		
Static volume of water in well	0		
Free product thickness (mm)=	0	Measurement method:	IM
Purging: (Y/N)	N	Purging/Sampling Equipment:	N/A
Volume Purged Water=			
Decontamination required: (Y/N)	N		
Number washes:			
Number rinses:			
Final pH=			
Final Conductivity (uS/cm)=			
Final Temperature (degC)=			

DEW LINE CLEANUP: POST-CONSTRUCTION - LANDFILL MONITORING

VISUAL INSPECTION CHECKLIST

INSPECTION REPORT – PAGE 1 OF 2

SITE NAME:	FOX-4
LANDFILL DESIGNATION:	NON-HAZARDOUS WASTE LANDFILL / TIER II DISPOSAL FACILITY
DATE OF INSPECTION:	26 August 2014
DATE OF PREVIOUS INSPECTION:	N/A (Landfill repaired in 2013)
INSPECTED BY:	Jason Mauchan / Stephen Borcsok
REPORT PREPARED BY:	Stephen Borcsok
The inspector/reporter represents to the best of the their knowledge, the following statements and observations are true and correct and to the best of the preparer's actual knowledge, no material facts have been suppressed or misstated.	

VISUAL INSPECTION CHECKLIST - INSPECTION REPORT – PAGE 2 OF 2

Checklist Item	Present Yes/No	Location (Describe relative to existing monuments/features and relative to landfill design i.e. surface, berms, toe)	Length	Width	Depth	Extent relative to Area of Landfill (%)	Description	Photographic Records Focal length, location, view point & direction (relative to magnetic north) Feature of note Scale	Additional Comments
Settlement	YES	NE corner of Non Haz Landfill	0.3m	0.3m	0.2m	<1%	Small Depression		
Erosion	YES	West side of slope between N and S side of TII landfill and east side	~3m	~2m	~0.2m	<1%	Erosion channel		
Frost Action	NO								
Sloughing and Cracking	NO								
Animal Burrows	NO								
Vegetation	NO								
Staining	YES	Inponded water between NII and TII				<1%	Natural oxidation staining		
Vegetation Stress	NO								
Seepage Points	NO								
Debris Exposed	YES	Southeast corner of Non Haz landfill				<1%	Small metal debris in berm		
Presence/Condition – Monitoring Instruments	YES	See drawing, 8 wells 9 thermistors							1 Thermistor was not on drawing (SA)
Features of Note.	YES	On Tier II Disp. Facility				<1%	Tire ruts		

SITE: FOX-4 LANDFILL: Non-Haz/Tier II

Preliminary Stability Assessment **Landfill:** FOX-4 Non-Haz / Tier II Disposal Facility

Feature	Severity Rating	Extent
Settlement	ACCEPTABLE	ISOLATED
Erosion	ACCEPTABLE	OCCASIONAL
Frost Action	NONE	NONE
Staining	ACCEPTABLE	ISOLATED
Vegetation Stress	NONE	NONE
Seepage/Ponded Water	ACCEPTABLE	OCCASIONAL
Debris exposure	ACCEPTABLE	OCCASIONAL
Overall Landfill Performance	ACCEPTABLE	

Performance/ Severity Rating	Description
Acceptable	Noted features are of little consequence. The landfill is performing as designed. Minor deviations in environmental or physical performance may be observed, such as isolated areas of erosion, settlement.
Marginal	Physical/environmental performance appears to be deteriorating with time. Observations may include an increase in size or number of features of note, such as differential settlement, erosion or cracking. No significant impact on landfill stability to date, but potential for failure is assessed as low or moderate.
Significant	Significant or potentially significant changes affecting landfill stability, such as significant changes in slope geometry, significant erosion or differential settlement; scarp development. The potential for failure is assessed as imminent.
Unacceptable	Stability of landfill is compromised to the extent that ability to contain waste materials is compromised. Examples may include: - Debris exposed in erosion channels or areas of differential settlement. - Liner exposed. - Slope failure.

Extent	Description
Isolated	Singular feature
Occasional	Features of note occurring at irregular intervals/locations
Numerous	Many features of note, impacted less than 50% of the surface area of the landfill
Extensive	Impacting greater than 50% of the surface area of the landfill

DEW LINE CLEANUP: POST-CONSTRUCTION - LANDFILL MONITORING

VISUAL INSPECTION CHECKLIST

INSPECTION REPORT – PAGE 1 OF 2

SITE NAME:	FOX-4
LANDFILL DESIGNATION:	HELIPAD WEST LANDFILL
DATE OF INSPECTION:	26 August 2014
DATE OF PREVIOUS INSPECTION:	N/A (Landfill repaired in 2013)
INSPECTED BY:	Jason Mauchan / Stephen Borcsok
REPORT PREPARED BY:	Stephen Borcsok
The inspector/reporter represents to the best of the their knowledge, the following statements and observations are true and correct and to the best of the preparer's actual knowledge, no material facts have been suppressed or misstated.	

VISUAL INSPECTION CHECKLIST - INSPECTION REPORT – PAGE 2 OF 2

Checklist Item	Present Yes/No	Location (Describe relative to existing monuments/features and relative to landfill design i.e. surface, berms, toe)	Length	Width	Depth	Extent relative to Area of Landfill (%)	Description	Photographic Records Focal length, location, view point & direction (relative to magnetic north) Feature of note Scale	Additional Comments
Settlement	YES	At bottom of berms above large granular fills				<1%	Small sinkholes		
Erosion	YES	Downhill on steep slopes				2%	Erosion Channels		
Frost Action	NO								
Sloughing and Cracking	NO								
Animal Burrows	NO								
Vegetation	~~YES~~ NO					[redacted]			
Staining	YES	Access road ~~west~~ east of MW98-02				<1%	Ox. staining in erosion channel	(natural origin)	
Vegetation Stress	NO								
Seepage Points	NO								
Debris Exposed	YES	On berms (see drawing)				<1%	Small metal debris		
Presence/Condition – Monitoring Instruments	YES								
Features of Note.	YES	Above berm (see drawing)				<1%	Tire ruts		

SITE: FOX-4 LANDFILL: HELIPAD WEST

Preliminary Stability Assessment **Landfill:** FOX-4 HELIPAD WEST LANDFILL

Feature	Severity Rating	Extent
Settlement	ACCEPTABLE	OCCASIONAL
Erosion	ACCEPTABLE	OCCASIONAL
Frost Action	NONE	NONE
Staining	ACCEPTABLE	OCCASIONAL
Vegetation Stress	NONE	NONE
Seepage/Ponded Water	NONE	NONE
Debris exposure	ACCEPTABLE	OCCASIONAL
Overall Landfill Performance	ACCEPTABLE	

Performance/ Severity Rating	Description
Acceptable	Noted features are of little consequence. The landfill is performing as designed. Minor deviations in environmental or physical performance may be observed, such as isolated areas of erosion, settlement.
Marginal	Physical/environmental performance appears to be deteriorating with time. Observations may include an increase in size or number of features of note, such as differential settlement, erosion or cracking. No significant impact on landfill stability to date, but potential for failure is assessed as low or moderate.
Significant	Significant or potentially significant changes affecting landfill stability, such as significant changes in slope geometry, significant erosion or differential settlement; scarp development. The potential for failure is assessed as imminent.
Unacceptable	Stability of landfill is compromised to the extent that ability to contain waste materials is compromised. Examples may include: - Debris exposed in erosion channels or areas of differential settlement. - Liner exposed. - Slope failure.

Extent	Description
Isolated	Singular feature
Occasional	Features of note occurring at irregular intervals/locations
Numerous	Many features of note, impacted less than 50% of the surface area of the landfill
Extensive	Impacting greater than 50% of the surface area of the landfill

DEW LINE CLEANUP: POST-CONSTRUCTION - LANDFILL MONITORING

VISUAL INSPECTION CHECKLIST

INSPECTION REPORT – PAGE 1 OF 2

SITE NAME:	FOX-4
LANDFILL DESIGNATION:	STATION AREA LANDFILL
DATE OF INSPECTION:	26 August 2014
DATE OF PREVIOUS INSPECTION:	N/A (Landfill repaired in 2013)
INSPECTED BY:	Jason Mauchan / Stephen Borcsok
REPORT PREPARED BY:	Stephen Borcsok
The inspector/reporter represents to the best of the their knowledge, the following statements and observations are true and correct and to the best of the preparer's actual knowledge, no material facts have been suppressed or misstated.	

VISUAL INSPECTION CHECKLIST - INSPECTION REPORT – PAGE 2 OF 2

Checklist Item	Present Yes/No	Location (Describe relative to existing monuments/features and relative to landfill design i.e. surface, berms, toe)	Length	Width	Depth	Extent relative to Area of Landfill (%)	Description	Photographic Records Focal length, location, view point & direction (relative to magnetic north) Feature of note Scale	Additional Comments
Settlement	YES	South and west side of landfill	1.0m 0.3m	1.0m 0.3m	0.3m 0.3m	<1'/.	Sinkholes, Settlement		
Erosion	YES	West of MW98-07					Small Erosion Channel		
Frost Action	NO								
Sloughing and Cracking	NO								
Animal Burrows	NO								
Vegetation	YES	Very sparse grasses/ mosses around area							
Staining	YES	NE of MW98-09 -oxidation stainings in	drainage	channel	(natural	origin)	Oxidation Stainings		
Vegetation Stress	NO								
Seepage Points	NO								
Debris Exposed	~~NO~~YES	West side of landfill					Metal/plastic debris, metal culvert		
Presence/Condition – Monitoring Instruments	YES	3 monitoring wells as shown on drawing					Monitoring Wells		Well casings filled with bentonite clay
Features of Note.	~~NO~~YES	N of landfill					Ponded water		

Ponded Water North of Landfill

Preliminary Stability Assessment **Landfill:** FOX-4 STATION AREA LANDFILL

Feature	Severity Rating	Extent
Settlement	ACCEPTABLE	OCCASIONAL
Erosion	ACCEPTABLE	OCCASIONAL
Frost Action	NONE	NONE
Staining	ACCEPTABLE	OCCASIONAL
Vegetation Stress	NONE	NONE
Seepage/Ponded Water	ACCEPTABLE	OCCASIONAL
Debris exposure	ACCEPTABLE	OCCASIONAL
Overall Landfill Performance	ACCEPTABLE	

Performance/ Severity Rating	Description
Acceptable	Noted features are of little consequence. The landfill is performing as designed. Minor deviations in environmental or physical performance may be observed, such as isolated areas of erosion, settlement.
Marginal	Physical/environmental performance appears to be deteriorating with time. Observations may include an increase in size or number of features of note, such as differential settlement, erosion or cracking. No significant impact on landfill stability to date, but potential for failure is assessed as low or moderate.
Significant	Significant or potentially significant changes affecting landfill stability, such as significant changes in slope geometry, significant erosion or differential settlement; scarp development. The potential for failure is assessed as imminent.
Unacceptable	Stability of landfill is compromised to the extent that ability to contain waste materials is compromised. Examples may include: - Debris exposed in erosion channels or areas of differential settlement. - Liner exposed. - Slope failure.

Extent	Description
Isolated	Singular feature
Occasional	Features of note occurring at irregular intervals/locations
Numerous	Many features of note, impacted less than 50% of the surface area of the landfill
Extensive	Impacting greater than 50% of the surface area of the landfill

DEW LINE CLEANUP: POST-CONSTRUCTION - LANDFILL MONITORING

VISUAL INSPECTION CHECKLIST

INSPECTION REPORT – PAGE 1 OF 2

SITE NAME:	FOX-4
LANDFILL DESIGNATION:	PALLET LINE LANDFILL
DATE OF INSPECTION:	25 August 2014
DATE OF PREVIOUS INSPECTION:	N/A (Landfill repaired in 2013)
INSPECTED BY:	Jason Mauchan / Stephen Borcsok
REPORT PREPARED BY:	Stephen Borcsok
The inspector/reporter represents to the best of the their knowledge, the following statements and observations are true and correct and to the best of the preparer's actual knowledge, no material facts have been suppressed or misstated.	

VISUAL INSPECTION CHECKLIST - INSPECTION REPORT – PAGE 2 OF 2

Checklist Item	Present Yes/No	Location (Describe relative to existing monuments/features and relative to landfill design i.e. surface, berms, toe)	Length	Width	Depth	Extent relative to Area of Landfill (%)	Description	Photographic Records Focal length, location, view point & direction (relative to magnetic north) Feature of note Scale	Additional Comments
Settlement	NO								
Erosion	NO								
Frost Action	NO								
Sloughing and Cracking	NO								
Animal Burrows	NO								
Vegetation	NO								
Staining	NO								
Vegetation Stress	NO								
Seepage Points	NO								
Debris Exposed	NO								
Presence/Condition – Monitoring Instruments	NO								
Features of Note.	YES	Ponded water NE of landfill				<1%	Ponded water		

SITE: FOX-4

LANDFILL: PALLET LINE LANDFILL

Preliminary Stability Assessment **Landfill:** FOX-4 PALLET LINE

Feature	Severity Rating	Extent
Settlement	NONE	NONE
Erosion	NONE	NONE
Frost Action	NONE	NONE
Staining	NONE	NONE
Vegetation Stress	NONE	NONE
Seepage/Ponded Water	ACCEPTABLE	ISOLATED
Debris exposure	NONE	NONE
Overall Landfill Performance	ACCEPTABLE	

Performance/ Severity Rating	Description
Acceptable	Noted features are of little consequence. The landfill is performing as designed. Minor deviations in environmental or physical performance may be observed, such as isolated areas of erosion, settlement.
Marginal	Physical/environmental performance appears to be deteriorating with time. Observations may include an increase in size or number of features of note, such as differential settlement, erosion or cracking. No significant impact on landfill stability to date, but potential for failure is assessed as low or moderate.
Significant	Significant or potentially significant changes affecting landfill stability, such as significant changes in slope geometry, significant erosion or differential settlement; scarp development. The potential for failure is assessed as imminent.
Unacceptable	Stability of landfill is compromised to the extent that ability to contain waste materials is compromised. Examples may include: - Debris exposed in erosion channels or areas of differential settlement. - Liner exposed. - Slope failure.

Extent	Description
Isolated	Singular feature
Occasional	Features of note occurring at irregular intervals/locations
Numerous	Many features of note, impacted less than 50% of the surface area of the landfill
Extensive	Impacting greater than 50% of the surface area of the landfill

DEW LINE CLEANUP: POST-CONSTRUCTION - LANDFILL MONITORING

VISUAL INSPECTION CHECKLIST

INSPECTION REPORT – PAGE 1 OF 2

SITE NAME:	FOX-4
LANDFILL DESIGNATION:	TANNER BAY LANDFILL
DATE OF INSPECTION:	24 August 2014
DATE OF PREVIOUS INSPECTION:	N/A
INSPECTED BY:	J. Mauchan
REPORT PREPARED BY:	S. Borcsok

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

Checklist Item	Present Yes/No	Location (Describe relative to existing monuments/features and relative to landfill/area design i.e. surface, berms, toe)	Length (m)	Width (m)	Depth (m)	Extent relative to Area extent of Landfill/ Area (%)	Description	Photographic Records Focal length, Location, view point & direction Feature of note Scale	Additional Comments/ Preliminary Stability Assessment
Settlement	Y	Scrub cap (P15)	1·5	1·0	0·05	<1%	minor	GPS #150 (P11)	
Erosion	Y	NE corner	2·0	0·8	0·05	<1%	[illegible]	GPS #139 (P1)	
Lateral Movement	N								
Sloughing of slopes	N								
Cracks	N								
Frost Action	N								
Animal Burrows	N								
Vegetation re-establishment	N								
Vegetation Stress	N								
Staining	N								
Seepage Points, or ponded water	Y	former ponded water, E end	8m	0·75	0·01	<1%	no ponded water	P12	
Debris or liner Exposure	Y	debris N of landfill				N. of LF	tin cans scrap wood	>100m N	minor debris
Presence/ Condition of Monitoring Instruments	N								
Other Features of Note.	Y	on cap NE of P-8	10	0·5	0·03	<1%	tree roots	GPS 145 P5	

Preliminary Stability Assessment **Landfill:** FOX-4 Tanner Bay Landfill

Feature	Severity Rating	Extent
Settlement	ACCEPTABLE	ISOLATED
Erosion	ACCEPTABLE	ISOLATED
Frost Action	NONE	NONE
Staining	NONE	NONE
Vegetation Stress	NONE	NONE
Seepage/Ponded Water	NONE	NONE
Debris exposure	NONE	NONE
Overall Landfill Performance	ACCEPTABLE	

Performance/ Severity Rating	Description
Acceptable	Noted features are of little consequence. The landfill is performing as designed. Minor deviations in environmental or physical performance may be observed, such as isolated areas of erosion, settlement.
Marginal	Physical/environmental performance appears to be deteriorating with time. Observations may include an increase in size or number of features of note, such as differential settlement, erosion or cracking. No significant impact on landfill stability to date, but potential for failure is assessed as low or moderate.
Significant	Significant or potentially significant changes affecting landfill stability, such as significant changes in slope geometry, significant erosion or differential settlement; scarp development. The potential for failure is assessed as imminent.
Unacceptable	Stability of landfill is compromised to the extent that ability to contain waste materials is compromised. Examples may include: - Debris exposed in erosion channels or areas of differential settlement. - Liner exposed. - Slope failure.

Extent	Description
Isolated	Singular feature
Occasional	Features of note occurring at irregular intervals/locations
Numerous	Many features of note, impacted less than 50% of the surface area of the landfill
Extensive	Impacting greater than 50% of the surface area of the landfill

APPENDIX C

LABORATORY QA/QC REPORTS AND CERTIFICATES OF ANALYSIS

Your Project #: 350600-515
Site Location: FOX-4 CAPE HOOPER
Your C.O.C. #: na

Attention:Stephen Borcsok

Decommissioning Consulting Services Limited
121 Granton Dr
Unit 11
Richmond Hill, ON
L4B 3N4

Report Date: 2014/09/11
Report #: R3153325
Version: 1

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B4G0864
Received: 2014/09/03, 13:15

Sample Matrix: Soil
Samples Received: 46

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Petroleum Hydro. CCME F1 & BTEX in Soil	1	2014/09/04	2014/09/04	OTT SOP-00002	CCME CWS
Petroleum Hydro. CCME F1 & BTEX in Soil	19	2014/09/04	2014/09/05	OTT SOP-00002	CCME CWS
Petroleum Hydro. CCME F1 & BTEX in Soil	8	2014/09/05	2014/09/05	OTT SOP-00002	CCME CWS
Petroleum Hydro. CCME F1 & BTEX in Soil	12	2014/09/05	2014/09/06	OTT SOP-00002	CCME CWS
Petroleum Hydro. CCME F1 & BTEX in Soil	5	2014/09/05	2014/09/08	OTT SOP-00002	CCME CWS
Petroleum Hydro. CCME F1 & BTEX in Soil (1)	1	2014/09/04	2014/09/09	CAM SOP-00315	CCME PHC-CWS m
Petroleum Hydrocarbons F2-F4 in Soil (1)	1	2014/09/06	2014/09/07	CAM SOP-00316	CCME CWS
Petroleum Hydrocarbons F2-F4 in Soil	23	2014/09/03	2014/09/05	OTT SOP-00001	CCME CWS
Petroleum Hydrocarbons F2-F4 in Soil	21	2014/09/03	2014/09/06	OTT SOP-00001	CCME CWS
Petroleum Hydrocarbons F2-F4 in Soil	1	2014/09/03	2014/09/09	OTT SOP-00001	CCME CWS
Strong Acid Leachable Metals by ICPMS (1)	40	2014/09/08	2014/09/09	CAM SOP-00447	EPA 6020 m
Strong Acid Leachable Metals by ICPMS (1)	6	2014/09/08	2014/09/10	CAM SOP-00447	EPA 6020 m
MOISTURE	30	N/A	2014/09/05	CAM SOP-00445	McKeague 2nd ed 1978
MOISTURE	15	N/A	2014/09/08	CAM SOP-00445	McKeague 2nd ed 1978
Moisture (1)	1	N/A	2014/09/04	CAM SOP-00445	R.Carter,1993
Polychlorinated Biphenyl in Soil (1)	2	2014/09/04	2014/09/04	CAM SOP-00309	EPA 8082 m
Polychlorinated Biphenyl in Soil (1)	16	2014/09/04	2014/09/05	CAM SOP-00309	EPA 8082 m
Polychlorinated Biphenyl in Soil (1)	2	2014/09/04	2014/09/06	CAM SOP-00309	EPA 8082 m
Polychlorinated Biphenyl in Soil (1)	8	2014/09/05	2014/09/05	CAM SOP-00309	EPA 8082 m
Polychlorinated Biphenyl in Soil (1)	12	2014/09/05	2014/09/06	CAM SOP-00309	EPA 8082 m
Polychlorinated Biphenyl in Soil (1)	6	2014/09/06	2014/09/07	CAM SOP-00309	EPA 8082 m

Sample Matrix: Water
Samples Received: 10

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Petroleum Hydro. CCME F1 & BTEX in Water	10	N/A	2014/09/04	OTT SOP-00002	CCME CWS
Petroleum Hydrocarbons F2-F4 in Water	10	2014/09/04	2014/09/04	OTT SOP-00001	CCME Hydrocarbons
Mercury in Water by CVAA (1)	6	2014/09/09	2014/09/10	CAM SOP-00453	EPA 7470A m
Mercury (low level) (1)	4	2014/09/08	2014/09/09	CAM SOP-00453	EPA 7470 m

Your Project #: 350600-515
Site Location: FOX-4 CAPE HOOPER
Your C.O.C. #: na

Attention:Stephen Borcsok

Decommissioning Consulting Services Limited
121 Granton Dr
Unit 11
Richmond Hill, ON
L4B 3N4

Report Date: 2014/09/11
Report #: R3153325
Version: 1

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B4G0864
Received: 2014/09/03, 13:15

Sample Matrix: Water
Samples Received: 10

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Polychlorinated Biphenyl in Water (1)	10	2014/09/05	2014/09/06	CAM SOP-00309	EPA 8082 m

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) This test was performed by Maxxam Analytics Mississauga

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Keshani Vijh, Project Manager
Email: KVijh@maxxam.ca
Phone# (613) 274-0573

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

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Maxxam Job #: B4G0864
Report Date: 2014/09/11

Decommissioning Consulting Services Limited
Client Project #: 350600-515
Site Location: FOX-4 CAPE HOOPER
Sampler Initials: SB

RESULTS OF ANALYSES OF SOIL

Maxxam ID		XK1904	XK1905	XK1906	XK1907	XK1908	XK1909		
Sampling Date		2014/08/24	2014/08/24	2014/08/24	2014/08/24	2014/08/24	2014/08/24		
COC Number		na	na	na	na	na	na		
	Units	F4-TAN-11-S	F4-TAN-11-D	F4-TAN-12-S	F4-TAN-12-D	F4-TAN-13-S	F4-TAN-13-D	RDL	QC Batch
Inorganics									
Moisture	%	12	15	6.6	2.7	19	14	0.2	3734883

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		XK1910	XK1911	XK1912	XK1913		
Sampling Date		2014/08/25	2014/08/25	2014/08/25	2014/08/25		
COC Number		na	na	na	na		
	Units	F4-HEL-MW98-01-S	F4-HEL-MW98-01-D	F4-HEL-MW98-02-S	F4-HEL-MW98-02-D	RDL	QC Batch
Inorganics							
Moisture	%	8.8	8.0	7.3	8.3	0.2	3734883

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		XK1914	XK1915	XK1958	XK1959		
Sampling Date		2014/08/25	2014/08/25	2014/08/25	2014/08/25		
COC Number		na	na				
	Units	F4-HEL-MW98-03-S	F4-HEL-MW98-03-D	F4-HEL-MW98-06-S	F4-HEL-MW98-06-D	RDL	QC Batch
Inorganics							
Moisture	%	3.0	7.7	5.5	6.7	0.2	3734885

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		XK1960			XK1961			XK1962		
Sampling Date		2014/08/25			2014/08/25			2014/08/25		
COC Number										
	Units	F4-STA-MW98-07-S	RDL	QC Batch	F4-STA-MW98-07-D	RDL	QC Batch	F4-STA-MW98-08-S	RDL	QC Batch
Inorganics										
Moisture	%	8.5	0.2	3734885	8.6	1.0	3736784	6.5	0.2	3734885

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		XK1963	XK1964	XK1965	XK1966		
Sampling Date		2014/08/25	2014/08/25	2014/08/25	2014/08/24		
COC Number							
	Units	F4-STA-MW98-08-D	F4-STA-MW98-09-S	F4-STA-MW98-09-D	F4-NH-MW11-01-S	RDL	QC Batch
Inorganics							
Moisture	%	14	5.3	8.4	8.0	0.2	3734885

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Decommissioning Consulting Services Limited
Client Project #: 350600-515
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Sampler Initials: SB

RESULTS OF ANALYSES OF SOIL

Maxxam ID		XK1967	XK1968	XK1969	XK1984		
Sampling Date		2014/08/24	2014/08/24	2014/08/24	2014/08/24		
COC Number							
	Units	F4-NH-MW11-01-D	F4-NH-MW11-02-S	F4-NH-MW11-02-D	F4-NH-MW11-03-S	RDL	QC Batch
Inorganics							
Moisture	%	5.1	13	18	12	0.2	3734885

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		XK1985	XK1986	XK1987	XK1988		
Sampling Date		2014/08/24	2014/08/24	2014/08/24	2014/08/24		
COC Number							
	Units	F4-NH-MW11-03-D	F4-NH-MW11-04-S	F4-NH-MW11-04-D	F4-NH-MW11-05-S	RDL	QC Batch
Inorganics							
Moisture	%	12	16	17	15	0.2	3734885

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		XK1989	XK1990		XK1991	XK1992		
Sampling Date		2014/08/24	2014/08/24		2014/08/24	2014/08/24		
COC Number								
	Units	F4-NH-MW11-05-D	F4-NH-MW11-06-S	QC Batch	F4-NH-MW11-06-D	F4-NH-MW12-07-S	RDL	QC Batch
Inorganics								
Moisture	%	15	8.3	3734885	24	23	0.2	3734887

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		XK1993	XK1994	XK1995	XK2004	XK2005		
Sampling Date		2014/08/24	2014/08/24	2014/08/24	2014/08/25			
COC Number								
	Units	F4-NH-MW12-07-D	F4-NH-MW12-08-S	F4-NH-MW12-08-D	F4-PAL-25-S	F4-PAL-25-D	RDL	QC Batch
Inorganics								
Moisture	%	14	6.6	6.0	1.5	2.4	0.2	3734887

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		XK2006	XK2007	XK2008	XK2009	XK2010	XK2011	XK2012		
Sampling Date										
COC Number										
	Units	F4-PAL-26-S	F4-PAL-26-D	F4-PAL-27-S	F4-PAL-27-D	F4-PAL-28-S	F4-PAL-28-D	F4-PAL-29-S	RDL	QC Batch
Inorganics										
Moisture	%	15	11	13	21	8.7	13	8.6	0.2	3734887

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Report Date: 2014/09/11

Decommissioning Consulting Services Limited
Client Project #: 350600-515
Site Location: FOX-4 CAPE HOOPER
Sampler Initials: SB

RESULTS OF ANALYSES OF SOIL

Maxxam ID		XK2013		
Sampling Date				
COC Number				
	Units	**F4-PAL-29-D**	**RDL**	**QC Batch**
Inorganics				
Moisture	%	16	0.2	3734887

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID			XK1904	XK1905		XK1906		XK1907		
Sampling Date			2014/08/24	2014/08/24		2014/08/24		2014/08/24		
COC Number			na	na		na		na		
	Units	Criteria	F4-TAN-11-S	F4-TAN-11-D	QC Batch	F4-TAN-12-S	QC Batch	F4-TAN-12-D	RDL	QC Batch
Metals										
Acid Extractable Arsenic (As)	ug/g	**12**	5.6	1.1	3739567	1.6	3739716	1.9	1.0	3739567
Acid Extractable Cadmium (Cd)	ug/g	**22**	<0.10	<0.10	3739567	<0.10	3739716	<0.10	0.10	3739567
Acid Extractable Chromium (Cr)	ug/g	**87**	20	15	3739567	21	3739716	21	1.0	3739567
Acid Extractable Cobalt (Co)	ug/g	**-**	2.8	1.7	3739567	3.6	3739716	3.3	0.10	3739567
Acid Extractable Copper (Cu)	ug/g	**91**	11	6.6	3739567	15	3739716	13	0.50	3739567
Acid Extractable Lead (Pb)	ug/g	**600**	4.1	3.2	3739567	4.1	3739716	3.9	1.0	3739567
Acid Extractable Nickel (Ni)	ug/g	**50**	7.6	5.2	3739567	11	3739716	10	0.50	3739567
Acid Extractable Zinc (Zn)	ug/g	**360**	15	11	3739567	23	3739716	19	5.0	3739567
Acid Extractable Mercury (Hg)	ug/g	**50**	<0.050	<0.050	3739567	<0.050	3739716	<0.050	0.050	3739567

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: CCME Industrial
Canadian Environmental Quality Guidelines for Soil 1998-1999

Maxxam ID			XK1908		XK1909		XK1910		
Sampling Date			2014/08/24		2014/08/24		2014/08/25		
COC Number			na		na		na		
	Units	Criteria	F4-TAN-13-S	QC Batch	F4-TAN-13-D	QC Batch	F4-HEL-MW98-01-S	RDL	QC Batch
Metals									
Acid Extractable Arsenic (As)	ug/g	**12**	2.1	3739269	1.9	3739567	**25**	1.0	3739269
Acid Extractable Cadmium (Cd)	ug/g	**22**	<0.10	3739269	<0.10	3739567	<0.10	0.10	3739269
Acid Extractable Chromium (Cr)	ug/g	**87**	18	3739269	17	3739567	49	1.0	3739269
Acid Extractable Cobalt (Co)	ug/g	**-**	2.3	3739269	2.3	3739567	9.7	0.10	3739269
Acid Extractable Copper (Cu)	ug/g	**91**	9.9	3739269	8.0	3739567	34	0.50	3739269
Acid Extractable Lead (Pb)	ug/g	**600**	3.8	3739269	2.7	3739567	6.1	1.0	3739269
Acid Extractable Nickel (Ni)	ug/g	**50**	8.0	3739269	7.2	3739567	31	0.50	3739269
Acid Extractable Zinc (Zn)	ug/g	**360**	17	3739269	16	3739567	47	5.0	3739269
Acid Extractable Mercury (Hg)	ug/g	**50**	<0.050	3739269	<0.050	3739567	<0.050	0.050	3739269

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: CCME Industrial
Canadian Environmental Quality Guidelines for Soil 1998-1999

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Decommissioning Consulting Services Limited
Client Project #: 350600-515
Site Location: FOX-4 CAPE HOOPER
Sampler Initials: SB

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID			XK1911		XK1912		XK1913		
Sampling Date			2014/08/25		2014/08/25		2014/08/25		
COC Number			na		na		na		
	Units	Criteria	F4-HEL-MW98-01-D	QC Batch	F4-HEL-MW98-02-S	QC Batch	F4-HEL-MW98-02-D	RDL	QC Batch
Metals									
Acid Extractable Arsenic (As)	ug/g	**12**	**23**	3739567	**130**	3739269	**42**	1.0	3739716
Acid Extractable Cadmium (Cd)	ug/g	**22**	<0.10	3739567	<0.10	3739269	<0.10	0.10	3739716
Acid Extractable Chromium (Cr)	ug/g	**87**	47	3739567	40	3739269	54	1.0	3739716
Acid Extractable Cobalt (Co)	ug/g	**-**	9.3	3739567	6.5	3739269	9.9	0.10	3739716
Acid Extractable Copper (Cu)	ug/g	**91**	32	3739567	19	3739269	34	0.50	3739716
Acid Extractable Lead (Pb)	ug/g	**600**	5.8	3739567	5.6	3739269	10	1.0	3739716
Acid Extractable Nickel (Ni)	ug/g	**50**	31	3739567	19	3739269	35	0.50	3739716
Acid Extractable Zinc (Zn)	ug/g	**360**	45	3739567	38	3739269	55	5.0	3739716
Acid Extractable Mercury (Hg)	ug/g	**50**	<0.050	3739567	<0.050	3739269	<0.050	0.050	3739716

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: CCME Industrial
Canadian Environmental Quality Guidelines for Soil 1998-1999

Maxxam ID			XK1914	XK1915		XK1958		
Sampling Date			2014/08/25	2014/08/25		2014/08/25		
COC Number			na	na				
	Units	Criteria	F4-HEL-MW98-03-S	F4-HEL-MW98-03-D	QC Batch	F4-HEL-MW98-06-S	RDL	QC Batch
Metals								
Acid Extractable Arsenic (As)	ug/g	**12**	**31**	**30**	3739567	**40**	1.0	3739269
Acid Extractable Cadmium (Cd)	ug/g	**22**	<0.10	<0.10	3739567	0.14	0.10	3739269
Acid Extractable Chromium (Cr)	ug/g	**87**	32	32	3739567	51	1.0	3739269
Acid Extractable Cobalt (Co)	ug/g	**-**	4.4	4.7	3739567	6.7	0.10	3739269
Acid Extractable Copper (Cu)	ug/g	**91**	14	19	3739567	20	0.50	3739269
Acid Extractable Lead (Pb)	ug/g	**600**	4.2	5.5	3739567	7.1	1.0	3739269
Acid Extractable Nickel (Ni)	ug/g	**50**	13	16	3739567	20	0.50	3739269
Acid Extractable Zinc (Zn)	ug/g	**360**	32	31	3739567	77	5.0	3739269
Acid Extractable Mercury (Hg)	ug/g	**50**	<0.050	<0.050	3739567	<0.050	0.050	3739269

RDL = Reportable Detection Limit
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Criteria: CCME Industrial
Canadian Environmental Quality Guidelines for Soil 1998-1999

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ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID			XK1959		XK1960		XK1961		
Sampling Date			2014/08/25		2014/08/25		2014/08/25		
COC Number									
	Units	Criteria	F4-HEL-MW98-06-D	QC Batch	F4-STA-MW98-07-S	QC Batch	F4-STA-MW98-07-D	RDL	QC Batch
Metals									
Acid Extractable Arsenic (As)	ug/g	**12**	**66**	3739269	**33**	3739716	**48**	1.0	3739269
Acid Extractable Cadmium (Cd)	ug/g	**22**	0.11	3739269	0.11	3739716	<0.10	0.10	3739269
Acid Extractable Chromium (Cr)	ug/g	**87**	40	3739269	61	3739716	67	1.0	3739269
Acid Extractable Cobalt (Co)	ug/g	**-**	6.2	3739269	7.8	3739716	11	0.10	3739269
Acid Extractable Copper (Cu)	ug/g	**91**	41	3739269	50	3739716	63	0.50	3739269
Acid Extractable Lead (Pb)	ug/g	**600**	6.1	3739269	23	3739716	5.7	1.0	3739269
Acid Extractable Nickel (Ni)	ug/g	**50**	21	3739269	30	3739716	47	0.50	3739269
Acid Extractable Zinc (Zn)	ug/g	**360**	52	3739269	57	3739716	56	5.0	3739269
Acid Extractable Mercury (Hg)	ug/g	**50**	<0.050	3739269	<0.050	3739716	<0.050	0.050	3739269

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: CCME Industrial
Canadian Environmental Quality Guidelines for Soil 1998-1999

Maxxam ID			XK1962		XK1963		XK1964		
Sampling Date			2014/08/25		2014/08/25		2014/08/25		
COC Number									
	Units	Criteria	F4-STA-MW98-08-S	QC Batch	F4-STA-MW98-08-D	QC Batch	F4-STA-MW98-09-S	RDL	QC Batch
Metals									
Acid Extractable Arsenic (As)	ug/g	**12**	**21**	3739716	**20**	3739567	**14**	1.0	3739269
Acid Extractable Cadmium (Cd)	ug/g	**22**	<0.10	3739716	<0.10	3739567	<0.10	0.10	3739269
Acid Extractable Chromium (Cr)	ug/g	**87**	28	3739716	32	3739567	25	1.0	3739269
Acid Extractable Cobalt (Co)	ug/g	**-**	4.0	3739716	4.0	3739567	3.7	0.10	3739269
Acid Extractable Copper (Cu)	ug/g	**91**	16	3739716	12	3739567	16	0.50	3739269
Acid Extractable Lead (Pb)	ug/g	**600**	5.4	3739716	3.7	3739567	7.5	1.0	3739269
Acid Extractable Nickel (Ni)	ug/g	**50**	14	3739716	14	3739567	12	0.50	3739269
Acid Extractable Zinc (Zn)	ug/g	**360**	30	3739716	32	3739567	35	5.0	3739269
Acid Extractable Mercury (Hg)	ug/g	**50**	<0.050	3739716	<0.050	3739567	<0.050	0.050	3739269

RDL = Reportable Detection Limit
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Client Project #: 350600-515
Site Location: FOX-4 CAPE HOOPER
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ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID			XK1965	XK1966		XK1967		
Sampling Date			2014/08/25	2014/08/24		2014/08/24		
COC Number								
	Units	Criteria	F4-STA-MW98-09-D	F4-NH-MW11-01-S	QC Batch	F4-NH-MW11-01-D	RDL	QC Batch
Metals								
Acid Extractable Arsenic (As)	ug/g	**12**	**66**	**48**	3739269	**170**	1.0	3739716
Acid Extractable Cadmium (Cd)	ug/g	**22**	<0.10	<0.10	3739269	<0.10	0.10	3739716
Acid Extractable Chromium (Cr)	ug/g	**87**	26	73	3739269	83	1.0	3739716
Acid Extractable Cobalt (Co)	ug/g	**-**	3.9	11	3739269	17	0.10	3739716
Acid Extractable Copper (Cu)	ug/g	**91**	16	52	3739269	**98**	0.50	3739716
Acid Extractable Lead (Pb)	ug/g	**600**	5.7	9.9	3739269	13	1.0	3739716
Acid Extractable Nickel (Ni)	ug/g	**50**	13	40	3739269	**73**	0.50	3739716
Acid Extractable Zinc (Zn)	ug/g	**360**	28	86	3739269	110	5.0	3739716
Acid Extractable Mercury (Hg)	ug/g	**50**	<0.050	<0.050	3739269	<0.050	0.050	3739716

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: CCME Industrial
Canadian Environmental Quality Guidelines for Soil 1998-1999

Maxxam ID			XK1968		XK1969		XK1984		
Sampling Date			2014/08/24		2014/08/24		2014/08/24		
COC Number									
	Units	Criteria	F4-NH-MW11-02-S	QC Batch	F4-NH-MW11-02-D	QC Batch	F4-NH-MW11-03-S	RDL	QC Batch
Metals									
Acid Extractable Arsenic (As)	ug/g	**12**	**31**	3739716	**34**	3739567	12	1.0	3739269
Acid Extractable Cadmium (Cd)	ug/g	**22**	<0.10	3739716	<0.10	3739567	2.3	0.10	3739269
Acid Extractable Chromium (Cr)	ug/g	**87**	80	3739716	82	3739567	39	1.0	3739269
Acid Extractable Cobalt (Co)	ug/g	**-**	14	3739716	14	3739567	4.8	0.10	3739269
Acid Extractable Copper (Cu)	ug/g	**91**	49	3739716	52	3739567	22	0.50	3739269
Acid Extractable Lead (Pb)	ug/g	**600**	11	3739716	12	3739567	10	1.0	3739269
Acid Extractable Nickel (Ni)	ug/g	**50**	41	3739716	42	3739567	14	0.50	3739269
Acid Extractable Zinc (Zn)	ug/g	**360**	70	3739716	74	3739567	50	5.0	3739269
Acid Extractable Mercury (Hg)	ug/g	**50**	<0.050	3739716	<0.050	3739567	<0.050	0.050	3739269

RDL = Reportable Detection Limit
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ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID			XK1985	XK1986		XK1987		
Sampling Date			2014/08/24	2014/08/24		2014/08/24		
COC Number								
	Units	Criteria	F4-NH-MW11-03-D	F4-NH-MW11-04-S	QC Batch	F4-NH-MW11-04-D	RDL	QC Batch
Metals								
Acid Extractable Arsenic (As)	ug/g	**12**	**21**	7.4	3739269	11	1.0	3739567
Acid Extractable Cadmium (Cd)	ug/g	**22**	0.90	<0.10	3739269	<0.10	0.10	3739567
Acid Extractable Chromium (Cr)	ug/g	**87**	36	21	3739269	31	1.0	3739567
Acid Extractable Cobalt (Co)	ug/g	-	4.3	2.1	3739269	3.7	0.10	3739567
Acid Extractable Copper (Cu)	ug/g	**91**	18	7.4	3739269	13	0.50	3739567
Acid Extractable Lead (Pb)	ug/g	**600**	8.8	2.5	3739269	3.1	1.0	3739567
Acid Extractable Nickel (Ni)	ug/g	**50**	12	7.1	3739269	14	0.50	3739567
Acid Extractable Zinc (Zn)	ug/g	**360**	37	16	3739269	27	5.0	3739567
Acid Extractable Mercury (Hg)	ug/g	**50**	<0.050	<0.050	3739269	<0.050	0.050	3739567

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: CCME Industrial
Canadian Environmental Quality Guidelines for Soil 1998-1999

Maxxam ID			XK1988	XK1989	XK1990		
Sampling Date			2014/08/24	2014/08/24	2014/08/24		
COC Number							
	Units	Criteria	F4-NH-MW11-05-S	F4-NH-MW11-05-D	F4-NH-MW11-06-S	RDL	QC Batch
Metals							
Acid Extractable Arsenic (As)	ug/g	**12**	10	12	**22**	1.0	3739269
Acid Extractable Cadmium (Cd)	ug/g	**22**	<0.10	<0.10	<0.10	0.10	3739269
Acid Extractable Chromium (Cr)	ug/g	**87**	24	28	24	1.0	3739269
Acid Extractable Cobalt (Co)	ug/g	-	2.7	3.4	3.5	0.10	3739269
Acid Extractable Copper (Cu)	ug/g	**91**	11	14	13	0.50	3739269
Acid Extractable Lead (Pb)	ug/g	**600**	2.5	3.1	3.9	1.0	3739269
Acid Extractable Nickel (Ni)	ug/g	**50**	9.0	11	11	0.50	3739269
Acid Extractable Zinc (Zn)	ug/g	**360**	18	22	21	5.0	3739269
Acid Extractable Mercury (Hg)	ug/g	**50**	<0.050	<0.050	<0.050	0.050	3739269

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: CCME Industrial
Canadian Environmental Quality Guidelines for Soil 1998-1999

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Report Date: 2014/09/11

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Sampler Initials: SB

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID			XK1991		XK1992	XK1993		
Sampling Date			2014/08/24		2014/08/24	2014/08/24		
COC Number								
	Units	Criteria	F4-NH-MW11-06-D	QC Batch	F4-NH-MW12-07-S	F4-NH-MW12-07-D	RDL	QC Batch
Metals								
Acid Extractable Arsenic (As)	ug/g	**12**	**45**	3739567	**30**	**16**	1.0	3739269
Acid Extractable Cadmium (Cd)	ug/g	**22**	<0.10	3739567	0.13	<0.10	0.10	3739269
Acid Extractable Chromium (Cr)	ug/g	**87**	29	3739567	41	24	1.0	3739269
Acid Extractable Cobalt (Co)	ug/g	**-**	3.8	3739567	9.9	5.1	0.10	3739269
Acid Extractable Copper (Cu)	ug/g	**91**	14	3739567	36	17	0.50	3739269
Acid Extractable Lead (Pb)	ug/g	**600**	5.4	3739567	13	4.5	1.0	3739269
Acid Extractable Nickel (Ni)	ug/g	**50**	14	3739567	36	20	0.50	3739269
Acid Extractable Zinc (Zn)	ug/g	**360**	26	3739567	74	31	5.0	3739269
Acid Extractable Mercury (Hg)	ug/g	**50**	<0.050	3739567	<0.050	<0.050	0.050	3739269

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: CCME Industrial
Canadian Environmental Quality Guidelines for Soil 1998-1999

Maxxam ID			XK1994	XK1995	XK2004	XK2005	XK2006		
Sampling Date			2014/08/24	2014/08/24	2014/08/25				
COC Number									
	Units	Criteria	F4-NH-MW12-08-S	F4-NH-MW12-08-D	F4-PAL-25-S	F4-PAL-25-D	F4-PAL-26-S	RDL	QC Batch
Metals									
Acid Extractable Arsenic (As)	ug/g	**12**	**59**	**16**	**38**	**110**	**21**	1.0	3739567
Acid Extractable Cadmium (Cd)	ug/g	**22**	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	3739567
Acid Extractable Chromium (Cr)	ug/g	**87**	52	64	50	58	27	1.0	3739567
Acid Extractable Cobalt (Co)	ug/g	**-**	6.9	7.8	4.6	7.4	3.2	0.10	3739567
Acid Extractable Copper (Cu)	ug/g	**91**	24	30	23	33	18	0.50	3739567
Acid Extractable Lead (Pb)	ug/g	**600**	15	18	10	6.8	33	1.0	3739567
Acid Extractable Nickel (Ni)	ug/g	**50**	19	22	14	23	12	0.50	3739567
Acid Extractable Zinc (Zn)	ug/g	**360**	53	56	38	46	28	5.0	3739567
Acid Extractable Mercury (Hg)	ug/g	**50**	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	3739567

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: CCME Industrial
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ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID			XK2007	XK2008		XK2009	XK2010	XK2011		
Sampling Date										
COC Number										
	Units	Criteria	F4-PAL-26-D	F4-PAL-27-S	QC Batch	F4-PAL-27-D	F4-PAL-28-S	F4-PAL-28-D	RDL	QC Batch
Metals										
Acid Extractable Arsenic (As)	ug/g	**12**	**140**	**14**	3739269	11	7.0	**14**	1.0	3739567
Acid Extractable Cadmium (Cd)	ug/g	**22**	<0.10	<0.10	3739269	<0.10	<0.10	0.11	0.10	3739567
Acid Extractable Chromium (Cr)	ug/g	**87**	78	20	3739269	30	31	61	1.0	3739567
Acid Extractable Cobalt (Co)	ug/g	**-**	12	2.9	3739269	4.0	6.1	12	0.10	3739567
Acid Extractable Copper (Cu)	ug/g	**91**	61	12	3739269	19	18	43	0.50	3739567
Acid Extractable Lead (Pb)	ug/g	**600**	7.0	8.0	3739269	41	5.9	9.3	1.0	3739567
Acid Extractable Nickel (Ni)	ug/g	**50**	43	8.4	3739269	16	17	41	0.50	3739567
Acid Extractable Zinc (Zn)	ug/g	**360**	61	19	3739269	28	31	67	5.0	3739567
Acid Extractable Mercury (Hg)	ug/g	**50**	<0.050	<0.050	3739269	<0.050	<0.050	<0.050	0.050	3739567

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: CCME Industrial
Canadian Environmental Quality Guidelines for Soil 1998-1999

Maxxam ID			XK2012		XK2013		
Sampling Date							
COC Number							
	Units	Criteria	F4-PAL-29-S	QC Batch	F4-PAL-29-D	RDL	QC Batch
Metals							
Acid Extractable Arsenic (As)	ug/g	**12**	**17**	3739567	**14**	1.0	3739269
Acid Extractable Cadmium (Cd)	ug/g	**22**	<0.10	3739567	0.14	0.10	3739269
Acid Extractable Chromium (Cr)	ug/g	**87**	72	3739567	84	1.0	3739269
Acid Extractable Cobalt (Co)	ug/g	**-**	5.6	3739567	9.6	0.10	3739269
Acid Extractable Copper (Cu)	ug/g	**91**	46	3739567	20	0.50	3739269
Acid Extractable Lead (Pb)	ug/g	**600**	12	3739567	8.2	1.0	3739269
Acid Extractable Nickel (Ni)	ug/g	**50**	16	3739567	37	0.50	3739269
Acid Extractable Zinc (Zn)	ug/g	**360**	43	3739567	61	5.0	3739269
Acid Extractable Mercury (Hg)	ug/g	**50**	<0.050	3739567	<0.050	0.050	3739269

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Criteria: CCME Industrial
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PETROLEUM HYDROCARBONS (CCME)

Maxxam ID			XK1904	XK1905	XK1906	XK1907	XK1908	XK1909		
Sampling Date			2014/08/24	2014/08/24	2014/08/24	2014/08/24	2014/08/24	2014/08/24		
COC Number			na	na	na	na	na	na		
	Units	Criteria	F4-TAN-11-S	F4-TAN-11-D	F4-TAN-12-S	F4-TAN-12-D	F4-TAN-13-S	F4-TAN-13-D	RDL	QC Batch
BTEX & F1 Hydrocarbons										
Benzene	ug/g	**5**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.005	3737250
Toluene	ug/g	**0.8**	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	3737250
Ethylbenzene	ug/g	**20**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	3737250
o-Xylene	ug/g	-	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	3737250
p+m-Xylene	ug/g	-	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.04	3737250
Total Xylenes	ug/g	-	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.04	3737250
F1 (C6-C10)	ug/g	-	<10	<10	<10	<10	<10	<10	10	3737250
F1 (C6-C10) - BTEX	ug/g	-	<10	<10	<10	<10	<10	<10	10	3737250
F2-F4 Hydrocarbons										
F2 (C10-C16 Hydrocarbons)	ug/g	-	<10	<10	<10	<10	<10	<10	10	3734889
F3 (C16-C34 Hydrocarbons)	ug/g	-	<10	<10	<10	<10	<10	<10	10	3734889
F4 (C34-C50 Hydrocarbons)	ug/g	-	<10	<10	<10	<10	<10	<10	10	3734889
Reached Baseline at C50	ug/g	-	Yes	Yes	Yes	Yes	Yes	Yes		3734889
Surrogate Recovery (%)										
1,4-Difluorobenzene	%	-	130	128	125	122	124	122		3737250
4-Bromofluorobenzene	%	-	85	92	80	70	79	85		3737250
D10-Ethylbenzene	%	-	95	83	95	93	83	88		3737250
D4-1,2-Dichloroethane	%	-	125	119	122	120	121	124		3737250
o-Terphenyl	%	-	78	80	80	79	82	77		3734889

RDL = Reportable Detection Limit
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Criteria: CCME Industrial
Canadian Environmental Quality Guidelines for Soil 1998-1999

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PETROLEUM HYDROCARBONS (CCME)

Maxxam ID			XK1910	XK1911	XK1912	XK1913		
Sampling Date			2014/08/25	2014/08/25	2014/08/25	2014/08/25		
COC Number			na	na	na	na		
	Units	Criteria	F4-HEL-MW98-01-S	F4-HEL-MW98-01-D	F4-HEL-MW98-02-S	F4-HEL-MW98-02-D	RDL	QC Batch
BTEX & F1 Hydrocarbons								
Benzene	ug/g	**5**	<0.005	<0.005	<0.005	<0.005	0.005	3737250
Toluene	ug/g	**0.8**	<0.02	<0.02	<0.02	<0.02	0.02	3737250
Ethylbenzene	ug/g	**20**	<0.01	<0.01	<0.01	<0.01	0.01	3737250
o-Xylene	ug/g	-	<0.02	<0.02	<0.02	<0.02	0.02	3737250
p+m-Xylene	ug/g	-	<0.04	<0.04	<0.04	<0.04	0.04	3737250
Total Xylenes	ug/g	-	<0.04	<0.04	<0.04	<0.04	0.04	3737250
F1 (C6-C10)	ug/g	-	<10	<10	<10	100	10	3737250
F1 (C6-C10) - BTEX	ug/g	-	<10	<10	<10	100	10	3737250
F2-F4 Hydrocarbons								
F2 (C10-C16 Hydrocarbons)	ug/g	-	<10	<10	26	1100	10	3734889
F3 (C16-C34 Hydrocarbons)	ug/g	-	<10	<10	35	250	10	3734889
F4 (C34-C50 Hydrocarbons)	ug/g	-	<10	<10	<10	<10	10	3734889
Reached Baseline at C50	ug/g	-	Yes	Yes	Yes	Yes		3734889
Surrogate Recovery (%)								
1,4-Difluorobenzene	%	-	126	115	123	122		3737250
4-Bromofluorobenzene	%	-	78	73	82	98		3737250
D10-Ethylbenzene	%	-	99	91	95	107		3737250
D4-1,2-Dichloroethane	%	-	127	121	121	122		3737250
o-Terphenyl	%	-	78	78	79	80		3734889

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: CCME Industrial
Canadian Environmental Quality Guidelines for Soil 1998-1999

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PETROLEUM HYDROCARBONS (CCME)

Maxxam ID			XK1914	XK1915	XK1958	XK1959		
Sampling Date			2014/08/25	2014/08/25	2014/08/25	2014/08/25		
COC Number			na	na				
	Units	Criteria	F4-HEL-MW98-03-S	F4-HEL-MW98-03-D	F4-HEL-MW98-06-S	F4-HEL-MW98-06-D	RDL	QC Batch
BTEX & F1 Hydrocarbons								
Benzene	ug/g	**5**	<0.005	<0.005	<0.005	<0.005	0.005	3736246
Toluene	ug/g	**0.8**	<0.02	<0.02	<0.02	<0.02	0.02	3736246
Ethylbenzene	ug/g	**20**	<0.01	<0.01	<0.01	<0.01	0.01	3736246
o-Xylene	ug/g	-	<0.02	<0.02	<0.02	<0.02	0.02	3736246
p+m-Xylene	ug/g	-	<0.04	<0.04	<0.04	<0.04	0.04	3736246
Total Xylenes	ug/g	-	<0.04	<0.04	<0.04	<0.04	0.04	3736246
F1 (C6-C10)	ug/g	-	<10	<10	<10	<10	10	3736246
F1 (C6-C10) - BTEX	ug/g	-	<10	<10	<10	<10	10	3736246
F2-F4 Hydrocarbons								
F2 (C10-C16 Hydrocarbons)	ug/g	-	<10	<10	<10	<10	10	3734925
F3 (C16-C34 Hydrocarbons)	ug/g	-	<10	<10	18	100	10	3734925
F4 (C34-C50 Hydrocarbons)	ug/g	-	<10	<10	<10	23	10	3734925
Reached Baseline at C50	ug/g	-	Yes	Yes	Yes	Yes		3734925
Surrogate Recovery (%)								
1,4-Difluorobenzene	%	-	123	98	128	115		3736246
4-Bromofluorobenzene	%	-	93	80	80	83		3736246
D10-Ethylbenzene	%	-	92	81	89	89		3736246
D4-1,2-Dichloroethane	%	-	125	90	124	117		3736246
o-Terphenyl	%	-	94	97	75	112		3734925

RDL = Reportable Detection Limit
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Criteria: CCME Industrial
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PETROLEUM HYDROCARBONS (CCME)

Maxxam ID			XK1960			XK1961		
Sampling Date			2014/08/25			2014/08/25		
COC Number								
	Units	Criteria	F4-STA-MW98-07-S	RDL	QC Batch	F4-STA-MW98-07-D	RDL	QC Batch
BTEX & F1 Hydrocarbons								
Benzene	ug/g	**5**	<0.005	0.005	3736246	<0.005	0.005	3739314
Toluene	ug/g	**0.8**	<0.02	0.02	3736246	<0.02	0.02	3739314
Ethylbenzene	ug/g	**20**	<0.01	0.01	3736246	<0.01	0.01	3739314
o-Xylene	ug/g	-	<0.02	0.02	3736246	<0.02	0.02	3739314
p+m-Xylene	ug/g	-	<0.04	0.04	3736246	<0.04	0.04	3739314
Total Xylenes	ug/g	-	<0.04	0.04	3736246	<0.04	0.04	3739314
F1 (C6-C10)	ug/g	-	<10	10	3736246	<10	10	3739314
F1 (C6-C10) - BTEX	ug/g	-	<10	10	3736246	<10	10	3739314
F2-F4 Hydrocarbons								
F2 (C10-C16 Hydrocarbons)	ug/g	-	<10	10	3734925	<10	10	3738629
F3 (C16-C34 Hydrocarbons)	ug/g	-	28	10	3734925	<50	50	3738629
F4 (C34-C50 Hydrocarbons)	ug/g	-	<10	10	3734925	<50	50	3738629
Reached Baseline at C50	ug/g	-	Yes		3734925	Yes		3738629
Surrogate Recovery (%)								
1,4-Difluorobenzene	%	-	127		3736246			
4-Bromofluorobenzene	%	-	81		3736246			
D10-Ethylbenzene	%	-	85		3736246			
D4-1,2-Dichloroethane	%	-	122		3736246			
1,4-Difluorobenzene	%	-				88		3739314
4-Bromofluorobenzene	%	-				106		3739314
D10-Ethylbenzene	%	-				84		3739314
D4-1,2-Dichloroethane	%	-				89		3739314
o-Terphenyl	%	-				97		3738629
o-Terphenyl	%	-	107		3734925			

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: CCME Industrial
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PETROLEUM HYDROCARBONS (CCME)

Maxxam ID			XK1962	XK1963	XK1964	XK1965		
Sampling Date			2014/08/25	2014/08/25	2014/08/25	2014/08/25		
COC Number								
	Units	Criteria	F4-STA-MW98-08-S	F4-STA-MW98-08-D	F4-STA-MW98-09-S	F4-STA-MW98-09-D	RDL	QC Batch
BTEX & F1 Hydrocarbons								
Benzene	ug/g	**5**	<0.005	<0.005	<0.005	<0.005	0.005	3736246
Toluene	ug/g	**0.8**	<0.02	<0.02	<0.02	<0.02	0.02	3736246
Ethylbenzene	ug/g	**20**	<0.01	<0.01	<0.01	<0.01	0.01	3736246
o-Xylene	ug/g	-	<0.02	<0.02	<0.02	<0.02	0.02	3736246
p+m-Xylene	ug/g	-	<0.04	<0.04	<0.04	<0.04	0.04	3736246
Total Xylenes	ug/g	-	<0.04	<0.04	<0.04	<0.04	0.04	3736246
F1 (C6-C10)	ug/g	-	<10	<10	<10	<10	10	3736246
F1 (C6-C10) - BTEX	ug/g	-	<10	<10	<10	<10	10	3736246
F2-F4 Hydrocarbons								
F2 (C10-C16 Hydrocarbons)	ug/g	-	10	<10	<10	<10	10	3734925
F3 (C16-C34 Hydrocarbons)	ug/g	-	<10	<10	<10	<10	10	3734925
F4 (C34-C50 Hydrocarbons)	ug/g	-	<10	<10	<10	<10	10	3734925
Reached Baseline at C50	ug/g	-	Yes	Yes	Yes	Yes		3734925
Surrogate Recovery (%)								
1,4-Difluorobenzene	%	-	128	124	121	129		3736246
4-Bromofluorobenzene	%	-	86	80	82	90		3736246
D10-Ethylbenzene	%	-	90	89	89	90		3736246
D4-1,2-Dichloroethane	%	-	129	121	122	122		3736246
o-Terphenyl	%	-	116	115	107	107		3734925

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: CCME Industrial
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PETROLEUM HYDROCARBONS (CCME)

Maxxam ID			XK1966	XK1967	XK1968	XK1969		
Sampling Date			2014/08/24	2014/08/24	2014/08/24	2014/08/24		
COC Number								
	Units	Criteria	F4-NH-MW11-01-S	F4-NH-MW11-01-D	F4-NH-MW11-02-S	F4-NH-MW11-02-D	RDL	QC Batch
BTEX & F1 Hydrocarbons								
Benzene	ug/g	**5**	<0.005	<0.005	<0.005	<0.005	0.005	3736246
Toluene	ug/g	**0.8**	<0.02	<0.02	<0.02	<0.02	0.02	3736246
Ethylbenzene	ug/g	**20**	<0.01	<0.01	<0.01	<0.01	0.01	3736246
o-Xylene	ug/g	-	<0.02	<0.02	<0.02	<0.02	0.02	3736246
p+m-Xylene	ug/g	-	<0.04	<0.04	<0.04	<0.04	0.04	3736246
Total Xylenes	ug/g	-	<0.04	<0.04	<0.04	<0.04	0.04	3736246
F1 (C6-C10)	ug/g	-	<10	<10	<10	<10	10	3736246
F1 (C6-C10) - BTEX	ug/g	-	<10	<10	<10	<10	10	3736246
F2-F4 Hydrocarbons								
F2 (C10-C16 Hydrocarbons)	ug/g	-	<10	<10	<10	<10	10	3734925
F3 (C16-C34 Hydrocarbons)	ug/g	-	<10	<10	<10	21	10	3734925
F4 (C34-C50 Hydrocarbons)	ug/g	-	<10	<10	<10	<10	10	3734925
Reached Baseline at C50	ug/g	-	Yes	Yes	Yes	Yes		3734925
Surrogate Recovery (%)								
1,4-Difluorobenzene	%	-	124	117	121	120		3736246
4-Bromofluorobenzene	%	-	71	86	71	78		3736246
D10-Ethylbenzene	%	-	84	93	93	95		3736246
D4-1,2-Dichloroethane	%	-	124	120	122	124		3736246
o-Terphenyl	%	-	110	121	102	107		3734925

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: CCME Industrial
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Report Date: 2014/09/11

Decommissioning Consulting Services Limited
Client Project #: 350600-515
Site Location: FOX-4 CAPE HOOPER
Sampler Initials: SB

PETROLEUM HYDROCARBONS (CCME)

Maxxam ID			XK1984	XK1985	XK1986	XK1987		
Sampling Date			2014/08/24	2014/08/24	2014/08/24	2014/08/24		
COC Number								
	Units	Criteria	F4-NH-MW11-03-S	F4-NH-MW11-03-D	F4-NH-MW11-04-S	F4-NH-MW11-04-D	RDL	QC Batch
BTEX & F1 Hydrocarbons								
Benzene	ug/g	**5**	<0.005	<0.005	<0.005	<0.005	0.005	3736246
Toluene	ug/g	**0.8**	<0.02	<0.02	<0.02	<0.02	0.02	3736246
Ethylbenzene	ug/g	**20**	<0.01	<0.01	<0.01	<0.01	0.01	3736246
o-Xylene	ug/g	-	<0.02	<0.02	<0.02	<0.02	0.02	3736246
p+m-Xylene	ug/g	-	<0.04	<0.04	<0.04	<0.04	0.04	3736246
Total Xylenes	ug/g	-	<0.04	<0.04	<0.04	<0.04	0.04	3736246
F1 (C6-C10)	ug/g	-	<10	<10	<10	<10	10	3736246
F1 (C6-C10) - BTEX	ug/g	-	<10	<10	<10	<10	10	3736246
F2-F4 Hydrocarbons								
F2 (C10-C16 Hydrocarbons)	ug/g	-	<10	<10	<10	<10	10	3734925
F3 (C16-C34 Hydrocarbons)	ug/g	-	39	13	82	<10	10	3734925
F4 (C34-C50 Hydrocarbons)	ug/g	-	<10	<10	14	<10	10	3734925
Reached Baseline at C50	ug/g	-	Yes	Yes	Yes	Yes		3734925
Surrogate Recovery (%)								
1,4-Difluorobenzene	%	-	122	119	121	122		3736246
4-Bromofluorobenzene	%	-	78	80	75	79		3736246
D10-Ethylbenzene	%	-	93	88	90	90		3736246
D4-1,2-Dichloroethane	%	-	127	116	117	122		3736246
o-Terphenyl	%	-	127	107	106	117		3734925

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: CCME Industrial
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Sampler Initials: SB

PETROLEUM HYDROCARBONS (CCME)

Maxxam ID			XK1988	XK1989	XK1990		
Sampling Date			2014/08/24	2014/08/24	2014/08/24		
COC Number							
	Units	Criteria	F4-NH-MW11-05-S	F4-NH-MW11-05-D	F4-NH-MW11-06-S	RDL	QC Batch
BTEX & F1 Hydrocarbons							
Benzene	ug/g	**5**	<0.005	<0.005	<0.005	0.005	3736246
Toluene	ug/g	**0.8**	<0.02	<0.02	<0.02	0.02	3736246
Ethylbenzene	ug/g	**20**	<0.01	<0.01	<0.01	0.01	3736246
o-Xylene	ug/g	-	<0.02	<0.02	<0.02	0.02	3736246
p+m-Xylene	ug/g	-	<0.04	<0.04	<0.04	0.04	3736246
Total Xylenes	ug/g	-	<0.04	<0.04	<0.04	0.04	3736246
F1 (C6-C10)	ug/g	-	<10	<10	<10	10	3736246
F1 (C6-C10) - BTEX	ug/g	-	<10	<10	<10	10	3736246
F2-F4 Hydrocarbons							
F2 (C10-C16 Hydrocarbons)	ug/g	-	<10	<10	<10	10	3734925
F3 (C16-C34 Hydrocarbons)	ug/g	-	43	17	17	10	3734925
F4 (C34-C50 Hydrocarbons)	ug/g	-	<10	<10	<10	10	3734925
Reached Baseline at C50	ug/g	-	Yes	Yes	Yes		3734925
Surrogate Recovery (%)							
1,4-Difluorobenzene	%	-	123	118	118		3736246
4-Bromofluorobenzene	%	-	74	82	80		3736246
D10-Ethylbenzene	%	-	90	83	88		3736246
D4-1,2-Dichloroethane	%	-	122	118	116		3736246
o-Terphenyl	%	-	125	117	110		3734925

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: CCME Industrial
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PETROLEUM HYDROCARBONS (CCME)

Maxxam ID			XK1991	XK1992	XK1993	XK1994		
Sampling Date			2014/08/24	2014/08/24	2014/08/24	2014/08/24		
COC Number								
	Units	Criteria	F4-NH-MW11-06-D	F4-NH-MW12-07-S	F4-NH-MW12-07-D	F4-NH-MW12-08-S	RDL	QC Batch
BTEX & F1 Hydrocarbons								
Benzene	ug/g	**5**	<0.005	<0.005	<0.005	<0.005	0.005	3737250
Toluene	ug/g	**0.8**	<0.02	<0.02	<0.02	<0.02	0.02	3737250
Ethylbenzene	ug/g	**20**	<0.01	<0.01	<0.01	<0.01	0.01	3737250
o-Xylene	ug/g	-	<0.02	<0.02	<0.02	<0.02	0.02	3737250
p+m-Xylene	ug/g	-	<0.04	<0.04	<0.04	<0.04	0.04	3737250
Total Xylenes	ug/g	-	<0.04	<0.04	<0.04	<0.04	0.04	3737250
F1 (C6-C10)	ug/g	-	<10	<10	<10	<10	10	3737250
F1 (C6-C10) - BTEX	ug/g	-	<10	<10	<10	<10	10	3737250
F2-F4 Hydrocarbons								
F2 (C10-C16 Hydrocarbons)	ug/g	-	<10	<10	<10	34	10	3734927
F3 (C16-C34 Hydrocarbons)	ug/g	-	22	56	<10	21	10	3734927
F4 (C34-C50 Hydrocarbons)	ug/g	-	<10	<10	<10	<10	10	3734927
Reached Baseline at C50	ug/g	-	Yes	Yes	Yes	Yes		3734927
Surrogate Recovery (%)								
1,4-Difluorobenzene	%	-	119	117	128	116		3737250
4-Bromofluorobenzene	%	-	72	78	69	80		3737250
D10-Ethylbenzene	%	-	100	99	103	91		3737250
D4-1,2-Dichloroethane	%	-	123	121	115	109		3737250
o-Terphenyl	%	-	81	77	79	82		3734927

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: CCME Industrial
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Sampler Initials: SB

PETROLEUM HYDROCARBONS (CCME)

Maxxam ID			XK1995	XK2004	XK2005	XK2006	XK2007	XK2008		
Sampling Date			2014/08/24	2014/08/25						
COC Number										
	Units	Criteria	F4-NH-MW12-08-D	F4-PAL-25-S	F4-PAL-25-D	F4-PAL-26-S	F4-PAL-26-D	F4-PAL-27-S	RDL	QC Batch
BTEX & F1 Hydrocarbons										
Benzene	ug/g	**5**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.005	3737250
Toluene	ug/g	**0.8**	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	3737250
Ethylbenzene	ug/g	**20**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	3737250
o-Xylene	ug/g	-	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	3737250
p+m-Xylene	ug/g	-	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.04	3737250
Total Xylenes	ug/g	-	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.04	3737250
F1 (C6-C10)	ug/g	-	<10	<10	<10	<10	<10	<10	10	3737250
F1 (C6-C10) - BTEX	ug/g	-	<10	<10	<10	<10	<10	<10	10	3737250
F2-F4 Hydrocarbons										
F2 (C10-C16 Hydrocarbons)	ug/g	-	320	<10	<10	<10	<10	<10	10	3734927
F3 (C16-C34 Hydrocarbons)	ug/g	-	49	<10	<10	24	<10	13	10	3734927
F4 (C34-C50 Hydrocarbons)	ug/g	-	<10	<10	<10	<10	<10	<10	10	3734927
Reached Baseline at C50	ug/g	-	Yes	Yes	Yes	Yes	Yes	Yes		3734927
Surrogate Recovery (%)										
1,4-Difluorobenzene	%	-	120	122	124	117	126	129		3737250
4-Bromofluorobenzene	%	-	77	72	75	72	71	80		3737250
D10-Ethylbenzene	%	-	119	100	98	101	97	102		3737250
D4-1,2-Dichloroethane	%	-	128	118	121	117	113	113		3737250
o-Terphenyl	%	-	80	83	81	75	76	77		3734927

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: CCME Industrial
Canadian Environmental Quality Guidelines for Soil 1998-1999

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Sampler Initials: SB

PETROLEUM HYDROCARBONS (CCME)

Maxxam ID			XK2009	XK2010	XK2011	XK2012	XK2013		
Sampling Date									
COC Number									
	Units	Criteria	F4-PAL-27-D	F4-PAL-28-S	F4-PAL-28-D	F4-PAL-29-S	F4-PAL-29-D	RDL	QC Batch
BTEX & F1 Hydrocarbons									
Benzene	ug/g	**5**	<0.005	<0.005	<0.005	<0.005	<0.005	0.005	3737266
Toluene	ug/g	**0.8**	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	3737266
Ethylbenzene	ug/g	**20**	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	3737266
o-Xylene	ug/g	-	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	3737266
p+m-Xylene	ug/g	-	<0.04	<0.04	<0.04	<0.04	<0.04	0.04	3737266
Total Xylenes	ug/g	-	<0.04	<0.04	<0.04	<0.04	<0.04	0.04	3737266
F1 (C6-C10)	ug/g	-	190	<10	<10	<10	<10	10	3737266
F1 (C6-C10) - BTEX	ug/g	-	190	<10	<10	<10	<10	10	3737266
F2-F4 Hydrocarbons									
F2 (C10-C16 Hydrocarbons)	ug/g	-	2700	<10	<10	<10	<10	10	3734927
F3 (C16-C34 Hydrocarbons)	ug/g	-	380	34	10	130	120	10	3734927
F4 (C34-C50 Hydrocarbons)	ug/g	-	<10	34	<10	19	<10	10	3734927
Reached Baseline at C50	ug/g	-	Yes	Yes	Yes	Yes	Yes		3734927
Surrogate Recovery (%)									
1,4-Difluorobenzene	%	-	118	121	120	121	120		3737266
4-Bromofluorobenzene	%	-	83	102	93	93	93		3737266
D10-Ethylbenzene	%	-	116	83	85	86	77		3737266
D4-1,2-Dichloroethane	%	-	113	122	122	123	122		3737266
o-Terphenyl	%	-	83	79	78	82	78		3734927

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: CCME Industrial
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Sampler Initials: SB

POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID			XK1904		XK1905		XK1906	XK1907		
Sampling Date			2014/08/24		2014/08/24		2014/08/24	2014/08/24		
COC Number			na		na		na	na		
	Units	Criteria	F4-TAN-11-S	QC Batch	F4-TAN-11-D	QC Batch	F4-TAN-12-S	F4-TAN-12-D	RDL	QC Batch
PCBs										
Aroclor 1016	ug/g	-	<0.010	3737684	<0.010	3736297	<0.010	<0.010	0.010	3737684
Aroclor 1221	ug/g	-	<0.010	3737684	<0.010	3736297	<0.010	<0.010	0.010	3737684
Aroclor 1232	ug/g	-	<0.010	3737684	<0.010	3736297	<0.010	<0.010	0.010	3737684
Aroclor 1242	ug/g	-	<0.010	3737684	<0.010	3736297	<0.010	<0.010	0.010	3737684
Aroclor 1248	ug/g	-	<0.010	3737684	<0.010	3736297	<0.010	<0.010	0.010	3737684
Aroclor 1254	ug/g	-	<0.010	3737684	<0.010	3736297	<0.010	<0.010	0.010	3737684
Aroclor 1260	ug/g	-	<0.010	3737684	<0.010	3736297	<0.010	<0.010	0.010	3737684
Aroclor 1262	ug/g	-	<0.010	3737684	<0.010	3736297	<0.010	<0.010	0.010	3737684
Aroclor 1268	ug/g	-	<0.010	3737684	<0.010	3736297	<0.010	<0.010	0.010	3737684
Total PCB	ug/g	**33**	<0.010	3737684	<0.010	3736297	<0.010	<0.010	0.010	3737684
Surrogate Recovery (%)										
Decachlorobiphenyl	%	-	82	3737684	89	3736297	88	83		3737684

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: CCME Industrial
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Sampler Initials: SB

POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID			XK1908	XK1909	XK1910	XK1911		
Sampling Date			2014/08/24	2014/08/24	2014/08/25	2014/08/25		
COC Number			na	na	na	na		
	Units	Criteria	F4-TAN-13-S	F4-TAN-13-D	F4-HEL-MW98-01-S	F4-HEL-MW98-01-D	RDL	QC Batch
PCBs								
Aroclor 1016	ug/g	-	<0.010	<0.010	<0.010	<0.010	0.010	3736297
Aroclor 1221	ug/g	-	<0.010	<0.010	<0.010	<0.010	0.010	3736297
Aroclor 1232	ug/g	-	<0.010	<0.010	<0.010	<0.010	0.010	3736297
Aroclor 1242	ug/g	-	<0.010	<0.010	<0.010	<0.010	0.010	3736297
Aroclor 1248	ug/g	-	<0.010	<0.010	<0.010	<0.010	0.010	3736297
Aroclor 1254	ug/g	-	<0.010	<0.010	<0.010	<0.010	0.010	3736297
Aroclor 1260	ug/g	-	<0.010	<0.010	<0.010	<0.010	0.010	3736297
Aroclor 1262	ug/g	-	<0.010	<0.010	<0.010	<0.010	0.010	3736297
Aroclor 1268	ug/g	-	<0.010	<0.010	<0.010	<0.010	0.010	3736297
Total PCB	ug/g	**33**	<0.010	<0.010	<0.010	<0.010	0.010	3736297
Surrogate Recovery (%)								
Decachlorobiphenyl	%	-	85	87	82	93		3736297

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: CCME Industrial
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Sampler Initials: SB

POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID			XK1912		XK1913	XK1914		
Sampling Date			2014/08/25		2014/08/25	2014/08/25		
COC Number			na		na	na		
	Units	Criteria	F4-HEL-MW98-02-S	QC Batch	F4-HEL-MW98-02-D	F4-HEL-MW98-03-S	RDL	QC Batch
PCBs								
Aroclor 1016	ug/g	-	<0.010	3736297	<0.010	<0.010	0.010	3737684
Aroclor 1221	ug/g	-	<0.010	3736297	<0.010	<0.010	0.010	3737684
Aroclor 1232	ug/g	-	<0.010	3736297	<0.010	<0.010	0.010	3737684
Aroclor 1242	ug/g	-	<0.010	3736297	<0.010	<0.010	0.010	3737684
Aroclor 1248	ug/g	-	<0.010	3736297	<0.010	<0.010	0.010	3737684
Aroclor 1254	ug/g	-	<0.010	3736297	<0.010	<0.010	0.010	3737684
Aroclor 1260	ug/g	-	<0.010	3736297	<0.010	<0.010	0.010	3737684
Aroclor 1262	ug/g	-	<0.010	3736297	<0.010	<0.010	0.010	3737684
Aroclor 1268	ug/g	-	<0.010	3736297	<0.010	<0.010	0.010	3737684
Total PCB	ug/g	**33**	<0.010	3736297	<0.010	<0.010	0.010	3737684
Surrogate Recovery (%)								
Decachlorobiphenyl	%	-	87	3736297	81	86		3737684

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: CCME Industrial
Canadian Environmental Quality Guidelines for Soil 1998-1999

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Sampler Initials: SB

POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID			XK1915		XK1958		XK1959		
Sampling Date			2014/08/25		2014/08/25		2014/08/25		
COC Number			na						
	Units	Criteria	F4-HEL-MW98-03-D	QC Batch	F4-HEL-MW98-06-S	QC Batch	F4-HEL-MW98-06-D	RDL	QC Batch
PCBs									
Aroclor 1016	ug/g	-	<0.010	3736297	<0.010	3737684	<0.010	0.010	3736297
Aroclor 1221	ug/g	-	<0.010	3736297	<0.010	3737684	<0.010	0.010	3736297
Aroclor 1232	ug/g	-	<0.010	3736297	<0.010	3737684	<0.010	0.010	3736297
Aroclor 1242	ug/g	-	<0.010	3736297	<0.010	3737684	<0.010	0.010	3736297
Aroclor 1248	ug/g	-	<0.010	3736297	<0.010	3737684	<0.010	0.010	3736297
Aroclor 1254	ug/g	-	<0.010	3736297	<0.010	3737684	<0.010	0.010	3736297
Aroclor 1260	ug/g	-	<0.010	3736297	<0.010	3737684	<0.010	0.010	3736297
Aroclor 1262	ug/g	-	<0.010	3736297	<0.010	3737684	<0.010	0.010	3736297
Aroclor 1268	ug/g	-	<0.010	3736297	<0.010	3737684	<0.010	0.010	3736297
Total PCB	ug/g	**33**	<0.010	3736297	<0.010	3737684	<0.010	0.010	3736297
Surrogate Recovery (%)									
Decachlorobiphenyl	%	-	84	3736297	96	3737684	80		3736297

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: CCME Industrial
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Report Date: 2014/09/11

Decommissioning Consulting Services Limited
Client Project #: 350600-515
Site Location: FOX-4 CAPE HOOPER
Sampler Initials: SB

POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID			XK1960		XK1961		XK1962		
Sampling Date			2014/08/25		2014/08/25		2014/08/25		
COC Number									
	Units	Criteria	F4-STA-MW98-07-S	QC Batch	F4-STA-MW98-07-D	QC Batch	F4-STA-MW98-08-S	RDL	QC Batch
PCBs									
Aroclor 1016	ug/g	-	<0.010	3737684	<0.010	3736297	<0.010	0.010	3737684
Aroclor 1221	ug/g	-	<0.010	3737684	<0.010	3736297	<0.010	0.010	3737684
Aroclor 1232	ug/g	-	<0.010	3737684	<0.010	3736297	<0.010	0.010	3737684
Aroclor 1242	ug/g	-	<0.010	3737684	<0.010	3736297	<0.010	0.010	3737684
Aroclor 1248	ug/g	-	<0.010	3737684	<0.010	3736297	<0.010	0.010	3737684
Aroclor 1254	ug/g	-	0.032	3737684	<0.010	3736297	0.26	0.010	3737684
Aroclor 1260	ug/g	-	<0.010	3737684	<0.010	3736297	<0.010	0.010	3737684
Aroclor 1262	ug/g	-	<0.010	3737684	<0.010	3736297	<0.010	0.010	3737684
Aroclor 1268	ug/g	-	<0.010	3737684	<0.010	3736297	<0.010	0.010	3737684
Total PCB	ug/g	**33**	0.032	3737684	<0.010	3736297	0.26	0.010	3737684
Surrogate Recovery (%)									
Decachlorobiphenyl	%	-	77	3737684	81	3736297	82		3737684

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: CCME Industrial
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Sampler Initials: SB

POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID			XK1963		XK1964	XK1965		
Sampling Date			2014/08/25		2014/08/25	2014/08/25		
COC Number								
	Units	Criteria	F4-STA-MW98-08-D	QC Batch	F4-STA-MW98-09-S	F4-STA-MW98-09-D	RDL	QC Batch
PCBs								
Aroclor 1016	ug/g	-	<0.010	3737684	<0.010	<0.010	0.010	3738673
Aroclor 1221	ug/g	-	<0.010	3737684	<0.010	<0.010	0.010	3738673
Aroclor 1232	ug/g	-	<0.010	3737684	<0.010	<0.010	0.010	3738673
Aroclor 1242	ug/g	-	<0.010	3737684	<0.010	<0.010	0.010	3738673
Aroclor 1248	ug/g	-	<0.010	3737684	<0.010	<0.010	0.010	3738673
Aroclor 1254	ug/g	-	0.18	3737684	0.10	0.15	0.010	3738673
Aroclor 1260	ug/g	-	<0.010	3737684	<0.010	<0.010	0.010	3738673
Aroclor 1262	ug/g	-	<0.010	3737684	<0.010	<0.010	0.010	3738673
Aroclor 1268	ug/g	-	<0.010	3737684	<0.010	<0.010	0.010	3738673
Total PCB	ug/g	**33**	0.18	3737684	0.10	0.15	0.010	3738673
Surrogate Recovery (%)								
Decachlorobiphenyl	%	-	84	3737684	80	82		3738673

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: CCME Industrial
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POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID			XK1966	XK1967	XK1968	XK1969		
Sampling Date			2014/08/24	2014/08/24	2014/08/24	2014/08/24		
COC Number								
	Units	Criteria	F4-NH-MW11-01-S	F4-NH-MW11-01-D	F4-NH-MW11-02-S	F4-NH-MW11-02-D	RDL	QC Batch
PCBs								
Aroclor 1016	ug/g	-	<0.010	<0.010	<0.010	<0.010	0.010	3737684
Aroclor 1221	ug/g	-	<0.010	<0.010	<0.010	<0.010	0.010	3737684
Aroclor 1232	ug/g	-	<0.010	<0.010	<0.010	<0.010	0.010	3737684
Aroclor 1242	ug/g	-	<0.010	<0.010	<0.010	<0.010	0.010	3737684
Aroclor 1248	ug/g	-	<0.010	<0.010	<0.010	<0.010	0.010	3737684
Aroclor 1254	ug/g	-	<0.010	<0.010	<0.010	0.012	0.010	3737684
Aroclor 1260	ug/g	-	<0.010	<0.010	<0.010	<0.010	0.010	3737684
Aroclor 1262	ug/g	-	<0.010	<0.010	<0.010	<0.010	0.010	3737684
Aroclor 1268	ug/g	-	<0.010	<0.010	<0.010	<0.010	0.010	3737684
Total PCB	ug/g	**33**	<0.010	<0.010	<0.010	0.012	0.010	3737684
Surrogate Recovery (%)								
Decachlorobiphenyl	%	-	85	96	92	89		3737684

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: CCME Industrial
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Sampler Initials: SB

POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID			XK1984	XK1985		XK1986		
Sampling Date			2014/08/24	2014/08/24		2014/08/24		
COC Number								
	Units	Criteria	F4-NH-MW11-03-S	F4-NH-MW11-03-D	QC Batch	F4-NH-MW11-04-S	RDL	QC Batch
PCBs								
Aroclor 1016	ug/g	-	<0.010	<0.010	3737684	<0.010	0.010	3736297
Aroclor 1221	ug/g	-	<0.010	<0.010	3737684	<0.010	0.010	3736297
Aroclor 1232	ug/g	-	<0.010	<0.010	3737684	<0.010	0.010	3736297
Aroclor 1242	ug/g	-	<0.010	<0.010	3737684	<0.010	0.010	3736297
Aroclor 1248	ug/g	-	<0.010	<0.010	3737684	<0.010	0.010	3736297
Aroclor 1254	ug/g	-	0.083	0.048	3737684	<0.010	0.010	3736297
Aroclor 1260	ug/g	-	<0.010	<0.010	3737684	<0.010	0.010	3736297
Aroclor 1262	ug/g	-	<0.010	<0.010	3737684	<0.010	0.010	3736297
Aroclor 1268	ug/g	-	<0.010	<0.010	3737684	<0.010	0.010	3736297
Total PCB	ug/g	**33**	0.083	0.048	3737684	<0.010	0.010	3736297
Surrogate Recovery (%)								
Decachlorobiphenyl	%	-	73	84	3737684	86		3736297

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: CCME Industrial
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POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID			XK1987		XK1988	XK1989		
Sampling Date			2014/08/24		2014/08/24	2014/08/24		
COC Number								
	Units	Criteria	F4-NH-MW11-04-D	QC Batch	F4-NH-MW11-05-S	F4-NH-MW11-05-D	RDL	QC Batch
PCBs								
Aroclor 1016	ug/g	-	<0.010	3737684	<0.010	<0.010	0.010	3738673
Aroclor 1221	ug/g	-	<0.010	3737684	<0.010	<0.010	0.010	3738673
Aroclor 1232	ug/g	-	<0.010	3737684	<0.010	<0.010	0.010	3738673
Aroclor 1242	ug/g	-	<0.010	3737684	<0.010	<0.010	0.010	3738673
Aroclor 1248	ug/g	-	<0.010	3737684	<0.010	<0.010	0.010	3738673
Aroclor 1254	ug/g	-	<0.010	3737684	<0.010	<0.010	0.010	3738673
Aroclor 1260	ug/g	-	<0.010	3737684	<0.010	<0.010	0.010	3738673
Aroclor 1262	ug/g	-	<0.010	3737684	<0.010	<0.010	0.010	3738673
Aroclor 1268	ug/g	-	<0.010	3737684	<0.010	<0.010	0.010	3738673
Total PCB	ug/g	**33**	<0.010	3737684	<0.010	<0.010	0.010	3738673
Surrogate Recovery (%)								
Decachlorobiphenyl	%	-	84	3737684	74	81		3738673

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: CCME Industrial
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Site Location: FOX-4 CAPE HOOPER
Sampler Initials: SB

POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID			XK1990	XK1991		XK1992		
Sampling Date			2014/08/24	2014/08/24		2014/08/24		
COC Number								
	Units	Criteria	F4-NH-MW11-06-S	F4-NH-MW11-06-D	QC Batch	F4-NH-MW12-07-S	RDL	QC Batch
PCBs								
Aroclor 1016	ug/g	-	<0.010	<0.010	3737684	<0.010	0.010	3738673
Aroclor 1221	ug/g	-	<0.010	<0.010	3737684	<0.010	0.010	3738673
Aroclor 1232	ug/g	-	<0.010	<0.010	3737684	<0.010	0.010	3738673
Aroclor 1242	ug/g	-	<0.010	<0.010	3737684	<0.010	0.010	3738673
Aroclor 1248	ug/g	-	<0.010	<0.010	3737684	<0.010	0.010	3738673
Aroclor 1254	ug/g	-	<0.010	<0.010	3737684	<0.010	0.010	3738673
Aroclor 1260	ug/g	-	<0.010	<0.010	3737684	<0.010	0.010	3738673
Aroclor 1262	ug/g	-	<0.010	<0.010	3737684	<0.010	0.010	3738673
Aroclor 1268	ug/g	-	<0.010	<0.010	3737684	<0.010	0.010	3738673
Total PCB	ug/g	**33**	<0.010	<0.010	3737684	<0.010	0.010	3738673
Surrogate Recovery (%)								
Decachlorobiphenyl	%	-	86	86	3737684	81		3738673

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: CCME Industrial
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POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID			XK1993		XK1994	XK1995		
Sampling Date			2014/08/24		2014/08/24	2014/08/24		
COC Number								
	Units	Criteria	F4-NH-MW12-07-D	QC Batch	F4-NH-MW12-08-S	F4-NH-MW12-08-D	RDL	QC Batch
PCBs								
Aroclor 1016	ug/g	-	<0.010	3738673	<0.010	<0.010	0.010	3737684
Aroclor 1221	ug/g	-	<0.010	3738673	<0.010	<0.010	0.010	3737684
Aroclor 1232	ug/g	-	<0.010	3738673	<0.010	<0.010	0.010	3737684
Aroclor 1242	ug/g	-	<0.010	3738673	<0.010	<0.010	0.010	3737684
Aroclor 1248	ug/g	-	<0.010	3738673	<0.010	<0.010	0.010	3737684
Aroclor 1254	ug/g	-	<0.010	3738673	<0.010	<0.010	0.010	3737684
Aroclor 1260	ug/g	-	<0.010	3738673	<0.010	<0.010	0.010	3737684
Aroclor 1262	ug/g	-	<0.010	3738673	<0.010	<0.010	0.010	3737684
Aroclor 1268	ug/g	-	<0.010	3738673	<0.010	<0.010	0.010	3737684
Total PCB	ug/g	**33**	<0.010	3738673	<0.010	<0.010	0.010	3737684
Surrogate Recovery (%)								
Decachlorobiphenyl	%	-	76	3738673	81	90		3737684

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: CCME Industrial
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POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID			XK2004	XK2005	XK2006	XK2007	XK2008	XK2009		
Sampling Date			2014/08/25							
COC Number										
	Units	Criteria	F4-PAL-25-S	F4-PAL-25-D	F4-PAL-26-S	F4-PAL-26-D	F4-PAL-27-S	F4-PAL-27-D	RDL	QC Batch
PCBs										
Aroclor 1016	ug/g	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	3736297
Aroclor 1221	ug/g	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	3736297
Aroclor 1232	ug/g	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	3736297
Aroclor 1242	ug/g	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	3736297
Aroclor 1248	ug/g	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	3736297
Aroclor 1254	ug/g	-	<0.010	<0.010	0.036	<0.010	<0.010	<0.010	0.010	3736297
Aroclor 1260	ug/g	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	3736297
Aroclor 1262	ug/g	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	3736297
Aroclor 1268	ug/g	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	3736297
Total PCB	ug/g	**33**	<0.010	<0.010	0.036	<0.010	<0.010	<0.010	0.010	3736297
Surrogate Recovery (%)										
Decachlorobiphenyl	%	-	92	80	81	89	89	88		3736297

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: CCME Industrial
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Client Project #: 350600-515
Site Location: FOX-4 CAPE HOOPER
Sampler Initials: SB

POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID			XK2010	XK2011	XK2012	XK2013		
Sampling Date								
COC Number								
	Units	Criteria	F4-PAL-28-S	F4-PAL-28-D	F4-PAL-29-S	F4-PAL-29-D	RDL	QC Batch
PCBs								
Aroclor 1016	ug/g	-	<0.010	<0.010	<0.010	<0.010	0.010	3736297
Aroclor 1221	ug/g	-	<0.010	<0.010	<0.010	<0.010	0.010	3736297
Aroclor 1232	ug/g	-	<0.010	<0.010	<0.010	<0.010	0.010	3736297
Aroclor 1242	ug/g	-	<0.010	<0.010	<0.010	<0.010	0.010	3736297
Aroclor 1248	ug/g	-	<0.010	<0.010	<0.010	<0.010	0.010	3736297
Aroclor 1254	ug/g	-	<0.010	<0.010	<0.010	<0.010	0.010	3736297
Aroclor 1260	ug/g	-	<0.010	<0.010	<0.010	<0.010	0.010	3736297
Aroclor 1262	ug/g	-	<0.010	<0.010	<0.010	<0.010	0.010	3736297
Aroclor 1268	ug/g	-	<0.010	<0.010	<0.010	<0.010	0.010	3736297
Total PCB	ug/g	**33**	<0.010	<0.010	<0.010	<0.010	0.010	3736297
Surrogate Recovery (%)								
Decachlorobiphenyl	%	-	90	91	83	84		3736297

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: CCME Industrial
Canadian Environmental Quality Guidelines for Soil 1998-1999

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ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		XK2030	XK2031	XK2032	XK2033	XK2034		
Sampling Date		2014/08/24	2014/08/24	2014/08/24	2014/08/24	2014/08/24		
	Units	F4-NH-MW11-01	F4-NH-MW11-02	F4-NH-MW11-03	F4-NH-MW11-04	F4-NH-MW11-05	RDL	QC Batch
Metals								
Mercury (Hg)	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	3741391

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		XK2035	XK2036	XK2037	XK2038	XK2039		
Sampling Date		2014/08/24	2014/08/25	2014/08/25	2014/08/25	2014/08/25		
	Units	F4-NH-MW12-07	F4-STA-MW98-07	F4-HEL-MW98-01	F4-HEL-MW98-02	F4-HEL-MW98-03	RDL	QC Batch
Metals								
Mercury (Hg)	mg/L	<0.00010					0.00010	3741391
Mercury (Hg)	ug/L		<0.01	<0.01	<0.01	<0.01	0.01	3739875

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Sampler Initials: SB

PETROLEUM HYDROCARBONS (CCME)

Maxxam ID		XK2030	XK2031	XK2032	XK2033	XK2034		
Sampling Date		2014/08/24	2014/08/24	2014/08/24	2014/08/24	2014/08/24		
	Units	F4-NH-MW11-01	F4-NH-MW11-02	F4-NH-MW11-03	F4-NH-MW11-04	F4-NH-MW11-05	RDL	QC Batch
BTEX & F1 Hydrocarbons								
Benzene	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	3735534
Toluene	ug/L	<0.20	0.41	0.97	<0.20	<0.20	0.20	3735534
Ethylbenzene	ug/L	<0.20	0.51	<0.20	<0.20	<0.20	0.20	3735534
o-Xylene	ug/L	<0.20	3.4	0.48	<0.20	<0.20	0.20	3735534
p+m-Xylene	ug/L	<0.40	1.7	0.46	<0.40	<0.40	0.40	3735534
Total Xylenes	ug/L	<0.40	5.1	0.95	<0.40	<0.40	0.40	3735534
F1 (C6-C10)	ug/L	<25	72	28	31	33	25	3735534
F1 (C6-C10) - BTEX	ug/L	<25	66	26	31	33	25	3735534
F2-F4 Hydrocarbons								
F2 (C10-C16 Hydrocarbons)	ug/L	<100	120	<100	<100	<100	100	3735514
F3 (C16-C34 Hydrocarbons)	ug/L	<100	<100	<100	<100	<100	100	3735514
F4 (C34-C50 Hydrocarbons)	ug/L	<100	<100	<100	<100	<100	100	3735514
Reached Baseline at C50	ug/L	Yes	Yes	Yes	Yes	Yes		3735514
Surrogate Recovery (%)								
1,4-Difluorobenzene	%	93	113	114	113	115		3735534
4-Bromofluorobenzene	%	97	89	89	90	98		3735534
D10-Ethylbenzene	%	90	79	95	91	92		3735534
D4-1,2-Dichloroethane	%	83	104	103	106	104		3735534
o-Terphenyl	%	90	94	91	92	94		3735514

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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PETROLEUM HYDROCARBONS (CCME)

Maxxam ID		XK2035	XK2036	XK2037	XK2038	XK2039		
Sampling Date		2014/08/24	2014/08/25	2014/08/25	2014/08/25	2014/08/25		
	Units	F4-NH-MW12-07	F4-STA-MW98-07	F4-HEL-MW98-01	F4-HEL-MW98-02	F4-HEL-MW98-03	RDL	QC Batch
BTEX & F1 Hydrocarbons								
Benzene	ug/L	<0.20	<0.20	<0.20	0.47	<0.20	0.20	3735534
Toluene	ug/L	<0.20	<0.20	<0.20	5.7	<0.20	0.20	3735534
Ethylbenzene	ug/L	<0.20	<0.20	<0.20	4.8	<0.20	0.20	3735534
o-Xylene	ug/L	<0.20	<0.20	<0.20	22	<0.20	0.20	3735534
p+m-Xylene	ug/L	<0.40	<0.40	<0.40	10	<0.40	0.40	3735534
Total Xylenes	ug/L	<0.40	<0.40	<0.40	32	<0.40	0.40	3735534
F1 (C6-C10)	ug/L	<25	<25	41	400	<25	25	3735534
F1 (C6-C10) - BTEX	ug/L	<25	<25	41	350	<25	25	3735534
F2-F4 Hydrocarbons								
F2 (C10-C16 Hydrocarbons)	ug/L	<100	<100	<100	940	<100	100	3735514
F3 (C16-C34 Hydrocarbons)	ug/L	<100	<100	<100	<100	<100	100	3735514
F4 (C34-C50 Hydrocarbons)	ug/L	<100	<100	<100	<100	<100	100	3735514
Reached Baseline at C50	ug/L	Yes	Yes	Yes	Yes	Yes		3735514
Surrogate Recovery (%)								
1,4-Difluorobenzene	%	113	118	115	116	115		3735534
4-Bromofluorobenzene	%	89	89	90	88	99		3735534
D10-Ethylbenzene	%	77	95	85	86	81		3735534
D4-1,2-Dichloroethane	%	104	107	105	103	104		3735534
o-Terphenyl	%	94	92	94	92	91		3735514

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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POLYCHLORINATED BIPHENYLS BY GC-ECD (WATER)

Maxxam ID		XK2030	XK2031	XK2032	XK2033	XK2034		
Sampling Date		2014/08/24	2014/08/24	2014/08/24	2014/08/24	2014/08/24		
	Units	F4-NH-MW11-01	F4-NH-MW11-02	F4-NH-MW11-03	F4-NH-MW11-04	F4-NH-MW11-05	RDL	QC Batch
PCBs								
Aroclor 1016	ug/L	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	3737223
Aroclor 1221	ug/L	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	3737223
Aroclor 1232	ug/L	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	3737223
Aroclor 1242	ug/L	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	3737223
Aroclor 1248	ug/L	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	3737223
Aroclor 1254	ug/L	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	3737223
Aroclor 1260	ug/L	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	3737223
Aroclor 1262	ug/L	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	3737223
Aroclor 1268	ug/L	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	3737223
Total PCB	ug/L	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	3737223
Surrogate Recovery (%)								
Decachlorobiphenyl	%	72	70	75	91	92		3737223

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		XK2035	XK2036	XK2037	XK2038	XK2039		
Sampling Date		2014/08/24	2014/08/25	2014/08/25	2014/08/25	2014/08/25		
	Units	F4-NH-MW12-07	F4-STA-MW98-07	F4-HEL-MW98-01	F4-HEL-MW98-02	F4-HEL-MW98-03	RDL	QC Batch
PCBs								
Aroclor 1016	ug/L	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	3737223
Aroclor 1221	ug/L	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	3737223
Aroclor 1232	ug/L	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	3737223
Aroclor 1242	ug/L	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	3737223
Aroclor 1248	ug/L	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	3737223
Aroclor 1254	ug/L	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	3737223
Aroclor 1260	ug/L	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	3737223
Aroclor 1262	ug/L	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	3737223
Aroclor 1268	ug/L	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	3737223
Total PCB	ug/L	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	3737223
Surrogate Recovery (%)								
Decachlorobiphenyl	%	78	79	83	81	86		3737223

RDL = Reportable Detection Limit
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GENERAL COMMENTS

Results relate only to the items tested.

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QUALITY ASSURANCE REPORT

Decommissioning Consulting Services Li...
Client Project #: 350600-515
Site Location: FOX-4 CAPE HOOPER
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			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits
3734889	o-Terphenyl	2014/09/05	80	30 - 130	78	30 - 130	80	%		
3734925	o-Terphenyl	2014/09/05	117	30 - 130	95	30 - 130	113	%		
3734927	o-Terphenyl	2014/09/06	90	30 - 130	82	30 - 130	77	%		
3735514	o-Terphenyl	2014/09/04	95	30 - 130	95	30 - 130	96	%		
3735534	1,4-Difluorobenzene	2014/09/04	111	70 - 130	123	70 - 130	97	%		
3735534	4-Bromofluorobenzene	2014/09/04	114	70 - 130	121	70 - 130	95	%		
3735534	D10-Ethylbenzene	2014/09/04	94	70 - 130	104	70 - 130	81	%		
3735534	D4-1,2-Dichloroethane	2014/09/04	96	70 - 130	104	70 - 130	82	%		
3736246	1,4-Difluorobenzene	2014/09/04	126	60 - 140	113	60 - 140	97	%		
3736246	4-Bromofluorobenzene	2014/09/04	82	60 - 140	107	60 - 140	83	%		
3736246	D10-Ethylbenzene	2014/09/04	91	30 - 130	89	30 - 130	76	%		
3736246	D4-1,2-Dichloroethane	2014/09/04	120	60 - 140	106	60 - 140	91	%		
3736297	Decachlorobiphenyl	2014/09/04	80	60 - 130	84	60 - 130	85	%		
3737223	Decachlorobiphenyl	2014/09/06	95	60 - 130	94	60 - 130	82	%		
3737250	1,4-Difluorobenzene	2014/09/05	124	60 - 140	128	60 - 140	127	%		
3737250	4-Bromofluorobenzene	2014/09/05	98	60 - 140	81	60 - 140	79	%		
3737250	D10-Ethylbenzene	2014/09/05	120	30 - 130	93	30 - 130	95	%		
3737250	D4-1,2-Dichloroethane	2014/09/05	112	60 - 140	118	60 - 140	126	%		
3737266	1,4-Difluorobenzene	2014/09/06	126	60 - 140	130	60 - 140	126	%		
3737266	4-Bromofluorobenzene	2014/09/06	86	60 - 140	77	60 - 140	70	%		
3737266	D10-Ethylbenzene	2014/09/06	95	30 - 130	99	30 - 130	104	%		
3737266	D4-1,2-Dichloroethane	2014/09/06	129	60 - 140	123	60 - 140	127	%		
3737684	Decachlorobiphenyl	2014/09/05	91	60 - 130	76	60 - 130	81	%		
3738629	o-Terphenyl	2014/09/08	96	60 - 130	95	60 - 130	100	%		
3738673	Decachlorobiphenyl	2014/09/07	76	60 - 130	81	60 - 130	73	%		
3739314	1,4-Difluorobenzene	2014/09/09	89	60 - 140	89	60 - 140	89	%		
3739314	4-Bromofluorobenzene	2014/09/09	105	60 - 140	106	60 - 140	106	%		
3739314	D10-Ethylbenzene	2014/09/09	92	60 - 140	88	60 - 140	90	%		
3739314	D4-1,2-Dichloroethane	2014/09/09	87	60 - 140	86	60 - 140	87	%		
3734883	Moisture	2014/09/05							3.7	50
3734885	Moisture	2014/09/05							26	50
3734887	Moisture	2014/09/08							12	50

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Decommissioning Consulting Services Li...
Client Project #: 350600-515
Site Location: FOX-4 CAPE HOOPER
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			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits
3734889	F2 (C10-C16 Hydrocarbons)	2014/09/06	89	50 - 130	90	80 - 120	<10	ug/g	NC	50
3734889	F3 (C16-C34 Hydrocarbons)	2014/09/06	89	50 - 130	90	80 - 120	<10	ug/g	2.8	50
3734889	F4 (C34-C50 Hydrocarbons)	2014/09/06	89	50 - 130	90	80 - 120	<10	ug/g	9.0	50
3734925	F2 (C10-C16 Hydrocarbons)	2014/09/05	126	50 - 130	99	80 - 120	<10	ug/g	NC	50
3734925	F3 (C16-C34 Hydrocarbons)	2014/09/05	126	50 - 130	99	80 - 120	<10	ug/g	NC	50
3734925	F4 (C34-C50 Hydrocarbons)	2014/09/05	126	50 - 130	99	80 - 120	<10	ug/g	NC	50
3734927	F2 (C10-C16 Hydrocarbons)	2014/09/06	97	50 - 130	85	80 - 120	<10	ug/g	NC	50
3734927	F3 (C16-C34 Hydrocarbons)	2014/09/06	97	50 - 130	85	80 - 120	<10	ug/g	NC	50
3734927	F4 (C34-C50 Hydrocarbons)	2014/09/06	97	50 - 130	85	80 - 120	<10	ug/g	NC	50
3735514	F2 (C10-C16 Hydrocarbons)	2014/09/04	76	50 - 130	75	60 - 130	<100	ug/L		
3735514	F3 (C16-C34 Hydrocarbons)	2014/09/04	76	50 - 130	75	60 - 130	<100	ug/L		
3735514	F4 (C34-C50 Hydrocarbons)	2014/09/04	76	50 - 130	75	60 - 130	<100	ug/L		
3735534	Benzene	2014/09/04	97	70 - 130	90	70 - 130	<0.20	ug/L	NC	40
3735534	Ethylbenzene	2014/09/04	81	70 - 130	84	70 - 130	<0.20	ug/L	NC	40
3735534	F1 (C6-C10) - BTEX	2014/09/04					<25	ug/L	5.3	40
3735534	F1 (C6-C10)	2014/09/04	118	70 - 130	87	70 - 130	<25	ug/L	4.4	40
3735534	o-Xylene	2014/09/04	123	70 - 130	81	70 - 130	<0.20	ug/L	1.1	40
3735534	p+m-Xylene	2014/09/04	77	70 - 130	81	70 - 130	<0.40	ug/L	2.4	40
3735534	Toluene	2014/09/04	76	70 - 130	82	70 - 130	<0.20	ug/L	NC	40
3735534	Total Xylenes	2014/09/04					<0.40	ug/L	0.55	40
3736246	Benzene	2014/09/04	77	60 - 140	77	60 - 140	<0.005	ug/g	NC	50
3736246	Ethylbenzene	2014/09/04	73	60 - 140	78	60 - 140	<0.01	ug/g	NC	50
3736246	F1 (C6-C10) - BTEX	2014/09/04					<10	ug/g	NC	50
3736246	F1 (C6-C10)	2014/09/04	100	60 - 140	92	80 - 120	<10	ug/g	NC	50
3736246	o-Xylene	2014/09/04	79	60 - 140	90	60 - 140	<0.02	ug/g	NC	50
3736246	p+m-Xylene	2014/09/04	69	60 - 140	70	60 - 140	<0.04	ug/g	NC	50
3736246	Toluene	2014/09/04	73	60 - 140	76	60 - 140	<0.02	ug/g	NC	50
3736246	Total Xylenes	2014/09/04					<0.04	ug/g	NC	50
3736297	Aroclor 1016	2014/09/04					<0.010	ug/g	NC	50
3736297	Aroclor 1221	2014/09/04					<0.010	ug/g	NC	50
3736297	Aroclor 1232	2014/09/04					<0.010	ug/g	NC	50
3736297	Aroclor 1242	2014/09/04					<0.010	ug/g	NC	50

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Site Location: FOX-4 CAPE HOOPER
Sampler Initials: SB

			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits
3736297	Aroclor 1248	2014/09/04					<0.010	ug/g	NC	50
3736297	Aroclor 1254	2014/09/04					<0.010	ug/g	NC	50
3736297	Aroclor 1260	2014/09/04	93	60 - 130	99	60 - 130	<0.010	ug/g	NC	50
3736297	Aroclor 1262	2014/09/04					<0.010	ug/g	NC	50
3736297	Aroclor 1268	2014/09/04					<0.010	ug/g	NC	50
3736297	Total PCB	2014/09/04	93	60 - 130	99	60 - 130	<0.010	ug/g	NC	50
3736784	Moisture	2014/09/04							1.6	20
3737223	Aroclor 1016	2014/09/06					<0.05	ug/L	NC	40
3737223	Aroclor 1221	2014/09/06					<0.05	ug/L	NC	40
3737223	Aroclor 1232	2014/09/06					<0.05	ug/L	NC	40
3737223	Aroclor 1242	2014/09/06					<0.05	ug/L	NC	30
3737223	Aroclor 1248	2014/09/06					<0.05	ug/L	NC	30
3737223	Aroclor 1254	2014/09/06					<0.05	ug/L	NC	30
3737223	Aroclor 1260	2014/09/06	73	60 - 130	71	60 - 130	<0.05	ug/L	NC	30
3737223	Aroclor 1262	2014/09/06					<0.05	ug/L	NC	40
3737223	Aroclor 1268	2014/09/06					<0.05	ug/L	NC	40
3737223	Total PCB	2014/09/06	73	60 - 130	71	60 - 130	<0.05	ug/L	NC	40
3737250	Benzene	2014/09/06	88	60 - 140	94	60 - 140	<0.005	ug/g	NC	50
3737250	Ethylbenzene	2014/09/06	75	60 - 140	79	60 - 140	<0.01	ug/g	NC	50
3737250	F1 (C6-C10) - BTEX	2014/09/06					<10	ug/g	NC	50
3737250	F1 (C6-C10)	2014/09/06	90	60 - 140	93	80 - 120	<10	ug/g	NC	50
3737250	o-Xylene	2014/09/06	76	60 - 140	87	60 - 140	<0.02	ug/g	NC	50
3737250	p+m-Xylene	2014/09/06	70	60 - 140	71	60 - 140	<0.04	ug/g	NC	50
3737250	Toluene	2014/09/06	75	60 - 140	76	60 - 140	<0.02	ug/g	NC	50
3737250	Total Xylenes	2014/09/06					<0.04	ug/g	NC	50
3737266	Benzene	2014/09/08	78	60 - 140	88	60 - 140	<0.005	ug/g	NC	50
3737266	Ethylbenzene	2014/09/08	78	60 - 140	75	60 - 140	<0.01	ug/g	NC	50
3737266	F1 (C6-C10) - BTEX	2014/09/08					<10	ug/g	NC	50
3737266	F1 (C6-C10)	2014/09/08	91	60 - 140	93	80 - 120	<10	ug/g	NC	50
3737266	o-Xylene	2014/09/08	81	60 - 140	78	60 - 140	<0.02	ug/g	NC	50
3737266	p+m-Xylene	2014/09/08	70	60 - 140	71	60 - 140	<0.04	ug/g	NC	50
3737266	Toluene	2014/09/08	75	60 - 140	79	60 - 140	<0.02	ug/g	NC	50

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Site Location: FOX-4 CAPE HOOPER
Sampler Initials: SB

			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits
3737266	Total Xylenes	2014/09/08					<0.04	ug/g	NC	50
3737684	Aroclor 1016	2014/09/05					<0.010	ug/g	NC	50
3737684	Aroclor 1221	2014/09/05					<0.010	ug/g	NC	50
3737684	Aroclor 1232	2014/09/05					<0.010	ug/g	NC	50
3737684	Aroclor 1242	2014/09/05					<0.010	ug/g	NC	50
3737684	Aroclor 1248	2014/09/05					<0.010	ug/g	NC	50
3737684	Aroclor 1254	2014/09/05					<0.010	ug/g	NC	50
3737684	Aroclor 1260	2014/09/05	93	60 - 130	86	60 - 130	<0.010	ug/g	NC	50
3737684	Aroclor 1262	2014/09/05					<0.010	ug/g	NC	50
3737684	Aroclor 1268	2014/09/05					<0.010	ug/g	NC	50
3737684	Total PCB	2014/09/05	93	60 - 130	86	60 - 130	<0.010	ug/g	NC	50
3738629	F2 (C10-C16 Hydrocarbons)	2014/09/08	103	50 - 130	102	80 - 120	<10	ug/g	NC	30
3738629	F3 (C16-C34 Hydrocarbons)	2014/09/08	103	50 - 130	102	80 - 120	<50	ug/g	NC	30
3738629	F4 (C34-C50 Hydrocarbons)	2014/09/08	111	50 - 130	110	80 - 120	<50	ug/g	NC	30
3738673	Aroclor 1016	2014/09/07					<0.010	ug/g	NC	50
3738673	Aroclor 1221	2014/09/07					<0.010	ug/g	NC	50
3738673	Aroclor 1232	2014/09/07					<0.010	ug/g	NC	50
3738673	Aroclor 1242	2014/09/07					<0.010	ug/g	NC	50
3738673	Aroclor 1248	2014/09/07					<0.010	ug/g	NC	50
3738673	Aroclor 1254	2014/09/07					<0.010	ug/g	NC	50
3738673	Aroclor 1260	2014/09/07	81	60 - 130	90	60 - 130	<0.010	ug/g	NC	50
3738673	Aroclor 1262	2014/09/07					<0.010	ug/g	NC	50
3738673	Aroclor 1268	2014/09/07					<0.010	ug/g	NC	50
3738673	Total PCB	2014/09/07	81	60 - 130	90	60 - 130	<0.010	ug/g	NC	50
3739269	Acid Extractable Arsenic (As)	2014/09/09	NC	75 - 125	103	80 - 120	<1.0	ug/g	2.9	30
3739269	Acid Extractable Cadmium (Cd)	2014/09/09	105	75 - 125	102	80 - 120	<0.10	ug/g	NC	30
3739269	Acid Extractable Chromium (Cr)	2014/09/09	NC	75 - 125	102	80 - 120	<1.0	ug/g	0.56	30
3739269	Acid Extractable Cobalt (Co)	2014/09/09	110	75 - 125	104	80 - 120	<0.10	ug/g	3.4	30
3739269	Acid Extractable Copper (Cu)	2014/09/09	NC	75 - 125	103	80 - 120	<0.50	ug/g	1.4	30
3739269	Acid Extractable Lead (Pb)	2014/09/09	104	75 - 125	104	80 - 120	<1.0	ug/g	1.5	30
3739269	Acid Extractable Mercury (Hg)	2014/09/09	109	75 - 125	108	80 - 120	<0.050	ug/g	NC	30
3739269	Acid Extractable Nickel (Ni)	2014/09/09	NC	75 - 125	102	80 - 120	<0.50	ug/g	0.42	30

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QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits
3739269	Acid Extractable Zinc (Zn)	2014/09/09	NC	75 - 125	102	80 - 120	<5.0	ug/g	0.97	30
3739314	Benzene	2014/09/09	88	60 - 140	89	60 - 140	<0.005	ug/g	NC	50
3739314	Ethylbenzene	2014/09/09	102	60 - 140	101	60 - 140	<0.01	ug/g	NC	50
3739314	F1 (C6-C10) - BTEX	2014/09/09					<10	ug/g	NC	50
3739314	F1 (C6-C10)	2014/09/09	90	60 - 140	95	80 - 120	<10	ug/g	NC	50
3739314	o-Xylene	2014/09/09	94	60 - 140	92	60 - 140	<0.02	ug/g	NC	50
3739314	p+m-Xylene	2014/09/09	90	60 - 140	90	60 - 140	<0.04	ug/g	NC	50
3739314	Toluene	2014/09/09	92	60 - 140	93	60 - 140	<0.02	ug/g	NC	50
3739314	Total Xylenes	2014/09/09					<0.04	ug/g	NC	50
3739567	Acid Extractable Arsenic (As)	2014/09/10	NC	75 - 125	101	80 - 120	<1.0	ug/g	16	30
3739567	Acid Extractable Cadmium (Cd)	2014/09/10	103	75 - 125	99	80 - 120	<0.10	ug/g	NC	30
3739567	Acid Extractable Chromium (Cr)	2014/09/10	NC	75 - 125	99	80 - 120	<1.0	ug/g	6.2	30
3739567	Acid Extractable Cobalt (Co)	2014/09/10	101	75 - 125	101	80 - 120	<0.10	ug/g	0.74	30
3739567	Acid Extractable Copper (Cu)	2014/09/10	NC	75 - 125	101	80 - 120	<0.50	ug/g	7.7	30
3739567	Acid Extractable Lead (Pb)	2014/09/10	100	75 - 125	99	80 - 120	<1.0	ug/g	NC	30
3739567	Acid Extractable Mercury (Hg)	2014/09/10	107	75 - 125	104	80 - 120	<0.050	ug/g	NC	30
3739567	Acid Extractable Nickel (Ni)	2014/09/10	NC	75 - 125	101	80 - 120	<0.50	ug/g	0.67	30
3739567	Acid Extractable Zinc (Zn)	2014/09/10	NC	75 - 125	97	80 - 120	<5.0	ug/g	5.9	30
3739716	Acid Extractable Arsenic (As)	2014/09/09	NC	75 - 125	102	80 - 120	<1.0	ug/g	21	30
3739716	Acid Extractable Cadmium (Cd)	2014/09/09	99	75 - 125	98	80 - 120	<0.10	ug/g	NC	30
3739716	Acid Extractable Chromium (Cr)	2014/09/09	NC	75 - 125	101	80 - 120	<1.0	ug/g	2.9	30
3739716	Acid Extractable Cobalt (Co)	2014/09/09	101	75 - 125	102	80 - 120	<0.10	ug/g	1.7	30
3739716	Acid Extractable Copper (Cu)	2014/09/09	NC	75 - 125	102	80 - 120	<0.50	ug/g	2.5	30
3739716	Acid Extractable Lead (Pb)	2014/09/09	99	75 - 125	102	80 - 120	<1.0	ug/g	0.76	30
3739716	Acid Extractable Mercury (Hg)	2014/09/09	104	75 - 125	103	80 - 120	<0.050	ug/g	NC	30
3739716	Acid Extractable Nickel (Ni)	2014/09/09	NC	75 - 125	101	80 - 120	<0.50	ug/g	1.8	30
3739716	Acid Extractable Zinc (Zn)	2014/09/09	NC	75 - 125	101	80 - 120	<5.0	ug/g	0.41	30
3739875	Mercury (Hg)	2014/09/09	95	75 - 125	91	80 - 120	<0.01	ug/L	NC	20
3741391	Mercury (Hg)	2014/09/10	102	80 - 120	99	80 - 120	<0.00010	mg/L	NC	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.

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Maxxam Job #: B4G0864
Report Date: 2014/09/11

QUALITY ASSURANCE REPORT(CONT'D)

Decommissioning Consulting Services Li...
Client Project #: 350600-515
Site Location: FOX-4 CAPE HOOPER
Sampler Initials: SB

			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits

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

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

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

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

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Maxxam Job #: B4G0864
Report Date: 2014/09/11

Decommissioning Consulting Services Limited
Client Project #: 350600-515
Site Location: FOX-4 CAPE HOOPER
Sampler Initials: SB

VALIDATION SIGNATURE PAGE

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

Cristina Carriere, Scientific Services

Paul Rubinato, Analyst, Maxxam Analytics

Steve Roberts, Lab Supervisor, Ottawa

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DCS SENES Consultants AN AECOM COMPANY

121 Granton Drive, Unit 11, Richmond Hill, ON
Tel: (905) 882-5984 Fax: (905) 882-8962
Email: engineers@dcsltd.ca Website: www.dcsltd.ca

Chain of Custody Record

Shipper

Project No.: 350600-515 **Site:** FOX-4 Cape Hooper
Project Manager: S. Borcsok
Field Engineer/Techician: S. Borcsok/J. Mauchan
Date: 26 August/14 **Route:** Courier
Lab: MAXXAM **Location** Ottawa
Required Date: _____ **Turnaround:** STD Day(s)
Quotation No.: _____
MDL's To Meet: SEE ATTACHED

Analyses Requested

Location/ Hole No.	Sample No.	Depth (m)	Description	Label No.	Grab/ Comp.	Date Collected	PHCs F1	PHCs F2-F4	PCBs	Inorganics: As, Cd, Cr, Co, Cu, Pb, Ni, Zn, Hg
F4-TAN-11-	S		SOIL			24Aug/14	X	X	X	X
F4-TAN-11-	D						X	X	X	X
F4-TAN-12-	S						X	X	X	X
F4-TAN-12-	D						X	X	X	X
F4-TAN-13-	S						X	X	X	X
F4-TAN-13-	D						X	X	X	X
F4-HEL-MW	98-01-S					25Aug/14	X	X	X	X
F4-HEL-MW9	8-01-D						X	X	X	X
F4-HEL-MW98	-02-S						X	X	X	X
F4-HEL-MW98	-02-D						X	X	X	X
F4-HEL-MW98	-03-S						X	X	X	X
F4-HEL-MW98	-03-D						X	X	X	X

Notice temps: 6,7,7 5,7,5 5,5,5 6,7,6 7,8,7

REC'D IN OTTAWA

Field Procedures

pH	Electrical Conductivity	Preservatives

3-Sep-14 13:15
Keshani Vijh
B4G0864
KP2 OTT-002

Relinquished By:	Date:	Time:	Received By:
	2014/09/03	13:10	Kelsey Pelan 2014/09/03 13:15
Relinquished By:	Date:	Time:	Received By:
Relinquished By:	Date:	Time:	Received By:

Laboratory

Remarks:
ALL RESULTS ARE TO BE SENT TO THE PROJECT MANAGER.

Project No. and Date

(Revision 1 - 17 May 2012)

DCS SENES Consultants AN AECOM COMPANY

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Email: engineers@dcsltd.ca Website: www.dcsltd.ca

Chain of Custody Record

Shipper

Project No.: 350600-515 **Site:** FOX-4 Cape Hooper
Project Manager: S. Borcsok
Field Engineer/Techician: S. Borcsok/J. Mauchan
Date: 26 August /14 **Route:** Courier
Lab: MAXXAM **Location** Ottawa
Required Date: _____ **Turnaround:** STD Day(s)
Quotation No.: _____
MDL's To Meet: _____

Analyses Requested

Location/ Hole No.	Sample No.	Depth (m)	Description	Label No.	Grab/ Comp.	Date Collected	PHCs F1	PHCs F2-F4	PCBs	Inorganics: As, Cd, Cr, Co, Cu, Pb, Ni, Zn, Hg								
FY-HEL-MW98-	06-S		SOIL			25Aug/14	X	X	X	X								
FY-HEL-MW98	06-D						X	X	X	X								
FY-STA-MW98	-07-S						X	X	X	X								
FY-STA-MW98	-07-D						X	X	X	X								
FY-STA-MW98	-08-S						X	X	X	X								
FY-STA-MW98	-08-D						X	X	X	X								
FY-STA-MW98	-09-S						X	X	X	X								
FY-STA-MW98	-09-D						X	X	X	X								
FY-NH-MW11	-01-S					24Aug/14	X	X	X	X								
FY-NH-MW11	-01-D						X	X	X	X								
FY-NH-MW11	-02-S						X	X	X	X								
FY-NH-MW11	-02-D						X	X	X	X								

No ice
temps: 6,7,7 5,7,5
5,5,5 6,7,6 7,8,7

REC'D IN OTTAWA

Field Procedures

pH	Electrical Conductivity	Preservatives

Relinquished By:	Date:	Time:	Received By:
	2014/09/03	13:10	Kelsey Pilon Kelsey Pilon
Relinquished By:	Date:	Time:	Received By:
Relinquished By:	Date:	Time:	Received By:

Laboratory

Remarks:
ALL RESULTS ARE TO BE SENT TO THE PROJECT MANAGER.

Project No. and Date

(Revision 1 - 17 May 2012)

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Chain of Custody Record

Shipper

Project No.: 350600-515 **Site:** FOX-4 Cape Hopper
Project Manager: S. Borcsok
Field Engineer/Techician: S. Borcsok/J. Mauchan
Date: 26 August /14 **Route:** Courier
Lab: MAXXAM **Location** Ottawa
Required Date: _____ **Turnaround:** STD Day(s)
Quotation No.: _____
MDL's To Meet: _____

Analyses Requested

No ice
temps: 6,7,7 5,7,5
5,5,5 6,7,6 7,8,7
REC'D IN OTTAWA

Location/ Hole No.	Sample No.	Depth (m)	Description	Label No.	Grab/ Comp.	Date Collected	PHCs F1	PHCs F2-F4	PCBs	Inorganics: As, Cd, Cr, Co, Cu, Pb, Ni, Zn, Hg							Field Procedures: pH	Field Procedures: Electrical Conductivity	Field Procedures: Preservatives
F4-NH-MW11	-03-S		SOIL			24Aug/14	X	X	X	X									
F4-NH-MW11	-03-D						X	X	X	X									
F4-NH-MW11	-04-S						X	X	X	X									
F4-NH-MW11	-04-D						X	X	X	X									
F4-NH-MW11	-05-S						X	X	X	X									
F4-NH-MW11	-05-D						X	X	X	X									
F4-NH-MW11	-06-S						X	X	X	X									
F4-NH-MW11	-06-D						X	X	X	X									
F4-NH-MW12	-07-S						X	X	X	X									
F4-NH-MW12	-07-D						X	X	X	X									
F4-NH-MW12	-08-S						X	X	X	X									
F4-NH-MW12	-08-D						X	X	X	X									

Relinquished By:	Date:	Time:	Received By:
	2014/09/03	13:10	Kelsey Pilon Kelsey Pilon
Relinquished By:	Date:	Time:	Received By:
Relinquished By:	Date:	Time:	Received By:

Laboratory

Remarks:
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Project No. and Date

(Revision 1 - 17 May 2012)

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Chain of Custody Record

Shipper

Project No.: 350600-515 **Site:** FOX-4 Cape Hooper
Project Manager: S. Borcsok
Field Engineer/Techician: S. Borcsok/J. Mauchan
Date: 26 August/14 **Route:** Courier
Lab: ~~MAXXAM~~ **Location** Ottawa
Required Date: _____ **Turnaround:** STD Day(s)
Quotation No.: _____
MDL's To Meet: _____

Analyses Requested

Notice
Temps: 6,7,7 5,7,5
5, 5,5 6,7,6 7,8,7
RECD IN OTTAWA

Location/ Hole No.	Sample No.	Depth (m)	Description	Label No.	Grab/ Comp.	Date Collected	PHCs F1	PHCs F2-F4	PCBs	Inorganics: As, Cd, Cr, Co, Cu, Pb, Ni, Zn, Hg						Field Procedures: pH	Field Procedures: Electrical Conductivity	Field Procedures: Preservatives
F4-PAL-25	-S		SOIL			25Aug/14	X	X	X	X								
F4-PAL-25	-D						X	X	X	X								
F4-PAL-26	-S						X	X	X	X								
F4-PAL-26	-D						X	X	X	X								
F4-PAL-27	-S						X	X	X	X								
F4-PAL-27	-D						X	X	X	X								
F4-PAL-28	-S						X	X	X	X								
F4-PAL-28	-D						X	X	X	X								
F4-PAL-29	-S						X	X	X	X								
F4-PAL-29	-D						X	X	X	X								

Relinquished By:	Date:	Time:	Received By:
	2014/09/03	13:10	Kelsey Pilon Kelsey Pilon
Relinquished By:	Date:	Time:	Received By:
Relinquished By:	Date:	Time:	Received By:

Laboratory

Remarks:
ALL RESULTS ARE TO BE SENT TO THE PROJECT MANAGER.

Project No. and Date

(Revision 1 - 17 May 2012)

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Chain of Custody Record

Shipper

Project No.: 350600-515 **Site:** FOX-4 Cape Hooper
Project Manager: S. Borcsok
Field Engineer/Techician: S. Borcsok/J. Mauchan
Date: 26 Aug/14 **Route:** Courier
Lab: MAXXAM **Location** Ottawa
Required Date: _____ **Turnaround:** STD Day(s)
Quotation No.: _____
MDL's To Meet: _____

Analyses Requested

Location/ Hole No.	Sample No.	Depth (m)	Description	Label No.	Grab/ Comp.	Date Collected	PHCs F1	PHCs F2-F4	PCBs	Inorganics: As, Cd, Cr, Co, Cu, Pb, Ni, Zn, Hg							pH	Electrical Conductivity	Preservatives
F4-NH-MW11-	01		GROUNDWATER			24 Aug/14	X	X	X	X									
F4-NH-MW11	-02						X	X	X	X									
F4-NH-MW11	-03						X	X	X	X									
F4-NH-MW11	-04						X	X	X	X									
F4-NH-MW11	-05						X	X	X	X									
F4-NH-MW12	-07						X	X	X	X									
F4-STA-MW9	8-07					25 Aug/14	X	X	X	X									
F4-HEL-MW9	8-01						X	X	X	X									
F4-HEL-MW	98-02						X	X	X	X									
F4-HEL-MW	98-03						X	X	X	X									

Noice
temps: 6,7,7 5,7,5
5,5,5 6,7,6 7,8,7

REC'D IN OTTAWA

Field Procedures

Relinquished By:	Date:	Time:	Received By:
	2014/09/03	13:10	Kelsey Pilon Kelsey Pilon
Relinquished By:	Date:	Time:	Received By:
Relinquished By:	Date:	Time:	Received By:

Laboratory

Remarks:
ALL RESULTS ARE TO BE SENT TO THE PROJECT MANAGER.

Project No. and Date

(Revision 1 - 17 May 2012)

Maxxam

6740 Campobello Road, Mississauga, Ontario L5N 2L8 www.maxxam.ca
Phone: 905-817-5700 Fax: 905-817-5779 Toll Free: 800-563-6266

CHAIN OF CUSTODY RECORD

37451 Page ____ of ____

INVOICE INFORMATION	REPORT INFORMATION (if differs from invoice)	PROJECT INFORMATION	TURNAROUND TIME (TAT) REQUIRED
Company Name:	Company Name:	Quotation #:	☐ Regular TAT (5-7 days)
Contact Name:	Contact Name:	P.O. #:	PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS
Address:	Address:	Project #:	Rush TAT (Applicable Surcharge)
		Site Location:	☐ 1 Day (100%)
Phone: Fax:	Phone: Fax:	Site #:	☐ 2 Days (50%)
Email:	Email:	Sampled By:	☐ 3-4 Days (25%)

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

REGULATION 153 (2011)	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 Municipality:
☐ Table ___	☐ Other (Specify):
FOR RSC (PLEASE CIRCLE) YES / NO	☐ REG 558 (MINIMUM 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	TIME SAMPLED	MATRIX	# OF CONT.	FIELD FILTERED (PLEASE CIRCLE) Metals / Hg / CrVI	ANALYSIS REQUESTED
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							

Rush Confirmation #:

Date Required:

LABORATORY USE ONLY

CUSTODY SEAL (Y/N)	Temperature (°C) on Receipt
Present N	10,10,10
Intact N	3/9/10
COOLING MEDIA PRESENT (Y / N) N	

COMMENTS / TAT COMMENTS

REC'D IN OTTAWA
3-Sep-1- 13:15
Keshani Vijh
B4G0864

RELINQUISHED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME:	RECEIVED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME:	# JARS AND SUBMI
			Kelsey Pilon Kelsey Pilon	2014/09/02	10:30	
			[illegible]	2014/09/03	09:15	

COC-1004 (11/13) - ENV. ENG.

Maxxam Analytics International Corporation o/a Maxxam Analytics

Your Project #: MB4G0864
Your C.O.C. #: B4G0864

Attention: SUB CONTRACTOR
MAXXAM ANALYTICS
CAMPOBELLO
6740 CAMPOBELLO ROAD
MISSISSAUGA, ON
CANADA L5N 2L8

Report Date: 2014/09/11
Report #: R1640164
Version: 1

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B477851
Received: 2014/09/04, 08:40

Sample Matrix: Water
Samples Received: 10

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Cadmium - low level CCME (Total)	7	2014/09/04	2014/09/10	AB SOP-00014 / AB SOP-00043	EPA 200.8 R5.4 m
Cadmium - low level CCME (Total)	3	2014/09/04	2014/09/11	AB SOP-00014 / AB SOP-00043	EPA 200.8 R5.4 m
Elements by ICP - Total	7	2014/09/08	2014/09/08	AB SOP-00014 / AB SOP-00042	EPA 200.7 CFR 2012 m
Elements by ICP - Total	3	2014/09/08	2014/09/09	AB SOP-00014 / AB SOP-00042	EPA 200.7 CFR 2012 m
Elements by ICPMS - Total	7	2014/09/08	2014/09/08	AB SOP-00014 / AB SOP-00043	EPA 200.8 R5.4 m
Elements by ICPMS - Total	3	2014/09/08	2014/09/11	AB SOP-00014 / AB SOP-00043	EPA 200.8 R5.4 m

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Cynny Hagen, Project Manager Assistant
Email: CHagen@maxxam.ca
Phone# (403) 735-2273

==========

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Total cover pages: 1

Maxxam Job #: B477851
Report Date: 2014/09/11

MAXXAM ANALYTICS
Client Project #: MB4G0864

REGULATED METALS (CCME/AT1) - TOTAL

Maxxam ID		KM9969		KM9970		KM9971		
Sampling Date		2014/08/24		2014/08/24		2014/08/24		
COC Number		B4G0864		B4G0864		B4G0864		
	UNITS	**F4-NH-MW11-01 (XK2030)**	**RDL**	**F4-NH-MW11-02 (XK2031)**	**RDL**	**F4-NH-MW11-03 (XK2032)**	**RDL**	**QC Batch**
Low Level Elements								
Total Cadmium (Cd)	ug/L	0.59	0.020	0.043	0.020	1.1	0.020	7624997
Elements								
Total Aluminum (Al)	mg/L	34	0.0030	3.1	0.0030	80 (1)	0.0075	7629192
Total Antimony (Sb)	mg/L	0.0066	0.00060	<0.00060	0.00060	0.017	0.00060	7629192
Total Arsenic (As)	mg/L	0.033	0.00020	0.11	0.00020	0.053	0.00020	7629192
Total Barium (Ba)	mg/L	0.024	0.010	0.043	0.010	0.13	0.010	7629198
Total Beryllium (Be)	mg/L	0.0043	0.0010	<0.0010	0.0010	0.0036	0.0010	7629192
Total Boron (B)	mg/L	<0.020	0.020	0.031	0.020	0.045	0.020	7629198
Total Calcium (Ca)	mg/L	91	0.30	22	0.30	58	0.30	7629198
Total Chromium (Cr)	mg/L	0.96	0.0010	0.027	0.0010	0.54	0.0010	7629192
Total Cobalt (Co)	mg/L	0.031	0.00030	0.0073	0.00030	0.095	0.00030	7629192
Total Copper (Cu)	mg/L	0.056	0.00020	0.022	0.00020	0.13	0.00020	7629192
Total Iron (Fe)	mg/L	100	0.060	68	0.060	80	0.060	7629198
Total Lead (Pb)	mg/L	0.018	0.00020	0.0039	0.00020	0.26	0.00020	7629192
Total Lithium (Li)	mg/L	0.028	0.020	<0.020	0.020	0.033	0.020	7629198
Total Magnesium (Mg)	mg/L	6.0	0.20	6.6	0.20	17	0.20	7629198
Total Manganese (Mn)	mg/L	0.30	0.0040	0.56	0.0040	0.77	0.0040	7629198
Total Molybdenum (Mo)	mg/L	0.0085	0.00020	0.0085	0.00020	0.0052	0.00020	7629192
Total Nickel (Ni)	mg/L	0.30	0.00050	0.037	0.00050	0.33	0.00050	7629192
Total Phosphorus (P)	mg/L	0.23	0.10	<0.10	0.10	0.39	0.10	7629198
Total Potassium (K)	mg/L	1.1	0.30	9.2	0.30	6.1	0.30	7629198
Total Selenium (Se)	mg/L	0.00063	0.00020	0.00058	0.00020	0.0013	0.00020	7629192
Total Silicon (Si)	mg/L	17	0.10	9.0	0.10	39	0.10	7629198
Total Silver (Ag)	mg/L	0.00010	0.00010	<0.00010	0.00010	0.00028	0.00010	7629192
Total Sodium (Na)	mg/L	7.0	0.50	50	0.50	7.6	0.50	7629198
Total Strontium (Sr)	mg/L	0.027	0.020	0.23	0.020	0.076	0.020	7629198
Total Sulphur (S)	mg/L	4.7	0.20	22	0.20	21	0.20	7629198
Total Thallium (Tl)	mg/L	<0.00020	0.00020	<0.00020	0.00020	0.00041	0.00020	7629192
Total Tin (Sn)	mg/L	0.0093	0.0010	<0.0010	0.0010	0.0057	0.0010	7629192
Total Titanium (Ti)	mg/L	13 (1)	0.010	0.41	0.0010	8.4 (1)	0.0050	7629192
Total Uranium (U)	mg/L	0.0078	0.00010	0.0018	0.00010	0.0063	0.00010	7629192
Total Vanadium (V)	mg/L	0.28	0.0010	0.016	0.0010	0.25	0.0010	7629192

RDL = Reportable Detection Limit
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.

Maxxam Job #: B477851
Report Date: 2014/09/11

MAXXAM ANALYTICS
Client Project #: MB4G0864

REGULATED METALS (CCME/AT1) - TOTAL

Maxxam ID		KM9969		KM9970		KM9971		
Sampling Date		2014/08/24		2014/08/24		2014/08/24		
COC Number		B4G0864		B4G0864		B4G0864		
	UNITS	**F4-NH-MW11-01 (XK2030)**	**RDL**	**F4-NH-MW11-02 (XK2031)**	**RDL**	**F4-NH-MW11-03 (XK2032)**	**RDL**	**QC Batch**
Total Zinc (Zn)	mg/L	0.094	0.0030	17 (1)	0.030	0.33	0.0030	7629192

RDL = Reportable Detection Limit
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.

Maxxam Job #: B477851
Report Date: 2014/09/11

MAXXAM ANALYTICS
Client Project #: MB4G0864

REGULATED METALS (CCME/AT1) - TOTAL

Maxxam ID		KM9972		KM9973		KM9974		
Sampling Date		2014/08/24		2014/08/24		2014/08/24		
COC Number		B4G0864		B4G0864		B4G0864		
	UNITS	**F4-NH-MW11-04 (XK2033)**	**RDL**	**F4-NH-MW11-05 (XK2034)**	**RDL**	**F4-NH-MW12-07 (XK2035)**	**RDL**	**QC Batch**
Low Level Elements								
Total Cadmium (Cd)	ug/L	0.12	0.020	0.083	0.020	0.25	0.020	7624997
Elements								
Total Aluminum (Al)	mg/L	21	0.0030	18	0.0030	29	0.0030	7629192
Total Antimony (Sb)	mg/L	<0.00060	0.00060	<0.00060	0.00060	<0.00060	0.00060	7629192
Total Arsenic (As)	mg/L	0.024	0.00020	0.031	0.00020	0.040	0.00020	7629192
Total Barium (Ba)	mg/L	0.14	0.010	0.12	0.010	0.18	0.010	7629198
Total Beryllium (Be)	mg/L	<0.0010	0.0010	<0.0010	0.0010	0.0013	0.0010	7629192
Total Boron (B)	mg/L	0.024	0.020	<0.020	0.020	<0.020	0.020	7629198
Total Calcium (Ca)	mg/L	59	0.30	15	0.30	27	0.30	7629198
Total Chromium (Cr)	mg/L	0.20	0.0010	0.068	0.0010	0.14	0.0010	7629192
Total Cobalt (Co)	mg/L	0.018	0.00030	0.014	0.00030	0.026	0.00030	7629192
Total Copper (Cu)	mg/L	0.069	0.00020	0.056	0.00020	0.082	0.00020	7629192
Total Iron (Fe)	mg/L	28	0.060	25	0.060	44	0.060	7629198
Total Lead (Pb)	mg/L	0.016	0.00020	0.014	0.00020	0.021	0.00020	7629192
Total Lithium (Li)	mg/L	0.033	0.020	<0.020	0.020	0.036	0.020	7629198
Total Magnesium (Mg)	mg/L	63	0.20	16	0.20	25	0.20	7629198
Total Manganese (Mn)	mg/L	0.34	0.0040	0.32	0.0040	0.44	0.0040	7629198
Total Molybdenum (Mo)	mg/L	0.0041	0.00020	0.0029	0.00020	0.0021	0.00020	7629192
Total Nickel (Ni)	mg/L	0.13	0.00050	0.055	0.00050	0.092	0.00050	7629192
Total Phosphorus (P)	mg/L	0.57	0.10	0.28	0.10	1.2	0.10	7629198
Total Potassium (K)	mg/L	13	0.30	7.6	0.30	10	0.30	7629198
Total Selenium (Se)	mg/L	0.00051	0.00020	0.00038	0.00020	0.00068	0.00020	7629192
Total Silicon (Si)	mg/L	36	0.10	31	0.10	38	0.10	7629198
Total Silver (Ag)	mg/L	<0.00010	0.00010	<0.00010	0.00010	0.00014	0.00010	7629192
Total Sodium (Na)	mg/L	38	0.50	13	0.50	18	0.50	7629198
Total Strontium (Sr)	mg/L	0.25	0.020	0.070	0.020	0.11	0.020	7629198
Total Sulphur (S)	mg/L	38	0.20	3.4	0.20	9.8	0.20	7629198
Total Thallium (Tl)	mg/L	0.00045	0.00020	0.00036	0.00020	0.00059	0.00020	7629192
Total Tin (Sn)	mg/L	<0.0010	0.0010	<0.0010	0.0010	0.0013	0.0010	7629192
Total Titanium (Ti)	mg/L	2.6 (1)	0.0025	1.8	0.0010	3.3 (1)	0.0025	7629192
Total Uranium (U)	mg/L	0.0032	0.00010	0.0027	0.00010	0.015	0.00010	7629192
Total Vanadium (V)	mg/L	0.098	0.0010	0.065	0.0010	0.10	0.0010	7629192

RDL = Reportable Detection Limit
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.

Maxxam Job #: B477851
Report Date: 2014/09/11

MAXXAM ANALYTICS
Client Project #: MB4G0864

REGULATED METALS (CCME/AT1) - TOTAL

Maxxam ID		KM9972		KM9973		KM9974		
Sampling Date		2014/08/24		2014/08/24		2014/08/24		
COC Number		B4G0864		B4G0864		B4G0864		
	UNITS	**F4-NH-MW11-04 (XK2033)**	**RDL**	**F4-NH-MW11-05 (XK2034)**	**RDL**	**F4-NH-MW12-07 (XK2035)**	**RDL**	**QC Batch**
Total Zinc (Zn)	mg/L	0.18	0.0030	0.65	0.0030	0.13	0.0030	7629192

RDL = Reportable Detection Limit

Maxxam Job #: B477851
Report Date: 2014/09/11

MAXXAM ANALYTICS
Client Project #: MB4G0864

REGULATED METALS (CCME/AT1) - TOTAL

Maxxam ID		KM9975		KM9976	KM9977	KM9978		
Sampling Date		2014/08/25		2014/08/25	2014/08/25	2014/08/25		
COC Number		B4G0864		B4G0864	B4G0864	B4G0864		
	UNITS	**F4-STA-MW98-07 (XK2036)**	**QC Batch**	**F4-HEL-MW98-01 (XK2037)**	**F4-HEL-MW98-02 (XK2038)**	**F4-HEL-MW98-03 (XK2039)**	**RDL**	**QC Batch**
Low Level Elements								
Total Cadmium (Cd)	ug/L	0.52	7624997	0.48	0.042	0.086	0.020	7624997
Elements								
Total Aluminum (Al)	mg/L	2.5	7629192	0.71	0.24	1.1	0.0030	7629630
Total Antimony (Sb)	mg/L	<0.00060	7629192	<0.00060	<0.00060	<0.00060	0.00060	7629630
Total Arsenic (As)	mg/L	0.0015	7629192	0.0016	0.027	0.0025	0.00020	7629630
Total Barium (Ba)	mg/L	0.026	7629198	0.017	0.012	0.011	0.010	7629638
Total Beryllium (Be)	mg/L	<0.0010	7629192	<0.0010	<0.0010	<0.0010	0.0010	7629630
Total Boron (B)	mg/L	<0.020	7629198	0.27	0.065	0.077	0.020	7629638
Total Calcium (Ca)	mg/L	2.0	7629198	15	39	8.5	0.30	7629638
Total Chromium (Cr)	mg/L	0.22	7629192	0.066	0.067	0.048	0.0010	7629630
Total Cobalt (Co)	mg/L	0.020	7629192	0.0098	0.018	0.0021	0.00030	7629630
Total Copper (Cu)	mg/L	0.035	7629192	0.17	0.0057	0.0063	0.00020	7629630
Total Iron (Fe)	mg/L	2.2	7629198	1.2	9.6	1.5	0.060	7629638
Total Lead (Pb)	mg/L	0.0037	7629192	0.0018	0.0013	0.0021	0.00020	7629630
Total Lithium (Li)	mg/L	<0.020	7629198	<0.020	<0.020	<0.020	0.020	7629638
Total Magnesium (Mg)	mg/L	1.2	7629198	4.9	5.8	5.3	0.20	7629638
Total Manganese (Mn)	mg/L	0.045	7629198	0.079	0.57	0.048	0.0040	7629638
Total Molybdenum (Mo)	mg/L	0.0068	7629192	0.0018	0.0025	0.0024	0.00020	7629630
Total Nickel (Ni)	mg/L	0.19	7629192	0.097	0.043	0.048	0.00050	7629630
Total Phosphorus (P)	mg/L	<0.10	7629198	<0.10	<0.10	<0.10	0.10	7629638
Total Potassium (K)	mg/L	1.2	7629198	1.6	3.0	1.7	0.30	7629638
Total Selenium (Se)	mg/L	<0.00020	7629192	0.00020	0.00076	0.00023	0.00020	7629630
Total Silicon (Si)	mg/L	3.9	7629198	5.0	4.0	8.3	0.10	7629638
Total Silver (Ag)	mg/L	<0.00010	7629192	<0.00010	<0.00010	<0.00010	0.00010	7629630
Total Sodium (Na)	mg/L	2.5	7629198	5.9	5.4	5.6	0.50	7629638
Total Strontium (Sr)	mg/L	<0.020	7629198	0.078	0.18	0.032	0.020	7629638
Total Sulphur (S)	mg/L	3.6	7629198	15	12	11	0.20	7629638
Total Thallium (Tl)	mg/L	<0.00020	7629192	<0.00020	<0.00020	<0.00020	0.00020	7629630
Total Tin (Sn)	mg/L	<0.0010	7629192	<0.0010	<0.0010	<0.0010	0.0010	7629630
Total Titanium (Ti)	mg/L	0.13	7629192	0.051	0.020	0.059	0.0010	7629630
Total Uranium (U)	mg/L	0.00071	7629192	0.00037	0.00036	0.00050	0.00010	7629630
Total Vanadium (V)	mg/L	0.0046	7629192	0.0023	0.0020	0.0024	0.0010	7629630

RDL = Reportable Detection Limit

Maxxam Job #: B477851
Report Date: 2014/09/11

MAXXAM ANALYTICS
Client Project #: MB4G0864

REGULATED METALS (CCME/AT1) - TOTAL

Maxxam ID		KM9975		KM9976	KM9977	KM9978		
Sampling Date		2014/08/25		2014/08/25	2014/08/25	2014/08/25		
COC Number		B4G0864		B4G0864	B4G0864	B4G0864		
	UNITS	**F4-STA-MW98-07 (XK2036)**	**QC Batch**	**F4-HEL-MW98-01 (XK2037)**	**F4-HEL-MW98-02 (XK2038)**	**F4-HEL-MW98-03 (XK2039)**	**RDL**	**QC Batch**
Total Zinc (Zn)	mg/L	0.10	7629192	0.38	0.034	0.16	0.0030	7629630

RDL = Reportable Detection Limit

MAXXAM ANALYTICS
Client Project #: MB4G0864

Maxxam Job #: B477851
Report Date: 2014/09/11

Package 1	6.0°C

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

General Comments

Results relate only to the items tested.

MAXXAM ANALYTICS
Attention: SUB CONTRACTOR
Client Project #: MB4G0864
P.O. #:
Site Location:

Quality Assurance Report

Maxxam Job Number: CB477851

QA/QC Batch Num	Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	UNITS	QC Limits
7629192	KA3	Matrix Spike	Total Aluminum (Al)	2014/09/08		94	%	80 - 120
			Total Antimony (Sb)	2014/09/08		104	%	80 - 120
			Total Arsenic (As)	2014/09/08		106	%	80 - 120
			Total Beryllium (Be)	2014/09/08		86	%	80 - 120
			Total Chromium (Cr)	2014/09/08		99	%	80 - 120
			Total Cobalt (Co)	2014/09/08		101	%	80 - 120
			Total Copper (Cu)	2014/09/08		NC	%	80 - 120
			Total Lead (Pb)	2014/09/08		102	%	80 - 120
			Total Molybdenum (Mo)	2014/09/08		115	%	80 - 120
			Total Nickel (Ni)	2014/09/08		99	%	80 - 120
			Total Selenium (Se)	2014/09/08		102	%	80 - 120
			Total Silver (Ag)	2014/09/08		97	%	80 - 120
			Total Thallium (Tl)	2014/09/08		101	%	80 - 120
			Total Tin (Sn)	2014/09/08		112	%	80 - 120
			Total Titanium (Ti)	2014/09/08		100	%	80 - 120
			Total Uranium (U)	2014/09/08		109	%	80 - 120
			Total Vanadium (V)	2014/09/08		107	%	80 - 120
			Total Zinc (Zn)	2014/09/08		NC	%	80 - 120
		Spiked Blank	Total Aluminum (Al)	2014/09/08		106	%	80 - 120
			Total Antimony (Sb)	2014/09/08		109	%	80 - 120
			Total Arsenic (As)	2014/09/08		110	%	80 - 120
			Total Beryllium (Be)	2014/09/08		114	%	80 - 120
			Total Chromium (Cr)	2014/09/08		110	%	80 - 120
			Total Cobalt (Co)	2014/09/08		113	%	80 - 120
			Total Copper (Cu)	2014/09/08		113	%	80 - 120
			Total Lead (Pb)	2014/09/08		113	%	80 - 120
			Total Molybdenum (Mo)	2014/09/08		115	%	80 - 120
			Total Nickel (Ni)	2014/09/08		109	%	80 - 120
			Total Selenium (Se)	2014/09/08		111	%	80 - 120
			Total Silver (Ag)	2014/09/08		104	%	80 - 120
			Total Thallium (Tl)	2014/09/08		113	%	80 - 120
			Total Tin (Sn)	2014/09/08		116	%	80 - 120
			Total Titanium (Ti)	2014/09/08		112	%	80 - 120
			Total Uranium (U)	2014/09/08		117	%	80 - 120
			Total Vanadium (V)	2014/09/08		116	%	80 - 120
			Total Zinc (Zn)	2014/09/08		107	%	80 - 120
		Method Blank	Total Aluminum (Al)	2014/09/08	<0.0030		mg/L	
			Total Antimony (Sb)	2014/09/08	<0.00060		mg/L	
			Total Arsenic (As)	2014/09/08	<0.00020		mg/L	
			Total Beryllium (Be)	2014/09/08	<0.0010		mg/L	
			Total Chromium (Cr)	2014/09/08	<0.0010		mg/L	
			Total Cobalt (Co)	2014/09/08	<0.00030		mg/L	
			Total Copper (Cu)	2014/09/08	<0.00020		mg/L	
			Total Lead (Pb)	2014/09/08	<0.00020		mg/L	
			Total Molybdenum (Mo)	2014/09/08	<0.00020		mg/L	
			Total Nickel (Ni)	2014/09/08	<0.00050		mg/L	
			Total Selenium (Se)	2014/09/08	<0.00020		mg/L	
			Total Silver (Ag)	2014/09/08	<0.00010		mg/L	
			Total Thallium (Tl)	2014/09/08	<0.00020		mg/L	
			Total Tin (Sn)	2014/09/08	<0.0010		mg/L	
			Total Titanium (Ti)	2014/09/08	<0.0010		mg/L	
			Total Uranium (U)	2014/09/08	<0.00010		mg/L	
			Total Vanadium (V)	2014/09/08	<0.0010		mg/L	
			Total Zinc (Zn)	2014/09/08	<0.0030		mg/L	
		RPD	Total Aluminum (Al)	2014/09/08	NC		%	20

MAXXAM ANALYTICS
Attention: SUB CONTRACTOR
Client Project #: MB4G0864
P.O. #:
Site Location:

Quality Assurance Report (Continued)

Maxxam Job Number: CB477851

QA/QC Batch Num	Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	UNITS	QC Limits
7629192	KA3	RPD	Total Antimony (Sb)	2014/09/08	NC		%	20
			Total Arsenic (As)	2014/09/08	NC		%	20
			Total Beryllium (Be)	2014/09/08	NC		%	20
			Total Chromium (Cr)	2014/09/08	NC		%	20
			Total Cobalt (Co)	2014/09/08	NC		%	20
			Total Copper (Cu)	2014/09/08	1.5		%	20
			Total Lead (Pb)	2014/09/08	NC		%	20
			Total Molybdenum (Mo)	2014/09/08	NC		%	20
			Total Nickel (Ni)	2014/09/08	NC		%	20
			Total Selenium (Se)	2014/09/08	NC		%	20
			Total Silver (Ag)	2014/09/08	NC		%	20
			Total Thallium (Tl)	2014/09/08	NC		%	20
			Total Tin (Sn)	2014/09/08	NC		%	20
			Total Titanium (Ti)	2014/09/08	NC		%	20
			Total Uranium (U)	2014/09/08	NC		%	20
			Total Vanadium (V)	2014/09/08	NC		%	20
			Total Zinc (Zn)	2014/09/08	3.4		%	20
7629198	JBA	Matrix Spike	Total Barium (Ba)	2014/09/08		79 (1)	%	80 - 120
			Total Boron (B)	2014/09/08		85	%	80 - 120
			Total Calcium (Ca)	2014/09/08		NC	%	80 - 120
			Total Iron (Fe)	2014/09/08		85	%	80 - 120
			Total Lithium (Li)	2014/09/08		82	%	80 - 120
			Total Magnesium (Mg)	2014/09/08		87	%	80 - 120
			Total Manganese (Mn)	2014/09/08		88	%	80 - 120
			Total Phosphorus (P)	2014/09/08		85	%	80 - 120
			Total Potassium (K)	2014/09/08		81	%	80 - 120
			Total Silicon (Si)	2014/09/08		83	%	80 - 120
			Total Sodium (Na)	2014/09/08		NC	%	80 - 120
			Total Strontium (Sr)	2014/09/08		82	%	80 - 120
		Spiked Blank	Total Barium (Ba)	2014/09/08		84	%	80 - 120
			Total Boron (B)	2014/09/08		87	%	80 - 120
			Total Calcium (Ca)	2014/09/08		91	%	80 - 120
			Total Iron (Fe)	2014/09/08		91	%	80 - 120
			Total Lithium (Li)	2014/09/08		84	%	80 - 120
			Total Magnesium (Mg)	2014/09/08		91	%	80 - 120
			Total Manganese (Mn)	2014/09/08		93	%	80 - 120
			Total Phosphorus (P)	2014/09/08		88	%	80 - 120
			Total Potassium (K)	2014/09/08		81	%	80 - 120
			Total Silicon (Si)	2014/09/08		85	%	80 - 120
			Total Sodium (Na)	2014/09/08		88	%	80 - 120
			Total Strontium (Sr)	2014/09/08		87	%	80 - 120
		Method Blank	Total Barium (Ba)	2014/09/08	<0.010		mg/L	
			Total Boron (B)	2014/09/08	<0.020		mg/L	
			Total Calcium (Ca)	2014/09/08	<0.30		mg/L	
			Total Iron (Fe)	2014/09/08	<0.060		mg/L	
			Total Lithium (Li)	2014/09/08	<0.020		mg/L	
			Total Magnesium (Mg)	2014/09/08	<0.20		mg/L	
			Total Manganese (Mn)	2014/09/08	<0.0040		mg/L	
			Total Phosphorus (P)	2014/09/08	<0.10		mg/L	
			Total Potassium (K)	2014/09/08	<0.30		mg/L	
			Total Silicon (Si)	2014/09/08	<0.10		mg/L	
			Total Sodium (Na)	2014/09/08	<0.50		mg/L	
			Total Strontium (Sr)	2014/09/08	<0.020		mg/L	
			Total Sulphur (S)	2014/09/08	<0.20		mg/L	
		RPD	Total Barium (Ba)	2014/09/08	NC		%	20

MAXXAM ANALYTICS
Attention: SUB CONTRACTOR
Client Project #: MB4G0864
P.O. #:
Site Location:

Quality Assurance Report (Continued)

Maxxam Job Number: CB477851

QA/QC Batch Num	Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	UNITS	QC Limits
7629198	JBA	RPD	Total Boron (B)	2014/09/08	2.0		%	20
			Total Calcium (Ca)	2014/09/08	0.9		%	20
			Total Iron (Fe)	2014/09/08	NC		%	20
			Total Lithium (Li)	2014/09/08	NC		%	20
			Total Magnesium (Mg)	2014/09/08	2.3		%	20
			Total Manganese (Mn)	2014/09/08	NC		%	20
			Total Phosphorus (P)	2014/09/08	NC		%	20
			Total Potassium (K)	2014/09/08	4.6		%	20
			Total Silicon (Si)	2014/09/08	1.4		%	20
			Total Sodium (Na)	2014/09/08	2.8		%	20
			Total Strontium (Sr)	2014/09/08	2.0		%	20
			Total Sulphur (S)	2014/09/08	2.3		%	20
7629630	KA3	Matrix Spike	Total Aluminum (Al)	2014/09/11		NC	%	80 - 120
			Total Antimony (Sb)	2014/09/11		96	%	80 - 120
			Total Arsenic (As)	2014/09/11		96	%	80 - 120
			Total Beryllium (Be)	2014/09/11		100	%	80 - 120
			Total Chromium (Cr)	2014/09/11		98	%	80 - 120
			Total Cobalt (Co)	2014/09/11		94	%	80 - 120
			Total Copper (Cu)	2014/09/11		96	%	80 - 120
			Total Lead (Pb)	2014/09/11		94	%	80 - 120
			Total Molybdenum (Mo)	2014/09/11		103	%	80 - 120
			Total Nickel (Ni)	2014/09/11		96	%	80 - 120
			Total Selenium (Se)	2014/09/11		100	%	80 - 120
			Total Silver (Ag)	2014/09/11		89	%	80 - 120
			Total Thallium (Tl)	2014/09/11		95	%	80 - 120
			Total Tin (Sn)	2014/09/11		100	%	80 - 120
			Total Titanium (Ti)	2014/09/11		100	%	80 - 120
			Total Uranium (U)	2014/09/11		98	%	80 - 120
			Total Vanadium (V)	2014/09/11		104	%	80 - 120
			Total Zinc (Zn)	2014/09/11		94	%	80 - 120
		Spiked Blank	Total Aluminum (Al)	2014/09/10		98	%	80 - 120
			Total Antimony (Sb)	2014/09/10		98	%	80 - 120
			Total Arsenic (As)	2014/09/10		96	%	80 - 120
			Total Beryllium (Be)	2014/09/10		95	%	80 - 120
			Total Chromium (Cr)	2014/09/10		96	%	80 - 120
			Total Cobalt (Co)	2014/09/10		92	%	80 - 120
			Total Copper (Cu)	2014/09/10		96	%	80 - 120
			Total Lead (Pb)	2014/09/10		100	%	80 - 120
			Total Molybdenum (Mo)	2014/09/10		102	%	80 - 120
			Total Nickel (Ni)	2014/09/10		96	%	80 - 120
			Total Selenium (Se)	2014/09/10		98	%	80 - 120
			Total Silver (Ag)	2014/09/10		93	%	80 - 120
			Total Thallium (Tl)	2014/09/10		102	%	80 - 120
			Total Tin (Sn)	2014/09/10		103	%	80 - 120
			Total Titanium (Ti)	2014/09/10		96	%	80 - 120
			Total Uranium (U)	2014/09/10		93	%	80 - 120
			Total Vanadium (V)	2014/09/10		101	%	80 - 120
			Total Zinc (Zn)	2014/09/10		91	%	80 - 120
		Method Blank	Total Aluminum (Al)	2014/09/11	<0.0030		mg/L	
			Total Antimony (Sb)	2014/09/11	<0.00060		mg/L	
			Total Arsenic (As)	2014/09/11	0.00023, RDL=0.00020		mg/L	
			Total Beryllium (Be)	2014/09/11	<0.0010		mg/L	
			Total Chromium (Cr)	2014/09/11	<0.0010		mg/L	
			Total Cobalt (Co)	2014/09/11	<0.00030		mg/L	
			Total Copper (Cu)	2014/09/11	<0.00020		mg/L	

MAXXAM ANALYTICS
Attention: SUB CONTRACTOR
Client Project #: MB4G0864
P.O. #:
Site Location:

Quality Assurance Report (Continued)

Maxxam Job Number: CB477851

QA/QC Batch Num	Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	UNITS	QC Limits
7629630	KA3	Method Blank	Total Lead (Pb)	2014/09/11	<0.00020		mg/L	
			Total Molybdenum (Mo)	2014/09/11	<0.00020		mg/L	
			Total Nickel (Ni)	2014/09/11	<0.00050		mg/L	
			Total Selenium (Se)	2014/09/11	0.00022, RDL=0.00020		mg/L	
			Total Silver (Ag)	2014/09/11	<0.00010		mg/L	
			Total Thallium (Tl)	2014/09/11	<0.00020		mg/L	
			Total Tin (Sn)	2014/09/11	<0.0010		mg/L	
			Total Titanium (Ti)	2014/09/11	<0.0010		mg/L	
			Total Uranium (U)	2014/09/11	<0.00010		mg/L	
			Total Vanadium (V)	2014/09/11	<0.0010		mg/L	
			Total Zinc (Zn)	2014/09/11	<0.0030		mg/L	
		RPD	Total Aluminum (Al)	2014/09/11	8.0		%	20
			Total Antimony (Sb)	2014/09/11	NC		%	20
			Total Arsenic (As)	2014/09/11	1.3		%	20
			Total Beryllium (Be)	2014/09/11	NC		%	20
			Total Chromium (Cr)	2014/09/11	NC		%	20
			Total Cobalt (Co)	2014/09/11	NC		%	20
			Total Copper (Cu)	2014/09/11	NC		%	20
			Total Lead (Pb)	2014/09/11	NC		%	20
			Total Molybdenum (Mo)	2014/09/11	NC		%	20
			Total Nickel (Ni)	2014/09/11	NC		%	20
			Total Selenium (Se)	2014/09/11	NC		%	20
			Total Silver (Ag)	2014/09/11	NC		%	20
			Total Thallium (Tl)	2014/09/11	NC		%	20
			Total Tin (Sn)	2014/09/11	NC		%	20
			Total Titanium (Ti)	2014/09/11	NC		%	20
			Total Uranium (U)	2014/09/11	NC		%	20
			Total Vanadium (V)	2014/09/11	NC		%	20
			Total Zinc (Zn)	2014/09/11	NC		%	20
7629638	STI	Matrix Spike	Total Barium (Ba)	2014/09/09		93	%	80 - 120
			Total Boron (B)	2014/09/09		98	%	80 - 120
			Total Calcium (Ca)	2014/09/09		NC	%	80 - 120
			Total Iron (Fe)	2014/09/09		98	%	80 - 120
			Total Lithium (Li)	2014/09/09		97	%	80 - 120
			Total Magnesium (Mg)	2014/09/09		NC	%	80 - 120
			Total Manganese (Mn)	2014/09/09		105	%	80 - 120
			Total Phosphorus (P)	2014/09/09		96	%	80 - 120
			Total Potassium (K)	2014/09/09		98	%	80 - 120
			Total Silicon (Si)	2014/09/09		100	%	80 - 120
			Total Sodium (Na)	2014/09/09		101	%	80 - 120
			Total Strontium (Sr)	2014/09/09		95	%	80 - 120
		Spiked Blank	Total Barium (Ba)	2014/09/09		93	%	80 - 120
			Total Boron (B)	2014/09/09		97	%	80 - 120
			Total Calcium (Ca)	2014/09/09		98	%	80 - 120
			Total Iron (Fe)	2014/09/09		98	%	80 - 120
			Total Lithium (Li)	2014/09/09		96	%	80 - 120
			Total Magnesium (Mg)	2014/09/09		101	%	80 - 120
			Total Manganese (Mn)	2014/09/09		105	%	80 - 120
			Total Phosphorus (P)	2014/09/09		95	%	80 - 120
			Total Potassium (K)	2014/09/09		96	%	80 - 120
			Total Silicon (Si)	2014/09/09		98	%	80 - 120
			Total Sodium (Na)	2014/09/09		100	%	80 - 120
			Total Strontium (Sr)	2014/09/09		96	%	80 - 120
		Method Blank	Total Barium (Ba)	2014/09/09	<0.010		mg/L	
			Total Boron (B)	2014/09/09	<0.020		mg/L	

MAXXAM ANALYTICS
Attention: SUB CONTRACTOR
Client Project #: MB4G0864
P.O. #:
Site Location:

Quality Assurance Report (Continued)

Maxxam Job Number: CB477851

QA/QC Batch Num	Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	UNITS	QC Limits
7629638	STI	Method Blank	Total Calcium (Ca)	2014/09/09	<0.30		mg/L	
			Total Iron (Fe)	2014/09/09	<0.060		mg/L	
			Total Lithium (Li)	2014/09/09	<0.020		mg/L	
			Total Magnesium (Mg)	2014/09/09	<0.20		mg/L	
			Total Manganese (Mn)	2014/09/09	<0.0040		mg/L	
			Total Phosphorus (P)	2014/09/09	<0.10		mg/L	
			Total Potassium (K)	2014/09/09	<0.30		mg/L	
			Total Silicon (Si)	2014/09/09	<0.10		mg/L	
			Total Sodium (Na)	2014/09/09	<0.50		mg/L	
			Total Strontium (Sr)	2014/09/09	<0.020		mg/L	
			Total Sulphur (S)	2014/09/09	<0.20		mg/L	
		RPD	Total Barium (Ba)	2014/09/09	0.9		%	20
			Total Boron (B)	2014/09/09	NC		%	20
			Total Calcium (Ca)	2014/09/09	0.8		%	20
			Total Iron (Fe)	2014/09/09	NC		%	20
			Total Lithium (Li)	2014/09/09	NC		%	20
			Total Magnesium (Mg)	2014/09/09	0.8		%	20
			Total Manganese (Mn)	2014/09/09	0.2		%	20
			Total Phosphorus (P)	2014/09/09	NC		%	20
			Total Potassium (K)	2014/09/09	2.1		%	20
			Total Silicon (Si)	2014/09/09	1.8		%	20
			Total Sodium (Na)	2014/09/09	1		%	20
			Total Strontium (Sr)	2014/09/09	1.2		%	20
			Total Sulphur (S)	2014/09/09	2.1		%	20

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.
Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.
Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.
NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).
NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).
(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

Validation Signature Page

Maxxam Job #: B477851

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

Peng Liang, Analyst II

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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.

AGAT Laboratories

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

CLIENT NAME: ARCADIS SENES CANADA INC(DCS)
121 GRANTON DRIVE, UNIT #11,
RICHMOND HILL, ON L4B3N4
(905) 882-5984

ATTENTION TO: Steve Borcsok

PROJECT: 350600-515

AGAT WORK ORDER: 14Z884832

SOIL ANALYSIS REVIEWED BY: Sofka Pehlyova, Senior Analyst

TRACE ORGANICS REVIEWED BY: Neli Popnikolova, Senior Chemist

WATER ANALYSIS REVIEWED BY: Sofka Pehlyova, Senior Analyst

DATE REPORTED: Sep 16, 2014

PAGES (INCLUDING COVER): 11

VERSION*: 1

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

*NOTES

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

AGAT Laboratories

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Certificate of Analysis

AGAT WORK ORDER: 14Z884832

PROJECT: 350600-515

CLIENT NAME: ARCADIS SENES CANADA INC(DCS)

ATTENTION TO: Steve Borcsok

SAMPLING SITE:

SAMPLED BY:J. Mauchan

Metals Scan (Soil)

DATE RECEIVED: 2014-09-05

DATE REPORTED: 2014-09-16

SAMPLE DESCRIPTION:				F4 - TAN - 11 - S	F4 - PAL - 27 - S	F4 - HEL - MW98 - 02 - S	F4 - STA - MW98 - 07 - 8	F4 - NH - MW12 - 08 - S
SAMPLE TYPE:				Soil	Soil	Soil	Soil	Soil
DATE SAMPLED:				8/24/2014	8/25/2014	8/25/2014	8/25/2014	8/25/2014
Parameter	Unit	G / S	RDL	5774845	5774880	5774884	5774890	5774900
Arsenic	µg/g		1	6	9	14	43	15
Cadmium	µg/g		0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cobalt	µg/g		0.5	2.4	2.8	7.4	10.5	4.4
Chromium	µg/g		2	13	20	39	68	32
Copper	µg/g		1	12	11	22	65	16
Lead	µg/g		1	4	13	6	6	5
Mercury	µg/g		0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nickel	µg/g		1	2	3	16	39	9
Zinc	µg/g		5	12	19	41	58	25

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to T1(All)
5774845-5774900

Certified By: Sofya Pehlyova

AGAT Laboratories

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Certificate of Analysis

AGAT WORK ORDER: 14Z884832

PROJECT: 350600-515

CLIENT NAME: ARCADIS SENES CANADA INC(DCS)

ATTENTION TO: Steve Borcsok

SAMPLING SITE:

SAMPLED BY:J. Mauchan

PCBs (soil)

DATE RECEIVED: 2014-09-05

DATE REPORTED: 2014-09-16

SAMPLE DESCRIPTION:				**F4 - TAN - 11 - S**	**F4 - PAL - 27 - S**	**F4 - HEL - MW98 - 02 - S**	**F4 - STA - MW98 - 07 - 8**	**F4 - NH - MW12 - 08 - S**
SAMPLE TYPE:				**Soil**	**Soil**	**Soil**	**Soil**	**Soil**
DATE SAMPLED:				**8/24/2014**	**8/25/2014**	**8/25/2014**	**8/25/2014**	**8/25/2014**
Parameter	**Unit**	**G / S**	**RDL**	**5774845**	**5774880**	**5774884**	**5774890**	**5774900**
PCBs	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Surrogate	**Unit**	**Acceptable Limits**						
Decachlorobiphenyl	%	60-130		96	92	90	92	94

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

5774845-5774900 Results are based on the dry weight of soil extracted.

Certified By: NPopnikolof

AGAT Laboratories

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Certificate of Analysis

AGAT WORK ORDER: 14Z884832

PROJECT: 350600-515

CLIENT NAME: ARCADIS SENES CANADA INC(DCS)

ATTENTION TO: Steve Borcsok

SAMPLING SITE:

SAMPLED BY:J. Mauchan

PCBs (water)

DATE RECEIVED: 2014-09-05

DATE REPORTED: 2014-09-16

			SAMPLE DESCRIPTION:	**F4 - NH - MW11 - 01**
			SAMPLE TYPE:	**Water**
			DATE SAMPLED:	**8/24/2014**
Parameter	**Unit**	**G / S**	**RDL**	**5774902**
PCBs	µg/L		0.1	<0.1
Surrogate	**Unit**	**Acceptable Limits**		
Decachlorobiphenyl	%	60-130		103

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

Certified By: NPopnikolof

AGAT Laboratories

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Certificate of Analysis

AGAT WORK ORDER: 14Z884832

PROJECT: 350600-515

CLIENT NAME: ARCADIS SENES CANADA INC(DCS)

ATTENTION TO: Steve Borcsok

SAMPLING SITE:

SAMPLED BY:J. Mauchan

PHCs F1 - F4 (Soil)

DATE RECEIVED: 2014-09-05

DATE REPORTED: 2014-09-16

SAMPLE DESCRIPTION:				F4 - TAN - 11 - S	F4 - PAL - 27 - S	F4 - HEL - MW98 - 02 - S	F4 - STA - MW98 - 07 - 8	F4 - NH - MW12 - 08 - S
SAMPLE TYPE:				Soil	Soil	Soil	Soil	Soil
DATE SAMPLED:				8/24/2014	8/25/2014	8/25/2014	8/25/2014	8/25/2014
Parameter	**Unit**	**G / S**	**RDL**	**5774845**	**5774880**	**5774884**	**5774890**	**5774900**
Benzene	µg/g		0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Toluene	µg/g		0.08	<0.08	<0.08	<0.08	<0.08	<0.08
Ethylbenzene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Xylene Mixture	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05
F1 (C6 to C10)	µg/g		5	<5	<5	<5	<5	<5
F1 (C6 to C10) minus BTEX	µg/g		5	<5	<5	<5	<5	<5
F2 (C10 to C16)	µg/g		10	<10	16	20	<10	48
F3 (C16 to C34)	µg/g		50	<50	52	54	<50	<50
F4 (C34 to C50)	µg/g		50	<50	<50	<50	<50	<50
Gravimetric Heavy Hydrocarbons	µg/g		50	NA	NA	NA	NA	NA
Moisture Content	%		0.1	11.6	10.4	8.0	9.1	5.5
Surrogate	**Unit**	**Acceptable Limits**						
Terphenyl	%	60-140		84	110	89	103	110

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

5774845-5774900 Results are based on sample dry weight.The soil sample was prepared in the lab using the Methanol extraction technique. The sample was not field preserved with methanol and an Encore was not provided for analysis.
The C6-C10 fraction is calculated using toluene response factor.
The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and n-C34.
Gravimetric Heavy Hydrocarbons are not included in the Total C16-C50 and are only determined if the chromatogram of the C34 - C50 hydrocarbons indicates that hydrocarbons >C50 are present.
The chromatogram has returned to baseline by the retention time of nC50.
Total C6 - C50 results are corrected for BTEX contributions.
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC6 and nC10 response factors are within 30% of Toluene response factor.
nC10, nC16 and nC34 response factors are within 10% of their average.
C50 response factor is within 70% of nC10 + nC16 + nC34 average.
Linearity is within 15%.
Extraction and holding times were met for this sample.
Fractions 1-4 are quantified with the contribution of PAHs. Under Ontario Regulation 153, results are considered valid without determining the PAH contribution if not requested by the client.
Quality Control Data is available upon request.

Certified By: N Popnikolof

AGAT Laboratories

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Certificate of Analysis

AGAT WORK ORDER: 14Z884832

PROJECT: 350600-515

CLIENT NAME: ARCADIS SENES CANADA INC(DCS)

ATTENTION TO: Steve Borcsok

SAMPLING SITE:

SAMPLED BY:J. Mauchan

PHCs F1 - F4 (Water)

DATE RECEIVED: 2014-09-05

DATE REPORTED: 2014-09-16

				F4 - NH - MW11
		SAMPLE DESCRIPTION:		- 01
		SAMPLE TYPE:		Water
		DATE SAMPLED:		8/24/2014
Parameter	**Unit**	**G / S**	**RDL**	**5774902**
Benzene	µg/L		0.20	<0.20
Toluene	µg/L		0.20	<0.20
Ethylbenzene	µg/L		0.10	<0.10
Xylene Mixture	µg/L		0.20	<0.20
F1 (C6 to C10)	µg/L		25	<25
F1 (C6 to C10) minus BTEX	µg/L		25	<25
F2 (C10 to C16)	µg/L		100	<100
F3 (C16 to C34)	µg/L		100	<100
F4 (C34 to C50)	µg/L		100	<100
Gravimetric Heavy Hydrocarbons	µg/L		500	NA
Surrogate	**Unit**	**Acceptable Limits**		
Terphenyl	%	60-140		96

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

5774902
The C6-C10 fraction is calculated using Toluene response factor.
The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and nC34.
Gravimetric Heavy Hydrocarbons are not included in the Total C16 - C50 and are only determined if the chromatogram of the C34 - C50 Hydrocarbons indicated that hydrocarbons >C50 are present.
The chromatogram has returned to baseline by the retention time of nC50.
Total C6-C50 results are corrected for BTEX contributions.
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC6 and nC10 response factors are within 30% of Toluene response factor.
nC10, nC16 and nC34 response factors are within 10% of their average.
C50 response factor is within 70% of nC10 + nC16 nC34 average.
Linearity is within 15%.
Extraction and holding times were met for this sample.
Fractions 1-4 are quantified with the contribution of PAHs. Under Ontario Regulation 153, results are considered valid without determining the PAH contribution if not requested by the client.
NA = Not Applicable

Certified By: N Popnikolof

AGAT Laboratories

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

Certificate of Analysis

AGAT WORK ORDER: 14Z884832

PROJECT: 350600-515

CLIENT NAME: ARCADIS SENES CANADA INC(DCS)

ATTENTION TO: Steve Borcsok

SAMPLING SITE:

SAMPLED BY:J. Mauchan

Metals (Water)

DATE RECEIVED: 2014-09-05

DATE REPORTED: 2014-09-16

				SAMPLE DESCRIPTION:	F4 - NH - MW11 - 01
				SAMPLE TYPE:	Water
				DATE SAMPLED:	8/24/2014
Parameter	Unit	G / S	RDL	5774902	
Arsenic	mg/L		0.003	0.009	
Cadmium	mg/L		0.002	<0.002	
Chromium	mg/L		0.003	1.07	
Cobalt	mg/L		0.001	0.036	
Copper	mg/L		0.003	0.105	
Lead	mg/L		0.002	0.020	
Mercury	mg/L		0.0001	<0.0001	
Nickel	mg/L		0.003	0.268	
Zinc	mg/L		0.005	0.107	

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

Certified By: Sofya Pehlyova

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Quality Assurance

CLIENT NAME: ARCADIS SENES CANADA INC(DCS)

AGAT WORK ORDER: 14Z884832

PROJECT: 350600-515

ATTENTION TO: Steve Borcsok

SAMPLING SITE:

SAMPLED BY:J. Mauchan

Soil Analysis

RPT Date: Sep 16, 2014			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Metals Scan (Soil)															
Arsenic	1		3	3	0.0%	< 1	95%	70%	130%	95%	80%	120%	96%	70%	130%
Cadmium	1		< 0.5	< 0.5	0.0%	< 0.5	101%	70%	130%	107%	80%	120%	108%	70%	130%
Cobalt	1		8.7	8.5	2.3%	< 0.5	95%	70%	130%	97%	80%	120%	96%	70%	130%
Chromium	1		17	17	0.0%	< 2	102%	70%	130%	99%	80%	120%	96%	70%	130%
Copper	1		22	22	0.0%	< 1	101%	70%	130%	103%	80%	120%	100%	70%	130%
Lead	1		9	9	0.0%	< 1	118%	70%	130%	115%	80%	120%	110%	70%	130%
Mercury	1		< 0.10	< 0.10	0.0%	< 0.10	120%	70%	130%	104%	80%	120%	106%	70%	130%
Nickel	1		12	12	0.0%	< 1	78%	70%	130%	95%	80%	120%	89%	70%	130%
Zinc	1		43	45	4.5%	< 5	102%	70%	130%	106%	80%	120%	103%	70%	130%

Certified By: Sofiya Pehlyova

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Quality Assurance

CLIENT NAME: ARCADIS SENES CANADA INC(DCS)
AGAT WORK ORDER: 14Z884832
PROJECT: 350600-515
ATTENTION TO: Steve Borcsok
SAMPLING SITE:
SAMPLED BY:J. Mauchan

Trace Organics Analysis

RPT Date: Sep 16, 2014			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
PHCs F1 - F4 (Soil)															
Benzene	1		< 0.02	< 0.02	0.0%	< 0.02	82%	50%	140%	116%	60%	130%	81%	50%	140%
Toluene	1		< 0.08	< 0.08	0.0%	< 0.08	91%	50%	140%	116%	60%	130%	91%	50%	140%
Ethylbenzene	1		< 0.05	< 0.05	0.0%	< 0.05	97%	50%	140%	115%	60%	130%	92%	50%	140%
Xylene Mixture	1		< 0.05	< 0.05	0.0%	< 0.05	99%	50%	140%	118%	60%	130%	90%	50%	140%
F1 (C6 to C10)	1		< 5	< 5	0.0%	< 5	105%	60%	140%	93%	80%	120%	81%	60%	140%
F2 (C10 to C16)	1		< 10	< 10	0.0%	< 10	100%	60%	140%	104%	80%	120%	75%	60%	140%
F3 (C16 to C34)	1		< 50	< 50	0.0%	< 50	103%	60%	140%	101%	80%	120%	85%	60%	140%
F4 (C34 to C50)	1		< 50	< 50	0.0%	< 50	99%	60%	140%	107%	80%	120%	102%	60%	140%
PCBs (soil)															
PCBs	1		< 0.1	< 0.1	0.0%	< 0.1	79%	60%	140%	74%	60%	140%	121%	60%	140%
PHCs F1 - F4 (Water)															
Benzene	1		< 0.20	< 0.20	0.0%	< 0.20	115%	50%	140%	119%	60%	130%	114%	50%	140%
Toluene	1		< 0.20	< 0.20	0.0%	< 0.20	117%	50%	140%	113%	60%	130%	116%	50%	140%
Ethylbenzene	1		< 0.10	< 0.10	0.0%	< 0.10	113%	50%	140%	106%	60%	130%	107%	50%	140%
Xylene Mixture	1		< 0.20	< 0.20	0.0%	< 0.20	107%	50%	140%	110%	60%	130%	115%	50%	140%
F1 (C6 to C10)	1		< 25	< 25	0.0%	< 25	91%	60%	140%	81%	60%	140%	99%	60%	140%
F2 (C10 to C16)	1		< 100	< 100	0.0%	< 100	100%	60%	140%	66%	60%	140%	76%	60%	140%
F3 (C16 to C34)	1		< 100	< 100	0.0%	< 100	96%	60%	140%	113%	60%	140%	83%	60%	140%
F4 (C34 to C50)	1		< 100	< 100	0.0%	< 100	82%	60%	140%	76%	60%	140%	65%	60%	140%
PCBs (water)															
PCBs	1		< 0.1	< 0.1	0.0%	< 0.1	96%	60%	140%	99%	60%	140%	88%	60%	140%

Certified By: N Popnikolof

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Quality Assurance

CLIENT NAME: ARCADIS SENES CANADA INC(DCS)

AGAT WORK ORDER: 14Z884832

PROJECT: 350600-515

ATTENTION TO: Steve Borcsok

SAMPLING SITE:

SAMPLED BY:J. Mauchan

Water Analysis

RPT Date: Sep 16, 2014			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Metals (Water)															
Arsenic	1		< 0.003	< 0.003	0.0%	< 0.003	97%	90%	110%	99%	90%	110%	102%	70%	130%
Cadmium	1		< 0.002	< 0.002	0.0%	< 0.002	99%	90%	110%	108%	90%	110%	102%	70%	130%
Chromium	1		< 0.003	< 0.003	0.0%	< 0.003	101%	90%	110%	110%	90%	110%	103%	70%	130%
Cobalt	1		< 0.001	< 0.001	0.0%	< 0.001	98%	90%	110%	103%	90%	110%	102%	70%	130%
Copper	1		< 0.003	< 0.003	0.0%	< 0.003	104%	90%	110%	110%	90%	110%	106%	70%	130%
Lead	1		< 0.002	< 0.002	0.0%	< 0.002	98%	90%	110%	99%	90%	110%	97%	70%	130%
Mercury	5776891		<0.0001	<0.0001	0.0%	< 0.0001	100%	90%	110%	99%	90%	110%	95%	80%	120%
Nickel	1		< 0.003	< 0.003	0.0%	< 0.003	105%	90%	110%	108%	90%	110%	103%	70%	130%
Zinc	1		< 0.005	< 0.005	0.0%	< 0.005	99%	90%	110%	104%	90%	110%	104%	70%	130%

Certified By: Sofiya Pehlyova

AGAT Laboratories

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Method Summary

CLIENT NAME: ARCADIS SENES CANADA INC(DCS)

AGAT WORK ORDER: 14Z884832

PROJECT: 350600-515

ATTENTION TO: Steve Borcsok

SAMPLING SITE:

SAMPLED BY:J. Mauchan

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Soil Analysis			
Arsenic	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Cadmium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Cobalt	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Chromium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Copper	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Lead	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Mercury	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Nickel	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Zinc	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Trace Organics Analysis			
PCBs	ORG-91-5113	EPA SW-846 3541 & 8082	GC/ECD
Decachlorobiphenyl	ORG-91-5113	EPA SW-846 3541 & 8082	GC/ECD
PCBs	ORG-91-5112	EPA SW-846 3510 & 8082	GC/ECD
Decachlorobiphenyl	ORG-91-5112	EPA SW-846 3510 & 8082	GC/ECD
Benzene	VOL-91-5009	EPA SW-846 5035 & 8260	P & T GC/MS
Toluene	VOL-91-5009	EPA SW-846 5035 & 8260	P & T GC/MS
Ethylbenzene	VOL-91-5009	EPA SW-846 5035 & 8260	P & T GC/MS
Xylene Mixture	VOL-91-5009	EPA SW-846 5035 & 8260	P & T GC/MS
F1 (C6 to C10)	VOL-91-5009	CCME Tier 1 Method	P & T GC/FID
F1 (C6 to C10) minus BTEX	VOL-91-5009	CCME Tier 1 Method	P & T GC/FID
F2 (C10 to C16)	VOL-91-5009	CCME Tier 1 Method, EPA SW846 8015	GC / FID
F3 (C16 to C34)	VOL-91-5009	CCME Tier 1 Method, EPA SW846 8015	GC / FID
F4 (C34 to C50)	VOL-91-5009	CCME Tier 1 Method, EPA SW846 8015	GC / FID
Gravimetric Heavy Hydrocarbons	VOL-91-5009	CCME Tier 1 Method	BALANCE
Moisture Content	VOL-91-5009	CCME Tier 1 Method	BALANCE
Terphenyl	VOL-91-5009		GC/FID
Benzene	VOL-91-5010	MOE PHC-E3421	(P&T)GC/FID
Toluene	VOL-91-5010	MOE PHC-E3421	(P&T)GC/FID
Ethylbenzene	VOL-91-5010	MOE PHC-E3421	(P&T)GC/FID
Xylene Mixture	VOL-91-5010	MOE PHC-E3421	(P&T)GC/FID
F1 (C6 to C10)	VOL-91-5010	MOE PHC-E3421	(P&T)GC/FID
F1 (C6 to C10) minus BTEX	VOL-91-5010	MOE PHC-E3421	(P&T)GC/FID
F2 (C10 to C16)	VOL-91-5010	MOE PHC-E3421	GC/FID
F3 (C16 to C34)	VOL-91-5010	MOE PHC-E3421	GC/FID
F4 (C34 to C50)	VOL -91- 5010	MOE PHC-E3421	GC/FID
Gravimetric Heavy Hydrocarbons	VOL-91-5010	MOE PHC-E3421	BALANCE
Terphenyl	VOL-91-5010		GC/FID
Water Analysis			
Arsenic	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Cadmium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Chromium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Cobalt	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Copper	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Lead	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Mercury	MET-93-6100	EPA SW 846 7470 & 245.1	CVAAS
Nickel	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Zinc	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS

DCS SENES Consultants
121 Granton Drive, Unit 11, Richmond Hill, ON
Tel: (905) 882-5984 Fax: (905) 882-8962
Email: engineers@dcsltd.ca Website: www.dcsltd.ca

Chain of Custody Record

6.3/6.8/5.4

Shipper

Project No.: 350600-515 **Site:** FOX- 4 Cape Hooper

Project Manager: S. Borcsok

Field Engineer/Techician: S. Borcsok/J. Mauchan

Date: 26 Aug 2014 **Route:** Courier

Lab: AGAT **Location** OTTAWA

Required Date: _____ **Turnaround:** STD Day(s)

Quotation No.: _____

MDL's To Meet: see attached

1428884832

Location/ Hole No.	Sample No.	Depth (m)	Description	Label No.	Grab/ Comp.	Date Collected	PHCs F1	PHCs F2-F4	PCBs	Inorganics: As, Cd, Cr, Co, Cu, Pb, Ni, Zn, Hg							pH	Electrical Conductivity	Preservatives
							Analyses Requested										Field Procedures		
F4-TAN-11-S			Soil			24 Aug 2014	✓	✓	✓	✓									
F4-PAL-27-S			Soil			25 Aug 2014	✓	✓	✓	✓									
F4-HEL-MW98-02-S			Soil			25 Aug 2014	✓	✓	✓	✓									
F4-STA-MW98-07-8			Soil			25 Aug 2014	✓	✓	✓	✓									
F4-NH-MW12-09-S			Soil			24 Aug 2014	✓	✓	✓	✓									
F4-NH-MW11-01			Ground Water			24 Aug 2014	✓	✓	✓	✓									

Relinquished By:	Date:	Time:	Received By:
J Mauchan	26 Aug 2014		Shazmin
Relinquished By:	Date:	Time:	Received By: Sept 5/14
Relinquished By:	Date:	Time:	Received By: 9:20am

Laboratory

Remarks:

ALL RESULTS ARE TO BE SENT TO THE PROJECT MANAGER.

Landfill Monitoring Detection Limits

Parameter	Soil (mg/kg)	Groundwater (mg/L)
Copper	<3.0	<0.005
Nickel	<5.0	<0.010
Cobalt	<5.0	<0.005
Cadmium	<1.0	<0.001
Lead	<10	<0.01
Zinc	<15	<0.005
Chromium	<20	<0.005
Arsenic	<0.2	<0.05
Mercury	<0.1	<0.001
PCBs	<0.05	<0.003
TPH	<40	<1

APPENDIX D

HISTORICAL CHEMISTRY SUMMARY TABLES (SOIL)

New Tier II and NHWL Facility Monitoring. Summary of 2013 and Ongoing Soil Analytical Data**

FOX-4 Cape Hooper - NHWL & Tier II Disposal Facilities - Summary of 2013-2028 Soil Analytical Data

Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	Cu [mg/kg]	Ni [mg/kg]	Co [mg/kg]	Cd [mg/kg]	Pb [mg/kg]	Zn [mg/kg]	Cr [mg/kg]	As [mg/kg]	Hg [mg/kg]	Total PCB [mg/kg]	F1 C_6-C_{10} [mg/kg]	F2 C_{10}-C_{16} [mg/kg]	F3 C_{16}-C_{34} [mg/kg]	Modified TPH^ - Total C6-C34 [mg/kg]	TPH Identity	
																				% Fuel Oil	% Lube Oil
Background Average						30	24	9	1.0	10	41	41	29								
Baseline Data - Average						**13**	**10**	**5.0**	**1.0**	**5.6**	**22**	**21**	**12**	**0.100**	**0.050**				**41**		
Baseline Data - Standard Deviation						24	8	2.1	0.23	11	15	15	19	0.014	0.0188				70		
Baseline Average + 3xStandard Deviation						83	34	11	1.7	38	67	67	69	0.14	0.11				251		
Detection Limit						<3.0	<5.0	<5.0	<1.0	<10	<15	<20	<0.2	<0.1	<0.05				<40		
DEW Line Cleanup Tier I Criteria										*200*					*1*						
DEW Line Cleanup Tier II Criteria & DLCU Hydrocarbon Action Level & site specific As criteria						*100*	*100*	*50*	*5*	*500*	*500*	*250*	*130*	*2.0*	*5*				*2500*		
Monitoring Data																					
Upgradient																					
	BMW 11-01 surface																				
F4-NH-MW11-01-S	BMW 11-01	2014	16	Phase II	0-15	**52**	**40**	**11**	<0.10	**9.9**	**86**	**73**	**48**	<0.050	<0.010	<10	<10	<10	15		
	BMW 11-01	2016	18	Phase II															#N/A		
	BMW 11-01	2018	20	Phase II															#N/A		
	BMW 11-01	2023	25	Phase II															#N/A		
	BMW 11-01	2028	30	Phase II															#N/A		
				Phase III															#N/A		
																			#N/A		
																			#N/A		
																			#N/A		
	BMW 11-01 depth																				
F4-NH-MW11-01-D	BMW 11-01	2014	16	Phase II	40-50	**98**	**73**	**17**	<0.10	**13**	**110**	**83**	*170*	<0.050	<0.010	<10	<10	<10	15		
	BMW 11-01	2016	18	Phase II															#N/A		
	BMW 11-01	2018	20	Phase II															#N/A		
	BMW 11-01	2023	25	Phase II															#N/A		
	BMW 11-01	2028	30	Phase II															#N/A		
				Phase III															#N/A		
																			#N/A		
																			#N/A		
Downgradient																					
	MW 11-02 surface																				
F4-NH-MW11-02-S	MW 11-02	2014	16	Phase II	0-15	**49**	**41**	**14**	<0.10	**11**	**70**	**80**	**31**	<0.050	<0.010	<10	<10	<10	15		
	MW 11-02	2016	18	Phase II															#N/A		
	MW 11-02	2018	20	Phase II															#N/A		
	MW 11-02	2023	25	Phase II															#N/A		
	MW 11-02	2028	30	Phase II															#N/A		
				Phase III															#N/A		
																			#N/A		
																			#N/A		
																			#N/A		
	MW 11-02 depth																				
F4-NH-MW11-02-D	MW 11-02	2014	16	Phase II	40-50	**52**	**42**	**14**	<0.10	**12**	**74**	**82**	**34**	<0.050	0.012	<10	<10	21	31		
	MW 11-02	2016	18	Phase II															#N/A		
	MW 11-02	2018	20	Phase II															#N/A		
	MW 11-02	2023	25	Phase II															#N/A		
	MW 11-02	2028	30	Phase II															#N/A		
				Phase III															#N/A		
																			#N/A		
																			#N/A		
																			#N/A		
	MW 11-03 surface																				
F4-NH-MW11-03-S	MW 11-03	2014	16	Phase II	0-15	**22**	**14**	4.8	**2.3**	**10**	**50**	**39**	12	<0.050	**0.083**	<10	<10	39	**49**		
	MW 11-03	2016	18	Phase II															#N/A		
	MW 11-03	2018	20	Phase II															#N/A		
	MW 11-03	2023	25	Phase II															#N/A		
	MW 11-03	2028	30	Phase II															#N/A		
				Phase III															#N/A		
																			#N/A		
																			#N/A		
																			#N/A		
	MW 11-03 depth																				
F4-NH-MW11-03-D	MW 11-03	2014	16	Phase II	40-50	**18**	**12**	4.3	0.9	**8.8**	**37**	**36**	**21**	<0.050	0.048	<10	<10	13	23		
	MW 11-03	2016	18	Phase II															#N/A		
	MW 11-03	2018	20	Phase II															#N/A		
	MW 11-03	2023	25	Phase II															#N/A		
	MW 11-03	2028	30	Phase II															#N/A		
				Phase III															#N/A		
																			#N/A		
																			#N/A		
																			#N/A		

FOX-4 Cape Hooper - NHWL & Tier II Disposal Facilities - Summary of 2013-2028 Soil Analytical Data

Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	Cu [mg/kg]	Ni [mg/kg]	Co [mg/kg]	Cd [mg/kg]	Pb [mg/kg]	Zn [mg/kg]	Cr [mg/kg]	As [mg/kg]	Hg [mg/kg]	Total PCB [mg/kg]	F1 C_6-C_{10} [mg/kg]	F2 C_{10}-C_{16} [mg/kg]	F3 C_{16}-C_{34} [mg/kg]	Modified TPH^ - Total C6-C34 [mg/kg]	TPH Identity	
																				% Fuel Oil	% Lube Oil
	MW 11-04 surface																				
F4-NH-MW11-04-S	MW 11-04	2014	16	Phase II	0-15	7.4	7.1	2.1	<0.10	2.5	16	21	7.4	<0.050	<0.010	<10	<10	82	**92**		
	MW 11-04	2016	18	Phase II															#N/A		
	MW 11-04	2018	20	Phase II															#N/A		
	MW 11-04	2023	25	Phase II															#N/A		
	MW 11-04	2028	30	Phase II															#N/A		
				Phase III															#N/A		
																			#N/A		
																			#N/A		
																			#N/A		
	MW 11-04 depth																				
F4-NH-MW11-04-D	MW 11-04	2014	16	Phase II	40-50	**13**	**14**	3.7	<0.10	3.1	**27**	**31**	11	<0.050	<0.010	<10	<10	<10	15		
	MW 11-04	2016	18	Phase II															#N/A		
	MW 11-04	2018	20	Phase II															#N/A		
	MW 11-04	2023	25	Phase II															#N/A		
	MW 11-04	2028	30	Phase II															#N/A		
				Phase III															#N/A		
																			#N/A		
																			#N/A		
																			#N/A		
	MW 11-05 surface																				
F4-NH-MW11-05-S	MW 11-05	2014	16	Phase II	0-15	11	9	2.7	<0.10	2.5	18	**24**	10	<0.050	<0.010	<10	<10	43	**53**		
	MW 11-05	2016	18	Phase II															#N/A		
	MW 11-05	2018	20	Phase II															#N/A		
	MW 11-05	2023	25	Phase II															#N/A		
	MW 11-05	2028	30	Phase II															#N/A		
				Phase III															#N/A		
																			#N/A		
																			#N/A		
																			#N/A		
	MW 11-05 depth																				
F4-NH-MW11-05-D	MW 11-05	2014	16	Phase II	40-50	**14**	**11**	3.4	<0.10	3.1	**22**	**28**	12	<0.050	<0.010	<10	<10	17	27		
	MW 11-05	2016	18	Phase II															#N/A		
	MW 11-05	2018	20	Phase II															#N/A		
	MW 11-05	2023	25	Phase II															#N/A		
	MW 11-06	2028	30	Phase II															#N/A		
				Phase III															#N/A		
																			#N/A		
																			#N/A		
																			#N/A		
	MW 11-06 surface																				
F4-NH-MW11-06-S	MW 11-06	2014	16	Phase II	0-15	**13**	**11**	3.5	<0.10	3.9	21	**24**	**22**	<0.050	<0.010	<10	<10	17	27		
	MW 11-06	2016	18	Phase II															#N/A		
	MW 11-06	2018	20	Phase II															#N/A		
	MW 11-06	2023	25	Phase II															#N/A		
	MW 11-06	2028	30	Phase II															#N/A		
				Phase III															#N/A		
																			#N/A		
																			#N/A		
																			#N/A		
	MW 11-06 depth																				
F4-NH-MW11-06-D	MW 11-06	2014	16	Phase II	40-50	**14**	**14**	3.8	<0.10	5.4	**26**	**29**	**45**	<0.050	<0.010	<10	<10	22	32		
	MW 11-06	2016	18	Phase II															#N/A		
	MW 11-06	2018	20	Phase II															#N/A		
	MW 11-06	2023	25	Phase II															#N/A		
	MW 11-06	2028	30	Phase II															#N/A		
				Phase III															#N/A		
																			#N/A		
																			#N/A		
																			#N/A		
	MW 12-07 surface																				
F4-NH-MW11-07-S	MW 12-07	2014	16	Phase II	0-15	**36**	**36**	**9.9**	0.13	**13**	**74**	**41**	**30**	<0.050	<0.010	<10	<10	56	**66**		
	MW 12-07	2016	18	Phase II															#N/A		
	MW 12-07	2018	20	Phase II															#N/A		
	MW 12-07	2023	25	Phase II															#N/A		
	MW 12-07	2028	30	Phase II															#N/A		
				Phase III															#N/A		
																			#N/A		
																			#N/A		
																			#N/A		

FOX-4 Cape Hooper - NHWL & Tier II Disposal Facilities - Summary of 2013-2028 Soil Analytical Data

Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	Cu [mg/kg]	Ni [mg/kg]	Co [mg/kg]	Cd [mg/kg]	Pb [mg/kg]	Zn [mg/kg]	Cr [mg/kg]	As [mg/kg]	Hg [mg/kg]	Total PCB [mg/kg]	F1 C_6-C_{10} [mg/kg]	F2 C_{10}-C_{16} [mg/kg]	F3 C_{16}-C_{34} [mg/kg]	Modified TPH^ - Total C6-C34 [mg/kg]	TPH Identity	
																				% Fuel Oil	% Lube Oil
	MW 12-07 depth																				
F4-NH-MW11-07-D	MW 12-07	2014	16	Phase II	40-50	**17**	**20**	**5.1**	<0.10	4.5	**31**	**24**	**16**	<0.050	<0.010	<10	<10	<10	15		
	MW 12-07	2016	18	Phase II															#N/A		
	MW 12-07	2018	20	Phase II															#N/A		
	MW 12-07	2023	25	Phase II															#N/A		
	MW 12-07	2028	30	Phase II															#N/A		
				Phase III															#N/A		
																			#N/A		
																			#N/A		
																			#N/A		
	MW 12-08 surface																				
F4-NH-MW11-08-S	MW 12-08	2014	16	Phase II	0-15	**20**	**14**	**5.65**	<0.5	**10**	**39**	**42**	**37**	<0.10	<0.05	<10	41	21	**67**		
	MW 12-08	2016	18	Phase II															#N/A		
	MW 12-08	2018	20	Phase II															#N/A		
	MW 12-08	2023	25	Phase II															#N/A		
	MW 12-08	2028	30	Phase II															#N/A		
				Phase III															#N/A		
																			#N/A		
																			#N/A		
																			#N/A		
	MW 12-08 depth																				
F4-NH-MW11-08-D	MW 12-08	2014	16	Phase II	40-50	**30**	**22**	**7.8**	<0.10	**18**	**56**	**64**	**16**	<0.050	<0.010	<10	320	49	**374**		
	MW 12-08	2016	18	Phase II															#N/A		
	MW 12-08	2018	20	Phase II															#N/A		
	MW 12-08	2023	25	Phase II															#N/A		
	MW 12-08	2028	30	Phase II															#N/A		
				Phase III															#N/A		
																			#N/A		
																			#N/A		
																			#N/A		

Legend

XX	sample exceeds background
XX	**sample exceeds baseline**
XX	*sample exceeds DLCU Tier I criteria*
XX	*sample exceeds DLCU Tier II criteria*

Note: Total Hydrocarbons (C_6-C_{34}) has been calculated by adding results for F1, F2 and F3.
** The New Tier II and NHWL Facility was constucted in 2012 during additional remediation at FOX-4.
The facilities received Tier II and Non-Hazardous material and were both closed in 2013.
Monitoring wells were established around the facilities in 2013.

FOX-4 Cape Hooper - Helipad Landfill West - Summary of Soil Analytical Data**

Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	Cu [mg/kg]	Ni [mg/kg]	Co [mg/kg]	Cd [mg/kg]	Pb [mg/kg]	Zn [mg/kg]	Cr [mg/kg]	As [mg/kg]	Hg [mg/kg]	Total PCB [mg/kg]	F1 C_6-C_{10} [mg/kg]	F2 C_{10}-C_{16} [mg/kg]	F3 C_{16}-C_{34} [mg/kg]	Modified TPH^ Total C6-C34 [mg/kg]	TPH Identity % Fuel Oil	TPH Identity % Lube Oil
Background Data - Average						30	24	8.8	1.0	10	41	41	29								
Baseline Data - Average						**15**	**16**	**5.9**	**1.0**	**24**	**36**	**35**	**34**		**0.001**				**222**	n/a	n/a
Baseline Data - Standard Deviation						4.4	3.2	0.7	0.02	4.7	5	5.9	30		0.056				517		
Baseline average + 3xStandard Deviation						29	25	8	1.1	38	51	53	123		0.17				1772		
Detection Limit						3.0	5.0	5.0	1.0	10	15	20	1.0	0.10	0.001				40		
DEW Line Cleanup Tier I Criteria										*200*					*1*						
DEW Line Cleanup Tier II Criteria & site specific As criteria						*100*	*100*	*50*	*5*	*500*	*500*	*250*	*130*	*2.0*	*5*				*2500*		
Monitoring Data																					
Upgradient- HELIPAD LANDFILL WEST																					
	MW-3 Surface (prior to 2013 excavation)																				
99-3729	MW-3	1999	1	Phase I	0	13	11	<5.0	<1.0	<1.0	26	28	12	<0.10	**0.015**				< 40	n/a	n/a
FO-3-1	MW-3	2000	2	Phase I	0-15	10	10	2.6	<0.10	4.0	18	16	17	<0.050	<0.0030				<100	n/a	n/a
FO-3-1	MW-3	2001	3	Phase I	0-15	9.9	12	3.9	<0.10	3.0	25	23	12	<0.050	<0.010				<20	n/a	n/a
FOM3-1	MW-3	2003	5	Phase I	0-15	13	10	4.0	<1.0	<1.0	23	24	**95**	<0.040	<0.0040	<10	<40	85	110		
MW-3(Soil)0-15cm	MW-3	2006	8	Phase II	0-15	**18**	7.0	2.0	<1.0	<1.0	16	16	8.4	<0.040	<0.10	<12	20	40	66		
MW-3(Soil)0-15cm	MW-3	2007	9	Phase II	0-15	13	10	3.0	0.9	<1.0	25	25	10	<0.040	<0.10	<11	<20	<20	26		
MW-3(Soil)0-15cm	MW-3	2008	10	Phase II	0-15	**21**	**19**	**6.0**	<0.50	7.0	23	**48**	**49**	<0.10	<0.050	<1.0	<1.0	18	19		
10-16957/58	MW-3	2010	12	Phase II	0-10	**26**	**17**	**14**	<1.0	<10	**52**	**43**	13	<0.1	<0.003	<10	4.1	28	37		
not sampled		2013																			
F4-HEL-MW98-03-S	MW-3	2014	16	Phase II	0-15	14	13	4.4	<0.10	4.2	32	32	31	<0.050	<0.010	<10	<10	<10	15		
		2016	18	Phase II															#N/A		
		2018	20	Phase II															#N/A		
		2023	25	Phase II															#N/A		
		2028	30	Phase II															#N/A		
				Phase III															#N/A		
																			#N/A		
	MW-3 depth (prior to 2013 excavation)																				
99-3731	MW-3	1999	1	Phase I	30	12	9.1	<5.0	<1.0	<1.0	20	22	11	<0.10	**0.0047**				< 40	n/a	n/a
FO-3-2	MW-3	2000	2	Phase I	40-50	10	11	2.7	<0.10	3.0	21	18	8.0	<0.050	<0.0030				<100	n/a	n/a
FO-3-2	MW-3	2001	3	Phase I	40-50	10	13	3.8	<0.10	4.0	24	23	13	<0.050	<0.010				<20	n/a	n/a
not sampled	MW-3	2003	5	Phase I																	
MW-3(Soil)40-50cm	MW-3	2006	8	Phase II	40-50	11	8.0	3.0	<1.0	<1.0	14	14	11	<0.040	<0.10	<12	<10	30	41		
MW-3(Soil)40-50cm	MW-3	2007	9	Phase II	40-50	11	9.0	3.0	0.9	<1.0	17	15	11	<0.040	<0.10	<10	<20	<20	25		
MW-3(Soil)40-50cm	MW-3	2008	10	Phase II	40-50	**17**	14	<5.0	<0.50	7.0	<2.0	25	17	<0.10	<0.050	<1.0	<1.0	<1.0	1.5		
10-16959/60	MW-3	2010	12	Phase II	30-40	15	13	5.3	<1.0	<10	28	28	14	<0.10	**0.008**	<10	4.5	<9.0	14		
not sampled		2013																	#N/A		
F4-HEL-MW98-03-D	MW-3	2014	16	Phase II	40-50	**19**	**16**	4.7	<0.10	5.5	31	32	30	<0.050	<0.010	<10	<10	<10	15		
		2016	18	Phase II															#N/A		
		2018	20	Phase II															#N/A		
		2023	25	Phase II															#N/A		
		2028	30	Phase II															#N/A		
																			#N/A		
																			#N/A		
																			#N/A		
																			#N/A		
	MW-4 Surface (prior to 2013 excavation)																				
99-3713	MW-4	1999	1	Phase I	0	**21**	15	5.1	<1.0	11	**46**	**35**	**44**	<0.10	**0.049**				#N/A	100	0
FO-4-1	MW-4	2000	2	Phase I	0-15	11	10	2.7	<0.10	<1.0	25	19	<1.0	<0.050	**0.068**				#N/A	n/a	n/a
FO-4-1	MW-4	2001	3	Phase I	0-15	4.1	7.0	2.5	<0.10	3.0	12	11	11	<0.050	<0.010				#N/A	n/a	n/a
FOM4-1	MW-4	2003	5	Phase I	0-15	10	9.0	4.0	<1.0	<1.0	22	21	9.6	<0.040	<0.005	<10	<40	<40	45		
MW-4	MW-4	2005	7	Phase II	0-12	**21**	6.0	3.0	<1.0	<1.0	19	15	4.5	<0.040	<0.050	<1.0	<40	<40	41		
MW-4(Soil)0-15cm	MW-4	2006	8	Phase II	0-15	**23**	15	4.0	<1.0	15	**51**	33	**37**	0.050	*1.00*	<12	100	210	**316**		
MW-4 (Soil)0-15cm	MW-4	2007	9	Phase II	0-15	13	9.0	3.0	<0.9	<10	35	20	14	<0.04	**0.7**	<11	24	78	108		
MW-4 (Soil)0-15cm	MW-4	2008	10	Phase II	0-15	9.0	8.0	<5	<0.5	3.0	<20	20	5	<0.1	<0.05	<10	<10	<10	15		
		2010	12	Phase II															#N/A		
	MW-4 depth (prior to 2013 excavation)																				
99-3715	MW-4	1999	1	Phase I	30	15	10	<5.0	<1.0	<1.0	26	34	23	<0.10	**0.042**				< 40	n/a	n/a
FO-4-2	MW-4	2000	2	Phase I	40-50	10	10	3.1	<0.10	3.0	23	19	10	<0.050	**0.015**				<100	n/a	n/a
FO-4-2	MW-4	2001	3	Phase I	40-50	4.5	8.0	2.2	<0.10	2.0	15	12	5.0	<0.050	**0.010**				<20	n/a	n/a
FOM4-2	MW-4	2003	5	Phase I	40-50	**21**	15	**6.0**	<1.0	<1.0	29	26	19	<0.040	<0.0010	<1.0	<40	<40	41		
MW-4(Soil)40-50cm	MW-4	2006	8	Phase II	40-50	**26**	15	4.0	<1.0	11	**51**	**35**	18	0.14	**0.90**	<12	220	210	**436**		
MW-4 (Soil)40-50cm	MW-4	2007	9	Phase II	40-50	**21**	13	4.0	<0.9	11	**49**	31	14	<0.04	**0.7**	<11	137	141	**284**		
MW-4 (Soil)40-50cm	MW-4	2008	10	Phase II	40-50	9	8	<5	<0.5	3	<20	18	4.0	<0.1	<0.05	<10	<10	<10	15		
		2010	12	Phase II															#N/A		
	BMW-06 surface (after 2013 excavation)																				
13-27331/13-27357	MW-6	2013	15	Phase II	0-10	**17**	14	<5.0	<1.0	<1.0	35	**39**	**77**	<0.10	<0.050	<1	<4.0	<9.0	7		
F4-HEL-MW98-06-S	MW-6	2014	16	Phase II	0-15	**20**	**20**	**6.7**	0.14	7.1	**77**	**51**	**40**	<0.050	<0.010	<10	<10	18	28		
		2016	18	Phase II															#N/A		
		2018	20	Phase II															#N/A		
		2023	25	Phase II															#N/A		
		2028	30	Phase II															#N/A		
																			#N/A		
																			#N/A		

FOX-4 Cape Hooper - Helipad Landfill West - Summary of Soil Analytical Data**

Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	Cu [mg/kg]	Ni [mg/kg]	Co [mg/kg]	Cd [mg/kg]	Pb [mg/kg]	Zn [mg/kg]	Cr [mg/kg]	As [mg/kg]	Hg [mg/kg]	Total PCB [mg/kg]	F1 C_6-C_{10} [mg/kg]	F2 C_{10}-C_{16} [mg/kg]	F3 C_{16}-C_{34} [mg/kg]	Modified TPH^ Total C6-C34 [mg/kg]	TPH Identity % Fuel Oil	TPH Identity % Lube Oil
																			#N/A		
																			#N/A		
	BMW-06 depth (after 2013 excavation)																				
13-27332/33	MW-6	2013	15	Phase II	30-40	**17**	14	<5.0	<1.0	<1.0	32	**41**	**39**	<0.10	<0.050	<1.0	4.3	15	19.8		
F4-HEL-MW98-06-D	MW-6	2014	16	Phase II	40-50	**41**	**21**	**6.2**	0.11	6.1	**52**	**40**	**66**	<0.050	<0.010	<10	<10	100	111		
		2016	18	Phase II															#N/A		
		2018	20	Phase II															#N/A		
		2023	25	Phase II															#N/A		
		2028	30	Phase II															#N/A		
																			#N/A		
																			#N/A		
																			#N/A		
																			#N/A		
Downgradient- Helipad Landfill West																					
	MW-01 surface																				
99-3725	MW-01	1999	1	Phase I	0	15	15	5.0	<1.0	<1.0	**36**	**47**	**45**	<0.10	<0.0030				< 40	n/a	n/a
FO-1-1	MW-01	2000	2	Phase I	0-15	**17**	**17**	4.9	<0.10	5.0	**36**	34	**58**	<0.050	<0.0030				<100	n/a	n/a
FO-1-1	MW-01	2001	3	Phase I	0-15	11	15	5.5	<0.10	3.0	**66**	24	14	<0.050	<0.010				65	0.0	100
FOM-1-1	MW-01	2003	5	Phase I	0-15	13	11	5.3	<1.0	<1.0	**69**	**47**	13	<0.040	<0.0040	<10	<40	<40	45		
MW-1	MW-01	2006	8	Phase II	0-12	11	11	**6.0**	<1.0	<1.0	29	28	30	<0.040	<0.050	<1.0	< 40	< 40	41		
MW-1(Soil) 0-15cm	MW-01	2006	8	Phase II	0-15	15	13	4.0	<1.0	<1.0	33	26	**81**	<0.040	<0.10	<12	<10	20	31		
MW-1(Soil)0-15cm	MW-01	2007	9	Phase II	0-15	13	13	**4**	0.9	<1.0	**62**	29	**51**	<0.040	<0.10	<11	<20	32	47.5		
MW-1(Soil)0-15cm	MW-01	2008	10	Phase II	0-15	**20**	**16**	5	<0.50	20	<2.0	31	16	<0.10	<0.050	<1.0	138	85	**224**		
10-16989/90	MW-01	2010	12	Phase II	0-10	15	**16**	**7.0**	<1.0	<1.0	**60**	**40**	17	<0.10	<0.0030	4.4	60	13	77		
13-27334/35	MW-01	2013	15	Phase II	0-10	**18**	15	<5.0	<1.0	<1.0	30	**42**	17	<0.10	<0.050	<1.0	<4.0	<9.0	7		
F4-HEL-MW98-01-S	MW-01	2014	16	Phase II	0-15	**34**	**31**	**9.7**	<0.10	6.1	**47**	**49**	25	<0.050	<0.010	<10	<10	<10	15		
		2016	18	Phase II															#N/A		
		2018	20	Phase II															#N/A		
		2023	25	Phase II															#N/A		
		2028	30	Phase II															#N/A		
																			#N/A		
																			#N/A		
																			#N/A		
																			#N/A		
	MW-01 depth																				
99-3727	MW-01	1999	1	Phase I	30	**19**	**18**	**6.9**	<1.0	<1.0	**48**	**57**	25	<0.10	<0.0030				< 40	n/a	n/a
n/s	MW-01	2000	2	Phase I	40-50																
FO-1-2	MW-01	2001	3	Phase I	40-50	12	13	4.3	<0.10	3.0	27	23	15	<0.050	<0.010				<20	n/a	n/a
FOM-1-2	MW-01	2003	5	Phase I	40-50	**16**	15	**7.0**	<1.0	<1.0	**50**	**57**	19	<0.040	<0.0010	<10	<40	<40	45		
MW-1(Soil) 40-50cm	MW-01	2006	8	Phase II	40-50	**20**	**18**	5.0	<1.0	<1.0	30	31	9	<0.040	<0.10	<12	20	50	76		
MW-1(Soil)40-50cm	MW-01	2007	9	Phase II	40-50	10	9	3.0	1	<1.0	32	23	8	<0.040	<0.10	<11	<20	51	67		
MW-1(Soil)40-50cm	MW-01	2008	10	Phase II	40-50	13	13	<5.0	<0.50	6	<2.0	22	14	<0.10	<0.050	<1.0	1800	42	**1843**		
10-16991/92	MW-01	2010	12	Phase II	30-40	**17**	**16**	**6.9**	<1.0	<1.0	**48**	**41**	**75**	<0.10	<0.0030	51	120	10	181		
13-27336/37	MW-01	2013	15	Phase II	30-40	15	13	<5.0	<1.0	<1.0	28	**42**	**38**	<0.10	<0.050	<1.0	<4.0	<9.0	7.0		
F4-HEL-MW98-01-D	MW-01	2014	16	Phase II	40-50	**32**	**31**	**9.3**	<0.10	5.8	**45**	**47**	23	<0.050	<0.010	<10	<10	<10	15		
		2016	18	Phase II															#N/A		
		2018	20	Phase II															#N/A		
		2023	25	Phase II															#N/A		
		2028	30	Phase II															#N/A		
																			#N/A		
																			#N/A		
																			#N/A		
																			#N/A		
	MW-02 surface																				
99-3733	MW-02	1999	1	Phase I	0	14	11	<5.0	<1.0	<1.0	32	**43**	**45**	<0.10	<0.0030				< 40	n/a	n/a
FO-2-1	MW-02	2000	2	Phase I	0-15	14	14	4.6	<0.10	3.0	33	31	15	<0.050	<0.0030				<100	n/a	n/a
FO-2-1	MW-02	2001	3	Phase I	0-15	10	12	4.0	<0.10	3.0	25	22	16	<0.050	<0.010				11.0	95	5.0
FOM-2-1	MW-02	2003	5	Phase I	0-15	13	12	**6.0**	<1.0	<1.0	30	**43**	**83**	<0.040	<0.0040	<10	<40	95	120		
MW-2	MW-02	2005	7	Phase II	0-10	**21**	6.0	**9.0**	<1.0	<1.0	**37**	30	14	<0.040	<0.050	<1.0	1100	480	**1581**		
MW-2(Soil)0-15cm	MW-02	2006	8	Phase II	0-15	12	13	4.0	<1.0	<1.0	24	26	13	<0.040	<0.10	<12	90	70	166		
MW-2(Soil)0-15cm	MW-02	2007	9	Phase II	0-15	11	10	3.0	0.9	<1.0	24	25	21	<0.040	<0.10	12	320	20	**352**		
MW-2(Soil)0-15cm	MW-02	2008	10	Phase II	0-15	**31**	**31**	**10**	<0.50	9	33	**46**	8	<0.10	<0.050	16	862	305	**1183**		
10-16977/78	MW-02	2010	12	Phase II	0-10	**16**	**17**	**7.4**	<1.0	<1.0	**41**	**41**	20	<0.10	<0.0030	<4.0	39	11	52		
13-27338/39	MW-02	2013	15	Phase II	0-10	**18**	**16**	<5.0	<1.0	<1.0	**36**	**43**	**50**	<0.10	<0.050	<1.0	<4.0	<9.0	7.0		
F4-HEL-MW98-02-S	MW-02	2014	16	Phase II	0-15	**20.5**	**17.5**	**6.95**	<0.5	5.8	**39.5**	**39.5**	**72**	<0.10	<0.05	<10	23	44.5	72.5		
		2016	18	Phase II															#N/A		
		2018	20	Phase II															#N/A		
		2023	25	Phase II															#N/A		
		2028	30	Phase II															#N/A		
				Phase III															#N/A		
																			#N/A		
																			#N/A		
																			#N/A		

FOX-4 Cape Hooper - Helipad Landfill West - Summary of Soil Analytical Data**

Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	Cu [mg/kg]	Ni [mg/kg]	Co [mg/kg]	Cd [mg/kg]	Pb [mg/kg]	Zn [mg/kg]	Cr [mg/kg]	As [mg/kg]	Hg [mg/kg]	Total PCB [mg/kg]	F1 C_{6}-C_{10} [mg/kg]	F2 C_{10}-C_{16} [mg/kg]	F3 C_{16}-C_{34} [mg/kg]	Modified TPH^ Total C6-C34 [mg/kg]	TPH Identity	
																				% Fuel Oil	% Lube Oil
	MW-02 depth																				
99-3735	MW-02	1999	1	Phase I	30	**16**	13	5.6	<1.0	<1.0	33	**46**	**58**	<0.10	<0.0030				49	100	0
FO-2-2	MW-02	2000	2	Phase I	40-50	14	12	3.9	<0.10	3.0	30	27	**92**	<0.050	<0.0030				<100	n/a	n/a
FO-2-2	MW-02	2001	3	Phase I	40-50	11	15	4.4	<0.10	3.0	28	23	**42**	<0.050	<0.010				<2.0	n.d	n.d
FOM-2-2	MW-02	2003	5	Phase I	40-50	15	13	**6.0**	<1.0	<1.0	33	**46**	21	<0.040	<0.0010	<10	<40	48	73		
MW-2(Soil)40-50cm	MW-02	2006	8	Phase II	40-50	**21**	**21**	**6.0**	<1.0	<1.0	32	33	12	<0.040	<0.10	60	920	60	**1040**		
MW-2(Soil)40-50cm	MW-02	2007	9	Phase II	40-50	13	12	3	0.9	<1.0	24	24	8	<0.040	<0.10	99	3300	87	*3486*		
MW-2(Soil)40-50cm	MW-02	2008	10	Phase II	40-50	**34**	**35**	**10**	<0.50	10	33	**49**	12	<0.10	<0.050	62	6800	764	*7626*		
10-16979/80	MW-02	2010	12	Phase II	30-40	15	14	**6.3**	<1.0	<1.0	32	**37**	21	<0.10	<0.0030	<4.0	17	<8.0	23		
13-27340/41	MW-02	2013	15	Phase II	30-40	**18**	**17**	5.3	<1.0	<1.0	32	**43**	16	<0.10	<0.050	25	970	120	**1115**		
F4-HEL-MW98-02-D	MW-02	2014	16	Phase II	40-50	**34**	**35**	**9.9**	<0.10	10	**55**	**54**	**42**	<0.050	<0.010	100	1100	250	**1450**		
		2016	18	Phase II															#N/A		
		2018	20	Phase II															#N/A		
		2023	25	Phase II															#N/A		
		2028	30	Phase II															#N/A		
				Phase III															#N/A		
																			#N/A		
																			#N/A		
																			#N/A		
	F4-17 surface (prior to 2013 excavation)																				
F4-17	F4-17	2005	7	Phase II	0-5														#N/A		
F4-17(Soil) 0-15cm	F4-17	2006	8	Phase II	0-15											<12	10	10	26		
	F4-17 depth																				
F4-17(Soil) 40-45cm	F4-17	2006	8	Phase II	40-45											<12	10	<10	21		
	F4-18 surface																				
S-1-1	MW-1 d/g	2001	3	Phase I	0-15	**22**	**21**	**6.8**	<0.10	15	**44**	**35**	**42**	<0.050	<0.010				#N/A	95	5
F4-18	F4-18	2005	7	Phase II	0-5											<12	1040	2220	*3266*		
F4-18(Soil) 0-15cm	F4-18	2006	8	Phase II	0-15											<12	140	420	**566**		
	F4-18 depth																				
F4-18(Soil) 40-50cm	F4-18	2006	8	Phase II	40-50											97	420	50	**567**		
	F4-19 surface																				
F4-19(Soil)0-15cm	F4-19	2006	8	Phase II	0-15											<12	1670	430	**2106**		
	F4-19 depth																				
F4- 19(Soil)40-45cm	F4-19	2006	8	Phase II	40-45											66	2560	650	*3276*		
	F4-20 surface																				
F4-20	F4-20	2005	7	Phase II	0-6											<12	<40	<40	46		
F4-20(Soil) 0-15cm	F4-20	2006	8	Phase II	0-15											<12	360	390	**756**		
	F4-20 depth																				
F4-20(Soil)30-40cm	F4-20	2006	8	Phase II	30-40											96	6940	420	*7456*		

Note: Total Hydrocarbons (C_6-C_{34}) has been calculated by adding results for F1, F2 and F3.
** The Helipad Landfill West underwent additional regrading in 2013.

Legend

XX	sample exceeds background
XX	**sample exceeds baseline**
XX	*sample exceeds DLCU Tier I criteria*
XX	*sample exceeds DLCU Tier II criteria*

FOX-4 Cape Hooper - Station Area Landfill - Summary of 1999-2028 Soil Analytical Data**

Sample #	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	Cu [mg/kg]	Ni [mg/kg]	Co [mg/kg]	Cd [mg/kg]	Pb [mg/kg]	Zn [mg/kg]	Cr [mg/kg]	As [mg/kg]	Hg [mg/kg]	Total PCB [mg/kg]	F1 C_6-C_{10} [mg/kg]	F2 C_{10}-C_{16} [mg/kg]	F3 C_{16}-C_{34} [mg/kg]	Modified TPH* - Total C6-C34 [mg/kg]	TPH Identity % Fuel Oil	TPH Identity % Lube Oil
Background Data - Average						30	24	8.8	1.00	10.0	41	41	28.6								
Baseline Data - Average						**17**	**20**	**5**	**0.12**	**26**	**35**	**28**	**13**		**0.16**				**53**	n/a	n/a
Baseline Data - Standard Deviation						6	14.8	0.9	0.05	4	6	8	3		0.14				30		
Baseline average + 3xStandard Deviation						35	64	7.7	0.3	37	53	50	23		0.6				144		
Detection Limit						3.0	5.0	5.0	1.0	10	15	20	0.20	0.10	0.050				40		
DEW Line Cleanup Tier I Criteria										*200*					*1*						
DEW Line Cleanup Tier II Criteria & site specific As criteria						*100*	*100*	*50*	*5*	*500*	*500*	*250*	*130*	*2.0*	*5*				*2500*		
Monitoring Data																					
Upgradient																					
	MW-7 surface																				
99-3737	MW-7	1999	1	Phase I	0	**69**	15	<5.0	<1.0	**64**	**71**	**50**	9.7	<0.10	0.13				< 40	n/a	n/a
FO-7-1	MW-7	2000	2	Phase I	0-15	**54**	**32**	**6.3**	**1.0**	**27**	**80**	**41**	**17**	<0.050	0.12				<100	n/a	n/a
FO-7-1	MW-7	2001	3	Phase I	0-15	**17**	11	3.4	<0.10	12	28	21	12	<0.050	*6.2*				11	95	5
FOM-7-1	MW-7	2003	5	Phase I	0-15	11	10	4.0	<0.10	<1.0	22	19	**19**	<0.040	0.021	<1.0	<40	44	**65**		
MW-7	MW-7	2005	7	Phase II	0-8	**50**	17	**7.0**	<1.0	**43**	**59**	**37**	**17**	<0.040	0.10	<1.0	<40	390	**411**		
MW-7 (Soil) 0-15 cm	MW-7	2006	8	Phase II	0-15	11	10	3.0	<1.0	<1.0	20	20	11	<0.040	<0.10	<1.0	<1.0	30	31		
MW-7(Soil)0-15cm	MW-7	2008	10	Phase II	0-15	**47**	**21**	**6.0**	**0.60**	**40**	**48**	**41**	**20**	<0.10	0.050	<1.0	<1.0	170	**171**		
10-16953/54	MW-7	2010	12	Phase II	0-10	**45**	15	**5.6**	<1.0	**39**	**52**	**31**	11	<0.10	0.05	<1.0	4.3	20	25		
13-27321/22	MW-7	2013	15	Phase II	0-10	**32**	**22**	**5.5**	<1.0	13	**49**	**43**	**26**	<0.10	0.04	<10	5.3	12	22		
F4-STA-MW98-07-S	MW-7	2014	16	Phase II	0-15	**50**	**30**	**7.8**	0.11	23	**57**	**61**	**33**	<0.050	0.032	<10	<10	28	38		
		2016	18	Phase II															#N/A		
		2018	20	Phase II															#N/A		
		2023	25	Phase II															#N/A		
		2028	30	Phase II															#N/A		
				Phase III															#N/A		
																			#N/A		
																			#N/A		
																			#N/A		
	MW-7 depth																				
99-3739	MW-7	1999	1	Phase I	30	*410*	**24**	**6.5**	<1.0	11	**49**	**61**	**20**	<0.10	0.019				< 40	n/a	n/a
n/s	MW-7	2000	2	Phase I	40-50																
FO-7-2	MW-7	2001	3	Phase I	40-50	14	15	3.7	<0.10	4.0	25	23	**22**		**0.19**				**54**	95	5.0
FOM-7-2	MW-7	2003	5	Phase I	40-50	**32**	**23**	**8.0**	<0.10	<1.0	**39**	**49**	**23**	<0.040	<0.0010	<1.0	<40	<40	41		
MW- 7 (Soil) 40-50 cm	MW-7	2006	8	Phase II	40-50	**18**	14	4.0	<1.0	<1.0	24	**28**	**13**	<0.040	<0.10	<1.0	<1.0	230	**231**		
MW-7(Soil)40-50cm	MW-7	2008	10	Phase II	40-50	**53**	**32**	**8.0**	<0.050	24	**46**	**61**	**24**	<0.10	<0.050	<1.0	<1.0	180	**181**		
10-16955/56	MW-7	2010	12	Phase II	30-40	**35**	**21**	**7.4**	<1.0	17	**50**	**45**	**16**	<0.10	0.017	<1.0	7.1	39	47		
13-27319/20	MW-7	2013	15	Phase II	30-40	**32**	**22**	<5.0	<1.0	13	**48**	**31**	**14**	<0.10	<0.050	<10	4.8	14	24		
F4-STA-MW98-07-D	MW-7	2014	16	Phase II	40-50	**64**	**43**	**10.8**	<0.5	5.85	**57**	**67.5**	**45.5**	<0.10	<0.05	<10	<10	<50	35		
		2016	18	Phase II															#N/A		
		2018	20	Phase II															#N/A		
		2023	25	Phase II															#N/A		
		2028	30	Phase II															#N/A		
				Phase III															#N/A		
																			#N/A		
																			#N/A		
																			#N/A		
Downgradient																					
	MW-8 surface																				
99-3741	MW-8	1999	1	Phase I	0	14	11	<5.0	<1.0	<1.0	34	**28**	10	<0.10	0.080				< 40	n/a	n/a
FO-8-1	MW-8	2000	2	Phase I	0-15	16	12	4.3	<0.10	5.0	**39**	25	**14**	<0.050	0.12				<100	n/a	n/a
FO-8-1	MW-8	2001	3	Phase I	0-15	12	12	3.7	<0.10	4.0	33	20	12	<0.050	**0.26**				<20	n/a	n/a
FOM-8-1	MW-8	2003	5	Phase I	0-15	13	11	4.0	<0.10	<1.0	22	21	12	<0.040	<0.0010	<1.0	<40	<40	41		
MW-8	MW-8	2005	7	Phase II	0-10	11	9.0	4.0	<1.0	<1.0	29	20	6.6	<0.040	<0.050	<1.0	< 40	< 40	41		
MW-8 (Soil) 0-15 cm	MW-8	2006	8	Phase II	0-15	13	10	3.0	<1.0	<1.0	20	19	10	<0.040	<0.10	<1.0	10	150	**161**		
MW-8(Soil)0-15cm	MW-8	2008	10	Phase II	0-15	**19**		<5.0	<0.050	8.0	21	**29**	**17**	<0.10	<0.050	<1.0	<1.0	37	38		
10-16945/46	MW-8	2010	12	Phase II	0-10	12	10	<5.0	<1.0	<1.0	**40**	23	7.5	<0.10	0.0060	<1.0	5.5	15	21		
13-27325/26	MW-8	2013	15	Phase II	0-10	10	11	<5.0	<1.0	<10	23	25	**21**	<0.10	<0.05	<10	3.4	9.5	18		
F4-STA-MW98-08-S	MW-8	2014	16	Phase II	0-15	16	14	4.0	<0.10	5	30	**28**	**21**	<0.050	**0.26**	<10	10	<10	20		
		2016	18	Phase II															#N/A		
		2018	20	Phase II															#N/A		
		2023	25	Phase II															#N/A		
		2028	30	Phase II															#N/A		
				Phase III															#N/A		
																			#N/A		
																			#N/A		
																			#N/A		
	MW-8 depth																				
99-3743	MW-8	1999	1	Phase I	30	**17**	16	<5.0	<1.0	<1.0	**42**	**36**	**19**	<0.10	0.019				**150**	100	0
FO-8-2	MW-8	2000	2	Phase I	40-50	**17**	12	3.5	<0.10	4.0	27	25	11	<0.050	0.053				<100	n/a	n/a
FO-8-2	MW-8	2001	3	Phase I	40-50	11	14	4.3	<0.10	3.0	30	24	**37**	<0.050	0.060				25	95	5.0
FOM-8-2	MW-8	2003	5	Phase I	40-50	15	14	**5**	<0.10	**70**	27	24	12	<0.040	<0.0010	<1.0	<40	<40	41		
MW-8 (Soil) 40-50 cm	MW-8	2006	8	Phase II	40-50	15	12	3.0	<1.0	<1.0	20	21	11	<0.040	<0.10	<1.0	<1.0	30	31		
MW-8(Soil)40-50cm	MW-8	2008	10	Phase II	40-50	**17**		<5.0	<0.050	7.0	<2.0	26	11	<0.10	<0.050	<1.0	<1.0	42	43		
10-16947/48	MW-8	2010	12	Phase II	30-40	16	9.2	<5.0	<1.0	<1.0	27	24	8.3	<0.10	0.019	<1.0	4.4	37	42		
13-27323/24	MW-8	2013	15	Phase II	30-40	15	13	<5.0	<1.0	<10	**38**	**28**	**16**	<0.10	**0.19**	<10	4.9	5.5	15		
F4-STA-MW98-08-D	MW-8	2014	16	Phase II	40-50	12	14	4.0	<0.10	4	32	**32**	**20**	<0.050	**0.18**	<10	<10	<10	15		
		2016	18	Phase II															#N/A		
		2018	20	Phase II															#N/A		
		2023	25	Phase II															#N/A		
		2028	30	Phase II															#N/A		
				Phase III															#N/A		
																			#N/A		
																			#N/A		
																			#N/A		

Sample #	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	Cu [mg/kg]	Ni [mg/kg]	Co [mg/kg]	Cd [mg/kg]	Pb [mg/kg]	Zn [mg/kg]	Cr [mg/kg]	As [mg/kg]	Hg [mg/kg]	Total PCB [mg/kg]	F1 C_6-C_{10} [mg/kg]	F2 C_{10}-C_{16} [mg/kg]	F3 C_{16}-C_{34} [mg/kg]	Modified TPH* - Total C6-C34 [mg/kg]	TPH Identity	
																				% Fuel Oil	% Lube Oil
	MW-9 surface																				
99-3745	MW-9	1999	1	Phase I	0	15	11	<5.0	<1.0	<1.0	29	**32**	**36**	<0.10	**0.20**				**68**	100	0
FO-9-1	MW-9	2000	2	Phase I	0-15	14	13	4.1	<0.10	5.0	29	21	**46**	<0.050	**0.35**				<100	n/a	n/a
FO-9-1	MW-9	2001	3	Phase I	0-15	11	13	4.3	<0.10	4.0	**53**	20	**19**	<0.050	0.080				<20	n/a	n/a
FOM-9-1	MW-9	2003	5	Phase I	0-15	15	13	**6.0**	<0.10	<1.0	**40**	**29**	**15**	<0.040	0.12	<1.0	<40	<40	41		
MW-9	MW-9	2005	7	Phase II	0-11	11	9.0	4.0	<1.0	<1.0	25	21	6.7	<0.040	*2.9*	<1.0	< 40	< 40	41		
MW-9 (Soil) 0-15 cm	MW-9	2006	8	Phase II	0-15	11	10	3.0	<1.0	<1.0	20	22	**61**	<0.040	<0.10	<1.0	10	<1.0	11		
MW-9(Soil)0-15cm	MW-9	2008	10	Phase II	0-15	**17**	12	<5.0	<0.050	7.0	<2.0	**30**	**18**	<0.10	**0.17**	<1.0	36	56	**93**		
10-16949/50	MW-9	2010	12	Phase II	0-10	**18**	8.6	**5.83**	<1.0	<1.0	**39**	**32**	**14**	<0.10	0.053	<1.0	6.1	13	20		
13-27327/28	MW-9	2013	15	Phase II	0-10	15	12	<5.0	<1.0	<10	**41**	**28**	10	<0.10	0.07	<10	4.1	6.9	16		
F4-STA-MW98-09-S	MW-9	2014	16	Phase II	0-15	16	12	3.7	<0.10	8	35	25	**14**	<0.050	0.1	<10	<10	<10	15		
		2016	18	Phase II															#N/A		
		2018	20	Phase II															#N/A		
		2023	25	Phase II															#N/A		
		2028	30	Phase II															#N/A		
				Phase III															#N/A		
																			#N/A		
																			#N/A		
																			#N/A		
	MW-9 depth																				
99-3747	MW-9	1999	1	Phase I	30	15	11	<5.0	<1.0	<1.0	22	25	**38**	<0.10	**0.33**				**75**	100	0
FO-9-2	MW-9	2000	2	Phase I	40-50	14	13	4.8	<0.10	4.0	34	25	**15**	<0.050	0.13				<100	n/a	n/a
FO-9-2	MW-9	2001	3	Phase I	40-50	9	11	3.5	<0.10	4.0	26	21	11	<0.050	**0.21**				<20	n/a	n/a
FOM-9-2	MW-9	2003	5	Phase I	40-50	12	11	**5.0**	<0.10	<1.0	31	**32**	*170*	<0.040	0.10	<1.0	<40	<40	41		
MW-9 (Soil) 40-45 cm	MW-9	2006	8	Phase II	40-45	10	10	3.0	<1.0	<1.0	18	22	**25**	<0.040	<0.10	<1.0	<1.0	<1.0	2		
MW-9(Soil)40-50cm	MW-9	2008	10	Phase II	40-50	**30**	8.7	**7.0**	<0.050	6.0	**37**	**65**	**15**	<0.10	0.050	<1.0	<1.0	29	30		
10-16951/52	MW-9	2010	12	Phase II	30-40	**17**	6.6	**7.82**	<1.0	<1.0	**51**	**47**	**26**	<0.10	0.056	<1.0	17	30	48		
13-27329/30	MW-9	2013	15	Phase II	40-50	**17**	13	<5.0	<1.0	<10	32	**33**	11	<0.040	0.07	<10	6.4	145	**156**		
F4-STA-MW98-09-D	MW-9	2014	16	Phase II	40-50	16	13	3.9	<0.10	6	28	26	**66**	<0.050	0.15	<10	<10	<10	15		
		2016	18	Phase II															#N/A		
		2018	20	Phase II															#N/A		
		2023	25	Phase II															#N/A		
		2028	30	Phase II															#N/A		
				Phase III															#N/A		
																			#N/A		
																			#N/A		
																			#N/A		

Note: Total Hydrocarbons (C_6-C_{34}) has been calculated by adding results for F1, F2 and F3.
** Additional regrading of the Station Landfill occurred in 2013.

Legend

XX	sample exceeds background
XX	**sample exceeds baseline**
XX	*sample exceeds DLCU Tier I criteria*
XX	*sample exceeds DLCU Tier II criteria*

FOX-4 Cape Hooper - Pallet Line Landfill - New Landfill Monitoring starting in 2014**

Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	Cu [mg/kg]	Ni [mg/kg]	Co [mg/kg]	Cd [mg/kg]	Pb [mg/kg]	Zn [mg/kg]	Cr [mg/kg]	As [mg/kg]	Hg [mg/kg]	Total PCB [mg/kg]	F1 C_6-C_{10} [mg/kg]	F2 C_{10}-C_{16} [mg/kg]	F3 C_{16}-C_{34} [mg/kg]	Modified TPH^ - Total C6-C34 [mg/kg]	TPH Identity % Fuel Oil	TPH Identity % Lube Oil
Background Average						30	24	9	0.62	6	41	41	29								
Baseline Data - Average						**27**	**17**	**3.9**	**1.0**	**10**	**37**	**39**	**37**	**0.10**	**0.050**				**26**		
Baseline Data - Standard Deviation						13.4	6.7	2.31	0.00	4	20.1	18.3	44.7	0.000	0.00				23		
Baseline Average + 3xStandard Deviation						67	37	10.8	1.0	22	98	94	171	0.100	0.05				94		
Detection Limit						3.0	5.0	5.0	1.0	10	15	20	0.20	0.10	0.050				10		
DEW Line Cleanup Tier I Criteria										*200*					*1*						
DEW Line Cleanup Tier II Criteria & site specific As criteria						*100*	*100*	*50*	*5*	*500*	*500*	*250*	*130*	*2.0*	*5*				*2500*		
Monitoring Data																					
Upgradient																					
	F4-25 Surface																				
F4-PAL-25-S	F4-25	2014	16	Phase II	0-15	23	14	**4.6**	<0.10	**10**	**38**	**50**	**38**	<0.050	<0.010	<10	<10	<10	15		
		2016	18	Phase II															#N/A		
		2018	20	Phase II															#N/A		
		2023	25	Phase II															#N/A		
		2028	30	Phase II															#N/A		
				Phase III															#N/A		
																			#N/A		
																			#N/A		
																			#N/A		
	F4-25 Depth																				
F4-PAL-25-D	F4-25	2014	16	Phase II	40-50	**33**	**23**	**7.4**	<0.10	6.8	**46**	**58**	**110**	<0.050	<0.010	<10	<10	<10	15		
		2016	18	Phase II															#N/A		
		2018	20	Phase II															#N/A		
		2023	25	Phase II															#N/A		
		2028	30	Phase II															#N/A		
				Phase III															#N/A		
																			#N/A		
																			#N/A		
																			#N/A		
	F4-26 Surface																				
F4-PAL-26-S	F4-26	2014	16	Phase II	0-15	18.0	12.0	3.2	<0.10	**33**	28	27	21	<0.050	0.036	<10	<10	24	**34**		
		2016	18	Phase II															#N/A		
		2018	20	Phase II															#N/A		
		2023	25	Phase II															#N/A		
		2028	30	Phase II															#N/A		
				Phase III															#N/A		
																			#N/A		
																			#N/A		
																			#N/A		
	F4-26 Depth																				
F4-PAL-26-D	F4-26	2014	16	Phase II	40-50	**61**	**43**	**12**	<0.10	7	**61**	**78**	*140*	<0.050	<0.010	<10	<10	<10	15		
		2016	18	Phase II															#N/A		
		2018	20	Phase II															#N/A		
		2023	25	Phase II															#N/A		
		2028	30	Phase II															#N/A		
				Phase III															#N/A		
																			#N/A		
																			#N/A		
Downgradient																					
	F4-27 Surface																				
F4-PAL-27-S	F4-27	2014	16	Phase II	0-15	11.5	5.7	2.85	<0.5	**10.5**	19	20	11.5	<0.10	<0.05	<10	16	32.5	**53.5**		
		2016	18	Phase II															#N/A		
		2018	20	Phase II															#N/A		
		2023	25	Phase II															#N/A		
		2028	30	Phase II															#N/A		
				Phase III															#N/A		
																			#N/A		
																			#N/A		
																			0		
	F4-27 Depth																				
F4-PAL-27-D	F4-27	2014	16	Phase II	40-50	19	16	**4**	<0.10	**41**	28	30	11	<0.050	<0.010	190	2700	380	*3270*		
		2016	18	Phase II															#N/A		
		2018	20	Phase II															#N/A		
		2023	25	Phase II															#N/A		
		2028	30	Phase II															#N/A		
				Phase III															#N/A		
																			#N/A		
																			#N/A		

FOX-4 Cape Hooper - Pallet Line Landfill - New Landfill Monitoring starting in 2014**

Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	Cu [mg/kg]	Ni [mg/kg]	Co [mg/kg]	Cd [mg/kg]	Pb [mg/kg]	Zn [mg/kg]	Cr [mg/kg]	As [mg/kg]	Hg [mg/kg]	Total PCB [mg/kg]	F1 C_6-C_{10} [mg/kg]	F2 C_{10}-C_{16} [mg/kg]	F3 C_{16}-C_{34} [mg/kg]	Modified TPH^ - Total C6-C34 [mg/kg]	TPH Identity	
																				% Fuel Oil	% Lube Oil
	F4-28 Surface																				
F4-PAL-28-S	F4-28	2014	16	Phase II	0-15	18	17.0	**6.1**	<0.10	5.9	31	31	7	<0.050	<0.010	<10	<10	34	**44**		
		2016	18	Phase II															#N/A		
		2018	20	Phase II															#N/A		
		2023	25	Phase II															#N/A		
		2028	30	Phase II															#N/A		
				Phase III															#N/A		
																			#N/A		
																			#N/A		
																			#N/A		
	F4-28 Depth																				
F4-PAL-28-D	F4-28	2014	16	Phase II	40-50	**43**	**41**	**12**	0.11	9.3	**67**	**61**	14	<0.050	<0.010	<10	<10	10	20		
		2016	18	Phase II															#N/A		
		2018	20	Phase II															#N/A		
		2023	25	Phase II															#N/A		
		2028	30	Phase II															#N/A		
				Phase III															#N/A		
																			#N/A		
																			#N/A		
																			#N/A		
	F4-29 Surface																				
F4-PAL-29-S	F4-29	2014	16	Phase II	0-15	**46**	16.0	**5.6**	<0.10	**12**	**43**	**72**	17	<0.050	<0.010	<10	<10	130	**140**		
		2016	18	Phase II															#N/A		
		2018	20	Phase II															#N/A		
		2023	25	Phase II															#N/A		
		2028	30	Phase II															#N/A		
				Phase III															#N/A		
																			#N/A		
																			#N/A		
																			#N/A		
	F4-29 Depth																				
F4-PAL-29-D	F4-29	2014	16	Phase II	40-50	20	**37**	**9.6**	0.14	8.2	**61**	**84**	14	<0.050	<0.010	<10	<10	120	**130**		
		2016	18	Phase II															#N/A		
		2018	20	Phase II															#N/A		
		2023	25	Phase II															#N/A		
		2028	30	Phase II															#N/A		
				Phase III															#N/A		
																			#N/A		
																			#N/A		
																			#N/A		

Note: Total Hydrocarbons (C_6-C_{34}) has been calculated by adding results for F1, F2 and F3.

** The Pallet Line Landfill originated from DEW Line operation activities. It was not part of the original monitoring which began in 1999.

Additional regrading was performed in 2013 and monitoring locations were established for ongoing landfill monitoring.

Legend		
	XX	sample exceeds background
	XX	**sample exceeds baseline**
	XX	*sample exceeds DLCU Tier I criteria*
	XX	*sample exceeds DLCU Tier II criteria*

FOX-4 Cape Hooper - Tanner Bay Landfill - Summary of Soil Analytical Data**

Sample #	Location	Date	Monitoring Year	Monitoring Phase	Depth (cm)	Cu [mg/kg]	Ni [mg/kg]	Co [mg/kg]	Cd [mg/kg]	Pb [mg/kg]	Zn [mg/kg]	Cr [mg/kg]	As [mg/kg]	Hg [mg/kg]	Total PCB [mg/kg]	F1 C_6-C_{10} [mg/kg]	F2 C_{10}-C_{16} [mg/kg]	F3 C_{16}-C_{34} [mg/kg]	Modified TPH* - Total C6-C34 [mg/kg]	TPH Identity % Fuel Oil	TPH Identity % Lube Oil
Background Average						19	19	7.9	1.0	10	34	31	5.5		0.000035						
Baseline Data - Average						**8.0**	**9.3**	**5.0**	**1.0**	**28**	**27**	**23**	**1.1**		**0.050**				**128**		
Baseline Data - Standard Deviation						0.0	2.5	0.85	1.16	17	6.0	7.2	0.7		0.00				265		
Baseline Average + 3xStandard Deviation						8.0	17	7.6	4.5	79	45	45	3.1		0.05				924		
Detection Limit						3.0	5.0	5.0	1.0	10	15	20	0.20	0.10	0.050				40		
DEW Line Cleanup Tier I Criteria										*200*					*1*						
DEW Line Cleanup Tier II Criteria						*100*	*100*	*50*	*5*	*500*	*500*	*250*	*30*	*2.0*	*5*				2500		
Monitoring Data																					
Upgradient																					
	F4-11 Surface																				
99-3763	ML #1/F4-11	1999	1	Phase I	30	4.9	5.6	<5.0	<1.0	<10	<15	<20	0.83	<0.10	<0.050				<40	n/a	n/a
FO-51-1	F4-11	2001	3	Phase I	0-15	1.4	<5.0	<5.0	<1.0	<10	<15	<20	**2.0**	<0.10	<0.050				<40	n/a	n/a
FO-9-1	F4-9/F4-11	2003	5	Phase I	0-15	7.0	7.0	<5.0	<1.0	<10	17	<20	**1.2**	<0.10	<0.050	<10	<40	<40	<40		
F4-11	F4-11	2005	7	Phase II	0-11	4.0	5.0	<5.0	<1.0	<10	<15	<20	<0.70	<0.10	<0.10	<10	<40	<40	<40		
F4-11(Soil)0-15cm	F4-11	2006	8	Phase II	0-15	**10**	**10**	<5.0	<1.0	<10	17	<20	1.1	<0.10	<0.10	<12	10	<10	21		
F4-11(Soil)0-15cm	F4-11	2007	9	Phase II	0-15	5.0	5.0	<5.0	<1.0	<10	<15	<20	1.1	<0.1	<0.10	<12	657	778	**1441**		
F4-11(Soil)0-15cm	F4-11	2008	10	Phase II	0-15	3.0	7.0	<5.0	<1.0	<10	<15	<20	<1.0	<0.10	<0.050	<1.0	1100	590	**1691**		
10-18023*/24	F-11	2010	12	Phase II	0-10	4.7	5.4	<5.0	<1.0	<10	<15	<20	**1.4**	<0.10	<0.050	<10	440	180	**625**		
13-27258/59	F4-11	2013	15	Phase II	0-10	7.4	6.1	<5.0	<1.0	<10	16.0	<20	**1.2**	<0.1	<0.05	<10	270	380	**655**		
F4-TAN-11-S	F4-11	2014	16	Phase II	0-15	**11.5**	4.8	2.6	<0.5	4.05	13.5	16.5	**5.8**	<0.10	<0.05	<10	<10	<50	35		
		2016	18	Phase II															#N/A		
		2018	20	Phase II															#N/A		
		2023	25	Phase II															#N/A		
		2028	30	Phase II															#N/A		
				Phase III															#N/A		
																			#N/A		
																			#N/A		
																			#N/A		
	F4-11 depth																				
FO-51-2	F4-11	2001	3	Phase I	40-50	**8.5**	**11**	<5.0	<1.0	<10	17	<20	**2.0**	<0.10	<0.050				<40		
FO-9-2	F4-9/F4-11	2003	5	Phase I	40-50	6.0	7.0	<5.0	<1.0	<10	16	<20	1.0	<0.10	<0.050	<1.0	<40	<1.0	<40		
F4-11(Soil)40-50cm	F4-11	2006	8	Phase II	40-50	**9.0**	8.0	<5.0	<1.0	<10	<15	<20	0.70	<0.10	<0.10	<12	<10	<10	16		
F4-11(Soil)40-50cm	F4-11	2007	9	Phase II	40-50	7.0	5.0	<5.0	<1.0	<10	<15	<20	0.80	<0.1	<0.1	<11	<20	23	39		
F4-11(Soil)40-50cm	F4-11	2008	10	Phase II	40-50	3.0	7.0	<5.0	<1.0	<10	<15	<20	<1.0	<0.10	<0.050	<1.0	270	110	**381**		
10-18025*/26	F-11	2010	12	Phase II	30-40	<3.0	<5.0	<5.0	<1.0	<10	<15	<20	**1.2**	<0.10	<0.050	<10	780	75	**860**		
13-27260/61	F4-11	2013	15	Phase II	30-40	6.5	5.1	<5.0	<1.0	<10	<15	<20	**2.3**	<0.1	<0.05	<10	4.4	33	42		
F4-TAN-11-D	F4-11	2014	16	Phase II	40-50	6.6	5.2	1.7	<0.10	3.2	11.0	15	1.10	<0.050	<0.010	<10	<10	<10	15		
		2016	18	Phase II															#N/A		
		2018	20	Phase II															#N/A		
		2023	25	Phase II															#N/A		
		2028	30	Phase II															#N/A		
				Phase III															#N/A		
																			#N/A		
																			#N/A		
																			#N/A		
Downgradient																					
	F4-12 Surface																				
99-3769	ML #3/F4-12	1999	1	Phase I	0	6.5	7.4	<5.0	<1.0	<10	19	21	0.81	<0.10	<0.050				41	100	0
FO-52-1	F4-12	2001	3	Phase I	0-15	1.7	5.0	<5.0	<0.10	<10	<15	<20	**2.0**	<0.10	<0.050				43	0.0	100
FO-11-1	F4-11/F4-12	2003	5	Phase I	0-15	**12**	**11**	<5.0	<0.10	<10	23	**25**	*70*	<0.10	<0.050	<10	<40	<40	<40		
F4-12	F4-12	2005	7	Phase II	0-11	6.0	7.0	<5.0	<1.0	<10	16	<20	<0.70	<0.10	<0.10	<10	40	47	<40		
F4-12(Soil)0-15cm	F4-12	2006	8	Phase II	0-15	3.0	5.0	<5.0	<1.0	<10	<15	<20	0.70	<0.10	<0.10	<12	<10	130	**141**		
F4-12(Soil)0-15cm	F4-12	2007	9	Phase II	0-15	4.0	5.0	<5.0	<1.0	<10	<15	<20	<0.7	<0.1	<0.10	<10	<10	11	21		
F4-12(Soil)0-15cm	F4-12	2008	10	Phase II	0-15	3.0	8.0	<5.0	<1.0	<10	<15	<20	<1.0	<0.10	<0.050	<1.0	<1.0	11	<40		
10-18019/20	F4-12	2010	12	Phase II	0-10	4.4	<5.0	<5.0	<1.0	<10	<15	<20	**1.8**	<0.10	<0.050	<10	5.6	<9.0	<40		
13-27262/63	F4-12	2013	15	Phase II	0-10	6.7	<5.0	<5.0	<1.0	<1.0	<1.1	<2.0	**1.6**	<0.10	<0.050	<10	< 4.0	< 9.0	12		
F4-TAN-12-S	F4-12	2014	16	Phase II	0-15	**15**	**11**	3.6	<0.10	4.1	23.0	21	**1.6**	<0.050	<0.010	<10	<10	<10	15		
		2016	18	Phase II															#N/A		
		2018	20	Phase II															#N/A		
		2023	25	Phase II															#N/A		
		2028	30	Phase II															#N/A		
				Phase III															#N/A		
																			#N/A		
																			#N/A		
	F4-12 depth																				
99-3771	ML #3/F4-12	1999	1	Phase I	30	4.3	<5.0	<5.0	<1.0	<10	<15	<20	0.57	<0.10	<0.050				**500**	100.0	0
FO-52-2	F4-12	2001	3	Phase I	40-50	5.5	6.0	<5.0	<1.0	<10	11	<20	**3.0**	<0.10	<0.050				84	1.0	99
FO-11-2	F4-11/F4-12	2003	5	Phase I	40-50	5.0	5.0	<5.0	<1.0	<10	<15	<20	**1.5**	<0.10	<0.050	35	1100	190	**1325**		
F4-12(Soil)40-50cm	F4-12	2006	8	Phase II	40-50	**14**	9.0	<5.0	<1.0	<10	<15	<20	0.90	<0.10	<0.10	<12	20	<10	31		
F4-12(Soil)40-50cm	F4-12	2007	9	Phase II	40-50	<5	8.0	<5.0	<1.0	<10	<20	<20	<1.0	<0.1	<0.1	<11	<20	<20	26		
F4-12(Soil)40-50cm	F4-12	2008	10	Phase II	40-50	3.0	8.0	<5.0	<1.0	<10	<15	<20	<1.0	<0.10	<2.0	<1.0	<1.0	<1.0	2		
10-18021*/22	F4-12	2010	12	Phase II	30-40	6.4	7.1	<5.0	<1.0	<10	15	<20	**1.7**	<0.10	<0.050	<10	5.7	13	24		
13-27264/65	F4-12	2013	15	Phase II	30-40	**11**	9.2	<5.0	<1.0	<10	19	**28**	**2.4**	<0.10	<0.050	<10	< 4.0	< 9.0	12		
F4-TAN-12-D	F4-12	2014	16	Phase II	40-50	**13**	**10**	3.3	<0.10	3.9	19	21	**1.9**	<0.050	<0.010	<10	<10	<10	15		
		2016	18	Phase II															#N/A		
		2018	20	Phase II															#N/A		
		2023	25	Phase II															#N/A		
		2028	30	Phase II															#N/A		
				Phase III															#N/A		
																			#N/A		
																			#N/A		
																			#N/A		

FOX-4 Cape Hooper - Tanner Bay Landfill - Summary of Soil Analytical Data**

Sample #	Location	Date	Monitoring Year	Monitoring Phase	Depth (cm)	Cu [mg/kg]	Ni [mg/kg]	Co [mg/kg]	Cd [mg/kg]	Pb [mg/kg]	Zn [mg/kg]	Cr [mg/kg]	As [mg/kg]	Hg [mg/kg]	Total PCB [mg/kg]	F1 C_6-C_{10} [mg/kg]	F2 C_{10}-C_{16} [mg/kg]	F3 C_{16}-C_{34} [mg/kg]	Modified TPH* - Total C6-C34 [mg/kg]	TPH Identity	
																				% Fuel Oil	% Lube Oil
	F4-13 Surface																				
99-3765	ML #2/F4-13	1999	1	Phase I	0	7.1	8.6	<5.0	<1.0	<10	17	<20	**1.3**	<0.10	<0.050				< 40	n/a	n/a
FO-53-1	F4-13	2001	3	Phase I	0-15	5.7	9.0	<5.0	<1.0	<10	<15	<20	**3.0**	<0.10	<0.050				<40	0.0	100
FO-10-1	F4-10/F4-13	2003	5	Phase I	0-15	5.0	6.0	<5.0	<1.0	<10	<15	<20	1.0	<0.10	<0.050	<10	<40	<40	<40		
F4-13	F4-13	2005	7	Phase II	0-11	5.0	5.0	<5.0	<1.0	<10	<15	<20	<0.70	<0.10	<0.10	<10	<40	<40	<40		
F4-13(Soil)0-15cm	F4-13	2006	8	Phase II	0-15	7.0	5.0	<5.0	<1.0	<10	<15	<20	0.90	<0.10	<0.10	<12	10	150	**146**		
F4-13(Soil)0-15cm	F4-13	2007	9	Phase II	0-15	6.0	7.0	<5.0	<1.0	<10	17	<20	0.70	<0.10	<0.1	<12	<20	<20	26		
F4-13(Soil)0-15cm	F4-13	2008	10	Phase II	0-15	3.0	**10**	<5.0	<1.0	<10	<15	<20	<1.0	<0.10	<0.050	<1.0	<1.0	<1.0	<40		
10-18015*/16*	F4-13	2010	12	Phase II	0-10	6.8	7.2	<5.0	<1.0	<10	19	<20	<1.0	<0.10	<0.050	<10	4.5	9	<40		
13-27266/67	F4-13	2013	15	Phase II	0-10	**8.1**	8.0	<5.0	<1.0	<10	16	<20	**1.2**	<0.10	<0.050	<10	< 4.0	< 9.0	12		
F4-TAN-13-S	F4-13	2014	16	Phase II	0-15	**9.9**	8.0	2.3	<0.10	3.8	17.0	18	**2.1**	<0.050	<0.010	<10	<10	<10	15		
		2016	18	Phase II															#N/A		
		2018	20	Phase II															#N/A		
		2023	25	Phase II															#N/A		
		2028	30	Phase II															#N/A		
				Phase III															#N/A		
																			#N/A		
																			#N/A		
																			#N/A		
	F4-13 depth																				
99-3767	ML #2/F4-13	1999	1	Phase I	30	5.5	<5.0	<5.0	<1.0	<10	<15	<20	0.62	<0.10	<0.050				<40	n/a	n/a
FO-53-2	F4-13	2001	3	Phase I	40-50	2.9	5.0	<5.0	<1.0	<10	<15	<20	**3.0**	<0.10	<0.010				71	0.0	100
FO-10-2	F4-10/F4-13	2003	5	Phase I	40-50	5.0	5.0	<5.0	<1.0	<10	<15	<20	1.1	<0.10	<0.050	<10	<40	<40	<40		
F4-13(Soil)40-50cm	F4-13	2006	8	Phase II	40-50	5.0	5.0	<5.0	<1.0	<10	<15	<20	0.80	<0.10	<0.10	<12	20	<10	31		
F4-13(Soil)40-50cm	F4-13	2007	9	Phase II	40-50	5.0	<5.0	<5.0	<1.0	<10	<15	<20	0.80	<0.1	<0.1	<12	20	<10	2		
F4-13(Soil)40-50cm	F4-13	2008	10	Phase II	40-50	3.0	8.0	<5.0	<1.0	<10	<15	<20	<1.0	<0.10	<0.050	<1.0	<1.0	<1.0	<1.0		
10-18017*/18	F4-13	2010	12	Phase II	30-40	5.7	5.6	<5.0	<1.0	<10	<15	<20	**2.1**	<0.10	<0.050	<10	5.4	12	22		
13-27268/69	F4-13	2013			30-40	7.5	5.3	<5.0	<1.0	<10	<15	<20	**1.7**	<0.10	<0.050	<10	< 4.0	< 9.0	12		
F4-TAN-13-D	F4-13	2014	16	Phase II	40-50	8.0	7.2	2.3	<0.10	2.7	16.0	17	**1.9**	<0.050	<0.010	<10	<10	<10	15		
		2016	18	Phase II															#N/A		
		2018	20	Phase II															#N/A		
		2023	25	Phase II															#N/A		
		2028	30	Phase II															#N/A		
				Phase III															#N/A		
																			#N/A		
																			#N/A		
																			#N/A		

Note: Total Hydrocarbons (C_6-C_{34}) has been calculated by adding results for F1, F2 and F3.

** Tanner Bay Landfill is located in the South Zone. First year monitoring occurred in 1999. The landfill was regraded in 2013.

Legend		
	<u>XX</u>	sample exceeds background
	XX	**sample exceeds baseline**
	XX	sample exceeds DLCU Tier I criteria
	XX	sample exceeds DLCU Tier II criteria

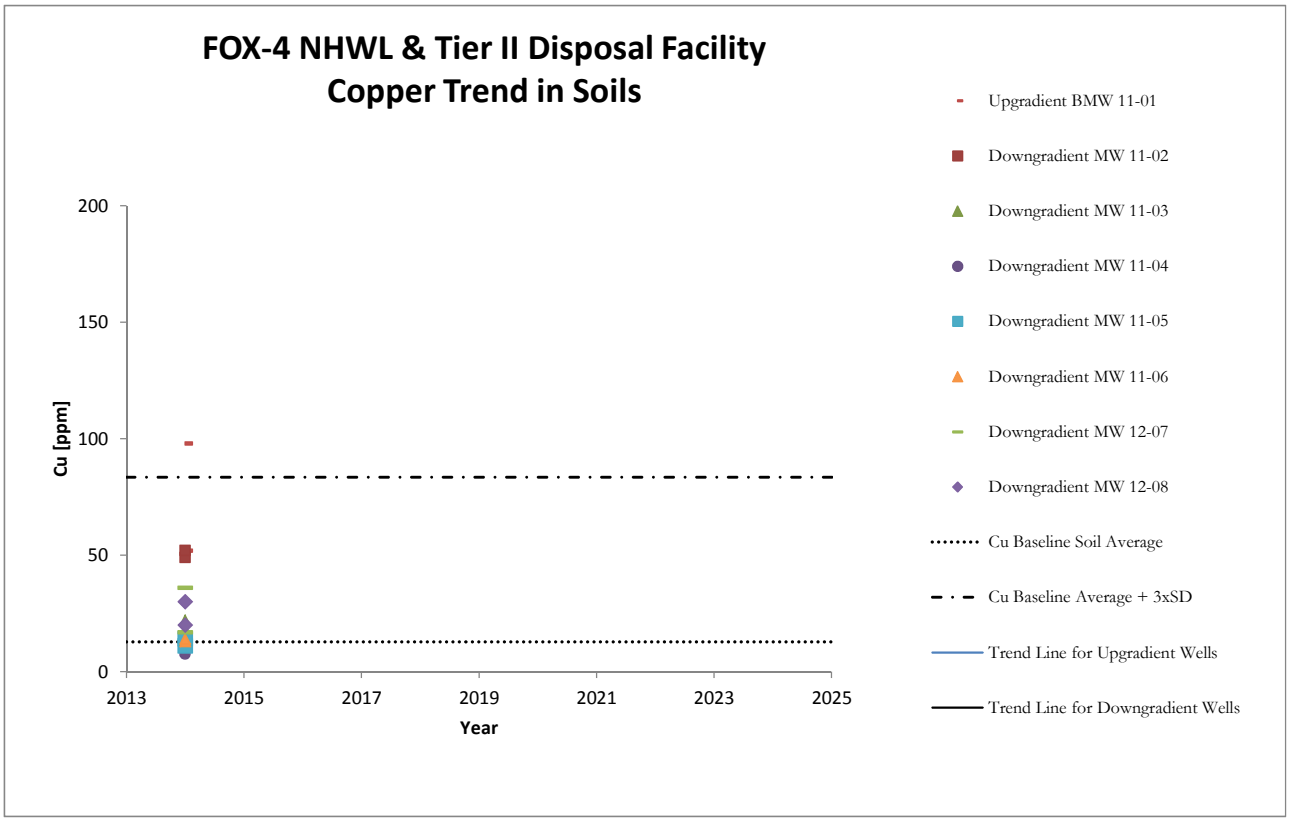
APPENDIX E

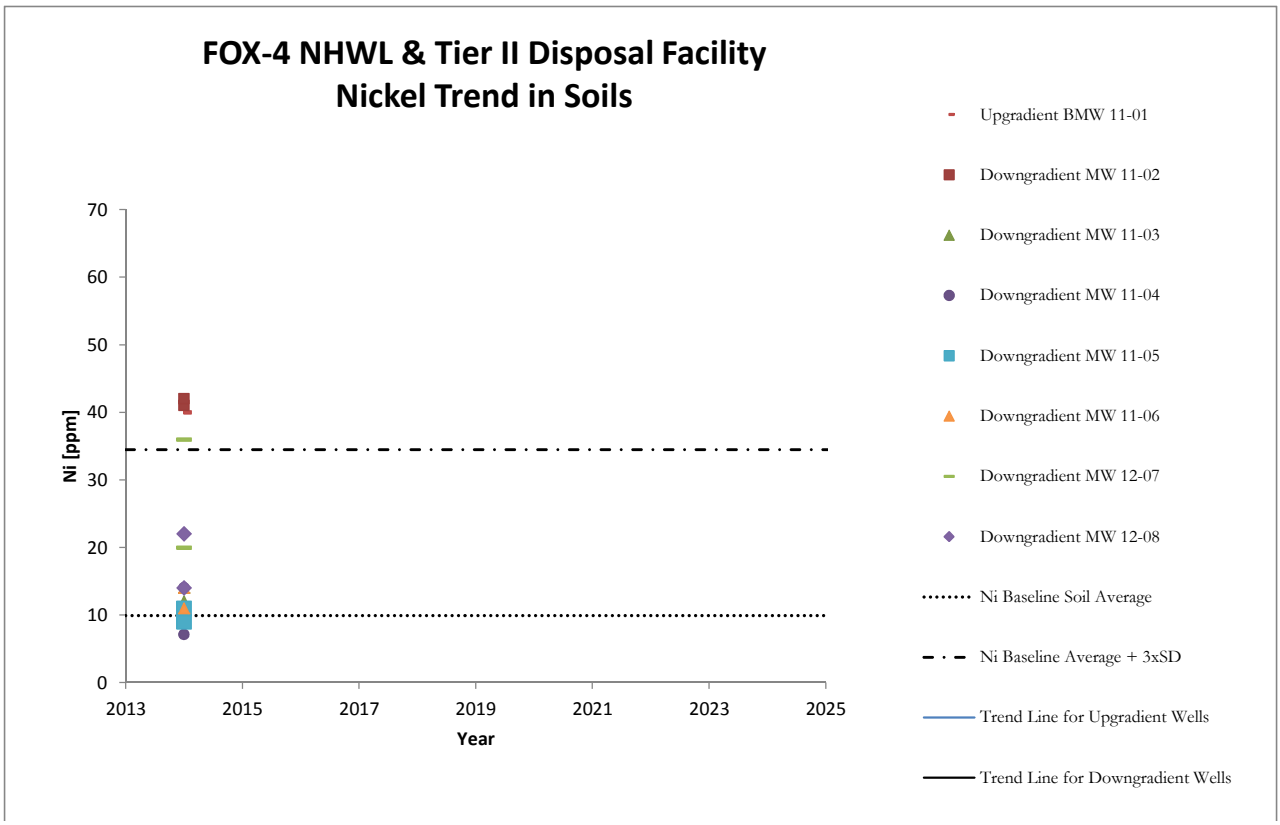
CHEMICAL CONCENTRATION TREND GRAPHS (SOIL)

FOX-4 NHWL & Tier II Disposal Facility Trends in Soil Inorganics, PCBs and PHCs (modified TPH)

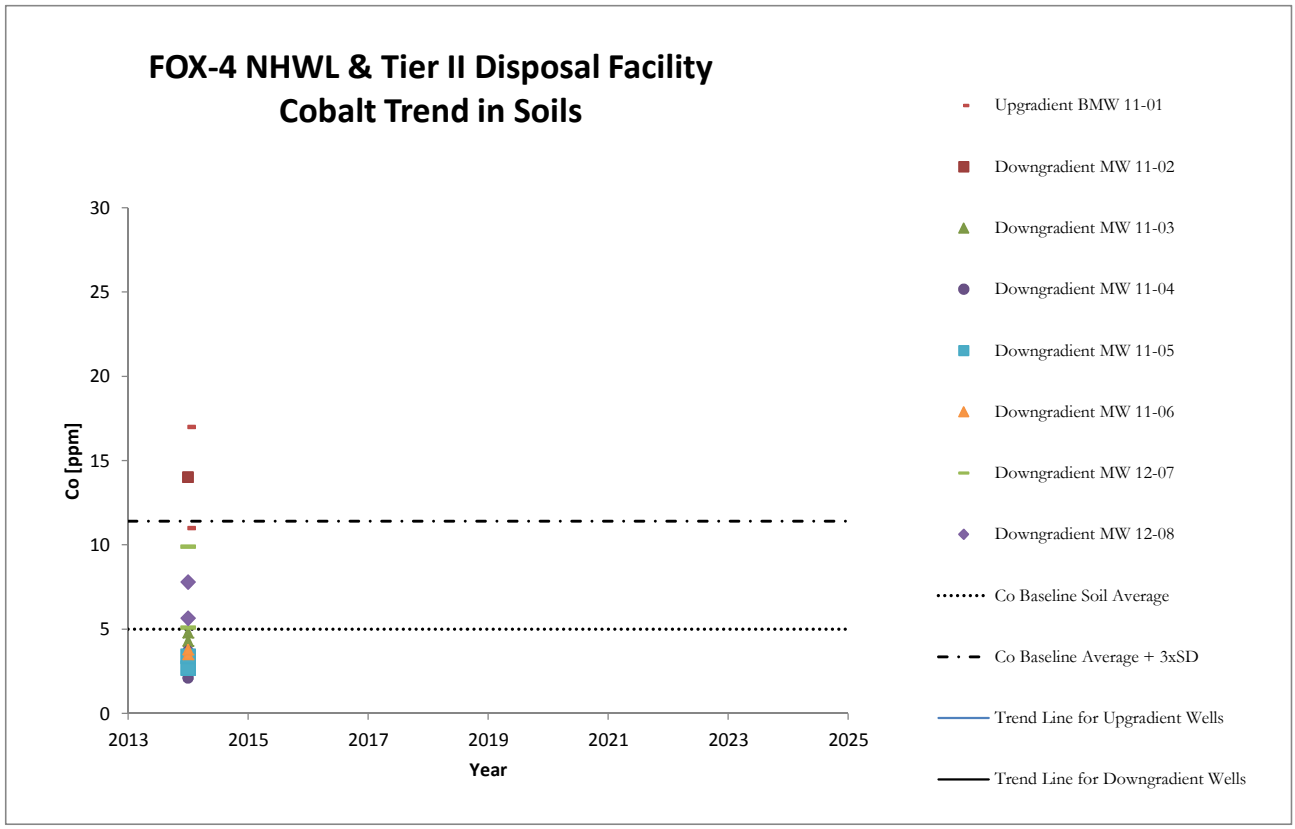
Where results are below detection, half of the detection limit has been used in the charts.

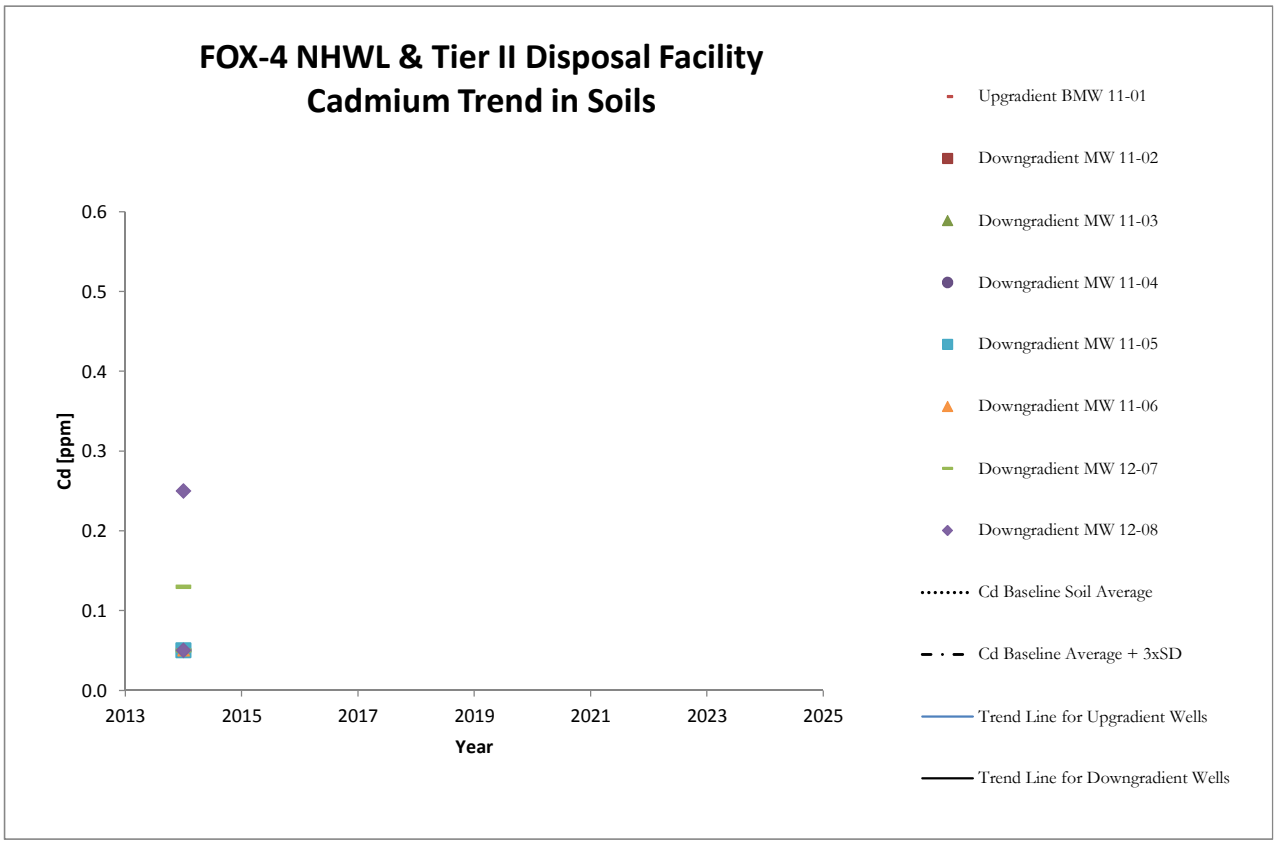
New monitoring locations were established in 2013 around the Tier II and NHWL facilities at FOX-4 and will be monitored as part of the landfill monitori program at FOX-4.



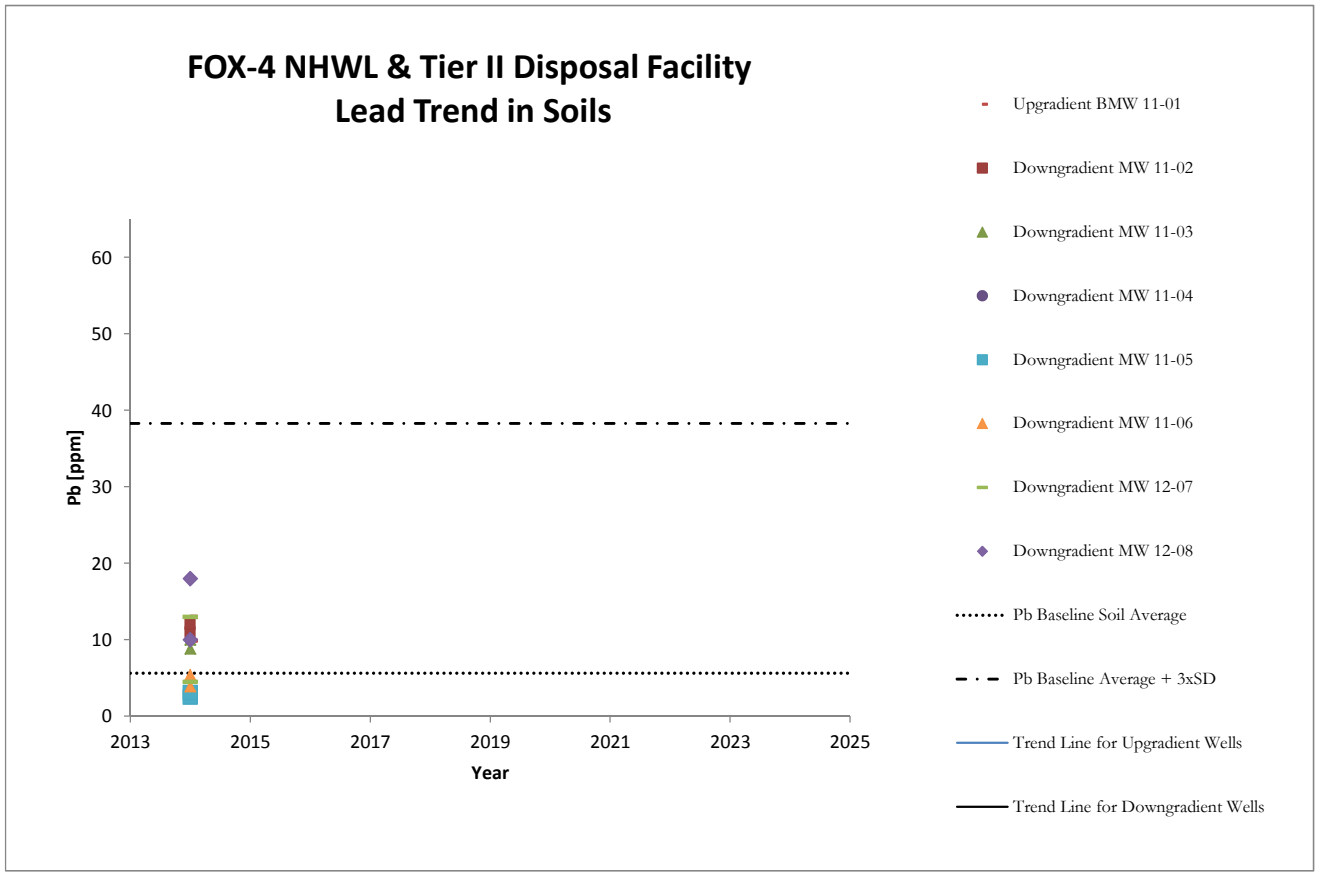


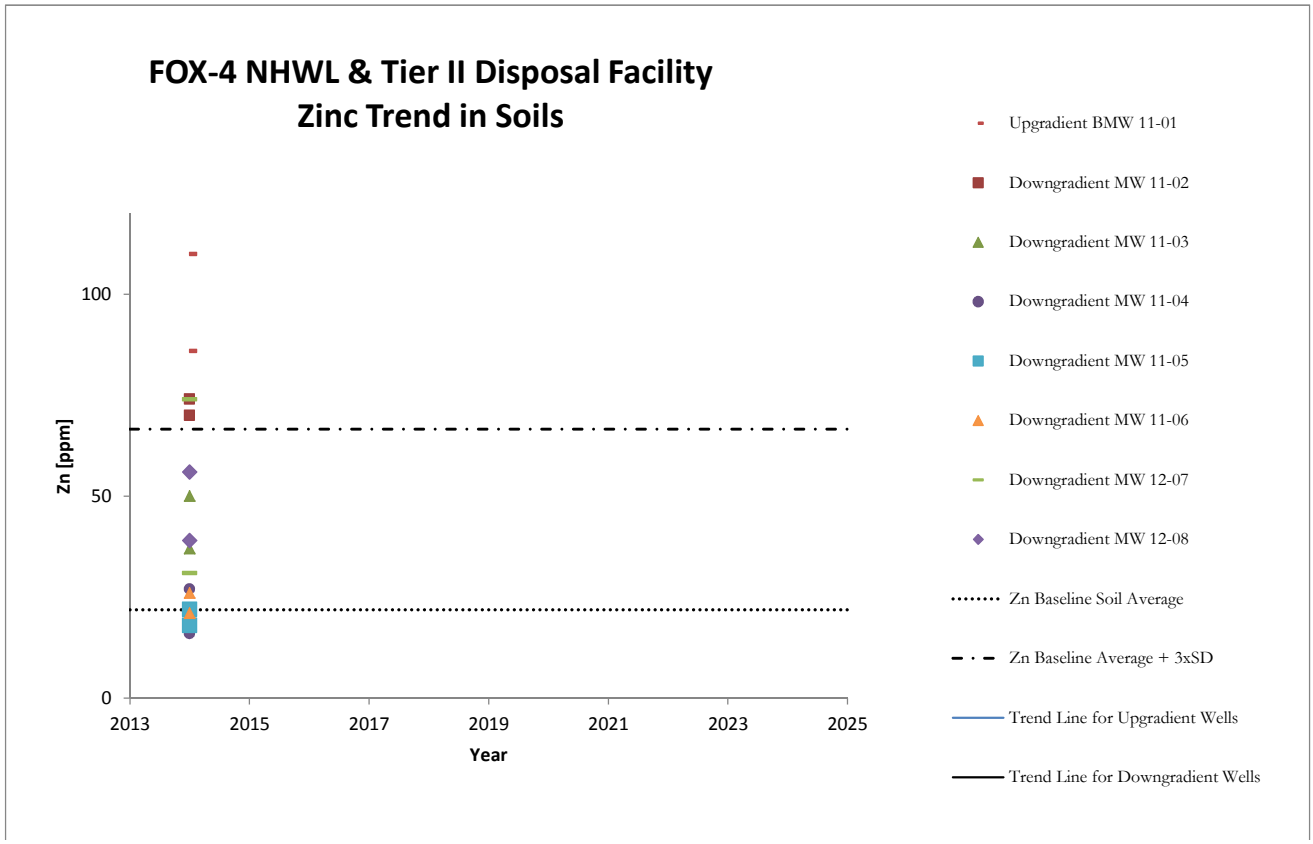
FOX-4 NHWL & Tier II Disposal Facility Trends in Soil Inorganics, PCBs and PHCs (modified TPH)



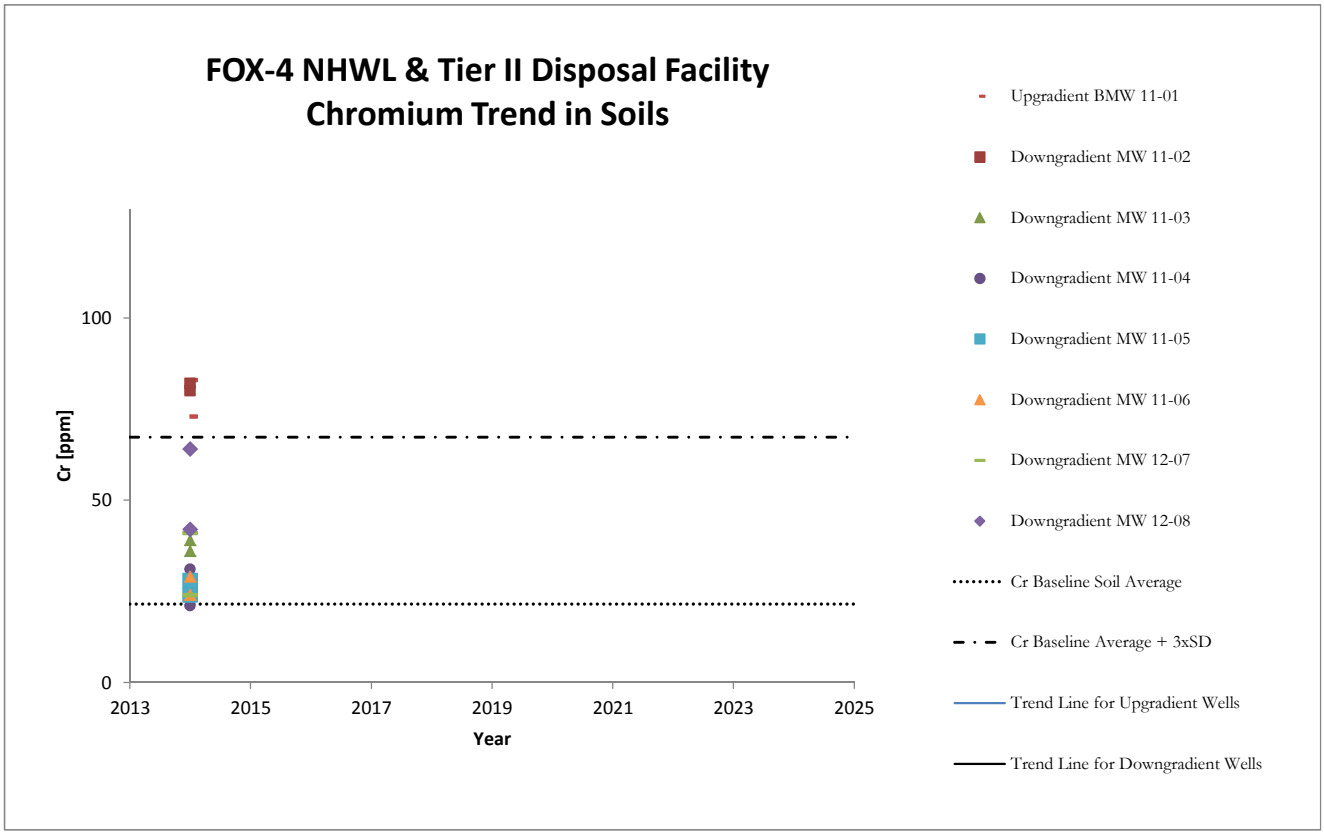


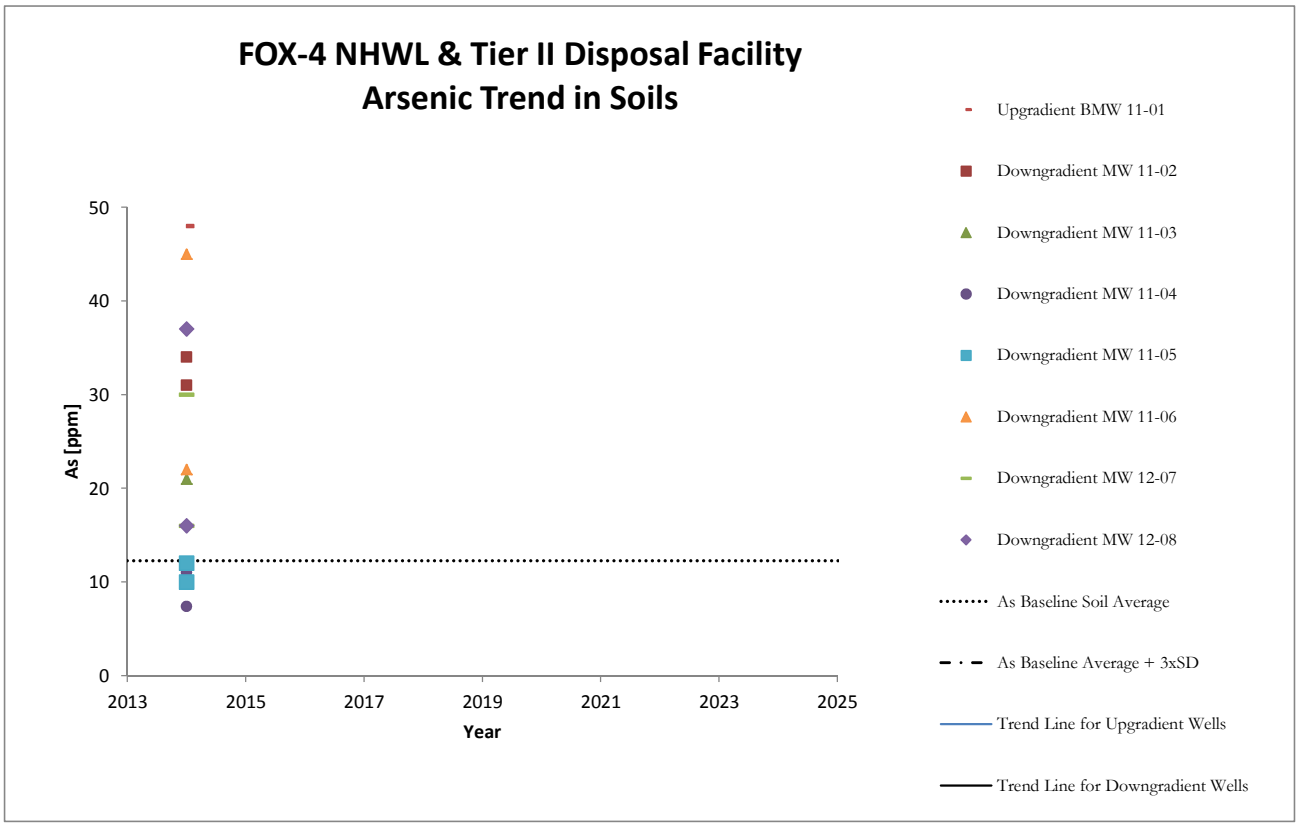
FOX-4 NHWL & Tier II Disposal Facility Trends in Soil Inorganics, PCBs and PHCs (modified TPH)



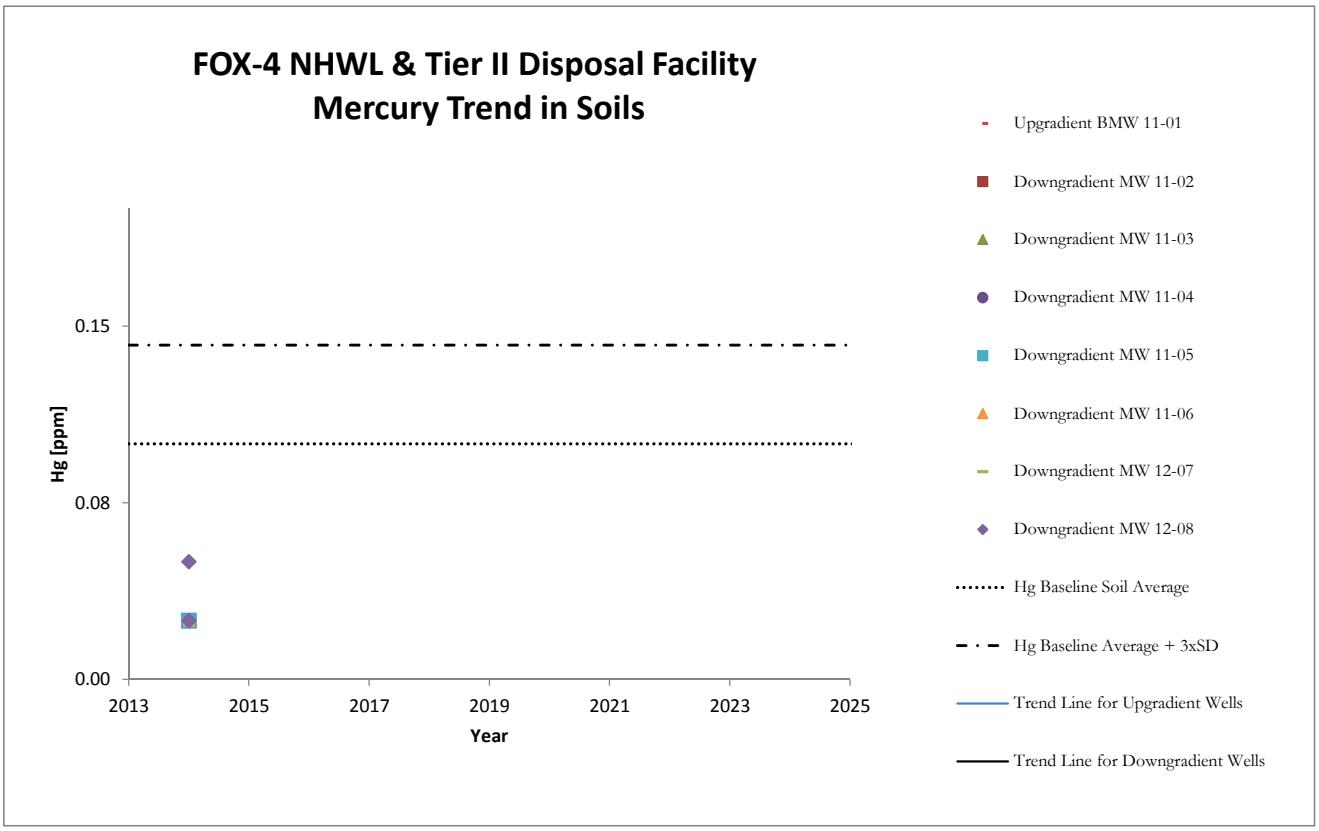


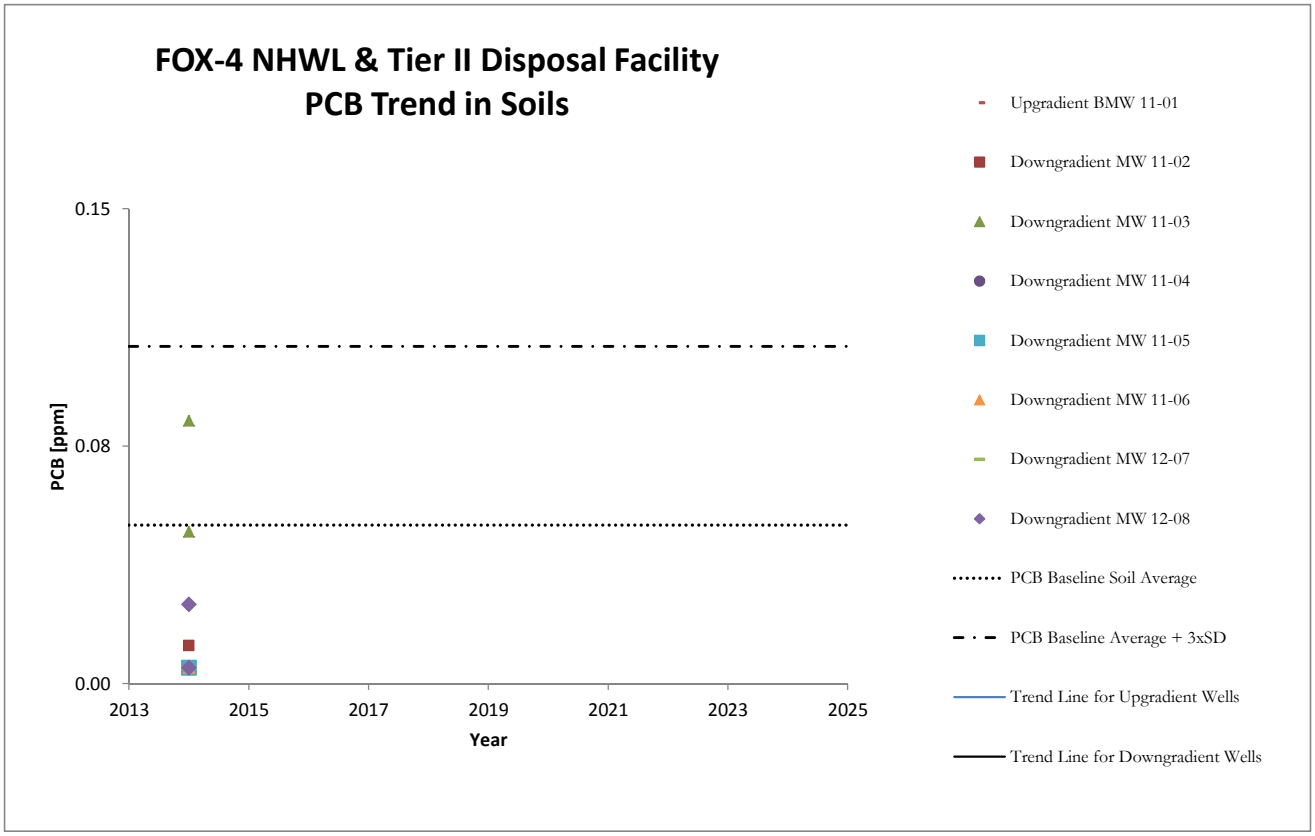
FOX-4 NHWL & Tier II Disposal Facility Trends in Soil Inorganics, PCBs and PHCs (modified TPH)



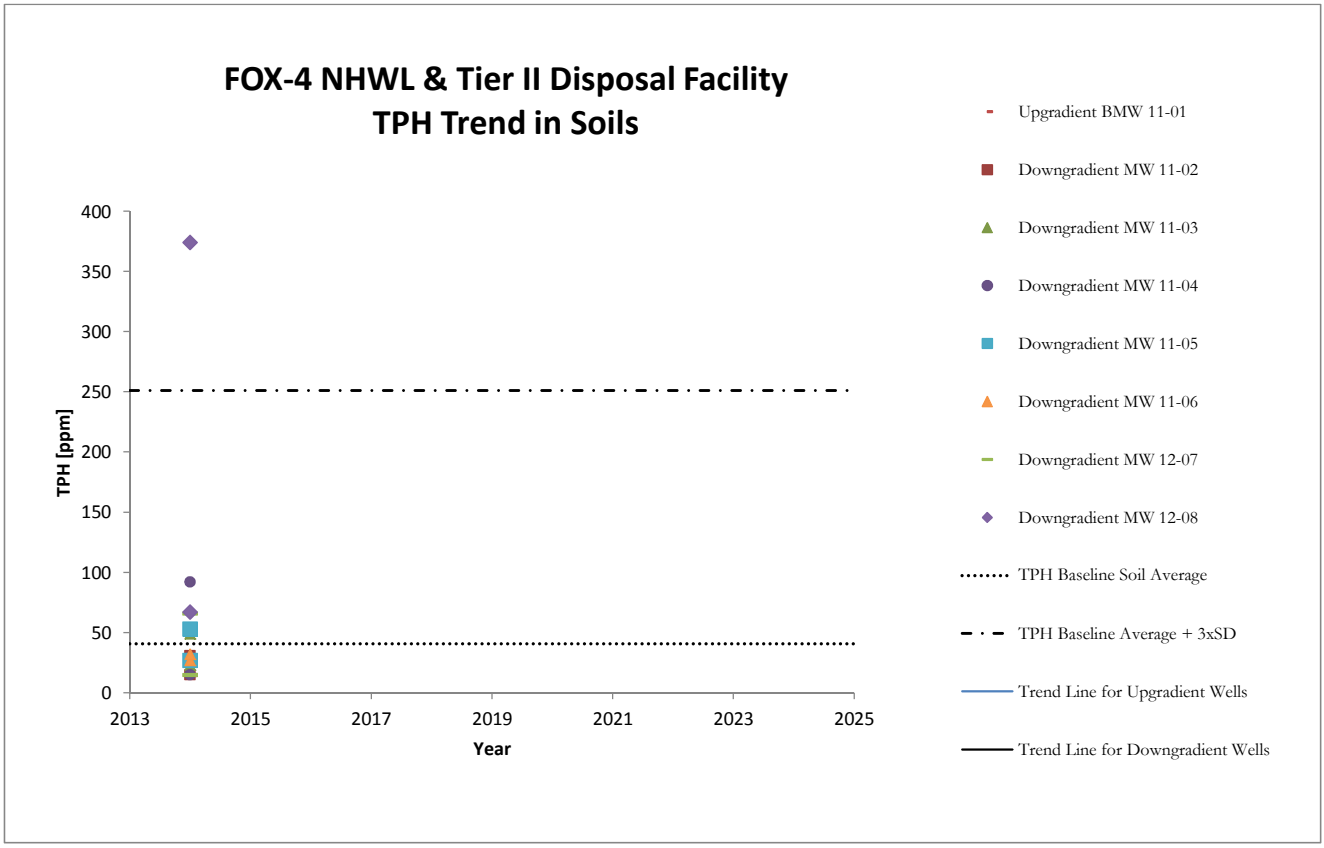


FOX-4 NHWL & Tier II Disposal Facility Trends in Soil Inorganics, PCBs and PHCs (modified TPH)



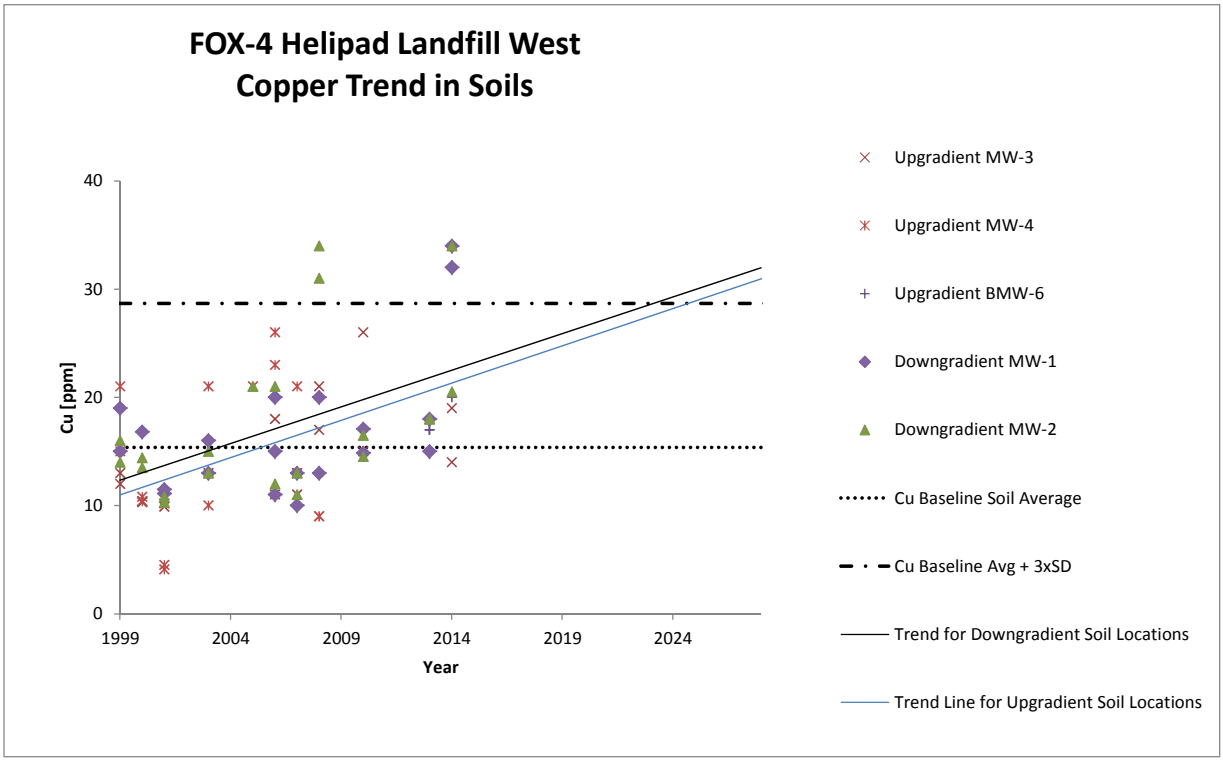


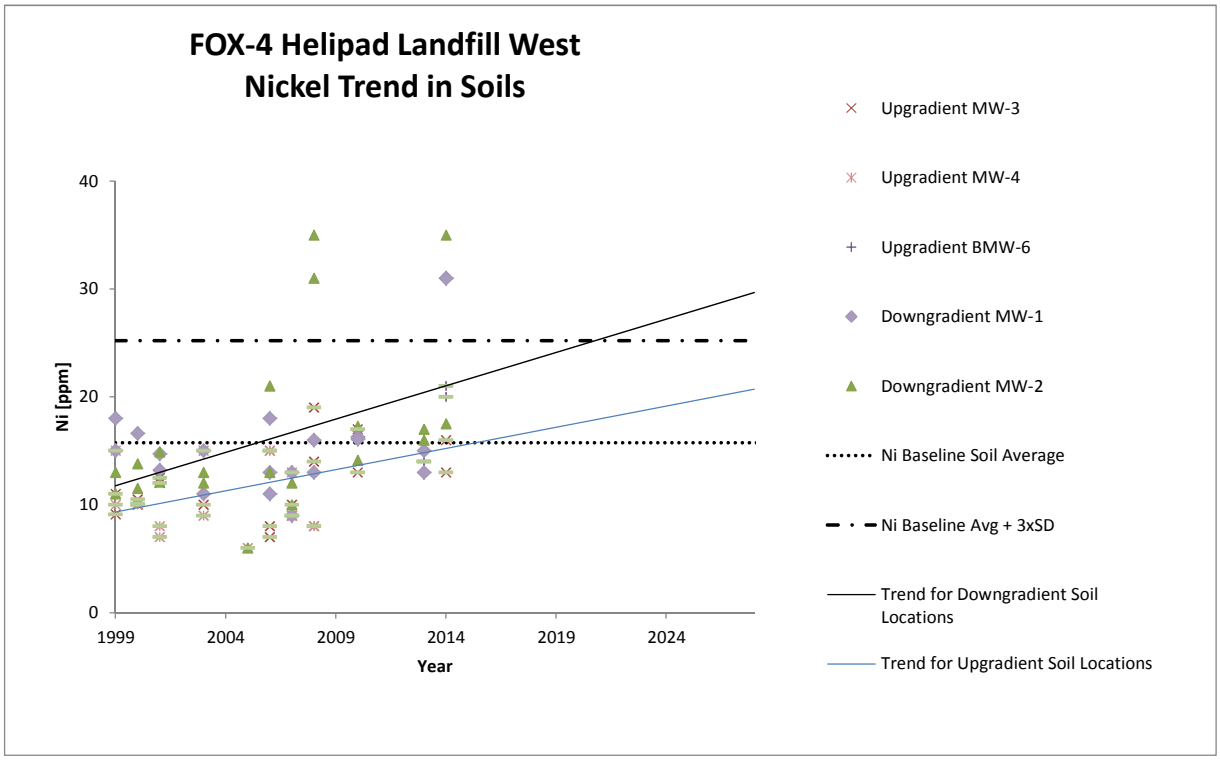
FOX-4 NHWL & Tier II Disposal Facility Trends in Soil Inorganics, PCBs and PHCs (modified TPH)



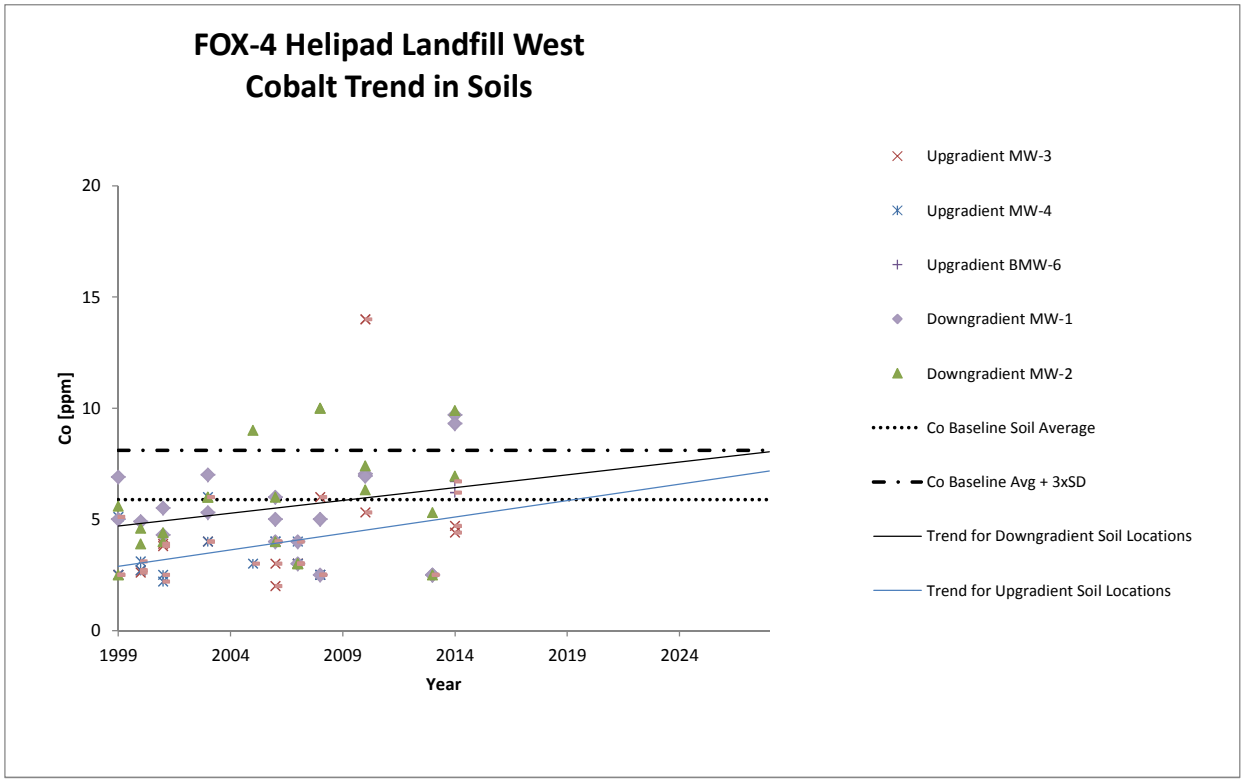
FOX-4 Helipad Landfill West Trends in Soil Inorganics, PCBs and PHCs (modified TPH)

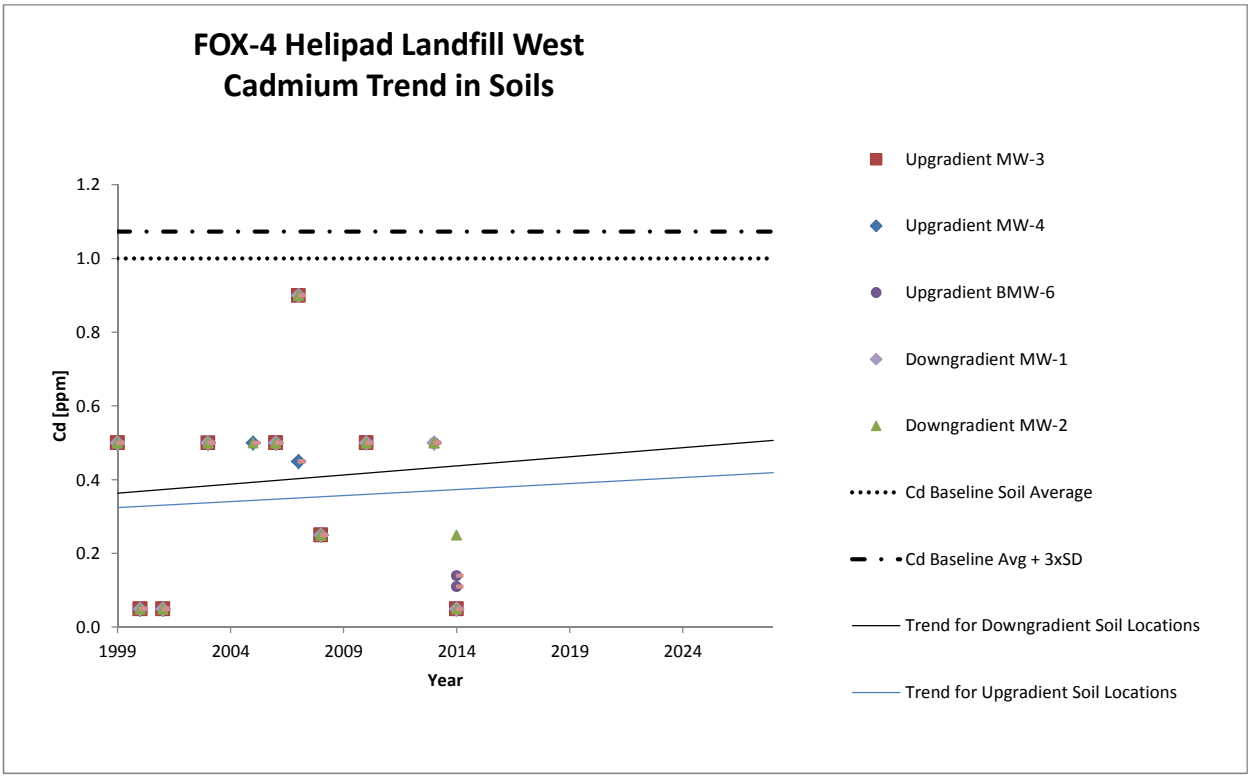
Where results are below detection, half of the detection limit has been used in the charts.
Helipad Landfill West underwent additional regrading in 2013.



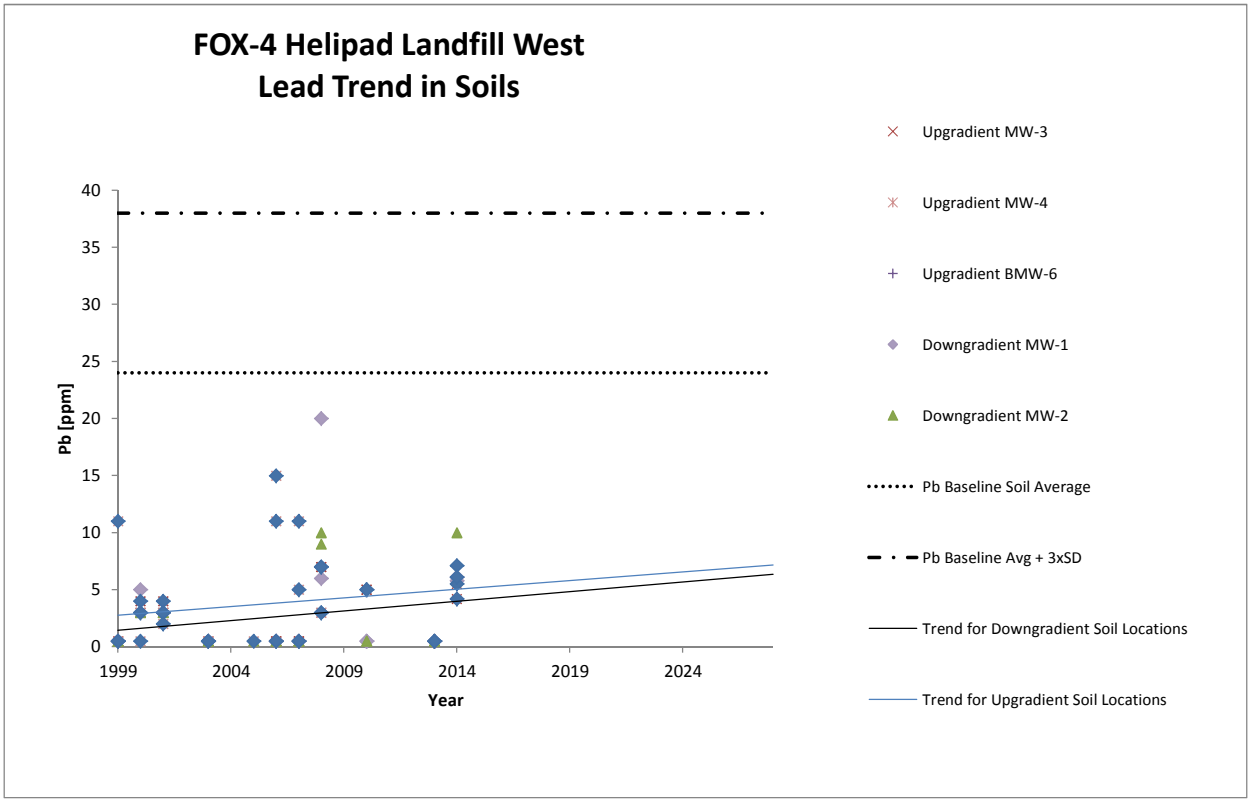


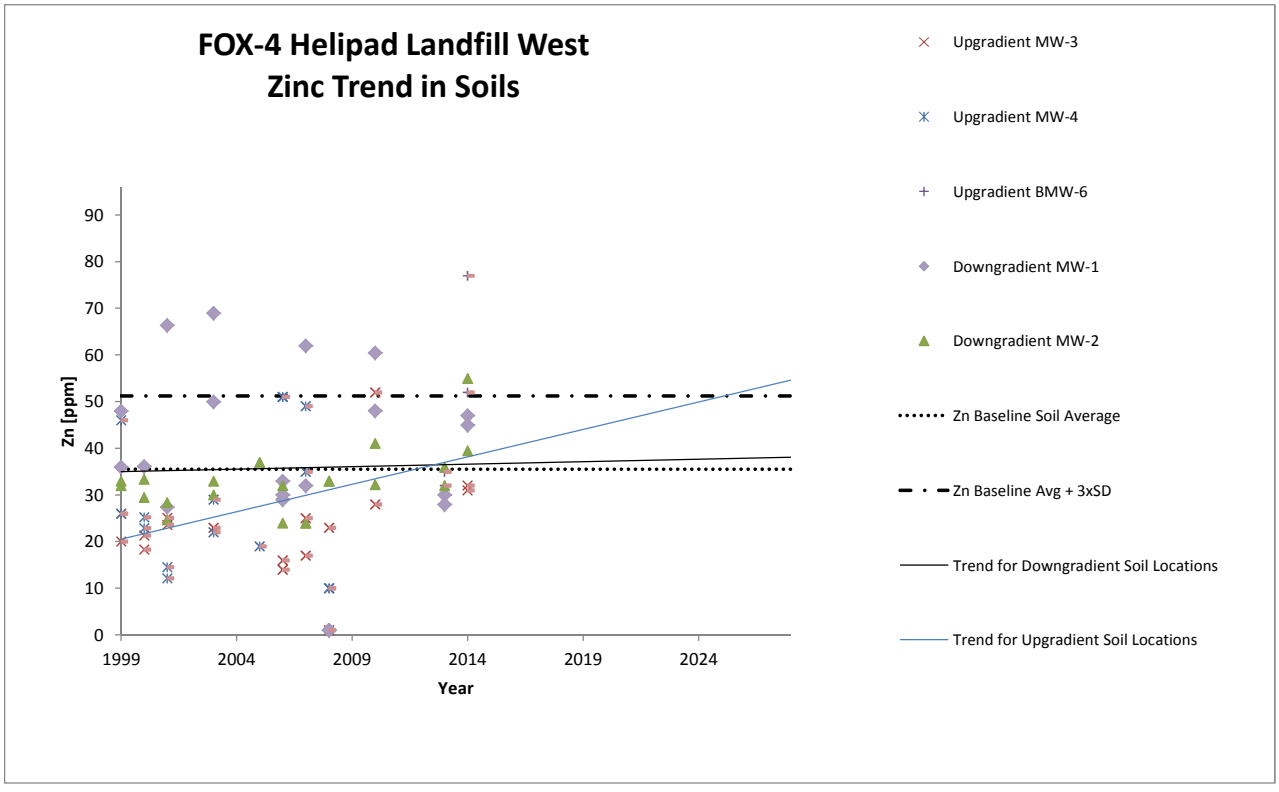
FOX-4 Helipad Landfill West Trends in Soil Inorganics, PCBs and PHCs (modified TPH)



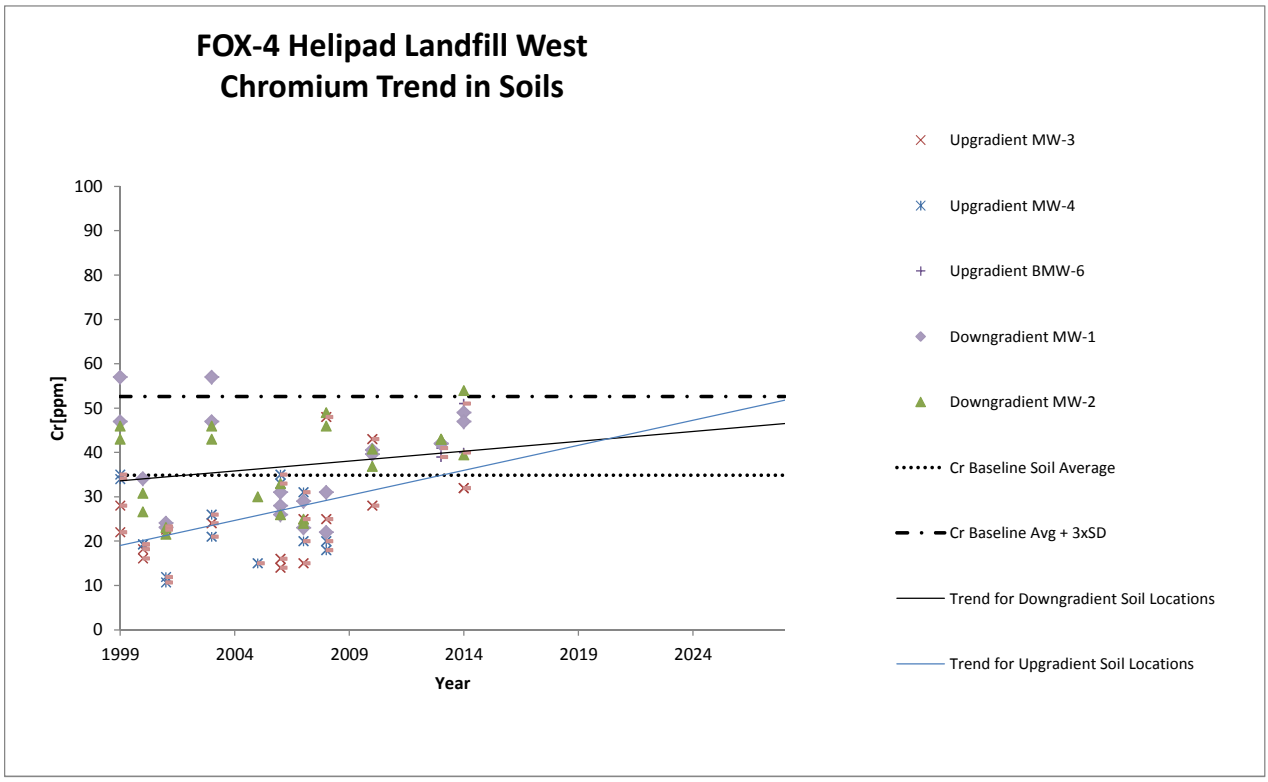


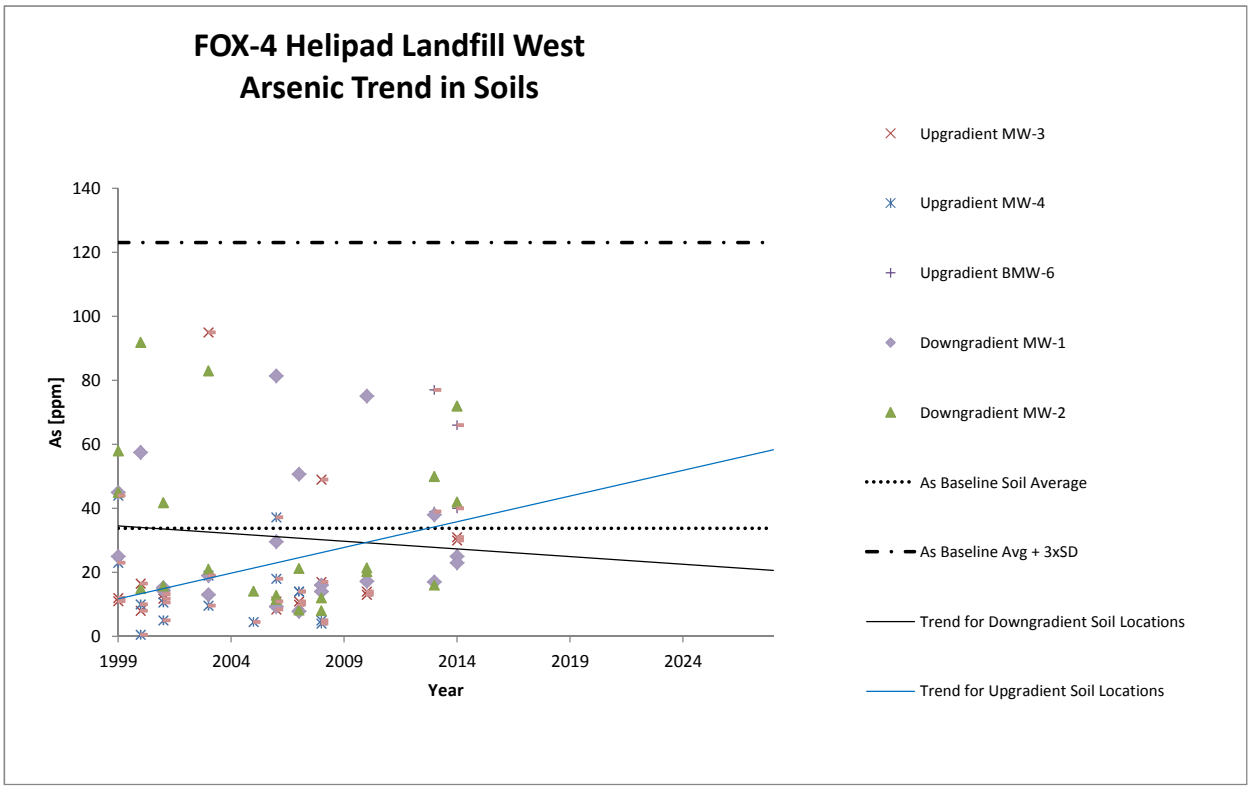
FOX-4 Helipad Landfill West Trends in Soil Inorganics, PCBs and PHCs (modified TPH)



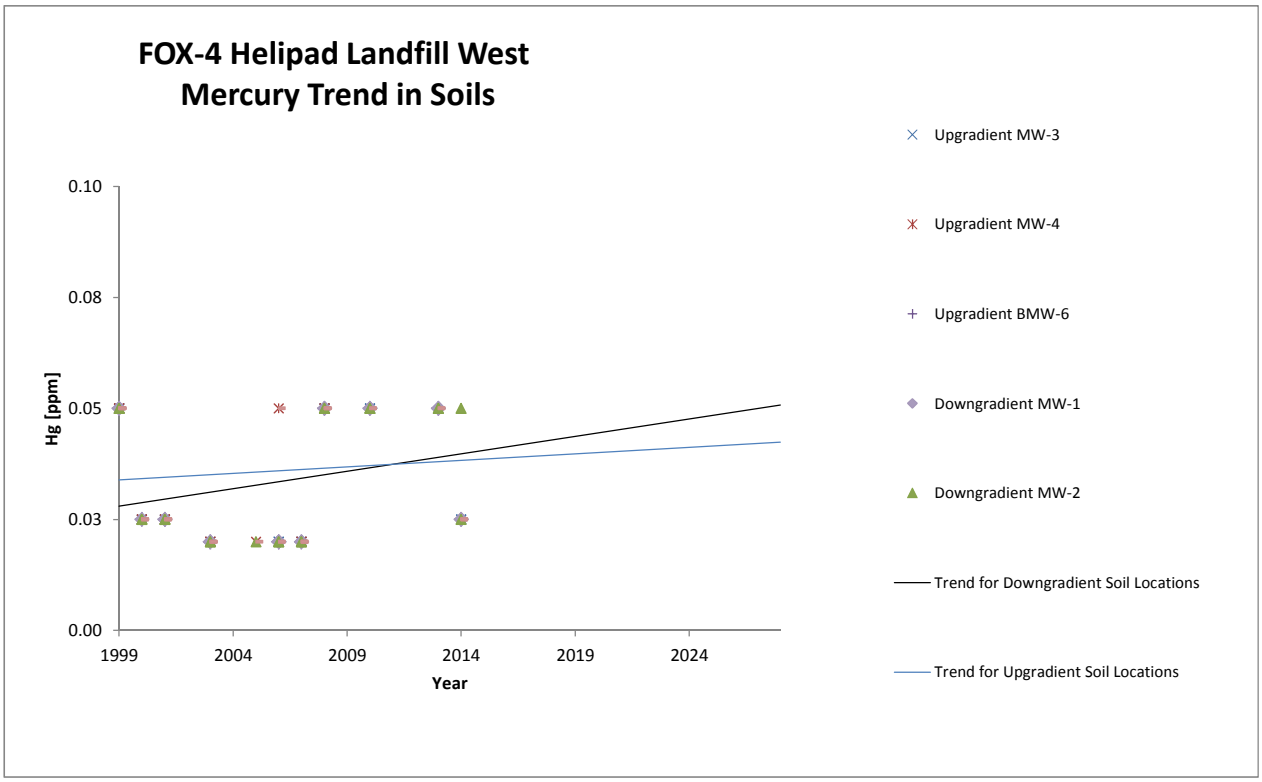


FOX-4 Helipad Landfill West Trends in Soil Inorganics, PCBs and PHCs (modified TPH)

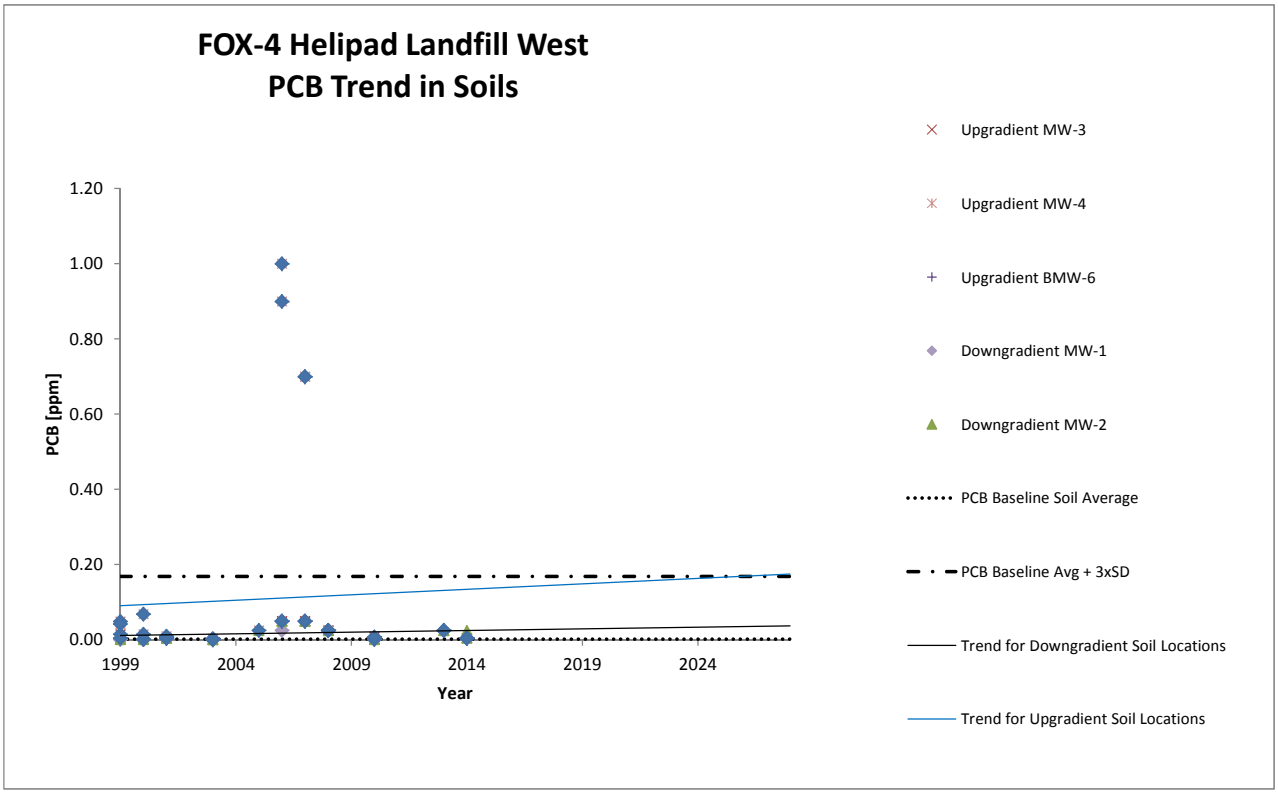




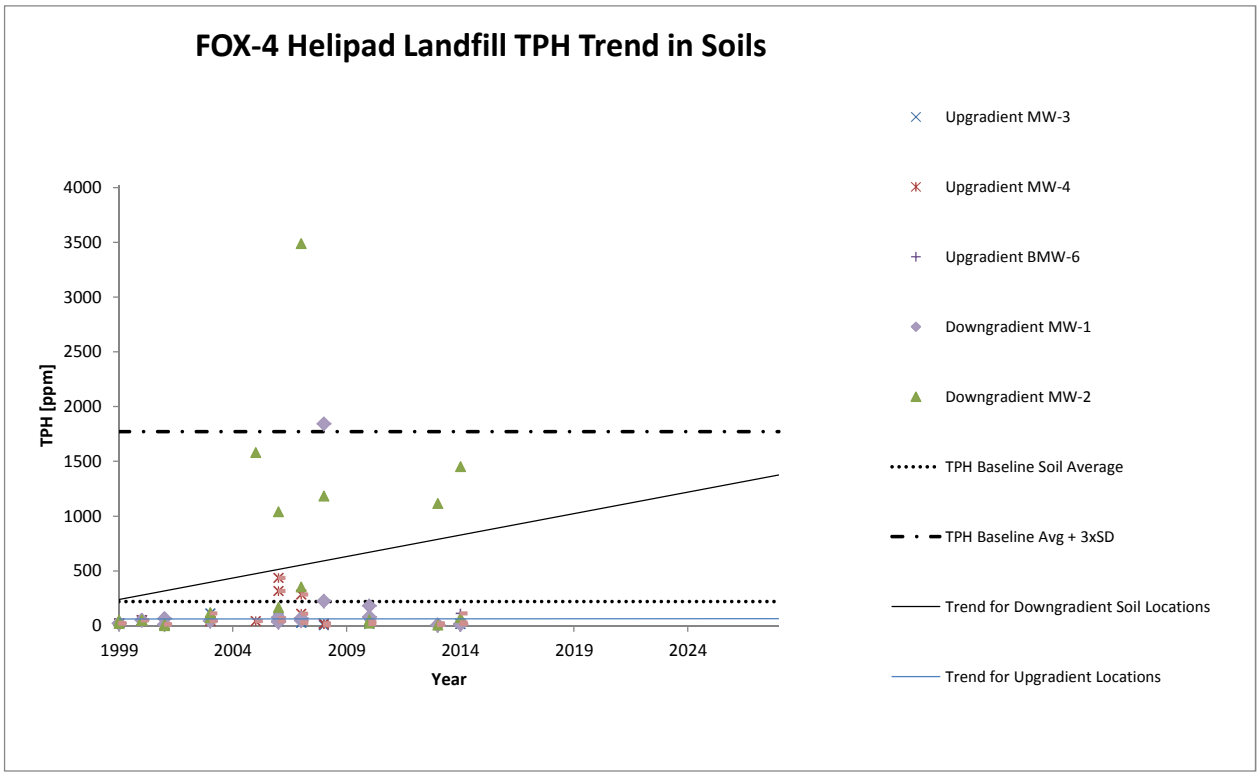
FOX-4 Helipad Landfill West Trends in Soil Inorganics, PCBs and PHCs (modified TPH)



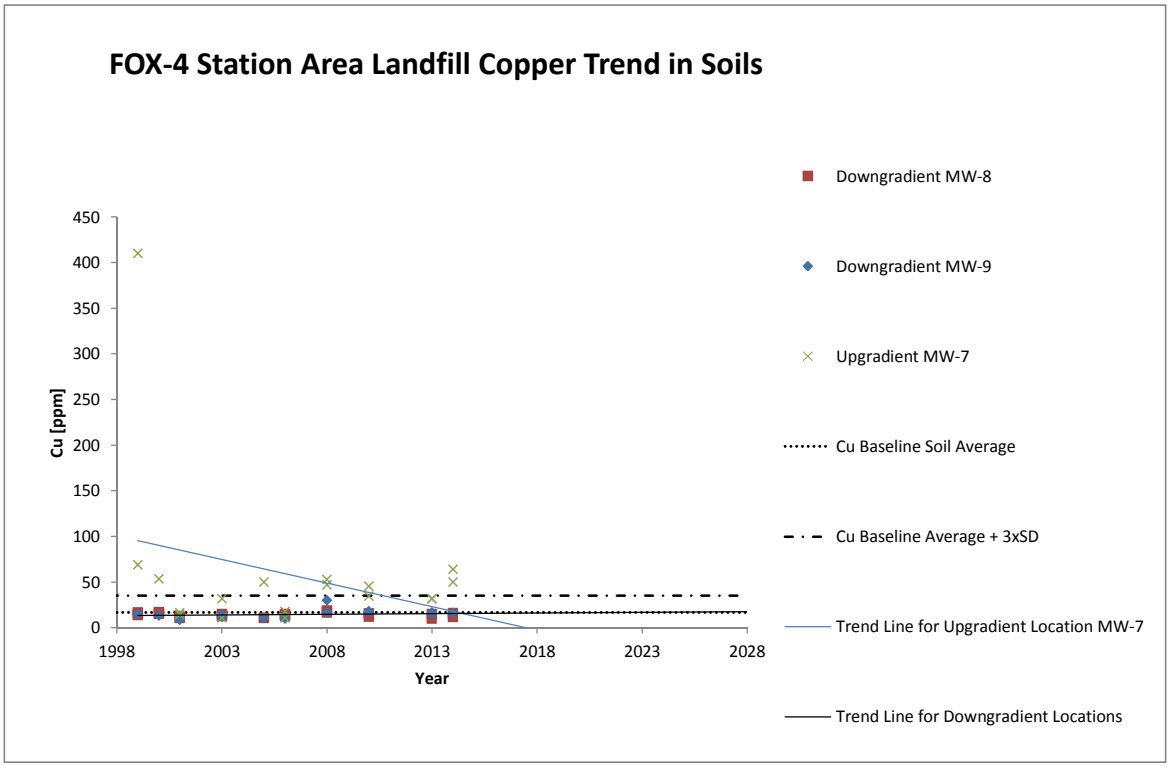
Baseline (1998) and background (1992, 2010 and 2011) did not include mercury analysis for this landfill.

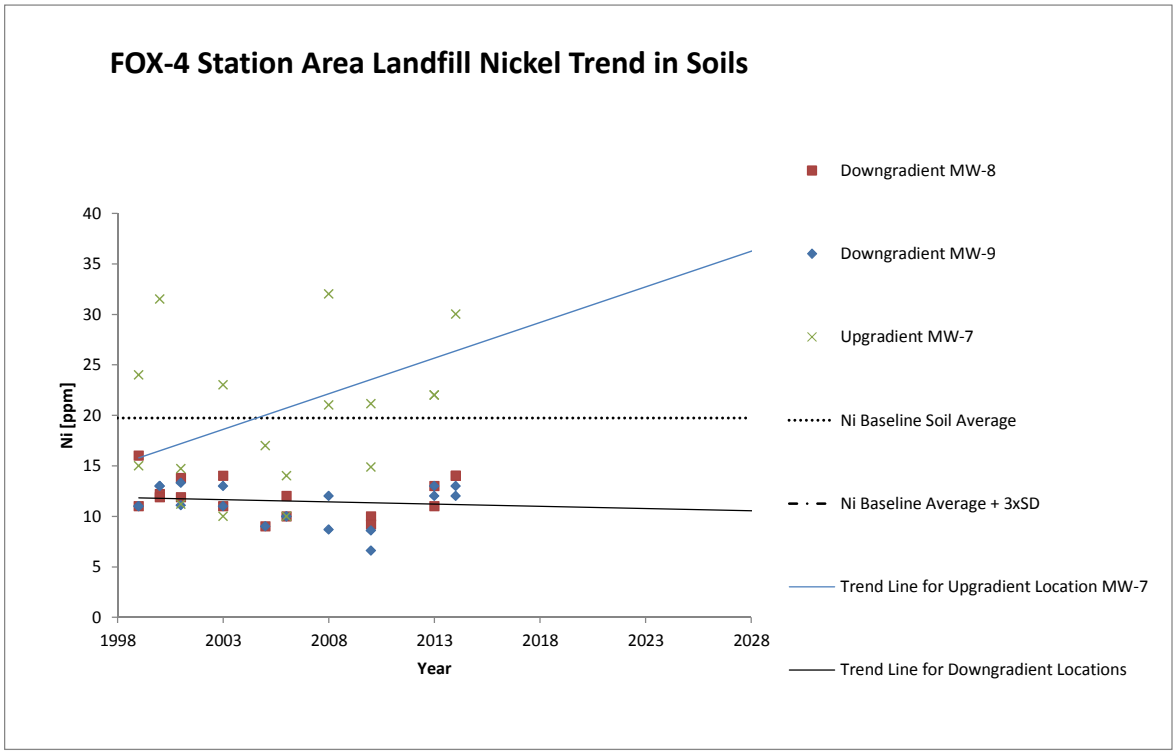


FOX-4 Helipad Landfill West Trends in Soil Inorganics, PCBs and PHCs (modified TPH)

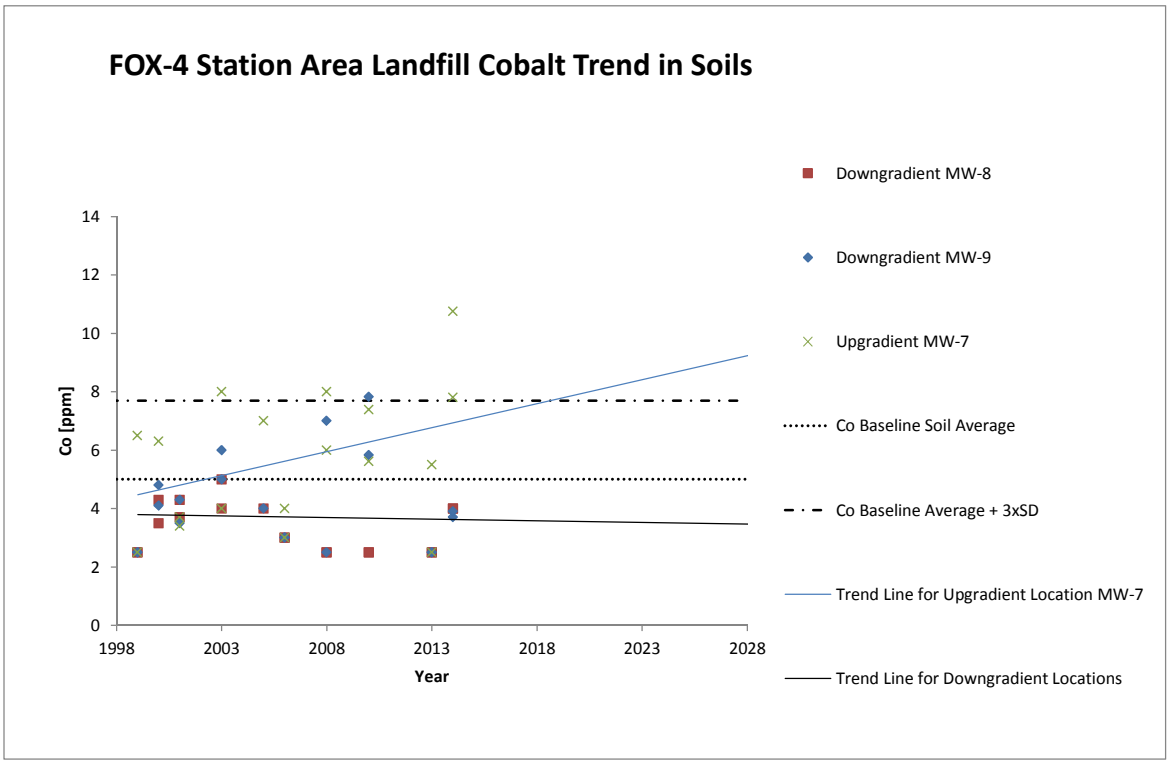


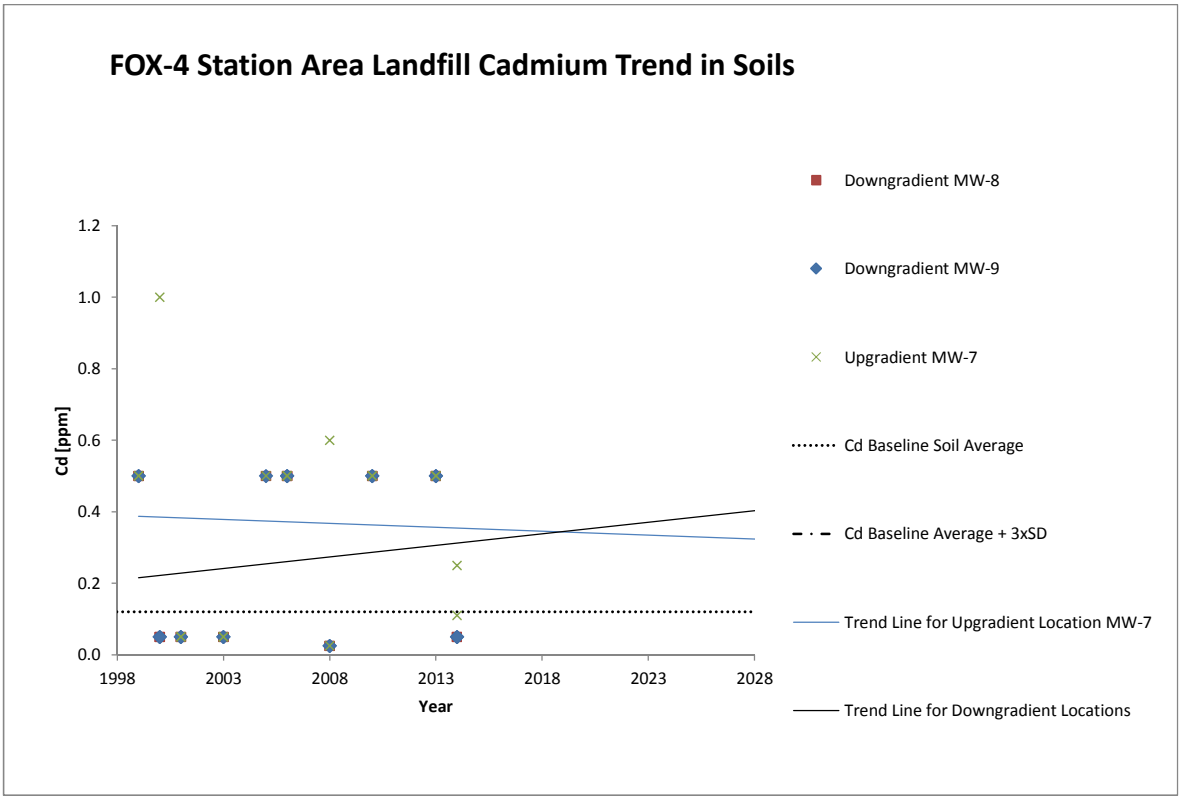
FOX-4 Station Area Landfill Trends in Soil Inorganics, PCBs and PHCs (modified TPH)
Where results are below detection, half of the detection limit has been used in the charts.



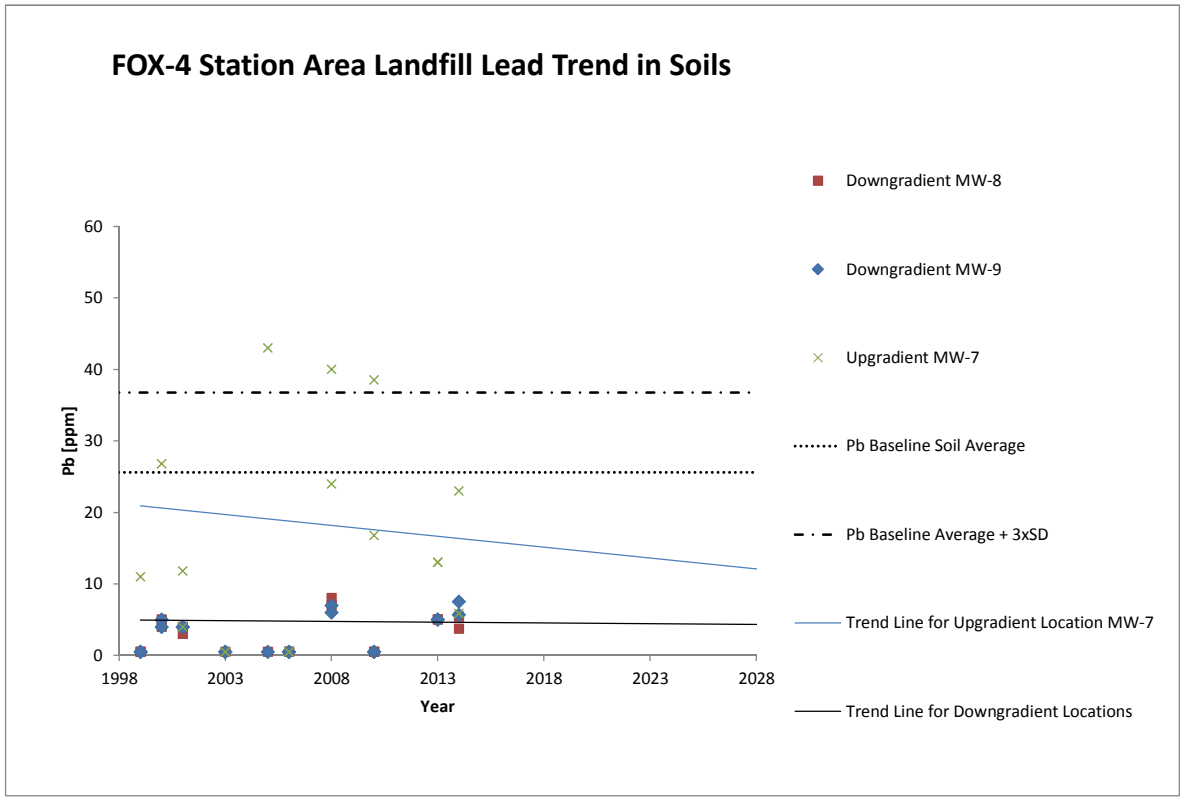


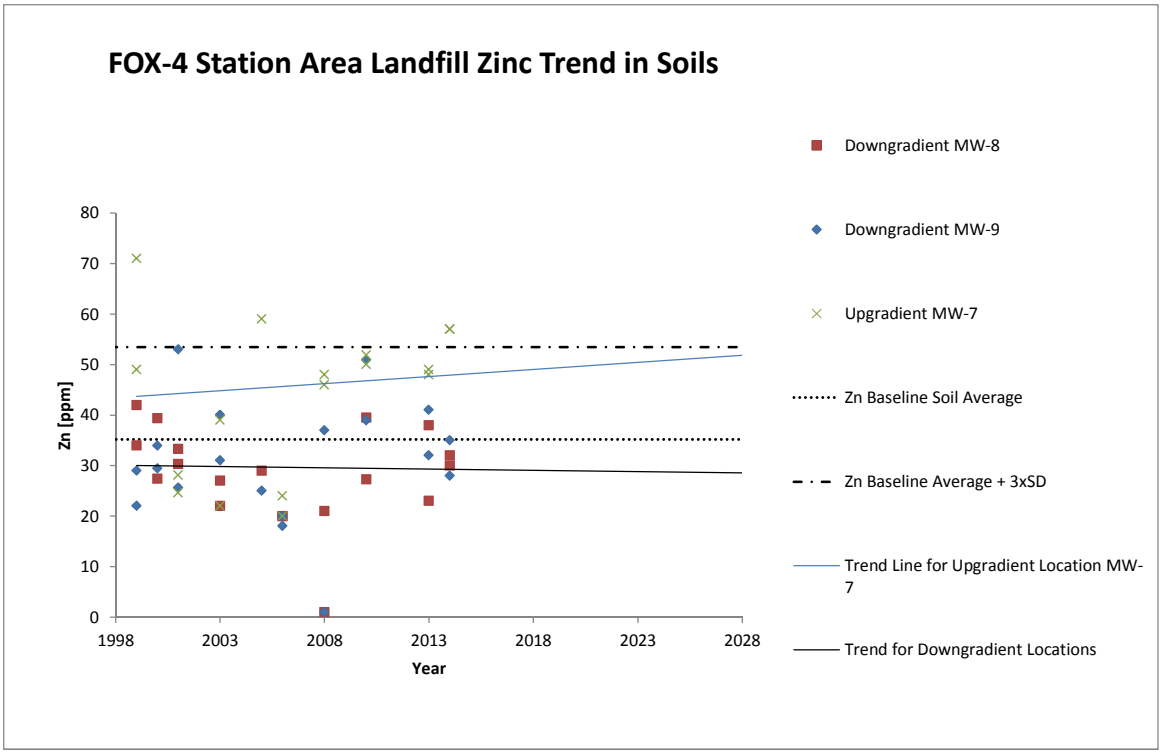
FOX-4 Station Area Landfill Trends in Soil Inorganics, PCBs and PHCs (modified TPH)
Where results are below detection, half of the detection limit has been used in the charts.



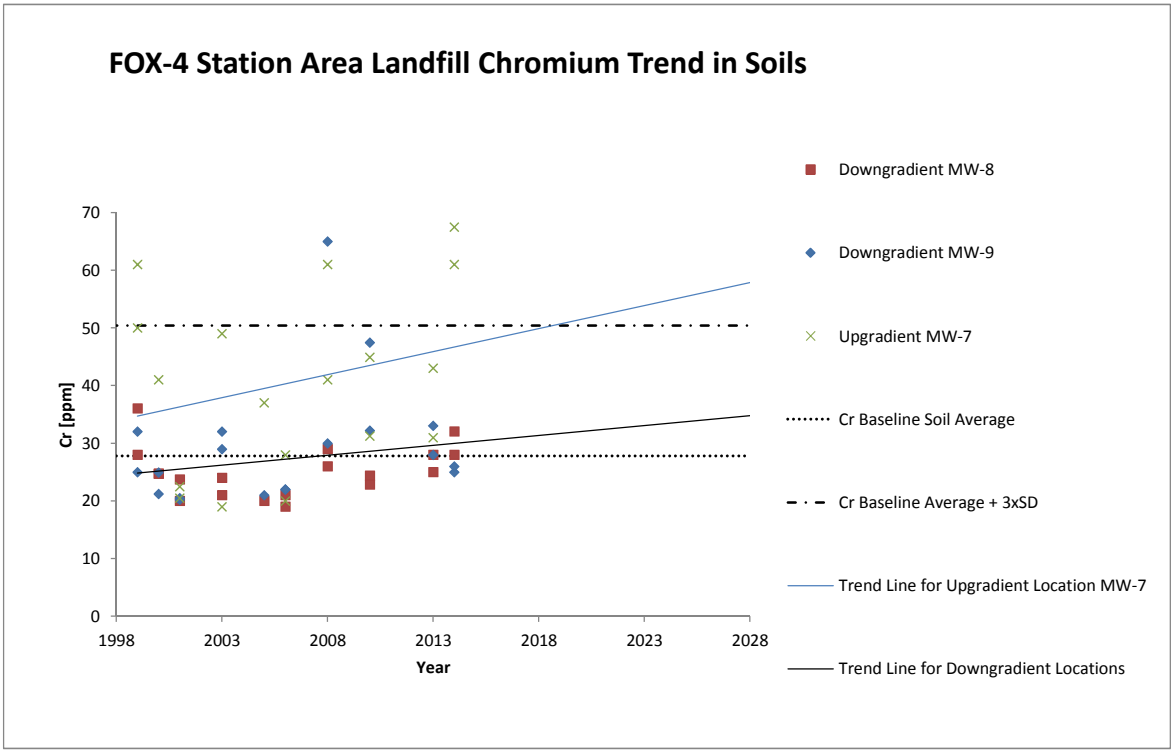


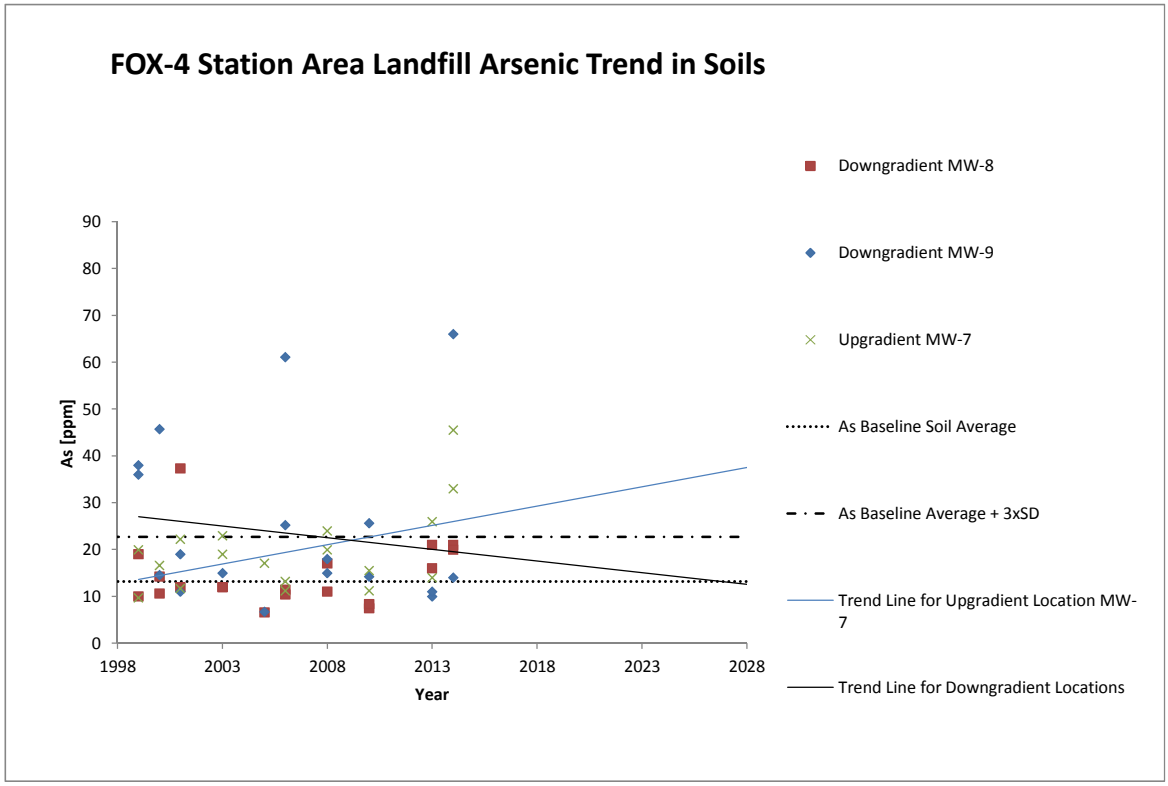
FOX-4 Station Area Landfill Trends in Soil Inorganics, PCBs and PHCs (modified TPH)
Where results are below detection, half of the detection limit has been used in the charts.





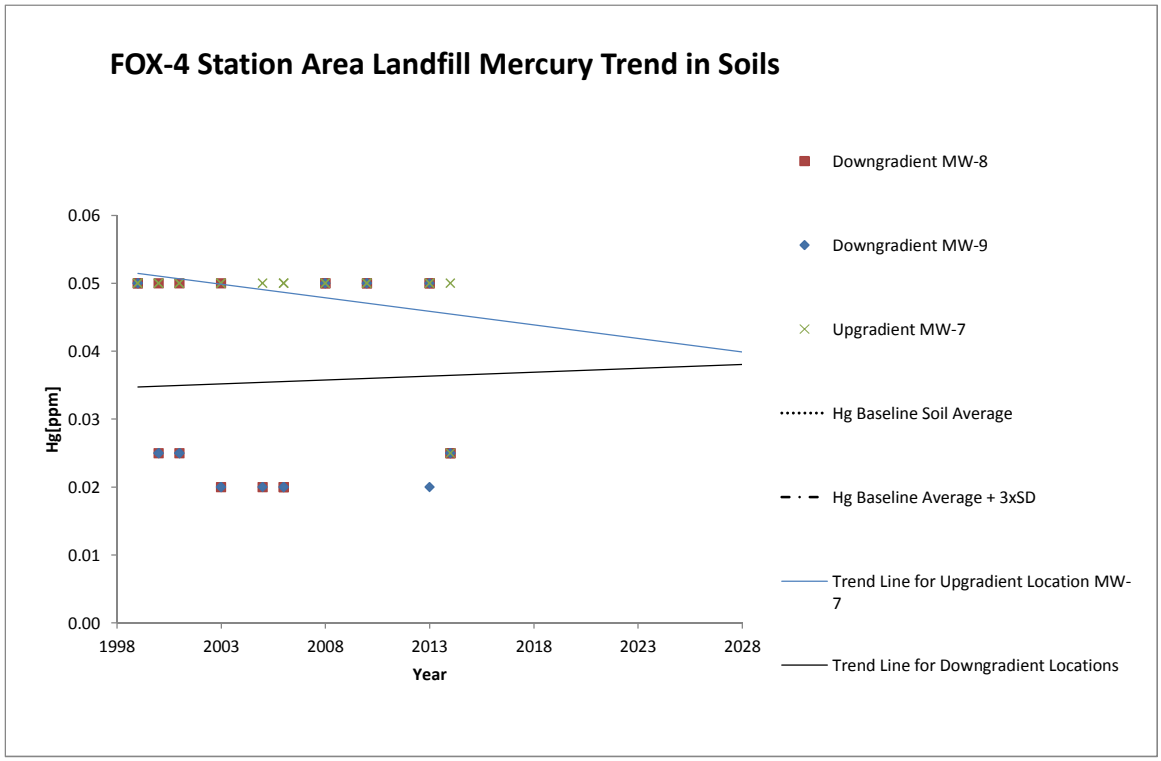
FOX-4 Station Area Landfill Trends in Soil Inorganics, PCBs and PHCs (modified TPH)
Where results are below detection, half of the detection limit has been used in the charts.

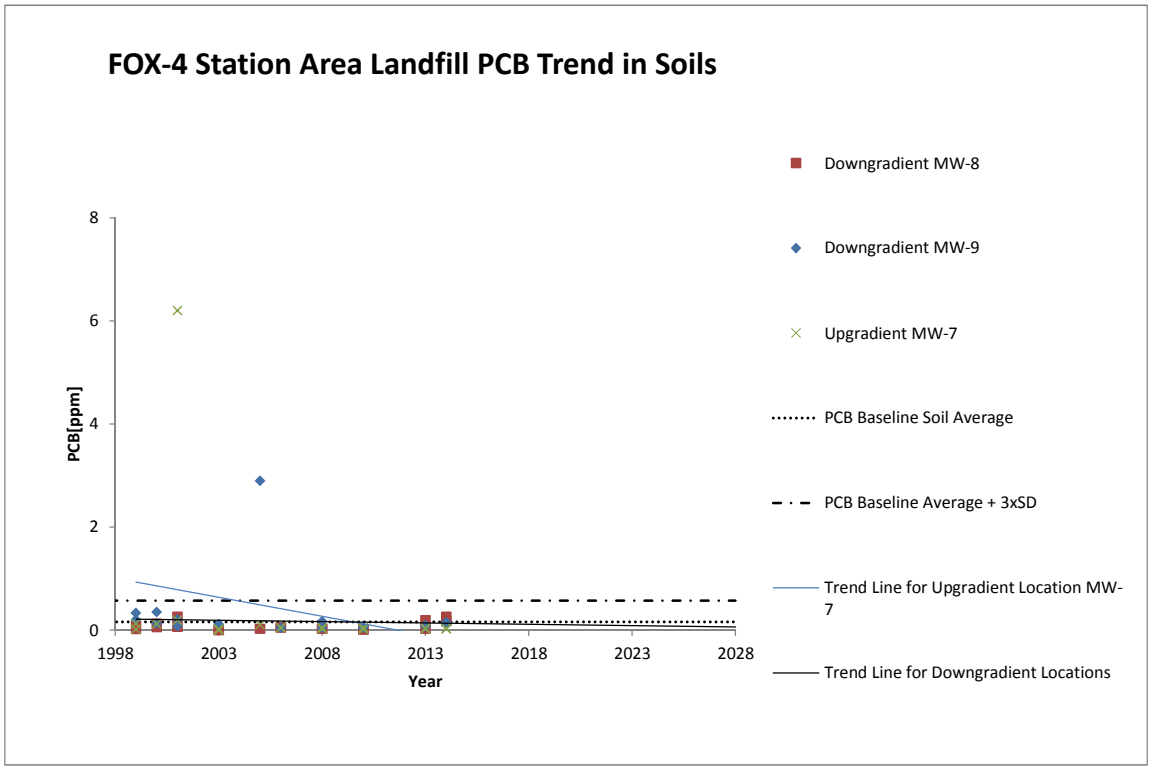




FOX-4 Station Area Landfill Trends in Soil Inorganics, PCBs and PHCs (modified TPH)

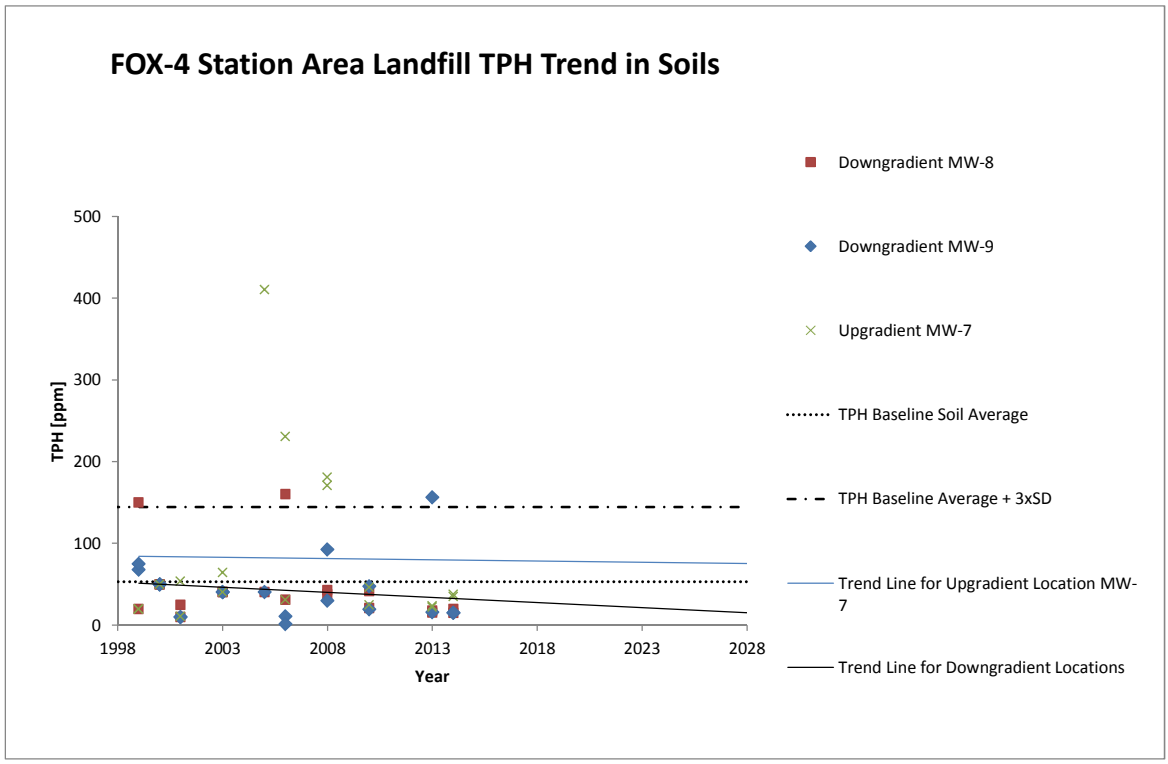
Where results are below detection, half of the detection limit has been used in the charts.





FOX-4 Station Area Landfill Trends in Soil Inorganics, PCBs and PHCs (modified TPH)

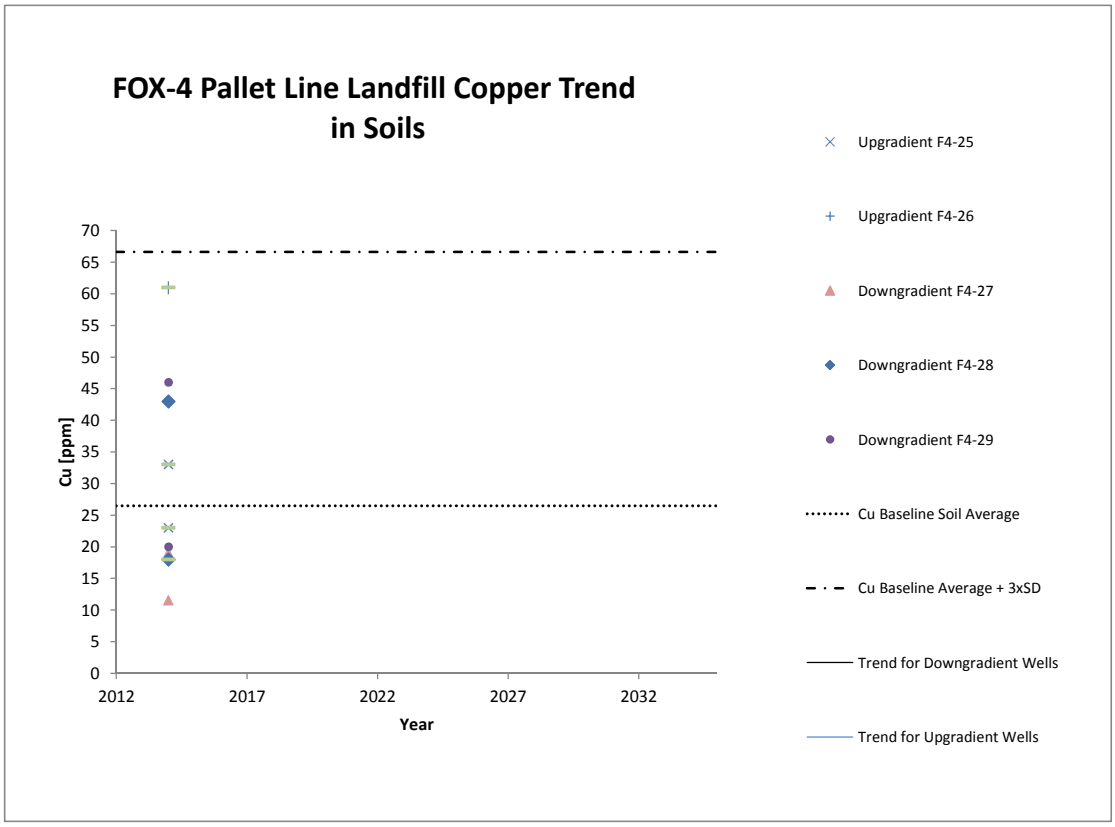
Where results are below detection, half of the detection limit has been used in the charts.

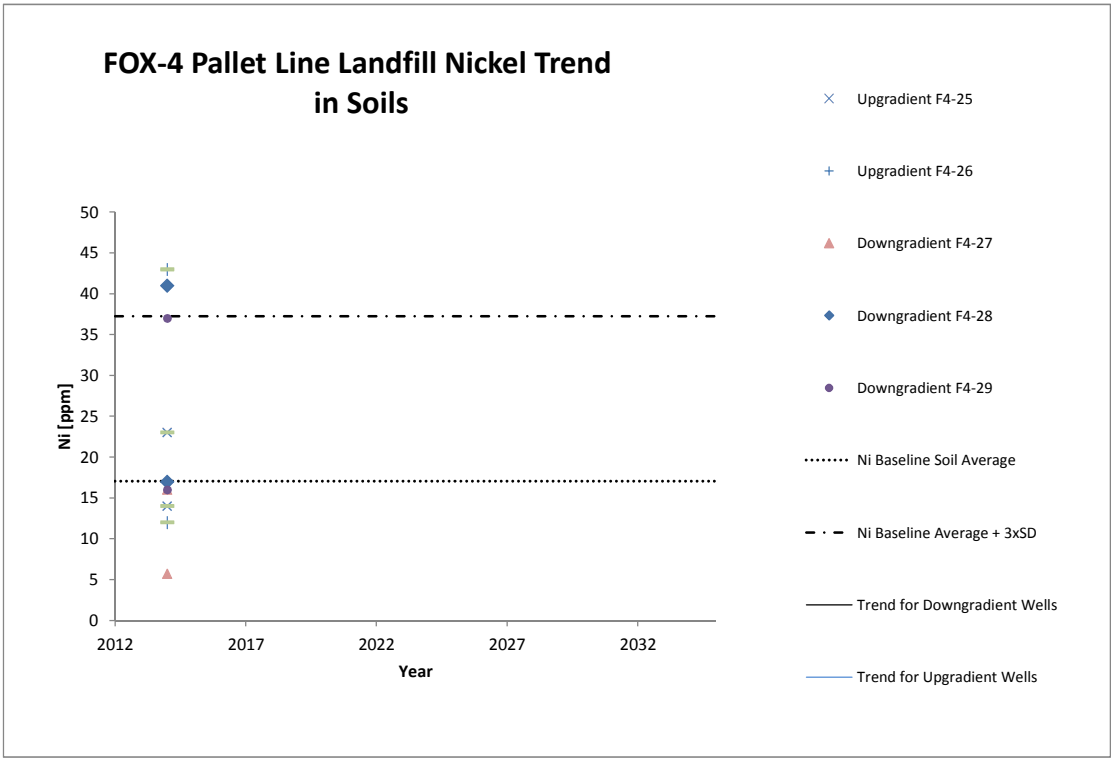


FOX-4 Pallet Line Landfill Trends in Soil Inorganics, PCBs and PHCs (modified TPH)

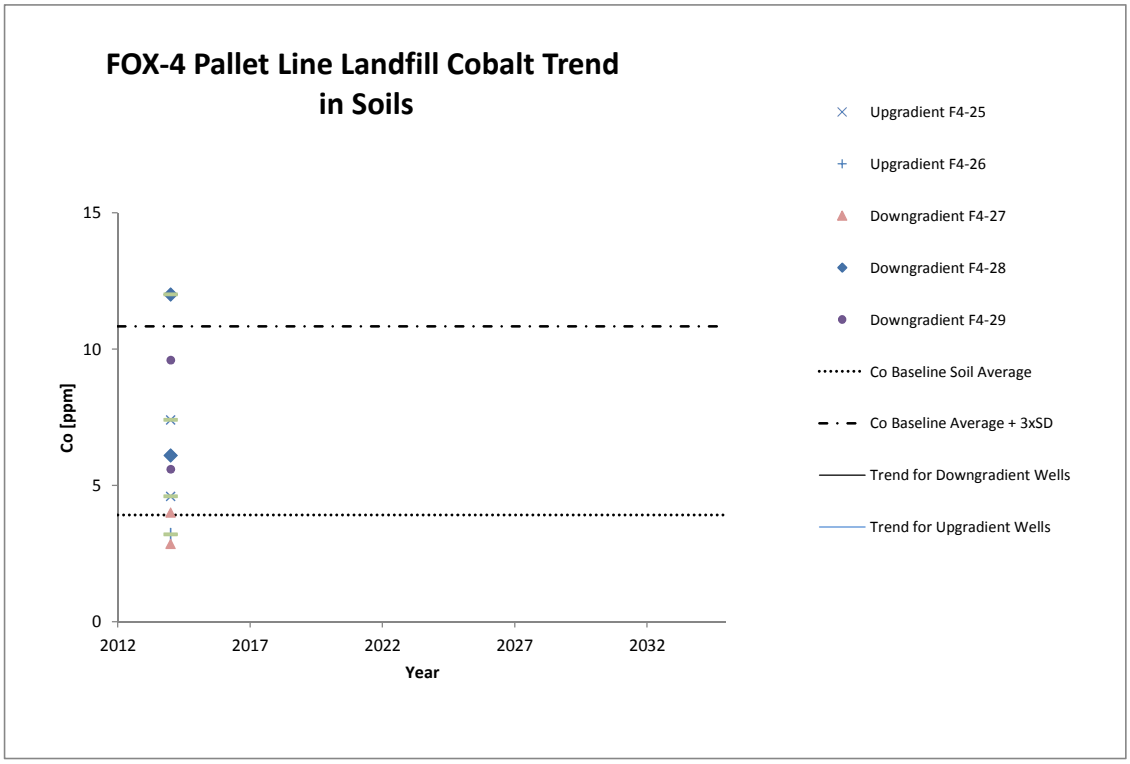
Where results are below detection, half of the detection limit has been used in the charts.

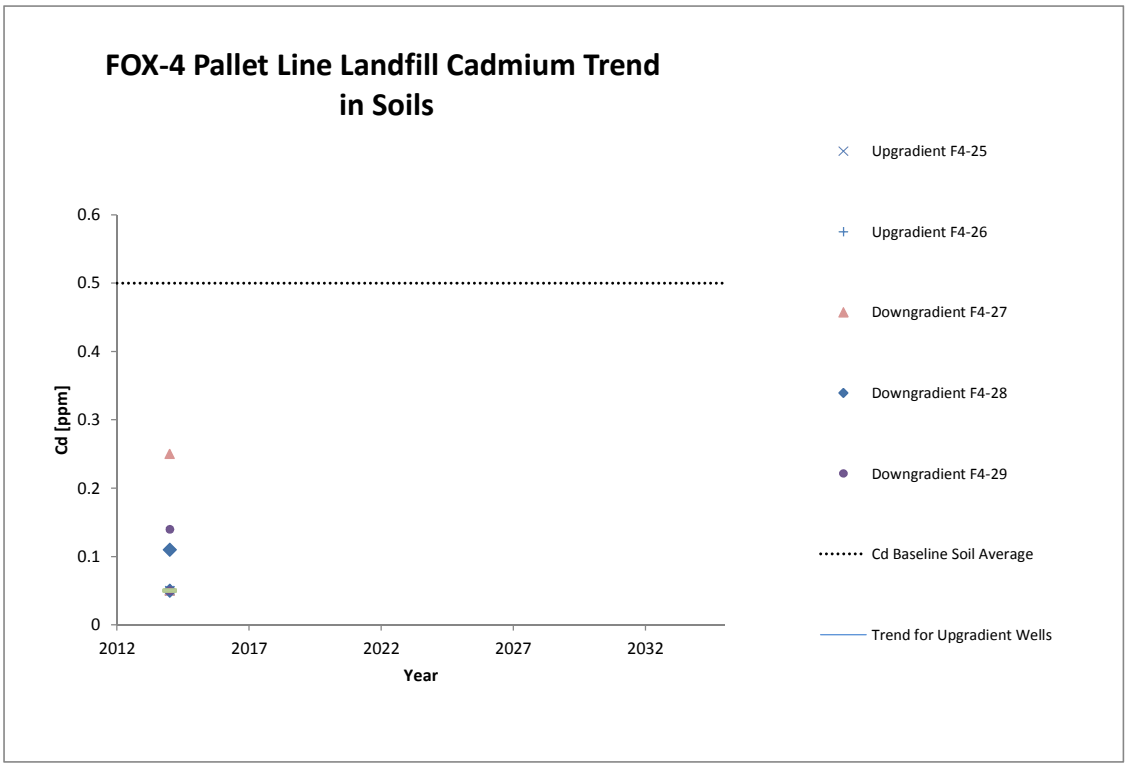
New monitoring locations were established in 2013 around the Pallet Line Landfill at FOX-4 and will be monitored as part of the landfill monitoring program.





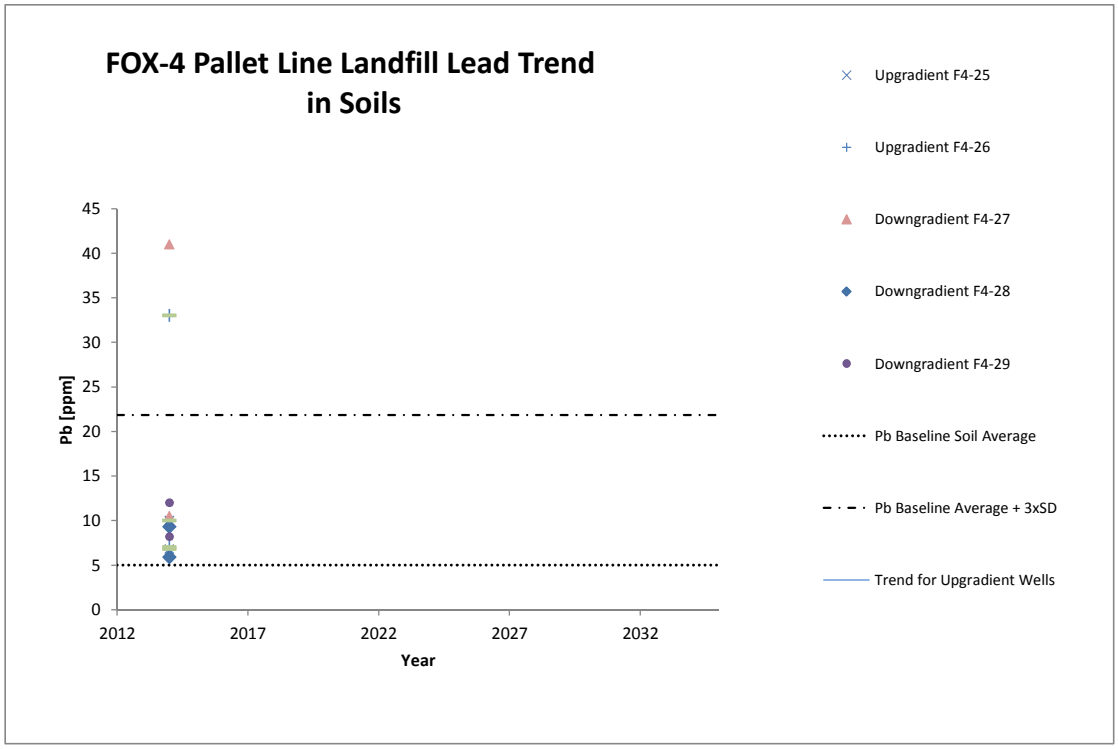
FOX-4 Pallet Line Landfill Trends in Soil Inorganics, PCBs and PHCs (modified TPH)

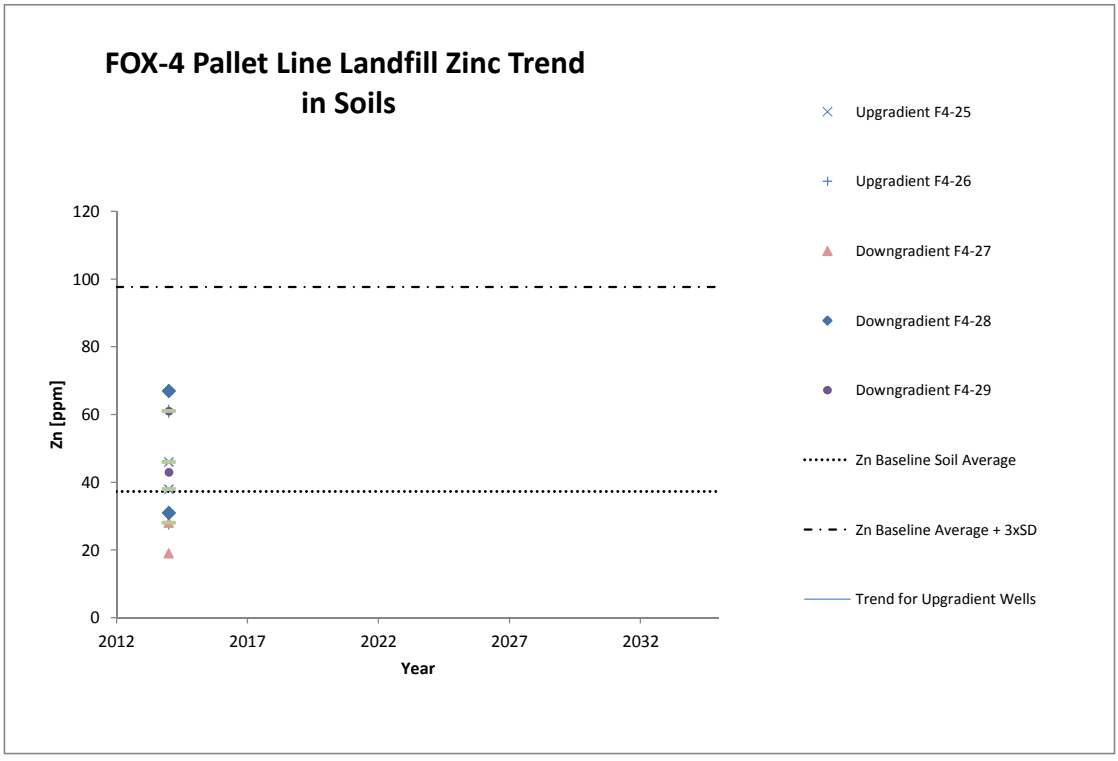




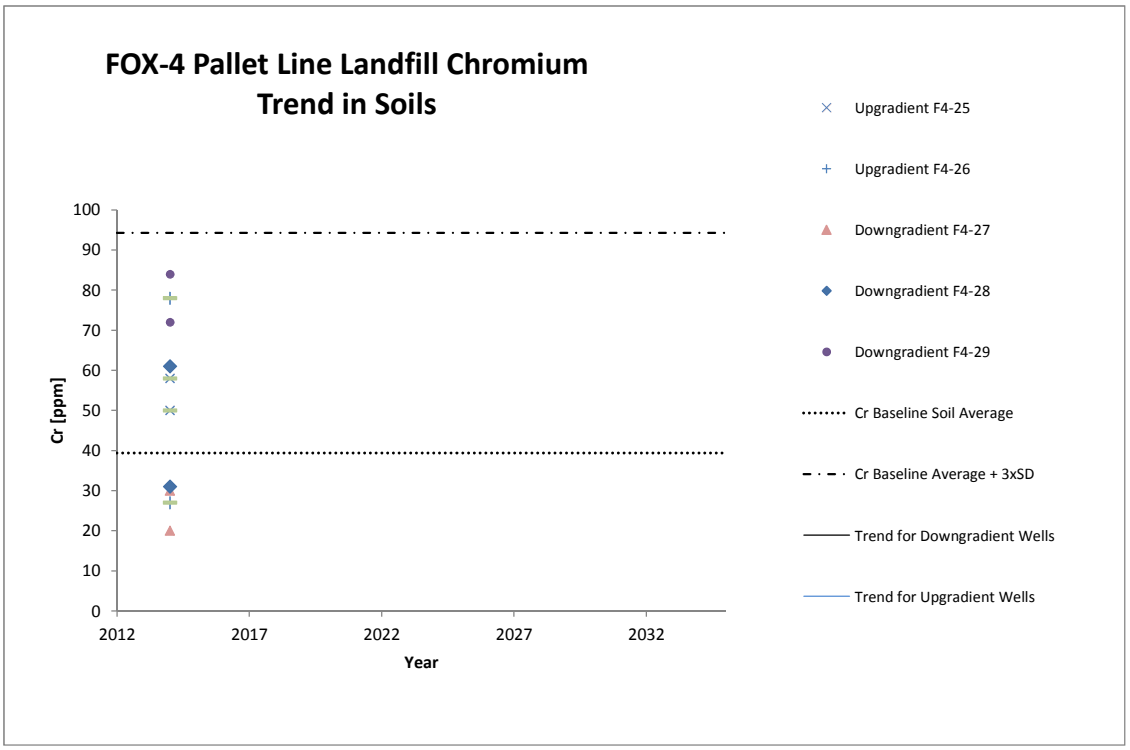
Cd Std Dev = 0

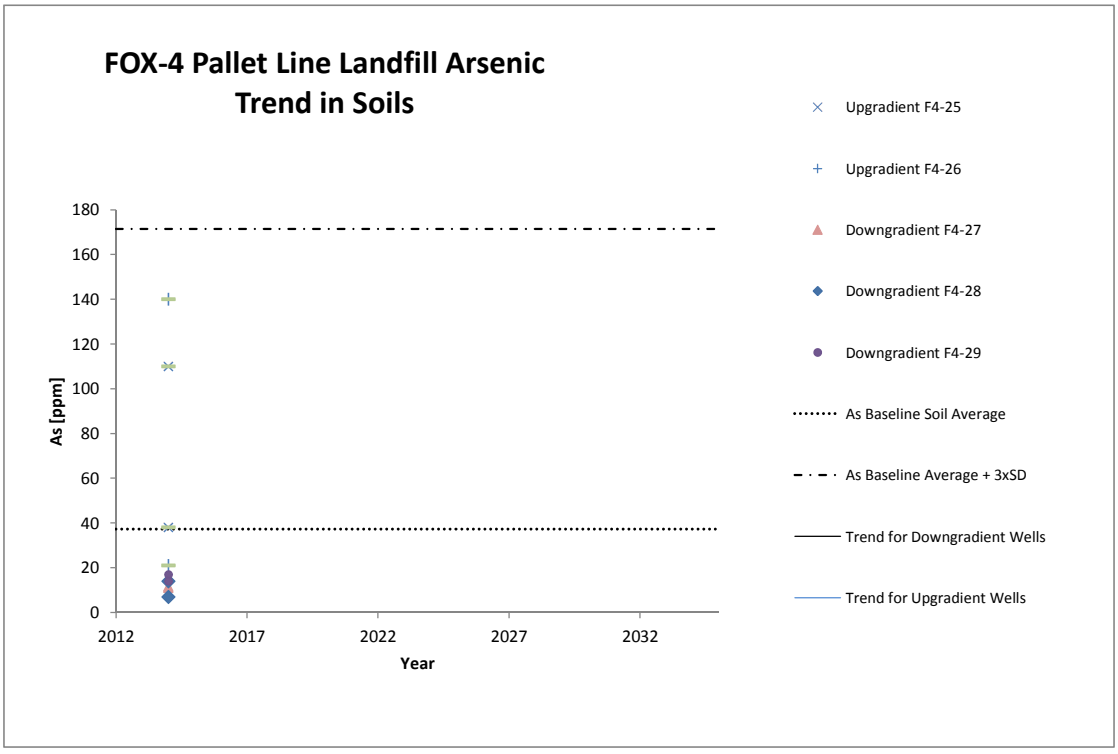
FOX-4 Pallet Line Landfill Trends in Soil Inorganics, PCBs and PHCs (modified TPH)



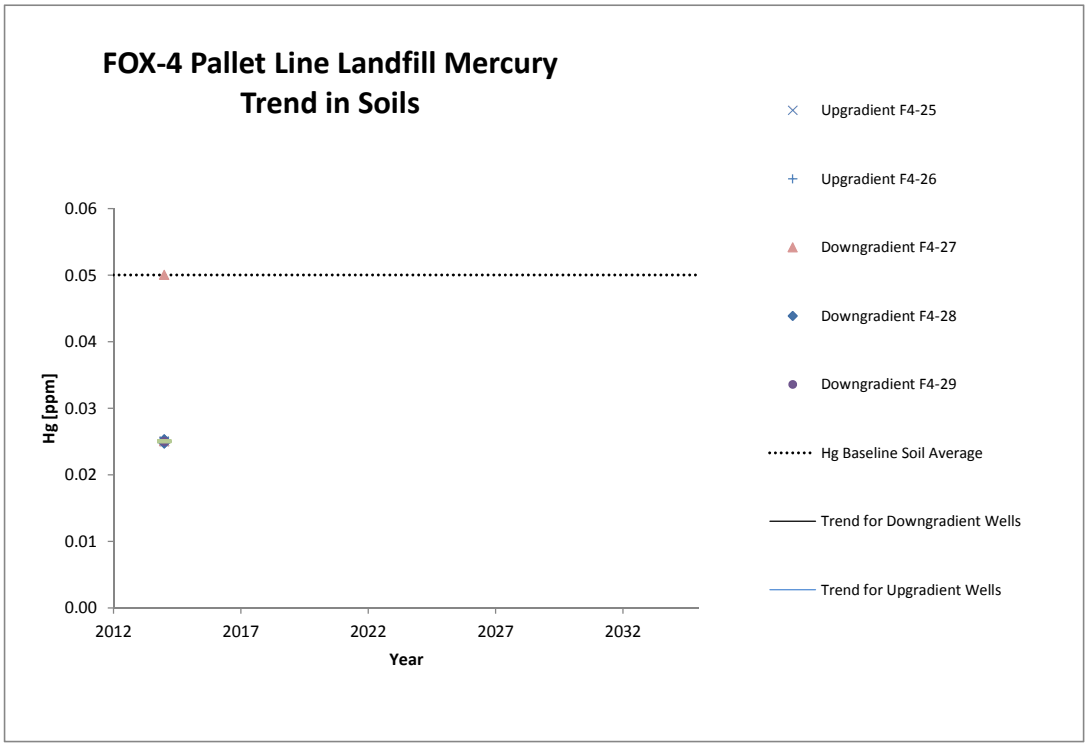


FOX-4 Pallet Line Landfill Trends in Soil Inorganics, PCBs and PHCs (modified TPH)

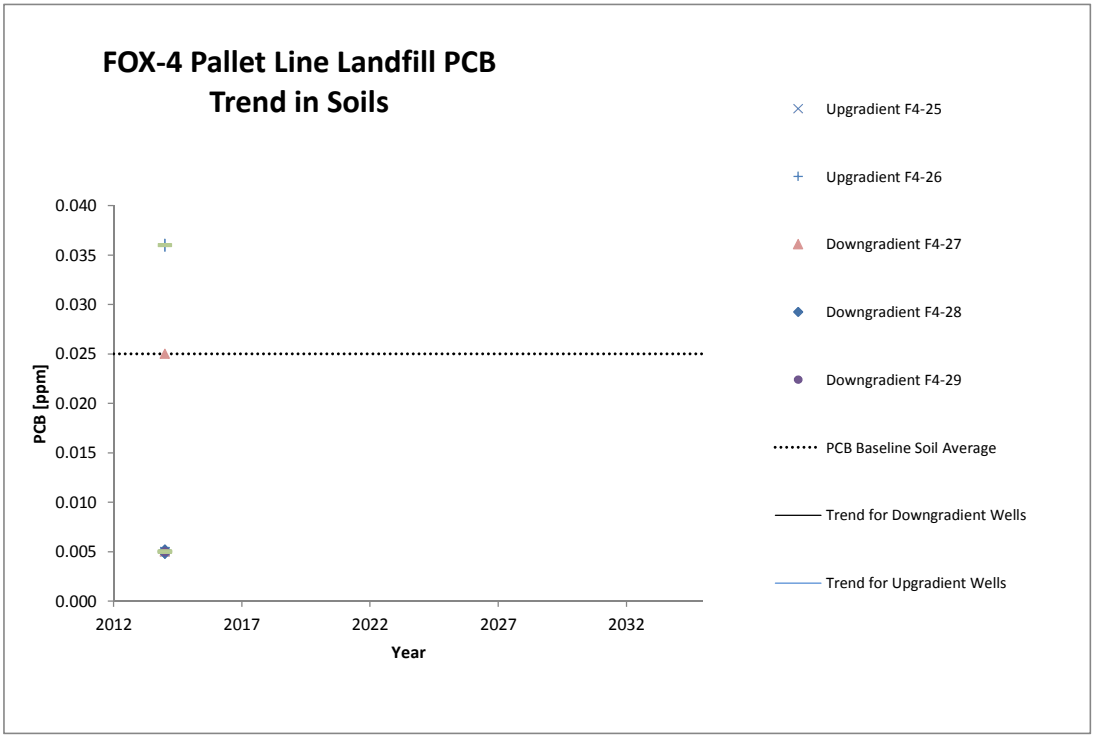




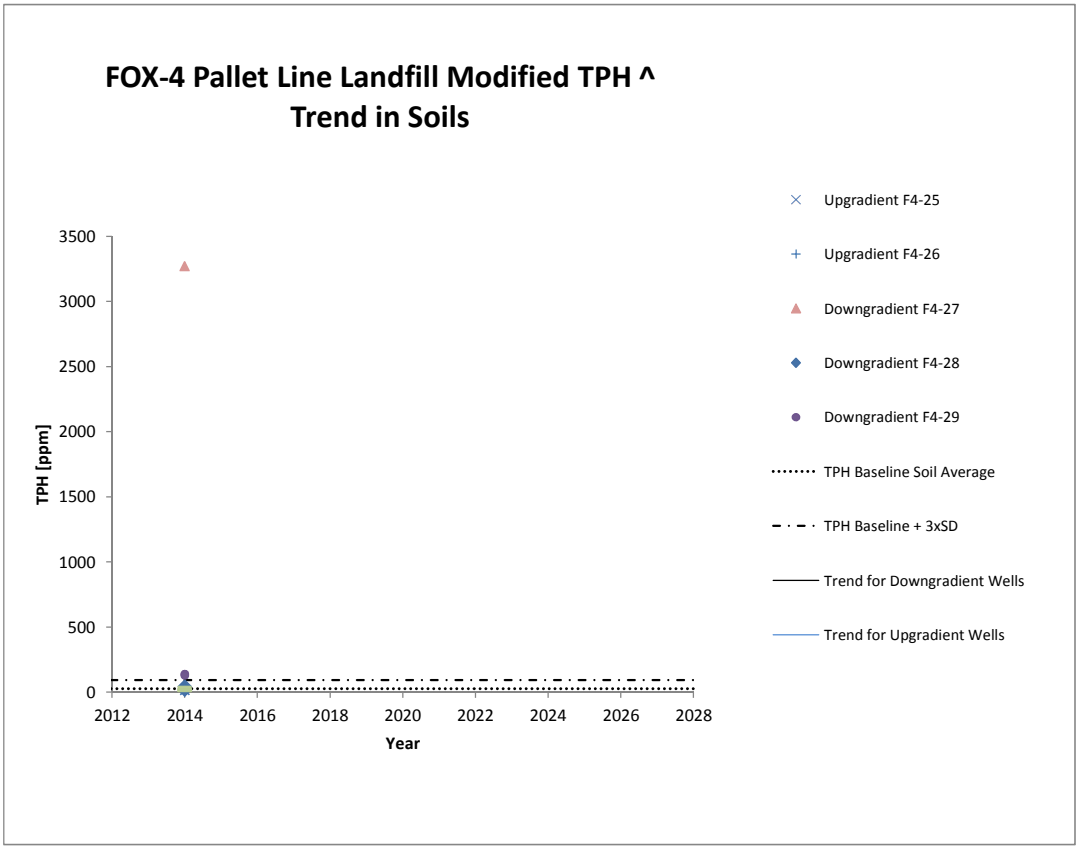
FOX-4 Pallet Line Landfill Trends in Soil Inorganics, PCBs and PHCs (modified TPH)



Hg Std Dev = 0



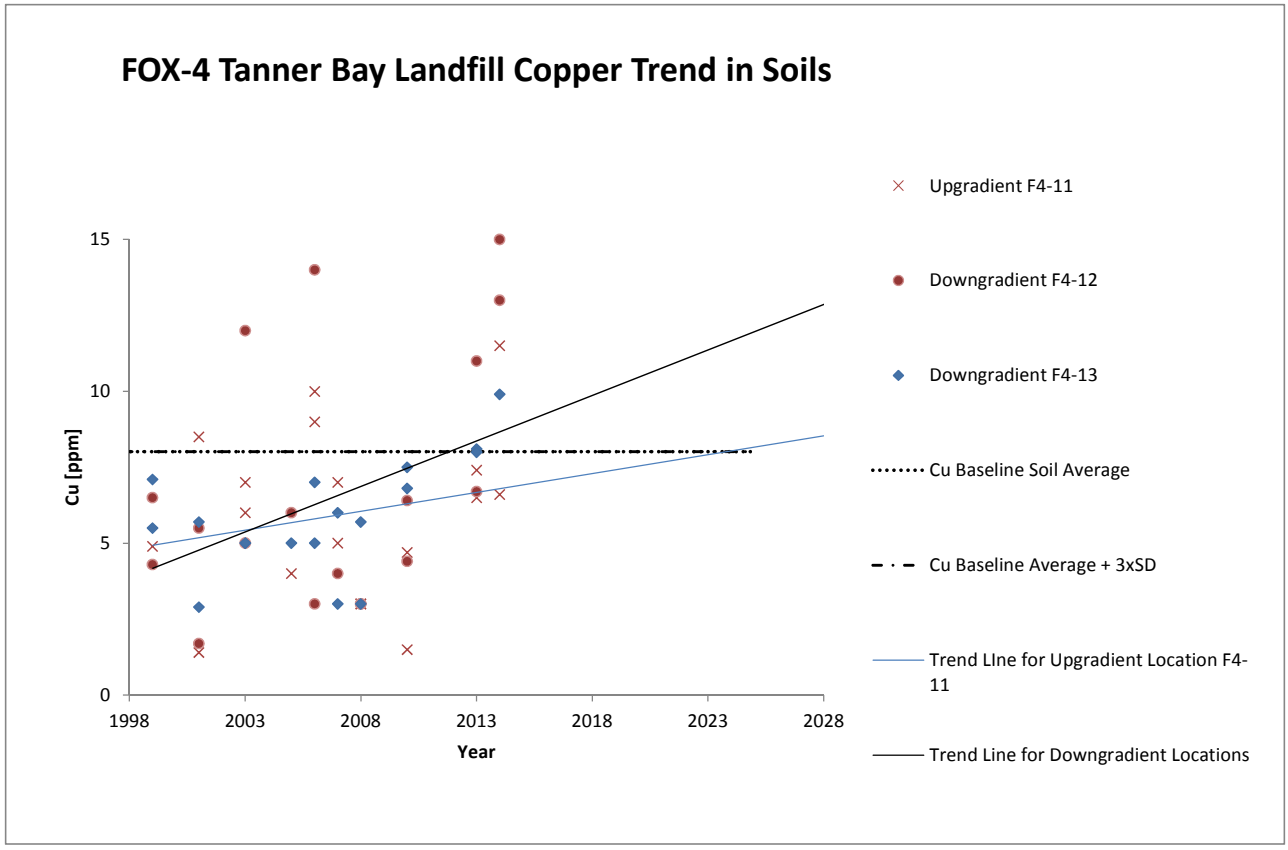
FOX-4 Pallet Line Landfill Trends in Soil Inorganics, PCBs and PHCs (modified TPH)

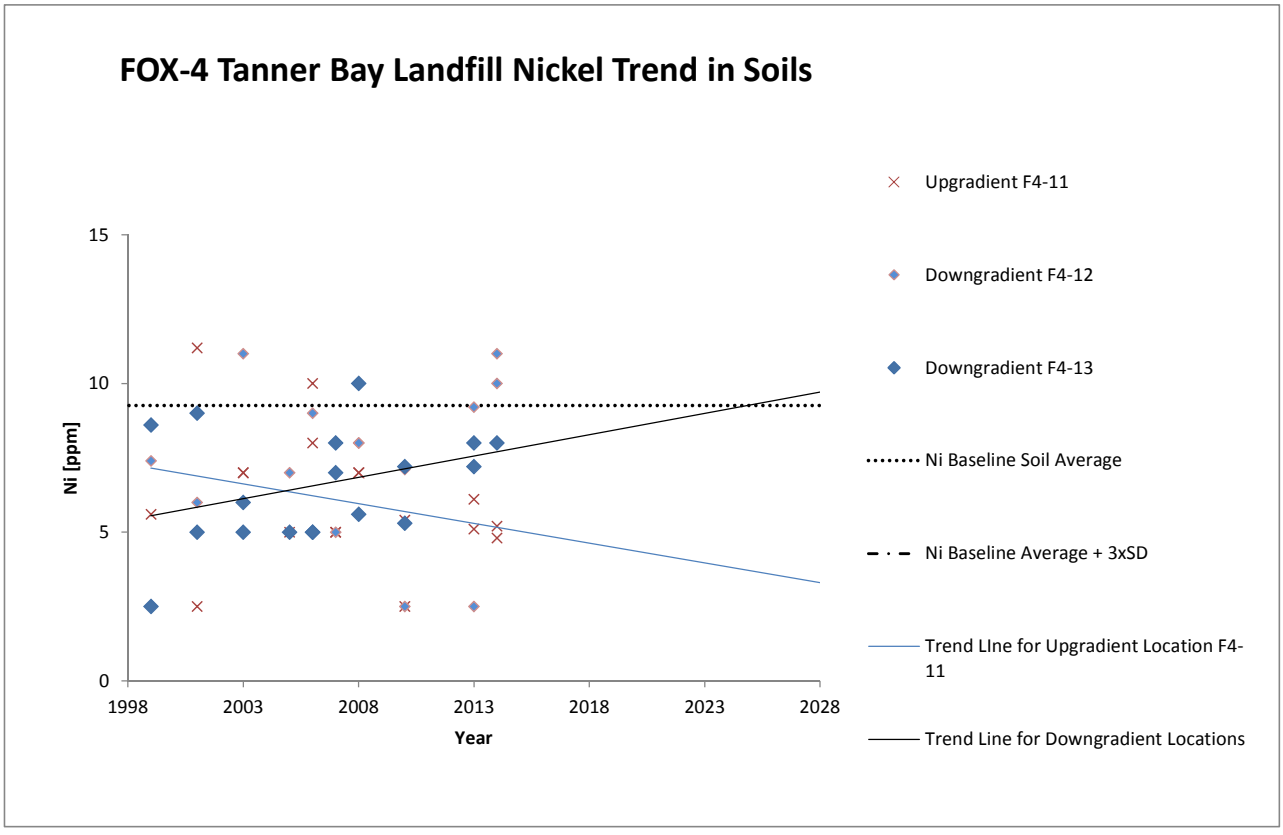


^ Total Hydrocarbons (C_6-C_{34}) has been calculated by adding results for F1, F2 and F3.

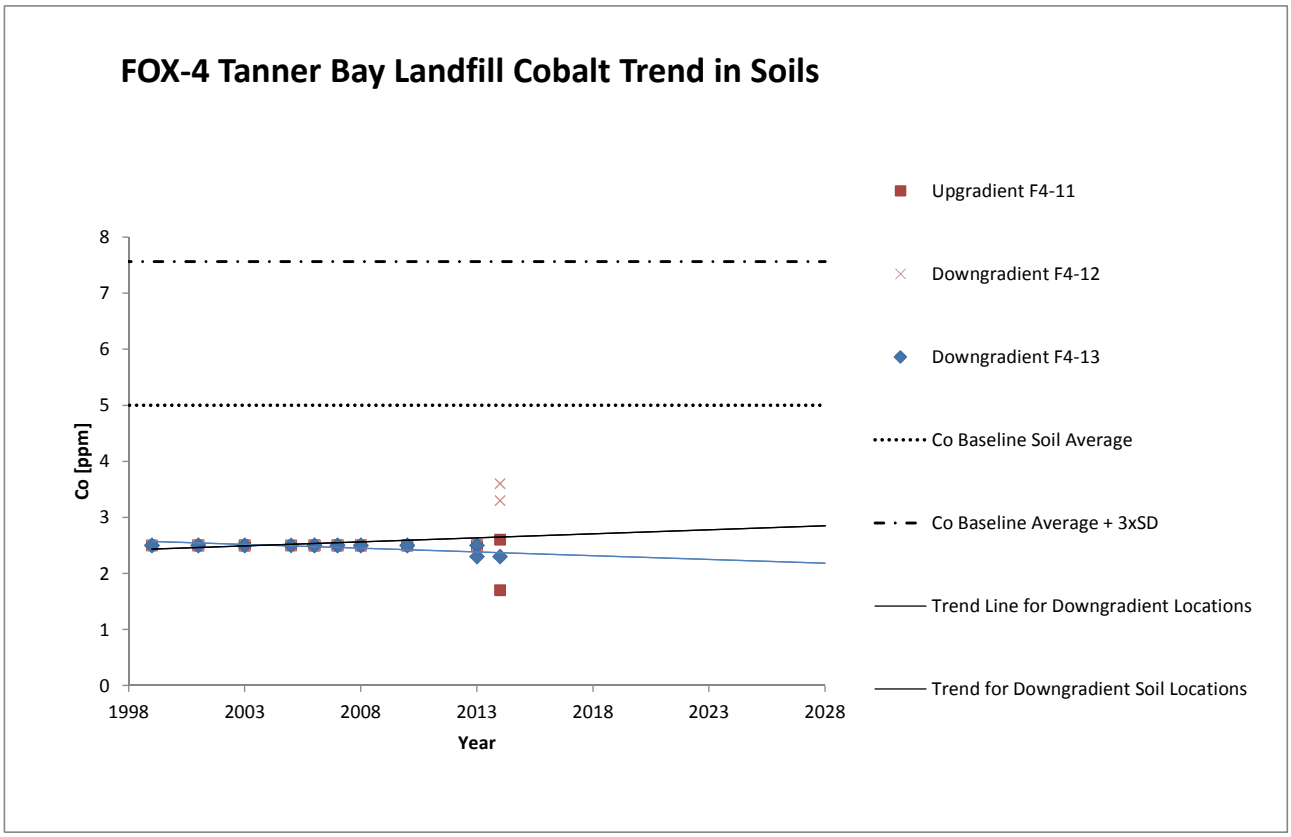
FOX-4 Tanner Bay Landfill Trends in Soil Inorganics, PCBs and PHCs (modified TPH)

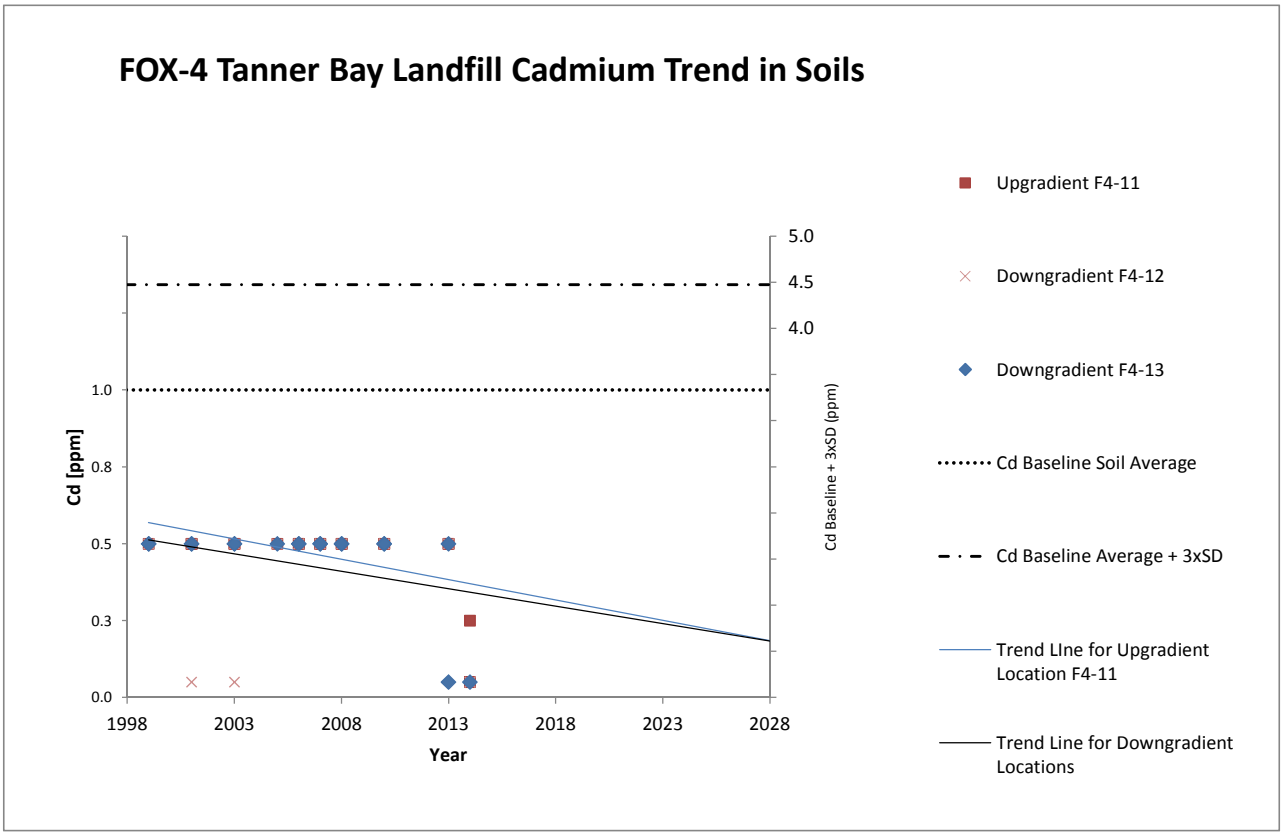
Where results are below detection, half of the detection limit has been used in the charts.



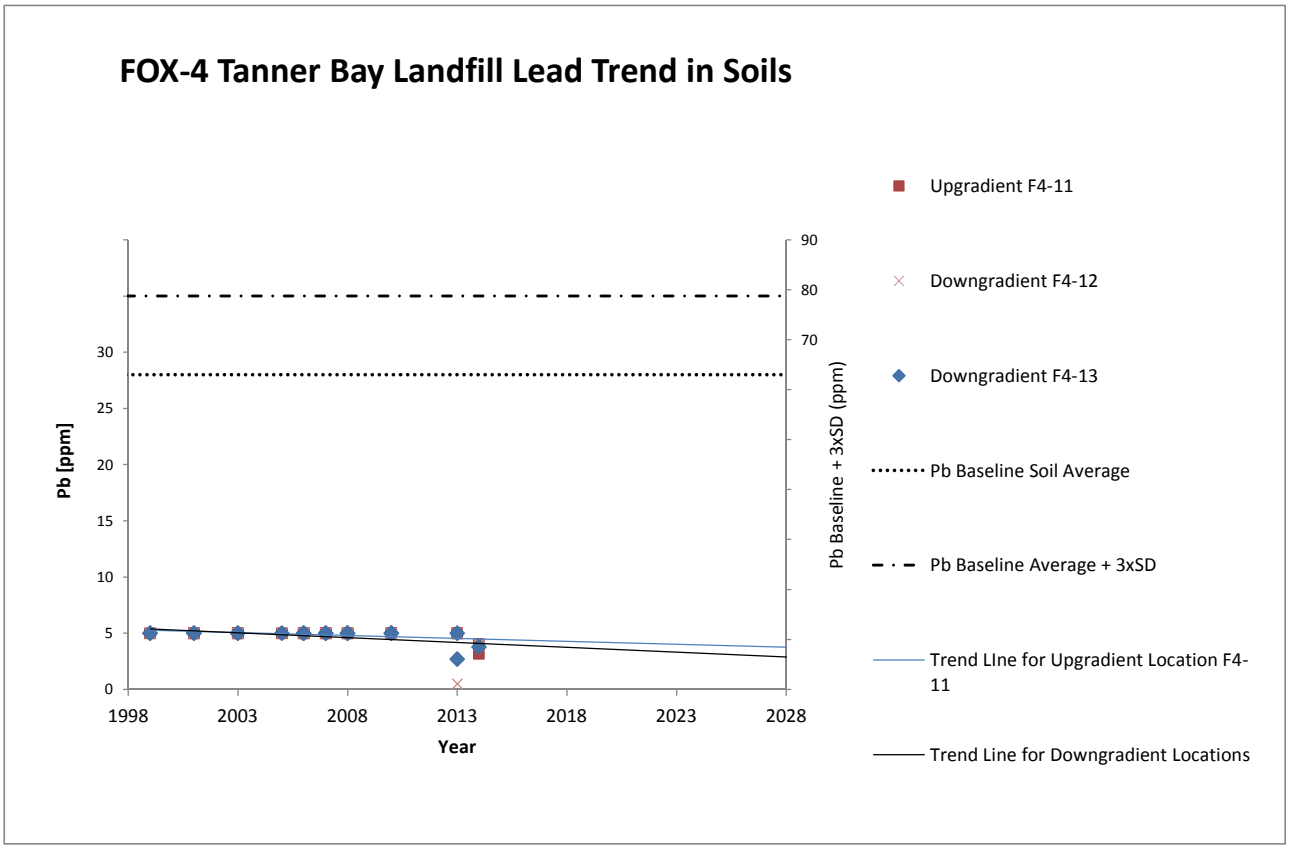


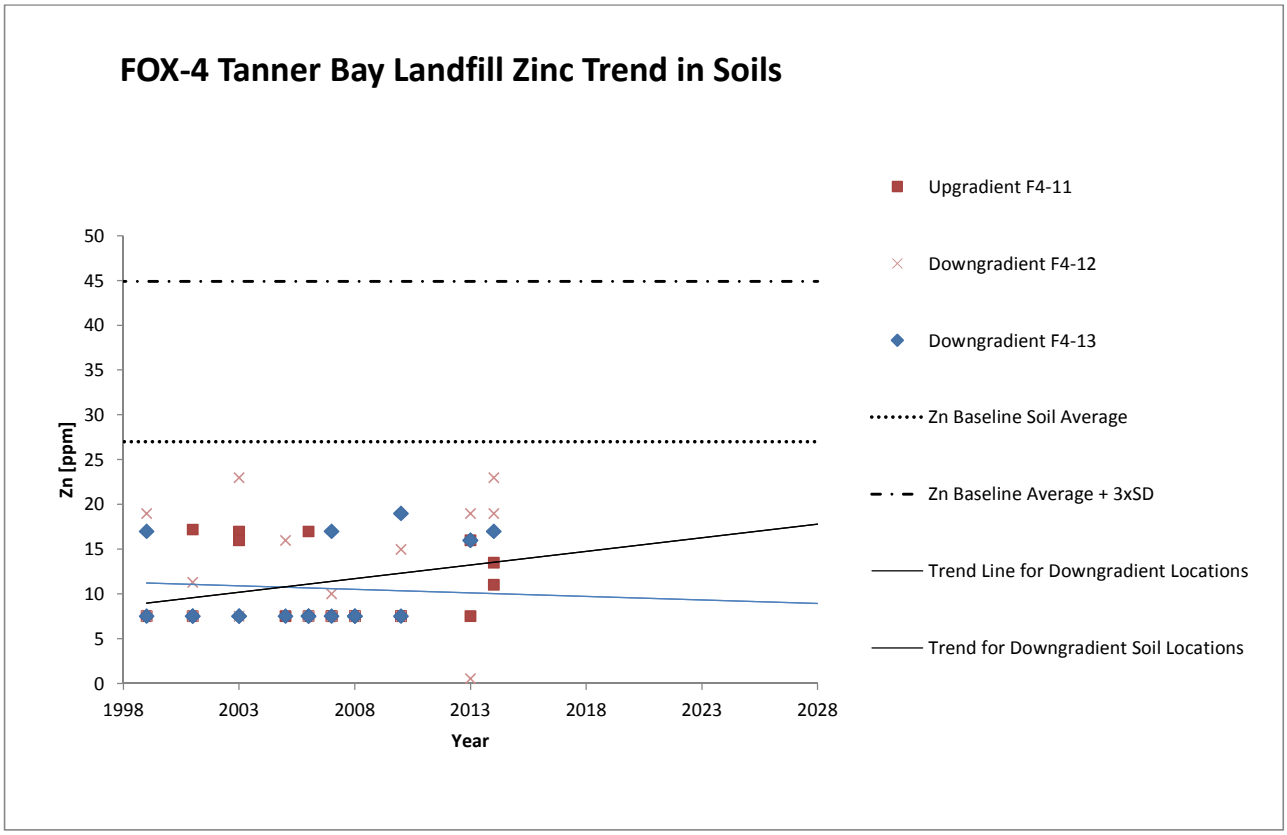
FOX-4 Tanner Bay Landfill Trends in Soil Inorganics, PCBs and PHCs (modified TPH)



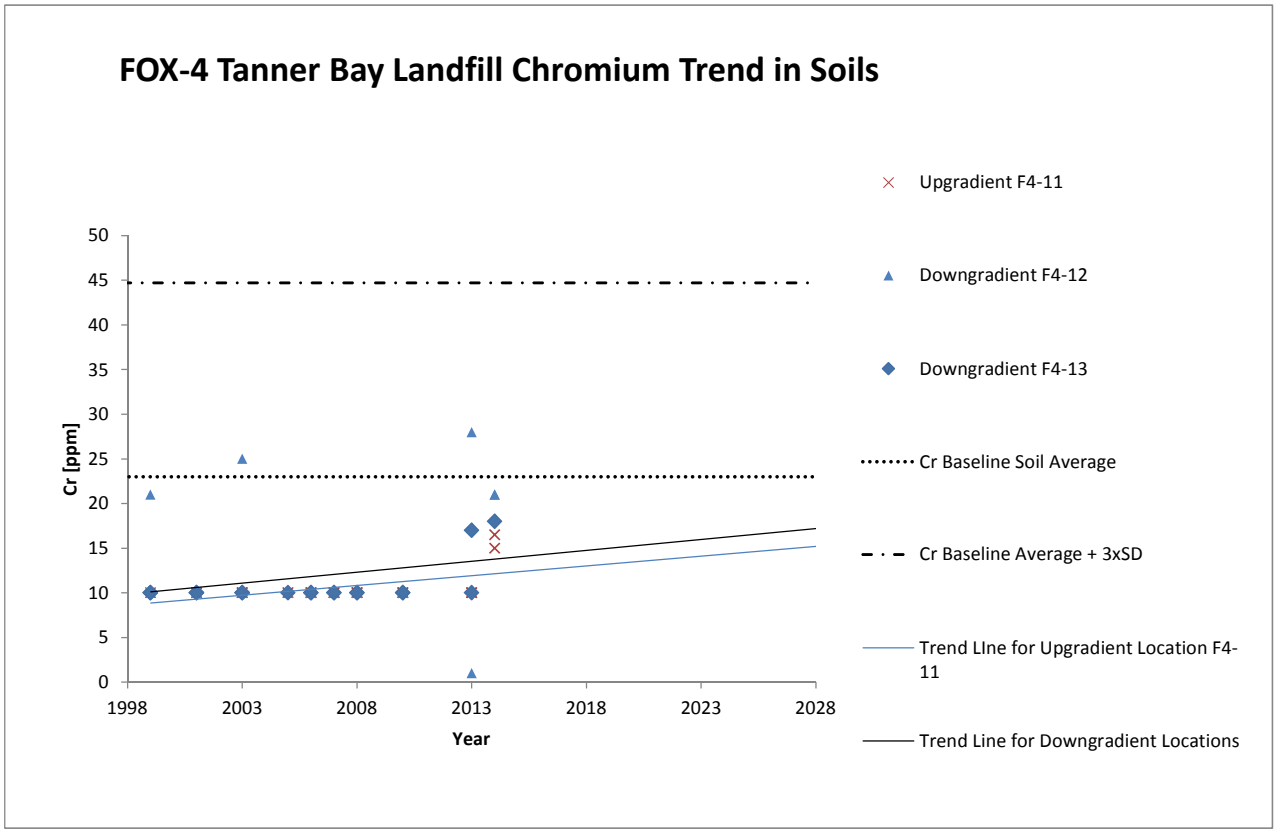


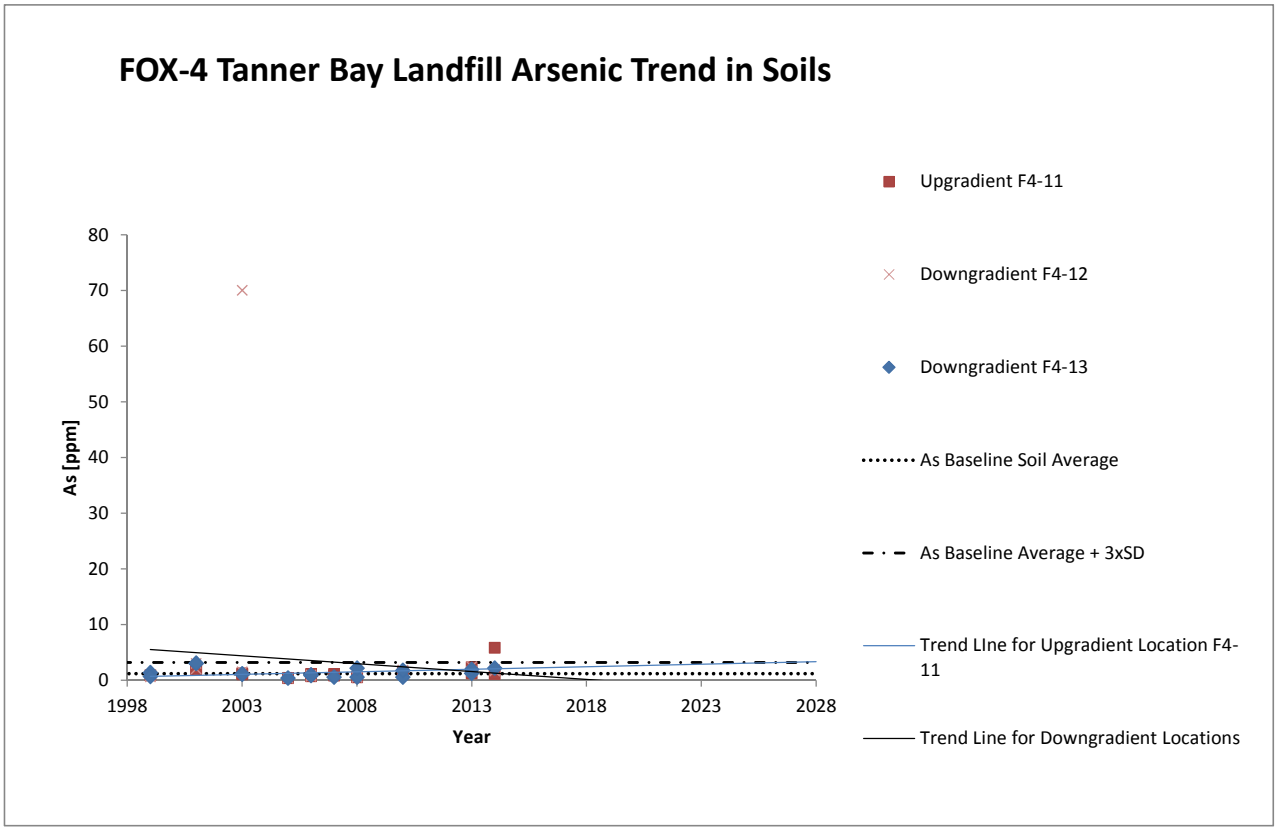
FOX-4 Tanner Bay Landfill Trends in Soil Inorganics, PCBs and PHCs (modified TPH)



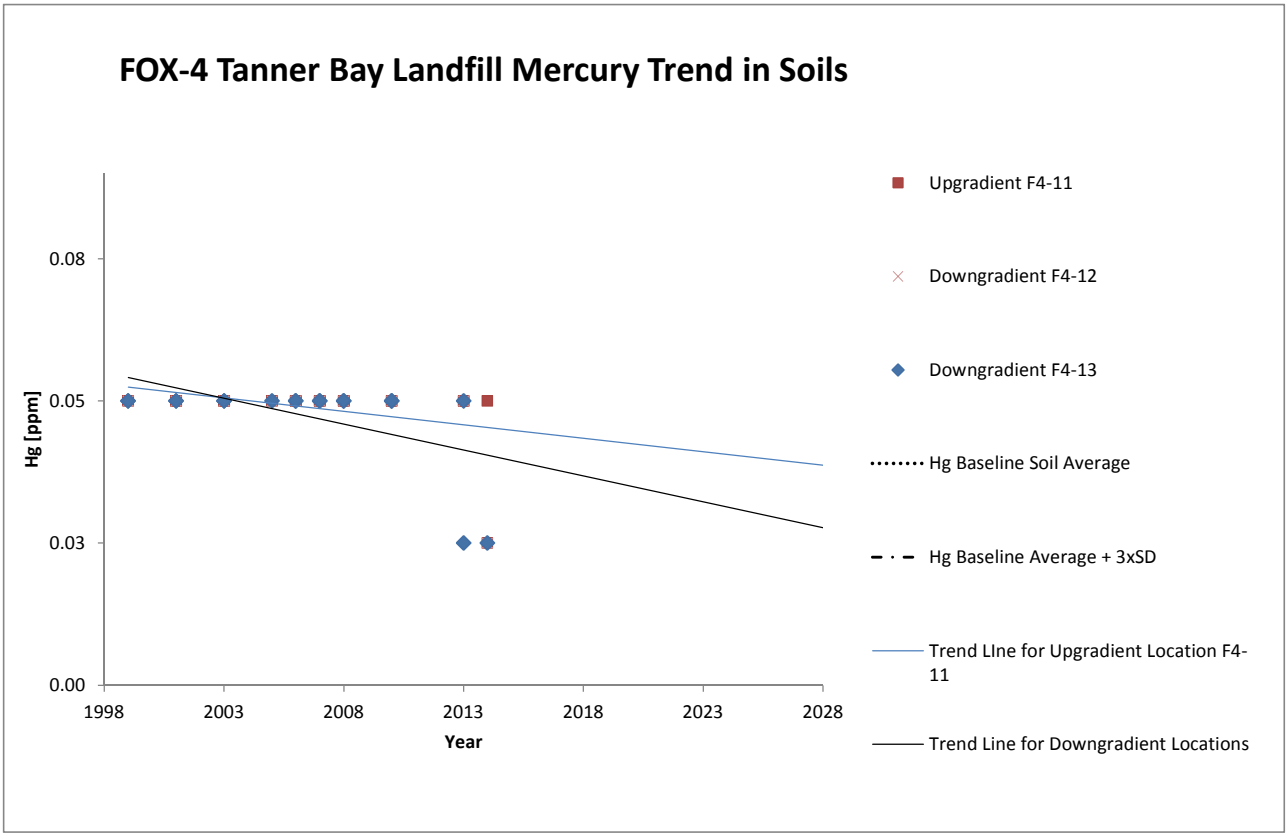


FOX-4 Tanner Bay Landfill Trends in Soil Inorganics, PCBs and PHCs (modified TPH)

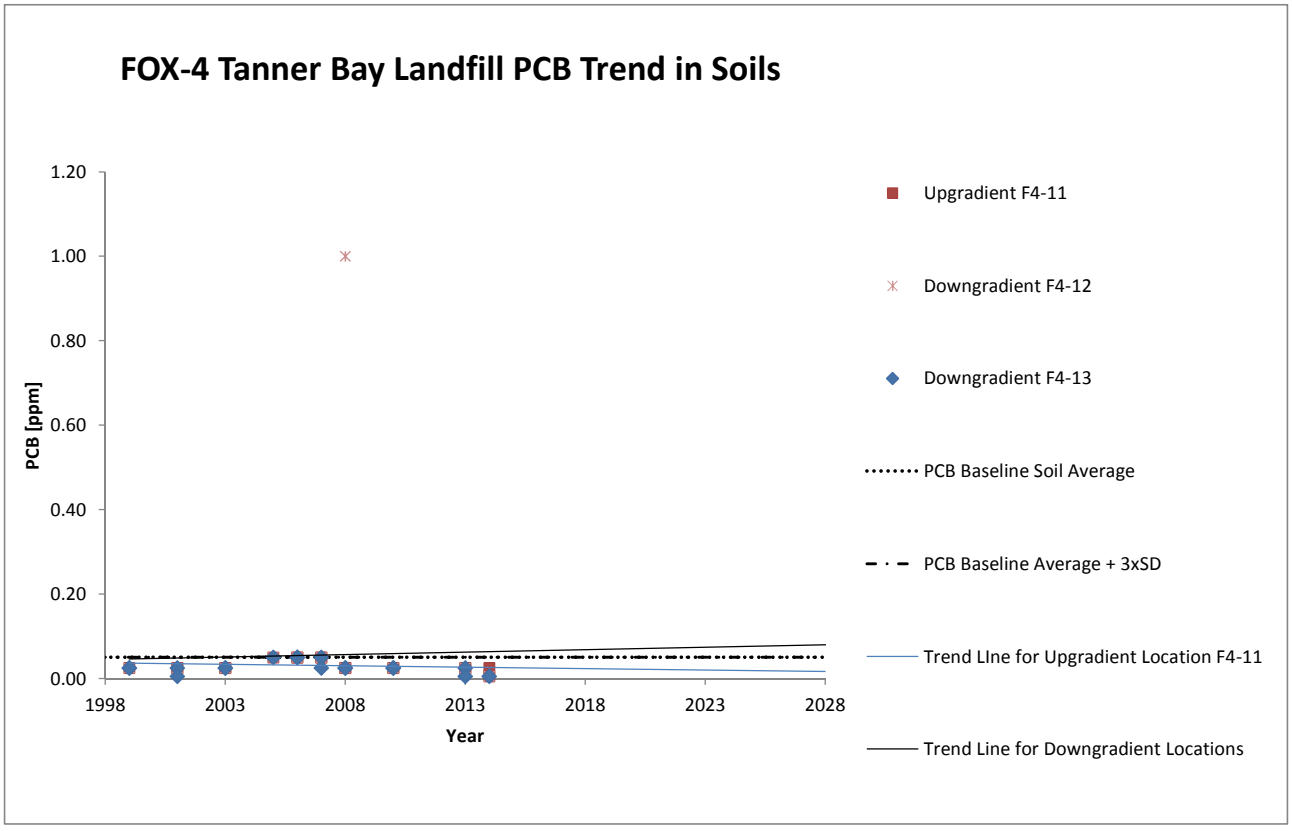




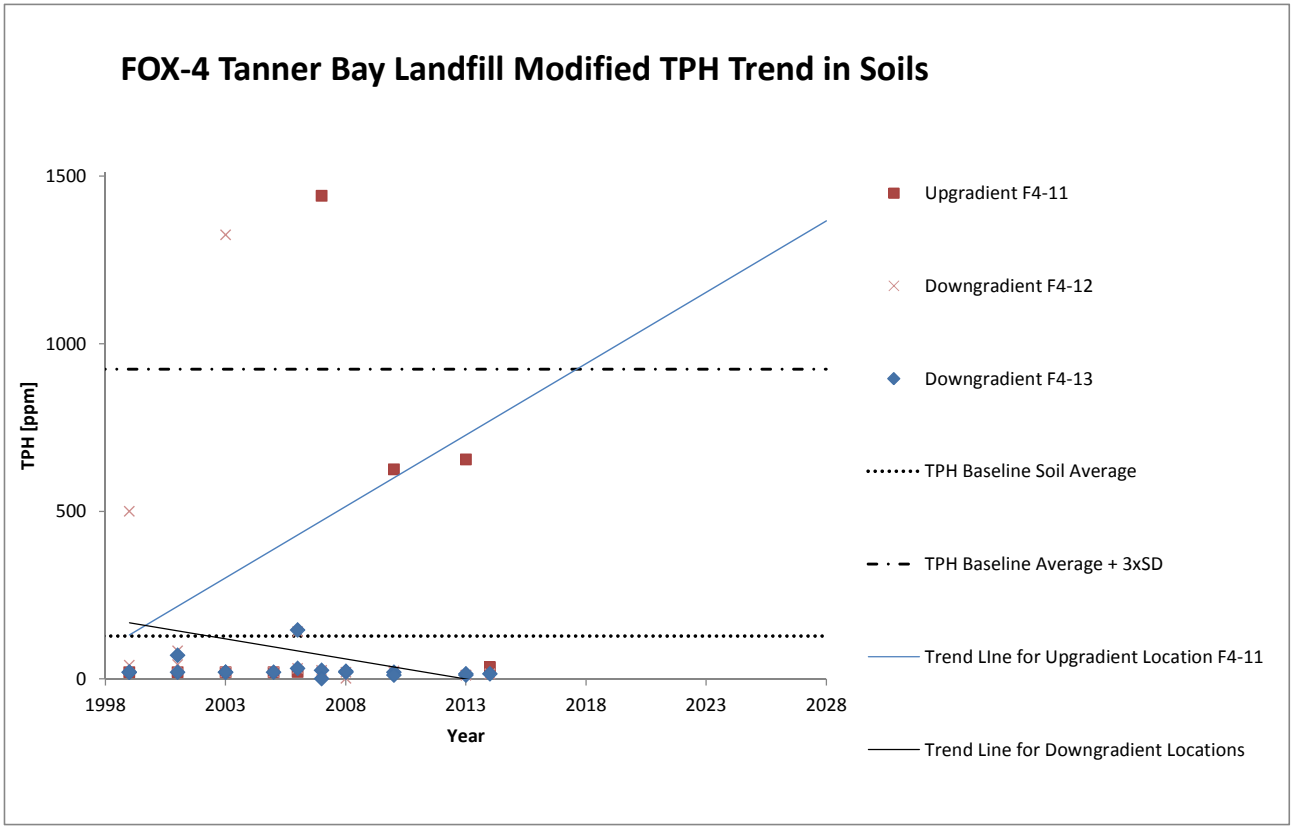
FOX-4 Tanner Bay Landfill Trends in Soil Inorganics, PCBs and PHCs (modified TPH)



Baseline samples were not analyzed for mercury at this location.



FOX-4 Tanner Bay Landfill Trends in Soil Inorganics, PCBs and PHCs (modified TPH)



APPENDIX F

HISTORICAL CHEMISTRY SUMMARY TABLES (GROUNDWATER)

New Tier II and NHWL Facility Monitoring. Summary of 2013 and Ongoing Groundwater Analytical Data**

FOX-4 Cape Hooper - NWHL & Tier II Disposal Facility - Summary of 1999-2006 Groundwater Analytical Data

Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Cu [mg/L]	Ni [mg/L]	Co [mg/L]	Cd [mg/L]	Pb [mg/L]	Zn [mg/L]	Cr [mg/L]	As [mg/L]	Hg [mg/L]	Total PCB [mg/L]	F1 C_6-C_{10} [mg/L]	F2 C_{10}-C_{16} [mg/L]	F3 C_{16}-C_{34} [mg/L]	Modified TPH^ - Total C6-C34 [mg/L]	TPH Identity % Fuel Oil	TPH Identity Oil
	Baseline Average				**0.010**	**0.057**	**0.0087**	**0.0010**	**0.0071**	**0.84**	**0.0306**	**0.0183**	**0.0006**	**0.0001**				**0.65**		
	Standard Deviation				0.018	0.081	0.008	0.001	0.015	1.20	0.076	0.042	0.001	0.0002				0.97		
	Baseline Average + 3xStandard Deviation				0.063	0.301	0.034	0.0043	0.05	4.43	0.2589	0.14	0.0026	0.0007				3.55		
	Detection Limit				0.0050	0.0050	0.005	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050				1.0		
Monitoring Data																				
Upgradient BMW 11-01																				
F4-NH-MW11-01	BMW 11-01	2014	16	Phase II	**0.0805**	**0.284**	**0.0335**	0.00059	**0.019**	0.1005	**1.015**	**0.021**	<0.0001	<0.0001	<0.025	<0.100	<0.100	0.11		
	BMW 11-01	2016	18	Phase II														#N/A		
	BMW 11-01	2018	20	Phase II														#N/A		
	BMW 11-01	2023	25	Phase II														#N/A		
		2028	30	Phase II														#N/A		
				Phase III														#N/A		
																		#N/A		
																		#N/A		
																		#N/A		
																		#N/A		
																		#N/A		
Downgradient - MW 11-02																				
F4-NH-MW11-02	MW 11-02	2014	16	Phase II	**0.022**	0.037	0.0073	0.000043	0.0039	**17**	0.027	**0.11**	<0.00010	<0.00005	0.072	0.12	<0.100	0.24		
	MW 11-02	2016	18	Phase II														#N/A		
	MW 11-02	2018	20	Phase II														#N/A		
	MW 11-02	2023	25	Phase II														#N/A		
		2028	30	Phase II														#N/A		
				Phase III														#N/A		
																		#N/A		
																		#N/A		
																		#N/A		
																		#N/A		
Downgradient- MW 11-03																				
F4-NH-MW11-03	MW 11-03	2014	16	Phase II	**0.13**	**0.33**	**0.095**	**0.0011**	**0.26**	0.33	**0.54**	**0.053**	<0.00010	<0.00005	0.028	<0.100	<0.100	0.13		
	MW 11-03	2016	18	Phase II														#N/A		
	MW 11-03	2018	20	Phase II														#N/A		
	MW 11-03	2023	25	Phase II														#N/A		
		2028	30	Phase II														#N/A		
				Phase III														#N/A		
																		#N/A		
																		#N/A		
																		#N/A		
																		#N/A		
Downgradient- MW 11-04																				
F4-NH-MW11-04	MW 11-04	2014	16	Phase II	**0.069**	**0.13**	**0.018**	0.00012	**0.016**	0.18	**0.2**	**0.024**	<0.00010	<0.00005	0.031	<0.100	<0.100	0.13		
	MW 11-04	2016	18	Phase II														#N/A		
	MW 11-04	2018	20	Phase II														#N/A		
	MW 11-04	2023	25	Phase II														#N/A		
		2028	30	Phase II														#N/A		
				Phase III														#N/A		
																		#N/A		
																		#N/A		
																		#N/A		
																		#N/A		

New Tier II and NHWL Facility Monitoring. Summary of 2013 and Ongoing Groundwater Analytical Data**

FOX-4 Cape Hooper - NWHL & Tier II Disposal Facility - Summary of 1999-2006 Groundwater Analytical Data

Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Cu [mg/L]	Ni [mg/L]	Co [mg/L]	Cd [mg/L]	Pb [mg/L]	Zn [mg/L]	Cr [mg/L]	As [mg/L]	Hg [mg/L]	Total PCB [mg/L]	F1 C_6-C_{10} [mg/L]	F2 C_{10}-C_{16} [mg/L]	F3 C_{16}-C_{34} [mg/L]	Modified TPH^ - Total C6-C34 [mg/L]	TPH Identity	
																		#N/A	% Fuel Oil	Oil
Downgradient- MW 11-05																				
F4-NH-MW11-05	MW 11-05	2014	16	Phase II	**0.056**	0.055	**0.014**	0.000083	**0.014**	0.65	**0.068**	**0.031**	<0.00010	<0.00005	0.033	<0.100	<0.100	0.13		
	MW 11-05	2016	18	Phase II														#N/A		
	MW 11-05	2018	20	Phase II														#N/A		
	MW 11-05	2023	25	Phase II														#N/A		
		2028	30	Phase II														#N/A		
				Phase III														#N/A		
																		#N/A		
																		#N/A		
																		#N/A		
																		#N/A		
																		#N/A		
Downgradient- MW 11-06																				
No sample collected - well was dry	MW 11-04	2014	16	Phase II														#N/A		
	MW 11-04	2016	18	Phase II														#N/A		
	MW 11-04	2018	20	Phase II														#N/A		
	MW 11-04	2023	25	Phase II														#N/A		
		2028	30	Phase II														#N/A		
				Phase III														#N/A		
																		#N/A		
																		#N/A		
																		#N/A		
																		#N/A		
Downgradient- MW 12-07																				
F4-NH-MW12-07	MW 12-07	2014	16	Phase II	**0.082**	**0.092**	**0.026**	0.00025	**0.021**	0.13	**0.14**	**0.04**	<0.00010	<0.00005	<0.025	<0.100	<0.100	0.11		
	MW 12-07	2016	18	Phase II														#N/A		
	MW 12-07	2018	20	Phase II														#N/A		
	MW 12-07	2023	25	Phase II														#N/A		
		2028	30	Phase II														#N/A		
				Phase III														#N/A		
																		#N/A		
																		#N/A		
																		#N/A		
																		#N/A		
Downgradient- MW 12-08																				
No sample collected - well was dry	MW 12-08	2014	16	Phase II														#N/A		
	MW 12-08	2016	18	Phase II														#N/A		
	MW 12-08	2018	20	Phase II														#N/A		
	MW 12-08	2023	25	Phase II														#N/A		
		2028	30	Phase II														#N/A		
				Phase III														#N/A		
																		#N/A		
																		#N/A		
																		#N/A		
																		#N/A		

Note: Total Hydrocarbons (C6-C34) has been calculated by adding results for F1, F2 a<1.0 F3.

** Further remediation occurred at the NHWL and Tier II Disposal Facility in 2011, 2012 and 2013. Because of this work, baseline data includes monitoring results in Monitoring Years 1-15 prior to the additional remediaton. This data can be found at the top of this sheet and on the sheet labelled Previous FOX-4 NHWL & Tier II GW Sum

FOX-4 Cape Hooper - Helipad Landfill West - Summary of Groundwater Analytical Data**

Sample #	Location	Date	Monitoring Year	Monitoring Phase	Cu [mg/L]	Ni [mg/L]	Co [mg/L]	Cd [mg/L]	Pb [mg/L]	Zn [mg/L]	Cr [mg/L]	As [mg/L]	Hg [mg/L]	Total PCB [mg/L]	F1 C_6-C_{10} (mg/L)	F2 C_{10}-C_{16} (mg/L)	F3 C_{16}-C_{34} (mg/L)	Modified TPH^ - Total C6-C34 [mg/L]	TPH Identity % Fuel Oil	TPH Identity % Lube Oil
Baseline Data																				
Upgradient- Helipad West																				
WF4-MW3_98	MW-3	1998			0.026	0.98	0.03	0.0015	0.0076	0.14	0.7	0.0028		<0.00001				4.0		
WF4-MW4_98	MW-4	1998			0.048	0.42	0.01	0.0012	0.0130	0.05	0.8	0.0079		0.00008				17		
WF4-MW6_98	MW-6	1998			0.096	2.00	0.13	0.0024	0.0095	0.30	1.9	0.0048		<0.00001				4.0		
Downgradient																				
WF4-MW1-98	MW-1	1998			0.083	0.97	0.028	0.0018	0.034	0.12	1.5	0.037		0.00003				2.0		
WF4-MW2-98	MW-2	1998			0.11	0.80	0.022	0.0018	0.016	0.078	1.4	0.022		0.00001				9.0		
		N value			5	5	5	5	5	5	5	5	0	5				5		
		Baseline Average			**0.072**	**1.03**	**0.044**	**0.0018**	**0.016**	**0.14**	**1.27**	**0.015**		**0.000026**				**7.2**		
		Standard Deviation			0.034	0.587	0.047	0.000	0.011	0.098	0.505	0.014		0.000032				6.1		
		Average + 3xStandard Deviation			0.17	2.8	0.19	0.00	0.05	0.43	2.79	0.06		0.00012				25.4		
		Detection Limit			0.005	0.010	0.005	0.001	0.010	0.005	0.005	0.050	0.001	0.00001				5.0		
Monitoring Data																				
Upgradient - MW-3																				
PO-3-1	MW-3	2000	2	Phase I	<0.003	0.03	<0.005	0.0003	<0.002	0.13	0.007	<0.002	<0.001	<0.000025				<0.1		
MW-3	MW-3	2006	8	Phase II	0.013	0.04	0.002	<0.001	**0.020**	**0.99**	0.028	0.001	<0.0002	<0.0001	<0.025	<0.1	<0.1	0.113		
no sample taken	MW-3	2013																		
F4-HEL-MW98-03	MW-3	2014	16	Phase II	0.0063	0.048	0.0021	0.000086	0.0021	**0.16**	0.048	0.0025	<0.00001	<0.05	<0.025	<0.100	<0.100	0.1125		
		2016	18	Phase II														#N/A		
		2018	20	Phase II														#N/A		
		2023	25	Phase II														#N/A		
		2028	30	Phase II														#N/A		
				Phase III														#N/A		
																		#N/A		
																		#N/A		
Upgradient - MW-4																				
PO-4-1	MW-4	2000	2	Phase I	0.012	0.33	<0.005	0.0005	0.005	0.047	0.053	<0.002	<0.001	<0.000021						
PO-4-1	MW-4	2001	3	Phase I	0.015	0.022	<0.005	**0.004**	0.003	**0.63**	0.095	0.009	<0.0001	<0.00005				<0.1		
MW-4	MW-4	2006	8	Phase II																
Upgradient - MW-6																				
PO-6-1	MW-6	2001	3	Phase I	0.037	0.12	0.042	**0.004**	**0.04**	**7.8**	0.087	**0.02**	<0.00010	<0.000050				<1.0		
MW-6	MW-6	2006	8	Phase II														#N/A		
no sample taken - well dry	MW-6	2013	15	Phase II														#N/A		
no sample taken - well dry		2014	16	Phase II														#N/A		
		2016	18	Phase II														#N/A		
		2018	20	Phase II														#N/A		
		2023	25	Phase II														#N/A		
		2028	30	Phase II														#N/A		
				Phase III														#N/A		
																		#N/A		
																		#N/A		
Downgradient - MW-1																				
99-3813	MW-1	1999	1	Phase I	0.006	0.074	0.015	0.001	<1.0	**0.17**	0.014	<0.05	<0.001	<0.00002				< 5		
PO-1-1	MW-1	2000	2	Phase I	0.036	0.35	0.015	**0.01**	**0.132**	**3.54**	0.036	**0.019**	<0.0010	<0.000021				<0.10		
PO-1-1	MW-1	2001	3	Phase I	0.025	**1.4**	0.035	**0.004**	**0.07**	**4.8**	0.027	**0.03**	<0.00010	<0.00005				<0.1		
PO-1-1	MW-1	2003	5	Phase I	<0.010	0.06	0.01	<0.010	<0.010	**0.28**	0.01	<0.010	<0.00020					0.43		
MW-1	MW-1	2005	7	Phase II	0.04	0.27	0.02	0.001	**0.09**	**0.42**	0.47	**0.02**	<0.00020					<5.0		
MW-1	MW-1	2006	8	Phase II	0.009	0.03	0.007	<0.0010	0.01	**0.47**	0.009	0.002	<0.00020	<0.0001				<0.10		
MW-1	MW-1	2007	9	Phase II	0.002	0.036	0.01	<0.0010	0.003	**0.39**	0.005	0.002	<0.00010							
MW-1	MW-1	2008	10	Phase II	<0.0010			<0.0010	<0.0010	<0.020	<0.050	<0.010	<0.00010	<0.000050				<0.20		
13-27355	MW-1	2013	15	Phase II	0.062	0.072	0.0092	<0.0010	<0.0010	**0.28**	0.079	0.0044	<0.00040	<0.0030				<0.050		
F4-HEL-MW98-01	MW-1	2014	16	Phase II	**0.17**	0.097	0.0098	0.00048	0.0018	**0.38**	0.066	0.0016	<0.00001	<0.05	0.041	<0.100	<0.100	0.141		
		2016	18	Phase II														#N/A		
		2018	20	Phase II														#N/A		
		2023	25	Phase II														#N/A		
		2028	30	Phase II														#N/A		
				Phase III														#N/A		
																		#N/A		
																		#N/A		
Downgradient - MW-2																				
99-3814	MW-2	1999	1	Phase I	0.014	0.064	0.008	0.001	<0.010	0.053	0.012	<0.050	<0.0010	<0.000050				<5.0		
PO-2-1	MW-2	2000	2	Phase I	0.01	0.25	0.024	0.0003	0.01	0.129	0.028	0.004	<0.0010	<0.000021				0.65		
PO-2-1	MW-2	2001	3	Phase I	0.016	0.15	<0.005	**0.002**	**0.1**	**0.47**	0.02	**0.02**	<0.00010	<0.000050				0.81		
PO-2-1	MW-2	2003	5	Phase I	0.01	0.04	0.01	<0.010	<0.010	0.1	0.01	0.01	<0.00020					2.6		
MW-2	MW-2	2005	7	Phase II	0.02	0.08	0.01	0.001	0.01	**0.39**	0.07	**0.03**	<0.00020							
MW-2	MW-2	2006	8	Phase II	**0.098**	0.01	0.01	<0.001	0.01	**0.58**	0.009	0.014	<0.00020	<0.0001				0.96		
MW-2	MW-2	2007	9	Phase II	0.009	0.009	0.017	<0.0010	0.001	0.08	0.005	**0.018**	<0.00010					0.732		
MW-2	MW-2	2008	10	Phase II	<0.0010			<0.0010	<0.0010	0.0214	<0.050	<0.010	<0.00010	<0.000050				0.869		
13-27356	MW 02	2013	15	Phase II	0.027	0.27	0.014	<0.0010	<0.0010	**0.14**	0.45	**0.065**	<0.00040	<0.0030				1.08		
F4-HEL-MW98-02	MW-2	2014	16	Phase II	0.0057	0.043	0.018	0.000042	0.0013	0.034	0.067	**0.027**	<0.00001	<0.05	0.4	0.94	<0.100	1.39		
		2016	18	Phase II														#N/A		

FOX-4 Cape Hooper - Helipad Landfill West - Summary of Groundwater Analytical Data**

Sample #	Location	Date	Monitoring Year	Monitoring Phase	Cu	Ni	Co	Cd	Pb	Zn	Cr	As	Hg	Total	F1 C_6-C_{10}	F2 C_{10}-C_{16}	F3 C_{16}-C_{34}	Modified TPH^ - Total C6-C34	TPH Identity	
					[mg/L]	[mg/L]	[mg/L]	[mg/L]	[mg/L]	[mg/L]	[mg/L]	[mg/L]	[mg/L]	PCB [mg/L]	(mg/L)	(mg/L)	(mg/L)	[mg/L]	% Fuel Oil	% Lube Oil
		2018	20	Phase II														#N/A		
		2023	25	Phase II														#N/A		
		2028	30	Phase II														#N/A		
				Phase III														#N/A		
																		#N/A		
																		#N/A		

Note: Total Hydrocarbons (C_6-C_{34}) has been calculated by adding results for F1, F2 and F3.
** The Helipad Landfill West underwent additional regrading in 2013.

Legend **XX** Sample exceeds Baseline Average

FOX-4 Cape Hooper - Station Landfill - Summary of Groundwater Analytical Data**

Sample #	Location	Year	Monitoring Year	Monitoring Phase	Cu [mg/L]	Ni [mg/L]	Co [mg/L]	Cd [mg/L]	Pb [mg/L]	Zn [mg/L]	Cr [mg/L]	As [mg/L]	Hg [mg/L]	Total PCB [mg/L]	F1 C_6-C_{10} [mg/L]	F2 C_{10}-C_{16} [mg/L]	F3 C_{16}-C_{34} [mg/L]	Modified TPH^ - Total C6-C34 [mg/L]	TPH Identity	
																			% Fuel Oil	% Lube Oil
Baseline Data																				
Upgradient:																				
WF4-MW-7-98	BMW 07	1998			0.020	0.19	0.0078	0.0021	0.027	0.10	0.31	0.0020		0.000021				2.0		
WF4-MW7-98	BMW 07	1999			0.0050	0.25	0.0090	0.0020	<0.010	0.32	0.015	<0.050	<0.0010	<0.000020				<5.0		
Downgradient:																				
WF4-MW9-98	MW-9	1998			0.050	1.5	0.049	0.00066	0.015	0.12	1.4	0.014		0.000038						
		N value			3	3	3	3	3	3	3	3	1	3				2		
		Average			**0.025**	**0.65**	**0.022**	**0.0016**	**0.016**	**0.2**	**0.56**	**0.050**	**0.001**	**0.00002**				**5.0**		
		Standard Deviation			0.023	0.75	0.024	0.001	0.0110	0.1	0.71	0.012		0.000				0		
		Average + 3xStandard Deviation			0.09	2.9	0.093	0.004	0.049	0.5	2.7	0.08		0.000				6.1		
		Detection Limit			0.0050	0.010	0.0050	0.0010	0.010	0.0050	0.0050	0.050	0.0010	0.0030				1.0		
Monitoring Data																				
Upgradient - MW-7																		**Total TPH will appear when F1, F2, F3 fractions are entered**		
99-3815	BMW 07	1999	1	Phase I	0.005	0.25	0.009	**0.002**	<0.01	**0.32**	0.015	<0.005	<0.001	<0.00002				< 5		
PO-7-1	BMW 07	2000	2	Phase I	<0.003	0.05	0.006	0.0008	0.005	0.15	0.02	<0.002	<0.001	<0.000025				<0.1		
PO-7-1	BMW 07	2001	3	Phase I	0.019	0.11	0.007	0.001	0.010	**0.99**	0.041	0.01	<0.0001	<0.00005				<0.1		
n/s	BMW 07	2003	5	Phase I																
MW-7	BMW 07	2006	8	Phase II	0.019	0.100	**0.022**	0.001	**0.02**	**1.1**	0.014	0.002	<0.0002	<0.0001				<0.1		
	BMW 07	2008	10	Phase II																
10-18408	BMW 07	2010	12	Phase II	**0.048**	0.27	**0.023**	<0.0010	<0.010	**0.45**	0.36	<0.0030	<0.0040	<0.000020				<1.0		
13-27353	BMW 07	2013	15	Phase II	**0.045**	0.44	**0.037**	0.0011	<0.0010	0.15	**0.60**	<0.0010	<0.0040	<0.0030	<0.05	<0.5	<1.0	0.775		
F4-STA-MW98-07	BMW 07	2014	16	Phase II	**0.04**	0.19	0.02	0.0005	0.0037	0.10	0.22	0.0015	<0.00001	<0.00005	<0.025	<0.100	<0.100	0.113		
		2016	18	Phase II														#N/A		
		2018	20	Phase II														#N/A		
		2023	25	Phase II														#N/A		
		2028	30	Phase II														#N/A		
				Phase III														#N/A		
																		#N/A		
																		#N/A		
Downgradient - MW-8																				
PO-8-1	MW-8	2001	3	Phase I	**0.03**	**0.74**	**0.036**	**0.004**	0.01	**5.4**	0.082	0.01	<0.0001	<0.00005				0.24		
PO-8	MW-8	2003	5	Phase I	**0.03**	0.47	**0.03**	**0.010**	**0.03**	**10**	0.14	**0.2**	0.0002	<0.0030				0.95		
MW-8	MW-8	2005	7	Phase II	0.01	0.06	0.02	0.001	0.008	**2.4**	0.062	0.006	<0.0002					<0.05		
MW-8	MW-8	2006	8	Phase II	0.008	0.030	0.009	0.001	0.010	**2.5**	0.015	0.003	<0.0002	<0.0001				<0.1		
MW-8	MW-8	2008	10	Phase II	<0.005		<0.005	<0.0010	<0.0010	**1.8**	<0.050	<0.010	<0.00010	<0.000050				0.22		
10-18407	MW-8	2010	12	Phase II	0.019	0.19	0.012	<0.0010	<0.010	**2.4**	0.24	<0.0030	<0.0040	<0.000020				<1.0		
not sampled		2013	15	Phase II														#N/A		
No sample collected - well was dry		2014	16	Phase II														#N/A		
		2016	18	Phase II														#N/A		
		2018	20	Phase II														#N/A		
		2023	25	Phase II														#N/A		
		2028	30	Phase II														#N/A		
				Phase III														#N/A		
																		#N/A		
																		#N/A		
Downgradient - MW-9																				
PO-8-1	MW 09	2000	2	Phase I	<0.003	0.09	0.015	0.0009	0.0070	**0.23**	0.0080	0.0080	<0.001	<0.00003				<0.1		
PO-9-1	MW 09	2001	3	Phase I	0.015	0.08	0.02	**0.0020**	0.0040	**0.7**	0.011	0.02	<0.0001	<0.00005				<0.1		
n/s	MW 09	2003	5	Phase I																
MW-9	MW 09	2006	8	Phase II																
	MW 09	2008	10	Phase II																
10-18406	MW 09	2010	12	Phase II	0.0067	0.12	0.0091	0.0013	<0.010	**1.5**	0.20	<0.0030	<0.0040	<0.000020				<1.0		
13-27354	MW 09	2013	15	Phase II	**0.15**	0.27	**0.047**	**0.0031**	<0.0010	**1.2**	0.470	0.0018	<0.0040	<0.0030	<0.05	<0.5	<1.0	0.775		
No sample collected - well was dry		2014	16	Phase II														#N/A		
		2016	18	Phase II														#N/A		
		2018	20	Phase II														#N/A		
		2023	25	Phase II														#N/A		
		2028	30	Phase II														#N/A		
				Phase III														#N/A		
																		#N/A		

Note: Total Hydrocarbons (C_6-C_{34}) has been calculated by adding results for F1, F2 and F3.
** Additional regrading of the Station Landfill occurred in 2013.

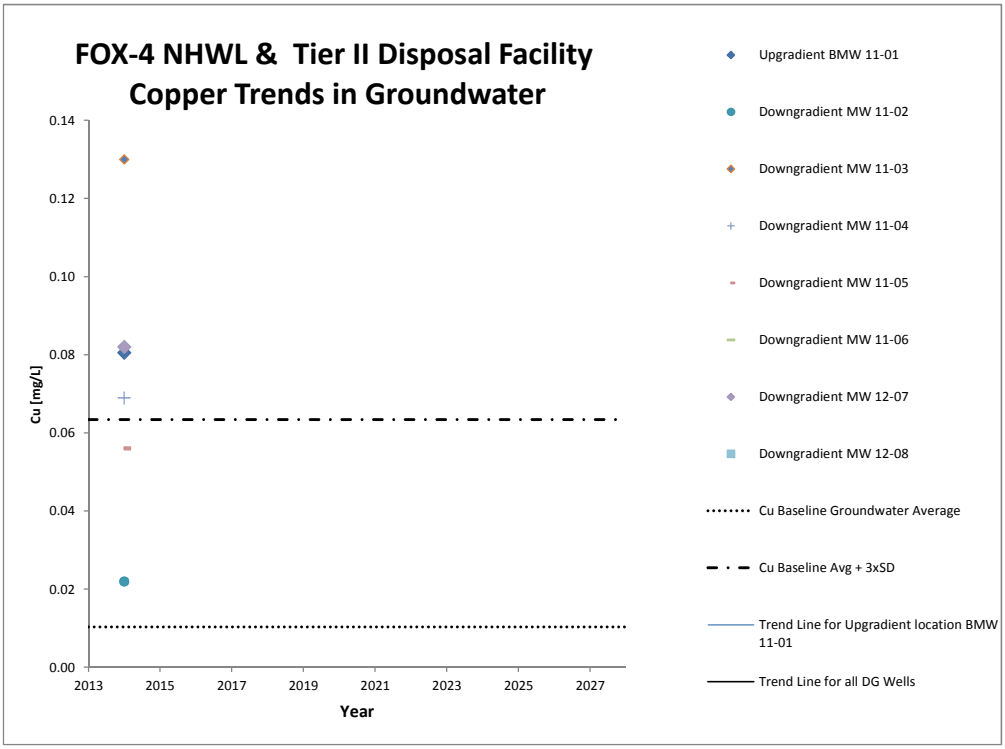
APPENDIX G

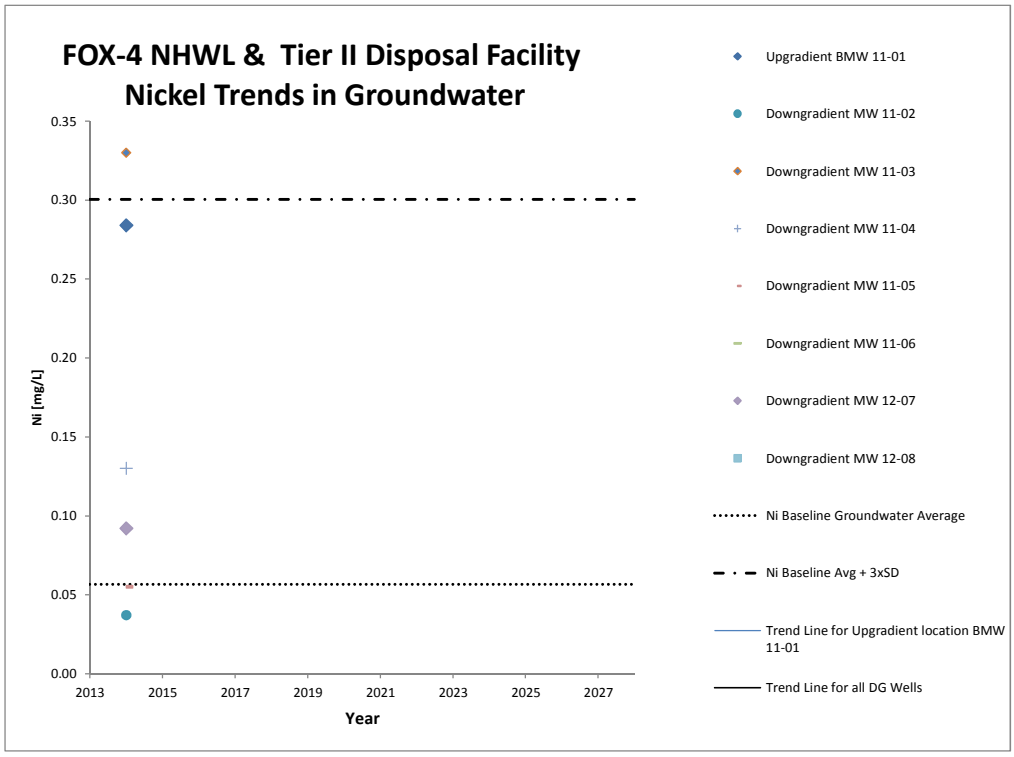
CHEMICAL CONCENTRATION TREND GRAPHS (GROUNDWATER)

FOX-4 NHWL & Tier II Disposal Facility Graphs of Trends for Inorganic Elements, PCBs and TPH in Groundwater Samples

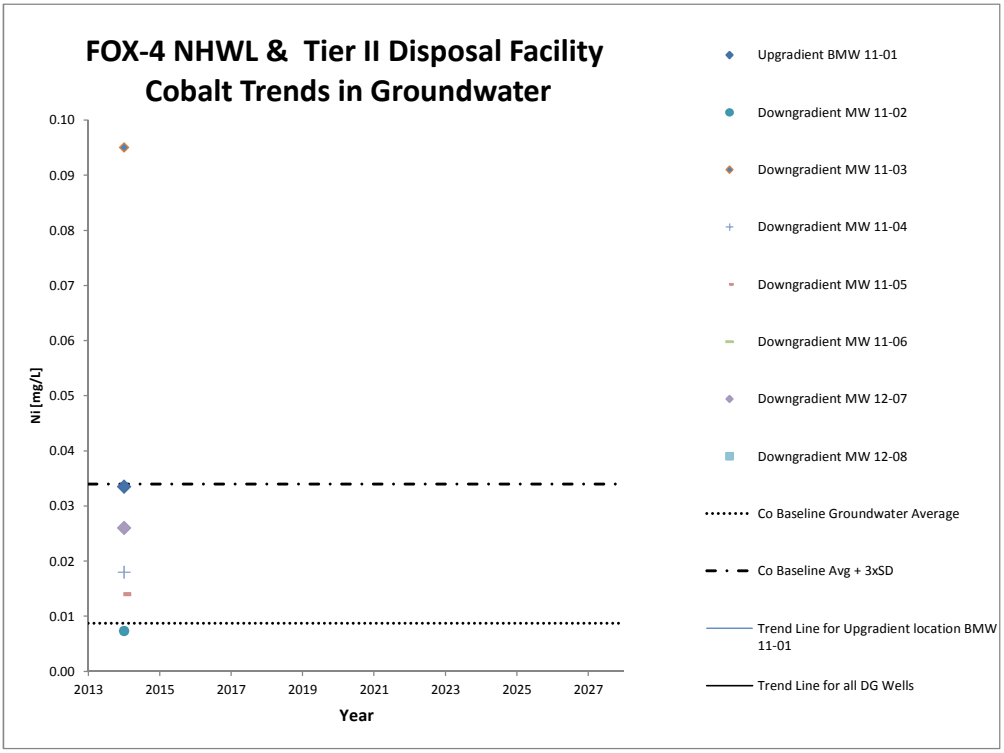
Where results are below detection, half of the detection limit has been used in the charts.

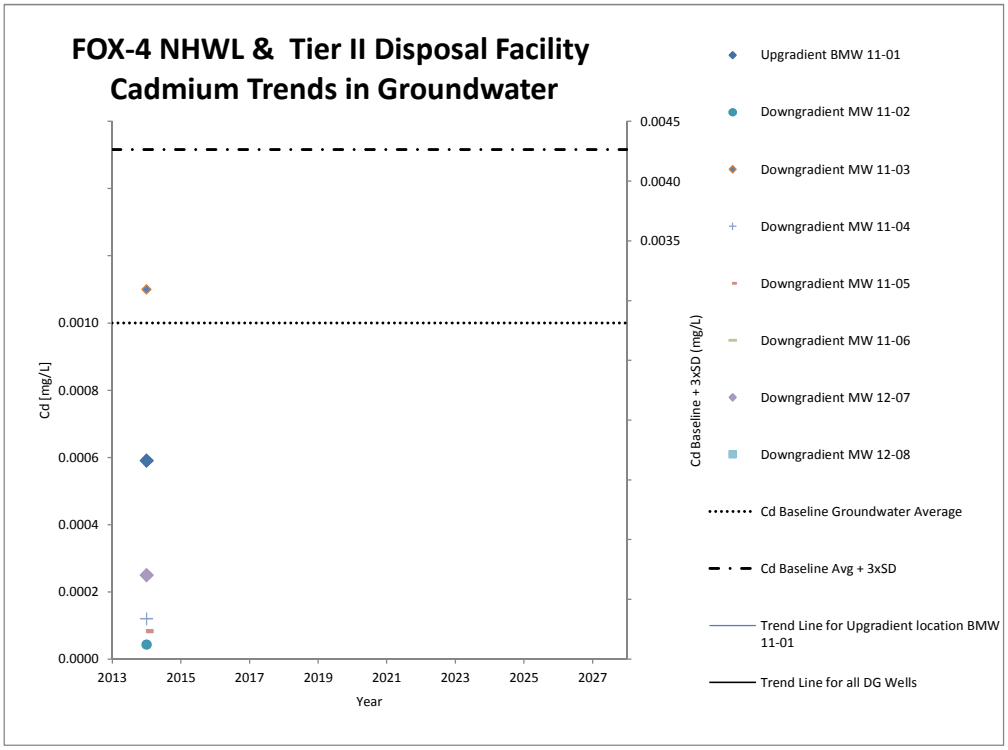
New monitoring locations were established in 2013 around the Tier II and NHWL facilities at FOX-4 and will be monitored as part of the landfill monitoring program.



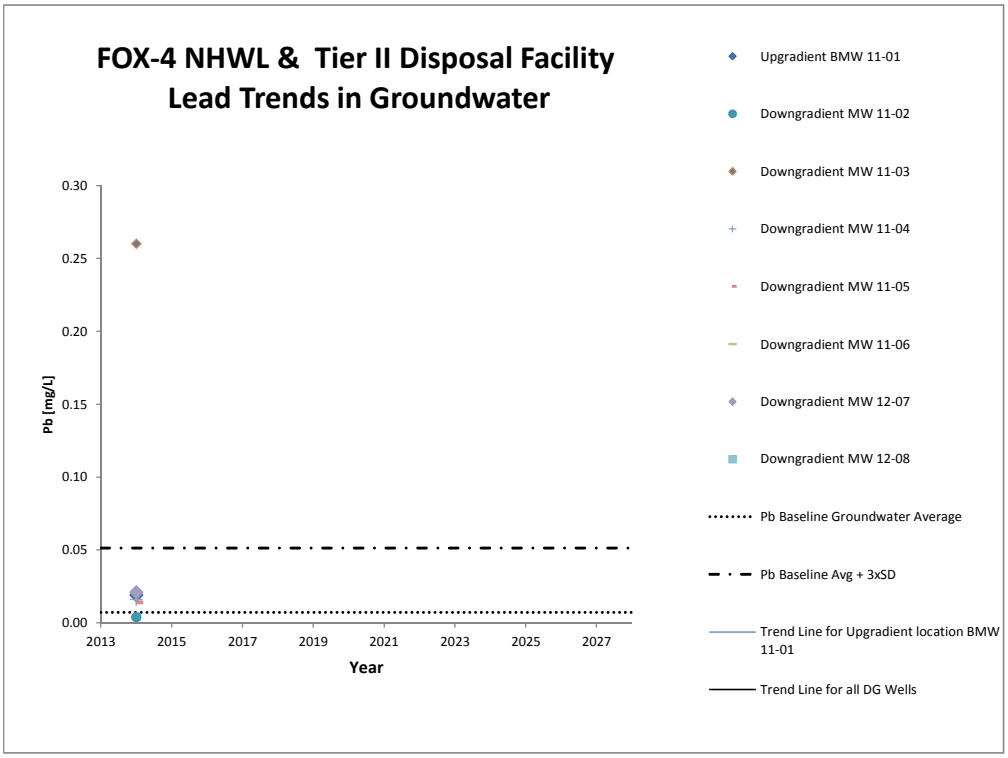


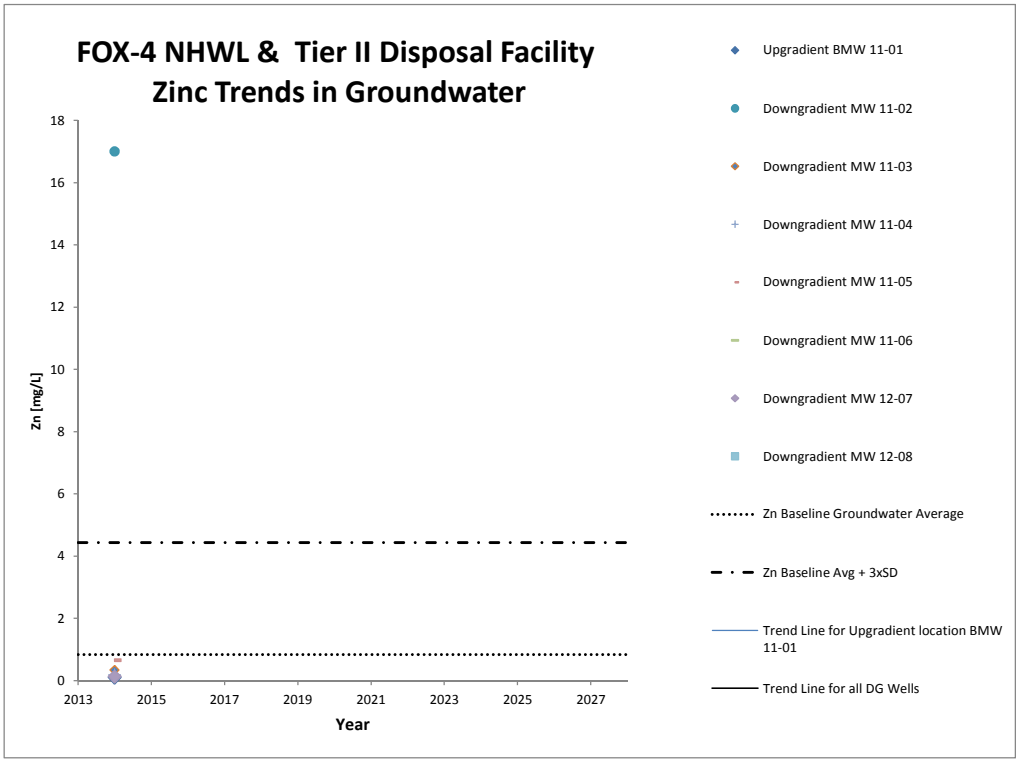
FOX-4 NHWL & Tier II Disposal Facility Graphs of Trends for Inorganic Elements, PCBs and TPH in Groundwater Samples



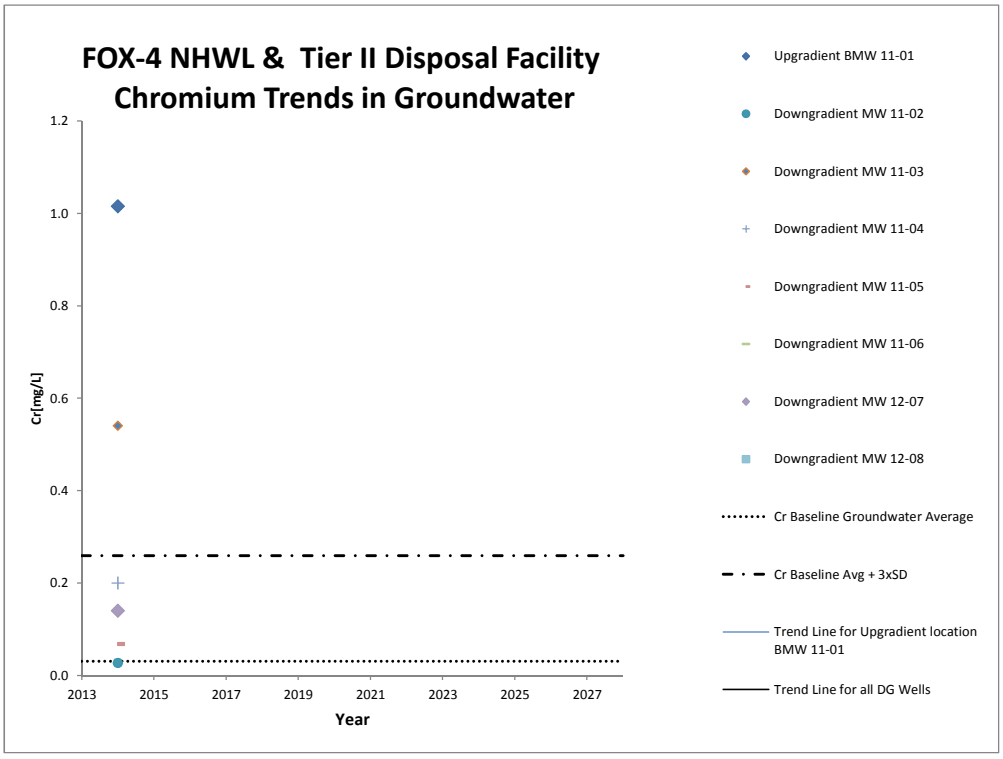


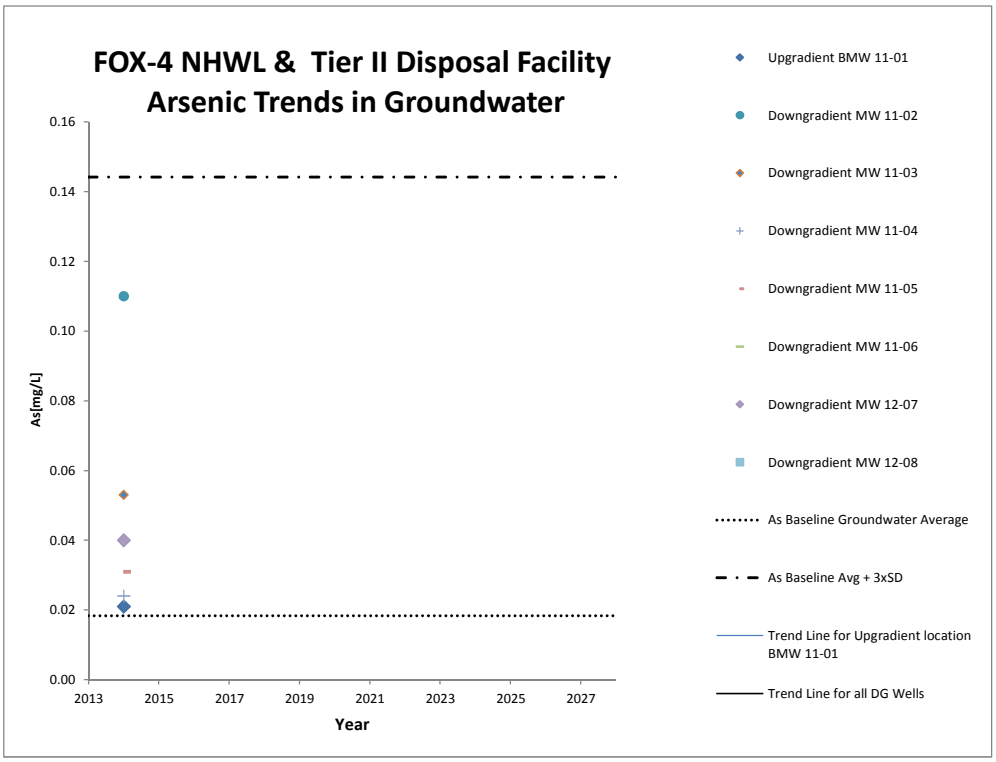
FOX-4 NHWL & Tier II Disposal Facility Graphs of Trends for Inorganic Elements, PCBs and TPH in Groundwater Samples



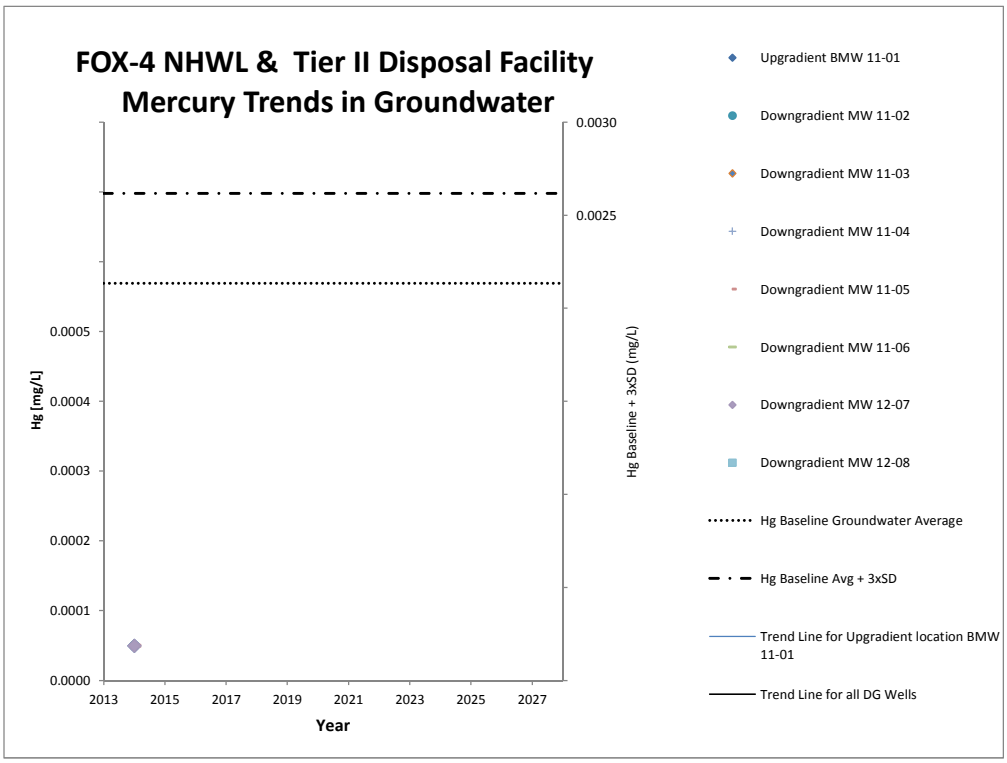


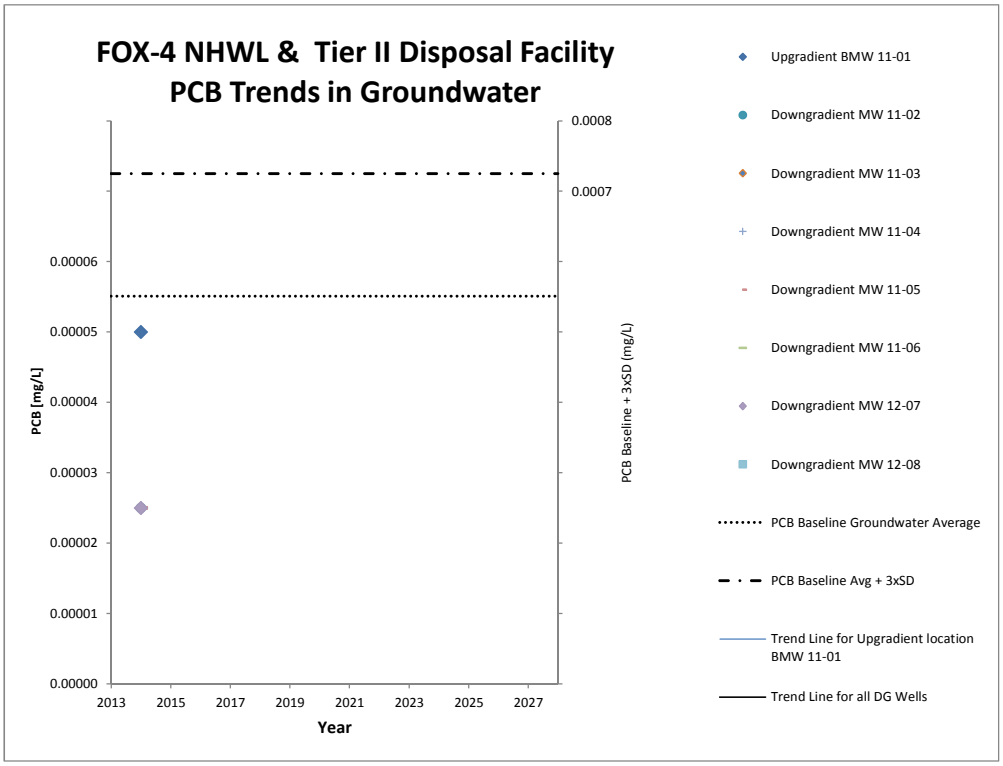
FOX-4 NHWL & Tier II Disposal Facility Graphs of Trends for Inorganic Elements, PCBs and TPH in Groundwater Samples



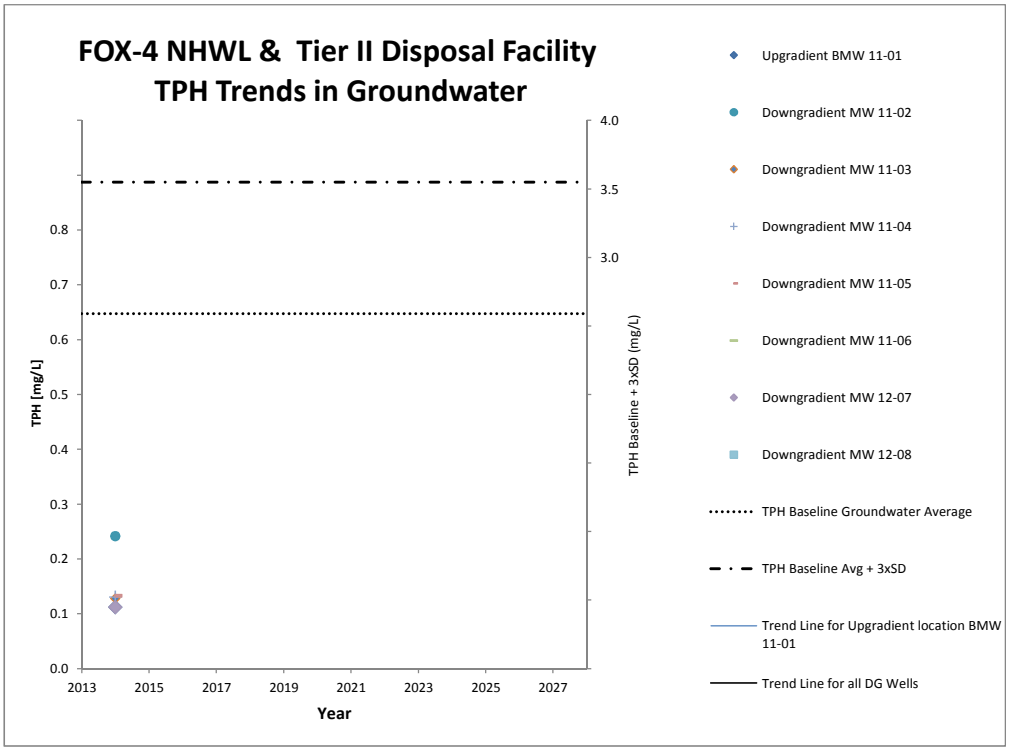


FOX-4 NHWL & Tier II Disposal Facility Graphs of Trends for Inorganic Elements, PCBs and TPH in Groundwater Samples



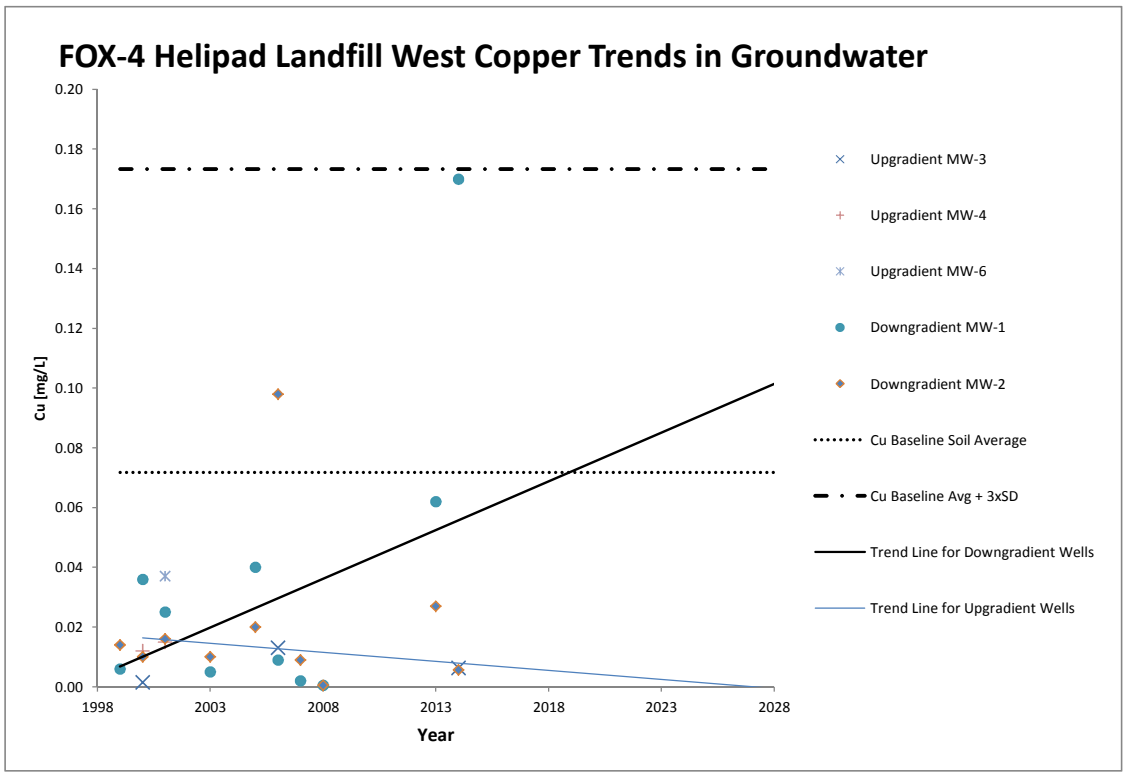


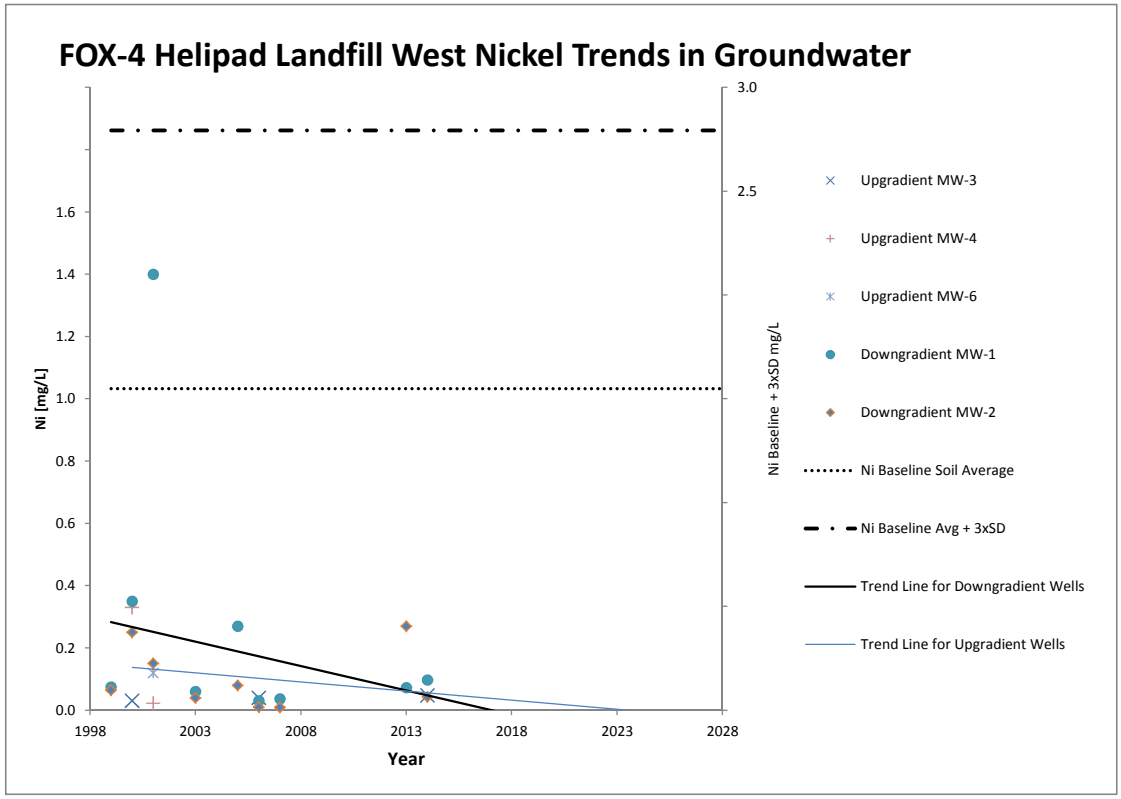
FOX-4 NHWL & Tier II Disposal Facility Graphs of Trends for Inorganic Elements, PCBs and TPH in Groundwater Samples



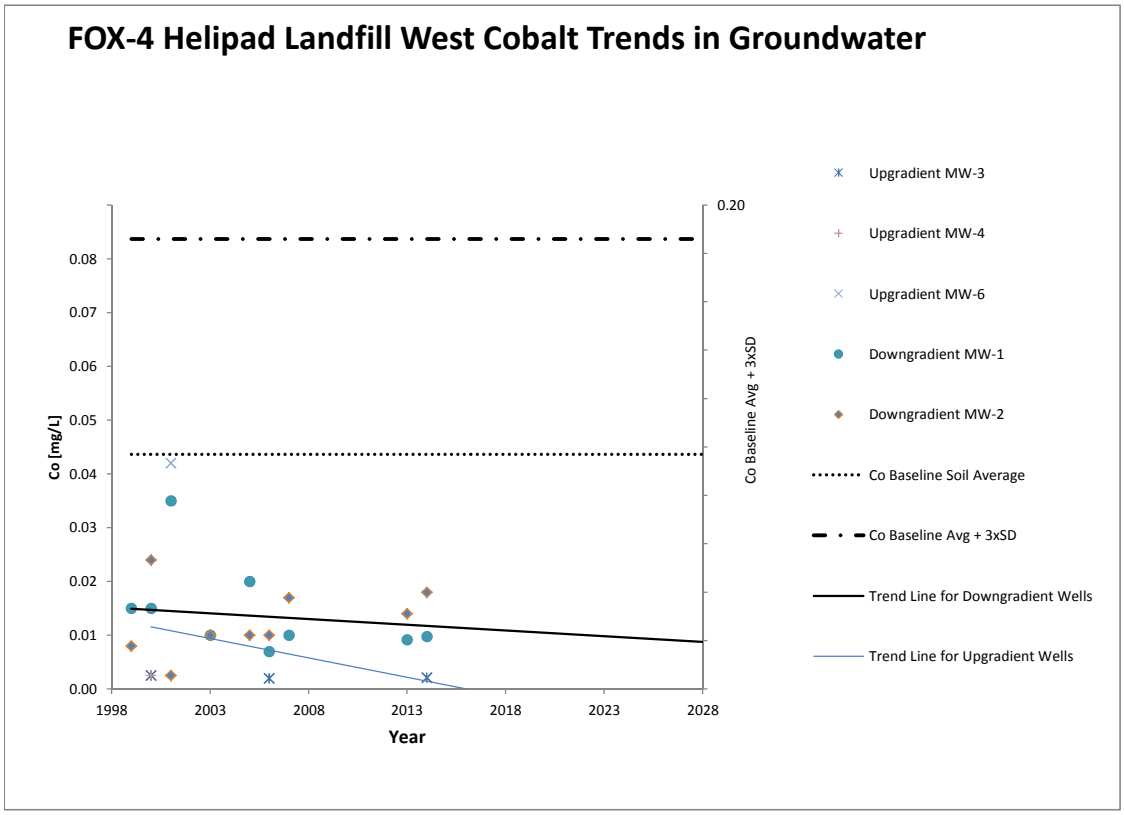
FOX-4 Helipad Landfill West Graphs of Trends for Inorganic Elements, PCBs and TPH in Groundwater Samples

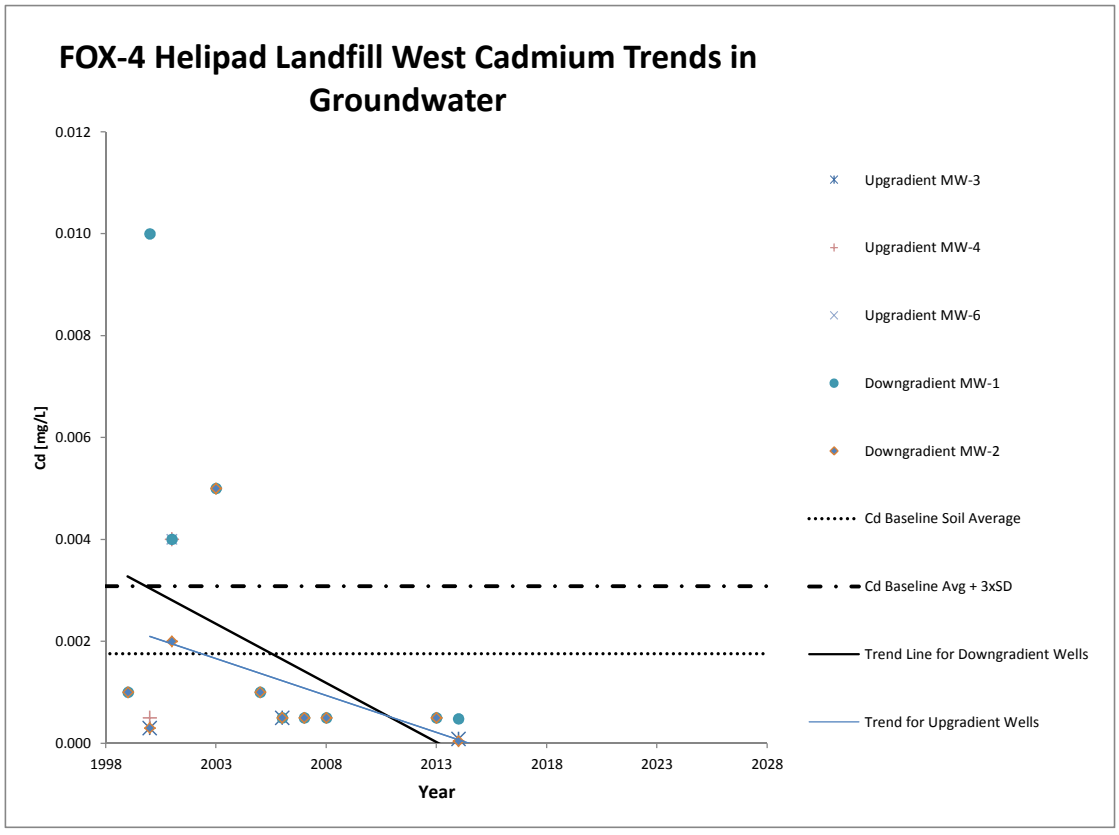
Where results are below detection, half of the detection limit has been used in the charts.



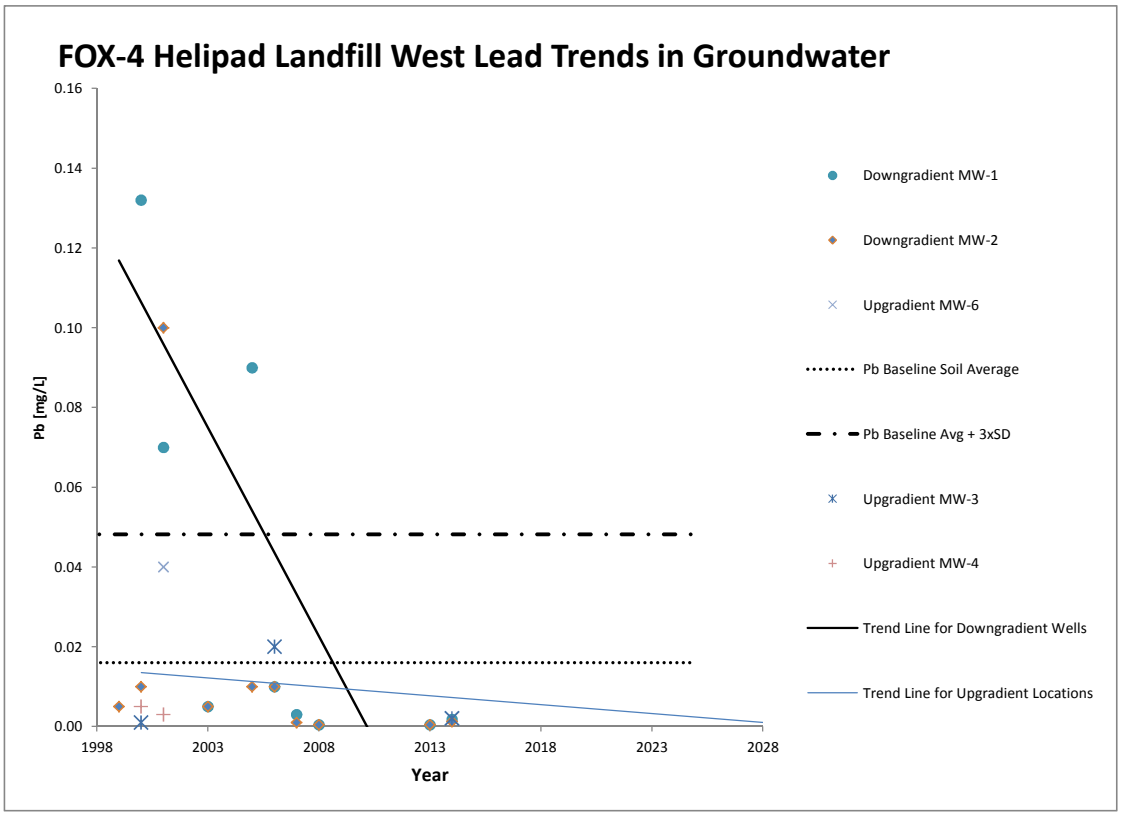


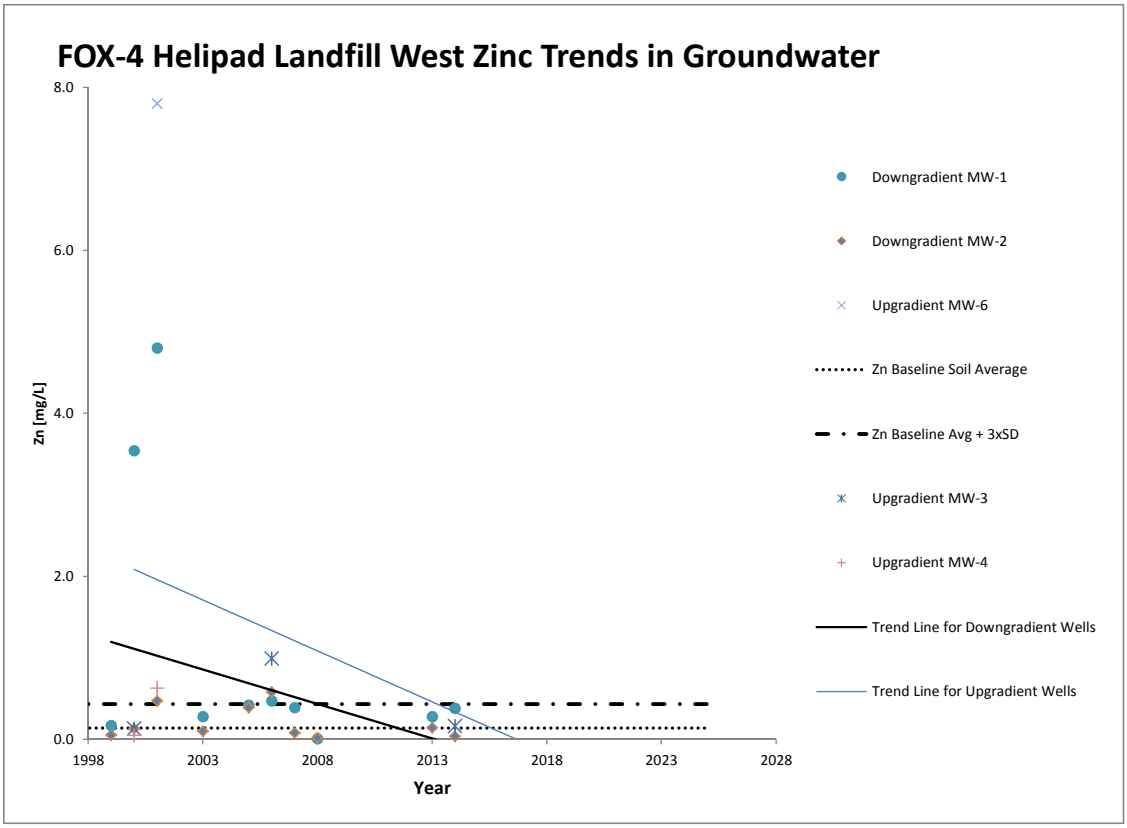
FOX-4 Helipad Landfill West Graphs of Trends for Inorganic Elements, PCBs and TPH in Groundwater Samples



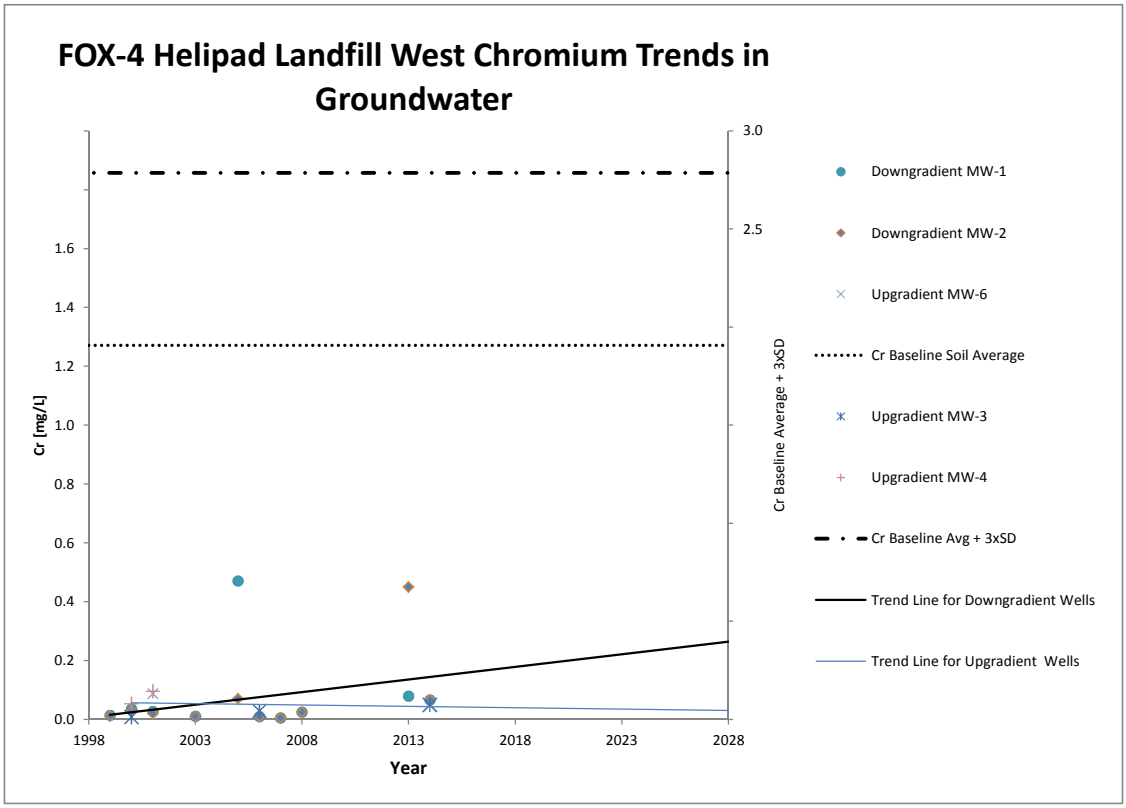


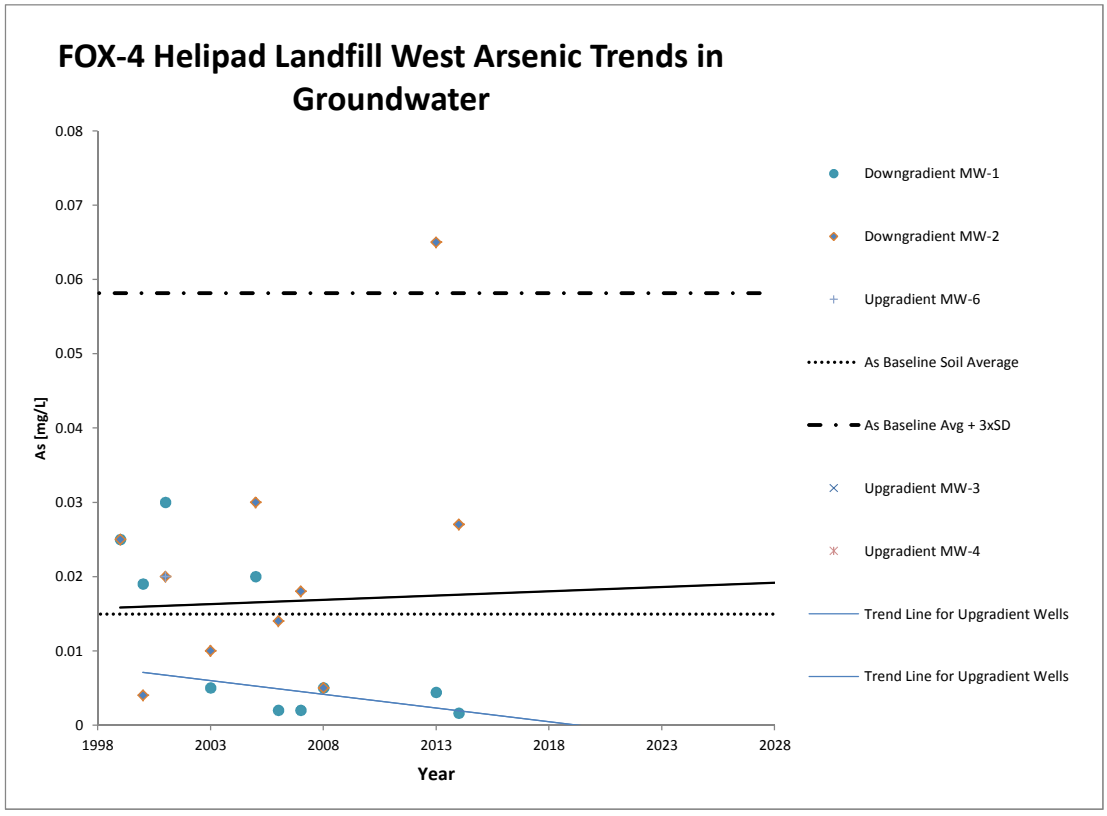
FOX-4 Helipad Landfill West Graphs of Trends for Inorganic Elements, PCBs and TPH in Groundwater Samples



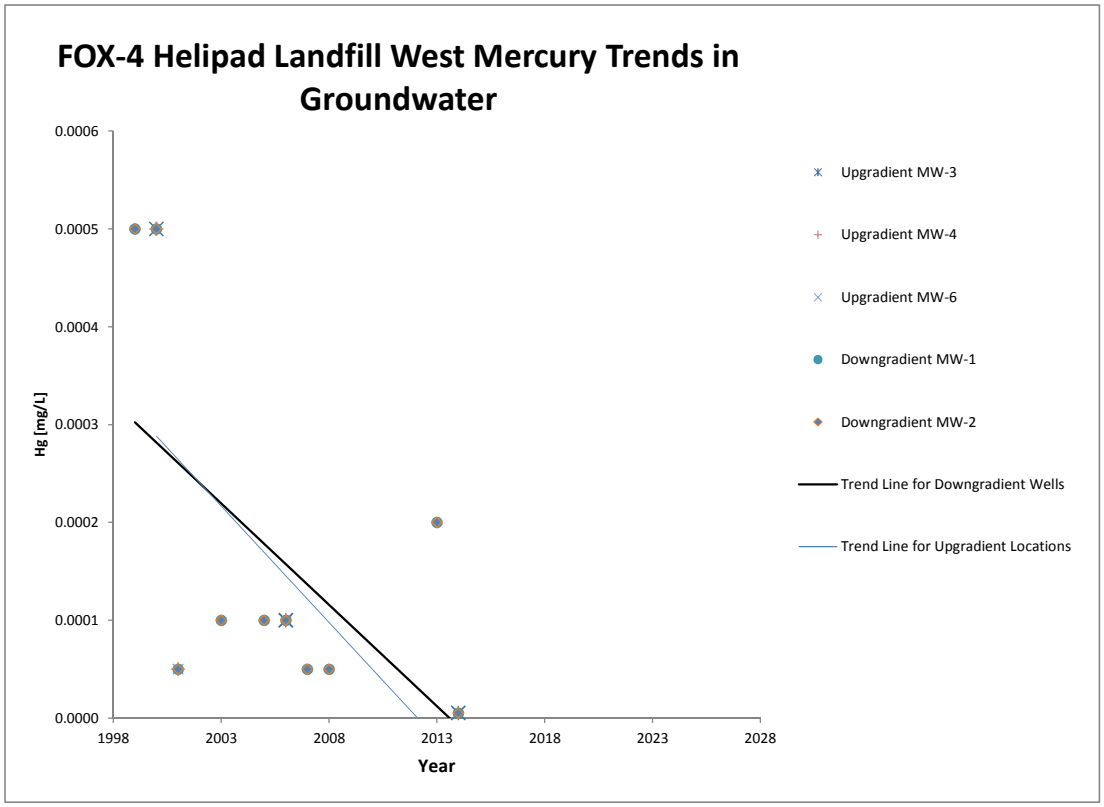


FOX-4 Helipad Landfill West Graphs of Trends for Inorganic Elements, PCBs and TPH in Groundwater Samples

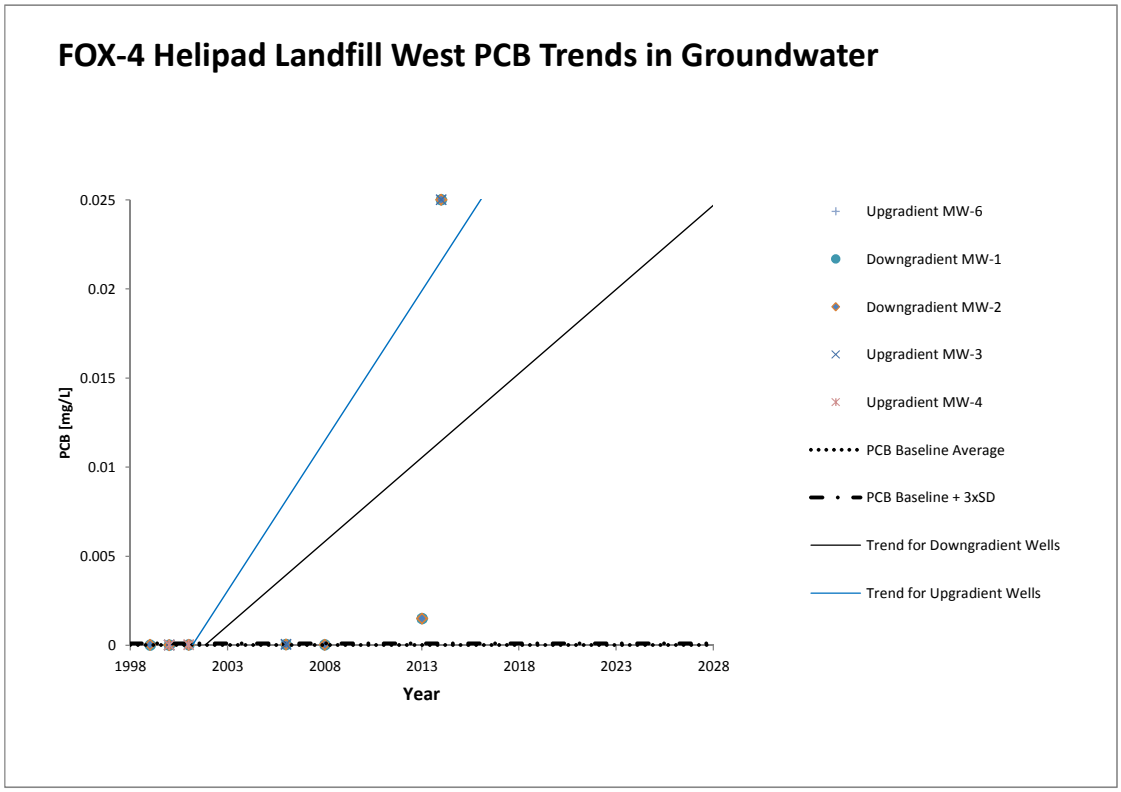




FOX-4 Helipad Landfill West Graphs of Trends for Inorganic Elements, PCBs and TPH in Groundwater Samples

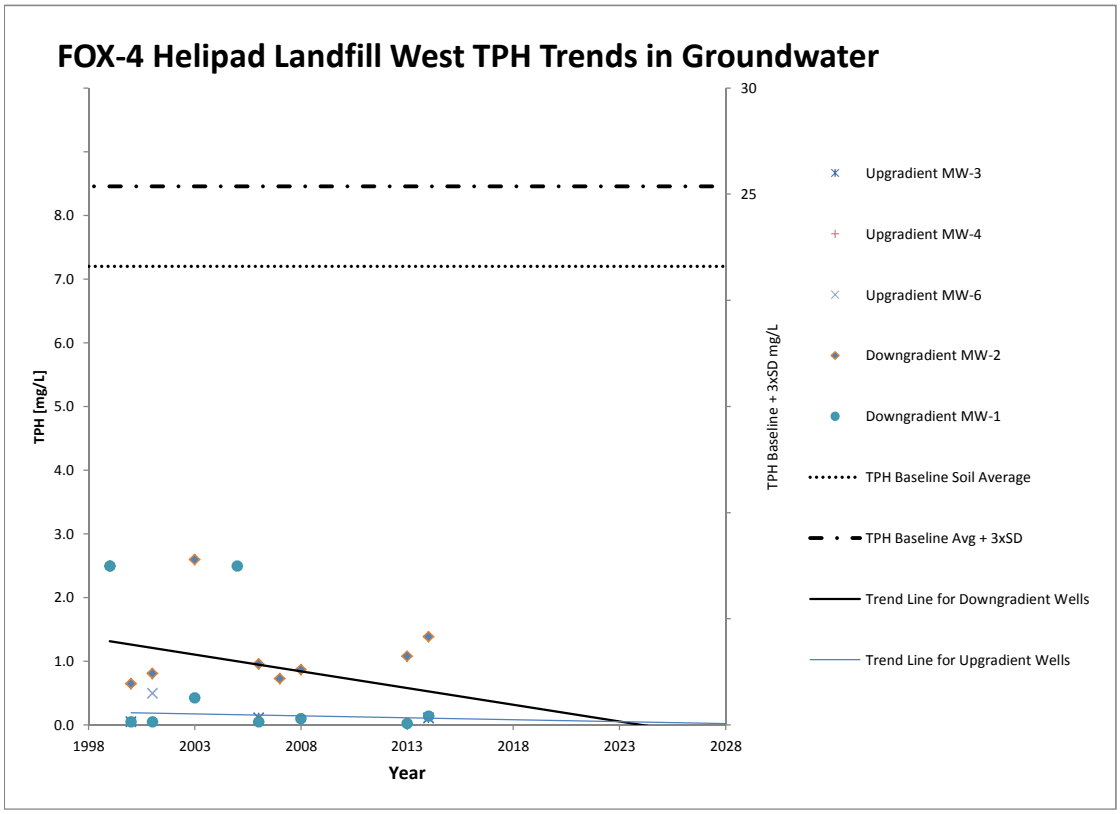


Mercury was not analyzed in 1998 Baseline samples.
Mercury results were below detection in monitoring groundwater samples up to 2014. Trendlines reflect changes in detection limits



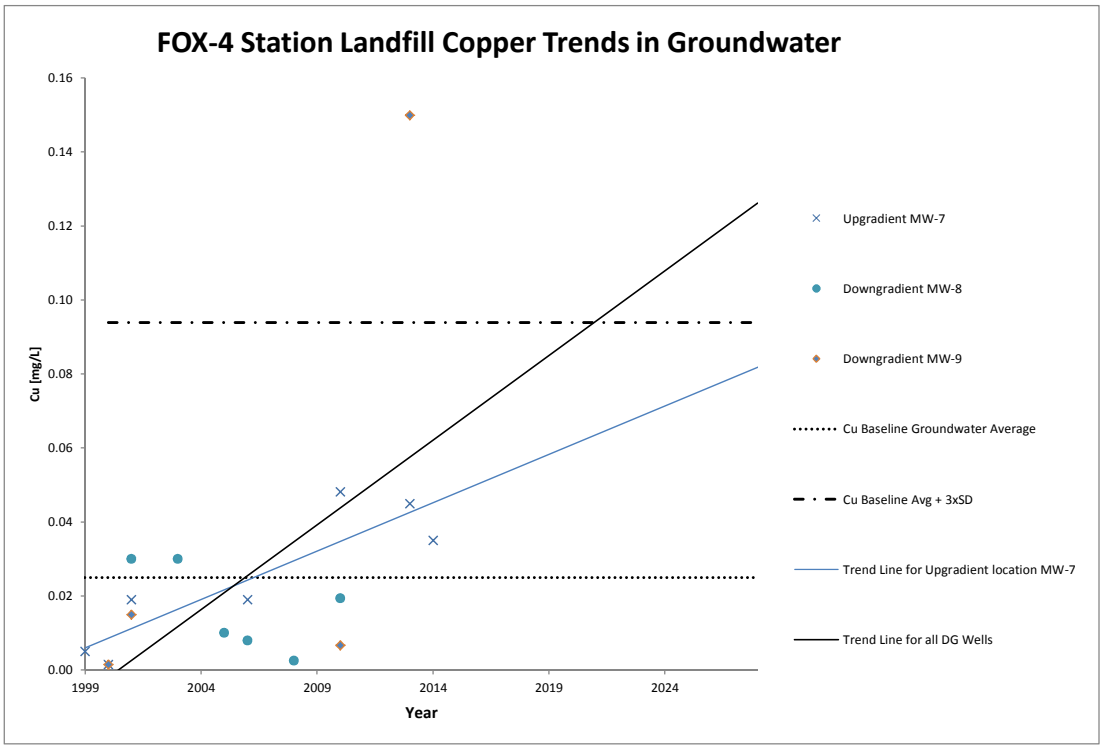
PCB results in groundwater have been below detection. Trendlines reflect changes in detection limits.

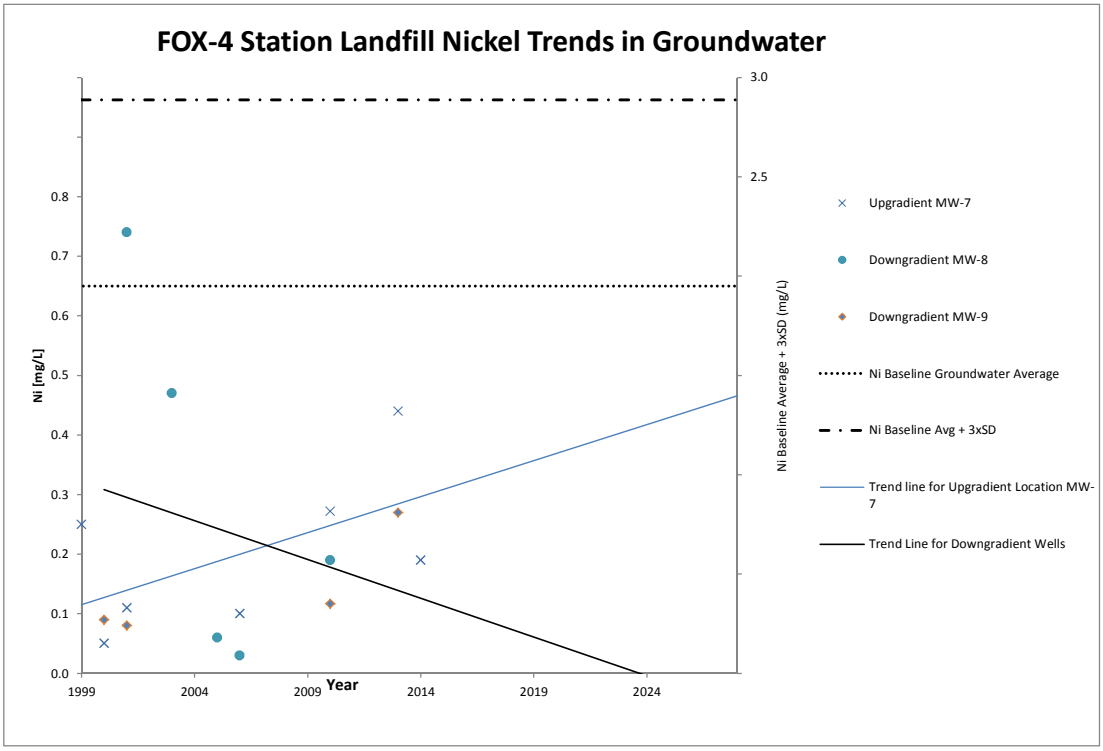
FOX-4 Helipad Landfill West Graphs of Trends for Inorganic Elements, PCBs and TPH in Groundwater Samples



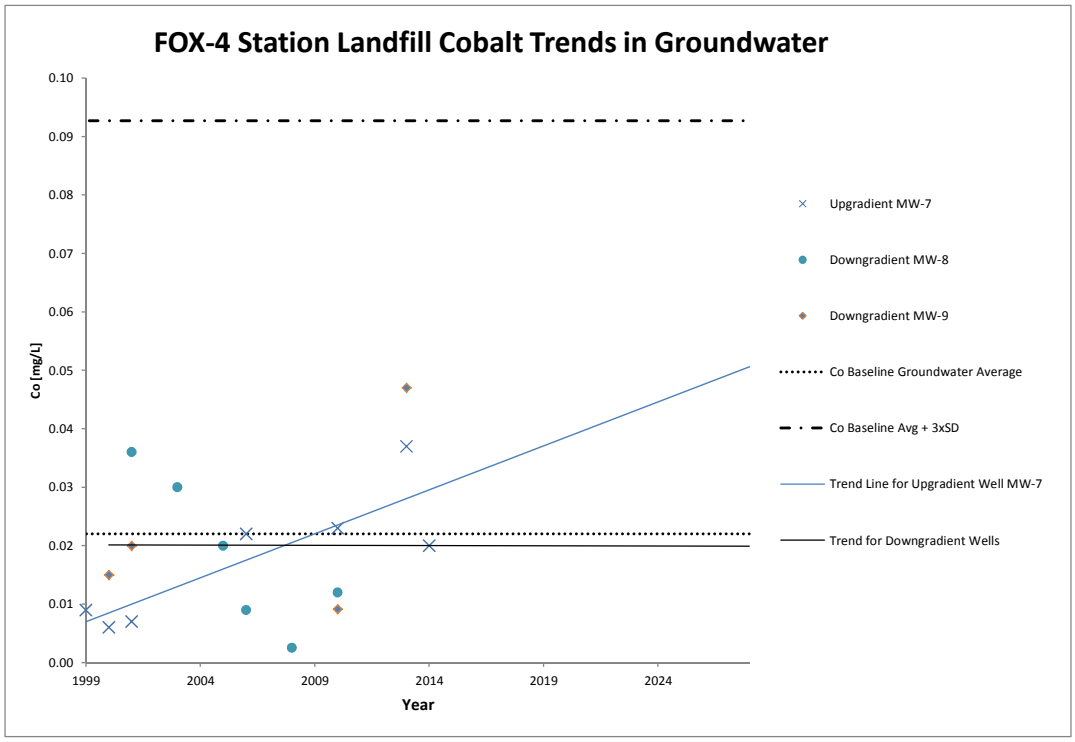
FOX-4 Station Landfill Graphs of Trends for Inorganic Elements, PCBs and TPH in Groundwater Samples

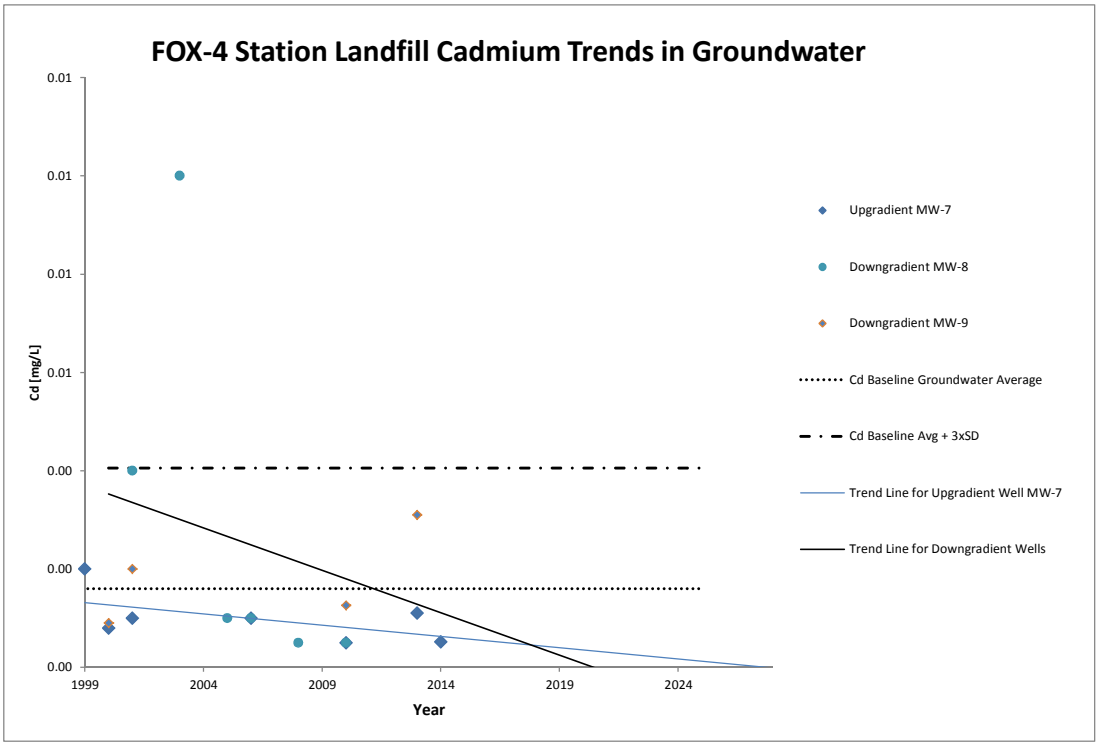
Where results are below detection, half of the detection limit has been used in the charts.



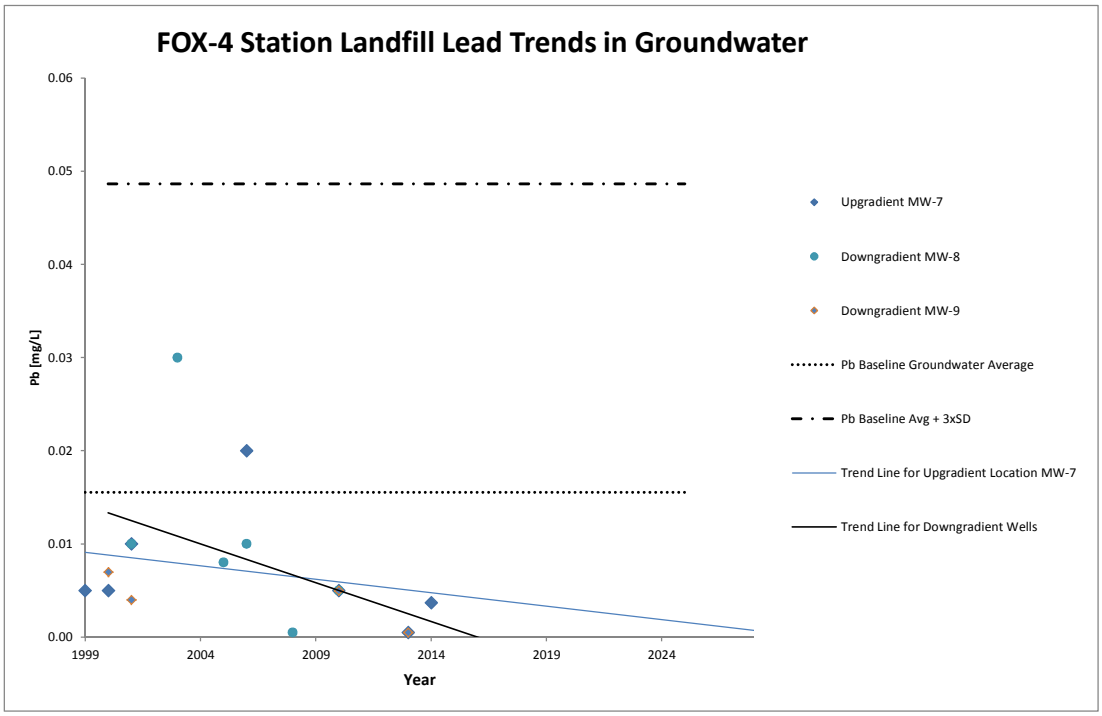


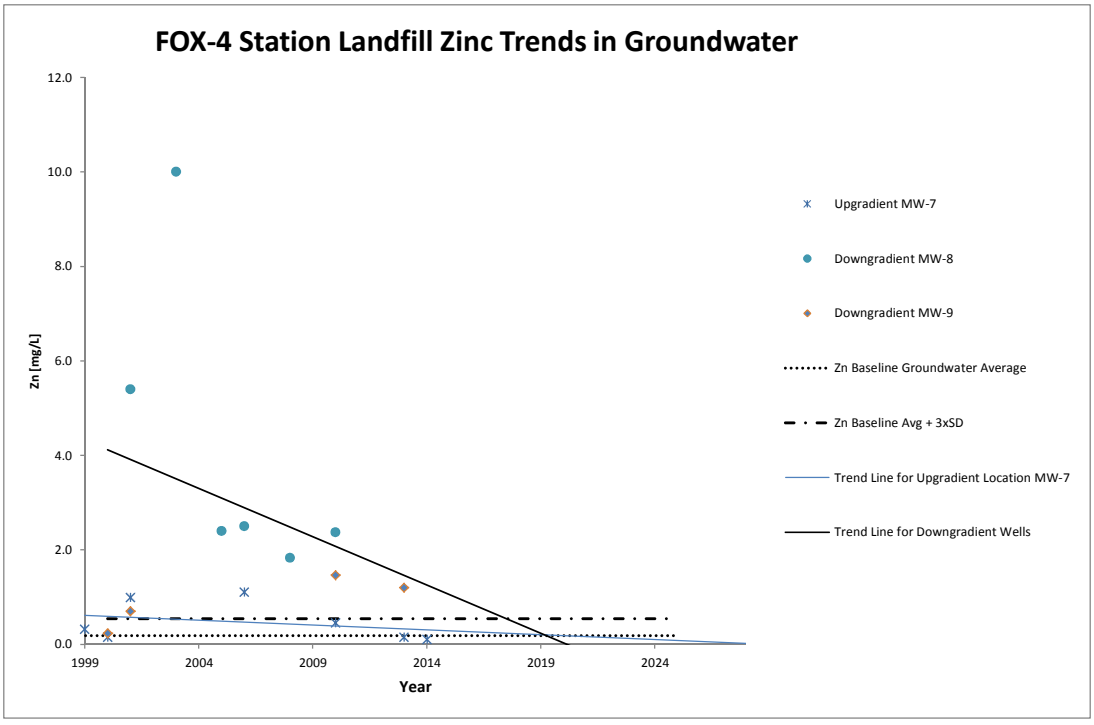
FOX-4 Station Landfill Graphs of Trends for Inorganic Elements, PCBs and TPH in Groundwater Samples



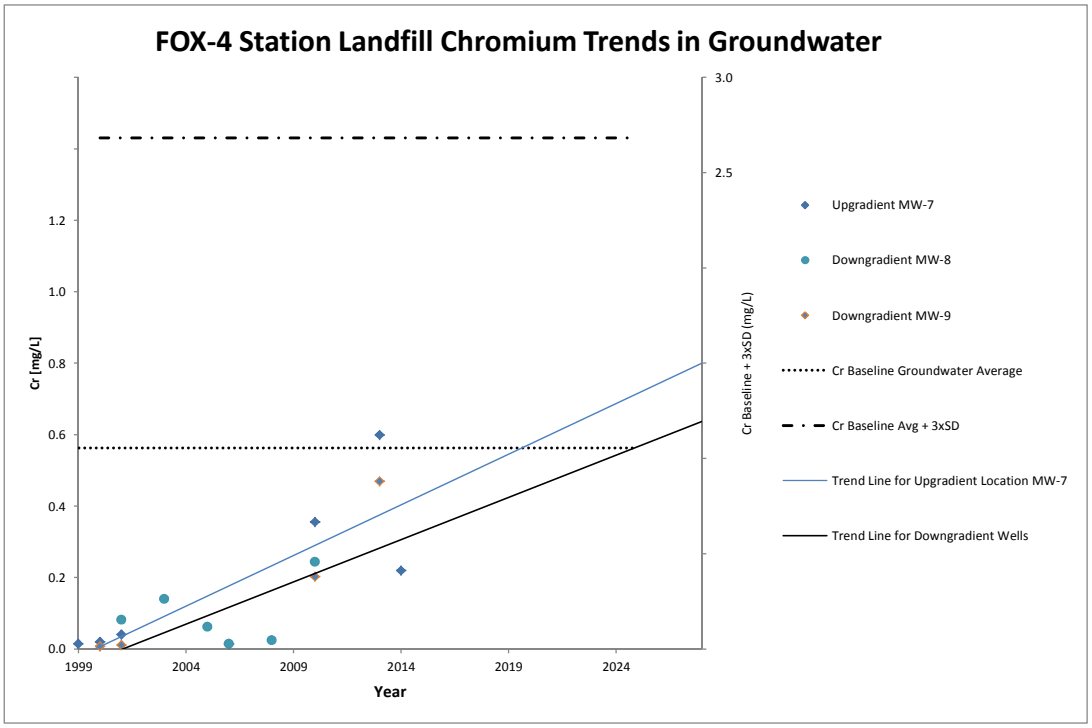


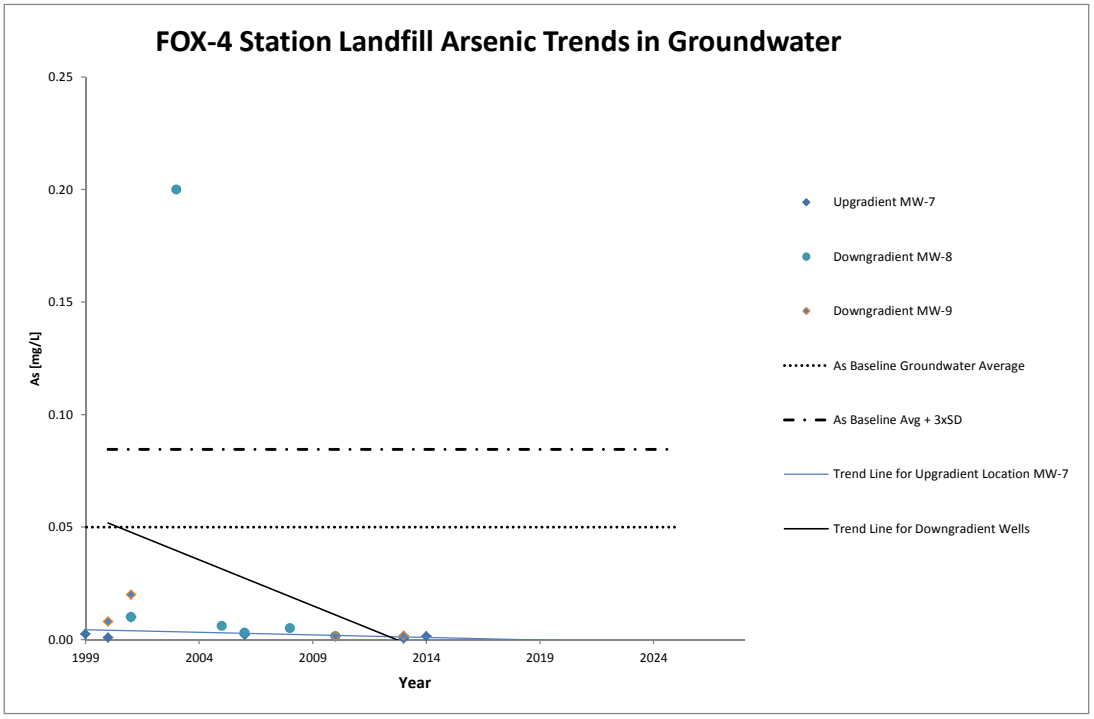
FOX-4 Station Landfill Graphs of Trends for Inorganic Elements, PCBs and TPH in Groundwater Samples



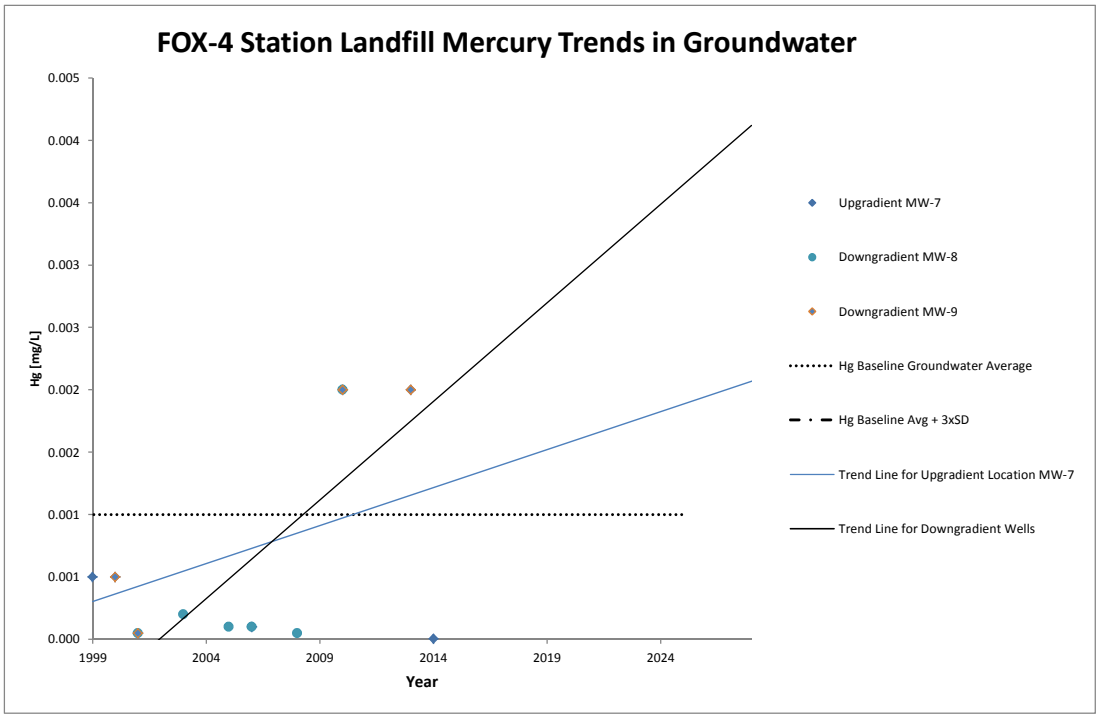


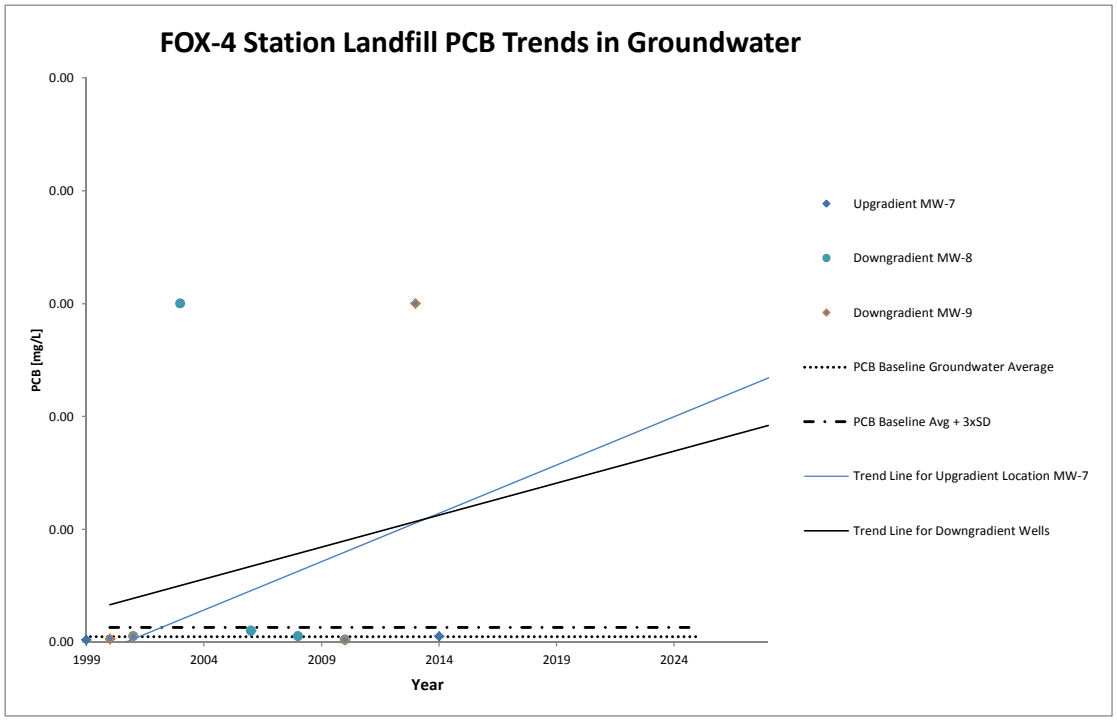
FOX-4 Station Landfill Graphs of Trends for Inorganic Elements, PCBs and TPH in Groundwater Samples





FOX-4 Station Landfill Graphs of Trends for Inorganic Elements, PCBs and TPH in Groundwater Samples





FOX-4 Station Landfill Graphs of Trends for Inorganic Elements, PCBs and TPH in Groundwater Samples