2014/2015 MONITORING AND MAINTENANCE PROGRAM
COME BY CHANCE SECURE LANDFILL
COME BY CHANCE, NEWFOUNDLAND AND LABRADOR

Prepared by:
Conestoga-Rovers & Associates

1118 Topsail Road
P.O. Box 8353, Station A
St. John's, Newfoundland
Canada A1B 3N7

Office: (709) 364-5353
Fax: (709) 364-5368

web: http://www.CRAworld.com

FEBRUARY 2015
REF. NO. 084308 (6)

EXECUTIVE SUMMARY

Conestoga-Rovers & Associates (CRA) was retained by the Newfoundland and Labrador Department of Environment and Conservation (ENVC) to complete the 2014/2015 monitoring and maintenance program at the Come By Chance Secure Landfill (Site) located on Refinery Road in Come By Chance, Newfoundland and Labrador (NL) as shown on Figure 1. Site visits and field activities were completed in accordance with the ENVC Tier I schedule as outlined in the June 2012 Operations, Maintenance , and Monitoring (OMM) Manual.

The Come By Chance Secure Landfill covers an area of approximately 19,778 square metres (m^2) located approximately 2.5 km west of the Trans Canada Highway and approximately 4 km south of the Town of Come By Chance, Newfoundland and Labrador (NL). The landfill was constructed between 1994 and 1996 to facilitate the clean-up of hazardous waste associated with the Come By Chance Oil Refinery. Leachate containment is achieved through the use of a redundant liner system consisting of independent primary and secondary liners as well as a drainage pipe system to manage excess fluid and provide a means for leachate discharge. A groundwater drainage system (GWDS) was installed in March 2009 starting at the east side of the landfill and is graded at one percent toward the northeast corner, then along the north side, and eventually discharging beyond the gravel road west of the Site.

The work completed by CRA during the 2014/15 monitoring and maintenance program generally involved sampling of the primary and secondary leachate collection valve chambers in advance of pumping down the chambers by discharging to a nearby ditch, groundwater and surface water sampling, landfill cover inspection, groundwater drainage system inspection, and clean-out inspection with cleaning (if required).

The 2014/15 Site sampling event was conducted in November 2014 with the leachate pumping event completed in December 2014. A summary of the 2014/15 monitoring and maintenance program is provided below along with recommendations for future work.

E.1 SAMPLING SCHEDULE

In accordance with the OMM Manual, CRA recommend that future leachate sampling continue to be conducted using the Tier I schedule (once per year) since leachate elevations were measured at less than 0.6 metres below the top of the valve chambers for the PLCS and SLCS again during the 2014 Site visits.

Monitoring and Maintenance Schedule: In accordance with the OMM Manual, CRA continue to recommend that groundwater, surface water, and leachate sampling be conducted using the Tier I schedule (once per year) since leachate elevations were measured at less than 0.6 metres below the top of the valve chambers for the PLCS and SLCS in 2014. In addition, the continued maintenance and inspection program for the landfill cover and groundwater drainage system clean-outs should be scheduled to coincide with the sampling program.

E.2 GROUNDWATER

In general, benzene, toluene, ethylbenzene, xylene (BTEX), modified total petroleum hydrocarbons (mTPH), polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), volatile organic compounds (VOCs), general chemistry, and metals analytical data show groundwater conditions to be of better quality compared to leachate analytical data with the exception of two metals exceedances (cadmium and zinc) at one monitor well located downgradient from the landfill; therefore, it does not appear that groundwater is being influenced by leachate from the secure landfill. Based on static groundwater levels measured during the 2014 Site visit, it also appears that groundwater infiltration may still be occurring at the northeastern area of the Site.

E.3 SURFACE WATER

In general, the BTEX/mTPH, PAH, PCB, VOC, and general chemistry analytical data show surface water conditions as dramatically distinct in comparison to the leachate analytical data. Three metals (aluminum, copper, and iron) reported exceedances in the upgradient surface water sample and one metal (aluminum) reported an exceedance in the downgradient surface water sample. The leachate analytical data did not report exceedances for any metals, and iron concentrations in the leachate were approximately half that of the surface water samples. Based on this information, it does not appear that leachate is seeping from the landfill liners into the downgradient surface water; therefore, the secure landfill liners appear to be performing in accordance with their original intent of acting as a barrier between leachate accumulations within the landfill and surface water in the surrounding area.

E.4 LEACHATE

In accordance with the OMM, both pumping events consisted of two Site visits so that a desired flow rate of 15 L/min could be achieved on two successive days. During the

Site visit for leachate pumping in December 2014, it was observed that the PLCS and SLCS valves were permanently in the open position with the discharge hose no longer connected to the PLCS valve. CRA determined in-flow rates by pumping down each valve chamber, measuring the change in head over a fixed period of time, then calculating in-flow. It was also noted that leachate elevations in the PLCS and SLCS for two consecutive Site visits were less than 0.6 metres below the top of the valve chambers.

A review of the current and historical leachate pumping volumes from the PLCS and SLCS valve chambers demonstrates that pumped leachate volumes have decreased since the installation of the groundwater drainage system. A comparison of the average pumped leachate volumes from the PLCS prior to and following installation of the groundwater drainage system shows a decrease of approximately 10 percent. In addition, a comparison of the average pumped leachate volumes from the SLCS prior to and following installation of the groundwater drainage system shows a decrease of approximately 58 percent. Consequently, it appears the groundwater drainage system has contributed to the reduction of volumes of pumped leachate from the PLCS and SLCS; however, significant volumes of leachate are still present within the two liners that require pumping on a regular basis.

E.5 LANDFILL COVER

The landfill cover inspection was conducted in November 2014, that indicated minor maintenance is required. The only issue of concern related to the cutting of vegetation, typically alders, which have reached 1.5 metres in height, considerably more than the OMM recommended height restriction of 0.3 metres. Meadow vole activity from tunneling and nesting was previously noted in numerous locations on the landfill cover during the 2012 inspection, and was again noted during the 2014 inspection; however, meadow voles typically limit their habitat to less than 300 mm from surface.

Upon reviewing the results of the elevation control survey, it was noted the elevation control points decreased by an average of 3 millimetres between the original elevations surveyed in August 2010 and the recent survey completed in 2014. Based on this information, the difference in elevation of the control points indicate that very limited and insignificant settlement is occurring at the landfill cover, which in turn indicates the contents of the landfill are not settling.

E.6 GROUNDWATER DRAINAGE SYSTEM

Four GWDS clean-outs were previously installed as part of the original system construction; visual inspections confirmed that water was not present except for a small amount of standing water at clean out location 4 during the November 2014 Site visit. The standing water was no longer present during the December 2014 Site visit. The discharge location, previously located on the west side of the gravel service road, was excavated and reconstructed at the roadside embankment as part of redevelopment of the area, which was related to the construction of a new asphalt plant (J-1 Contracting) prior to the August 2013 Site visit. A new rodent screen was installed on the discharge pipe during the October 2013 Site visit; however, it was no longer present during the November 2014 Site visit. A very low flow of water was observed from the discharge of the GWDS.

Debris or blockages were not present in any of the clean-outs during the Site visit and combined with the water flow from the downgradient discharge, it was determined the GWDS was functioning properly and cleaning was not required.

E.7 RECOMMENDATIONS

Based on the findings of the 2014/15 monitoring and maintenance program along with data from previous monitoring programs, the following recommendations are offered for consideration by ENVC:

Monitoring and Maintenance Schedule: The leachate quality is continually reporting BTEX/TPH, PAH, PCB, general chemistry, and metals concentrations at levels that would not affect the surrounding environment, most notably groundwater and surface water. In addition, the landfill was constructed approximately 20 years ago and based on the historical analytical data reviewed in this report, it appears that leachate has reached a steady-state condition. Furthermore, groundwater infiltration has been evident for many years and has acted as a flushing mechanism for any contaminants that may have been present, although elevated levels of contaminants have not historically been identified. Therefore, CRA recommend that further monitoring of the landfill and pumping out of the PLCS and SLCS are not required on an annual basis; however, annual inspections should be continued to ensure the landfill cover system is not compromised by erosion. CRA understands that ENVC would prefer to continue monitoring activities at the landfill as a matter of due diligence; therefore, CRA recommend that monitoring and leachate pumping schedule should be amended to every 2 years.

Vegetation Control: CRA recommend that all vegetation on the landfill cover that measures over 0.3 metres in height should be trimmed.

In addition, it was noted that access to two monitor wells (MW93-1 and MW93-1A) was somewhat difficult due to the excessive vegetative growth in the area with alders reaching heights of 1.8 metres. CRA recommend that alders be trimmed in this location to better facilitate future field programs (i.e. the transport of field equipment such as water level meters, coolers, sample jars, etc.). This work can be completed in conjunction with vegetation control on the landfill cover.

Animal Control: CRA recommend that a new rodent screen be installed at the discharge location.

TABLE OF CONTENTS

LIST OF FIGURES
(Following Text)

LIST OF TABLES
(Following Text)

LIST OF TABLES
(Following Text)

LIST OF APPENDICES

1.0 INTRODUCTION

Conestoga-Rovers & Associates (CRA) was retained by the Newfoundland and Labrador Department of Environment and Conservation (ENVC) to complete the 2014/2015 Monitoring and Maintenance Program at the Come By Chance Secure Landfill (Site) located on Refinery Road in Come By Chance, Newfoundland and Labrador (NL) as shown on Figure 1. Site visits and field activities were completed in accordance with the ENVC Tier I schedule as outlined in the June 2012 Operations, Maintenance, and Monitoring (OMM) Manual.

The work generally involved sampling of the primary and secondary leachate collection valve chambers in advance of pumping down the chambers by discharging to a nearby ditch, groundwater and surface water sampling, landfill cover inspection, and groundwater drainage system inspection, and clean-out inspection with cleaning (if required).

The 2014/15 Site sampling event was conducted in November 2014 with the leachate pumping event completed in December 2015.

2.0 SITE DESCRIPTION

The Come By Chance Secure Landfill covers an area of approximately 19,778 square metres (m^2) located approximately 2.5 km west of the Trans Canada Highway and approximately 4 km south of the Town of Come By Chance (Town), NL. The landfill was constructed between 1994 and 1996 to facilitate the clean-up of hazardous waste associated with the Come By Chance Oil Refinery. Leachate containment is achieved through the use of a redundant liner system consisting of independent primary and secondary liners as well as a drainage pipe system to manage excess fluid and provide a means for leachate discharge.

A groundwater drainage system was installed in March 2009 starting at the east side of the landfill and is graded at one percent toward the northeast corner, then along the north side, and eventually discharging beyond the gravel road west of the Site. The system consists of 140 metres of perforated PVC pipe, 150 mm in diameter, installed in a trench of washed crushed stone measuring approximately 600 mm x 600 mm wrapped in filter fabric and 110 metres of corrugated steel pipe, 200 mm in diameter.

3.0 METHODOLOGY

3.1 GROUNDWATER SAMPLING

On November 25, 2014, static water levels were measured using an electronic product/water interface probe at the on-Site monitor wells (Table 1). The monitor wells were then developed, allowed to recover, and sampled using dedicated, disposable bailers. Seven groundwater samples were collected from the on-Site monitor wells during the sampling event, including one field duplicate. Note that two monitor well locations (MW93-1 and MW93-2) were surrounded with very high vegetative growth in the area; alders were still noted to reach a height of approximately 1.8 metres.

All groundwater samples collected from the six existing monitor wells (MW93-1, MW93-1A, MW93-2, MW93-2A, MW10-1, and MW10-1A), plus a field duplicate (DUP-07) of MW10-1, were submitted for analysis of benzene, toluene, ethylbenzene, xylene (BTEX), modified total petroleum hydrocarbons (mTPH), polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), volatile organic compounds (VOCs), general chemistry, and metals. Groundwater samples were submitted to Maxxam Analytics Inc. (Maxxam) in Bedford, Nova Scotia (NS) for analysis except BTEX/mTPH samples that were submitted to Maxxam in St. John's, NL.

3.2 SURFACE WATER SAMPLING

Surface water sampling was intended to demonstrate background analyte concentrations from the upgradient sample location (SURFACE UP) and assess potential leachate infiltration into surface water by sampling downgradient (SURFACE DOWN). The previous SURFACE DOWN location was destroyed as a result of an industrial development with an asphalt plant; therefore, a new SURFACE DOWN location was selected and sampled since November 2012. The surface water locations are located southeast of the fenced area and upstream (SURFACE UP) along with one southwest of the Site beyond the gravel road and downstream (SURFACE DOWN), both of which were submitted for analysis of BTEX/mTPH, PAHs, PCBs, VOCs, general chemistry, and metals that included hexavalent and total chromium. All surface water samples were submitted to Maxxam in Bedford, NS for analysis except BTEX/mTPH samples that were submitted to Maxxam in St. John's, NL. GPS co-ordinates using NAD27 (UTM Zone 21) geo-reference were also recorded for the two surface water sample locations (Table 2), which are shown on Figure 2.

3.3 LEACHATE SAMPLING AND PUMPING

CRA collected leachate samples on November 25, 2014 from the primary and secondary containment leachate systems (PLCS and SLCS, respectively) along with a field duplicate (DUP-08) of PLCS for BTEX/mTPH, PAHs, PCBs, VOCs, general chemistry, metals, and toxicity. All leachate samples were submitted to Maxxam in Bedford, NS for analysis except BTEX/mTPH samples that were submitted to Maxxam in St. John's, NL; toxicity samples were submitted to Petroforma Labortories (Petroforma) in St. John's, NL. Note that all laboratories are CALA certified for the respective analyses that were completed. GPS co-ordinates using NAD27 (UTM Zone 21) geo-reference were confirmed for the two leachate collection system valve chamber sample locations (Table 2), which are shown on Figure 2. Field data recorded prior to and during the PLCS and SLCS leachate discharge events are presented in Tables 3 and 4, respectively.

Leachate analytical data was required to determine if pumping down the PLCS and SLCS valve chambers and discharging into a nearby ditch was permitted under the Provincial Environmental Control Water and Sewer Regulations, Schedule A (2003) for the respective comparison criteria, where available. The tabulated analytical results from the sampling event were presented to ENVC for review and approval. Since the drainage ditch location planned for leachate discharge is within the Town boundaries, approval was also requested from the Town prior to discharging leachate from both collection systems into the nearby ditch.

3.4 LANDFILL COVER INSPECTION AND ELEVATION CONTROL

A landfill cover visual inspection was completed during the Site visit in November 2014 along with a detailed inspection documented in Table 5 in accordance with the OMM Manual (Refer to Photographs 1 and 7 of Appendix A). The comprehensive landfill cover inspection conducted in November 2014 assessed the following:

- Height of vegetation
- Condition of landfill vents
- Condition of slopes
- Condition of lateral drains
- Evidence or erosion/animal burrows

The ability to accurately measure potential settlement of the landfill cover was recently incorporated into the landfill surface with the installation of concrete elevation control points that were established at four locations on the landfill cover in 2010. GPS co-ordinates using NAD27 (UTM Zone 21) geo-reference were available for the four elevation control points and landfill vent locations (Table 2), which are shown on

Figure 2. In addition, results of the elevational control point survey are presented in Table 6.

3.5 GROUNDWATER DRAINAGE SYSTEM

Historically, large volumes of leachate from the SLCS were required to be pumped during each Site visit, which was previously suspect to be a result of groundwater infiltration into the secondary liner. Consequently, a Groundwater Drainage System (GWDS) was installed in 2009 outside the fenced area of the secure landfill along the eastern and northern boundaries at an elevation that was anticipated to intercept groundwater and divert it through the drainage system.

A visual inspection of the groundwater drainage system was conducted during the November 2014 Site visit to determine if cleaning was required and/or if groundwater was present in the clean-out locations. GPS co-ordinates using NAD27 (UTM Zone 21) geo-reference were available for the four clean-out locations (Table 2), which are shown on Figure 2. Following construction of an asphalt plant on the western side of the gravel road beyond the secure landfill, the original discharge location for the GWDS was destroyed and relocated to an area immediately adjacent to the gravel road. Refer to Photographs 2 to 5 and 10 of Appendix A showing a typical clean-out location during the November 2014 Site visit and the new discharge location. A new rodent screen was installed on the discharge pipe during the October 2013 Site visit; however, it was no longer present during the November 2014 Site visit (Refer to Photograph 10 of Appendix A).

4.0 GUIDELINE FRAMEWORK

4.1 GROUNDWATER

As specified in the OMM Manual, petroleum hydrocarbon compound concentrations (BTEX/TPH) in groundwater were assessed in relation to the Atlantic Risk-Based Corrective Action (RBCA) Version 3.0 (updated July 2012) Tier I Risk-Based Screening Levels (RBSLs) for a commercial property with non-potable groundwater and coarse-grained soil.

PAH, PCB, VOC, metals, and general chemistry concentrations in groundwater were assessed in relation to the Ontario Ministry of the Environment (MOE) "Soil, Ground Water, and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act" dated April 15, 2011, Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition.

4.2 SURFACE WATER

BTEX/TPH in groundwater were assessed in relation to the RBCA Version 3.0 (July 2012) Tier I Ecological Screening Levels (ESLs), which were released one month after the OMM Manual.

As specified in the OMM Manual, PAH, VOC, metals (including trivalent and hexavalent chromium), and general chemistry concentrations in surface water were evaluated in relation to the Canadian Council of Ministers of the Environment (CCME) Canadian Water Quality Guidelines (CWQGs) for the Protection of Aquatic Life (Freshwater or FAL). The FAL were from the Canadian Environmental Quality Guidelines (Update 7.0, September 2007).

4.3 LEACHATE

As specified in the OMM Manual, leachate was assessed in relation to the Newfoundland and Labrador Regulation 65/03, Environmental Control Water and Sewage Regulations, 2003, Schedule "A", under the Water Resources Act (Filed May 23, 2003) (referred to as Schedule "A" of the ENVC Regulations); and the CCME CWQGs for the Protection of FAL, updated 2007.

5.0 ANALYTICAL RESULTS

5.1 GROUNDWATER

Groundwater analytical results for BTEX/mTPH, PAHs, PCBs, VOCs, general chemistry, and metals are presented in Tables 7 to 12, respectively. Sample locations are shown on Figure 2 and Laboratory Certificates of Analyses are included as Appendix B. Additional discussion is presented in Section 6.1 regarding the groundwater analytical results.

5.1.1 BTEX/mTPH IN GROUNDWATER

Laboratory analytical results for BTEX/mTPH from the six groundwater samples (MW93-1, MW93-1A, MW93-2, MW93-2A, MW10-1, and MW10-1A) are presented in Table 7, all of which reported BTEX/mTPH concentrations as non-detectable and below the applicable guidelines.

One field duplicate (DUP-07) was also collected from MW10-1 during the November 2014 sampling event, which reported BTEX/mTPH concentrations consistent with the original sample results.

5.1.2 PAHs IN GROUNDWATER

Laboratory analytical results for PAHs from the six groundwater samples (MW93-1, MW93-1A, MW93-2, MW93-2A, MW10-1, and MW10-1A) are presented in Table 8, all of which reported PAH concentrations as non-detectable and below the applicable guidelines.

In addition, one field duplicate (DUP-07) was also collected from MW10-1 that reported PAH concentrations consistent with the original sample results.

5.1.3 PCBs IN GROUNDWATER

Laboratory analytical results for PCBs from the six groundwater samples (MW93-1, MW93-1A, MW93-2, MW93-2A, MW10-1, and MW10-1A) are presented in Table 9, all of which reported PCB concentrations as non-detectable and below the applicable guidelines.

In addition, one field duplicate (DUP-07) was collected from MW10-1 that also reported PCB concentrations consistent with the original sample results.

5.1.4 VOCs IN GROUNDWATER

Laboratory analytical results for VOCs from the six groundwater samples (MW93-1, MW93-1A, MW93-2, MW93-2A, MW10-1, and MW10-1A) are presented in Table 10, all of which reported VOC concentrations as non-detectable or below the applicable guidelines.

In addition, one field duplicate (DUP-07) was collected from MW10-1 that also reported VOC concentrations consistent with the original sample results.

5.1.5 GENERAL CHEMISTRY IN GROUNDWATER

Laboratory analytical results for general chemistry from the six groundwater samples (MW93-1, MW93-1A, MW93-2, MW93-2A, MW10-1, and MW10-1A) are presented in Table 11, all of which reported general chemistry concentrations as non-detectable or within the applicable guidelines.

In addition, one field duplicate (DUP-07) was collected from MW10-1 that also reported general chemistry concentrations consistent with the original sample results.

5.1.6 METALS IN GROUNDWATER

Laboratory analytical results for metals from the six groundwater samples (MW93-1, MW93-1A, MW93-2, MW93-2A, MW10-1, and MW10-1A) are presented in Table 12, all of which reported metals concentrations as non-detectable or below the applicable guidelines except cadmium and zinc in groundwater sample MW93-2A, which exceeded the applicable guidelines.

In addition, one field duplicate (DUP-07) was collected from MW10-1 that also reported metals concentrations consistent with the original sample results.

5.2 SURFACE WATER

Surface water analytical results for BTEX/mTPH, PAHs, PCBs, VOCs, general chemistry, and metals that included hexavalent chromium were compared to applicable guidelines are shown in Tables 13 to 18, respectively. Sample locations are shown on Figure 2 and Laboratory Certificates of Analyses are included as Appendix B. Additional discussion is presented in Section 6.2 regarding the surface water analytical results.

5.2.1 BTEX/mTPH IN SURFACE WATER

Laboratory analytical results for BTEX/mTPH from the two surface water samples (SURFACE-UP and SURFACE-DOWN) collected in November 2014 are presented in Table 13, both of which reported BTEX/mTPH concentrations as non-detectable and below the applicable guidelines.

5.2.2 PAHs IN SURFACE WATER

Laboratory analytical results for PAHs from the two surface water samples (SURFACE-UP and SURFACE-DOWN) collected in November 2014 are presented in Table 14, both of which reported PAH concentrations as non-detectable and below the applicable guidelines.

5.2.3 PCBs IN SURFACE WATER

Laboratory analytical results for PCBs from the two surface water samples (SURFACE-UP and SURFACE-DOWN) collected in November 2014 are presented in Table 15, all of which reported PCB concentrations as non-detectable. Note that CCME CWQGs (FAL) does not specify a criterion for PCBs in surface water.

5.2.4 VOCs IN SURFACE WATER

Laboratory analytical results for VOCs from the two surface water samples (SURFACE-UP and SURFACE-DOWN) collected in November 2014 are presented in Table 16, both of which reported VOC concentrations as non-detectable and within the applicable guidelines.

5.2.5 GENERAL CHEMISTRY IN SURFACE WATER

Laboratory analytical results for general chemistry from the two surface water samples (SURFACE-UP and SURFACE-DOWN) collected in November 2014 are presented in Table 17, both of which reported general chemistry concentrations as non-detectable or within the applicable guidelines.

5.2.6 METALS IN SURFACE WATER

Laboratory analytical results for metals from two surface water samples (SURFACE-UP and SURFACE-DOWN) collected in November 2014 are presented in Table 18, both of which reported metals concentrations as non-detectable or below the applicable guidelines except exceedances at both locations for aluminium, and exceedances for copper and iron at the upgradient sample loaction.

The upgradient sample collected in November 2014 reported iron exceedances at concentrations very similar to the downgradient sample, which did not report an exceedance as the reported iron concentration was equal to the criterion. The summary table below demonstrates the difference in concentrations between the upgradient reference sample and the downgradient sample.

Summary Table of Upgradient vs. Downgradient Surface Water Sample Exceedances – November 2012			
Analyte	**Upgradient Concentration (µg/L)**	**Downgradient Concentration (µg/L)**	**Difference**
Iron	***310***	300	0.97 x

#.## Exceeds CCME CWQGs

The above-noted exceedances of aluminium were identified in all previous monitoring events except August 2009 and August 2013. The above-noted exceedances of iron were identified in all previous monitoring events except November 2014 in the downgradient sample location, and all previous monitoring events except July 2010 in the upgradient sample location. The above-noted exceedances of copper were identified in the downstream surface water location in July and December 2010, and September 2011, while the November 2014 sampling event reported copper as non detect; however, the upgradient sample location reported a copper exceedance for the first time in November 2014.

5.3 LEACHATE SAMPLING

Leachate analytical results for BTEX/mTPH, PAHs, PCBs, VOCs, general chemistry, and metals are presented in Tables 19 to 24, respectively. Sample locations are shown on Figure 2 and Laboratory Certificates of Analyses are included as Appendix B. In addition, PLCS and SLCS toxicity analytical results for 2014 as reported by Petroforma are included as Appendix C. Further discussion is presented in Section 6.3 regarding the leachate analytical results.

5.3.1 BTEX/mTPH IN LEACHATE

Laboratory analytical results for BTEX/mTPH from the two leachate samples (PLCS and SLCS) collected in November 2014 are presented in Table 19, both of which reported BTEX/mTPH concentrations as non-detectable. TPH concentrations were non-detectable and below the Schedule A criterion for Provincial Environmental Control Water and Sewer regulations. In addition, BTEX and TPH concentrations were below the CCME CWQGs FAL criteria and the Atlantic RBCA Tier I Surface Water Ecological Screening Levels for protection of aquatic life.

In addition, one field duplicate (DUP-08) was collected from PLCS that also reported BTEX/mTPH concentrations consistent with the original sample results.

5.3.2 PAHs IN LEACHATE

Laboratory analytical results for PAHs from the two leachate samples (PLCS and SLCS) collected in November 2014 are presented in Table 20, both of which reported PAH concentrations as very low or non-detectable and below CCME CWQGs (FAL), where applicable. Provincial regulations or guidelines for PAHs do not exist in consideration of discharging an effluent into a drainage ditch.

In addition, one field duplicate (DUP-08) was collected from PLCS that also reported PAH concentrations consistent with the original sample results.

5.3.3 PCBs IN LEACHATE

Laboratory analytical results for PCBs from the two leachate samples (PLCS and SLCS) collected in November 2014 are presented in Table 21, both of which reported PCB concentrations as non-detectable. Provincial regulations or guidelines for PCBs do not

exist in consideration of discharging an effluent into a drainage ditch and the CCME CWQGs (FAL) do not specify criteria for PCBs.

In addition, one field duplicate (DUP-08) was collected from PLCS that also reported PCB concentrations consistent with the original sample results.

5.3.4 VOCs IN LEACHATE

Laboratory analytical results for VOCs from the two leachate samples (PLCS and SLCS) collected in November 2014 are presented in Table 22, both of which reported VOC concentrations as non-detectable. Provincial regulations or guidelines for VOCs do not exist in consideration of discharging an effluent into a drainage ditch.

In addition, one field duplicate (DUP-08) was collected from PLCS that also reported VOC concentrations consistent with the original sample results.

5.3.5 GENERAL CHEMISTRY IN LEACHATE

Laboratory analytical results for general chemistry from the two leachate samples (PLCS and SLCS) collected in November 2014 are presented in Table 23, both of which reported general chemistry concentrations as non-detectable or within the applicable guidelines.

In addition, one field duplicate (DUP-08) was collected from PLCS that also reported general chemistry concentrations consistent with the original sample results.

5.3.6 METALS IN LEACHATE

Laboratory analytical results for metals from the two leachate samples (PLCS and SLCS) collected during the November 2014 sampling event are presented in Table 24, both of which reported metals concentrations as non-detectable or below the Provincial regulations.

In addition, one field duplicate (DUP-08) was collected from PLCS that also reported metals concentrations consistent with the original sample results.

5.3.7 TOXICITY IN LEACHATE

Leachate samples from the PLCS and SLCS were also submitted for toxicity analysis, which concluded the effluent from the PLCS and SLCS were non-toxic to rainbow trout with zero mortality for both samples after 96 hours.

6.0 DISCUSSION

6.1 GROUNDWATER

A review of groundwater analytical data from the November 2014 sampling event was compared to leachate analytical data collected from the PLCS and SLCS to determine if leachate appeared to be impacting groundwater. In general, BTEX/mTPH, PAH, PCB, VOC, general chemistry, and metals analytical data show groundwater conditions to be of better quality compared to leachate analytical data, with the exception of two metals exceedances (cadmium and zinc) at one monitor well (MW93-2A) located downgradient from the landfill; however, it does not appear that groundwater is being influenced by leachate from the secure landfill. Groundwater data that includes previous monitoring programs from 2008 to 2013 is included in Appendix D.

Based on static groundwater levels measured during the 2014 Site visit, groundwater was confirmed to flow in a southwesterly direction toward Come By Chance Cove. In addition, static groundwater elevations in 2014 from the three sets of monitor wells and two surface water sample locations were compared to the PLCS and SLCS leachate elevations in the valve chambers. The groundwater elevations at MW93-1 and MW93-1A were measured at approximately 0.23 and 0.47 metres above the leachate elevation at the SLCS valve chamber, respectively. In comparison, groundwater elevations at MW93-2, MW93-2A, MW10-1, and MW10-1A measured approximately 1.32 to 2.20 metres below the leachate elevation at the SLCS valve chamber.

6.2 SURFACE WATER

A review of the downgradient surface water analytical data from the November 2014 sampling event was compared to leachate analytical data to determine if leachate may be impacting the surface water. In general, the BTEX/mTPH, PAH, PCB, VOC, and general chemistry analytical data show surface water conditions as dramatically distinct in comparison to the leachate analytical data. Three metals (aluminum, copper, and iron) reported exceedances in the upgradient surface water sample and one metal (aluminum) reported an exceedance in the downgradient surface water sample. The leachate analytical data did not report exceedances for any metals, and iron concentrations in the leachate were approximately half that of the surface water samples. Surface water data that includes previous monitoring programs from 2008 to 2013 is included in Appendix D. Based on this information, it does not appear that leachate is seeping from the landfill liners into the downgradient surface water; therefore, the secure landfill liners appear to be performing in accordance with their original intent of

acting as a barrier between leachate accumulations within the landfill and surface water in the surrounding area.

6.3 LEACHATE

Prior to pumping and discharging leachate from the PLCS and SLCS, all analytical parameters were reviewed for compliance with Schedule A. In addition, copies of the results were submitted to ENVC and the Town for approval prior to the pumping event. On December 4 and 15, 2014, approvals for discharge were received from ENVC and the Town, respectively. In accordance with the OMM Manual, the pumping event consisted of two Site visits so that a desired flow rate of 15 L/min was achieved on two successive days.

During the initial leachate pumping event in December 17, 2014, it was observed that the PLCS and SLCS valves were in the open position with the discharge hose no longer connected to the PLCS valve. CRA determined in-flow rates by pumping down each valve chamber, measuring the change in head over a fixed period of time, then calculated in-flow rates. Maintaining these valves in the open position does not create any integrity issues for containment as the hydraulic head in the two leachate valve chambers has not historically risen above the ground surface.

6.3.1 DECEMBER 2014 LEACHATE PUMPING EVENT

CRA returned to the Site on December 17, 2014 to initiate the leachate collection system pumping program. Approximately 18,331 Litres (L) were pumped from the PLCS valve chamber with a final measured in-flow rate of 14.4 L/min while approximately 15,592 L were pumped from the SLCS valve chamber with a final measured in-flow rate of 11.5 L/min. The desired in-flow rate of 15 L/min was achieved for the PLCS and SLCS during the initial pumping event.

CRA completed the subsequent leachate collection system pumping program on December 18, 2014. Approximately 4,693 L were pumped from the PLCS valve chamber with a final measured in-flow rate of 7.2 L/min while approximately 2,902 L were pumped from the SLCS valve chamber with a final measured in-flow rate of 3.7 L/min.

6.3.2 LEACHATE PUMPING EVALUATION

Volumes of leachate pumped and discharged from the PLCS and SLCS were compared to previous pumped volumes. A summary of leachate pumping from November 2000 to December 2014 is presented in the table below.

Summary of Leachate Pumping Volumes (Litres)			
Year	**Month**	**PLCS**	**SLCS**
2000	November	13,000	70,000
2003	November	15,000	56,000
2004	August	NA	45,000
2004	September	15,500	83,000
2004	October	NA	32,000
2006	October	NA	68,000
2007	February	6,000	63,000
2007	July	NA	103,000
2008	November	NA	74,000
Average Pre GWDS		***~12,500***	***~66,000***
2009	August	3,406	19,475
2009	December	4,542	30,699
2010	February	3,406	21,350
2010	August	12,100	35,200
2011	January	8,600	30,200
2012	November	12,200	24,900
2013	October	22,700	42,500
2014	December	23,024	18,494
Average Post GWDS		***~11,200***	***~27,800***

GWDS: Groundwater drainage system installed in March 2009

NA: No leachate present / Not available

A review of the current and historical leachate pumping volumes from the PLCS and SLCS valve chambers demonstrates that pumped leachate volumes have decreased since the installation of the GWDS. A comparison of the average pumped leachate volumes from the PLCS prior to and following installation of the GWDS shows a decrease of approximately 10 percent. In addition, a comparison of the average pumped leachate volumes from the SLCS prior to and following installation of the GWDS shows a decrease of approximately 58 percent. Consequently, the GWDS appears to contribute to reduce volumes of pumped leachate from the PLCS and SLCS; however, significant

volumes of leachate are still present within the two liners that require pumping on a regular basis (Refer to Photograph 11 of Appendix A).

6.4 LANDFILL COVER INSPECTION

A landfill cover inspection was conducted on November 25, 2014. Notable items resulting from the landfill cover inspection are outlined below:

- Vegetation height reaching 1.5 metres, typically alders, which exceeds the OMM requirement of maximum vegetation height of 0.3 metres.
- Landfill vents in good condition and not obstructed.
- No evidence of erosion or large animal burrows on the landfill cover.
- Meadow vole activity from tunneling and nesting was previously noted in numerous locations on the landfill cover during the 2012 inspection and was again noted during the 2014 inspection.
- Slopes in good condition and covered with vegetation with no signs of erosion.
- Lateral drains dry with occasional areas of standing water.

Landfill cover inspection data from previous monitoring programs is included in Appendix D.

Upon reviewing the results of the elevation control survey, it was noted the elevation control points increased slightly in elevation by an average of 3 millimetres between the original elevations surveyed in August 2010 and the recent survey completed in December 2014. Based on this information, the difference in elevation of the control points indicate that very limited and insignificant settlement is occurring at the landfill cover, which in turn indicates the contents of the landfill are not settling.

6.5 GROUNDWATER DRAINAGE SYSTEM

Four GWDS clean-outs were previously installed as part of the original system construction; visual inspections confirmed that water was not present except for a small amount of standing water at clean out location 4 during the November 2014 Site visit. The standing water was no longer present during the December 2014 Site visit. The discharge location, previously located on the west side of the gravel service road, was excavated and reconstructed at the roadside embankment as part of redevelopment of the area, which was related to the construction of a new asphalt plant (J-1 Contracting) prior to the August 2013 Site visit. A new rodent screen was installed on the discharge

pipe during the October 2013 Site visit; however, it was no longer present during the November 2014 Site visit (Refer to Photograph 10 of Appendix A). A very low flow of water was observed from the discharge of the GWDS.

Debris or blockages were not present in any of the clean-outs during the Site visit and combined with the water flow from the downgradient discharge, it was determined the GWDS was functioning properly and cleaning was not required.

7.0 SUMMARY AND RECOMMENDATIONS

Conestoga-Rovers & Associates (CRA) was retained by the Newfoundland and Labrador Department of Environment and Conservation (ENVC) to complete the 2014/15 monitoring and maintenance program at the Come By Chance Secure Landfill (Site) located on Refinery Road in Come By Chance, Newfoundland and Labrador (NL). Site visits and field activities were completed in accordance with the ENVC 2012 Operations and Maintenance Manual (OMM).

The Come By Chance Secure Landfill covers an area of approximately 19,778 square metres (m^2) located approximately 2.5 km west of the Trans Canada Highway and approximately 4 km south of the Town, NL. The landfill was constructed between 1994 and 1996 to facilitate the clean-up of hazardous waste associated with the Come By Chance Oil Refinery. Leachate containment is achieved through the use of a redundant liner system consisting of independent primary and secondary liners as well as a drainage pipe system to manage excess fluid and provide a means for leachate discharge.

A groundwater drainage system was installed in March 2009 starting at the east side of the landfill and is graded at one percent toward the northeast corner, then along the north side, and eventually discharging beyond the gravel road west of the Site.

The work completed by CRA during the 2014/15 monitoring and maintenance program involved sampling of the primary and secondary leachate collection valve chambers in advance of pumping down the chambers by discharging to a nearby ditch, groundwater and surface water sampling, landfill cover inspection, and groundwater drainage system inspection, and clean-out repairs (if required).

The Site visit with leachate, groundwater, and surface water sampling was conducted in November 2014; the leachate pumping event was completed in December 2014. Information regarding the 2014/15 monitoring and maintenance program is summarized below in Section 7.1 with recommendations provided in Section 7.2.

7.1 2014/15 MONITORING AND MAINTENANCE SUMMARY

7.1.1 GROUNDWATER

In general, benzene, toluene, ethylbenzene, xylene (BTEX), modified total petroleum hydrocarbons (mTPH), polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), volatile organic compounds (VOCs), general chemistry, and metals analytical data show groundwater conditions to be of better quality compared to leachate analytical data with the exception of two metals exceedances (cadmium and zinc) at one monitor well located downgradient from the landfill; therefore, it does not appear that groundwater is being influenced by leachate from the secure landfill. Based on static groundwater levels measured during the 2014 Site visit, it also appears that groundwater infiltration may still be occurring at the northeastern area of the Site.

7.1.2 SURFACE WATER

In general, the BTEX/mTPH, PAH, PCB, VOC, and general chemistry analytical data show surface water conditions as dramatically distinct in comparison to the leachate analytical data. Three metals (aluminum, copper, and iron) reported exceedances in the upgradient surface water sample and one metal (aluminum) reported an exceedance in the downgradient surface water sample. The leachate analytical data did not report exceedances for any metals, and iron concentrations in the leachate were approximately half that of the surface water samples. Based on this information, it does not appear that leachate is seeping from the landfill liners into the downgradient surface water; therefore, the secure landfill liners appear to be performing in accordance with their original intent of acting as a barrier between leachate accumulations within the landfill and surface water in the surrounding area.

7.1.3 LEACHATE

In accordance with the OMM, both pumping events consisted of two Site visits so that a desired flow rate of 15 L/min could be achieved on two successive days. During the Site visit for leachate pumping in December 2014, it was observed that the PLCS and SLCS valves were permanently in the open position with the discharge hose no longer connected to the PLCS valve. CRA determined in-flow rates by pumping down each valve chamber, measuring the change in head over a fixed period of time, then calculating in-flow. It was also noted that leachate elevations in the PLCS and SLCS for two consecutive Site visits were less than 0.6 metres below the top of the valve chambers.

A review of the current and historical leachate pumping volumes from the PLCS and SLCS valve chambers demonstrates that pumped leachate volumes have decreased since the installation of the groundwater drainage system. A comparison of the average pumped leachate volumes from the PLCS prior to and following installation of the groundwater drainage system shows a decrease of approximately 10 percent. In addition, a comparison of the average pumped leachate volumes from the SLCS prior to and following installation of the groundwater drainage system shows a decrease of approximately 58 percent. Consequently, it appears the groundwater drainage system has contributed to the reduction of volumes of pumped leachate from the PLCS and SLCS; however, significant volumes of leachate are still present within the two liners that require pumping on a regular basis.

7.1.4 LANDFILL COVER

The landfill cover inspection was conducted in November 2014, that indicated minor maintenance is required. The only issue of concern related to the cutting of vegetation, typically alders, which have reached 1.5 metres in height, considerably more than the OMM recommended height restriction of 0.3 metres. Meadow vole activity from tunneling and nesting was previously noted in numerous locations on the landfill cover during the 2012 inspection, and was again noted during the 2014 inspection; however, meadow voles typically limit their habitat to less than 300 mm from surface.

Upon reviewing the results of the elevation control survey, it was noted the elevation control points decreased by an average of 3 millimetres between the original elevations surveyed in August 2010 and the recent survey completed in 2014. Based on this information, the difference in elevation of the control points indicate that very limited and insignificant settlement is occurring at the landfill cover, which in turn indicates the contents of the landfill are not settling.

7.1.5 GROUNDWATER DRAINAGE SYSTEM

Four GWDS clean-outs were previously installed as part of the original system construction; visual inspections confirmed that water was not present except for a small amount of standing water at clean out location 4 during the November 2014 Site visit. The standing water was no longer present during the December 2014 Site visit. The discharge location, previously located on the west side of the gravel service road, was excavated and reconstructed at the roadside embankment as part of redevelopment of the area, which was related to the construction of a new asphalt plant (J-1 Contracting)

prior to the August 2013 Site visit. A new rodent screen was installed on the discharge pipe during the October 2013 Site visit; however, it was no longer present during the November 2014 Site visit. A very low flow of water was observed from the discharge of the GWDS.

Debris or blockages were not present in any of the clean-outs during the Site visit and combined with the water flow from the downgradient discharge, it was determined the GWDS was functioning properly and cleaning was not required.

7.2 RECOMMENDATIONS

Based on the findings of the 2014/15 monitoring and maintenance program along with data from previous monitoring programs, the following recommendations are offered for consideration by ENVC:

Monitoring and Maintenance Schedule: The leachate quality is continually reporting BTEX/TPH, PAH, PCB, general chemistry, and metals concentrations at levels that would not affect the surrounding environment, most notably groundwater and surface water. In addition, the landfill was constructed approximately 20 years ago and based on the historical analytical data reviewed in this report, it appears that leachate has reached a steady-state condition. Furthermore, groundwater infiltration has been evident for many years and has acted as a flushing mechanism for any contaminants that may have been present, although elevated levels of contaminants have not historically been identified. Therefore, CRA recommend that further monitoring of the landfill and pumping out of the PLCS and SLCS are not required on an annual basis; however, annual inspections should be continued to ensure the landfill cover system is not compromised by erosion. CRA understands that ENVC would prefer to continue monitoring activities at the landfill as a matter of due diligence; therefore, CRA recommend that monitoring and leachate pumping schedule should be amended to every 2 years.

Vegetation Control: CRA recommend that all vegetation on the landfill cover that measures over 0.3 metres in height should be trimmed.

In addition, it was noted that access to two monitor wells (MW93-1 and MW93-1A) was somewhat difficult due to the excessive vegetative growth in the area with alders reaching heights of 1.8 metres. CRA recommend that alders be trimmed in this location to better facilitate future field programs (i.e. the transport of field equipment such as

water level meters, coolers, sample jars, etc.). This work can be completed in conjunction with vegetation control on the landfill cover.

Animal Control: CRA recommend that a new rodent screen be installed at the discharge location.

8.0 REFERENCES

Report entitled "*Annual Summary Report, 2009/2010 Environmental Monitoring and Maintenance Program, Come By Chance Secure Landfill, Come By Chance, Newfoundland*" prepared by Pinchin Leblanc Environmental Limited for Newfoundland and Labrador Department of Environment and Conservation, dated May 2010.

Report entitled "*Annual Summary Report 2010/2011 Monitoring and Maintenance Program, Come By Chance Secure Landfill, Come By Chance, NL*" prepared by CRA Limited for Newfoundland and Labrador Department of Environment and Conservation, dated March 2011.

Report entitled "*2011/2012 Monitoring and Maintenance Program, Come By Chance Secure Landfill, Come By Chance, NL*" prepared by CBCL Limited for Newfoundland and Labrador Department of Environment and Conservation, dated May 24, 2012.

Report entitled "*Come By Chance Secure Landfill – Operations, Maintenance and Monitoring (OMM) Manual*" prepared by Newfoundland and Labrador Department of Environment and Conservation, Pollution Prevention Division, dated June 2012.

Report entitled "*2012/2013 Monitoring and Maintenance Program, Come By Chance Secure Landfill, Come By Chance, NL*" prepared by CRA Limited for Newfoundland and Labrador Department of Environment and Conservation, dated May 2013.

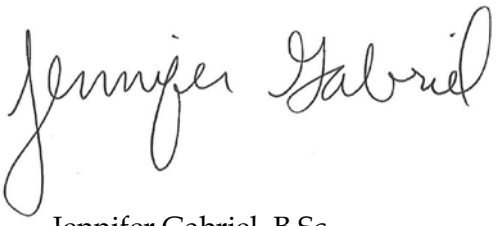
Report entitled "*2013/2014 Monitoring and Maintenance Program, Come By Chance Secure Landfill, Come By Chance, NL*" prepared by CRA Limited for Newfoundland and Labrador Department of Environment and Conservation, dated November 2013.

9.0 CLOSURE

All of Which is Respectfully Submitted,

CONESTOGA-ROVERS & ASSOCIATES

Brian Luffman, P. Eng.



Jennifer Gabriel, B.Sc.

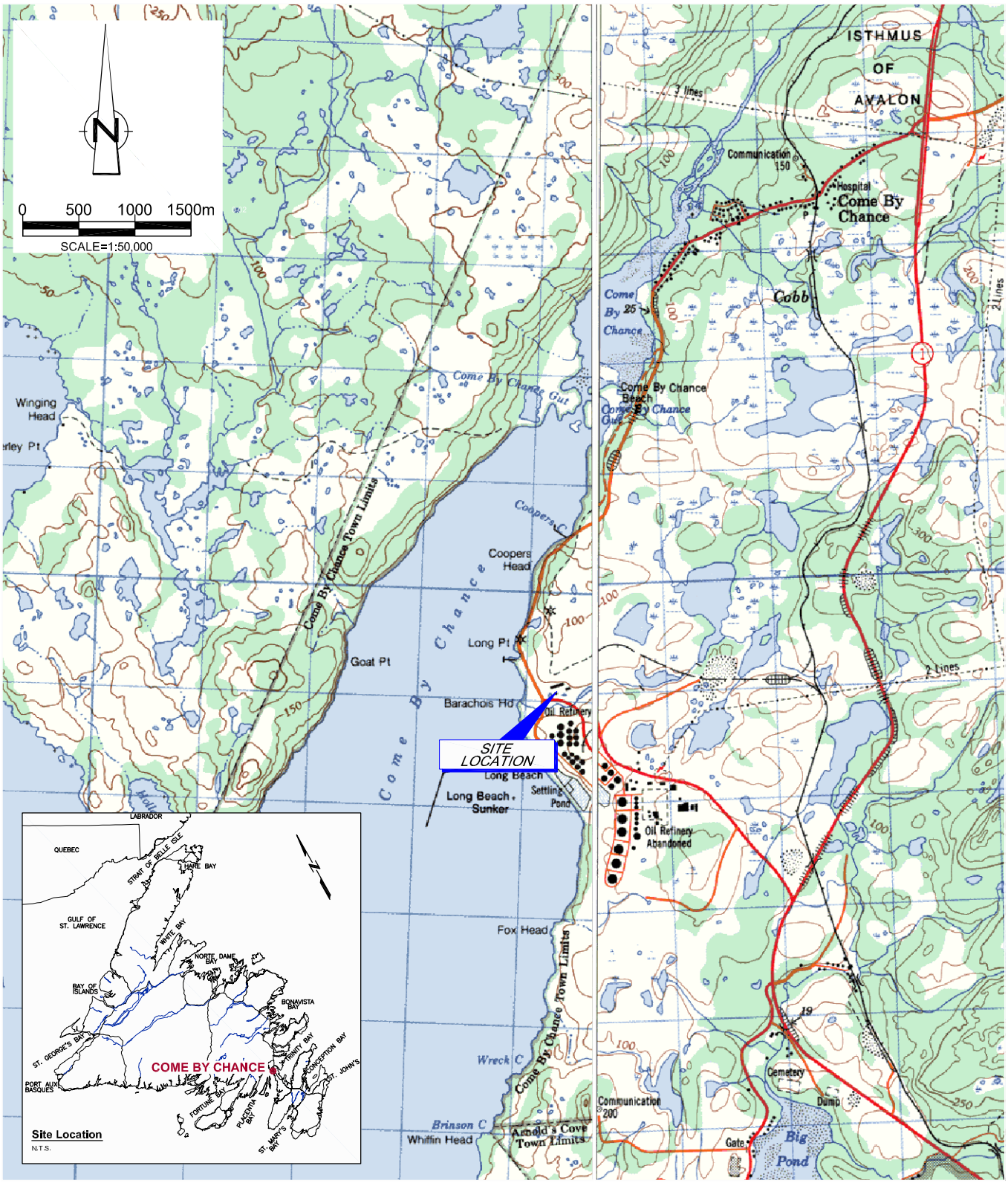


figure 1

SITE LOCATION MAP
2014/2015 MONITORING AND MAINTENANCE PROGRAM
DEPT. OF ENVIRONMENT AND CONSERVATION
Come By Chance Secure Landfill, Come By Chance, NL

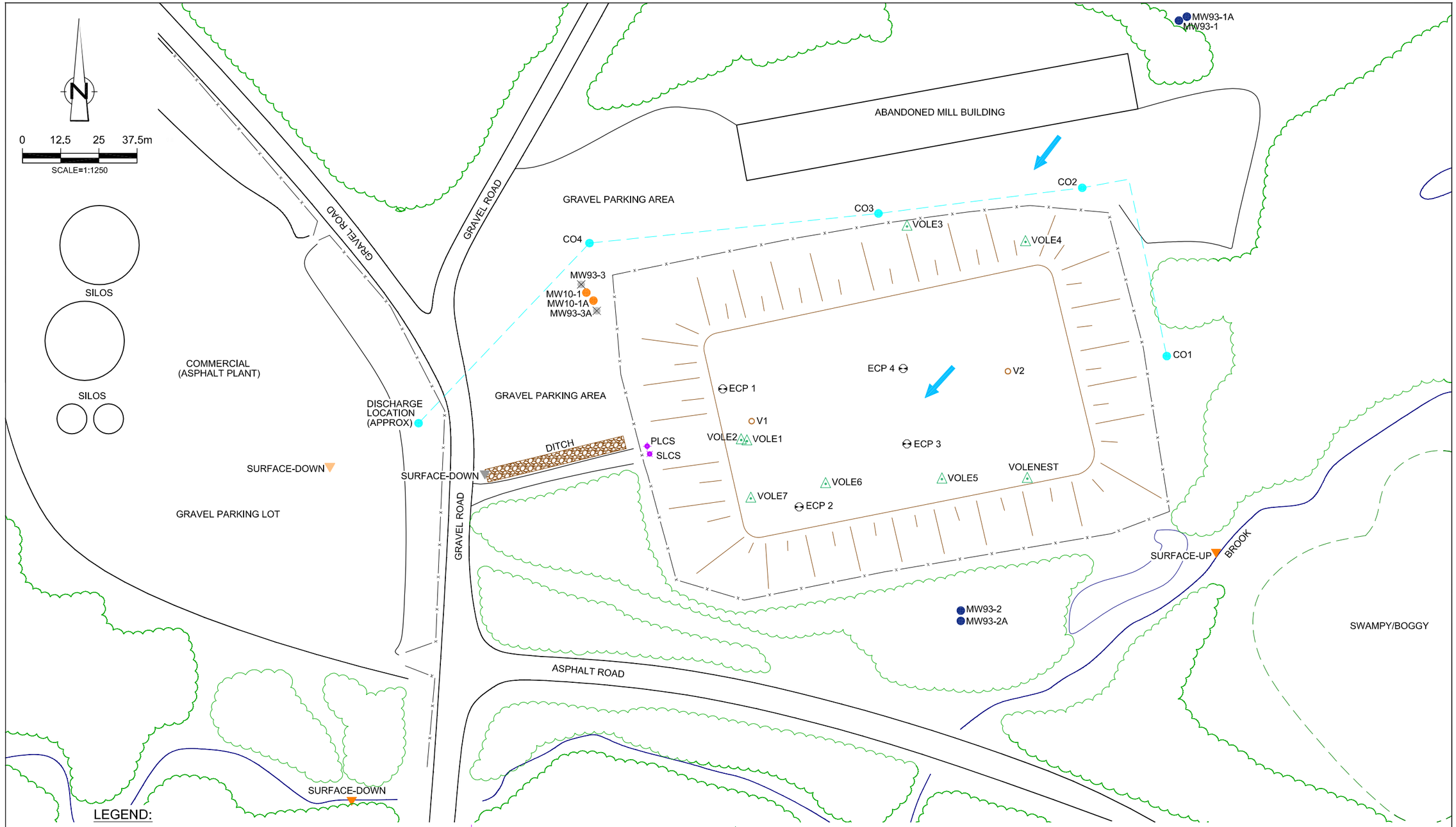


figure 2

SITE PLAN WITH SAMPLE LOCATIONS
2014/2015 MONITORING AND MAINTENANCE PROGRAM
DEPT. OF ENVIRONMENT AND CONSERVATION
Come By Chance Secure Landfill, Come By Chance, NL

084308(006) GN-NL002

TABLE 1

STATIC WATER LEVELS
2014/15 MONITORING AND MAINTENANCE PROGRAM
COME BY CHANCE SECURE LANDFILL
COME BY CHANCE, NL

ID	Ground Surface Elevation	Length of Stick-up	TOC Elevation	Groundwater Depth	Water Elevation
				Nov, 2014	Nov, 2014
	(masl)	(m)	(masl)	(mbTOC)	(masl)
PLCS	15.960	-	15.960	0.403	15.557
SLCS	15.955	-	15.955	0.404	15.551
MW93-1	16.300	1.100	17.400	1.616	15.784
MW93-1A	16.310	1.400	17.710	1.688	16.022
MW93-2	14.290	1.100	15.390	2.035	13.355
MW93-2A	14.310	1.100	15.410	1.181	14.229
MW10-1	15.790	0.846	16.636	2.999	13.637
MW10-1A	15.890	0.854	16.744	3.047	13.697

Notes:

m = Metres
TOC = Top of Casing
masl = Metres Above Sea Level
mbTOC = Metres Below Top of Casing

TABLE 2

GPS CO-ORDINATES OF KEY SITE FEATURES
2014/15 MONITORING AND MAINTENANCE PROGRAM
COME BY CHANCE SECURE LANDFILL
COME BY CHANCE, NL

ID	NORTHING	EASTING
	(m)	(m)
PLCS	5299282.569	724372.496
SLCS	5299280.034	724373.295
MW93-1	5299421.760	724546.360
MW93-1A	5299422.020	724548.440
MW93-2	5299235.085	724470.927
MW93-2A	5299232.673	724472.066
MW10-1	5299332.811	724352.601
MW10-1A	5299330.374	724354.471
SURFACE UP	5299241.840	724543.520
SURFACE DOWN	5299166.473	724273.883
ECP 1	5299300.345	724396.495
ECP 2	5299262.242	724421.331
ECP 3	5299284.519	724455.814
ECP 4	5299308.292	724454.469
CLEAN-OUT 1	5299162.490	724361.549
CLEAN-OUT2	5299172.051	724428.014
CLEAN-OUT 3	5299117.496	724456.616
CLEAN-OUT 4	5299348.991	724353.634
VENT 1	5299290.775	724406.665
VENT 2	5299307.780	724490.445

Notes:

All points recorded using Universal Transverse Mercator Zone 21 as coordinate system

PLCS = Primary Leachate Collection System Valve Chamber
SLCS = Secondary Leachate Collection System Valve Chamber
MW = Monitoring Well
ECP = Elevation Control Point

TABLE 3

LEACHATE SAMPLING AND PUMPING INFORMATION
PRIMARY LEACHATE COLLECTION SYSTEM
2014/15 MONITORING AND MAINTENANCE PROGRAM
COME BY CHANCE SECURE LANDFILL
COME BY CHANCE, NL

PLCS LEACHATE SAMPLING					PLCS PUMPING EVENT				
Date	Weather	Valve Condition	Initial head (mbTOVC)	Analysis Conducted Sample Condition	Date	Weather	Valve Condition	Final Flow Rate (L/min)	Pumping Time (hours)
November 25, 2014	Overcast, +10 °C	Unknown*	0.403	BTEX, TPH, Gen. Chem., Metals, PAH, VOC, PCB, Toxicity	December 17, 2014	Overcast, 5 °C	Open, flowing freely, hose disconnected	14.4	10

Notes:

Always maintain samples at 4°C

Plan to deliver samples to analytical laboratory within 3 days of sampling

mbTOVC - Metres from water level to top of valve chamber

*PLCS valve chamber completely filled with leachate; therefore, unable to inspect valve

Elevation of Top of PLCS Valve Chamber = 15.960 m

Containers Required For Analysis

BTEX:	3 x 40 mL amber glass vials (filled, with no headspace)
TPH:	2 x 250 mL amber glass
Gen Chem:	1 x 1 L plastic
PAHs:	2 x 250 mL amber glass
VOCs:	3 x 40 mL amber glass vials (filled, with no headspace)
PCBs:	2 x 250 mL glass
Metals:	1 x 50 mL plastic tube or 1 x 250 mL plastic
Toxicity:	2 x 20 L plastic food grade

TABLE 4

LEACHATE SAMPLING AND PUMPING INFORMATION
SECONDARY LEACHATE COLLECTION SYSTEM
2014/15 MONITORING AND MAINTENANCE PROGRAM
COME BY CHANCE SECURE LANDFILL
COME BY CHANCE, NL

SLCS LEACHATE SAMPLING					SLCS PUMPING EVENT				
Date	**Weather**	**Valve Condition**	**Initial head (mbTOVC)**	**Analysis Conducted Sample Condition**	**Date**	**Weather**	**Valve Condition**	**Final Flow Rate (L/min)**	**Pumping Time (hours)**
November 25, 2014	Overcast, +10 °C	Unknown*	0.404	BTEX, TPH, Gen. Chem., Metals, PAH, VOC, PCB, Toxicity	December 17, 2014	Overcast, 5 °C	Open, flowing freely, hose disconnected	12	7.5

Notes:

Always maintain samples at 4°C

Plan to deliver samples to analytical laboratory within 3 days of sampling

mbTOVC - Metres from water level to top of manhole

*SLCS valve chamber completely filled with leachate; therefore, unable to inspect valve

Elevation of Top of SLCS Valve Chamber = 15.96 m

Containers Required For Analysis

BTEX:	3 x 40 mL amber glass vials (filled, with no headspace)
TPH:	2 x 250 mL amber glass
Gen Chem:	1 x 1 L plastic
PAHs:	2 x 250 mL amber glass
VOCs:	3 x 40 mL amber glass vials (filled, with no headspace)
PCBs:	2 x 250 mL glass
Metals:	1 x 50 mL plastic tube or 1 x 250 mL plastic
Toxicity:	2 x 20 L plastic food grade

TABLE 5

LANDFILL CAP INSPECTION FORM
2014/15 MONITORING AND MAINTENANCE PROGRAM
COME BY CHANCE SECURE LANDFILL
COME BY CHANCE, NL

Date	Weather	Landfill Cap Inspection					Elevational Survey Control Points			
		Vegetative Height (metres)	Vent Condition	Evidence of Erosion / Animal Burrows	Condition of Slopes	Condition of Lateral Drains	Point 1	Point 2	Point 3	Point 4
December 17, 2014	Overcast, +5 °C	0 - 1.5 m	No damage, not obstructed	Meadow vole evident	No erosion or damage noted	Dry, occasional puddles, grassy	20.424	20.429	20.959	21.219

Notes: Elevations measured using an assumed benchmark of 15.960 m at top of PLCS valve chamber

TABLE 6

ELEVATIONAL CONTROL POINT SURVEY DATA
2014/15 MONITORING AND MAINTENANCE PROGRAM
COME BY CHANCE SECURE LANDFILL
COME BY CHANCE, NL

Original Survey Date:				Jul 16, 2010	
Recent Survey Date:				Dec 17, 2014	
Location	**Original Elevation**	**2010**		**2014**	
		Survey	**DIFF**	**Survey**	**DIFF**
PLCS	15.960	-	-	-	-
ECP1	20.439	20.388	0.051	20.424	0.015
ECP2	20.442	20.405	0.037	20.429	0.013
ECP3	20.935	20.896	0.039	20.959	-0.024
ECP4	21.212	21.162	0.050	21.219	-0.007

Notes:

BM = PLCS
All measurements are in metres.
ECP = Elevational Control Point
DIFF = Difference of original versus current elevations
(Positive indicates amount of settlement)

TABLE 7

GROUNDWATER ANALYTICAL DATA - BTEX/mTPH (mg/L)
2014/15 MONITORING AND MAINTENANCE PROGRAM
COME BY CHANCE SECURE LANDFILL
COME BY CHANCE, NL

Sample Location	Date Sampled	Benzene	Toluene	Ethyl-benzene	Xylenes	Total Petroleum Hydrocarbons (TPH)					Comments
						F1 C_6-C_{10}	F2 C_{10}-C_{16}	F3 C_{16}-C_{21}	F3 C_{21}-C_{32}	Modified TPH	
MW93-1	Nov 25, 2014	<	<	<	<	<	<	<		<	-
MW93-1A	Nov 25, 2014	<	<	<	<	<	<	<		<	-
MW93-2	Nov 25, 2014	<	<	<	<	<	<	<		<	-
MW93-2A	Nov 25, 2014	<	<	<	<	<	<	<		<	-
MW10-1	Nov 25, 2014	<	<	<	<	<	<	<		<	-
DUP-07	Nov 25, 2014	<	<	<	<	<	<	<		<	-
MW10-1A	Nov 25, 2014	<	<	<	<	<	<	<		<	-
RDL		0.001	0.001	0.001	0.002	0.01	0.05	0.1	0.1	0.1	-
Atlantic RBCA Tier I RBSLs [1] (Commercial, Non-Potable)		**20**	**20**	**20**	**20**	**na**	**na**	**na**	**na**	**20**	**Gasoline**
										20	**Diesel / #2 Fuel Oil**
										20	**# 6 Oil**

Notes:

Analysis completed by Maxxam Analytics Inc. laboratory in St. John's, NL.
1. Atlantic Risk-Based Corrective Action (RBCA) 2012 Tier I Risk-Based Screening Level (RBSL) Table values {coarse-grained soil}.

RDL = Reportable Detection Limit
< = Parameter below detection limit
- = Not analysed
0.0 = above criteria
<(#) = Parameter below specified detection limit
DUP-07 = Field Duplicate of MW10-1
MW = Monitor Well

G = Gasoline
FO = Fuel Oil
LO = Lube Oil
W = Weathered

TABLE 8

GROUNDWATER ANALYTICAL DATA - PAHs
2014/15 MONITORING AND MAINTENANCE PROGRAM
COME BY CHANCE SECURE LANDFILL
COME BY CHANCE, NL

Parameter	MW93-1	MW93-1A	MW93-2	MW93-2A	MW10-1	DUP-07	MW10-1A	RDL	Criteria*
	Nov 25, 2014	Nov 25, 2014	Nov 25, 2014	Nov 25, 2014	Nov 25, 2014	Nov 25, 2014	Nov 25, 2014		
1-Methylnaphthalene	<	<	<	<	<	<	<	0.05	1,800
2-Methylnaphthalene	<	<	<	<	<	<	<	0.05	1,800
Acenaphthene	<	<	<	<	<	<	<	0.01	600
Acenaphthylene	<	<	<	<	<	<	<	0.01	1.8
Anthracene	<	<	<	<	<	<	<	0.01	2.4
Benzo(a)anthracene	<	<	<	<	<	<	<	0.01	4.7
Benzo(a)pyrene	<	<	<	<	<	<	<	0.01	0.8
Benzo(b)fluoranthene	<	<	<	<	<	<	<	0.01	0.75
Benzo(g,h,i)perylene	<	<	<	<	<	<	<	0.01	0.2
Benzo(j)fluoranthene	<	<	<	<	<	<	<	0.01	-
Benzo(k)fluoranthene	<	<	<	<	<	<	<	0.01	0.4
Chrysene	<	<	<	<	<	<	<	0.01	1
Dibenz(a,h)anthracene	<	<	<	<	<	<	<	0.01	0.52
Fluoranthene	<	<	<	<	<	<	<	0.01	130
Fluorene	<	<	<	<	<	<	<	0.01	400
Indeno(1,2,3-cd)pyrene	<	<	<	<	<	<	<	0.01	0.2
Naphthalene	<	<	<	<	<	<	<	0.20	1,400
Perylene	<	<	<	<	<	<	<	0.01	-
Phenanthrene	<	<	<	<	<	<	<	0.01	580
Pyrene	<	<	<	<	<	<	<	0.01	68

Analysis completed by Maxxam Analytics Inc. laboratory in Bedford, NS.
* Ontario Ministry of the Environment (MOE) "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", April 15, 2011, Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition
RDL = Reportable Detection Limit **0.0**
MW = Monitor Well
- = Not analysed/No criteria
< = Parameter below detection limit
DUP-07 = Field Duplicate of MW10-1

TABLE 9

GROUNDWATER ANALYTICAL DATA - PCBs
2014/15 MONITORING AND MAINTENANCE PROGRAM
COME BY CHANCE SECURE LANDFILL
COME BY CHANCE, NL

Parameter	MW93-1	MW93-1A	MW93-2	MW93-2A	MW10-1	DUP-07	MW10-1A	RDL	Criteria*
	Nov 25, 2014	Nov 25, 2014	Nov 25, 2014	Nov 25, 2014	Nov 25, 2014	Nov 25, 2014	Nov 25, 2014		
Total PCBs	<	<	<	<	<	<	<	0.05	7.8

Notes:

Analysis completed by Maxxam Analytics Inc. laboratory in Bedford, NS.
* Ontario Ministry of the Environment (MOE) "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", April 15, 2011, Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition

RDL = Reportable Detection Limit
MW = Monitor Well
< = Parameter below detection limit
DUP-07 = Field Duplicate of MW10-1

0.0 = above criteria

TABLE 10

GROUNDWATER ANALYTICAL DATA - VOCs
2014/15 MONITORING AND MAINTENANCE PROGRAM
COME BY CHANCE SECURE LANDFILL
COME BY CHANCE, NL

Parameter	RDL	MW93-1	MW93-1A	MW93-2	MW93-2A	MW10-1	DUP-07	MW10-1A	Criteria*
		Nov 25, 2014	Nov 25, 2014	Nov 25, 2014	Nov 25, 2014	Nov 25, 2014	Nov 25, 2014	Nov 25, 2014	
Benzene	1.00	<	<	<	<	<	<	<	44
Bromodichloromethane	1.00	<	<	<	<	<	<	<	85,000
Bromoform	1.00	<	<	<	<	<	<	<	380
Bromomethane	3.00	<	<	<	<	<	<	<	5.6
Carbon Tetrachloride	1.00	<	<	<	<	<	<	<	0.79
Chlorobenzene	1.00	<	<	<	<	<	<	<	630
Chloroethane	8.00	<	<	<	<	<	<	<	-
Chloroform	1.00	<	<	<	<	<	<	<	2.4
Chloromethane	8.00	<	<	<	<	<	<	<	-
Dibromochloromethane	1.00	<	<	<	<	<	<	<	82,000
1,2-Dichlorobenzene	0.50	<	<	<	<	<	<	<	4,600
1,3-Dichlorobenzene	1.00	<	<	<	<	<	<	<	9,600
1,4-Dichlorobenzene	1.00	<	<	<	<	<	<	<	8
1,1-Dichloroethane	2.00	<	<	<	<	<	<	<	320
1,2-Dichloroethane	1.00	<	<	<	<	<	<	<	1.6
1,1-Dichloroethylene	0.50	<	<	<	<	<	<	<	1.6
cis-1,2-Dichloroethylene	2.00	<	<	<	<	<	<	<	1.6
trans-1,2-Dichloroethylene	2.00	<	<	<	<	<	<	<	1.6
1,2-Dichloropropane	1.00	<	<	<	<	1.0	1.0	<	16
cis-1,3-Dichloropropene	2.00	<	<	<	<	<	<	<	5.2
trans-1,3-Dichloropropene	1.00	<	<	<	<	<	<	<	5.2
Ethylbenzene	1.00	<	<	<	<	<	<	<	2,300
Methylene Chloride(Dichloromethane)	3.00	<	<	<	<	<	<	<	610
Xylenes	2.00	<	<	<	<	<	<	<	4,200
Styrene	1.00	<	<	<	<	<	<	<	1,300
Tetrachloroethylene	1.00	<	<	<	<	<	<	<	1.6
1,1,2,2-Tetrachloroethane	1.00	<	<	<	<	<	<	<	3.2
Toluene	1.00	<	<	<	<	<	<	<	18,000
Trichloroethylene	1.00	<	<	<	<	<	<	<	1.6
1,1,1-Trichloroethane	1.00	<	<	<	<	<	<	<	640
1,1,2-Trichloroethane	1.00	<	<	<	<	<	<	<	4.7
Trichlorofluoromethane (FREON 11)	8.00	<	<	<	<	<	<	<	2,500
Vinyl Chloride	0.50	<	<	<	<	<	<	<	0.5

Notes:
Analysis completed by Maxxam Analytics Inc. laboratory in Bedford, NS.
* Ontario Ministry of the Environment (MOE) "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", April 15, 2011, Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition
RDL = Reportable Detection Limit
MW = Monitor Well **0.0** = above criteria
-= Not analysed/No criteria
< = Parameter below detection limit
DUP-07 = Field Duplicate of MW10-1

TABLE 11

GROUNDWATER ANALYTICAL DATA - GENERAL CHEMISTRY
2014/15 MONITORING AND MAINTENANCE PROGRAM
COME BY CHANCE SECURE LANDFILL
COME BY CHANCE, NL

Parameter	RDL	Units	MW93-1	MW93-1A	MW93-2	MW93-2A	MW10-1	DUP-07	MW10-1A	Criteria*
			Nov 25, 2014	Nov 25, 2014	Nov 25, 2014	Nov 25, 2014	Nov 25, 2014	Nov 25, 2014	Nov 25, 2014	
Anion Sum	N/A	me/L	6.21	7.66	6.18	2.27	3.11	3.16	2.92	-
Bicarb. Alkalinity (calc. as CaCO3)	1.00	mg/L	250	320	220	7.7	96	98	90	-
Calculated TDS	1.00	mg/L	330	400	340	150	170	170	160	-
Carb. Alkalinity (calc. as CaCO3)	1.00	mg/L	3.7	3.3	1.7	<	<	<	<	-
Cation Sum	N/A	me/L	5.72	7.38	6.01	1.96	2.99	3.01	2.76	-
Hardness (CaCO3)	1.00	mg/L	130	180	250	61	130	130	120	-
Ion Balance (% Difference)	N/A	%	4.11	1.86	1.39	7.33	1.97	2.43	2.82	-
Langelier Index (@ 20C)	N/A	N/A	0.644	0.743	0.711	-3.60	-0.00600	0.00700	-0.0830	-
Langelier Index (@ 4C)	N/A	N/A	0.395	0.495	0.462	-3.85	-0.256	-0.243	-0.333	-
Nitrate (N)	0.05	mg/L	<	<	<	0.43	0.13	0.14	0.069	-
Saturation pH (@ 20C)	N/A	N/A	7.56	7.29	7.20	9.26	7.73	7.72	7.76	-
Saturation pH (@ 4C)	N/A	N/A	7.81	7.54	7.45	9.51	7.98	7.97	8.01	-
Total Alkalinity (Total as CaCO3)	30	mg/L	250	320	220	7.7	96	98	90	-
Dissolved Chloride (Cl)	1	mg/L	17	10	18	31	26	26	27	-
Colour	5.00	TCU	<	<	<	14	<	<	16	-
Nitrate + Nitrite	0.05	mg/L	<	<	<	0.43	0.13	0.14	0.069	-
Nitrite (N)	0.01	mg/L	<	<	<	<	<	<	<	-
Nitrogen (Ammonia Nitrogen)	0.05	mg/L	<	<	<	0.21	<	<	<	-
Total Organic Carbon (C)	0.50	mg/L	0.86	<5(1)	0.81	13	2.2	2.3	7.1 (1)	-
Orthophosphate (P)	0.01	mg/L	<	<	<	<	<	<	<	-
pH	N/A	pH	8.2	8.03	7.91	5.66	7.73	7.72	7.68	-
Reactive Silica (SiO2)	0.50	mg/L	7.9	7.7	17	7.0	4.5	4.5	2.9	-
Dissolved Sulphate (SO4)	2	mg/L	37	43	56	58	21	21	16	-
Turbidity	0.1	NTU	5.1	490	6.1	70	37	38	310	-
Conductivity	1	uS/cm	520	680	550	260	300	300	280	-

Notes:
Analysis completed by Maxxam Analytics Inc. laboratory in St. John's, NL.
* Ontario Ministry of the Environment (MOE) "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", April 15, 2011, Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition

RDL = Reportable Detection Limit **0.0** = above criteria
MW = Monitor Well
- = Not analysed/No criteria
< = Parameter below detection limit
DUP-07 = Field Duplicate of MW10-1
(1) = Reporting limit was increased due to turbidity

TABLE 12

GROUNDWATER ANALYTICAL DATA - METALS
2014/15 MONITORING AND MAINTENANCE PROGRAM
COME BY CHANCE SECURE LANDFILL
COME BY CHANCE, NL

Parameter	RDL	MW93-1	MW93-1A	MW93-2	MW93-2A	MW10-1	DUP-07	MW10-1A	Criteria*
		Nov 25, 2014	Nov 25, 2014	Nov 25, 2014	Nov 25, 2014	Nov 25, 2014	Nov 25, 2014	Nov 25, 2014	
Aluminum (Al)	5.0	14	18	6.2	270	12	17	75	-
Antimony (Sb)	1.0	<	<	<	<	<	<	<	20,000
Arsenic (As)	1.0	1.2	<	3.0	<	<	<	<	1,900
Barium (Ba)	1.0	85	71	190	90	41	41	22	29,000
Beryllium (Be)	1.0	<	<	<	<	<	<	<	67
Bismuth (Bi)	2.0	<	<	<	<	<	<	<	-
Boron (B)	5.0	98	64	980	<	<	<	<	45,000
Cadmium (Cd)	0.017	0.022	0.012	<	**11**	<	<	<	2.7
Calcium (Ca)	100	30,000	45,000	76,000	16,000	46,000	47,000	45,000	-
Chromium (Cr)	1.0	<	<	<	<	<	<	<	810/140[(1)]
Cobalt (Co)	0.4	<	<	<	5.2	<	<	<	66
Copper (Cu)	2.0	<	<	<	<	3.8	3.8	6.8	87
Iron (Fe)	50	330	<	130	730	<	<	86	-
Lead (Pb)	0.5	<	<	<	1.0	<	<	<	25
Magnesium (Mg)	100	14,000	17,000	15,000	4,900	3,900	3,900	1,800	-
Manganese (Mn)	2.0	120	71	720	6,700	12	13	3.3	-
Molybdenum (Mo)	2.0	15	15	<	<	<	<	<	9,200
Nickel (Ni)	2.0	<	<	<	4.8	<	<	<	490
Phosphorus (P)	100	<	<	<	110	<	<	<	-
Potassium (K)	100	1,700	2,500	1300	1,600	1,100	1,100	850	-
Selenium (Se)	1.0	<	<	<	<	<	<	<	63
Silver (Ag)	0.1	<	<	<	<	<	<	<	1.5
Sodium (Na)	100	69,000	85,000	22,000	15,000	8,000	7,800	8,100	2,300,000
Strontium (Sr)	2.0	220	280	230	77	98	98	85	-
Thallium (Tl)	0.1	<	<	<	<	<	<	<	510
Tin (Sn)	2.0	<	<	<	<	<	<	<	-
Titanium (Ti)	2.0	<	<	<	<	<	<	3.9	-
Uranium (U)	0.1	0.34	3.1	0.23	<	0.20	0.21	0.14	-
Vanadium (V)	2.0	<	<	<	<	<	<	<	250
Zinc (Zn)	5.0	10	<	<	**2,900**	<	<	<	1,100

Notes:

Analysis completed by Maxxam Analytics Inc. laboratory in Bedford, NS.
* Ontario Ministry of the Environment (MOE) "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", April 15, 2011, Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition

RDL = Reportable Detection Limit **0.0** = above criteria
MW = Monitor Well
- = Not analysed/No criteria
< = Parameter below detection limit
DUP-07 = Field Duplicate of MW10-1
(1) Criteria for Total Chromium = 810 ug/L, Criteria for Chromium (VI) = 140 ug/L

TABLE 13

SURFACE WATER ANALYTICAL DATA - BTEX/mTPH (mg/L)
2014/15 MONITORING AND MAINTENANCE PROGRAM
COME BY CHANCE SECURE LANDFILL
COME BY CHANCE, NL

Sample Location	Date Sampled	Benzene	Toluene	Ethyl-benzene	Xylenes	Total Petroleum Hydrocarbons (TPH)					Comments
						F1 C_6-C_{10}	F2 C_{10}-C_{16}	F3 C_{16}-C_{21}	F3 C_{21}-C_{32}	Modified TPH	
SURFACE UP	Nov 25, 2014	<	<	<	<	<	<	<	<	<	-
SURACE DOWN	Nov 25, 2014	<	<	<	<	<	<	<	<	<	-
RDL		0.001	0.001	0.001	0.002	0.01	0.05	0.1	0.1	0.1	-
2012 RBCA Tier I Ecological Screening Levels for the Protection of Aquatic Life [1]		**2.10**	**0.77**	**0.32**	**0.33**	**-**	**-**	**-**	**-**	**1.5**	**Gasoline**
										0.1	**Diesel /#2 Fuel Oil**
										0.1	**#6 Oil**

Notes:

Analysis completed by Maxxam Analytics Inc. laboratory in St. John's, NL.
1. Atlantic RBCA (Risk-Based Corrective Action) Version 3.0 (July 2012) Tier I Surface Water Screening Levels for the Protection of Freshwater and Marine Aquatic Life (mg/L)

RDL = Reportable Detection Limit
< = Parameter below detection limit
- = Not analysed
0.0 = above criteria

TPuH = Total Purgeable Hydrocarbons
TExH = Total Extractable Hydrocarbons
TPH = Total Petroleum Hydrocarbons
Modified TPH = mTPH = TExH + TPuH
TPH = mTPH + BTEX

G = Gasoline
FO = Fuel Oil
LO = Lube Oil
W = Weathered

TABLE 14

SURFACE WATER ANALYTICAL DATA - PAHs
2014/15 MONITORING AND MAINTENANCE PROGRAM
COME BY CHANCE SECURE LANDFILL
COME BY CHANCE, NL

Parameter	RDL	SURFACE UP	SURFACE DOWN	Criteria*
		Nov 25, 2014	Nov 25, 2014	
1-Methylnaphthalene	0.05	<	<	-
2-Methylnaphthalene	0.05	<	<	-
Acenaphthene	0.01	<	<	5.8
Acenaphthylene	0.01	<	<	-
Anthracene	0.01	<	<	0.012
Benzo(a)anthracene	0.01	<	<	0.018
Benzo(a)pyrene	0.01	<	<	0.015
Benzo(b)fluoranthene	0.01	<	<	-
Benzo(g,h,i)perylene	0.01	<	<	-
Benzo(j)fluoranthene	0.01	<	<	-
Benzo(k)fluoranthene	0.01	<	<	-
Chrysene	0.01	<	<	-
Dibenz(a,h)anthracene	0.01	<	<	-
Fluoranthene	0.01	<	<	0.04
Fluorene	0.01	<	<	3.0
Indeno(1,2,3-cd)pyrene	0.01	<	<	-
Naphthalene	0.2	<	<	1.1
Perylene	0.01	<	<	-
Phenanthrene	0.01	<	<	0.4
Pyrene	0.01	<	<	0.025

Analysis completed by Maxxam Analytics Inc. laboratory in St. John's, NL.
* Canadian Council of Ministers of the Environment (CCME) Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (2007 - Update 7.1).

RDL = Reportable Detection Limit **0.0**
- = Not analysed/No criteria
< = Parameter below detection limit

TABLE 15

SURFACE WATER ANALYTICAL DATA - TOTAL PCBs
2014/15 MONITORING AND MAINTENANCE PROGRAM
COME BY CHANCE SECURE LANDFILL
COME BY CHANCE, NL

Parameter	RDL	SURFACE UP	SURFACE DOWN	Criteria*
		Nov 25, 2014	Nov 25, 2014	
Total PCBs	0.05	<	<	-

Notes:

Analysis completed by Maxxam Analytics Inc. laboratory in St. John's, NL.
* Canadian Council of Ministers of the Environment (CCME) Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (2007 - Update 7.1).

RDL = Reportable Detection Limit **0.0** = above criteria
< = Parameter below detection limit

SURFACE WATER ANALYTICAL DATA - VOCs
2014/15 MONITORING AND MAINTENANCE PROGRAM
COME BY CHANCE SECURE LANDFILL
COME BY CHANCE, NL

Parameter	RDL	SURFACE UP	SURFACE DOWN	Criteria*
		Nov 25, 2014	Nov 25, 2014	
Benzene	1	<	<	370
Bromodichloromethane	1	<	<	-
Bromoform	1	<	<	-
Bromomethane	3	<	<	-
Carbon Tetrachloride	1	<	<	13.3
Chlorobenzene	1	<	<	1.3
Chloroethane	8	<	<	-
Chloroform	1	<	<	1.8
Chloromethane	8	<	<	-
Dibromochloromethane	1	<	<	-
1,2-Dichlorobenzene	0.5	<	<	0.7
1,3-Dichlorobenzene	1	<	<	150
1,4-Dichlorobenzene	1	<	<	26
1,1-Dichloroethane	2	<	<	-
1,2-Dichloroethane	1	<	<	100
1,1-Dichloroethylene	0.5	<	<	-
cis-1,2-Dichloroethylene	2	<	<	-
trans-1,2-Dichloroethylene	2	<	<	-
1,2-Dichloropropane	1	<	<	-
cis-1,3-Dichloropropene	2	<	<	-
trans-1,3-Dichloropropene	1	<	<	-
Ethylbenzene	1	<	<	90
Methylene Chloride(Dichloromethane)	3	<	<	98.1
o-Xylene	1	<	<	-
p+m-Xylene	2	<	<	-
Styrene	1	<	<	300
Tetrachloroethylene	1	<	<	72
1,1,2,2-Tetrachloroethane	1	<	<	-
Toluene	1	<	<	111
Trichloroethylene	1	<	<	2.0
1,1,1-Trichloroethane	1	<	<	-
1,1,2-Trichloroethane	1	<	<	-
Trichlorofluoromethane (FREON 11)	8	<	<	21
Vinyl Chloride	0.5	<	<	-

Notes:
Analysis completed by Maxxam Analytics Inc. laboratory in St. John's, NL.
* Canadian Council of Ministers of the Environment (CCME) Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (2007 - Update 7.1).

RDL = Reportable Detection Limit **0.0** = above criteria
- = Not analysed/No criteria
< = Parameter below detection limit

TABLE 17

SURFACE WATER ANALYTICAL DATA - GENERAL CHEMISTRY
2014/15 MONITORING AND MAINTENANCE PROGRAM
COME BY CHANCE SECURE LANDFILL
COME BY CHANCE, NL

Parameter	RDL	Units	SURFACE UP	SURFACE DOWN	Criteria*
			Nov 25, 2014	Nov 25, 2014	
Anion Sum	N/A	me/L	0.820	0.840	-
Bicarb. Alkalinity (calc. as CaCO3)	1	mg/L	10	10	-
Calculated TDS	1	mg/L	51	51	-
Carb. Alkalinity (calc. as CaCO3)	1	mg/L	<	<	-
Cation Sum	N/A	me/L	0.850	0.840	-
Hardness (CaCO3)	1	mg/L	17	18	-
Ion Balance (% Difference)	N/A	%	1.800	0.000	-
Langelier Index (@ 20C)	N/A	N/A	-2.69	-2.73	-
Langelier Index (@ 4C)	N/A	N/A	-2.94	-2.98	-
Nitrate (N)	0.05	mg/L	0.068	0.076	13
Saturation pH (@ 20C)	N/A	N/A	9.61	9.59	-
Saturation pH (@ 4C)	N/A	N/A	9.86	9.85	-
Total Alkalinity (Total as CaCO3)	30	mg/L	10	10	-
Carbonaceous BOD	5	mg/L	-	-	-
Dissolved Chloride (Cl)	1	mg/L	17	16	-
Colour	5	TCU	52	57	-
Strong Acid Dissoc. Cyanide (CN)	0.002	mg/L	-	-	-
Nitrate + Nitrite	0.05	mg/L	0.068	0.076	-
Nitrite (N)	0.01	mg/L	<	<	0.06
Nitrogen (Ammonia Nitrogen)	0.05	mg/L	<	<	-
Total Organic Carbon (C)	0.5	mg/L	6.4	6.8	-
Orthophosphate (P)	0.01	mg/L	<	<	-
pH	N/A	pH	6.92	6.87	6.5 - 9
Phenols-4AAP	0.001	mg/L	-	-	-
Reactive Silica (SiO2)	0.5	mg/L	2.3	2.4	-
Total Suspended Solids (TSS)	2	mg/L	-	-	-
Dissolved Sulphate (SO4)	2	mg/L	6.7	7.8	-
Sulphide	0.02	mg/L	-	-	-
Turbidity	0.1	NTU	3.0	4.4	-
Conductivity	1	uS/cm	91	94	-
Total Oil & Grease	5	mg/L	-	-	-

Notes:

Analysis completed by Maxxam Analytics Inc. laboratory in St. John's, NL.

* Canadian Council of Ministers of the Environment (CCME) Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (2007 - Update 7.1).

RDL = Reportable Detection Limit

0.0 = above criteria

-= Not analysed/No criteria

< = Parameter below detection limit

TABLE 18

SURFACE WATER ANALYTICAL DATA - TOTAL METALS
2014/15 MONITORING AND MAINTENANCE PROGRAM
COME BY CHANCE SECURE LANDFILL
COME BY CHANCE, NL

Parameter	RDL	Units	SURFACE UP	SURFACE DOWN	Criteria*
			Nov 25, 2014	Nov 25, 2014	
Aluminum (Al)	5.0	ug/L	**240**	**270**	100(1)
Antimony (Sb)	1.0	ug/L	<	<	-
Arsenic (As)	1.0	ug/L	<	<	5.0
Barium (Ba)	1.0	ug/L	11	11	-
Beryllium (Be)	1.0	ug/L	<	<	-
Bismuth (Bi)	2.0	ug/L	<	<	-
Boron (B)	5.0	ug/L	<	<	-
Cadmium (Cd)	0.017	ug/L	<	<	0.04(2)
Calcium (Ca)	100	ug/L	4,900	5,000	-
Chromium (Cr)	1.0	ug/L	<	<	8.9(3)
Hexavalent Chromium (Cr^{6+})	1.0	ug/L	0.63	0.74	1.0
Cobalt (Co)	0.4	ug/L	<	<	-
Copper (Cu)	2.0	ug/L	**5**	<	2(4)
Iron (Fe)	50	ug/L	**310**	300	300
Lead (Pb)	0.50	ug/L	<	<	1, 2(5)
Magnesium (Mg)	100	ug/L	1,200	1,300	-
Manganese (Mn)	2.0	ug/L	49	41	-
Molybdenum (Mo)	2.0	ug/L	<	<	73.00
Nickel (Ni)	2.0	ug/L	<	<	25, 65(6)
Phosphorus (P)	100	ug/L	<	<	-
Potassium (K)	100	ug/L	860	580	-
Selenium (Se)	1.0	ug/L	<	<	1.0
Silver (Ag)	0.1	ug/L	<	<	0.1
Sodium (Na)	100	ug/L	11,000	11,000	-
Strontium (Sr)	2.0	ug/L	16	17	-
Thallium (Tl)	0.1	ug/L	<	<	0.8
Tin (Sn)	2.0	ug/L	<	<	-
Titanium (Ti)	2.0	ug/L	4.5	3.5	-
Uranium (U)	0.10	ug/L	<	<	-
Vanadium (V)	2.0	ug/L	<	<	-
Zinc (Zn)	5.0	ug/L	18	<	30

Notes:

Analysis completed by Maxxam Analytics Inc. laboratory in St. John's, NL.
* Canadian Council of Ministers of the Environment (CCME) Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (2007 - Update 7.1).

RDL = Reportable Detection Limit
- = Not analysed/No criteria
< = Parameter below detection limit
0.0 = above criteria

(1) Aluminum guideline = 5 ug/L at pH < 6.5
= 100 ug/L at pH ≥ 6.5

(2) Cadmium guideline = $10^{\{0.86[\log(\text{hardness})]-3.2\}}$

(3) Criteria for Chromium (III) = 8.9 ug/L, Criteria for Chromium (VI) = 1.0 ug/L

(4) Copper guideline = 2 ug/L at $[CaCO_3]$ = 0-120 mg/L
= 3 ug/L at $[CaCO_3]$ = 120-180 mg/L
= 4 ug/L at $[CaCO_3]$ >180 mg/L

(5) Lead guideline = 1 ug/L at $[CaCO_3]$ = 0-60 mg/L
= 2 ug/L at $[CaCO_3]$ = 60-120 mg/L
= 4 ug/L at $[CaCO_3]$ = 120-180 mg/L
= 7 ug/L at $[CaCO_3]$ >180 mg/L

(6) Nickel guideline = 25 ug/L at $[CaCO_3]$ = 0-60 mg/L
= 65 ug/L at $[CaCO_3]$ = 60-120 mg/L
= 110 ug/L at $[CaCO_3]$ = 120-180 mg/L
= 150 ug/L at $[CaCO_3]$ >180 mg/L

TABLE 19

LEACHATE ANALYTICAL DATA - BTEX/mTPH (mg/L)
2014/15 MONITORING AND MAINTENANCE PROGRAM
COME BY CHANCE SECURE LANDFILL
COME BY CHANCE, NL

Sample Location	Date Sampled	Benzene	Toluene	Ethyl-benzene	Xylenes	Total Petroleum Hydrocarbons (TPH)					Comments
						F1 C_6-C_{10}	F2 C_{10}-C_{16}	F3 C_{16}-C_{21}	F3 C_{21}-C_{32}	Modified TPH	
PLCS	Nov 25, 2014	<	<	<	<	<	<	<	<	<	-
DUP-08	Nov 25, 2014	<	<	<	<	<	<	<	<	<	-
SLCS	Nov 25, 2014	<	<	<	<	<	<	<	<	<	-
RDL		0.0010	0.0010	0.0010	0.0020	0.01	0.05	0.05	0.1	0.1	-
Schedule A Water & Sewer Regulations [1]		-	-	-	-	-	-		-	15	-
2007 CCME Freshwater Aquatic Life Guidelines [2]		**4.00**	**2.00**	**0.39**	**-**	**-**	**-**	**-**	**-**	**-**	**Gasoline**
										-	**Diesel /#2 Fuel Oil**
										-	**#6 Oil**
2012 Tier I Surface Water ESL - Freshwater [3]		**2.10**	**0.77**	**0.32**	**0.33**	**-**	**-**	**-**	**-**	**1.5**	**Gasoline**
										0.1	**Diesel /#2 Fuel Oil**
										0.1	**#6 Oil**

Notes:

Analysis completed by Maxxam Analytics Inc. laboratory in St. John's, NL.

1. Schedule A of NL Environmental Control Water and Sewer Regulations, 2003.
2. 2007 CCME Freshwater Aquatic Life Guidelines
3 Atlantic Risk-Based Corrective Action (RBCA) Tier I Surface Water Ecological Screening Level (ESL) Table values for protection of freshwater and marine aquatic life.
DUP-08 = Field duplicate of PLCS

PLCS = Primary Leachate Collection System
SLCS = Secondary Leachate Collection System
RDL = Reportable Detection Limit
< = Parameter below detection limit
- = Not analysed
0.00 = above criteria

LEACHATE ANALYTICAL DATA - PAHs (ug/L)
2014/15 MONITORING AND MAINTENANCE PROGRAM
COME BY CHANCE SECURE LANDFILL
COME BY CHANCE, NL

Parameter	RDL	PLCS	DUP-08	SLCS	Criteria	
		Nov 25, 2014	Nov 25, 2014	Nov 25, 2014	NL [1]	CCME [2]
1-Methylnaphthalene	0.05	<	<	<	-	-
2-Methylnaphthalene	0.05	<	<	<	-	-
Acenaphthene	0.01	<	<	<	-	580
Acenaphthylene	0.01	<	<	<	-	-
Anthracene	0.01	<	<	<	-	1.2
Benzo(a)anthracene	0.01	<	<	<	-	1.8
Benzo(a)pyrene	0.01	<	<	<	-	1.5
Benzo(b)fluoranthene	0.01	<	<	<	-	-
Benzo(g,h,i)perylene	0.01	<	<	<	-	-
Benzo(j)fluoranthene	0.01	<	<	<	-	-
Benzo(k)fluoranthene	0.01	<	<	<	-	-
Chrysene	0.01	<	<	<	-	-
Dibenz(a,h)anthracene	0.01	<	<	<	-	-
Fluoranthene	0.01	<	<	0.010	-	4
Fluorene	0.01	<	<	<	-	300
Indeno(1,2,3-cd)pyrene	0.01	<	<	<	-	-
Naphthalene	0.2	<	<	<	-	110
Perylene	0.01	<	<	<	-	-
Phenanthrene	0.01	0.012	<	<	-	40
Pyrene	0.01	0.013	<	0.064	-	2.5

Analysis completed by Maxxam Analytics Inc. laboratory in Bedford, NS
1. Schedule A of NL Environmental Control Water and Sewer Regulations, 2003.

2. CCME Canadian Water Quality Guidelines for Protection of Freshwater Aquatic Life (2007 - Update 7.1) with a dilution factor of 100 based on distance between ditch and receiving waters and percolation through soil.

PLCS = Primary Leachate Collection System
SLCS = Secondary Leachate Collection System

0.0 = above CCME Criteria

< = Parameter below detection limit
<(0.0) = Parameter below elevated detection limit
DUP-08 = Field Duplicate of PLCS

RDL = Reportable Detection Limit
- = Not analysed/No criteria

TABLE 21

LEACHATE ANALYTICAL DATA - TOTAL PCBs (ug/L)
2014/15 MONITORING AND MAINTENANCE PROGRAM
COME BY CHANCE SECURE LANDFILL
COME BY CHANCE, NL

Parameter	RDL	PLCS	DUP-08	SLCS	Criteria[1]
		Nov 25, 2014	Nov 25, 2014	Nov 25, 2014	
Total PCBs	0.05	<	<	<	-

Notes:

Analysis completed by Maxxam Analytics Inc. laboratory in Bedford, NS.
1. Schedule A of NL Environmental Control Water and Sewer Regulations, 2003.

PLCS = Primary Leachate Collection System
SLCS = Secondary Leachate Collection System

< = Parameter below detection limit
0.0 = above Criteria

RDL = Reportable Detection Limit
DUP-08 = Field Duplicate of PLCS

- = Not analysed/No criteria

LEACHATE ANALYTICAL DATA - VOCs (ug/L)
2014/15 MONITORING AND MAINTENANCE PROGRAM
COME BY CHANCE SECURE LANDFILL
COME BY CHANCE, NL

Parameter	RDL	PLCS	DUP-08	SLCS	Criteria[1]
		Nov 25, 2014	Nov 25, 2014	Nov 25, 2014	
Benzene	1	<	<	<	-
Bromodichloromethane	1	<	<	<	-
Bromoform	1	<	<	<	-
Bromomethane	0.5	<	<	<	-
Carbon Tetrachloride	0.5	<	<	<	-
Chlorobenzene	1	<	<	<	-
Chloroethane	8	<	<	<	-
Chloroform	1	<	<	<	-
Chloromethane	8	<	<	<	-
Dibromochloromethane	1	<	<	<	-
1,2-Dichlorobenzene	0.5	<	<	<	-
1,3-Dichlorobenzene	1	<	<	<	-
1,4-Dichlorobenzene	1	<	<	<	-
1,1-Dichloroethane	2	<	<	<	-
1,2-Dichloroethane	1	<	<	<	-
1,1-Dichloroethylene	0.5	<	<	<	-
cis-1,2-Dichloroethylene	0.5	<	<	<	-
trans-1,2-Dichloroethylene	0.5	<	<	<	-
1,2-Dichloropropane	0.5	<	<	<	-
cis-1,3-Dichloropropene	0.5	<	<	<	-
trans-1,3-Dichloropropene	0.5	<	<	<	-
Ethylbenzene	1	<	<	<	-
Methylene Chloride(Dichloromethane)	3	<	<	<	-
o-Xylene	1	<	<	<	-
p+m-Xylene	2	<	<	<	-
Styrene	1	<	<	<	-
Tetrachloroethylene	1	<	<	<	-
1,1,2,2-Tetrachloroethane	1	<	<	<	-
Toluene	1	<	<	<	-
Trichloroethylene	1	<	<	<	-
1,1,1-Trichloroethane	1	<	<	<	-
1,1,2-Trichloroethane	1	<	<	<	-
Trichlorofluoromethane (FREON 11)	8	<	<	<	-
Vinyl Chloride	0.5	<	<	<	-

Notes:

Analysis completed by Maxxam Analytics Inc. laboratory in Bedford, NS.
1. Schedule A of NL Environmental Control Water and Sewer Regulations, 2003.

PLCS = Primary Leachate Collection System
SLCS = Secondary Leachate Collection System

< = Parameter below detection limit
0.0 = above Criteria

RDL = Reportable Detection Limit
DUP-08 = Field Duplicate of PLCS

- = Not analysed/No criteria

TABLE 23

LEACHATE ANALYTICAL DATA - GENERAL CHEMISTRY
2014/15 MONITORING AND MAINTENANCE PROGRAM
COME BY CHANCE SECURE LANDFILL
COME BY CHANCE, NL

Parameter	RDL	Units	PLCS	DUP-08	SLCS	Criteria[1]
			Nov 25, 2014	Nov 25, 2014	Nov 25, 2014	
Anion Sum	N/A	me/L	3.36	3	7.39	-
Bicarb. Alkalinity (calc. as CaCO3)	1	mg/L	140	120	310	-
Calculated TDS	1	mg/L	180	180	390	1,000
Carb. Alkalinity (calc. as CaCO3)	1	mg/L	<	1.2	<	-
Cation Sum	N/A	me/L	3.18	3.27	7.16	-
Hardness (CaCO3)	1	mg/L	120	120	280	-
Ion Balance (% Difference)	N/A	%	2.75	1.40	1.58	-
Langelier Index (@ 20C)	N/A	N/A	0.189	0.339	0.441	-
Langelier Index (@ 4C)	N/A	N/A	-0.0610	0.089	0.193	-
Nitrate (N)	0.05	mg/L	0.25	0.32	0.23	10
Saturation pH (@ 20C)	N/A	N/A	7.64	7.67	7.01	-
Saturation pH (@ 4C)	N/A	N/A	7.89	7.92	7.26	-
Total Alkalinity (Total as CaCO3)	30.00	mg/L	140	120	310	-
Carbonaceous BOD	15.00	mg/L	<	<	<	20
Dissolved Chloride (Cl)	1	mg/L	12	14	26	1,000
Colour	5	TCU	14	21	10	-
Strong Acid Dissoc. Cyanide (CN)	0.001	mg/L	0.0017	<	<	25
Nitrate + Nitrite	0.05	mg/L	0.25	0.32	0.23	-
Nitrite (N)	0.01	mg/L	<	<	<	-
Nitrogen (Ammonia Nitrogen)	0.05	mg/L	<	<	0.062	2
Total Organic Carbon (C)	0.5	mg/L	3.9	3.7	7.3	-
Orthophosphate (P)	0.01	mg/L	<	<	<	-
pH	N/A	pH	7.83	8.01	7.45	5.5 - 9.0
Phenols-4AAP	0.001	mg/L	0.0012	<	0.0015	0.10
Reactive Silica (SiO2)	0.5	mg/L	7.4	7.6	13	-
Total Suspended Solids (TSS)	2.0	mg/L	<	<	1.2	30
Dissolved Sulphate (SO4)	2.0	mg/L	13	13	17	-
Sulphide	0.02	mg/L	<	<	<	0.50
Turbidity	0.1	NTU	0.68	0.51	0.64	-
Conductivity	1	uS/cm	300	300	630	-
Total Oil & Grease	5.00	mg/L	<	<	<	-

Notes:
Analysis completed by Maxxam Analytics Inc. laboratory in Bedford, NS.

1. Schedule A of NL Environmental Control Water and Sewer Regulations, 2003.

PLCS = Primary Leachate Collection System
SLCS = Secondary Leachate Collection System
(1)= Elevated reporting limit due to sample matrix
(2)= The sample was decanted due to sediment
< = Parameter below detection limit
<(0.0) = Parameter below elevated detection limit
DUP-08 = Field Duplicate of PLCS

0.0 = above Criteria

RDL = Reportable Detection Limit
- = Not analysed/No criteria

TABLE 24

LEACHATE ANALYTICAL DATA - TOTAL METALS (ug/L)
2014/15 MONITORING AND MAINTENANCE PROGRAM
COME BY CHANCE SECURE LANDFILL
COME BY CHANCE, NL

Parameter	RDL	PLCS	DUP-08	SLCS	Criteria[1]
		Nov 25, 2014	Nov 25, 2014	Nov 25, 2014	
Aluminum (Al)	5	40	90	14	-
Antimony (Sb)	1	<	<	<	-
Arsenic (As)	1	<	<	<	500
Barium (Ba)	1	13	13	13	5,000
Beryllium (Be)	1	<	<	<	-
Bismuth (Bi)	2	<	<	<	-
Boron (B)	5	200	210	1,200	5,000
Cadmium (Cd)	0.010	<	<	<	50
Calcium (Ca)	100	41,000	42,000	87,000	-
Chromium (Cr)	1	<	<	<	1,000
Hexavalent Chromium (Cr^{6+})	0.5	<	<	<	50
Cobalt (Co)	0.4	<	<	<	-
Copper (Cu)	2	<	<	<	300
Iron (Fe)	50	62	150	130	10,000
Lead (Pb)	0.5	<	<	<	200
Magnesium (Mg)	100	4,100	4,200	16,000	-
Manganese (Mn)	2	65	67	850	-
Mercury (Hg)	0.013	<	<	<	5
Molybdenum (Mo)	2	<	<	<	-
Nickel (Ni)	2	<	<	<	500
Phosphorus (P)	100	<	110	<	-
Potassium (K)	100	13,000	13,000	22,000	-
Selenium (Se)	1	<	<	<	10
Silver (Ag)	0.1	<	<	<	50
Sodium (Na)	100	11,000	11,000	21,000	-
Strontium (Sr)	2	90	93	220	-
Thallium (Tl)	0.1	<	<	<	-
Tin (Sn)	2	<	<	<	-
Titanium (Ti)	2	2.3	4.50	<	-
Uranium (U)	1	0.19	0.21	0.72	-
Vanadium (V)	2	<	<	<	-
Zinc (Zn)	5	<	<	<	500

Notes:

Analysis completed by Maxxam Analytics Inc. laboratory in Bedford, NS.
1. Schedule A of NL Environmental Control Water and Sewer Regulations, 2003.

PLCS = Primary Leachate Collection System
SLCS = Secondary Leachate Collection System

0.0 = above Criteria
RDL = Reportable Detection Limit
- = Not analysed/No criteria

< = Parameter below detection limit
<(0.0) = Parameter below elevated detection limit
DUP-08 = Field Duplicate of PLCS

APPENDIX A

SITE PHOTOGRAPHS

Photo 1: View, looking west, from the landfill during the November 2014 sampling event.

Photo 2: View, looking south, toward clean-out 1 with landfill fencing in the background.

Photo 3: View, looking southeast, toward clean-out 2 with landfill fencing in the background.

Photo 4: View, looking southeast, toward clean-out 3.

Photo 5: View, looking east, toward clean-out 4 with landfill fencing in background.

Photo 6: View, looking southeast, showing MW 10-1 and MW 10-1A during the November 2014 sampling event.

Photo 7: View, looking northeast, showing the vegetative overgrowth at the ECP-1 during the landfill cover inspection in December 2014.

Photo 8: View, looking west, showing vegetative overgrowth around MW93-1 and MW93-1A during the November 2014 sampling event.

Photo 9: View, looking south, showing MW93-2 and MW93-2A during the November 2014 sampling event.

Photo 10: View, looking northeast, showing the groundwater interception drainage system during the November 2014 site visit. Note discharge pipe without a rodent screen and iron oxide staining.

Photo 11: View, looking southwest, while pumping leachate from the PLCS and SLCS valve chambers in December 2014.

APPENDIX B

LABORATORY CERTIFICATES OF ANALYSES

Maxxam
A Bureau Veritas Group Company

Success Through Science®

Your P.O. #: 20-019531
Your Project #: 084308-01
Site Location: MONITORING & MAINTENANCE, COME BY CHANCE
Your C.O.C. #: B 128577, B 128575

Attention:Brian Luffman

Conestoga-Rovers and Associates Ltd
Mount Pearl/St. John's
PO Box 8353 Stn A
1118 Topsail Rd
St. John's, NL
A1B 3N7

Report Date: 2014/12/05
Report #: R3247484
Version: 4 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B4M4704
Received: 2014/11/27, 13:53

Sample Matrix: Water
Samples Received: 12

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Carbonate, Bicarbonate and Hydroxide (1)	2	N/A	2014/11/28	N/A	SM 22 4500-CO2 D
Carbonate, Bicarbonate and Hydroxide (1)	10	N/A	2014/12/04	N/A	SM 22 4500-CO2 D
Alkalinity (1)	2	N/A	2014/12/01	ATL SOP 00013	EPA 310.2 R1974 m
Alkalinity (1)	10	N/A	2014/12/05	ATL SOP 00013	EPA 310.2 R1974 m
Carbonaceous BOD (1)	3	N/A	2014/12/02	ATL SOP 00041	SM 22 5210B m
Chloride (1)	2	N/A	2014/11/28	ATL SOP 00014	SM 22 4500-Cl- E m
Chloride (1)	10	N/A	2014/12/04	ATL SOP 00014	SM 22 4500-Cl- E m
Str. Acid Diss. Cyanide water (1, 3)	2	N/A	2014/12/01	ATL SOP 00040	EPA 335.3 m
Str. Acid Diss. Cyanide water (1, 3)	1	N/A	2014/12/05	ATL SOP 00040	EPA 335.3 m
Colour (1)	2	N/A	2014/11/28	ATL SOP 00020	SM 22 2120C m
Colour (1)	10	N/A	2014/12/04	ATL SOP 00020	SM 22 2120C m
Chromium (VI) in Water (2)	5	N/A	2014/12/01	CAM SOP-00436	EPA 7199 m
Conductance - water (1)	2	N/A	2014/11/28	ATL SOP 00004	SM 22 2510B m
Conductance - water (1)	10	N/A	2014/12/03	ATL SOP 00004	SM 22 2510B m
Hardness (calculated as CaCO3) (1)	3	N/A	2014/12/01	ATL SOP 00048	SM 22 2340 B
Hardness (calculated as CaCO3) (1)	9	N/A	2014/12/02	ATL SOP 00048	SM 22 2340 B
Mercury - Total (CVAA,LL) (1)	3	2014/12/01	2014/12/01	ATL SOP 00026	EPA 245.1 R3 m
Metals Water Diss. MS (as rec'd) (1)	9	N/A	2014/12/01	ATL SOP 00058	EPA 6020A R1 m
Metals Water Total MS (1, 4)	3	2014/11/28	2014/11/28	ATL SOP 00058	EPA 6020A R1 m
Ion Balance (% Difference) (1)	2	N/A	2014/12/01		Auto Calc.
Ion Balance (% Difference) (1)	10	N/A	2014/12/05		Auto Calc.
Anion and Cation Sum (1)	2	N/A	2014/12/01		Auto Calc.
Anion and Cation Sum (1)	10	N/A	2014/12/04		Auto Calc.
Nitrogen Ammonia - water (1)	2	N/A	2014/12/01	ATL SOP 00015	EPA 350.1 R2 m
Nitrogen Ammonia - water (1)	10	N/A	2014/12/02	ATL SOP 00015	EPA 350.1 R2 m
Nitrogen - Nitrate + Nitrite (1)	2	N/A	2014/12/01	ATL SOP 00016	USGS SOPINCF0452.2 m
Nitrogen - Nitrate + Nitrite (1)	10	N/A	2014/12/04	ATL SOP 00016	USGS SOPINCF0452.2 m
Nitrogen - Nitrite (1)	2	N/A	2014/11/28	ATL SOP 00017	SM 22 4500-NO2- B m
Nitrogen - Nitrite (1)	10	N/A	2014/12/03	ATL SOP 00017	SM 22 4500-NO2- B m

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax: 709-754-8612 www.maxxamanalytics.com

Your P.O. #: 20-019531
Your Project #: 084308-01
Site Location: MONITORING & MAINTENANCE, COME BY CHANCE
Your C.O.C. #: B 128577, B 128575

Attention:Brian Luffman

Conestoga-Rovers and Associates Ltd
Mount Pearl/St. John's
PO Box 8353 Stn A
1118 Topsail Rd
St. John's, NL
A1B 3N7

Report Date: 2014/12/05
Report #: R3247484
Version: 4 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B4M4704
Received: 2014/11/27, 13:53

Sample Matrix: Water
Samples Received: 12

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Nitrogen - Nitrate (as N) (1)	2	N/A	2014/12/01	ATL SOP 00018	ASTM D3867
Nitrogen - Nitrate (as N) (1)	10	N/A	2014/12/04	ATL SOP 00018	ASTM D3867
PAH in Water by GC/MS (SIM) (1)	2	2014/11/28	2014/11/29	ATL SOP 00103	EPA 8270D m
PAH in Water by GC/MS (SIM) (1)	6	2014/12/02	2014/12/03	ATL SOP 00103	EPA 8270D m
PAH in Water by GC/MS (SIM) (1)	4	2014/12/02	2014/12/04	ATL SOP 00103	EPA 8270D m
PCBs in water by GC/ECD (1)	12	2014/11/28	2014/12/01	ATL SOP 00107	EPA 8082 m
PCB Aroclor sum (water) (1)	12	N/A	2014/12/01		Auto Calc.
Phenols (4-AAP) (1)	3	N/A	2014/11/28	ATL SOP 00039	EPA 420.2 m
pH (1, 5)	2	N/A	2014/11/28	ATL SOP 00003	SM 22 4500-H+ B m
pH (1, 5)	10	N/A	2014/12/03	ATL SOP 00003	SM 22 4500-H+ B m
Phosphorus - ortho (1)	2	N/A	2014/11/28	ATL SOP 00021	EPA 365.2 m
Phosphorus - ortho (1)	10	N/A	2014/12/04	ATL SOP 00021	EPA 365.2 m
Sat. pH and Langelier Index (@ 20C) (1)	2	N/A	2014/12/01	ATL SOP 00049	Auto Calc.
Sat. pH and Langelier Index (@ 20C) (1)	10	N/A	2014/12/05	ATL SOP 00049	Auto Calc.
Sat. pH and Langelier Index (@ 4C) (1)	2	N/A	2014/12/01	ATL SOP 00049	Auto Calc.
Sat. pH and Langelier Index (@ 4C) (1)	10	N/A	2014/12/05	ATL SOP 00049	Auto Calc.
Reactive Silica (1)	2	N/A	2014/11/27	ATL SOP 00022	EPA 366.0 m
Reactive Silica (1)	10	N/A	2014/12/02	ATL SOP 00022	EPA 366.0 m
Sulphate (1)	2	N/A	2014/11/28	ATL SOP 00023	EPA 375.4 R1978 m
Sulphate (1)	10	N/A	2014/12/05	ATL SOP 00023	EPA 375.4 R1978 m
Sulphide (2)	3	N/A	2014/11/29	CAM SOP-00455	SM 22 4500-S G m
Total Dissolved Solids (TDS calc) (1)	2	N/A	2014/12/01		Auto Calc.
Total Dissolved Solids (TDS calc) (1)	10	N/A	2014/12/05		Auto Calc.
Organic carbon - Total (TOC) (1, 6)	2	N/A	2014/12/01	ATL SOP 00037	SM 22 5310C m
Organic carbon - Total (TOC) (1, 6)	10	N/A	2014/12/02	ATL SOP 00037	SM 22 5310C m
Total Oil and Grease - Water (1)	3	2014/11/28	2014/12/01	ATL SOP 00101	EPA 1664 RA m
Total Suspended Solids (1)	2	N/A	2014/12/01	ATL SOP 00007	EPA 160.2 m
Total Suspended Solids (1)	1	N/A	2014/12/03	ATL SOP 00007	EPA 160.2 m
Turbidity (1)	2	N/A	2014/11/28	ATL SOP 00011	EPA 180.1 R2 m

Your P.O. #: 20-019531
Your Project #: 084308-01
Site Location: MONITORING & MAINTENANCE, COME BY CHANCE
Your C.O.C. #: B 128577, B 128575

Attention:Brian Luffman

Conestoga-Rovers and Associates Ltd
Mount Pearl/St. John's
PO Box 8353 Stn A
1118 Topsail Rd
St. John's, NL
A1B 3N7

Report Date: 2014/12/05
Report #: R3247484
Version: 4 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B4M4704
Received: 2014/11/27, 13:53

Sample Matrix: Water
Samples Received: 12

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Turbidity (1)	10	N/A	2014/12/04	ATL SOP 00011	EPA 180.1 R2 m
Volatile Organic Compounds in Water (1, 7)	2	N/A	2014/11/28	ATL SOP 00133	EPA 8260C R3 m
Volatile Organic Compounds in Water (1, 7)	10	N/A	2014/11/29	ATL SOP 00133	EPA 8260C R3 m

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) This test was performed by Maxxam Bedford
(2) This test was performed by Maxxam Analytics Mississauga
(3) Strong acid dissociable cyanide value may include contribution from thiocyanate.
New RDLs in effect due to release of NS Contaminated Sites Regulations. Reduced RDL based on MDL study performance. Low level analytical run checks being implemented.
(4) New RDLs in effect due to release of NS Contaminated Sites Regulations. Reduced RDL based on MDL study performance. Low level analytical run checks being implemented.
(5) The APHA Standard Method require pH to be analyzed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the APHA Standard Method holding time.
(6) TOC / DOC present in the sample should be considered as non-purgeable TOC / DOC.
(7) New RDLs in effect due to release of NS Contaminated Sites Regulations.

Encryption Key

Rachael Mansfield
05 Dec 2014 17:57:36 -04:00

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Michelle Hill, Project Manager
Email: MHill@maxxam.ca
Phone# (902)420-0203 Ext:289

==========

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

Maxxam Job #: B4M4704
Report Date: 2014/12/05

Conestoga-Rovers and Associates Ltd
Client Project #: 084308-01
Site Location: MONITORING & MAINTENANCE, COME BY CHANCE
Your P.O. #: 20-019531
Sampler Initials: AB

ATLANTIC RCAP-MS TOTAL METALS IN WATER (WATER)

Maxxam ID		YQ2836	YQ2836	YQ2837		YQ2838	YQ2838	YQ2839		
Sampling Date		2014/11/25 14:45	2014/11/25 14:45	2014/11/25 14:45		2014/11/25 14:45	2014/11/25 14:45	2014/11/25 10:00		
COC Number		B 128577	B 128577	B 128577		B 128577	B 128577	B 128577		
	Units	PLCS	PLCS Lab-Dup	SLCS	QC Batch	DUP-08	DUP-08 Lab-Dup	MW93-1	RDL	QC Batch
Calculated Parameters										
Anion Sum	me/L	3.36		7.39	3838849	3.18		6.21	N/A	3838849
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	140		310	3838846	120		250	1.0	3838846
Calculated TDS	mg/L	180		390	3838852	180		330	1.0	3838852
Carb. Alkalinity (calc. as CaCO3)	mg/L	<1.0		<1.0	3838846	1.2		3.7	1.0	3838846
Cation Sum	me/L	3.18		7.16	3838849	3.27		5.72	N/A	3838849
Hardness (CaCO3)	mg/L	120		280	3838847	120		130	1.0	3838847
Ion Balance (% Difference)	%	2.75		1.58	3838848	1.40		4.11	N/A	3838848
Langelier Index (@ 20C)	N/A	0.189		0.441	3838850	0.339		0.644		3838850
Langelier Index (@ 4C)	N/A	-0.0610		0.193	3838851	0.0890		0.395		3838851
Nitrate (N)	mg/L	0.25		0.23	3838867	0.32		<0.050	0.050	3838867
Saturation pH (@ 20C)	N/A	7.64		7.01	3838850	7.67		7.56		3838850
Saturation pH (@ 4C)	N/A	7.89		7.26	3838851	7.92		7.81		3838851
Inorganics										
Total Alkalinity (Total as CaCO3)	mg/L	140		310	3838783	120	140	250	25	3844210
Dissolved Chloride (Cl)	mg/L	12		26	3837117	14	13	17	1.0	3844212
Colour	TCU	14		10	3838788	21	20	<5.0	5.0	3844217
Nitrate + Nitrite	mg/L	0.25		0.23	3838793	0.32	0.32	<0.050	0.050	3844222
Nitrite (N)	mg/L	<0.010		<0.010	3838797	<0.010	<0.010	<0.010	0.010	3844223
Nitrogen (Ammonia Nitrogen)	mg/L	<0.050		0.062	3840758	<0.050		<0.050	0.050	3842885
Total Organic Carbon (C)	mg/L	3.9		7.3	3842899	3.7		0.86	0.50	3844430
Orthophosphate (P)	mg/L	<0.010		<0.010	3838789	<0.010	<0.010	<0.010	0.010	3844218
pH	pH	7.83		7.45	3840684	8.01		8.20	N/A	3845939
Reactive Silica (SiO2)	mg/L	7.4		13	3838786	7.6	7.6	7.9	0.50	3844215
Dissolved Sulphate (SO4)	mg/L	13		17	3837118	13	12	37	2.0	3844214
Turbidity	NTU	0.68	0.73	0.64	3841272	0.51		5.1	0.10	3848246
Conductivity	uS/cm	300		630	3840690	300		520	1.0	3845943
Metals										
Total Aluminum (Al)	ug/L	40		14	3840473	90			5.0	3840473
Total Antimony (Sb)	ug/L	<1.0		<1.0	3840473	<1.0			1.0	3840473
Total Arsenic (As)	ug/L	<1.0		<1.0	3840473	<1.0			1.0	3840473

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax: 709-754-8612 www.maxxamanalytics.com

Maxxam Job #: B4M4704
Report Date: 2014/12/05

Conestoga-Rovers and Associates Ltd
Client Project #: 084308-01
Site Location: MONITORING & MAINTENANCE, COME BY CHANCE
Your P.O. #: 20-019531
Sampler Initials: AB

ATLANTIC RCAP-MS TOTAL METALS IN WATER (WATER)

Maxxam ID		YQ2836	YQ2836	YQ2837		YQ2838	YQ2838	YQ2839		
Sampling Date		2014/11/25 14:45	2014/11/25 14:45	2014/11/25 14:45		2014/11/25 14:45	2014/11/25 14:45	2014/11/25 10:00		
COC Number		B 128577	B 128577	B 128577		B 128577	B 128577	B 128577		
	Units	PLCS	PLCS Lab-Dup	SLCS	QC Batch	DUP-08	DUP-08 Lab-Dup	MW93-1	RDL	QC Batch
Total Barium (Ba)	ug/L	13		13	3840473	13			1.0	3840473
Total Beryllium (Be)	ug/L	<1.0		<1.0	3840473	<1.0			1.0	3840473
Total Bismuth (Bi)	ug/L	<2.0		<2.0	3840473	<2.0			2.0	3840473
Total Boron (B)	ug/L	200		1200	3840473	210			50	3840473
Total Cadmium (Cd)	ug/L	<0.010		<0.010	3840473	<0.010			0.010	3840473
Total Calcium (Ca)	ug/L	41000		87000	3840473	42000			100	3840473
Total Chromium (Cr)	ug/L	<1.0		<1.0	3840473	<1.0			1.0	3840473
Total Cobalt (Co)	ug/L	<0.40		<0.40	3840473	<0.40			0.40	3840473
Total Copper (Cu)	ug/L	<2.0		<2.0	3840473	<2.0			2.0	3840473
Total Iron (Fe)	ug/L	62		130	3840473	150			50	3840473
Total Lead (Pb)	ug/L	<0.50		<0.50	3840473	<0.50			0.50	3840473
Total Magnesium (Mg)	ug/L	4100		16000	3840473	4200			100	3840473
Total Manganese (Mn)	ug/L	65		850	3840473	67			2.0	3840473
Total Molybdenum (Mo)	ug/L	<2.0		<2.0	3840473	<2.0			2.0	3840473
Total Nickel (Ni)	ug/L	<2.0		<2.0	3840473	<2.0			2.0	3840473
Total Phosphorus (P)	ug/L	<100		<100	3840473	110			100	3840473
Total Potassium (K)	ug/L	13000		22000	3840473	13000			100	3840473
Total Selenium (Se)	ug/L	<1.0		<1.0	3840473	<1.0			1.0	3840473
Total Silver (Ag)	ug/L	<0.10		<0.10	3840473	<0.10			0.10	3840473
Total Sodium (Na)	ug/L	11000		21000	3840473	11000			100	3840473
Total Strontium (Sr)	ug/L	90		220	3840473	93			2.0	3840473
Total Thallium (Tl)	ug/L	<0.10		<0.10	3840473	<0.10			0.10	3840473
Total Tin (Sn)	ug/L	<2.0		<2.0	3840473	<2.0			2.0	3840473
Total Titanium (Ti)	ug/L	2.3		<2.0	3840473	4.5			2.0	3840473
Total Uranium (U)	ug/L	0.19		0.72	3840473	0.21			0.10	3840473
Total Vanadium (V)	ug/L	<2.0		<2.0	3840473	<2.0			2.0	3840473
Total Zinc (Zn)	ug/L	<5.0		<5.0	3840473	<5.0			5.0	3840473

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

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax: 709-754-8612 www.maxxamanalytics.com

Maxxam Job #: B4M4704
Report Date: 2014/12/05

Conestoga-Rovers and Associates Ltd
Client Project #: 084308-01
Site Location: MONITORING & MAINTENANCE, COME BY CHANCE
Your P.O. #: 20-019531
Sampler Initials: AB

ATLANTIC RCAP-MS TOTAL METALS IN WATER (WATER)

Maxxam ID		YQ2840		YQ2841		YQ2842		YQ2843		
Sampling Date		2014/11/25 10:05		2014/11/25 11:00		2014/11/25 11:05		2014/11/25 12:00		
COC Number		B 128577		B 128577		B 128577		B 128577		
	Units	MW93-1A	RDL	MW10-1	RDL	MW10-1A	RDL	MW93-2	RDL	QC Batch
Calculated Parameters										
Anion Sum	me/L	7.66	N/A	3.11	N/A	2.92	N/A	6.18	N/A	3838849
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	320	1.0	96	1.0	90	1.0	220	1.0	3838846
Calculated TDS	mg/L	400	1.0	170	1.0	160	1.0	340	1.0	3838852
Carb. Alkalinity (calc. as CaCO3)	mg/L	3.3	1.0	<1.0	1.0	<1.0	1.0	1.7	1.0	3838846
Cation Sum	me/L	7.38	N/A	2.99	N/A	2.76	N/A	6.01	N/A	3838849
Hardness (CaCO3)	mg/L	180	1.0	130	1.0	120	1.0	250	1.0	3838847
Ion Balance (% Difference)	%	1.86	N/A	1.97	N/A	2.82	N/A	1.39	N/A	3838848
Langelier Index (@ 20C)	N/A	0.743		-0.00600		-0.0830		0.711		3838850
Langelier Index (@ 4C)	N/A	0.495		-0.256		-0.333		0.462		3838851
Nitrate (N)	mg/L	<0.050	0.050	0.13	0.050	0.069	0.050	<0.050	0.050	3838867
Saturation pH (@ 20C)	N/A	7.29		7.73		7.76		7.20		3838850
Saturation pH (@ 4C)	N/A	7.54		7.98		8.01		7.45		3838851
Inorganics										
Total Alkalinity (Total as CaCO3)	mg/L	320	25	96	10	90	5.0	220	25	3844210
Dissolved Chloride (Cl)	mg/L	10	1.0	26	1.0	27	1.0	18	1.0	3844212
Colour	TCU	<5.0	5.0	<5.0	5.0	16	5.0	<5.0	5.0	3844217
Nitrate + Nitrite	mg/L	<0.050	0.050	0.13	0.050	0.069	0.050	<0.050	0.050	3844222
Nitrite (N)	mg/L	<0.010	0.010	<0.010	0.010	<0.010	0.010	<0.010	0.010	3844223
Nitrogen (Ammonia Nitrogen)	mg/L	<0.050	0.050	<0.050	0.050	<0.050	0.050	<0.050	0.050	3842885
Total Organic Carbon (C)	mg/L	<5.0 (1)	5.0	2.2	0.50	7.1 (1)	5.0	0.81	0.50	3844430
Orthophosphate (P)	mg/L	<0.010	0.010	<0.010	0.010	<0.010	0.010	<0.010	0.010	3844218
pH	pH	8.03	N/A	7.73	N/A	7.68	N/A	7.91	N/A	3845939
Reactive Silica (SiO2)	mg/L	7.7	0.50	4.5	0.50	2.9	0.50	17	0.50	3844215
Dissolved Sulphate (SO4)	mg/L	43	10	21	2.0	16	2.0	56	10	3844214
Turbidity	NTU	490	3.0	37	0.10	310	1.0	6.1	0.10	3848246
Conductivity	uS/cm	680	1.0	300	1.0	280	1.0	550	1.0	3845943

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable
(1) Reporting limit was increased due to turbidity.

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax: 709-754-8612 www.maxxamanalytics.com

Maxxam Job #: B4M4704
Report Date: 2014/12/05

Conestoga-Rovers and Associates Ltd
Client Project #: 084308-01
Site Location: MONITORING & MAINTENANCE, COME BY CHANCE
Your P.O. #: 20-019531
Sampler Initials: AB

ATLANTIC RCAP-MS TOTAL METALS IN WATER (WATER)

Maxxam ID		YQ2844	YQ2844			YQ2845		YQ2849		
Sampling Date		2014/11/25 12:05	2014/11/25 12:05			2014/11/25 11:00		2014/11/25 12:45		
COC Number		B 128577	B 128577			B 128577		B 128575		
	Units	MW93-2A	MW93-2A Lab-Dup	RDL	QC Batch	DUP-07	RDL	SURFACE UP	RDL	QC Batch
Calculated Parameters										
Anion Sum	me/L	2.27		N/A	3838849	3.16	N/A	0.820	N/A	3838849
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	7.7		1.0	3838846	98	1.0	10	1.0	3838846
Calculated TDS	mg/L	150		1.0	3838852	170	1.0	51	1.0	3838852
Carb. Alkalinity (calc. as CaCO3)	mg/L	<1.0		1.0	3838846	<1.0	1.0	<1.0	1.0	3838846
Cation Sum	me/L	1.96		N/A	3838849	3.01	N/A	0.850	N/A	3838849
Hardness (CaCO3)	mg/L	61		1.0	3838847	130	1.0	17	1.0	3838847
Ion Balance (% Difference)	%	7.33		N/A	3838848	2.43	N/A	1.80	N/A	3838848
Langelier Index (@ 20C)	N/A	-3.60			3838850	0.00700		-2.69		3838850
Langelier Index (@ 4C)	N/A	-3.85			3838851	-0.243		-2.94		3838851
Nitrate (N)	mg/L	0.43		0.050	3838867	0.14	0.050	0.068	0.050	3838867
Saturation pH (@ 20C)	N/A	9.26			3838850	7.72		9.61		3838850
Saturation pH (@ 4C)	N/A	9.51			3838851	7.97		9.86		3838851
Inorganics										
Total Alkalinity (Total as CaCO3)	mg/L	7.7		5.0	3844210	98	10	10	5.0	3844210
Dissolved Chloride (Cl)	mg/L	31		1.0	3844212	26	1.0	17	1.0	3844212
Colour	TCU	14		5.0	3844217	<5.0	5.0	52	25	3844217
Nitrate + Nitrite	mg/L	0.43		0.050	3844222	0.14	0.050	0.068	0.050	3844222
Nitrite (N)	mg/L	<0.010		0.010	3844223	<0.010	0.010	<0.010	0.010	3844223
Nitrogen (Ammonia Nitrogen)	mg/L	0.21		0.050	3842885	<0.050	0.050	<0.050	0.050	3842885
Total Organic Carbon (C)	mg/L	13		0.50	3844430	2.3	0.50	6.4	0.50	3844431
Orthophosphate (P)	mg/L	<0.010		0.010	3844218	<0.010	0.010	<0.010	0.010	3844218
pH	pH	5.66	5.61	N/A	3845935	7.72	N/A	6.92	N/A	3845939
Reactive Silica (SiO2)	mg/L	7.0		0.50	3844215	4.5	0.50	2.3	0.50	3844215
Dissolved Sulphate (SO4)	mg/L	58		10	3844214	21	2.0	6.7	2.0	3844214
Turbidity	NTU	70		0.50	3848246	38	0.10	3.0	0.10	3848246
Conductivity	uS/cm	260	260	1.0	3845938	300	1.0	91	1.0	3845943

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax: 709-754-8612 www.maxxamanalytics.com

Maxxam Job #: B4M4704
Report Date: 2014/12/05

Conestoga-Rovers and Associates Ltd
Client Project #: 084308-01
Site Location: MONITORING & MAINTENANCE, COME BY CHANCE
Your P.O. #: 20-019531
Sampler Initials: AB

ATLANTIC RCAP-MS TOTAL METALS IN WATER (WATER)

Maxxam ID		YQ2850		
Sampling Date		2014/11/25 13:00		
COC Number		B 128575		
	Units	**SURFACE DOWN**	**RDL**	**QC Batch**
Calculated Parameters				
Anion Sum	me/L	0.840	N/A	3838849
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	10	1.0	3838846
Calculated TDS	mg/L	51	1.0	3838852
Carb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	1.0	3838846
Cation Sum	me/L	0.840	N/A	3838849
Hardness (CaCO3)	mg/L	18	1.0	3838847
Ion Balance (% Difference)	%	0.00	N/A	3838848
Langelier Index (@ 20C)	N/A	-2.73		3838850
Langelier Index (@ 4C)	N/A	-2.98		3838851
Nitrate (N)	mg/L	0.076	0.050	3838867
Saturation pH (@ 20C)	N/A	9.59		3838850
Saturation pH (@ 4C)	N/A	9.85		3838851
Inorganics				
Total Alkalinity (Total as CaCO3)	mg/L	10	5.0	3844210
Dissolved Chloride (Cl)	mg/L	16	1.0	3844212
Colour	TCU	57	25	3844217
Nitrate + Nitrite	mg/L	0.076	0.050	3844222
Nitrite (N)	mg/L	<0.010	0.010	3844223
Nitrogen (Ammonia Nitrogen)	mg/L	<0.050	0.050	3842885
Total Organic Carbon (C)	mg/L	6.8	0.50	3844431
Orthophosphate (P)	mg/L	<0.010	0.010	3844218
pH	pH	6.87	N/A	3845939
Reactive Silica (SiO2)	mg/L	2.4	0.50	3844215
Dissolved Sulphate (SO4)	mg/L	7.8	2.0	3844214
Turbidity	NTU	4.4	0.10	3848246
Conductivity	uS/cm	94	1.0	3845943

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax: 709-754-8612 www.maxxamanalytics.com

Maxxam Job #: B4M4704
Report Date: 2014/12/05

Conestoga-Rovers and Associates Ltd
Client Project #: 084308-01
Site Location: MONITORING & MAINTENANCE, COME BY CHANCE
Your P.O. #: 20-019531
Sampler Initials: AB

ATLANTIC VOC IN WATER (WATER)

Maxxam ID		YQ2836	YQ2837		YQ2838	YQ2839	YQ2840		
Sampling Date		2014/11/25 14:45	2014/11/25 14:45		2014/11/25 14:45	2014/11/25 10:00	2014/11/25 10:05		
COC Number		B 128577	B 128577		B 128577	B 128577	B 128577		
	Units	PLCS	SLCS	QC Batch	DUP-08	MW93-1	MW93-1A	RDL	QC Batch
Chlorobenzenes									
1,2-Dichlorobenzene	ug/L	<0.50	<0.50	3840656	<0.50	<0.50	<0.50	0.50	3840794
1,3-Dichlorobenzene	ug/L	<1.0	<1.0	3840656	<1.0	<1.0	<1.0	1.0	3840794
1,4-Dichlorobenzene	ug/L	<1.0	<1.0	3840656	<1.0	<1.0	<1.0	1.0	3840794
Chlorobenzene	ug/L	<1.0	<1.0	3840656	<1.0	<1.0	<1.0	1.0	3840794
Volatile Organics									
1,1,1-Trichloroethane	ug/L	<1.0	<1.0	3840656	<1.0	<1.0	<1.0	1.0	3840794
1,1,2,2-Tetrachloroethane	ug/L	<0.50	<0.50	3840656	<0.50	<0.50	<0.50	0.50	3840794
1,1,2-Trichloroethane	ug/L	<1.0	<1.0	3840656	<1.0	<1.0	<1.0	1.0	3840794
1,1-Dichloroethane	ug/L	<2.0	<2.0	3840656	<2.0	<2.0	<2.0	2.0	3840794
1,1-Dichloroethylene	ug/L	<0.50	<0.50	3840656	<0.50	<0.50	<0.50	0.50	3840794
1,2-Dichloroethane	ug/L	<1.0	<1.0	3840656	<1.0	<1.0	<1.0	1.0	3840794
1,2-Dichloropropane	ug/L	<0.50	<0.50	3840656	<0.50	<0.50	<0.50	0.50	3840794
Benzene	ug/L	<1.0	<1.0	3840656	<1.0	<1.0	<1.0	1.0	3840794
Bromodichloromethane	ug/L	<1.0	<1.0	3840656	<1.0	<1.0	<1.0	1.0	3840794
Bromoform	ug/L	<1.0	<1.0	3840656	<1.0	<1.0	<1.0	1.0	3840794
Bromomethane	ug/L	<0.50	<0.50	3840656	<0.50	<0.50	<0.50	0.50	3840794
Carbon Tetrachloride	ug/L	<0.50	<0.50	3840656	<0.50	<0.50	<0.50	0.50	3840794
Chloroethane	ug/L	<8.0	<8.0	3840656	<8.0	<8.0	<8.0	8.0	3840794
Chloroform	ug/L	<1.0	<1.0	3840656	<1.0	<1.0	<1.0	1.0	3840794
Chloromethane	ug/L	<8.0	<8.0	3840656	<8.0	<8.0	<8.0	8.0	3840794
cis-1,2-Dichloroethylene	ug/L	<0.50	<0.50	3840656	<0.50	<0.50	<0.50	0.50	3840794
cis-1,3-Dichloropropene	ug/L	<0.50	<0.50	3840656	<0.50	<0.50	<0.50	0.50	3840794
Dibromochloromethane	ug/L	<1.0	<1.0	3840656	<1.0	<1.0	<1.0	1.0	3840794
Ethylbenzene	ug/L	<1.0	<1.0	3840656	<1.0	<1.0	<1.0	1.0	3840794
Ethylene Dibromide	ug/L	<0.20	<0.20	3840656	<0.20	<0.20	<0.20	0.20	3840794
Methylene Chloride(Dichloromethane)	ug/L	<3.0	<3.0	3840656	<3.0	<3.0	<3.0	3.0	3840794
o-Xylene	ug/L	<1.0	<1.0	3840656	<1.0	<1.0	<1.0	1.0	3840794
p+m-Xylene	ug/L	<2.0	<2.0	3840656	<2.0	<2.0	<2.0	2.0	3840794
Styrene	ug/L	<1.0	<1.0	3840656	<1.0	<1.0	<1.0	1.0	3840794
Tetrachloroethylene	ug/L	<1.0	<1.0	3840656	<1.0	<1.0	<1.0	1.0	3840794
Toluene	ug/L	<1.0	<1.0	3840656	<1.0	<1.0	<1.0	1.0	3840794
trans-1,2-Dichloroethylene	ug/L	<0.50	<0.50	3840656	<0.50	<0.50	<0.50	0.50	3840794

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax: 709-754-8612 www.maxxamanalytics.com

Maxxam Job #: B4M4704
Report Date: 2014/12/05

Conestoga-Rovers and Associates Ltd
Client Project #: 084308-01
Site Location: MONITORING & MAINTENANCE, COME BY CHANCE
Your P.O. #: 20-019531
Sampler Initials: AB

ATLANTIC VOC IN WATER (WATER)

Maxxam ID		YQ2836	YQ2837		YQ2838	YQ2839	YQ2840		
Sampling Date		2014/11/25 14:45	2014/11/25 14:45		2014/11/25 14:45	2014/11/25 10:00	2014/11/25 10:05		
COC Number		B 128577	B 128577		B 128577	B 128577	B 128577		
	Units	PLCS	SLCS	QC Batch	DUP-08	MW93-1	MW93-1A	RDL	QC Batch
trans-1,3-Dichloropropene	ug/L	<0.50	<0.50	3840656	<0.50	<0.50	<0.50	0.50	3840794
Trichloroethylene	ug/L	<1.0	<1.0	3840656	<1.0	<1.0	<1.0	1.0	3840794
Trichlorofluoromethane (FREON 11)	ug/L	<8.0	<8.0	3840656	<8.0	<8.0	<8.0	8.0	3840794
Vinyl Chloride	ug/L	<0.50	<0.50	3840656	<0.50	<0.50	<0.50	0.50	3840794
Surrogate Recovery (%)									
4-Bromofluorobenzene	%	99	99	3840656	99	100	99		3840794
D4-1,2-Dichloroethane	%	100	99	3840656	101	98	101		3840794
D8-Toluene	%	100	99	3840656	98	99	97		3840794

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax: 709-754-8612 www.maxxamanalytics.com

Maxxam Job #: B4M4704
Report Date: 2014/12/05

Conestoga-Rovers and Associates Ltd
Client Project #: 084308-01
Site Location: MONITORING & MAINTENANCE, COME BY CHANCE
Your P.O. #: 20-019531
Sampler Initials: AB

ATLANTIC VOC IN WATER (WATER)

Maxxam ID		YQ2841	YQ2842	YQ2843	YQ2844	YQ2845	YQ2849		
Sampling Date		2014/11/25 11:00	2014/11/25 11:05	2014/11/25 12:00	2014/11/25 12:05	2014/11/25 11:00	2014/11/25 12:45		
COC Number		B 128577	B 128577	B 128577	B 128577	B 128577	B 128575		
	Units	MW10-1	MW10-1A	MW93-2	MW93-2A	DUP-07	SURFACE UP	RDL	QC Batch
Chlorobenzenes									
1,2-Dichlorobenzene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	3840794
1,3-Dichlorobenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	3840794
1,4-Dichlorobenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	3840794
Chlorobenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	3840794
Volatile Organics									
1,1,1-Trichloroethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	3840794
1,1,2,2-Tetrachloroethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	3840794
1,1,2-Trichloroethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	3840794
1,1-Dichloroethane	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	3840794
1,1-Dichloroethylene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	3840794
1,2-Dichloroethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	3840794
1,2-Dichloropropane	ug/L	1.0	<0.50	<0.50	<0.50	1.0	<0.50	0.50	3840794
Benzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	3840794
Bromodichloromethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	3840794
Bromoform	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	3840794
Bromomethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	3840794
Carbon Tetrachloride	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	3840794
Chloroethane	ug/L	<8.0	<8.0	<8.0	<8.0	<8.0	<8.0	8.0	3840794
Chloroform	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	3840794
Chloromethane	ug/L	<8.0	<8.0	<8.0	<8.0	<8.0	<8.0	8.0	3840794
cis-1,2-Dichloroethylene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	3840794
cis-1,3-Dichloropropene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	3840794
Dibromochloromethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	3840794
Ethylbenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	3840794
Ethylene Dibromide	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	3840794
Methylene Chloride(Dichloromethane)	ug/L	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	3.0	3840794
o-Xylene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	3840794
p+m-Xylene	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	3840794
Styrene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	3840794
Tetrachloroethylene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	3840794
Toluene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	3840794
trans-1,2-Dichloroethylene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	3840794

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax: 709-754-8612 www.maxxamanalytics.com

Maxxam Job #: B4M4704
Report Date: 2014/12/05

Conestoga-Rovers and Associates Ltd
Client Project #: 084308-01
Site Location: MONITORING & MAINTENANCE, COME BY CHANCE
Your P.O. #: 20-019531
Sampler Initials: AB

ATLANTIC VOC IN WATER (WATER)

Maxxam ID		YQ2841	YQ2842	YQ2843	YQ2844	YQ2845	YQ2849		
Sampling Date		2014/11/25 11:00	2014/11/25 11:05	2014/11/25 12:00	2014/11/25 12:05	2014/11/25 11:00	2014/11/25 12:45		
COC Number		B 128577	B 128577	B 128577	B 128577	B 128577	B 128575		
	Units	MW10-1	MW10-1A	MW93-2	MW93-2A	DUP-07	SURFACE UP	RDL	QC Batch
trans-1,3-Dichloropropene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	3840794
Trichloroethylene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	3840794
Trichlorofluoromethane (FREON 11)	ug/L	<8.0	<8.0	<8.0	<8.0	<8.0	<8.0	8.0	3840794
Vinyl Chloride	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	3840794
Surrogate Recovery (%)									
4-Bromofluorobenzene	%	99	99	99	99	99	99		3840794
D4-1,2-Dichloroethane	%	101	101	101	101	100	101		3840794
D8-Toluene	%	97	98	97	98	98	97		3840794

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax: 709-754-8612 www.maxxamanalytics.com

Maxxam Job #: B4M4704
Report Date: 2014/12/05

Conestoga-Rovers and Associates Ltd
Client Project #: 084308-01
Site Location: MONITORING & MAINTENANCE, COME BY CHANCE
Your P.O. #: 20-019531
Sampler Initials: AB

ATLANTIC VOC IN WATER (WATER)

Maxxam ID		YQ2850		
Sampling Date		2014/11/25 13:00		
COC Number		B 128575		
	Units	SURFACE DOWN	RDL	QC Batch
Chlorobenzenes				
1,2-Dichlorobenzene	ug/L	<0.50	0.50	3840794
1,3-Dichlorobenzene	ug/L	<1.0	1.0	3840794
1,4-Dichlorobenzene	ug/L	<1.0	1.0	3840794
Chlorobenzene	ug/L	<1.0	1.0	3840794
Volatile Organics				
1,1,1-Trichloroethane	ug/L	<1.0	1.0	3840794
1,1,2,2-Tetrachloroethane	ug/L	<0.50	0.50	3840794
1,1,2-Trichloroethane	ug/L	<1.0	1.0	3840794
1,1-Dichloroethane	ug/L	<2.0	2.0	3840794
1,1-Dichloroethylene	ug/L	<0.50	0.50	3840794
1,2-Dichloroethane	ug/L	<1.0	1.0	3840794
1,2-Dichloropropane	ug/L	<0.50	0.50	3840794
Benzene	ug/L	<1.0	1.0	3840794
Bromodichloromethane	ug/L	<1.0	1.0	3840794
Bromoform	ug/L	<1.0	1.0	3840794
Bromomethane	ug/L	<0.50	0.50	3840794
Carbon Tetrachloride	ug/L	<0.50	0.50	3840794
Chloroethane	ug/L	<8.0	8.0	3840794
Chloroform	ug/L	<1.0	1.0	3840794
Chloromethane	ug/L	<8.0	8.0	3840794
cis-1,2-Dichloroethylene	ug/L	<0.50	0.50	3840794
cis-1,3-Dichloropropene	ug/L	<0.50	0.50	3840794
Dibromochloromethane	ug/L	<1.0	1.0	3840794
Ethylbenzene	ug/L	<1.0	1.0	3840794
Ethylene Dibromide	ug/L	<0.20	0.20	3840794
Methylene Chloride(Dichloromethane)	ug/L	<3.0	3.0	3840794
o-Xylene	ug/L	<1.0	1.0	3840794
p+m-Xylene	ug/L	<2.0	2.0	3840794
Styrene	ug/L	<1.0	1.0	3840794
Tetrachloroethylene	ug/L	<1.0	1.0	3840794
Toluene	ug/L	<1.0	1.0	3840794
trans-1,2-Dichloroethylene	ug/L	<0.50	0.50	3840794

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax: 709-754-8612 www.maxxamanalytics.com

Maxxam Job #: B4M4704
Report Date: 2014/12/05

Conestoga-Rovers and Associates Ltd
Client Project #: 084308-01
Site Location: MONITORING & MAINTENANCE, COME BY CHANCE
Your P.O. #: 20-019531
Sampler Initials: AB

ATLANTIC VOC IN WATER (WATER)

Maxxam ID		YQ2850		
Sampling Date		2014/11/25 13:00		
COC Number		B 128575		
	Units	**SURFACE DOWN**	**RDL**	**QC Batch**
trans-1,3-Dichloropropene	ug/L	<0.50	0.50	3840794
Trichloroethylene	ug/L	<1.0	1.0	3840794
Trichlorofluoromethane (FREON 11)	ug/L	<8.0	8.0	3840794
Vinyl Chloride	ug/L	<0.50	0.50	3840794
Surrogate Recovery (%)				
4-Bromofluorobenzene	%	99		3840794
D4-1,2-Dichloroethane	%	101		3840794
D8-Toluene	%	97		3840794

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax: 709-754-8612 www.maxxamanalytics.com

Maxxam Job #: B4M4704
Report Date: 2014/12/05

Conestoga-Rovers and Associates Ltd
Client Project #: 084308-01
Site Location: MONITORING & MAINTENANCE, COME BY CHANCE
Your P.O. #: 20-019531
Sampler Initials: AB

RESULTS OF ANALYSES OF WATER

Maxxam ID		YQ2836	YQ2836		YQ2837	YQ2837		YQ2838		
Sampling Date		2014/11/25 14:45	2014/11/25 14:45		2014/11/25 14:45	2014/11/25 14:45		2014/11/25 14:45		
COC Number		B 128577	B 128577		B 128577	B 128577		B 128577		
	Units	PLCS	PLCS Lab-Dup	RDL	SLCS	SLCS Lab-Dup	QC Batch	DUP-08	RDL	QC Batch
Inorganics										
Carbonaceous BOD	mg/L	<15		15	<5.0		3839169	<5.0	5.0	3839169
Strong Acid Dissoc. Cyanide (CN)	mg/L	0.0017	<0.0010	0.0010	<0.0010		3843376	<0.0010	0.0010	3848324
Phenols-4AAP	mg/L	0.0012		0.0010	0.0015		3841234	<0.0010	0.0010	3841234
Total Suspended Solids	mg/L	<1.0		1.0	1.2		3840457	<1.0	1.0	3844297
Sulphide	mg/L	<0.020		0.020	<0.020		3842218	<0.020	0.020	3842218
Petroleum Hydrocarbons										
Total Oil & Grease	mg/L	<5.0		5.0	<5.0	<5.0	3840541	<5.0	5.0	3840541

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

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax: 709-754-8612 www.maxxamanalytics.com

Maxxam Job #: B4M4704
Report Date: 2014/12/05

Conestoga-Rovers and Associates Ltd
Client Project #: 084308-01
Site Location: MONITORING & MAINTENANCE, COME BY CHANCE
Your P.O. #: 20-019531
Sampler Initials: AB

MERCURY BY COLD VAPOUR AA (WATER)

Maxxam ID		YQ2836	YQ2837	YQ2837	YQ2838		
Sampling Date		2014/11/25 14:45	2014/11/25 14:45	2014/11/25 14:45	2014/11/25 14:45		
COC Number		B 128577	B 128577	B 128577	B 128577		
	Units	PLCS	SLCS	SLCS Lab-Dup	DUP-08	RDL	QC Batch
Metals							
Total Mercury (Hg)	ug/L	<0.013	<0.013	<0.013	<0.013	0.013	3842894

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

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax: 709-754-8612 www.maxxamanalytics.com

Maxxam Job #: B4M4704
Report Date: 2014/12/05

Conestoga-Rovers and Associates Ltd
Client Project #: 084308-01
Site Location: MONITORING & MAINTENANCE, COME BY CHANCE
Your P.O. #: 20-019531
Sampler Initials: AB

ELEMENTS BY ICP/MS (WATER)

Maxxam ID		YQ2839	YQ2840	YQ2841	YQ2842	YQ2843	YQ2844		
Sampling Date		2014/11/25 10:00	2014/11/25 10:05	2014/11/25 11:00	2014/11/25 11:05	2014/11/25 12:00	2014/11/25 12:05		
COC Number		B 128577	B 128577	B 128577	B 128577	B 128577	B 128577		
	Units	MW93-1	MW93-1A	MW10-1	MW10-1A	MW93-2	MW93-2A	RDL	QC Batch
Metals									
Dissolved Aluminum (Al)	ug/L	14	18	12	75	6.2	270	5.0	3842647
Dissolved Antimony (Sb)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	3842647
Dissolved Arsenic (As)	ug/L	1.2	<1.0	<1.0	<1.0	3.0	<1.0	1.0	3842647
Dissolved Barium (Ba)	ug/L	85	71	41	22	190	90	1.0	3842647
Dissolved Beryllium (Be)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	3842647
Dissolved Bismuth (Bi)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	3842647
Dissolved Boron (B)	ug/L	98	64	<50	<50	980	<50	50	3842647
Dissolved Cadmium (Cd)	ug/L	0.022	0.012	<0.010	<0.010	<0.010	11	0.010	3842647
Dissolved Calcium (Ca)	ug/L	30000	45000	46000	45000	76000	16000	100	3842647
Dissolved Chromium (Cr)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	3842647
Dissolved Cobalt (Co)	ug/L	<0.40	<0.40	<0.40	<0.40	<0.40	5.2	0.40	3842647
Dissolved Copper (Cu)	ug/L	<2.0	<2.0	3.8	6.8	<2.0	<2.0	2.0	3842647
Dissolved Iron (Fe)	ug/L	330	<50	<50	86	130	730	50	3842647
Dissolved Lead (Pb)	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	1.0	0.50	3842647
Dissolved Magnesium (Mg)	ug/L	14000	17000	3900	1800	15000	4900	100	3842647
Dissolved Manganese (Mn)	ug/L	120	71	12	3.3	720	6700	2.0	3842647
Dissolved Molybdenum (Mo)	ug/L	15	15	<2.0	<2.0	<2.0	<2.0	2.0	3842647
Dissolved Nickel (Ni)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	4.8	2.0	3842647
Dissolved Phosphorus (P)	ug/L	<100	<100	<100	<100	<100	110	100	3842647
Dissolved Potassium (K)	ug/L	1700	2500	1100	850	1300	1600	100	3842647
Dissolved Selenium (Se)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	3842647
Dissolved Silver (Ag)	ug/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	3842647
Dissolved Sodium (Na)	ug/L	69000	85000	8000	8100	22000	15000	100	3842647
Dissolved Strontium (Sr)	ug/L	220	280	98	85	230	77	2.0	3842647
Dissolved Thallium (Tl)	ug/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	3842647
Dissolved Tin (Sn)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	3842647
Dissolved Titanium (Ti)	ug/L	<2.0	<2.0	<2.0	3.9	<2.0	<2.0	2.0	3842647
Dissolved Uranium (U)	ug/L	0.34	3.1	0.20	0.14	0.23	<0.10	0.10	3842647
Dissolved Vanadium (V)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	3842647
Dissolved Zinc (Zn)	ug/L	10	<5.0	<5.0	<5.0	<5.0	2900	5.0	3842647

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax: 709-754-8612 www.maxxamanalytics.com

Maxxam Job #: B4M4704
Report Date: 2014/12/05

Conestoga-Rovers and Associates Ltd
Client Project #: 084308-01
Site Location: MONITORING & MAINTENANCE, COME BY CHANCE
Your P.O. #: 20-019531
Sampler Initials: AB

ELEMENTS BY ICP/MS (WATER)

Maxxam ID		YQ2845	YQ2849	YQ2850		
Sampling Date		2014/11/25 11:00	2014/11/25 12:45	2014/11/25 13:00		
COC Number		B 128577	B 128575	B 128575		
	Units	DUP-07	SURFACE UP	SURFACE DOWN	RDL	QC Batch
Metals						
Dissolved Aluminum (Al)	ug/L	17	240	270	5.0	3842648
Dissolved Antimony (Sb)	ug/L	<1.0	<1.0	<1.0	1.0	3842648
Dissolved Arsenic (As)	ug/L	<1.0	<1.0	<1.0	1.0	3842648
Dissolved Barium (Ba)	ug/L	41	11	11	1.0	3842648
Dissolved Beryllium (Be)	ug/L	<1.0	<1.0	<1.0	1.0	3842648
Dissolved Bismuth (Bi)	ug/L	<2.0	<2.0	<2.0	2.0	3842648
Dissolved Boron (B)	ug/L	<50	<50	<50	50	3842648
Dissolved Cadmium (Cd)	ug/L	<0.010	<0.010	<0.010	0.010	3842648
Dissolved Calcium (Ca)	ug/L	47000	4900	5000	100	3842648
Dissolved Chromium (Cr)	ug/L	<1.0	<1.0	<1.0	1.0	3842648
Dissolved Cobalt (Co)	ug/L	<0.40	<0.40	<0.40	0.40	3842648
Dissolved Copper (Cu)	ug/L	3.8	5.0	<2.0	2.0	3842648
Dissolved Iron (Fe)	ug/L	<50	310	300	50	3842648
Dissolved Lead (Pb)	ug/L	<0.50	<0.50	<0.50	0.50	3842648
Dissolved Magnesium (Mg)	ug/L	3900	1200	1300	100	3842648
Dissolved Manganese (Mn)	ug/L	13	49	41	2.0	3842648
Dissolved Molybdenum (Mo)	ug/L	<2.0	<2.0	<2.0	2.0	3842648
Dissolved Nickel (Ni)	ug/L	<2.0	<2.0	<2.0	2.0	3842648
Dissolved Phosphorus (P)	ug/L	<100	<100	<100	100	3842648
Dissolved Potassium (K)	ug/L	1100	860	580	100	3842648
Dissolved Selenium (Se)	ug/L	<1.0	<1.0	<1.0	1.0	3842648
Dissolved Silver (Ag)	ug/L	<0.10	<0.10	<0.10	0.10	3842648
Dissolved Sodium (Na)	ug/L	7800	11000	11000	100	3842648
Dissolved Strontium (Sr)	ug/L	98	16	17	2.0	3842648
Dissolved Thallium (Tl)	ug/L	<0.10	<0.10	<0.10	0.10	3842648
Dissolved Tin (Sn)	ug/L	<2.0	<2.0	<2.0	2.0	3842648
Dissolved Titanium (Ti)	ug/L	<2.0	4.5	3.5	2.0	3842648
Dissolved Uranium (U)	ug/L	0.21	<0.10	<0.10	0.10	3842648
Dissolved Vanadium (V)	ug/L	<2.0	<2.0	<2.0	2.0	3842648
Dissolved Zinc (Zn)	ug/L	<5.0	18	<5.0	5.0	3842648

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax: 709-754-8612 www.maxxamanalytics.com

Maxxam Job #: B4M4704
Report Date: 2014/12/05

Conestoga-Rovers and Associates Ltd
Client Project #: 084308-01
Site Location: MONITORING & MAINTENANCE, COME BY CHANCE
Your P.O. #: 20-019531
Sampler Initials: AB

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		YQ2836	YQ2837		YQ2838	YQ2849	YQ2850		
Sampling Date		2014/11/25 14:45	2014/11/25 14:45		2014/11/25 14:45	2014/11/25 12:45	2014/11/25 13:00		
COC Number		B 128577	B 128577		B 128577	B 128575	B 128575		
	Units	PLCS	SLCS	QC Batch	DUP-08	SURFACE UP	SURFACE DOWN	RDL	QC Batch
Metals									
Chromium (VI)	ug/L	<0.50	<0.50	3842152	<0.50	0.63	0.74	0.50	3842237

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax: 709-754-8612 www.maxxamanalytics.com

Maxxam Job #: B4M4704
Report Date: 2014/12/05

Conestoga-Rovers and Associates Ltd
Client Project #: 084308-01
Site Location: MONITORING & MAINTENANCE, COME BY CHANCE
Your P.O. #: 20-019531
Sampler Initials: AB

SEMI-VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		YQ2836		YQ2837		YQ2838	YQ2839	YQ2840	YQ2841		
Sampling Date		2014/11/25 14:45		2014/11/25 14:45		2014/11/25 14:45	2014/11/25 10:00	2014/11/25 10:05	2014/11/25 11:00		
COC Number		B 128577		B 128577		B 128577	B 128577	B 128577	B 128577		
	Units	PLCS	RDL	SLCS	QC Batch	DUP-08	MW93-1	MW93-1A	MW10-1	RDL	QC Batch
Polyaromatic Hydrocarbons											
1-Methylnaphthalene	ug/L	<0.050	0.050	<0.050	3840504	<0.050	<0.050	<0.050	<0.050	0.050	3844235
2-Methylnaphthalene	ug/L	<0.050	0.050	<0.050	3840504	<0.050	<0.050	<0.050	<0.050	0.050	3844235
Acenaphthene	ug/L	<0.010	0.010	<0.010	3840504	<0.010	<0.010	<0.010	<0.010	0.010	3844235
Acenaphthylene	ug/L	<0.010	0.010	<0.010	3840504	<0.010	<0.010	<0.010	<0.010	0.010	3844235
Anthracene	ug/L	<0.010	0.010	<0.010	3840504	<0.010	<0.010	<0.010	<0.010	0.010	3844235
Benzo(a)anthracene	ug/L	<0.020 (1)	0.020	<0.010	3840504	<0.010	<0.010	<0.010	<0.010	0.010	3844235
Benzo(a)pyrene	ug/L	<0.010	0.010	<0.010	3840504	<0.010	<0.010	<0.010	<0.010	0.010	3844235
Benzo(b)fluoranthene	ug/L	<0.010	0.010	<0.010	3840504	<0.010	<0.010	<0.010	<0.010	0.010	3844235
Benzo(g,h,i)perylene	ug/L	<0.010	0.010	<0.010	3840504	<0.010	<0.010	<0.010	<0.010	0.010	3844235
Benzo(j)fluoranthene	ug/L	<0.010	0.010	<0.010	3840504	<0.010	<0.010	<0.010	<0.010	0.010	3844235
Benzo(k)fluoranthene	ug/L	<0.010	0.010	<0.010	3840504	<0.010	<0.010	<0.010	<0.010	0.010	3844235
Chrysene	ug/L	<0.010	0.010	<0.010	3840504	<0.010	<0.010	<0.010	<0.010	0.010	3844235
Dibenz(a,h)anthracene	ug/L	<0.010	0.010	<0.010	3840504	<0.010	<0.010	<0.010	<0.010	0.010	3844235
Fluoranthene	ug/L	<0.010	0.010	0.010	3840504	<0.010	<0.010	<0.010	<0.010	0.010	3844235
Fluorene	ug/L	<0.010	0.010	<0.010	3840504	<0.010	<0.010	<0.010	<0.010	0.010	3844235
Indeno(1,2,3-cd)pyrene	ug/L	<0.010	0.010	<0.010	3840504	<0.010	<0.010	<0.010	<0.010	0.010	3844235
Naphthalene	ug/L	<0.20	0.20	<0.20	3840504	<0.20	<0.20	<0.20	<0.20	0.20	3844235
Perylene	ug/L	<0.010	0.010	<0.010	3840504	<0.010	<0.010	<0.010	<0.010	0.010	3844235
Phenanthrene	ug/L	0.012	0.010	<0.010	3840504	<0.010	<0.010	<0.010	<0.010	0.010	3844235
Pyrene	ug/L	0.013	0.010	0.064	3840504	<0.010	<0.010	<0.010	<0.010	0.010	3844235
Surrogate Recovery (%)											
D10-Anthracene	%	76		104	3840504	63	62	67	65		3844235
D14-Terphenyl	%	80		113	3840504	66 (2)	66 (2)	69 (2)	72 (2)		3844235
D8-Acenaphthylene	%	71		103	3840504	65	66	69	71		3844235

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) Elevated PAH RDL(s) due to matrix / co-extractive interference.
(2) PAH sample contained sediment.

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax: 709-754-8612 www.maxxamanalytics.com

Maxxam Job #: B4M4704
Report Date: 2014/12/05

Conestoga-Rovers and Associates Ltd
Client Project #: 084308-01
Site Location: MONITORING & MAINTENANCE, COME BY CHANCE
Your P.O. #: 20-019531
Sampler Initials: AB

SEMI-VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		YQ2842	YQ2843	YQ2844	YQ2845	YQ2849	YQ2850		
Sampling Date		2014/11/25 11:05	2014/11/25 12:00	2014/11/25 12:05	2014/11/25 11:00	2014/11/25 12:45	2014/11/25 13:00		
COC Number		B 128577	B 128577	B 128577	B 128577	B 128575	B 128575		
	Units	MW10-1A	MW93-2	MW93-2A	DUP-07	SURFACE UP	SURFACE DOWN	RDL	QC Batch
Polyaromatic Hydrocarbons									
1-Methylnaphthalene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	3844235
2-Methylnaphthalene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	3844235
Acenaphthene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	3844235
Acenaphthylene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	3844235
Anthracene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	3844235
Benzo(a)anthracene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	3844235
Benzo(a)pyrene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	3844235
Benzo(b)fluoranthene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	3844235
Benzo(g,h,i)perylene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	3844235
Benzo(j)fluoranthene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	3844235
Benzo(k)fluoranthene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	3844235
Chrysene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	3844235
Dibenz(a,h)anthracene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	3844235
Fluoranthene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	3844235
Fluorene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	3844235
Indeno(1,2,3-cd)pyrene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	3844235
Naphthalene	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	3844235
Perylene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	3844235
Phenanthrene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	3844235
Pyrene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	3844235
Surrogate Recovery (%)									
D10-Anthracene	%	57	91	62	62	61	62		3844235
D14-Terphenyl	%	61 (1)	95 (1)	69 (1)	65 (1)	63 (1)	67 (1)		3844235
D8-Acenaphthylene	%	62	99	64	64	64	60		3844235

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) PAH sample contained sediment.

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax: 709-754-8612 www.maxxamanalytics.com

Maxxam Job #: B4M4704
Report Date: 2014/12/05

Conestoga-Rovers and Associates Ltd
Client Project #: 084308-01
Site Location: MONITORING & MAINTENANCE, COME BY CHANCE
Your P.O. #: 20-019531
Sampler Initials: AB

POLYCHLORINATED BIPHENYLS BY GC-ECD (WATER)

Maxxam ID		YQ2836	YQ2836	YQ2837	YQ2838	YQ2839	YQ2840	YQ2841		
Sampling Date		2014/11/25 14:45	2014/11/25 14:45	2014/11/25 14:45	2014/11/25 14:45	2014/11/25 10:00	2014/11/25 10:05	2014/11/25 11:00		
COC Number		B 128577	B 128577	B 128577	B 128577	B 128577	B 128577	B 128577		
	Units	PLCS	PLCS Lab-Dup	SLCS	DUP-08	MW93-1	MW93-1A	MW10-1	RDL	QC Batch
PCBs										
Aroclor 1016	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	3840613
Aroclor 1221	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	3840613
Aroclor 1232	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	3840613
Aroclor 1248	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	3840613
Aroclor 1242	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	3840613
Aroclor 1254	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	3840613
Aroclor 1260	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	3840613
Calculated Total PCB	ug/L	<0.050		<0.050	<0.050	<0.050	<0.050	<0.050	0.050	3839056
Surrogate Recovery (%)										
Decachlorobiphenyl	%	94	87	125	68	76	68	68		3840613

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

Maxxam ID		YQ2842	YQ2843	YQ2844	YQ2845	YQ2849	YQ2850		
Sampling Date		2014/11/25 11:05	2014/11/25 12:00	2014/11/25 12:05	2014/11/25 11:00	2014/11/25 12:45	2014/11/25 13:00		
COC Number		B 128577	B 128577	B 128577	B 128577	B 128575	B 128575		
	Units	MW10-1A	MW93-2	MW93-2A	DUP-07	SURFACE UP	SURFACE DOWN	RDL	QC Batch
PCBs									
Aroclor 1016	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	3840613
Aroclor 1221	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	3840613
Aroclor 1232	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	3840613
Aroclor 1248	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	3840613
Aroclor 1242	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	3840613
Aroclor 1254	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	3840613
Aroclor 1260	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	3840613
Calculated Total PCB	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	3839056
Surrogate Recovery (%)									
Decachlorobiphenyl	%	53	95	66	96	88	60		3840613

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax: 709-754-8612 www.maxxamanalytics.com

Maxxam Job #: B4M4704
Report Date: 2014/12/05

Conestoga-Rovers and Associates Ltd
Client Project #: 084308-01
Site Location: MONITORING & MAINTENANCE, COME BY CHANCE
Your P.O. #: 20-019531
Sampler Initials: AB

GENERAL COMMENTS

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

Package 1	8.5°C

Sample YQ2844-01 : Poor RCAp Ion Balance due to sample matrix. Cation sum does not include contribution from manganese.

Sample YQ2849-01 : Total/Dissolved Chromium < Hexavalent Chromium: Both values fall within acceptable RPD limits for duplicates and are likely equivalent.

Sample YQ2850-01 : Total/Dissolved Chromium < Hexavalent Chromium: Both values fall within acceptable RPD limits for duplicates and are likely equivalent.

Results relate only to the items tested.

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax: 709-754-8612 www.maxxamanalytics.com

Maxxam Job #: B4M4704
Report Date: 2014/12/05

QUALITY ASSURANCE REPORT

Conestoga-Rovers and Associates Ltd
Client Project #: 084308-01
MONITORING & MAINTENANCE, COME BY
Site Location: CHANCE
Your P.O. #: 20-019531
Sampler Initials: AB

			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
3840504	D10-Anthracene	2014/11/29	71	30 - 130	106	30 - 130	110	%				
3840504	D14-Terphenyl	2014/11/29	76 (2)	30 - 130	104	30 - 130	109	%				
3840504	D8-Acenaphthylene	2014/11/29	72	30 - 130	101	30 - 130	98	%				
3840613	Decachlorobiphenyl	2014/12/01	107 (5)	30 - 130	78	30 - 130	80	%				
3840656	4-Bromofluorobenzene	2014/11/28	100	70 - 130	101	70 - 130	99	%				
3840656	D4-1,2-Dichloroethane	2014/11/28	101	70 - 130	100	70 - 130	99	%				
3840656	D8-Toluene	2014/11/28	98	70 - 130	98	70 - 130	98	%				
3840794	4-Bromofluorobenzene	2014/11/29	100	70 - 130	101	70 - 130	99	%				
3840794	D4-1,2-Dichloroethane	2014/11/29	102	70 - 130	102	70 - 130	100	%				
3840794	D8-Toluene	2014/11/29	97	70 - 130	97	70 - 130	98	%				
3844235	D10-Anthracene	2014/12/03	57	30 - 130	96	30 - 130	93	%				
3844235	D14-Terphenyl	2014/12/03	62	30 - 130	101	30 - 130	90	%				
3844235	D8-Acenaphthylene	2014/12/03	61	30 - 130	103	30 - 130	105	%				
3837117	Dissolved Chloride (Cl)	2014/11/28	NC	80 - 120	97	80 - 120	<1.0	mg/L	1.3 (1)	25	108	80 - 120
3837118	Dissolved Sulphate (SO4)	2014/11/28	NC	80 - 120	100	80 - 120	<2.0	mg/L	2.5 (1)	25		
3838783	Total Alkalinity (Total as CaCO3)	2014/12/01	NC	80 - 120	113	80 - 120	<5.0	mg/L	5.0 (1)	25		
3838786	Reactive Silica (SiO2)	2014/11/27	NC	80 - 120	101	80 - 120	<0.50	mg/L	6.7 (1)	25		
3838788	Colour	2014/11/28			97	80 - 120	<5.0	TCU	NC (1)	25		
3838789	Orthophosphate (P)	2014/11/28	92	80 - 120	97	80 - 120	<0.010	mg/L	NC (1)	25		
3838793	Nitrate + Nitrite	2014/12/01	99	80 - 120	98	80 - 120	<0.050	mg/L	NC (1)	25		
3838797	Nitrite (N)	2014/11/28	89	80 - 120	91	80 - 120	<0.010	mg/L	NC (1)	25		
3839169	Carbonaceous BOD	2014/12/02			89	80 - 120	<5.0	mg/L	NC (1)	25	95	80 - 120
3840457	Total Suspended Solids	2014/12/01					<1.0	mg/L	4.4 (1)	25	94	80 - 120
3840473	Total Aluminum (Al)	2014/11/28	97	80 - 120	96	80 - 120	<5.0	ug/L	10 (1)	20		
3840473	Total Antimony (Sb)	2014/11/28	101	80 - 120	100	80 - 120	<1.0	ug/L	NC (1)	20		
3840473	Total Arsenic (As)	2014/11/28	96	80 - 120	94	80 - 120	<1.0	ug/L	NC (1)	20		
3840473	Total Barium (Ba)	2014/11/28	96	80 - 120	95	80 - 120	<1.0	ug/L	NC (1)	20		
3840473	Total Beryllium (Be)	2014/11/28	97	80 - 120	97	80 - 120	<1.0	ug/L	NC (1)	20		
3840473	Total Bismuth (Bi)	2014/11/28	96	80 - 120	99	80 - 120	<2.0	ug/L	NC (1)	20		
3840473	Total Boron (B)	2014/11/28	99	80 - 120	100	80 - 120	<50	ug/L	NC (1)	20		

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax: 709-754-8612 www.maxxamanalytics.com

QUALITY ASSURANCE REPORT(CONT'D)

Conestoga-Rovers and Associates Ltd
Client Project #: 084308-01
MONITORING & MAINTENANCE, COME BY
Site Location: CHANCE
Your P.O. #: 20-019531
Sampler Initials: AB

			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
3840473	Total Cadmium (Cd)	2014/11/28	95	80 - 120	94	80 - 120	<0.010	ug/L	NC (1)	20		
3840473	Total Calcium (Ca)	2014/11/28	NC	80 - 120	96	80 - 120	<100	ug/L	4.2 (1)	20		
3840473	Total Chromium (Cr)	2014/11/28	94	80 - 120	92	80 - 120	<1.0	ug/L	NC (1)	20		
3840473	Total Cobalt (Co)	2014/11/28	94	80 - 120	92	80 - 120	<0.40	ug/L	NC (1)	20		
3840473	Total Copper (Cu)	2014/11/28	92	80 - 120	91	80 - 120	<2.0	ug/L	NC (1)	20		
3840473	Total Iron (Fe)	2014/11/28	NC	80 - 120	100	80 - 120	<50	ug/L	NC (1)	20		
3840473	Total Lead (Pb)	2014/11/28	96	80 - 120	95	80 - 120	<0.50	ug/L	NC (1)	20		
3840473	Total Magnesium (Mg)	2014/11/28	102	80 - 120	100	80 - 120	<100	ug/L	3.9 (1)	20		
3840473	Total Manganese (Mn)	2014/11/28	NC	80 - 120	95	80 - 120	<2.0	ug/L	3.5 (1)	20		
3840473	Total Molybdenum (Mo)	2014/11/28	99	80 - 120	96	80 - 120	<2.0	ug/L	NC (1)	20		
3840473	Total Nickel (Ni)	2014/11/28	93	80 - 120	93	80 - 120	<2.0	ug/L	NC (1)	20		
3840473	Total Phosphorus (P)	2014/11/28	102	80 - 120	101	80 - 120	<100	ug/L	NC (1)	20		
3840473	Total Potassium (K)	2014/11/28	104	80 - 120	95	80 - 120	<100	ug/L	NC (1)	20		
3840473	Total Selenium (Se)	2014/11/28	95	80 - 120	93	80 - 120	<1.0	ug/L	NC (1)	20		
3840473	Total Silver (Ag)	2014/11/28	92	80 - 120	90	80 - 120	<0.10	ug/L	NC (1)	20		
3840473	Total Sodium (Na)	2014/11/28	100	80 - 120	98	80 - 120	<100	ug/L	3.9 (1)	20		
3840473	Total Strontium (Sr)	2014/11/28	99	80 - 120	95	80 - 120	<2.0	ug/L	6.8 (1)	20		
3840473	Total Thallium (Tl)	2014/11/28	97	80 - 120	97	80 - 120	<0.10	ug/L	NC (1)	20		
3840473	Total Tin (Sn)	2014/11/28	100	80 - 120	99	80 - 120	<2.0	ug/L	NC (1)	20		
3840473	Total Titanium (Ti)	2014/11/28	98	80 - 120	96	80 - 120	<2.0	ug/L	NC (1)	20		
3840473	Total Uranium (U)	2014/11/28	100	80 - 120	98	80 - 120	<0.10	ug/L	NC (1)	20		
3840473	Total Vanadium (V)	2014/11/28	98	80 - 120	96	80 - 120	<2.0	ug/L	NC (1)	20		
3840473	Total Zinc (Zn)	2014/11/28	93	80 - 120	93	80 - 120	<5.0	ug/L	NC (1)	20		
3840504	1-Methylnaphthalene	2014/11/29	65	30 - 130	92	30 - 130	<0.050	ug/L	NC (1)	40		
3840504	2-Methylnaphthalene	2014/11/29	69	30 - 130	95	30 - 130	<0.050	ug/L	NC (1)	40		
3840504	Acenaphthene	2014/11/29	75	30 - 130	103	30 - 130	<0.010	ug/L	NC (1)	40		
3840504	Acenaphthylene	2014/11/29	69	30 - 130	98	30 - 130	<0.010	ug/L	NC (1)	40		
3840504	Anthracene	2014/11/29	73	30 - 130	102	30 - 130	<0.010	ug/L	NC (1)	40		
3840504	Benzo(a)anthracene	2014/11/29	58	30 - 130	83	30 - 130	<0.010	ug/L	NC (1)	40		
3840504	Benzo(a)pyrene	2014/11/29	72	30 - 130	101	30 - 130	<0.010	ug/L	NC (1)	40		

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax: 709-754-8612 www.maxxamanalytics.com

Maxxam Job #: B4M4704
Report Date: 2014/12/05

QUALITY ASSURANCE REPORT(CONT'D)

Conestoga-Rovers and Associates Ltd
Client Project #: 084308-01
MONITORING & MAINTENANCE, COME BY
Site Location: CHANCE
Your P.O. #: 20-019531
Sampler Initials: AB

			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
3840504	Benzo(b)fluoranthene	2014/11/29	74	30 - 130	104	30 - 130	<0.010	ug/L	NC (1)	40		
3840504	Benzo(g,h,i)perylene	2014/11/29	69	30 - 130	98	30 - 130	<0.010	ug/L	NC (1)	40		
3840504	Benzo(j)fluoranthene	2014/11/29	68	30 - 130	96	30 - 130	<0.010	ug/L	NC (1)	40		
3840504	Benzo(k)fluoranthene	2014/11/29	74	30 - 130	100	30 - 130	<0.010	ug/L	NC (1)	40		
3840504	Chrysene	2014/11/29	64	30 - 130	93	30 - 130	<0.010	ug/L	NC (1)	40		
3840504	Dibenz(a,h)anthracene	2014/11/29	59	30 - 130	77	30 - 130	<0.010	ug/L	NC (1)	40		
3840504	Fluoranthene	2014/11/29	68	30 - 130	95	30 - 130	<0.010	ug/L	NC (1)	40		
3840504	Fluorene	2014/11/29	73	30 - 130	103	30 - 130	<0.010	ug/L	NC (1)	40		
3840504	Indeno(1,2,3-cd)pyrene	2014/11/29	63	30 - 130	91	30 - 130	<0.010	ug/L	NC (1)	40		
3840504	Naphthalene	2014/11/29	68	30 - 130	94	30 - 130	<0.20	ug/L	NC (1)	40		
3840504	Perylene	2014/11/29	65	30 - 130	102	30 - 130	<0.010	ug/L	NC (1)	40		
3840504	Phenanthrene	2014/11/29	75	30 - 130	101	30 - 130	<0.010	ug/L	NC (1)	40		
3840504	Pyrene	2014/11/29	67	30 - 130	96	30 - 130	<0.010	ug/L	NC (1)	40		
3840541	Total Oil & Grease	2014/12/01	99 (3)	70 - 130	98	70 - 130	<5.0	mg/L	NC (4)	40		
3840613	Aroclor 1016	2014/12/01					<0.050	ug/L	NC (6)	40		
3840613	Aroclor 1221	2014/12/01					<0.050	ug/L	NC (6)	40		
3840613	Aroclor 1232	2014/12/01					<0.050	ug/L	NC (6)	40		
3840613	Aroclor 1242	2014/12/01					<0.050	ug/L	NC (6)	40		
3840613	Aroclor 1248	2014/12/01					<0.050	ug/L	NC (6)	40		
3840613	Aroclor 1254	2014/12/01	112 (5)	30 - 130	96	30 - 130	<0.050	ug/L	NC (6)	40		
3840613	Aroclor 1260	2014/12/01					<0.050	ug/L	NC (6)	40		
3840656	1,1,1-Trichloroethane	2014/11/28	99	70 - 130	91	70 - 130	<1.0	ug/L	NC (1)	40		
3840656	1,1,2,2-Tetrachloroethane	2014/11/28	95	70 - 130	88	70 - 130	<0.50	ug/L	NC (1)	40		
3840656	1,1,2-Trichloroethane	2014/11/28	93	70 - 130	85	70 - 130	<1.0	ug/L	NC (1)	40		
3840656	1,1-Dichloroethane	2014/11/28	96	70 - 130	90	70 - 130	<2.0	ug/L	NC (1)	40		
3840656	1,1-Dichloroethylene	2014/11/28	106	70 - 130	99	70 - 130	<0.50	ug/L	NC (1)	40		
3840656	1,2-Dichlorobenzene	2014/11/28	95	70 - 130	88	70 - 130	<0.50	ug/L	NC (1)	40		
3840656	1,2-Dichloroethane	2014/11/28	101	70 - 130	93	70 - 130	<1.0	ug/L	NC (1)	40		
3840656	1,2-Dichloropropane	2014/11/28	94	70 - 130	87	70 - 130	<0.50	ug/L	NC (1)	40		
3840656	1,3-Dichlorobenzene	2014/11/28	93	70 - 130	88	70 - 130	<1.0	ug/L	NC (1)	40		

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax: 709-754-8612 www.maxxamanalytics.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
3840656	1,4-Dichlorobenzene	2014/11/28	94	70 - 130	88	70 - 130	<1.0	ug/L	NC (1)	40		
3840656	Benzene	2014/11/28	101	70 - 130	94	70 - 130	<1.0	ug/L	NC (1)	40		
3840656	Bromodichloromethane	2014/11/28	98	70 - 130	91	70 - 130	<1.0	ug/L	NC (1)	40		
3840656	Bromoform	2014/11/28	95	70 - 130	88	70 - 130	<1.0	ug/L	NC (1)	40		
3840656	Bromomethane	2014/11/28	99	60 - 140	98	60 - 140	<0.50	ug/L	NC (1)	40		
3840656	Carbon Tetrachloride	2014/11/28	98	70 - 130	90	70 - 130	<0.50	ug/L	NC (1)	40		
3840656	Chlorobenzene	2014/11/28	96	70 - 130	90	70 - 130	<1.0	ug/L	NC (1)	40		
3840656	Chloroethane	2014/11/28	97	60 - 140	92	60 - 140	<8.0	ug/L	NC (1)	40		
3840656	Chloroform	2014/11/28	105	70 - 130	97	70 - 130	<1.0	ug/L	NC (1)	40		
3840656	Chloromethane	2014/11/28	92	60 - 140	90	60 - 140	<8.0	ug/L	NC (1)	40		
3840656	cis-1,2-Dichloroethylene	2014/11/28	95	70 - 130	88	70 - 130	<0.50	ug/L	NC (1)	40		
3840656	cis-1,3-Dichloropropene	2014/11/28	98	70 - 130	92	70 - 130	<0.50	ug/L	NC (1)	40		
3840656	Dibromochloromethane	2014/11/28	97	70 - 130	89	70 - 130	<1.0	ug/L	NC (1)	40		
3840656	Ethylbenzene	2014/11/28	93	70 - 130	87	70 - 130	<1.0	ug/L	NC (1)	40		
3840656	Ethylene Dibromide	2014/11/28	100	70 - 130	91	70 - 130	<0.20	ug/L	NC (1)	40		
3840656	Methylene Chloride(Dichloromethane)	2014/11/28	101	70 - 130	95	70 - 130	<3.0	ug/L	NC (1)	40		
3840656	o-Xylene	2014/11/28	89	70 - 130	84	70 - 130	<1.0	ug/L	NC (1)	40		
3840656	p+m-Xylene	2014/11/28	96	70 - 130	90	70 - 130	<2.0	ug/L	NC (1)	40		
3840656	Styrene	2014/11/28	93	70 - 130	88	70 - 130	<1.0	ug/L	NC (1)	40		
3840656	Tetrachloroethylene	2014/11/28	94	70 - 130	86	70 - 130	<1.0	ug/L	NC (1)	40		
3840656	Toluene	2014/11/28	94	70 - 130	86	70 - 130	<1.0	ug/L	NC (1)	40		
3840656	trans-1,2-Dichloroethylene	2014/11/28	96	70 - 130	90	70 - 130	<0.50	ug/L	NC (1)	40		
3840656	trans-1,3-Dichloropropene	2014/11/28	104	70 - 130	99	70 - 130	<0.50	ug/L	NC (1)	40		
3840656	Trichloroethylene	2014/11/28	96	70 - 130	90	70 - 130	<1.0	ug/L	NC (1)	40		
3840656	Trichlorofluoromethane (FREON 11)	2014/11/28	98	60 - 140	91	60 - 140	<8.0	ug/L	NC (1)	40		
3840656	Vinyl Chloride	2014/11/28	92	60 - 140	90	60 - 140	<0.50	ug/L	NC (1)	40		
3840684	pH	2014/11/28							0.17 (1)	N/A	100	97 - 103
3840690	Conductivity	2014/11/28			101	80 - 120	1.3, RDL=1.0	uS/cm	0 (1)	25		
3840758	Nitrogen (Ammonia Nitrogen)	2014/12/01	NC	80 - 120	101	80 - 120	<0.050	mg/L	0.75 (1)	25		
3840794	1,1,1-Trichloroethane	2014/11/29	101	70 - 130	96	70 - 130	<1.0	ug/L	NC (1)	40		

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax: 709-754-8612 www.maxxamanalytics.com

QUALITY ASSURANCE REPORT(CONT'D)

Conestoga-Rovers and Associates Ltd
Client Project #: 084308-01
MONITORING & MAINTENANCE, COME BY
Site Location: CHANCE
Your P.O. #: 20-019531
Sampler Initials: AB

			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
3840794	1,1,2,2-Tetrachloroethane	2014/11/29	94	70 - 130	90	70 - 130	<0.50	ug/L	NC (1)	40		
3840794	1,1,2-Trichloroethane	2014/11/29	92	70 - 130	87	70 - 130	<1.0	ug/L	NC (1)	40		
3840794	1,1-Dichloroethane	2014/11/29	100	70 - 130	95	70 - 130	<2.0	ug/L	NC (1)	40		
3840794	1,1-Dichloroethylene	2014/11/29	110	70 - 130	106	70 - 130	<0.50	ug/L	NC (1)	40		
3840794	1,2-Dichlorobenzene	2014/11/29	93	70 - 130	89	70 - 130	<0.50	ug/L	1.7 (1)	40		
3840794	1,2-Dichloroethane	2014/11/29	101	70 - 130	96	70 - 130	<1.0	ug/L	NC (1)	40		
3840794	1,2-Dichloropropane	2014/11/29	93	70 - 130	89	70 - 130	<0.50	ug/L	NC (1)	40		
3840794	1,3-Dichlorobenzene	2014/11/29	92	70 - 130	88	70 - 130	<1.0	ug/L	NC (1)	40		
3840794	1,4-Dichlorobenzene	2014/11/29	92	70 - 130	88	70 - 130	<1.0	ug/L	NC (1)	40		
3840794	Benzene	2014/11/29	100	70 - 130	96	70 - 130	<1.0	ug/L	NC (1)	40		
3840794	Bromodichloromethane	2014/11/29	98	70 - 130	93	70 - 130	<1.0	ug/L	NC (1)	40		
3840794	Bromoform	2014/11/29	94	70 - 130	90	70 - 130	<1.0	ug/L	NC (1)	40		
3840794	Bromomethane	2014/11/29	97	60 - 140	96	60 - 140	<0.50	ug/L	NC (1)	40		
3840794	Carbon Tetrachloride	2014/11/29	101	70 - 130	96	70 - 130	<0.50	ug/L	NC (1)	40		
3840794	Chlorobenzene	2014/11/29	94	70 - 130	91	70 - 130	<1.0	ug/L	NC (1)	40		
3840794	Chloroethane	2014/11/29	101	60 - 140	96	60 - 140	<8.0	ug/L	NC (1)	40		
3840794	Chloroform	2014/11/29	108	70 - 130	103	70 - 130	<1.0	ug/L	NC (1)	40		
3840794	Chloromethane	2014/11/29	98	60 - 140	93	60 - 140	<8.0	ug/L	NC (1)	40		
3840794	cis-1,2-Dichloroethylene	2014/11/29	97	70 - 130	93	70 - 130	<0.50	ug/L	NC (1)	40		
3840794	cis-1,3-Dichloropropene	2014/11/29	85	70 - 130	80	70 - 130	<0.50	ug/L	NC (1)	40		
3840794	Dibromochloromethane	2014/11/29	96	70 - 130	91	70 - 130	<1.0	ug/L	NC (1)	40		
3840794	Ethylbenzene	2014/11/29	92	70 - 130	88	70 - 130	<1.0	ug/L	NC (1)	40		
3840794	Ethylene Dibromide	2014/11/29	98	70 - 130	94	70 - 130	<0.20	ug/L	NC (1)	40		
3840794	Methylene Chloride(Dichloromethane)	2014/11/29	104	70 - 130	100	70 - 130	<3.0	ug/L	NC (1)	40		
3840794	o-Xylene	2014/11/29	89	70 - 130	85	70 - 130	<1.0	ug/L	NC (1)	40		
3840794	p+m-Xylene	2014/11/29	94	70 - 130	91	70 - 130	<2.0	ug/L	NC (1)	40		
3840794	Styrene	2014/11/29	92	70 - 130	89	70 - 130	<1.0	ug/L	NC (1)	40		
3840794	Tetrachloroethylene	2014/11/29	93	70 - 130	89	70 - 130	<1.0	ug/L	NC (1)	40		
3840794	Toluene	2014/11/29	93	70 - 130	88	70 - 130	<1.0	ug/L	NC (1)	40		
3840794	trans-1,2-Dichloroethylene	2014/11/29	98	70 - 130	95	70 - 130	<0.50	ug/L	NC (1)	40		

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax: 709-754-8612 www.maxxamanalytics.com

Maxxam Job #: B4M4704
Report Date: 2014/12/05

QUALITY ASSURANCE REPORT(CONT'D)

Conestoga-Rovers and Associates Ltd
Client Project #: 084308-01
MONITORING & MAINTENANCE, COME BY
Site Location: CHANCE
Your P.O. #: 20-019531
Sampler Initials: AB

			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
3840794	trans-1,3-Dichloropropene	2014/11/29	87	70 - 130	83	70 - 130	<0.50	ug/L	NC (1)	40		
3840794	Trichloroethylene	2014/11/29	95	70 - 130	92	70 - 130	<1.0	ug/L	NC (1)	40		
3840794	Trichlorofluoromethane (FREON 11)	2014/11/29	101	60 - 140	96	60 - 140	<8.0	ug/L	NC (1)	40		
3840794	Vinyl Chloride	2014/11/29	97	60 - 140	93	60 - 140	<0.50	ug/L	NC (1)	40		
3841234	Phenols-4AAP	2014/11/28	99	80 - 120	96	80 - 120	<0.0010	mg/L	NC (1)	25		
3841272	Turbidity	2014/11/28					<0.10	NTU	7.1 (7)	25	103	80 - 120
3842152	Chromium (VI)	2014/12/01	91	80 - 120	94	80 - 120	<0.50	ug/L	NC (1)	20		
3842218	Sulphide	2014/11/29	83	80 - 120	104	80 - 120	<0.020	mg/L	NC (1)	20		
3842237	Chromium (VI)	2014/12/01	93	80 - 120	94	80 - 120	<0.50	ug/L	NC (1)	20		
3842647	Dissolved Aluminum (Al)	2014/12/01	104	80 - 120	105	80 - 120	<5.0	ug/L	NC (1)	20		
3842647	Dissolved Antimony (Sb)	2014/12/01	108	80 - 120	102	80 - 120	<1.0	ug/L	NC (1)	20		
3842647	Dissolved Arsenic (As)	2014/12/01	99	80 - 120	98	80 - 120	<1.0	ug/L	NC (1)	20		
3842647	Dissolved Barium (Ba)	2014/12/01	97	80 - 120	100	80 - 120	<1.0	ug/L	0.24 (1)	20		
3842647	Dissolved Beryllium (Be)	2014/12/01	100	80 - 120	101	80 - 120	<1.0	ug/L	NC (1)	20		
3842647	Dissolved Bismuth (Bi)	2014/12/01	99	80 - 120	103	80 - 120	<2.0	ug/L	NC (1)	20		
3842647	Dissolved Boron (B)	2014/12/01	100	80 - 120	103	80 - 120	<50	ug/L	NC (1)	20		
3842647	Dissolved Cadmium (Cd)	2014/12/01	102	80 - 120	101	80 - 120	<0.010	ug/L	NC (1)	20		
3842647	Dissolved Calcium (Ca)	2014/12/01	NC	80 - 120	93	80 - 120	<100	ug/L	0.66 (1)	20		
3842647	Dissolved Chromium (Cr)	2014/12/01	98	80 - 120	97	80 - 120	<1.0	ug/L	NC (1)	20		
3842647	Dissolved Cobalt (Co)	2014/12/01	97	80 - 120	97	80 - 120	<0.40	ug/L	0.56 (1)	20		
3842647	Dissolved Copper (Cu)	2014/12/01	96	80 - 120	97	80 - 120	<2.0	ug/L	NC (1)	20		
3842647	Dissolved Iron (Fe)	2014/12/01	NC	80 - 120	106	80 - 120	<50	ug/L	0.54 (1)	20		
3842647	Dissolved Lead (Pb)	2014/12/01	98	80 - 120	101	80 - 120	<0.50	ug/L	NC (1)	20		
3842647	Dissolved Magnesium (Mg)	2014/12/01	NC	80 - 120	110	80 - 120	<100	ug/L	0.30 (1)	20		
3842647	Dissolved Manganese (Mn)	2014/12/01	NC	80 - 120	101	80 - 120	<2.0	ug/L	0.78 (1)	20		
3842647	Dissolved Molybdenum (Mo)	2014/12/01	102	80 - 120	101	80 - 120	<2.0	ug/L	NC (1)	20		
3842647	Dissolved Nickel (Ni)	2014/12/01	98	80 - 120	98	80 - 120	<2.0	ug/L	NC (1)	20		
3842647	Dissolved Phosphorus (P)	2014/12/01	108	80 - 120	109	80 - 120	<100	ug/L	NC (1)	20		
3842647	Dissolved Potassium (K)	2014/12/01	NC	80 - 120	103	80 - 120	<100	ug/L	1.0 (1)	20		
3842647	Dissolved Selenium (Se)	2014/12/01	101	80 - 120	102	80 - 120	<1.0	ug/L	NC (1)	20		

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax: 709-754-8612 www.maxxamanalytics.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
3842647	Dissolved Silver (Ag)	2014/12/01	97	80 - 120	98	80 - 120	<0.10	ug/L	NC (1)	20		
3842647	Dissolved Sodium (Na)	2014/12/01	NC	80 - 120	106	80 - 120	<100	ug/L	0.73 (1)	20		
3842647	Dissolved Strontium (Sr)	2014/12/01	NC	80 - 120	99	80 - 120	<2.0	ug/L	1.2 (1)	20		
3842647	Dissolved Thallium (Tl)	2014/12/01	102	80 - 120	103	80 - 120	<0.10	ug/L	NC (1)	20		
3842647	Dissolved Tin (Sn)	2014/12/01	105	80 - 120	105	80 - 120	<2.0	ug/L	NC (1)	20		
3842647	Dissolved Titanium (Ti)	2014/12/01	104	80 - 120	108	80 - 120	<2.0	ug/L	NC (1)	20		
3842647	Dissolved Uranium (U)	2014/12/01	104	80 - 120	104	80 - 120	<0.10	ug/L	NC (1)	20		
3842647	Dissolved Vanadium (V)	2014/12/01	102	80 - 120	100	80 - 120	<2.0	ug/L	NC (1)	20		
3842647	Dissolved Zinc (Zn)	2014/12/01	100	80 - 120	100	80 - 120	<5.0	ug/L	NC (1)	20		
3842648	Dissolved Aluminum (Al)	2014/12/01	100	80 - 120	103	80 - 120	<5.0	ug/L	NC (1)	20		
3842648	Dissolved Antimony (Sb)	2014/12/01	107	80 - 120	105	80 - 120	<1.0	ug/L	NC (1)	20		
3842648	Dissolved Arsenic (As)	2014/12/01	99	80 - 120	98	80 - 120	<1.0	ug/L	0.46 (1)	20		
3842648	Dissolved Barium (Ba)	2014/12/01	NC	80 - 120	100	80 - 120	<1.0	ug/L	0.35 (1)	20		
3842648	Dissolved Beryllium (Be)	2014/12/01	94	80 - 120	97	80 - 120	<1.0	ug/L	NC (1)	20		
3842648	Dissolved Bismuth (Bi)	2014/12/01	98	80 - 120	104	80 - 120	<2.0	ug/L	NC (1)	20		
3842648	Dissolved Boron (B)	2014/12/01	92	80 - 120	98	80 - 120	<50	ug/L	NC (1)	20		
3842648	Dissolved Cadmium (Cd)	2014/12/01	100	80 - 120	100	80 - 120	<0.010	ug/L	NC (1)	20		
3842648	Dissolved Calcium (Ca)	2014/12/01	NC	80 - 120	93	80 - 120	<100	ug/L	0.23 (1)	20		
3842648	Dissolved Chromium (Cr)	2014/12/01	95	80 - 120	96	80 - 120	<1.0	ug/L	NC (1)	20		
3842648	Dissolved Cobalt (Co)	2014/12/01	94	80 - 120	97	80 - 120	<0.40	ug/L	NC (1)	20		
3842648	Dissolved Copper (Cu)	2014/12/01	93	80 - 120	95	80 - 120	<2.0	ug/L	NC (1)	20		
3842648	Dissolved Iron (Fe)	2014/12/01	NC	80 - 120	106	80 - 120	<50	ug/L	0.17 (1)	20		
3842648	Dissolved Lead (Pb)	2014/12/01	98	80 - 120	101	80 - 120	<0.50	ug/L	NC (1)	20		
3842648	Dissolved Magnesium (Mg)	2014/12/01	NC	80 - 120	107	80 - 120	<100	ug/L	0.28 (1)	20		
3842648	Dissolved Manganese (Mn)	2014/12/01	NC	80 - 120	100	80 - 120	<2.0	ug/L	1.2 (1)	20		
3842648	Dissolved Molybdenum (Mo)	2014/12/01	101	80 - 120	102	80 - 120	<2.0	ug/L	NC (1)	20		
3842648	Dissolved Nickel (Ni)	2014/12/01	94	80 - 120	96	80 - 120	<2.0	ug/L	NC (1)	20		
3842648	Dissolved Phosphorus (P)	2014/12/01	107	80 - 120	108	80 - 120	<100	ug/L	NC (1)	20		
3842648	Dissolved Potassium (K)	2014/12/01	101	80 - 120	102	80 - 120	<100	ug/L	0.49 (1)	20		
3842648	Dissolved Selenium (Se)	2014/12/01	100	80 - 120	100	80 - 120	<1.0	ug/L	NC (1)	20		

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax: 709-754-8612 www.maxxamanalytics.com

Maxxam Job #: B4M4704
Report Date: 2014/12/05

QUALITY ASSURANCE REPORT(CONT'D)

Conestoga-Rovers and Associates Ltd
Client Project #: 084308-01
MONITORING & MAINTENANCE, COME BY
Site Location: CHANCE
Your P.O. #: 20-019531
Sampler Initials: AB

			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
3842648	Dissolved Silver (Ag)	2014/12/01	67 (8)	80 - 120	100	80 - 120	<0.10	ug/L	NC (1)	20		
3842648	Dissolved Sodium (Na)	2014/12/01	NC	80 - 120	103	80 - 120	<100	ug/L	1.5 (1)	20		
3842648	Dissolved Strontium (Sr)	2014/12/01	NC	80 - 120	101	80 - 120	<2.0	ug/L	0.67 (1)	20		
3842648	Dissolved Thallium (Tl)	2014/12/01	101	80 - 120	103	80 - 120	<0.10	ug/L	NC (1)	20		
3842648	Dissolved Tin (Sn)	2014/12/01	107	80 - 120	103	80 - 120	<2.0	ug/L	NC (1)	20		
3842648	Dissolved Titanium (Ti)	2014/12/01	99	80 - 120	97	80 - 120	<2.0	ug/L	NC (1)	20		
3842648	Dissolved Uranium (U)	2014/12/01	103	80 - 120	104	80 - 120	<0.10	ug/L	0.34 (1)	20		
3842648	Dissolved Vanadium (V)	2014/12/01	97	80 - 120	99	80 - 120	<2.0	ug/L	NC (1)	20		
3842648	Dissolved Zinc (Zn)	2014/12/01	99	80 - 120	99	80 - 120	<5.0	ug/L	NC (1)	20		
3842885	Nitrogen (Ammonia Nitrogen)	2014/12/02	NC	80 - 120	99	80 - 120	<0.050	mg/L	0.19 (1)	25		
3842894	Total Mercury (Hg)	2014/12/01	93 (9)	80 - 120	95	80 - 120	<0.013	ug/L	NC (10)	20		
3842899	Total Organic Carbon (C)	2014/12/01	NC	80 - 120	103	80 - 120	<0.50	mg/L	0.035 (1)	20		
3843376	Strong Acid Dissoc. Cyanide (CN)	2014/12/01	95 (11)	80 - 120	72 (12)	80 - 120	<0.0010	mg/L	NC (13)	25		
3844210	Total Alkalinity (Total as CaCO3)	2014/12/05	NC (14)	80 - 120	111	80 - 120	<5.0	mg/L	NC (15)	25		
3844212	Dissolved Chloride (Cl)	2014/12/04	NC (14)	80 - 120	102	80 - 120	<1.0	mg/L	2.2 (15)	25	104	80 - 120
3844214	Dissolved Sulphate (SO4)	2014/12/05	NC (14)	80 - 120	95	80 - 120	<2.0	mg/L	3.9 (15)	25		
3844215	Reactive Silica (SiO2)	2014/12/02	NC (14)	80 - 120	101	80 - 120	<0.50	mg/L	0.47 (15)	25		
3844217	Colour	2014/12/04			111	80 - 120	<5.0	TCU	NC (15)	25		
3844218	Orthophosphate (P)	2014/12/04	91 (14)	80 - 120	96	80 - 120	<0.010	mg/L	NC (15)	25		
3844222	Nitrate + Nitrite	2014/12/04	101 (14)	80 - 120	99	80 - 120	<0.050	mg/L	0.032 (15)	25		
3844223	Nitrite (N)	2014/12/03	101 (14)	80 - 120	94	80 - 120	<0.010	mg/L	NC (15)	25		
3844235	1-Methylnaphthalene	2014/12/03	58	30 - 130	97	30 - 130	<0.050	ug/L				
3844235	2-Methylnaphthalene	2014/12/03	61	30 - 130	111	30 - 130	<0.050	ug/L				
3844235	Acenaphthene	2014/12/03	59	30 - 130	99	30 - 130	<0.010	ug/L				
3844235	Acenaphthylene	2014/12/03	70	30 - 130	123	30 - 130	<0.010	ug/L	NC (1)	40		
3844235	Anthracene	2014/12/03	59	30 - 130	116	30 - 130	<0.010	ug/L	NC (1)	40		
3844235	Benzo(a)anthracene	2014/12/03	66	30 - 130	111	30 - 130	<0.010	ug/L				
3844235	Benzo(a)pyrene	2014/12/03	64	30 - 130	98	30 - 130	<0.010	ug/L				
3844235	Benzo(b)fluoranthene	2014/12/03	63	30 - 130	93	30 - 130	<0.010	ug/L				
3844235	Benzo(g,h,i)perylene	2014/12/03	62	30 - 130	97	30 - 130	<0.010	ug/L				

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax: 709-754-8612 www.maxxamanalytics.com

Maxxam Job #: B4M4704
Report Date: 2014/12/05

QUALITY ASSURANCE REPORT(CONT'D)

Conestoga-Rovers and Associates Ltd
Client Project #: 084308-01
MONITORING & MAINTENANCE, COME BY
Site Location: CHANCE
Your P.O. #: 20-019531
Sampler Initials: AB

			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
3844235	Benzo(j)fluoranthene	2014/12/03	66	30 - 130	98	30 - 130	<0.010	ug/L				
3844235	Benzo(k)fluoranthene	2014/12/03	61	30 - 130	92	30 - 130	<0.010	ug/L				
3844235	Chrysene	2014/12/03	63	30 - 130	106	30 - 130	<0.010	ug/L				
3844235	Dibenz(a,h)anthracene	2014/12/03	48 (16)	30 - 130	90	30 - 130	<0.010	ug/L				
3844235	Fluoranthene	2014/12/03	68	30 - 130	110	30 - 130	<0.010	ug/L				
3844235	Fluorene	2014/12/03	73	30 - 130	118	30 - 130	<0.010	ug/L	NC (1)	40		
3844235	Indeno(1,2,3-cd)pyrene	2014/12/03	61	30 - 130	98	30 - 130	<0.010	ug/L				
3844235	Naphthalene	2014/12/03	56	30 - 130	89	30 - 130	<0.20	ug/L	NC (1)	40		
3844235	Perylene	2014/12/03	63	30 - 130	99	30 - 130	<0.010	ug/L				
3844235	Phenanthrene	2014/12/03	69	30 - 130	102	30 - 130	<0.010	ug/L	NC (1)	40		
3844235	Pyrene	2014/12/03	69	30 - 130	109	30 - 130	<0.010	ug/L	NC (1)	40		
3844297	Total Suspended Solids	2014/12/03					<1.0	mg/L	NC (1)	25	98	80 - 120
3844430	Total Organic Carbon (C)	2014/12/02	96	80 - 120	101	80 - 120	<0.50	mg/L	NC (1)	20		
3844431	Total Organic Carbon (C)	2014/12/02	101	80 - 120	101	80 - 120	<0.50	mg/L	NC (1)	20		
3845935	pH	2014/12/03							0.89 (17)	N/A	100	97 - 103
3845938	Conductivity	2014/12/03			100	80 - 120	1.3, RDL=1.0	uS/cm	0 (17)	25		
3845939	pH	2014/12/03							0.35 (1)	N/A	100	97 - 103
3845943	Conductivity	2014/12/03			102	80 - 120	1.5, RDL=1.0	uS/cm	0.11 (1)	25		
3848246	Turbidity	2014/12/04					<0.10	NTU	1.2 (1)	25	103	80 - 120
3848324	Strong Acid Dissoc. Cyanide (CN)	2014/12/05	99	80 - 120	91	80 - 120	<0.0010	mg/L	NC (1)	25		

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax: 709-754-8612 www.maxxamanalytics.com

Maxxam Job #: B4M4704
Report Date: 2014/12/05

QUALITY ASSURANCE REPORT(CONT'D)

Conestoga-Rovers and Associates Ltd
Client Project #: 084308-01
MONITORING & MAINTENANCE, COME BY
Site Location: CHANCE
Your P.O. #: 20-019531
Sampler Initials: AB

			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

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 spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

(1) Duplicate Parent ID

(2) PAH sample contained sediment.

(3) Matrix Spike Parent ID [YQ2838-01]

(4) Duplicate Parent ID [YQ2837-01]

(5) Matrix Spike Parent ID [YQ2837-02]

(6) Duplicate Parent ID [YQ2836-02]

(7) Duplicate Parent ID [YQ2836-07]

(8) Low recovery due to sample matrix. Result confirmed by repeat spiking and analysis.

(9) Matrix Spike Parent ID [YQ2838-10]

(10) Duplicate Parent ID [YQ2837-10]

(11) Matrix Spike Parent ID [YQ2836-12]

(12) Recovery on complex cyanide in blank spike outside acceptance limits, all simple cyanide Q.C. within acceptance limits.

(13) Duplicate Parent ID [YQ2836-12]

(14) Matrix Spike Parent ID [YQ2838-07]

(15) Duplicate Parent ID [YQ2838-07]

(16) Matrix Spike: < 10 % of compounds in multi-component analysis in violation.

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax: 709-754-8612 www.maxxamanalytics.com

Maxxam Job #: B4M4704
Report Date: 2014/12/05

QUALITY ASSURANCE REPORT(CONT'D)

Conestoga-Rovers and Associates Ltd
Client Project #: 084308-01
MONITORING & MAINTENANCE, COME BY
Site Location: CHANCE
Your P.O. #: 20-019531
Sampler Initials: AB

			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
(17) Duplicate Parent ID [YQ2844-03]												

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax: 709-754-8612 www.maxxamanalytics.com

Maxxam Job #: B4M4704
Report Date: 2014/12/05

Conestoga-Rovers and Associates Ltd
Client Project #: 084308-01
Site Location: MONITORING & MAINTENANCE, COME BY CHANCE
Your P.O. #: 20-019531
Sampler Initials: AB

VALIDATION SIGNATURE PAGE

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

Cristina Carriere, Scientific Services

Kevin MacDonald, Inorganics Supervisor

Mike MacGillivray, Scientific Specialist (Inorganics)

Rose MacDonald, Scientific Specialist (Organics)

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

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax: 709-754-8612 www.maxxamanalytics.com

Maxxam Analytics International Corporation

200 Bluewater Road, Suite 105, Bedford, Nova Scotia B4B 1G9 Tel: 902-4
49 Elizabeth Ave., St John's, NL A1A 1W9 Tel: 709-7
90 Esplanade Sydney, NS B1P 1A1 Tel: 902-5
www.maxxamanalytics.com E-mail: Clientservicesbedfo

B4M4704

MAXXAM Chain of Custody Record

COC #: B 128577 Page 1 of 2

This column for lab use only:
Client Code
Maxxam Job #: B4M4704

Cooler ID	Seal Present	Seal Intact	Temp 1	Temp 2	Temp 3	Average Temp
			8.5	8.6	8.5	

Integrity: YES (NO) | Integrity / Checklist by:
Labelled by | Location / Bin #: 1

INVOICE INFORMATION:
Company Name: Conestoga-Rovers & Assoc
Contact Name: Brian Cuffman
Address: 1118 Topsail Rd.
St. John's, NL Postal Code A1B 3N7
Email: bluffman@crawworld.com
Ph: (709) 364-5353 Fax: (709) 364-5368

RE
Company Name: SAME
Contact Name:
Address:
Postal Code
Email:
Ph: Fax:

PO #: To Follow
Project # / Phase #: 089528-01
Project Name / Site Location: Monitoring & Maintenance, Come By Chance
Quote: 14-166KG
Site #:
Task Order #:
Sampled by: Andrew Bryant, Geoff Murphy

TURNAROUND TIME
Standard ☒
10 day ☐
If RUSH Specify Date:
Pre-schedule rush work
Charge for # Jars used but not submitted: 0

Guideline Requirements / Detection Limits / Special Instructions
Please c.c. datam@crawworld.com

*Specify Matrix: Surface/Salt/Ground/Tapwater/Sewage/Effluent/Potable/NonPotable/Tissue/Soil/Sludge/Metal/Seawater

	Field Sample Identification	Matrix*	Date/Time Sampled	# & type of bottles	Field Filtered & Preserved	Lab Filtration Required	RCAP-30	RCAP-MS (Choose Total or Diss Metals)	Metals Water: Total Digest (Default Method) for well water, surface water	Metals Water: Dissolved for ground water	Metals Water: Mercury	Metals Soil: Metals & Mercury Default Available Digest Method	Metals Soil: Metals Total Digest - for Ocean sediments (HNO3/HF/HClO4)	Metals Soil: Mercury Low level by Cold Vapour AA	Metals Soil: Selenium (low level) Req'd for CCME Residential, Parklands, Agricultural	Metals Soil: Hot Water soluble Boron (required for CCME Agricultural)	Hydrocarbons: RBCA Hydrocarbons (BTEX, C6-C32)	Hydrocarbons: Soil (Potable), NS Fuel Oil Soil Policy Low Level BTEX, C6-C32	Hydrocarbons: NB Potable Water BTEX, VPH, Low level T.E.H.	Hydrocarbons: TPH Fractionation	Hydrocarbons: PAH's	Hydrocarbons: PAH's with Acridine, Quinoline	VOC / PCBs	CYANIDE / SULPHIDE	PHENOLS	TSS / BOD	Oil & Grease / Chromium III+VI
	1 PLCS	LEACHATE	NOV. 25/2014 2:45PM	23	Y(F) Yes	NO		T			X						X				X		X	X	X	X	X
	2 SLCS	LEACHATE	NOV. 25/2014 2:30PM	23	Y(F) Yes	NO		T			X						X				X		X	X	X	X	X
	3 DUP-08	LEACHATE	NOV. 25/2014 2:45PM	23	Y(F) Yes	NO		T			X						X				X		X	X	X	X	X
	4 MW93-1	GROUND	NOV 25/2014 10:00AM	14	(F+P) YES	NO		D									X				X		X				
	5 MW93-1A	GROUND	NOV 25/2014 10:05AM	14	(F+P) Yes	NO		D									X				X		X				
	6 MW10-1	GROUND	NOV 25/2014 11:00AM	14	(F+P) Yes	NO		D									X				X		X				
SHIPPED FROM	7 MW10-1A	GROUND	NOV 25/2014 11:05AM	14	(F+P) Yes	NO		D									X				X		X				
26-11-2014	8 MW93-2	GROUND	NOV 25/2014 12:00PM	14	(F+P) Yes	NO		D									X				X		X				
MAXXAM NL	9 MW93-2A	GROUND	NOV 25/2014 12:05PM	14	(F+P) Yes	NO		D									X				X		X				
	10 DUP-07	GROUND	NOV. 25/2014 11:00AM	14	(F+P) Yes	NO		D									X				X		X				

RELINQUISHED BY: (Signature/Print)	Date	Time	RECEIVED BY: (Signature/Print)	Date	Time
Andrew Bryant / Andrew Bryant	NOV. 26/2014	1:00PM	Michael Richards	2014/11/26	15:30
			TIFFANY MORASH		2014 NOV 27 13:53

White: Maxxam Yellow: Mail Pink: Client

ATL FCD 00149 / Revision 10

Maxxam Analytics International Corporation

200 Bluewater Road, Suite 105, Bedford, Nova Scotia B4B 1G9 — Tel: 902-420-0203 — Fax: 902-420-8612 — Toll Free: 1-800-565-7227
49 Elizabeth Ave., St John's, NL A1A 1W9 — Tel: 709-754-0203 — Fax: 709-754-8612 — Toll Free: 1-888-492-7227
90 Esplanade Sydney, NS B1P 1A1 — Tel: 902-567-1255 — Fax: 902-539-6504 — Toll Free: 1-888-535-7770
www.maxxamanalytics.com E-mail: Clientservicesbedford@maxxamanalytics.com

MAXXAM Chain of Custody Record

COC #: B 128575 Page 2 of 2

This column for lab use only:
Client Code:
Maxxam Job #: B4M4704

Cooler ID	Seal Present	Seal Intact	Temp 1	Temp 2	Temp 3	Average Temp
			85	86	83	

Integrity: YES NO
Integrity / Checklist by:
Labelled by:
Location / Bin #: 1

INVOICE INFORMATION:
Company Name: Conestoga-Rovers & Assoc.
Contact Name: Brian Luffman
Address: 1112 Topsail Rd.
St. John's, NL Postal Code A1B 3N7
Email: bluffman@crgworld.com
Ph: (709) 364-5353 Fax: (709) 364-5368

REPORT INFORMATION (if differs from invoice):
Company Name:
Contact Name:
Address: SAME
Postal Code
Email:
Ph: Fax:

PO #: TO FOLLOW
Project # / Phase #: 084308-01
Project Name / Site Location: Monitoring & Maintenance, Chance Cove By
Quote: 14-166KG
Site #:
Task Order #:
Sampled by: Andrew Bryant, Geoff Murphy

TURNAROUND TIME
Standard ☒
10 day ☐
If RUSH Specify Date:
Pre-schedule rush work
Charge for # Jars used but not submitted: 10

Guideline Requirements / Detection Limits / Special Instructions

*Specify Matrix: Surface/Salt/Ground/Tapwater/Sewage/Effluent/Potable/NonPotable/Tissue/Soil/Sludge/Metal/Seawater

	Field Sample Identification	Matrix*	Date/Time Sampled	# & type of bottles	Field Filtered & Preserved	Lab Filtration Required	RCAP-30 Choose Total or Diss Metals	RCAP-MS Choose Total or Diss Metals	Metals Water: Total Digest (Default Method) for well water, surface water	Metals Water: Dissolved for ground water	Metals Water: Mercury	Metals Soil: Metals & Mercury Default Available Digest Method	Metals Soil: Metals Total Digest - for Ocean sediments (HNO3/HF/HClO4)	Metals Soil: Mercury Low level by Cold Vapour AA	Metals Soil: Selenium (low level) Rec'd for CCME Residential, Parklands, Agricultural	Metals Soil: Hot Water soluble Boron (required for CCME Agricultural)	Hydrocarbons: RBCA Hydrocarbons (BTEX, C6-C32)	Hydrocarbons: Hydrocarbons Soil (Potable), NS Fuel Oil Soil Policy Low Level BTEX, C6-C32	Hydrocarbons: NB Potable Water BTEX, VPH, Low level T.E.H.	Hydrocarbons: TPH Fractionation	Hydrocarbons: PAH's	Hydrocarbons: PAH's with Acridine, Quinoline	VOCs	PCBs	Chromium
1	SURFACE UP	SURFACE	NOV.25/2014 12:45 PM	15	(P) Yes	No		X									X				X	X	X	X
2	SURFACE DOWN	SURFACE	NOV.25/2014 1:00 PM	15	(F) Yes	No		X									X				X	X	X	X
3																								
4																								
5																								
6	SHIPPED FROM																							
7	26-11-2014																							
8	MAXXAM NL																							
9																								
10																								

RELINQUISHED BY: (Signature/Print) Date Time
Andrew Bryant/Andrew Bryant NOV.26/2014 1:05PM

RECEIVED BY: (Signature/Print) Date Time
Michael Kozlowski 2014/11/26 15:30
TIFFANY MORASH 2014 NOV 27 13:53

White: Maxxam Yellow: Mail Pink: Client

ATL FCD 00149 / Revision 10

Success Through Science®

Your P.O. #: 20-019531
Your Project #: 084308-01
Site Location: MONITORING & MAINTENANCE, COME BY CHANCE
Your C.O.C. #: B128577

Attention:Brian Luffman

Conestoga-Rovers and Associates Ltd
Mount Pearl/St. John's
PO Box 8353 Stn A
1118 Topsail Rd
St. John's, NL
A1B 3N7

Report Date: 2015/01/16
Report #: R3304456
Version: 3 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B4M3741
Received: 2014/11/26, 15:30

Sample Matrix: Water
Samples Received: 12

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
TEH in Water (PIRI)	4	2014/11/27	2014/12/01	ATL SOP 00198	Atl. PIRI v3 m
TEH in Water (PIRI)	1	2014/11/27	2014/12/03	ATL SOP 00198	Atl. PIRI v3 m
TEH in Water (PIRI)	7	2014/12/02	2014/12/03	ATL SOP 00198	Atl. PIRI v3 m
VPH in Water (PIRI)	2	N/A	2014/11/27	ATL SOP 00200	Atl. PIRI v3 m
VPH in Water (PIRI)	3	N/A	2014/12/01	ATL SOP 00200	Atl. PIRI v3 m
VPH in Water (PIRI)	6	N/A	2014/12/03	ATL SOP 00200	Atl. PIRI v3 m
VPH in Water (PIRI)	1	N/A	2014/12/04	ATL SOP 00200	Atl. PIRI v3 m
ModTPH (T1) Calc. for Water	2	N/A	2014/12/01	N/A	Atl. PIRI v3 m
ModTPH (T1) Calc. for Water	3	N/A	2014/12/03	N/A	Atl. PIRI v3 m
ModTPH (T1) Calc. for Water	7	N/A	2014/12/04	N/A	Atl. PIRI v3 m

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Encryption Key

Robert Whelan
16 Jan 2015 10:32:04 -03:30

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Rob Whelan, Laboratory Manager
Email: RWhelan@maxxam.ca
Phone# (709)754-0203

==========

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

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax: 709-754-8612 www.maxxamanalytics.com

Maxxam Job #: B4M3741
Report Date: 2015/01/16

Conestoga-Rovers and Associates Ltd
Client Project #: 084308-01
Site Location: MONITORING & MAINTENANCE, COME BY CHANCE
Your P.O. #: 20-019531
Sampler Initials: ABG

RBCA HYDROCARBONS IN WATER (WATER)

Maxxam ID		YP7638	YP7655		YP7656	YP7656	YP7657		
Sampling Date		2014/11/25 02:45	2014/11/25 02:30		2014/11/25 02:45	2014/11/25 02:45	2014/11/25 10:00		
COC Number		B128577	B128577		B128577	B128577	B128577		
	Units	PLCS	SLCS	QC Batch	DUP-08	DUP-08 Lab-Dup	MW93-1	RDL	QC Batch
Petroleum Hydrocarbons									
Benzene	mg/L	<0.0010	<0.0010	3838934	<0.0010	<0.0010	<0.0010	0.0010	3842724
Toluene	mg/L	<0.0010	<0.0010	3838934	<0.0010	<0.0010	<0.0010	0.0010	3842724
Ethylbenzene	mg/L	<0.0010	<0.0010	3838934	<0.0010	<0.0010	<0.0010	0.0010	3842724
Total Xylenes	mg/L	<0.0020	<0.0020	3838934	<0.0020	<0.0020	<0.0020	0.0020	3842724
C6 - C10 (less BTEX)	mg/L	<0.010	<0.010	3838934	<0.010	<0.010	<0.010	0.010	3842724
>C10-C16 Hydrocarbons	mg/L	<0.050	<0.050	3839546	<0.050		<0.050	0.050	3839546
>C16-C21 Hydrocarbons	mg/L	<0.050	<0.050	3839546	<0.050		<0.050	0.050	3839546
>C21-<C32 Hydrocarbons	mg/L	<0.10	<0.10	3839546	<0.10		<0.10	0.10	3839546
Modified TPH (Tier1)	mg/L	<0.10	<0.10	3837198	<0.10		<0.10	0.10	3837198
Reached Baseline at C32	mg/L	Yes	Yes	3839546	Yes		Yes	N/A	3839546
Surrogate Recovery (%)									
Isobutylbenzene - Extractable	%	98	97	3839546	95		95		3839546
n-Dotriacontane - Extractable	%	95	97	3839546	92		92		3839546
Isobutylbenzene - Volatile	%	87	83	3838934	94	98	91		3842724

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax: 709-754-8612 www.maxxamanalytics.com

Maxxam Job #: B4M3741
Report Date: 2015/01/16

Conestoga-Rovers and Associates Ltd
Client Project #: 084308-01
Site Location: MONITORING & MAINTENANCE, COME BY CHANCE
Your P.O. #: 20-019531
Sampler Initials: ABG

RBCA HYDROCARBONS IN WATER (WATER)

Maxxam ID		YP7658		YP7659	YP7659	YP7660	YP7661		
Sampling Date		2014/11/25 10:05		2014/11/25 11:00	2014/11/25 11:00	2014/11/25 11:05	2014/11/25 12:00		
COC Number		B128577		B128577	B128577	B128577	B128577		
	Units	MW93-1A	QC Batch	MW10-1	MW10-1 Lab-Dup	MW10-1A	MW93-2	RDL	QC Batch
Petroleum Hydrocarbons									
Benzene	mg/L	<0.0010	3842724	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	3845896
Toluene	mg/L	<0.0010	3842724	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	3845896
Ethylbenzene	mg/L	<0.0010	3842724	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	3845896
Total Xylenes	mg/L	<0.0020	3842724	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	3845896
C6 - C10 (less BTEX)	mg/L	<0.010	3842724	<0.010	<0.010	<0.010	<0.010	0.010	3845896
>C10-C16 Hydrocarbons	mg/L	<0.050	3844587	<0.050		<0.050	<0.050	0.050	3844587
>C16-C21 Hydrocarbons	mg/L	<0.050	3844587	<0.050		<0.050	<0.050	0.050	3844587
>C21-<C32 Hydrocarbons	mg/L	<0.10	3844587	0.10		<0.10	<0.10	0.10	3844587
Modified TPH (Tier1)	mg/L	<0.10	3837198	0.10		<0.10	<0.10	0.10	3837198
Reached Baseline at C32	mg/L	Yes	3844587	Yes		Yes	Yes	N/A	3844587
Hydrocarbon Resemblance	mg/L			COMMENT (1)				N/A	3844587
Surrogate Recovery (%)									
Isobutylbenzene - Extractable	%	104	3844587	102		103	99		3844587
n-Dotriacontane - Extractable	%	106 (2)	3844587	100 (2)		101 (2)	96		3844587
Isobutylbenzene - Volatile	%	88	3842724	92	73	86	82		3845896

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable
(1) No resemblance to petroleum products in lube oil range.
(2) TEH sample contained sediment.

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax: 709-754-8612 www.maxxamanalytics.com

Maxxam Job #: B4M3741
Report Date: 2015/01/16

Conestoga-Rovers and Associates Ltd
Client Project #: 084308-01
Site Location: MONITORING & MAINTENANCE, COME BY CHANCE
Your P.O. #: 20-019531
Sampler Initials: ABG

RBCA HYDROCARBONS IN WATER (WATER)

Maxxam ID		YP7661	YP7662	YP7663	YP7664	YP7665		
Sampling Date		2014/11/25 12:00	2014/11/25 12:05	2014/11/25 11:00	2014/11/25 12:45	2014/11/25 01:00		
COC Number		B128577	B128577	B128577	B128577	B128577		
	Units	MW93-2 Lab-Dup	MW93-2A	DUP-07	SURFACE UP	SURFACE DOWN	RDL	QC Batch
Petroleum Hydrocarbons								
Benzene	mg/L		<0.0010	<0.0010	<0.0010	<0.0010	0.0010	3845896
Toluene	mg/L		<0.0010	<0.0010	<0.0010	<0.0010	0.0010	3845896
Ethylbenzene	mg/L		<0.0010	<0.0010	<0.0010	<0.0010	0.0010	3845896
Total Xylenes	mg/L		<0.0020	<0.0020	<0.0020	<0.0020	0.0020	3845896
C6 - C10 (less BTEX)	mg/L		<0.010	<0.010	<0.010	<0.010	0.010	3845896
>C10-C16 Hydrocarbons	mg/L	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	3844587
>C16-C21 Hydrocarbons	mg/L	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	3844587
>C21-<C32 Hydrocarbons	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	3844587
Modified TPH (Tier1)	mg/L		<0.10	<0.10	<0.10	<0.10	0.10	3837198
Reached Baseline at C32	mg/L	Yes	Yes	Yes	Yes	Yes	N/A	3844587
Surrogate Recovery (%)								
Isobutylbenzene - Extractable	%	101	104	100	101	104		3844587
n-Dotriacontane - Extractable	%	99	105	96 (1)	98	105		3844587
Isobutylbenzene - Volatile	%		82	90	83	87		3845896

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable
(1) TEH sample contained sediment.

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax: 709-754-8612 www.maxxamanalytics.com

Maxxam Job #: B4M3741
Report Date: 2015/01/16

Conestoga-Rovers and Associates Ltd
Client Project #: 084308-01
Site Location: MONITORING & MAINTENANCE, COME BY CHANCE
Your P.O. #: 20-019531
Sampler Initials: ABG

GENERAL COMMENTS

Results relate only to the items tested.

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax: 709-754-8612 www.maxxamanalytics.com

Maxxam Job #: B4M3741
Report Date: 2015/01/16

QUALITY ASSURANCE REPORT

Conestoga-Rovers and Associates Ltd
Client Project #: 084308-01
MONITORING & MAINTENANCE, COME BY
Site Location: CHANCE
Your P.O. #: 20-019531
Sampler Initials: ABG

			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits
3838934	Isobutylbenzene - Volatile	2014/11/28	81	70 - 130	86	70 - 130	100	%		
3839546	Isobutylbenzene - Extractable	2014/12/01	95	30 - 130	100	30 - 130	103	%		
3839546	n-Dotriacontane - Extractable	2014/12/01	97	30 - 130	102	30 - 130	102	%		
3842724	Isobutylbenzene - Volatile	2014/12/01	91 (2)	70 - 130	97	70 - 130	101	%		
3844587	Isobutylbenzene - Extractable	2014/12/03	105 (4)	30 - 130	102	30 - 130	102	%		
3844587	n-Dotriacontane - Extractable	2014/12/03	107 (4)	30 - 130	102	30 - 130	97	%		
3845896	Isobutylbenzene - Volatile	2014/12/03	79 (6)	70 - 130	92	70 - 130	100	%		
3838934	Benzene	2014/11/27	90	70 - 130	90	70 - 130	<0.0010	mg/L	NC (1)	40
3838934	C6 - C10 (less BTEX)	2014/11/27					<0.010	mg/L	NC (1)	40
3838934	Ethylbenzene	2014/11/27	80	70 - 130	85	70 - 130	<0.0010	mg/L	NC (1)	40
3838934	Toluene	2014/11/27	85	70 - 130	85	70 - 130	<0.0010	mg/L	NC (1)	40
3838934	Total Xylenes	2014/11/27	83	70 - 130	87	70 - 130	<0.0020	mg/L	NC (1)	40
3839546	>C10-C16 Hydrocarbons	2014/12/01	53	30 - 130	86	30 - 130	<0.050	mg/L	NC (1)	40
3839546	>C16-C21 Hydrocarbons	2014/12/01	57	30 - 130	100	30 - 130	<0.050	mg/L	NC (1)	40
3839546	>C21-<C32 Hydrocarbons	2014/12/01	49	30 - 130	89	30 - 130	<0.10	mg/L	NC (1)	40
3842724	Benzene	2014/12/01	85 (2)	70 - 130	90	70 - 130	<0.0010	mg/L	NC (3)	40
3842724	C6 - C10 (less BTEX)	2014/12/01					<0.010	mg/L	NC (3)	40
3842724	Ethylbenzene	2014/12/01	90 (2)	70 - 130	90	70 - 130	<0.0010	mg/L	NC (3)	40
3842724	Toluene	2014/12/01	85 (2)	70 - 130	90	70 - 130	<0.0010	mg/L	NC (3)	40
3842724	Total Xylenes	2014/12/01	87 (2)	70 - 130	92	70 - 130	<0.0020	mg/L	NC (3)	40
3844587	>C10-C16 Hydrocarbons	2014/12/03	100 (4)	30 - 130	105	30 - 130	<0.050	mg/L	NC (5)	40
3844587	>C16-C21 Hydrocarbons	2014/12/03	115 (4)	30 - 130	122	30 - 130	<0.050	mg/L	NC (5)	40
3844587	>C21-<C32 Hydrocarbons	2014/12/03	106 (4)	30 - 130	109	30 - 130	<0.10	mg/L	NC (5)	40
3845896	Benzene	2014/12/04	85 (6)	70 - 130	95	70 - 130	<0.0010	mg/L	NC (7)	40
3845896	C6 - C10 (less BTEX)	2014/12/04					<0.010	mg/L	NC (7)	40
3845896	Ethylbenzene	2014/12/04	85 (6)	70 - 130	90	70 - 130	<0.0010	mg/L	NC (7)	40
3845896	Toluene	2014/12/04	85 (6)	70 - 130	95	70 - 130	<0.0010	mg/L	NC (7)	40

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax: 709-754-8612 www.maxxamanalytics.com

Maxxam Job #: B4M3741
Report Date: 2015/01/16

QUALITY ASSURANCE REPORT(CONT'D)

Conestoga-Rovers and Associates Ltd
Client Project #: 084308-01
MONITORING & MAINTENANCE, COME BY
Site Location: CHANCE
Your P.O. #: 20-019531
Sampler Initials: ABG

			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits
3845896	Total Xylenes	2014/12/04	85 (6)	70 - 130	95	70 - 130	<0.0020	mg/L	NC (7)	40

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

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

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

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

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

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

(1) Duplicate Parent ID

(2) Matrix Spike Parent ID [YP7657-01]

(3) Duplicate Parent ID [YP7656-01]

(4) Matrix Spike Parent ID [YP7663-01]

(5) Duplicate Parent ID [YP7661-01]

(6) Matrix Spike Parent ID [YP7660-01]

(7) Duplicate Parent ID [YP7659-01]

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax: 709-754-8612 www.maxxamanalytics.com

Maxxam Job #: B4M3741
Report Date: 2015/01/16

Conestoga-Rovers and Associates Ltd
Client Project #: 084308-01
Site Location: MONITORING & MAINTENANCE, COME BY CHANCE
Your P.O. #: 20-019531
Sampler Initials: ABG

VALIDATION SIGNATURE PAGE

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

Paula Chaplin, Project Manager

Rob Whelan, Laboratory Manager

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

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax: 709-754-8612 www.maxxamanalytics.com

Maxxam Analytics International Corporation

200 Bluewater Road, Suite 105, Bedford, Nova Scotia B4B 1G9 — Tel: 902-420-0203 — Fax: 902-420-8612 — Toll Free: 1-800-565-7227
49 Elizabeth Ave., St John's, NL A1A 1W9 — Tel: 709-754-0203 — Fax: 709-754-8612 — Toll Free: 1-888-492-7227
90 Esplanade Sydney, NS B1P 1A1 — Tel: 902-567-1255 — Fax: 902-539-6504 — Toll Free: 1-888-535-7770
www.maxxamanalytics.com E-mail: Clientservicesbedford@maxxamanalytics.com

MAXXAM Chain of Custody Record

COC #: B 128577 Page 1 of 2

This column for lab use only:
Client Code: 6275
Maxxam Job #: B4M3741

Cooler ID	Seal Present	Seal Intact	Temp 1	Temp 2	Temp 3	Average Temp
			8.5	8.6	8.5	8.5

Integrity: YES (NO) — Integrity Checklist by: CW
Labelled by: CW — Location / Bin #:

INVOICE INFORMATION:
Company Name: Conestoga-Rovers & Assoc
Contact Name: Brian Luffman
Address: 1118 Topsail Rd, St.John's, NL Postal Code A1B 3N7
Email: bluffman@craworld.com
Ph: (709)364-5353 Fax: (709)364-5368

REPORT INFORMATION (if differs from invoice):
Company Name:
Contact Name:
Address: SAME Postal Code
Email:
Ph: Fax:

PO #: TO FOLLOW
Project # / Phase #: 089308-01
Project Name / Site Location: Monitoring & Maintenance, Come By Chance
Quote: J14-166KG
Site #:
Task Order #:
Sampled by: Andrew Bryant, Geoff Murphy

TURNAROUND TIME
Standard ☒
10 day ☐
If RUSH Specify Date:
Pre-schedule rush work
Charge for # Jars used but not submitted: 0

Guideline Requirements / Detection Limits / Special Instructions:
Please c.c. dafanl@craworld.com

*Specify Matrix: Surface/Salt/Ground/Tapwater/Sewage/Effluent/Potable/NonPotable/Tissue/Soil/Sludge/Metal/Seawater

	Field Sample Identification	Matrix*	Date/Time Sampled	# & type of bottles	Field Filtered & Preserved	Lab Filtration Required	RCAP-30 Choose Total or Diss Metals	RCAP-MS Choose (Total) or Diss Metals	Metals Water: Total Digest (Default Method) for well water, surface water	Metals Water: Dissolved for ground water	Metals Water: Mercury	Metals Soil: Metals & Mercury Default Available Digest Method	Metals Soil: Metals Total Digest - for Ocean sediments (HNO3/HF/HClO4)	Metals Soil: Mercury Low level (low level) Reg'd for CCME Residential, Parklands, Agricultural	Metals Soil: Selenium (low level) Reg'd for CCME Residential, Parklands, Agricultural	Metals Soil: Hot Water soluble Boron (required for CCME Agricultural)	Hydrocarbons: RBCA Hydrocarbons (BTEX, C6-C32)	Hydrocarbons: Soil (Potable), NS Fuel Oil Spill Policy Low Level BTEX, C6-C32	Hydrocarbons: NB Potable Water BTEX, VPH, Low level T.E.H.	Hydrocarbons: TPH Fractionation	Hydrocarbons: PAH's	Hydrocarbons: PAH's with Acridine, Quinoline	VOC / PCBs	CYANIDE / SULPHIDE	PHENOLS	TSS / BOD	Oil & Grease / Chromium III+VI
1	PLCS	LEACHATE	NOV.25/2014 2:45PM	23	(F/P) Yes	NO		T			X						X				X		X	X	X	X	X
2	SLCS	LEACHATE	NOV.25/2014 2:30PM	23	(F/P) Yes	NO		T			X						X				X		X	X	X	X	X
3	DUP-08	LEACHATE	NOV.25/2014 2:45PM	23	(F/P) Yes	NO		T			X						X				X		X	X	X	X	X
4	MW93-1	GROUND	NOV.25/2014 10:00AM	14	(F+P) YES	NO		D									X				X		X				
5	MW93-1A	GROUND	NOV.25/2014 10:05AM	14	(F+P) Yes	NO		D									X				X		X				
6	MW10-1	GROUND	NOV.25/2014 11:00AM	14	(F+P) Yes	NO		D									X				X		X				
7	MW10-1A	GROUND	NOV.25/2014 11:05AM	14	(F+P) Yes	NO		D									X				X		X				
8	MW93-2	GROUND	NOV.25/2014 12:00PM	14	(F+P) Yes	NO		D									X				X		X				
9	MW93-2A	GROUND	NOV.25/2014 12:05PM	14	(F+P) Yes	NO		D									X				X		X				
10	DUP-07	GROUND	NOV.25/2014 11:00AM	14	(F+P) Yes	NO		D									X				X		X				

RELINQUISHED BY: (Signature/Print)	Date	Time	RECEIVED BY: (Signature/Print)	Date	Time
Andrew Bryant / Andrew Bryant	NOV.26/2014	1:00PM	Michael Richard	2014/11/26	15:30

White: Maxxam Yellow: Mail Pink: Client ATL FCD 00149 / Revision 10

Maxxam Analytics International Corporation

200 Bluewater Road, Suite 105, Bedford, Nova Scotia B4B 1G9 Tel: 902-420-0203 Fax: 902-420-8612 Toll Free: 1-800-565-7227
49 Elizabeth Ave., St John's, NL A1A 1W9 Tel: 709-754-0203 Fax: 709-754-8612 Toll Free: 1-888-492-7227
90 Esplanade Sydney, NS B1P 1A1 Tel: 902-567-1255 Fax: 902-539-6504 Toll Free: 1-888-535-7770
www.maxxamanalytics.com E-mail: Clientservicesbedford@maxxamanalytics.com

MAXXAM Chain of Custody Record

COC #: B 128575 Page 2 of 2

This column for lab use only:
Client Code 16275
Maxxam Job # B4M3741

Cooler ID	Seal Present	Seal Intact	Temp 1	Temp 2	Temp 3	Average Temp
			8.5	8.6	8.5	8.5

Integrity: YES NO
Integrity / Checklist by:
Labelled by:
Location / Bin #:

INVOICE INFORMATION:
Company Name: Conestoga-Rovers & Assoc.
Contact Name: Brian Luffman
Address: 111B Topsail Rd.
St. John's, NL Postal Code A1B 3N7
Email: bluffman@crgworld.com
Ph: (709)364-5353 Fax: (709)364-5368

REPORT INFORMATION (if differs from invoice):
Company Name:
Contact Name:
Address: SAME
Postal Code
Email:
Ph: Fax:

PO # TO FOLLOW
Project # / Phase # 084308-01
Project Name / Site Location Monitoring & Maintenance, Cove By Chance
Quote 14-166KG
Site #
Task Order #
Sampled by Andrew Bryant, Geoff Murphy

TURNAROUND TIME
Standard ☒
10 day ☐
If RUSH Specify Date:
Pre-schedule rush work
Charge for # Jars used but not submitted 10

Guideline Requirements / Detection Limits / Special Instructions

*Specify Matrix: Surface/Salt/Ground/Tapwater/Sewage/Effluent/Potable/NonPotable/Tissue/Soil/Sludge/Metal/Seawater

	Field Sample Identification	Matrix*	Date/Time Sampled	# & type of bottles	Field Filtered & Preserved	Lab Filtration Required	RCAP-30 Choose Total or Diss Metals	RCAP-MS (Total) Choose Total or Diss Metals	Metals Water: Total Digest (Default Method) for well water, surface water	Metals Water: Dissolved for ground water	Metals Water: Mercury	Metals Soil: Metals & Mercury Default Available Digest Method	Metals Soil: Metals Total Digest - for Ocean sediments (HNO3/HF/HCLO4)	Metals Soil: Mercury Low level by Cold Vapour AA	Metals Soil: Selenium (low level) Req'd for CCME Residential, Parklands, Agricultural	Metals Soil: Hot Water soluble Boron (required for CCME Agricultural)	Hydrocarbons: RBCA Hydrocarbons (BTEX, C6-C32)	Hydrocarbons: Hydrocarbons Soil (Potable), NS Fuel Oil Spill Policy Low Level BTEX, C6-C32	Hydrocarbons: NB Potable Water BTEX, VPH, Low level T.E.H.	Hydrocarbons: TPH Fractionation	Hydrocarbons: PAH's	Hydrocarbons: PAH's with Acridine, Quinoline	VOCs	PCBs	Chromium
1	SURFACE UP	SURFACE	NOV.25/2014 12:45PM	15	(P) Yes	No		X									X				X	X	X	X
2	SURFACE DOWN	SURFACE	NOV.25/2014 1:00PM	15	(P) Yes	No		X									X				X	X	X	X
3																								
4																								
5																								
6																								
7																								
8																								
9																								
10																								

RELINQUISHED BY: (Signature/Print) Andrew Bryant/Andrew Bryant Date: NOV.26/2014 Time: 1:05PM

RECEIVED BY: (Signature/Print) Michael Richard Date: 2014/11/26 Time: 15:30

White: Maxxam Yellow : Mail Pink: Client

ATL FCD 00149 / Revision 10

APPENDIX C

PETROFORMA LETHALITY LABORATORY REPORTS

Registered to ISO 9001:2008
ISO/IEC 17025:2005 Accredited
SCC-Food Scope (No.268)
CALA-Environmental Scope (No.2709)

petroforma LABORATORIES

December 4, 2014
Project: 10938
Lab Refer No.: B-6143-09

Report No.: 05889

Conestoga-Rovers & Associates
1118 Topsail Road, Box 8353
St. John's, NL
A1N 3N7
Tel: (709) 364-5353
Fax: (709) 364-5368

Attention: Brian Luffman

Dear Mr. Luffman

Reference: Toxicology Testing Results

Please find enclosed the results of the 96-hour static bioassay conducted November 26 - 30, 2014. This toxicity test was performed on the PLCS sample. This effluent was collected on November 25, 2014. The sample was received in acceptable condition.

Test conditions for a multi concentration test were followed according to the Reference Method: For Determining Acute Lethality of Effluents to Rainbow Trout (Report EPS 1/RM/13 Second Edition, December 2000 and May 2007 amendment). All tests parameters were maintained within the recommended levels outlined in the above protocol.

The PLCS sample is not acutely lethal to the fish since less than 50.00 % of the fish died in the 100.00 % effluent during the 96 hour period. The SoftTox™ Program was used to calculate the LC50 value. The LC50 for the PLCS sample was determined to be greater than 100.00 %.

Please call if you have any questions regarding these results.

Sincerely,

petroforma Laboratories

L Cameron

Suzette Winter, B.Sc
Manager

Attachments:

A- Bench Data Sheet(s)

422 Logy Bay Road St. John's, NL A1A 5C6 Canada

December 4, 2014
Attention: Brian Luffman

Project: 10938
Report No.: 05889

Reference: Toxicology Testing Results

SAMPLE

Lab Refer.No.:	B-6143-09
Company:	Conestoga-Rovers & Associates
Sample Material:	PLCS
Sampling Method:	Grab
Sample Condition:	Received in acceptable condition
Collected:	November 25, 2014; 3:00 PM
Collected By:	A. Bryant

SAMPLE CHARACTERIZATION

Received (Date and Time):	November 26, 2014; 9:50 AM
Volume:	2 x 20 L
Temperature:	14.7 °C
Dissolved Oxygen:	4.6 mg/L
pH:	7.5 pH units
Conductivity:	326 µS/cm
Colour:	Clear, yellow
Odour:	None
Storage:	0 hrs @ 15.0 ± 1.0 °C

DILUTION WATER CHARACTERIZATION (MONTHLY AVERAGE)

Source:	St. John's Dechlorinated
Dissolved Oxygen:	9.9 ± 0.2 mg/L
Conductivity:	142 ± 10 µS/cm
Hardness:	25 ± 0 mg/L
pH:	6.8 ± 0.4 pH units
Date Revised:	December 2, 2014

TEST CONDITIONS

Started (Date and Time):	November 26, 2014; 12:15 PM
Ended (Date and Time):	November 30, 2014; 12:15 PM
Type of Test:	Static Acute 96 hour LC_{50}
Volume of Test Solutions:	20 Litres
Photoperiod:	16h ± 1h Light/08h ± 1h Dark
Light Intensity:	298 Lux
Aeration Rate:	6.5 ± 1.0 mL/min.L^{-1}
Preaeration Time:	60 mins
Test Temperature:	15 ± 1 °C
Duration:	96 hours

TEST ORGANISM

Species:	Rainbow Trout (*Oncorhynchus mykiss*)		
Source:	Rainbow Springs Hatchery		
Batch Number:	14-08		
Number per Tank:	10		
% Mortality:	0.00 % (7 days prior to testing)		
Mean Fork Length (cm):	3.2 ± 0.2	Range (cm):	2.9 – 3.3
Mean Total Weight (g):	0.3 ± 0.1	Range (g):	0.1 – 0.4
Loading Density (g/L):	0.1 g/L		

42 Logy Bay Road St. John's, NL A1A 5C8 Canada

December 4, 2014
Attention: Brian Luffman

Project: 10938
Report No.: 05889

Reference: Toxicology Testing Results

TEST RESULTS

Lab Refer No.:	B-6143-09
Sample Material:	PLCS
Collection Date:	November 25, 2014; 3:00 PM
Protocol:	EPS 1/RM/13
Test Type:	LC_{50}
LC_{50} value (static, acute):	>100.00 %
95% Confidence Intervals:	100% – Infinity

Effluent	Temp(°C)		D.O. (mg/L)		pH (units)		Cond.(µS/cm)		Mortality
Conc.(%)	Init.	Final	Init.	Final	Init.	Final	Init.	Final	(%)
100	14.7	14.8	9.6	10.0	7.5	7.9	326	557	0
50	14.4	14.7	8.8	9.5	7.5	7.8	297	413	0
25	14.4	14.6	8.8	9.9	7.3	7.8	193	286	0
12.5	14.4	14.8	8.9	10.0	7.1	7.5	166	217	0
6.25	14.4	14.9	8.9	10.0	7.0	7.5	154	183	0
0	14.3	14.8	9.8	10.0	7.2	7.0	142	146	0

COMMENTS:

- Arrival temperature of 16.8°C.
- The sample did not contain suspended particles.
- Samples have not been pH adjusted or filtered.
- The above analysis was conducted according to protocols indicated. The above results, which refer to the sample(s) tested only, are for your information and will be held in the strictest of confidence by this firm.
- Sample controls are considered a part of a sample test and as such are subject to the same treatment. (This includes, but is not limited to, aeration and temperature testing requirements.)

REFERENCE TOXICITY TEST DATA (LOG SCALE)

Test Organism:	*Oncorhynchus mykiss*
Toxicant:	Phenol
Fish Batch No.:	14-08
Reference Toxicant Date:	November 24 - 28, 2014
LC_{50} Value:	0.92 mg/L
95% Confidence Limits:	0.91 – 0.93 mg/L
Historic Mean ± 2 SD (Warning Limits):	0.97 ± 0.16 mg/L

Performed by: Amanda Woodrow/Jennifer Mews

Technical Reviewer: Amanda Woodrow/A Woodrow
(Print Name/Signature)

Senior Reviewer: Lana Cameron / L Cameron Date: Dec 16/14
(Print Name/Signature)

132 Logy Bay Road, St. John's, NL, A1A 3G5, Canada

Reference: Toxicology Testing Results

ATTACHMENT A

Bench Data Sheet (s)

422 Logy Bay Road, St. John's, NL, A1A 5C6, Canada

petroforma

petroforma Laboratories

Lab Form: B-0010
Date: February 14, 2014

LC50 Fish Bioassay Data Sheet

Customer: CRA
David McCoil/James O'Neill
1118 Topsail Road PO Box 8353
St. John's, NL
A1N 3N7
(709) 364-5353
(709) 364-5368

Sample ID # B-6143-09
Project # 121510938

Sample Material: PLCS
Test Period: 112614 (start)
113014 (finish)
Date Collected: 112514 Time Collected: 3:00
Date Rec'd: 112614 Time Rec'd: 9:50

Preaeration Time: 60min
Test Org - Batch #: 14-08
Source: RSH
Test Start Date: 112614
Test Start Time: 12:15

Clarity (I): clear
Colour (I): yellow
Odour (I): none
Susp. Part. (I): none
Other (I): Arrival temp @ 16.8°C Collected by AB.

Light Intensity: 298 lux
Int. Ammonia (ppm): /
Fin. Ammonia (ppm):

Time	Day	Monit By	HR.	Conc: 100% Mort #	TEMP (°C)	DO (mg/l)	pH	COND (µs/cm)	Conc: 50% Mort #	TEMP (°C)	DO (mg/l)	pH	COND (µs/cm)	Conc: 25% Mort #	TEMP (°C)	DO (mg/l)	pH	COND (µs/cm)
11:15	112614	AW	INT		14.7	4.6	7.5	326										
12:15	112614	AW	0	—	14.7	9.6	7.5	326	—	14.4	8.8	7.5	297	—	14.4	8.8	7.3	193
9:10	112714	AW	24	—	14.5	8.8	7.7	325	—	14.6	8.9	7.3	299	—	14.5	9.0	7.1	193
10:00	112814	AW	48	—	14.8	8.9	7.7	328	—	14.8	9.9	7.3	300	—	14.8	9.7	7.1	190
10:10	112914	AM	72	—	14.5	10.0	8.0	323	—	14.5	9.2	7.7	244	—	14.5	9.8	7.4	197
12:15	113014	AM	96	—	14.8	10.0	7.9	557	—	14.7	9.5	7.8	413	—	14.6	9.9	7.8	286

Fish Behaviour Comments
LC50 Value: >100%
95% Conf Inter: 100-00

All alive with NB

Pretreatment: Composite ☑ Dissolved Oxygen ☑ Temp ☑ Water Hardness ☐ Other ☐

Comments: EPS1 / RM / 13 Second Edition - December 2000

petroforma

petroforma Laboratories

Lab Form: B-0010
Date: February 14, 2014

LC50 Fish Bioassay Data Sheet

Customer: CRA
David McCoil/James O'Neill
1118 Topsail Road PO Box 8353
St. John's, NL
A1N 3N7
(709) 364-5353
(709) 364-5368

Sample ID # B-6143-09
Project # 121510938

Sample Material:	PLCS	Control/Dil Water:	Declorinated Water
Test Period:	112614 (start)	Aeration Rate:	6.5 ± mL/min. L-1
	113014 (finish)	Test Finish Date:	113014
Volume:	2x20 L	Test Finish Time:	12:15
Duration:	96 h	Static:	pH Ambient:

Clarity (F):
Colour (F):
Odour (F): Same as initial
Susp. Part. (F):
Other (F):

Light Intensity: 298 lux
Storage: Temp in 15°C WB.

	Conc: 12.5 ·1.	Conc: 6.25 ·1.	Conc: Control 0·1.

Time	Day	Monit By	HR.	Mort #	TEMP (°C)	DO (mg/l)	pH	COND (µS/cm)	Mort #	TEMP (°C)	DO (mg/l)	pH	COND (µS/cm)	Mort #	TEMP (C)	DO (mg/l)	pH	COND (µS/cm)
12:15	112614	AW	0	—	14.4	8.9	7.1	166	—	14.4	8.9	7.0	154	—	14.3	9.8	7.2	142
9:10	112714	AW	24	—	14.5	8.9	7.1	166	—	14.5	8.9	7.1	156	—	14.4	9.3	7.2	142
10:00	112814	AW	48	—	14.8	9.9	7.2	168	—	14.8	9.9	7.2	156	—	14.9	9.9	7.2	142
11:00	112914	QM	72	—	14.5	10.0	7.2	170	—	14.6	9.9	7.0	159	—	14.5	9.9	7.2	146
12:15	113014	QM	96	—	14.8	10.0	7.5	217	—	14.9	10.0	7.5	183	—	14.8	10.0	7.0	146

Fish Behaviour Comments

All alive w/ NB

Fish Measurements | Loading Density (g/l): 0.14

Fork Length (cm.): 3.3, 3.0, 3.1, 2.9, 3.0, 3.3, 3.2, 3.1, 3.3, 3.3 Mean: 3.15 +/- 0.15

Wet Weight (g): 0.3, 0.2, 0.2, 0.1, 0.3, 0.3, 0.3, 0.3, 0.3, 0.4 Mean: 0.27 +/- 0.08

SoftTox™ Bioassay Calculator

Test Date: 112614-113014 Analyst: AW/JM

B-6143-09 **Control Group** CRA

Number exposed: 10 Number dead: 0 Mortality: 0 %

Group Number	Concentration	Number Exposed	Number Dead	Percent Mortality
1	100.00	10	0	0 %
2	50.00	10	0	0 %
3	25.00	10	0	0 %
4	12.50	10	0	0 %
5	6.25	10	0	0 %

L.C. 50 Result: ~~0.00~~ >100.1.

Upper 95% Confidence Limit: Infinity
Lower 95% Confidence Limit: 100.00

Calculated with *Binomial Probability*

Registered to ISO 9001:2008
ISO/IEC 17025:2005 Accredited
SCC-Food Scope (No.268)
CALA-Environmental Scope (No.2709)

petroforma LABORATORIES

December 4, 2014
Project: 10938
Lab Refer No.: B-6144-09

Report No.: 05888

Conestoga-Rovers & Associates
1118 Topsail Road, Box 8353
St. John's, NL
A1N 3N7
Tel: (709) 364-5353
Fax: (709) 364-5368

Attention: Brian Luffman

Dear Mr. Luffman

Reference: Toxicology Testing Results

Please find enclosed the results of the 96-hour static bioassay conducted November 26 - 30, 2014. This toxicity test was performed on the SLCS sample. This effluent was collected on November 25, 2014. The sample was received in acceptable condition.

Test conditions for a multi concentration test were followed according to the Reference Method: For Determining Acute Lethality of Effluents to Rainbow Trout (Report EPS 1/RM/13 Second Edition, December 2000 and May 2007 amendment). All tests parameters were maintained within the recommended levels outlined in the above protocol.

The SLCS sample is not acutely lethal to the fish since less than 50.00 % of the fish died in the 100.00 % effluent during the 96 hour period. The SoftTox™ Program was used to calculate the LC50 value. The LC50 for the SLCS sample was determined to be greater than 100.00 %.

Please call if you have any questions regarding these results.

Sincerely,

petroforma Laboratories

L Cameron

Suzette Winter, B.Sc
Manager

Attachments:

A- Bench Data Sheet(s)

422 Logy Bay Road St. John's, NL A1A 5C6 Canada

December 4, 2014
Attention: Brian Luffman

Project: 10938
Report No.: 05888

Reference: Toxicology Testing Results

SAMPLE

Lab Refer.No.:	B-6144-09
Company:	Conestoga-Rovers & Associates
Sample Material:	SLCS
Sampling Method:	Grab
Sample Condition:	Received in acceptable condition
Collected:	November 25, 2014; 3:00 PM
Collected By:	A. Bryant

SAMPLE CHARACTERIZATION

Received (Date and Time):	November 26, 2014; 9:50 AM
Volume:	2 x 20 L
Temperature:	14.8 °C
Dissolved Oxygen:	10.3 mg/L
pH:	8.1 pH units
Conductivity:	638 µS/cm
Colour:	Clear, light yellow
Odour:	None
Storage:	0 hrs @ 15.0 ± 1.0 °C

DILUTION WATER CHARACTERIZATION (MONTHLY AVERAGE)

Source:	St. John's Dechlorinated
Dissolved Oxygen:	9.9 ± 0.2 mg/L
Conductivity:	142 ± 10 µS/cm
Hardness:	25 ± 0 mg/L
pH:	6.8 ± 0.4 pH units
Date Revised:	December 2, 2014

TEST CONDITIONS

Started (Date and Time):	November 26, 2014; 11:50 AM
Ended (Date and Time):	November 30, 2014; 11:50 AM
Type of Test:	Static Acute 96 hour LC_{50}
Volume of Test Solutions:	20 Litres
Photoperiod:	16h ± 1h Light/08h ± 1h Dark
Light Intensity:	386 Lux
Aeration Rate:	6.5 ± 1.0 mL/min.L^{-1}
Preaeration Time:	30 mins
Test Temperature:	15 ± 1 °C
Duration:	96 hours

TEST ORGANISM

Species:	Rainbow Trout (*Oncorhynchus mykiss*)		
Source:	Rainbow Springs Hatchery		
Batch Number:	14-08		
Number per Tank:	10		
% Mortality:	0.00 % (7 days prior to testing)		
Mean Fork Length (cm):	3.1 ± 0.1	Range (cm):	2.9 – 3.3
Mean Total Weight (g):	0.3 ± 0.1	Range (g):	0.2 – 0.4
Loading Density (g/L):	0.1 g/L		

42 Logy Bay Road - St. John's NL - A1A 5G6 - Canada

December 4, 2014
Attention: Brian Luffman

Project: 10938
Report No.: 05888

Reference: Toxicology Testing Results

TEST RESULTS

Lab Refer No.:	B-6144-09
Sample Material:	SLCS
Collection Date:	November 25, 2014; 3:00 PM
Protocol:	EPS 1/RM/13
Test Type:	LC_{50}
LC_{50} value (static, acute):	>100.00 %
95% Confidence Intervals:	100% – Infinity

Effluent	Temp(°C)		D.O. (mg/L)		pH (units)		Cond.(µS/cm)		Mortality
Conc.(%)	Init.	Final	Init.	Final	Init.	Final	Init.	Final	(%)
100	14.8	14.5	9.6	10.0	8.1	8.0	638	334	0
50	14.4	14.5	9.9	10.0	7.8	8.0	404	245	0
25	14.4	14.5	9.9	9.8	7.8	8.0	280	198	0
12.5	14.4	14.5	9.9	10.0	7.2	7.7	212	171	0
6.25	14.4	14.5	9.9	9.2	7.2	7.5	175	160	0
0	14.3	14.5	9.8	10.0	7.2	7.0	142	147	0

COMMENTS:

- Arrival temperature of 16.8°C.
- The sample contained a few small brown suspended particles.
- Samples have not been pH adjusted or filtered.
- The above analysis was conducted according to protocols indicated. The above results, which refer to the sample(s) tested only, are for your information and will be held in the strictest of confidence by this firm.
- Sample controls are considered a part of a sample test and as such are subject to the same treatment. (This includes, but is not limited to, aeration and temperature testing requirements.)

REFERENCE TOXICITY TEST DATA (LOG SCALE)

Test Organism:	*Oncorhynchus mykiss*
Toxicant:	Phenol
Fish Batch No.:	14-08
Reference Toxicant Date:	November 24 - 28, 2014
LC_{50} Value:	0.92 mg/L
95% Confidence Limits:	0.91 – 0.93 mg/L
Historic Mean ± 2 SD (Warning Limits):	0.97 ± 0.16 mg/L

Performed by: Amanda Woodrow/Jennifer Mews

Technical Reviewer: Amanda Woodrow / A Woodrow
(Print Name/Signature)

Senior Reviewer: Lana Cameron / L Cameron Date: Dec 10/14
(Print Name/Signature)

422 Logy Bay Road St. John's, NL A1A 5C6 Canada

December 4, 2014
Attention: Brian Luffman

Project: 10938
Report No.: 05888

Reference: Toxicology Testing Results

ATTACHMENT A

Bench Data Sheet (s)

422 Logy Bay Road - St. John's, NL - A1A 5C6 - Canada

petroforma

petroforma Laboratories

Lab Form: B-0010
Date: February 14, 2014

LC50 Fish Bioassay Data Sheet

Customer: CRA
David McCoil/James O'Neill
1118 Topsail Road PO Box 8353
St. John's, NL
A1N 3N7
(709) 364-5353
(709) 364-5368

Sample ID # B-6144-09
Project # 121510938

Sample Material: SLCS
Test Period: 112614 (start)
113014 (finish)
Date Collected: 112514 Time Collected: 3.00
Date Rec'd: 112614 Time Rec'd: 9.50

Preaeration Time: 30
Test Org - Batch #: 14-08
Source: RSH
Test Start Date: 112614
Test Start Time: 11:50

Clarity (I): clear
Colour (I): light yellow
Odour (I): none
Susp. Part. (I): few small brown
Other (I): Arrival temp @ 16.8°C

Collected by AB.

Light Intensity: 386 lux
Int. Ammonia (ppm):
Fin. Ammonia (ppm): /

	Conc: 100 %	Conc: 50 %	Conc: 25 %

Time	Day	Monit By	HR.	Mort #	TEMP (°C)	DO (mg/l)	pH	COND (µs/cm)	Mort #	TEMP (°C)	DO (mg/l)	pH	COND (µs/cm)	Mort #	TEMP (°C)	DO (mg/l)	pH	COND (µs/cm)
11:20	112614	AW	INT		14.8	10.3	8.1	638										
11:50	112614	AW	0	—	14.8	9.6	8.1	638	—	14.4	9.9	7.8	404	—	14.4	9.9	7.8	280
9:00	112714	AW	24	—	14.5	9.9	8.2	630	—	14.5	9.8	7.8	406	—	14.5	9.8	7.7	280
9:30	112814	AW	48	—	14.6	9.9	8.1	630	—	14.6	10.0	7.8	405	—	14.5	9.9	7.7	280
11:00	112914	gm	72	—	14.7	10.0	8.1	566	—	14.6	10.0	7.9	411	—	14.5	9.2	7.8	285
11:50	113014	gm	96	—	14.5	10.0	8.0	334	—	14.5	10.0	8.0	245	—	14.5	9.8	8.0	198

Fish Behaviour Comments
LC50 Value: >100%
95% Conf Inter: 100 - ∞

All alive w/ NB

Pretreatment: Composite ☑ Dissolved Oxygen ☑ Temp ☑ Water Hardness ☐ Other ☐

Comments: EPS1 / RM / 13 Second Edition - December 2000

petroforma LABORATORIES

petroforma Laboratories

Lab Form: B-0010
Date: February 14, 2014

LC50 Fish Bioassay Data Sheet

Customer: CRA
David McCoil/James O'Neill
1118 Topsail Road PO Box 8353
St. John's, NL
A1N 3N7
(709) 364-5353
(709) 364-5368

Sample ID # B-6144-09
Project # 121510938

Sample Material: SLCS
Test Period: 112614 (start)
113014 (finish)
Volume: 2x20 L
Duration: 96 h

Control/Dil Water: Declorinated Water
Aeration Rate: 6.5 ± mL/min. L-1
Test Finish Date: 112614
Test Finish Time: 11:50
Static: pH Ambient:

Clarity (F):
Colour (F):
Odour (F): Same as initial
Susp. Part. (F):
Other (F):

Light Intensity: 386 lux
Storage: Tempered @ 15°C NB.

	Conc: 12.5 · 1.					Conc: 6.25 · 1.					Conc: Control 0 · 1.				
Time	Day	Monit By	HR.	Mort #	TEMP (°C)	DO (mg/l)	pH	COND (µS/cm)	Mort #	TEMP (°C)	DO (mg/l)	pH	COND (µS/cm)	Mort #	TEMP (C)	DO (mg/l)	pH	COND (µS/cm)
11:50	112614	AW	0	—	14.4	9.9	7.2	212	—	14.4	9.9	7.2	175	—	14.3	9.8	7.2	142
9:00	112714	AW	24	—	MS	9.8	7.2	233	—	14.5	9.7	7.2	176	—	14.5	9.7	7.2	142
9:30	112814	AW	48	—	14.6	10.0	7.4	230	—	MS	9.9	7.2	175	—	MS	9.9	7.2	142
11:00	112914	QM	72	—	14.7	10.0	7.5	217	—	14.7	8.9	7.2	182	—	14.6	9.9	7.2	146
11:50	113014	QM	96	—	14.5	10.0	7.7	171	—	14.5	9.2	7.5	160	—	14.5	10.0	7.0	147

Fish Behaviour Comments

All alive wl NB

Fish Measurements | Loading Density (g/l): 0.14

Fork Length (cm.): 3.0, 3.1, 3.3, 3.3, 3.2, 3.2, 3.3, 3.1, 3.0, 2.9 Mean: 3.14 +/- 0.14

Wet Weight (g): 0.2, 0.3, 0.3, 0.4, 0.3, 0.2, 0.3, 0.3, 0.2, 0.2 Mean: 0.27 +/- 0.07

SoftTox™ Bioassay Calculator

Test Date: 112614-113014 Analyst: JM/AW

CRA **Control Group** B-6144-09

Number exposed: 10 Number dead: 0 Mortality: 0 %

Group Number	Concentration	Number Exposed	Number Dead	Percent Mortality
1	100.00	10	0	0 %
2	50.00	10	0	0 %
3	25.00	10	0	0 %
4	12.50	10	0	0 %
5	6.25	10	0	0 %

L.C. 50 Result: ~~0.00~~ >100-1

Upper 95% Confidence Limit: Infinity
Lower 95% Confidence Limit: 100.00

Calculated with *Binomial Probability*

APPENDIX D

PREVIOUS MONITORING DATA

TABLE D1

HISTORICAL STATIC GROUNDWATER LEVELS
2013/14 MONITORING AND MAINTENANCE PROGRAM
COME BY CHANCE SECURE LANDFILL
COME BY CHANCE, NL

Location	Ground Surface Elevation	Length of Stick-up	TOC Elevation	Groundwater Depth (mbToC)																
				Mar	Jul	Sep	Oct	Jun	Jul	Oct	Dec	Oct	Sep	Mar	Jul	Dec	Sep	Dec	Aug	Nov
	(masl)	(m)	(masl)	2004				2006				2007	2008	2009	2010		2011	2012	2013	2014
PLCS	15.960	--	15.960	--	--	--	--	--	--	--	--	--	--		0.55	0.73	0.59	0.89	0.55	0.403
SLCS	15.955	--	15.955	--	--	--	--	--	--	--	--	--	--	--	0.52	0.713	0.55	0.892	0.549	0.404
MW 93-1	16.300	1.100	17.400	--	--	--	--	--	--	--	--	--	--	1.975	1.703	1.915	1.921	1.780	1.756	1.616
MW 93-1A	16.310	1.400	17.710	0.39	1.88	0.41	0.16	2.06	1.68	2.11	1.84	1.67	2.17	2.50	1.638	1.636	2.204	1.669	1.815	1.688
MW 93-2	14.290	1.100	15.390	0.67	0.56	0.58	0.28	1.85	2.16	2.13	--	1.72	2.18	2.20	2.084	2.147	--	2.111	2.323	2.035
MW 93-2A	14.310	1.100	15.410	--	--	--	--	--	--	--	--	--	--	1.84	1.456	1.375	--	1.234	1.663	1.181
MW 93-3*	--	--	--	--	--	--	--	--	--	--	--	--	--	1.335	--	--	--	--	--	--
MW 93-3A*	--	--	--	2.37	Dry	--	1.20	Dry	3.21	3.37	--	3.32	Dry	3.52	--	--	--	--	--	--
MW 10-1	15.790	0.846	16.636	--	--	--	--	--	--	--	--	--	--	--	3.015	3.254	3.551	3.188	3.427	2.999
MW 10-1A	15.890	0.854	16.744	--	--	--	--	--	--	--	--	--	--	--	3.084	3.279	3.662	3.234	3.513	3.047

Location	Ground Surface Elevation	Length of Stick-up	TOC Elevation	Groundwater Elevation (masl)																
				Mar	Jul	Sep	Oct	Jun	Jul	Oct	Dec	Oct	Sep	Mar	Jul	Dec	Sep	Dec	Aug	Nov
	(masl)	(m)	(masl)	2004				2006				2007	2008	2009	2010		2011	2012	2013	2014
PLCS	15.960	--	15.960	--	--	--	--	--	--	--	--	--	--		15.410	15.230	15.370	15.070	15.410	15.557
SLCS	15.955	--	15.955	--	--	--	--	--	--	--	--	--	--	--	15.435	15.242	15.405	15.063	15.406	15.551
MW 93-1	16.300	1.100	17.400	--	--	--	--	--	--	--	--	--	--	15.425	15.697	15.485	15.479	15.620	15.644	15.784
MW 93-1A	16.310	1.400	17.710	17.320	15.830	17.300	17.550	15.650	16.030	15.600	15.870	16.040	15.540	15.210	16.072	16.074	15.506	16.041	15.895	16.022
MW 93-2	14.290	1.100	15.390	14.720	14.830	14.810	15.110	13.540	13.230	13.260	--	13.670	13.210	13.190	13.306	13.243	--	13.279	13.067	13.355
MW 93-2A	14.310	1.100	15.410	--	--	--	--	--	--	--	--	--	--	13.570	13.954	14.035	--	14.176	13.747	14.229
MW 93-3*	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW 93-3A*	--	--	15.900	13.530	Dry	--	14.700	Dry	12.690	12.530	--	12.580	Dry	12.380	--	--	--	--	--	--
MW 10-1	15.790	0.846	16.636	--	--	--	--	--	--	--	--	--	--	--	13.621	13.382	13.085	13.448	13.209	13.637
MW 10-1A	15.890	0.854	16.744	--	--	--	--	--	--	--	--	--	--	--	13.660	13.465	13.082	13.510	13.231	13.697

Notes:

PLCS = Primary Leachate Collection System Valve Chamber
SLCS = Secondary Leachate Collection System Valve Chamber
MW = Monitor Well

m = Metres
TOC = Top of Casing

masl = Metres Above Sea Level
mbTOC = Metres Below Top of Casing

* = Monitor Well Decommissioned in July 2010

TABLE D2

HISTORICAL GROUNDWATER ANALYTICAL DATA - BTEX/mTPH
2013/14 MONITORING AND MAINTENANCE PROGRAM
COME BY CHANCE SECURE LANDFILL
COME BY CHANCE, NL

Sample Location	Date Sampled	Benzene	Toluene	Ethyl-benzene	Xylenes	Total Petroleum Hydrocarbons (TPH)					Comments
						F1 C_6-C_{10}	F2 C_{10}-C_{16}	F3 C_{16}-C_{21}	F3 C_{21}-C_{32}	Modified TPH	
MW 93-1	Aug 19, 2009	<	<	<	<	<	<	<		<	-
	Aug 19, 2009[1]	<	<	<	<	<	<	<		<	-
	Jul 16, 2010	<	<	<	<	<	<	<		<	-
	Dec 13, 2010	<	<	<	<	<	<	<		<	-
	Sep 02, 2011	<	<	<	<	<	<	<		<	-
	Aug 30, 2012	<(0.0013)	<(0.0013)	<(0.0013)	<(0.0026)	<(0.013)	<	<		<	-
	Aug 28, 2013	<	<	<	<	<	<	<		<	-
	Nov 25, 2014	<	<	<	<	<	<	<		<	-
MW 93-1A	2008 (AMEC)	<(0.2)	<(0.2)	<(0.2)	<(0.6)	<(0.05)[2]	<(0.05)[2]	<(0.05)[2]		<(0.15)[2]	-
	Aug 19, 2009	<	<	<	<	<	<	<		<	-
	Jul 16, 2010	<	<	<	<	<	<	<		<	-
	Dec 13, 2010	<	<	<	<	<	<	<		<	-
	Sep 02, 2011	<	<	<	<	<	<	<		<	-
	Aug 30, 2012	<(0.0013)	<(0.0013)	<(0.0013)	<(0.0026)	<(0.013)	<	<		<	-
DUP-03	Aug 30, 2012	<	<	<	<	<	<	<		<	-
	Aug 28, 2013	<	<	<	<	<	<	<		<	-
	Nov 25, 2014	<	<	<	<	<	<	<		<	-
MW 93-2	2008 (AMEC)	<(0.2)	<(0.2)	<(0.2)	<(0.6)	<(0.05)[2]	<(0.05)[2]	<(0.05)[2]		<(0.15)[2]	-
	Aug 19, 2009	<	<	<	<	<	<	<		<	-
	Jul 16, 2010	<	<	<	<	<	<	<		<	-
	Jul 16, 2010[3]	-	-	-	-	-	<	<		-	-
	Dec 13, 2010	<	<	<	<	<	<	<		<	-
	Dec 13, 2010[3]	-	-	-	-	-	<	<		-	-
	Sep 02, 2011	<	<	<	<	<	<	<		<	-
	Aug 30, 2012	<(0.0013)	<(0.0013)	<(0.0013)	<(0.0026)	<(0.013)	<	<		<	-
	Aug 28, 2013	<	<	<	<	<	<	<		<	-
	Nov 25, 2014	<	<	<	<	<	<	<		<	-
MW 93-2A	Aug 19, 2009	<	<	<	<	<	<	<		<	-
	Jul 16, 2010	<	<	<	<	<	<	<		<	-
	Dec 13, 2010	<	<	<	<	<	<	<		<	-
	Sep 02, 2011	<	<	<	<	<	<	<		<	-
	Aug 30, 2012	<	<	<	<	<	<	<		<	-
	Aug 28, 2013	<	<	<	<	<	<	<		<	-
	Nov 25, 2014	<	<	<	<	<	<	<		<	-
MW 10-1	Jul 16, 2010	<	<	<	<	<	<	<		<	-
	Jul 16, 2010[1]	<	<	<	<	<	<	<		<	-
	Dec 13, 2010	<	<	<	<	<	<	<		<	-
	Sep 02, 2011	<	<	<	<	<	<	0.4		0.4	Possible LO fraction
	Aug 30, 2012	<	<	<	<	<	<	<		<	-
	Aug 28, 2013										
DUP-05	Aug 28, 2013	<	<	<	<	<	<	<		<	-
	Nov 25, 2014	<	<	<	<	<	<	<	0.1	0.1	No resemblance to petroleum products in lube oil range
DUP-07	Nov 25, 2014	<	<	<	<	<	<	<	<	<	
MW 10-1A	Jul 16, 2010	<	<	<	<	<	<	<		<	-
	Dec 13, 2010	<	<	<	<	<	<	<		<	-
	Dec 13, 2010[1]	<	<	<	<	<	<	<		<	-
	Sep 02, 2011	<	<	<	<	<	<	<		<	-
	Aug 30, 2012	<	<	<	<	<	<	<		<	-
DUP- A	Sep 02, 2011	<	<	<	<	<	<	<		<	-
	Aug 28, 2013	<	<	<	<	<	<	<		<	-
	Nov 25, 2014	<	<	<	<	<	<	<		<	-
RDL		0.001	0.001	0.001	0.002	0.01	0.05	0.1	0.1	0.1	-
Atlantic RBCA Tier I RBSLs*		6.9	20	20	20	na	na	na	na	20	Gasoline
										20	Diesel / #2 Fuel Oil
										20	# 6 Oil

Notes:

Analysis completed by Maxxam Analytics Inc. laboratory in St. John's, NL.
1. Field Duplicate
2. Assumed transcript error by factor of 1,000 from Pinchin LeBlanc Environmental Table 2 from March 2010 OMM Report
3. Lab Duplicate
DUP-A= Field Dup of MW 10-1A
DUP-03= Field Dup of MW 93-1A
DUP-05= Field Dup of MW 10-1
DUP-07 = Field Dup of MW 10-01
* 2012 Atlantic Risk-Based Corrective Action (RBCA) Tier I Risk-Based Screening Level (RBSL) Table values {commercial/non-potable/coarse grained soil}.

G = Gasoline
FO = Fuel Oil
LO = Lube Oil
W = Weathered

RDL = Reportable Detection Limit
< = Parameter below detection limit
- = Not analysed
0.0 = above criteria

TABLE D3

HISTORICAL GROUNDWATER ANALYTICAL DATA - PAHs (ug/L)
2013/14 MONITORING AND MAINTENANCE PROGRAM
COME BY CHANCE SECURE LANDFILL
COME BY CHANCE, NL

Parameter	RDL	Criteria*	MW 93-1								MW 93-1A								
			Aug 19, 2009	Aug 19, 2009 Field Dup	Jul 16, 2010	Dec 13, 2010	Sep 02, 2011	Aug 30, 2012	Aug 28, 2013	Nov 25, 2014	AMEC 2008	Aug 19, 2009	Jul 16, 2010	Dec 13, 2010	Sep 02, 2011	Aug 30, 2012	Aug 30, 2012 DUP-03	Aug 28, 2013	Nov 25, 2014
1-Methylnaphthalene	0.05	1,800	<	<	<	<	<	<	<	<	<0.03	<	<	<	<	<	<	<	<
2-Methylnaphthalene	0.05	1,800	<	<	<	<	<	<	<	<	<0.03	<	<	<	<	<	<	<	<
Acenaphthene	0.01	600	<	<	<	<	0.01	<	<	<	<0.04	<	<	<	<	<	<	<	<
Acenaphthylene	0.01	2	<	<	<	<	<	<	<	<	<0.03	<	<	<	<	<	<	<	<
Acridine	0.05	-	-	-	<	<	-	-	<	<	-	-	<	<	-	-	-	<	<
Anthracene	0.01	2	<	<	<	<	<	<	<	<	<0.01	<	<	<	<	<	<	<	<
Benzo(a)anthracene	0.01	5	<	<	<	<	<	<	<	<	<0.01	<	<	<	<	<	<	<	<
Benzo(a)pyrene	0.01	0.8	<	0.01	<	<	<	<	<	<	<0.01	<	<	<	<	<	<	<	<
Benzo(b)fluoranthene	0.01	1	<	0.02	<	<	<	<	<	<	<0.05	<	<	<	<	<	<	<	<
Benzo(g,h,i)perylene	0.01	0.2	<	0.02	<	<	<	<	<	<	<0.03	<	<	<	<	<	<	<	<
Benzo(k)fluoranthene	0.01	0.4	<	0.02	<	<	<	<	<	<	<0.05	<	<	<	<	<	<	<	<
Chrysene	0.01	1	<	<	<	<	<	<	<	<	<0.04	<	<	<	<	<	<	<	<
Dibenz(a,h)anthracene	0.01	0.52	<	0.03	<	<	<	<	<	<	-	<	<	<	<	<	<	<	<
Fluoranthene	0.01	130	<	<	<	<	<	<	<	<	<0.03	<	<	<	<	<	<	<	<
Fluorene	0.01	400	<	<	<	<	<	<	<	<	<0.03	<	<	<	<	<	<	<	<
Indeno(1,2,3-cd)pyrene	0.01	0.20	<	0.02	<	<	<	<	<	<	<0.05	<	<	<	<	<	<	<	<
Naphthalene	0.20	1,400	<	<	<	<	<	<	<	<	-	<	<	<	<	<	<	<	<
Perylene	0.01	-	<	<	<	<	<	<	<	<	-	<	<	<	<	<	<	<	<
Phenanthrene	0.01	580	0.01	<	<	<	<	<	<	<	<0.04	0.01	<	<	<	<	<	<	<
Pyrene	0.01	68	<	<	<	<	<	<	<	<	<0.01	<	<	<	<	<	<	<	<
Quinoline	0.05	-	-	-	<	<	-	-	-	-	-	-	<	<	-	-	-	-	-

Analysis completed by Maxxam Analytics Inc. laboratory in Bedford, NS.
* Ontario Ministry of the Environment (MOE) "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", April 15, 2011, Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition
RDL = Reportable Detection Limit
- = Not analysed/No criteria
< = Parameter below detection limit
<(#) = Parameter below AMEC laboratory detection limit
0.0 = above criteria
DUP-01 = Field Duplicate of MW 10-1, First Sampling Event
DUP-02 = Field Duplicate of MW 10-1, Second Sampling Event
DUP-A= Field Duplicate of MW-101A
DUP-03= Field Duplicate of MW 93-1A
DUP-05= Field Duplicate of MW 10-1
DUP-07 = Field Duplicate of MW 10-1
(1)= Elevated PAH RDL(s) due to matrix/co-extractive interference

TABLE D3

HISTORICAL GROUNDWATER ANALYTICAL DATA - PAHs (ug/L)
2013/14 MONITORING AND MAINTENANCE PROGRAM
COME BY CHANCE SECURE LANDFILL
COME BY CHANCE, NL

Parameter	RDL	Criteria*	MW 93-2								MW 93-2A						
			AMEC 2008	Aug 19, 2009	Jul 16, 2010	Dec 13, 2010	Sep 02, 2011	Aug 30, 2012	Aug 28, 2013	Nov 25, 2014	Aug 19, 2009	Jul 16, 2010	Dec 13, 2010	Sep 02, 2011	Aug 30, 2012	Aug 28, 2013	Nov 25, 2014
1-Methylnaphthalene	0.05	1,800	<0.03	<	<	<	<	<	<	<	<	<	<	<	<	<	<
2-Methylnaphthalene	0.05	1,800	<0.03	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Acenaphthene	0.01	600	<0.04	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Acenaphthylene	0.01	2	<0.03	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Acridine	0.05	-	-	-	<	<	-	-	<	<	-	<	<	-	-	<	<
Anthracene	0.01	2	<0.01	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Benzo(a)anthracene	0.01	5	<0.01	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Benzo(a)pyrene	0.01	0.8	<0.01	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Benzo(b)fluoranthene	0.01	1	<0.05	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Benzo(g,h,i)perylene	0.01	0.2	<0.03	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Benzo(k)fluoranthene	0.01	0.4	<0.05	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Chrysene	0.01	1	<0.04	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Dibenz(a,h)anthracene	0.01	0.52	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Fluoranthene	0.01	130	<0.03	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Fluorene	0.01	400	<0.03	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Indeno(1,2,3-cd)pyrene	0.01	0.20	<0.05	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Naphthalene	0.20	1,400	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Perylene	0.01	-	-	<	<	<	<	<	<	<	<	<	<	0.02	<	<	<
Phenanthrene	0.01	580	<0.04	0.01	<	<	<	<	<	<	0.01	<	<	<	0.012	<	<
Pyrene	0.01	68	<0.01	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Quinoline	0.05	-	-	-	<	<	-	-	-	-	-	<	<	-	-	-	-

Analysis completed by Maxxam Analytics Inc. laboratory in Bedford, NS.
* Ontario Ministry of the Environment (MOE) "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", April 15, 2011, Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition
RDL = Reportable Detection Limit
- = Not analysed/No criteria
< = Parameter below detection limit
<(#) = Parameter below AMEC laboratory detection limit
0.0 = above criteria
DUP-01 = Field Duplicate of MW 10-1, First Sampling Event
DUP-02 = Field Duplicate of MW 10-1, Second Sampling Event
DUP-A= Field Duplicate of MW-101A
DUP-03= Field Duplicate of MW 93-1A
DUP-05= Field Duplicate of MW 10-1
DUP-07 = Field Duplicate of MW 10-1
(1)= Elevated PAH RDL(s) due to matrix/co-extractive interference

TABLE D3

HISTORICAL GROUNDWATER ANALYTICAL DATA - PAHs (ug/L)
2013/14 MONITORING AND MAINTENANCE PROGRAM
COME BY CHANCE SECURE LANDFILL
COME BY CHANCE, NL

Parameter	RDL	Criteria*	MW 10-1										MW 10-1A					
			Jul 16, 2010	Jul 16, 2010 DUP-01	Dec 13, 2010	Dec 13, 2010 DUP-02	Sep 02, 2011	Aug 30, 2012	Aug 28, 2013	Aug 28, 2013 DUP-05	Nov 25, 2014	Nov 25, 2014 Dup-07	Jul 16, 2010	Dec 13, 2010	Sep 02, 2011	Sep 02, 2011 DUP-A	Aug 28, 2013	Nov 25, 2014
1-Methylnaphthalene	0.05	1,800	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
2-Methylnaphthalene	0.05	1,800	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Acenaphthene	0.01	600	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Acenaphthylene	0.01	2	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Acridine	0.05	-	<	<	<	<	-	-	<	<	<	<	<	<	-	-	<	<
Anthracene	0.01	2	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Benzo(a)anthracene	0.01	5	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Benzo(a)pyrene	0.01	0.8	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Benzo(b)fluoranthene	0.01	1	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Benzo(g,h,i)perylene	0.01	0.2	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Benzo(k)fluoranthene	0.01	0.4	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Chrysene	0.01	1	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Dibenz(a,h)anthracene	0.01	0.52	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Fluoranthene	0.01	130	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Fluorene	0.01	400	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Indeno(1,2,3-cd)pyrene	0.01	0.20	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Naphthalene	0.20	1,400	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Perylene	0.01	-	<	<	<	0.04	<	<	<	<	<	<	<	<	<	<	0.019	<
Phenanthrene	0.01	580	<	<	<	<	<	<	<	<	<	<	<	<	<	<	0.013	<
Pyrene	0.01	68	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Quinoline	0.05	-	<	<	<	<	-	-	-	<	-	-	<	<	<	<	-	-

Analysis completed by Maxxam Analytics Inc. laboratory in Bedford, NS.
* Ontario Ministry of the Environment (MOE) "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", April 15, 2011, Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition
RDL = Reportable Detection Limit
- = Not analysed/No criteria
< = Parameter below detection limit
<(#) = Parameter below AMEC laboratory detection limit
0.0 = above criteria
DUP-01 = Field Duplicate of MW 10-1, First Sampling Event
DUP-02 = Field Duplicate of MW 10-1, Second Sampling Event
DUP-A= Field Duplicate of MW-101A
DUP-03= Field Duplicate of MW 93-1A
DUP-05= Field Duplicate of MW 10-1
DUP-07 = Field Duplicate of MW 10-1
(1)= Elevated PAH RDL(s) due to matrix/co-extractive interference

TABLE D4

GROUNDWATER ANALYTICAL DATA - PCBs
2013/14 MONITORING AND MAINTENANCE PROGRAM
COME BY CHANCE SECURE LANDFILL
COME BY CHANCE, NL

Sample Location	Date Sampled	Total PCBs
MW 93-1	Aug 19, 2009	<
	Aug 19, 2009	<[1]
	Aug 19, 2009	<[2]
	Jul 16, 2010	<
	Dec 13, 2010	<
	Sep 02,2011	<
	Aug 30, 2012	<
	Aug 28, 2013	<
	Nov 25, 2014	<
MW 93-1A	AMEC 2008	<0.04
	Aug 19, 2009	0.1
	Jul 16, 2010	<
	Dec 13, 2010	<
	Sep 02, 2011	<
	Aug 30, 2012	<
DUP-03	Aug 30, 2012	<
	Aug 28, 2013	<
	Nov 25, 2014	<
MW 93-2	AMEC 2008	<0.04
	Aug 19, 2009	<
	Jul 16, 2010	<
	Dec 13, 2010	<
	Sep 02, 2011	<
	Aug 30, 2012	<
	Aug 28, 2013	<
	Nov 25, 2014	<
MW 93-2A	Aug 19, 2009	0.11
	Jul 16, 2010	<
	Dec 13, 2010	<
	Sep 02, 2011	<
	Aug 30, 2012	<
	Aug 28, 2013	<
	Nov 25, 2014	<
MW 10-1	Jul 16, 2010	<
	Jul 16, 2010	<[2]
	Dec 13, 2010	<
	Sep 02, 2011	<
	Aug 30, 2012	<
	Aug 28, 2013	<
DUP-05	Aug 28, 2013	<
	Nov 25, 2014	<
DUP-07	Nov 25, 2014	<
MW 10-1A	Jul 16, 2010	<
	Dec 13, 2010	<
	Dec 13, 2010	<[2]
	Sep 02, 2011	<
	Aug 30, 2012	<
DUP-A	Sep 02, 2011	<
	Aug 28, 2013	<
	Nov 25, 2014	<
RDL		0.05
Criteria* - Ontario MOE		7.8

Notes:

Analysis completed by Maxxam Analytics Inc. laboratory in Bedford, NS.
1. Lab Duplicate
2. Field Duplicate
* Ontario Ministry of the Environment (MOE) "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", April 15, 2011, Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition

MW = Monitor Well
DUP-01 = Field Duplicate of MW 10-1, First Sampling Event
DUP-02 = Field Duplicate of MW 10-1, Second Sampling Event
DUP-A = Field Duplicate of MW 10-1A
DUP-03= Field Duplicate of MW 93-1A
DUP-04= Field Duplicate of PLCS
DUP-05 = Field Duplicate of MW 10-1
DUP-07 = Field Duplicate of MW 10-1
RDL = Reportable Detection Limit
< = Parameter below detection limit
0.0 = above criteria

TABLE D5

HISTORICAL GROUNDWATER ANALYTICAL DATA - VOCs (ug/L)
2013/14 MONITORING AND MAINTENANCE PROGRAM
COME BY CHANCE SECURE LANDFILL
COME BY CHANCE, NL

Parameter	RDL	Criteria*	MW 93-1								MW 93-1A								
			Aug 19, 2009	Aug 19, 2009 Field Dup	Jul 16, 2010	Dec 13, 2010	Sep 02, 2011	Aug 30, 2012	Aug 28, 2013	Nov 25, 2014	AMEC 2008	Aug 19, 2009	Jul 16, 2010	Dec 13, 2010	Sep 02, 2011	Aug 30, 2012	Aug 30, 2012 DUP-03	Aug 28, 2013	Nov 25, 2014
Benzene	1.00	44	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Bromodichloromethane	1.00	85,000	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Bromoform	1.00	380	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Bromomethane	3.00	5.6	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Carbon Tetrachloride	1.00	1	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Chlorobenzene	1.00	630	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Chloroethane	8.00	-	<	<	<	<	<10 (1)	<	<	<	<	<	<	<	<10 (1)	<	<	<	<
Chloroform	1.00	2	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Chloromethane	8.00	-	<	<	<	<	<10 (1)	<	<	<	<	<	<	<	<10 (1)	<	<	<	<
Dibromochloromethane	1.00	82,000	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
1,2-Dichlorobenzene	0.50	4,600	<	<	<	<	<0.7 (1)	<	<	<	<	<	<	<	<0.7 (1)	<	<	<	<
1,3-Dichlorobenzene	1.00	9,600	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
1,4-Dichlorobenzene	1.00	8	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethane	2.00	320	<	<	<	<	<3 (1)	<	<	<	<	<	<	<	<3 (1)	<	<	<	<
1,2-Dichloroethane	1.00	1.6	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethylene	0.50	1.6	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
cis-1,2-Dichloroethylene	2.00	1.6	<	<	<	<	<3 (1)	<	<	<	<	<	<	<	<3 (1)	<	<	<	<
trans-1,2-Dichloroethylene	2.00	2	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
1,2-Dichloropropane	1.00	16.0	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
cis-1,3-Dichloropropene	2.00	5.2	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
trans-1,3-Dichloropropene	1.00	5.2	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Ethylbenzene	1.00	2,300	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Methylene Chloride(Dichloromethane)	3.00	610	<	<	<	<	<4 (1)	<	<	<	<	<	<	<	<4 (1)	<	<	<	<
o-Xylene	1.00	4,200	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
p+m-Xylene	2.00	4,200	<	<	<	<	<3 (1)	<	<	<	<	<	<	<	<3 (1)	<	<	<	<
Styrene	1.00	1,300	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Tetrachloroethylene	1.00	2	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
1,1,2,2-Tetrachloroethane	1.00	3	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Toluene	1.00	18,000	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Trichloroethylene	1.00	2	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
1,1,1-Trichloroethane	1.00	640	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
1,1,2-Trichloroethane	1.00	5	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Trichlorofluoromethane (FREON 11)	8.00	2,500	<	<	<	<	<10 (1)	<	<	<	<	<	<	<	<10 (1)	<	<	<	<
Vinyl Chloride	0.50	0.5	<	<	<	<	<	<	<	<	0.2	<	<	<	<	<	<	<	<

Notes:
Analysis completed by Maxxam Analytics Inc. laboratory in Bedford, NS.
* Ontario Ministry of the Environment (MOE) "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", April 15, 2011, Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition
RDL = Reportable Detection Limit
SW = Surface Water Sample
-= Not analysed/No criteria
< = Parameter below detection limit
0.0 = above criteria
DUP-01 = Field Duplicate of MW 10-1, First Sampling Event
DUP-02 = Field Duplicate of MW 10-1, Second Sampling Event
DUP-A= Field Duplicate of MW 10-1A
DUP-03= Field Duplicate of MW 93-1A
DUP-05 = Field Duplicate of MW 10-1
DUP-07 = Field Duplicate of MW 10-1
(1)=Elevated RDL for analyzed VOC(s)

TABLE D5

HISTORICAL GROUNDWATER ANALYTICAL DATA - VOCs (ug/L)
2013/14 MONITORING AND MAINTENANCE PROGRAM
COME BY CHANCE SECURE LANDFILL
COME BY CHANCE, NL

Parameter	RDL	Criteria*	MW 93-2								MW 93-2A						
			AMEC 2008	Aug 19, 2009	Jul 16, 2010	Dec 13, 2010	Sep 02, 2011	Aug 30, 2012	Aug 28, 2013	Nov 25, 2014	Aug 19, 2009	Jul 16, 2010	Dec 13, 2010	Sep 02, 2011	Aug 30, 2012	Aug 28, 2013	Nov 25, 2014
Benzene	1.00	44	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Bromodichloromethane	1.00	85,000	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Bromoform	1.00	380	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Bromomethane	3.00	5.6	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Carbon Tetrachloride	1.00	1	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Chlorobenzene	1.00	630	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Chloroethane	8.00	-	<	<	<	<	<10 (1)	<	<	<	<	<	<	<10 (1)	<	<	<
Chloroform	1.00	2	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Chloromethane	8.00	-	<	<	<	<	<10 (1)	<	<	<	<	<	<	<10 (1)	<	<	<
Dibromochloromethane	1.00	82,000	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
1,2-Dichlorobenzene	0.50	4,600	<	<	<	<	<0.7 (1)	<	<	<	<	<	<	<0.7 (1)	<	<	<
1,3-Dichlorobenzene	1.00	9,600	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
1,4-Dichlorobenzene	1.00	8	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethane	2.00	320	<	<	<	<	<3 (1)	<	<	<	<	<	<	<3 (1)	<	<	<
1,2-Dichloroethane	1.00	1.6	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethylene	0.50	1.6	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
cis-1,2-Dichloroethylene	2.00	1.6	<	<	<	<	<3 (1)	<	<	<	<	<	<	<3 (1)	<	<	<
trans-1,2-Dichloroethylene	2.00	2	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
1,2-Dichloropropane	1.00	16.0	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
cis-1,3-Dichloropropene	2.00	5.2	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
trans-1,3-Dichloropropene	1.00	5.2	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Ethylbenzene	1.00	2,300	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Methylene Chloride(Dichloromethane)	3.00	610	<	<	<	<	<4 (1)	<	<	<	<	<	<	<4 (1)	<	<	<
o-Xylene	1.00	4,200	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
p+m-Xylene	2.00	4,200	<	<	<	<	<3 (1)	<	<	<	<	<	<	<3 (1)	<	<	<
Styrene	1.00	1,300	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Tetrachloroethylene	1.00	2	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
1,1,2,2-Tetrachloroethane	1.00	3	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Toluene	1.00	18,000	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Trichloroethylene	1.00	2	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
1,1,1-Trichloroethane	1.00	640	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
1,1,2-Trichloroethane	1.00	5	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Trichlorofluoromethane (FREON 11)	8.00	2,500	<	<	<	<	<10 (1)	<	<	<	<	<	<	<10 (1)	<	<	<
Vinyl Chloride	0.50	0.5	0.2	<	<	<	<	<	<	<	<	<	<	<	<	<	<

Notes:
Analysis completed by Maxxam Analytics Inc. laboratory in Bedford, NS.
* Ontario Ministry of the Environment (MOE) "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", April 15, 2011, Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition
RDL = Reportable Detection Limit
SW = Surface Water Sample
-= Not analysed/No criteria
< = Parameter below detection limit
0.0 = above criteria
DUP-01 = Field Duplicate of MW 10-1, First Sampling Event
DUP-02 = Field Duplicate of MW 10-1, Second Sampling Event
DUP-A= Field Duplicate of MW 10-1A
DUP-03= Field Duplicate of MW 93-1A
DUP-05 = Field Duplicate of MW 10-1
DUP-07 = Field Duplicate of MW 10-1
(1)=Elevated RDL for analyzed VOC(s)

TABLE D5

HISTORICAL GROUNDWATER ANALYTICAL DATA - VOCs (ug/L)
2013/14 MONITORING AND MAINTENANCE PROGRAM
COME BY CHANCE SECURE LANDFILL
COME BY CHANCE, NL

Parameter	RDL	Criteria*	MW 10-1									MW 10-1A						
			Jul 16, 2010	Dec 13, 2010	Jul 16, 2010 DUP-01	Dec 13, 2010 DUP-02	Sep 02, 2011	Aug 30, 2012	Aug 28, 2013	Aug 28, 2013 DUP-05	Nov 25, 2014	Nov 25, 2014 DUP-07	Jul 16, 2010	Dec 13, 2010	Sep 02, 2011	Aug 30, 2012	Sep 02, 2011 DUP- A	Aug 28, 2013	Nov 25, 2014
Benzene	1.00	44	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Bromodichloromethane	1.00	85,000	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Bromoform	1.00	380	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Bromomethane	3.00	5.6	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Carbon Tetrachloride	1.00	1	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Chlorobenzene	1.00	630	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Chloroethane	8.00	-	<	<	<	<	<10 (1)	<	<	<	<	<	<	<	<10 (1)	<	<10 (1)	<	<
Chloroform	1.00	2	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Chloromethane	8.00	-	<	<	<	<	<10 (1)	<	<	<	<	<	<	<	<10 (1)	<	<10 (1)	<	<
Dibromochloromethane	1.00	82,000	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
1,2-Dichlorobenzene	0.50	4,600	<	<	<	<	<0.7 (1)	<	<	<	<	<	<	<	<0.7 (1)	<	<0.7 (1)	<	<
1,3-Dichlorobenzene	1.00	9,600	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
1,4-Dichlorobenzene	1.00	8	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethane	2.00	320	<	<	<	<	<3 (1)	<	<	<	<	<	<	<	<3 (1)	<	<3 (1)	<	<
1,2-Dichloroethane	1.00	1.6	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethylene	0.50	1.6	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
cis-1,2-Dichloroethylene	2.00	1.6	<	<	<	<	<3 (1)	<	<	<	<	<	<	<	<3 (1)	<	<3 (1)	<	<
trans-1,2-Dichloroethylene	2.00	2	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
1,2-Dichloropropane	1.00	16.0	<	<	<	4.00	2.00	<	<	<	1.00	1.00	<	2.00	7.00	3.00	7.00	7.1	<
cis-1,3-Dichloropropene	2.00	5.2	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
trans-1,3-Dichloropropene	1.00	5.2	<	<	<	1.00	<	<	<	<	<	<	<	1.00	<	<	<	<	<
Ethylbenzene	1.00	2,300	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Methylene Chloride(Dichloromethane)	3.00	610	<	<	<	<	<4 (1)	<	<	<	<	<	<	<	<4 (1)	<	<4 (1)	<	<
o-Xylene	1.00	4,200	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
p+m-Xylene	2.00	4,200	<	<	<	<	<3 (1)	<	<	<	<	<	<	<	<3 (1)	<	<3 (1)	<	<
Styrene	1.00	1,300	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Tetrachloroethylene	1.00	2	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
1,1,2,2-Tetrachloroethane	1.00	3	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Toluene	1.00	18,000	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Trichloroethylene	1.00	2	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
1,1,1-Trichloroethane	1.00	640	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
1,1,2-Trichloroethane	1.00	5	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Trichlorofluoromethane (FREON 11)	8.00	2,500	<	<	<	<	<10 (1)	<	<	<	<	<	<	<	<10 (1)	<	<10 (1)	<	<
Vinyl Chloride	0.50	0.5	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<

Notes:
Analysis completed by Maxxam Analytics Inc. laboratory in Bedford, NS.
* Ontario Ministry of the Environment (MOE) "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", April 15, 2011, Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition
RDL = Reportable Detection Limit
SW = Surface Water Sample
-= Not analysed/No criteria
< = Parameter below detection limit
0.0 = above criteria
DUP-01 = Field Duplicate of MW 10-1, First Sampling Event
DUP-02 = Field Duplicate of MW 10-1, Second Sampling Event
DUP-A= Field Duplicate of MW 10-1A
DUP-03= Field Duplicate of MW 93-1A
DUP-05 = Field Duplicate of MW 10-1
DUP-07 = Field Duplicate of MW 10-1
(1)=Elevated RDL for analyzed VOC(s)

TABLE D6

HISTORICAL GROUNDWATER ANALYTICAL DATA - GENERAL CHEMISTRY
2013/14 MONITORING AND MAINTENANCE PROGRAM
COME BY CHANCE SECURE LANDFILL
COME BY CHANCE, NL

Parameter	Units	RDL	Criteria*	MW 93-1								MW 93-1A								
				Aug 19, 2009	Aug 19, 2009 Field Dup	Jul 16, 2010	Dec 13, 2010	Sep 02, 2011	Aug 30, 2012	Aug 28, 2013	Nov 25, 2014	AMEC 2008	Aug 19, 2009	Jul 16, 2010	Dec 13, 2010	Sep 02, 2011	Aug 30, 2012	Aug 30, 2012 DUP-03	Aug 28, 2013	Nov 25, 2014
Anion Sum	me/L	N/A	-	6.10	7.22	5.87	5.52	7.47	6.51	6.2	6.2	-	7.22	7.33	7.46	5.61	6.5	6.47	7.23	7.66
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	1.00	-	236.0	292.0	229.0	210.0	304.0	270	240	250	-	285.0	293.0	297.0	216.0	260	250	300	320
Calculated TDS	mg/L	1.00	-	338.0	375.0	313.0	313.0	389.0	338	330	330	265.0	447.0	390.0	401.0	302.0	334	334	380	400
Carb. Alkalinity (calc. as CaCO3)	mg/L	1.00	-	2.00	3.00	3.00	2.00	4.00	4.7	2.6	3.7	-	3.00	3.00	2.00	3.00	5.2	5.4	2.8	3.3
Cation Sum	me/L	N/A	-	6.60	6.77	5.62	5.90	6.90	6.14	5.82	5.72	-	9.57	7.02	7.19	5.35	5.89	5.94	7.05	7.38
Hardness (CaCO3)	mg/L	1.00	-	160	160	120	120	180	150	140	130	205	210	170	170	120	140	150	170	180
Ion Balance (% Difference)	%	N/A	-	4.00	3.22	2.18	3.33	3.97	2.92	3.16	4.11	-	14.00	2.16	1.84	2.37	4.92	4.27	1.26	1.86
Langelier Index (@ 20C)	N/A	N/A	-	0.50	0.62	0.47	0.38	0.80	0.815	0.51	0.64	-	0.70	0.62	0.61	0.55	0.826	0.846	0.65	0.74
Langelier Index (@ 4C)	N/A	N/A	-	0.30	0.37	0.22	0.13	0.55	0.566	0.261	0.395	-	0.45	0.37	0.36	0.31	0.577	0.597	0.401	0.495
Nitrate (N)	mg/L	0.05	-	<	<	<	<	<	<	<	<	-	<	<	<	<	<	<	<	<
Saturation pH (@ 20C)	N/A	N/A	-	7.50	7.41	7.64	7.64	7.32	7.45	7.54	7.56	-	7.31	7.37	7.32	7.67	7.5	7.5	7.34	7.29
Saturation pH (@ 4C)	N/A	N/A	-	7.80	7.66	7.89	7.89	7.57	7.69	7.79	7.81	-	7.55	7.62	7.57	7.92	7.75	7.75	7.59	7.54
Total Alkalinity (Total as CaCO3)	mg/L	30	-	240	300	230	210	310	280	250	250	290	290	300	300	220	260	260	310	320
Carbonaceous BOD	mg/L	5.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dissolved Chloride (Cl)	mg/L	1	-	36	35	19	15	11	11	24	17	11	12	11	11	16	30	30	11	10
Colour	TCU	5.00	-	<	<	<	<	<	<	<	<	-	<	<	<5	<5	<	<	<	<
Strong Acid Dissoc. Cyanide (CN)	mg/L	0.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate + Nitrite	mg/L	0.05	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Nitrite (N)	mg/L	0.01	-	<	<	<	<	<	<	<	<	0.015	<	<	<	<	<	<	<	<
Nitrogen (Ammonia Nitrogen)	mg/L	0.05	-	0.10	<	<	<	<	<	<	<	0.02	<	<	<0.05	<0.05	<	<	<	<
Total Organic Carbon (C)	mg/L	0.50	-	1.20	1.00	2.10	0.90	930.00	<	1.1	0.86	2.00	<	<(5) (1)	<(5) (1)	<(0.5)	1.4	1.5	2.6 (1)	<
Orthophosphate (P)	mg/L	0.01	-	<	<	<	<	<	<	0.013	<	-	<	<	0.04	<	<	<	<	<
pH	pH	N/A	-	8.00	8.03	8.11	8.02	8.12	8.26	8.05	8.2	8.02	8.00	7.99	7.93	8.22	8.33	8.35	7.99	8.03
Phenols-4AAP	mg/L	0.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Reactive Silica (SiO2)	mg/L	0.50	-	9.90	10.00	7.60	7.60	6.90	5.3	8.1	7.9	-	5.00	7.10	6.80	7.70	9.1	9.1	6.3	7.7
Total Suspended Solids (TSS)	mg/L	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dissolved Sulphate (SO4)	mg/L	2	-	2	16	33	42	48	33	27	37	-	55	53	56	38	19	20	38	43
Sulphide	mg/L	0.02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Turbidity	NTU	0.1	-	0.5	1.3	61.0	34.0	<1000	590	2.1	5.1	-	350.0	300.0	470.0	1.1	5.9	5.7	160	490
Conductivity	uS/cm	1	-	580	580	520	500	630	580	540	520	511	610	630	640	500	580	590	620	680
Total Oil & Grease	mg/L	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:
Analysis completed by Maxxam Analytics Inc. laboratory in St. John's, NL.
* Ontario Ministry of the Environment (MOE) "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", April 15, 2011, Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition
RDL = Reportable Detection Limit **0.0** = above criteria
- = Not analysed/No criteria (2)= Reporting limit was increased due to turbidity
< = Parameter below detection limit
<(#) = Parameter below AMEC laboratory detection limit
DUP-01 = Field Duplicate of MW 10-1, First Sampling Event
DUP-02 = Field Duplicate of MW 10-1, Second Sampling Event
DUP-03= Field Duplicate of MW 93-1A
DUP-05= Field Duplicate of MW 10-1
Dup-07 = Field Duplicate of MW 10-1
(1) = Elevated detection limit due to matrix interference

TABLE D6

HISTORICAL GROUNDWATER ANALYTICAL DATA - GENERAL CHEMISTRY
2013/14 MONITORING AND MAINTENANCE PROGRAM
COME BY CHANCE SECURE LANDFILL
COME BY CHANCE, NL

Parameter	Units	RDL	Criteria*	MW 93-2								MW 93-2A						
				AMEC 2008	Aug 19, 2009	Jul 16, 2010	Dec 13, 2010	Sep 02, 2011	Aug 30, 2012	Aug 28, 2013	Nov 25, 2014	Aug 19, 2009	Jul 16, 2010	Dec 13, 2010	Sep 02, 2011	Aug 30, 2012	Aug 28, 2013	Nov 25, 2014
Anion Sum	me/L	N/A	-	-	6.90	6.30	6.58	6.42	6.36	6.33	6.18	2.69	6.43	1.31	2.42	1.37	1.72	2.27
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	1.00	-	-	232.0	205.0	219.0	210.0	210.0	220	220	62.0	212.0	14.0	61.0	11.0	14	7.7
Calculated TDS	mg/L	1.00	-	331.0	380.0	346.0	368.0	361.0	353.0	350	340	184.0	351.0	87.0	145.0	96.0	120	150
Carb. Alkalinity (calc. as CaCO3)	mg/L	1.00	-	-	1.00	1.00	1.00	2.00	2.60	1.3	1.7	<	1.00	<	<	<	<	<
Cation Sum	me/L	N/A	-	-	6.50	5.66	6.19	6.10	5.99	5.97	6.01	3.43	5.70	1.15	2.09	1.44	1.87	1.96
Hardness (CaCO3)	mg/L	1.00	-	245	270	240	250	260	250	250	250	120	240	31	73	34	42	61
Ion Balance (% Difference)	%	N/A	-	-	2.60	5.35	3.05	2.56	3.00	2.93	1.39	12.10	`	6.50	7.32	2.49	4.18	7.33
Langelier Index (@ 20C)	N/A	N/A	-	-	0.50	0.53	0.54	0.68	0.90	0.591	0.711	-1.51	0.48	-3.48	-1.21	-3.03	-3.37	-3.6
Langelier Index (@ 4C)	N/A	N/A	-	-	0.30	0.28	0.29	0.43	0.65	0.342	0.462	-1.76	0.24	-3.73	-1.46	-3.28	-3.62	-3.85
Nitrate (N)	mg/L	0.05	-	-	<	<	<	<	<	<	<	<	<	0.15	<	<	<	0.43
Saturation pH (@ 20C)	N/A	N/A	-	-	7.20	7.28	7.20	7.23	7.22	7.22	7.2	8.06	7.27	9.25	8.27	9.28	9.14	9.26
Saturation pH (@ 4C)	N/A	N/A	-	-	7.40	7.53	7.45	7.47	7.47	7.47	7.45	8.31	7.52	9.50	8.52	9.53	9.39	9.51
Total Alkalinity (Total as CaCO3)	mg/L	30	-	205	2,320	210	220	210	220	220	220	62	210	14	61	12	14	7.7
Carbonaceous BOD	mg/L	5.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dissolved Chloride (Cl)	mg/L	1	-	24	24	23	21	20	20	19	18	21	23	14	16	17	22	31
Colour	TCU	5.00	-	-	<	<	<5	<5	<	<	<	6.00	<	79.00	120.00	41.00	65	14
Strong Acid Dissoc. Cyanide (CN)	mg/L	0.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate + Nitrite	mg/L	0.05	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	0.43
Nitrite (N)	mg/L	0.01	-	0.02	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Nitrogen (Ammonia Nitrogen)	mg/L	0.05	-	<0.01	<	<	<	<	<	<	<	0.24	<	0.35	0.25	0.40	0.53	0.21
Total Organic Carbon (C)	mg/L	0.50	-	2.00	0.50	1.50	1.30	1.00	0.88	1	1	6.20	1.30	16.00	17.00	22.00	16	13
Orthophosphate (P)	mg/L	0.01	-	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<
pH	pH	N/A	-	7.50	7.70	7.81	7.74	7.90	8.12	7.81	7.91	6.55	7.75	5.77	7.06	6.25	5.77	5.66
Phenols-4AAP	mg/L	0.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Reactive Silica (SiO2)	mg/L	0.50	-	-	19.00	18.00	19.00	19.00	18.00	18	17	12.00	18.00	6.40	11.00	5.70	6.4	7
Total Suspended Solids (TSS)	mg/L	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dissolved Sulphate (SO4)	mg/L	2	-	-	73	74	76	78	71	68	56	41	74	31	36	32	40	58
Sulphide	mg/L	0.02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Turbidity	NTU	0.1	-	-	13.0	5.4	13.0	3.9	4.0	1.1	6.1	84.0	3.2	100.0	190.0	120.0	44	70
Conductivity	uS/cm	1	-	549	560	570	580	570	580	560	550	260	570	140	230	150	190	260
Total Oil & Grease	mg/L	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:
Analysis completed by Maxxam Analytics Inc. laboratory in St. John's, NL.
* Ontario Ministry of the Environment (MOE) "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", April 15, 2011, Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition
RDL = Reportable Detection Limit **0.0** = above criteria
- = Not analysed/No criteria (2)= Reporting limit was increased due to turbidity
< = Parameter below detection limit
<(#) = Parameter below AMEC laboratory detection limit
DUP-01 = Field Duplicate of MW 10-1, First Sampling Event
DUP-02 = Field Duplicate of MW 10-1, Second Sampling Event
DUP-03= Field Duplicate of MW 93-1A
DUP-05= Field Duplicate of MW 10-1
Dup-07 = Field Duplicate of MW 10-1
(1) = Elevated detection limit due to matrix interference

TABLE D6

HISTORICAL GROUNDWATER ANALYTICAL DATA - GENERAL CHEMISTRY
2013/14 MONITORING AND MAINTENANCE PROGRAM
COME BY CHANCE SECURE LANDFILL
COME BY CHANCE, NL

Parameter	Units	RDL	Criteria*	MW 10-1										MW 10-1A						
				Jul 16, 2010	Dec 13, 2010	Jul 16, 2010 DUP-01	Dec 13, 2010 DUP-02	Sep 02, 2011	Aug 30, 2012	Aug 28, 2013	Aug 28, 2013 DUP-05	Nov 25, 2014	Nov 25, 2014 Dup-07	Jul 16, 2010	Dec 13, 2010	Sep 02, 2011	Aug 30, 2012	Sep 02, 2011 DUP-A	Aug 28, 2013	Nov 25, 2014
Anion Sum	me/L	N/A	-	3.87	2.63	3.89	2.70	3.48	3.24	2.92	2.96	3.11	3.16	3.86	3.08	1.43	2.11	1.44	1.66	2.92
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	1.00	-	94.0	92.0	96.0	95.0	144.0	140	120	120	96	98	94.0	114.0	50.0	77.0	51.0	49	90
Calculated TDS	mg/L	1.00	-	215.0	147.0	217.0	149.0	185.0	174	160	160	170	170	215.0	171.0	95.0	122.0	95.0	100	160
Carb. Alkalinity (calc. as CaCO3)	mg/L	1.00	-	<	<	<	<	<	1.1	<	<	<	<	<	<	<	<	<	<	<
Cation Sum	me/L	N/A	-	3.60	2.55	3.66	2.57	3.27	3.11	2.89	2.91	2.99	3.01	3.61	3.08	1.57	1.98	1.59	1.61	2.76
Hardness (CaCO3)	mg/L	1.00	-	100	110	100	110	150	140	130	130	130	130	100	140	61	84	61	68	120
Ion Balance (% Difference)	%	N/A	-	3.61	1.54	3.05	2.47	3.11	2.05	0.52	0.85	1.97	2.43	3.35	0.00	4.67	3.18	4.95	1.53	2.82
Langelier Index (@ 20C)	N/A	N/A	-	-0.23	-0.79	-0.31	-0.68	0.34	0.365	-0.202	-0.192	-0.006	0.007	-0.36	-0.18	-1.18	-0.60	-1.11	-1.51	-0.083
Langelier Index (@ 4C)	N/A	N/A	-	-0.48	-1.05	-0.56	-0.93	0.09	0.115	-0.452	-0.442	-0.256	-0.243	-0.61	-0.43	-1.43	-0.85	-1.36	-1.76	-0.333
Nitrate (N)	mg/L	0.05	-	<	0.24	<	0.25	<	0.16	<	<	0.13	0.14	<	0.26	0.10	0.08	0.08	0.068	0.069
Saturation pH (@ 20C)	N/A	N/A	-	7.93	7.79	7.91	7.77	7.51	7.55	7.64	7.63	7.73	7.72	7.92	7.64	8.32	8.00	8.31	8.29	7.76
Saturation pH (@ 4C)	N/A	N/A	-	8.18	8.05	8.16	8.02	7.76	7.8	7.89	7.88	7.98	7.97	8.17	7.89	8.57	8.25	8.56	8.54	8.01
Total Alkalinity (Total as CaCO3)	mg/L	30	-	95	92	96	96	140	140	120	120	96	98	95	110	51	77	51	49	90
Carbonaceous BOD	mg/L	5.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dissolved Chloride (Cl)	mg/L	1	-	56	12	56	12	6	3.8	5.4	5.8	26	26	56	14	3	4	3	5.7	27
Colour	TCU	5.00	-	10.00	9.00	6.00	13.00	9.00	5.6	<	<	<	<	7.00	5.00	22.00	7.70	18.00	8.2	16
Strong Acid Dissoc. Cyanide (CN)	mg/L	0.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate + Nitrite	mg/L	0.05	-	<	<	<	<	0.90	0.16	<	<	0.13	0.14	<	<	0.11	0.08	0.08	0.068	0.069
Nitrite (N)	mg/L	0.01	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Nitrogen (Ammonia Nitrogen)	mg/L	0.05	-	0.14	<0.05	0.14	<0.05	0.28	<	<	<	<	<	0.15	0.09	<	0.11	<	<	<
Total Organic Carbon (C)	mg/L	0.50	-	8 (1)	33.00	8 (1)	18.00	18.00	2.7	3	3.1	2.2	2.3	8 (1)	2.30	15.00	8.70	18.00	34 (1)	7.1 (2)
Orthophosphate (P)	mg/L	0.01	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
pH	pH	N/A	-	7.70	7.00	7.60	7.09	7.85	7.91	7.44	7.44	7.73	7.72	7.56	7.46	7.14	7.40	7.20	6.78	7.68
Phenols-4AAP	mg/L	0.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Reactive Silica (SiO2)	mg/L	0.50	-	7.00	6.20	7.00	6.00	8.00	7.4	6.9	7	4.5	4.5	7.10	7.60	10.00	10.00	10.00	11	2.9
Total Suspended Solids (TSS)	mg/L	2	-	-	-	-	-	-	-	-	-	-	-	-	-	7,000	-	9,400	-	-
Dissolved Sulphate (SO4)	mg/L	2	-	18	21	19	21	20	17	17	18	21	21	19	19	22	21	22	24	16
Sulphide	mg/L	0.02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Turbidity	NTU	0.1	-	640.0	>1000	570.0	540.0	320.0	26	110	110	37	38	520.0	110.0	>1000	240.0	>1000	>1000	310
Conductivity	uS/cm	1	-	380	250	380	260	320	300	270	280	300	300	380	300	150	200	150	160	280
Total Oil & Grease	mg/L	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:
Analysis completed by Maxxam Analytics Inc. laboratory in St. John's, NL.
* Ontario Ministry of the Environment (MOE) "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", April 15, 2011, Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition
RDL = Reportable Detection Limit **0.0** = above criteria
- = Not analysed/No criteria (2)= Reporting limit was increased due to turbidity
< = Parameter below detection limit
<(#) = Parameter below AMEC laboratory detection limit
DUP-01 = Field Duplicate of MW 10-1, First Sampling Event
DUP-02 = Field Duplicate of MW 10-1, Second Sampling Event
DUP-03= Field Duplicate of MW 93-1A
DUP-05= Field Duplicate of MW 10-1
Dup-07 = Field Duplicate of MW 10-1
(1) = Elevated detection limit due to matrix interference

TABLE D7

HISTORICAL GROUNDWATER ANALYTICAL DATA - METALS
2013/14 MONITORING AND MAINTENANCE PROGRAM
COME BY CHANCE SECURE LANDFILL
COME BY CHANCE, NL

Parameter	RDL	Criteria*	MW 93-1								MW 93-1A								
			Aug 19, 2009	Aug 19, 2009 Field Dup	Jul 16, 2010	Dec 13, 2010	Sep 02, 2011	Aug 30, 2012	Aug 28, 2013	Nov 25, 2014	AMEC 2008	Aug 19, 2009	Jul 16, 2010	Dec 13, 2010	Sep 02, 2011	Aug 30, 2012	Aug 30, 2012 DUP-03	Aug 28, 2013	Nov 25, 2014
Aluminum (Al)	5.0	-	100	120	37	17	73.7	73.7	8.3	14	42000	13,000	15	31	5.9	5.9	13.0	10	18
Antimony (Sb)	1.0	20,000	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Arsenic (As)	1.0	1,900	<	<	<	<	<	<	<	1.2	36	7	<	<	<	<	<	<	<
Barium (Ba)	1.0	29,000	130	150	88	70	77.9	77.9	100	85	426	240	79	73	68.6	68.6	107	83	71
Beryllium (Be)	1.0	67	<	<	<	<	<1	<1	<	<	2	<	<	<	<	<	<	<	<
Bismuth (Bi)	2.0	-	<	<	<	<	<2	<2	<	<	-	<	<	<	<	<	<	<	<
Boron (B)	5.0	45,000	120	120	100	99	63	63	110	98	-	58	56	57	96	96	118	69	64
Cadmium (Cd)	0.0	2.7	0.4	<	0.02	0.05	<	<	0.044	0.022	3	<	0.03	0.07	<	<	<	<	0.012
Calcium (Ca)	100	-	-	-	26,000	29,000	43,500	43,500	31,000	30,000	-	-	40,000	45,000	26,300	26,300	33,000	42,000	45,000
Chromium (Cr)	1.0	810/140[(1)]	<	<	<	<	<	<	<	<	54	39	<	<	<	<	<	<	<
Cobalt (Co)	0.4	66	<	<	<	<	0.44	0.44	<	<	**110**	**170**	0.7	0.4	<	<	<	1	<
Copper (Cu)	2.0	87	6	3	<	<	<2	<2	<	<	**370**	**170**	2	<	<	<	6.8	<	<
Iron (Fe)	50	-	670	550	<	<	65	65	570	330	370	37000	<	<	<	<	55	530	<
Lead (Pb)	1	25	4.6	1	<	<	<	<	<	<	**45**	17	<	<	<	<	<	<	<
Magnesium (Mg)	100	-	-	-	14,000	12,000	16,400	16,400	15,000	14,000	-	-	17,000	14,000	12,200	12,200	15,400	17,000	17,000
Manganese (Mn)	2.0	-	110	120	120	81	60	60	110	120	2,620	1200	160	57	259	259	103	160	71
Molybdenum (Mo)	2.0	9,200	6	6	20	18	16.3	16.3	15	15	20	11	15	14	19.2	19.2	10.7	16	15
Nickel (Ni)	2.0	490	6	<	<	<	<	<	<	<	154	87	<	<	<	<	<	<	<
Phosphorus (P)	100	-	-	-	<	<	-	-	<	<	-	-	<	130	-	-	<	<	<
Potassium (K)	100	-	-	-	1,900	2,000	2,680	2,680	1,800	1,700	-	-	2,500	2,700	1,830	1,830	1,730	2,700	2,500
Selenium (Se)	1.0	63	<	<	<	<	<	<	<	<	<1	<	<	<	<	<	<	<	<
Silver (Ag)	0.1	1.5	<	<	<	<	<	<	<	<	1	<	<	<	<	<	<	<	<
Sodium	100	2,300,000	-	-	-	-	76,100	70,400	69,000	69,000	-	-	-	-	68,600	68,200	68,600	80,000	85,000
Strontium (Sr)	2.0	-	250	260	230	220	263	263	240	220	-	300	300	280	192	192	249	280	280
Thallium (Tl)	0.1	510	<	<	<	<	<	<	<	<	-	-	<	<	<	<	<	<	<
Tin (Sn)	2.0	-	<	<	<	<	<2	<2	<	<	-	<	<	<	<	<	<	<	<
Titanium (Ti)	2.0	-	3	3	<	<	2.6	2.6	<	<	-	720	<	2	<	<	<	<	<
Uranium (U)	0.1	-	0.2	0.2	0.3	0.2	3.06	3.06	0.16	0.34	-	6	2.9	2.8	0.4	0.4	0.21	2.3	3.1
Vanadium (V)	2.0	250	<	<	<	<	<	<	<	<	155	28	<	<	<	<	<	<	<
Zinc (Zn)	5.0	1,100	360	32	10	10	<	<	12	10	443	250	<	<	<	<	<	<	<

Notes:

Analysis completed by Maxxam Analytics Inc. laboratory in Bedford, NS.
* Ontario Ministry of the Environment (MOE) "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", April 15, 2011, Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition
RDL = Reportable Detection Limit
- = Not analysed/No criteria
< = Parameter below detection limit
<(#) = Parameter below AMEC laboratory detection limit
0.0 = above criteria
DUP-01 = Field Duplicate of MW 10-1, First Sampling Event
DUP-02 = Field Duplicate of MW 10-1, Second Sampling Event
DUP-03= Field Duplicate of MW 93-1A
DUP-05 = Field Duplicate of MW 10-1
DUP-07 = Field Duplicate fo MW 10-1
(1) Criteria for Total Chromium = 2000 ug/L, Criteria for Chromium (VI) = 110 ug/L

TABLE D7

HISTORICAL GROUNDWATER ANALYTICAL DATA - METALS
2013/14 MONITORING AND MAINTENANCE PROGRAM
COME BY CHANCE SECURE LANDFILL
COME BY CHANCE, NL

Parameter	RDL	Criteria*	MW 93-2								MW 93-2A						
			AMEC 2008	Aug 19, 2009	Jul 16, 2010	Dec 13, 2010	Sep 02, 2011	Aug 30, 2012	Aug 28, 2013	Nov 25, 2104	Aug 19, 2009	Jul 16, 2010	Dec 13, 2010	Sep 02, 2011	Aug 30, 2012	Aug 28, 2013	Nov 25, 2014
Aluminum (Al)	5.0	-	484	460	9	<	<	<	5.4	6.2	630	<	150	86.6		290	270
Antimony (Sb)	1.0	20,000	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Arsenic (As)	1.0	1,900	3	2	2	2	1.2	1.2	1.9	3.0	<	2	<	<	<	<	<
Barium (Ba)	1.0	29,000	131	180	170	160	171	171	170	190	69	180	39	54.1	54.1	48	90
Beryllium (Be)	1.0	67	<0.1	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Bismuth (Bi)	2.0	-	<0.5	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Boron (B)	5.0	45,000	-	1100	980	1100	<	<	1,100	980	440.0	1000	24	317	317	<	<
Cadmium (Cd)	0.0	2.7	-	<	0.15	0.1	**1160**	**1160**	<0.010	<	**11**	0.15	**3.5**	0.304	0.304	0.32	**11**
Calcium (Ca)	100	-	-	-	69,000	80,000	77,300	77,400	75,000	76000	-	69,000	9,000	20,600	20,600	11,000	16,000
Chromium (Cr)	1.0	810/140[(1)]	1	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Cobalt (Co)	0.4	66	1	<	<	0.4	<	<	<	<	1	<	1.4	1.19	1.19	0.93	5.2
Copper (Cu)	2.0	87	8	5	<	<	0.56	0.56	<	<	6	<	<	<	<	<	<
Iron (Fe)	50	-	1300	980	<	<	<	<	57	130	9900	<	1900	3000	3000	12,000	730
Lead (Pb)	1	25	5	2	<	<	<	<	<	<	6.9	<	0.8	1.17	1.17	1	1
Magnesium (Mg)	100	-	-	-	16,000	13,000	15,600	15,600	15,000	15000		16,000	2,200	5,220	5,220	3,300	4,900
Manganese (Mn)	2.0	-	15,300	1200	880	950	1,120	1,120	980	720	4300	890	4,000	4,190	4,190	5,000	6,700
Molybdenum (Mo)	2.0	9,200	2	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Nickel (Ni)	2.0	490	1	<	<	<	<	<	<	<	<	<	<	<	<	<	4.8
Phosphorus (P)	100	-	-	-	<	150	-	-	<	<	-	<	<	-	-	<	110
Potassium (K)	100	-	-	-	1,200	1,400	1,560	1,560	1,300	1300	-	1,200	980	1,040	1,040	1,300	1,600
Selenium (Se)	1.0	63	1	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Silver (Ag)	0.1	1.5	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Sodium	100	2,300,000	-	-	-	-	21,000	20,300	22,000	22000	-	-	-	11,000	9,100	12,000	15,000
Strontium (Sr)	2.0	-	-	230	240	230	210	210	220	230	100	240	41	70.6	70.6	52	77
Thallium (Tl)	0.1	510	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Tin (Sn)	2.0	-	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Titanium (Ti)	2.0	-	-	21	<	<	<	<	<	<	20	<	2	<	<	2.2	<
Uranium (U)	0.1	-	-	0	0.3	0.2	0.24	0.24	0.26	0.23	0.3	0.3	<	<	<	<	<
Vanadium (V)	2.0	250	2	<	<	<	<	<	<	<	4	<	<	<	<	<	<
Zinc (Zn)	5.0	1,100	33	41	19	18	5	5	<	<	**1,700**	17	**1,300**	568	568	190	**2,900**

Notes:

Analysis completed by Maxxam Analytics Inc. laboratory in Bedford, NS.
* Ontario Ministry of the Environment (MOE) "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", April 15, 2011, Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition
RDL = Reportable Detection Limit
- = Not analysed/No criteria
< = Parameter below detection limit
<(#) = Parameter below AMEC laboratory detection limit
0.0 = above criteria
DUP-01 = Field Duplicate of MW 10-1, First Sampling Event
DUP-02 = Field Duplicate of MW 10-1, Second Sampling Event
DUP-03= Field Duplicate of MW 93-1A
DUP-05 = Field Duplicate of MW 10-1
DUP-07 = Field Duplicate fo MW 10-1
(1) Criteria for Total Chromium = 2000 ug/L, Criteria for Chromium (VI) = 110 ug/L

TABLE D7

HISTORICAL GROUNDWATER ANALYTICAL DATA - METALS
2013/14 MONITORING AND MAINTENANCE PROGRAM
COME BY CHANCE SECURE LANDFILL
COME BY CHANCE, NL

Parameter	RDL	Criteria*	MW 10-1										MW 10-1A						
			Jul 16, 2010	Dec 13, 2010	Jul 16, 2010 DUP-01	Dec 13, 2010 DUP-02	Sep 02, 2011	Aug 30, 2012	Aug 28, 2013	Aug 28, 2013 DUP-05	Nov 25, 2014	Nov 25, 2014 DUP-07	Jul 16, 2010	Dec 13, 2010	Sep 02, 2011	Aug 30, 2012	Sep 02, 2011 DUP-A	Aug 28, 2013	Nov 25, 2014
Aluminum (Al)	5.0	-	200	38	160	36	41.8	41.8	30	26	12	17	100	11	74.5	74.5	68.3	58	75
Antimony (Sb)	1.0	20,000	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Arsenic (As)	1.0	1,900	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Barium (Ba)	1.0	29,000	100	36	110	38	50.2	50.2	38	38	41	41	110	62	28.8	28.8	29.4	35	22
Beryllium (Be)	1.0	67	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Bismuth (Bi)	2.0	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Boron (B)	5.0	45,000	45	9	38	9	<	<	<	<	<	<	42	13	<	<	<	<	<
Cadmium (Cd)	0.0	2.7	0.03	<	0.03	<	0.032	0.032	0.037	0.053	<	<	0.02	0.03	0.039	0.039	0.036	0.033	<
Calcium (Ca)	100	-	31,000	41,000	32,000	42,000	51,100	51,100	45,000	45,000	46,000	47,000	31,000	48,000	20,600	20,600	20,800	23,000	45,000
Chromium (Cr)	1.0	810/140[(1)]	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Cobalt (Co)	0.4	66	2.3	1.4	2.4	1.4	4.91	4.91	0.41	<	<	<	2.5	3.3	1.54	1.54	2.07	12	<
Copper (Cu)	2.0	87	5	9	5	9	7.3	7.3	5.8	6	3.8	4	4	<	9.4	9.4	9.1	11	6.8
Iron (Fe)	50	-	120	50	140	59	50	50	84	<	<	<	82	<	96	96	92	560	86
Lead (Pb)	1	25	<	<	<	<	<	<	<	<	<	<	<	<	<	<	2.66	<	<
Magnesium (Mg)	100	-	5,800	2,300	5,900	2,300	4,540	4,540	4,100	4,000	3,900	3,900	5,900	3,900	2,190	2,190	2,150	2,500	1,800
Manganese (Mn)	2.0	-	390	190	390	170	239	239	27	26	12	13	400	380	106	106	139	860	3.3
Molybdenum (Mo)	2.0	9,200	16	3	16	3	2.5	2.5	<	<	<	<	14	5	8.5	8.5	6.1	3.2	<
Nickel (Ni)	2.0	490	6	6	6	6	6.5	6.5	2	2.1	<	<	5	6	8.9	8.9	8.3	11	<
Phosphorus (P)	100	-	<	150	<	<	-	-	<	<	<	<	<	<	-	-	-	<	<
Potassium (K)	100	-	6,400	1,100	6,400	980	1,360	1,360	1,200	1,300	1,100	1,100	6,400	1,400	714	714	693	720	850
Selenium (Se)	1.0	63	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Silver (Ag)	0.1	1.5	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	0.15	<
Sodium	100	2,300,000	-	-	-	-	6,570	7,020	6,600	6,600	8,000	7,800	-	-	4,670	5,750	4,600	5,100	8,100
Strontium (Sr)	2.0	-	98	85	99	87	106	106	98	98	98	98	99	100	46.9	46.9	45.4	56	85
Thallium (Tl)	0.1	510	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Tin (Sn)	2.0	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Titanium (Ti)	2.0	-	3	<	3	<	<	<	<	<	<	<	2	<	2.1	2.1	<	<	3.9
Uranium (U)	0.1	-	0.4	<	0.4	<	0.43	0.43	0.29	0.29	0.2	0.21	0.4	0.3	<	<	<	<	0.14
Vanadium (V)	2.0	250	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Zinc (Zn)	5.0	1,100	5	11	6	11	9	9	8.2	11	<	<	5	10	8.9	8.9	10.1	6.9	<

Notes:

Analysis completed by Maxxam Analytics Inc. laboratory in Bedford, NS.
* Ontario Ministry of the Environment (MOE) "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", April 15, 2011, Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition
RDL = Reportable Detection Limit
- = Not analysed/No criteria
< = Parameter below detection limit
<(#) = Parameter below AMEC laboratory detection limit
0.0 = above criteria
DUP-01 = Field Duplicate of MW 10-1, First Sampling Event
DUP-02 = Field Duplicate of MW 10-1, Second Sampling Event
DUP-03= Field Duplicate of MW 93-1A
DUP-05 = Field Duplicate of MW 10-1
DUP-07 = Field Duplicate fo MW 10-1
(1) Criteria for Total Chromium = 2000 ug/L, Criteria for Chromium (VI) = 110 ug/L

TABLE D8

HISTORICAL SURFACE WATER ANALYTICAL DATA - BTEX/MTPH
2013/14 MONITORING AND MAINTENANCE PROGRAM
COME BY CHANCE SECURE LANDFILL
COME BY CHANCE, NL

Sample Location	Date Sampled	Benzene	Toluene	Ethyl-benzene	Xylenes	Total Petroleum Hydrocarbons (TPH)					Comments
						F1	F2	F3		Modified TPH	
						C_6-C_{10}	C_{10}-C_{16}	C_{16}-C_{21}	C_{21}-C_{32}		
SURFACE UP	2008 (AMEC)	<(0.2)	<(0.2)	<(0.2)	<(0.6)	<(0.05)[1]	<(0.05)[1]		<(0.05)[1]	<(0.15)[1]	-
	Aug 19, 2009	<	<	<	<	<	<		<	<	-
	Jul 16, 2010	<	<	<	<	<	<		<	<	-
	Dec 13, 2010	<	<	<	<	<	<		<	<	-
	Sep 02, 2011	<	<	<	<	<	<		<	<	-
	Nov 07, 2012	<	<	<	<	<	<		<	<	-
	Aug 28, 2013	<	<	<	<	<	<	<	<	<	-
	Nov 25, 2014	<	<	<	<	<	<	<	<	<	-
SURACE DOWN	2008 (AMEC)	<(0.2)	<(0.2)	<(0.2)	<(0.6)	<(0.05)[1]	<(0.05)[1]		<(0.05)[1]	<(0.15)[1]	-
	Aug 19, 2009	<	<	<	<	<	<		<	<	-
	Jul 16, 2010	<		<	<	<	<		<	<	-
	Dec 13, 2010	<	<	<	<	<	<		<	<	-
	Sep 02, 2011	<	0.02	<	<	<	<		<	<	-
	Nov 07, 2012	<	<	<	<	<	<		<	<	-
	Aug 28, 2013	<	<	<	<	<	<	<	<	<	-
	Nov 25, 2014	<	<	<	<	<	<	<	<	<	-
RDL		0.001	0.001	0.001	0.002	0.01	0.05	0.1	0.1	0.1	-
2007 CCME Freshwater Aquatic Life Guidelines[2]		**4.00**	**2.00**	**0.39**	**-**	**-**	**-**	**-**	**-**	**-**	**Gasoline**
										-	**Diesel /#2 Fuel Oil**
										-	**#6 Oil**
1997 BC Guidelines for Protection of Aquatic Life[3]		**-**	**-**	**-**	**-**	**1.5**	**0.5**	**-**	**-**	**-**	**-**
										-	**-**
										-	**-**

Notes:

Analysis completed by Maxxam Analytics Inc. laboratory in St. John's, NL.
1. Assumed transcript error by factor of 1,000 from Pinchin LeBlanc Environmental Table 2 from March 2010 OMM Report
2. 2007 CCME Freshwater Aquatic Life Guidelines
3. BC Ministry of Water, Land and Air Protection Guidelines for Protection of Aquatic Life

RDL = Reportable Detection Limit
< = Parameter below detection limit
- = Not analysed

DUP = Laboratory duplicate
0.0 = above criteria
<(#) = Parameter below AMEC laboratory detection limit

TABLE D9

HISTORICAL SURFACE WATER ANALYTICAL DATA - PAHs (ug/L)
2013/14 MONITORING AND MAINTENANCE PROGRAM
COME BY CHANCE SECURE LANDFILL
COME BY CHANCE, NL

Parameter	RDL	Criteria*	SURFACE UP								SURFACE DOWN							
			AMEC 2008	Aug 19, 2009	Jul 16, 2010	Dec 13, 2010	Sep 02, 2011	Nov 07, 2012	Aug 28, 2013	Nov 25. 2014	AMEC 2008	Aug 19, 2009	Jul 16, 2010	Dec 13, 2010	Sep 02, 2011	Nov 07, 2012	Aug 28, 2013	Nov 25, 2014
1-Methylnaphthalene	0.05	-	<0.03	<	<	<	<	<	<	<	<0.03	<	<	<	<	<	<	<
2-Methylnaphthalene	0.05	-	<0.03	<	<	<	<	<	<	<	<0.03	<	<	<	<	<	<	<
Acenaphthene	0.01	5.8	<0.04	<	<	<	<	<	<	<	<0.04	<	<	<	<	<	<	<
Acenaphthylene	0.01	-	<0.03	<	<	<	<	<	<	<	<0.03	<	<	<	<	<	<	<
Acridine	0.05	4.4	-	-	<	<	-	-	<	<	-	-	<	<	-	-	<	<
Anthracene	0.01	0.012	<0.01	<	<	<	<	<	<	<	<0.01	<	<	<	<	<	<	<
Benzo(a)anthracene	0.01	0.018	<0.01	<	<	<	<	<	<	<	<0.01	<	<	<	<	<	<	<
Benzo(a)pyrene	0.01	0.015	<0.01	<	<	<	<	<	<	<	<0.01	<	<	<	<	<	<	<
Benzo(b)fluoranthene	0.01	-	<0.05	<	<	<	<	<	<	<	<0.05	<	<	<	<	<	<	<
Benzo(g,h,i)perylene	0.01	-	<0.03	<	<	<	<	<	<	<	<0.03	<	<	<	<	<	<	<
Benzo(j)fluoranthene	0.01		-	-	-	-	<	<	<	<	-	-	-	-	<	<	<	<
Benzo(k)fluoranthene	0.01	-	<0.05	<	<	<	<	<	<	<	<0.05	<	<	<	<	<	<	<
Chrysene	0.01	-	<0.04	<	<	<	<	<	<	<	<0.04	<	<	<	<	<	<	<
Dibenz(a,h)anthracene	0.01	-	-	<	<	<	<	<	<	<	NA	<	<	<	<	<	<	<
Fluoranthene	0.01	0.04	<0.03	<	<	<	<	<	<	<	<0.03	<	<	<	<	<	<	<
Fluorene	0.01	3.0	<0.03	<	<	<	<	<	<	<	<0.03	<	<	<	<	<	<	<
Indeno(1,2,3-cd)pyrene	0.01	-	<0.05	<	<	<	<	<	<	<	<0.05	<	<	<	<	<	<	<
Naphthalene	0.2	1.1	-	<	<	<	<	<	<	<	NA	<	<	<	<	<	<	<
Perylene	0.01	-	-	<	0.01	<	<	<	<	<	NA	<	<	<	<	<	<	<
Phenanthrene	0.01	0.4	<0.04	<	<	<	<	0.011	<	<	<0.04	0.01	<	<	<	0.012	<	<
Pyrene	0.01	0.025	<	<	<	<	<	<	<	<	<0.01	<	<	<	<	<	<	<
Quinoline	0.05	3.4	-	-	<	<	-	-	<	<	-	-	<	<	-	-	<	<

Analysis completed by Maxxam Analytics Inc. laboratory in St. John's, NL.
* Canadian Council of Ministers of the Environment (CCME) Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (2007 - Update 7.1).

RDL = Reportable Detection Limit
0.0 = above criteria
- = Not analysed/No criteria
< = Parameter below detection limit
<(#) = Parameter below AMEC laboratory detection limit

TABLE D10

HISTORICAL SURFACE WATER ANALYTICAL DATA - PCBs (ug/L)
2013/14 MONITORING AND MAINTENANCE PROGRAM
COME BY CHANCE SECURE LANDFILL
COME BY CHANCE, NL

Parameter	RDL	Criteria*	SURFACE UP							
			AMEC 2008	Aug 19, 2009	Jul 16, 2010	Dec 13, 2010	Sep 02, 2011	Nov 07, 2012	Aug 28, 2013	Nov 25, 2014
Total PCBs	0.05	-	<0.04	0.11	<	<	<	<	<	<

Parameter	RDL	Criteria*	SURFACE DOWN							
			AMEC 2008	Aug 19, 2009	Jul 16, 2010	Dec 13, 2010	Sep 02, 2011	Nov 07, 2012	Aug 28, 2013	Nov 25, 2014
Total PCBs	0.05	-	<0.04	0.13	<	<	<	<	<	<

Notes:

Analysis completed by Maxxam Analytics Inc. laboratory in Bedford, NS.
* Canadian Council of Ministers of the Environment (CCME) Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (2007 - Update 7.1).
RDL = Reportable Detection Limit
< = Parameter below detection limit
< (#) = Parameter below AMEC laboratory detection limit
0.0 = above criteria

TABLE D11

HISTORICAL SURFACE WATER ANALYTICAL DATA - VOCs (ug/L)
2013/14 MONITORING AND MAINTENANCE PROGRAM
COME BY CHANCE SECURE LANDFILL
COME BY CHANCE, NL

Parameter	RDL	Criteria*	SURFACE UP								SURFACE DOWN							
			AMEC 2008	Aug 19, 2009	Jul 16, 2010	Dec 13, 2010	Sep 02, 2011	Nov 07, 2012	Aug 28, 2013	Nov 25, 2014	AMEC 2008	Aug 19, 2009	Jul 16, 2010	Dec 13, 2010	Sep 02, 2011	Nov 07, 2012	Aug 28, 2013	Nov 25, 2014
Benzene	1	370	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Bromodichloromethane	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Bromoform	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Bromomethane	3	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Carbon Tetrachloride	1	13.3	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Chlorobenzene	1	1.3	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Chloroethane	8	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Chloroform	1	1.8	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Chloromethane	8	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Dibromochloromethane	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
1,2-Dichlorobenzene	0.5	0.7	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
1,3-Dichlorobenzene	1	150	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
1,4-Dichlorobenzene	1	26	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethane	2	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
1,2-Dichloroethane	1	100	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethylene	0.5	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
cis-1,2-Dichloroethylene	2	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
trans-1,2-Dichloroethylene	2	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
1,2-Dichloropropane	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
cis-1,3-Dichloropropene	2	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
trans-1,3-Dichloropropene	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Ethylbenzene	1	90	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Methylene Chloride(Dichloromethane)	3	98.1	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
o-Xylene	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
p+m-Xylene	2	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Styrene	1	300	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Tetrachloroethylene	1	72	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
1,1,2,2-Tetrachloroethane	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Toluene	1	111	<	<	<	<	2	<	<	<	<	<	<	<	<	<	<	<
Trichloroethylene	1	2.0	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
1,1,1-Trichloroethane	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
1,1,2-Trichloroethane	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Trichlorofluoromethane (FREON 11)	8	21	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Vinyl Chloride	0.5	-	0.2	<	<	<	<	<	<	<	0.2	<	<	<	<	<	<	<

Notes:
Analysis completed by Maxxam Analytics Inc. laboratory in Bedford, NS.
* Canadian Council of Ministers of the Environment (CCME) Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (2007 - Update 7.1).

RDL = Reportable Detection Limit
- = Not analysed/No criteria
< = Parameter below detection limit
0.0 = above criteria

TABLE D12

HISTORICAL SURFACE WATER ANALYTICAL DATA - GENERAL CHEMISTRY
2013/14 MONITORING AND MAINTENANCE PROGRAM
COME BY CHANCE SECURE LANDFILL
COME BY CHANCE, NL

Parameter	Units	RDL	Criteria*	SURFACE UP								SURFACE DOWN							
				AMEC 2008	Aug 19, 2009	Jul 16, 2010	Dec 13, 2010	Sep 02, 2011	Nov 07, 2012	Aug 28, 2013	Nov 25, 2014	AMEC 2008	Aug 19, 2009	Jul 16, 2010	Dec 13, 2010	Sep 02, 2011	Nov 07, 2012	Aug 28, 2013	Nov 25, 2014
Anion Sum	me/L	N/A	-	-	4.8	1.14	0.34	0.68	0.610	0.64	0.82	-	3.78	2.69	1.53	3.8	0.630	0.69	0.84
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	1	-	-	118	38	6	17	7.6	11	10	-	150	117	12	159	8.2	12	10
Calculated TDS	mg/L	1	-	53	267	62	23	63	38.0	39	51	145	205	140	122	204	39.0	41	51
Carb. Alkalinity (calc. as CaCO3)	mg/L	1	-	-	<	<	<	<	<	<	<	-	3	<	<	<	<	<	<
Cation Sum	me/L	N/A	-	-	4.8	1.05	0.43	1.45	0.650	0.74	0.85	-	3.8	2.54	2.4	3.85	0.650	0.74	0.84
Hardness (CaCO3)	mg/L	1	-	21.5	100	41	10	29	14	15	17	138	170	110	70	170	14	16	18
Ion Balance (% Difference)	%	N/A	-	-	0.6	4.11	11.7	36.2	3.17	7.25	1.8	-	0.26	2.87	22.1	0.65	1.56	3.5	0.0
Langelier Index (@ 20C)	N/A	N/A	-	-	-0.4	-1.36	-3.49	-3.19	-2.97	-2.82	-2.69	-	0.996	-0.099	-2.64	0.248	-2.95	-2.57	-2.73
Langelier Index (@ 4C)	N/A	N/A	-	-	-0.7	-1.61	-3.74	3.44	-3.22	-3.07	-2.94	-	0.746	-0.35	-2.89	-0.002	-3.20	-2.82	-2.98
Nitrate (N)	mg/L	0.05	13	<	<	0.17	<	<	0.054	<	0.068	<	<	<	2	1.6	0.058	<	0.076
Saturation pH (@ 20C)	N/A	N/A	-	-	7.8	8.62	10.1	9.18	9.83	9.61	9.61	-	7.39	7.69	9.01	7.39	9.80	9.56	9.59
Saturation pH (@ 4C)	N/A	N/A	-	-	8.1	8.87	10.3	9.43	10.1	9.86	9.86	-	7.64	7.94	9.26	7.64	10.0	9.81	9.85
Total Alkalinity (Total as CaCO3)	mg/L	30	-	24	120	39	39	17	7.6	11	10	136	150	120	120	160	8.2	12	10
Carbonaceous BOD	mg/L	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dissolved Chloride (Cl)	mg/L	1	-	8.9	79	5	6	7	12	12	17	3.6	4	1	23	8	12	13	16
Colour	TCU	5	-	-	44	38	49	140	67	65	52	-	23	39	120	32	78	71	57
Strong Acid Dissoc. Cyanide (CN)	mg/L	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate + Nitrite	mg/L	0.05	-	-	<	0.17	<	<	0.054	<	0.068	-	<	<	2	1.6	0.058	<	0.076
Nitrite (N)	mg/L	0.01	0.06	<0.015	<	<	<	<	<	<	<	<0.015	<	<	<	<	<	<	<
Nitrogen (Ammonia Nitrogen)	mg/L	0.05	-	-	0.1	<	<	<	<	<	<	-	<	0.19	0.06	<	<	<	<
Total Organic Carbon (C)	mg/L	0.5	-	9.5	5.7	6	6.4	41	7.9	8.2	6.4	9.2	4.3	5.4	18	2.8	7.9	7.9	6.8
Orthophosphate (P)	mg/L	0.01	-	-	<	<	<	<	<	<	<	-	<	<	<	<	<	<	<
pH	pH	N/A	6.5 - 9	6.9	7.4	7.26	6.58	5.99	6.86	6.79	6.92	7.48	8.39	7.59	6.37	7.64	6.85	6.99	6.87
Phenols-4AAP	mg/L	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Reactive Silica (SiO2)	mg/L	0.5	-	-	6.3	1.5	1.5	3.5	2.1	1.5	2.3	-	4	3.1	7.4	1.8	2.2	1.6	2.4
Total Suspended Solids (TSS)	mg/L	2	-	-	-	-	-	840	-	-	-	-	-	-	-	160	-	-	-
Dissolved Sulphate (SO4)	mg/L	2	-	-	8	11	3	-	5.7	3.2	6.7	-	29	15	24	-	5.8	3.5	7.8
Sulphide	mg/L	0.02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Turbidity	NTU	0.1	-	-	2.9	3.8	2.2	30	0.72	1.6	3	-	5.2	39	140	5.6	0.88	0.77	4.4
Conductivity	uS/cm	1	-	87	470	110	43	72	66	72	91	275	290	240	170	340	67	76	94
Total Oil & Grease	mg/L	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:
Analysis completed by Maxxam Analytics Inc. laboratory in Bedford, NS.
* Canadian Council of Ministers of the Environment (CCME) Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (2007 - Update 7.1).

RDL = Reportable Detection Limit
-= Not analysed/No criteria
< = Parameter below detection limit
< (#) = Parameter below AMEC laboratory detection limit
0.0 = above criteria = above criteria

TABLE D13

HISTORICAL SURFACE WATER ANALYTICAL DATA - METALS
2013/14 MONITORING AND MAINTENANCE PROGRAM
COME BY CHANCE SECURE LANDFILL
COME BY CHANCE, NL

Parameter	Units	RDL	Criteria*	SURFACE UP								SURFACE DOWN							
				AMEC 2008	Aug 19, 2009	Jul 16, 2010	Dec 13, 2010	Sep 02, 2011	Nov 07, 2012	Aug 28, 2013	Nov 25, 2014	AMEC 2008	Aug 19, 2009	Jul 16, 2010	Dec 13, 2010	Sep 02, 2011	Nov 07, 2012	Aug 28, 2013	Nov 25, 2014
Aluminum (Al)	ug/L	5.0	100[1]	**484**	18	**108**	**257**	**1,140**	**113**	86	**270**	**42,000**	69	**527**	**5,210**	**941**	**117**	83	**270**
Antimony (Sb)	ug/L	1.0	-	<	<	<	<	-	<	<	<	<	<	<	<	<	<	<	<
Arsenic (As)	ug/L	1.0	5.0	3	<	<	<	2.50	<	<	<	**36**	<	1.1	3.3	2.5	<	<	<
Barium (Ba)	ug/L	1.0	-	131	26	22.3	9.4	132.0	8.9	9.1	11	426	82	102	289	179	8.6	8.6	11
Beryllium (Be)	ug/L	1.0	-	<0.1	<	<	<	<	<	<	<	1.8	<	<	<	<	<	<	<
Bismuth (Bi)	ug/L	2.0	-	<0.5	<	<	<	<	<	<	<	<0.1	<	<	<	<	<	<	<
Boron (B)	ug/L	5	-	-	14	9.4	6.9	<50	<	<	<	-	22	27.1	9	<	<	<	<
Cadmium (Cd)	ug/L	0.017	0.04[2]	**0.273**	<	**0.028**	**0.04**	**0.066**	<	<	<	**2.65**	<	**0.044**	**0.232**	**-**	<	<	<
Calcium (Ca)	ug/L	100	-	-	-	12,900	2,960	8,230	3,870	4,500	4,900	-	-	40,100	18,300	62,300	3,890	4,500	5,000
Chromium (Cr)	ug/L	1	8.9/1.0[3]	1	<	<	<	2.3	<	<	<	110	<	<	8	163	<	<	<
Hexavalent Chromium (Cr^{6+})	ug/L	1	1.00						<	0.61	0.63						<	0.68	0.74
Cobalt (Co)	ug/L	0.4	-	1	<	<	<	1.9	<	<	<	307	<	0.9	6.69	1.98	<	<	<
Copper (Cu)	ug/L	2	2[4]	8	<	<	<	5.3	<	<	5	370	<	**12.7**	**32.9**	**3**	<	<	<
Iron (Fe)	ug/L	50	300	**1,300**	**1,300**	289	**722**	**16,700**	**387**	**530**	**310**	**59,000**	**380**	**1,820**	**10,900**	**4,130**	**382**	**440**	300
Lead (Pb)	ug/L	0.5	1, 2[5]	5	<	<	<	0.5	<	<	<	45	<	1.48	**7.64**	**0.69**	<	<	<
Magnesium (Mg)	ug/L	100	-	-	-	2,140	713	100	1,040	1,000	1,200	-	-	3,320	5,840	3,830	1,050	1,100	1,300
Manganese (Mn)	ug/L	2	-	1,260	230	98	142	2	41	110	49	2,620	62	481	427	1,760	38	66	41
Molybdenum (Mo)	ug/L	2	73.00	2	3.0	<	<	2	<	<	<	0.09	<	<	<	<2	<	<	<
Nickel (Ni)	ug/L	2	25, 65[6]	1	<	<	<	2	<	<	<	2	<	3	16.7	-	<	<	<
Phosphorus (P)	ug/L	100	-	-	-	<	<	-	<	<	<	-	-	120	852	-	<	<	<
Potassium (K)	ug/L	100	-	-	-	588	295	100	363	310	860	-	-	1080	4060	1030	400	320	580
Selenium (Se)	ug/L	1	1.0	1	<	<	<	1	<	<	<	<	<	<	<	<1	<	<	<
Silver (Ag)	ug/L	0.1	0.1	<	<	<	<	0.1	<	<	<	0.5	<	<	<	<	<	<	<
Sodium (Na)	ug/L	100	-	-	-	4,720	3,680	100	7,930	9,300	11,000	-	-	4,300	11,500	5,820	7,880	9,100	11,000
Strontium (Sr)	ug/L	2	-	-	90	40.7	9.7	2	13.4	16	16	-	110	85.4	49.9	110	13.3	17	17
Thallium (Tl)	ug/L	0.1	0.8	-	<	<	<	0.1	<	<	<	-	<	<	<	<0.1	<	<	<
Tin (Sn)	ug/L	2	-	-	<	<	<	2	<	<	<	-	<	<	<	<2	<	<	<
Titanium (Ti)	ug/L	2	-	-	<	2.1	7.9	2	3.1	2	5	-	2.0	17.2	148	37.2	2.7	2.5	3.5
Uranium (U)	ug/L	0.1	-	-	0.2	<	<	0.1	<	<	<	-	0.9	0.38	0.38	0.35	<	<	<
Vanadium (V)	ug/L	2	-	<	<	<	<	2	<	<	<	155	<	<	0.34	2.8	<	<	<
Zinc (Zn)	ug/L	5	30	33	<	9.2	10.7	5	<	<	18	**443**	<	25.2	**103**	**12.4**	<	<	<
Hardness (CaCO3)	mg/L	1	-	21.5	100	41	10	29	14	15	17	138	170	110	70	170	14	16	18
pH	pH	-	6.5 - 9	6.9	7.4	7.26	6.58	5.99	6.86	6.79	6.92	7.48	8.39	7.59	6.37	7.64	6.85	6.99	6.87

Notes:

Analysis completed by Maxxam Analytics Inc. laboratory in Bedford, NS.
* Canadian Council of Ministers of the Environment (CCME) Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (2007 - Update 7.1).

(1) Aluminum guideline = 5 ug/L at pH < 6.5
= 100 ug/L at pH ≥ 6.5

(2) Cadmium guideline = $10^{\{0.86[\log(\text{hardness})]-3.2\}}$

(3) Criteria for Chromium (III) = 8.9 ug/L, Criteria for Chromium (VI) = 1.0 ug/L

(4) Copper guideline = 2 ug/L at $[CaCO_3]$ = 0-120 mg/L
= 3 ug/L at $[CaCO_3]$ = 120-180 mg/L
= 4 ug/L at $[CaCO_3]$ >180 mg/L

(5) Lead guideline = 1 ug/L at $[CaCO_3]$ = 0-60 mg/L
= 2 ug/L at $[CaCO_3]$ = 60-120 mg/L
= 4 ug/L at $[CaCO_3]$ = 120-180 mg/L
= 7 ug/L at $[CaCO_3]$ >180 mg/L

(6) Nickel guideline = 25 ug/L at $[CaCO_3]$ = 0-60 mg/L
= 65 ug/L at $[CaCO_3]$ = 60-120 mg/L
= 110 ug/L at $[CaCO_3]$ = 120-180 mg/L
= 150 ug/L at $[CaCO_3]$ >180 mg/L

RDL = Reportable Detection Limit

- = Not analysed/No criteria
< = Parameter below detection limit
0.0 = above criteria

TABLE D14

HISTORICAL LEACHATE ANALYTICAL DATA - BTEX/MTPH
2013/14 MONITORING AND MAINTENANCE PROGRAM
COME BY CHANCE SECURE LANDFILL
COME BY CHANCE, NL

Sample Location	Date Sampled	Benzene	Toluene	Ethyl-benzene	Xylenes	Total Petroleum Hydrocarbons (TPH)					Comments
						F1	F2	F3		Modified TPH	
						C_6-C_{10}	C_{10}-C_{16}	C_{16}-C_{21}	C_{21}-C_{32}		
PLCS	Aug 19, 2009	<	<	<	<	<	0.08		0.1	0.2	NR
	Oct 13, 2009	<	<	<	<	<	0.2		0.1	0.3	WFO
	Jan 26, 2010	<	<	<	<	<	0.09		<	<	WFO
	Jul 16, 2010	<	<	<	<	<	<		<	<	-
	Dec 13, 2010	<	<	<	<	<	<		<	<	-
	Sep 02, 2011	<	<	<	<	<	0.05		<	<	-
	Feb 07, 2012	<	<	<	<	<	0.05		<	<	-
	Aug 30, 2012	<	<	<	<	<	<		<	<	-
	Aug 30, 2012 DUP-04	<	<	<	<	<	0.173		<	0.18	No resemblance to petroleum products in fuel oil range.
	Aug 28, 2013	<	<	<	<	<	<	<	<	<	-
	Nov 25, 2014	<	<	<	<	<	<	<	<	<	-
	Nov 25, 2014 (DUP-08)	<	<	<	<	<	<	<	<	<	-
SLCS	2008 (AMEC)	<(0.2)	<(0.2)	<(0.2)	<(0.6)	<(0.05)[1]	<(0.05)[1]		<(0.05)[1]	<(0.15)[1]	-
	Aug 19, 2009	<	<	<	<	<	<		<	<	-
	Oct 13, 2009	<	<	<	<	<	0.14		<	0.1	WFO
	Jan 26, 2010	<	<	<	<	<	0.11		<	0.1	WFO
	Jan 26, 2010[2]	<	<	<	<	<	0.11		<	0.1	WFO
	Jul 16, 2010	<	<	<	<	<	<		<	<	-
	Dec 13, 2010	<	<	<	<	<	0.05		<	<	-
	Sep 02, 2011	<	<	<	<	<	0.05		<	<	-
	Feb 07, 2012	<	<	<	<	<	0.11		<	0.21	One product in fuel/ lube oil range
	Feb 07, 2012 (DUP)	<	<	<	<	<	0.11		<	0.11	One product in fuel/ lube oil range
	Aug 30, 2012	<	<	<	<	<	0.159		<	0.16	No resemblance to petroleum products in fuel oil range.
	Aug 28, 2013	<	<	<	<	<	0.058	0.062	<	0.12	No resemblance to petroleum products in fuel oil range.
	Aug 28, 2013 (DUP-06)	<	<	<	<	<	0.071	0.061	<	0.13	No resemblance to petroleum products in fuel oil range.
	Nov 25, 2015	<	<	<	<	<	<	<	<	<	-
RDL		0.001	0.001	0.001	0.002	0.01	0.05	0.1	0.1	0.1	-
2007 CCME Freshwater Aquatic Life Guidelines[3]		**4.00**	**2.00**	**0.39**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
										-	**-**
										-	**-**
Schedule A Water & Sewer Regulations*		-	-	-	-	-	-	-	-	**15**	-
2012 Tier I Surface Water ESL - Freshwater[4]		**2.10**	**0.77**	**0.32**	**0.33**	**-**	**-**	**-**	**-**	**1.5**	**Gasoline**
										0.1	**Diesel /#2 Fuel Oil**
										0.1	**#6 Oil**

Notes:

Analysis completed by Maxxam Analytics Inc. laboratory in St. John's, NL.
* Schedule A of Environmental Control Water and Sewer Regulations, 2003.

1. Assumed transcript error by factor of 1,000 from Pinchin LeBlanc Environmental Table 2 from March 2010 OMM Report
2. Field Duplicate
3. 2007 CCME Freshwater Aquatic Life Guidelines
4. Atlantic Risk-Based Corrective Action (RBCA) Tier I Surface Water Ecological Screening Level (ESL)
Table values for protection of freshwater and marine aquatic life.

PLCS = Primary Leachate Collection System
SLCS = Secondary Leachate Collection System
DUP-04 = Field Duplicate of PLCS
DUP-06 = Field Duplicate of SLCS

RDL = Reportable Detection Limit
< = Parameter below detection limit
- = Not analysed
0.0 = above criteria

G = Gasoline
FO = Fuel Oil
LO = Lube Oil
W = Weathered

TABLE D15

HISTORICAL LEACHATE ANALYTICAL DATA - PAHs (ug/L)
2013/14 MONITORING AND MAINTENANCE PROGRAM
COME BY CHANCE SECURE LANDFILL
COME BY CHANCE, NL

Parameter	RDL	Criteria*		PLCS												
		NL [1]	CCME [2]	Aug 19, 2009	Oct 13, 2009	Jan 25, 2010	Jul 16, 2010	Dec 13, 2010	Sep 02, 2012	Feb 07, 2012	Aug 30, 2012	Aug 30, 2012 DUP-04	Aug 28, 2013	Nov 25, 2014	Nov 25, 2014 DUP-08
1-Methylnaphthalene	0.05	-	-	<	<	<	<	<	<	<	<	<	<	<	<
2-Methylnaphthalene	0.05	-	-	<	<	<	<	<	<	<	<	<	<	<	<
Acenaphthene	0.01	-	580	<	0.01	0.01	<	<	<	0.011	0.041	0.01	<	<	<
Acenaphthylene	0.01	-	-	<	<	<	<	<	<	<	<	<	<	<	<
Acridine	0.05			-	-	-	<	<	<	<	-	<	-	<	<
Anthracene	0.01	-	1.2	<	0.05	0.06	<	0.04	<	<	<0.15 (1)	<0.040 (1)	<	<0.020 (1)	<
Benzo(a)anthracene	0.01	-	1.8	<	0.01	0.02	<	<	<	<	0.039	0.013	<	<	<
Benzo(a)pyrene	0.01	-	1.5	<	<	<	<	<	<	<	<	<	<	<	<
Benzo(b)fluoranthene	0.01	-	-	<	<	<	<	<	<	<	<	<	<	<	<
Benzo(g,h,i)perylene	0.01	-	-	<	<	<	<	<	<	<	<	<	<	<	<
Benzo(j)fluoranthene	0.01	-	-										<	<	<
Benzo(k)fluoranthene	0.01	-	-	<	<	<	<	<	<	<	<	<	<	<	<
Chrysene	0.01	-	-	<	0.04	0.03	<	0.02	<	<	0.064	0.024	<	<	<
Dibenz(a,h)anthracene	0.01	-	-	<	<	<	<	<	<	<	<	<	<	<	<
Fluoranthene	0.01	-	4	<	0.05	0.07	<	0.04	<	0.011	0.18	0.046	0.011	<	<
Fluorene	0.01	-	300	<	0.02	0.02	<	<	<		0.049	0.014	<	<	<
Indeno(1,2,3-cd)pyrene	0.01	-	-	<	<	<	<	<	<	0.017	<	<	<	<	<
Naphthalene	0.2	-	110	<	<	<	<	<	<	<	<	<	<	<	<
Perylene	0.01	-	-	<	<	<	<	<	<	<	<	<	<	<	<
Phenanthrene	0.01	-	40	<	0.17	0.23	<	0.07	<	0.034	<0.020 (1)	<0.060(1)	<	0.012	<
Pyrene	0.01	-	2.5	<	0.36	0.32	<	0.17	0.2	0.046	0.85	0.01	0.052	0.013	<
Quinoline	0.05	-	-	<	-	-	<	<	-	-	-	-	-	-	-

Analysis completed by Maxxam Analytics Inc. laboratory in Bedford, NS.
NL = Environmental Control Water and Sewer Regulations, 2003, under the Water Resources Act, Newfoundland and Labrador Regulation 65/03.
CCME = Canadian Council of Ministers of the Environment (CCME) Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (2007 - Update 7.1).
PLCS = Primary Leachate Collection System
SLCS = Secondary Leachate Collection System
DUP-04= Field Duplicate of PLCS
DUP-06 = Field Duplicate of SLCS
(1) = Elevated PAH RDL(s) due to matrix / co-extractive interference.
RDL = Reportable Detection Limit
- = Not analysed/No criteria
< = Parameter below detection limit
<(#) = Parameter below AMEC laboratory detection limit
0.0 = above NL criteria
0.0 = above CCME criteria for surface water

TABLE D15

HISTORICAL LEACHATE ANALYTICAL DATA - PAHs (ug/L)
2013/14 MONITORING AND MAINTENANCE PROGRAM
COME BY CHANCE SECURE LANDFILL
COME BY CHANCE, NL

Parameter	RDL	Criteria*		SLCS													
		NL [1]	CCME [2]	AMEC 2008	Aug 19, 2009	Oct 13, 2009	Jan 25, 2010	Jan 25, 2010 Field Dup	Jul 16, 2010	Dec 13, 2010	Sep 02, 2012	Feb 07, 2012	Aug 30, 2012	Aug 28, 2013	Aug 28, 2013 DUP-06	Nov 25, 2014
1-Methylnaphthalene	0.05	-	-	<0.03	<	<	<	<	<	<	<	<	<	<	<	<
2-Methylnaphthalene	0.05	-	-	<0.03	<	<	<	<	0.22	<	<	<	<	<	<	<
Acenaphthene	0.01	-	580	<0.04	<	<	0.01	<	<	<	<	<	0.019	0.014	0.017	<
Acenaphthylene	0.01	-	-	<0.03	<	<	<	<	<	<	<	<	0.018	<	<(0.02)	<
Acridine	0.05			-					<	<	<	<	-	-	-	<
Anthracene	0.01	-	1.2	<0.01	<	0.1	0.06	0.06	<	<	<	<	<0.20 (1)	<(0.06)	<(0.15)	<
Benzo(a)anthracene	0.01	-	1.8	<0.01	<	0.06	0.02	0.03	<	<	<	<	0.064	0.05	0.062	<
Benzo(a)pyrene	0.01	-	1.5	<0.01	<	<	<	<	<	<	<	<	<	<	<	<
Benzo(b)fluoranthene	0.01	-	-	<0.05	<	<	<	<	<	<	<	<	<	<	<	<
Benzo(g,h,i)perylene	0.01	-	-	<0.03	<	<	<	<	<	<	<	<	<	<	<	<
Benzo(j)fluoranthene	0.01	-	-											<	<	<
Benzo(k)fluoranthene	0.01	-	-	<0.05	<	<	<	<	<	<	<	<	<	<	<	<
Chrysene	0.01	-	-	<0.04	<	0.09	0.04	0.04	<	0.01	<	0.013	0.10	0.085	0.11	<
Dibenz(a,h)anthracene	0.01	-	-	-	<	<	<	<	<	<	<	<	<	<	<	<
Fluoranthene	0.01	-	4	<0.03	<	0.26	0.11	0.11	0.01	<	<	0.018	0.37	0.24	0.29	0.01
Fluorene	0.01	-	300	<0.03	<	0.02	<	<	<	<	<	<	0.031	<(0.02)	<(0.04)	<
Indeno(1,2,3-cd)pyrene	0.01	-	-	<0.05	<	<	<	<	<	<	<	<	<	<	<	<
Naphthalene	0.2	-	110	-	<	<	<	<	<	<	<	<	<	<	<	<
Perylene	0.01	-	-	-	<	<	<	<	<	<	<	<	<	<	<	<
Phenanthrene	0.01	-	40	<0.04	<	0.4	0.13	0.07	0.02	0.01	<	0.012	<0.30 (1)	<	<(0.04)	<
Pyrene	0.01	-	2.5	<0.01	<	1.5	0.55	0.55	0.06	<	<	0.085	1.8	1.3	1.7	0.064
Quinoline	0.05	-	-	-	-	-	-	-	<	<	-	-	-	-	-	-

Analysis completed by Maxxam Analytics Inc. laboratory in Bedford, NS.
NL = Environmental Control Water and Sewer Regulations, 2003, under the Water Resources Act, Newfoundland and Labrador Regulation 65/03.
CCME = Canadian Council of Ministers of the Environment (CCME) Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (2007 - Update 7.1).
PLCS = Primary Leachate Collection System
SLCS = Secondary Leachate Collection System
DUP-04= Field Duplicate of PLCS
DUP-06 = Field Duplicate of SLCS
(1) = Elevated PAH RDL(s) due to matrix / co-extractive interference.
RDL = Reportable Detection Limit
- = Not analysed/No criteria
< = Parameter below detection limit
<(#) = Parameter below AMEC laboratory detection limit
0.0 = above NL criteria
0.0 = above CCME criteria for surface water

TABLE D16

HISTORICAL LEACHATE ANALYTICAL DATA - PCBs (ug/L)
2013/14 MONITORING AND MAINTENANCE PROGRAM
COME BY CHANCE SECURE LANDFILL
COME BY CHANCE, NL

Parameter	RDL	Criteria*	PLCS											
			Aug 19, 2009	Oct 13, 2009	Jan 26, 2010	Jul 16, 2010	Dec 13, 2010	Sep 02, 2011	Feb 07, 2012	Aug 30, 2012	Aug 30, 2012 DUP-04	Aug 28, 2013	Nov 25, 2014	Nov 25, 2014 DUP-08
Total PCBs	0.05	-	0.16	<	<	<	<	<	<	<	<	<	<	<

Parameter	RDL	Criteria*	SLCS											
			AMEC 2008	Aug 19, 2009	Oct 13, 2009	Jan 26, 2010	Jul 16, 2010	Dec 13, 2010	Sep 02, 2011	Feb 07, 2012	Aug 30, 2012	Aug 28, 2013	Aug 28, 2013 DUP-06	Nov 25, 2014
Total PCBs	0.05	-	<0.04	<	<	<	<	<	<	<	<	<	<	<

Notes:

Analysis completed by Maxxam Analytics Inc. laboratory in Bedford, NS.

* Environmental Control Water and Sewer Regulations, 2003, under the Water Resources Act, Newfoundland and Labrador Regulation 65/03.

PLCS = Primary Leachate Collection System
SLCS = Secondary Leachate Collection System
DUP-04= Field Duplicate of PLCS
DUP-06= Field Duplicate of SLCS
DUP-08 = Field Duplicate on PLCS
RDL = Reportable Detection Limit

< = Parameter below detection limit

0.0 = above criteria

TABLE D17

HISTORICAL LEACHATE ANALYTICAL DATA - VOCs
2013/14 MONITORING AND MAINTENANCE PROGRAM
COME BY CHANCE SECURE LANDFILL
COME BY CHANCE, NL

Parameter	RDL	Criteria*	PLCS											
			Aug 19, 2009	Oct 13, 2009	Jan 26, 2010	Jul 16, 2010	Dec 13, 2010	Sep 02, 2011	Feb 07, 2012	Aug 30, 2012	Aug 30, 2012 DUP-04	Aug 28, 2013	Nov 25, 2014	Nov 25, 2014 DUP-08
Benzene	1	-	<	<	<	<	<	<	<	<	<	<	<	<
Bromodichloromethane	1	-	<	<	<	<	<	<	<	<	<	<	<	<
Bromoform	1	-	<	<	<	<	<	<	<	<	<	<	<	<
Bromomethane	3	-	<	<	<	<	<	<	<(4)	<	<	<	<	<
Carbon Tetrachloride	1	-	<	<	<	<	<	<	<	<	<	<	<	<
Chlorobenzene	1	-	<	<	<	<	<	<	<	<	<	<	<	<
Chloroethane	8	-	<	<	<	<	<	<	<(10)	<	<	<	<	<
Chloroform	1	-	<	<	<	<	<	<	<	<	<	<	<	<
Chloromethane	8	-	<	<	<	<	<	<	<(10)	<	<	<	<	<
Dibromochloromethane	1	-	<	<	<	<	<	<	<	<	<	<	<	<
1,2-Dichlorobenzene	0.5	-	<	<	<	<	<	<	<(0.7)	<	<	<	<	<
1,3-Dichlorobenzene	1	-	<	<	<	<	<	<	<	<	<	<	<	<
1,4-Dichlorobenzene	1	-	<	<	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethane	2	-	<	<	<	<	<	<	<	<	<	<	<	<
1,2-Dichloroethane	1	-	<	<	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethylene	0.5	-	<	<	<	<	<	<	<(0.7)	<	<	<	<	<
cis-1,2-Dichloroethylene	2	-	<	<	<	<	<	<	<(3)	<	<	<	<	<
trans-1,2-Dichloroethylene	2	-	<	<	<	<	<	<	<(3)	<	<	<	<	<
1,2-Dichloropropane	1	-	<	<	<	<	<	<	<	<	<	<	<	<
cis-1,3-Dichloropropene	2	-	<	<	<	<	<	<	<(3)	<	<	<	<	<
trans-1,3-Dichloropropene	1	-	<	<	<	<	<	<	<	<	<	<	<	<
Ethylbenzene	1	-	<	<	<	<	<	<	<	<	<	<	<	<
Methylene Chloride(Dichloromethane)	3	-	<	<	<	<	<	<	<(4)	<	<	<	<	<
o-Xylene	1	-	<	<	<	<	<	<	<	<	<	<	<	<
p+m-Xylene	2	-	<	<	<	<	<	<	<(3)	<	<	<	<	<
Styrene	1	-	<	<	<	<	<	<	<	<	<	<	<	<
Tetrachloroethylene	1	-	<	<	<	<	<	<	<	<	<	<	<	<
1,1,2,2-Tetrachloroethane	1	-	<	<	<	<	<	<	<	<	<	<	<	<
Toluene	1	-	<	<	<	<	<	<	<	<	<	<	<	<
Trichloroethylene	1	-	<	<	<	<	<	<	<	<	<	<	<	<
1,1,1-Trichloroethane	1	-	<	<	<	<	<	<	<	<	<	<	<	<
1,1,2-Trichloroethane	1	-	<	<	<	<	<	<	<	<	<	<	<	<
Trichlorofluoromethane (FREON 11)	8	-	<	<	<	<	<	<	<(10)	<	<	<	<	<
Vinyl Chloride	0.5	-	<	<	<	<	<	<	<(0.7)	<	<	<	<	<

Notes:

Analysis completed by Maxxam Analytics Inc. laboratory in Bedford, NS.
* Environmental Control Water and Sewer Regulations, 2003, under the Water Resources Act, Newfoundland and Labrador Regulation 65/03.
PLCS = Primary Leachate Collection System - = Not analysed/No criteria
SLCS = Secondary Leachate Collection System < = Parameter below detection limit
DUP-04 = Field Duplicate of PLCS
DUP-06 = Field Duplicate of SLCS
RDL = Reportable Detection Limit
0.0 = above criteria

TABLE D17

HISTORICAL LEACHATE ANALYTICAL DATA - VOCs
2013/14 MONITORING AND MAINTENANCE PROGRAM
COME BY CHANCE SECURE LANDFILL
COME BY CHANCE, NL

Parameter	RDL	Criteria*	SLCS												
			AMEC 2008	Aug 19, 2009	Oct 13, 2009	Jan 26, 2010	Jan 26, 2010 Field Dup	Jul 16, 2010	Dec 13, 2010	Sep 02, 2011	Feb 07, 2012	Aug 30, 2012	Aug 28, 2013	Aug 28, 2013 DUP-06	Nov 25, 2014
Benzene	1	-		<	<	<	<	<	<	<	<	<	<	<	<
Bromodichloromethane	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<
Bromoform	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<
Bromomethane	3	-	<	<	<	<	<	<	<	<(4)	<(4)	<	<	<	<
Carbon Tetrachloride	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<
Chlorobenzene	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<
Chloroethane	8	-	<	<	<	<	<	<	<	<(10)	<(10)	<	<	<	<
Chloroform	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<
Chloromethane	8	-	<	<	<	<	<	<	<	<(10)	<(10)	<	<	<	<
Dibromochloromethane	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<
1,2-Dichlorobenzene	0.5	-	<	<	<	<	<	<	<	<(0.7)	<(0.7)	<	<	<	<
1,3-Dichlorobenzene	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<
1,4-Dichlorobenzene	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethane	2	-	<	<	<	<	<	<	<	<	<	<	<	<	<
1,2-Dichloroethane	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethylene	0.5	-	<	<	<	<	<	<	<	<(0.7)	<(0.7)	<	<	<	<
cis-1,2-Dichloroethylene	2	-	<	<	<	<	<	<	<	<(3)	<(3)	<	<	<	<
trans-1,2-Dichloroethylene	2	-	<	<	<	<	<	<	<	<(3)	<(3)	<	<	<	<
1,2-Dichloropropane	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<
cis-1,3-Dichloropropene	2	-	<	<	<	<	<	<	<	<(3)	<(3)	<	<	<	<
trans-1,3-Dichloropropene	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<
Ethylbenzene	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<
Methylene Chloride(Dichloromethane)	3	-	<	<	<	<	<	<	<	<(4)	<(4)	<	<	<	<
o-Xylene	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<
p+m-Xylene	2	-	<	<	<	<	<	<	<	<(3)	<(3)	<	<	<	<
Styrene	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<
Tetrachloroethylene	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<
1,1,2,2-Tetrachloroethane	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<
Toluene	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<
Trichloroethylene	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<
1,1,1-Trichloroethane	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<
1,1,2-Trichloroethane	1	-	<	<	<	<	<	<	<	<	<	<	<	<	<
Trichlorofluoromethane (FREON 11)	8	-	<	<	<	<	<	<	<	<(10)	<(10)	<	<	<	<
Vinyl Chloride	0.5	-	<	<	<	<	<	<	<	<(0.7)	<(0.7)	<	<	<	<

Notes:

Analysis completed by Maxxam Analytics Inc. laboratory in Bedford, NS.
* Environmental Control Water and Sewer Regulations, 2003, under the Water Resources Act, Newfoundland and Labrador Regulation 65/03.
PLCS = Primary Leachate Collection System - = Not analysed/No criteria
SLCS = Secondary Leachate Collection System < = Parameter below detection limit
DUP-04 = Field Duplicate of PLCS
DUP-06 = Field Duplicate of SLCS
RDL = Reportable Detection Limit
0.0 = above criteria

TABLE D18

HISTORICAL LEACHATE ANALYTICAL DATA - GENERAL CHEMISTRY
2013/14 MONITORING AND MAINTENANCE PROGRAM
COME BY CHANCE SECURE LANDFILL
COME BY CHANCE, NL

Parameter	Units	RDL	Criteria*	PLCS										
				Aug 19, 2009	Oct 13, 2009	Jan 26, 2010	Jul 16, 2010	Dec 13, 2010	Sep 02, 2011	Aug 30, 2012	Aug 30, 2012 DUP-04	Aug 28, 2013	Nov 25, 2014	Nov 25, 2014 DUP-08
Anion Sum	me/L	N/A	-	2.30	12.20	12.20	4.86	10.10	4.21	12.5	9.53	10	3.36	3.18
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	1	-	90	482	453	176	400	167	520	390	420	140	120
Calculated TDS	mg/L	1	1,000	133	640	662	263	546	239	624	564	540	180	180
Carb. Alkalinity (calc. as CaCO3)	mg/L	1	-	<	<	<	1	1	1	2.6	2.3	<	<	1.2
Cation Sum	me/L	N/A	-	2.30	11.60	11.90	4.47	10.10	4.06	10.7	12.3	10	3.18	3.27
Hardness (CaCO3)	mg/L	1	-	71	510	540	190	190	140	470	530	430	120	120
Ion Balance (% Difference)	%	N/A	-	0.40	2.40	1.30	4.18	0.00	1.81	7.94	12.9	0.05	2.75	1.40
Langelier Index (@ 20C)	N/A	N/A	-	-0.10	0.60	0.60	0.42	0.86	0.366	1.10	1.11	0.449	0.19	0.339
Langelier Index (@ 4C)	N/A	N/A	-	-0.40	0.30	0.30	0.17	0.61	0.116	0.856	0.864	0.202	-0.061	0.089
Nitrate (N)	mg/L	0.05	10	0.30	<	0.10	0.35	0.28	0.32	0.061	0.41	0.11	0.25	0.32
Saturation pH (@ 20C)	N/A	N/A	-	8.00	6.60	6.60	7.40	6.74	7.51	6.63	6.69	6.73	7.64	7.67
Saturation pH (@ 4C)	N/A	N/A	-	8.30	6.90	6.90	7.65	6.98	7.76	6.87	6.94	6.98	7.89	7.92
Total Alkalinity (Total as CaCO3)	mg/L	30.00	-	91	480	450	180	400	170	530	390	420	140	120
Carbonaceous BOD	mg/L	5.00	20	-	-	-	<	<	-	-	-	<	<	<
Dissolved Chloride (Cl)	mg/L	1	-	8	40	33	11	29	11	39	31	30	12	14
Colour	TCU	5	-	31	35	20	15	17	18	10	10	8.6	14	21
Strong Acid Dissoc. Cyanide (CN)	mg/L	0.002	25	-	-	-	<	<	-	<0.0020	-	<(2)	0.0017	<
Nitrate + Nitrite	mg/L	0.05	-	0.30	<	0.10	0.37	0.28	0.32	0.061	0.41	0.11	0.25	0.32
Nitrite (N)	mg/L	0.01	-	<	<	<	0.03	<	ND	<0.010	<	<	<	<
Nitrogen (Ammonia Nitrogen)	mg/L	0.05	2	<	0.30	0.40	<	0.10	ND	0.53	0.45	0.35	<	<
Total Organic Carbon (C)	mg/L	0.5	-	4.7	25.0	16.0	6.4	11.0	5.1	16 (1)	20 (5)	13	3.9	3.7
Orthophosphate (P)	mg/L	0.01	-	<	<	<	<	<	ND	<0.010	<	<	<	<
pH	pH	N/A	5.5 - 9.0	7.90	7.20	7.20	7.82	7.59	7.88	7.73	7.8	7.18	7.83	8.01
Phenols-4AAP	mg/L	0.001	0.10	-	-	-	0.01	0.003	0.003	0.012	-	0.0064	0.0012	<
Reactive Silica (SiO2)	mg/L	0.5	-	4.30	16.00	16.00	8.40	13.00	12	17	14	14	7.4	7.6
Total Suspended Solids (TSS)	mg/L	2.0	30	-	2	6	11	17	5	9.8	-	1.6	<	<
Dissolved Sulphate (SO4)	mg/L	2.0	-	11	66	110	47	61	25	43	36	42	13	13
Sulphide	mg/L	0.02	0.50	-	-	-	<	<	ND	<0.020	-	<	<	<
Turbidity	NTU	0.1	-	0.4	62.0	6.8	1.6	16.0	0.7	160	12	140	0.68	0.51
Conductivity	uS/cm	1	-	220	1000	1000	440	840	400	1000	820	820	300	300
Total Oil & Grease	mg/L	5.00	-	-	-	-	<	<	-	-	-	<	<	<
Coliform-Fecal	#/100mL	-	1,000/100 mL	-	-	-	0	0	-	-	-	-	-	-
Coliform-Total	#/100mL	-	5,000/100 mL	-	-	-	>80	>80	-	-	-	-	-	-

Notes:

Analysis completed by Maxxam Analytics Inc. laboratory in Bedford, NS.
Coliform analysis completed by Newfoundland and Labrador Government Services in Grand Falls-Windsor, NL
* Environmental Control Water and Sewer Regulations, 2003, under the Water Resources Act, Newfoundland and Labrador Regulation 65/03.
PLCS = Primary Leachate Collection System
SLCS = Secondary Leachate Collection System
DUP-04= Field Duplicate of PLCS
DUP-06= Field Duplicate of SLCS
RDL = Reportable Detection Limit **0.0** = above criteria
-= Not analysed/No criteria
< = Parameter below detection limit
<(#) = Parameter below AMEC laboratory detection limit

TABLE D18

HISTORICAL LEACHATE ANALYTICAL DATA - GENERAL CHEMISTRY
2013/14 MONITORING AND MAINTENANCE PROGRAM
COME BY CHANCE SECURE LANDFILL
COME BY CHANCE, NL

Parameter	Units	RDL	Criteria*	SLCS											
				AMEC 2008	Aug 19, 2009	Oct 13, 2009	Jan 26, 2010	Jan 26, 2010 Field Dup	Jul 16, 2010	Dec 13, 2010	Sep 02, 2011	Aug 30, 2012	Aug 28, 2013	Aug 28, 2013 DUP-06	Nov 25, 2014
Anion Sum	me/L	N/A	-	-	10.80	13.70	13.60	13.40	8.68	10.90	6.93	12.3	11.2	12.8	7.39
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	1	-	-	428	542	532	509	315	420	267	500	460	530	310
Calculated TDS	mg/L	1	1,000	780	598	737	728	716	460	574	383	647	640	710	390
Carb. Alkalinity (calc. as CaCO3)	mg/L	1	-	-	<	<	<	<	1	2	2	2.2	<	<	<
Cation Sum	me/L	N/A	-	-	10.70	13.90	12.90	13.10	7.81	10.40	6.6	12.0	13.5	14.2	7.2
Hardness (CaCO3)	mg/L	1	-	658	410	580	560	570	320	320	240	500	560	580	280
Ion Balance (% Difference)	%	N/A	-	-	0.50	0.70	3.70	1.10	5.28	2.44	2.44	1.07	9.25	5.24	1.58
Langelier Index (@ 20C)	N/A	N/A	-	-	0.60	0.40	0.50	0.60	0.67	0.99	0.749	1.04	0.511	0.487	0.441
Langelier Index (@ 4C)	N/A	N/A	-	-	0.40	0.20	0.30	0.30	0.42	0.74	0.5	0.787	0.264	0.24	0.193
Nitrate (N)	mg/L	0.05	10	<0.05	0.10	<	<	<	0.35	0.10	0.48	0.067	0.077	<	0.23
Saturation pH (@ 20C)	N/A	N/A	-	-	6.80	6.60	6.60	6.60	7.00	6.73	7.17	6.63	6.6	6.53	7.01
Saturation pH (@ 4C)	N/A	N/A	-	-	7.00	6.80	6.80	6.80	7.25	6.98	7.42	6.87	6.85	6.78	7.26
Total Alkalinity (Total as CaCO3)	mg/L	30.00	-	587	430	540	530	510	320	420	270	510	460	530	310
Carbonaceous BOD	mg/L	5.00	20	-	-	-	-	-	<	<	-	-	<	<	<
Dissolved Chloride (Cl)	mg/L	1	-	67	40	54	48	48	32	43	29	44	38	42	26
Colour	TCU	5	-	-	17	19	15	15	12	56	10	12	13	12	10
Strong Acid Dissoc. Cyanide (CN)	mg/L	0.002	25	-	-	-	-	-	<	<	-	<0.0020	<(2)	<(2)	<
Nitrate + Nitrite	mg/L	0.05	-	-	0.10	<	<	<	0.37	0.10	0.48	0.067	0.1	<	0.23
Nitrite (N)	mg/L	0.01	-	<0.015	<	<	<	<	0.02	<	ND	<0.010	0.028	<	<
Nitrogen (Ammonia Nitrogen)	mg/L	0.05	2	0.43	0.40	0.50	0.50	0.50	0.12	0.26	ND	0.50	0.38	0.53	0.06
Total Organic Carbon (C)	mg/L	0.5	-	25.7	16.0	24.0	19.0	19.0	12.0	13.0	ND	20 (1)	18	19(1)	7.3
Orthophosphate (P)	mg/L	0.01	-	-	<	<	<	<	<	<	ND	<0.010	<	<	<
pH	pH	N/A	5.5 - 9.0	6.80	7.40	7.00	7.10	7.10	7.67	7.72	7.92	7.66	7.11	7.02	7.45
Phenols-4AAP	mg/L	0.001	0.10	-	-	-	-	-	0.003	<0.01*	0.004	0.014	0.0088	0.0086	0.0015
Reactive Silica (SiO2)	mg/L	0.5	-	-	19.00	17.00	17.00	18.00	14.00	14.00	19	15	15	16	13
Total Suspended Solids (TSS)	mg/L	2.0	30	**69**	-	**34**	18	16	5	**33**	**5**	24	29	28	1.2
Dissolved Sulphate (SO4)	mg/L	2.0	-	-	54	64	90	88	69	60	34	44	40	43	17
Sulphide	mg/L	0.02	0.50	-	-	-	-	-	<	<	ND	0.060	<	<	<
Turbidity	NTU	0.1	-	-	140.0	200.0	77.0	65.0	6.6	17.0	0.9	280	130	220	0.64
Conductivity	uS/cm	1	-	1250	980	990	1200	1100	750	900	620	1100	950	1,100	630
Total Oil & Grease	mg/L	5.00	-	-	-	-	-	-	<	<	-	-	<	<	<
Coliform-Fecal	#/100mL	-	1,000/100 mL	-	-	-	-	-	0	- [1]	-	-	-	-	-
Coliform-Total	#/100mL	-	5,000/100 mL	-	-	-	-	-	>80	- [1]	-	-	-	-	-

Notes:

Analysis completed by Maxxam Analytics Inc. laboratory in Bedford, NS.
Coliform analysis completed by Newfoundland and Labrador Government Services in Grand Falls-Windsor, NL
* Environmental Control Water and Sewer Regulations, 2003, under the Water Resources Act, Newfoundland and Labrador Regulation 65/03.
PLCS = Primary Leachate Collection System
SLCS = Secondary Leachate Collection System
DUP-04= Field Duplicate of PLCS
DUP-06= Field Duplicate of SLCS
RDL = Reportable Detection Limit **0.0** = above criteria
-= Not analysed/No criteria
< = Parameter below detection limit
<(#) = Parameter below AMEC laboratory detection limit

TABLE D19

HISTORICAL LEACHATE ANALYTICAL DATA - TOTAL METALS (ug/L)
2012/13 MONITORING AND MAINTENANCE PROGRAM
COME BY CHANCE SECURE LANDFILL
COME BY CHANCE, NL

Parameter	RDL	Criteria*	PLCS										
			Aug 19, 2009	Oct 13, 2009	Jan 26, 2010	Jul 16, 2010	Dec 13, 2010	Sep 02, 2011	Aug 30, 2012	Aug 30, 2012 DUP-04	Aug 28, 2013	Nov 25, 2014	Nov 25, 2014 DUP-08
Aluminum (Al)	5	-	35	<	<	36.8	<	41	14.2	22.2	18	-	-
Antimony (Sb)	1	-	<	<	<	<	<	-	<	<	<	-	-
Arsenic (As)	1	500	<	<	<	<	<	-	<	1.0	<	-	-
Barium (Ba)	1	5,000	7.0	73	71	13.3	51	11	72.7	85.7	85	13.0	13
Beryllium (Be)	1	-	<	<	<	<	<	-	<	<	<	<	<
Bismuth (Bi)	2	-	<	<	<	<	<	-	<	<	<	<	<
Boron (B)	5	5,000	170	7,400	3,400	1,170	2,230	650	1,500	1,890	1,700	200	210
Cadmium (Cd)	0.017	50	<	<	<	<	<	-	<	<	0.012	<	<
Calcium (Ca)	100	-	-	-	-	58,400	138,000	46,100	140,000	159,000		41,000	42,000
Total Chromium (Cr)	1	1,000	<	<	<	<	<	-	<	<	<	<	<
Chromium VI	0.001	0.05	-	-	-	<	<	-	-	<	0.58	-	<
Cobalt (Co)	0.4	-	<	<	<	<	<	-	<	<	<	<	<
Copper (Cu)	2	300	4.0	<	<	2.50	<	2	<	<	<	<	<
Iron (Fe)	50	10,000	77	4,900	4,000	1,790	3,150	342	5,470	**14,300**	**12,000**	62	150
Lead (Pb)	5	200	<	<	<	<	<	-	<	<	<	<	<
Magnesium (Mg)	100	-	-	-	-	10,700	24,300	7,070	28,800	32,900	23,000	4,100	4,200
Manganese (Mn)	2	-	7.0	9,100	8,800	1,130	6,240	369	7,270	8,770	5,700	65	67
Mercury (Hg)	0.013	5	-	-	<	<	<	-	-	<	<	<	<
Molybdenum (Mo)	2	-	<	<	<	<	<	-	<	<	<	<	<
Nickel (Ni)	2	500	<	<	<	<	<	-	<	<	<	<	<
Phosphorus (P)	100	-	-	-	-	<	<	-	<	<	<	<	110.00
Potassium (K)	100	-	-	-	-	7,270	6,530	21,000	5,840	5,800	6,100	13,000	13,000
Selenium (Se)	1	10	<	<	<	<	<	-	<	<	<	<	<
Silver (Ag)	0.1	50	-	-	-	<	<	-	<	<	<	<	<
Sodium (Na)	100	-	<	<	<	9,880	22,500	14,300	21,100	23,700	19,000	11,000	11,000
Strontium (Sr)	2	-	52	360	350	156	289	104	318	362	300	90	93
Thallium (Tl)	0.1	-	<	<	<	<	<	-	<	<	<	<	<
Tin (Sn)	2	-	<	<	<	<	<	-	<	<	<	<	<
Titanium (Ti)	2	-	<	<	<	<	<	-	<	2.00	<	2.30	4.50
Uranium (U)	1	-	0.1	<	<	0.25	<	0	0.79	0.94	0.66	0.19	0.21
Vanadium (V)	2	-	<	<	<	<	<	-	<	<	<	<	<
Zinc (Zn)	50	500	<	67.0	<	8.10	<	14	<	6.50	<	<	<

Notes:

Analysis completed by Maxxam Analytics Inc. laboratory in Bedford, NS.
* Environmental Control Water and Sewer Regulations, 2003, under the Water Resources Act, Newfoundland and Labrador Regulation 65/03.
PLCS = Primary Leachate Collection System
SLCS = Secondary Leachate Collection System
DUP-04 = Field Duplicate of PLCS
DUP-06 = Field Duplicate of SLCS
RDL = Reportable Detection Limit -= Not analysed/No criteria
< = Parameter below detection limit
<(#) = Parameter below AMEC laboratory detection limit
0.0 = above criteria

TABLE D19

HISTORICAL LEACHATE ANALYTICAL DATA - TOTAL METALS (ug/L)
2012/13 MONITORING AND MAINTENANCE PROGRAM
COME BY CHANCE SECURE LANDFILL
COME BY CHANCE, NL

Parameter	RDL	Criteria*	SLCS											
			AMEC 2008	Aug 19, 2009	Oct 13, 2009	Jan 26, 2010	Jan 26, 2010 Field Dup	Jul 16, 2010	Dec 13, 2010	Sep 02, 2011	Aug 30, 2012	Aug 28, 2013	Aug 28, 2013 DUP-06	Nov 25, 2014
Aluminum (Al)	5	-	42	<	100	<	<	23.1	<	23.7	16.3	22	28	-
Antimony (Sb)	1	-	<1	<	<	<	<	<	<	-	<	<	<	-
Arsenic (As)	1	500	2	<	<	<	<	<	<	-	1.1	<	1.1	-
Barium (Ba)	1	5,000	69.8	38	93	68	68	18.9	40	5.3	78.2	98	110	13
Beryllium (Be)	1	-	<0.1	<	<	<	<	<	<	-	<	<	<	<
Bismuth (Bi)	2	-	1.1	<	<	<	<	<	<	-	<	<	<	<
Boron (B)	5	5,000	-	2,800	3,100	2,300	2,400	1,970	1,870	1,350	2,500	2,300	2,400	1,200
Cadmium (Cd)	0.017	50	1.3	<	<	<	<	<	<	-	<	<	<	<
Calcium (Ca)	100	-	-	-	-	-	-	90,900	135,000	69,700	147,000	170,000	180,000	87,000
Total Chromium (Cr)	1	1,000	1	<	<	<	<	<	<	63.2	<	<	<	<
Chromium VI	0.001	0.05	-	-	-	-	-	<	<	-	-	<	<	-
Cobalt (Co)	0.4	-	<1	<	<	<	<	0.49	<	-	1.04	0.61	0.47	<
Copper (Cu)	2	300	1	<	<	<	<	<	<	-	<	<	<	<
Iron (Fe)	50	10,000	**29,900**	6,800	**19,000**	8,500	8,300	1,320	2,240	-	**15,100**	**22,000**	**27,000**	130
Lead (Pb)	5	200	6	<	<	<	<	<	<	-	<	<	<	<
Magnesium (Mg)	100	-	-	-	-	-	-	23,500	27,400	16900	33,200	34,000	35,000	16,000
Manganese (Mn)	2	-	11,000	5,400	10,000	8,900	9,000	3,270	5,120	241	8,250	9,300	9,500	850
Mercury (Hg)	0.013	5	-	-	-	<	<	<	<	-	-	<	<	<
Molybdenum (Mo)	2	-	2	<	<	<	<	<	<	-	7.20	<	<	<
Nickel (Ni)	2	500	1	<	<	<	<	<	<	-	2.40	<	<	<
Phosphorus (P)	100	-	-	-	-	-	-	<	<	-	<	<	<	<
Potassium (K)	100	-	-	-	-	-	-	<	7,750	28,400	8,870	9,100	10,000	22,000
Selenium (Se)	1	10	1	<	<	<	<	<	<	-	<	<	<	<
Silver (Ag)	0.1	50	-	-	-	-	-	<	<	-	<	<	<	<
Sodium (Na)	100	-	0.6	<	<	<	<	21,300	25,500	23,100	26,600	26,000	28,000	21,000
Strontium (Sr)	2	-	-	280	440	380	390	282	324	183	369	430	450	220
Thallium (Tl)	0.1	-	-	<	<	<	<	<	<	-	<	<	<	<
Tin (Sn)	2	-	-	<	<	<	<	<	<	-	<	<	<	<
Titanium (Ti)	2	-	-	<	<	<	<	<	<	-	<	<	2.5	<
Uranium (U)	1	-	-	0.8	1	2	2	1.11	1	0.71	5.05	1.2	1.1	0.7
Vanadium (V)	2	-	4	<	<	<	<	<	<	-	<	<	<	<
Zinc (Zn)	50	500	7	<	<	<	<	5.20	<	32.2	8.30	16	180	<

Notes:

Analysis completed by Maxxam Analytics Inc. laboratory in Bedford, NS.
* Environmental Control Water and Sewer Regulations, 2003, under the Water Resources Act, Newfoundland and Labrador Regulation 65/03.
PLCS = Primary Leachate Collection System
SLCS = Secondary Leachate Collection System
DUP-04 = Field Duplicate of PLCS
DUP-06 = Field Duplicate of SLCS
RDL = Reportable Detection Limit -= Not analysed/No criteria
< = Parameter below detection limit
<(#) = Parameter below AMEC laboratory detection limit
0.0 = above criteria