COMPLIANCE LONG TERM MONITORING FOR TRANSPORT CANADA AT THE FORMER IQALUIT METAL DUMP IQALUIT, NU

Submitted to:

Public Services and Procurement Canada | Services publics et Approvisionnement Canada

Public Services and Procurement Canada

Western Region

10025 Jasper Avenue

Edmonton, AB T5J 1S6

Prepared by:

BluMetric Environmental Inc.

4916 49th Street, Second Floor

Yellowknife, NT X1A 1P3

Project Number: 200607

17 December 2020

COMPLIANCE LONG TERM MONITORING
FOR TRANSPORT CANADA
AT THE FORMER IQALUIT METAL DUMP
IQALUIT, NU

Submitted to:

Public Services and Procurement Canada | Services publics et Approvisionnement Canada

Public Services and Procurement Canada
Western Region
10025 Jasper Avenue
Edmonton, AB T5J 1S6

Prepared by:

BluMetric Environmental Inc.

Postal:	Physical:
P.O. Box 11086	4916 49th Street, Second Floor
Yellowknife, NT X1A 3X7	Yellowknife, NT X1A 1P3

Project Number: 200607

17 December 2020

EXECUTIVE SUMMARY

BluMetric Environmental Inc. (BluMetric™) was retained by Public Services and Procurement Canada (PSPC), Western Region on behalf of Transport Canada (TC) Canada to complete the 2020-2021 Compliance Long Term Monitoring requirements at the Former Iqaluit Metal Dump, located in Iqaluit, NU. The Site location is indicated in Figure 1.

The Iqaluit Former Metal Dump/Community Landfill is located 1.7 km southwest of the City of Iqaluit, Nunavut on the border of the Sylvia Grinnell Territorial Park and the Sylvia Grinnell River. The site covers an area of approximately 72,500 m^2. The United States Air Force (USAF) used the site from 1955 to 1963 as a metal dump for vehicles, truck bodies, barrels and scrap metal. The majority of materials were deposited in 1963 when the US Military left Frobisher Bay. The debris was scattered over a large area and consisted of vehicles, equipment, barrels, and scrap metal. Shops, buildings, and other materials were simply bulldozed over the cliff.

The two main areas of waste present at the site include the main debris/community landfill, located in the central portion of the site and spanning the top, and toe of a bedrock escarpment that runs northwest/southeast, and the vehicle dump located approximately to the south and parallel with the main landfill. The site was remediated during Fiscal Year 2017-2018. A Long term monitoring (LTM) plan was developed in February 2018 by Arcadis, outlining a sampling program to monitor natural attenuation at the site. As per the LTM, the initial Phase 1 of monitoring is required in Years 1, 3, and 5 following remediation. Dillon Consulting/Outcome Consultants in joint venture (DOJV) completed the Year 1 LTM requirements for the site in 2018, and in 2019 they conducted additional monitoring that was supplemental to the defined LTM program. The field program described herein was conducted in accordance with the year 3 LTM requirements.

The 2020 LTM field program took place on September 19, and included visual monitoring and monitoring of the natural environment, in addition to an environmental sampling program. A total of nine surface water samples and nine sediment samples, including a duplicate for each medium, were collected during the field program. It was determined that no seepage or soil sampling was required during the 2020 field program. All work was completed in accordance with the Nunavut Water Board (NWB) Water License 1BR-MDR1721 and the Performance and Long Term Monitoring Plan (Arcadis, August 2017), in addition to the Sampling Analysis and Quality Assurance and Quality Control Plan prepared by BluMetric.

Exceedances to the applicable environmental quality guidelines (EQG) in the 2020 surface water analytical results were limited to zinc at LTM-7 only. A review of the data over time indicates that concentrations are overall decreasing in surface water, however it is noted that zinc, cadmium, and lead were each elevated at SW7 in 2019 and continued monitoring at the location is required to determine whether concentrations will continue to decrease at this location.

A number of exceedances to the applicable EQG were noted among the 2020 sediment analytical results, as summarized in the table below. The sediment exceedances were generally similar to those reported in previous years.

Summary of 2020 Sediment Exceedances

Exceedance	PHC F2 (µg/g)	PHC F3 (µg/g)	Chromium (µg/g)	Cadmium (µg/g)	Lead (µg/g)	Zinc (µg/g)	Total PCBs (µg/g)
SQGPAL Freshwater [1] ISQG/PEL	NV	NV	37.3 / 90	0.6 / 3.5	35 / 91.3	123 / 315	0.0341 / 0.277
SQGPAL Marine [2] ISQG/PEL	NV	NV	52.3 / 160	0.7 / 4.2	30.2 / 112	124 / 271	0.0215 / 0.189
CWS [3] Residential/ Commercial	150 / 260	300 / 1700	NA	NA	NA	NA	NA
LTM-SD3	--	--	38	--	--	--	--
LTM-SD4	--	--	--	--	110	--	--
LTM-SD5	440	490	--	1.9	73	210	0.21
LTM-SD6	2100	1700	--	2.9	89	280	3.4
LTM-SD7	--	--	--	--	--	140	0.082
LTM-SD9 (DUP of SD5)	160	--	--	1.3	36	130	1.3

Notes:
1 - Canadian Council of Members of the Environment (CCME), Canadian Sediment Quality Guidelines for the Protection of Aquatic Life (SQGPAL), Freshwater (CCME, 1999 with updates)
2 - Canadian Council of Members of the Environment (CCME), Canadian Sediment Quality Guidelines for the Protection of Aquatic Life (SQGPAL), Marine. (CCME, 1999 with updates)
3 - Canadian Council of Members of the Environment (CCME) Canada-Wide Standards (CWS) for Petroleum Hydrocarbons in Soil, Residential/Commercial Use, Coarse Grained Soil (CCME, 2008)
NV – No Value
NA – Not Applicable
ISQG – Interim Sediment Quality Guideline
PEL – Probable Affect Levels

Metals and PHC parameters generally continue to be measured at consistent concentrations at the site since 2018 with some exceptions. Total PCBs have been detected in sediment at several locations at the site since monitoring was initiated in 2018. Concentrations at LTM-6 have remained consistently elevated, while decreases have been noted at LTM-5 and LTM-7.

It should be noted that the 2020 LTM program is representative of only the third sediment sampling event and therefore not enough data is available to make any conclusions from the trend analysis. Continued monitoring is required to fully evaluate the fluctuation in parameter concentrations measured in sediments at the site.

The following recommendations have been developed based on the 2020 compliance long term monitoring program at the Iqaluit Former Metal Dump:

- It is recommended that monitoring be conducted in 2021 to obtain additional data for the evaluation of the progression of natural attenuation at the site. Monitoring conducted in 2021 would be representative of conditions in year 4 following remediation, and although monitoring in year 4 is not required as per the LTM plan, the additional data would assist in interpreting trends in on-going impacts, particularly in sediments as seen in 2020.
- It is recommended to continue monitoring soil settlement and erosion features previously identified at the site in 2018 and 2019, and that minor site grading be considered should erosional features worsen.
- It is recommended that PAH analysis at LTM8 can be discontinued for future monitoring events, as PAHs were not reported above the EQG in the surface water or sediment sample collected at the location in 2020. PAHs do not appear to be a contaminant of concern. Continued sampling at LTM8 and analysis of parameters excluding PAHs is recommended to establish conditions up gradient of the site.
- Continue monitoring as was conducted in 2020, with the exception of the discontinuation of PAH analyses as noted above, including visual monitoring and monitoring of the natural environment, surface water and sediment sampling, as well as seepage and soil sampling on an as-needed basis.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

1. INTRODUCTION

BluMetric Environmental Inc. (BluMetric™) was retained by Public Services and Procurement Canada (PSPC), Western Region on behalf of Transport Canada (TC) Canada to complete the 2020-2021 Compliance Long Term Monitoring requirements at the Former Iqaluit Metal Dump, located in Iqaluit, NU. The Site location is indicated on Figure 1.

All work was completed in accordance with the Statement of Work (SOW) entitled "Compliance Long Term Monitoring for Transport Canada at the Former Iqaluit Metal Dump, Iqaluit, NU" dated June 2020 and issued as a call-up under Standing Offer Agreement (SOA) EW699-170520. The following documents were referenced in development of the Sampling and Analysis and Quality Assurance and Quality Control Plan (BluMetric, 2020) and throughout reporting activities:

- Nunavut Water Board (NWB) Water License 1BR-MDR1721;
- Arcadis Canada Inc. Performance and Long Term Monitoring Plan, Former Metal Dump and Community Landfill, Iqaluit, NU (August 2017);
- Arcadis Canada Inc. NWB 2017 Annual Report (March 2018);
- Dillon Consulting LTD. / Outcome Consultants Inc. (DOJV), NWB 2018 Annual Report (March 2019), and;
- Dillon Consulting LTD. / Outcome Consultants Inc. (DOJV), NWB 2019 Annual Report (March 2020).

1.1 BACKGROUND

The Iqaluit Former Metal Dump/Community Landfill is located 1.7 km southwest of the City of Iqaluit, Nunavut on the border of the Sylvia Grinnell Territorial Park and the Sylvia Grinnell River. The site covers an area of approximately 72,500 m^2. The United States Air Force (USAF) used the site from 1955 to 1963 as a metal dump for vehicles, truck bodies, barrels and scrap metal. The majority of materials were deposited in 1963 when the US Military left Frobisher Bay. The debris was scattered over a large area and consisted of vehicles, equipment, barrels, and scrap metal. Shops, buildings, and other materials were simply bulldozed over the cliff. Two main areas of waste are present at the site as a result of former land use activities:

1) The main debris/community landfill is located in the central portion of the site and spanning the top, and toe of a bedrock escarpment that runs northwest/southeast; and
2) The vehicle dump located approximately to the south and parallel with the main landfill.

The site was remediated during Fiscal Year 2017-2018. A Long term monitoring (LTM) plan was developed in February 2018 by Arcadis, outlining a sampling program to monitor natural attenuation at the site. As per the LTM, the initial Phase 1 of monitoring is required in years 1, 3, and 5 following remediation. DOJV completed the year 1 LTM requirements for the site in 2018, and in 2019 they conducted additional monitoring that was supplemental to the defined LTM program. The field program described herein was conducted in accordance with the year 3 LTM requirements.

2. ENVIRONMENTAL QUALITY GUIDELINES

The applicable environmental quality guidelines (EQG) for the Site were established as part of the Long Term Monitoring Plan (Arcadis, 2017). The federal EQG are based on the level of risk a contaminant poses to humans, plants and wildlife. The EQG are used in the LTMP to identify the areas where mitigation of exposure to chemicals of concern is required and are also incorporated as site-specific remedial objectives. As per the Plan, results from the 2020 program were evaluated using the following criteria:

- Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health (CSQGs) (CCME, 1999, with updates);
- Canada-Wide Standards (CWS) for Petroleum Hydrocarbons in Soil (CCME, 2008);
- Canadian Soil Quality Guidelines (CSQG) Polycyclic Aromatic Hydrocarbons factsheet (CCME, 2010);
- Canadian Environmental Quality Guidelines. Canadian Sediment Quality Guidelines (CSedQG) for the Protection of Aquatic Life (CCME, 2007, with updates), and;
- Canadian Environmental Quality Guidelines. Canadian Water Quality Guidelines (CWQG) for the Protection of Aquatic Life (CCME, 2007, with updates).

Additionally, DJOV used the following criteria for PHCs in surface water in absence of an applicable federal or territorial guideline, and the use of these criteria has been carried through in this report:

- Alberta Government, Alberta Tier 1 Soil and Groundwater Guidelines. Table 2. (AEP, 2019).

The LTM Plan divided the Site into three (3) sectors; the upper, lower eastern and lower western. Table 1 outlines each sector, the associated LTM stations and the EQG classification.

Table 1: EQG Classification for LTM Stations

Sector	LTM Station (s)	EQG
Upper	7, 8	Commercial, Freshwater, Coarse-grained soil
Lower – Eastern Portion	2, 5, 6	Wildland, Freshwater, Coarse-grained Soil
Lower – Western Portion	1, 3, 4	Wildland, Lowest of Marine or Freshwater, Coarse-grained soil

3. METHODOLOGY

3.1 SITE-SPECIFIC HEALTH AND SAFETY PLAN

Prior to the commencement of the field program, BluMetric prepared a site-specific Environmental Health and Safety (EH&S) plan in accordance with all territorial and federal policies and procedures. The EH&S plan was created based on the work plan and detailed information regarding work in the northern environment, including;

- COVID-19 Precautions
- Wildlife safety
- Personal protective equipment (PPE) requirements
- Safety procedures for monitoring to be conducted before, during, and after the Site investigation
- Decontamination procedures
- Documentation and records of on-site safety meetings
- Documentation of health and safety training given to staff
- Remote communication procedures
- Emergency contacts
- Tailgate safety forms
- Airport safety procedures and communications

A copy of the EH&S Plan was reviewed and accepted by the PSPC Project Manager prior to the September 2020 field program. BluMetric conducted a tailgate safety meeting on site with all field staff at the beginning of the field work day.

3.2 Sampling Analysis and Quality Assurance and Quality Control Plan

Prior to the commencement of the 2020 field program BluMetric prepared a Sampling Analysis and Quality Assurance and Quality Control (SA & QA/QC) Plan based on a review of all existing information relevant to the Site. The Plan includes a Site Plan with the proposed sampling locations and analytical parameters as per the LTM requirements outlined within the Site's NWB Water license. A copy of the SA & QA/QC Plan was reviewed and accepted by the PSPC Project Manager prior to the September 2020 field program.

3.3 Visual Monitoring

Visual inspections of the following site features were conducted as part of the LTM activities on September 19, 2020:

Isolation Cover Surface

- Settlement
- Erosion
- Lateral Movement
- Frost Action
- Sloughing
- Cracking
- Animal Burrows
- Vegetation re-establishment
- Vegetation stress
- Seepage points and/or ponded water
- Debris and/or exposed geotextile
- Features of note/other relevant observations (eg. signs of activity, ruts etc.)

Access Roadway

- Culverts
- Down-gradient Ponds
    - Staining
    - Vegetation stress

Photos were taken of points of interest at standard photo locations as specified within the LTM Plan. Locations were confirmed with a handheld GPS.

3.4 MONITORING OF NATURAL ENVIRONMENT

Monitoring of the natural environment was conducted as part of the LTM activities on September 19, 2020. Observations of the natural environment were made while in the vicinity of the Site, in particular the following aspects were assessed:

- Wildlife sightings (species, number, general, juveniles);
- Other evidence of recent wildlife presence (dropping, tracks, feathers/fur, carcass remains etc.);
- Wildlife activity (summering/nesting/denning, migratory/passing through);
- Qualitative assessments of relative numbers vs previous years (more, same, less); and,
- Revegetation of disturbed areas vs previous years (more, same, less).

Information regarding observations made at the Site by others is also considered; efforts were made to collect the following pertinent information from Iqaluit locals:

- Wildlife sightings;
- Use by people for traditional activities;
- Seasonal use of the Site;
- Site activities (hunting, trapping, fishing, camping, harvesting, other);
- Relative frequency of current Site use vs Site use over previous years (more, same, less);
- Wildlife species present (sightings or evidence);
- Current wildlife presence vs presence over previous years (more, same, less);
- Health of wildlife observed or harvested (good, average, poor); and,
- Relative health of wildlife vs health of wildlife over previous years (better, same, worse).

3.5 SAMPLING PROGRAM

All sampling conducted throughout the 2020 LTM program was completed in compliance with the protocol outlined in CCME 2016 “Guidance Manual for Environmental Site Characterization in Support of Environmental and Human Health Risk Assessment”, Volume 3 “Standard Operating Procedures”. Furthermore, sample collection, preservation, and analysis was conducted in accordance with methodology prescribed in the current edition of “Standard Methods for the Examination of Water and Wastewater” in accordance with Part K, condition 2 of the Water Licence.

New sampling materials were used at each sampling location (Ziploc® bags, nitrile gloves, jars, stainless steel shovel), with the exception of stainless steel trowels, used for sediment sampling, which were thoroughly decontaminated using distilled water and detergent (Alconox) between sampling locations. All samples were collected using laboratory-provided containers with appropriate preservative (where required). Following collection, samples were placed into coolers with ice for preservation at approximately 4°C until shipment to the lab. Rigorous chain of custody documentation was completed for accompaniment of each sample cooler for sign-off by the shipper and the receiver.

All samples were submitted for analysis at Bureau Veritas Laboratories (Bureau Veritas), a Canadian Association of Laboratory Accreditation (CALA) certified Laboratory, in Ottawa, ON.

3.5.1 Seepage Sampling

During the visual inspection process the perimeter and surface of the landfill isolation cover was inspected for potential seepage locations. In the event that areas of seepage are identified during LTM activities, and sufficient volume exists, samples are collected for laboratory analysis of Benzene, Toluene, Ethylbenzene, and Xylene (BTEX) and Petroleum Hydrocarbons (PHCs), Metals (arsenic, cadmium, chromium, cobalt, lead, nickel and zinc), Polychlorinated Biphenyls (PCBs), General Chemistry (major ions, hardness, Total Dissolved Solids, Total Suspended Solids, pH, conductivity, and temperature. Field parameters at seepage locations are to be monitored and recorded using a multi-parameter instrument (YSI Pro Plus or equivalent).

No seepage areas were observed in the vicinity of the landfill isolation cover on September 19, 2020 and therefore no seepage samples were collected as part of the 2020 LTM activities.

3.5.2 Soil Sampling

Soil sampling is conducted throughout the LTM program on an as needed basis in the event that staining or seepage is identified on or around the landfill isolation cover. When required, soil samples are collected at the intervals of 0 to 0.15 m and 0.35 to 0.5 m in depth. Detailed logging of the soil stratigraphy is conducted for each soil sampling location. Soil sampling is conducted using a clean stainless steel trowel, sample material is obtained directly from the excavation. A geological and visual description of the subsurface materials is recorded for each sample location in detail in order to define potentially contaminated horizons. Additionally, a photographic record is to be generated for each test pit advanced at the Site. Soil samples are to besubmitted for laboratory analysis of BTEX/PHCs, Metals (arsenic, cadmium, chromium, cobalt, lead, nickel and zinc) and PCBs.

No areas of staining or seepage were observed in the vicinity of the landfill isolation cover on September 19, 2020 and therefore no soil samples were collected as part of the 2020 LTM activities.

3.5.3 Surface Water Sampling

Surface water sampling was conducted as part of the LTM activities on September 19, 2020. Samples were collected at LTM sampling stations LTM-SW1 to LTM-SW8 as summarized below in Table 2 and indicated on Figure 2.

Table 2: Surface Water Sampling Locations

Location ID	Feature	Northing	Easting
LTM1	Pond 1	7067946.256	521750.251
LTM2	Pond 2	7067986.503	521800.108
LTM3	Pond 3	7067795.774	521836.893
LTM4	Pond 4	7067686.315	521860.124
LTM5	Pond 5	7067718.731	521915.011
LTM6	Pond 6	7067744.086	521936.764
LTM7	Culvert	7067865.856	522027.627
LTM8	Drainage system	7068013.000	522064.000

Surface water samples were collected manually by dipping a clean collection bottle, without preservative, into the water without disturbing the sediments or vegetation. The water was then decanted into pre-labeled laboratory supplied sample bottles.

Indicator parameters including pH, conductivity and temperature were measured and recorded in the field with a multi-parameter instrument (YSI Pro Plus). Surface water samples were submitted for analysis of BTEX/PHCs, Metals (arsenic, cadmium, cobalt, chromium, lead, nickel, and zinc), PCBs, Polycyclic Aromatic Hydrocarbons (PAHs) (LTM-8 only), General Chemistry (major ions, hardness, total dissolved solids, total suspended solids), pH, conductivity, and temperature.

3.5.4 Sediment Sampling

Sediment sampling was conducted as part of the LTM activities on September 19, 2020. Sediment samples were collected at pre-determined locations that correspond with the LTM surface water sampling stations along the down-gradient drainage and pond system, as summarized above Table 2 and indicated in Figure 2.

Sediment samples were collected manually as grab samples using a clean stainless steel trowel and transferred to the laboratory-supplied containers. Sediment samples were submitted for laboratory analysis of BTEX/PHCs, Metals (arsenic, cadmium, cobalt, chromium, lead, nickel, and zinc, PCBs, and PAHs (LTM-8 only).

3.5.5 Quality Assurance/Quality Control (QA/QC)

A QA/QC program was developed as part of the project specific SA & QA/QC Plan, and followed to ensure that the sampling and analytical data is interpretable, meaningful and reproducible. Blind field duplicate samples are collected to demonstrate that field sampling techniques utilized by BluMetric are capable of yielding reproducible results. Duplicate samples are collected from the same location and at the same time as the original sample and are submitted to the laboratory under "blind label" for the same analyses as the original sample. As a standard, duplicate samples are collected at a rate of approximately 10% of the total number of samples collected for each media type.

Sampling precision is measured by calculating the relative percentage difference (RPD) for the duplicate samples. If the concentrations are greater than five times the laboratory lowest detection limit (LDL), an RPD is calculated. Concentration results less than five times the LDL become increasingly imprecise and RPDs are not calculated. The CCME recommends an acceptable RPD of 40% for water but this is applicable only when the analytical values are significantly greater than the method detection limit (CCME, 2016).

The RPD is the difference between the duplicate results divided by the mean of the results, expressed as a percentage, calculated as follows:

$$\text{RPD (\%)} = [(DUP1 - DUP2)/(\frac{DUP1+DUP2}{2})]\, X\, 100$$

3.6 Mann-Kendall Trend Analyses

Mann-Kendall is a type of nonparametric statistical test useful for evaluating contaminant plume behavior over time, if it is receding, advancing, or stable. It is most often used as part of a monitored natural attenuation program and works best with at least six or more sampling events. Concentrations reported at the laboratory reported detection limit (RDL) are dealt with by assigning a single value equal to half the value of the lowest reported RDL. For example, the lowest RDL for total lead over the five samples was 0.2 ug/L, therefore a RDL of 0.1 ug/L was used in the test calculations sheets. This method eliminates variations in RDL over time as their use could lead to erroneous results.

The Mann-Kendall test was performed using the calculator provided by the Wisconsin Department of Natural Resources (WDNR) as part of the Guidance on Natural Attenuation for Petroleum Releases (WDNR, 2003).

The Mann-Kendall test was used to determine if trends in surface water could be discerned for arsenic, cadmium, cobalt, lead, nickel, and zinc. The test encompassed all available surface water samples, five in total ranging between 2017 and 2020, except for location LTM1 which only had four samples, and LTM8 which only had two samples. Many parameter concentrations were reported as less than the RDL, over multiple sampling events, for which the test does not work correctly given so few samples. In these cases, the result was determined by visual inspection of the data and manually labelled as "Stable/No Trend". Results are discussed in Section 4.3.1, and data and charts are included in Appendix C.

After review of the sediment data, it was determined that the Mann-Kendall test was not appropriate and more data should be collected before this type of analyses is undertaken. General trends can be discerned by a visual inspection of the included time series charts (Appendix C) with results discussed in Section 4.3.2.

4. RESULTS AND DISCUSSION

4.1 VISUAL MONITORING

Visual inspections of site features were conducted as part of the LTM activities on September 19, 2020. No major issues were identified on Site during the field program. General Site photos and photos of key Site features are included in Appendix A.

4.2 MONITORING OF NATURAL ENVIRONMENT

Monitoring of the natural environment was conducted as part of the LTM activities on September 19, 2020. Observations of the natural environment were made while in the vicinity of the Site.

Several observations were made indicating use of the Site by local residents; ATV tracks were noted on the top of the landfill and remnants of tents were found on the south side of the landfill. Dog prints were also seen in the vicinity of the landfill and people were seen fishing off-shore. Local residents assisting with the field activities indicated that the Site is known to be commonly used as a fishing location.

Bird excrement was the only evidence of wildlife observed in In the vicinity of the site and vegetation was noted to be sparse.

4.3 SAMPLING PROGRAM

4.3.1 Surface Water

A total of nine surface water samples, including one duplicate sample, were collected during the LTM program conducted on September 19, 2020. Field parameters recorded at each sampling location are included in Table 3 (following the text).

Samples were submitted for laboratory analysis of BTEX/PHCs, Metals (arsenic, cadmium, cobalt, chromium, lead, nickel, and zinc), PCBs, PAHs (LTM-SW8 only), General Chemistry (major ions, hardness, total dissolved solids, total suspended solids), pH, conductivity, and temperature. Surface water analytical results were compared to the CWQG. The September 2020 surface water analytical results, along with historical surface water quality results for the Site, are provided in Tables 4 through 8 (following the text) in comparison to the applicable criteria. Laboratory certificates of analysis have been provided in Appendix B.

Exceedances to the EQG for surface water samples in 2020 were limited to zinc at LTM-SW7 only. Historic surface water samples collected during LTM events conducted between 2017 and 2019 yielded EQG exceedances for cadmium and lead, in addition to zinc. A summary of the parameters reported in exceedance of the applicable EQG within surface water throughout the complete LTM program to date is presented below in Table 9.

Table 9: Summary of LTM Surface Water Exceedances

LTM Year	2017	2018	2019	2020
LTM-SW1	--	--	--	--
LTM-SW2	Cadmium, Zinc	--	--	--
LTM-SW3	Zinc	--	--	--
LTM-SW4	--	--	--	--
LTM-SW5	Zinc	Cadmium, Lead, Zinc	--	--
LTM-SW6	Zinc	Cadmium, Lead, Zinc	--	--
LTM-SW7	Zinc	Zinc	Cadmium, Lead, Zinc	Zinc
LTM-SW8	NA	NA	Zinc	--

Notes:
NA – Not Analyzed

It is noted that all exceedances indicated above in Table 9 were found to be in exceedance of the Freshwater CCME CQWG. As described in Section 2, LTM Stations 1, 3, and 4 are compared to the lower value of either the Marine or the Freshwater CWQG, however none of the parameters for which surface water exceedances were noted had corresponding guidelines for marine settings and therefore the freshwater guidelines were used.

Mann-Kendall trend analyses were completed with the available LTM surface water analytical results to date. The results of the Mann-Kendall trend analyses indicated that most parameters have no trend or are of stable concentration. This is largely the result of concentrations reported at less than the RDL. The calculation charts are included in Appendix C and Table 10 summarizes the test results at each of the seven locations. Decreasing trends were calculated for: lead at LTM2; zinc at LTM3; cadmium at LTM4; cadmium, cobalt, and lead at LTM5; cadmium, cobalt, and lead at LTM6; and nickel at LTM7.

Table 10: Mann-Kendall Trend Analysis Summary

Station #	LTM1	LTM2	LTM3	LTM4	LTM5	LTM6	LTM7
Arsenic	Stable/ No Trend	Stable/ No Trend	Stable/ No Trend	Stable/ No Trend	Stable/ No Trend	Stable/ No Trend	Decreasing
Cadmium	Stable/ No Trend	Stable/ No Trend	Stable/ No Trend	Decreasing	Decreasing	Decreasing	Stable/ No Trend
Cobalt	Stable/ No Trend	Stable/ No Trend	Stable/ No Trend	Stable/ No Trend	Decreasing	Decreasing	Stable/ No Trend
Lead	Stable/ No Trend	Decreasing	Stable/ No Trend	Stable/ No Trend	Decreasing	Stable/ No Trend	Stable/ No Trend
Nickel	Stable/ No Trend	Stable/ No Trend	Stable/ No Trend	Stable/ No Trend	Stable/ No Trend	Stable/No Trend	Decreasing
Zinc	Stable/ No Trend	Stable/ No Trend	Decreasing	Stable/ No Trend	Decreasing	Decreasing	Stable/ No Trend

This type of statistical analyses is best done with a dataset spanning at least six events, therefore results should be deemed as inconclusive and additional monitoring is warranted if this type of analyses is to be relied upon. Concentrations consistently reported at less than the RDL are of limited usefulness for the test and should be removed from future analyses. This does not eliminate the need to monitor for the parameter.

To support the Mann-Kendall trend analysis results time series charts were prepared for concentrations of zinc, lead, and cadmium in surface water at the site. The charts are included in Appendix C. Concentrations of zinc, cadmium, and lead in surface water in 2020 were measured to be generally consistent with or below values reported at the site historically. A review of the data over time indicates that concentrations are overall decreasing in surface water, however it is noted that zinc, cadmium, and lead were each elevated at SW7 in 2019 and continued monitoring at the location is required to determine whether concentrations will continue to decrease at this location.

4.3.2 Sediments

A total of nine sediment samples, including one duplicate sample, were collected during the LTM program conducted on September 19, 2020.

Sediment samples were submitted for laboratory analysis of BTEX/PHCs, Metals (arsenic, cadmium, cobalt, chromium, lead, nickel, and zinc, and PCBs. The September 2020 sediment analytical results, along with historical sediment quality results for the site, are provided in Tables 11 through 14 (following the text) in comparison to the applicable criteria, and have been summarized below in Table 15. Complete laboratory certificates of analysis have been provided in Appendix B.

Table 15: Summary of 2020 Sediment Exceedances

Exceedance	PHC F2 (ug/g)	PHC F3 (ug/g)	Chromium (ug/g)	Cadmium (ug/g)	Lead (ug/g)	Zinc (ug/g)	Total PCBs (ug/g)
SQGPAL Freshwater [1] ISQG/PEL	NV	NV	37.3 / 90	0.6 / 3.5	35 / 91.3	123 / 315	0.0341 / 0.277
SQGPAL Marine [2] ISQG/PEL	NV	NV	52.3 / 160	0.7 / 4.2	30.2 / 112	124 / 271	0.0215 / 0.189
CWS [3] Residential/ Commercial	150 / 260	300 / 1700	NA	NA	NA	NA	NA
LTM-SD3	--	--	38	--	--	--	--
LTM-SD4	--	--	--	--	110	--	--
LTM-SD5	440	490	--	1.9	73	210	0.21
LTM-SD6	2100	1700	--	2.9	89	280	3.4
LTM-SD7	--	--	--	--	--	140	0.082
LTM-SD9 (DUP of SD5)	160	--	--	1.3	36	130	1.3

Notes:
1 - Canadian Council of Members of the Environment (CCME), Canadian Sediment Quality Guidelines for the Protection of Aquatic Life (SQGPAL), Freshwater (CCME, 1999 with updates)
2 - Canadian Council of Members of the Environment (CCME), Canadian Sediment Quality Guidelines for the Protection of Aquatic Life (SQGPAL), Marine. (CCME, 1999 with updates)
3 - Canadian Council of Members of the Environment (CCME) Canada-Wide Standards (CWS) for Petroleum Hydrocarbons in Soil, Residential/Commercial Use, Coarse Grained Soil (CCME, 2008)
NV – No Value
NA – Not Applicable
ISQG – Interim Sediment Quality Guideline
PEL – Probable Affect Levels

It is noted that all exceedances indicated above in Table 15 were found to be in exceedance of the criteria applicable to the specific LTM Station, as described in Section 2. LTM Stations 1, 3, and 4 are compared to the lower value of either the Marine or the Freshwater SQGPAL, Stations 2, 5, 6, 7 and 8 are compared to the Freshwater SQGPAL. The CWS for PHCs in soil are also used for evaluation of the sediment quality results as neither the SQGPAL nor the CSQWG include PHC guidelines. Stations 1-6 are compared to the CWS Residential/Parkland land use criteria, while Stations 7 and 8 are compared to the CWS Commercial Land Use Criteria.

Historic sediment samples collected during LTM events conducted in 2018 and 2019 yielded parameters in exceedance with the EQG that were consistent with those observed in 2020, with the exception of chromium which was measured slightly above the applicable criteria within LTM-SD3 in 2020 only. A summary of the parameters reported in exceedance of the applicable EQG within sediment throughout the complete LTM program to date is presented below in Table 16.

Table 16: Summary of LTM Sediment Exceedances

LTM Year	2018	2019	2020
LTM-SD1	--	--	--
LTM-SD2	--	--	--
LTM-SD3	--	--	Chromium
LTM-SD4	--	--	Lead
LTM-SD5	F3, Cadmium, Lead, Zinc, Total PCBs	F3, Cadmium, Zinc, Total PCBs	F2, F3, Cadmium, Lead, Zinc, Total PCBs
LTM-SD6	Toluene, F2, F3, Cadmium, Lead, Zinc, Total PCBs	F2, F3, Cadmium, Lead, Zinc, Total PCBs	F2, F3, Cadmium, Lead, Zinc, Total PCBs
LTM-SD7	Zinc, Total PCBs	Zinc	Zinc, Total PCBs
LTM-SD8	--	Zinc	--

Notes:
NA – Not Analyzed

Time series charts were prepared to allow for analysis of the fluctuation of concentrations of select parameters measured in sediments at the site since monitoring was initiated in 2018. Metals parameters, including zinc, lead, chromium, and cadmium, which have been frequently reported above the applicable EQG within sediments at the site, continue to remain at consistent concentrations with some exceptions. Cadmium was reported at relatively decreased concentrations in sediment at LTM-5 in 2019 and 2020 when compared to the concentration measured at the location in 2018. Zinc concentrations also appear to be trending downwards in sediment at LTM-5 and LTM-7. Lead concentrations were found to have decreased at most sediment sampling locations in 2019, with the exception of LTM-6, however in 2020 concentrations were found to return to their 2018 levels, and at LTM-4 noticeably exceed its 2018 concentration.

PHC concentrations have also remained generally stable in sediment since 2018 with some exceptions. PHC F2 and F3 were found to have decreased slightly at LTM-6 in 2019 relative to 2018 concentrations, however were found to have increased again in 2020. Increases in PHC-F2 were also noted at LTM-5 and LTM-7 in 2020, however while F3 was noted to have also increased at LTM-7 in 2020 it was found to have decreased at LTM-5. Slight increases in F4 have also been noted at LTM-5 and LTM-7 since 2018.

Total PCBs have been detected in sediment at several locations at the site since monitoring was initiated in 2018. Concentrations at LTM-6 have remained consistently elevated, between 3.4 and 3.9 ug/g, while concentrations measured at LTM-5 have decreased from 1.4 ug/g in 2018 to 0.21 ug/g in 2020, and from 0.59 ug/g in 2018 to 0.082 ug/g in 2020 at LTM-7.

It should be noted that the 2020 LTM program is representative of only the third sediment sampling event and therefore not enough data is available to draw any conclusions from the trend analysis. Continued monitoring is required to fully evaluate the fluctuation in parameter concentrations measured in sediments at the site.

4.3.3 QA/QC Results

One duplicate QA/QC surface water sample and one sediment sample were collected on September 19, 2020, as part of the 2020 monitoring program. The surface water duplicate sample was collected at LTM station SW7 while the sediment duplicate sample was collected at LTM station SD5. The duplicate samples were analyzed for the same parameters as their corresponding sample, as indicated in Section 3. A review of the analytical results for duplicate sample pairs was carried out, a total of six parameters, between the two duplicate sample pairs, were associated with RPD values above the CCME RPD limit of 40%. The six elevated RPD values, for which two correspond with the surface water duplicate pair and four correspond with the sediment duplicate pair, represent approximately 10% of the total analytical results and, although is indicative of some sample heterogeneity, is considered an acceptable result. The full RPD results for the duplicate pairs are provided in Table 17 for surface water and Table 18 for sediment.

Additional QA/QC procedures were performed by Bureau Veritas, including method duplicates, blanks, spikes, and recoveries as part of their internal QA/QC protocol. Bureau Vertitas' QA/QC results were reviewed and are included along with the Certificates of Analysis in Appendix B.

5. RECOMMENDATIONS

The following recommendations have been developed based on the 2020 compliance long term monitoring program at the Iqaluit Former Metal Dump:

- It is recommended that monitoring be conducted in 2021 to obtain additional data for the evaluation of the progression of natural attenuation at the site. Monitoring conducted in 2021 would be representative of conditions in year 4 following remediation, and although monitoring in year 4 is not required as per the LTM plan, the additional data would assist in interpreting trends in on-going impacts, particularly in sediments as seen in 2020.
- It is recommended to continue monitoring soil settlement and erosion features previously identified at the site in 2018 and 2019, and that minor site grading be considered should erosional features worsen.

- It is recommended that PAH analysis at LTM8 may be discontinued for future monitoring events, as PAHs were not reported above the EQG in the surface water or sediment sample collected at the location in 2020. PAHs do not appear to be a contaminant of concern. Continued sampling at LTM8 and analysis of parameters excluding PAHs is recommended to establish conditions up gradient of the site.
- Continue monitoring as was conducted in 2020, with the exception of the discontinuation of PAH analyses as noted above, including visual monitoring and monitoring of the natural environment, surface water and sediment sampling, as well as seepage and soil sampling on an as-needed basis.

6. CLOSURE

The conclusions presented in this report represent our professional opinion and are based upon the work described in this report and any limiting conditions in the statement of work, scope of work, or conditions noted herein. The findings presented in this report are based on conditions observed at the specified dates and locations, and on the analysis of samples for the specified parameters. Unless otherwise stated, the findings cannot be extended to previous or future site conditions, portions of the Site that were not investigated directly, or types of analysis not performed.

BluMetric Environmental Inc. makes no warranty as to the accuracy or completeness of the information provided by others, or of conclusions and recommendations predicated on the accuracy of that information. Nothing in this report is intended to constitute or provide a legal opinion. BluMetric Environmental Inc. makes no representation as to compliance with environmental laws, rules, regulations, or policies established by regulatory agencies.

This report has been prepared for Public Services and Procurement Canada and Transport Canada. Any use a third party makes of this report, any reliance on the report, or decisions based upon the report, are the responsibility of those third parties unless authorization is received from BluMetric Environmental Inc. in writing.

BluMetric Environmental Inc. accepts no responsibility for any loss or damages suffered by any unauthorized third party as a result of decisions made or actions taken based on this report.

If you have any questions please do not hesitate to contact the undersigned.

Respectfully submitted,
BluMetric Environmental Inc.

Jenna Findlay, B.Sc., P.Geo
Geoscientist
jfindlay@blumetric.ca

Heather Wolczanski, M.Sc., P.Geo
Geoscientist
hwolczanski@blumetric.ca

Andrea Jenney P.Eng.
Senior Project Engineer
ajenney@blumetric.ca

7. REFERENCES

Alberta Environment and Parks (AEP), 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division, 198 pp.

Arcadis Canada Inc., 2018, Performance and Long Term Monitoring Plan, Former Metal Dump and Community Landfill, Iqaluit, NU. August 2017.

Arcadis Canada Inc., 2017. NWB 2017 Annual Report. March 2018.

Canadian Council of Ministers of the Environment (CCME), 2016. Guidance Manual for Environmental Site Characterization in Support of Environmental and Human Health Risk Assessment – Volume 1 Guidance Manual.

Canadian Council of Ministers of the Environment (CCME), 2016. Guidance Manual for Environmental Site Characterization in Support of Environmental and Human Health Risk Assessment – Volume 3 Standard Operating Procedures.

Canadian Council of Ministers of the Environment (CCME), 2010. Canadian Soil Quality Guidelines (CSQG) Polycyclic Aromatic Hydrocarbons Factsheet. CCME 2010.

Canadian Council of Ministers of the Environment (CCME), 2008. Canada Wide Standards (CWS) for Petroleum Hydrocarbons in Soil. CCME 2008, as updated.

Canadian Council of Ministers of the Environment (CCME), 2007. Canadian Sediment Quality Guidelines (CSedQG) for the Protection of Aquatic Life. CCME 2007, as updated. (http://ceqg-rcqe.ccme.ca/)

Canadian Council of Ministers of the Environment (CCME), 2007. Canadian Water Quality Guidelines (CWQG) for the Protection of Aquatic Life. CCME 2007, as updated. (http://ceqg-rcqe.ccme.ca/)

Canadian Council of Ministers of the Environment (CCME), 1999. Canadian Environmental Quality Guidelines. CCME 1999, as updated. (http://ceqg-rcqe.ccme.ca/)

Dillon Consulting LTD. / Outcome Consultants Inc. (DOJV), 2020. Compliance Long-Term Monitoring at the Former Iqaluit Metal Dump and Community Landfill. March 2020.

Dillon Consulting LTD. / Outcome Consultants Inc. (DOJV), 2019. Compliance Long-Term Monitoring at the Former Iqaluit Metal Dump and Community Landfill. March 2019.

Nunavut Water Board (NWB) Licence No. 1BR-MDR1721. July 31, 2017.

USGS, 2012. Statistical Methods in Water Resources. (https://pubs.usgs.gov/twri/twri4a3/twri4a3.pdf)

Wisconsin Department of Natural Resources, 2003. Guidance of Natural Attenuation For Petroleum Releases. PUB-RR-614. March 2003.

FIGURES

Site Location

Hubbard Rd.

Akiliiq Rd

LEGEND

Road

Elevation Contour (10 m)

REV.	DESCRIPTION	YY/MM/DD	BY	CHK
1				

REFERENCES

DO NOT SCALE DRAWING.
THIS DRAWING MAY HAVE BEEN REDUCED. ALL SCALE NOTATIONS INDICATED ARE BASED ON 11"x17" FORMAT DRAWINGS.

N W E S

0 50 100 Metres

1:5,000

CLIENT

Public Service and Procurement Canada

PROJECT

Compliance Long Term Monitoring for Transport Canada at the Former Iqaluit Dump

TITLE

Site Location

4916 49th Street,
PO Box 11086
Yellowknife, NT, X1A 1P3
TEL: (867) 873-3500
FAX: (867) 873-3499
Email: info@blumetric.ca
Web: http://www.blumetric.ca

PROJECT #	DATE
200607-00	October 27, 2020

DRAWN	CHECKED	FIG NO.	REV
GM	HW	01	0

N:\GIS_PROJECTS\200000\200607 - P05950 - PSPC Iqaluit Former Metal Dump\MXD\2020-10-27\P05950 - Fig1-SiteLocation.mxd

LEGEND

- ArcadisSampleLocations
- Approximate Limit of Former Landfill
- Road
- Elevation Contour (10 m)

REV.	DESCRIPTION	YY/MM/DD	BY	CHK
1				

REFERENCES

N, W, E, S

0 50 100 Metres

1:2,000

CLIENT

Public Service and Procurement Canada

PROJECT

Compliance Long Term Monitoring for Transport Canada at the Former Iqaluit Dump

TITLE

Site Plan

BluMetric™ Environmental

4916 49th Street,
PO Box 11086
Yellowknife, NT, X1A 1P3
TEL: (867) 873-3500
FAX: (867) 873-3499
Email: info@blumetric.ca
Web: http://www.blumetric.ca

PROJECT #	DATE
200607-00	October 27, 2020

DRAWN	CHECKED	FIG NO.	REV
GM	HW	02	0

N:\GIS_PROJECTS\200000\200607 - P05950 - PSPC Iqaluit Former Metal Dump\MXD\2020-10-27\200607 - Fig2-SitePlan.mxd

LTM-SW7	9/19/2020	2020-09-19 DUP (SW9)
Zinc (mg/L)	250	12

LEGEND

- Sample Location
- Approximate Limit of Former Landfill
- Road
- Elevation Contour (10 m)

Parameter	CWQG[1]
Zinc (mg/L)	7

1 - Canadian Council of Members of the Environment (CCME), Canadian Water Quality Guidelines (CWQG) for the Protection of Aquatic Life. Long Term Exposure, Freshwater. (CCME, 2007, with updates)

REV.	DESCRIPTION	YY/MM/DD	BY	CHK
1				

REFERENCES

DO NOT SCALE DRAWING.
THIS DRAWING MAY HAVE BEEN REDUCED. ALL SCALE NOTATIONS INDICATED ARE BASED ON 11"x17" FORMAT DRAWINGS.

N
W E
S

0 50 100 Metres

1:2,000

CLIENT

Public Service and Procurement Canada

PROJECT

Compliance Long Term Monitoring for Transport Canada at the Former Iqaluit Dump

TITLE

Surface Water Environmental Quality Guideline Exceedances

BluMetric™ Environmental

4916 49th Street,
PO Box 11086
Yellowknife, NT, X1A 1P3
TEL: (867) 873-3500
FAX: (867) 873-3499
Email: info@blumetric.ca
Web: http://www.blumetric.ca

PROJECT #	DATE
200607	October 27, 2020

DRAWN	CHECKED	FIG NO.	REV
KH	HW	03	0

N:\GIS_PROJECTS\200000\200607 - P05950 - PSPC Iqaluit Former Metal Dump\MXD\2020-10-27\200607 - Fig3-SWExceedances.mxd

LTM-SD7	9/19/2020
Zinc (ug/g)	140
Total PCBs (ug/g)	0.082

LTM-SD3	9/19/2020
Chromium (ug/g)	38

LTM-SD6	9/19/2020
PHC F2 (ug/g)	2100
PHC F3 (ug/g)	1700
Cadmium (ug/g)	2.9
Lead (ug/g)	89
Zinc (ug/g)	280
Total PCBs (ug/g)	3.4

LTM-SD4	9/19/2020
Lead (ug/g)	110

LTM-SD5	9/19/2020	2020-09-19 DUP (SD9)
PHC F2 (ug/g)	440	160
PHC F3 (ug/g)	490	--
Cadmium (ug/g)	1.9	1.3
Lead (ug/g)	73	36
Zinc (ug/g)	210	130
Total PCBs (ug/g)	0.21	1.3

LEGEND

- Sample Location
- Approximate Limit of Former Landfill
- Road
- Elevation Contour (10 m)

Parameter	SQGPAL Freshwater [1] ISQG/PEL	SQGPAL Marine [2] ISQG/PEL	CWS [3] Residential/ Commercial
PHC F2 (ug/g)	NV	NV	150 / 260
PHC F3 (ug/g)	NV	NV	300 / 1700
Chromium (ug/g)	37.3 / 90	52.3 / 160	NA
Cadmium (ug/g)	0.6 / 3.5	0.7 / 4.2	NA
Lead (ug/g)	35 / 91.3	30.2 / 112	NA
Zinc (ug/g)	123 / 315	124 / 271	NA
Total PCBs (ug/g)	0.0341 / 0.277	0.0215 / 0.189	NA

1 - Canadian Council of Members of the Environment (CCME), Canadian Sediment Quality Guidelines for the Protection of Aquatic Life (SQGPAL), Freshwater (CCME, 1999 with updates)
2 - Canadian Council of Members of the Environment (CCME), Canadian Sediment Quality Guidelines for the Protection of Aquatic Life (SQGPAL), Marine. (CCME, 1999 with updates)
3 - Canadian Council of Members of the Environment (CCME) Canada-Wide Standards (CWS) for Petroleum Hydrocarbons in Soil, Residential/Commercial Use, Coarse Grained Soil (CCME, 2008)

REV.	DESCRIPTION	YY/MM/DD	BY	CHK
1				

REFERENCES

DO NOT SCALE DRAWING.
THIS DRAWING MAY HAVE BEEN REDUCED. ALL SCALE NOTATIONS INDICATED ARE BASED ON 11"x17" FORMAT DRAWINGS.

N W E S

0 50 100 Metres

1:2,000

CLIENT

Public Service and Procurement Canada

PROJECT

Compliance Long Term Monitoring for Transport Canada at the Former Iqaluit Dump

TITLE

Sediment Environmental Quality Guideline Exceedances

BluMetric™ Environmental

4916 49th Street,
PO Box 11086
Yellowknife, NT, X1A 1P3
TEL: (867) 873-3500
FAX: (867) 873-3499
Email: info@blumetric.ca
Web: http://www.blumetric.ca

PROJECT #	DATE
200607	**October 27, 2020**

DRAWN	CHECKED	FIG NO.	REV
KH	**HW**	**04**	**0**

N:\GIS_PROJECTS\200000\200607 - P05950 - PSPC Iqaluit Former Metal Dump\MXD\2020-10-27\200607 - Fig4-SedExceedances.mxd

TABLES

Table 3: Field Parameters and Purge Water Observations

Well ID	Date	TDS (NTU)	Temperature (°C)	Electrical Conductivity (µS/cm)	Dissolved Oxygen (mg/L)	pH	Oxygen Reducing Potential (mV)
LTM-SW1	2020-09-19	0.2	2.2	36.8	16.69	7.43	81
LTM-SW2	2020-09-19	0.1	2.99	26.0	10.18	7.83	112
LTM-SW3	2020-09-19	3.8	2.36	21.8	15.52	7.47	98
LTM-SW4	2020-09-19	0.4	2.27	25.7	18.18	7.87	58
LTM-SW5	2020-09-19	1.3	2.3	22.1	19.2	8.49	40
LTM-SW6	2020-09-19	0.2	1.11	0.22	16.18	8.19	61
LTM-SW7	2020-09-19	0.6	2.23	0.101	18.81	10.02	138
LTM-SW8	2020-09-19	2.3	1.92	0.114	26.86	8.94	184

Notes:

NTU - Nephelometric Turbidity Unit

°C - Degrees Celcius

µS/cm - Microsiemens per Centimeter

mg/L - Milligrams per Liter

Table 4: Surface Water Analytical Results - General Chemistry

Sample ID	RDL	Units	CWQG Freshwater[1]	CWQG Marine[2]	LTM1	DUP 1	LTM1-SW1-18	LTM1-SW1-19	LTM2-DUP-19-SW	LTM-SW1	LTM2	LTM2	LTM1-SW2-18
Date Sampled					2017-09-21	2017-09-21	2018-09-19	2019-07-30	2019-07-30	2020-09-19	2017-09-21	2017-10-03	2018-09-19
BV Labs ID					--	--	--	--	--	NSD389	--	--	--
Hardness (CaCO3)	1.0	mg/L	NV	NV	--	--	350	300	280	3600	--	--	250
Conductivity	1.0	mS/cm	NV	NV	--	--	3.13	1.16	--	32	--	--	2.56
Total Dissolved Solids	10.0	mg/L	NV	NV	--	--	1,880	1,520	1,410	24400	--	--	1340
pH	NV	pH	6.5 - 9.0	7.0 - 8.7	7.67	7.63	7.59	7.24	7.38	7.51	7.67	6.64	7.49
Total Suspended Solids	1	mg/L	NV	NV	--	--	7	2	3	11	--	--	1

Notes:

10 Exceeds Applicable CCME Criteria

1 - Canadian Council of Members of the Environment (CCME), Canadian Water Quality Guidelines (CWQG) for the Protection of Aquatic Life. Longterm Exposure, Freshwater. (CCME, 2007, with updates)

2 - Canadian Council of Members of the Environment (CCME), Canadian Water Quality Guidelines (CWQG) for the Protection of Aquatic Life. Longterm Exposure, Marine. (CCME, 2007, with updates)

mS/cm - microsiemens per centimeter

mg/L - milligrams per litre

NV - No Value

RDL - Reportable Detection Limit

Table 4: Surface Water Analytical Results - General Chemistry

Sample ID	RDL	Units	CWQG Freshwater[1]	CWQG Marine[2]	LTM2-SW2-19	LTM-SW2	LTM3	LTM3	LTM1-SW3-18	LTM2-SW3-19	LTM-SW3	LTM4	LTM4
Date Sampled					2019-07-30	2020-09-19	2017-09-21	2017-10-03	2018-09-19	2019-07-30	2020-09-19	2017-09-21	2017-10-03
BV Labs ID					--	NSD390	--	--	--	--	NSD391	--	--
Hardness (CaCO3)	1.0	mg/L	NV	NV	310	2500	--	--	840	1000	2000	--	--
Conductivity	1.0	mS/cm	NV	NV	2.90	22	--	--	8.92	8.44	19	--	--
Total Dissolved Solids	10.0	mg/L	NV	NV	1700	15400	--	--	4740	5760	12400	--	--
pH	NV	pH	6.5 - 9.0	7.0 - 8.7	7.77	7.48	7.53	6.79	7.52	8.22	7.69	7.64	7.43
Total Suspended Solids	1	mg/L	NV	NV	6	12	--	--	5	3	7	--	--

Notes:

10 Exceeds Applicable CCME Criteria

1 - Canadian Council of Members of the Environment (CCME), Canadian Water Quality Guidelines (CWQG) for the Protection of Aquatic Life. Longterm Exposure, Freshwater. (CCME, 2007, with updates)

2 - Canadian Council of Members of the Environment (CCME), Canadian Water Quality Guidelines (CWQG) for the Protection of Aquatic Life. Longterm Exposure, Marine. (CCME, 2007, with updates)

mS/cm - microsiemens per centimeter

mg/L - milligrams per litre

NV - No Value

RDL - Reportable Detection Limit

Table 4: Surface Water Analytical Results - General Chemistry

Sample ID	RDL	Units	CWQG Freshwater[1]	CWQG Marine[2]	LTM1-SW4-18	LTM2-SW4-19	LTM-SW4	LTM5	LTM5	LTM1-SW5-18	LTM2-SW5-19	LTM-SW5	LTM6
Date Sampled					2018-09-19	2019-07-30	2020-09-19	2017-09-21	2017-10-03	2018-09-19	2019-07-30	2020-09-19	2017-09-21
BV Labs ID					--	--	NSD392	--	--	--	--	NSD393	--
Hardness (CaCO3)	1.0	mg/L	NV	NV	110	440	2500	--	--	46	71	1700	--
Conductivity	1.0	mS/cm	NV	NV	1.27	4.09	23	--	--	0.15	0.13	17	--
Total Dissolved Solids	10.0	mg/L	NV	NV	395	2630	16300	--	--	170	110	11200	--
pH	NV	pH	6.5 - 9.0	7.0 - 8.7	7.62	8.37	7.72	7.61	7.41	7.45	7.70	7.44	7.63
Total Suspended Solids	1	mg/L	NV	NV	1	2	13	--	--	28	5	10	--

Notes:

10 Exceeds Applicable CCME Criteria

1 - Canadian Council of Members of the Environment (CCME), Canadian Water Quality Guidelines (CWQG) for the Protection of Aquatic Life. Longterm Exposure, Freshwater. (CCME, 2007, with updates)

2 - Canadian Council of Members of the Environment (CCME), Canadian Water Quality Guidelines (CWQG) for the Protection of Aquatic Life. Longterm Exposure, Marine. (CCME, 2007, with updates)

mS/cm - microsiemens per centimeter

mg/L - milligrams per litre

NV - No Value

RDL - Reportable Detection Limit

Table 4: Surface Water Analytical Results - General Chemistry

Sample ID	RDL	Units	CWQG Freshwater[1]	CWQG Marine[2]	LTM6	LTM1-SW6-18	LTM2-SW6-19	LTM-SW6	LTM7	LTM7	DUP2	LTM1-SW7-18	LTM2-SW7-19
Date Sampled					2017-10-03	2018-09-19	2019-07-31	2020-09-19	2017-09-21	2017-10-03	2017-10-03	2018-09-19	2019-07-30
BV Labs ID					--	--	--	NSD394	--	--	--	--	--
Hardness (CaCO3)	1.0	mg/L	NV	NV	--	44	70	89	--	--	--	50	65
Conductivity	1.0	mS/cm	NV	NV	--	0.11	0.15	0.28	--	--	--	0.12	0.13
Total Dissolved Solids	10.0	mg/L	NV	NV	--	130	85	165	--	--	--	80	95
pH	NV	pH	6.5 - 9.0	7.0 - 8.7	7.37	7.42	7.59	7.60	7.31	7.23	7.22	7.29	7.22
Total Suspended Solids	1	mg/L	NV	NV	--	64	42	3	--	--	--	1	530

Notes:

10 Exceeds Applicable CCME Criteria

1 - Canadian Council of Members of the Environment (CCME), Canadian Water Quality Guidelines (CWQG) for the Protection of Aquatic Life. Longterm Exposure, Freshwater. (CCME, 2007, with updates)

2 - Canadian Council of Members of the Environment (CCME), Canadian Water Quality Guidelines (CWQG) for the Protection of Aquatic Life. Longterm Exposure, Marine. (CCME, 2007, with updates)

mS/cm - microsiemens per centimeter

mg/L - milligrams per litre

NV - No Value

RDL - Reportable Detection Limit

Table 4: Surface Water Analytical Results - General Chemistry

Sample ID	RDL	Units	CWQG Freshwater[1]	CWQG Marine[2]	LTM-SW7	LTM-SW9 (DUP of SW7)	LTM2-SW8-19	LTM-SW8
Date Sampled					2020-09-19	2020-09-19	2019-07-31	2020-09-19
BV Labs ID					NSD395	NSD397	--	NSD396
Hardness (CaCO3)	1.0	mg/L	NV	NV	28	21	74	44
Conductivity	1.0	mS/cm	NV	NV	0.10	0.09	0.12	0.12
Total Dissolved Solids	10.0	mg/L	NV	NV	85	90	115	100
pH	NV	pH	6.5 - 9.0	7.0 - 8.7	7.13	6.87	7.19	7.09
Total Suspended Solids	1	mg/L	NV	NV	61	14	12	8

Notes:

10 Exceeds Applicable CCME Criteria

1 - Canadian Council of Members of the Environment (CCME), Canadian Water Quality Guidelines (CWQG) for the Protection of Aquatic Life. Longterm Exposure, Freshwater. (CCME, 2007, with updates)

2 - Canadian Council of Members of the Environment (CCME), Canadian Water Quality Guidelines (CWQG) for the Protection of Aquatic Life. Longterm Exposure, Marine. (CCME, 2007, with updates)

mS/cm - microsiemens per centimeter

mg/L - milligrams per litre

NV - No Value

RDL - Reportable Detection Limit

Table 5: Surface Water Analytical Results - Total Metals

Sample ID		RDL	Units	CWQG Freshwater[1]	CWQG Marine[2]	LTM1	DUP1	LTM1-SW1-18	LTM2-SW1-19	LTM2-DUP-19- SW	LTM-SW1	LTM2	LTM2
Date Sampled						2017-09-21	2017-09-21	2018-09-19	2019-07-30	2019-07-30	2020-09-19	2017-09-21	2017-10-03
BV Labs ID						--	--	--	--	--	NSD389	--	--
Total Arsenic (As)		1.0	ug/L	5	12.5	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<0.10	<0.10
Total Cadmium (Cd)		0.1	ug/L	0.09[3]	0.12	<0.10	<0.10	<0.10	<0.10	<0.10	<0.45	<0.010	0.111
Total Chromium (Cr)		1.0	ug/L	NV	NV	<10	<10	<5	<5.0	<5.0	<25	<1.0	<1.0
Total Cobalt (Co)		0.1	ug/L	NV	NV	<2.0	<2.0	<0.50	<0.50	<0.50	<2.5	<0.20	0.33
Total Lead (Pb)		1.0	ug/L	7[5]	NV	<2.0	<2.0	<0.5	<0.50	<0.50	<2.5	0.64	2.31
Total Nickel (Ni)		0.5	ug/L	150[7]	NV	<10	<10	<1	<1.0	<1.0	<5.0	<1.0	1.3
Total Zinc (Zn)		5.0	ug/L	7	NV	<50	<50	5.6	<5.0	<5.0	<25	<5.0	14.7

Notes:

10 Exceeds Applicable CCME Criteria

1 - Canadian Council of Members of the Environment (CCME), Canadian Water Quality Guidelines (CWQG) for the Protection of Aquatic Life. Longterm Exposure, Freshwater. (CCME, 2007, with updates)

2 - Canadian Council of Members of the Environment (CCME), Canadian Water Quality Guidelines (CWQG) for the Protection of Aquatic Life. Longterm Exposure, Marine. (CCME, 2007, with updates)

3 - If Hardness > 280 mg/L CWQG is 0.37 ug/L, if hardness is < 17 mg/L CWQG is 0.04 ug/L, if hardness is > 17 and < 280 mg/L CWQG is calculated.

4 - If Hardness > 180 mg/L CWQG is 4 ug/L, if hardness if < 82 mg/L CWQG is 2 ug/L, if hardness is > 82 and < 180 mg/L the CWQG is calculated.

5 - If Hardness > 180 mg/L CWQG is 7 ug/L, if hardness if < 60 mg/L CWQG is 1 ug/L, if hardness is > 60 and < 180 mg/L the CWQG is calculated.

6 - Variable, calculated.

7 - If Hardness > 180 mg/L CWQG is 150 ug/L, if hardness if < 60 mg/L CWQG is 25 ug/L, if hardness is > 60 and < 180 mg/L the CWQG is calculated.

ug/L - micrograms per litre

NV - No Value

RDL - Reportable Detection Limit

Table 5: Surface Water Analytical Results - Total Metals

Sample ID		RDL	Units	CWQG Freshwater[1]	CWQG Marine[2]	LTM1-SW2-18	LTM2-SW2-19	LTM-SW2	LTM3	LTM3	LTM1-SW3-18	LTM2-SW3-19	LTM-SW3
Date Sampled						2018-09-19	2019-07-30	2020-09-19	2017-09-21	2017-10-03	2018-09-19	2019-07-30	2020-09-19
BV Labs ID						--	--	NSD390	--	--	--	--	NSD391
Total Arsenic (As)		1.0	ug/L	5	12.5	<1.0	<1.0	<5.0	<0.50	0.6	<1.0	<1.0	<5.0
Total Cadmium (Cd)		0.1	ug/L	0.09[3]	0.12	<0.10	<0.10	<0.45	<0.050	0.017	<0.10	<0.10	<0.45
Total Chromium (Cr)		1.0	ug/L	NV	NV	<5	<5.0	<25	<5.0	<1.0	<5	<5.0	<25
Total Cobalt (Co)		0.1	ug/L	NV	NV	<0.50	<0.50	<2.5	<1.0	0.54	<0.50	<0.50	<2.5
Total Lead (Pb)		1.0	ug/L	7[5]	NV	<0.5	<0.50	<2.5	<1.0	12.9	<0.5	<0.50	<2.5
Total Nickel (Ni)		0.5	ug/L	150[7]	NV	<1	<1.0	<5.0	<5.0	2.5	<1	<1.0	<5.0
Total Zinc (Zn)		5.0	ug/L	7	NV	<5	<5.0	<25	68	18.4	<5	<5.0	<25

Notes:

10 Exceeds Applicable CCME Criteria

1 - Canadian Council of Members of the Environment (CCME), Canadian Water Quality Guidelines (CWQG) for the Protection of Aquatic Life. Longterm Exposure, Freshwater. (CCME, 2007, with updates)

2 - Canadian Council of Members of the Environment (CCME), Canadian Water Quality Guidelines (CWQG) for the Protection of Aquatic Life. Longterm Exposure, Marine. (CCME, 2007, with updates)

3 - If Hardness > 280 mg/L CWQG is 0.37 ug/L, if hardness is < 17 mg/L CWQG is 0.04 ug/L, if hardness is > 17 and < 280 mg/L CWQG is calculated.

4 - If Hardness > 180 mg/L CWQG is 4 ug/L, if hardness if < 82 mg/L CWQG is 2 ug/L, if hardness is > 82 and < 180 mg/L the CWQG is calculated.

5 - If Hardness > 180 mg/L CWQG is 7 ug/L, if hardness if < 60 mg/L CWQG is 1 ug/L, if hardness is > 60 and < 180 mg/L the CWQG is calculated.

6 - Variable, calculated.

7 - If Hardness > 180 mg/L CWQG is 150 ug/L, if hardness if < 60 mg/L CWQG is 25 ug/L, if hardness is > 60 and < 180 mg/L the CWQG is calculated.

ug/L - micrograms per litre

NV - No Value

RDL - Reportable Detection Limit

Table 5: Surface Water Analytical Results - Total Metals

Sample ID		RDL	Units	CWQG Freshwater[1]	CWQG Marine[2]	LTM4	LTM4	LTM1-SW4-18	LTM2-SW4-19	LTM-SW4	LTM5	LTM5	LTM1-SW5-18
Date Sampled						2017-09-21	2017-10-03	2018-09-19	2019-07-30	2020-09-19	2017-09-21	2017-10-03	2018-09-19
BV Labs ID						--	--	--	--	NSD392	--	--	--
Total Arsenic (As)		1.0	ug/L	5	12.5	<0.10	<0.10	<1.0	<1.0	<5.0	<0.10	<0.10	<1.0
Total Cadmium (Cd)		0.1	ug/L	0.09[3]	0.12	0.021	0.04	<0.10	<0.10	<0.45	0.035	0.043	0.14
Total Chromium (Cr)		1.0	ug/L	NV	NV	<1.0	<1.0	<5	<5.0	<25	<1.0	<1.0	<5
Total Cobalt (Co)		0.1	ug/L	NV	NV	<0.20	<0.20	<0.50	<0.50	<2.5	<0.20	0.22	0.54
Total Lead (Pb)		1.0	ug/L	7[5]	NV	<0.20	<0.20	<0.5	<0.50	<2.5	0.26	<0.20	1.8
Total Nickel (Ni)		0.5	ug/L	150[7]	NV	<1.0	<1.0	<1	<1.0	<5.0	<1.0	<1.0	<1
Total Zinc (Zn)		5.0	ug/L	7	NV	<5.0	5.3	<5	<5.0	<25	5.7	28	16

Notes:

10 Exceeds Applicable CCME Criteria

1 - Canadian Council of Members of the Environment (CCME), Canadian Water Quality Guidelines (CWQG) for the Protection of Aquatic Life. Longterm Exposure, Freshwater. (CCME, 2007, with updates)

2 - Canadian Council of Members of the Environment (CCME), Canadian Water Quality Guidelines (CWQG) for the Protection of Aquatic Life. Longterm Exposure, Marine. (CCME, 2007, with updates)

3 - If Hardness > 280 mg/L CWQG is 0.37 ug/L, if hardness is < 17 mg/L CWQG is 0.04 ug/L, if hardness is > 17 and < 280 mg/L CWQG is calculated.

4 - If Hardness > 180 mg/L CWQG is 4 ug/L, if hardness if < 82 mg/L CWQG is 2 ug/L, if hardness is > 82 and < 180 mg/L the CWQG is calculated.

5 - If Hardness > 180 mg/L CWQG is 7 ug/L, if hardness if < 60 mg/L CWQG is 1 ug/L, if hardness is > 60 and < 180 mg/L the CWQG is calculated.

6 - Variable, calculated.

7 - If Hardness > 180 mg/L CWQG is 150 ug/L, if hardness if < 60 mg/L CWQG is 25 ug/L, if hardness is > 60 and < 180 mg/L the CWQG is calculated.

ug/L - micrograms per litre

NV - No Value

RDL - Reportable Detection Limit

Table 5: Surface Water Analytical Results - Total Metals

Sample ID		RDL	Units	CWQG Freshwater[1]	CWQG Marine[2]	LTM2-SW5-19	LTM-SW5	LTM6	LTM6	LTM1-SW6-18	LTM2-SW6-19	LTM-SW6	LTM7
Date Sampled						2019-07-30	2020-09-19	2017-09-21	2017-10-03	2018-09-19	2019-07-31	2020-09-19	2017-09-21
BV Labs ID						--	NSD393	--	--	--	--	NSD394	--
Total Arsenic (As)		1.0	ug/L	5	12.5	<1.0	<5.0	<0.10	<0.10	<1	<1.0	<1.0	0.15
Total Cadmium (Cd)		0.1	ug/L	0.09[3]	0.12	<0.10	<0.45	0.025	0.043	0.15	<0.10	<0.090	<0.010
Total Chromium (Cr)		1.0	ug/L	NV	NV	<5.0	<25	<1.0	<1.0	<5	<5.0	<5.0	<1.0
Total Cobalt (Co)		0.1	ug/L	NV	NV	<0.50	<2.5	<0.20	0.26	0.68	<0.50	<0.50	<0.20
Total Lead (Pb)		1.0	ug/L	7[5]	NV	<0.50	<2.5	<0.20	<0.20	2.4	0.51	<0.50	0.21
Total Nickel (Ni)		0.5	ug/L	150[7]	NV	<1.0	<5.0	<1.0	<1.0	<1	<1.0	<1.0	<1.0
Total Zinc (Zn)		5.0	ug/L	7	NV	<5.0	<25	14.4	9.1	16	<5.0	<5.0	40.8

Notes:

10 Exceeds Applicable CCME Criteria

1 - Canadian Council of Members of the Environment (CCME), Canadian Water Quality Guidelines (CWQG) for the Protection of Aquatic Life. Longterm Exposure, Freshwater. (CCME, 2007, with updates)

2 - Canadian Council of Members of the Environment (CCME), Canadian Water Quality Guidelines (CWQG) for the Protection of Aquatic Life. Longterm Exposure, Marine. (CCME, 2007, with updates)

3 - If Hardness > 280 mg/L CWQG is 0.37 ug/L, if hardness is < 17 mg/L CWQG is 0.04 ug/L, if hardness is > 17 and < 280 mg/L CWQG is calculated.

4 - If Hardness > 180 mg/L CWQG is 4 ug/L, if hardness if < 82 mg/L CWQG is 2 ug/L, if hardness is > 82 and < 180 mg/L the CWQG is calculated.

5 - If Hardness > 180 mg/L CWQG is 7 ug/L, if hardness if < 60 mg/L CWQG is 1 ug/L, if hardness is > 60 and < 180 mg/L the CWQG is calculated.

6 - Variable, calculated.

7 - If Hardness > 180 mg/L CWQG is 150 ug/L, if hardness if < 60 mg/L CWQG is 25 ug/L, if hardness is > 60 and < 180 mg/L the CWQG is calculated.

ug/L - micrograms per litre

NV - No Value

RDL - Reportable Detection Limit

Table 5: Surface Water Analytical Results - Total Metals

Sample ID		RDL	Units	CWQG Freshwater[1]	CWQG Marine[2]	LTM7	DUP2	LTM1-SW7-18	LTM2-SW7-19	LTM-SW7	LTM-SW9 (DUP of SW7)	LTM2-SW8-19	LTM-SW8
Date Sampled						2017-10-03	2017-10-03	2018-09-19	2019-07-30	2020-09-19	2020-09-19	2019-07-31	2020-09-19
BV Labs ID						--	--	--	--	NSD395	NSD397	--	NSD396
Total Arsenic (As)		1.0	ug/L	5	12.5	0.17	0.17	<1.0	1.2	<1.0	<1.0	<1.0	<1.0
Total Cadmium (Cd)		0.1	ug/L	0.09[3]	0.12	0.01300	0.01900	<0.1	0.23	<0.090	<0.090	<0.10	<0.090
Total Chromium (Cr)		1.0	ug/L	NV	NV	<1.0	<1.0	<5	<5.0	<5.0	<5.0	<5.0	<5.0
Total Cobalt (Co)		0.1	ug/L	NV	NV	0.56	0.62	<0.50	6.8	0.64	3.9	1.9	<0.50
Total Lead (Pb)		1.0	ug/L	7[5]	NV	0.61	0.62	<0.5	11	<0.50	<0.50	<0.50	<0.50
Total Nickel (Ni)		0.5	ug/L	150[7]	NV	<1.0	1.3	<1	4.2	1.2	1.2	1.1	<1.0
Total Zinc (Zn)		5.0	ug/L	7	NV	223	254	57	640	250	12	7.9	6.2

Notes:

10 Exceeds Applicable CCME Criteria

1 - Canadian Council of Members of the Environment (CCME), Canadian Water Quality Guidelines (CWQG) for the Protection of Aquatic Life. Longterm Exposure, Freshwater. (CCME, 2007, with updates)

2 - Canadian Council of Members of the Environment (CCME), Canadian Water Quality Guidelines (CWQG) for the Protection of Aquatic Life. Longterm Exposure, Marine. (CCME, 2007, with updates)

3 - If Hardness > 280 mg/L CWQG is 0.37 ug/L, if hardness is < 17 mg/L CWQG is 0.04 ug/L, if hardness is > 17 and < 280 mg/L CWQG is calculated.

4 - If Hardness > 180 mg/L CWQG is 4 ug/L, if hardness if < 82 mg/L CWQG is 2 ug/L, if hardness is > 82 and < 180 mg/L the CWQG is calculated.

5 - If Hardness > 180 mg/L CWQG is 7 ug/L, if hardness if < 60 mg/L CWQG is 1 ug/L, if hardness is > 60 and < 180 mg/L the CWQG is calculated.

6 - Variable, calculated.

7 - If Hardness > 180 mg/L CWQG is 150 ug/L, if hardness if < 60 mg/L CWQG is 25 ug/L, if hardness is > 60 and < 180 mg/L the CWQG is calculated.

ug/L - micrograms per litre

NV - No Value

RDL - Reportable Detection Limit

Table 6: Surface Water Analytical Results - BTEX and PHCs

Sample ID	RDL	Units	CWQG Freshwater[1]	CWQG Marine[2]	Alberta Tier 1[3]	LTM1	DUP1	LTM1-SW1-18	LTM2-SW1-19	LTM2-DUP-19-SW	LTM-SW1	LTM2
Date Sampled						2017-09-21	2017-09-21	2018-09-19	2019-07-30	2019-07-30	2020-09-19	2017-09-21
BV Labs ID						--	--	--	--	--	NSD389	--
BTEX												
Benzene	0.20	ug/L	370	110	NV	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Ethylbenzene	0.20	ug/L	90	25	NV	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Toluene	0.20	ug/L	2	215	NV	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
o-Xylene	0.20	ug/L	NV	NV	NV	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
m+p-Xylene	0.40	ug/L	NV	NV	NV	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Xylenes	0.40	ug/L	74	NV	NV	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Hydrocarbons												
F1 (C6-C10)	25	ug/L	NV	NV	2200	<25	<25	<25	<25	<25	<25	<25
F1 (C6-C10) - BTEX	25	ug/L	NV	NV	NV	<25	<25	<25	<25	<25	<25	<25
F2 (C10-C16)	100	ug/L	NV	NV	1100	<100	<100	<100	<100	<100	<100	<100
F3 (C16-C34)	200	ug/L	NV	NV	NV	<200	<200	<200	<200	<200	<200	<200
F4 (C34-C50)	200	ug/L	NV	NV	NV	<200	<200	<200	<200	<200	<200	<200
Reached Baseline at C50	NA	NA	NV	NV	NV	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes:

10 Exceeds Applicable CCME Criteria

1 - Canadian Council of Members of the Environment (CCME), Canadian Water Quality Guidelines (CWQG) for the Protection of Aquatic Life. Longterm Exposure, Freshwater. (CCME, 2007, with updates)

2 - Canadian Council of Members of the Environment (CCME), Canadian Water Quality Guidelines (CWQG) for the Protection of Aquatic Life. Longterm Exposure, Marine. (CCME, 2007, with updates)

3 - Alberta Government, Alberta Tier 1 Soil and Groundwater Guidelines. Table 2. (AEP, 2019)

ug/L - micrograms per litre

NV - No Value

RDL - Reportable Detection Limit

Table 6: Surface Water Analytical Results - BTEX and PHCs

Sample ID	RDL	Units	CWQG Freshwater[1]	CWQG Marine[2]	Alberta Tier 1[3]	LTM2	LTM1-SW2-18	LTM2-SW2-19	LTM-SW2	LTM3	LTM3	LTM1-SW3-18
Date Sampled						2017-10-03	2018-09-19	2019-07-30	2020-09-19	2017-09-21	2017-10-03	2018-09-19
BV Labs ID						--	--	--	NSD390	--	--	--
BTEX												
Benzene	0.20	ug/L	370	110	NV	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Ethylbenzene	0.20	ug/L	90	25	NV	<0.20	<0.20	<0.20	<0.20	<0.20	0.69	<0.20
Toluene	0.20	ug/L	2	215	NV	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
o-Xylene	0.20	ug/L	NV	NV	NV	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
m+p-Xylene	0.40	ug/L	NV	NV	NV	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Xylenes	0.40	ug/L	74	NV	NV	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Hydrocarbons												
F1 (C6-C10)	25	ug/L	NV	NV	2200	<25	<25	<25	<25	<25	56	<25
F1 (C6-C10) - BTEX	25	ug/L	NV	NV	NV	<25	<25	<25	<25	<25	56	<25
F2 (C10-C16)	100	ug/L	NV	NV	1100	<100	<100	<100	<100	<100	<100	<100
F3 (C16-C34)	200	ug/L	NV	NV	NV	<200	<200	<200	<200	<200	<200	<200
F4 (C34-C50)	200	ug/L	NV	NV	NV	<200	<200	<200	<200	<200	<200	<200
Reached Baseline at C50	NA	NA	NV	NV	NV	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes:

10 Exceeds Applicable CCME Criteria

1 - Canadian Council of Members of the Environment (CCME), Canadian Water Quality Guidelines (CWQG) for the Protection of Aquatic Life. Longterm Exposure, Freshwater. (CCME, 2007, with updates)

2 - Canadian Council of Members of the Environment (CCME), Canadian Water Quality Guidelines (CWQG) for the Protection of Aquatic Life. Longterm Exposure, Marine. (CCME, 2007, with updates)

3 - Alberta Government, Alberta Tier 1 Soil and Groundwater Guidelines. Table 2. (AEP, 2019)

ug/L - micrograms per litre

NV - No Value

RDL - Reportable Detection Limit

Table 6: Surface Water Analytical Results - BTEX and PHCs

Sample ID	RDL	Units	CWQG Freshwater[1]	CWQG Marine[2]	Alberta Tier 1[3]	LTM2-SW3-19	LTM-SW3	LTM4	LTM4	LTM1-SW4-18	LTM2-SW4-19	LTM-SW4
Date Sampled						2019-07-30	2020-09-19	2017-09-21	2017-10-03	2018-09-19	2019-07-30	2020-09-19
BV Labs ID						--	NSD391	--	--	--	--	NSD392
BTEX												
Benzene	0.20	ug/L	370	110	NV	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Ethylbenzene	0.20	ug/L	90	25	NV	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Toluene	0.20	ug/L	2	215	NV	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
o-Xylene	0.20	ug/L	NV	NV	NV	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
m+p-Xylene	0.40	ug/L	NV	NV	NV	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Xylenes	0.40	ug/L	74	NV	NV	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Hydrocarbons												
F1 (C6-C10)	25	ug/L	NV	NV	2200	<25	<25	<25	<25	<25	<25	<25
F1 (C6-C10) - BTEX	25	ug/L	NV	NV	NV	<25	<25	<25	<25	<25	<25	<25
F2 (C10-C16)	100	ug/L	NV	NV	1100	<100	<100	<100	<100	<100	<100	<100
F3 (C16-C34)	200	ug/L	NV	NV	NV	<200	<200	<200	<200	<200	<200	<200
F4 (C34-C50)	200	ug/L	NV	NV	NV	<200	<200	<200	<200	<200	<200	<200
Reached Baseline at C50	NA	NA	NV	NV	NV	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes:

10 Exceeds Applicable CCME Criteria

1 - Canadian Council of Members of the Environment (CCME), Canadian Water Quality Guidelines (CWQG) for the Protection of Aquatic Life. Longterm Exposure, Freshwater. (CCME, 2007, with updates)

2 - Canadian Council of Members of the Environment (CCME), Canadian Water Quality Guidelines (CWQG) for the Protection of Aquatic Life. Longterm Exposure, Marine. (CCME, 2007, with updates)

3 - Alberta Government, Alberta Tier 1 Soil and Groundwater Guidelines. Table 2. (AEP, 2019)

ug/L - micrograms per litre

NV - No Value

RDL - Reportable Detection Limit

Table 6: Surface Water Analytical Results - BTEX and PHCs

Sample ID	RDL	Units	CWQG Freshwater[1]	CWQG Marine[2]	Alberta Tier 1[3]	LTM5	LTM5	LTM1-SW5-18	LTM2-SW5-19	LTM-SW5	LTM6	LTM6
Date Sampled						2017-09-21	2017-10-03	2018-09-19	2019-07-30	2020-09-19	2017-09-21	2017-10-03
BV Labs ID						--	--	--	--	NSD393	--	--
BTEX												
Benzene	0.20	ug/L	370	110	NV	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Ethylbenzene	0.20	ug/L	90	25	NV	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Toluene	0.20	ug/L	2	215	NV	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
o-Xylene	0.20	ug/L	NV	NV	NV	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
m+p-Xylene	0.40	ug/L	NV	NV	NV	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Xylenes	0.40	ug/L	74	NV	NV	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Hydrocarbons												
F1 (C6-C10)	25	ug/L	NV	NV	2200	<25	<25	<25	<25	<25	<25	<25
F1 (C6-C10) - BTEX	25	ug/L	NV	NV	NV	<25	<25	<25	<25	<25	<25	<25
F2 (C10-C16)	100	ug/L	NV	NV	1100	<100	<100	<100	<100	<100	<100	<100
F3 (C16-C34)	200	ug/L	NV	NV	NV	<200	<200	<200	<200	<200	<200	<200
F4 (C34-C50)	200	ug/L	NV	NV	NV	<200	<200	<200	<200	<200	<200	<200
Reached Baseline at C50	NA	NA	NV	NV	NV	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes:

10 Exceeds Applicable CCME Criteria

1 - Canadian Council of Members of the Environment (CCME), Canadian Water Quality Guidelines (CWQG) for the Protection of Aquatic Life. Longterm Exposure, Freshwater. (CCME, 2007, with updates)

2 - Canadian Council of Members of the Environment (CCME), Canadian Water Quality Guidelines (CWQG) for the Protection of Aquatic Life. Longterm Exposure, Marine. (CCME, 2007, with updates)

3 - Alberta Government, Alberta Tier 1 Soil and Groundwater Guidelines. Table 2. (AEP, 2019)

ug/L - micrograms per litre

NV - No Value

RDL - Reportable Detection Limit

Table 6: Surface Water Analytical Results - BTEX and PHCs

Sample ID	RDL	Units	CWQG Freshwater[1]	CWQG Marine[2]	Alberta Tier 1[3]	LTM1-SW6-18	LTM2-SW6-19	LTM-SW6	LTM7	LTM7	DUP2	LTM1-SW7-18
Date Sampled						2018-09-19	2019-07-31	2020-09-19	2017-09-21	2017-10-03	2017-10-03	2018-09-19
BV Labs ID						--	--	NSD394	--	--	--	--
BTEX												
Benzene	0.20	ug/L	370	110	NV	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Ethylbenzene	0.20	ug/L	90	25	NV	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Toluene	0.20	ug/L	2	215	NV	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
o-Xylene	0.20	ug/L	NV	NV	NV	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
m+p-Xylene	0.40	ug/L	NV	NV	NV	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Xylenes	0.40	ug/L	74	NV	NV	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Hydrocarbons												
F1 (C6-C10)	25	ug/L	NV	NV	2200	<25	<25	<25	<25	<25	<25	<25
F1 (C6-C10) - BTEX	25	ug/L	NV	NV	NV	<25	<25	<25	<25	<25	<25	<25
F2 (C10-C16)	100	ug/L	NV	NV	1100	<100	<100	<100	<100	<100	<100	<100
F3 (C16-C34)	200	ug/L	NV	NV	NV	<200	<200	<200	<200	<200	<200	<200
F4 (C34-C50)	200	ug/L	NV	NV	NV	<200	<200	<200	<200	<200	<200	<200
Reached Baseline at C50	NA	NA	NV	NV	NV	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes:

10 Exceeds Applicable CCME Criteria

1 - Canadian Council of Members of the Environment (CCME), Canadian Water Quality Guidelines (CWQG) for the Protection of Aquatic Life. Longterm Exposure, Freshwater. (CCME, 2007, with updates)

2 - Canadian Council of Members of the Environment (CCME), Canadian Water Quality Guidelines (CWQG) for the Protection of Aquatic Life. Longterm Exposure, Marine. (CCME, 2007, with updates)

3 - Alberta Government, Alberta Tier 1 Soil and Groundwater Guidelines. Table 2. (AEP, 2019)

ug/L - micrograms per litre

NV - No Value

RDL - Reportable Detection Limit

Table 6: Surface Water Analytical Results - BTEX and PHCs

Sample ID	RDL	Units	CWQG Freshwater[1]	CWQG Marine[2]	Alberta Tier 1[3]	LTM2-SW7-19	LTM-SW7	LTM-SW9 (DUP of SW7)	LTM2-SW8-19	LTM-SW8
Date Sampled						2019-07-30	2020-09-19	2020-09-19	2019-07-31	2020-09-19
BV Labs ID						--	NSD395	NSD397	--	NSD396
BTEX										
Benzene	0.20	ug/L	370	110	NV	<0.20	<0.20	<0.20	<0.20	<0.20
Ethylbenzene	0.20	ug/L	90	25	NV	<0.20	<0.20	<0.20	<0.20	0.35
Toluene	0.20	ug/L	2	215	NV	1.1	<0.20	<0.20	<0.20	<0.20
o-Xylene	0.20	ug/L	NV	NV	NV	<0.20	<0.20	<0.20	<0.20	<0.20
m+p-Xylene	0.40	ug/L	NV	NV	NV	<0.40	<0.40	<0.40	<0.40	<0.40
Xylenes	0.40	ug/L	74	NV	NV	<0.40	<0.40	<0.40	<0.40	<0.40
Hydrocarbons										
F1 (C6-C10)	25	ug/L	NV	NV	2200	<25	<25	<25	<25	<25
F1 (C6-C10) - BTEX	25	ug/L	NV	NV	NV	<25	<25	<25	<25	<25
F2 (C10-C16)	100	ug/L	NV	NV	1100	<100	<100	<100	<100	<100
F3 (C16-C34)	200	ug/L	NV	NV	NV	<200	<200	<200	<200	<200
F4 (C34-C50)	200	ug/L	NV	NV	NV	<200	<200	<200	<200	<200
Reached Baseline at C50	NA	NA	NV	NV	NV	Yes	Yes	Yes	Yes	Yes

Notes:

10 Exceeds Applicable CCME Criteria

1 - Canadian Council of Members of the Environment (CCME), Canadian Water Quality Guidelines (CWQG) for the Protection of Aquatic Life. Longterm Exposure, Freshwater. (CCME, 2007, with updates)

2 - Canadian Council of Members of the Environment (CCME), Canadian Water Quality Guidelines (CWQG) for the Protection of Aquatic Life. Longterm Exposure, Marine. (CCME, 2007, with updates)

3 - Alberta Government, Alberta Tier 1 Soil and Groundwater Guidelines. Table 2. (AEP, 2019)

ug/L - micrograms per litre

NV - No Value

RDL - Reportable Detection Limit

Table 7: Surface Water Analytical Results - PCBs

Sample ID	RDL	Units	CWQG Freshwater[1]	CWQG Marine[2]	LTM1	DUP1	LTM1-SW1-18	LTM2-SW1-19	LTM2-DUP-19-SW	LTM-SW1	LTM2	LTM2	LTM1-SW2-18
Date Sampled					2017-09-21	2017-09-21	2018-09-19	2019-07-30	2019-07-30	2020-09-19	2017-09-21	2017-10-03	2018-09-19
BV Labs ID					--	--	--	--	--	NSD389	--	--	--
Aroclor 1016	0.05	ug/L	NV	NV	<0.05	<0.05	--	--	--	<0.05	<0.05	<0.05	--
Aroclor 1221	0.05	ug/L	NV	NV	<0.05	<0.05	--	--	--	<0.05	<0.05	<0.05	--
Aroclor 1232	0.05	ug/L	NV	NV	<0.05	<0.05	--	--	--	<0.05	<0.05	<0.05	--
Aroclor 1242	0.05	ug/L	NV	NV	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Aroclor 1248	0.05	ug/L	NV	NV	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Aroclor 1254	0.05	ug/L	NV	NV	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Aroclor 1260	0.05	ug/L	NV	NV	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Aroclor 1262	0.05	ug/L	NV	NV	--	--	--	--	--	<0.05	--	--	--
Aroclor 1268	0.05	ug/L	NV	NV	--	--	--	--	--	<0.05	--	--	--
Total PCB	0.05	ug/L	NV	NV	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

Notes:

10 Exceeds Applicable CCME Criteria

1 - Canadian Council of Members of the Environment (CCME), Canadian Water Quality Guidelines (CWQG) for the Protection of Aquatic Life. Longterm Exposure, Freshwater. (CCME, 2007, with updates)

2 - Canadian Council of Members of the Environment (CCME), Canadian Water Quality Guidelines (CWQG) for the Protection of Aquatic Life. Longterm Exposure, Marine. (CCME, 2007, with updates)

ug/L - micrograms per litre
NV - No Value
RDL - Reportable Detection Limit

Table 7: Surface Water Analytical Results - PCBs

Sample ID	RDL	Units	CWQG Freshwater[1]	CWQG Marine[2]	LTM2-SW2-19	LTM-SW2	LTM3	LTM3	LTM1-SW3-18	LTM2-SW3-19	LTM-SW3	LTM4	LTM4
Date Sampled					2019-07-30	2020-09-19	2017-09-21	2017-10-03	2018-09-19	2019-07-30	2020-09-19	2017-09-21	2017-10-03
BV Labs ID					--	NSD390	--	--	--	--	NSD391	--	--
Aroclor 1016	0.05	ug/L	NV	NV	--	<0.05	<0.05	<0.05	--	--	<0.05	<0.05	<0.05
Aroclor 1221	0.05	ug/L	NV	NV	--	<0.05	<0.05	<0.05	--	--	<0.05	<0.05	<0.05
Aroclor 1232	0.05	ug/L	NV	NV	--	<0.05	<0.05	<0.05	--	--	<0.05	<0.05	<0.05
Aroclor 1242	0.05	ug/L	NV	NV	<0.05	*<0.05*	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Aroclor 1248	0.05	ug/L	NV	NV	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Aroclor 1254	0.05	ug/L	NV	NV	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Aroclor 1260	0.05	ug/L	NV	NV	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Aroclor 1262	0.05	ug/L	NV	NV	--	<0.05	--	--	--	--	<0.05	--	--
Aroclor 1268	0.05	ug/L	NV	NV	--	<0.05	--	--	--	--	<0.05	--	--
Total PCB	0.05	ug/L	NV	NV	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

Notes:

10 Exceeds Applicable CCME Criteria

1 - Canadian Council of Members of the Environment (CCME), Canadian Water Quality Guidelines (CWQG) for the Protection of Aquatic Life. Longterm Exposure, Freshwater. (CCME, 2007, with updates)

2 - Canadian Council of Members of the Environment (CCME), Canadian Water Quality Guidelines (CWQG) for the Protection of Aquatic Life. Longterm Exposure, Marine. (CCME, 2007, with updates)

ug/L - micrograms per litre
NV - No Value
RDL - Reportable Detection Limit

Table 7: Surface Water Analytical Results - PCBs

Sample ID	RDL	Units	CWQG Freshwater[1]	CWQG Marine[2]	LTM1-SW4-18	LTM2-SW4-19	LTM-SW4	LTM5	LTM5	LTM1-SW5-18	LTM2-SW5-19	LTM-SW5	LTM6
Date Sampled					2018-09-19	2019-07-30	2020-09-19	2017-09-21	2017-10-03	2018-09-19	2019-07-30	2020-09-19	2017-09-21
BV Labs ID					--	--	NSD392	--	--	--	--	NSD393	--
Aroclor 1016	0.05	ug/L	NV	NV	--	--	<0.05	<0.05	<0.05	--	--	<0.05	<0.05
Aroclor 1221	0.05	ug/L	NV	NV	--	--	<0.05	<0.05	<0.05	--	--	<0.05	<0.05
Aroclor 1232	0.05	ug/L	NV	NV	--	--	<0.05	<0.05	<0.05	--	--	<0.05	<0.05
Aroclor 1242	0.05	ug/L	NV	NV	<0.05	<0.05	*<0.05*	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Aroclor 1248	0.05	ug/L	NV	NV	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Aroclor 1254	0.05	ug/L	NV	NV	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Aroclor 1260	0.05	ug/L	NV	NV	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Aroclor 1262	0.05	ug/L	NV	NV	--	--	<0.05	--	--	--	--	<0.05	--
Aroclor 1268	0.05	ug/L	NV	NV	--	--	<0.05	--	--	--	--	<0.05	--
Total PCB	0.05	ug/L	NV	NV	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

Notes:

10 Exceeds Applicable CCME Criteria

1 - Canadian Council of Members of the Environment (CCME), Canadian Water Quality Guidelines (CWQG) for the Protection of Aquatic Life. Longterm Exposure, Freshwater. (CCME, 2007, with updates)

2 - Canadian Council of Members of the Environment (CCME), Canadian Water Quality Guidelines (CWQG) for the Protection of Aquatic Life. Longterm Exposure, Marine. (CCME, 2007, with updates)

ug/L - micrograms per litre
NV - No Value
RDL - Reportable Detection Limit

Table 7: Surface Water Analytical Results - PCBs

Sample ID	RDL	Units	CWQG Freshwater[1]	CWQG Marine[2]	LTM6	LTM1-SW6-18	LTM2-SW6-19	LTM-SW6	LTM7	LTM7	DUP2	LTM1-SW7-18	LTM2-SW7-19
Date Sampled					2017-10-03	2018-09-19	2019-07-31	2020-09-19	2017-09-21	2017-10-03	2017-10-03	2018-09-19	2019-07-30
BV Labs ID					--	--	--	NSD394	--	--	--	--	--
Aroclor 1016	0.05	ug/L	NV	NV	<0.05	--	--	<0.05	<0.05	<0.05	<0.05	--	--
Aroclor 1221	0.05	ug/L	NV	NV	<0.05	--	--	<0.05	<0.05	<0.05	<0.05	--	--
Aroclor 1232	0.05	ug/L	NV	NV	<0.05	--	--	<0.05	<0.05	<0.05	<0.05	--	--
Aroclor 1242	0.05	ug/L	NV	NV	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Aroclor 1248	0.05	ug/L	NV	NV	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Aroclor 1254	0.05	ug/L	NV	NV	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Aroclor 1260	0.05	ug/L	NV	NV	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Aroclor 1262	0.05	ug/L	NV	NV	--	--	--	<0.05	--	--	--	--	--
Aroclor 1268	0.05	ug/L	NV	NV	--	--	--	<0.05	--	--	--	--	--
Total PCB	0.05	ug/L	NV	NV	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

Notes:

10 Exceeds Applicable CCME Criteria

1 - Canadian Council of Members of the Environment (CCME), Canadian Water Quality Guidelines (CWQG) for the Protection of Aquatic Life. Longterm Exposure, Freshwater. (CCME, 2007, with updates)

2 - Canadian Council of Members of the Environment (CCME), Canadian Water Quality Guidelines (CWQG) for the Protection of Aquatic Life. Longterm Exposure, Marine. (CCME, 2007, with updates)

ug/L - micrograms per litre
NV - No Value
RDL - Reportable Detection Limit

Table 7: Surface Water Analytical Results - PCBs

Sample ID	RDL	Units	CWQG Freshwater[1]	CWQG Marine[2]	LTM-SW7	LTM-SW9 (DUP of SW7)	LTM2-SW8-19	LTM-SW8
Date Sampled					2020-09-19	2020-09-19	2019-07-31	2020-09-19
BV Labs ID					NSD395	NSD397	--	NSD396
Aroclor 1016	0.05	ug/L	NV	NV	<0.05	<0.05	--	<0.05
Aroclor 1221	0.05	ug/L	NV	NV	<0.05	<0.05	--	<0.05
Aroclor 1232	0.05	ug/L	NV	NV	<0.05	<0.05	--	<0.05
Aroclor 1242	0.05	ug/L	NV	NV	<0.05	<0.05	<0.05	<0.05
Aroclor 1248	0.05	ug/L	NV	NV	<0.05	<0.05	<0.05	<0.05
Aroclor 1254	0.05	ug/L	NV	NV	<0.05	<0.05	<0.05	<0.05
Aroclor 1260	0.05	ug/L	NV	NV	<0.05	<0.05	<0.05	<0.05
Aroclor 1262	0.05	ug/L	NV	NV	<0.05	<0.05	--	<0.05
Aroclor 1268	0.05	ug/L	NV	NV	<0.05	<0.05	--	<0.05
Total PCB	0.05	ug/L	NV	NV	<0.05	<0.05	<0.05	<0.05

Notes:

10 Exceeds Applicable CCME Criteria

1 - Canadian Council of Members of the Environment (CCME), Canadian Water Quality Guidelines (CWQG) for the Protection of Aquatic Life. Longterm Exposure, Freshwater. (CCME, 2007, with updates)

2 - Canadian Council of Members of the Environment (CCME), Canadian Water Quality Guidelines (CWQG) for the Protection of Aquatic Life. Longterm Exposure, Marine. (CCME, 2007, with updates)

ug/L - micrograms per litre
NV - No Value
RDL - Reportable Detection Limit

Table 8: Surface Water Analytical Results - PAHs

Sample ID	RDL	Units	CWQG Freshwater[1]	CWQG Marine[2]	LTM-SW8
Date Sampled					2020-09-19
BV Labs ID					NSD396
Acenaphthene	0.1	ug/L	5.8	NV	<0.10
Acenaphthylene	0.1	ug/L	NV	NV	<0.10
Anthracene	0.01	ug/L	0.012	NV	<0.010
Benzo(a)anthracene	0.0085	ug/L	0.018	NV	<0.0085
Benzo(a)pyrene	0.0075	ug/L	0.015	NV	<0.0075
Benzo(b/j)fluoranthene	0.0085	ug/L	NV	NV	<0.0085
Benzo(ghi)perylene	-	ug/L	NV	NV	-
Benzo(k)fluoranthene	0.0085	ug/L	NV	NV	<0.0085
Chrysene	0.0085	ug/L	NV	NV	<0.0085
Dibenzo(a,h)anthracene	0.0075	ug/L	NV	NV	<0.0075
Fluoranthene	0.01	ug/L	0.04	NV	<0.010
Fluorene	0.05	ug/L	3	NV	<0.050
Indeno(1,2,3-cd)pyrene	0.0085	ug/L	NV	NV	<0.0085
1-Methylnaphthalene	0.1	ug/L	NV	NV	<0.10
2-Methylnaphthalene	0.1	ug/L	NV	NV	<0.10
Naphthalene	0.1	ug/L	1.1	1.4	<0.10
Phenanthrene	0.05	ug/L	0.4	NV	<0.050
Pyrene	0.02	ug/L	0.025	NV	<0.020
Methylnaphthalene, 2-(1-)	-	ug/L	NV	NV	-

Notes:

10 Exceeds Applicable CCME Criteria

1 - Canadian Council of Members of the Environment (CCME), Canadian Water Quality Guidelines (CWQG) for the Protection of Aquatic Life. Longterm Exposure, Freshwater. (CCME, 2007, with updates)

2 - Canadian Council of Members of the Environment (CCME), Canadian Water Quality Guidelines (CWQG) for the Protection of Aquatic Life. Longterm Exposure, Marine. (CCME, 2007, with updates)

ug/L - micrograms per litre
NV - No Value
RDL - Reportable Detection Limit

Table 11: Sediment Analytical Results - BTEX and PHCs

Sample ID	RDL	Units	SQGPAL Freshwater[1]		SQGPAL Marine[2]		CSQG[3] Residential / Parkland	CSQG[4] Commercial	CWS[5] Residential / Parkland	CWS[6] Commercial	LTM-SD1-18	LTM2-SD1-19	LTM2-DUP-19- SD	LTM-SD1	LTM-SD2-18	LTM2-SD2-19	LTM-SD2	LTM-SD3-18
Date Sampled											2018-09-19	2019-07-30	2019-07-30	2020-09-19	2018-09-19	2019-07-30	2020-09-19	2018-09-19
BV Labs ID			ISQG	PEL	ISQG	PEL					--	--	--	NSD398	--	--	NSD399	--
BTEX																		
Benzene	0.012	ug/g	NV	NV	NV	NV	0.03	0.03	NV	NV	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060
Ethylbenzene	0.020	ug/g	NV	NV	NV	NV	0.37	0.37	NV	NV	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Toluene	0.040	ug/g	NV	NV	NV	NV	0.082	0.082	NV	NV	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.03
o-Xylene	0.040	ug/g	NV	NV	NV	NV	NV	NV	NV	NV	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
m+p-Xylene	0.040	ug/g	NV	NV	NV	NV	NV	NV	NV	NV	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Xylenes	0.040	ug/g	NV	NV	NV	NV	11	11	NV	NV	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Hydrocarbons																		
F1 (C6-C10)	20	ug/g	NV	NV	NV	NV	NV	NV	210	230	<10	<10	<10	<10	<10	<10	<10	<10
F1 (C6-C10) - BTEX	20	ug/g	NV	NV	NV	NV	NV	NV	NV	NV	<10	<10	<10	<10	<10	<10	<10	<10
F2 (C10-C16)	30	ug/g	NV	NV	NV	NV	NV	NV	150	260	<10	<10	--	<10	<10	<10	<10	<10
F3 (C16-C34)	150	ug/g	NV	NV	NV	NV	NV	NV	300	1700	<50	<50	--	<50	<50	<50	88	<50
F4 (C34-C50)	150	ug/g	NV	NV	NV	NV	NV	NV	2800	3300	<50	<50	--	<50	<50	<50	<50	<50
Reached Baseline at C50	NA	NA	NV	NV	NV	NV	NV	NV	NV	NV	--	Yes	--	Yes	--	Yes	Yes	--

Notes:

10 Exceeds Applicable SQGPAL Criteria
250 Exceeds Applicable CSQG or CWS Criteria

1 - Canadian Council of Members of the Environment (CCME), Canadian Sediment Quality Guidelines for the Protection of Aquatic Life (SQGPAL), Freshwater. (CCME, 1999 with updates)

2 - Canadian Council of Members of the Environment (CCME), Canadian Sediment Quality Guidelines for the Protection of Aquatic Life (SQGPAL), Marine. (CCME, 1999 with updates)

3 - Canadian Council of Members of the Environment (CCME), Canadian Soil Quality Guidelines (CSQG) for the Protection of Environmental and Human Health , Residential/Parkland Use, Coarse Grained Soil (CCME, 2010)

4 - Canadian Council of Members of the Environment (CCME), Canadian Soil Quality Guidelines (CSQG) for the Protection of Environmental and Human Health , Commercial Land Use, Coarse Grained Soil (CCME, 2010)

5 - Canadian Council of Members of the Environment (CCME) Canada-Wide Standards (CWS) for Petroleum Hydrocarbons in Soil, Residential/Parkland Use, Coarse Grained Soil (CCME, 2008)

6 - Canadian Council of Members of the Environment (CCME) Canada-Wide Standards (CWS) for Petroleum Hydrocarbons in Soil, Commercial Land Use, Coarse Grained Soil (CCME, 2008)

ISQG - Interim Sediment Quality Guideline
PEL - Probable Effect Levels
ug/g - micrograms per gram
NV - No Value
RDL - Reportable Detection Limit

Table 11: Sediment Analytical Results - BTEX and PHCs

Sample ID	RDL	Units	SQGPAL Freshwater[1]		SQGPAL Marine[2]		CSQG[3] Residential / Parkland	CSQG[4] Commercial	CWS[5] Residential / Parkland	CWS[6] Commercial	LTM2-SD3-19	LTM-SD3	LTM-SD4-18	LTM2-SD4-19	LTM-SD4	LTM-SD5-18	LTM2-SD5-19	LTM-SD5	LTM-SD9 (DUP of SD5)
Date Sampled											2019-07-30	2020-09-19	2018-09-19	2019-07-30	2020-09-19	2018-09-19	2019-07-31	2020-09-19	2020-09-19
BV Labs ID			ISQG	PEL	ISQG	PEL					--	NSD400	--	--	NSD401	--	--	NSD402	NSD406
BTEX																			
Benzene	0.012	ug/g	NV	NV	NV	NV	0.03	0.03	NV	NV	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.036	<0.012	<0.0060	<0.012
Ethylbenzene	0.020	ug/g	NV	NV	NV	NV	0.37	0.37	NV	NV	<0.010	<0.010	<0.010	<0.010	<0.010	<0.060	<0.020	<0.010	<0.020
Toluene	0.040	ug/g	NV	NV	NV	NV	0.082	0.082	NV	NV	<0.020	<0.020	<0.020	<0.020	<0.020	<0.12	<0.040	<0.020	<0.040
o-Xylene	0.040	ug/g	NV	NV	NV	NV	NV	NV	NV	NV	<0.020	<0.020	<0.020	<0.020	<0.020	<0.12	<0.040	<0.020	<0.040
m+p-Xylene	0.040	ug/g	NV	NV	NV	NV	NV	NV	NV	NV	<0.020	<0.020	<0.020	<0.020	<0.020	<0.12	<0.040	<0.020	<0.040
Xylenes	0.040	ug/g	NV	NV	NV	NV	11	11	NV	NV	<0.020	<0.020	<0.020	<0.020	<0.020	<0.12	<0.040	<0.020	<0.040
Hydrocarbons																			
F1 (C6-C10)	20	ug/g	NV	NV	NV	NV	NV	NV	210	230	<10	<10	<10	<10	<10	<60	<20	<10	<20
F1 (C6-C10) - BTEX	20	ug/g	NV	NV	NV	NV	NV	NV	NV	NV	<10	<10	<10	<10	<10	<60	<20	<10	<20
F2 (C10-C16)	30	ug/g	NV	NV	NV	NV	NV	NV	150	260	<10	<10	<10	<10	<10	290	71	440	160
F3 (C16-C34)	150	ug/g	NV	NV	NV	NV	NV	NV	300	1700	97	<50	<50	<50	<50	1400	350	490	280
F4 (C34-C50)	150	ug/g	NV	NV	NV	NV	NV	NV	2800	3300	53	<50	<50	<50	<50	<500	130	200	<150
Reached Baseline at C50	NA	NA	NV	NV	NV	NV	NV	NV	NV	NV	--	Yes	--	Yes	Yes	--	Yes	Yes	Yes

Notes:

10 Exceeds Applicable SQGPAL Criteria
250 Exceeds Applicable CSQG or CWS Criteria

1 - Canadian Council of Members of the Environment (CCME), Canadian Sediment Quality Guidelines for the Protection of Aquatic Life (SQGPAL), Freshwater. (CCME, 1999 with updates)

2 - Canadian Council of Members of the Environment (CCME), Canadian Sediment Quality Guidelines for the Protection of Aquatic Life (SQGPAL), Marine. (CCME, 1999 with updates)

3 - Canadian Council of Members of the Environment (CCME), Canadian Soil Quality Guidelines (CSQG) for the Protection of Environmental and Human Health , Residential/Parkland Use, Coarse Grained Soil (CCME, 2010)

4 - Canadian Council of Members of the Environment (CCME), Canadian Soil Quality Guidelines (CSQG) for the Protection of Environmental and Human Health , Commercial Land Use, Coarse Grained Soil (CCME, 2010)

5 - Canadian Council of Members of the Environment (CCME) Canada-Wide Standards (CWS) for Petroleum Hydrocarbons in Soil, Residential/Parkland Use, Coarse Grained Soil (CCME, 2008)

6 - Canadian Council of Members of the Environment (CCME) Canada-Wide Standards (CWS) for Petroleum Hydrocarbons in Soil, Commercial Land Use, Coarse Grained Soil (CCME, 2008)

ISQG - Interim Sediment Quality Guideline
PEL - Probable Effect Levels
ug/g - micrograms per gram
NV - No Value
RDL - Reportable Detection Limit

Table 11: Sediment Analytical Results - BTEX and PHCs

Sample ID	RDL	Units	SQGPAL Freshwater[1]		SQGPAL Marine[2]		CSQG[3] Residential / Parkland	CSQG[4] Commercial	CWS[5] Residential / Parkland	CWS[6] Commercial	LTM-SD6-18	LTM2-SD6-19	LTM-SD6	LTM-SD7-18	LTM2-SD7-19	LTM-SD7	LTM2-SD8-19	LTM-SD8
Date Sampled											2018-09-19	2019-07-31	2020-09-19	2018-09-19	2019-07-30	2020-09-19	2019-07-31	2020-09-19
BV Labs ID			ISQG	PEL	ISQG	PEL					--	--	NSD403	--	--	NSD404	--	NSD405
BTEX																		
Benzene	0.012	ug/g	NV	NV	NV	NV	0.03	0.03	NV	NV	<0.018	<0.012	0.013	<0.012	<0.0060	<0.0060	<0.0060	<0.0060
Ethylbenzene	0.020	ug/g	NV	NV	NV	NV	0.37	0.37	NV	NV	<0.030	<0.020	<0.020	<0.020	<0.010	<0.010	<0.010	<0.010
Toluene	0.040	ug/g	NV	NV	NV	NV	0.082	0.082	NV	NV	0.10	<0.040	<0.040	<0.040	<0.020	<0.020	<0.020	<0.020
o-Xylene	0.040	ug/g	NV	NV	NV	NV	NV	NV	NV	NV	<0.0060	<0.040	0.053	<0.040	<0.020	<0.020	<0.020	<0.020
m+p-Xylene	0.040	ug/g	NV	NV	NV	NV	NV	NV	NV	NV	<0.0060	<0.040	<0.040	<0.040	<0.020	<0.020	<0.020	<0.020
Xylenes	0.040	ug/g	NV	NV	NV	NV	11	11	NV	NV	<0.0060	<0.040	0.053	<0.040	<0.020	<0.020	<0.020	<0.020
Hydrocarbons																		
F1 (C6-C10)	20	ug/g	NV	NV	NV	NV	NV	NV	210	230	<30	<20	31	<20	<10	<10	<10	<10
F1 (C6-C10) - BTEX	20	ug/g	NV	NV	NV	NV	NV	NV	NV	NV	<30	<20	31	<20	<10	<10	<10	<10
F2 (C10-C16)	30	ug/g	NV	NV	NV	NV	NV	NV	150	260	2700	1300	2100	<30	<10	300	<10	<20
F3 (C16-C34)	150	ug/g	NV	NV	NV	NV	NV	NV	300	1700	1700	1400	1700	290	140	800	200	370
F4 (C34-C50)	150	ug/g	NV	NV	NV	NV	NV	NV	2800	3300	540	490	520	<150	61	230	71	120
Reached Baseline at C50	NA	NA	NV	NV	NV	NV	NV	NV	NV	NV	--	Yes	Yes	--	No	Yes	No	Yes

Notes:

10 Exceeds Applicable SQGPAL Criteria
250 Exceeds Applicable CSQG or CWS Criteria

1 - Canadian Council of Members of the Environment (CCME), Canadian Sediment Quality Guidelines for the Protection of Aquatic Life (SQGPAL), Freshwater. (CCME, 1999 with updates)

2 - Canadian Council of Members of the Environment (CCME), Canadian Sediment Quality Guidelines for the Protection of Aquatic Life (SQGPAL), Marine. (CCME, 1999 with updates)

3 - Canadian Council of Members of the Environment (CCME), Canadian Soil Quality Guidelines (CSQG) for the Protection of Environmental and Human Health , Residential/Parkland Use, Coarse Grained Soil (CCME, 2010)

4 - Canadian Council of Members of the Environment (CCME), Canadian Soil Quality Guidelines (CSQG) for the Protection of Environmental and Human Health , Commercial Land Use, Coarse Grained Soil (CCME, 2010)

5 - Canadian Council of Members of the Environment (CCME) Canada-Wide Standards (CWS) for Petroleum Hydrocarbons in Soil, Residential/Parkland Use, Coarse Grained Soil (CCME, 2008)

6 - Canadian Council of Members of the Environment (CCME) Canada-Wide Standards (CWS) for Petroleum Hydrocarbons in Soil, Commercial Land Use, Coarse Grained Soil (CCME, 2008)

ISQG - Interim Sediment Quality Guideline
PEL - Probable Effect Levels
ug/g - micrograms per gram
NV - No Value
RDL - Reportable Detection Limit

Table 12: Sediment Analytical Results - Metals

Sample ID	RDL	Units	SQGPAL Freshwater[1]		SQGPAL Marine[2]		LTM-SD1-18	LTM2-SD1-19	LTM2-DUP-19-SD	LTM-SD1	LTM-SD2-18
Date Sampled							2018-09-19	2019-07-30	2019-07-30	2020-09-19	2018-09-19
BV Labs ID			ISQG	PEL	ISQG	PEL	--	--	--	NSD398	--
Acid Extractable Arsenic (As)	1.0	ug/g	5.9	17.0	7.2	41.6	1.4	1.2	1.1	<1.0	1.6
Acid Extractable Cadmium (Cd)	0.10	ug/g	0.6	3.5	0.7	4.2	<0.10	<0.10	<0.10	<0.10	0.18
Acid Extractable Chromium (Cr)	1.0	ug/g	37.3	90	52.3	160	28	29	25	22	22
Acid Extractable Cobalt (Co)	0.10	ug/g	NV	NV	NV	NV	4.4	3.6	3.6	3.8	4.5
Acid Extractable Lead (Pb)	1.0	ug/g	35	91.3	30.2	112	3.6	3.4	3	4.6	3.6
Acid Extractable Nickel (Ni)	0.50	ug/g	NV	NV	NV	NV	7.5	6.8	6.2	7.0	8.2
Acid Extractable Zinc (Zn)	5.0	ug/g	123	315	124	271	40	46	31	30	56

Notes:

10 Exceeds Applicable CCME Criteria

1 - Canadian Council of Members of the Environment (CCME), Canadian Sediment Quality Guidelines for the Protection of Aquatic Life (SQGPAL), Freshwater. (CCME, 1999 with updates)

2 - Canadian Council of Members of the Environment (CCME), Canadian Sediment Quality Guidelines for the Protection of Aquatic Life (SQGPAL), Marine. (CCME, 1999 with updates)

ISQG - Interim Sediment Quality Guideline
PEL - Probable Effect Levels
ug/g - micrograms per gram
NV - No Value
RDL - Reportable Detection Limit

Table 12: Sediment Analytical Results - Metals

Sample ID	RDL	Units	SQGPAL Freshwater[1]		SQGPAL Marine[2]		LTM2-SD2-19	LTM-SD2	LTM-SD3-18	LTM2-SD3-19	LTM-SD3
Date Sampled							2019-07-30	2020-09-19	2018-09-19	2019-07-30	2020-09-19
BV Labs ID			ISQG	PEL	ISQG	PEL	--	NSD399	--	--	NSD400
Acid Extractable Arsenic (As)	1.0	ug/g	5.9	17.0	7.2	41.6	<1.0	<1.0	1.2	2.6	1.7
Acid Extractable Cadmium (Cd)	0.10	ug/g	0.6	3.5	0.7	4.2	<0.10	<0.10	<0.10	0.13	<0.10
Acid Extractable Chromium (Cr)	1.0	ug/g	37.3	90	52.3	160	21	14	19	18	38
Acid Extractable Cobalt (Co)	0.10	ug/g	NV	NV	NV	NV	3.4	2.3	5.3	3.7	4.5
Acid Extractable Lead (Pb)	1.0	ug/g	35	91.3	30.2	112	4.7	6.8	8.9	23	7.3
Acid Extractable Nickel (Ni)	0.50	ug/g	NV	NV	NV	NV	5.5	4.3	5.5	6.5	7.4
Acid Extractable Zinc (Zn)	5.0	ug/g	123	315	124	271	33	28	46	48	40

Notes:

10 Exceeds Applicable CCME Criteria

1 - Canadian Council of Members of the Environment (CCME), Canadian Sediment Quality Guidelines for the Protection of Aquatic Li

2 - Canadian Council of Members of the Environment (CCME), Canadian Sediment Quality Guidelines for the Protection of Aquatic L

ISQG - Interim Sediment Quality Guideline
PEL - Probable Effect Levels
ug/g - micrograms per gram
NV - No Value
RDL - Reportable Detection Limit

Table 12: Sediment Analytical Results - Metals

Sample ID	RDL	Units	SQGPAL Freshwater[1]		SQGPAL Marine[2]		LTM-SD4-18	LTM2-SD4-19	LTM-SD4	LTM-SD5-18	LTM2-SD5-19
Date Sampled							2018-09-19	2019-07-30	2020-09-19	2018-09-19	2019-07-31
BV Labs ID			ISQG	PEL	ISQG	PEL	--	--	NSD401	--	--
Acid Extractable Arsenic (As)	1.0	ug/g	5.9	17.0	7.2	41.6	1.6	1.6	1.6	1.8	1.4
Acid Extractable Cadmium (Cd)	0.10	ug/g	0.6	3.5	0.7	4.2	0.2	0.11	0.19	4.9	0.75
Acid Extractable Chromium (Cr)	1.0	ug/g	37.3	90	52.3	160	17	15	16	23	20.0
Acid Extractable Cobalt (Co)	0.10	ug/g	NV	NV	NV	NV	3.6	3.3	4.7	7.5	5.6
Acid Extractable Lead (Pb)	1.0	ug/g	35	91.3	30.2	112	6.5	10	110	69	22
Acid Extractable Nickel (Ni)	0.50	ug/g	NV	NV	NV	NV	5.3	4.9	7.8	14	11
Acid Extractable Zinc (Zn)	5.0	ug/g	123	315	124	271	52	49	53	250	190

Notes:

10 Exceeds Applicable CCME Criteria

1 - Canadian Council of Members of the Environment (CCME), Canadian Sediment Quality Guidelines for the Protection of Aquatic Li

2 - Canadian Council of Members of the Environment (CCME), Canadian Sediment Quality Guidelines for the Protection of Aquatic L

ISQG - Interim Sediment Quality Guideline
PEL - Probable Effect Levels
ug/g - micrograms per gram
NV - No Value
RDL - Reportable Detection Limit

Table 12: Sediment Analytical Results - Metals

Sample ID	RDL	Units	SQGPAL Freshwater[1]		SQGPAL Marine[2]		LTM-SD5	LTM-SD9 (DUP of SD5)	LTM-SD6-18	LTM2-SD6-19	LTM-SD6
Date Sampled							2020-09-19	2020-09-19	2018-09-19	2019-07-31	2020-09-19
BV Labs ID			ISQG	PEL	ISQG	PEL	NSD402	NSD406	--	--	NSD403
Acid Extractable Arsenic (As)	1.0	ug/g	5.9	17.0	7.2	41.6	1.5	1.9	1.8	3.3	1.5
Acid Extractable Cadmium (Cd)	0.10	ug/g	0.6	3.5	0.7	4.2	1.9	1.3	3.9	7.4	2.9
Acid Extractable Chromium (Cr)	1.0	ug/g	37.3	90	52.3	160	22	24	28	36	27
Acid Extractable Cobalt (Co)	0.10	ug/g	NV	NV	NV	NV	6.0	6.2	7.8	17.0	7.7
Acid Extractable Lead (Pb)	1.0	ug/g	35	91.3	30.2	112	73	36	100	130	89
Acid Extractable Nickel (Ni)	0.50	ug/g	NV	NV	NV	NV	11	8.5	12	16	11
Acid Extractable Zinc (Zn)	5.0	ug/g	123	315	124	271	210	130	240	350	280

Notes:

10 Exceeds Applicable CCME Criteria

1 - Canadian Council of Members of the Environment (CCME), Canadian Sediment Quality Guidelines for the Protection of Aquatic Li

2 - Canadian Council of Members of the Environment (CCME), Canadian Sediment Quality Guidelines for the Protection of Aquatic L

ISQG - Interim Sediment Quality Guideline
PEL - Probable Effect Levels
ug/g - micrograms per gram
NV - No Value
RDL - Reportable Detection Limit

Table 12: Sediment Analytical Results - Metals

Sample ID	RDL	Units	SQGPAL Freshwater[1]		SQGPAL Marine[2]		LTM-SD7-18	LTM2-SD7-19	LTM-SD7	LTM2-SD8-19	LTM-SD8
Date Sampled							2018-09-19	2019-07-30	2020-09-19	2019-07-31	2020-09-19
BV Labs ID			ISQG	PEL	ISQG	PEL	--	--	NSD404	--	NSD405
Acid Extractable Arsenic (As)	1.0	ug/g	5.9	17.0	7.2	41.6	2.7	<1.0	2.1	1.2	1.0
Acid Extractable Cadmium (Cd)	0.10	ug/g	0.6	3.5	0.7	4.2	0.2	0.15	0.32	<0.10	<0.10
Acid Extractable Chromium (Cr)	1.0	ug/g	37.3	90	52.3	160	43	34	36	19	25
Acid Extractable Cobalt (Co)	0.10	ug/g	NV	NV	NV	NV	10.0	5.8	9.4	4.4	4.4
Acid Extractable Lead (Pb)	1.0	ug/g	35	91.3	30.2	112	20	12	31	11	4.600000
Acid Extractable Nickel (Ni)	0.50	ug/g	NV	NV	NV	NV	15	9.9	20	7.9	7.2
Acid Extractable Zinc (Zn)	5.0	ug/g	123	315	124	271	230	190	140	140	27

Notes:

10 Exceeds Applicable CCME Criteria

1 - Canadian Council of Members of the Environment (CCME), Canadian Sediment Quality Guidelines for the Protection of Aquatic Li

2 - Canadian Council of Members of the Environment (CCME), Canadian Sediment Quality Guidelines for the Protection of Aquatic L

ISQG - Interim Sediment Quality Guideline
PEL - Probable Effect Levels
ug/g - micrograms per gram
NV - No Value
RDL - Reportable Detection Limit

Table 13: Sediment Analytical Results - PCBs

Sample ID	RDL	Units	SQGPAL Freshwater[1]		SQGPAL Marine[2]		LTM-SD1-18	LTM2-SD1-19	LTM2-DUP-19- SD	LTM-SD1	LTM-SD2-18
Date Sampled							2018-09-19	2019-07-30	2019-07-30	2020-09-19	2018-09-19
BV Labs ID			ISQG	PEL	ISQG	PEL	--	--	--	NSD398	--
Aroclor 1242	0.030	ug/g	NV	NV	NV	NV	<0.010	<0.010	<0.010	<0.010	<0.010
Aroclor 1248	0.030	ug/g	NV	NV	NV	NV	<0.010	<0.010	<0.010	<0.010	<0.010
Aroclor 1254	0.030	ug/g	0.06	0.34	0.0633	0.709	<0.010	<0.010	<0.010	<0.010	<0.010
Aroclor 1260	0.030	ug/g	NV	NV	NV	NV	<0.010	<0.010	<0.010	<0.010	<0.010
Total PCB	0.030	ug/g	0.0341	0.277	0.0215	0.189	<0.010	<0.010	<0.010	<0.010	<0.010

Notes:

10 Exceeds Applicable CCME Criteria

1 - Canadian Council of Members of the Environment (CCME), Canadian Sediment Quality Guidelines for the Protection of Aquatic Life (SQGPAL), Freshwater. (CCME, 1999 with updates)

2 - Canadian Council of Members of the Environment (CCME), Canadian Sediment Quality Guidelines for the Protection of Aquatic Life (SQGPAL), Marine. (CCME, 1999 with updates)

ISQG - Interim Sediment Quality Guideline

PEL - Probable Effect Levels

ug/g - micrograms per gram

NV - No Value

RDL - Reportable Detection Limit

Table 13: Sediment Analytical Results - PCBs

Sample ID	RDL	Units	SQGPAL Freshwater[1]		SQGPAL Marine[2]		LTM2-SD2-19	LTM-SD2	LTM-SD3-18	LTM2-SD3-19	LTM-SD3	LTM-SD4-18
Date Sampled							2019-07-30	2020-09-19	2018-09-19	2019-07-30	2020-09-19	2018-09-19
BV Labs ID			ISQG	PEL	ISQG	PEL	--	NSD399	--	--	NSD400	--
Aroclor 1242	0.030	ug/g	NV	NV	NV	NV	<0.010	<0.020	<0.010	<0.010	<0.010	<0.010
Aroclor 1248	0.030	ug/g	NV	NV	NV	NV	<0.010	<0.020	<0.010	<0.010	<0.010	<0.010
Aroclor 1254	0.030	ug/g	0.06	0.34	0.0633	0.709	<0.010	<0.020	<0.010	<0.010	<0.010	<0.010
Aroclor 1260	0.030	ug/g	NV	NV	NV	NV	<0.010	0.025	<0.010	<0.010	0.017	<0.010
Total PCB	0.030	ug/g	0.0341	0.277	0.0215	0.189	<0.010	0.025	<0.010	<0.010	0.017	<0.010

Notes:

10 Exceeds Applicable CCME Criteria

1 - Canadian Council of Members of the Environment (CCME), Canadian Sediment Quality Guidelines for the Protection of Aquatic Life (SQGPAL), Freshwater. (CCME, 1999 with updates)

2 - Canadian Council of Members of the Environment (CCME), Canadian Sediment Quality Guidelines for the Protection of Aquatic Life (SQGPAL), Marine. (CCME, 1999 with updates)

ISQG - Interim Sediment Quality Guideline

PEL - Probable Effect Levels

ug/g - micrograms per gram

NV - No Value

RDL - Reportable Detection Limit

Table 13: Sediment Analytical Results - PCBs

Sample ID	RDL	Units	SQGPAL Freshwater[1]		SQGPAL Marine[2]		LTM2-SD4-19	LTM-SD4	LTM-SD5-18	LTM2-SD5-19	LTM-SD5
Date Sampled							2019-07-30	2020-09-19	2018-09-19	2019-07-31	2020-09-19
BV Labs ID			ISQG	PEL	ISQG	PEL	--	NSD401	--	--	NSD402
Aroclor 1242	0.030	ug/g	NV	NV	NV	NV	<0.010	<0.010	<0.090	<0.020	<0.020
Aroclor 1248	0.030	ug/g	NV	NV	NV	NV	<0.010	<0.010	<0.090	<0.020	<0.020
Aroclor 1254	0.030	ug/g	0.06	0.34	0.0633	0.709	<0.010	<0.010	<0.090	<0.020	<0.020
Aroclor 1260	0.030	ug/g	NV	NV	NV	NV	<0.010	0.011	1.4	0.17	0.21
Total PCB	0.030	ug/g	0.0341	0.277	0.0215	0.189	<0.010	0.011	1.4	0.17	0.21

Notes:

10 Exceeds Applicable CCME Criteria

1 - Canadian Council of Members of the Environment (CCME), Canadian Sediment Quality Guidelines for the Protection of Aquatic Life (SQGPAL), Freshwater. (CCME, 1999 with updates)

2 - Canadian Council of Members of the Environment (CCME), Canadian Sediment Quality Guidelines for the Protection of Aquatic Life (SQGPAL), Marine. (CCME, 1999 with updates)

ISQG - Interim Sediment Quality Guideline

PEL - Probable Effect Levels

ug/g - micrograms per gram

NV - No Value

RDL - Reportable Detection Limit

Table 13: Sediment Analytical Results - PCBs

Sample ID	RDL	Units	SQGPAL Freshwater[1]		SQGPAL Marine[2]		LTM-SD9 (DUP of SD5)	LTM-SD6-18	LTM2-SD6-19	LTM-SD6	LTM-SD7-18
Date Sampled							2020-09-19	2018-09-19	2019-07-31	2020-09-19	2018-09-19
BV Labs ID			ISQG	PEL	ISQG	PEL	NSD406	--	--	NSD403	--
Aroclor 1242	0.030	ug/g	NV	NV	NV	NV	<0.030	<0.60	<0.40	<0.30	<0.040
Aroclor 1248	0.030	ug/g	NV	NV	NV	NV	<0.030	<0.60	<0.40	<0.30	<0.040
Aroclor 1254	0.030	ug/g	0.06	0.34	0.0633	0.709	<0.030	<0.60	<0.40	<0.30	<0.040
Aroclor 1260	0.030	ug/g	NV	NV	NV	NV	1.3	3.4	3.9	3.4	0.59
Total PCB	0.030	ug/g	0.0341	0.277	0.0215	0.189	1.3	3.4	3.9	3.4	0.59

Notes:

10 Exceeds Applicable CCME Criteria

1 - Canadian Council of Members of the Environment (CCME), Canadian Sediment Quality Guidelines for the Protection of Aquatic Life (SQGPAL), Freshwater. (CCME, 1999 with updates)

2 - Canadian Council of Members of the Environment (CCME), Canadian Sediment Quality Guidelines for the Protection of Aquatic Life (SQGPAL), Marine. (CCME, 1999 with updates)

ISQG - Interim Sediment Quality Guideline

PEL - Probable Effect Levels

ug/g - micrograms per gram

NV - No Value

RDL - Reportable Detection Limit

Table 13: Sediment Analytical Results - PCBs

Sample ID	RDL	Units	SQGPAL Freshwater[1]		SQGPAL Marine[2]		LTM2-SD7-19	LTM-SD7	LTM2-SD8-19	LTM-SD8
Date Sampled							2019-07-30	2020-09-19	2019-07-31	2020-09-19
BV Labs ID			ISQG	PEL	ISQG	PEL	--	NSD404	--	NSD405
Aroclor 1242	0.030	ug/g	NV	NV	NV	NV	<0.020	<0.020	<0.020	<0.020
Aroclor 1248	0.030	ug/g	NV	NV	NV	NV	<0.020	<0.020	<0.020	<0.020
Aroclor 1254	0.030	ug/g	0.06	0.34	0.0633	0.709	<0.020	<0.020	<0.020	<0.020
Aroclor 1260	0.030	ug/g	NV	NV	NV	NV	<0.020	0.082	<0.020	<0.020
Total PCB	0.030	ug/g	0.0341	0.277	0.0215	0.189	<0.020	0.082	<0.020	<0.020

Notes:

10 Exceeds Applicable CCME Criteria

1 - Canadian Council of Members of the Environment (CCME), Canadian Sediment Quality Guidelines for the Protection of Aquatic Life (SQGPAL), Freshwater. (CCME, 1999 with updates)

2 - Canadian Council of Members of the Environment (CCME), Canadian Sediment Quality Guidelines for the Protection of Aquatic Life (SQGPAL), Marine. (CCME, 1999 with updates)

ISQG - Interim Sediment Quality Guideline

PEL - Probable Effect Levels

ug/g - micrograms per gram

NV - No Value

RDL - Reportable Detection Limit

Table 14: Sediment Analytical Results - PAHs

Sample ID	RDL	Units	SQGPAL Freshwater[1]		SQGPAL Marine[2]		LTM-SD8
Date Sampled							2020-09-19
BV Labs ID			ISQG	PEL	ISQG	PEL	NSD405
Acenaphthene	0.005	ug/kg	0.00671	0.0889	0.00671	0.0889	<0.005
Acenaphthylene	0.005	ug/kg	0.00587	0.128	0.00587	0.128	<0.005
Anthracene	0.004	ug/kg	0.0469	0.245	0.0469	0.245	<0.004
Benzo(a)anthracene	0.005	ug/kg	0.0317	0.285	0.0748	0.693	0.012
Benzo(a)pyrene	0.005	ug/kg	0.0319	0.782	0.0888	0.763	0.019
Benzo(b/j)fluoranthene	0.005	ug/kg	NV	NV	NV	NV	0.03
Benzo(ghi)perylene	-	ug/kg	NV	NV	NV	NV	-
Benzo(k)fluoranthene	0.005	ug/kg	NV	NV	NV	NV	0.0099
Chrysene	0.005	ug/kg	0.0571	0.862	0.108	0.846	0.014
Dibenzo(a,h)anthracene	0.005	ug/kg	0.00622	0.135	0.00622	0.135	<0.005
Fluoranthene	0.005	ug/kg	0.111	2.355	0.113	1.494	0.038
Fluorene	0.005	ug/kg	0.0212	0.144	0.0212	0.144	<0.005
Indeno(1,2,3-cd)pyrene	0.005	ug/kg	NV	NV	NV	NV	0.025
1-Methylnaphthalene	0.005	ug/kg	NV	NV	NV	NV	<0.005
2-Methylnaphthalene	0.005	ug/kg	0.0202	0.201	0.0202	0.201	0.011
Naphthalene	0.005	ug/kg	0.0346	0.391	0.0346	0.391	0.025
Phenanthrene	0.005	ug/kg	0.0419	0.515	0.0867	0.544	0.018
Pyrene	0.005	ug/kg	0.053	0.875	0.153	1.398	0.034

Notes:

10 Exceeds Applicable CCME Criteria

1 - Canadian Council of Members of the Environment (CCME), Canadian Sediment Quality Guidelines for the Protection of Aquatic Life (SQGPAL), Freshwater. (CCME, 1999 with updates)

2 - Canadian Council of Members of the Environment (CCME), Canadian Sediment Quality Guidelines for the Protection of Aquatic Life (SQGPAL), Marine. (CCME, 1999 with updates)

ug/L - micrograms per litre
NV - No Value
RDL - Reportable Detection Limit

Table 17: Surface Water Analytical Results - QAQC

Sample ID	RDL	5x	Units	LTM-SW7	LTM-SW9 (DUP of SW7)	RPD
Date Sampled				19-Sep-2020	19-Sep-2020	
BV Lab ID				NSD395	NSD397	
General Chemistry						
Hardness (CaCO3)	1.0	5	mg/L	28	21	29%
Conductivity	1.0	5	umho/cm	100	90	11%
Total Dissolved Solids	20	100	mg/L	85	90	NC
Total Suspended Solids	1	5	mg/L	61	14	125%
Metals						
Total Arsenic (As)	1.0	5	ug/L	<1.0	<1.0	NC
Total Cadmium (Cd)	0.1	0.5	ug/L	<0.090	<0.090	NC
Total Chromium (Cr)	1.0	5	ug/L	<5.0	<5.0	NC
Total Cobalt (Co)	0.1	0.5	ug/L	0.64	3.9	144%
Total Lead (Pb)	1.0	5	ug/L	<0.50	<0.50	NC
Total Nickel (Ni)	0.5	2.5	ug/L	1.2	1.2	0%
Total Zinc (Zn)	5.0	25	ug/L	250	12	NC
BTEX						
Benzene	0.20	1.0	ug/L	<0.20	<0.20	NC
Ethylbenzene	0.20	1.0	ug/L	<0.20	<0.20	NC
Toluene	0.20	1.0	ug/L	<0.20	<0.20	NC
o-Xylene	0.20	1.0	ug/L	<0.20	<0.20	NC
m+p-Xylene	0.40	2.0	ug/L	<0.40	<0.40	NC
Xylenes	0.40	2.0	ug/L	<0.40	<0.40	NC
Hydrocarbons						
F1 (C6-C10)	25	125	ug/L	<25	<25	NC
F1 (C6-C10) - BTEX	25	125	ug/L	<25	<25	NC
F2 (C10-C16)	100	500	ug/L	<100	<100	NC
F3 (C16-C34)	200	1000	ug/L	<200	<200	NC
F4 (C34-C50)	200	1000	ug/L	<200	<200	NC
Reached Baseline at C50	NA	NA	NA	Yes	Yes	NC
PCBs						
Aroclor 1016	0.05	0.25	ug/L	<0.05	<0.05	NC
Aroclor 1221	0.05	0.25	ug/L	<0.05	<0.05	NC
Aroclor 1232	0.05	0.25	ug/L	<0.05	<0.05	NC
Aroclor 1242	0.05	0.25	ug/L	<0.05	<0.05	NC
Aroclor 1248	0.05	0.25	ug/L	<0.05	<0.05	NC
Aroclor 1254	0.05	0.25	ug/L	<0.05	<0.05	NC
Aroclor 1260	0.05	0.25	ug/L	<0.05	<0.05	NC
Aroclor 1262	0.05	0.25	ug/L	<0.05	<0.05	NC
Aroclor 1268	0.05	0.25	ug/L	<0.05	<0.05	NC
Total PCB	0.05	0.25	ug/L	<0.05	<0.05	NC

Notes:

10 Exceeds CCME RPD Limit of 40%

mg/L - milligrams per litre

ug/L - micrograms per litre

NC - Not Calculated

RDL - Reportable Detection Limit

RPD - Relative Percent Difference

Table 18: Sediment Analytical Results - QAQC

Sample ID	RDL	5x	Units	LTM-SD5	LTM-SD9 (DUP of SD5)	RPD
Date Sampled				2020-09-19	2020-09-19	
BV Lab ID				NSD402	NSD406	
Metals						
Total Arsenic (As)	1.0	5	ug/g	1.5	1.9	NC
Total Cadmium (Cd)	0.1	0.5	ug/g	1.9	1.3	38%
Total Chromium (Cr)	1.0	5	ug/g	22	24	9%
Total Cobalt (Co)	0.1	0.5	ug/g	6.0	6.2	3%
Total Lead (Pb)	1.0	5	ug/g	73	36	68%
Total Nickel (Ni)	0.5	2.5	ug/g	11	8.5	26%
Total Zinc (Zn)	5.0	25	ug/g	210	130	47%
BTEX						
Benzene	0.01	0.1	ug/L	<0.20	<0.20	NC
Ethylbenzene	0.02	0.1	ug/L	<0.20	<0.20	NC
Toluene	0.04	0.2	ug/L	<0.20	<0.20	NC
o-Xylene	0.04	0.2	ug/L	<0.20	<0.20	NC
m+p-Xylene	0.40	2.0	ug/L	<0.40	<0.40	NC
Xylenes	0.40	2.0	ug/L	<0.40	<0.40	NC
Hydrocarbons						
F1 (C6-C10)	20	100	ug/L	<25	<25	NC
F1 (C6-C10) - BTEX	20	100	ug/L	<25	<25	NC
F2 (C10-C16)	30.00	150	ug/L	<100	<100	NC
F3 (C16-C34)	150.00	750	ug/L	<200	<200	NC
F4 (C34-C50)	150.00	750	ug/L	<200	<200	NC
Reached Baseline at C50	NA	NA	NA	Yes	Yes	NC
PCBs						
Aroclor 1242	0.030	0.15	ug/L	<0.020	<0.030	NC
Aroclor 1248	0.030	0.15	ug/L	<0.020	<0.030	NC
Aroclor 1254	0.030	0.15	ug/L	<0.020	<0.030	NC
Aroclor 1260	0.030	0.15	ug/L	0.21	1.3	144%
Total PCB	0.030	0.15	ug/L	0.21	1.3	144%

Notes:

10 Exceeds CCME RPD Limit of 40%

mg/L - milligrams per litre

ug/L - micrograms per litre

NC - Not Calculated

RDL - Reportable Detection Limit

RPD - Relative Percent Difference

APPENDIX A

Photo Sheets

Figure 1: Main Landfill Sign
(Road Entrance, Looking South West)

Figure 2: Territorial Park Sign
(South of Landfill)

Figure 3: Missing Main Landfill Sign
(South of Landfill)

Figure 4: Landfill Profile
(Looking North East)

Figure 5: ATV Tracks on Top of Landfill
(Looking South West)

Figure 6: Swale on South Side of Landfill
(Looking West)

Figure 7: Swale on South Side of Landfill
(Looking South West)

Figure 8: Evidence of Tent on South Side of Landfill
(Looking South West)

Figure 9: LTM-SW1
(Looking North West)

Figure 10: LTM-SW2
(Looking North)

Figure 11: LTM-SW3
(Looking North)

Figure 12: LTM-SW4
(Looking North West)

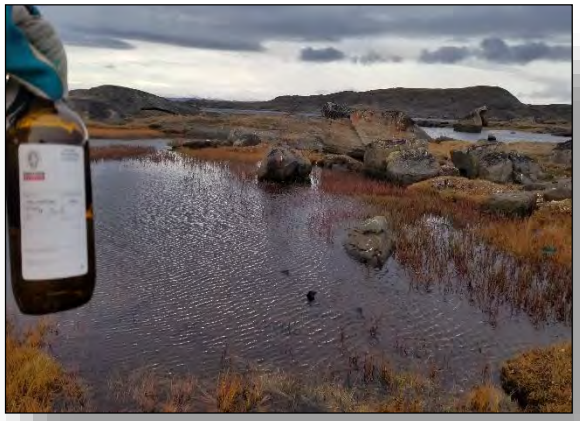


Figure 13: LTM-SW5
(Looking West)

Figure 14: LTM-SW6
(Looking North)

Figure 15: LTM-SW7
(Looking East)

Figure 16: LTM-SW8
(Looking North East)

Figure 17: Animal Prints
(Located North East of LTM-SW4)

APPENDIX B

Laboratory Certificates of Analysis

Your Project #: P05059
Your C.O.C. #: 792612-01-01, 792612-02-01

Attention: Heather Wolczanski

BluMetric Environmental Inc
PO Box 430
3108 Carp Rd
Carp, ON
CANADA K0A 1L0

Report Date: 2020/10/28
Report #: R6388426
Version: 4 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

BV LABS JOB #: C0O8399
Received: 2020/09/23, 14:40

Sample Matrix: Soil
Samples Received: 9

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Petroleum Hydrocarbons F2-F4 in Soil (2)	5	2020/09/28	2020/09/28	CAM SOP-00316	CCME CWS m
Petroleum Hydrocarbons F2-F4 in Soil (2)	4	2020/09/28	2020/09/29	CAM SOP-00316	CCME CWS m
Strong Acid Leachable Metals by ICPMS	7	2020/09/25	2020/09/29	CAM SOP-00447	EPA 6020B m
Strong Acid Leachable Metals by ICPMS	2	2020/09/28	2020/09/29	CAM SOP-00447	EPA 6020B m
Moisture (Subcontracted) (1, 3)	1	N/A	2020/10/10	AB SOP-00002	CCME PHC-CWS m
CCME Index of Additive Cancer Risk (1, 4)	1	2020/10/07	2020/10/11		CCME PHC-CWS
B[a]P Total Potency Equivalent (1)	1	N/A	2020/10/11		CCME
PAH in Soil by GC/MS (1)	1	2020/10/10	2020/10/11	AB SOP-00036/AB SOP-00003	EPA 3540C/8270E m
Moisture	9	N/A	2020/09/25	CAM SOP-00445	Carter 2nd ed 51.2 m
Polychlorinated Biphenyl in Soil	8	2020/09/28	2020/09/29	CAM SOP-00309	EPA 8082A m
Polychlorinated Biphenyl in Soil	1	2020/09/28	2020/09/30	CAM SOP-00309	EPA 8082A m
Volatile Organic Compounds and F1 PHCs	7	N/A	2020/09/25	CAM SOP-00230	EPA 8260 m
Volatile Organic Compounds and F1 PHCs	2	N/A	2020/09/29	CAM SOP-00230	EPA 8260 m

Sample Matrix: Water
Samples Received: 9

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Conductivity	3	N/A	2020/09/28	CAM SOP-00414	SM 23 2510 m
Conductivity	6	N/A	2020/09/29	CAM SOP-00414	SM 23 2510 m
Petroleum Hydro. CCME F1 & BTEX in Water	4	N/A	2020/09/26	CAM SOP-00315	CCME PHC-CWS m
Petroleum Hydro. CCME F1 & BTEX in Water	5	N/A	2020/09/27	CAM SOP-00315	CCME PHC-CWS m
Petroleum Hydrocarbons F2-F4 in Water (2)	7	2020/09/25	2020/09/25	CAM SOP-00316	CCME PHC-CWS m
Petroleum Hydrocarbons F2-F4 in Water (2)	2	2020/09/25	2020/09/26	CAM SOP-00316	CCME PHC-CWS m
Hardness (calculated as CaCO3)	9	N/A	2020/09/29	CAM SOP 00102/00408/00447	SM 2340 B
Total Metals Analysis by ICPMS	9	N/A	2020/09/29	CAM SOP-00447	EPA 6020B m
B[a]P Total Potency Equivalent (1, 5)	1	N/A	2020/10/11		CCME
PAH in Water by GC/MS (1)	1	2020/10/09	2020/10/10	AB SOP-00037/AB SOP-00003	EPA 3510C/8270E m

Your Project #: P05059
Your C.O.C. #: 792612-01-01, 792612-02-01

Attention: Heather Wolczanski

BluMetric Environmental Inc
PO Box 430
3108 Carp Rd
Carp, ON
CANADA K0A 1L0

Report Date: 2020/10/28
Report #: R6388426
Version: 4 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

BV LABS JOB #: C0O8399
Received: 2020/09/23, 14:40

Sample Matrix: Water
Samples Received: 9

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Polychlorinated Biphenyl in Water	9	2020/09/28	2020/09/29	CAM SOP-00309	EPA 8082A m
pH	3	2020/09/25	2020/09/28	CAM SOP-00413	SM 4500H+ B m
pH	6	2020/09/25	2020/09/29	CAM SOP-00413	SM 4500H+ B m
Total Dissolved Solids	9	2020/09/25	2020/09/28	CAM SOP-00428	SM 23 2540C m
Low Level Total Suspended Solids	9	2020/09/25	2020/09/29	CAM SOP-00428	SM 23 2540D m

Remarks:

Bureau Veritas Laboratories are accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by BV Labs are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

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

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

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by BV Labs, results relate to the supplied samples tested.

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) This test was performed by BVLabs Calgary via Mississauga
(2) All CCME PHC results met required criteria unless otherwise stated in the report. The CWS PHC methods employed by Bureau Veritas Laboratories conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following “Alberta Environment’s Interpretation of the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Validation of Performance-Based Alternative Methods September 2003”. Documentation is available upon request. Modifications from Reference Method for the Canada-wide Standard for Petroleum Hydrocarbons in Soil-Tier 1 Method: F2/F3/F4 data reported using validated cold solvent extraction instead of Soxhlet extraction.
(3) Offsite analysis requires that subcontracted moisture be reported.

Your Project #: P05059
Your C.O.C. #: 792612-01-01, 792612-02-01

Attention: Heather Wolczanski

BluMetric Environmental Inc
PO Box 430
3108 Carp Rd
Carp, ON
CANADA K0A 1L0

Report Date: 2020/10/28
Report #: R6388426
Version: 4 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

BV LABS JOB #: C0O8399
Received: 2020/09/23, 14:40

(4) Total PAHs include only those PAHs specified in the sewer use by-by-law.
(5) B[a]P TPE is calculated using 1/2 of the RDL for non detect results as per Alberta Environment instructions. This protocol may not apply in other jurisdictions.

Encryption Key

Christine Gripton
Senior Project Manager
28 Oct 2020 16:46:13

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Christine Gripton, Senior Project Manager
Email: Christine.Gripton@bvlabs.com
Phone# (519)652-9444

==========

BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

CCME PETROLEUM HYDROCARBONS SOIL (SOIL)

BV Labs ID		NSD398		NSD399		NSD400		NSD401		
Sampling Date		2020/09/19 14:45		2020/09/19 13:45		2020/09/19 12:45		2020/09/19 11:45		
COC Number		792612-02-01		792612-02-01		792612-02-01		792612-02-01		
	UNITS	LTM-SD1	QC Batch	LTM-SD2	QC Batch	LTM-SD3	QC Batch	LTM-SD4	RDL	QC Batch
Inorganics										
Moisture	%	21	6965402	37	6965313	21	6965402	25	1.0	6964744
Volatile Organics										
Benzene	ug/g	<0.0060	6964520	<0.0060	6964520	<0.0060	6964520	<0.0060	0.0060	6964520
Ethylbenzene	ug/g	<0.010	6964520	<0.010	6964520	<0.010	6964520	<0.010	0.010	6964520
Toluene	ug/g	<0.020	6964520	<0.020	6964520	<0.020	6964520	<0.020	0.020	6964520
p+m-Xylene	ug/g	<0.020	6964520	<0.020	6964520	<0.020	6964520	<0.020	0.020	6964520
o-Xylene	ug/g	<0.020	6964520	<0.020	6964520	<0.020	6964520	<0.020	0.020	6964520
Total Xylenes	ug/g	<0.020	6964520	<0.020	6964520	<0.020	6964520	<0.020	0.020	6964520
F1 (C6-C10)	ug/g	<10	6964520	<10	6964520	<10	6964520	<10	10	6964520
F1 (C6-C10) - BTEX	ug/g	<10	6964520	<10	6964520	<10	6964520	<10	10	6964520
F2-F4 Hydrocarbons										
F2 (C10-C16 Hydrocarbons)	ug/g	<10	6969306	<10	6969306	<10	6969306	<10	10	6969306
F3 (C16-C34 Hydrocarbons)	ug/g	<50	6969306	88	6969306	<50	6969306	<50	50	6969306
F4 (C34-C50 Hydrocarbons)	ug/g	<50	6969306	<50	6969306	<50	6969306	<50	50	6969306
Reached Baseline at C50	ug/g	Yes	6969306	Yes	6969306	Yes	6969306	Yes		6969306
Surrogate Recovery (%)										
o-Terphenyl	%	88	6969306	91	6969306	91	6969306	95		6969306
4-Bromofluorobenzene	%	94	6964520	95	6964520	95	6964520	96		6964520
D10-o-Xylene	%	101	6964520	97	6964520	101	6964520	100		6964520
D4-1,2-Dichloroethane	%	98	6964520	87	6964520	98	6964520	96		6964520
D8-Toluene	%	98	6964520	101	6964520	99	6964520	98		6964520

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas Laboratories 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

CCME PETROLEUM HYDROCARBONS SOIL (SOIL)

BV Labs ID		NSD401			NSD402			NSD403		
Sampling Date		2020/09/19 11:45			2020/09/19 10:45			2020/09/19 09:45		
COC Number		792612-02-01			792612-02-01			792612-02-01		
	UNITS	LTM-SD4 Lab-Dup	RDL	QC Batch	LTM-SD5	RDL	QC Batch	LTM-SD6	RDL	QC Batch
Inorganics										
Moisture	%				44	1.0	6965313	62	1.0	6965402
Volatile Organics										
Benzene	ug/g	<0.0060	0.0060	6964520	<0.0060	0.0060	6964520	0.013	0.012	6964520
Ethylbenzene	ug/g	<0.010	0.010	6964520	<0.010	0.010	6964520	<0.020	0.020	6964520
Toluene	ug/g	<0.020	0.020	6964520	<0.020	0.020	6964520	<0.040	0.040	6964520
p+m-Xylene	ug/g	<0.020	0.020	6964520	<0.020	0.020	6964520	0.053	0.040	6964520
o-Xylene	ug/g	<0.020	0.020	6964520	<0.020	0.020	6964520	<0.040	0.040	6964520
Total Xylenes	ug/g	<0.020	0.020	6964520	<0.020	0.020	6964520	0.053	0.040	6964520
F1 (C6-C10)	ug/g	<10	10	6964520	<10	10	6964520	31	20	6964520
F1 (C6-C10) - BTEX	ug/g	<10	10	6964520	<10	10	6964520	31	20	6964520
F2-F4 Hydrocarbons										
F2 (C10-C16 Hydrocarbons)	ug/g				440	20	6969306	2100	20	6969306
F3 (C16-C34 Hydrocarbons)	ug/g				490	100	6969306	1700	100	6969306
F4 (C34-C50 Hydrocarbons)	ug/g				200	100	6969306	520	100	6969306
Reached Baseline at C50	ug/g				Yes		6969306	Yes		6969306
Surrogate Recovery (%)										
o-Terphenyl	%				90		6969306	91		6969306
4-Bromofluorobenzene	%	97		6964520	97		6964520	97		6964520
D10-o-Xylene	%	98		6964520	111		6964520	98		6964520
D4-1,2-Dichloroethane	%	100		6964520	96		6964520	98		6964520
D8-Toluene	%	98		6964520	100		6964520	98		6964520

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

Bureau Veritas Laboratories 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

CCME PETROLEUM HYDROCARBONS SOIL (SOIL)

BV Labs ID		NSD404		NSD405			NSD406		
Sampling Date		2020/09/19 15:45		2020/09/19 16:45			2020/09/19 16:00		
COC Number		792612-02-01		792612-02-01			792612-02-01		
	UNITS	LTM-SD7	RDL	LTM-SD8	RDL	QC Batch	LTM-SD9	RDL	QC Batch
Inorganics									
Moisture	%	34	1.0	48	1.0	6965402	66	1.0	6965313
Volatile Organics									
Benzene	ug/g	<0.0060	0.0060	<0.0060	0.0060	6964520	<0.012	0.012	6964520
Ethylbenzene	ug/g	<0.010	0.010	<0.010	0.010	6964520	<0.020	0.020	6964520
Toluene	ug/g	<0.020	0.020	<0.020	0.020	6964520	<0.040	0.040	6964520
p+m-Xylene	ug/g	<0.020	0.020	<0.020	0.020	6964520	<0.040	0.040	6964520
o-Xylene	ug/g	<0.020	0.020	<0.020	0.020	6964520	<0.040	0.040	6964520
Total Xylenes	ug/g	<0.020	0.020	<0.020	0.020	6964520	<0.040	0.040	6964520
F1 (C6-C10)	ug/g	<10	10	<10	10	6964520	<20	20	6964520
F1 (C6-C10) - BTEX	ug/g	<10	10	<10	10	6964520	<20	20	6964520
F2-F4 Hydrocarbons									
F2 (C10-C16 Hydrocarbons)	ug/g	300	10	<20	20	6969306	160	30	6969306
F3 (C16-C34 Hydrocarbons)	ug/g	800	50	370	100	6969306	280	150	6969306
F4 (C34-C50 Hydrocarbons)	ug/g	230	50	120	100	6969306	<150	150	6969306
Reached Baseline at C50	ug/g	Yes		Yes		6969306	Yes		6969306
Surrogate Recovery (%)									
o-Terphenyl	%	96		96		6969306	92		6969306
4-Bromofluorobenzene	%	95		95		6964520	98		6964520
D10-o-Xylene	%	109		97		6964520	111		6964520
D4-1,2-Dichloroethane	%	96		98		6964520	89		6964520
D8-Toluene	%	99		99		6964520	100		6964520

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas Laboratories 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

CCME ICPMS METALS (SOIL)

BV Labs ID		NSD398	NSD399		NSD400		NSD401		
Sampling Date		2020/09/19 14:45	2020/09/19 13:45		2020/09/19 12:45		2020/09/19 11:45		
COC Number		792612-02-01	792612-02-01		792612-02-01		792612-02-01		
	UNITS	LTM-SD1	LTM-SD2	QC Batch	LTM-SD3	QC Batch	LTM-SD4	RDL	QC Batch
Metals									
Acid Extractable Arsenic (As)	ug/g	<1.0	<1.0	6965073	1.7	6968501	1.6	1.0	6965073
Acid Extractable Cadmium (Cd)	ug/g	<0.10	<0.10	6965073	<0.10	6968501	0.19	0.10	6965073
Acid Extractable Chromium (Cr)	ug/g	22	14	6965073	38	6968501	16	1.0	6965073
Acid Extractable Cobalt (Co)	ug/g	3.8	2.3	6965073	4.5	6968501	4.7	0.10	6965073
Acid Extractable Lead (Pb)	ug/g	4.6	6.8	6965073	7.3	6968501	110	1.0	6965073
Acid Extractable Nickel (Ni)	ug/g	7.0	4.3	6965073	7.4	6968501	7.8	0.50	6965073
Acid Extractable Zinc (Zn)	ug/g	30	28	6965073	40	6968501	53	5.0	6965073

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

BV Labs ID		NSD402	NSD403		NSD404		NSD405		
Sampling Date		2020/09/19 10:45	2020/09/19 09:45		2020/09/19 15:45		2020/09/19 16:45		
COC Number		792612-02-01	792612-02-01		792612-02-01		792612-02-01		
	UNITS	LTM-SD5	LTM-SD6	QC Batch	LTM-SD7	QC Batch	LTM-SD8	RDL	QC Batch
Metals									
Acid Extractable Arsenic (As)	ug/g	1.5	1.5	6965073	2.1	6968343	1.0	1.0	6965073
Acid Extractable Cadmium (Cd)	ug/g	1.9	2.9	6965073	0.32	6968343	<0.10	0.10	6965073
Acid Extractable Chromium (Cr)	ug/g	22	27	6965073	36	6968343	25	1.0	6965073
Acid Extractable Cobalt (Co)	ug/g	6.0	7.7	6965073	9.4	6968343	4.4	0.10	6965073
Acid Extractable Lead (Pb)	ug/g	73	89	6965073	31	6968343	4.6	1.0	6965073
Acid Extractable Nickel (Ni)	ug/g	11	11	6965073	20	6968343	7.2	0.50	6965073
Acid Extractable Zinc (Zn)	ug/g	210	280	6965073	140	6968343	27	5.0	6965073

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas Laboratories 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

CCME ICPMS METALS (SOIL)

BV Labs ID		NSD405	NSD406		
Sampling Date		2020/09/19 16:45	2020/09/19 16:00		
COC Number		792612-02-01	792612-02-01		
	UNITS	LTM-SD8 Lab-Dup	LTM-SD9	RDL	QC Batch
Metals					
Acid Extractable Arsenic (As)	ug/g	1.0	1.9	1.0	6965073
Acid Extractable Cadmium (Cd)	ug/g	<0.10	1.3	0.10	6965073
Acid Extractable Chromium (Cr)	ug/g	22	24	1.0	6965073
Acid Extractable Cobalt (Co)	ug/g	4.2	6.2	0.10	6965073
Acid Extractable Lead (Pb)	ug/g	4.2	36	1.0	6965073
Acid Extractable Nickel (Ni)	ug/g	6.6	8.5	0.50	6965073
Acid Extractable Zinc (Zn)	ug/g	25	130	5.0	6965073

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

Bureau Veritas Laboratories 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

CCME PAHS (SOIL)

BV Labs ID		NSD405		
Sampling Date		2020/09/19 16:45		
COC Number		792612-02-01		
	UNITS	LTM-SD8	RDL	QC Batch
Physical Testing				
Moisture-Subcontracted	%	48	0.30	6996562
Calculated Parameters				
Index of Additive Cancer Risk -IACR	N/A	0.4	0.1	6996563
Polyaromatic Hydrocarbons				
Acenaphthene	mg/kg	<0.0050	0.0050	6996565
Benzo(a)pyrene Total Potency Equiv.	mg/kg	0.029	0.0071	6996564
Acenaphthylene	mg/kg	<0.0050	0.0050	6996565
Acridine	mg/kg	0.037	0.010	6996565
Anthracene	mg/kg	<0.0040	0.0040	6996565
Benzo(a)anthracene	mg/kg	0.012	0.0050	6996565
Benzo(b/j)fluoranthene	mg/kg	0.030	0.0050	6996565
Benzo(k)fluoranthene	mg/kg	0.0099	0.0050	6996565
Benzo(g,h,i)perylene	mg/kg	0.020	0.0050	6996565
Benzo(c)phenanthrene	mg/kg	<0.0050	0.0050	6996565
Benzo(a)pyrene	mg/kg	0.019	0.0050	6996565
Benzo(e)pyrene	mg/kg	0.019	0.0050	6996565
Chrysene	mg/kg	0.014	0.0050	6996565
Dibenzo(a,h)anthracene	mg/kg	<0.0050	0.0050	6996565
Fluoranthene	mg/kg	0.038	0.0050	6996565
Fluorene	mg/kg	<0.0050	0.0050	6996565
Indeno(1,2,3-cd)pyrene	mg/kg	0.025	0.0050	6996565
1-Methylnaphthalene	mg/kg	<0.0050	0.0050	6996565
2-Methylnaphthalene	mg/kg	0.011	0.0050	6996565
Naphthalene	mg/kg	0.025	0.0050	6996565
Phenanthrene	mg/kg	0.018	0.0050	6996565
Perylene	mg/kg	<0.0050	0.0050	6996565
Pyrene	mg/kg	0.034	0.0050	6996565
Quinoline	mg/kg	<0.010	0.010	6996565
Surrogate Recovery (%)				
D10-Anthracene	%	98		6996565
D14-Terphenyl	%	127		6996565
D8-Acenaphthylene	%	102		6996565

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas Laboratories 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

CCME PAHS (SOIL)

BV Labs ID		NSD405		
Sampling Date		2020/09/19 16:45		
COC Number		792612-02-01		
	UNITS	LTM-SD8	RDL	QC Batch
D8-Naphthalene	%	97		6996565

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas Laboratories 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

CCME PAHS (WATER)

BV Labs ID		NSD396		
Sampling Date		2020/09/19 16:15		
COC Number		792612-01-01		
	UNITS	LTM-SW8	RDL	QC Batch
Polyaromatic Hydrocarbons				
Benzo(a)pyrene Total Potency Equiv.	ug/L	<0.010	0.010	6996560
Acenaphthene	ug/L	<0.10	0.10	6996561
Acenaphthylene	ug/L	<0.10	0.10	6996561
Acridine	ug/L	<0.040	0.040	6996561
Anthracene	ug/L	<0.010	0.010	6996561
Benzo(a)anthracene	ug/L	<0.0085	0.0085	6996561
Benzo(b/j)fluoranthene	ug/L	<0.0085	0.0085	6996561
Benzo(k)fluoranthene	ug/L	<0.0085	0.0085	6996561
Benzo(g,h,i)perylene	ug/L	<0.0085	0.0085	6996561
Benzo(c)phenanthrene	ug/L	<0.050	0.050	6996561
Benzo(a)pyrene	ug/L	<0.0075	0.0075	6996561
Benzo(e)pyrene	ug/L	<0.050	0.050	6996561
Chrysene	ug/L	<0.0085	0.0085	6996561
Dibenzo(a,h)anthracene	ug/L	<0.0075	0.0075	6996561
Fluoranthene	ug/L	<0.010	0.010	6996561
Fluorene	ug/L	<0.050	0.050	6996561
Indeno(1,2,3-cd)pyrene	ug/L	<0.0085	0.0085	6996561
1-Methylnaphthalene	ug/L	<0.10	0.10	6996561
2-Methylnaphthalene	ug/L	<0.10	0.10	6996561
Naphthalene	ug/L	<0.10	0.10	6996561
Phenanthrene	ug/L	<0.050	0.050	6996561
Perylene	ug/L	<0.050	0.050	6996561
Pyrene	ug/L	<0.020	0.020	6996561
Quinoline	ug/L	<0.20	0.20	6996561
Surrogate Recovery (%)				
D10-Anthracene	%	95		6996561
D14-Terphenyl	%	135 (1)		6996561
D8-Acenaphthylene	%	79		6996561
D8-Naphthalene	%	59		6996561

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

Bureau Veritas Laboratories 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

CCME PHCS, BTEX/F1-F4 (WATER)

BV Labs ID		NSD389	NSD390	NSD391	NSD392	NSD393	NSD394		
Sampling Date		2020/09/19 14:15	2020/09/19 13:15	2020/09/19 12:15	2020/09/19 11:15	2020/09/19 10:15	2020/09/19 09:15		
COC Number		792612-01-01	792612-01-01	792612-01-01	792612-01-01	792612-01-01	792612-01-01		
	UNITS	LTM-SW1	LTM-SW2	LTM-SW3	LTM-SW4	LTM-SW5	LTM-SW6	RDL	QC Batch
BTEX & F1 Hydrocarbons									
Benzene	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	6967382
Toluene	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	6967382
Ethylbenzene	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	6967382
o-Xylene	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	6967382
p+m-Xylene	ug/L	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	0.40	6967382
Total Xylenes	ug/L	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	0.40	6967382
F1 (C6-C10)	ug/L	<25	<25	<25	<25	<25	<25	25	6967382
F1 (C6-C10) - BTEX	ug/L	<25	<25	<25	<25	<25	<25	25	6967382
F2-F4 Hydrocarbons									
F2 (C10-C16 Hydrocarbons)	ug/L	<100	<100	<100	<100	<100	<100	100	6964487
F3 (C16-C34 Hydrocarbons)	ug/L	<200	<200	<200	<200	<200	<200	200	6964487
F4 (C34-C50 Hydrocarbons)	ug/L	<200	<200	<200	<200	<200	<200	200	6964487
Reached Baseline at C50	ug/L	Yes	Yes	Yes	Yes	Yes	Yes		6964487
Surrogate Recovery (%)									
1,4-Difluorobenzene	%	97	99	101	97	100	98		6967382
4-Bromofluorobenzene	%	93	93	96	95	95	94		6967382
D10-o-Xylene	%	81	87	85	86	86	86		6967382
D4-1,2-Dichloroethane	%	106	106	106	108	108	103		6967382
o-Terphenyl	%	99	98	97	100	99	100		6964487

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas Laboratories 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

CCME PHCS, BTEX/F1-F4 (WATER)

BV Labs ID		NSD395	NSD396	NSD397		
Sampling Date		2020/09/19 15:15	2020/09/19 16:15	2020/09/19 15:30		
COC Number		792612-01-01	792612-01-01	792612-01-01		
	UNITS	LTM-SW7	LTM-SW8	LTM-SW9	RDL	QC Batch
BTEX & F1 Hydrocarbons						
Benzene	ug/L	<0.20	<0.20	<0.20	0.20	6967382
Toluene	ug/L	<0.20	0.35	<0.20	0.20	6967382
Ethylbenzene	ug/L	<0.20	<0.20	<0.20	0.20	6967382
o-Xylene	ug/L	<0.20	<0.20	<0.20	0.20	6967382
p+m-Xylene	ug/L	<0.40	<0.40	<0.40	0.40	6967382
Total Xylenes	ug/L	<0.40	<0.40	<0.40	0.40	6967382
F1 (C6-C10)	ug/L	<25	<25	<25	25	6967382
F1 (C6-C10) - BTEX	ug/L	<25	<25	<25	25	6967382
F2-F4 Hydrocarbons						
F2 (C10-C16 Hydrocarbons)	ug/L	<100	<100	<100	100	6964487
F3 (C16-C34 Hydrocarbons)	ug/L	<200	<200	<200	200	6964487
F4 (C34-C50 Hydrocarbons)	ug/L	<200	<200	<200	200	6964487
Reached Baseline at C50	ug/L	Yes	Yes	Yes		6964487
Surrogate Recovery (%)						
1,4-Difluorobenzene	%	99	97	96		6967382
4-Bromofluorobenzene	%	95	96	95		6967382
D10-o-Xylene	%	85	85	86		6967382
D4-1,2-Dichloroethane	%	106	106	105		6967382
o-Terphenyl	%	99	99	99		6964487

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas Laboratories 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

O.REG 153 PCBS (SOIL)

BV Labs ID		NSD398		NSD399		NSD400	NSD401		NSD402		
Sampling Date		2020/09/19 14:45		2020/09/19 13:45		2020/09/19 12:45	2020/09/19 11:45		2020/09/19 10:45		
COC Number		792612-02-01		792612-02-01		792612-02-01	792612-02-01		792612-02-01		
	UNITS	LTM-SD1	RDL	LTM-SD2	RDL	LTM-SD3	LTM-SD4	RDL	LTM-SD5	RDL	QC Batch
PCBs											
Aroclor 1242	ug/g	<0.010	0.010	<0.020	0.020	<0.010	<0.010	0.010	<0.020	0.020	6970057
Aroclor 1248	ug/g	<0.010	0.010	<0.020	0.020	<0.010	<0.010	0.010	<0.020	0.020	6970057
Aroclor 1254	ug/g	<0.010	0.010	<0.020	0.020	<0.010	<0.010	0.010	<0.020	0.020	6970057
Aroclor 1260	ug/g	<0.010	0.010	0.025	0.020	0.017	0.011	0.010	0.21	0.020	6970057
Total PCB	ug/g	<0.010	0.010	0.025	0.020	0.017	0.011	0.010	0.21	0.020	6970057
Surrogate Recovery (%)											
Decachlorobiphenyl	%	91		94		87	92		92		6970057

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

BV Labs ID		NSD403		NSD404	NSD405		NSD406		
Sampling Date		2020/09/19 09:45		2020/09/19 15:45	2020/09/19 16:45		2020/09/19 16:00		
COC Number		792612-02-01		792612-02-01	792612-02-01		792612-02-01		
	UNITS	LTM-SD6	RDL	LTM-SD7	LTM-SD8	RDL	LTM-SD9	RDL	QC Batch
PCBs									
Aroclor 1242	ug/g	<0.30	0.30	<0.020	<0.020	0.020	<0.030	0.030	6970057
Aroclor 1248	ug/g	<0.30	0.30	<0.020	<0.020	0.020	<0.030	0.030	6970057
Aroclor 1254	ug/g	<0.30	0.30	<0.020	<0.020	0.020	<0.030	0.030	6970057
Aroclor 1260	ug/g	3.4	0.30	0.082	<0.020	0.020	1.3	0.030	6970057
Total PCB	ug/g	3.4	0.30	0.082	<0.020	0.020	1.3	0.030	6970057
Surrogate Recovery (%)									
Decachlorobiphenyl	%	106		102	93		98		6970057

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas Laboratories 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

RESULTS OF ANALYSES OF WATER

BV Labs ID		NSD389	NSD390		NSD391	NSD392		
Sampling Date		2020/09/19 14:15	2020/09/19 13:15		2020/09/19 12:15	2020/09/19 11:15		
COC Number		792612-01-01	792612-01-01		792612-01-01	792612-01-01		
	UNITS	LTM-SW1	LTM-SW2	QC Batch	LTM-SW3	LTM-SW4	RDL	QC Batch
Calculated Parameters								
Hardness (CaCO3)	mg/L	3600	2500	6962221	2000	2500	1.0	6962221
Inorganics								
Conductivity	umho/cm	32000	22000	6965677	19000	23000	1.0	6965804
Total Dissolved Solids	mg/L	24400	15400	6965592	12400	16300	20	6965592
pH	pH	7.51	7.48	6965682	7.69	7.72		6965807
Total Suspended Solids	mg/L	11	12	6964847	7	13	1	6964847

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

BV Labs ID		NSD392			NSD393			NSD393		
Sampling Date		2020/09/19 11:15			2020/09/19 10:15			2020/09/19 10:15		
COC Number		792612-01-01			792612-01-01			792612-01-01		
	UNITS	LTM-SW4 Lab-Dup	RDL	QC Batch	LTM-SW5	RDL	QC Batch	LTM-SW5 Lab-Dup	RDL	QC Batch
Calculated Parameters										
Hardness (CaCO3)	mg/L				1700	1.0	6962221			
Inorganics										
Conductivity	umho/cm				17000	1.0	6965804	17000	1.0	6965804
Total Dissolved Solids	mg/L	16300	20	6965592	11200	20	6965592			
pH	pH				7.44		6965807	7.50		6965807
Total Suspended Solids	mg/L				10	1	6964847			

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

Bureau Veritas Laboratories 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

RESULTS OF ANALYSES OF WATER

BV Labs ID		NSD394		NSD395	NSD396	NSD397		
Sampling Date		2020/09/19 09:15		2020/09/19 15:15	2020/09/19 16:15	2020/09/19 15:30		
COC Number		792612-01-01		792612-01-01	792612-01-01	792612-01-01		
	UNITS	LTM-SW6	QC Batch	LTM-SW7	LTM-SW8	LTM-SW9	RDL	QC Batch
Calculated Parameters								
Hardness (CaCO3)	mg/L	89	6962221	28	44	21	1.0	6962221
Inorganics								
Conductivity	umho/cm	280	6965677	100	120	90	1.0	6965804
Total Dissolved Solids	mg/L	165	6965592	85	100	90	10	6965592
pH	pH	7.60	6965682	7.13	7.09	6.87		6965807
Total Suspended Solids	mg/L	3	6964847	61	8	14	1	6964847

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas Laboratories 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

BV Labs ID		NSD389	NSD390	NSD391	NSD392	NSD393		NSD394		
Sampling Date		2020/09/19 14:15	2020/09/19 13:15	2020/09/19 12:15	2020/09/19 11:15	2020/09/19 10:15		2020/09/19 09:15		
COC Number		792612-01-01	792612-01-01	792612-01-01	792612-01-01	792612-01-01		792612-01-01		
	UNITS	LTM-SW1	LTM-SW2	LTM-SW3	LTM-SW4	LTM-SW5	RDL	LTM-SW6	RDL	QC Batch
Metals										
Total Arsenic (As)	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	5.0	<1.0	1.0	6970840
Total Cadmium (Cd)	ug/L	<0.45	<0.45	<0.45	<0.45	<0.45	0.45	<0.090	0.090	6970840
Total Chromium (Cr)	ug/L	<25	<25	<25	<25	<25	25	<5.0	5.0	6970840
Total Cobalt (Co)	ug/L	<2.5	<2.5	<2.5	<2.5	<2.5	2.5	<0.50	0.50	6970840
Total Lead (Pb)	ug/L	<2.5	<2.5	<2.5	<2.5	<2.5	2.5	<0.50	0.50	6970840
Total Nickel (Ni)	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	5.0	<1.0	1.0	6970840
Total Zinc (Zn)	ug/L	<25	<25	<25	<25	<25	25	<5.0	5.0	6970840

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

BV Labs ID		NSD395	NSD395	NSD396	NSD397		
Sampling Date		2020/09/19 15:15	2020/09/19 15:15	2020/09/19 16:15	2020/09/19 15:30		
COC Number		792612-01-01	792612-01-01	792612-01-01	792612-01-01		
	UNITS	LTM-SW7	LTM-SW7 Lab-Dup	LTM-SW8	LTM-SW9	RDL	QC Batch
Metals							
Total Arsenic (As)	ug/L	<1.0	<1.0	<1.0	<1.0	1.0	6970840
Total Cadmium (Cd)	ug/L	<0.090	<0.090	<0.090	<0.090	0.090	6970840
Total Chromium (Cr)	ug/L	<5.0	<5.0	<5.0	<5.0	5.0	6970840
Total Cobalt (Co)	ug/L	0.64	0.63	<0.50	3.9	0.50	6970840
Total Lead (Pb)	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	6970840
Total Nickel (Ni)	ug/L	1.2	1.2	<1.0	1.2	1.0	6970840
Total Zinc (Zn)	ug/L	250	250	6.2	12	5.0	6970840

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

Bureau Veritas Laboratories 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

POLYCHLORINATED BIPHENYLS BY GC-ECD (WATER)

BV Labs ID		NSD389	NSD390	NSD391	NSD392	NSD393	NSD394		
Sampling Date		2020/09/19 14:15	2020/09/19 13:15	2020/09/19 12:15	2020/09/19 11:15	2020/09/19 10:15	2020/09/19 09:15		
COC Number		792612-01-01	792612-01-01	792612-01-01	792612-01-01	792612-01-01	792612-01-01		
	UNITS	LTM-SW1	LTM-SW2	LTM-SW3	LTM-SW4	LTM-SW5	LTM-SW6	RDL	QC Batch
PCBs									
Aroclor 1016	ug/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	6969411
Aroclor 1221	ug/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	6969411
Aroclor 1232	ug/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	6969411
Aroclor 1242	ug/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	6969411
Aroclor 1248	ug/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	6969411
Aroclor 1254	ug/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	6969411
Aroclor 1260	ug/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	6969411
Aroclor 1262	ug/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	6969411
Aroclor 1268	ug/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	6969411
Total PCB	ug/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	6969411
Surrogate Recovery (%)									
Decachlorobiphenyl	%	103	105	106	96	98	102		6969411

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

BV Labs ID		NSD395	NSD396	NSD397		
Sampling Date		2020/09/19 15:15	2020/09/19 16:15	2020/09/19 15:30		
COC Number		792612-01-01	792612-01-01	792612-01-01		
	UNITS	LTM-SW7	LTM-SW8	LTM-SW9	RDL	QC Batch
PCBs						
Aroclor 1016	ug/L	<0.05	<0.05	<0.05	0.05	6969411
Aroclor 1221	ug/L	<0.05	<0.05	<0.05	0.05	6969411
Aroclor 1232	ug/L	<0.05	<0.05	<0.05	0.05	6969411
Aroclor 1242	ug/L	<0.05	<0.05	<0.05	0.05	6969411
Aroclor 1248	ug/L	<0.05	<0.05	<0.05	0.05	6969411
Aroclor 1254	ug/L	<0.05	<0.05	<0.05	0.05	6969411
Aroclor 1260	ug/L	<0.05	<0.05	<0.05	0.05	6969411
Aroclor 1262	ug/L	<0.05	<0.05	<0.05	0.05	6969411
Aroclor 1268	ug/L	<0.05	<0.05	<0.05	0.05	6969411
Total PCB	ug/L	<0.05	<0.05	<0.05	0.05	6969411
Surrogate Recovery (%)						
Decachlorobiphenyl	%	92	95	99		6969411

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas Laboratories 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

GENERAL COMMENTS

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

Package 1	17.7°C
Package 2	17.3°C
Package 3	16.3°C
Package 4	16.7°C
Package 5	17.3°C

Revised report (2020/10/06): Amended list of metal parameters.
Revised report (2020/10/16): Includes repeat analysis of ICPMS and PCBs on select samples, as well as PAH analysis on LTM-SW8 and LTM-SD8.
Revised report (2020/10/28): Split file as requested.

PCB Analysis: Detection limits were adjusted for high moisture content.

Sample NSD389 [LTM-SW1] : Metals: Due to the sample matrix, the sample required dilution. Detection limits were adjusted accordingly.

Metals Analysis:Due to the sample matrix, the sample required dilution. Detection limits were adjusted accordingly.

Sample NSD390 [LTM-SW2] : Metals: Due to the sample matrix, the sample required dilution. Detection limits were adjusted accordingly.

Metals Analysis:Due to the sample matrix, the sample required dilution. Detection limits were adjusted accordingly.

Sample NSD391 [LTM-SW3] : Metals: Due to the sample matrix, the sample required dilution. Detection limits were adjusted accordingly.

Metals Analysis:Due to the sample matrix, the sample required dilution. Detection limits were adjusted accordingly.

Sample NSD392 [LTM-SW4] : Metals: Due to the sample matrix, the sample required dilution. Detection limits were adjusted accordingly.

Metals Analysis:Due to the sample matrix, the sample required dilution. Detection limits were adjusted accordingly.

Sample NSD393 [LTM-SW5] : Metals: Due to the sample matrix, the sample required dilution. Detection limits were adjusted accordingly.

Metals Analysis:Due to the sample matrix, the sample required dilution. Detection limits were adjusted accordingly.

Sample NSD396 [LTM-SW8] : Sample was analyzed past method specified hold time for PAH in Water by GC/MS.

Sample NSD398 [LTM-SD1] : VOCF1 Analysis: Soil weight exceeds the protocol specification of approximately 5g in the field preserved vial. Additional methanol was added to the vial to ensure extraction efficiency

Sample NSD399 [LTM-SD2] : VOCF1 Analysis: Soil weight exceeds the protocol specification of approximately 5g in the field preserved vial. Additional methanol was added to the vial to ensure extraction efficiency

Sample NSD400 [LTM-SD3] : VOCF1 Analysis: Soil weight exceeds the protocol specification of approximately 5g in the field preserved vial. Additional methanol was added to the vial to ensure extraction efficiency

Sample NSD402 [LTM-SD5] : F2-F4 Analysis: Detection limits were adjusted for high moisture content.
PCB analysis: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.
Detection limits were adjusted for high moisture content.

Sample NSD403 [LTM-SD6] : VOCF1 Analysis: Detection limits were raised due to high moisture of soil provided.

F2-F4 Analysis: Detection limits were adjusted for high moisture content.

Bureau Veritas Laboratories 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

PCB Analysis: Due to high concentrations of the target analytes, sample required dilution. Detection limits were adjusted accordingly.

Sample NSD404 [LTM-SD7] : VOCF1 Analysis: Soil weight exceeds the protocol specification of approximately 5g in the field preserved vial. Additional methanol was added to the vial to ensure extraction efficiency

Sample NSD405 [LTM-SD8] : F2-F4 Analysis: Detection limits were adjusted for high moisture content. Sample was analyzed past method specified hold time for PAH in Soil by GC/MS.

Sample NSD406 [LTM-SD9] : F2-F4 Analysis: Detection limits were adjusted for high moisture content.

VOCF1 Analysis: Detection limits were raised due to high moisture content.

PCB Analysis: Detection limits were raised due to high moisture content..

Results relate only to the items tested.

Bureau Veritas Laboratories 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

QUALITY ASSURANCE REPORT

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
6964487	o-Terphenyl	2020/09/25	101	60 - 130	102	60 - 130	101	%				
6964520	4-Bromofluorobenzene	2020/09/25	101	60 - 140	102	60 - 140	96	%				
6964520	D10-o-Xylene	2020/09/25	98	60 - 130	74	60 - 130	101	%				
6964520	D4-1,2-Dichloroethane	2020/09/25	98	60 - 140	98	60 - 140	97	%				
6964520	D8-Toluene	2020/09/25	101	60 - 140	102	60 - 140	99	%				
6967382	1,4-Difluorobenzene	2020/09/26	100	70 - 130	102	70 - 130	98	%				
6967382	4-Bromofluorobenzene	2020/09/26	96	70 - 130	92	70 - 130	92	%				
6967382	D10-o-Xylene	2020/09/26	93	70 - 130	92	70 - 130	84	%				
6967382	D4-1,2-Dichloroethane	2020/09/26	98	70 - 130	97	70 - 130	101	%				
6969306	o-Terphenyl	2020/09/28	95	60 - 130	85	60 - 130	81	%				
6969411	Decachlorobiphenyl	2020/09/29	98	60 - 130	105	60 - 130	74	%				
6970057	Decachlorobiphenyl	2020/09/29	90	60 - 130	89	60 - 130	87	%				
6996561	D10-Anthracene	2020/10/10	96	50 - 130	98	50 - 130	87	%				
6996561	D14-Terphenyl	2020/10/10	127	50 - 130	153 (1)	50 - 130	130	%				
6996561	D8-Acenaphthylene	2020/10/10	84	50 - 130	90	50 - 130	81	%				
6996561	D8-Naphthalene	2020/10/10	63	50 - 130	80	50 - 130	72	%				
6996565	D10-Anthracene	2020/10/10	88	50 - 130	86	50 - 130	94	%				
6996565	D14-Terphenyl	2020/10/10	122	50 - 130	120	50 - 130	129	%				
6996565	D8-Acenaphthylene	2020/10/10	92	50 - 130	89	50 - 130	97	%				
6996565	D8-Naphthalene	2020/10/10	87	50 - 130	84	50 - 130	92	%				
6964487	F2 (C10-C16 Hydrocarbons)	2020/09/25	104	50 - 130	105	60 - 130	<100	ug/L	NC	30		
6964487	F3 (C16-C34 Hydrocarbons)	2020/09/25	114	50 - 130	118	60 - 130	<200	ug/L	NC	30		
6964487	F4 (C34-C50 Hydrocarbons)	2020/09/25	111	50 - 130	116	60 - 130	<200	ug/L	NC	30		
6964520	Benzene	2020/09/25	104	60 - 140	95	60 - 130	<0.0060	ug/g	NC	50		
6964520	Ethylbenzene	2020/09/25	102	60 - 140	94	60 - 130	<0.010	ug/g	NC	50		
6964520	F1 (C6-C10) - BTEX	2020/09/25					<10	ug/g	NC	30		
6964520	F1 (C6-C10)	2020/09/25	94	60 - 140	95	80 - 120	<10	ug/g	NC	30		
6964520	o-Xylene	2020/09/25	100	60 - 140	93	60 - 130	<0.020	ug/g	NC	50		
6964520	p+m-Xylene	2020/09/25	98	60 - 140	91	60 - 130	<0.020	ug/g	NC	50		
6964520	Toluene	2020/09/25	106	60 - 140	97	60 - 130	<0.020	ug/g	NC	50		
6964520	Total Xylenes	2020/09/25					<0.020	ug/g	NC	50		

Bureau Veritas Laboratories 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
6964744	Moisture	2020/09/25							3.6	20		
6964847	Total Suspended Solids	2020/09/29					<1	mg/L	11	25	95	85 - 115
6965073	Acid Extractable Arsenic (As)	2020/09/29	92	75 - 125	100	80 - 120	<1.0	ug/g	0.99	30		
6965073	Acid Extractable Cadmium (Cd)	2020/09/29	89	75 - 125	100	80 - 120	<0.10	ug/g	NC	30		
6965073	Acid Extractable Chromium (Cr)	2020/09/29	89	75 - 125	102	80 - 120	<1.0	ug/g	11	30		
6965073	Acid Extractable Cobalt (Co)	2020/09/29	91	75 - 125	101	80 - 120	<0.10	ug/g	4.6	30		
6965073	Acid Extractable Lead (Pb)	2020/09/29	94	75 - 125	100	80 - 120	<1.0	ug/g	9.3	30		
6965073	Acid Extractable Nickel (Ni)	2020/09/29	93	75 - 125	100	80 - 120	<0.50	ug/g	8.0	30		
6965073	Acid Extractable Zinc (Zn)	2020/09/29	NC	75 - 125	100	80 - 120	<5.0	ug/g	6.3	30		
6965313	Moisture	2020/09/25							1.1	20		
6965402	Moisture	2020/09/25							1.3	20		
6965592	Total Dissolved Solids	2020/09/28					<10	mg/L	0.061	25	97	90 - 110
6965677	Conductivity	2020/09/28			102	85 - 115	<1.0	umho/cm	0	25		
6965682	pH	2020/09/28			102	98 - 103			0.24	N/A		
6965804	Conductivity	2020/09/29			101	85 - 115	<1.0	umho/cm	0.33	25		
6965807	pH	2020/09/29			102	98 - 103			0.77	N/A		
6967382	Benzene	2020/09/26	109	50 - 140	114	50 - 140	<0.20	ug/L	NC	30		
6967382	Ethylbenzene	2020/09/26	112	50 - 140	115	50 - 140	<0.20	ug/L	NC	30		
6967382	F1 (C6-C10) - BTEX	2020/09/26					<25	ug/L	NC	30		
6967382	F1 (C6-C10)	2020/09/26	105	70 - 130	109	70 - 130	<25	ug/L	NC	30		
6967382	o-Xylene	2020/09/26	111	50 - 140	112	50 - 140	<0.20	ug/L	NC	30		
6967382	p+m-Xylene	2020/09/26	104	50 - 140	104	50 - 140	<0.40	ug/L	NC	30		
6967382	Toluene	2020/09/26	103	50 - 140	106	50 - 140	<0.20	ug/L	NC	30		
6967382	Total Xylenes	2020/09/26					<0.40	ug/L	NC	30		
6968343	Acid Extractable Arsenic (As)	2020/09/29	102	75 - 125	101	80 - 120	<1.0	ug/g	NC	30		
6968343	Acid Extractable Cadmium (Cd)	2020/09/29	101	75 - 125	103	80 - 120	<0.10	ug/g	NC	30		
6968343	Acid Extractable Chromium (Cr)	2020/09/29	104	75 - 125	102	80 - 120	<1.0	ug/g	2.8	30		
6968343	Acid Extractable Cobalt (Co)	2020/09/29	101	75 - 125	101	80 - 120	<0.10	ug/g	6.0	30		
6968343	Acid Extractable Lead (Pb)	2020/09/29	101	75 - 125	102	80 - 120	<1.0	ug/g	1.7	30		
6968343	Acid Extractable Nickel (Ni)	2020/09/29	101	75 - 125	104	80 - 120	<0.50	ug/g	2.0	30		

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
6968343	Acid Extractable Zinc (Zn)	2020/09/29	102	75 - 125	98	80 - 120	<5.0	ug/g	6.9	30		
6968501	Acid Extractable Arsenic (As)	2020/09/29	96	75 - 125	104	80 - 120	<1.0	ug/g				
6968501	Acid Extractable Cadmium (Cd)	2020/09/29	94	75 - 125	102	80 - 120	<0.10	ug/g				
6968501	Acid Extractable Chromium (Cr)	2020/09/29	NC	75 - 125	100	80 - 120	<1.0	ug/g				
6968501	Acid Extractable Cobalt (Co)	2020/09/29	96	75 - 125	100	80 - 120	<0.10	ug/g				
6968501	Acid Extractable Lead (Pb)	2020/09/29	95	75 - 125	101	80 - 120	<1.0	ug/g				
6968501	Acid Extractable Nickel (Ni)	2020/09/29	93	75 - 125	100	80 - 120	<0.50	ug/g				
6968501	Acid Extractable Zinc (Zn)	2020/09/29	NC	75 - 125	99	80 - 120	<5.0	ug/g				
6969306	F2 (C10-C16 Hydrocarbons)	2020/09/29	96	50 - 130	86	80 - 120	<10	ug/g	NC	30		
6969306	F3 (C16-C34 Hydrocarbons)	2020/09/29	104	50 - 130	94	80 - 120	<50	ug/g	NC	30		
6969306	F4 (C34-C50 Hydrocarbons)	2020/09/29	101	50 - 130	91	80 - 120	<50	ug/g	NC	30		
6969411	Aroclor 1016	2020/09/29					<0.05	ug/L	NC	40		
6969411	Aroclor 1221	2020/09/29					<0.05	ug/L	NC	40		
6969411	Aroclor 1232	2020/09/29					<0.05	ug/L	NC	40		
6969411	Aroclor 1242	2020/09/29					<0.05	ug/L	NC	30		
6969411	Aroclor 1248	2020/09/29					<0.05	ug/L	NC	30		
6969411	Aroclor 1254	2020/09/29					<0.05	ug/L	NC	30		
6969411	Aroclor 1260	2020/09/29	92	60 - 130	97	60 - 130	<0.05	ug/L	NC	30		
6969411	Aroclor 1262	2020/09/29					<0.05	ug/L	NC	40		
6969411	Aroclor 1268	2020/09/29					<0.05	ug/L	NC	40		
6969411	Total PCB	2020/09/29	92	60 - 130	97	60 - 130	<0.05	ug/L	NC	40		
6970057	Aroclor 1242	2020/09/29					<0.010	ug/g	NC	50		
6970057	Aroclor 1248	2020/09/29					<0.010	ug/g	NC	50		
6970057	Aroclor 1254	2020/09/29					<0.010	ug/g	NC	50		
6970057	Aroclor 1260	2020/09/29	114	30 - 130	114	30 - 130	<0.010	ug/g	NC	50		
6970057	Total PCB	2020/09/29	114	30 - 130	114	30 - 130	<0.010	ug/g	NC	50		
6970840	Total Arsenic (As)	2020/09/29	101	80 - 120	97	80 - 120	<1.0	ug/L	NC	20		
6970840	Total Cadmium (Cd)	2020/09/29	100	80 - 120	96	80 - 120	<0.090	ug/L	NC	20		
6970840	Total Chromium (Cr)	2020/09/29	101	80 - 120	97	80 - 120	<5.0	ug/L	NC	20		
6970840	Total Cobalt (Co)	2020/09/29	100	80 - 120	95	80 - 120	<0.50	ug/L	2.2	20		
6970840	Total Lead (Pb)	2020/09/29	97	80 - 120	93	80 - 120	<0.50	ug/L	NC	20		

Bureau Veritas Laboratories 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
6970840	Total Nickel (Ni)	2020/09/29	100	80 - 120	95	80 - 120	<1.0	ug/L	1.2	20		
6970840	Total Zinc (Zn)	2020/09/29	103	80 - 120	101	80 - 120	<5.0	ug/L	0.92	20		
6996561	1-Methylnaphthalene	2020/10/10	81	50 - 130	77	50 - 130	<0.10	ug/L				
6996561	2-Methylnaphthalene	2020/10/10	72	50 - 130	67	50 - 130	<0.10	ug/L				
6996561	Acenaphthene	2020/10/10	81	50 - 130	77	50 - 130	<0.10	ug/L				
6996561	Acenaphthylene	2020/10/10	78	50 - 130	72	50 - 130	<0.10	ug/L				
6996561	Acridine	2020/10/10	84	50 - 130	83	50 - 130	<0.040	ug/L				
6996561	Anthracene	2020/10/10	96	50 - 130	80	50 - 130	<0.010	ug/L				
6996561	Benzo(a)anthracene	2020/10/10	83	50 - 130	94	50 - 130	<0.0085	ug/L				
6996561	Benzo(a)pyrene	2020/10/10	76	50 - 130	88	50 - 130	<0.0075	ug/L				
6996561	Benzo(b/j)fluoranthene	2020/10/10	80	50 - 130	89	50 - 130	<0.0085	ug/L				
6996561	Benzo(c)phenanthrene	2020/10/10	82	50 - 130	100	50 - 130	<0.050	ug/L				
6996561	Benzo(e)pyrene	2020/10/10	81	50 - 130	94	50 - 130	<0.050	ug/L				
6996561	Benzo(g,h,i)perylene	2020/10/10	84	50 - 130	95	50 - 130	<0.0085	ug/L				
6996561	Benzo(k)fluoranthene	2020/10/10	93	50 - 130	109	50 - 130	<0.0085	ug/L				
6996561	Chrysene	2020/10/10	85	50 - 130	102	50 - 130	<0.0085	ug/L				
6996561	Dibenzo(a,h)anthracene	2020/10/10	81	50 - 130	94	50 - 130	<0.0075	ug/L				
6996561	Fluoranthene	2020/10/10	88	50 - 130	88	50 - 130	<0.010	ug/L				
6996561	Fluorene	2020/10/10	88	50 - 130	81	50 - 130	<0.050	ug/L				
6996561	Indeno(1,2,3-cd)pyrene	2020/10/10	79	50 - 130	85	50 - 130	<0.0085	ug/L				
6996561	Naphthalene	2020/10/10	66	50 - 130	69	50 - 130	<0.10	ug/L				
6996561	Perylene	2020/10/10	77	50 - 130	87	50 - 130	<0.050	ug/L				
6996561	Phenanthrene	2020/10/10	86	50 - 130	84	50 - 130	<0.050	ug/L				
6996561	Pyrene	2020/10/10	87	50 - 130	90	50 - 130	<0.020	ug/L				
6996561	Quinoline	2020/10/10	94	50 - 130	93	50 - 130	<0.20	ug/L				
6996562	Moisture-Subcontracted	2020/10/10					<0.30	%				
6996565	1-Methylnaphthalene	2020/10/10	87	50 - 130	88	50 - 130	<0.0050	mg/kg				
6996565	2-Methylnaphthalene	2020/10/10	81	50 - 130	79	50 - 130	<0.0050	mg/kg				
6996565	Acenaphthene	2020/10/10	82	50 - 130	83	50 - 130	<0.0050	mg/kg				
6996565	Acenaphthylene	2020/10/10	79	50 - 130	81	50 - 130	<0.0050	mg/kg				
6996565	Acridine	2020/10/10	65	50 - 130	67	50 - 130	<0.010	mg/kg				

Bureau Veritas Laboratories 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
6996565	Anthracene	2020/10/10	80	50 - 130	82	50 - 130	<0.0040	mg/kg				
6996565	Benzo(a)anthracene	2020/10/10	83	50 - 130	85	50 - 130	<0.0050	mg/kg				
6996565	Benzo(a)pyrene	2020/10/10	72	50 - 130	76	50 - 130	<0.0050	mg/kg				
6996565	Benzo(b/j)fluoranthene	2020/10/10	72	50 - 130	75	50 - 130	<0.0050	mg/kg				
6996565	Benzo(c)phenanthrene	2020/10/10	81	50 - 130	83	50 - 130	<0.0050	mg/kg				
6996565	Benzo(e)pyrene	2020/10/10	72	50 - 130	75	50 - 130	<0.0050	mg/kg				
6996565	Benzo(g,h,i)perylene	2020/10/10	77	50 - 130	83	50 - 130	<0.0050	mg/kg				
6996565	Benzo(k)fluoranthene	2020/10/10	78	50 - 130	80	50 - 130	<0.0050	mg/kg				
6996565	Chrysene	2020/10/10	80	50 - 130	83	50 - 130	<0.0050	mg/kg				
6996565	Dibenzo(a,h)anthracene	2020/10/10	80	50 - 130	85	50 - 130	<0.0050	mg/kg				
6996565	Fluoranthene	2020/10/10	83	50 - 130	84	50 - 130	<0.0050	mg/kg				
6996565	Fluorene	2020/10/10	83	50 - 130	84	50 - 130	<0.0050	mg/kg				
6996565	Indeno(1,2,3-cd)pyrene	2020/10/10	79	50 - 130	84	50 - 130	<0.0050	mg/kg				
6996565	Naphthalene	2020/10/10	74	50 - 130	75	50 - 130	<0.0050	mg/kg				
6996565	Perylene	2020/10/10	76	50 - 130	82	50 - 130	<0.0050	mg/kg				
6996565	Phenanthrene	2020/10/10	79	50 - 130	80	50 - 130	<0.0050	mg/kg				
6996565	Pyrene	2020/10/10	82	50 - 130	84	50 - 130	<0.0050	mg/kg				
6996565	Quinoline	2020/10/10	97	50 - 130	102	50 - 130	<0.010	mg/kg				

N/A = Not Applicable

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

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

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

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

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

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

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

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

(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

Bureau Veritas Laboratories 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

VALIDATION SIGNATURE PAGE

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

Anastassia Hamanov, Scientific Specialist

Veronica Falk, B.Sc., P.Chem., QP, Scientific Specialist, Organics

Jared Wiseman, B.Sc., P.Chem., QP, Senior Analyst, Organics

BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Bureau Veritas Laboratories 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

APPENDIX C

Trend Analysis

200607 Former Iqaluit Dump, Mann Kendall Trend Evaluation

Contaminant: Arsenic

Monitoring Inputs

Event	LTM1	LTM2	LTM3	LTM4	LTM5
	ug/l	ug/l	ug/l	ug/l	ug/l
1	0.05	0.05	0.05	0.05	0.05
2	0.05	0.05	0.6	0.05	0.05
3	0.05	0.05	0.05	0.05	0.05
4	0.05	0.05	0.05	0.05	0.05
5		0.05	0.05	0.05	0.05
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					

Data Entry Cell

Concentration less than RDL

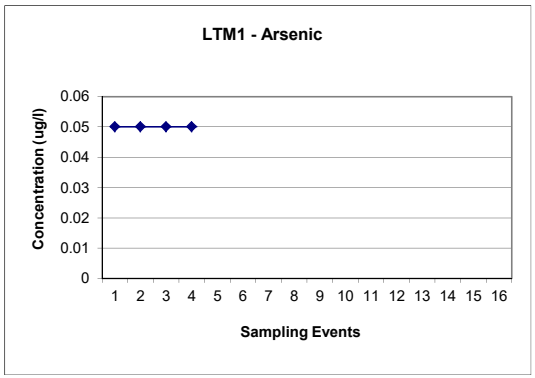
Mann-Kendall Results

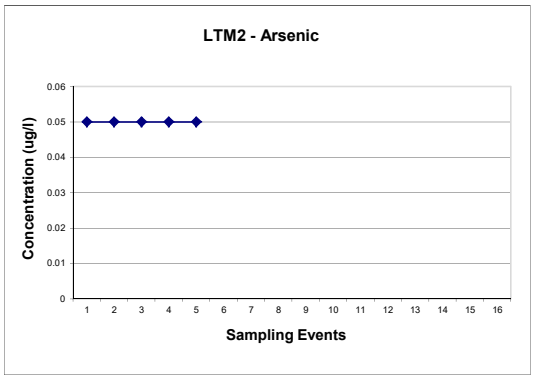
0-5 Event Evaluation

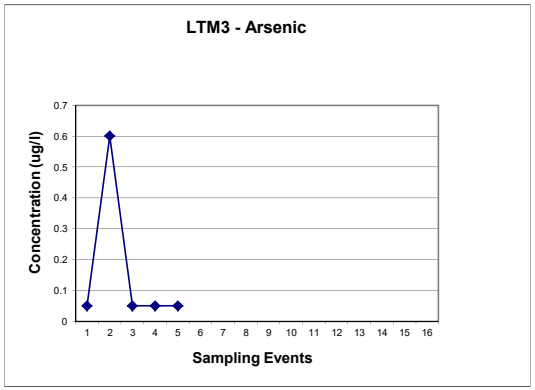
LTM1	Stable/No Trend
LTM2	Stable/No Trend
LTM3	Stable/No Trend
LTM4	Stable/No Trend
LTM5	Stable/No Trend

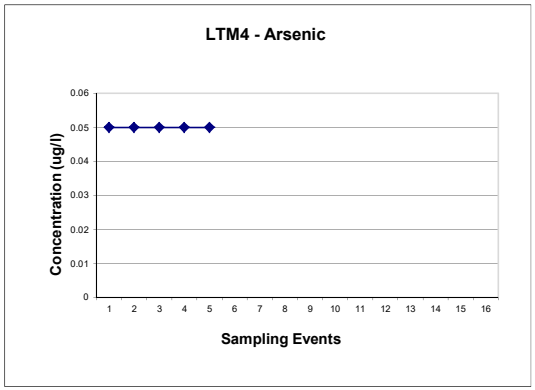
Notes:

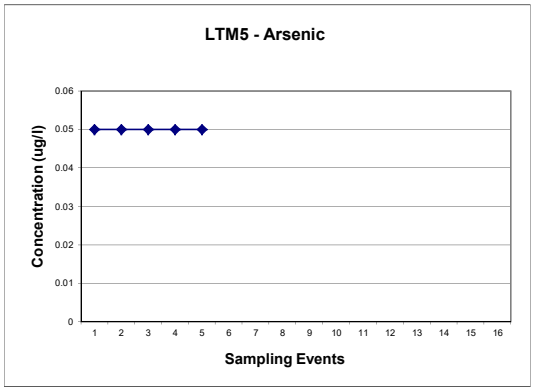
Values below detection limits were assigned a common value of 0.05, half the lowest RD
An S value of 4 was employed for LTM1, LTM2, LTM3, LTM4, & LTM5 where MK analyses was not appropriate due to abundant of RDLs. This S value sets the evaluation as "Stable/No Trend".











200607 Former Iqaluit Dump, Mann Kendall Trend Evaluation

Contaminant: Arsenic

Monitoring Inputs

Event	LTM6	LTM7			
	ug/l	ug/l			
1	0.05	0.15			
2	0.05	0.17			
3	0.05	0.05			
4	0.05	1.2			
5	0.05	0.05			
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					

Data Entry Cell

Concentration less than RDL

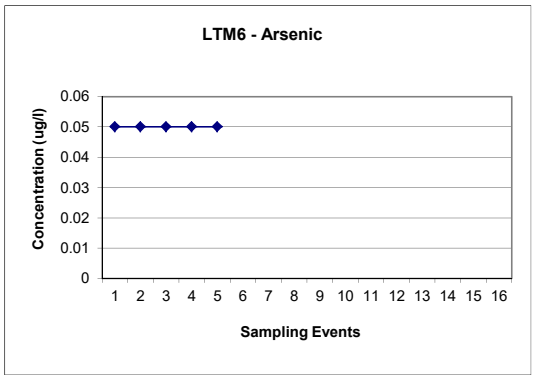
Mann-Kendall Results

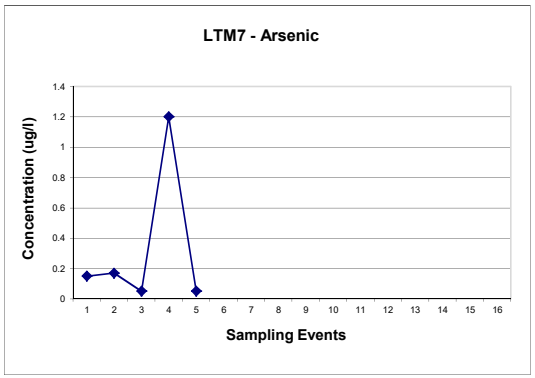
0-5 Event Evaluation

LTM6	Stable/No Trend
LTM7	Decreasing

Notes:

Values below detection limits were assigned a common value of 0.05, half the lowest RD
An S value of 4 was employed for LTM6 where MK analyses was not appropriate due to abundant of RDLs. This S value sets the evaluation as "Stable/No Trend".





200607 Former Iqaluit Dump, Mann Kendall Trend Evaluation

Contaminant: Cadmium

Monitoring Inputs

Event	LTM1	LTM2	LTM3	LTM4	LTM5
	ug/l	ug/l	ug/l	ug/l	ug/l
1	0.005	0.005	0.005	0.021	0.035
2	0.005	0.111	0.017	0.04	0.043
3	0.005	0.005	0.005	0.005	0.14
4	0.005	0.005	0.005	0.005	0.005
5		0.005	0.005	0.005	0.005
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					

Data Entry Cell

Concentration less than RDL

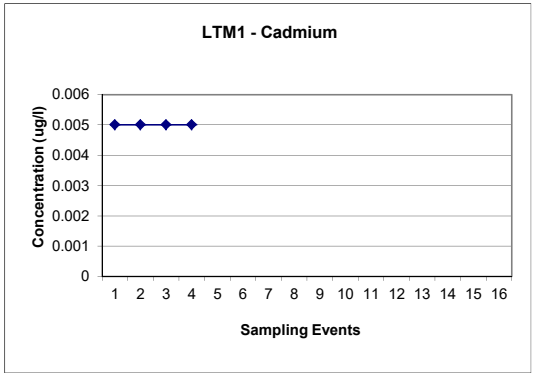
Mann-Kendall Results

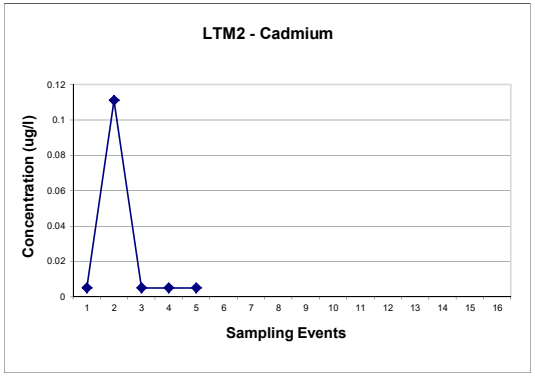
0-5 Event Evaluation

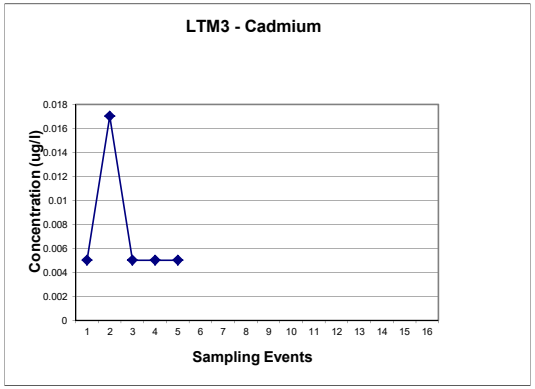
LTM1	Stable/No Trend
LTM2	Stable/No Trend
LTM3	Stable/No Trend
LTM4	Decreasing
LTM5	Decreasing

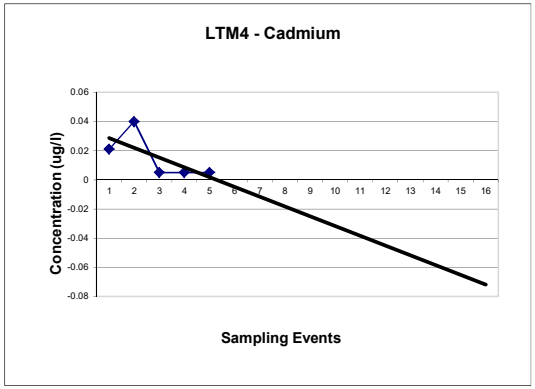
Notes:

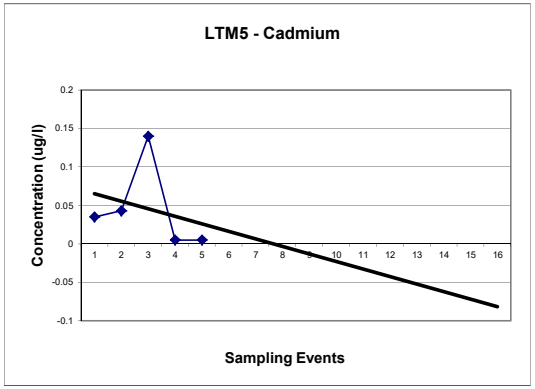
Values below detection limits were assigned a common value of 0.005, half the lowest RI
An S value of 4 was employed for LTM1, LTM2, & LTM3 where MK analyses was not appropriate due to abundant of RDLs. This S value sets the evaluation as "Stable/No Trend".











200607 Former Iqaluit Dump, Mann Kendall Trend Evaluation

Contaminant: Cadmium

Monitoring Inputs

Event	LTM6	LTM7			
	ug/l	ug/l			
1	0.025	0.005			
2	0.043	0.013			
3	0.15	0.005			
4	0.005	0.23			
5	0.005	0.005			
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					

Data Entry Cell

Concentration less than RDL

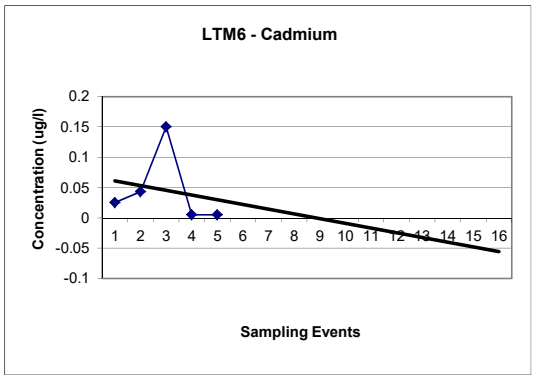
Mann-Kendall Results

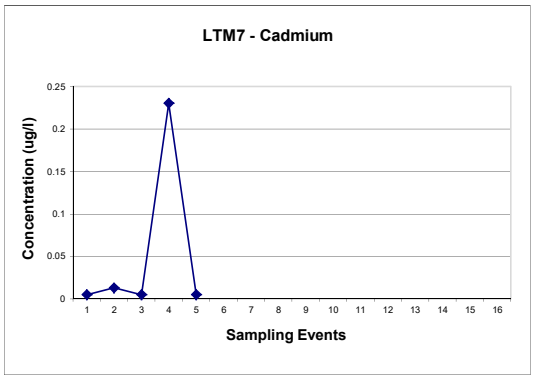
0-5 Event Evaluation

LTM6	Decreasing
LTM7	Stable/No Trend

Notes:

Values below detection limits were assigned a common value of 0.005, half the lowest RI
An S value of 4 was employed for LTM7 where MK analyses was not appropriate due to abundant of RDLs. This S value sets the evaluation as "Stable/No Trend".





200607 Former Iqaluit Dump, Mann Kendall Trend Evaluation

Contaminant: Cobalt

Monitoring Inputs

Event	LTM1	LTM2	LTM3	LTM4	LTM5
	ug/l	ug/l	ug/l	ug/l	ug/l
1	0.1	0.1	0.1	0.1	0.1
2	0.1	0.33	0.54	0.1	0.22
3	0.1	0.1	0.1	0.1	0.54
4	0.1	0.1	0.1	0.1	0.1
5		0.1	0.1	0.1	0.1
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					

Data Entry Cell

Concentration less than RDL

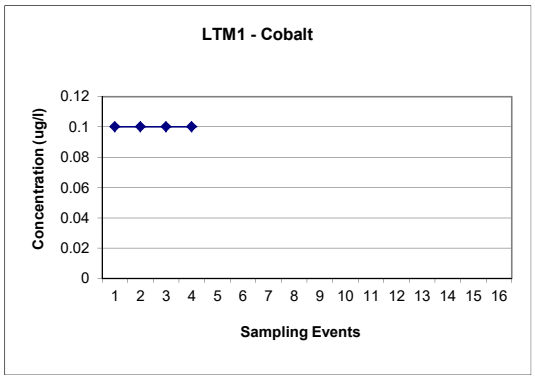
Mann-Kendall Results

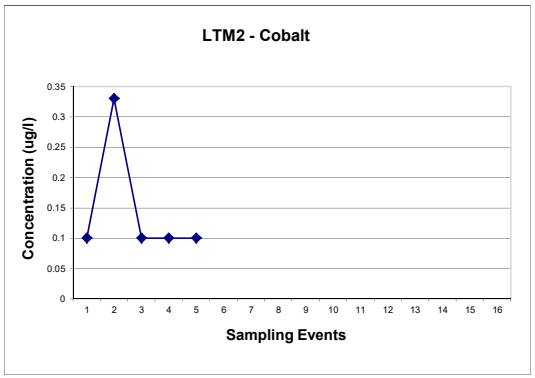
0-5 Event Evaluation

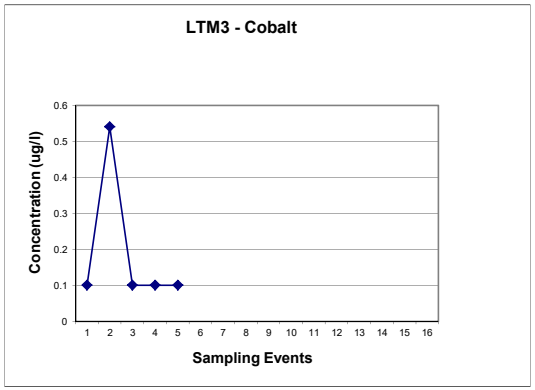
LTM1	Stable/No Trend
LTM2	Stable/No Trend
LTM3	Stable/No Trend
LTM4	Stable/No Trend
LTM5	Decreasing

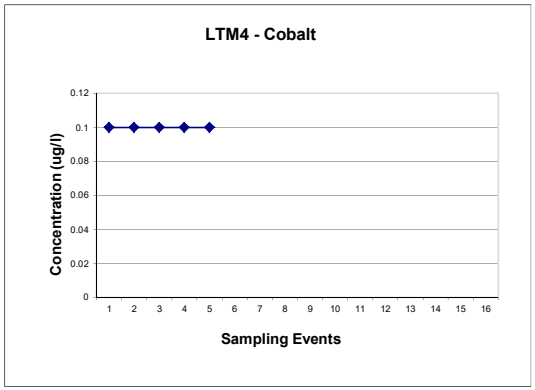
Notes:

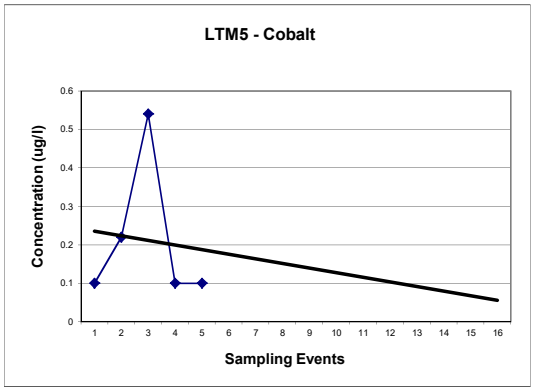
Values below detection limits were assigned a common value of 0.1, half the lowest RDL
An S value of 4 was employed for LTM1, LTM2, LTM3, & LTM4 where MK analyses was not appropriate due to abundant of RDLs. This S value sets the evaluation as "Stable/No Trend".











200607 Former Iqaluit Dump, Mann Kendall Trend Evaluation

Contaminant: Cobalt

Monitoring Inputs

Event	LTM6	LTM7			
	ug/l	ug/l			
1	0.1	0.1			
2	0.26	0.56			
3	0.68	0.1			
4	0.1	6.8			
5	0.1	0.64			
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					

Data Entry Cell

Concentration less than RDL

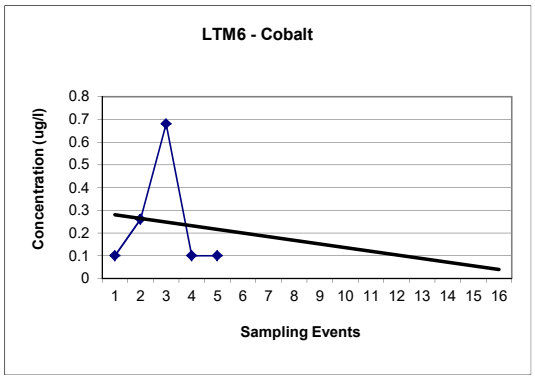
Mann-Kendall Results

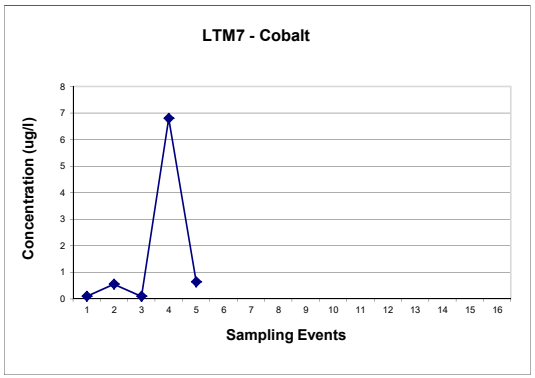
0-5 Event Evaluation

LTM6	Decreasing
LTM7	Stable/No Trend

Notes:

Values below detection limits were assigned a common value of 0.1, half the lowest RDL





200607 Former Iqaluit Dump, Mann Kendall Trend Evaluation

Contaminant: Lead

Monitoring Inputs

Event	LTM1	LTM2	LTM3	LTM4	LTM5
	ug/l	ug/l	ug/l	ug/l	ug/l
1	0.1	0.64	0.1	0.1	0.26
2	0.1	2.31	12.9	0.1	0.1
3	0.1	0.1	0.1	0.1	1.8
4	0.1	0.1	0.1	0.1	0.1
5		0.1	0.1	0.1	0.1
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					

Data Entry Cell

Concentration less than RDL

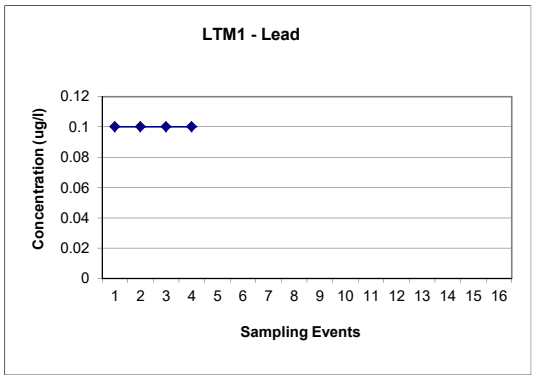
Mann-Kendall Results

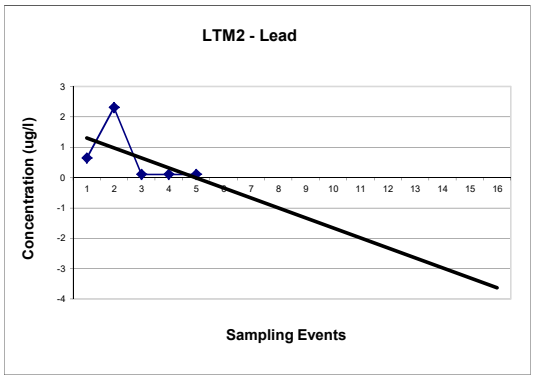
0-5 Event Evaluation

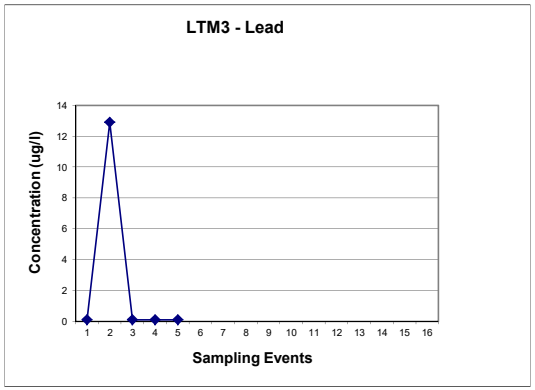
LTM1	Stable/No Trend
LTM2	Decreasing
LTM3	Stable/No Trend
LTM4	Stable/No Trend
LTM5	Decreasing

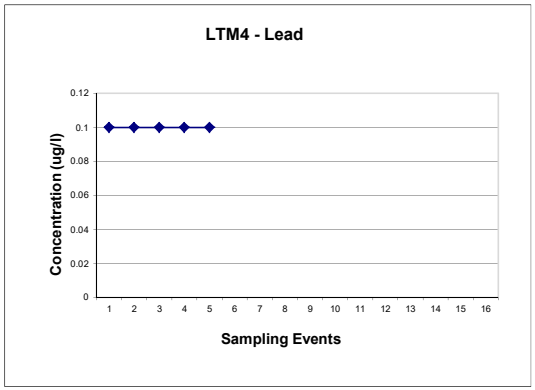
Notes:

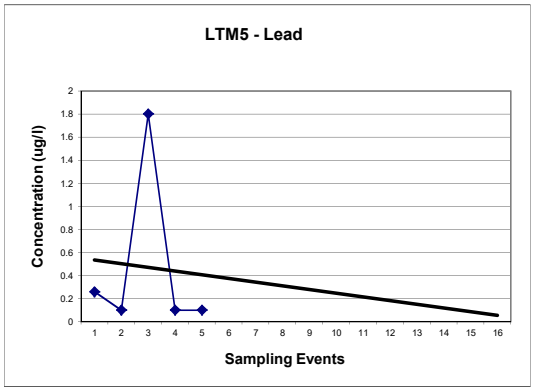
Values below detection limits were assigned a common value of 0.1, half the lowest RDL
An S value of 4 was employed for LTM1, LTM3, & LTM4 where MK analyses was not appropriate due to abundant of RDLs. This S value sets the evaluation as "Stable/No Trend".











200607 Former Iqaluit Dump, Mann Kendall Trend Evaluation

Contaminant: Lead

Monitoring Inputs

Event	LTM6	LTM7			
	ug/l	ug/l			
1	0.1	0.21			
2	0.1	0.61			
3	2.4	0.1			
4	0.51	11			
5	0.5	0.1			
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					

Data Entry Cell

Concentration less than RDL

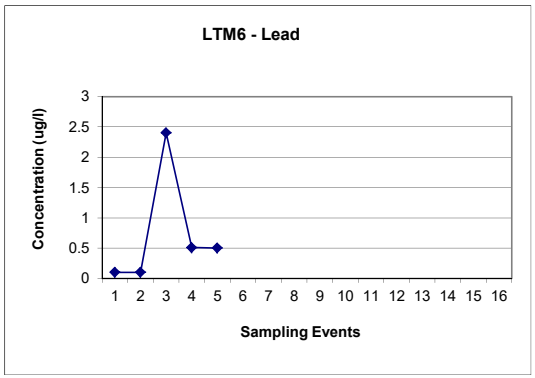
Mann-Kendall Results

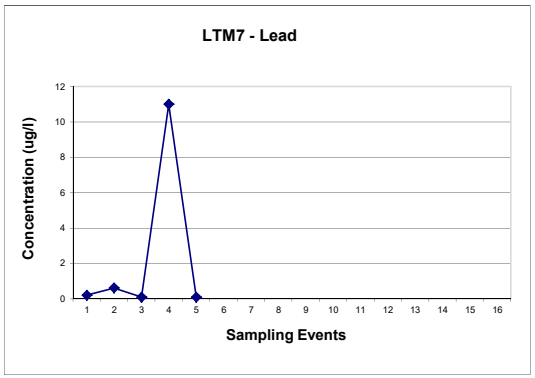
0-5 Event Evaluation

LTM6	Stable/No Trend
LTM7	Stable/No Trend

Notes:

Values below detection limits were assigned a common value of 0.1, half the lowest RDL
An S value of 4 was employed for LTM6 and LTM7 where MK analyses was not appropriate due to abundant of RDLs. This S value sets the evaluation as "Stable/No Trend".





200607 Former Iqaluit Dump, Mann Kendall Trend Evaluation

Contaminant: Nickel

Monitoring Inputs

Event	LTM1	LTM2	LTM3	LTM4	LTM5
	ug/l	ug/l	ug/l	ug/l	ug/l
1	0.5	0.5	0.5	0.5	0.5
2	0.5	1.3	2.5	0.5	0.5
3	0.5	0.5	0.5	0.5	0.5
4	0.5	0.5	0.5	0.5	0.5
5		0.5	0.5	0.5	0.5
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					

Data Entry Cell

Concentration less than RDL

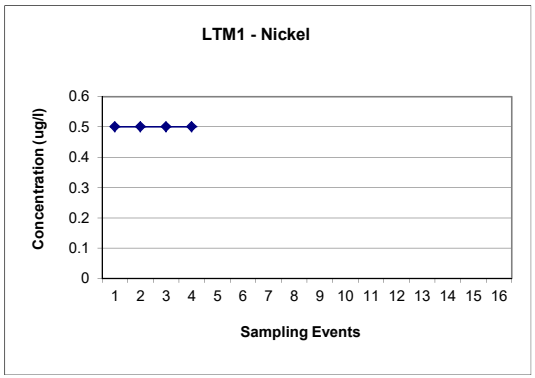
Mann-Kendall Results

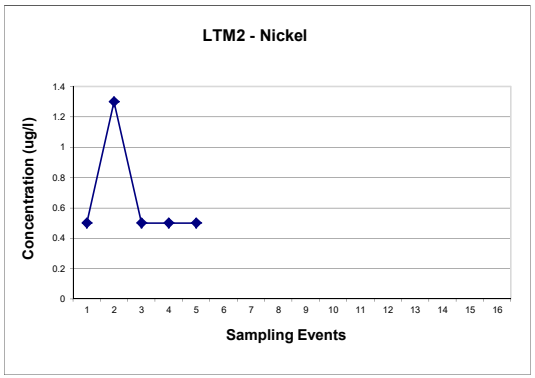
0-5 Event Evaluation

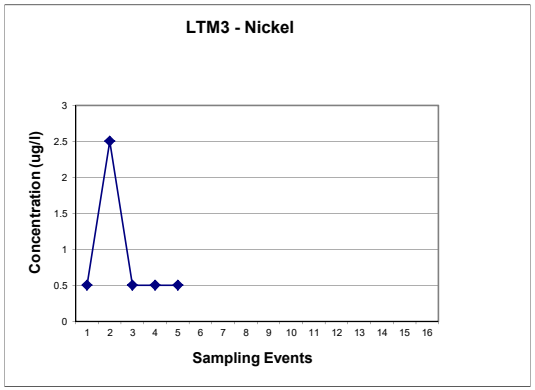
LTM1	Stable/No Trend
LTM2	Stable/No Trend
LTM3	Stable/No Trend
LTM4	Stable/No Trend
LTM5	Stable/No Trend

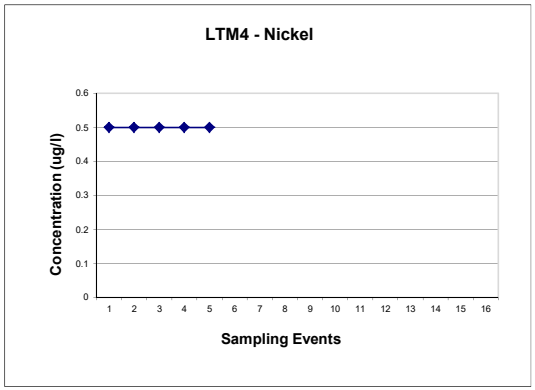
Notes:

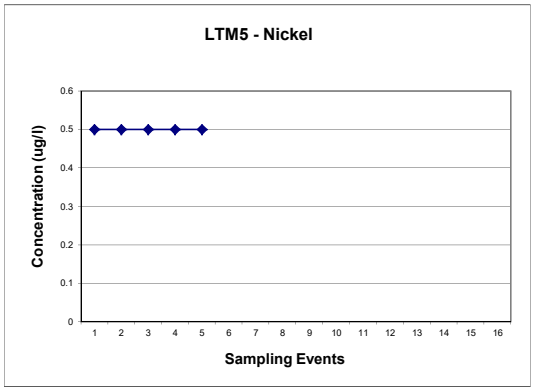
Values below detection limits were assigned a common value of 0.5, half the lowest RDL
An S value of 4 was employed for LTM1, LTM2, LTM3, LTM4, & LTM5 where MK analyses was not appropriate due to abundant of RDLs. This S value sets the evaluation as "Stable/No Trend".











200607 Former Iqaluit Dump, Mann Kendall Trend Evaluation

Contaminant: Nickel

Monitoring Inputs

Event	LTM6	LTM7			
	ug/l	ug/l			
1	0.5	0.5			
2	0.5	1.3			
3	0.5	0.5			
4	0.5	4.2			
5	0.5	1.2			
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					

Data Entry Cell

Concentration less than RDL

Mann-Kendall Results

0-5 Event Evaluation

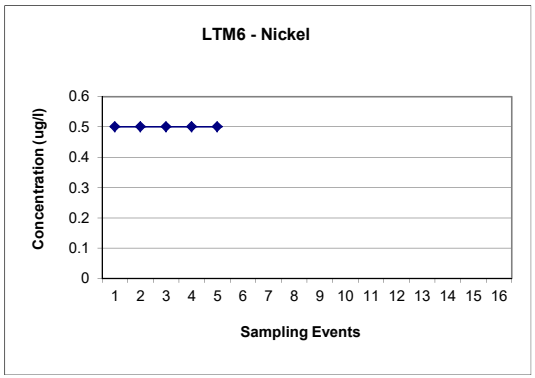
LTM6	Stable/No Trend
LTM7	Decreasing

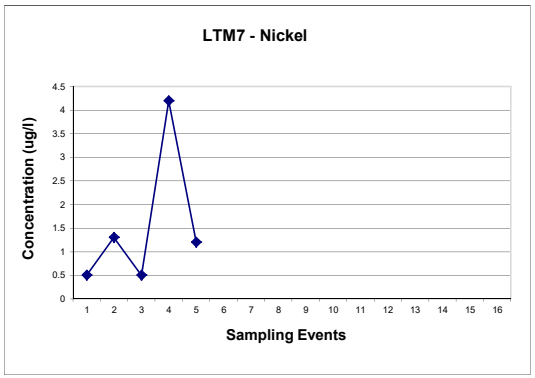
Notes:

Values below detection limits were assigned a common value of 0.5, half the lowest RDL

Duplicate of LTM7 Event 2 chosen instead of sample as was higher

An S value of 4 was employed for LTM6 where MK analyses was not appropriate due to abundant of RDLs. This S value sets the evaluation as "Stable/No Trend".





200607 Former Iqaluit Dump, Mann Kendall Trend Evaluation

Contaminant: Zinc

Monitoring Inputs

Event	LTM1	LTM2	LTM3	LTM4	LTM5
	ug/l	ug/l	ug/l	ug/l	ug/l
1	2.5	2.5	68	2.5	5.7
2	5.6	14.7	18.4	5.3	28
3	2.5	2.5	2.5	2.5	16
4	2.5	2.5	2.5	2.5	2.5
5		2.5	2.5	2.5	2.5
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					

Data Entry Cell

Concentration less than RDL

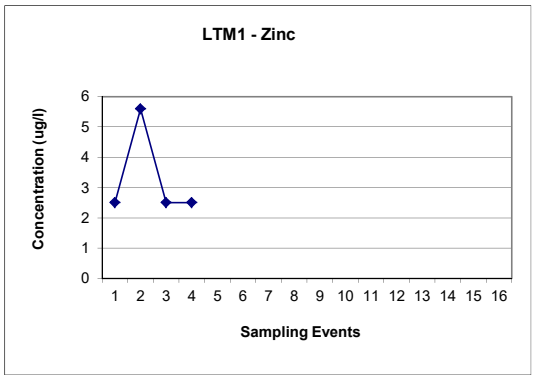
Mann-Kendall Results

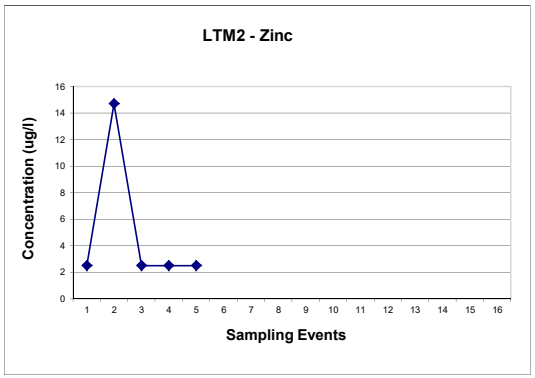
0-5 Event Evaluation

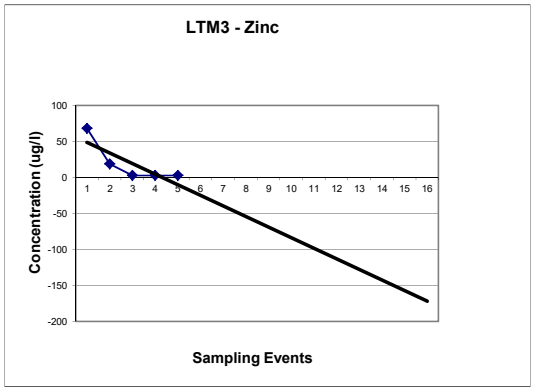
LTM1	Stable/No Trend
LTM2	Stable/No Trend
LTM3	Decreasing
LTM4	Stable/No Trend
LTM5	Decreasing

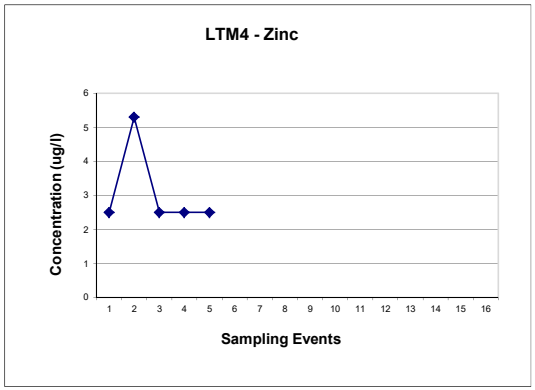
Notes:

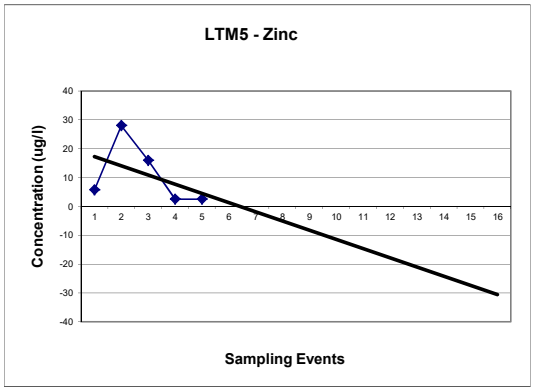
Values below detection limits were assigned a common value of 2.5, half the lowest RDL
An S value of 4 was employed for LTM1, LTM2, and LTM4 where MK analyses was not appropriate due to abundant of RDLs. This S value sets the evaluation as "Stable/No Trend".











200607 Former Iqaluit Dump, Mann Kendall Trend Evaluation

Contaminant: Zinc

Monitoring Inputs

Event	LTM6	LTM7			
	ug/l	ug/l			
1	14.4	40.8			
2	9.1	223			
3	16	57			
4	2.5	640			
5	2.5	250			
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					

Data Entry Cell

Concentration less than RDL

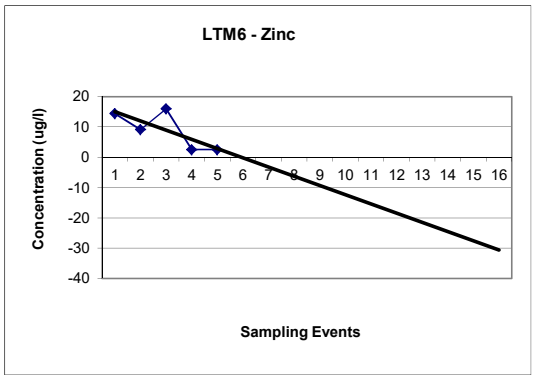
Mann-Kendall Results

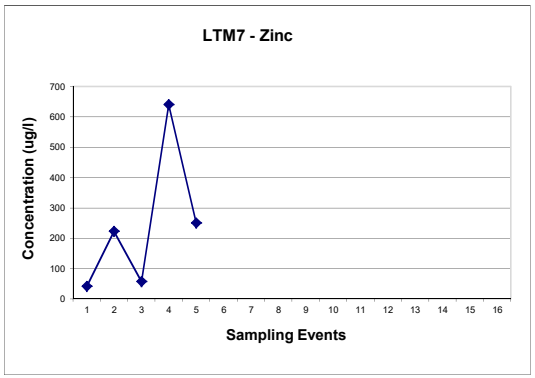
0-5 Event Evaluation

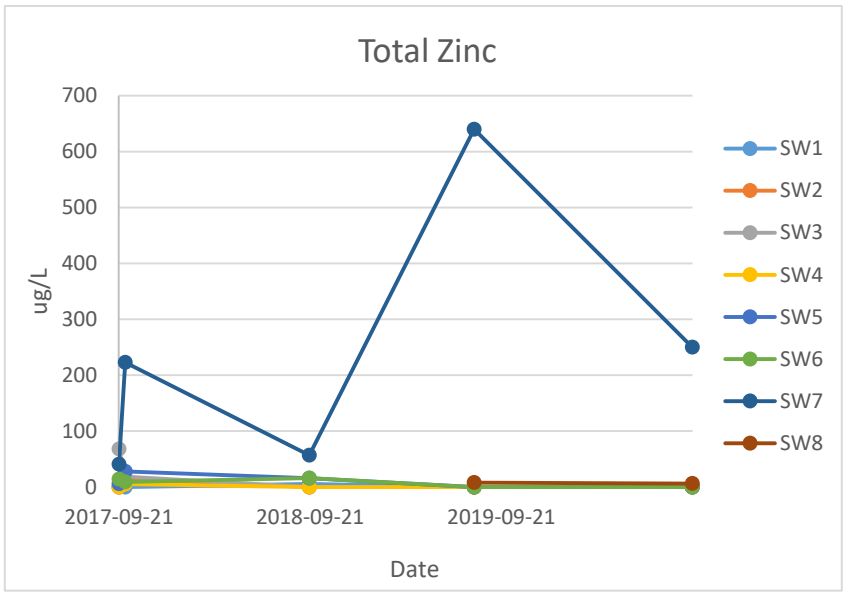
LTM6	Decreasing
LTM7	Stable/No Trend

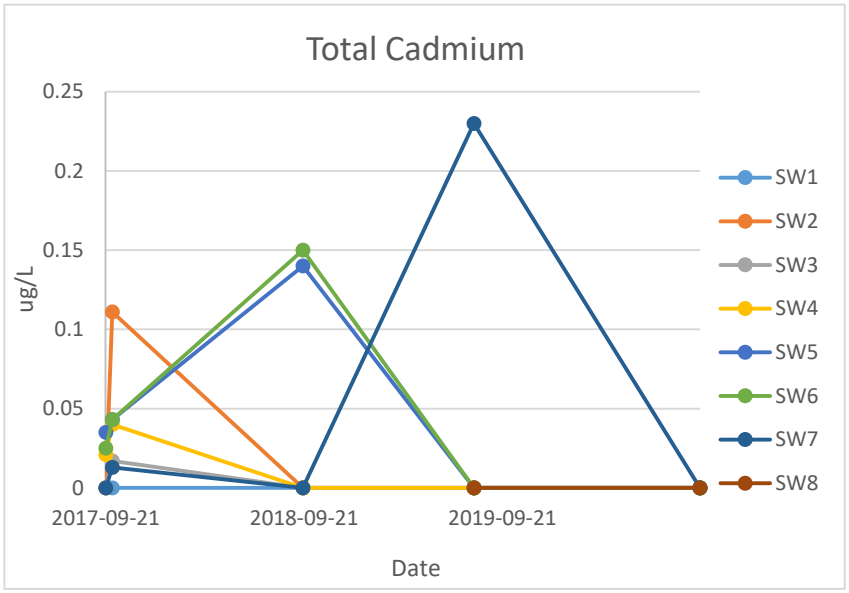
Notes:

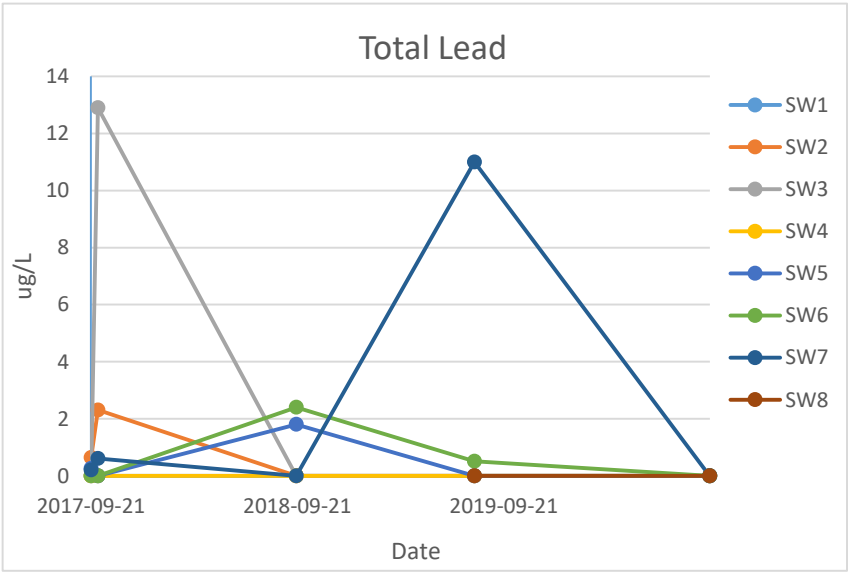
Values below detection limits were assigned a common value of 2.5, half the lowest RDL

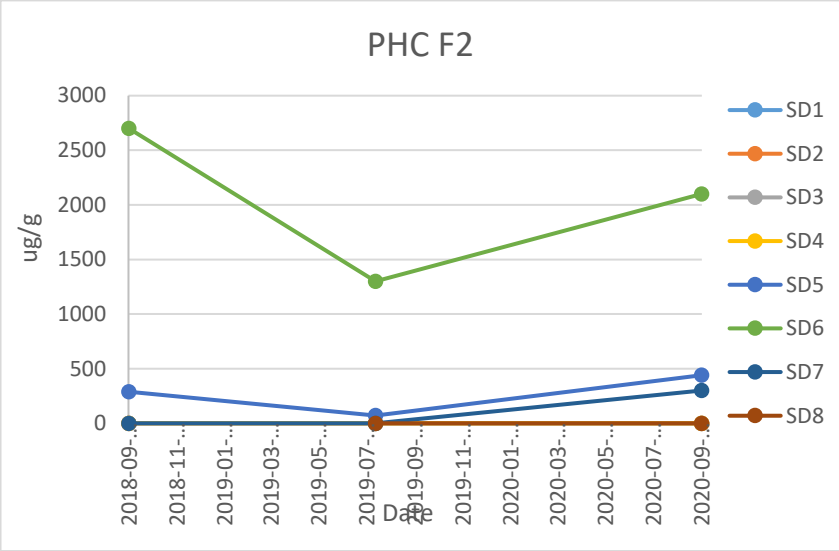


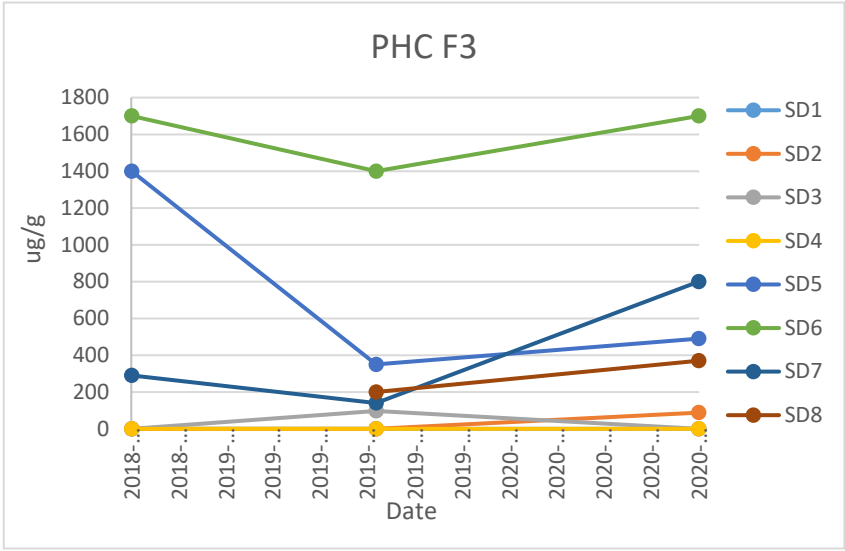


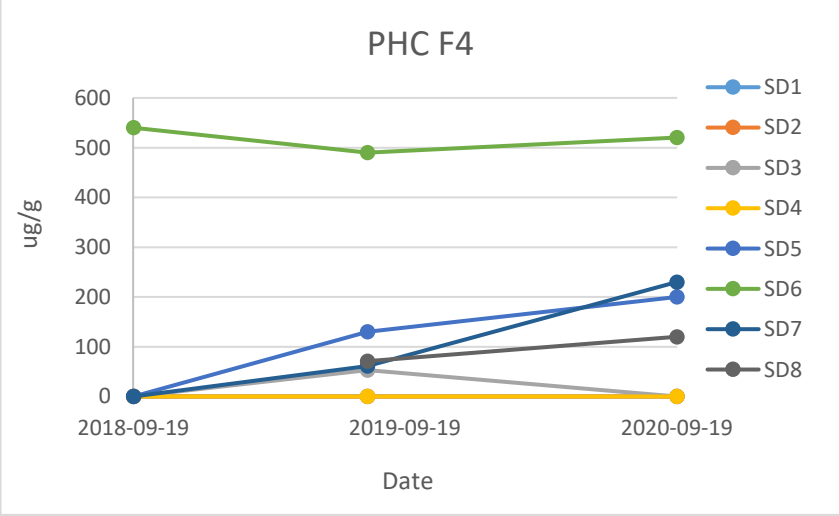

Total Zinc
700
600
500
400
300
200
100
0
ug/L
2017-09-21
2018-09-21
2019-09-21
Date
SW1
SW2
SW3
SW4
SW5
SW6
SW7
SW8

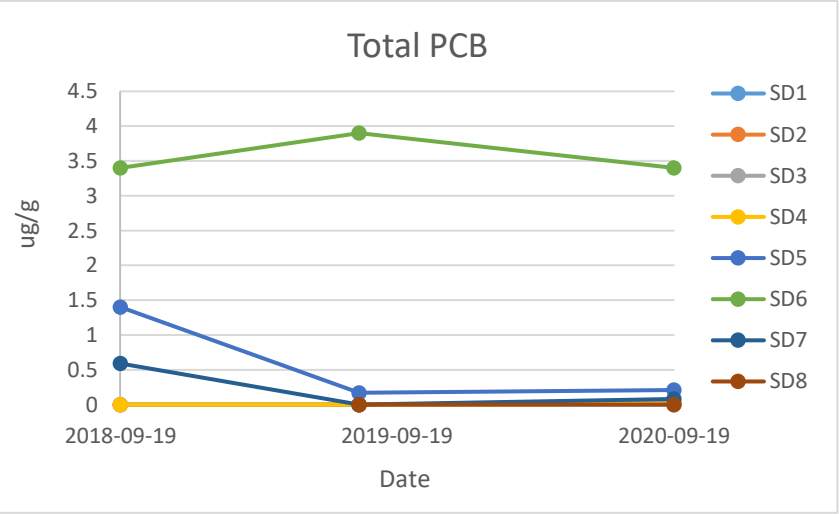

Total Cadmium
0.25
0.2
0.15
0.1
0.05
0
ug/L
2017-09-21
2018-09-21
2019-09-21
Date
SW1
SW2
SW3
SW4
SW5
SW6
SW7
SW8

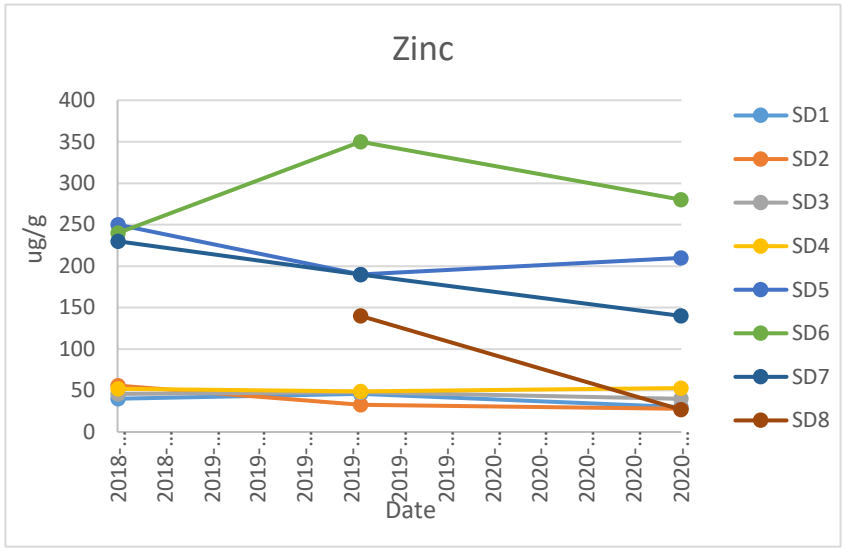

Total Lead
14
12
10
8
6
4
2
0
ug/L
2017-09-21
2018-09-21
2019-09-21
Date
SW1
SW2
SW3
SW4
SW5
SW6
SW7
SW8

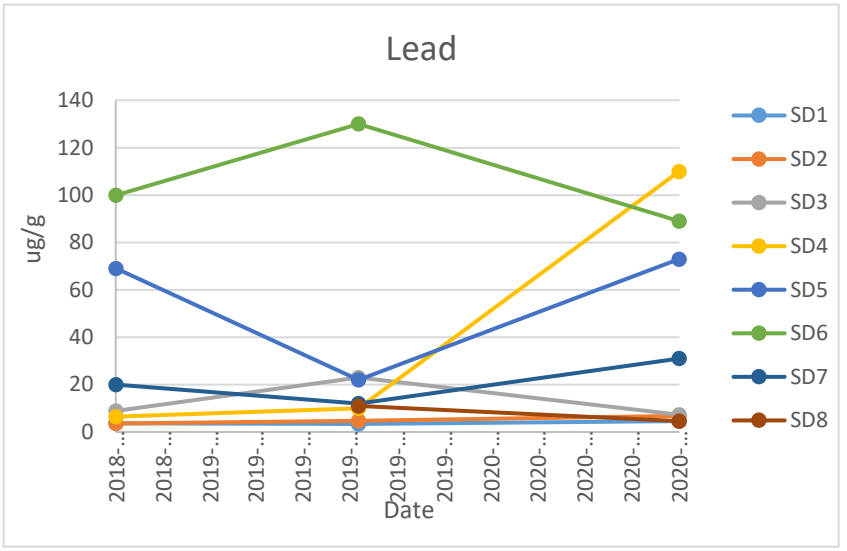

PHC F2
3000
2500
2000
1500
1000
500
0
ug/g
2018-09-...
2018-11-...
2019-01-...
2019-03-...
2019-05-...
2019-07-...
2019-09-...
2019-11-...
2020-01-...
2020-03-...
2020-05-...
2020-07-...
2020-09-...
Date
SD1
SD2
SD3
SD4
SD5
SD6
SD7
SD8

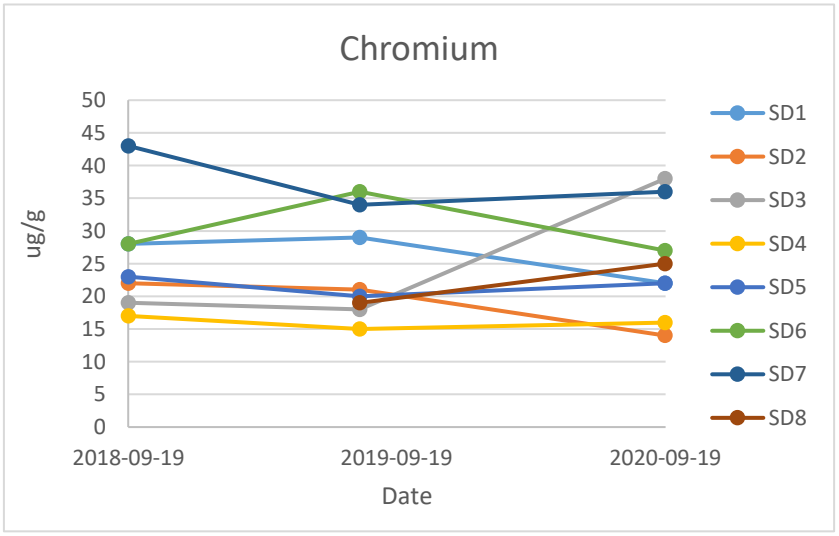

PHC F3
1800
1600
1400
1200
1000
800
600
400
200
0
ug/g
2018-...
2018-...
2019-...
2019-...
2019-...
2019-...
2019-...
2019-...
2020-...
2020-...
2020-...
2020-...
2020-...
Date
SD1
SD2
SD3
SD4
SD5
SD6
SD7
SD8

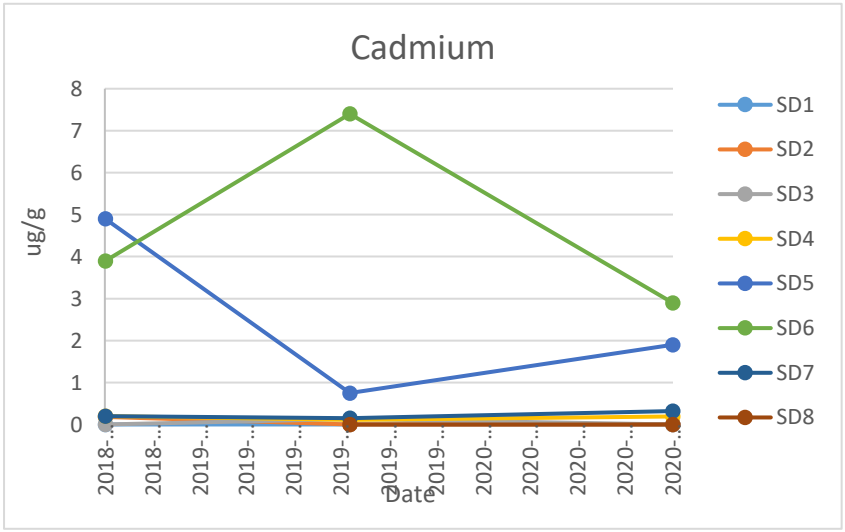

PHC F4
600
500
400
300
200
100
0
ug/g
2018-09-19
2019-09-19
2020-09-19
Date
SD1
SD2
SD3
SD4
SD5
SD6
SD7
SD8


Total PCB
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
ug/g
2018-09-19
2019-09-19
2020-09-19
Date
SD1
SD2
SD3
SD4
SD5
SD6
SD7
SD8


Zinc
ug/g
400
350
300
250
200
150
100
50
0
2018-...
2018-...
2019-...
2019-...
2019-...
2019-...
2019-...
2019-...
2020-...
2020-...
2020-...
2020-...
2020-...
Date
SD1
SD2
SD3
SD4
SD5
SD6
SD7
SD8


Lead
ug/g
140
120
100
80
60
40
20
0
2018-...
2018-...
2019-...
2019-...
2019-...
2019-...
2019-...
2019-...
2020-...
2020-...
2020-...
2020-...
2020-...
Date
SD1
SD2
SD3
SD4
SD5
SD6
SD7
SD8


Chromium
ug/g
50
45
40
35
30
25
20
15
10
5
0
2018-09-19
2019-09-19
2020-09-19
Date
SD1
SD2
SD3
SD4
SD5
SD6
SD7
SD8


Cadmium
ug/g
8
7
6
5
4
3
2
1
0
2018-...
2018-...
2019-...
2019-...
2019-...
2019-...
2019-...
2019-...
2020-...
2020-...
2020-...
2020-...
2020-...
Date
SD1
SD2
SD3
SD4
SD5
SD6
SD7
SD8

BluMetric Environmental Inc.

1682 Woodward Drive
Ottawa, Ontario
Canada K2C 3R8
Tel: 613.839.3053
Fax: 613.839.5376
ottawa@blumetric.ca

4 Cataraqui Street
The Tower, The Woolen Mill
Kingston, Ontario
Canada K7K 1Z7
Tel: 613.531.2725
Fax: 613.531.1852
kingston@blumetric.ca

209 Frederick Street
Unit 3B
Kitchener, Ontario
Canada N2H 2M7
Tel: 519.742.6685
kitchener@blumetric.ca

825 Milner Avenue
Toronto, Ontario
Canada M1B 3C3
Tel: 877.487.8436
toronto@blumetric.ca

102-957 Cambrian Heights Drive
Sudbury, Ontario
Canada P3C 5S5
Tel: 705.525.6075
Fax: 705.525.6077
sudbury@blumetric.ca

PO Box 36
Shebandowan, Ontario
Canada P0T 2T0
Tel: 807.707.1687
thunderbay@blumetric.ca

4-41 de Valcourt Street
Gatineau, Quebec
Canada J8T 8G9
Tel: 819.243.7555
Fax: 819.243.0167
gatineau@blumetric.ca

276 Saint-Jacques Street
Suite 818
Montreal, Quebec
Canada H2Y 1N3
Tel: 514.844.7199
Fax: 514.841.9111
montreal@blumetric.ca

4916 – 49th Street
Yellowknife, NT
Canada X1A 1P3
Tel: 867.873.3500
Fax: 867.873.3499
yellowknife@blumetric.ca

202b Strickland Street
Whitehorse, Yukon
Canada Y1A 2J8
Tel: 867.689.8465
whitehorse@blumetric.ca

www.blumetric.ca