Municipality of Greenstone

2018 to 2020 Environmental Quality Monitoring Report

Longlac Landfill, Municipality of Greenstone, Ontario

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1 Introduction and Background

EXP Services Inc. (EXP) was commissioned by the Municipality of Greenstone to prepare the environmental quality monitoring report (2018 to 2020) for the Longlac Landfill site, in accordance with the Ministry of the Environment, Conservation and Parks (MECP) Amendment to Environmental Compliance Approval (ECA) No. 5968-5ZRM25 (Notice No. 1), dated May 2, 2016, and in accordance with Condition No. 8 of the current ECA, dated June 3, 2008, which is referred to as a Certificate of Approval (C of A); the MECP subsequently revised terminology from C of A to ECA. Copies of the current C of A and Amendment to the ECA (C of A) are provided in Appendix A. The site is located north of Highway 11, off of Crib Road, about 3 km northeast of the Town of Longlac, Ontario, as shown on Figure 1 in Appendix B.

The currently defined and approved landfill and attenuation zone areas are as follows:

- Area of site (including attenuation zone): 80 ha (see Figure 4 – Appendix B)
- Landfilling Total /recycling area: 4.5 ha
- Closed landfill area: 1.6 ha

The amendment to the ECA, dated May 2, 2016, provided approval for a reduction in sampling frequency from three times annually (spring, summer and fall) to twice annually (spring and fall), and approval for a reduction in monitoring report frequency from annually to every three years. However, an annual report regarding Record Keeping and Reporting (Conditions 6[6] and 6[7]) is required, with the first two reports for the current monitoring period (2018-2020) having already been submitted to the MECP. The annual record keeping and reporting requirements for 2020 are contained within the present report.

This report presents the results of the 2018, 2019 and 2020 monitoring program in the context of historical results and applicable criteria. Analytical results for groundwater are compared to the MECP Ontario Drinking Water Standards (ODWS, from *Technical Support Document for Ontario Drinking Water Standards, Objectives and Guidelines,* June 2003), and MOE Guideline B-7, which incorporates the Reasonable Use concept into MECP groundwater management activities. Analytical results for surface water are compared to the MECP Provincial Water Quality Objectives (PWQO, from *Provincial Water Quality Objectives*, July 1994 [updated]).

In August 2018, a site inspection of the Longlac Landfill was conducted by the MECP. A Solid Non-Hazardous Waste Disposal Site Inspection Report was issued on September 19, 2018, detailing several action items requested by the MECP to ensure that the requirements of the C of A / ECA are met. A copy of the Solid Non-Hazardous Waste Disposal Inspection Report is provided in Appendix A. The actions items required to be addressed are as follows (with responses in *italics*):

- By December 31, 2020, the Municipality must register the waste site and attenuation zone on Title and submit a Certificate of Requirement to the MECP.

    - *The C of A defines the site as "the entire waste disposal site, including buffer lands, and contaminant attenuation zone." Therefore, registration on title is required for the entire 80 ha site, including the waste footprint and attenuation zone. It is understood that on June 25, 2019, the Municipality completed and submitted an Application for Crown Land to the Ministry of Natural Resources and Forestry (MNRF). The Municipality has not recently heard from the MNRF and will be contacting the local MNRF office regarding the application status; however, it is understood that the local MNRF office has had some staff/personnel turnover and with the current COVID-19 epidemic, making contact could be difficult. In addition, the Municipality is prepared to resurvey if the MNRF deems it necessary. EXP understands that the Municipality continues to address this matter and registration on title of the entire site has not yet been completed.*

- By December 31, 2019, the Municipality must develop and implement a comprehensive training plan for staff working at the Landfill Site, as required by the Environmental Compliance Approval and provide regular updated training to staff on all aspects of operating the waste site. The training will not be limited to, but must include, review of the ECA, review of the design and operation of the site, all conditions associated to the HHW condition 11, reasoning for clear boundary identification, reasoning for the elevation markers.

    - *It is understood that the Municipality has developed and implemented a comprehensive training plan for staff working at the landfill site. The training program will also be conducted annually to review and advise staff of any changes to site operations. In addition, one on one training has also occurred, if required (e.g. staff turnovers). However, due to the COVID-19 pandemic, annual training for all employees is outstanding at this time. The Municipality is exploring options for self directed online training but until a suitable program is established/found the Municipality will conduct one on one training with the landfill operators annually.*

- By December 31, 2019, the Municipality is to refresh the approved WDS dumping boundaries, the WDS area and elevation markers.

    - *On August 7, 2019, Delta Survey Inc. placed temporary stakes at the perimeter of the currently-approved waste footprint boundary, and the current elevations at the temporary stakes were surveyed and cut/fill differences were provided to the Municipality. In addition, the Municipality installed permanent stakes and has GPS data of all the stakes, should any of the stakes be damaged or accidentally removed. The use of GPS and existing stakes (both permanent and the existing temporary) are still utilized and have proven effective.*

2 Site Hydrology/Hydrogeology

The following paragraphs summarize the general hydrogeological setting of the Longlac Landfill. Much of this information is taken from AEC's historical report[1] (cited in Section 1) which was submitted in support of the previous C of A application, and information contained therein is generally assumed to be correct.

During their site investigation, AEC installed 11 monitoring wells (including two nested pairs) at the locations shown on Figure 5. In June 2008, EXP installed a new upgradient background well (MW10) and a nested pair of wells (MW12-I and MW12-II) near the southwest attenuation zone boundary. EXP also installed an additional pair of downgradient wells, MW11-I (deep) and MW11-II (shallow), near the southeast site boundary in September 2009.

The borehole logs are provided in Appendix C.

2.1 Topography/Drainage

The site is located within a broad valley underlain by outwash/glaciolacustrine sediments radiating from a Precambrian bedrock knoll. Based on 1:50,000 topographic mapping (Figure 1), and 2005, 2012 and 2019 aerial photography / satellite imagery (Figures 2A, 2B and 2C), surface water drains southeast and southwest from the site, generally towards Crib Road south of the site. Flow from the southeast eventually drains toward a creek located about 750 m east of the landfill site. This creek flows south and discharges into Rockyshore Creek. Surface water from the southwest part of the site drains to a culvert at Crib Road and eventually discharges into wetlands adjacent to the Kenogami River, about 2 km west of the site. This in effect divides the site into two watersheds.

The first "sub-watershed" (east/southeast of the topographical divide) is about 40 hectares in size upgradient of the creek. Based on a two hectare waste footprint within the easterly watershed, the expected leachate dilution ratio would be 20:1. The lowlands between the waste area and the creek are predominantly forested swamp and peat lands. This environment is considered to be conducive to attenuation and biodegradation (organics) of leachate contaminants.

The second "sub-watershed" (west/southwest of the topographical divide) is about 450 hectares in size. Approximately two thirds of the waste will be located within the westerly sub-watershed. This should provide for a minimum leachate dilution ratio of 75:1. The area down gradient of the waste is forested swamp as well, which is again conducive to attenuation/degradation of leachate.

Receptors in the area of the landfill are few. There are no water wells in the area or within 1 km downgradient. Surface water bodies are the main receptors of concern. However, the

[1] Azimuth Environmental Consulting Inc., (1997). *Application for Environmental Protection Act Approval for the Proposed Landfill Site, Longlac Waste Management Study, Town of Longlac*. Project No. AEC 96-016, December 1997.

risk that they could be significantly impacted by landfill leachate is considered low because of the large areas of watershed upgradient of the potential discharge zones.

The following paragraph deals only with the upgradient watershed of the southeasterly creek because the upgradient watershed for the Kenogami River is very large in comparison. The watershed of the southeasterly creek is approximately 715 hectares in size. Creek flow is derived from both groundwater discharge and surface run-off. Flow in the creek has been estimated to be approximately 1,200 times greater than the volume of diluted leachate-impacted water that discharges to the creek. This is based on an estimated groundwater infiltration of 30% of the water surplus and the relative areas of the waste and the contributing watershed. This means that there will be substantial dilution at the point of discharge, so landfill leachate impacts should not be discernible in the surface water chemistry.

According to the AEC report, lands in both sub-watersheds within 500 m downgradient of the waste have been included in a Contaminant Attenuation Zone (CAZ) to restrict groundwater usage within these areas. The CAZ is shown on Figure 4. As previously noted, the Municipality is currently in the process with the MNRF regarding acquiring lands not currently owned by the Municipality of Greenstone.

2.2 **Overburden**

Based on the available geological map (Ontario Geological Survey, Map 5078 – Longlac), the site is situated in an area with Glaciolacustrine Plain and Bedrock Knob Landforms and the soil consists mainly of sandy and silty materials (Figure 3).

Based on the borehole logs (Appendix C), reported thickness of overburden (i.e., depth to refusal on assumed bedrock) at the monitoring well locations ranged from 3.7 m (MW2) to 17.6 m (MW6).

Stratigraphic sections from borehole logs were prepared, and these are shown on Figures 8, 9 and 10. The existing landfill area is underlain by a thick till overburden that was deposited around the flanks of the bedrock knoll and forms a wedge against the bedrock surface. The sections indicate that the overburden consists of poorly sorted and well mixed sediments, primarily silty sand and sandy silt. Finer sediments are typically found at depth. However, we have noted that the grain size distributions and hydraulic conductivity estimates (see below) presented in AEC's report indicate the presence of layers containing significant amounts of clay. The overburden thins away from the knoll as seen in the topographic relief and transitions into lowlands and forested swamps. The bedrock is at a depth of about 5 m in the lowland areas.

Based on AEC's report, the outwash deposit grades from coarser sand and gravelly sand within the upgradient area adjacent to the landfill footprint and MW7 to finer clayey silt beneath the downgradient monitors MW2 and MW3. Finer-grained granular sediments likely occur within the outwash deposit beyond MW2 toward the creek.

Hydraulic conductivities (m/s) for the overburden soils were estimated by AEC to be as follows:

- MW1 3.1×10^{-6} sandy silt
- MW2 5.5×10^{-6} clayey silt (borehole log says sandy silt)
- MW3 1.4×10^{-6} clayey silt (borehole log says sandy silt)
- MW4-I $<10^{-9}$ sandy, clayey silt
- MW4-II 1.4×10^{-6} well mixed silt, sand & gravel
- MW5 1.1×10^{-8} silty sand
- MW6 7.9×10^{-9} silty sand with gravel
- MW7 1.6×10^{-7} silty sand with gravel
- MW8-I 7.8×10^{-8} sandy gravel
- MW8-II 7.7×10^{-8} well mixed silt, sand & gravel
- MW9 1.9×10^{-5} sandy silt with gravel (borehole log says sand and gravel).

EXP has noted that some of the above estimates appear to be low, while others are high, based on the descriptions provided. Also, the above soil descriptions are not always consistent with those shown on AEC's borehole logs and stratigraphic sections.

Based on the AEC data, average linear groundwater velocity in the overburden around the knoll was estimated to range between 10 and 30 m/yr. As indicated above, hydraulic conductivity was estimated to vary between 7.7×10^{-8} and 3.1×10^{-6} m/s in the overburden silt. The overburden in the lowlands is more consistent, with less hydraulic conductivity variability of between 1.9×10^{-5} and 5.5×10^{-6} m/s. Lateral gradients are greatest nearest the knoll and vary from 0.02 to 0.04, while in the lowlands, lateral gradients appear to be generally consistent at approximately 0.01. Based on the lower gradient and increased hydraulic conductivity, groundwater velocities in the lowland areas are expected to be between 20 to 40 m/yr. Based on AEC's 1997 calculations, leachate-impacted groundwater could reach the small creek to the southeast in approximately 25 years and the Kenogami River to the northwest in approximately 70 years. However, dilution is expected to mitigate the potential for any significant off-site impacts.

2.3 Groundwater Recharge

AEC estimated the regional water surplus (i.e., difference between precipitation and evapotranspiration) to be between 260 and 360 mm/yr. This surplus was calculated based on climate data from Manitouwadge and Hornepayne (Canadian Climate Normals, 1961-1990) which were the nearest weather recording stations.

The water surplus is the amount of water that is available to either runoff as stream flow or infiltrate into the groundwater regime. Because of the moderate surface drainage in the area of the landfill and fine-grained nature of the surficial soils, the infiltration is considered to be medium to low, suggesting that approximately 15-30% of the water surplus infiltrates to the groundwater regime and approximately 70-85% runs off as stream flow or overland flow.

Thus, the expected volume of leachate can be determined from the infiltration rate, the water surplus and waste footprint. The volume of leachate is estimated to be between 46 and 90 L per m^2 of waste footprint per year.

2.4 Ground and Surface Water Elevations and Flow

The most recent topographic survey of the site was performed by Delta Survey Inc. on September 9, 2020, including elevations of the ground surface and top of pipe at the monitoring well locations. Depth to groundwater was measured in each well during the spring and fall sampling. The recorded groundwater elevations (derived from Geodetic Bench Marks 963011C and 963011A), along with historical groundwater levels, are summarized in Appendix D, Table 1.

Generally similar to historical observations, depths to groundwater on or in the immediate vicinity of the site, as measured on September 30, 2020, ranged from 9.99 m below ground surface at MW6 along the east side of the bedrock knoll, to artesian conditions at nested pair wells MW11-I/II (east of entrance gate). Wells MW8-II and MW9 were dry.

Due to the presence of the bedrock knoll, the active landfill area is on a local groundwater divide and the flow drains both to the southwest (eventually turning northwest toward the Kenogami River about 2.2 km away) and southeast (discharging to a stream about 750 m away). The crest of the knoll generally slopes southward and therefore a southerly component to groundwater flow would also be anticipated. However, the current arrangement of monitoring wells is not sufficient to monitor flows off-site to the south and west. The southeasterly flow pathway is considered to be of main concern for leachate based on the proximity of receptors. Interpolated groundwater contours using the data collected from the May 2020 sampling event are illustrated on Figure 6. Note that there may also be westward to southwestward components to groundwater flow off of the site, but additional wells would be required to define these. Regardless, the attenuation zone west of the fill area is considered to be more than adequate.

The available surface water elevations, derived from Geodetic Bench Marks 963011C and 963011A, as measured using staff gauges installed in the culvert southeast of the site (SW1) and in a man-made pond (SW2) are summarized in Appendix D, Table 2. Note that elevations for another man-made pond (SW3) are not available for the current reporting period (staff gauge no longer present), with the last measurement having been obtained by Delta Survey in June 2017. The current and historical elevations have been generally consistent with topography and groundwater conditions.

3 Monitoring/Reporting Requirements

3.1 Water Monitoring

MECP monitoring requirements, as specified in the amendment to the ECA (May 2, 2016), amended C of A (June 3, 2008), C of A (June 10, 2004) and/or other referenced documentation (see Appendix A), are as follows:

- Locations MW2, MW3, MW4-I, MW4-II, MW5, MW6, MW7, MW8-I, MW8-II, MW9, MW10, MW11-I, MW11-II, MW12-I, MW12-II – twice per year.

In conjunction with the groundwater monitoring, surface water monitoring is required at three locations (SW1, SW2, SW3), including field parameters (pH, conductivity, temperature).

The following parameters were specified for analysis at all locations:

- pH, conductivity, major ions (Ca, Mg, Na, K, Cl, sulphate, alkalinity), metal scan (cadmium, chromium, copper, lead, iron, manganese, nickel, zinc), mercury, TKN, ammonia, nitrate, phenols, total phosphorus, DOC.

The following additional parameters were specified for analysis at wells MW6, MW7, MW8-I and MW8-II during one event only:

- Volatile organic compounds (VOCs).

In order to be consistent with Schedule 5 of the MECP (1998) Landfill Standards Guidelines, nitrite and COD were also measured. BOD and TSS were measured in “source” wells MW7, MW8-I and MW8-II.

In 2018, 2019 and 2020, monitoring was conducted twice annually (spring and fall).

3.2 Reporting

The amended ECA stipulates that the following record keeping information must be submitted to MECP by April 30th of the year following the period being reported:

- an assessment of the operation and performance of all engineered facilities, the need to amend the design or operation of the site;
- calculations of the volume of waste, daily and intermediate cover, and final cover deposited or placed at the site during the reporting period and a calculation of the total volume of site capacity used during the reporting period;
- a calculation of the remaining capacity of the site and an estimate of the remaining site life;
- a summary of the weekly, maximum daily and total annual quantity (tonnes) of waste received at the site;
- a summary of any complaints received and the responses made;

- a discussion of any operational problems encountered at the site and corrective action taken;
- any changes to the Design and Operations Report and the Closure Plan that have been approved by the Director since the Annual Report;
- a report on the status of all monitoring wells and a statement as to compliance with Ontario Regulation 903; and
- any other information with respect to the site which the Regional Director may require from time to time.

The amended ECA also stipulates that the following landfill monitoring information must be submitted to MECP by April 30, 2018 and every three years thereafter:

- the results and an interpretative analysis of all leachate, groundwater, surface water and landfill gas monitoring, including an assessment of the need to amend the monitoring programs;
- a detailed discussion of the elevated contaminant concentrations at MW12-I and MW12-II to determine if they result from landfill leachate;
- the Durov plots for each well location need to show the year of each of the plotted points so that the change with time can be determined;
- a single Durov plot that provides a comparison between MW12-I and MW12-II and background and source wells. It may be beneficial to provide series of plots each representing a different time period with a single point from well MW12-I, MW12-II, MW4-II, MW8-I, and MW10. These comparisons can be used to investigate if the elevated contaminant concentrations at MW12-I and MW12-II are due to landfill leachate;
- the adequacy of and need to implement the contingency plans; and
- site plans showing the existing contours of the site; areas of landfilling operation during the reporting period; areas of intended operation during the next reporting period; areas of excavation during the reporting period; the progress of final cover, vegetative cover, and any intermediate cover application; previously existing site facilities; facilities installed during the reporting period; and site preparations and facilities planned for installation during the next reporting period.

Note that issues regarding Site Operations have previously been discussed in detail in the updated Design and Operations (D & O) Plan[2]. It is understood that any additional operational information required by the amended ECA and C of A and not included in the present report will be provided to the MECP by the Municipality of Greenstone.

[2] EXP Services Inc. (Dec. 2018). *Updated Design and Operations Plan, Longlac Waste Disposal Site, Municipality of Greenstone, Ontario*. EXP Ref No. THB-00006196-NE. December 12, 2018.

4 Operational Information

4.1 Volume of Landfill Waste

Landfill waste deposition commenced sometime prior to 1997 with waste initially being deposited approximately 40 m north of the entrance. While landfill deposition began at the current location in 1998, there is no available information on the method of disposal and estimated waste volumes between 1998 and 2006. It appears that the waste disposal method was changed to a bench or area fill method in recent years. Based on calculations detailed in EXP's (formerly Trow Associates Inc.) previous Design and Operations Plan[3], the previous fill area has an estimated total volume of about 13,125 m^3. As of the end of 2007, the waste volume in the current site (including interim cover) was estimated to be about 51,000 m^3. Updated waste volumes are presented below.

4.2 Remaining Life Expectancy

Based on an approved capacity of 262,300 m^3 (including final cover), less than 20 percent of the total capacity was expended from 1998 through 2006. Calculations by a previous consultant (AEC) in 1997 gave the landfill an estimated life expectancy of 40 years which was based on an estimated 5,920 m^3 of waste (and interim cover) per year. Based on these numbers, the remaining landfill capacity at the end of 2006 was estimated to be 195,500 m^3. No waste volume was reported in 2007; however, it has been assumed that the average of 5,920 m^3 was deposited. In 2008, approximately 4,600 m^3 of waste (excluding cover material) was deposited on site. Using an adjusted estimated annual (long term) volume of refuse and interim cover material of 6,300 m^3 (refer to Design and Operations Plan [D&O]), EXP previously estimated that the landfill would reach capacity in 2032, assuming no significant increases of population or expansion of the service area. The previous calculations by AEC appear to have coincided reasonably well with EXP's capacity and life expectancy calculations; however, AEC's calculations were based on the trench method and, as indicated, the site switched to the bench system which gave added capacity.

A site survey was conducted in October 2009 to determine the limit of fill, surface contours and the current volume of waste, including any cover, and to update contours. Delta Survey determined that approximately 28,000 m^3 of waste and cover material were deposited at the site during the three-year period from November 2006 to October 2009. This equates to some 9,330 m^3/yr., which was substantially greater than a previous estimate of 6,300 m^3/yr. An updated topographic survey was conducted in June 2015, which indicated that about 34,900 m^3 of waste and interim cover had been deposited at the site since October 2009, representing five years and eight months (5.67 years or 68 months) of deposition. This equates to some 6,150 m^3/yr., which is similar to an earlier (2007) estimate of 6,300 m^3/yr. Based on an estimated *in situ* volume of 72,700 m^3 in October 2009, and the June 10, 2015 topographic survey, the estimated total *in situ* volume as of June 2015 was about 107,600 m^3. On June

[3] Trow Associates Inc., (2007). *Design and Operations Plan*, Longlac Landfill, Municipality of Greenstone, Ontario. Project No. F-06196-A/E, May 1, 2007.

28 and 29, 2017, an additional topographic survey was conducted, and indicated that about 14,500 m^3 of waste and cover material were deposited at the site during the two-year period (June 2015 to June 2017 – about 25 months), which equates to about 6,960 m^3 per year. This results in a total *in situ* volume on site at the end of June 2017 of about 122,100 m^3.

The most recent topographic survey was conducted on September 8-9, 2020. It revealed a volume increase from the previous survey (conducted end-June 2017) of only some 5,800 m^3, equating to only about 1,830 m^3/yr. This surprisingly low figure (significantly lower than expected) can possibly be attributed to efforts to move the waste pile into the approved footprint, which may have compressed the waste (note that the surveyed footprint in the 2020 survey was reduced in size from the 2017 survey). It is also possible that not all of the material included in the waste volume in that part of the former expanded waste footprint area that is no longer included in the current area was moved into the current area (resulting is a "loss" of waste). In any event, the estimated in situ volume (waste and interim cover) at the end of August, 2020 was about 127,900 m^3. Allowing for an additional 2,100 m^3 of waste during the remaining four months of 2020 (based on about 500 m^3 per month – typical historical volume increase of about 6,150 m^3 per year – see above) results in an estimated total of 129,900 m^3 as of the end of 2020.

Based on a total landfill capacity of 228,300 m^3 (excluding estimated final cover volume of 34,000 m^3), the estimated remaining capacity is about 99,300 m^3. The current estimated remaining lifespan (based on an historical average of 6,150 m^3/yr. of waste and interim cover) is therefore about 16 years, or to end-2036. This is four years longer than the previous estimate of 2032 given in the Annual Report for 2019 (which utilized a figure of 6,900 m^3/yr based on the previous topographic survey findings), but it agrees quite closely with the estimated closure date of 2035 given in EXP's previous monitoring report.

It appears that the Municipality's waste volume records continue to over-estimate the actual quantities of compacted waste. It is noted that the waste estimates and projected lifespan are subject to annual review. Updated contours with calculations of actual increases in waste and interim cover material are required every three years. The next updated contour survey will be provided with the Environmental Quality Monitoring Report (including the Annual Report for 2023) due April 30, 2024.

Stratigraphic-sections (based on September 2020 survey data, as well as historical data to show differences) are given in Figures 8, 9 and 10.

4.3 Summary of Waste Volumes for 2020

Based on information provided by the Municipality of Greenstone, the weekly as-delivered and uncompacted volumes of waste received/deposited at the Longlac Landfill in 2020 are summarized below. The 2018 and 2019 weekly volumes were reported in the annual reports previously submitted.

Weekly As-Delivered Waste Volumes – 2020					
Week	Volume (m^3)	Week	Volume (m^3)	Week	Volume (m^3)
Jan. 1 – 6	55.5	May 3 – 9	104.5	Sept. 5 – 12	76.0
Jan. 7 – 13	74.0	May 10 – 16	92.0	Sept. 13 – 19	95.0
Jan. 14 – 20	38.5	May 17 – 23	110.0	Sept. 20 – 26	82.0
Jan. 21 – 27	99.5	May 24 – 30	66.5	Sept. 27 – Oct. 3	82.5
Jan. 28 – Feb. 3	57.0	June 1 – 6	110.0	Oct. 4 – 9	50.5
Feb. 4 – 10	55.0	June 7 – 13	106.0	Oct. 10 – 17	120.5
Feb. 11 – 19	107.5	June 14 – 20	174.0	Oct. 18 – 24	43.5
Feb. 18 – 24	74.0	June 21 – 27	82.5	Oct. 25 – 31	112.0
Feb. 25 – Mar. 2	103.0	June 28 – July 4	36.0	Nov. 1 – 6	209.5
Mar. 3 – 8	69.5	July 5 – 11	83.0	Nov. 7 – 13	48.0
Mar. 9 – 14	30.5	July 12 – 18	77.0	Nov. 14 – 20	64.0
Mar. 15 – 21	65.5	July 19 - 25	78.0	Nov. 21 – 26	163.0
Mar. 22 – 27	39.5	July 26 – Aug. 1	66.5	Nov. 26 – Dec. 2	541.5
Mar 28 – Apr. 1	37.0	Aug. 2 – 8	75.0	Dec. 3 – 9	40.5
Apr. 2 – 8	73.5	Aug. 9 – 15	63.0	Dec. 10 – 16	59.0
Apr. 9 – 18	121.5	Aug. 16 – 22	105.0	Dec. 17 – 23	52.5
Apr. 19 – 25	52.5	Aug. 23 – 29	65.0	Dec. 24 – 30	31.5
Apr. 26 – May 2	158.0	Aug. 30 – Sept.	62.5	**TOTAL**	**4739.5**

As indicated above, the approximate total waste volume received at the Longlac Landfill in 2020 was 4,739.5 m^3. This is similar to the volumes deposited in both 2017 and 2018. The estimated annual volumes over the 2018-2020 monitoring period are less than the 2016 estimated volume of 6,750 m^3 and are also considerably less than the estimated annual long-term average (for landfill lifespan calculations) of 6,150 m^3 (which, however, includes interim cover). In 2020, the maximum volume of waste received in a week was 541.5 m^3, during the period of November 26 to December 2. The maximum daily volume of 222.75 m^3 was received on December 2, most of which represented demolition waste from a fire-damaged motel in Geraldton.

4.4 Operational Problems and Complaints

Municipality of Greenstone personnel advised that there were no significant operational problems or public complaints regarding the Longlac Landfill during the 2018 to 2020 reporting period.

4.5 Waste Types and Waste Diversion

The landfill only accepts solid non-hazardous municipal waste, including wood, as well as certain recyclable materials (see below).

It was recommended in the Design and Operations Plan (referenced above) that a recycling depot (i.e., for standard recyclables such as glass, plastic, metal containers [steel and aluminum], tetra packs, paper and cardboard) be established at the site. It is understood that no action has yet been taken on this matter. However, the following recyclable materials are accepted at the site: used tires, scrap metal, batteries, electronic waste, fluorescent bulbs, refrigerators/freezers (tagged).

A temporary HHW depot designed to meet MECP requirements was established by the Municipality at the Longlac Landfill, and was operated over the following dates during the current reporting period:

- 2018 - June 15 to August 25
- 2019 - July 6 to September 7
- 2020 – July 4 to September 5

Manifests for the collection of HHW materials in 2020 are provided in Appendix H. Manifests for 2019 and 2018 were provided in the Annual Reports for those years.

The Municipality of Greenstone intends to operate the HHW depot annually during the summer months. 2020 was the sixth consecutive year of operation.

A small amount of concrete with rebar, originally deposited over 20 years ago, remains buried in the southeast corner of the landfill.

Additional details concerning operation of the landfill are provided in the D&O Plan.

5 Field Procedures

5.1 Monitoring Program

As indicated, EXP was commissioned to conduct two monitoring events (spring and fall) in 2018, 2019 and 2020 (current reporting period).

At the time of monitoring, above-ground well components were inspected for compliance with O.Reg. 903. In 2020, MW9 was significantly heaved and well repairs are needed. All other monitoring wells were in compliance in 2020.

5.2 Sampling Protocol

EXP personnel collected water samples on May 15 and October 16, 2018; May 7-8 and October 29-30, 2019; and May 12 and September 30, 2020. The fieldwork included collection of groundwater samples from all monitoring wells and collection of surface water samples from three (3) locations (ditch along the north side of Crib Road and two constructed ponds near the westerly site limit) during the spring and fall events, where conditions permitted.

Prior to purging, static water levels were measured in each sampled well using an electronic water level indicator. Between measurements, the stainless-steel probe of the indicator was rinsed with distilled water in order to prevent cross contamination of the wells. Each well was then purged (minimum 3 well volumes or to dryness) using the dedicated Waterra® sampling equipment and allowed to recover prior to sampling. Groundwater samples were collected directly from the sampling equipment into bottles provided precleaned and with appropriate preservatives by the laboratory. Groundwater samples for metals, including mercury analysis were generally filtered in the field at the time of sample collection using in-line 0.45-micron filter cartridges. Surface water samples were collected directly from the water body using unpreserved bottles supplied by the laboratory in a manner as to not disturb sediment. Sample bottles containing any required preservatives were then filled from unpreserved bottles.

The filled sample bottles were placed in chilled coolers and couriered under chain-of-custody to Maxxam Analytics Inc. (renamed Bureau Veritas Laboratories as of fall, 2019), a CALA-certified laboratory located in Mississauga, Ontario.

6 Results and Discussion

6.1 Groundwater

The laboratory reports containing the analytical results for the 2018, 2019 and 2020 (current reporting period) monitoring programs are provided in Appendix E.

The groundwater results for the current reporting period are summarized along with historical results in Appendix D, Table 3, where they are compared to criteria given in the MECP's *Technical Support Document for Ontario Drinking Water Standards, Objectives and Guidelines* (ODWS, June 2003). The ODWS criteria can be either standards (**Maximum Acceptable Concentrations** and **Interim Maximum Acceptable Concentrations**) or objectives (**Aesthetic Objectives** and **Operational Guidelines**). Graphs of concentration versus time (selected parameters only) are found in Appendix F, and are discussed in the context of possible trends suggestive of increasing impact in Section 6.1.5. Durov plots, which present the major ion chemistry in graphical format, are provided in Appendix G.

6.1.1 Background Conditions

MW1 & MW10

Monitoring well **MW1** (screened in sandy silt at about 5.7 to 7 m depth)**,** which is upgradient of the identified area of municipal waste placement, was tentatively identified as a background well. However, the AEC report stated that some historical wood waste placement occurred in the vicinity of this well. Historical monitoring data (including elevated conductivity, TDS, DOC, nitrate, nitrite, alkalinity) and results for the June 2008 monitoring event at this well also suggested impact. Therefore, a new background well MW10 (screened in silty sand till at about 2.5 to 5.8 m depth) was installed north of MW1 in late June 2008.

In 2018-2020, similar to previous years, parameter results at **MW10** were generally within ODWS criteria with the exception of hardness and organic nitrogen, which appear to be naturally elevated. There was also a marginal exceedance for manganese in the May 2020 sample (though not a historical high), while aluminum in this sample was a historical high. Remaining results generally fell within historical ranges.

6.1.2 Source Well Conditions

MW7, MW8-I & MW8-II

In the absence of a true "source well" (i.e., directly through the waste material), and for the purposes of this report, the results for **MW7** (screened in silty sand with gravel at about 5.3 to 6.4 m depth), located about 50 m east of the active fill pile, and/or paired wells **MW8-I** (screened in sandy gravel at about 8.5 to 10 m depth) and **MW8-II** (screened in silt below sand and gravel at about 4.5 to 6 m depth), located about 50 m off the southern toe of the active fill pile, are considered to potentially indicate source concentrations due to their

proximity to the downgradient toe of the active landfill. Historical and current exceedances of ODWS criteria are summarized in the following table.

Source Well Historical (pre-2018) and Current ODWS Exceedances		
Well	**Historical ODWS Exceedances**	**2018 to 2020 ODWS Exceedances**
MW7	TDS, hardness, DOC, organic nitrogen, sodium, alkalinity, chloride, nitrate, iron, manganese	TDS, hardness, DOC, organic nitrogen, nitrate, alkalinity, iron, manganese
MW8-I	TDS, hardness, DOC, organic nitrogen, sodium, alkalinity, chloride, sulphate, aluminum, iron, manganese	TDS, hardness, DOC, organic nitrogen, sodium, chloride, alkalinity, aluminum, iron, manganese
MW8-II	TDS, hardness, DOC, organic nitrogen, aluminum, manganese	TDS, hardness, organic nitrogen, manganese
Note: 1) *Italics* indicate that the ODWS exceedance is new (i.e., not present historically).		

Generally, the parameters which exceeded ODWS criteria in the current reporting period (2018 to 2020) were similar to the historical parameters exceeded, and there were no new exceedances.

MW8-I (deeper paired well) continues to generally be the most highly impacted well on the site, followed by MW7, which, however, has higher nitrate levels than MW8-I.

Compared with MW8-I, MW8-II (the shallower of the paired wells) has generally much lower levels of indicator parameters, which is an indication of a sinking plume at this location.

The following historical highs were noted during the current monitoring period:

MW7 – hardness (May 2018), organic nitrogen (Oct. 2019), calcium (May 2018), potassium (Oct. 2018 & Sept. 2020), nitrate (May 2018), nitrite (Oct. 2019), sulphate (Oct. 2019), total phosphorus (May 2018)

MW8-I – aluminum (May 2020), boron (May 2020), iron (May 2019), benzene (Oct. 2019)

MW8-II – ammonia (Oct. 2019), potassium (Oct. 2019), sodium (Oct. 2019), nitrite (Oct. 2019), boron (Oct. 2019)

6.1.3 West and Southwest of Bedrock Knoll

MW4-I

Well **MW4-I** (screened in sandy/clayey silt at about 13.1 to 14.7 m depth) is located adjacent to the northwest (cross-gradient) corner of the active landfill. Historical ODWS exceedances included TDS, hardness, DOC, organic nitrogen, alkalinity, aluminum, iron and manganese. During some or all of the current reporting period (2018 to 2020), exceedances were reported for hardness, organic nitrogen, iron and manganese. These are potentially largely of natural origin, although some leachate impact is possible. A spike, but not a historical high, was noted for potassium in October 2018.

MW4-II

Well **MW4-II** (screened in well mixed silt with sand & gravel at about 2.5 to 5.5 m depth) is located adjacent to MW4-I. Historical exceedances included TDS, hardness, DOC, organic nitrogen, nitrite, sodium, alkalinity and manganese. TDS, hardness, DOC, organic nitrogen, nitrite, alkalinity, aluminum, iron and manganese exceeded ODWS criteria in one or more samples from 2018 to 2020. There is evidently more leachate impact in this well than in the deeper well MW4-I; therefore, a sinking plume is not present here. Historical highs and spikes were noted for iron in May 2020 and for hardness, magnesium and manganese in September 2020, while historical highs were noted for nitrite (Sept. 2020), aluminum (May 2020) and total phosphorus (Oct. 2019).

MW9

Well **MW9** (screened in sandy silt with gravel at about 1.1 to 3.2 m depth) is located approximately 30 metres southwest of the former landfill area. Historical ODWS exceedances included hardness, organic nitrogen, aluminum, iron and manganese. Only hardness and organic nitrogen exceeded ODWS criteria in 2018 to 2020. The generally low levels of leachate-related parameters at MW9 (roughly similar to those in background well MW10) suggest that the contaminant plume emanating from the former fill area is concentrated beneath the current depth at MW9, and/or that the groundwater divide does not extend quite so far to the southwest, and the slight gradient from MW9 towards MW8-I (about 6.0 $x10^{-4}$ m/m) is enough to direct the plume in a southeast direction (as interpreted on Figure 6).

MW12-I

Well **MW12-I** (screened in bedrock at about 3.8 to 7.6 m depth) is located about 30 m southwest of the entrance to the landfill near the southwest attenuation zone boundary. This well was installed in June 2008 and groundwater samples were collected for the first time during the 2008 summer sampling event. Historical ODWS exceedances included TDS, hardness, organic nitrogen and manganese. These same parameters also revealed exceedances during the 2018 to 2020 monitoring period. However, there were also single exceedances for aluminum and iron. Results were similar to historical ranges with the exception of the new single exceedances.

MW12-II

Well **MW12-II** (screened in sand and gravel at about 1.5 to 3.0 m depth) is located adjacent to MW12-I. This well was installed in June 2008 and groundwater samples were collected for the first time during the 2008 summer sampling event. Historical ODWS exceedances included TDS, hardness, organic nitrogen and manganese. In 2018 to 2020, ODWS exceedances included TDS, hardness and organic nitrogen, as well as single exceedances for aluminum and iron (i.e., similar to MW12-I). Levels of indicator parameters in MW12-II generally remained slightly higher than in the deeper paired well. Based on the levels and types of potential contaminants present, relative to those found in the "source" wells, impact at this location could be related to vehicles accessing the landfill via Crib Road (including road salt impacts) and/or possible impact from snowmobile traffic on the nearby skidoo trail. The possibility of leachate impact in the vicinity of MW12 is discussed further below.

MW8-I / II and MW12-I / II Comparison

As previously indicated, MW8-I / II are the source wells, and MW12-I / II are the boundary wells. Note that MW8-I / II is about 180 m upgradient from MW12-I / II compared to about 270 between MW12-I / II and MW7; as such, no comparison between source well MW7 with boundary wells is made at this time. MW8-I and MW12-I are the deeper wells of their nested pair (MW8-II and MW12-II are the shallow wells).

As previously indicated, concentrations in MW8-I were generally higher than in MW8-II (and MW8-I results were also generally higher than MW7).

Concentrations that exceeded ODWS criteria during the current reporting period in both the deep source well (MW8-I) and the deep boundary well (MW12-I) were TDS, hardness, organic nitrogen, manganese, iron (with the boundary well only having a single possibly anomalous exceedance) and aluminum (with each well having only a single possibly anomalous exceedance). Note that hardness, organic nitrogen and manganese exceeded ODWS levels in the background well MW10 suggesting that these parameters are naturally elevated in the area. Parameters that exceeded ODWS levels in the deep source well (MW8-I) but did not exceed in the deep boundary well (MW12-I) include DOC, sodium, chloride and alkalinity, the concentrations of which were appreciably lower in MW12-I compared to MW8-I. Levels of several parameters (e.g., TDS, aluminum, iron) exceeded ODWS criteria in MW12-I but not in the background well MW10 during the current monitoring period.

Parameters that exceeded ODWS criteria during the current reporting period in both the shallow source well (MW8-II) and the shallow boundary well (MW12-II) were TDS, hardness and organic nitrogen. Again, note that hardness and organic nitrogen, as well as manganese, exceeded ODWS levels in the background well MW10, suggesting that these parameters are naturally elevated in the area. The only parameter that exceeded ODWS levels in the shallow source well (MW8-ll) but did not exceed in the shallow boundary well (MW12-II) was manganese. The shallow boundary well also had single possibly-anomalous exceedances for aluminum and iron. Potential salt-related parameters including conductivity, TDS and calcium, as well as alkalinity, were generally higher at the boundary well, MW12-II, than in the

source well MW8-II. Levels of sodium and chloride were somewhat higher in the source well MW8-II.

A comparison of trends in wells MW12-I&II with those for source (leachate-impacted) wells is found in Section 6.1.5.

6.1.4 East and South of Bedrock Knoll

As previously discussed, the east/southeast flow direction is considered to be the most significant landfill leachate pathway to potential off-site receptors (i.e., creek about 750 m southeast of site). A cross-section is illustrated in Figure 10.

Well **MW5** (screened in silty sand at about 7.3 to 10 m depth) is located northeast of the active fill pile. Historical exceedances of ODWS criteria included hardness, organic nitrogen, aluminum, iron and manganese, likely all of natural origin, except for aluminum and iron which appear to be anomalous. In 2018 to 2020, hardness and organic nitrogen exceeded ODWS criteria. Results are similar to historical levels. Although potentially hydraulically downgradient of MW1, at present there do not appear to be leachate-related impacts at this location and depth.

Well **MW6** (screened in silty sand with gravel at about 16.1 to 17.7 m depth) is located immediately east of the northeast limit of waste placement. Historical ODWS exceedances included TDS, hardness, DOC, organic nitrogen, alkalinity, aluminum, iron and manganese. Hardness, organic nitrogen, alkalinity, aluminum, iron and manganese exceeded ODWS criteria in 2018 to 2020. Results were generally within historical ranges, with the notable exception of September 2020 spikes and historical highs for aluminum and iron. It is possible that the plume is more highly concentrated above the level of the screen at this location.

Well **MW11-I** (screened in silty material at about 7.0 to 10.1 m depth) is located about 40 m north of Crib Road and about 280 m southeast of the active fill area. This well was installed in September 2009 and groundwater samples were collected for the first time during the fall sampling event that year. Historical exceedances of ODWS criteria included TDS, hardness, DOC, organic nitrogen, alkalinity, iron and manganese. 2018 to 2020 ODWS exceedances included these same parameters, as well as a potentially-anomalous aluminum exceedance in the May 2020 sample (as was also reported in some other wells). The levels of potential contaminants present, relative to those found in the “source” and background wells, suggest some leachate impact at this location. It is possible, however, that some of the apparent contaminant levels are due to other sources (i.e., natural sources, road salt application on Crib Road). Historical highs were noted for hardness, calcium, magnesium, aluminum, iron and manganese in May 2020, potassium in October 2018, alkalinity in May 2018.

Well **MW11-II** (screened in silt at about 3.1 to 4.6 m depth) is located adjacent to MW11-I. This well was installed in September 2009 and groundwater samples were collected for the first time during the fall sampling event. Historical exceedances of ODWS criteria included TDS, hardness, DOC, organic nitrogen, iron and manganese. In 2018 to 2020, ODWS

exceedances were reported for these same parameters. Levels remained generally lower than in the deeper paired well (MW11-I). Results were generally similar to historical levels.

Well **MW2** (screened in clayey silt at about 2.2 to 3.6 m depth) is located about 650 m southeast (downgradient) of the fill area, and just beyond the attenuation zone boundary. Historical exceedances of ODWS criteria included hardness, DOC, organic nitrogen, iron and manganese. In 2018 to 2020, these same parameters were above ODWS criteria. Based on the parameters and levels measured (including relatively low levels of other potential indicator parameters including conductivity), the absence of any increasing trends of note, and the fact that leachate is not expected to have travelled this distance downgradient, these exceedances are likely attributable to natural conditions.

Well **MW3** (screened in silty material below peat at about 2.6 to 4.1 m depth) is located beyond the downgradient attenuation zone boundary, some 50 m south of Crib Road and about 700 m southeast of the fill area. Historical ODWS exceedances included hardness, organic nitrogen, iron and manganese. Hardness, iron and manganese exceeded ODWS criteria in 2018 to 2020. Similar to MW2, these exceedances are likely attributable to natural conditions.

6.1.5 **Analysis of Trends**

With reference to the time series graphs for selected indicator parameters in Appendix F, there were no strong increasing trends in any of the wells. However, possibly increasing concentrations (based on at least two clearly increased values over the past three years) of the following parameters at the various wells are suggested:

- MW2 (near CAZ boundary): None
- MW3 (near CAZ boundary): None
- MW4-I (deep): None
- MW4-II (shallow): Hardness, Iron, Manganese
- MW5: None
- MW6: None
- MW7 (source well): None
- MW8-I (deep source well): Iron
- MW8-II (shallow source well): Manganese
- MW9: None
- MW10 (background): None
- MW11-I (deep “trigger” well): Alkalinity, Hardness, Iron
- MW11-II (shallow “trigger well”): Alkalinity
- MW12-I (near CAZ boundary - deep): None
- MW12-II (near CAZ boundary - shallow): Alkalinity, Hardness, Iron.

It is noted that the results for the deep source well MW8-I suggest a trend of increasing iron, whereas the deep south boundary well (MW12-I) has no apparent trends. Also, the results for the shallow source well MW8-II suggest a trend for increasing manganese, while the results for the shallow south boundary well (MW12-II) suggest increasing trends for alkalinity,

hardness and iron. With no increasing trends in the deep source well, and increasing trends for different parameters in the shallow source well than in either of the source wells, the suggestion is that the waste site is not the source of the increasing trends (impact) in the south shallow boundary well.

However, the deep trigger well (MW11-I) reveals the same increasing trends as the shallow boundary well (MW12-II). This suggests that deeper impact from the area of the trigger wells may be influencing the results for the south shallow boundary well. The trends for the trigger wells are generally different from those for the source wells, suggesting that the trends for neither the trigger wells nor the boundary wells are due to recent impacts from the source. Additional monitoring is indicated.

6.1.6 **Durov Plots**

The Durov plots for groundwater (Figures G-1 to G-16 in Appendix G), with results depicted in three-year groupings, reflect the differences in chemistry between impacted and non-impacted groundwater at the site. The water chemistry of the wells is described below.

MW2 and **MW3** (both near CAZ boundary) are relatively non-impacted wells and continue to be strongly dominated by calcium and bicarbonate.

MW4-I (deep) is a borderline impacted well and has historically been skewed to the various cations with the 2009 to 2017 results weakly dominated by calcium and magnesium, but the current results appear to be more strongly calcium dominated. The anions continue to be strongly bicarbonate dominated.

MW4-II (shallow) is an impacted well and has historically (2009 to 2017) revealed generally strong sodium and potassium dominance; however, the current reporting period shows weak dominance of sodium, potassium and magnesium, with a now stronger pull towards magnesium.

MW5 is a relatively non-impacted well and continues to be strongly dominated by calcium and bicarbonate.

MW6 is a borderline impacted well which has historically revealed weak calcium dominance but current results show increased calcium dominance. The anions continue to be strongly bicarbonate dominated.

MW7 is an impacted source well and historically revealed generally weak calcium bicarbonate dominance with some pull towards sodium, potassium and chloride. The current anion results generally differ from the historical anions and indicate some sulphate and nitrate pull / dominance.

MW8-I (deep) is an impacted source well and historically revealed no dominance of any specific cation; however, recent results (including current results) indicate pull towards sodium and potassium. The anions continue to be generally bicarbonate dominated.

MW8-II (shallow) is a borderline impacted source well and continues to be generally calcium carbonate dominated.

MW9 is a relatively non-impacted well and continues to be strongly dominated by calcium and bicarbonate.

MW10 (background) is a relatively non-impacted well and continues to be strongly dominated by calcium and bicarbonate.

MW11-I (deep) and **MW11-II** (shallow) are borderline impacted "trigger" wells and continue to be weekly dominated by calcium bicarbonate.

MW12-I (deep) and **MW12-II** (shallow) are borderline impacted wells located near the CAZ boundary and continue to be weekly dominated by calcium bicarbonate.

Relatively non-impacted wells, including MW2, MW3, MW5, MW9 and MW10, continue to be strongly dominated by calcium and bicarbonate. This is a typical background water type in northwestern Ontario. However, water chemistry of clearly impacted wells, including MW4-II, MW7 and especially MW8-I, are skewed toward various other ions, including sodium, potassium, magnesium, sulphate and nitrate, with a weaker dominance by bicarbonate. Wells MW4-I, MW6 and MW8-II appear to be borderline impacted, but they remain essentially calcium/magnesium bicarbonate dominated. The Durov plots for wells MW12-I (deep) and 12-II (shallow) south of Crib Road are nearly identical, and do not appear to suggest any appreciable leachate impact, although they are skewed slightly more toward sulphate and nitrate than are the other non-impacted wells. However, the absence of any apparent appreciable differences between the shallow and deep paired wells at this location is notable in comparison with the results for the well pairs at locations MW4 and MW8, which illustrate clear differences in water quality with depth, associated with differing degrees of leachate impact. This observation supports the contention that there is no appreciable leachate impact at the MW12 location. The Durov plots for wells MW11-I (deep) and MW11-II (shallow) located north of Crib Road and more or less directly hydraulically downgradient of the landfill, also do not suggest significant leachate impact, but they are skewed slightly toward chloride, possibly due to road salt impact. Higher levels of chloride (as well as TDS and conductivity) in the deeper well (MW11-I) than in the shallower well could suggest some impact from a sinking plume (notwithstanding the presence of artesian conditions).

Some trends with time are apparent when comparing the current and historical results, particularly concerning the cation influences at MW4-I / 4-II and MW6, which now reveal more of a calcium pull/dominance trend, and at MW8-I and MW8-II which now reveal more of a trend towards sodium and potassium. In addition, the current results at MW7 indicate a trend towards sulphate and nitrate.

In order to assess in more detail whether there is leachate impact at MW12-I / 12-II, Figures G-17, G-18 and G-19 in Appendix G present Durov plots for the years 2018, 2019 and 2020 (i.e., current monitoring period) that compare the chemistry for these two wells, plus MW4-II (moderately impacted waste footprint well), MW8-I (highly impacted source well) and MW10

(unimpacted background), on the same plot. Differences between the chemistry of groundwater at the MW12 location and the leachate impacted locations (MW4-II and MW8-I) are readily apparent. Differences between the MW12 and MW10 (background) locations are less distinct. The MW12 wells have a slightly larger influence of potential leachate-related anions than the background well, but the cation components are very similar (characteristic of non-leachate impacted groundwater). The main characteristic of the landfill leachate, observed at both MW4-II and MW8-I, appears to be a large sodium + potassium component. Interestingly, MW4-II and the background well have very similar anion components. In total, however, the data suggest that groundwater in MW12-I / MW12-II has not been appreciably impacted by leachate. These results are similar to the previous monitoring period (2015 to 2017).

6.2 Reasonable Use Assessment

The MECP's Guideline B-7, which incorporates the Reasonable Use Policy (RUP) into the Ministry's groundwater management activities, allows off-site impacts from waste disposal sites within established guidelines based on ODWS criteria in order to allow for attenuation of impacts while protecting existing and potential downgradient groundwater users. The guideline allows for increases in concentrations up to 25 and 50 percent of the difference between background and ODWS concentrations for health-related and non-health-related parameters, respectively. The guideline applies only to groundwater at or beyond the attenuation zone boundary.

As previously discussed, new background well MW10 was installed in June 2008 to replace the previous background well (MW1). RUP criteria for 2018 to 2020 were calculated using the arithmetic mean of the most recent three years' results for well MW10 (which is hydraulically upgradient of the municipal waste dump areas and has the highest groundwater elevation of any of the wells). The assessment is provided for all wells in the attached summary tables. The attenuation zone, by definition, is intended to allow for contaminant concentrations to decrease to Guideline B-7 levels as the groundwater migrates toward the attenuation boundary. Exceedances of the RUP criteria are normal and not unexpected within an attenuation zone. However, MW2 and MW3 are outside the attenuation zone and MW12-I&II are at the southwest attenuation zone boundary; therefore, Guideline B-7 criteria are considered most applicable to the results for these wells. Exceedances of the calculated criteria in 2018 to 2020 are summarized in the following table. Historical (2009 to 2017) exceedances are bracketed.

Parameters Exceeding Guideline B-7 (RUP) Criteria in 2018 to 2020	
Monitoring Well	**Exceedance(s)**
MW1	Not sampled (TDS, DOC, nitrate, nitrite, alkalinity)[1]
MW2[2]	DOC, iron, manganese (DOC, organic nitrogen, iron, manganese)

Parameters Exceeding Guideline B-7 (RUP) Criteria in 2018 to 2020	
Monitoring Well	**Exceedance(s)**
MW3	Iron, manganese (DOC, organic nitrogen, iron, manganese)
MW4-I	Hardness, organic nitrogen, iron, manganese (TDS, hardness, DOC, organic nitrogen, alkalinity, iron, manganese)
MW4-II	TDS, hardness, DOC, organic nitrogen, nitrate, nitrite, alkalinity, iron, manganese (TDS, hardness, DOC, organic nitrogen, sodium, chloride, nitrate, nitrite, alkalinity, barium, manganese)
MW5	Hardness, organic nitrogen (hardness, DOC, organic nitrogen, nitrate, aluminum, iron)
MW6	TDS, hardness, DOC, organic nitrogen, alkalinity, iron, manganese (TDS, hardness, DOC, organic nitrogen, nitrite, alkalinity, arsenic, iron, manganese)
MW7	TDS, hardness, DOC, organic nitrogen, sodium, chloride, nitrate, nitrite, alkalinity, arsenic, iron, manganese (TDS, hardness, DOC, organic nitrogen, sodium, chloride, nitrate, nitrite, alkalinity, arsenic, barium, boron, iron, manganese)
MW8-I	TDS, hardness, DOC, organic nitrogen, sodium, chloride, sulphate, alkalinity, aluminum, arsenic, barium, boron, iron, manganese (TDS, hardness, DOC, organic nitrogen, sodium, chloride, sulphate, alkalinity, arsenic, barium, boron, iron, manganese)
MW8-II	TDS, hardness, DOC, organic nitrogen, nitrite, alkalinity, manganese (TDS, hardness, DOC, organic nitrogen, nitrate, nitrite, alkalinity, manganese)
MW9	Hardness, organic nitrogen, nitrate (TDS, hardness, DOC, organic nitrogen, nitrate, alkalinity, manganese)
MW10 (background)	Hardness, organic nitrogen, manganese (hardness, DOC, organic nitrogen, manganese)
MW11-I	TDS, hardness, DOC, organic nitrogen, alkalinity, aluminum, iron, manganese (TDS, hardness, DOC, organic nitrogen, chloride, alkalinity, iron, manganese)
MW11-II	TDS, hardness, DOC, organic nitrogen, alkalinity, iron, manganese (TDS, hardness, DOC, organic nitrogen, chloride, alkalinity, iron, manganese)
MW12-I	TDS, hardness, organic nitrogen, alkalinity, aluminum, iron, manganese (TDS, hardness, organic nitrogen, alkalinity, manganese)

Parameters Exceeding Guideline B-7 (RUP) Criteria in 2018 to 2020	
Monitoring Well	**Exceedance(s)**
MW12-II	TDS, hardness, organic nitrogen, alkalinity, aluminum, iron (TDS, hardness, DOC, organic nitrogen, alkalinity, manganese)

Notes: 1. Historical (2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016 and/or 2017) parameter exceedances are bracketed.
2. **Bold** indicates well at or beyond attenuation zone boundary (i.e., RUP criteria are applicable).

6.2.1 Well MW2

MW2 is situated about 15 m beyond the attenuation zone boundary, in organic (peaty) terrain underlain with silty clay. Generally similar to historical findings, DOC, iron and manganese exceeded RUP criteria at this location in 2018 to 2020; however, these parameters are highly variable in northern Ontario groundwater and may be naturally elevated in areas of organic terrain. In general, there are no apparent trends toward increasing contaminant levels in MW2, relative to background and RUP criteria, which might suggest leachate impact at this location.

6.2.2 Well MW3

MW3 is situated about 65 m beyond the attenuation zone boundary, also in organic (peaty) terrain underlain by silty clay. In 2018 to 2020, iron and manganese exceeded RUP criteria, generally consistent with historical exceedances. As previously stated, these parameters are highly variable in northern Ontario groundwater and may be naturally elevated in areas of organic terrain. As with MW2, there are no apparent trends toward increasing contaminant levels in MW3.

6.2.3 Well MW12-I

MW12-I is situated at the southwest attenuation zone boundary and is screened in bedrock underlying a sand and gravel and silty sand stratum. This well is located near a snowmobile trail. In 2018 to 2020, TDS, hardness, organic nitrogen, alkalinity, aluminum, iron and manganese exceeded RUP criteria. The exceedances for aluminum and iron were not reported historically. However, they are based on a single exceedance for each parameter (May 2020) and are considered likely to be anomalous. In general, and as discussed above, the nature and degree of current exceedances do not suggest any appreciable leachate impact. In addition, the available data do not indicate any increasing trends. This is the only bedrock monitoring well at the site, and results could reflect differing bedrock chemistry relative to overburden wells.

6.2.4 **Well MW12-II**

MW12-II is the shallow well of the nested pair and is screened in sand and gravel. TDS, hardness, organic nitrogen, alkalinity, aluminum and iron exceeded RUP criteria in 2018 to 2020. Similar to the deeper paired well MW12-I, the exceedances for aluminum and iron were not reported historically. However, they also are based mainly on a single exceedance for each parameter (May 2020) and are considered likely to be anomalous. There was an additional, although much smaller, exceedance of the B-7 criterion for aluminum in the September 2020 sample. Whatever the reason for the elevated aluminum, aluminum levels are not elevated in the source wells, so landfill leachate cannot be the cause. The exceedances for hardness and organic nitrogen are potentially attributable to naturally variable conditions in northern Ontario groundwater, although hardness could be trending higher, suggesting possible leachate impact. The TDS exceedance could reflect local road salt impact, although again some leachate impact seems likely. Also, a historical high for alkalinity was reported in the May 2018 sample, and it is possible that alkalinity, as well as hardness and iron, are trending higher. However, ongoing monitoring is indicated to determine whether leachate impacts are occurring that could justify expansion of the attenuation zone.

6.3 **Surface Water**

The analytical results for the surface water samples collected from the ditch along the north side of Crib Road at the point where the ditch discharges to the adjacent south-flowing creek (location SW1 on Figure 5) and the two ponds along the westerly limit of the property (locations SW2 and SW3) are tabulated in Appendix D, Table 4.

6.3.1 **SW1**

During the 2018 to 2020 reporting period, a single exceedance of the PWQO criterion for iron (September 2020) was reported at SW1, but the value was well within the historical range. The iron was possibly associated with suspended particulate. The available monitoring data do not reveal any trends. At present, the landfill does not appear to be impacting the waters in the downgradient creek.

6.3.2 **SW2**

This location is both topographically (surface water) and hydraulically (groundwater) downgradient of the active waste pile. In 2018 to 2020, reported laboratory exceedances of PWQO or interim PWQO criteria at SW2 included: phenols, boron and phosphorus, generally similar to historical results which also revealed exceedances for aluminum and iron. Parameters which had historically shown increasing trends appear to have largely levelled off, although a historical high was reported for boron. However, generally elevated levels relative to SW1 indicate leachate impact.

6.3.3 SW3

SW3 is about 65 m south of SW2. The location was dry in September 2020 and no samples were collected. Reported exceedances of PWQO criteria at SW3 in 2018 to 2020 included: phenols, arsenic, boron, cadmium, copper, iron, lead, phosphorus and zinc, generally similar to historical exceedances (which also included aluminum and chromium). Similar to SW2, parameters which had historically shown increasing trends (based largely on the 2017 results) appear to have levelled off, although a few historical highs were reported. In comparison to SW1, leachate impact is again indicated, although at generally lower levels than SW2.

6.3.4 Durov Plots

The Durov plots for the surface water samples (Figures G-20, G-21 and G-22 in Appendix G) illustrate the differences in chemistry between SW1 and the two ponds, SW2 and SW3. The Durov plot for SW1 reveals that the water is strongly dominated by calcium bicarbonate, similar to downgradient wells MW2 and MW3. In comparison, water in the man-made pond SW2 (located along the westerly boundary) is weakly dominated by bicarbonate and sodium and potassium, with the current results generally showing a stronger pull towards sodium and potassium; this is somewhat similar to deep source well MW8-I. SW3 (also located along the westerly boundary) has historically indicated, in general, a weak calcium bicarbonate dominance but during the current reporting period, a stronger pull/dominance of calcium is observed; however, a pull towards sulphate and nitrate (i.e., away from bicarbonate) is also noted; the pull towards sulphate and nitrate is similar to source well MW7. Both of the impacted surface water plots suggest generally increasing impact over time (i.e., pre-2012 versus 2012 to present).

6.4 QA/QC

6.4.1 Cation/Anion Balances

In general, a cation/anion balance difference of up to 10% is considered acceptable. However, since the chemistry of groundwater affected by landfills can be quite complex and may not be balanced by the method used, the anion-cation balances of background monitoring wells are considered to be a better indicator of the reliability of results.

Reported ion balances for monitoring well results in 2018 to 2020 (shown on the summary tables) were generally below 10%, which is considered acceptable, with the exception of the following:

- MW4-II: May 2018 sample ion balance = 10.3%
- MW6: May 2020 sample ion balance = 17.7% and 14.7% in the two duplicates
- MW6: September 2020 sample ion balance = 10.5%
- MW8-II: May 2018 ion balance = 15.3%
- MW11-I: May 2020 ion balance = 13.6%.

The above somewhat elevated ion balances could suggest some laboratory imprecision, or they could be due to the presence of additional ions that are not accounted for. Regardless, they are not considered significant enough to call into question the overall validity of the results.

6.4.2 Duplicates and Blanks

In 2018 to 2020, six blind duplicate samples (i.e., where a duplicate sample is collected in the field and is labelled with a different but logical sample number) were submitted to the laboratory, and were labelled as MW13. The blind duplicate samples were collected from MW6 and MW7 as indicated below:

May 2018 – MW7
October 2018 – MW7
May 2019 – MW7
October 2019 – MW6
May 2020 – MW6
September 2020 – MW7

The relative percent difference (RPD) between the results for the sample and the field duplicate sample for each analysed parameter was calculated as the absolute value of the following excluding organic nitrogen (obtained by difference):

$$RPD = \frac{(\text{Sample Result} - \text{Duplicate Result}) \times 100}{(\text{Sample Result} + \text{Duplicate Result}) / 2}$$

The RPD calculation is not considered valid for parameters reported to be present in very low concentrations (i.e., where the average of the two results is <5 times the laboratory detection limit). The maximum RPD that EXP generally considers acceptable for blind duplicate groundwater samples is 40%.

Excluding TSS (which is generally not considered a reliable indicator parameter for groundwater samples) and organic nitrogen (obtained by difference), the following comparisons exceeded an RPD of 40%:

May 2018
- Phosphorus = 92%

October 2018
- Nitrate = 44%
- Nitrite = 93%

May 2019
- None

October 2019
- None

May 2020
- COD = 77%
- Nitrite = 48%
- Aluminum = 105%
- Phosphorus = 140%

September 2020
- Nitrite = 58%

Overall, agreement between the original sample and blind duplicate was good (i.e., ≤ 40% difference from the mean). The reported differences did not affect the determination of whether or not groundwater contamination was present, and they are not considered to significantly affect the overall validity of the data.

6.4.3 **Hold Times**

All of the samples were received by the laboratory within two days of collection. Based on the analysis dates reported by the laboratory, the MECP's recommended hold times appear to have been generally met.

6.4.4 **Internal QA/QC**

Internal quality control results (for blanks, spiked samples and lab duplicates) reported by the laboratory appear to be acceptable.

6.5 **Landfill Gas Monitoring**

Landfill gas has not been identified as an issue of concern at this site, and no monitoring for downwell methane levels has been conducted. There are no permanent enclosed structures on or in the vicinity of the site that are considered to have the potential to accumulate landfill gases to potentially hazardous levels. Therefore, a contingency plan for landfill gas has not been developed and is not considered to be required at this time. This issue is discussed further in the Design and Operation Plan previously submitted.

Regardless, however, the ECA requires that all buildings on the site be monitored for methane. Accordingly, during the current monitoring period (2018 – 2020) methane gas measurements were conducted within all structures on the site, including the attendant's shed, at the time of the routine water monitoring events. The methane measurements were obtained using an RKI Eagle 2 gas monitor calibrated to hexane standards. Methane concentrations were reported as the difference between full gas mode vapour concentrations (including methane) and methane elimination mode vapour concentrations. The results are presented in Table 5 in Appendix D.

During the May 2018 monitoring event, methane was detected in all of the structures monitored. Methane levels ranged up to 65 ppm, which is still considered very low in relation to the LEL (lower explosive limit) for methane of about 5% (50,000 ppm). There were no detectable vapour readings (i.e., all values were <10 ppm) during any of the subsequent monitoring events. The May 2018 values are therefore suspect, although there were no other indications of meter malfunction. Note that no occupational exposure limit for methane itself has been established in Ontario.

7 Contingency Plan

In accordance with the C of A, a contingency plan and trigger mechanisms relative to groundwater and surface water quality are required for the site.

Exceedances of MECP Guideline B-7 and/or PWQO criteria, as appropriate, attributable to landfill leachate effects at or beyond the established attenuation zone boundaries to the southeast and west of the landfill are not anticipated. Indeed, as described in this report, no such exceedances are evident based on available monitoring results. However, results for well MW12-II (shallow paired well) on the attenuation zone boundary due southwest of the landfill, indicate possible leachate impact (i.e., exceedances of RUP criteria, notably for alkalinity, hardness and iron, which reveal possible increasing trends). No increasing trends were noted in the deeper paired well MW12-I. These wells are not located within the expected primary plume path, however, which follows the inferred groundwater flow direction indicated on Figure 6. The data are not definitive at this point, and other sources (whether natural or man-made) could be responsible. Additional monitoring is required to determine any trends suggestive of actual leachate impact southwest of the landfill that could require implementation of contingency plan measures.

Wells MW11-I and MW11-II are located downgradient of the waste footprint and about 475 m upgradient (northwest) of the attenuation zone boundary. 2018 to 2020 monitoring results for these wells are compared with “trigger concentrations” that could predict future off-site impact (i.e., above Guideline B-7 levels) in Section 7.1 below.

Should monitoring results indicate or predict exceedances of criteria applicable beyond the attenuation zone boundary, the data would be scrutinized to ensure that they are valid and representative of actual conditions. It might be appropriate to require additional monitoring data before any decisions on remedial actions are made. If it is determined that an unacceptable risk of criteria exceedances is present, the most reasonable recourse would likely be to seek approval to further expand the attenuation zone (given that the Municipality is understood to own lands for a considerable distance in all directions). Should this not be feasible or appropriate, the following measures could be undertaken to reduce leachate volumes and/or strength:

- The groundwater table beneath the waste pile could be lowered through ditching to intercept upgradient surface water and possible shallow groundwater inflow, and/or through other site drainage improvements.
- Landfill waste possibly buried below the groundwater table in some areas could be excavated and deposited above the water table, or alternatively moved to a different approved location.
- The amount and frequency of cover material applications could be increased.
- Lower permeability cover material could be used.

- Volumes of waste deposited in the landfill could be restricted and/or reduced through increased recycling efforts.

- If necessary, active leachate control (e.g., interception via a “French drain” system and redirection or capture for recirculation or treatment) could be implemented.

If the above measures are not successful, as a last recourse, the landfill could require premature capping and closure.

Additional details on contingency measures which would enable the particular nature of the potential impact to be assessed and properly addressed are found in the Design and Operation Plan.

7.1 Trigger Levels

As indicated, trigger levels for implementation of one or more aspects of the groundwater and surface water Contingency Plan would consist of predicted or actual exceedances of applicable criteria at or beyond the attenuation zone boundaries. The applicable criteria for groundwater are RUP criteria calculated according to Guideline B-7. The applicable criteria for surface water are the Provincial Water Quality Objectives.

7.1.1 Groundwater

As previously discussed, the groundwater flow pathway to the southeast is considered to be the main route of concern for migration of the contaminant plume from the landfill site. Monitoring wells MW2 and MW3 are located downgradient of the site in this direction, just outside of the attenuation zone boundary. Current trigger levels for these wells are measured exceedances of Guideline B-7 criteria that could reasonably be ascribed to leachate impact. As previously noted, no such exceedances have been found to date (RUP criteria exceedances indicated are likely due to naturally elevated conditions in organic terrain).

In late 2009, a nested pair of “trigger” wells (consisting of deeper well MW11-I and shallower well MW11-II) were installed downgradient (southeast) of impacted (source) wells MW7 / MW8-I / II, to provide advance warning of possible future RUP criteria exceedances, calculated using results for the new background well MW10. Trigger concentrations for these wells have been developed by assuming a linear decrease in concentration with distance from the source wells through the trigger wells to RUP criteria levels at the attenuation zone boundary. Exceedances of the trigger levels could suggest contaminant migration that might potentially result in future exceedances of RUP criteria at the attenuation zone boundary. The table below outlines the calculated trigger levels for MW11-I and MW11-II in 2018 to 2020.

2018 to 2020 Trigger Levels for Groundwater (mg/L)

Parameter	Source Concentration and Well (MW7, 8-I or 8-II)	B-7 Criteria	MW11-I/11-II Trigger Levels	MW11-I/11-II Maximum 2018-2020 Concentration
TDS	2,357 (MW8-I)	379	1,721	820
DOC	58 (MW8-I)	4.2	41	4.7
Sodium	313 (MW8-I)	101	245	37
Chloride	385 (MW8-I)	126	302	120
Alkalinity	1,500 (MW8-I)	373	1,137	440
Iron	5.8 (MW8-I)	0.19	4.0	1.9
Manganese	0.99 (MW8-I)	0.036	0.68	0.14
Distance from source well MW7 to "trigger point" monitoring well (m)			245	
Distance from source well MW7 to attenuation zone boundary (m)			575	
Distance from source well MW8-I & MW8-II to "trigger point" monitoring well (m)			230	
Distance from source well MW8-I & MW8-II to attenuation zone boundary (m)			715	

Note: Source values are the highest arithmetic mean of the most recent three years' results from either MW7, MW8-I or MW8-II. Generally similar to 2015-2017 (with the exception of iron, for which MW-7 was the source well in 2015-2017), well MW8-I was the source well for all parameters in 2018 to 2020. Therefore, the calculations of all of the above trigger levels utilized the distance values for source wells MW8-I/II.

As was the case in 2015 to 2017, the maximum values measured in MW11-I and 11-II were all well below the trigger levels, and are between three and twelve times lower than source concentrations. Due to the proximity of Crib Road (about 40 m), it is possible that sources other than leachate (e.g., road salting) are contributing to sodium, chloride and TDS levels at MW11-I/11-II.

The groundwater flow pathway to the west is considered to be a secondary route of migration of the contaminant plume. However, as described in the AEC report, given the extent of available westerly attenuation prior to eventual discharge to the Kenogami River (some 2.2 km northwest of the site), impact in this direction is considered to be of lesser concern (given also that there are no identified groundwater users in the intervening area). Additional

monitoring wells west of the site would be indicated if confirmation of conditions in this direction were required. This does not appear to be justified at this time.

As previously noted, there are indications of potential minor off-site impact at wells MW12-I&II which could suggest future exceedances of RUP criteria beyond the attenuation zone due southwest of the waste footprint. Ongoing monitoring is indicated.

7.1.2 **Surface Water**

Trigger levels considered applicable to surface water at this site are actual measured exceedances of PWQO criteria at or beyond the boundary of the attenuation zone that cannot reasonably be ascribed to alternative sources (e.g., road salting, vehicle traffic) or natural conditions. As discussed previously, no such exceedances were measured in samples collected in the current reporting period from location SW1 in the ditch along the north side of Crib Road, with the possible exception of iron. The two man-made ponds denoted as SW2 and SW3 in the western part of the site have had several PWQO exceedances mainly related to trace metals and phenols. Phenols and iron exceedances have occasionally also been noted at SW1, although generally at considerably lower levels potentially attributable to natural conditions. Elevated chloride and TDS levels at SW2, in particular, also suggest leachate impact. Due to the size of the westerly attenuation zone (see Figure 4), this is not presently considered to be of concern.

7.1.3 **Landfill Gas**

Landfill gas has not been identified as an issue of concern at this site, and no monitoring for downwell levels has been conducted. There are no permanent enclosed structures on or in the vicinity of the site that are considered to have the potential to accumulate landfill gases to potentially hazardous methane levels.

As previously discussed, methane gas measurements in on-site structures, including the attendant's shed, at the time of the routine water monitoring events in 2018-2020 were generally non-detectable, except for very low levels reported in all structures during the first event (considered anomalous).

Therefore, a contingency plan for landfill gas is not indicated at this time. This issue is discussed further in the Design and Operation Plan previously submitted.

8 Conclusions

Consistent with historical findings, the 2018 to 2020 monitoring results confirm that leachate with concentrations of several potential indicator parameters (DOC, TDS, alkalinity, conductivity, chloride, iron, manganese) that are typically one to two orders of magnitude higher than background is being generated at the site.

Data also continue to indicate the presence of a sinking leachate plume immediately downgradient of the waste footprint. However, contaminant levels in downgradient wells MW11-I and MW11-II are not predictive of exceedances of RUP criteria beyond the attenuation zone boundary, indicating that impacted groundwater east/southeast of the landfill (considered to be the primary pathway of concern) is being effectively attenuated. Concentrations of potential indicator parameters in nested monitoring wells MW12-I&II at the southwest attenuation zone boundary are somewhat suggestive of potentially-unacceptable leachate impact beyond the attenuation zone in this direction, but in-depth examination of Durov plots does not currently indicate the presence of appreciable leachate impact at this location. The available monitoring data suggest concentrations of alkalinity and iron in shallow well MW12-II may be increasing, however. Ongoing monitoring is indicated to determine whether levels continue to increase, possibly requiring implementation of contingency measures. It is understood that the Municipality owns the lands that could be required for any future expansion of the attenuation zone.

Leachate impact to surface water beyond the attenuation zone boundary (location SW1) is not evident at this time. Although impact is present in ponds along the west side of the waste site (location SW2 and SW3), no such impact would be anticipated to surface water (i.e., Kenogami River, about 2.2 km from the site) beyond the attenuation zone boundary in this direction. However, as previously noted, historical highs were reported for a number of parameters at SW2 and SW3, which could be attributed to waste deposition having moved towards these surface water locations since 2014; refer to Figures 4 and 7.

9 Recommendations

- The monitoring program should be continued in 2021 to 2023, in accordance with the Amendment to ECA, and in accordance with Condition No. 8 of the C of A (now termed ECA).

- Statistical trend analysis (Mann-Kendall) should be conducted on data for selected wells (including MW12-I/II) to determine if levels of parameters of concern are increasing.

- Given that methane levels recorded to date in site buildings have been very low to non-detectable, a request should be made to MECP to delete the requirement for methane measurements.

- To minimize leachate production, when areas of the landfill are brought up to final elevation, they should be capped and seeded as soon as possible (refer to Design and Operations Plan).

- The Municipality should increase waste diversion and recycling activities to the extent possible/practical.

- The Municipality should continue to operate an annual (summer) HHW depot, in accordance with the C of A.

- The Registration on Title of the entire 80 ha site (including the attenuation zone) should be completed as soon as possible.

- The Municipality should continue to ensure that all MECP requirements, including record keeping, reporting, staff training, marking limits of fill boundaries, litter fencing, etc. are being complied with.

10 Closing Comments

This report has been prepared for and is intended for the use of the client (Municipality of Greenstone) and the MECP. The contents of this report may not be reproduced in whole or in part, or used or relied upon in whole or in part by any other party for any purpose whatsoever without the expressed written consent of EXP. Any use which a third party makes of this report, or any reliance on or decision made based on it, is the sole responsibility of such third party and EXP accepts no responsibility for any damages of any kind or nature whatsoever, suffered by any other third party as a result of decisions made or actions based upon this report. The findings are relevant for the date(s) of the investigation and should not be relied upon to represent conditions of other dates.

This report provides certain information concerning the results of the 2018 to 2020 groundwater and surface water monitoring program at the Longlac Landfill, as described herein. It is based on an authorized scope of work. Professional judgement was exercised in gathering and interpreting the information obtained and in the formulation of conclusions.

Conclusions regarding site conditions are based on observations of current and historical conditions and the results of limited chemical analyses. The groundwater and surface water results are only directly applicable to the actual locations sampled, and conditions could differ in areas not tested. Substances could also exist in forms not indicated by the limited analytical testing conducted. Additionally, the scope of work was based, in part, on rules and regulations that we understand to be current or expected at the time of the work. Changes in regulations, interpretations and/or enforcement policies may occur in the future. Such changes could be reflected in the degree of remediation actually required, if any, at the time of the action.

If additional relevant information becomes available concerning this site, such information should be provided to EXP so that our report may be reviewed and modified as necessary. EXP accepts no responsibility for the consequential effects of this factual report on the real or perceived value of this site, or on the ability to sell, finance or insure the property.

All reports, field data, notes, laboratory test data, calculations, estimates and other documents which are communicated by EXP to the client or third parties, are instruments of service and will be retained by EXP. These records will be stored in our files for a period of 10 years following submission of the final report, during which time they will be made available to the client, at all reasonable times, for review.

EXP has conducted the services reported herein in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practising in the same locality and under similar conditions as this project. No other representation, expressed or implied, is included or intended in this document.

We trust that this report is satisfactory for your present requirements. Should you have any questions, please contact the undersigned at your convenience.

Yours truly,

EXP Services Inc.

Ahileas Mitsopoulos, P.Eng
Project Engineer

Robert J. Rinne, M.Sc., QEP
Senior Scientist

Demetri N. Georgiou, MASc., P.Eng.
Principal Engineer/Branch Manager

APPENDIX A – MECP Documentation

Ontario

Ministry of the Environment and Climate Change
Ministère de l'Environnement et de l'Action en matière de changement climatique

AMENDMENT TO ENVIRONMENTAL COMPLIANCE APPROVAL
NUMBER 5968-5ZRM25
Notice No. 1
Issue Date: May 2, 2016

The Corporation of the Municipality of Greenstone
1800 Main St
Post Office Box, No. 70
Geraldton, Ontario
P0T 1M0

Site Location: Longlac Landfill Site
Northside of Kimberly-Clark's Crib Road Exten
Greenstone Municipality, District of Thunder Bay

You are hereby notified that I have amended Approval No. 5968-5ZRM25 issued on June 3, 2008 for the use and operation of 4.5 hectare landfilling/recycling area and 0.6 hectare closed landfill area within a total area of 80 hectares , as follows:

Conditions 6.(6), 6.(7) and 8.(3) is hereby revoked and replaced as follows:

6. RECORD KEEPING AND REPORTING

Annual Report

(6) A written report on the development, operation and monitoring of the *Site,* shall be completed annually (the "Annual Report"). The Annual Report shall be submitted to the *District Manager,* by **April 30th** of the year following the period being reported upon.

(7) The Annual Report shall include the following:

(a) an assessment of the operation and performance of all engineered facilities, the need to amend the design or operation of the *Site;*

(b) calculations of the volume of waste, daily and intermediate cover, and final cover deposited or placed at the *Site* during the reporting period and a calculation of the total volume of *Site* capacity used during the reporting period;

(c) a calculation of the remaining capacity of the *Site* and an estimate of the remaining *Site* life;

(d) a summary of the weekly, maximum daily and total annual quantity (tonnes) of

waste received at the *Site;*

(e) a summary of any complaints received and the responses made;

(f) a discussion of any operational problems encountered at the *Site* and corrective action taken;

(g) any changes to the Design and Operations Report and the Closure Plan that have been approved by the *Director* since the last *Annual Report;*

(h) a report on the status of all monitoring wells and a statement as to compliance with *Ontario Regulation 903;* and

(i) any other information with respect to the *Site* which the *Regional Director* may require from time to time.

8. LANDFILL MONITORING

Surface Water and Ground Water

(3) (1) The *Owner* shall monitor surface water and groundwater in accordance with Item 2 in Schedule "A" with the frequency found in Schedule "B".

(2) (a) The results and an interpretive analysis of all leachate, groundwater, surface water, and landfill gas monitoring, including an assessment of the need to amend the monitoring programs will be submitted **April 30, 2018** and every three (3) years thereafter, alongside the Annual Report required in Condition 6.(7).

(b) The 2018 report shall include but is not limited to:

(i) a detailed discussion of the elevated contaminant concentrations at MW12-I and MW 12-II to determine if they result from landfill leachate.

(ii) the Durov plots for each well location need to show the year of each of the plotted points so that the change with time can be determined.

(iii) a single Durov plot that provides a comparison between MW12-I and MW 12-II and the background and source wells. It may be beneficial to provide series of plots each representing a different time period with a single point from wells MW12-I, MW12-II, MW4-II, MW8-1, AND MW-10. These comparisons can be used to investigate if the elevated contaminants concentrations at MW12-I and MW12-II are due to landfill leachate.

(iv) the adequacy of and need to implement the contingency plans.

(v) site plans showing the existing contours of the *Site;* areas of landfilling operation during the reporting period; areas of intended operation during the next reporting period; areas of excavation during the reporting period; the progress of final cover, vegetative cover, and any intermediate cover application; previously existing site facilities; facilities installed during the reporting period; and site preparations and facilities planned for installation during the next reporting period.

The reason for this amendment to the Approval is as follows:

The reason for this amendment is to reduce the groundwater monitoring program and reporting frequency.

SCHEDULE "B"
Groundwater Sampling Schedule

Sample Number	Time of Sample
1	May or June
2	September or October

This Notice shall constitute part of the approval issued under Approval No. 5968-5ZRM25 dated June 3, 2008

In accordance with Section 139 of the Environmental Protection Act, you may by written Notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act provides that the Notice requiring the hearing shall state:

1. The portions of the environmental compliance approval or each term or condition in the environmental compliance approval in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

Pursuant to subsection 139(3) of the Environmental Protection Act, a hearing may not be required with respect to any terms and conditions in this environmental compliance approval, if the terms and conditions are substantially the same as those contained in an approval that is amended or revoked by this environmental compliance approval.

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The environmental compliance approval number;
6. The date of the environmental compliance approval;
7. The name of the Director, and;
8. The municipality or municipalities within which the project is to be engaged in.

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
655 Bay Street, Suite 1500
Toronto, Ontario
M5G 1E5

AND

The Director appointed for the purposes of Part II.1 of the Environmental Protection Act
Ministry of the Environment and Climate Change
135 St. Clair Avenue West, 1st Floor
Toronto, Ontario
M4V 1P5

*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349, Fax: (416) 326-5370 or www.ert.gov.on.ca**

The above noted activity is approved under s.20.3 of Part II.1 of the Environmental Protection Act.

DATED AT TORONTO this 2nd day of May, 2016

Dale Gable, P.Eng.
Director
appointed for the purposes of Part II.1 of the
Environmental Protection Act

AV/

c: District Manager, MOECC Thunder Bay - District
Ahileas Mitsopoulos, P. Eng., exp Services Inc., The Corporation of the Municipality of Greenstone

Ontario

Ministry of the Environment
Ministère de l'Environnement

AMENDED PROVISIONAL CERTIFICATE OF APPROVAL
WASTE DISPOSAL SITE
NUMBER 5968-5ZRM25
Issue Date: June 3, 2008

The Corporation of the Municipality of Greenstone
PO Box 70
Geraldton, Ontario
P0T 1M0

Site Location: Longlac Landfill Site
North side of Kimberly-Clark's Crib Road Extension
Greenstone Municipality, District of Thunder Bay

You have applied in accordance with Section 27 of the Environmental Protection Act for approval of:

the use and operation of 4.5 hectare landfilling/recycling area and 0.6 hectare closed landfill area within a total area of 80 hectares, as follows:

For the purpose of this Certificate of Approval and the terms and conditions specified below, the following definitions apply:

"CAZ" means the Contaminant Attenuation Zone;

"*Certificate* " means this entire provisional Certificate of Approval document, issued in accordance with section 39 of the *EPA,* and includes any schedules to it, the application and the supporting documentation listed in Schedule "A";

"*Director*" means any *Ministry* employee appointed in writing by the Minister pursuant to section 5 of the EPA as a Director for the purposes of Part V of the *EPA;*

"*District Manager*" means the District Manager of the local district office of the *Ministry* in which the *Site* is geographically located;

"*EPA* " means *Environmental Protection Act* , R.S.O. 1990, c. E. 19, as amended;

"*HHW* " means household hazardous waste;

"*NMA* " means *Nutrient Management Act* , 2002, S.O. 2002, c. 4, as amended from time to time;

"*Operator*" means any person, other than the Owner's employees, authorized by the *Owner* as having

the charge, management or control of any aspect of the *Site* and includes its successors or assigns;

"*Owner*" means any person that is responsible for the establishment or operation of the *Site* being approved by this *Certificate,* and includes the Corporation of the Municipality of Greenstone, its successors and assigns;

"*OWRA* " means the *Ontario Water Resources Act* , R.S.O. 1990, c. O.40, as amended;

"*PA* " means the *Pesticides Act* , R.S.O. 1990, c. P-11, as amended from time to time;

"*Provincial Officer*" means any person designated in writing by the Minister as a provincial officer pursuant to Section 5 of the *OWRA* or Section 5 of the *EPA* or Section 17 of *PA* or Section 4 of *NMA* or Section 8 of *SDWA* .

"*Refrigerant Appliances*" means household appliances which use, or may use refrigerants, and which include, but is not restricted to, refrigerators, freezers and air-conditioning systems;

"*Regional Director* " means the Regional Director of the local Regional Office of the *Ministry* in which the *Site* is located.

"*Regulation 347* " or "*Reg. 347* " means Regulation 347, R.R.O. 1990, made under the EPA, as amended from time to time;

"*SDWA*" means *Safe Drinking Water Act* , 2002, S.O. 2002, c. 32, as amended from time to time;

"*Site* " means the entire waste disposal site, including the buffer lands, and contaminant attenuation zone at Longlac Landfill Site, North side of Kimberly-Clark's Crib Road Extension, Greenstone Municipality, District of Thunder Bay;

"*Trained personnel*" means knowledgeable in the following through instruction and/or practice:

a. relevant waste management legislation, regulations and guidelines;
b. major environmental concerns pertaining to the waste to be handled;
c. occupational health and safety concerns pertaining to the processes and wastes to be handled;
d. management procedures including the use and operation of equipment for the processes and wastes to be handled;
e. emergency response procedures;
f. specific written procedures for the control of nuisance conditions;
g. specific written procedures for refusal of unacceptable waste loads; and
h. the requirements of this *Certificate;* and

"*White Goods*" means household appliances which did not use refrigerants.

You are hereby notified that this approval is issued to you subject to the terms and conditions outlined below:

TERMS AND CONDITIONS

1. GENERAL

Compliance

(1) The *Owner* and *Operator* shall ensure compliance with all the conditions of this *Certificate* and shall ensure that any person authorized to carry out work on or operate any aspect of the *Site* is notified of this *Certificate* and the conditions herein and shall take all reasonable measures to ensure any such person complies with the same.

(2) Any person authorized to carry out work on or operate any aspect of the *Site* shall comply with the conditions of this *Certificate* .

In Accordance

(3) Except as otherwise provided for in this *Certificate* , the *Site* shall be designed, developed, built, operated and maintained in accordance with the applications for *Certificate* s of Approval, dated July 20, 1972 and the supporting documentation listed in Schedule "A".

Interpretation

(4) Where there is a conflict between a provision of any document, including the application, referred to in this *Certificate,* and the conditions of this *Certificate,* the conditions in this *Certificate* shall take precedence.

(5) Where there is a conflict between the application and a provision in any documents listed in Schedule "A", the application shall take precedence, unless it is clear that the purpose of the document was to amend the application and that the *Ministry* approved the amendment.

(6) Where there is a conflict between any two documents listed in Schedule "A", other than the application, the document bearing the most recent date shall take precedence.

(7) The conditions of this *Certificate* are severable. If any condition of this *Certificate,* or the application of any condition of this *Certificate* to any circumstance, is held invalid or unenforceable, the application of such condition to other circumstances and the remainder of this *Certificate* shall not be affected thereby.

Other Legal Obligations

(8) The issuance of, and compliance with, this *Certificate* does not:

(a) relieve any person of any obligation to comply with any provision of any applicable statute, regulation or other legal requirement; or

(b) limit in any way the authority of the *Ministry* to require certain steps be taken or to require the *Owner* and *Operator* to furnish any further information related to compliance with this *Certificate* .

Adverse Effect

(9) The *Owner* and *Operator* shall take steps to minimize and ameliorate any adverse effect on the natural environment or impairment of water quality resulting from the *Site,* including such accelerated or additional monitoring as may be necessary to determine the nature and extent of the effect or impairment.

(10) Despite an *Owner, Operator* or any other person fulfilling any obligations imposed by this *Certificate* the person remains responsible for any contravention of any other condition of this *Certificate* or any applicable statute, regulation, or other legal requirement resulting from any act or omission that caused the adverse effect to the natural environment or impairment of water quality.

Change of Ownership

(11) The *Owner* shall notify the *Director,* in writing, and forward a copy of the notification to the *District Manager,* within 30 days of the occurrence of any changes in the following information:

(a) the ownership of the *Site;*

(b) the *Operator* of the *Site;*

(c) the address of the *Owner or Operator;* and

(d) the partners, where the *Owner or Operator* is or at any time becomes a partnership and a copy of the most recent declaration filed under the *Business Names Act* , R. S. O. 1990, c. B.17, shall be included in the notification.

(12) No portion of this *Site* shall be transferred or encumbered prior to or after closing of the *Site* unless the *Director* is notified in advance and sufficient financial assurance is deposited with the *Ministry* to ensure that these conditions will be carried out.

(13) In the event of any change in *Ownership* of the works, other than change to a successor Owner, the *Owner* shall notify the successor of and provide the successor with a copy of this *Certificate,* and the *Owner* shall provide a copy of the notification to the *District Manager* and the *Director.*

Certificate of Requirement/Registration on Title - Site

(14) The Owner shall:

(a) Within 60 days of the date of the issuance of this *Certificate,* submit to the *Director* for review, two copies of a completed Certificate of Requirement with a registerable description of the Property; and

(b) Within 10 calendar days of receiving the Certificate of Requirement authorized by the *Director,* register the Certificate of Requirement in the appropriate Land Registry Office on title to the Property and submit to the Director the duplicate registered copy immediately following registration.

(15) Pursuant to Section 197 of the Environmental Protection Act, neither the *Owner* nor any person having an interest in the *Site* shall deal with the Property in any way without first giving a copy of this *Certificate* to each person acquiring an interest in the *Site* as a result of the dealing.

Certificate of Requirement/Registration on Title - CAZ

(16) The Owner shall:

(a) Within 60 days of the date of the issuance of this *Certificate,* submit to the *Director* for review, two copies of a completed Certificate of Requirement with a registerable description of the CAZ; and

(b) Within 10 calendar days of receiving the Certificate of Requirement authorized by the *Director,* register the Certificate of Requirement in the appropriate Land Registry Office on title to the CAZ and submit to the Director the duplicate registered copy immediately following registration.

Inspections by the Ministry

(17) No person shall hinder or obstruct a *Provincial Officer* from carrying out any and all inspections authorized by the *OWRA, the EPA,* the *PA,* the *SDWA* or the *NMA,* of any place to which this *Certificate* relates, and without limiting the foregoing:

(a) to enter upon the premises where the approved works are located, or the location where the records required by the conditions of this *Certificate* are kept;
(b) to have access to, inspect, and copy any records required to be kept by the conditions of this *Certificate;*
(c) to inspect the *Site,* related equipment and appurtenances;
(d) to inspect the practices, procedures, or operations required by the conditions of this *Certificate;* and
(e) to sample and monitor for the purposes of assessing compliance with the terms

and conditions of this Certificate or the *EPA*, the *OWRA*, the *PA*, the *SDWA* or the *NMA*.

Information and Record Retention

(18) Any information requested, by the *Ministry*, concerning the *Site* and its operation under this *Certificate* , including but not limited to any records required to be kept by this *Certificate* shall be provided to the *Ministry*, upon request, in a timely manner. Records shall be retained for contaminating life span of the *Site* except for as otherwise authorized in writing by the *Director*.

(19) The receipt of any information by the *Ministry* or the failure of the *Ministry* to prosecute any person or to require any person to take any action, under this *Certificate* or under any statute, regulation or other legal requirement, in relation to the information, shall not be construed as:

(a) an approval, waiver, or justification by the *Ministry* of any act or omission of any person that contravenes any term or condition of this *Certificate* or any statute, regulation or other legal requirement; or

(b) acceptance by the *Ministry* of the information's completeness or accuracy.

(20) The Owner shall ensure that a copy of this Certificate, in its entirety and including all its Notices of Amendment, and documentation listed in Schedule "A", are retained at the Site at all times.

2. SITE OPERATION

Operation

(1) The *Site* shall be operated and maintained at all time including management and disposal of all waste in accordance with the *EPA*, *Regulation 347*, and the conditions of this *Certificate*. At no time shall the discharge of a contaminant that causes or is likely to cause an adverse effect be permitted

Signs

(2) A sign shall be installed and maintained at the main entrance/exit to the *Site* on which is legibly displayed the following information:

(a) the name of the *Site* and *Owner;*
(b) the number of the *Certificate;*
(c) the name of the *Operator;*
(d) the normal hours of operation;
(e) the allowable and prohibited waste types;
(f) the telephone number to which complaints may be directed;
(g) a warning against unauthorized access;
(h) a twenty-four (24) hour emergency telephone number (if different from above); and

(i) a warning against dumping outside the *Site* .

(3) The Owner shall install and maintain signs to direct vehicles to working face and recycling areas.

(4) The Owner shall provide signs at recycling depot informing users what materials are acceptable and directing users to appropriate storage area.

Vermin, Vectors, Dust, Litter, Odour, Noise and Traffic

(5) The *Site* shall be operated and maintained such that the vermin, vectors, dust, litter, odour, noise and traffic do not create a nuisance.

Burning Waste Prohibited

(6) Burning of waste at the *Site* is prohibited.

Site Access

(7) Waste shall only be accepted at the *Site* from 9:00 am to 6:00 p.m.

(8) On-site equipment used for daily site preparation and closing activities shall be operated one (1) hour before and one (1) hour after the hours of operation approved by this *Certificate.*

(9) With the prior written approval from the *District Manager,* the time periods may be extended to accommodate seasonal or unusual quantities of waste.

Site Security

(10) No waste shall be received, landfilled or removed from the *Site* unless a site supervisor or attendant is present and supervises the operations during operating hours. The *Site* shall be closed when a site attendant is not present to supervise landfilling operations.

(11) The *Site* shall be operated and maintained in a safe and secure manner. During non-operating hours, the *Site* entrance and exit gates shall be locked and the *Site* shall be secured against access by unauthorized persons.

3. EMPLOYEE TRAINING

(1) A training plan for all employees that operate any aspect of the *Site* shall be developed and implemented by the *Operator.* Only *Trained Personnel* shall operate any aspect of the *Site* or carry out any activity required under this *Certificate* .

4. COMPLAINTS RESPONSE PROCEDURE

(1) If at any time the *Owner* receives complaints regarding the operation of the *Site,* the *Owner* shall respond to these complaints according to the following procedure:

(a) The *Owner* shall record and number each complaint, either electronically or in a log book, and shall include the following information: the nature of the complaint, the name, address and the telephone number of the complainant if the complainant will provide this information and the time and date of the complaint;

(b) The *Owner,* upon notification of the complaint, shall initiate appropriate steps to determine all possible causes of the complaint, proceed to take the necessary actions to eliminate the cause of the complaint and forward a formal reply to the complainant; and

(c) The *Owner* shall complete and retain on-site a report written within one (1) week of the complaint date, listing the actions taken to resolve the complaint and any recommendations for remedial measures, and managerial or operational changes to reasonably avoid the recurrence of similar incidents.

5. EMERGENCY RESPONSE

(1) Any spills, fires or other emergency situations shall be forthwith reported directly to the *Ministry's* Spills Action Centre (1-800-268-6060) and shall be cleaned up immediately.

(2) In addition, the *Owner* shall submit, to the *District Manager* a written report within three (3) business days of the emergency situation, outlining the nature of the incident, remedial measures taken, handling of waste generated as a result of the emergency situation and the measures taken to prevent future occurrences at the *Site.*

(3) All wastes resulting from an emergency situation shall be managed and disposed of in accordance with *O.Reg. 347.*

(4) All equipment and materials required to handle the emergency situations shall be:

(a) kept on hand at all times that waste landfilling and/or handling is undertaken at the *Site;* and

(b) adequately maintained and kept in good repair.

(5) The *Owner* shall ensure that the emergency response personnel are familiar with the use of such equipment and its location(s).

6. RECORD KEEPING AND REPORTING

Daily Log Book

(1) A daily log shall be maintained in written format and shall include the following information:

(a) the type, date and time of arrival, hauler, and quantity (tonnes) of all industrial and commercial waste and cover material received at the *Site;*
(b) the area of the *Site* in which waste disposal operations are taking place;
(c) a record of litter collection activities and the application of any dust suppressants;
(d) a record of the daily inspections; and
(e) a description of any out-of-service period of any control, treatment, disposal or monitoring facilities, the reasons for the loss of service, and action taken to restore and maintain service.

(2) Any information requested, by the *Director* or a *Provincial Officer,* concerning the *Site* and its operation under this *Certificate,* including but not limited to any records required to be kept by this *Certificate* shall be provided to the *Ministry,* upon request.

Daily Inspections and Log Book

(3) An inspection of the entire *Site* and all equipment on the *Site* shall be conducted each day the *Site* is in operation to ensure that: the *Site* is secure; that the operation of the *Site* is not causing any nuisances; that the operation of the *Site* is not causing any adverse effects on the environment and that the *Site* is being operated in compliance with this *Certificate.* Any deficiencies discovered as a result of the inspection shall be remedied immediately, including temporarily ceasing operations at the *Site* if needed.

(4) A record of the inspections shall be kept in a daily log book that includes:
(a) the name and signature of person that conducted the inspection;
(b) the date and time of the inspection;
(c) the list of any deficiencies discovered;
(d) the recommendations for remedial action; and
(e) the date, time and description of actions taken.

(5) A record shall be kept in the daily log book of all refusals of waste shipments, the reason(s) for refusal, and the origin of the waste, if known.

Annual Report

(6) A written report on the development, operation and monitoring of the *Site,* shall be completed annually (the "Annual Report"). The Annual Report shall be submitted to the *District Manager,* by April 30th of the year following the period being reported upon.

(7) The Annual Report shall include the following:
(a) the results and an interpretive analysis of the results of all leachate, groundwater surface water and landfill gas monitoring, including an assessment of the need to amend the monitoring programs;
(b) an assessment of the operation and performance of all engineered facilities, the need to amend the design or operation of the *Site,* and the adequacy of and need to implement the contingency plans;

(c) site plans showing the existing contours of the *Site;* areas of landfilling operation during the reporting period; areas of intended operation during the next reporting period; areas of excavation during the reporting period; the progress of final cover, vegetative cover, and any intermediate cover application; previously existing site facilities; facilities installed during the reporting period; and site preparations and facilities planned for installation during the next reporting period;

(d) calculations of the volume of waste, daily and intermediate cover, and final cover deposited or placed at the *Site* during the reporting period and a calculation of the total volume of *Site* capacity used during the reporting period;

(e) a calculation of the remaining capacity of the *Site* and an estimate of the remaining *Site* life;

(f) a summary of the weekly, maximum daily and total annual quantity (tonnes) of waste received at the *Site;*

(g) a summary of any complaints received and the responses made;

(h) a discussion of any operational problems encountered at the *Site* and corrective action taken;

(i) any changes to the Design and Operations Report and the Closure Plan that have been approved by the *Director* since the last *Annual Report;*

(j) a report on the status of all monitoring wells and a statement as to compliance with *Ontario Regulation 903;* and

(k) any other information with respect to the *Site* which the *Regional Director* may require from time to time.

7. LANDFILL DESIGN AND DEVELOPMENT

Approved Waste Types

(1) Only solid non-hazardous municipal waste as defined under *Reg. 347* shall be accepted at the *Site* for landfilling.

(2) No liquid industrial waste or hazardous wastes as defined under Reg. 347 shall be received at the *Site.*

(3) The *Owner* shall develop and implement a program to inspect waste to ensure that the waste received at the *Site* is of a type approved for acceptance under this *Certificate.*

(4) The *Owner* shall ensure that all loads of waste are properly inspected by trained site personnel prior to acceptance at the *Site* and that the waste vehicles are directed to the appropriate areas for disposal or transfer of the waste. The *Owner* shall notify the *District Manager,* in writing, of load rejections at the *Site* within one (1) business day from their occurrence.

Capacity

(5) The maximum amount of waste, daily cover, intermediate cover and final cover placed within the 4.5 hectare foot print shall not exceed the final contours shown in Figure 12, Item 1 of Schedule "A". This is equivalent to 262,300 cubic metres.

(6) This approval is for the design, operation and use of the above capacity as per Design and Operations Plan, Longlac Landfill, dated May 1, 2007 (Item 5, Schedule "A").

Service Area

(7) Only waste that is generated within the boundaries of the Municipality of Greenstone, Daley and Oak Townships, First Nations (Ginoogaming #77 and Long Lake #58) and Unorganized Areas (Houck, Croll, Oaks, Abrey, Daley, Bain and O'Meara) shall be accepted at the *Site.*

Cover

(8) Alternative materials to soil may be used as daily and interim cover material, based on an application with supporting information and applicable fee for a trial use or permanent use, submitted by the *Owner* to the *Director,* copied to the *District Manager* and as approved by the *Director* via an amendment to this *Certificate.* The alternative material shall be non-hazardous according to *Reg. 347* and will be expected to perform at least as well as soil in relation to the following functions:

(a) Control of blowing litter, odours, dust, landfill gas, gulls, vectors, vermin and fires;

(b) Provision for an aesthetic condition of the landfill during the active life of the *Site;*

(c) Provision for vehicle access to the active tipping face; and

(d) Compatibility with the design of the *Site* for groundwater protection, leachate management and landfill gas management.

(9) Cover material shall be applied as follows:

(a) Daily Cover - Weather permitting, deposited waste shall be covered at the end of each working day in a manner acceptable to the *District Manager* so that no waste is exposed to the atmosphere;

(b) Intermediate Cover - In areas where landfilling has been temporarily discontinued for six (6) months or more, a minimum thickness of 300 millimetre of soil cover or an approved thickness of alternative cover material shall be placed; and

(c) Final Cover - In areas where landfilling has been completed to final contours, a minimum 600 millimetre thick layer of clay and 150 millimetres of top soil (final cover) shall be placed. Fill areas shall be progressively completed and rehabilitated as landfill development reaches final contours.

8. LANDFILL MONITORING

Landfill Gas

(1) The *Owner* shall ensure that any buildings or structures at the *Site* contain adequate ventilation systems to relieve any possible landfill gas accumulation. Routine monitoring for explosive methane gas levels shall be conducted in all buildings or structures at the *Site,* especially enclosed structures which at times are occupied by people.

Compliance Limits

(2) The *Site* shall be operated in such a way as to ensure compliance with the following:

(a) Reasonable Use Guideline B-7 for the protection of the groundwater at the *Site;* and

(b) Provincial Water Quality Objectives included in the July 1994 publication entitled *Water Management Policies, Guidelines, Provincial Water Quality Objectives,* as amended from time to time or limits set by the *Regional Director,* for the protection of the surface water at and off the *Site.*

Surface Water and Ground Water

(3) The *Owner* shall monitor surface water and ground water in accordance with Items 2 in Schedule "A".

(4) A certified Professional Geoscientist or Engineer possessing appropriate hydrogeologic training and experience shall execute or directly supervise the execution of the groundwater monitoring and reporting program.

Groundwater Wells and Monitors

(5) The *Owner* shall ensure that all groundwater monitoring wells which form part of the monitoring program are properly capped, locked and protected from damage.

(6) Where landfilling is to proceed around monitoring wells, suitable extensions shall be added to the wells and the wells shall be properly re-secured.

(7) Any groundwater monitoring wells included in the on-going monitoring program that are damaged shall be assessed, repaired, replaced or decommissioned by the *Owner,* as required.

(a) The *Owner* shall repair or replace any monitoring well which is destroyed or in any way made to be inoperable for sampling such that no more than one regular sampling event is missed.

(b) All monitoring wells which are no longer required as part of the groundwater monitoring program, and have been approved by the *District Manager* for abandonment, shall be decommissioned by the *Owner,* as required, in accordance with *O.Reg. 903,* that will prevent contamination through the abandoned well. A report on the decommissioning of the well shall be included in the Annual Report for the period during which the well was decommissioned.

Trigger Mechanisms and Contingency Plans

(8) Within one (1) year from the date of this *Certificate,* the *Owner* shall submit to the *Director,* for approval, and copies to the *District Manager,* details of a trigger mechanisms plan for surface water and groundwater quality monitoring for the purpose of initiating investigative activities into the cause of increased contaminant concentrations at the Contaminant Attenuation Zone (*CAZ*) limit.

(9) Within one (1) year from the date of this *Certificate,* the *Owner* shall submit to the *Director* for approval, and copies to the *District Manager,* details of a contingency plan to be implemented in the event that the surface water or groundwater quality exceeds the a trigger mechanism at the *CAZ* limit.

(10) In the event of a confirmed exceedence of a site-specific trigger level relating to leachate mounding or groundwater or surface water impacts due to leachate at the site's *CAZ* limit, the *Owner* shall immediately notify the *District Manager,* and an investigation into the cause and the need for implementation of remedial or contingency actions shall be carried out by the *Owner* in accordance with the approved trigger mechanisms and associated contingency plans.

(11) If monitoring results, investigative activities and/or trigger mechanisms indicate the need to implement contingency measures, the *Owner* shall ensure that the following steps are taken:

(a) The *Owner* shall notify the *District Manager,* in writing of the need to implement contingency measures, no later than 30 days after confirmation of the exceedences;
(b) Detailed plans, specifications and descriptions for the design, operation and maintenance of the contingency measures shall be prepared and submitted by the *Owner* to the *District Manager* for approval; and
(c) The contingency measures shall be implemented by the *Owner* upon approval by the *District Manager* .

(12) The *Owner* shall ensure that any proposed changes to the site-specific trigger levels for leachate impacts to the surface water or groundwater, shall be approved in advance by the *Director* via an amendment to this *Certificate.*

(13) (a) If expanding the contaminant attenuation zone is required as a remedial measures necessary for proper operation of a landfilling site, the Owner of the landfilling site must own property rights respecting the contaminant attenuation zone, unless,

(i) the contaminant attenuation zone is on Crown land and the Crown has agreed in writing to the use of the land for that purpose; or

(ii) the contaminant attenuation zone is on a public road and the road authority has agreed in writing to the use of the land for that purpose.

(b) The holder of the certificate of approval must continue to own the property rights for all of the contaminating life span of the site.

(c) The ownership of the property rights must include the right to,

(i) discharge contaminants from the landfilling site into the contaminant attenuation zone;

(ii) enter into the contaminant attenuation zone and onto the surface above the contaminant attenuation zone for purposes of testing, monitoring, intercepting contaminants and carrying out remedial work;

(iii) install, operate and maintain works, for the purposes mentioned in clause (b), in or above the contaminant attenuation zone, including on the surface above the contaminant attenuation zone; and

(iv) prevent the owner of the land in which the contaminant attenuation zone is located from paving, erecting a structure or making any use of land above or in the vicinity of the contaminant attenuation zone that would interfere with the functioning of the contaminant attenuation zone or with the exercise of any of the rights mentioned in this subsection.

Changes to the Monitoring Plan

(14) The *Owner* may request to make changes to the monitoring program(s) to the *District Manager* in accordance with the recommendations of the annual report. The Owner shall make clear reference to the proposed changes in separate letter that shall accompany the annual report.

(15) Within fourteen (14) days of receiving the written correspondence from the *District* Manager confirming that the *District Manager* is in agreement with the proposed changes to the environmental monitoring program, the *Owner* shall forward a letter identifying the proposed changes and a copy of the correspondences from the *District Manager* and all other correspondences and responses related to the changes to the monitoring program, to the *Director* requesting the *Certificate* be amended to approve the proposed changes to the environmental monitoring plan prior to implementation.

(16) In the event any other changes to the environmental monitoring program are proposed outside of the recommendation of the annual report, the *Owner* shall follow current ministry procedures for seeking approval for amending the Certificate of Approval.

9. CLOSURE PLAN

(1) At least 2 years prior to the anticipated date of closure of this *Site,* the *Owner* shall submit to the *Director* for approval, with copies to the *District Manager,* a detailed *Site* closure plan pertaining to the termination of landfilling operations at this *Site,* post-closure inspection, maintenance and monitoring, and end use. The plan shall include the following:

- (a) a plan showing *Site* appearance after closure;
- (b) a description of the proposed end use of the *Site;*
- (c) a descriptions of the procedures for closure of the *Site,* including:
  - (i) advance notification of the public of the landfill closure;
  - (ii) posting of a sign at the *Site* entrance indicating the landfill is closed and identifying any alternative waste disposal arrangements;
  - (iii) completion, inspection and maintenance of the final cover and landscaping;
  - (iv) *Site* security;
  - (v) removal of unnecessary landfill-related structures, buildings and facilities;
  - (vi) final construction of any control, treatment, disposal and monitoring facilities for leachate, groundwater, surface water and landfill gas; and
  - (vii) a schedule indicating the time-period for implementing sub-conditions (i) to (vi) above;
- (d) descriptions of the procedures for post-closure care of the *Site,* including:
  - (i) operation, inspection and maintenance of the control, treatment, disposal and monitoring facilities for leachate, groundwater, surface water and landfill gas;
  - (ii) record keeping and reporting; and
  - (iii) complaint contact and response procedures;
- (e) an assessment of the adequacy of and need to implement the contingency plans for leachate and methane gas; and
- (f) an updated estimate of the contaminating life span of the *Site,* based on the results of the monitoring programs to date.

(2) The *Site* shall be closed in accordance with the closure plan as approved by the *Director.*

10. WASTE DIVERSION

(2) The Owner shall ensure that:

- (a) all bins and waste storage areas are clearly labelled;
- (b) all lids or doors on bins shall be kept closed during non-operating hours and

during the high wind events; and

(c) if necessary to prevent litter, waste storage areas shall be covered during the high winds events.

(3) The Owner shall provide a segregated area for the storage of *Refrigerant Appliances* so that the following are ensured:

(a) all *Refrigerant Appliances* have been tagged to indicate that the refrigerant has been removed by a licensed technician. The tag number shall be recorded in the log book and shall remain affixed to the appliance until transferred from the *Site;* **or**

(b) all *Refrigerant Appliances* accepted at the *Site,* which have not been tagged by a licensed technician to verify that the equipment no longer contains refrigerants, are stored segregated, in a clearly marked area, in an upright position and in a manner which allows for the safe handling and transfer from the *Site* for removal of refrigerants as required by O.Reg. 189; and

(c) all *Refrigerant Appliances* received on-site shall either have the refrigerant removed prior to being transferred from the *Site* or shall be shipped off-site only to facilities where the refrigerants can be removed by a licensed technician in accordance with O.Reg. 189.

(4) Propane cylinders shall be stored in a segregated area in a manner which prevents cylinders from being knocked over or cylinder valves from breaking.

(5) The Owner shall transfer waste and recyclable materials from the *Site* as follows:

(a) recyclable materials shall be transferred off-site once their storage bins are full;

(b) scrap metal shall be transferred off-site at least twice a year;

(c) tires shall be transferred off-site as soon as a load for the contractor hired by the Owner has accumulated or as soon as the accumulated volume exceeds the storage capacity of its bunker; and

(d) immediately, in the event that waste is creating an odour or vector problem.

(6) The Owner shall notify the appropriate contractors that waste and recyclable wastes that are to be transferred off the *Site* are ready for removal. Appropriate notice time, as determined by the contract shall be accommodated in the notification procedure.

11. HOUSEHOLD HAZARDOUS WASTE DEPOT

HHW Facility Operations

(1) The *HHW* depot shall not receive more than 5 cubic metres of *HHW* per day.

(2) The *HHW* depot shall not store in excess of 10 cubic metres of *HHW* on *Site.*

(3) *HHW* shall not be stored at the *Site* for longer than one hundred eighty (180) days, unless the consent of the *District Manager* has been obtained, with the exception of waste oil

which shall be stored on *Site* in accordance with Condition 11(2).

(4) All household hazardous waste received and stored must be managed in accordance with *Ontario Regulation 347, R.R.O. 1990,* as amended, and with the Ministry of Environment document entitled "Household Hazardous Waste Collection and Facility Guidelines" dated May 1993.

(5) All storage of liquid wastes shall be in accordance with this *Ministry's* publication "Guidelines of Environmental Protection Measures at Chemical Storage Facilities", dated October 1978 as amended.

(6) All *HHW* shall be stored in secondary containment that is adequate to contain any spills or leaks. Segregated secondary containment shall be provided for incompatible types of waste.

(7) Incoming *HHW* shall be inspected by *Trained Personnel* , prior to being accepted at the *Site,* to ensure that the *Site* is approved to accept that type of waste.

(8) All containers shall be clearly labelled indicating the type and nature of the hazardous waste stored as required by regulation. All points of access to the *Site* shall be posted to warn that the area contains hazardous materials.

(9) No radioactive wastes shall be accepted at this *Site.*

(10) Oil and oil-based paints which have been manufactured prior to 1972; or whose manufacturing date cannot be determined, may contain PCBs and shall be handled as follows:

(a) The oil and oil-based paints shall not be mixed (bulked) with other paints prior to testing. Paints which are lab-packed are not considered to be mixed under this *Certificate;*

(b) The oil and oil-based paints shall be tested by a certified laboratory for PCB content and shall be handled in the manner outlined in Condition 35.10 (c) if found to contain PCBs;

(c) If the oil and oil-based paints are found to have PCBs at or above levels identified in Condition 35.10 (d), it shall be forthwith reported to the *District Manager* and shall be managed in accordance with Regulation 362 and stored or removed from the *Site* to an approved PCB storage site, in accordance with written instructions from the *District Manager;* and

(d) The oil and oil-based paints shall not be distributed for reuse if they have any measurable PCB content. The oil and oil-based paint is considered to be a PCB waste, if measured levels are equal to or greater than 50 parts per million.

(11) Except for oil based paints that become classified as PCB Waste, paints may be offered for reuse to the public. Records shall be kept of the type, volume and recipient of paint returned to the public.

(12) The *Owner* shall maintain, at the *Site,* a log book which records daily, the following information:

(a) date of record;
(b) types, quantities and source of *HHW* received;
(c) quantities of *HHW* stored at the *Site;*
(d) quantities and destination of *HHW* shipped from the *Site;* and
(e) quantities of waste returned to the public as noted in Condition 11(11).

SCHEDULE "A"

1. A report titled "Application for Environmental Protection Act Approval for the Proposed Landfill Site, Longlac Waste management Study; Technical Report-Natural Sciences, Conceptual Design and Operations", dated December 1997 and prepared by Azimuth Environmental Consulting, Inc.

2. Technical Memorandum dated June 29, 2001, by Azimuth Environmental Consulting Inc. regarding performance monitoring program.

3. Letter from Tesfaye Gebrezghi, MOE, dated January 4, 2000, to Paul Neals, Azimuth Environmental Consulting, Inc.

4. Response letter report to MOE comments dated August 16, 2000, from Azimuth Environmental Consulting, Inc., to Tesfaye Gebrezghi, MOE.

5. Report titled "Design and Operations Plan, Longlac Landfill, Municipality of Greenstone, Ontario" dated May 1, 2007 prepared by Trow Associates Inc.

6. Report titled "2006 Environmental Quality Monitoring Report, Longlac Landfill, Municipality of Greenstone, Ontario" dated March 30, 2007, prepared by Trow Associates Inc.

7. Letter dated May 5, 2008, addresses to Ranjani Munasinghe, Ministry of the Environment, from Robert Rinne, Trow Associates Inc.

The reasons for the imposition of these terms and conditions are as follows:

GENERAL

1. The reason for Conditions 1(1), (2), (4), (5), (6), (7), (8), (9), (10), (18), (19) and (20) is to clarify the legal rights and responsibilities of the *Owner* and *Operator* under this Certificate of Approval.

2. The reasons for Condition 1(3) is to ensure that the *Site* is designed, operated, monitored and maintained in accordance with the application and supporting documentation submitted by the *Owner,* and not in a manner which the *Director* has not been asked to consider.

3. The reasons for Condition 1(11) are to ensure that the *Site* is operated under the corporate name

which appears on the application form submitted for this approval and to ensure that the *Director* is informed of any changes.

4. The reasons for Condition 1(12) are to restrict potential transfer or encumbrance of the *Site* without the approval of the *Director* and to ensure that any transfer of encumbrance can be made only on the basis that it will not endanger compliance with this Certificate of Approval.

5. The reason for Condition 1(13) is to ensure that the successor is aware of its legal responsibilities.

6. Conditions 1 (14), (15) and (16) are included, pursuant to subsection 197(1) of the *EPA* , to provide that any persons having an interest in the *Site* are aware that the land has been approved and used for the purposes of waste disposal.

7. The reason for Condition 1(17) is to ensure that appropriate Ministry staff has ready access to the Site for inspection of facilities, equipment, practices and operations required by the conditions in this Certificate of Approval. This Condition is supplementary to the powers of entry afforded a Provincial Officer pursuant to the *Act* , the *OWRA* , the *PA* , the *NMA* and the *SDWA* .

SITE OPERATION

8. The reasons for Conditions 2(1), 2(5) and 6(3) are to ensure that the *Site* is operated, inspected and maintained in an environmentally acceptable manner and does not result in a hazard or nuisance to the natural environment or any person.

9. The reason for Conditions 2 (2), 2(3) and 2(4) is to ensure that users of the *Site* are fully aware of important information and restrictions related to *Site* operations and access under this *Certificate.*

10. The reason for Condition 2(6) is that open burning of municipal waste is unacceptable because of concerns with air emissions, smoke and other nuisance affects, and the potential fire hazard.

11. The reasons for Condition 2(7), 2(8) and 2(9) are to specify the hours of operation for the landfill site and a mechanism for amendment of the hours of operation, as required.

12. The reasons for Condition 2(10) and 2(11) are to ensure that the *Site* is supervised by properly trained staff in a manner which does not result in a hazard or nuisance to the natural environment or any person and to ensure the controlled access and integrity of the *Site* by preventing unauthorized access when the Site is closed and no site attendant is on duty.

EMPLOYEE TRAINING

13. The reason for Condition 3(1) is to ensure that the *Site* is supervised and operated by properly trained staff in a manner which does not result in a hazard or nuisance to the natural environment or any person.

COMPLAINTS RESPONSE PROCEDURE

14. The reason for Condition 4(1) is to ensure that any complaints regarding landfill operations at this *Site* are responded to in a timely and efficient manner.

EMERGENCY RESPONSE

15. Conditions 5(1) and 5(2) are included to ensure that emergency situations are reported to the Ministry to ensure public health and safety and environmental protection.

16. Conditions 5(3), 5(4) and 5(5) are included to ensure that emergency situations are handled in a manner to minimize the likelihood of an adverse effect and to ensure public health and safety and environmental protection.

RECORD KEEPING AND REPORTING

17. The reason for Conditions 6(1) and 6(2) is to ensure that accurate waste records are maintained to ensure compliance with the conditions in this Certificate of Approval (such as fill rate, site capacity, record keeping, annual reporting, and financial assurance requirements), the *EPA* and its regulations.

18. The reason for Conditions 6(4) and 6(5) is to ensure that detailed records of *Site* inspections are recorded and maintained for inspection and information purposes.

19. The reasons for Conditions 6(6) and 6(7) are to ensure that regular review of site development, operations and monitoring data is documented and any possible improvements to site design, operations or monitoring programs are identified. An annual report is an important tool used in reviewing site activities and for determining the effectiveness of site design.

LANDFILL DESIGN AND DEVELOPMENT

20. The reason for Conditions 7(1) to 7(7) inclusive is to specify the approved areas from which waste may be accepted at the *Site* and the types and amounts of waste that may be accepted for disposal at the *Site,* based on the *Owner* 's application and supporting documentation.

21. The reason for Condition 7 (8) is to specify the approved alternative cover material and to specify requirements for use of alternative cover material at the *Site* .

22. The reasons for Condition 7(9) are to ensure that daily and intermediate cover is used to control potential nuisance effects, to facilitate vehicle access on the *Site,* and to ensure an acceptable site appearance is maintained. The proper closure of a landfill site requires the application of a final cover which is aesthetically pleasing, controls infiltration, and is suitable for the end use planned for the *Site.*

LANDFILL MONITORING

23. Reasons for Condition 8(1) are to ensure that off site migration of landfill gas is monitored and all buildings at the *Site* are free of any landfill gas accumulation, which due to a methane gas component may be explosive and thus create a danger to any persons at the *Site*.

24. Condition 8(2) is included to provide the groundwater and surface water limits to prevent water pollution at the *Site*.

25. Conditions 8(3) and 8(4) are included to require the Owner to demonstrate that the *Site* is performing as designed and the impacts on the natural environment are acceptable. Regular monitoring allows for the analysis of trends over time and ensures that there is an early warning of potential problems so that any necessary remedial/contingency action can be taken.

26. Conditions 8(5), 8(6) and 8(7) are included to ensure the integrity of the groundwater monitoring network so that accurate monitoring results are achieved and the natural environment is protected.

27. Conditions 8(8) to 8(13) inclusive are added to ensure the *Owner* has a plan with an organized set of procedures for identifying and responding to potential issues relating to groundwater and surface water contamination near or at the *Site's* compliance point.

28. Reasons for conditions 8(14), 8(15) and 8(16) are included to streamline the approval of the changes to the monitoring plan.

CLOSURE PLAN

29. The reasons for Condition 9 are to ensure that final closure of the *Site* is completed in an aesthetically pleasing manner, in accordance with Ministry standards, and to ensure the long-term protection of the health and safety of the public and the environment.

WASTE DIVERSION

30. Condition 10 is included to ensure that the recyclable materials are stored in their temporary storage location in a manner as to minimize a likelihood of an adverse effect or a hazard the natural environment or any person.

HOUSEHOLD HAZARDOUS WASTE DEPOT

31. The reasons for the condition 11 are to approve the establishment and operation of a household hazardous waste collection depot and to ensure that the wastes are managed in a manner that protects the environment and the health and safety of the public.

This Provisional Certificate of Approval revokes and replaces Certificate(s) of Approval No. 5968-5ZRM25 issued on June 10, 2004

In accordance with Section 139 of the Environmental Protection Act, R.S.O. 1990, Chapter E-19, as amended, you may by written notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act, provides that the Notice requiring the hearing shall state:

1. The portions of the approval or each term or condition in the approval in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to eachportion appealed.

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The Certificate of Approval number;
6. The date of the Certificate of Approval;
7. The name of the Director;
8. The municipality within which the waste disposal site is located;

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
655 Bay Street, 15th Floor
Toronto, Ontario
M5G 1E5

AND

The Director
Section 39, *Environmental Protection Act*
Ministry of the Environment
2 St. Clair Avenue West, Floor 12A
Toronto, Ontario
M4V 1L5

*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 314-4600, Fax: (416) 314-4506 or www.ert.gov.on.ca**

The above noted waste disposal site is approved under Section 39 of the Environmental Protection Act.

DATED AT TORONTO this 3rd day of June, 2008

Tesfaye Gebrezghi, P.Eng.
Director
Section 39, *Environmental Protection Act*

RM/
c: District Manager, MOE Thunder Bay - District
Vance A. Czerwinski, The Corporation of the Municipality of Greenstone

MUNICIPALITY OF GREENSTONE
PUBLIC WORKS DEPARTMENT
FILE
LANDFILL SITES
2004-65

Ministry of the Environment
Ministère de l'Environnement
Ontario

PROVISIONAL CERTIFICATE OF APPROVAL
WASTE DISPOSAL SITE
NUMBER 5968-5ZRM25

The Corporation of the Municipality of Greenstone
PO Box 70
Geraldton, Ontario
P0T 1M0

MUNICIPALITY OF GREENSTONE
PUBLIC WORKS DEPARTMENT
FILE
LONGLAC LANDFILL
CERTIFICATE OF APPROVAL
Copy sent to Paul Nee
Azimuth Environmental Consulting Inc.
July 7/04

RECEIVED
JUN 21 2004
CORPORATION OF THE MUNICIPALITY OF GREENSTONE

Site Location: Longlac Landfill Site
Northside of Kimberly-Clark's Crib Road Extension
Greenstone Municipality, District of Thunder Bay

You have applied in accordance with Section 27 of the Environmental Protection Act for approval of:

the use and operation of a 4.5 hectare landfilling area within a 23 hectare landfill site property,

which includes the use of the site only for the disposal of solid municipal waste (Note: Use of the site for additional categories of wastes requires a new application and amendments to the Provisional Certificate of Approval)

Note: Use of the site for any other type of waste is not approved under this Certificate, and requires obtaining a separate approval amending this Certificate.

For the purpose of this Provisional Certificate of Approval and the terms and conditions specified below, the following definitions apply:

1. Definition of Terms

1.1 In this Certificate of Approval ("Certificate"), the following definitions shall apply:

1.1.1 "Owner" means the Municipality of Greenstone.

1.1.2 "Buffer" means those lands between the limit of fill and the boundaries of the property owned by the Municipality of Greenstone, that shall in no instance be less than 30 meters;

1.1.3 "Certificate" means this Certificate of Approval No. A590603 as amended from time to time and all Schedules attached to and forming part of this Certificate;

1.1.4 "District Manager" means the Manager of the Thunder Bay District Office, Ministry of the Environment.

1.1.5 "Director" means the one or more persons who from time to time so designated for the purpose of Part V of the Environmental Protection Act, R.S.O. 1990, as amended from time to time;

1.1.6 "Engineer" means a professional engineer licensed under the Ontario Professional Engineers Act;

1.1.7 "EPA" means the Environmental Protection Act, R.S.O. 1990, as amended;

1.1.8 "Landfill" means the part of the Site comprising the Limit of Fill and the Buffer

1.1.9 "Limit of Fill" means the area in which waste is approved for final disposal according to this Certificate;

1.1.10 "Ministry" or "MOE" means the Ontario Ministry of Environment;

1.1.11 "ODWS" means the Ontario Drinking Water Standards as amended from time to time;

1.1.12 "OWRA" means the Ontario Water Resources Act, R.S.O. 1990, c.0.40, as amended;

1.1.13 "PWQO" means the Provincial Water Quality Objectives included in the July 1994 publication entitled *Water Management Policies, Guidelines, Provincial Water Quality Objectives*, as amended from time to time;

1.1.14 "Regional Director" means the Director, Northern Region, Ministry of Environment;

1.1.15 "Site" means the property owned by the Municipality of Greenstone for the purposes of waste disposal, described as Northside of Kimberly-Clark's Crib Road Extension, Township of Longlac and Daley, District of Thunder Bay.

You are hereby notified that this approval is issued to you subject to the terms and conditions outlined below:

TERMS AND CONDITIONS

2. General

2.1 This Certificate revokes all previously issued Provisional Certificates of Approval issued under Part V, EPA, for this site. The approval given herein, including the Terms and Conditions set out, replaces all previously issued approvals and related Terms and Conditions under Part V, EPA for this Site.

2.2 The site shall be constructed and operated in accordance with Item 1 in Schedule "A" (Technical Report-Natural Sciences, Conceptual Design and Operations) and in accordance with all other documents listed in Schedule "A" of this Certificate.

2.3 Schedules A and B are integral parts of these Conditions of Approval.

2.4 a) Pursuant to Section 197 of the EPA, neither the Owner nor any person having an interest in the Site shall deal with the Site in any way without first giving a copy of the Provisional Certificate of Approval to each person acquiring an interest in the Site as a result of the dealing;

b) Within sixty (60) calendar days of the date of this Certificate of Approval, the Owner shall submit to the Director for the Director 's signature two (2) copies of a completed Certificate of Prohibition containing a registerable description of the Site, in accordance with Form 1 of O. Reg. 14/92; and,

c) Within ten (10) calendar days of receiving the Certificate of Prohibition, the Owner shall register the Certificate of Prohibition in the appropriate Land Registry Office on title and immediately following registration, submit to the Director the duplicate registered copy.

2.5 Should there be any discrepancies between items in Schedule "A", and the conditions in this Certificate, the conditions shall take precedence. In all matters requiring the interpretation and implementation of this Certificate, the conditions of the Certificate shall take precedence.

2.6 The Owner shall comply with the Conditions and schedules in this Certificate. The requirements specified in this Certificate are minimum requirements and do not abrogate the need to take all reasonable steps to avoid violating the provisions of other applicable legislation.

2.7 The requirements of this Certificate are severable. If any requirement of this Certificate, or the application of any requirement of this Certificate, due to any circumstances, is held invalid, the application of such requirement to other circumstances and the remainder of this Certificate shall not be affected thereby.

2.8 The service area from which waste may be received shall be limited to generators within the Municipality of Greenstone, Daley and Oak Townships, First Nations (Ginoogaming #77 and Long Lake #58), and Unorganized Areas (Houck, Croll, Oakes, Abrey, Daley, Bain and O'Meara).

2.9 The Owner shall allow MOE personnel, or a MOE authorized representative(s), upon presentation of credentials, to:

a) carry out any and all inspections authorized by the EPA, OWRA, or the *Pesticides Act*, R.S.O. 1990, as amended from time to time, of any place to which this Certificate relates, and without restricting the generality of the foregoing, to:

b) (I) enter upon the premises or the location where the records required by the conditions of this Certificate are kept;

(ii) have access to and copy, at any reasonable time, any records required by the conditions of this Certificate;

(iii) inspect, at reasonable times, any facilities, equipment (including monitoring and control equipment), practices or operations required by the conditions of this Certificate, and

(iv) sample and monitor, at reasonable times, for the purposes of assuring compliance with the conditions of this Certificate.

2.10 The Owner shall, forthwith upon request of the Director, District Manager, or Provincial Officer (as defined in the EPA), furnish any information requested by such persons with respect to compliance with this Certificate, including but not limited to, any records required to be kept under this Certificate; and In the event, the Owner provides the Ministry with information, records, documentation or notification in accordance with this Certificate (for the purposes of this condition referred to as "Information"),

a) the receipt of Information by the Ministry;

b) the acceptance by the Ministry of the Information's completeness or accuracy; or

c) the failure of the Ministry to prosecute, or to require the Owner to take any action, under this Certificate or any statute or regulation in relation to the Information;

shall not be construed as an approval, excuse or justification by the Ministry of any act or omission of the Owner relating to the Information, amounting to non-compliance with this Certificate or any statute or regulation.

2.11 The Owner shall notify the Director in writing of any of the following changes within thirty (30) days of the change occurring:

a) change of owner or operator of the Site or both;

b) change of address or address of the new owner or operator;

c) change of partners where the owner or operator is or at any time becomes a partnership, and a copy of the most recent declaration filed under the **Business Names Act**, 1991 shall be included in the notification to the Director;

3. Site Design and Development

3.1 Within six months of the issuance date of this Certificate, the Owner shall submit to the Director a Legal Survey for the Site.

3.2 Within six months of the issuance date of this Certificate, the Owner shall submit to the Director a final Design and Operating report. This report, once submitted to, and approved by, the Director, shall replace Item 1 of Schedule "A" (the Technical Report-Natural sciences, Conceptual Design and Operations report referenced throughout this Certificate of Approval).

3.3 Any significant design optimization or modification not otherwise requiring an amendment to this Certificate shall be submitted to the Director for approval at least 60 days prior to its implementation along with an explanation of the reasons.

3.4 Waste may only be disposed of within the 4.3 hectare Limit of Fill as described in Figure 11, Item 1 of Schedule "A". Within 60 days of this Certificate coming into effect, the boundaries of the Limit of Fill shall be marked using proper surveying techniques and maintained so as to be visible throughout the year.

3.5 The maximum amount of waste, daily cover, intermediate cover and final cover placed within the Limit of Fill shall not exceed the final contours shown in Figure 12, Item 1 of Schedule "A".

3.6 Final cover shall be applied progressively, as weather conditions permit, as each part of the Limit of Fill reaches its final grades. The design of the final cover shall comply with the specifications contained in Item 1, Schedule "A". Vegetation of completed final cover using drought-resistant, low-nutrient requirement grass and legume blends which regenerate annually shall occur within one month of its placement and final grading, or as soon as weather permits.

3.7 The Buffer shall not be used for waste disposal but may be used for receiving and recording waste arrivals, monitoring, surface water management, and the operation of other approved ancillary waste management facilities, all in accordance with Item 1 in Schedule "A". All parts of the Buffer, other than roadways, parking areas and structures shall be maintained with a healthy vegetative cover or other appropriate surface treatment which will minimize erosion.

3.8 By December 31, 2005, the Owner shall install perimeter fencing consisting of 1.15 meter "post and wire" farm fence along the road adjacent to the landfill (access road) and around the site boundary where it is needed (from the edge of the existing forest area along the roadway to the northwest running to the forest area to the southeast) to secure access to the Site, with "No Trespassing" signs posted at 30 meter intervals around the perimeter.

4. Site Operations

4.1 The maximum waste disposal operating hours of the Landfill shall be 9:00 a.m. to 6:00 p.m. Monday to Sunday. The Owner may provide more limited hours of operation providing that they are correctly posted at the landfill gate and that suitable public notice is given of any change. During days when the Landfill is open, on-site activity other than waste disposal may occur up to two hours prior to opening and/or up to two hours after closing. Equipment maintenance and administrative functions may occur at any time. Upon reasonable notification of the Director, contingency actions may proceed outside of the normal hours of operation. Emergency response may occur at any time, as required.

4.2 During non-operating hours, the Landfill entrance and exit gates will be locked or otherwise secured against access by unauthorized persons.

4.3 No waste shall be received for disposal at the Landfill except during the operating hours and under the supervision of the landfill attendants.

4.4 Only solid non-hazardous waste shall be disposed of in the Landfill.

4.5 The Owner shall record the following information with respect to all wastes received at the Landfill:

a) hauler name, or "residential" if delivered by individual residents;

b) an estimate of net tonnage;

c) waste category; and

d) date received.

The name and vehicle license shall be recorded for any load rejected for disposal in the Landfill along with the reason for rejection.

4.6 Access to the Landfill shall be *via* the existing main entrance from Crib Road, as shown in Figure 2, Item 1 of Schedule "A". Any changes to the main Landfill entrance or exit shall be submitted to the Regional Director for prior approval. Other service entrances may be established for access by Owner staff or contractors, or for contingency or emergency use, provided that they are secured from entry when not in use.

4.7 The burning of wastes at the Landfill is prohibited except for clean wood which shall occur only with the prior approval of the District Manager.

4.8 Scavenging at the Landfill is prohibited, except at the designated re-use area and under the supervision of the landfill attendant.

4.9 The Owner shall take all practical steps to prevent the escape of litter from the site. Periodic pick-up of litter at the Site and along the Access Road in the vicinity of the Site shall be carried out as required, or every two weeks as a minimum. Private property adjacent to the Landfill shall be inspected weekly and litter shall be collected if necessary, with permission of access from the property owner. Litter fencing shall be erected around the working area of the landfill.

4.10 The Owner shall ensure that all Landfill attendant receive initial and ongoing training with respect to the following: the Certificate and Conditions attached to the Certificate, conceptual design and operations; relevant waste management regulations and legislation; environmental concerns related to the waste being handled at the site; occupational health and safety concerns pertaining to the waste being handled at the site; fire fighting protocol; and emergency and contingency measures for the preventing of off-site impacts.

4.11 No water obtained from surface water or from a well constructed on the Site shall be used for drinking purposes without prior approval from the District Manager. Any other water supply system that obtains water from a well or surface water source on the Site shall be clearly marked to indicate that the water is not potable.

4.12 Waste shall be deposited in a manner that minimizes the area of exposed waste at the Landfill working face and shall be compacted before cover material is applied according to the requirements of this Certificate.

4.13 At the end of each working day, and within two hours of the entrance gate closure, weather permitting, cover material consisting of a minimum of 0.15 m thickness of soil and/or a mixture of composted leaves and wood chips and/or landfill fines shall be applied to all incoming wastes received at the tipping face. Any alternative cover material must be approved by the Director.

4.14 In landfilling areas where waste placement is below the final approved contours and landfilling is to be suspended for one month or more, an interim cover consisting of a minimum of 0.30 m thickness of soil and/or a mixture of composted leaves and wood chips and/or landfill fines shall be applied.

4.15 Where existing cover material has eroded such that waste is exposed, the cover material shall be promptly replaced.

5. Monitoring

5.1 The Owner shall monitor groundwater, surface water and leachate as per Schedule "B". The Owner may amend Schedule "B" from time-to-time with the prior written consent of the District Manager.

5.2 All monitoring wells which form part of any monitoring program shall be properly capped, locked and protected from damage. Any groundwater monitoring wells that are damaged shall be repaired, replaced forthwith or properly abandoned.

5.3 In the event that the results of the monitoring programs listed in Schedule "B" are such that an off-site exceedance of the criteria set by the Reasonable Use Policy (RUP), the Ontario Drinking Water Standards (ODWS) and/or the Provincial Water Quality Objectives (PWQO) has occurred as a result of the operation of the Landfill Site, the Owner shall notify the Regional Director as soon as reasonably possible and specify the following:

a) details of the off-site exceedance, confirmatory monitoring requirements and the potential off-site impacts to surface water and groundwater users;

b) the extent and timing of contingency measures to be implemented;

c) modifications, if any, which should be made to the monitoring program; and

d) other mitigation measures, if any, which may be necessary to reduce or prevent off-site impacts.

5.4 In the event that the results of the monitoring programs listed in Schedule "B" are such that an off-site exceedance of the RUP, ODWS or PWQO can reasonably be predicted to occur, the Owner shall include in the annual report:

a) the details of any such predicted off-site exceedance, including the assumptions upon which the prediction is based;

b) a discussion of the modifications, if any, to intended operations which would be necessary to prevent the predicted off-site exceedance;

c) a discussion of the modifications, if any, which should be made to the monitoring program; and

d) a discussion of other mitigation measures or contingency actions, if any, which may be necessary to prevent off-site impacts.

6. Contingency Plans

6.1 The final Design and Operating report described under Condition 3.2 of this Certificate shall include a detailed Contingency Plan and the triggering of such contingency plans, to be used in the event expected performance does not occur and unacceptable impacts occur due to landfill leachate.

6.2 If it is determined by the District Manager that noise, dust, odour, litter, traffic, vector or vermin associated with the operation of the Site must be reduced or otherwise controlled to prevent adverse impacts, the Owner shall implement reasonable contingency measures as agreed to by the Owner and the District Manager.

7. Closure

7.1 At the earlier of two years prior to the anticipated date of closure or when the site has reached 90 percent of its final approved capacity, the Owner shall submit a complete plan for the closure, long term maintenance, long term monitoring and after use of the Site to the Director. The plan shall be developed in consultation with the public. The plan shall include, but not be limited to, the following:

a) plans for fencing and access control;

b) details of any additional cover required;

c) details of any vegetative cover required;

d) post-closure land use plans, including any further grading, filling or landscaping and the need for any structures;

e) the need for any municipal or provincial approvals that would be required to implement the proposed closure plan and the schedule for obtaining such approvals;

f) plans for the continued maintenance, operation and monitoring of the stormwater management system, and landfill gas collection/destruction system (if implemented);

g) plans for the continued monitoring of landfill gas, surface water and groundwater;

h) updated contingency plans to mitigate potential impacts from landfill gas, leachate and stormwater; and

i) details of post-closure ownership of the Site.

7.2 The Owner shall continue to be responsible for the operation, maintenance and monitoring of the Site until such time as the Owner can demonstrate to the Director that the leachate and gas being produced at the site would not cause an exceedance of the PWQO, ODWS, Reasonable Use Guideline and/or all other relevant statutes and policies respecting groundwater, surface water and air as may be applicable at that time.

8. Reporting

8.1 An Annual Report on the development, operation and monitoring of the Site shall be submitted by the Owner to the District Manager. The Annual Report shall be submitted annually for at least the first five (5) years from the issuance date of this Certificate. Thereafter, the frequency of the report may be reduced with prior written permission of the District Manager, and provided that the Owner demonstrates to the District Manager that the site operations and monitoring results have become routine and consistent. Notwithstanding any approved change in reporting frequency, the District Manager may at any time require the Owner to return to annual submission of the Status Report if there is reasonable evidence to conclude that the site operations or monitoring results are no longer routine or consistent.

8.2 Each Annual Report shall be submitted no later than March 31 of the year following the period being reported upon.

8.3 The Annual Report shall, as a minimum, include the following elements:

a) Executive Summary

I) A summary of findings, conclusions and recommendations;

b) Site Operations

I) A site plan of the landfilling area showing: the current and final extent of the Limit of Fill with contours and cross-sections; and any changes to the Site layout;

ii) A report on the landfill capacity used during the reporting period and the remaining capacity;

iii) A report on the types and volumes of waste diverted from the landfill by transfer from the Site;

iv) A report on any variances from Item 1 in Schedule "A" (the Technical Report-Natural Sciences, Conceptual Design and Operations);

v) A summary of complaints regarding the Site operations and the Owner's response;

vi) An assessment as to whether or not the Owner is operating the site in a manner consistent with the Conditions of this Certificate;

c) Environmental Quality Monitoring

I) Site plan only if there has been any changes to the monitoring network;

ii) An analysis and interpretation of gas, surface water and groundwater monitoring data;

iii) An assessment of the surface water quality at the Site boundaries with respect to PWQO;

iv) An assessment of the adequacy of the natural attenuation of leachate and gas generated by the Landfill;

v) An assessment of the physical condition of the groundwater monitoring well installations and discussions on the extent of the contaminant plume resulting from landfill leachate supported by a plume map.

d) Recommendations

I) Recommendations respecting any proposed changes to gas, surface water or groundwater monitoring programs or any repairs required to the monitoring well network.

ii) Recommendations respecting any proposed changes to the operation of the landfill.

iii) Recommendations respecting the requirement for any remedial works or contingency actions based on the monitoring results or operation of the Site.

9. Public Complaints Procedure

9.1 The Owner shall establish a public complaints procedure that includes:

a) within 60 days of the date of this Certificate, posting and maintaining a copy of the landfill complaints procedures at the Site office and the Longlac Ward Office of the Municipality of Greenstone;

b) within 60 days of the date of this Certificate, distributing a copy of the complaints procedures to all residences and commercial establishments within 500 m of the Landfill;

c) designating a person to receive any complaints and to respond within ten working days with a written notice of action; and

d) recording the name and address of each complainant, and the date, time and nature of complaint.

The reasons for the imposition of these terms and conditions are as follows:

1. Condition No. 1.1 is included to define terms that are used throughout the Certificate.
2. Condition No. 2.1, 2.2, 2.3, and 2.5 are included to ensure that the environment is protected and the Site is operated in accordance with the application and supporting documentation submitted by the Owner, and not in a manner which the Director has not been asked to consider.
3. Condition No. 2.4 is included, pursuant to subsection 197(1) of the EPA, to ensure that any persons having an interest in the site are aware that the land has been approved and used for the purposes of waste disposal.
4. Conditions Nos. 2.6 and 2.7 are included to clarify the legal rights and responsibilities of the Owner (severable, violation of EPA).
5. Conditions Nos. 2.9 and 2.10 are included to ensure that the appropriate Ministry staff have ready access to information and the operations of the Site.
6. Conditions Nos. 2.8, 3.5 and 4.4 are included to specify the approved areas from which waste may be accepted at the site and the amounts and types of waste that may be accepted for disposal at the site, based on the application and the supporting documentation.
7. Condition No. 2.11 is included is to clarify the legal rights and responsibilities of the Owner.
8. Conditions No. 3.1, 3.2 and 3.3 are included to ensure that the proposed detailed design for the engineering works are submitted for the Director's approval in a timely manner and approved prior to the commencement of the construction.

9. Conditions No. 3.2 and 3.6 are included to ensure that enough physical space around the fill area is available for the purposes described under Condition 3.6 and in the event a need arises for mitigative measures in the future.

10. Condition No. 3.7 is included to ensure that contaminated groundwater in the area of the landfill site is managed in an environmentally acceptable manner.

11. Condition No. 3.8 is included to in order to address well contaminations issues in adjacent property.

12. Condition 3.8 is included to prevent unauthorized entry to landfill property and reduce visual impacts of landfill.

13. Conditions No. 4.1 and 4.2 are included to specify the operating hours of the site and ensure security against access by unauthorized persons.

14. Condition No.4.3 is included to ensure that landfilling of waste is done under supervision of a properly trained person, to ensure that it is done in accordance with the requirements of this Certificate.

15. Condition No. 4.5 is included to ensure that the Owner accurately estimates the amount of waste brought to the site so that compliance with this Certificate can be verified.

16. Condition No.4.6 is included to specify access to landfill.

17. Conditions Nos. 4.7, 4.8, 4.9 and 4.11 are included to ensure that certain activities are not carried out at the site that are not environmentally acceptable and not safe for human health, and to minimize litter impacts resulting from the operating activities of the Site. In light of existing groundwater contamination in the area of the landfill, even currently potable water could be contaminated anytime in the future.

18. Condition No. 4.10 is included to ensure that the Owner properly trained the staff operating the site and to ensure that the operations are undertaken in accordance with the requirements of this Certificate.

19. Condition No. 4.12 is included to ensure that efficient and environmentally sound procedures are employed during the operation of the landfill site.

20. Conditions Nos. 4.13 and 4.15 are included to ensure that the waste is adequately covered with a suitable material, to minimize the environmental impacts from the landfilling operations.

21. Conditions No. 3.6 and 4.14 are included to ensure that the waste is covered with a suitable final cover material in a timely manner, to minimize the environmental impacts from the disposal of waste.

22. Condition No. 5 is included to require the Owner to undertake the monitoring activities in accordance with the methods acceptable to the Ministry, in order to demonstrate that the site is performing as designed and the impacts on the natural environment are acceptable.

23. Condition No. 6 is included to ensure that there is a plan with an organized set of procedures for identifying and responding to unforeseen but possible problems at the site. A contingency plan is necessary to ensure protection of the natural environment.

24. Condition No. 7 is included to ensure that final closure of the site is completed in an aesthetically pleasing manner and to ensure the long term protection of the natural environment.

25. Condition No. 8 is included to ensure that regular review of site development, operations and monitoring is documented and any possible improvements to site design, operations or monitoring programs are identified.

26. Condition No. 9 is included is to ensure that the Owner has a plan to adequately address public complaints in order to minimize the impacts from the operations at the site. It is also included so that if any complaints are caused by the Facility the complaints are addressed in a timely manner and action is taken to prevent further complaints.

Schedule A:
Supporting Documents

1. A report titled "Application for Environmental Protection Act Approval for the Proposed Landfill Site, Longlac Waste management Study; Technical Report-Natural Sciences, Conceptual Design and Operations", dated December 1997 and prepared by Azimuth Environmental Consulting, Inc.

2. Technical Memorandum dated June 29, 2001, by Azimuth Environmental Consulting Inc. regarding performance monitoring program.

3. Letter from Tesfaye Gebrezghi, MOE, dated January 4, 2000, to Paul Neals, Azimuth Environmental Consulting, Inc

4. Response letter report to MOE comments dated August 16, 2000, from Azimuth Environmental Consulting, Inc., to Tesfaye Gebrezghi, MOE.

Schedule B:
Performance Monitoring Program

1. As per the Monitoring Program described in the Technical Memorandum dated June 29, 2001, from David Ketcheson, Azimuth Environmental Consulting Inc., to Tesfaye Gebrezghi, MOE.
2. As per Condition 5.1 of this Certificate.

In accordance with Section 139 of the Environmental Protection Act, R.S.O. 1990, Chapter E-19, as amended, you may by written notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act, provides that the Notice requiring the hearing shall state:

1. The portions of the approval or each term or condition in the approval in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The Certificate of Approval number;
6. The date of the Certificate of Approval;
7. The name of the Director;
8. The municipality within which the works are located;

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
2300 Yonge St., 12th Floor
P.O. Box 2382
Toronto, Ontario
M4P 1E4

AND

The Director
Section 39, *Environmental Protection Act*
Ministry of Environment and Energy
2 St. Clair Avenue West, Floor 12A
Toronto, Ontario
M4V 1L5

*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 314-4600, Fax: (416) 314-4506 or www.ert.gov.on.ca**

The above noted waste disposal site is approved under Section 39 of the Environmental Protection Act.

DATED AT TORONTO this 10th day of June, 2004

Technical Memorandum

From: David Ketcheson, Azimuth
To: Tesfaye Gebrezghi, MOE Approvals

Re: Town of Longlac
Municipal Solid Waste Facility
Performance Monitoring Program Revisions

Project: 96-016
Date: June 29, 2001

The purpose of this memorandum is to provide a revised performance monitoring program for the proposed expansion of the Municipal Solid Waste facility at the Town of Longlac. These revisions are based in part on discussions held with the MOE Approvals Branch on December 15, 2000 and follow upon our previous correspondence of August 16, 2000.

Based on several discussions the proposed ground water performance monitoring program is suggested for the initial two years of operation following expansion of the landfill. The following ground water sampling frequency is proposed:

Monitoring Location	Annual Frequency for Sampling
2,3, 6, 7, 8-I, 8-II	3 events per annum
Remaining monitors	2 events per annum

A review of the sampling data will be performed in the second year to evaluate the need any changes to the monitoring program. This evaluation will assessed the seasonality of the data at these monitoring points and the need to address these issues as it pertains to the landfill operations as outlined in our August 16, 2000 correspondence.

Similarly, as indicated in our August 16, 2000 correspondence, a surface water monitoring station at Crib Road will be added immediately west of the landfill to ensure there are not unanticipated losses along this pathway.

Performance monitoring of the surface water stations will be assessed at the same time as the ground water monitoring program to provide a comprehensive evaluation that relates the information to surface/ ground water interactions.

A generic water quality package offered by the analytical laboratories would be used. These packages meet the Schedule 5 requirements identified in the Landfill Standards Guideline (MOE, 1998) for both the ground and surface water indicator lists. The field measurements specified in the Schedule 5 would also be collected, at a minimum. It should be noted that the commercial water quality packages also provide most of the

parameters in the comprehensive list for ground and surface waters. The marginal cost increase for the additional parameters is more than offset by the enhanced geochemical understanding the information provides. It is felt that this type of geochemical information will prove invaluable when conducting the initial performance monitoring review two years following the expansion of the landfill.

Finally, a staff gauges will be installed and monitored in both the man-made ponds along the west boundary of the site. These gauges like the adjacent ground water monitors will allow for a better interpretation of the ground water / surface water interactions at the site.

The recalculation on the waste volume is nearing completion and will be forwarded under separate cover. It is our understanding that the Town of Longlac is in the process of conducting a legal survey of the site and this too will be provided when it is completed.

DRK:

Attach: January 4, 2000 correspondence
August 16, 2000 correspondence.

Ministry of the Environment
and Climate Change
Thunder Bay/Kenora District
435 James Street South
Suite 331
Thunder Bay, ON P7E 6S7
Northern Region Technical Support

Ministère de l'Environnement
l'Action en matière de changement climatique
district de Thunder Bay/Kenora
435 rue James sud
Bureau 331
Thunder Bay, ON P7E 6S7

Ontario

Fax (807) 475-1754
Direct Line: (807) 475-1218

June 23, 2015

MEMORANDUM

To: Monika Holenstein
Sr. Environmental Officer
Thunder Bay District Office

From: Alisdair Brown
Regional Hydrogeologist
Technical Support Section, Northern Region

Re: 2014 Environmental Monitoring Report
Longlac Landfill
Municipality of Greenstone, Ontario

As requested, I have reviewed from a hydrogeology perspective the monitoring report prepared by exp Services Inc. (exp) entitled *"2014 Environmental Quality Monitoring Report, Longlac Landfill, Municipality of Greenstone, Ontario"* dated March 2014.

Reasonable Use exceedances occur consistently in almost all of the wells. However, for the critical compliance wells MW2 and MW3, the exceedances are in line with background concentrations, and do not represent off site impacts due to leachate. With respect to the exceedances at MW12-I and MW12-II, which are also located at the property boundary, the contaminant levels are in excess of the background levels and are therefore not so easily explained. It is the consultant's opinion based on the provided Durov plots that the chemical signature at these wells is not characteristic of leachate, and that the exceedances do not represent an off-site impact due to landfill leachate. In general, I tend to concur with the consultant, but believe that further monitoring and more exhaustive analysis of the results is needed to clearly determine the source of the exceedances at these 2 wells.

The consultant has provided the following recommendations regarding the ongoing monitoring and operation of the waste disposal site:

- Reduction to only 2 sampling events each year with elimination of the summer event;
- Reduction of reporting frequency from annual to every three years:
- Carry out a volume survey and determine filling rates and the remaining site capacity;
- Progressive covering of landfill areas as they reach the final elevations to reduce leachate production;

I concur with all of the consultant's recommendations. With respect to the reduction of the sampling frequency, the first sample each year should be collected in May or June, with the intention to collect a sample during periods of higher water levels; and the

second sample is best collected in September or October. With the reduction of reporting to every three years, the next report would be due March 31, 2018.

With regards to the potential for leachate impact at MW12-I and MW12-II, the consultant has stated that the chemistry at these wells is dissimilar to that of the leachate based on the Durov plots. While it is true that the current plots for these wells do not match well with those of the leachate wells (MW8-I and MW4-II), the chemistry also does not match with that of the background well or the more distant and likely unimpacted down gradient wells. Instead, the chemistry of these wells lies somewhere between the two extremes. It is therefore recommended that the chemistry data for these wells needs to be looked at in more detail to determine if the wells are being impacted by landfill leachate, or if the elevated contaminant concentrations are due to another source. Specifically, it is my recommendation that in the next report, the Durov plots for each well location need to show (likely using a legend) the actual dates of each of the plotted points so that the change with time can be determined. Also, a single Durov plot is required that provides a comparison between MW12-I and MW12-II and the background and source wells. In this case, it would be beneficial to provide series of plots each representing a different time period (i.e. one for each year of monitoring) with a single point from wells MW12-I, MW12-II, MW4-II, MW8-I and MW-10. These comparisons can then be used to investigate if the elevated contaminants concentrations at MW12-I and MW12-II are due to landfill leachate. In particular, these plots should aid in determining if the chemistry at these wells is trending with time towards conditions representative of leachate impact from the active fill area.

In summary, although there are reasonable use exceedances of some parameters at wells located at and beyond the property line, there is evidence to indicate that these exceedances are not a result of landfill leachate. As such, it is agreed that sampling can be reduced to only 2 events each year, and that reporting can be reduced to every third year (next report due March 2018). The next report should include a more detailed discussion of the elevated contaminant concentrations at MW12-I and MW12-II to determine if they are resulting from landfill leachate.

If you have any questions regarding the above comments and recommendations, do not hesitate to contact me. The purpose of the preceding review is to provide advice to the Ministry of the Environment and Climate Change regarding groundwater conditions based on the information provided in the above referenced documents. The conclusions, opinions and recommendations of the reviewer are based on information provided by others, except where otherwise specifically noted. The Ministry cannot guarantee that the information that has been provided by others is accurate or complete. A lack of specific comment by the reviewer is not to be construed as endorsing the content or views expressed in the reviewed material.

Alisdair Brown, P.Eng.
Regional Hydrogeologist

Ministry of the Environment, Conservation and Parks
Investigations and Enforcement Branch
Thunder Bay District Office
331-435 James St S
Thunder Bay ON P7E 6S7
Fax: (807) 475-1777
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Ministère de l'Environnement, de la Protection de la nature et des Parcs
Direction des enquêtes et de l'application des lois
Bureau du district de Thunder Bay
331-435 rue James S
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Télécopieur: (807) 475-1777
Tél: 807 475 1418

Ontario

September 19, 2018

The Corporation of the Municipality of Greenstone
1800 Main St
Geraldton, Ontario, P0T 1M0
Canada

Dear Sir/Madam

RE: Longlac WDS inspection
Greenstone, District of Thunder Bay

Reference Number 2128-B45PGK

Thanks for taking the time for the site inspection in regards to the Waste Disposal activities at the Longlac Waste Disposal Site.

Please review the reports for your files. Action items identified in Section 5.0 Action Required must be addressed by the assigned dates. If the deadlines cannot be met, the Owner must inform the under signed Environmental Officer five (5) days prior to the deadline date for consultation on the possible extension of these deadlines.

If you have any further question please do not hesitate to contact the undersigned Environmental Officer.
Yours truly,
Yours truly,

Mike Landers
Investigations Officer
IEB Thunder Bay District

File Storage Number: TB LX CR 610

Ontario

Ministry of the Environment, Conservation and Parks
Ministère de l'Environnement, de la Protection de la nature et des Parcs

Solid Non-Hazardous Waste Disposal Site Inspection Report

Client:	The Corporation of the Municipality of Greenstone Mailing Address: 1800 Main St, Post Office Box, 70, Geraldton, Ontario, Canada, P0T 1M0 Physical Address: 1800 Main St Geraldton, Greenstone, Municipality, District of Thunder Bay, Ontario, Canada, P0T 1M0 Telephone: (807)854-1100, Extension: 2060, FAX: (807)854-1150, email: brian.aaltonen@greenstone.ca Client #: 0380-4TKQAV, Client Type: Municipal Government, NAICS: 913910 Additional Address Info: Geraldton		
Inspection Site Address:	Longlac Landfill Site Address: Northside of Kimberly-Clark's Crib Road Exten, Greenstone, Municipality, District of Thunder Bay District Office: Thunder Bay - District Site #: 6266-5PWSWR		
Contact Name:	Rick Miron	**Title:**	
Contact Telephone:	(807)876-1138 **ext**	**Contact Fax:**	
Last Inspection Date:	2014/08/15		
Inspection Start Date:	2018/08/28	**Inspection Finish Date:**	2018/09/13
Region:	Northern		

1.0 INTRODUCTION

The Municipality of Greenstone - Longlac Ward municipal waste disposal site has been in operation for more than 40 years. Up until 1997, the waste site was approved under Environmental Compliance Approval A590603. In 1997 an Environmental Assessment was completed for site expansion which resulted in a new 4.5 ha footprint which was approved in 2004 under Environmental Compliance Approval # 5968-5ZRM25. In 2006, the Municipality applied to amend the Certificate of Approval to add a recycle transfer operation, including Freon appliances, small amounts of building asbestos, scrap metal, scrap tires, diesel fuel sand, and concrete rubble. This application also requested an expansion to the site for a greater attenuation zone. In June, 2008, an amended approval was issued containing a number of standard conditions regarding the operation of the site.

The waste disposal site property consists of 4.5 ha fill area within a total site area of 80 ha, and is located on the north side of Crib Road, 3 kilometres north-east of the Town of Longlac. The site mainly serves the Longlac Ward of the Municipality of Greenstone, with a population of approximately 3100. The Service Area specified in the Certificate of Approval is specified as follows *"only waste generated within the boundaries of the Municipality of Greenstone, Daley and Oak Townships, First Nations (Ginoogaming #77 and Long Lake #58) and Unorganized Areas (Houck, Croll, Oaks, Aubrey, Daley, Bain, and O'Meara) shall be accepted at the site."*

The purpose of this inspection was to assess compliance with Ministry of Environment Conservation and Parks (MECP) legislation, specifically the Environmental Compliance Approval, Regulation 347 and the waste management provisions of the Environmental Protection Act. The inspection consisted of a review of files and reports, as well as a site visit on August 28, 2018, accompanied by the Longlac Public Works employee, Mike Gagnon.

2.0 INSPECTION OBSERVATIONS

Certificate of Approval Number(s):
The site is authorized to operate under Environmental Compliance Approval #5968-5ZRM25.

Up until 1997, the waste site was approved under Environmental Compliance Approval A590603. In 1997, an Environmental Assessment was completed for site expansion and this resulted in a new Environmental Compliance Approval with a 4.5 ha footprint was approved in 2004 (ECA# 5968-5ZRM25). In 2006, the Municipality applied to amend the Environmental Compliance Approval to add some waste types to the site, as well as a recycle transfer operation including: Freon appliances, small amounts of building asbestos, scrap metal, scrap tires, diesel fuel sand, and concrete rubble. In June, 2008, an amended approval was issued.

Furthermore an amendment to the ECA, dated May 2, 2016, provided approval for a reduction in sampling frequency from three times annually (spring, summer and fall) to twice annually (spring and fall), and approval for a reduction in monitoring report frequency from annually to every three years. However, an annual report regarding Record Keeping and Reporting (Conditions 6[6] and 6[7]) is required, with the first such report having been submitted to the MOECC for the 2015 calendar year, and the second for 2016.

2.1 FINANCIAL ASSURANCE:

Specifics:
There is no MECP requirement for Financial Assurance for Municipally owned Waste Disposal Sites.

2.2 APPROVED AREA OF THE SITE:

Specifics:
The site is approved for the use and operation of a 4.5 hectare landfilling/recycling area and a 1.6 hectare closed landfill area within a total area of 80 hectares.

Registration on Title

Condition 14 of the Certificate of Approval contains the following requirements:
(14) The Owner shall:
(a) Within 60 days of the date of the issuance of this Certificate, submit to the Director for review, copies of a completed Certificate of Requirement with a registerable description of the Property; and
(b) Within 10 calendar days of receiving the Certificate of Requirement authorized by the Director, r the Certificate of Requirement in the appropriate Land Registry Office on title to the Property and subm Director the duplicate registered copy immediately following registration.

Condition 16 of the Certificate of Approval contains the following requirements:
(16) The Owner shall:
(a) Within 60 days of the date of the issuance of this Certificate, submit to the Director for review, copies of a completed Certificate of Requirement with a registerable description of the CAZ; and
(b) Within 10 calendar days of receiving the Certificate of Requirement authorized by the Director, r the Certificate of Requirement in the appropriate Land Registry Office on title to the CAZ and submit to Director the duplicate registered copy immediately following registration.

The Municipality completed a legal survey of the site in 2009 and placed markers around the fill area (subsequently needs refreshing). ***To date, the MECP has not received a Certificate of Requirement appears that the Municipality has not complied with this requirement. The Municipality must pr with Registration on Title by the end of 2020.*** *It is documented that the Municipality is still investigat matter and registration on title of the entire site has not yet been completed. Also documented (and to explored further) Based on the historical reports recommending the current attenuation zone boundarie Municipality owns all of these lands.*

2.3 APPROVED CAPACITY:

Specifics:

Site Capacity

Condition 7(5) of the The Certificate of Approval outlines the approved Site Capacity as :

(5) The maximum amount of waste, daily cover, intermediate cover and final cover placed within the 4.5 hectare foot print shall not exceed the final contours shown in Figure 12, Item 1 of Schedule "A". This is equivalent to 262,300 cubic metres.

Since 2014, the Longlac site received waste previously disposed of in the Geraldton site, as the Geraldton site is nearing capacity. This may have had an impact on the remaining capacity of the Longlac site. The Municipality continues to redirect waste from the Geraldton landfill site due to capacity issues. Therefore the Longlac WDS has had a steady increase in waste deposited at the site lowering its capacity/yrs of life expectancy.

The latest report submitted to MECP (still under review) estimated the approximate total volume of was at the end of 2017 at 125,000 m_3.
Based on a total landfill capacity of 228,300 m_3 (excluding estimated final cover volume of 34,000 m_3), the estimated remaining capacity is about 103,300 m_3. The current estimated remaining life span (based on 6,150 m_3/yr. of waste and interim cover) is therefore about 17 years, or to 2035.

2.4 ACCESS CONTROL:

Specifics:

Site Security

Site Signs

Condition 2 (2) of the Certificate of Approval requires:
Signs
(2) A sign shall be installed and maintained at the main entrance/exit to the Site on which is legibly displayed the following information:
(a) the name of the Site and Owner;
(b) the number of the Certificate;
(c) the name of the Operator;
(d) the normal hours of operation;
(e) the allowable and prohibited waste types;
(f) the telephone number to which complaints may be directed;
(g) a warning against unauthorized access;

(h) a twenty-four (24) hour emergency telephone number (if different from above); and
(i) a warning against dumping outside the Site
(3) The Owner shall install and maintain signs to direct vehicles to working face and recycling areas.
(4) The Owner shall provide signs at recycling depot informing users what materials are acceptable and directing users to appropriate storage area.

Signage at entrance of Longlac Landfill

Condition 2 of the Certificate of Approval requires:
(10) No waste shall be received, landfilled or removed from the Site unless a site supervisor or attendant is present and supervises the operations during operating hours. The Site shall be closed when a site attendant is not present to supervise landfilling operations.
(11) The Site shall be operated and maintained in a safe and secure manner. During non-operating hours, the Site entrance and exit gates shall be locked and the Site shall be secured against access by unauthorized persons.

Access to the site is controlled by means of a locked gate. An attendant is on duty whenever the site is open. At the time of inspection, there was no evidence of unauthorized access.

Daily Inspection

Condition 6 of the Certificate of Approval requires daily inspections of the site and the maintenance of a log book:
(3) An inspection of the entire Site and all equipment on the Site shall be conducted each day the Site is in operation to ensure that: the Site is secure; that the operation of the Site is not causing any nuisances; that the operation of the Site is not causing any adverse effects on the environment and that the Site is being operated in compliance with this Certificate. Any deficiencies discovered as a result of the inspection shall be remedied immediately, including temporarily ceasing operations at the Site if needed.
(4) A record of the inspections shall be kept in a daily log book that includes:

(a) the name and signature of person that conducted the inspection;
(b) the date and time of the inspection;
(c) the list of any deficiencies discovered;
(d) the recommendations for remedial action; and
(e) the date, time and description of actions taken.

It appears the site operator has been keeping a log book for these requirements.

Household Hazardous Wastes

The Municipality has opened a Household Hazardous Waste Site at the Longlac site. This is permitted by Condition 11 of the Environmental Compliance Approval, which contains specific requirements:

HHW Facility Operations

(1) The HHW depot shall not receive more than 5 cubic metres of HHW per day.
(2) The HHW depot shall not store in excess of 10 cubic metres of HHW on Site.
(3) HHW shall not be stored at the Site for longer than one hundred eighty (180) days, unless the consent of the District Manager has been obtained, with the exception of waste oil which shall be stored on Site in accordance with Condition 11(2).
(4) All household hazardous waste received and stored must be managed in accordance with Ontario Regulation 347, R.R.O. 1990, as amended, and with the Ministry of Environment document entitled "Household Hazardous Waste Collection and Facility Guidelines" dated May 1993.
(5) All storage of liquid wastes shall be in accordance with this Ministry's publication "Guidelines of Environmental Protection Measures at Chemical Storage Facilities", dated October 1978 as amended.
(6) All HHW shall be stored in secondary containment that is adequate to contain any spills or leaks. Segregated secondary containment shall be provided for incompatible types of waste.
(7) Incoming HHW shall be inspected by Trained Personnel, prior to being accepted at the Site, to ensure that the Site is approved to accept that type of waste.
(8) All containers shall be clearly labelled indicating the type and nature of the hazardous waste stored as required by regulation. All points of access to the Site shall be posted to warn that the area contains hazardous materials.
(9) No radioactive wastes shall be accepted at this Site.
(10) Oil and oil-based paints which have been manufactured prior to 1972; or whose manufacturing date cannot be determined, may contain PCBs and shall be handled as follows:
(a) The oil and oil-based paints shall not be mixed (bulked) with other paints prior to testing. Paints which are lab-packed are not considered to be mixed under this Certificate;
(b) The oil and oil-based paints shall be tested by a certified laboratory for PCB content and shall be handled in the manner outlined in Condition 35.10 (c) if found to contain PCBs;
(c) If the oil and oil-based paints are found to have PCBs at or above levels identified in Condition 35.10 (d), it shall be forthwith reported to the District Manager and shall be managed in accordance with Regulation 362 and stored or removed from the Site to an approved PCB storage site, in accordance with written instructions from the District Manager; and
(d) The oil and oil-based paints shall not be distributed for reuse if they have any measurable

PCB content. The oil and oil-based paint is considered to be a PCB waste, if measured levels are equal to or greater than 50 parts per million.

(11) Except for oil based paints that become classified as PCB Waste, paints may be offered for reuse to the public. Records shall be kept of the type, volume and recipient of paint returned to the public.

(12) The Owner shall maintain, at the Site, a log book which records daily, the following information:

(a) date of record;
(b) types, quantities and source of HHW received;
(c) quantities of HHW stored at the Site;
(d) quantities and destination of HHW shipped from the Site; and
(e) quantities of waste returned to the public as noted in Condition 11(11).

At the time of inspection, it did not appear that the Municipality complied with a number of these conditions, specifically, the HHW log book, labelling of containers and site access points. Incoming HHW shall be inspected by Trained Personnel,.... etc. As well, it did not appear that the Operator of the HHW had sufficient training to operate the HHW site. The Municipality should review the requirements of the Environmental Compliance Approval and ensure the HHW site operators are familiar with all of the requirements.

Employee Training

Condition 3 of the Certificate of Approval requires:

(1) A training plan for all employees that operate any aspect of the Site shall be developed and implemented by the Operator. Only Trained Personnel shall operate any aspect of the Site or carry out any activity required under this Certificate.

Trained Personnel are defined in the Certificate of Approval as:
"Trained personnel" means knowledgeable in the following through instruction and/or practice:

a. relevant waste management legislation, regulations and guidelines;
b. major environmental concerns pertaining to the waste to be handled;
c. occupational health and safety concerns pertaining to the processes and wastes to be handled;
d. management procedures including the use and operation of equipment for the processes and wastes to be handled;
e. emergency response procedures;
f. specific written procedures for the control of nuisance conditions;
g. specific written procedures for refusal of unacceptable waste loads; and
h. the requirements of this Certificate; and

It is critical to the operation of the site that employees working at the site be aware of appropriate waste disposal site operation.

At the time of inspection, discussions with the site operators indicate that they are unaware of the Design and Operating Plan for the site and has had limited training in the handling and logging of Household Hazardous Goods.

It appears in years past the Municipality provided training to all site operators. It does not appear that any additional re occurring training has been completed for experienced staff or any training being provided to newer and temporary staff.
The Municipality must develop a comprehensive training plan for staff as required by the Environmental Compliance Approval and provide regular updated training to staff on all aspects of operating the waste site.
This appears to be an ongoing issue for this site due to many reasons, therefore, there is more motivation to ensure a comprehensive training plan with regular updates are to be shared/trained with the staff operating at the site.

2.5 COVER MATERIAL:

Specifics:
Condition 7(9) of the Certificate of Approval contains requirements regarding cover material:
Cover material shall be applied as follows:
(a) Daily Cover - Weather permitting, deposited waste shall be covered at the end of each working day in a manner acceptable to the District Manager so that no waste is exposed to the atmosphere;
(b) Intermediate Cover - In areas where landfilling has been temporarily discontinued for six (6) months or more, a minimum thickness of 300 millimetre of soil cover or an approved thickness of alternative cover material shall be placed; and
(c) Final Cover - In areas where landfilling has been completed to final contours, a minimum 600 millimetre thick layer of clay and 150 millimetres of top soil (final cover) shall be placed. Fill areas shall be progressively completed and rehabilitated as landfill development reaches final contours.

At the time of inspection there was some uncovered waste and a little wind thrown bags due to equipment breakdown. The operator assured the full covering of the fill area would be resolved once equipment is operational. Therefore, it appeared that adequate cover was being applied to the working area.

The importance of a clearly understood design and operating plan has been discussed with the Municipality in years past. The site operators must be aware of the progression of site usage and fill area limits as well as final elevations and contours for the fill area. Fill area, current working area, final contours must be clearly indicated at the site to assist in the orderly use of the site and eventual final closure. Areas that have reached final elevation should be sloped, covered and seeded.

2.6 WASTE BURNING:

Specifics:
Condition 2 (6) of the Environmental Compliance Approval prohibits burning of waste at the site. At the time of inspection there was no evidence of burning at the site.

2.7 GROUNDWATER/SURFACEWATER IMPACT:

Specifics:
Condition 8 of the Environmental Compliance Approval (and associated Notice 1, issued May 2, 2016) contains Ground and Surface Water monitoring requirements:

LANDFILL MONITORING

Surface Water and Ground Water

(3) (1) The *Owner* shall monitor surface water and groundwater in accordance with Item 2 in "A" with the frequency found in Schedule "B".

(2) (a) The results and an interpretive analysis of all leachate, groundwater, surface water, an gas monitoring, including an assessment of the need to amend the monitoring programs will be s **April 30, 2018** and every three (3) years thereafter, alongside the Annual Report required in Con 6.(7).

(b) The 2018 report shall include but is not limited to:

(i) a detailed discussion of the elevated contaminant concentrations at MW12-I ar 12-II to determine if they result from landfill leachate.

(ii) the Durov plots for each well location need to show the year of each of the plot so that the change with time can be determined.

(iii) a single Durov plot that provides a comparison between MW12-I and MW 12-II background and source wells. It may be beneficial to provide series of plots each representing a time period with a single point from wells MW12-I, MW12-II, MW4-II, MW8-1, AND MW-10. Thes comparisons can be used to investigate if the elevated contaminants concentrations at MW12-I a MW12-II are due to landfill leachate.

(iv) the adequacy of and need to implement the contingency plans.

(v) site plans showing the existing contours of the *Site;* areas of landfilling operati the reporting period; areas of intended operation during the next reporting period; areas of excav during the reporting period; the progress of final cover, vegetative cover, and any intermediate cc application; previously existing site facilities; facilities installed during the reporting period; and sit preparations and facilities planned for installation during the next reporting period.

(4) A certified Professional Geoscientist or Engineer possessing appropriate hydrogeologic training a experience shall execute or directly supervise the execution of the groundwater monitoring and r program.

The Municipality has been conducting surface water and ground water monitoring and submitting Annual Environmental Monitoring Reports as required by the Environmental Compliance Approval. The 2015-2017 reports have not yet been reviewed by the MECP's Hydrogeologist. When available, the review will be forwarded to the Municipality.

2.8 LEACHATE CONTROL SYSTEM:

Specifics:

There is no requirement for a leachate control system at this site, as the site is considered to be naturally attenuation. Ground water monitoring has indicated contaminants are largely attenuated within the approved limits of the site.

2.9 METHANE GAS CONTROL SYSTEM:

Specifics:

There is no requirement for a methane control system at this site. However, Condition 8 of the Certificate of Approval requires:

(1) The Owner shall ensure that any buildings or structures at the Site contain adequate ventilation systems to relieve any possible landfill gas accumulation. Routine monitoring for explosive methane gas levels shall be conducted in all buildings or structures at the Site, especially enclosed structures which at times are occupied by people.

Monitoring has occured in the past and reported on in the latest annual report submitted to MECP

30, 2018. A GasTechtor Model No. 1238 was used in 2015, and using an RKI Eagle 2 gas monitor c to hexane standards in 2016 and 2017. Methane was measured by the difference between full ga (including methane) and methane elimination mode. Methane levels were mainly non-detectable (ppm); however, results ranged up to 45 ppm, which is still considered very low.

2.10 OTHER WASTES:

Specifics:
All of the additional waste/recyclable that is not solid non hazardous and that is not deposited within the fill area is scheduled to be picked up for recycling.

Fridges for recycling by Dutchak

Tires to be picked up by OTS company

Steel to be recycled by Dutchak

HHW to be picked up by GFL

3.0 REVIEW OF PREVIOUS NON-COMPLIANCE ISSUES

The inspection in 2014, revealed a number of areas where the Municipality was not complying with requirements set in the Environmental Compliance Approval:

- **The 2013 Environmental Quality Monitoring Report still refers the 2004 Certificate of Approval and indicates to a total site area of 23 hectares. All of the Figures showing fill area and attenuation zones are inaccurate in this report. All future Annual Reports must be based on the most current Certificate of Approval. The figures for the 2013 Report should be revised and submitted to the MOE by October 31, 2014.**
- **The MOE has not received a Certificate of Requirement and it appears that the Municipality has not complied with the requirement to register the site and attenuation zone on Title. The Municipality must proceed with Registration on Title by December 31, 2014.**
- **At the time of inspection, discussions with the site operator indicate that he is unaware of the Design and Operating Plan for the site and has had limited training in the handling**

of Household Hazardous Goods. The Municipality must develop a comprehensive training plan for staff as required by the Certificate of Approval and provide regular updated training to staff on all aspects of operating the waste site.

- **The importance of a clearly understood design and operating plan has been discussed with the Municipality many times. The site operators must be aware of the progression of site usage and fill area limits as well as final elevations and contours for the fill area. Fill area, current working area, final contours must be clearly indicated at the site to assist in the orderly use of the site and eventual final closure.**
- **Waste areas that have reached final elevation have not been sloped, covered and seeded as required by the Certificate of approval**
- **A review of the 2013 Annual report indicated that detail information on fill area, progress of final cover and vegetative cover, etc were not included in the report as required by the Certificate of Approval. Ensure all future reports include all required information.**
- **The Approval requires routine monitoring of methane gas levels on all building on the site. At the time of inspection, it did not appear that the Municipality had a routine monitoring program for methane gas levels.**
- **The Municipality has recently initiated a HHW depot at the site. At the time of inspection, it appeared that the Municipality was not complying with some of the HHW requirements contained in the Certificate of Approval, specifically: the offering of paint for re-use, the HHW log book, labelling of containers and site, special handling provisions for paints, etc. As well, it did not appear that the Operator of the HHW had sufficient training to operate the HHW site. The Municipality should review the requirements of the Certificate of Approval and ensure the HHW site operator is familiar with all of the requirements. The lack of ventilation in a HHW container may also be of concern and should be reviewed.**

4.0 SUMMARY OF INSPECTION FINDINGS (HEALTH/ENVIRONMENTAL IMPACT)

Was there any indication of a known or anticipated human health impact during the inspection and/or review of relevant material, related to this Ministry's mandate?
No

Specifics:

Was there any indication of a known or anticipated environmental impact during the inspection and/or review of relevant material ?
No

Specifics:

Was there any indication of a known or suspected violation of a legal requirement during the inspection and/or review of relevant material which could cause a human health impact or environmental impairment ?
Yes

Specifics:
The non- compliant issues (listed below) are unchanged from the ones identified in the 2014 inspection. Due to the repeated observations, It is expected that the Municipality take control and address the issues.

1. **The MOE has not received a Certificate of Requirement and it appears that the**

Municipality has not complied with the requirement to register the site and attenuation zone on Title. The Municipality must proceed with Registration on Title by December 31, 2020.

2. **At the time of inspection, discussions with the site operators had indicated that they are unaware of the Design and Operating Plan for the site and have limited training in the handling of Household Hazardous Goods. The Municipality must develop a comprehensive training plan for staff as required by the Environmental Compliance Approval and provide regular updated training to staff on all aspects of operating the waste site.**
3. **The importance of a clearly understood design and operating plan has been discussed with the Municipality many times. The site operators must be aware of the progression of site usage and fill area limits as well as final elevations and contours for the fill area. Fill area, current working area, final contours must be clearly indicated and understood at the site to assist in the orderly use of the site and eventual final closure.**
4. **The Municipality has initiated a HHW depot at the site. At the time of inspection, it appeared that the Municipality was not complying with some of the HHW requirements contained in the Environmental Compliance Approval, specifically: the offering of paint for re-use, the HHW log book, labelling of containers and site, special handling provisions for paints, etc. As well, it did not appear that the Operator of the HHW had sufficient t training to operate the HHW site. The Municipality should review the requirements of the Certificate of Approval and ensure the HHW site operator is familiar with all of the requirements. The lack of ventilation in a HHW container may also be of concern and should be reviewed.**

Was there any indication of a potential for environmental impairment during the inspection and/or the review of relevant material ?
No

Specifics:

Was there any indication of minor administrative non-compliance?
No

Specifics:

5.0 ACTION(S) REQUIRED

The Municipality must ensure compliance with the ECA and comply with the following non compliant is

- By December 31, 2020, the Municipality must register the waste site and attenuation zone on Title submit a Certificate of Requirement to the MECP.

- By December 31, 2019, The Municipality must develop and implement a comprehensive training plan for staff, working at the Landfill Site,as required by the Environmental Compliance Approval and provide regular updated training to staff on all aspects of operating the waste site. The training will not be limited too, but must include, review of the ECA, Review the Design and operation of the site, all conditions associated to the HHW condition 11, reasoning for clear boundary identification, reasoning for the elevation markers.

- By December 31, 2019, the Municipality is to refresh the approved WDS dumping

boundaries, the WDS area and elevation markers.

1. By December 31, 2020, the Municipality must register the waste site and attenuation zone on Title and submit a Certificate of Requirement to the MECP.

   By December 31, 2019, The Municipality must develop and implement a comprehensive training plan for staff, working at the Landfill Site,as required by the Environmental Compliance Approval and provide regular updated training to staff on all aspects of operating the waste site. The training will not be limited too, but must include, review of the ECA, Review the Design and operation of the site, all conditions associated to the HHW condition 11, reasoning for clear boundary identification, reasoning for the elevation markers.

   By December 31, 2019, the Municipality is to refresh the approved WDS dumping boundaries, the WDS area and elevation markers.

6.0 OTHER INSPECTION FINDINGS

Reason given at the time of inspection for the Mattress waste pile is understandable, but maintenance of such a pile needs to be addressed on a more frequent basis.

Reasoning given at the time of inspection for the sofa chair in the HHW bin is understood but the item needs to be removed and disposed of.

The review of the monitoring reports submitted by the Municipality is currently underway. Once the review is completed by the MECP, the recommendations (if any) will be forward to the Municipality.

7.0 INCIDENT REPORT

Applicable
0633-B4DPTU ☐

8.0 ATTACHMENTS

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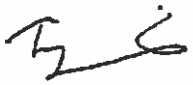
PREPARED BY:
Environmental Officer:

Name:	**Mike Landers**
District Office:	**IEB Thunder Bay District**
Date:	**2018/09/13**
Signature	

REVIEWED BY:
District Supervisor:

Name:	**Tyler Manning**
District Office:	**Thunder Bay District Office**

Date: 2018/09/14

Signature: 

File Storage Number: TB LX CR 610

Note:
"This inspection report does not in any way suggest that there is or has been compliance with applicable legislation and regulations as they may apply to this facility. It is, and remains, the responsibility of the owner and/or the operating authority to ensure compliance with all applicable legislative and regulatory requirements"

Ministry of the Environment and Climate Change
Northern Region
Thunder Bay District Office
331-435 James St S
Thunder Bay ON P7E 6S7
Fax: (807) 475-1754
Tel: (807) 475-1699

Ministère de l'Environnement et de l'Action en matière de changement climatique
Direction régionale du Nord
Bureau du district de Thunder Bay
Bureau du district de Thunder Bay
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Ontario

October 6, 2014

The Corporation of the Municipality of Greenstone
1800 Main St
Geraldton, Ontario, P0T 1M0
Canada
Attn: Brian Aaltonen, Director Public Services

Dear Sir,

RE: Inspection report for Longlac Waste Disposal Site
Reference Number 5236-9N4RX6

On August 15, 2014, I conducted an inspection of the Longlac Waste Disposal Site, accompanied by Rick Miron. Attached is a copy of the inspection report.

Please take note of all of the required actions found in Section 5.0 of the report and ensure that the requirements of the Certificate of Approval are followed for this site.

Two of the required actions had compliance dates of October 31, 2014, but due to the delay in sending you these reports, those dates can be extended to November 30, 2014.

Please do not hesitate to contact me if you have any questions regarding the report or the required actions.

Yours truly,

Monika Holenstein
Senior Environmental Officer
Thunder Bay District Office

File Storage Number: TB LX CR 600

Ontario

Ministry of the Environment
Ministère de l'Environnement

Solid Non-Hazardous Waste Disposal Site Inspection Report

Client:	The Corporation of the Municipality of Greenstone Mailing Address: 1800 Main St, Post Office Box, 70, Geraldton, Ontario, Canada, P0T 1M0 Physical Address: 1800 Main St Geraldton, Greenstone, Municipality, District of Thunder Bay, Ontario, Canada, P0T 1M0 Telephone: (807)854-1100, Extension: 2060, FAX: (807)854-1150, email: brian.aaltonen@greenstone.ca Client #: 0380-4TKQAV, Client Type: Municipal Government, NAICS: 913910 Additional Address Info: Geraldton		
Inspection Site Address:	Longlac Waste Disposal Site Address: Crib Rd, Greenstone, Municipality, District of Thunder Bay District Office: Thunder Bay - District GeoReference: , LIO GeoReference: Zone: , UTM Easting: , UTM Northing: , Latitude: , Longitude:		
Contact Name:	Rick Miron	**Title:**	Public Works Working Supervisor
Contact Telephone:	(807)876-1138 **ext**	**Contact Fax:**	
Last Inspection Date:	2009/12/08		
Inspection Start Date:	2014/08/15	**Inspection Finish Date:**	2014/09/18
Region:	Northern		

1.0 INTRODUCTION

The Municipality of Greenstone - Longlac Ward municipal waste disposal site has been in operation for more than 40 years. Up until 1997, the waste site was approved under Certificate of Approval A590603. In 1997 an Environmental Assessment was completed for site expansion which resulted in a new 4.5 ha footprint which was approved in 2004 under Certificate of Approval # 5968-5ZRM25. In 2006, the Municipality applied to amend the Certificate of Approval to add a recycle transfer operation, including Freon appliances, small amounts of building asbestos, scrap metal, scrap tires, diesel fuel sand, and concrete rubble. This application also requested an expansion to the site for a greater attenuation zone. In June, 2008, an amended approval was issued containing a number of standard conditions regarding the operation of the site.

The waste disposal site property consists of 4.5 ha fill area within a total site area of 80 ha, and is located on the north side of Crib Road, 3 kilometres north-east of the Town of Longlac. The site mainly serves the Longlac Ward of the Municipality of Greenstone, with a population of approximately 3100. The Service Area specified in the Certificate of Approval is specified as follows *"only waste generated within the boundaries of the Municipality of Greenstone, Daley and Oak Townships, First Nations (Ginoogaming #77 and Long Lake #58) and Unorganized Areas (Houck, Croll, Oaks, Aubrey, Daley, Bain, and O'Meara) shall be accepted at the site."*

The purpose of this inspection was to assess compliance with Ministry of Environment legislation, specifically the Certificate of Approval, Regulation 347 and the waste management provisions of the Environmental Protection Act. The inspection consisted of a review of files and reports, as well as a site visit on August 15, 2014, accompanied by the Longlac Public Works Working Foreman, Rick Miron.

2.0 INSPECTION OBSERVATIONS

Certificate of Approval Number(s):
Thel site is authorized to operate under Certificate of Approval 5968-5ZRM25.

Up until 1997, the waste site was approved under Certificate of Approval A590603. In 1997, an Environmental Assessment was completed for site expansion and this resulted in a new Certificate of Approval with a 4.5 ha footprint was approved in 2004 (C of A 5968-5ZRM25). In 2006, the Municipality applied to amend the Certificate of Approval to add some waste types to the site, as well as a recycle transfer operation including: Freon appliances, small amounts of building asbestos, scrap metal, scrap tires, diesel fuel sand, and concrete rubble. In June, 2008, an amended approval was issued. Specific requirements of the Approval are discussed in the relevant sections of the inspection report.

2.1 FINANCIAL ASSURANCE:

Specifics:

There is no MOE requirement for Financial Assurance at municipally owned Waste Disposal Sites.

2.2 APPROVED AREA OF THE SITE:

Specifics:

The site is approved for the use and operation of a 4.5 hectare landfilling/recycling area and a 0.6 hectare closed landfill area within a total area of 80 hectares. The previous approval, from 2004, approved a 4.5 hectare landfill within a total site area of 23 hectares. In the 2007 Design and Operating Report for the site, which was the basis for the 2008 Approval amendment, the attenuation zone was expanded to bring the total site area to 80 hectares.

The reporting section of the current Certificate of Approval requires that *"a site plan of the landfilling area showing the current and final extent of the Limit of Fill with contours and cross-sections, and any changes to Site layout"* be included in the Annual Report. The 2013 Environmental Quality Monitoring Report still refers to the 2004 Certificate of Approval and indicates a total site area of 23 hectares. All of the Figures showing fill area and attenuation zones are inaccurate in this report. **All future Annual Reports must be based on the most current Certificate of Approval. The figures for the 2013 Report should be revised and submitted to the MOE by October 31, 2014.**

Registration on Title

Condition 14 of the Certificate of Approval contains the following requirements:
(14) The Owner shall:
(a) Within 60 days of the date of the issuance of this Certificate, submit to the Director for review, two copies of a completed Certificate of Requirement with a registerable description of the Property; and
(b) Within 10 calendar days of receiving the Certificate of Requirement authorized by the Director, register the Certificate of Requirement in the appropriate Land Registry Office on title to the Property and submit to the Director the duplicate registered copy immediately following registration.

Condition 16 of the Certificate of Approval contains the following requirements:

(16) The Owner shall:
(a) Within 60 days of the date of the issuance of this Certificate, submit to the Director for review, two copies of a completed Certificate of Requirement with a registerable description of the CAZ; and
(b) Within 10 calendar days of receiving the Certificate of Requirement authorized by the Director, register the Certificate of Requirement in the appropriate Land Registry Office on title to the CAZ and submit to the Director the duplicate registered copy immediately following registration.

The Municipality completed a legal survey of the site in 2009 and placed markers around the fill area. The Municipality has been in discussions with a adjacent land owner to resolve issues with the attenuation zone and natural gas pipeline right of way for several years. **To date, the MOE has not received a Certificate of Requirement and it appears that the Municipality has not complied with this requirement. The Municipality must proceed with Registration on Title by the end of 2014.**

2.3 APPROVED CAPACITY:

Specifics:

Site Capacity

Condition 7(5) of the The Certificate of Approval outlines the approved Site Capacity as :

(5) The maximum amount of waste, daily cover, intermediate cover and final cover placed within the 4.5 hectare foot print shall not exceed the final contours shown in Figure 12, Item 1 of Schedule "A". This is equivalent to 262,300 cubic metres.

According to the 2013 Environmental Quality Monitoring Report, the estimated total *in situ* volume of waste at the end of 2013 was about 103,200 m3. With a total capacity of 206,000 m3, this leaves the site with an estimated remaining capacity of about 102,800 m3, which is estimated to represent approximately 11 years of capacity. The 2013 Report contains a recommendation that a volume survey be conducted in 2014 to determine the increase in the volume of waste and interim cover since the previous survey in October 2009, and to provide confirmation of the remaining life span.

For a number of months in 2014, the Longlac site received waste previously disposed of in the Geraldton site, as the Geraldton site was closed pending resolution of capacity issues. This may have had an impact on the remaining capacity of the Longlac site.

A volume survey should be conducted in 2014 to determine the amount of waste in the site and the remaining capacity.

2.4 ACCESS CONTROL:

Specifics:

Site Security

Condition 2 of the Certificate of Approval requires:
(10) No waste shall be received, landfilled or removed from the Site unless a site supervisor or attendant is present and supervises the operations during operating hours. The Site shall be closed when a site attendant is not present to supervise landfilling operations.
(11) The Site shall be operated and maintained in a safe and secure manner. During non-operating hours, the Site entrance and exit gates shall be locked and the Site shall be secured against access by unauthorized persons.

Access to the site is controlled by means of a locked gate. An attendant is on duty whenever the site is open. At the time of inspection, there was no evidence of unauthorized access.

Site Signs

Condition 2 (2) of the Certificate of Approval requires:
Signs
(2) A sign shall be installed and maintained at the main entrance/exit to the Site on which is legibly displayed the following information:
(a) the name of the Site and Owner;
(b) the number of the Certificate;
(c) the name of the Operator;
(d) the normal hours of operation;
(e) the allowable and prohibited waste types;
(f) the telephone number to which complaints may be directed;
(g) a warning against unauthorized access;
(h) a twenty-four (24) hour emergency telephone number (if different from above); and
(i) a warning against dumping outside the Site
(3) The Owner shall install and maintain signs to direct vehicles to working face and recycling areas.
(4) The Owner shall provide signs at recycling depot informing users what materials are acceptable and directing users to appropriate storage area.

A sign has been posted at the gate which contains all of the required information.

Sign at front gate

Employee Training

Condition 3 of the Certificate of Approval requires:
(1) A training plan for all employees that operate any aspect of the Site shall be developed and implemented by the Operator. Only Trained Personnel shall operate any aspect of the Site or carry out any activity required under this Certificate.

Trained Personnel are defined in the Certificate of Approval as:
"Trained personnel" means knowledgeable in the following through instruction and/or practice:
a. relevant waste management legislation, regulations and guidelines;
b. major environmental concerns pertaining to the waste to be handled;
c. occupational health and safety concerns pertaining to the processes and wastes to be handled;
d. management procedures including the use and operation of equipment for the processes and wastes to be handled;
e. emergency response procedures;
f. specific written procedures for the control of nuisance conditions;
g. specific written procedures for refusal of unacceptable waste loads; and
h. the requirements of this Certificate; and

It is critical to the operation of the site that employees working at the site be aware of appropriate waste disposal site operation.

In 2009, the Municipality provided training to all site operators. It does not appear that any additional training has occurred for staff since that time.

At the time of inspection, discussions with the site operator indicate that he is unaware of the Design and Operating Plan for the site and has had limited training in the handling of

Household Hazardous Goods. The Municipality must develop a comprehensive training plan for staff as required by the Certificate of Approval and provide regular updated training to staff on all aspects of operating the waste site.

Daily Inspection
Condition 6 of the Certificate of Approval requires daily inspections of the site and the maintenance of a log book:
(3) An inspection of the entire Site and all equipment on the Site shall be conducted each day the Site is in operation to ensure that: the Site is secure; that the operation of the Site is not causing any nuisances; that the operation of the Site is not causing any adverse effects on the environment and that the Site is being operated in compliance with this Certificate. Any deficiencies discovered as a result of the inspection shall be remedied immediately, including temporarily ceasing operations at the Site if needed.
(4) A record of the inspections shall be kept in a daily log book that includes:
(a) the name and signature of person that conducted the inspection;
(b) the date and time of the inspection;
(c) the list of any deficiencies discovered;
(d) the recommendations for remedial action; and
(e) the date, time and description of actions taken.

It appears the site operator has been keeping a log book as required.

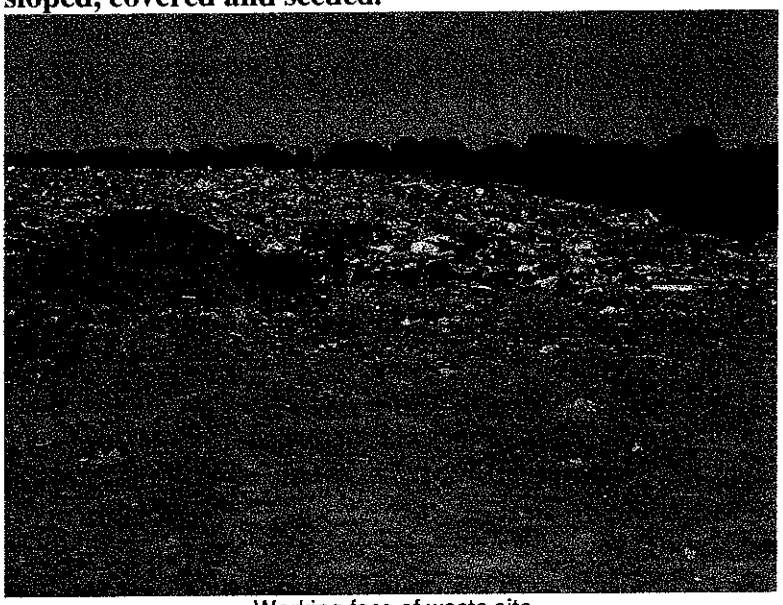
2.5 COVER MATERIAL:

Specifics:
Condition 7(9) of the Certificate of Approval contains requirements regarding cover material:
Cover material shall be applied as follows:
(a) Daily Cover - Weather permitting, deposited waste shall be covered at the end of each working day in a manner acceptable to the District Manager so that no waste is exposed to the atmosphere;
(b) Intermediate Cover - In areas where landfilling has been temporarily discontinued for six (6) months or more, a minimum thickness of 300 millimetre of soil cover or an approved thickness of alternative cover material shall be placed; and
(c) Final Cover - In areas where landfilling has been completed to final contours, a minimum 600 millimetre thick layer of clay and 150 millimetres of top soil (final cover) shall be placed. Fill areas shall be progressively completed and rehabilitated as landfill development reaches final contours.

At the time of inspection it appeared that adequate cover was being applied to the working area. **However, as recommended in the 2013 Environmental Monitoring Report, "to minimize leachate production, when areas of the landfill are brought up to final elevation, they should be capped and seeded as soon as possible (refer to Design and Operations plan)."**

The importance of a clearly understood design and operating plan has been discussed with the Municipality many times. **The site operators must be aware of the progression of site usage and fill area limits as well as final elevations and contours for the fill area. Fill area, current working area, final contours must be clearly indicated at the site to assist in the orderly use**

of the site and eventual final closure. Areas that have reached final elevation should be sloped, covered and seeded.



Working face of waste site

Condition 6(6) of the Certificate of Approval requires that the Annual Report contain: *"site plans showing the existing contours of the Site; areas of landfilling operation during the reporting period; areas of intended operation during the next reporting period; areas of excavation during the reporting period; the progress of final cover, vegetative cover, and any intermediate cover application; previously existing site facilities; facilities installed during the reporting period; and site preparations and facilities planned for installation during the next reporting period"*

A review of the 2013 report indicated that detailed information on fill area, progress of final cover and vegetative cover, etc were not included in the report.

2.6 WASTE BURNING:

Specifics:

Condition 2 (6) of the Certificate of Approval prohibits burning of waste at the site. At the time of inspection there was no evidence of burning at the site.

2.7 GROUNDWATER/SURFACEWATER IMPACT:

Specifics:

Condition 8 of the Certificate of Approval contains Ground and Surface Water monitoring requirements:

Surface Water and Ground Water

(3) The Owner shall monitor surface water and ground water in accordance with Items 2 in Schedule "A".

(4) A certified Professional Geoscientist or Engineer possessing appropriate hydrogeologic training and experience shall execute or directly supervise the execution of the groundwater monitoring and reporting program.

The Municipality has been conducting surface water and ground water monitoring and submitting Annual Environmental Monitoring Reports as required by the Certificate of Approval. The 2010-2013 reports have not yet been reviewed by the MOE's Hydrogeologist. When available, the review will be forwarded to the Municipality.

The 2013 Environmental Quality Monitoring Report (exp Services Inc.) concluded:

"Consistent with historical findings, the 2013 monitoring results confirm that leachate with concentrations of several potential indicator parameters....that are typically one to two orders of magnitude higher than background is being generated at the site.

Data also continue to indicate the presence of a sinking leachate plume. However, plume movement east/southeast of the landfill (considered to be the primary pathway of concern) appears to be largely attenuated within the approved limits of the site.....However, on-going monitoring is indicated.

Similarly, leachate impact to surface water outside the southeast attenuation zone boundary is not evident. Although impact is present in ponds along the west side of the waste site...., no such impact would be anticipated to surface water (i.e., Kenogami River, about 2.2 km from the site) beyond the attenuation zone boundary in this direction."

The report recommended that the analytical program be continued in 2014 in accordance with the Certificate of Approval, however suggested that sampling requirements be reduced from three times sampling events per year to two and that frequency of reporting be reduced from annually to once every 3 years. The MOE will consider these suggestions when reviewing the 2010-2013 reports.

2.8 LEACHATE CONTROL SYSTEM:

Specifics:

There is no requirement for a leachate control system at this site, as the site is considered to be naturally attenuation. Ground water monitoring has indicated contaminants are largely attenuated within the approved limits of the site.

2.9 METHANE GAS CONTROL SYSTEM:

Specifics:

There is no requirement for a methane control system at this site. However, Condition 8 of the Certificate of Approval requires:

(1) The Owner shall ensure that any buildings or structures at the Site contain adequate ventilation systems to relieve any possible landfill gas accumulation. Routine monitoring for explosive methane gas levels shall be conducted in all buildings or structures at the Site, especially enclosed structures which at times are occupied by people.

At the time of inspection, it did not appear that the Municipality had a routine monitoring program for methane gas levels.

2.10 OTHER WASTES:

Specifics:

The Certificate of Approval has a number of specific conditions relating to the handling of other wastes. Overall, the operator is required to inspect all loads entering into the site and make sure the wastes are directed to the appropriate area. To confirm this, the Certificate of Approval requires the maintenance of a Log Book.

Daily Inspections and Log Book

Condition 6 of the Certificate of Approval Requires requires:

(1) A daily log shall be maintained in written format and shall include the following information:

(a) the type, date and time of arrival, hauler, and quantity (tonnes) of all industrial and commercial waste and cover material received at the Site;

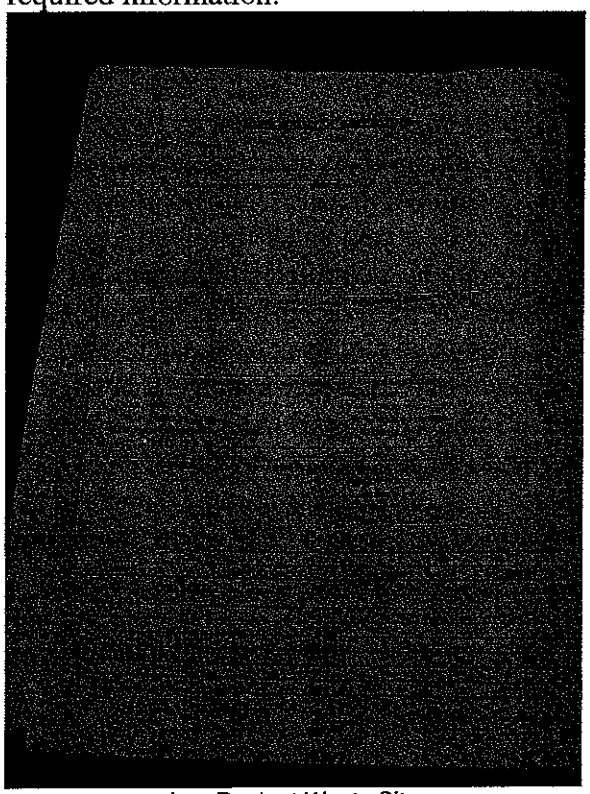
(b) the area of the Site in which waste disposal operations are taking place;

(c) a record of litter collection activities and the application of any dust suppressants;

(d) a record of the daily inspections; and

(e) a description of any out-of-service period of any control, treatment, disposal or monitoring facilities, the reasons for the loss of service, and action taken to restore and maintain service.

At the time of inspection it appeared that a logbook was being kept that contained most of the required information.



Log Book at Waste Site

Household Hazardous Wastes

Since the last inspection, the Municipality has opened a Household Hazardous Waste Site at the Longlac site. This is permitted by Condition 11 of the Certificate of Approval, which contains specific requirements:

HHW Facility Operations

(1) The HHW depot shall not receive more than 5 cubic metres of HHW per day.

(2) The HHW depot shall not store in excess of 10 cubic metres of HHW on Site.

(3) HHW shall not be stored at the Site for longer than one hundred eighty (180) days, unless the consent of the District Manager has been obtained, with the exception of waste oil which shall be stored on Site in accordance with Condition 11(2).

(4) All household hazardous waste received and stored must be managed in accordance with Ontario Regulation 347, R.R.O. 1990, as amended, and with the Ministry of Environment document entitled "Household Hazardous Waste Collection and Facility Guidelines" dated May 1993.

(5) All storage of liquid wastes shall be in accordance with this Ministry's publication "Guidelines of Environmental Protection Measures at Chemical Storage Facilities", dated October 1978 as amended.

(6) All HHW shall be stored in secondary containment that is adequate to contain any spills or leaks. Segregated secondary containment shall be provided for incompatible types of waste.

(7) Incoming HHW shall be inspected by Trained Personnel, prior to being accepted at the Site, to ensure that the Site is approved to accept that type of waste.

(8) All containers shall be clearly labelled indicating the type and nature of the hazardous waste stored as required by regulation. All points of access to the Site shall be posted to warn that the area contains hazardous materials.

(9) No radioactive wastes shall be accepted at this Site.

(10) Oil and oil-based paints which have been manufactured prior to 1972; or whose manufacturing date cannot be determined, may contain PCBs and shall be handled as follows:

(a) The oil and oil-based paints shall not be mixed (bulked) with other paints prior to testing. Paints which are lab-packed are not considered to be mixed under this Certificate;

(b) The oil and oil-based paints shall be tested by a certified laboratory for PCB content and shall be handled in the manner outlined in Condition 35.10 (c) if found to contain PCBs;

(c) If the oil and oil-based paints are found to have PCBs at or above levels identified in Condition 35.10 (d), it shall be forthwith reported to the District Manager and shall be managed in accordance with Regulation 362 and stored or removed from the Site to an approved PCB storage site, in accordance with written instructions from the District Manager; and

(d) The oil and oil-based paints shall not be distributed for reuse if they have any measurable PCB content. The oil and oil-based paint is considered to be a PCB waste, if measured levels are equal to or greater than 50 parts per million.

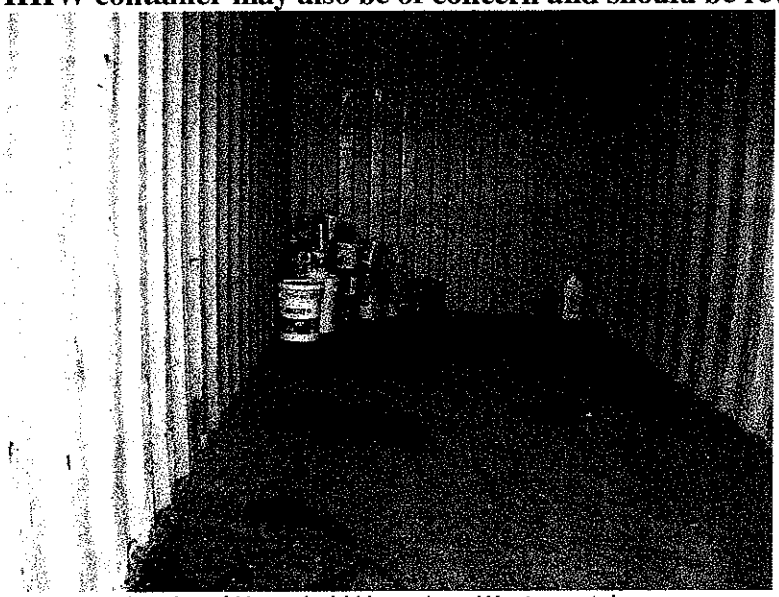
(11) Except for oil based paints that become classified as PCB Waste, paints may be offered for reuse to the public. Records shall be kept of the type, volume and recipient of paint returned to the public.

(12) The Owner shall maintain, at the Site, a log book which records daily, the following information:

(a) date of record;

(b) types, quantities and source of HHW received;
(c) quantities of HHW stored at the Site;
(d) quantities and destination of HHW shipped from the Site; and
(e) quantities of waste returned to the public as noted in Condition 11(11).

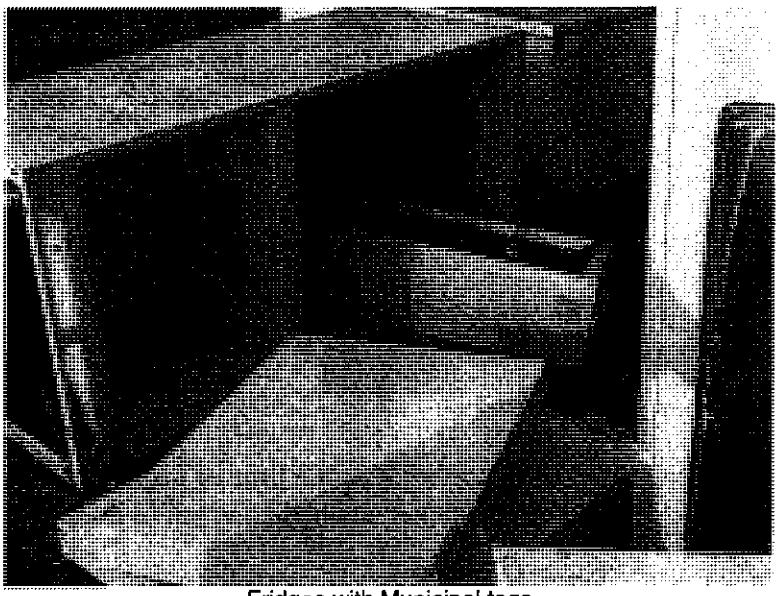
At the time of inspection, it did not appear that the Municipality complied with a number of these conditions, specifically, the offering of paint for re-use, the HHW log book, labelling of containers and site, special handling provisions for paints, etc. As well, it did not appear that the Operator of the HHW had sufficient t training to operate the HHW site. The Municipality should review the requirements of the Certificate of Approval and ensure the HHW site operator is familiar with all of the requirements. The lack of ventilation in a HHW container may also be of concern and should be reviewed.



Interier of Household Hazardous Waste container

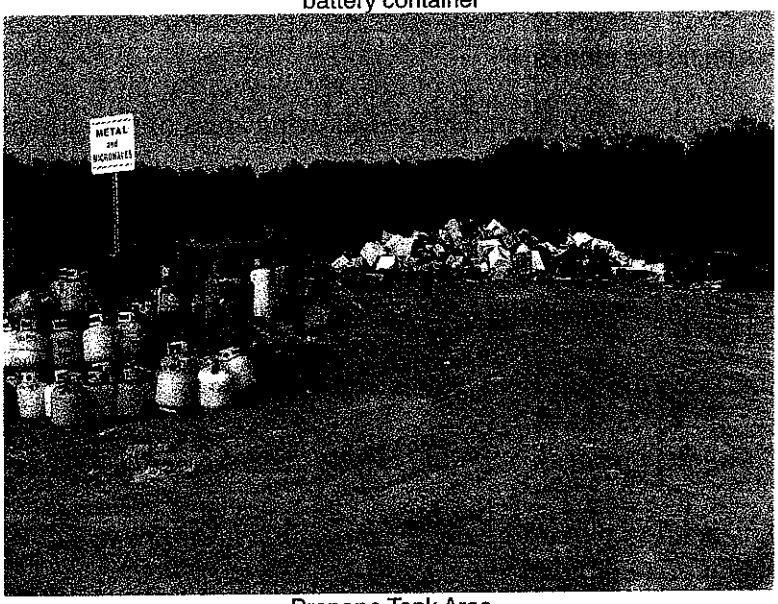
The Site has designated areas for Fridges and Freezers. At the time of inspection all of the fridges and freezers appeared to have the Municipality's sticker and had been put in a separate area.

Area for Fridges and Freezers


Fridges with Municipal tags

The Site also has designated areas for Propane Tanks, Scrap Metal, E-waste and batteries

battery container



Propane Tank Area

e-waste container

3.0 REVIEW OF PREVIOUS NON-COMPLIANCE ISSUES

The previous inspection (December,2009) identified the following areas of non-compliance:

A number of requirements of the Certificate of Approval have still not been addressed including:

- *attendant and site operator training*
- *legal survey*
- *registration on title of site and Contaminant Attenuation Zone*

The previous inspection contained the following required actions:

- *Immediately ensure that sufficient cover material is made available to the operator to ensure adequate daily cover.*
- *By May 30, 2010, complete all required training to ensure that all staff working at the Longlac site meet the definition of "Trained Personnel" in the Certificate of Approval.*
- *By June 30, 2010, complete a legal survey of the site and establish permanent markers to delineate the limit of fill area.*
- *By July 31, 2010, complete Registration on Title the entire site (including the attenuation zone).*

Since that time, the Municipality completed an initial round of attendant and site operator training (see Section 2.4 above), completed a site survey in 2009 and as yet, has not completed the registration on title of the site and contaminant attenuation zone.

4.0 SUMMARY OF INSPECTION FINDINGS (HEALTH/ENVIRONMENTAL IMPACT)

Was there any indication of a known or anticipated human health impact during the inspection and/or review of relevant material, related to this Ministry's mandate?

No

Specifics:

Was there any indication of a known or anticipated environmental impact during the inspection and/or review of relevant material ?
No

Specifics:

Was there any indication of a known or suspected violation of a legal requirement during the inspection and/or review of relevant material which could cause a human health impact or environmental impairment ?
No

Specifics:

Was there any indication of a potential for environmental impairment during the inspection and/or the review of relevant material ?
No

Specifics:

Was there any indication of minor administrative non-compliance?
Yes

Specifics:

The inspection revealed a number of areas where the Municipality is not complying with requirements the
Certificate of Approval:

- **The 2013 Environmental Quality Monitoring Report still refers the 2004 Certificate of Approval and indicates to a total site area of 23 hectares. All of the Figures showing fill area and attenuation zones are inaccurate in this report. All future Annual Reports must be based on the most current Certificate of Approval. The figures for the 2013 Report shonld be revised and submitted to the MOE by October 31, 2014.**
- **The MOE has not received a Certificate of Reqnirement and it appears that the Municipality has not complied with the requirement to register the site and attenuation zone on Title. The Mnnicipality must proceed with Registration on Title by December 31, 2014.**
- **At the time of inspection, discussions with the site operator indicate that he is unaware of the Design and Operating Plan for the site and has had limited training in the handling of Household Hazardous Goods. The Municipality must develop a comprehensive training plan for staff as required by the Certificate of Approval and provide regular updated training to staff on all aspects of operating the waste site.**
- **The importance of a clearly understood design and operating plan has been discussed with the Municipality many times. The site operators must be aware of the progression of site usage and fill area limits as well as final elevations and contours for the fill area. Fill area, current working area, final contours must be clearly indicated at the site to assist in the orderly use of the site and eventual final closure.**
- **Waste areas that have reached final elevation have not been sloped, covered and seeded as required by the Certificate of approval**
- **A review of the 2013 Annual report indicated that detail information on fill area, progress of final cover and vegetative cover, etc were not included in the report as required by the Certificate of Approval. Ensure all future reports include all required**

information.

- **The Approval requires routine monitoring of methane gas levels on all building on the site. At the time of inspection, it did uot appear that the Municipality had a routine monitoring program for methane gas levels.**
- **The Municipality has recently initiated a HHW depot at the site. At the time of inspection, it appeared that the Municipality was not complying with some of the HHW requirements contained in the Certificate of Approval, specifically: the offering of paint for re-use, the HHW log book, labelling of containers and site, special handling provisions for paints, etc. As well, it did not appear that the Operator of the HHW had sufficient t training to operate the HHW site. The Muuicipality should review the requirements of tlie Certificate of Approval and ensure the HHW site operator is familiar with all of the requirements. The lack of ventilation in a HHW container may also be of concern and should be reviewed.**

5.0 ACTION(S) REQUIRED

1. By October 31, 2014, revise all figures in the 2013 Annual Report to reflect approved site area and submitt revised figures to the MOE.
2. By December 31, 2014, complete the Registration on Title for the waste site and attenuation zone.
3. By December 31, 2014, develop a comprehensive training plan for staff as required by the Certificate of Approval and provide regular updated training to staff on all aspects of operating the waste site.
4. By December 31, 2014, ensure that all areas to be filled and final elevations are clearly marked at the waste site.
5. Ensure that all buildings on site are routinely monitored for methane levels as required by the Certificate of Approval.
6. By October 31, 2014, review the operation of the HHW program at the site and ensure compliance with all requirements of the Certificate of Approval.

6.0 OTHER INSPECTION FINDINGS

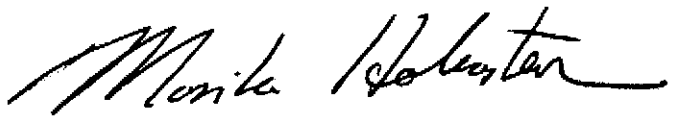
The 2013 Report contains a recommendation that a volume survey be conducted in 2014 to determine the increase in the volume of waste and interim cover since the previous survey in October 2009, and to provide confirmation of the remaining life span.
For a number of months in 2014, the Longlac site received waste previously disposed of in the Geraldton site, as the Geraldton site was closed pending resolution of capacity issues. This may have had an impact on the remaining capacity of the Longlac site.
A volume survey should be conducted in 2014 to determine the amount of waste in the site and the remaining capacity.

7.0 INCIDENT REPORT

Applicable
6320-9P3LNV

8.0 ATTACHMENTS

PREPARED BY:
Environmental Officer:
Name: **Monika Holenstein**
District Office: **Thunder Bay District Office**
Date: **2014/09/18**
Signature



REVIEWED BY:
District Supervisor:
Name: **Drew Stajkowski**
District Office: **Thunder Bay District Office**
Date: **2014/09/18**

Signature:

File Storage Number: TB LX CR 600

Note:
"This inspection report does not in any way suggest that there is or has been compliance with applicable legislation and regulations as they may apply to this facility. It is, and remains, the responsibility of the owner and/or the operating authority to ensure compliance with all applicable legislative and regulatory requirements"

Ministry of the Environment
435 James Street South
Suite 331
Thunder Bay, ON P7E 6S7

Ministère de l'Environnement
435 rue James sud
Bureau 331
Thunder Bay, ON P7E 6S7

Ontario

Thunder Bay/Kenora District

Fax: (807) 475-1754
Direct Line: (807) 475-1698

September 24, 2007

Municipality of Greenstone
Administration Office
301 East Street, P.O. Box 70
GERALDTON, ON P0T 1M0

Attention: Vance Czerwinski

Dear Mr. Czerwinski:

Re: Longlac Landfill- Annual Monitoring Report

The technical review of the 2006 Annual Monitoring Report for Greenstone Longlac has been completed by Rob Purdon, Hydrogeologist, in the Ministry's Technical Support Section. The following comments and recommendations are based on that review.

1. It appears that no monitoring, at the landfill, site was conducted in the period 1997-2006. The Municipality should be aware of the Certificate of Approval requirements and monitoring should take place going forward.

2. Although the report does not identify any off-site adverse impacts, there are indications that a leachate plume is migrating towards the property line, and may in fact be moving off the current attenuation area to the south. There are also indications that the plume may be sinking below some of the down gradient monitors.

3. In order to more fully assess the leachate impacts and address the potential for Reasonable Use Exceedances beyond the attenuation zone boundary we agree with the following recommendations made by your consultant.

    a. Establish a new background monitoring well north of the fill area.

    b. Establish a new nested pair of monitoring wells south of the former fill area near the attenuation zone boundary.

    c. Establish a new nested pair of monitoring wells southeast of the fill area.

4. The Municipality must continue to submit annual monitoring reports until we have at least 3 years of monitoring data using the new monitoring wells and can arrive at clearer conclusions pertaining to leachate migration and existing/potential impacts.

Please, contact me should you have any questions.

Yours truly,

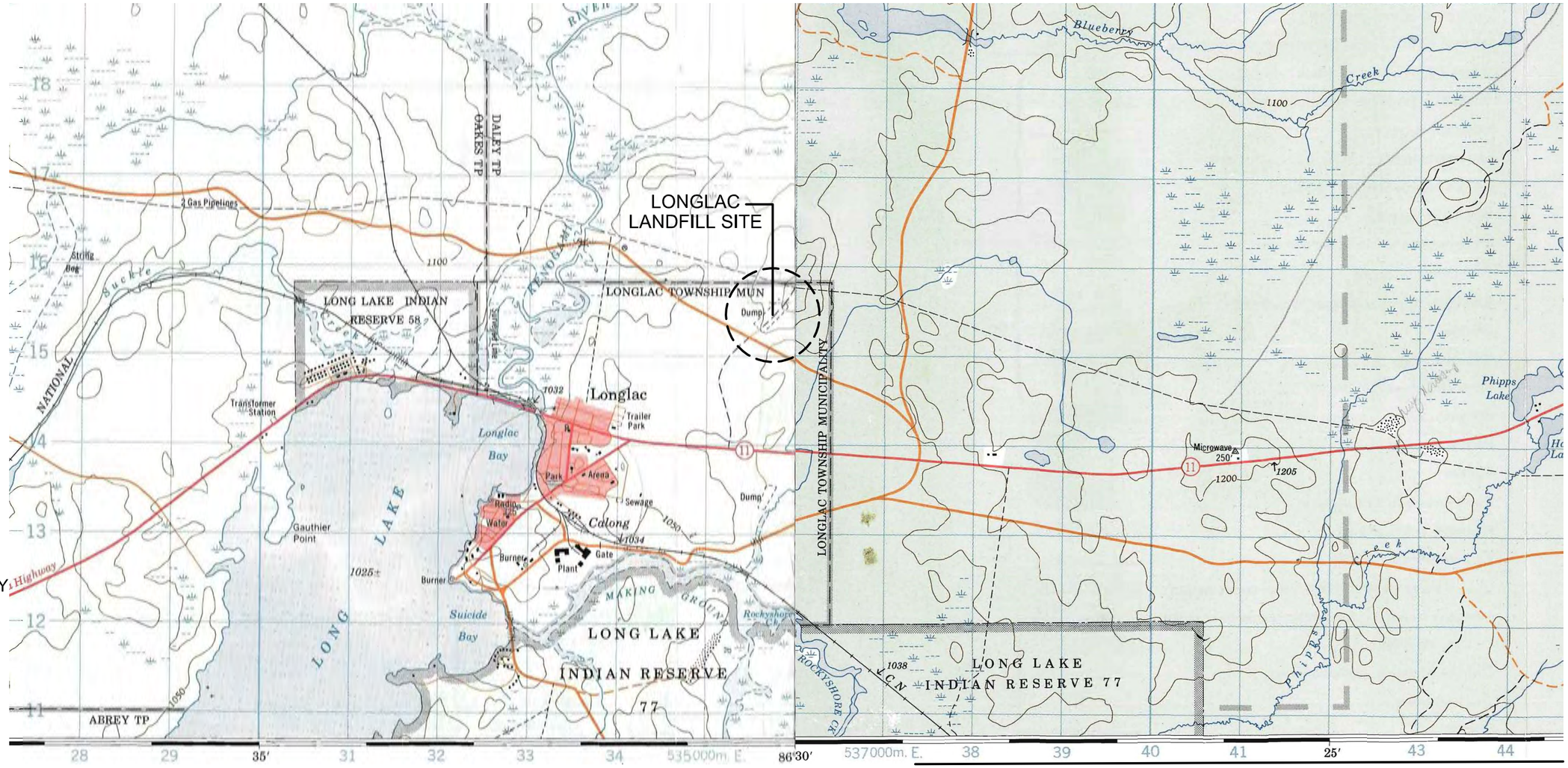
D. Kachkowski

Don Kachkowski
Sr. Environmental Officer
Thunder Bay Office
Northern Region

DK:cm

APPENDIX B – Figures

LIST OF FIGURES



500 0 500 1000
IN METRES

NOTES:
1) REFERENCE: 1:50,000 MAP SHEETS 42 E/15 & 42 E/16.

exp. Thunder Bay, Ontario

FIGURE 1

SITE LOCATION PLAN
2018 to 2020 Environmental Quality Monitoring Report
Longlac Landfill
Municipality of Greenstone

PROJECT NO.:	THB-00006196-PE
SCALE:	1:50,000
DRAWN BY:	MS
CHECKED BY:	AM
DATE:	April 9, 2021

NOTES:
1) REFERENCE: 2005 AIR PHOTOGRAPH.

exp.

Thunder Bay, Ontario

FIGURE 2A

2005 AIR PHOTO

2018 to 2020 Environmental Quality Monitoring Report
Longlac Landfill
Municipality of Greenstone

PROJECT NO.:	THB-00006196-PE
SCALE:	~1:22,500
DRAWN BY:	MS
CHECKED BY:	AM
DATE:	April 9, 2021

NOTES:
1) REFERENCE: 2012 GOOGLE EARTH SATELLITE IMAGE.

exp.

Thunder Bay, Ontario

FIGURE 2B

2012 SATELLITE IMAGE

2018 to 2020 Environmental Quality Monitoring Report
Longlac Landfill
Municipality of Greenstone

PROJECT NO.:	THB-00006196-PE
SCALE:	~1:22,500
DRAWN BY:	MS
CHECKED BY:	AM
DATE:	April 9, 2021

NOTES:
1) REFERENCE: 2019 GOOGLE EARTH SATELLITE IMAGE.

exp.

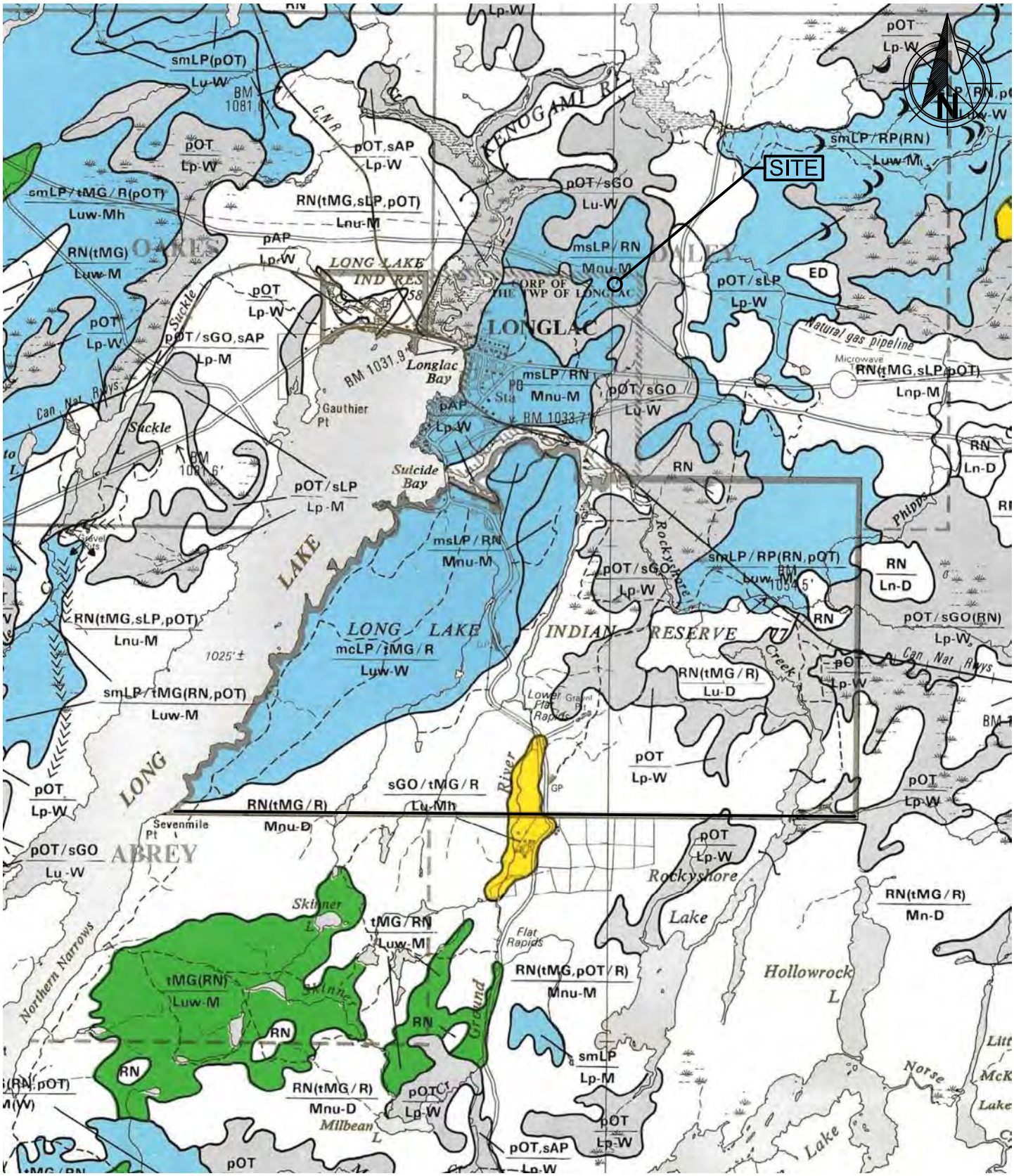
Thunder Bay, Ontario

FIGURE 2C

2019 SATELLITE IMAGE

2018 to 2020 Environmental Quality Monitoring Report
Longlac Landfill
Municipality of Greenstone

PROJECT NO.:	THB-00006196-PE
SCALE:	~1:22,500
DRAWN BY:	MS
CHECKED BY:	AM
DATE:	April 9, 2021



NOTES:
1) REFERENCE: ONTARIO GEOLOGICAL SURVEY MAP (5078 - LONGLAC).

500 0 500 1000
IN METRES

exp.

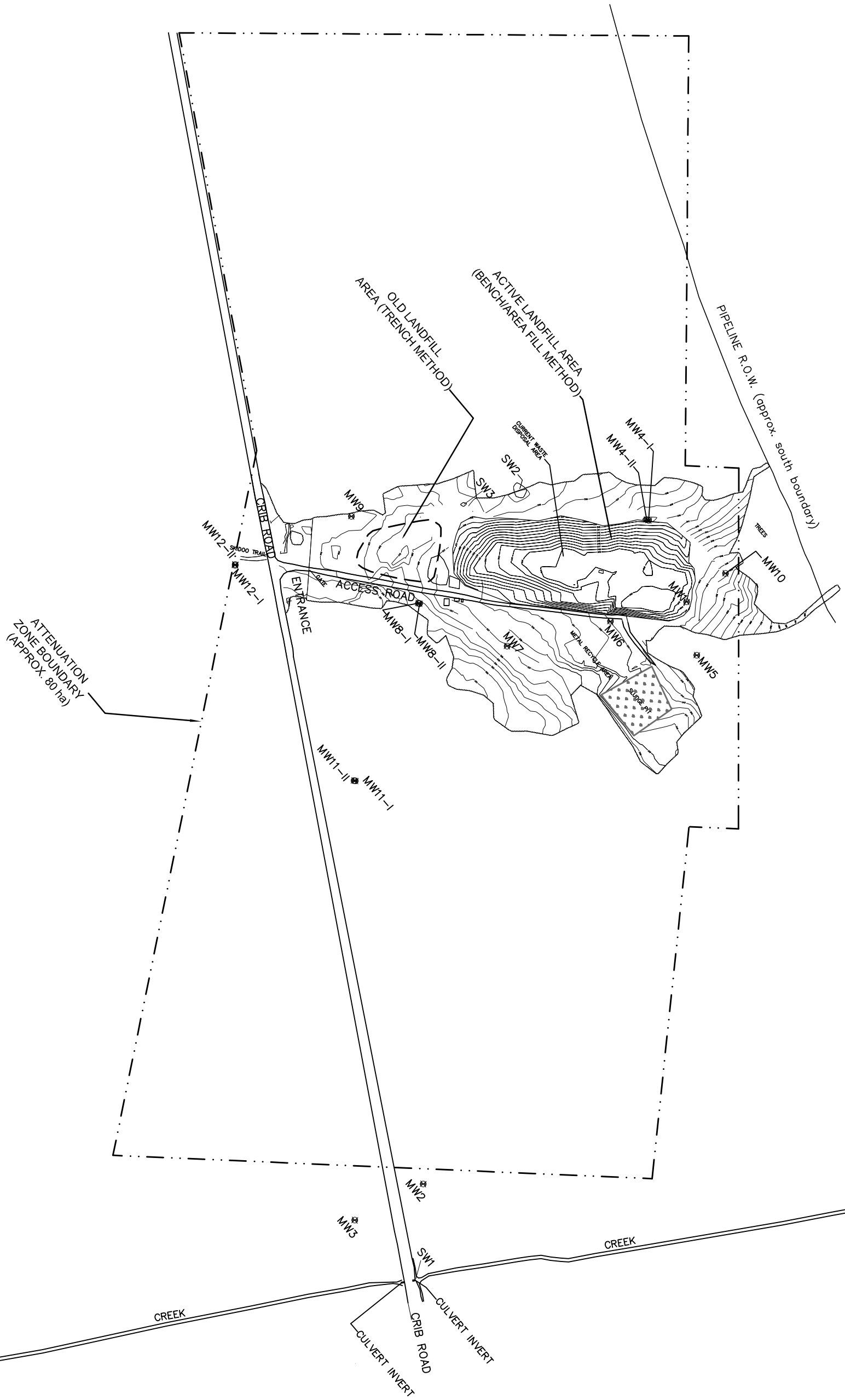
Thunder Bay, Ontario

FIGURE 3

LANDFORMS, TOPOGRAPHY & DRAINAGE

2018 to 2020 Environmental Quality Monitoring Report
Longlac Landfill
Municipality of Greenstone

PROJECT NO.:	THB-00006196-PE
SCALE:	1:50,000
DRAWN BY:	MS
CHECKED BY:	AM
DATE:	April 9, 2021



LEGEND:

- MW9 MONITORING WELL LOCATION
- SW SURFACE WATER MONITORING STATION
- TREE LINE

NOTES:

1) BASE DRAWING PROVIDED BY DELTA SURVEY INC.
2) GPS AND TOTAL STATION SURVEY CONDUCTED BY DELTA SURVEY INC. ON SEPTEMBER 9, 2020.
3) COORDINATES ARE METRIC AND REFERENCED TO GBM 963011C AND GBM 963011A.
4) GROUND SURFACE CONTOUR INTERVAL 1m.

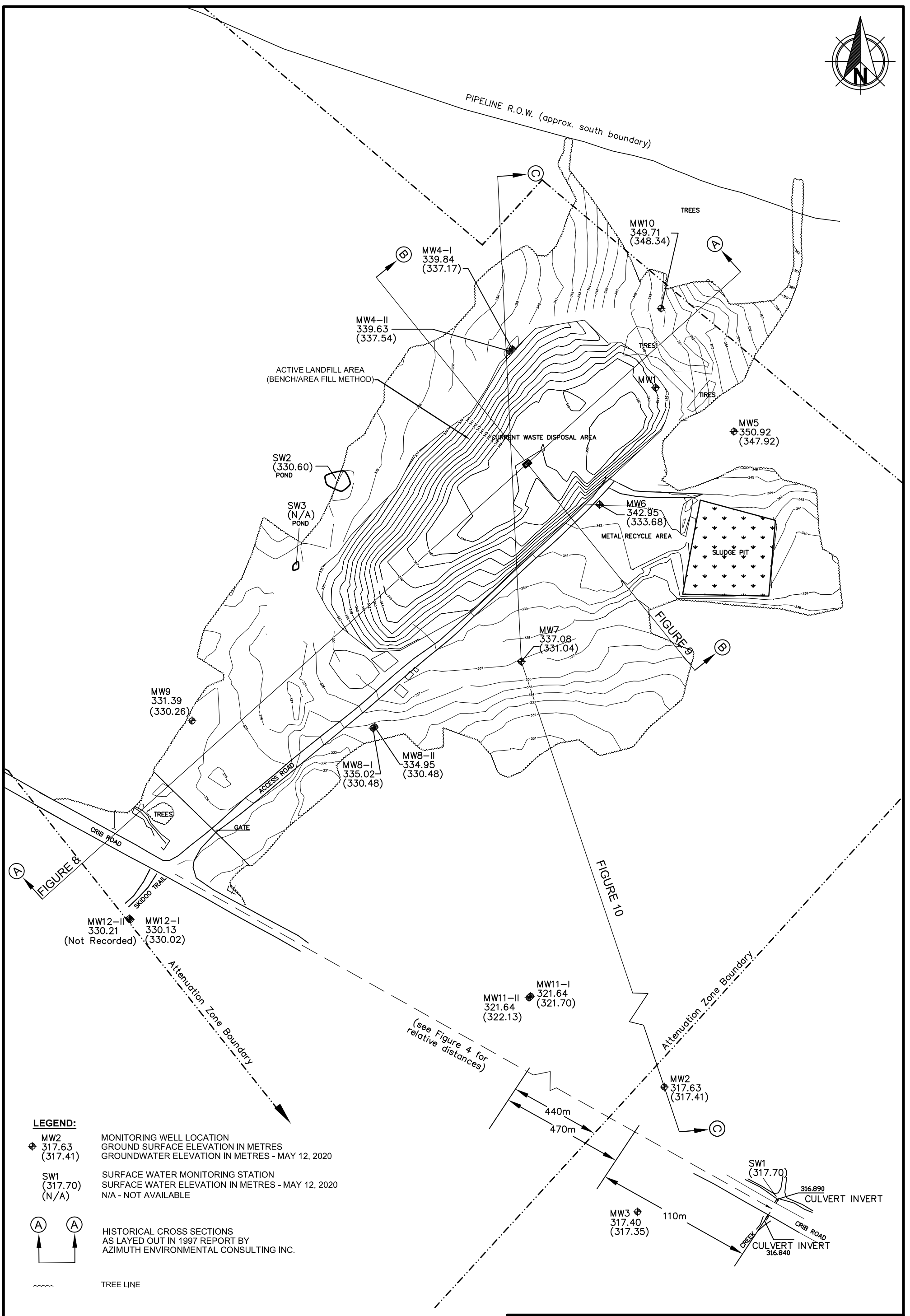
40 0 40 80
IN METRES

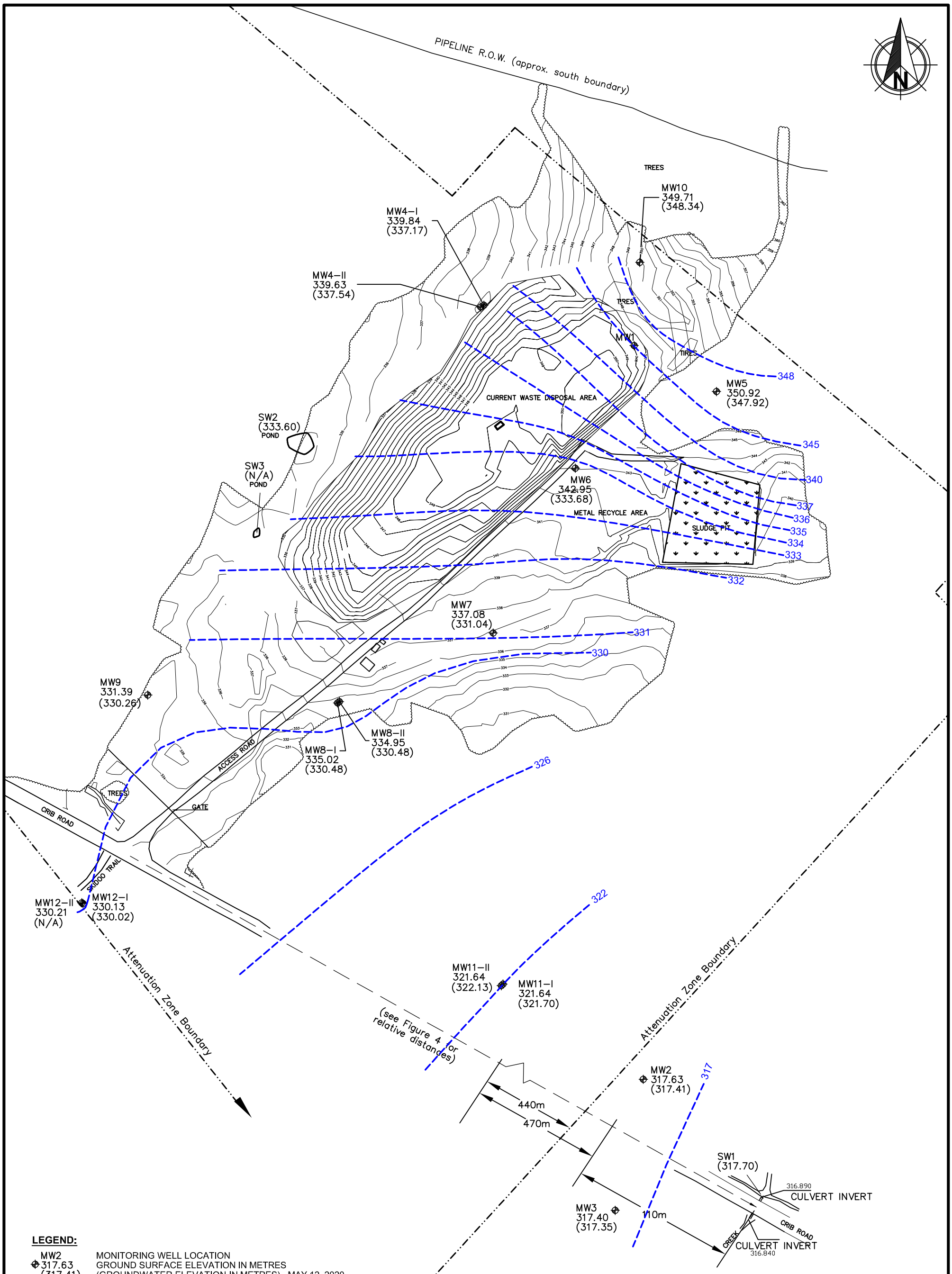
exp. Thunder Bay, Ontario

FIGURE 4

ATTENUATION ZONE BOUNDARY
2018 to 2020 Environmental Quality Monitoring Report
Longlac Landfill
Municipality of Greenstone

PROJECT NO.:	THB-00006196-PE
SCALE:	1:5,000
DRAWN BY:	KP/MS
CHECKED BY:	AM
DATE:	April 9, 2021


PIPELINE R.O.W. (approx. south boundary)
TREES
MW10
349.71
(348.34)
MW4–I
339.84
(337.17)
MW4–II
339.63
(337.54)
ACTIVE LANDFILL AREA
(BENCH/AREA FILL METHOD)
MW1
TIRES
MW5
350.92
(347.92)
CURRENT WASTE DISPOSAL AREA
SW2
(330.60)
POND
SW3
(N/A)
POND
MW6
342.95
(333.68)
METAL RECYCLE AREA
SLUDGE PIT
MW7
337.08
(331.04)
FIGURE 9
MW9
331.39
(330.26)
MW8–I
335.02
(330.48)
MW8–II
334.95
(330.48)
ACCESS ROAD
TREES
GATE
CRIB ROAD
FIGURE 8
SKIDOO TRAIL
MW12–II
330.21
(Not Recorded)
MW12–I
330.13
(330.02)
FIGURE 10
Attenuation Zone Boundary
MW11–II
321.64
(322.13)
MW11–I
321.64
(321.70)
(see Figure 4 for relative distances)
MW2
317.63
(317.41)
440m
470m
110m
MW3
317.40
(317.35)
SW1
(317.70)
316.890
CULVERT INVERT
CRIB ROAD
CREEK
CULVERT INVERT
316.840
LEGEND:
MW2
317.63
(317.41)
MONITORING WELL LOCATION
GROUND SURFACE ELEVATION IN METRES
GROUNDWATER ELEVATION IN METRES - MAY 12, 2020
SW1
(317.70)
(N/A)
SURFACE WATER MONITORING STATION
SURFACE WATER ELEVATION IN METRES - MAY 12, 2020
N/A - NOT AVAILABLE
HISTORICAL CROSS SECTIONS
AS LAYED OUT IN 1997 REPORT BY
AZIMUTH ENVIRONMENTAL CONSULTING INC.
TREE LINE
NOTES:
1) BASE DRAWING PROVIDED BY DELTA SURVEY INC.
2) GPS AND TOTAL STATION SURVEY CONDUCTED BY DELTA SURVEY INC. ON SEPTEMBER 9, 2020.
3) COORDINATES ARE METRIC AND REFERENCED TO GBM 963011C AND GBM 963011A.
4) GROUND SURFACE CONTOUR INTERVAL 1m.
20 0 20 40
IN METRES
exp.
Thunder Bay, Ontario
FIGURE 5
MONITORING WELL LOCATION PLAN
2018 to 2020 Environmental Quality Monitoring Report
Longlac Landfill
Municipality of Greenstone
PROJECT NO.: THB-00006196-PE
SCALE: 1:2,500
DRAWN BY: KP/MS
CHECKED BY: AM
DATE: April 9, 2021



LEGEND:

MW2 ⌖ 317.63 (317.41)	MONITORING WELL LOCATION GROUND SURFACE ELEVATION IN METRES (GROUNDWATER ELEVATION IN METRES) - MAY 12, 2020
SW1 (317.70) (N/A)	SURFACE WATER MONITORING STATION SURFACE WATER ELEVATION IN METRES - MAY 12, 2020 N/A - NOT AVAILABLE
– – –	GROUNDWATER CONTOUR IN METRES
~~	TREE LINE

NOTES:

1) BASE DRAWING PROVIDED BY DELTA SURVEY INC.
2) GPS AND TOTAL STATION SURVEY CONDUCTED BY DELTA SURVEY INC. ON SEPTEMBER 9, 2020.
3) COORDINATES ARE METRIC AND REFERENCED TO GBM 963011C AND GBM 963011A.
4) GROUND SURFACE CONTOUR INTERVAL 1m.

20 0 20 40
IN METRES

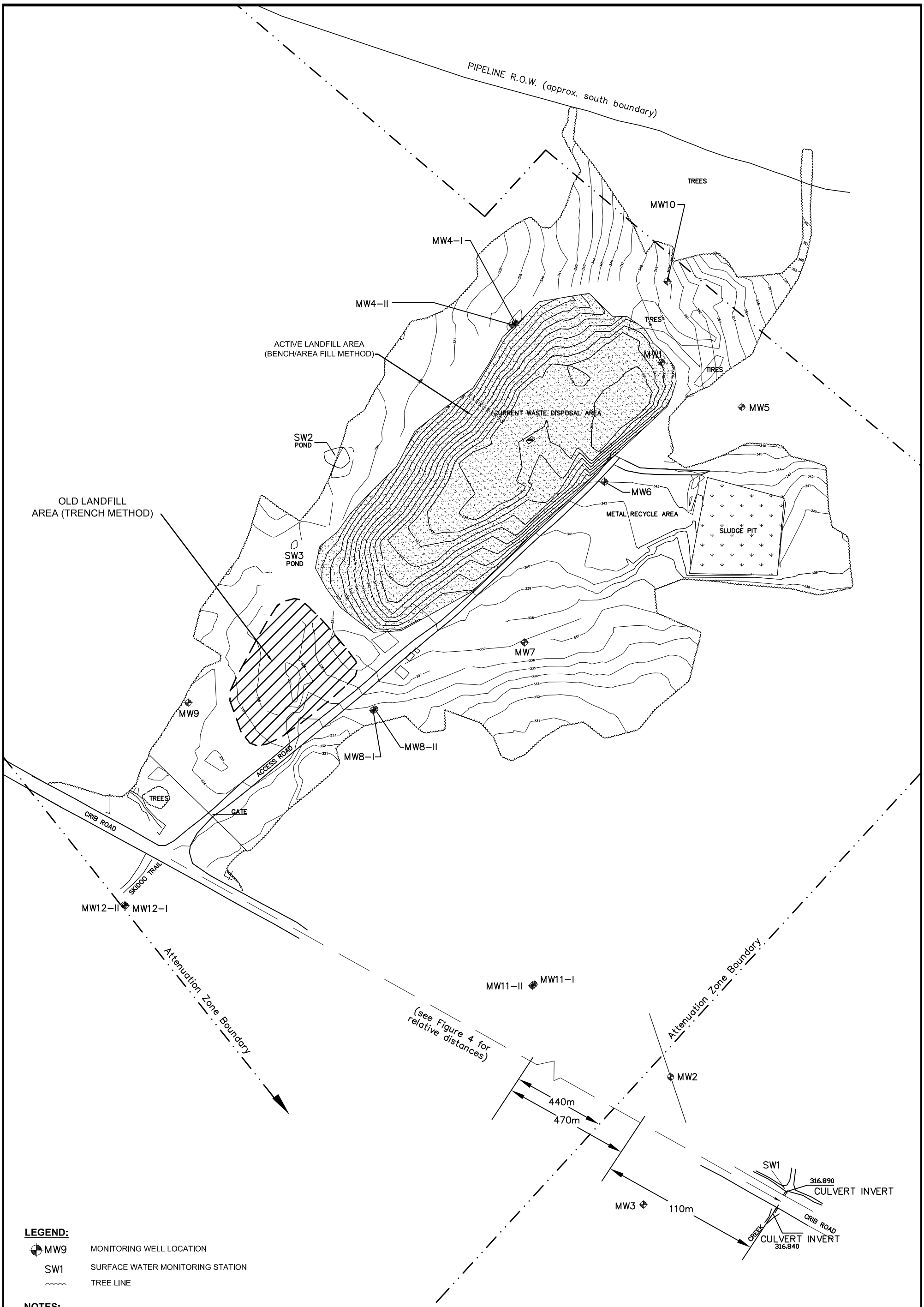
exp. Thunder Bay, Ontario

FIGURE 6

GROUNDWATER CONTOUR PLAN

2018 to 2020 Environmental Quality Monitoring Report
Longlac Landfill
Municipality of Greenstone

PROJECT NO.:	THB-00006196-PE
SCALE:	1:2,500
DRAWN BY:	KP
CHECKED BY:	AM
DATE:	April 9 2021



LEGEND:

MW9	MONITORING WELL LOCATION
SW1	SURFACE WATER MONITORING STATION
~~	TREE LINE

NOTES:

1) BASE DRAWING PROVIDED BY DELTA SURVEY INC.
2) GPS AND TOTAL STATION SURVEY CONDUCTED BY DELTA SURVEY INC. ON SEPTEMBER 9, 2020.
3) COORDINATES ARE METRIC AND REFERENCED TO GBM 963011C AND GBM 963011A.
4) GROUND SURFACE CONTOUR INTERVAL 1m.

20 0 20 40
IN METRES

N

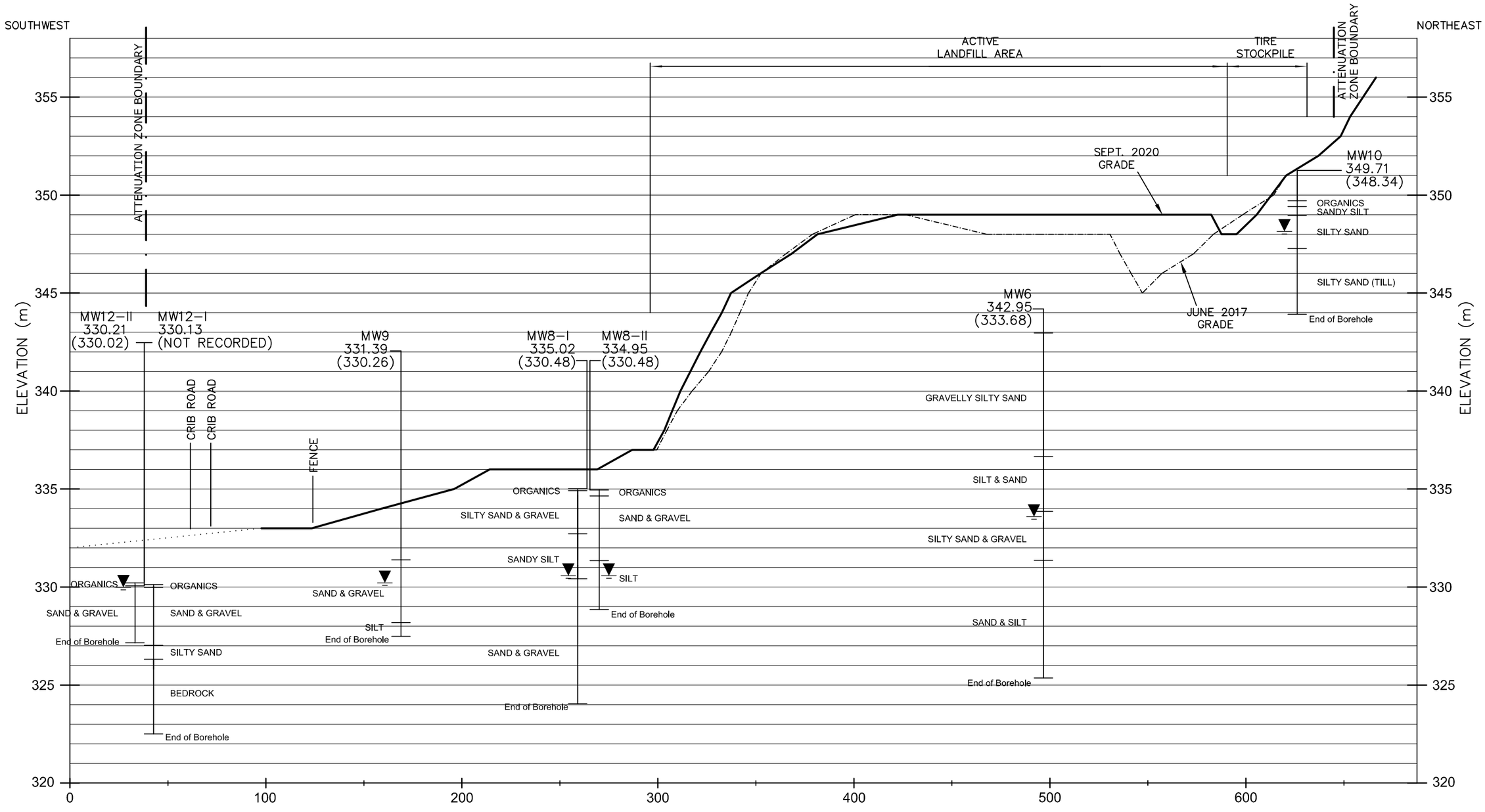
exp. Thunder Bay, Ontario

FIGURE 7

EXISTING FILL AREAS

2018 to 2020 Environmental Quality Monitoring Report
Longlac Landfill
Municipality of Greenstone

PROJECT NO.:	THB-00006196-PE
SCALE:	1:2,500
DRAWN BY:	MS
CHECKED BY:	AM
DATE:	April 9, 2021



NOTES:

1) SEE FIGURE 5 FOR LOCATION OF SECTION.
2) GPS AND TOTAL STATION SURVEY CONDUCTED BY DELTA SURVEY INC. ON SEPTEMBER 9, 2020.
3) DOTTED LINE AT GROUND SURFACE INDICATES AREAS IN WHICH TOPOGRAPHIC SURVEY WAS NOT CONDUCTED. ELEVATION INTERPRETED FROM NEARBY POINTS OF KNOWN OR MEASURED ELEVATION.
4) WELLS NOT DIRECTLY ON THE SECTION LINE ARE PROJECTED PERPENDICULAR TO THE SECTION LINE.

LEGEND:

MW8-I	MONITORING WELL LOCATION
335.02	GROUND SURFACE ELEVATION IN METRES
(330.48)	(GROUNDWATER ELEVATION IN METRES) - MAY 12, 2020
▼	GROUNDWATER ELEVATION - MAY 12, 2020

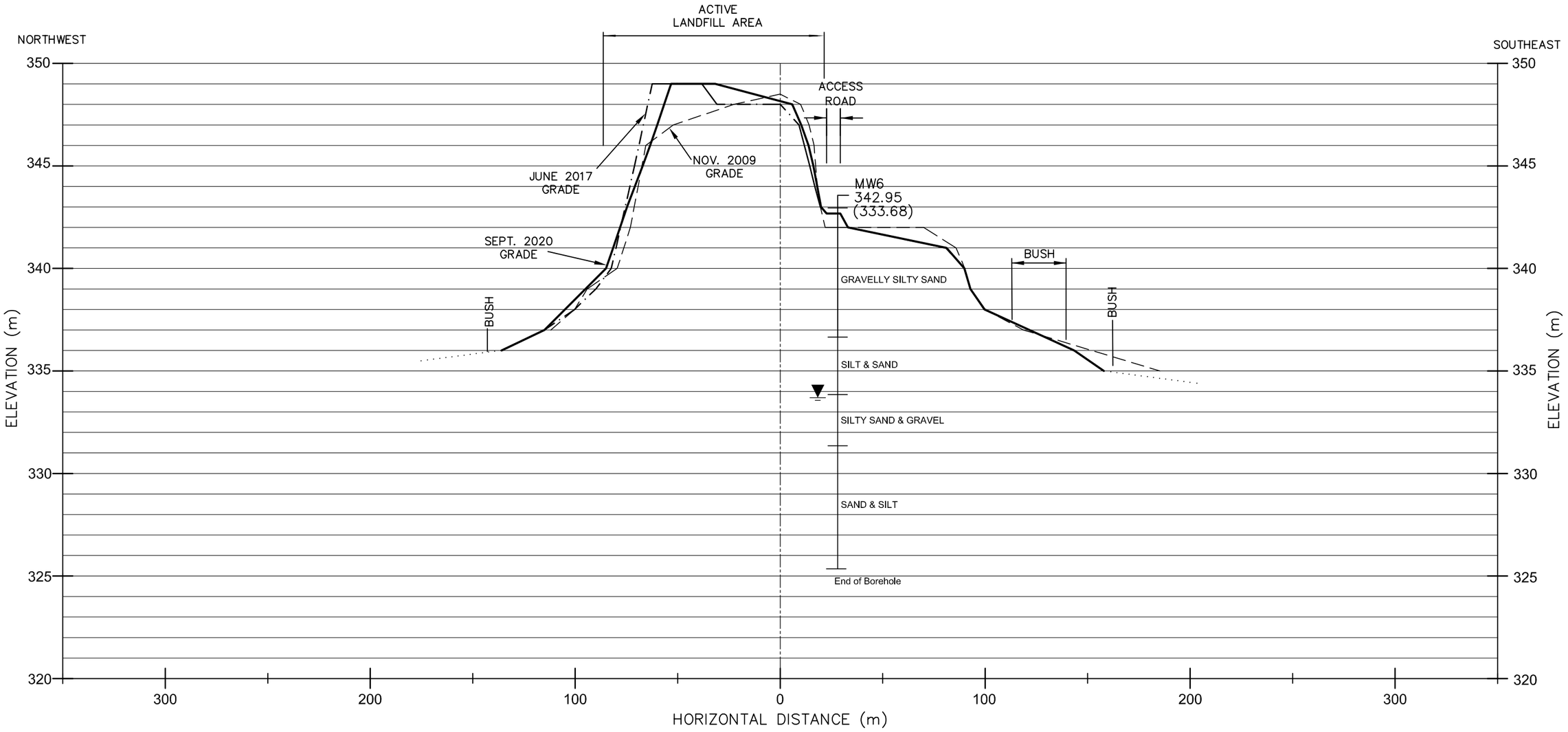
exp. Thunder Bay, Ontario

FIGURE 8

SECTION A-A

2018 to 2020 Environmental Quality Monitoring Report
Longlac Landfill
Municipality of Greenstone

PROJECT NO.:	THB-00006196-PE
SCALE:	1:2000 H/1:200 V
DRAWN BY:	KP
CHECKED BY:	AM
DATE:	April 9, 2021



NOTES:

1) SEE FIGURE 5 FOR LOCATION OF SECTION.
2) GPS AND TOTAL STATION SURVEY CONDUCTED BY DELTA SURVEY INC. ON SEPTEMBER 9, 2020.
3) DOTTED LINE AT GROUND SURFACE INDICATES AREAS IN WHICH TOPOGRAPHIC SURVEY WAS NOT CONDUCTED. ELEVATION INTERPRETED FROM NEARBY POINTS OF KNOWN OR MEASURED ELEVATION.
4) WELLS NOT DIRECTLY ON THE SECTION LINE ARE PROJECTED PERPENDICULAR TO THE SECTION LINE.

LEGEND:

MW6	MONITORING WELL LOCATION
342.95	GROUND SURFACE ELEVATION IN METRES
(333.68)	(GROUNDWATER ELEVATION IN METRES) - MAY 12, 2020
▼	GROUNDWATER ELEVATION - MAY 12, 2020

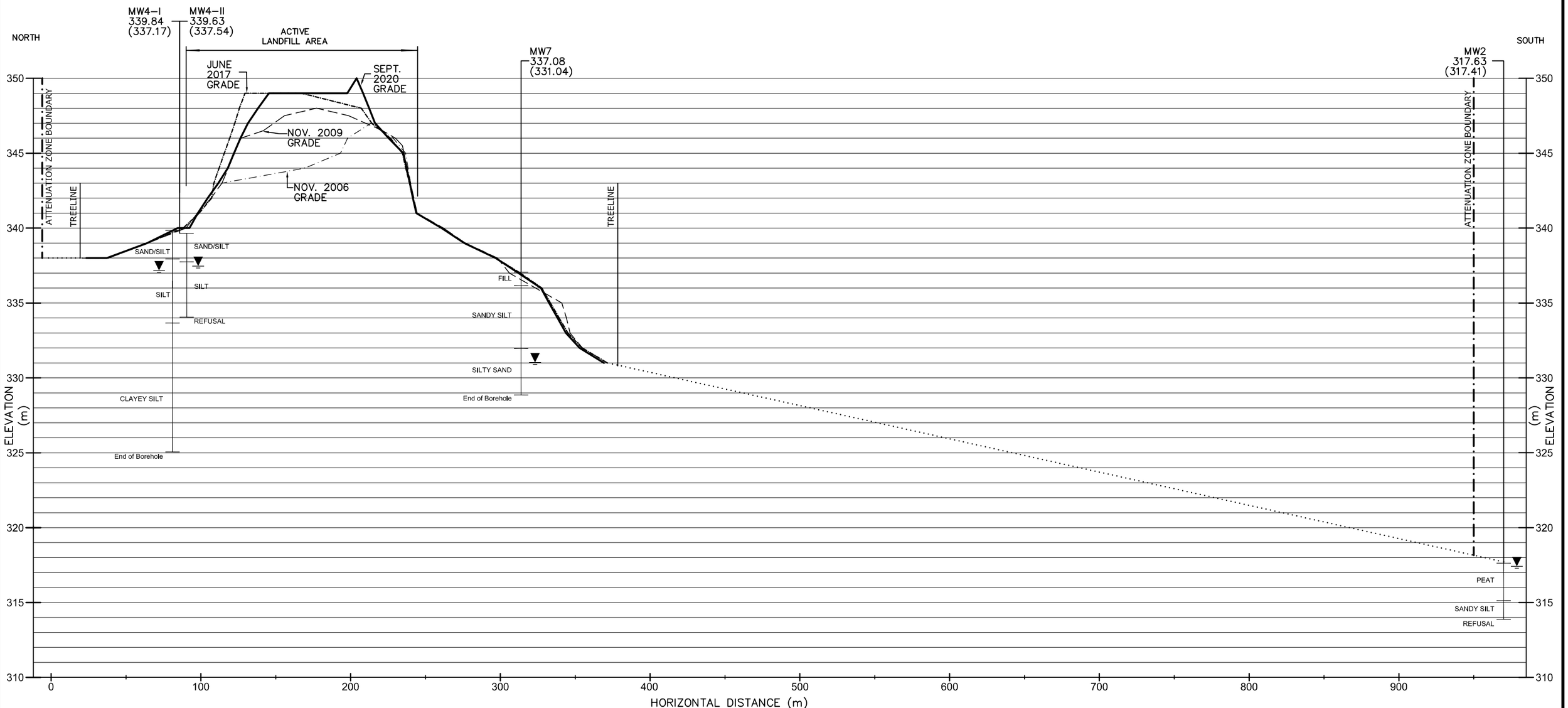
exp. Thunder Bay, Ontario

FIGURE 9

SECTION B-B

2018 to 2020 Environmental Quality Monitoring Report
Longlac Landfill
Municipality of Greenstone

PROJECT NO.:	THB-00006196-PE
SCALE:	1:2000 H/1:200 V
DRAWN BY:	KP/MS
CHECKED BY:	AM
DATE:	April 9, 2021



NOTES:

1) SEE FIGURE 5 FOR LOCATION OF SECTION.
2) GPS AND TOTAL STATION SURVEY CONDUCTED BY DELTA SURVEY INC. ON SEPTEMBER 9, 2020.
3) DOTTED LINE AT GROUND SURFACE INDICATES AREAS IN WHICH TOPOGRAPHIC SURVEY WAS NOT CONDUCTED. ELEVATION INTERPRETED FROM NEARBY POINTS OF KNOWN OR MEASURED ELEVATION.
4) WELLS NOT DIRECTLY ON THE SECTION LINE ARE PROJECTED PERPENDICULAR TO THE SECTION LINE.

LEGEND:

MW7 337.08 (331.04)	MONITORING WELL LOCATION GROUND SURFACE ELEVATION IN METRES (GROUND WATER ELEVATION IN METRES) - MAY 12, 2020
▼	GROUNDWATER ELEVATION - MAy 12, 2020

exp. Thunder Bay, Ontario

FIGURE 10

SECTION C-C

2018 to 2020 Environmental Quality Monitoring Report
Longlac Landfill
Municipality of Greenstone

PROJECT NO.:	THB-00006196-PE
SCALE:	1:2500H / 1:250V
DRAWN BY:	KP/MS
CHECKED BY:	AM
DATE:	April 9, 2021

APPENDIX C – Borehole Logs

SYMBOLS AND TERMS USED ON THE BOREHOLE AND TEST PIT RECORDS

SOIL DESCRIPTION

Behavioural properties (i.e. plasticity, permeability) take precedence over particle gradation in describing soils.

Terminology describing soil structure:

Desiccated	- having visible signs of weathering by oxidization of clay minerals, shrinkage cracks, etc.
Fissured	- having cracks, and hence a blocky structure
Varved	- composed of regular alternating layers of silt and clay
Stratified	- composed of alternating layers of different soil types, e.g. silt and sand or slit and clay
Well Graded	- having wide range in grain sizes and substantial amounts of all intermediate particle sizes.
Uniformly Graded	- predominantly of one grain size.

Terminology used for describing soil strata based upon the proportion of individual particle sizes present:

Trace, or occasional	less than 10%
Some	10-20%
Adjective (e.g. silty or sandy)	20-35%
And (e.g. silt and sand)	35-50%

The standard terminology to describe cohesionless soils includes the relative density, as determined by laboratory test or by the Standard Penetration Test 'N' – value: the number of blows of 140 pound (64kg) hammer falling 30 inches (760mm), required to drive a 2 inch (50.8mm) O.D. split spoon sample one foot (305mm) into the soil.

Relative Density	'N' Value	Relative Density %
Very Loose	<4	<15
Loose	4-10	15-35
Compact	10-30	35-65
Dense	30-50	65-85
Very Dense	>5	>85

The standard terminology to describe cohesive soils includes the consistency, which is based on undrained shear strength as measured by insitu vane tests, penetrometer tests, unconfined compression tests, or occasionally by standard penetration tests.

Consistency	Undrained Shear Stength		'N' Value
	kips/sq.ft.	kPa	
Very Soft	<0.25	<12.5	<2
Soft	0.25-0.5	12.5-25	2-4
Firm	0.5-1.0	25-50	4-8
Stiff	1.0-2.0	50-100	8-15
Very Stiff	2.0-4.0	100-200	15-30
Hard	>4.0	>200	>30

STATA PLOT


Gravel & Boulders


Sand


Silt


Clay


Fill

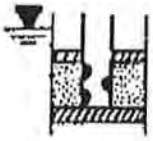

Ignsous Bedrock


Sedimentary Bedrock


Metamorphic Bedrock

WATER LEVEL MEASUREMENT


Borehole or Standpipe


Piezometer

SAMPLES

SS... Split spoon sample (obtained by performing the standard penetration test)
ST... Shelby tube or thin wall tube
PS... Piston sample

BS... Bulk sample
WS... Wash sample
RC... Rock core
AXT, BXL. etc...
Rock core samples obtained with the use of standard diamond drilling bits.

OTHER TESTS

G... Specific gravity
H... Hydrometer analysis
S... Sieve analysis
γ Unit weight
C.... Consolidation
CD... Consolidated drained triaxial

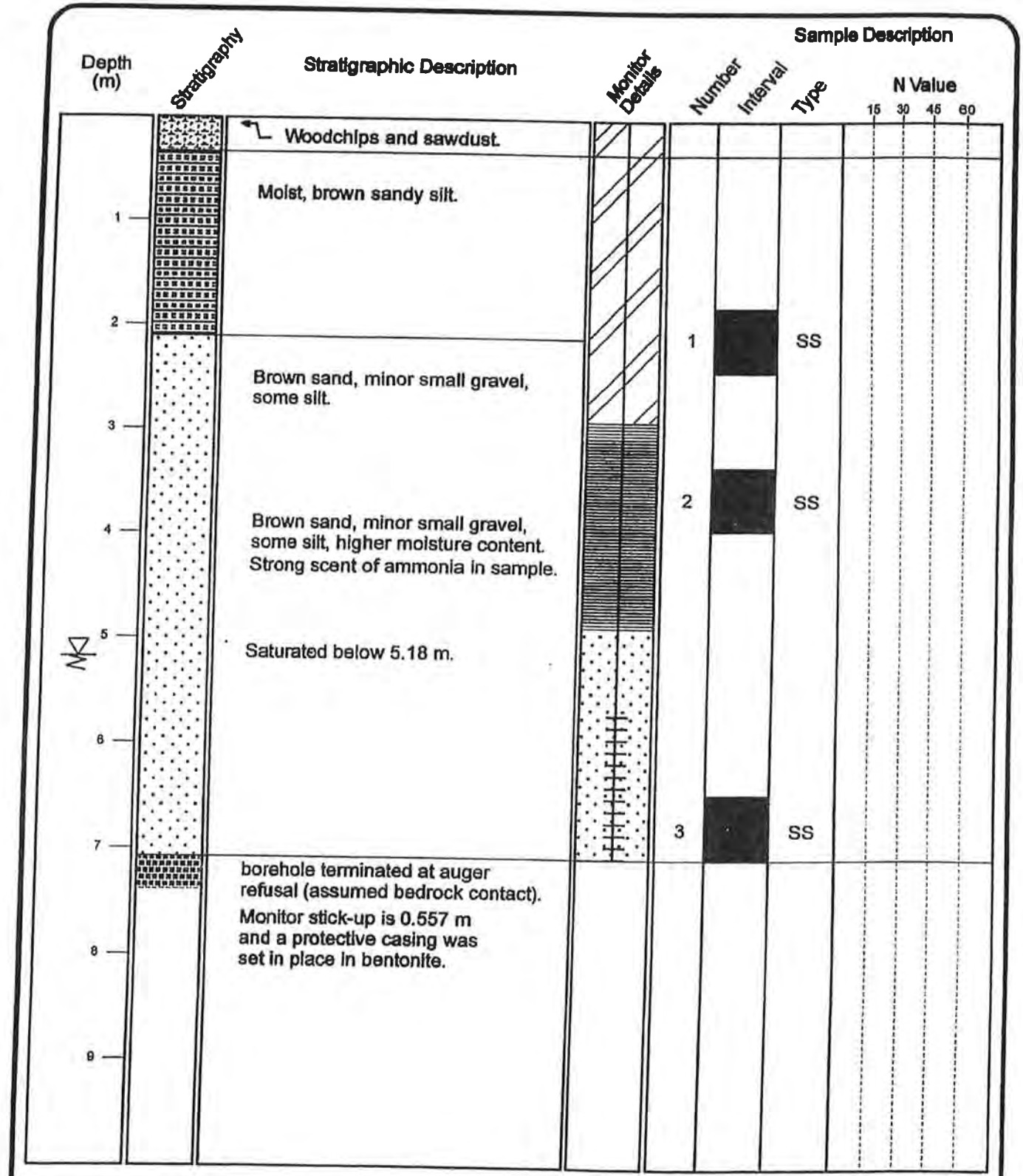
CU... Consolidated undrained triaxial with pore pressure measurements
UU... Unconsolidated undrained triaxial
DS... Direct shear
P.... Field permeability

ROCK DESCRIPTION

The description of bedrock is based on the rock quality designation (RQD). The classification is based on a modified core recovery percentage in which all pieces of sound core over 100mm long are counted as recovery. The smaller pieces are considered to be due to close shearing, jointing, faulting, ore weathering in the rock mass and are not counted. In most cases RQD is run on NXL core; however, it can be used on different core sizes if the bulk of the fractures caused by drilling stresses are easily distinguishable from normal insitu fractures.

RQD	ROCK QUALITY
90-100	Excellent, intact, very sound
75-90	Good, massive, moderately jointed or sound
50-75	Fair, blocky and seamy, fractured
25-50	Poor, shattered and very seamy or blocky, severely fractured
0-25	Very poor, crushed, very severely fractured

exp.



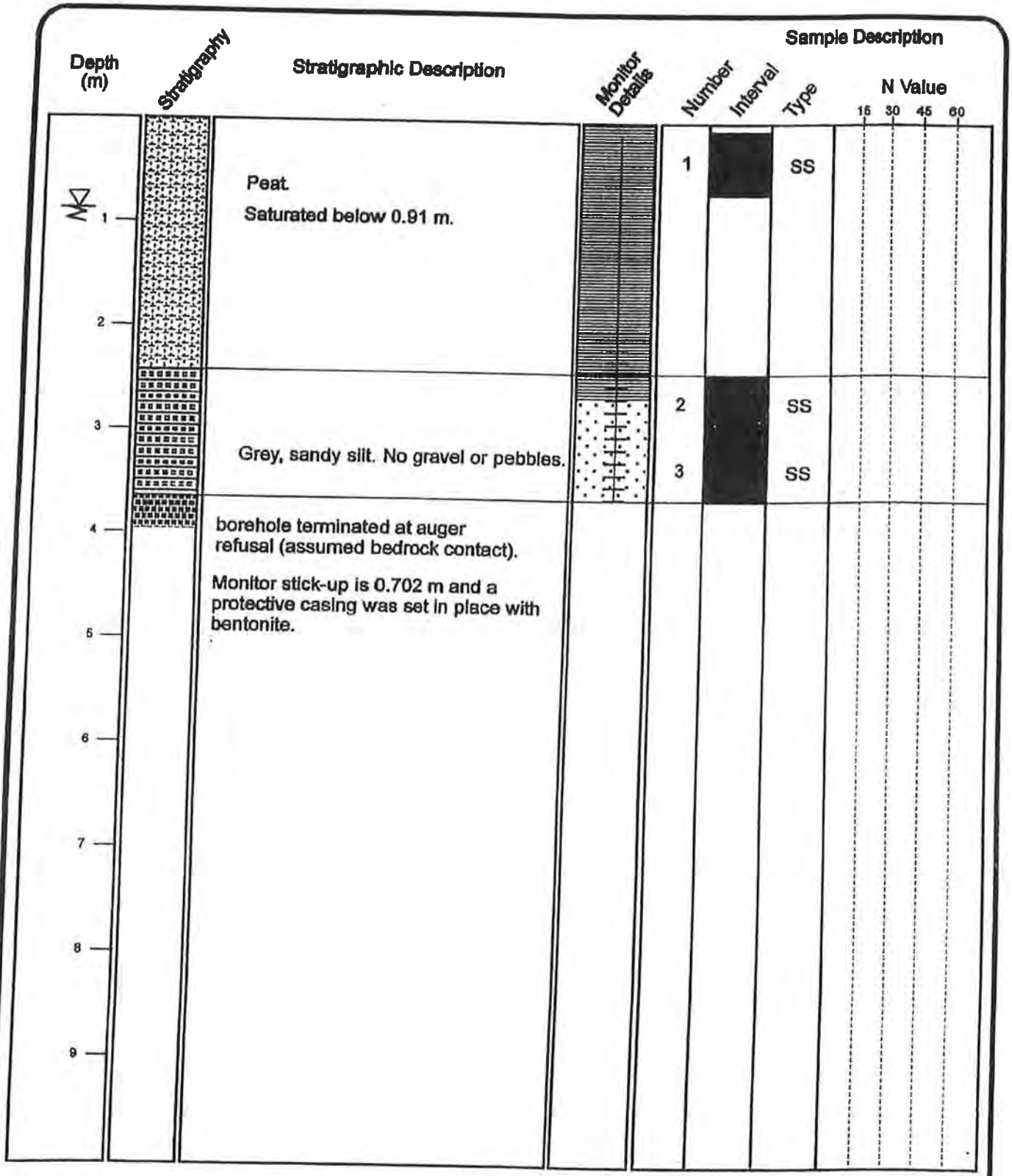
BOREHOLE LOG: 1

Client: Town of Longlac. Municipal landfill survey.

Project: 96016

Date Drilled: Apr. 16 1997
Geologist: M. Jones
Elevation: +13.35 m*

Notes: This borehole was located to evaluate depth of bedrock, identify stratigraphy and to allow monitoring of ground water flow direction and quality.
* elevation in metres above selected datum



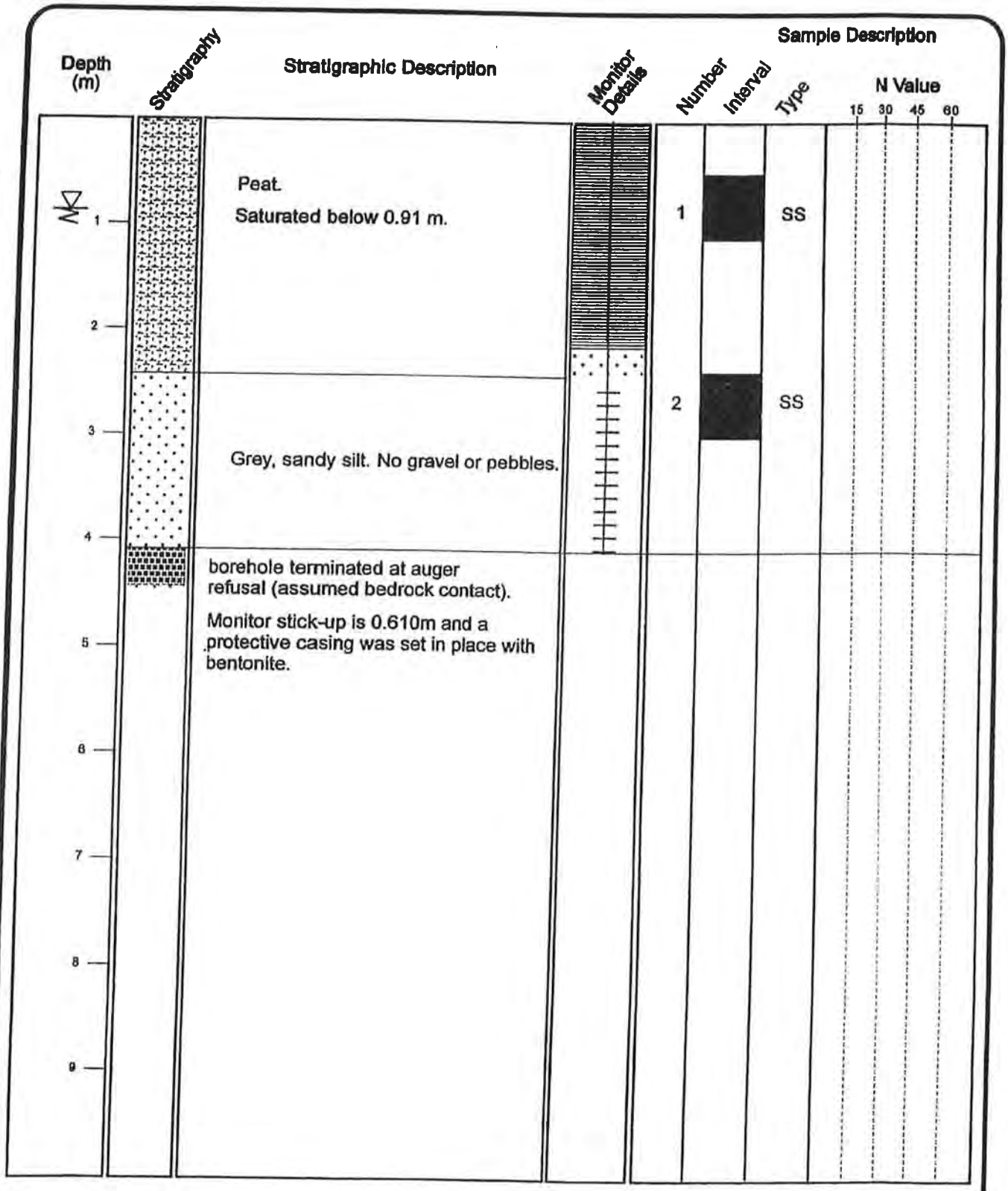
BOREHOLE LOG: 2

Client: Town of Longlac. Municipal landfill survey.

Project: 96016

Date Drilled: Apr. 16 1997
Geologist: M. Jones
Elevation: - 13.54 m*

Notes: This borehole was located to identify stratigraphy, depth to bedrock and to allow monitoring of ground water flow direction and quality.
* elevation in metres above selected datum



BOREHOLE LOG: 3

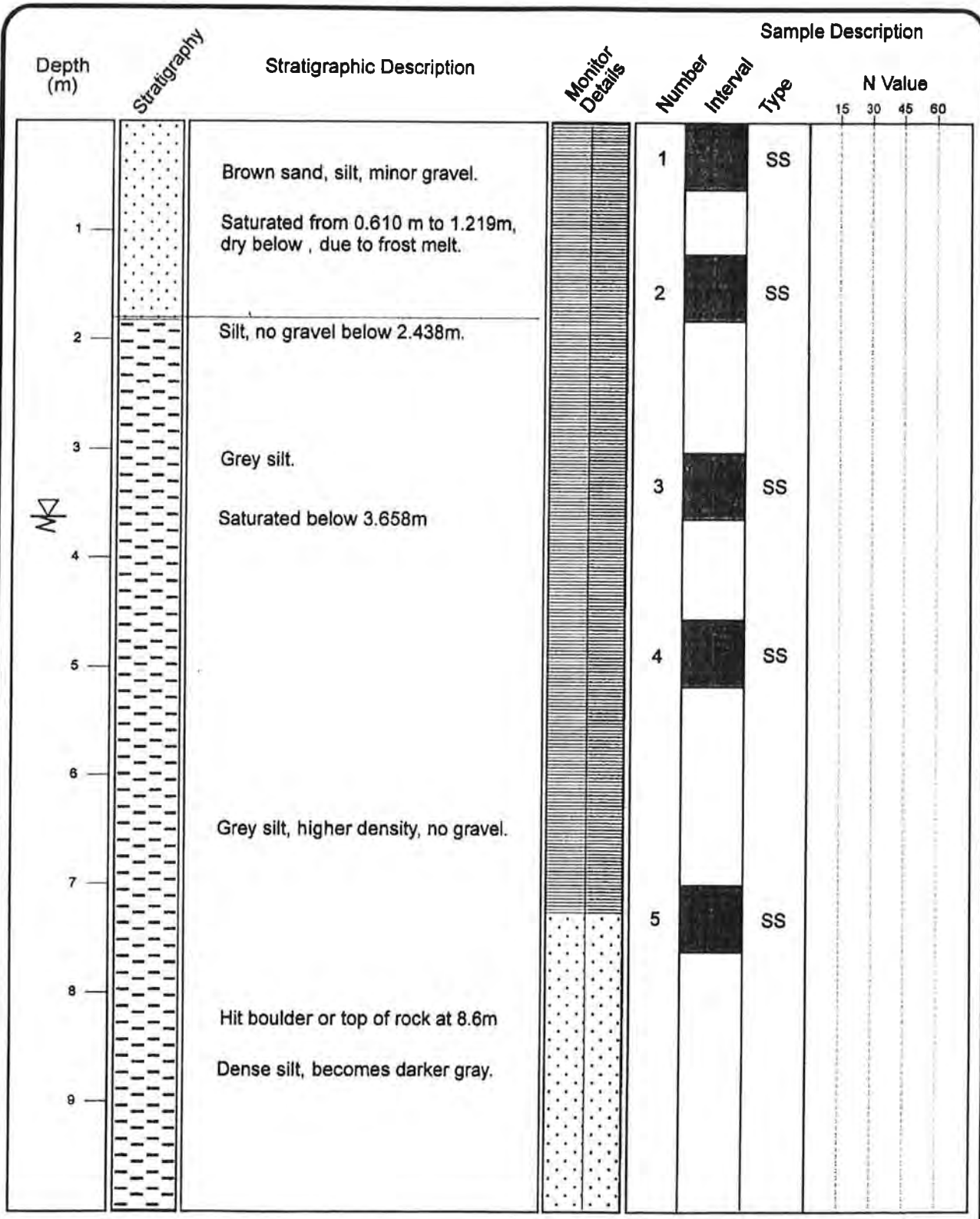
Client: Town of Longlac. Municipal landfill survey.

Project: 96016

Date Drilled: Apr. 16 1997
Geologist: M. Jones
Elevation: - 13.91 masl

Notes: This borehole was located to identify stratigraphy, depth to bedrock and to allow monitoring of ground water flow direction and quality.

* elevation in metres above selected datum



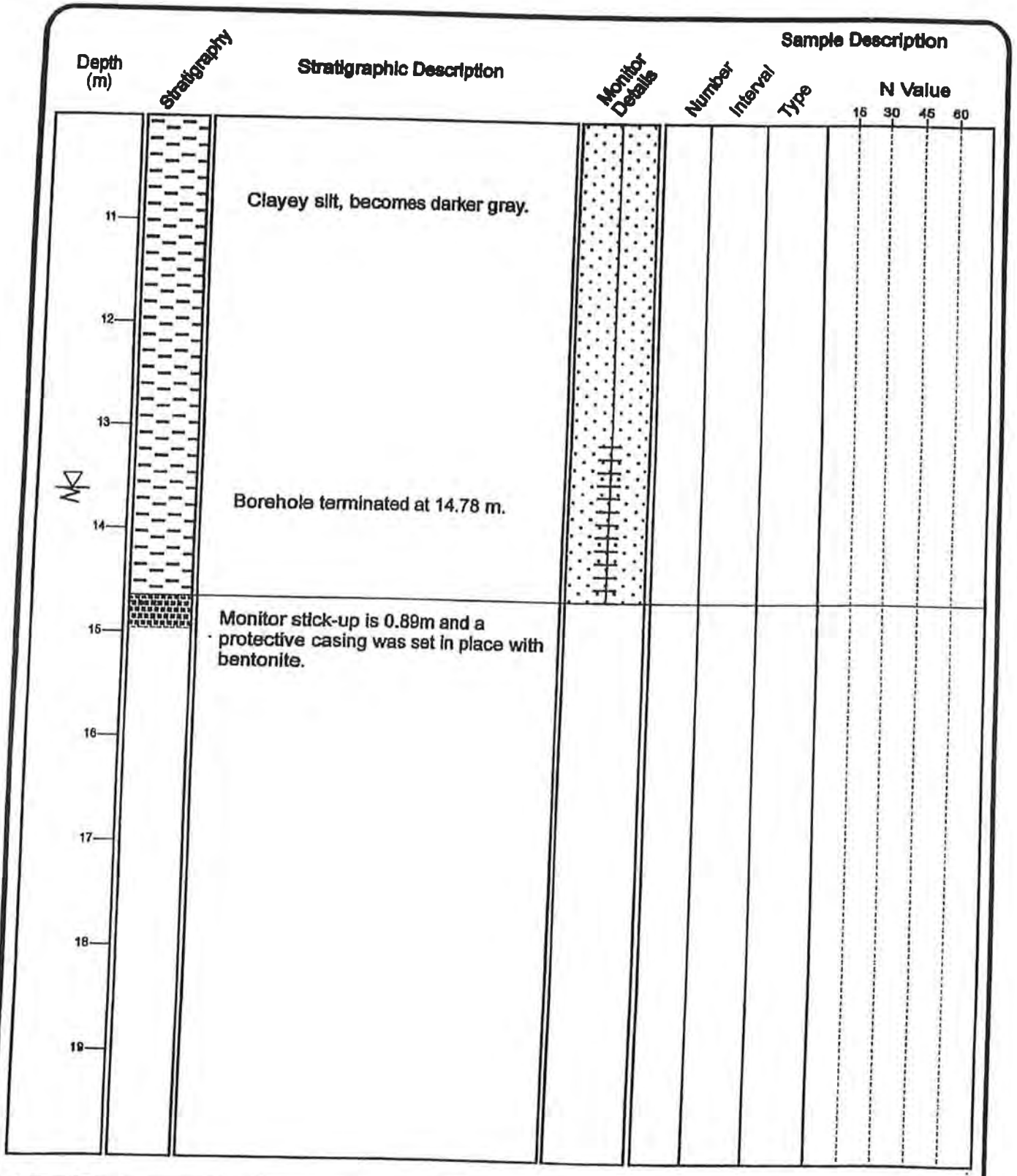
BOREHOLE LOG: 4-I

Client: Town of Longlac. Municipal landfill survey.

Project: 96016

Date Drilled: Apr. 17 1997
Geologist: M. Jones
Elevation: + 3.92 m

Notes: This borehole was located to evaluate depth to bedrock, bedrock competency and to allow monitoring of ground water flow direction and quality.
* elevation in metres above selected datum



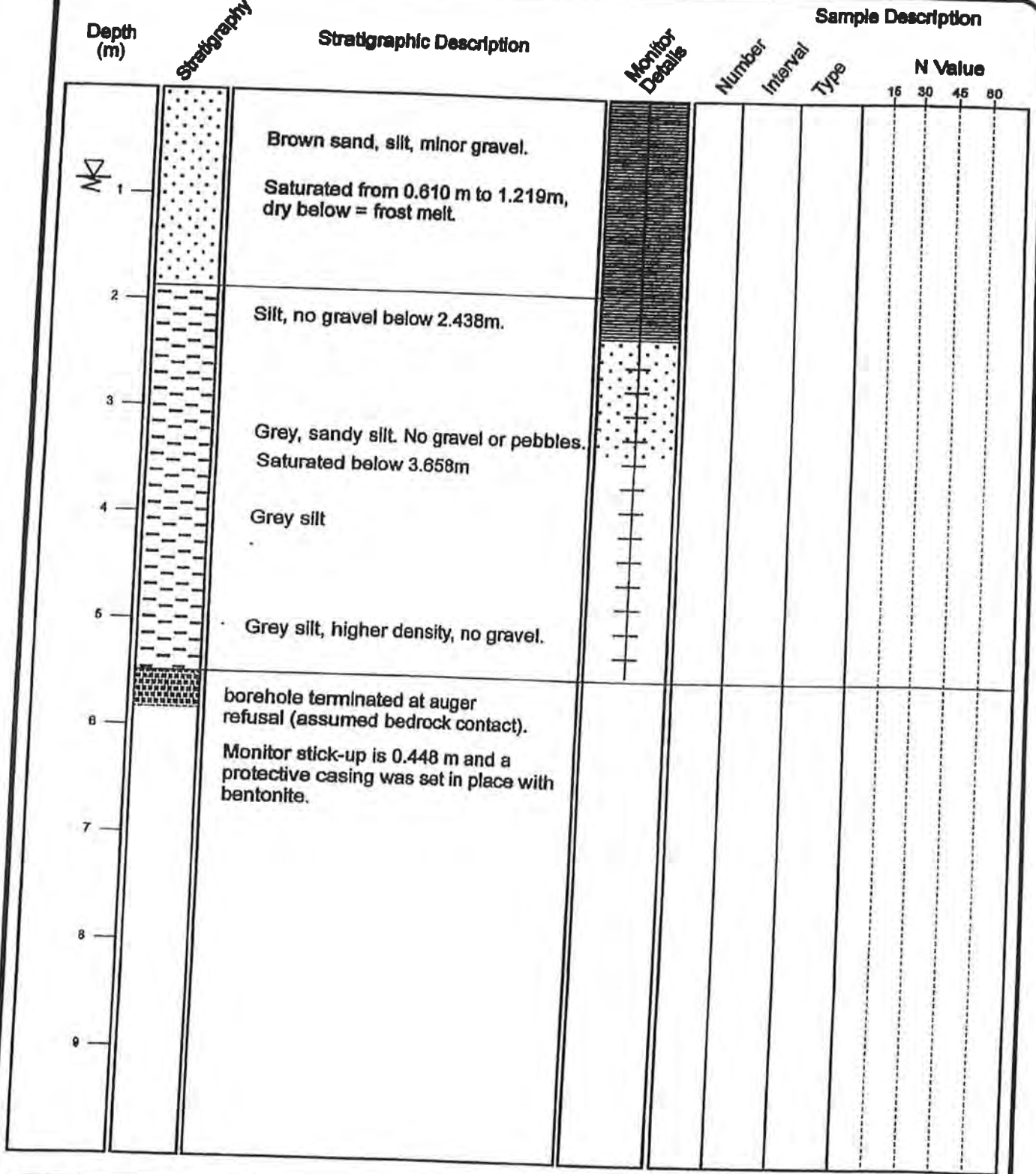
BOREHOLE LOG: 4-I

Client: Town of Longlac. Municipal landfill survey.

Project: 96016

Date Drilled: Apr. 17 1997
Geologist: M. Jones
Elevation: + 3.92 m

Notes: This borehole was located to evaluate depth to bedrock, bedrock competency and to allow monitoring of ground water flow direction and quality.
* elevation in metres above selected datum



BOREHOLE LOG: 4-II

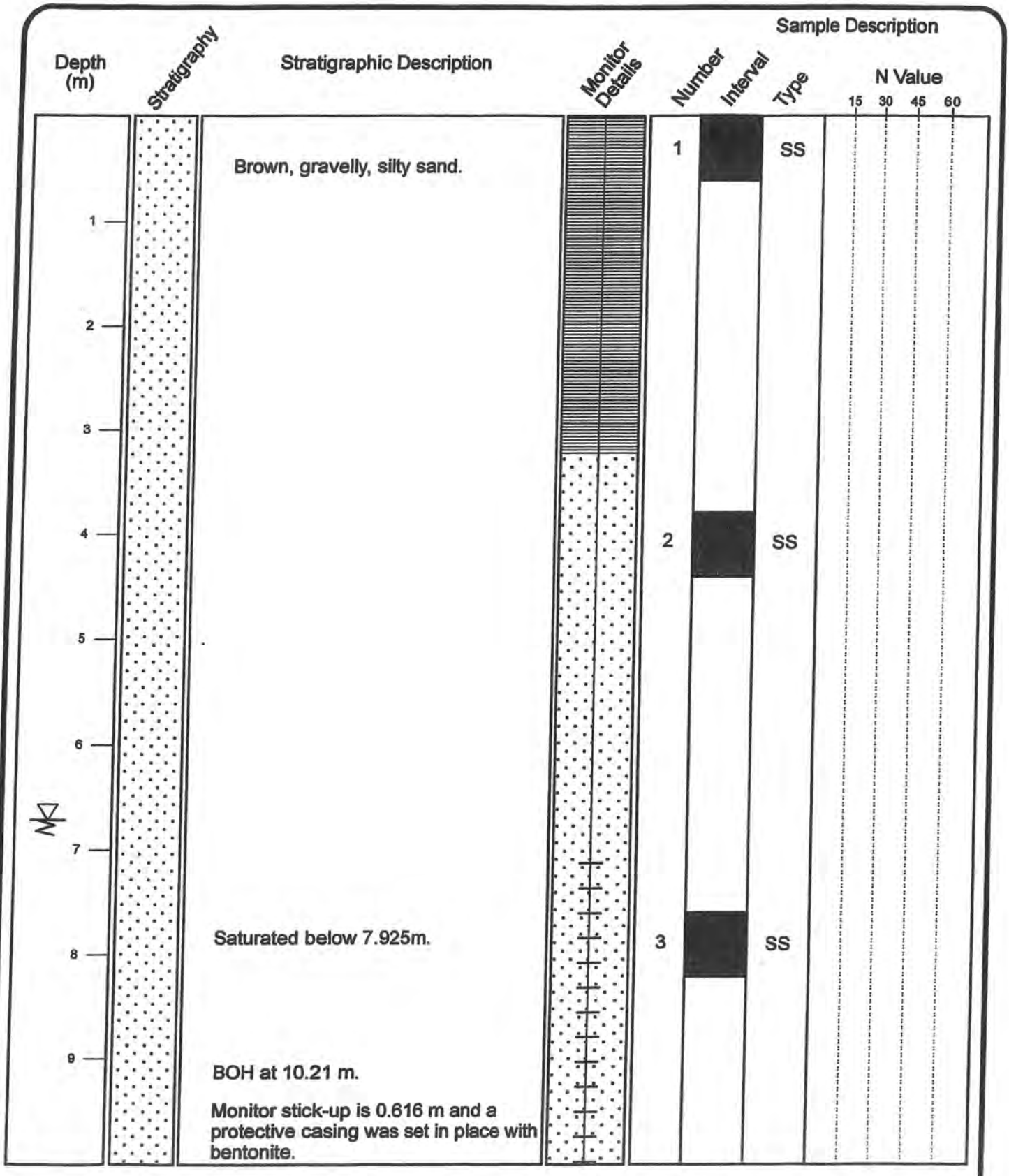
Client: Town of Longlac. Municipal landfill survey.

Project: 96016

Date Drilled: Apr. 17 1997
Geologist: M. Jones
Elevation: + 3.79 m*

Notes: This borehole was located to evaluate depth to bedrock and to allow monitoring of ground water flow direction and quality.

* elevation in metres above selected datum



BOREHOLE LOG: 5-I

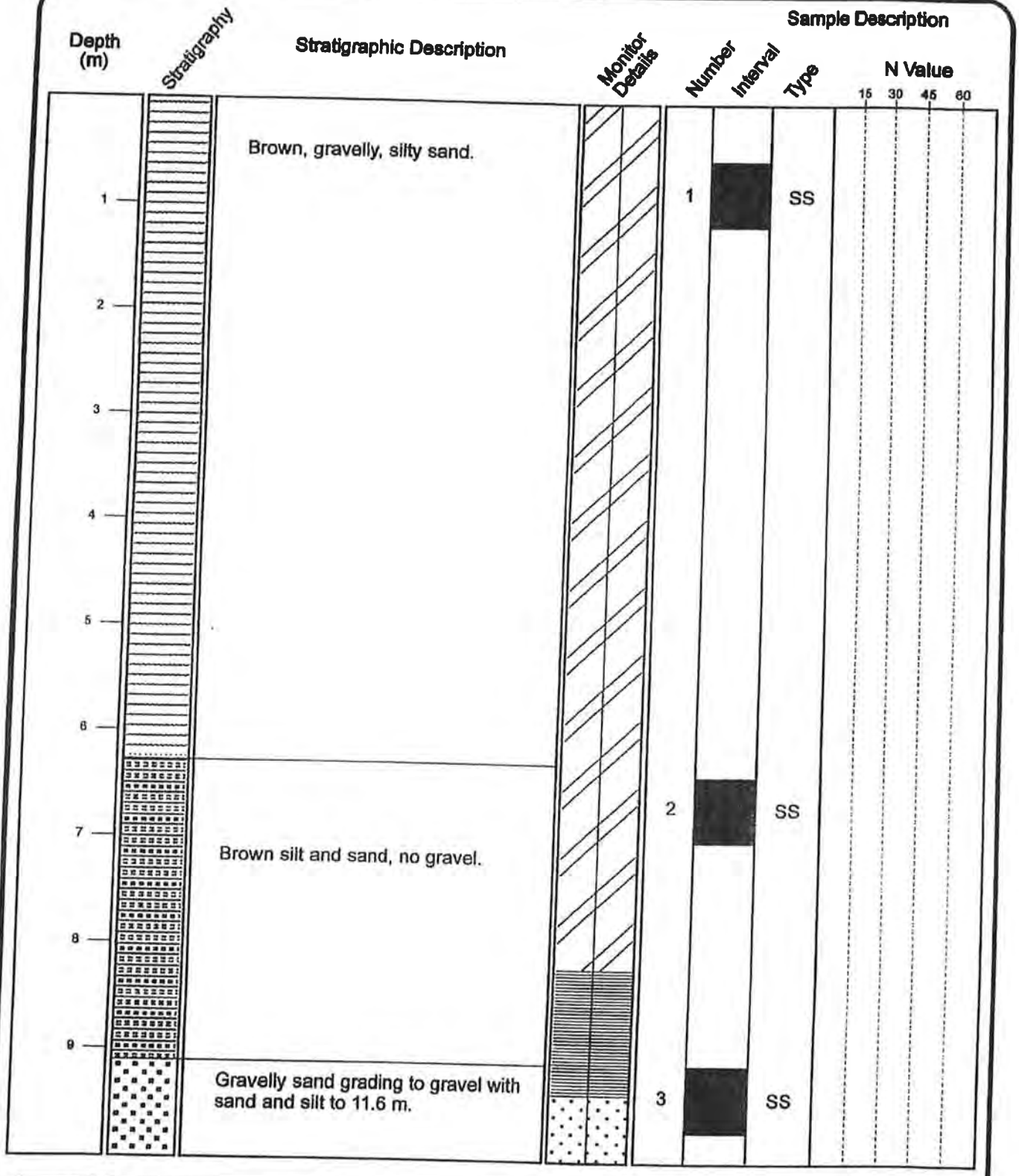
Client: Town of Longlac. Municipal landfill survey.

Project: 96016

Date Drilled: Apr. 17 1997
Geologist: M. Jones
Elevation: + 15.47 m*l

Notes: This borehole was located to evaluate depth to bedrock, bedrock competency and to allow monitoring of ground water flow direction and quality.

* elevation in metres above selected datum



BOREHOLE LOG: 6

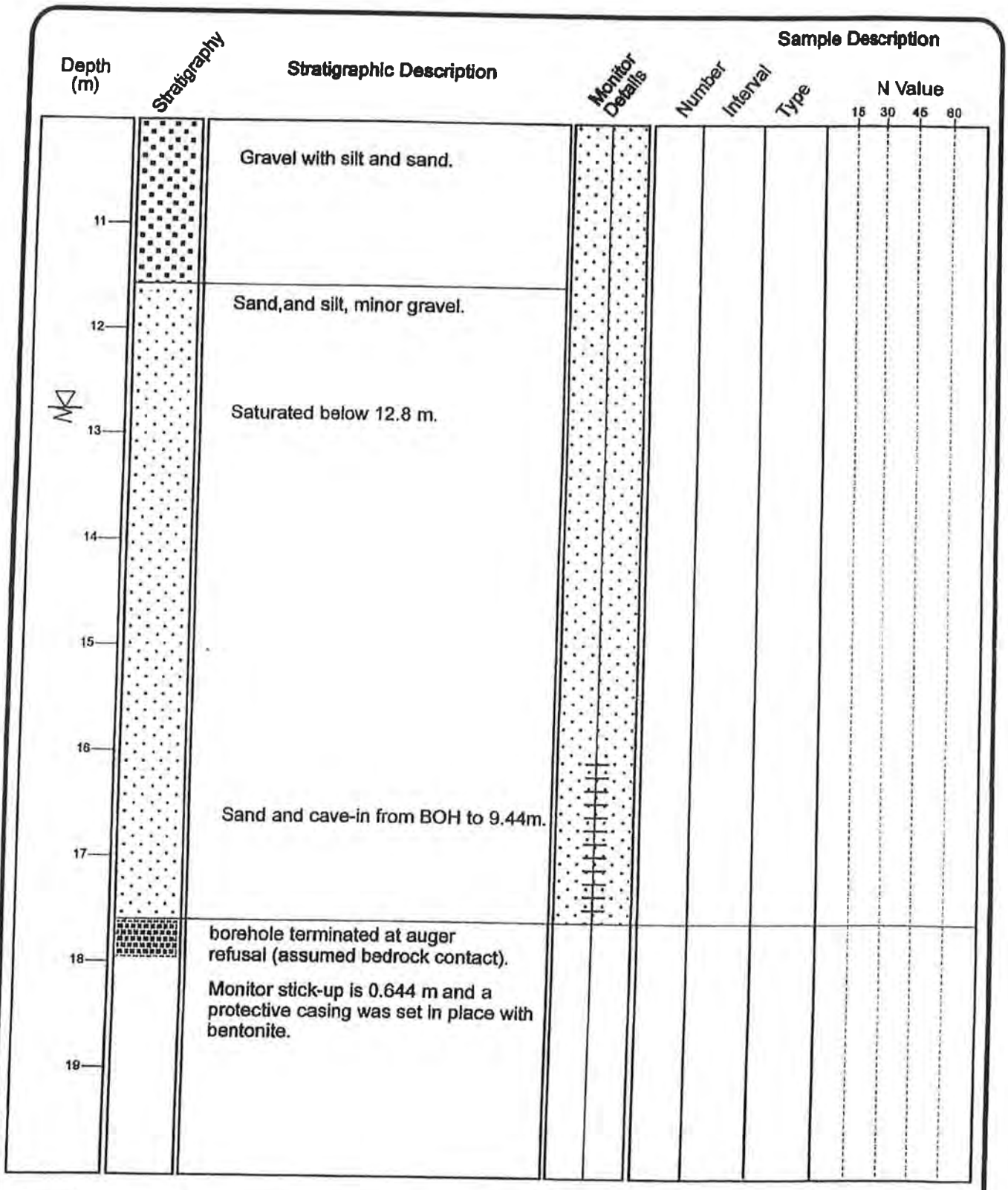
Client: Town of Longlac. Municipal landfill survey.

Project: 96016

Date Drilled: Apr. 17 1997
Geologist: M. Jones
Elevation: + 7.21 m*

Notes: This borehole was located to identify stratigraphy, depth to bedrock and to allow monitoring of ground water flow direction and quality.

* elevation in metres above selected datum



BOREHOLE LOG: 6

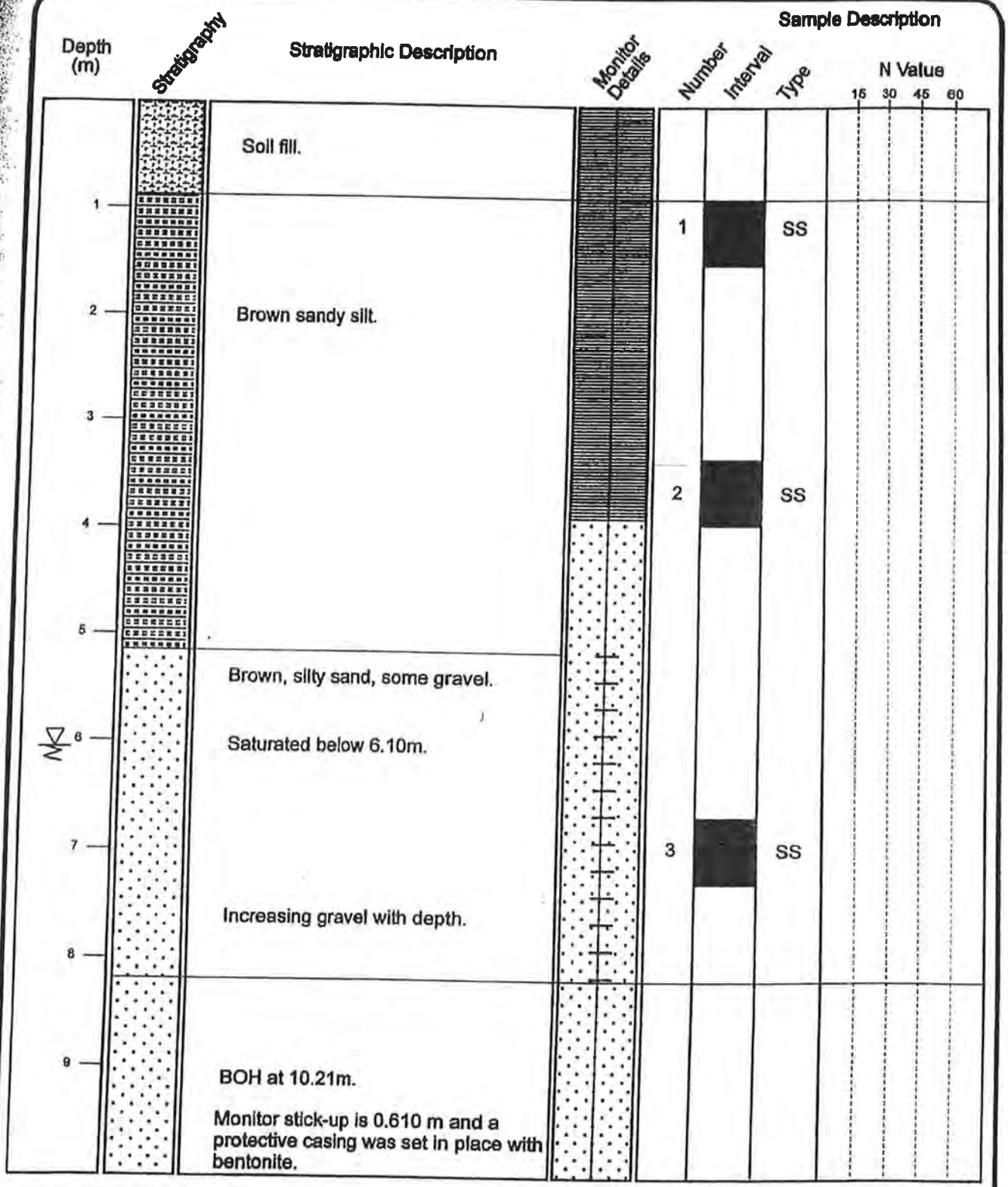
Client: Town of Longlac. Municipal landfill survey.

Project: 96016

Date Drilled: Apr. 17 1997
Geologist: M. Jones
Elevation: + 7.21 m*

Notes: This borehole was located to identify stratigraphy, depth to bedrock and to allow monitoring of ground water flow direction and quality.

* elevation in metres above selected datum



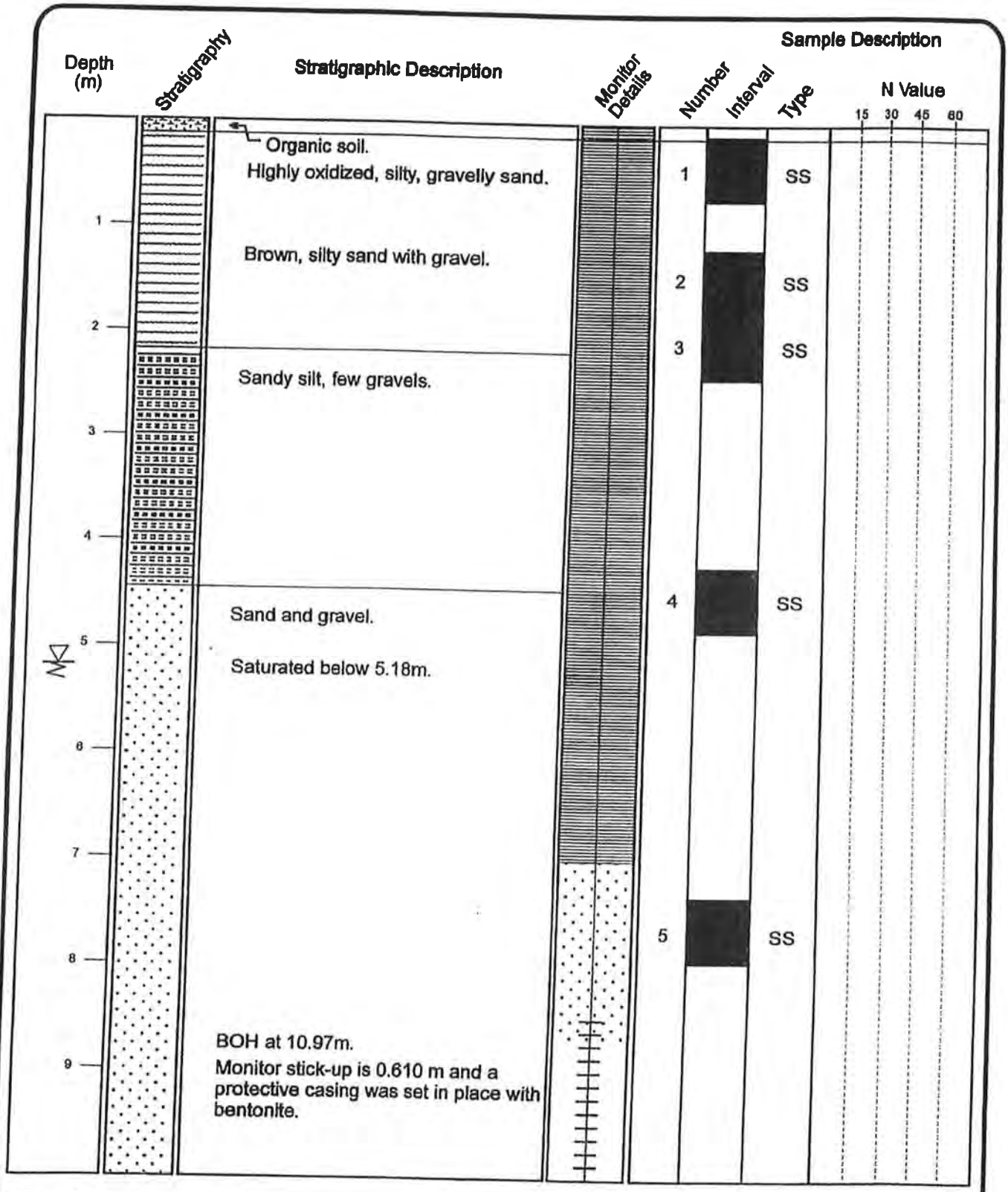
BOREHOLE LOG: 7

Client: Town of Longlac. Municipal landfill survey.

Project: 96016

Date Drilled: Apr. 18 1997
Geologist: M. Jones
Elevation: + 1.32 masl

Notes: This borehole was located to identify stratigraphy, depth to bedrock and to allow monitoring of ground water flow direction and quality.



BOREHOLE LOG: 8- 1

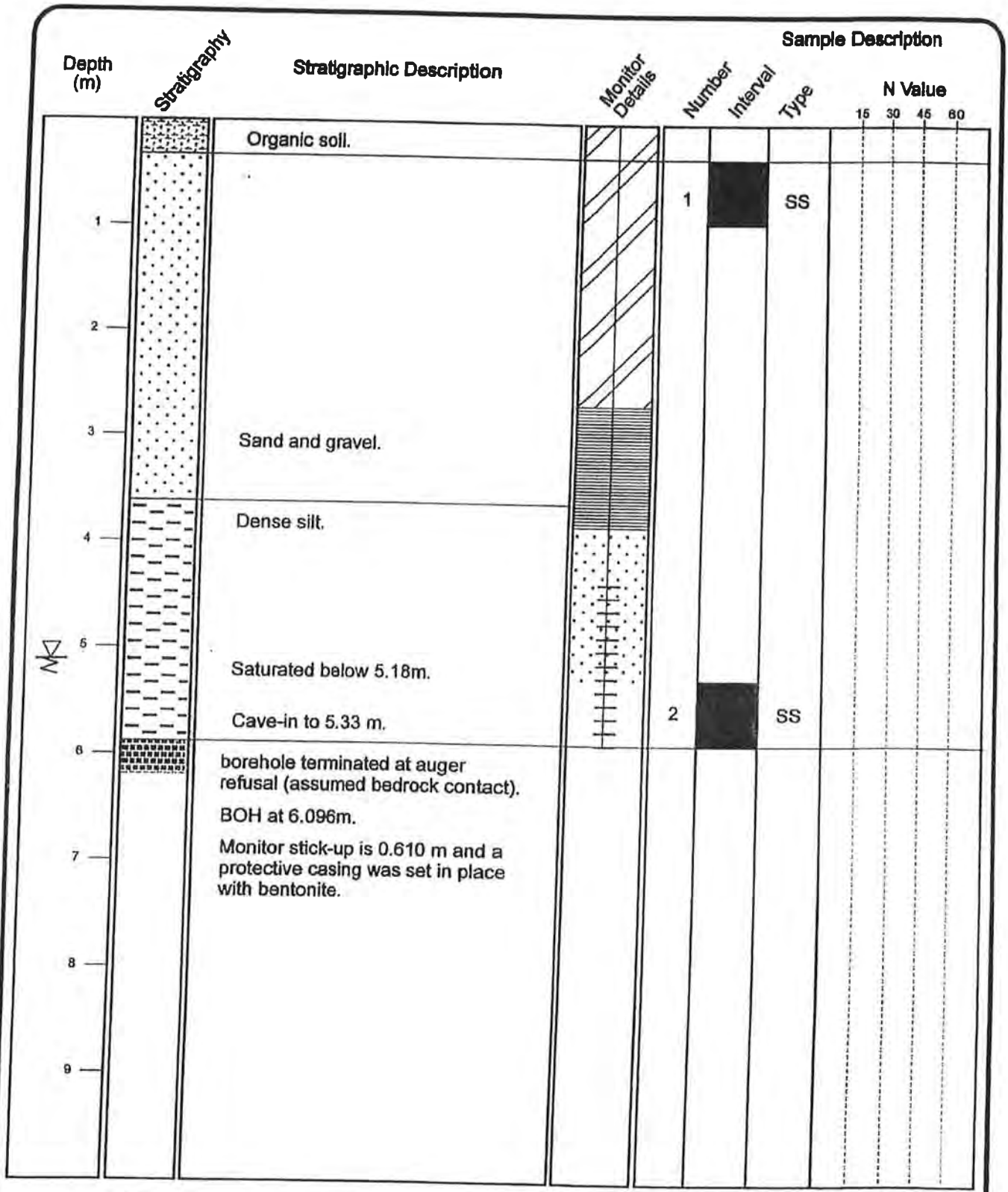
Client: **Town of Longlac.** Municipal landfill survey.

Project: **96016**

Date Drilled: Apr. 18 1997
Geologist: M. Jones
Elevation: + 0.80 m*

Notes: This borehole was located to evaluate depth to bedrock bedrock competency and to allow monitoring of ground water flow direction and quality.

* elevation in metres above selected datum



BOREHOLE LOG: 8-II

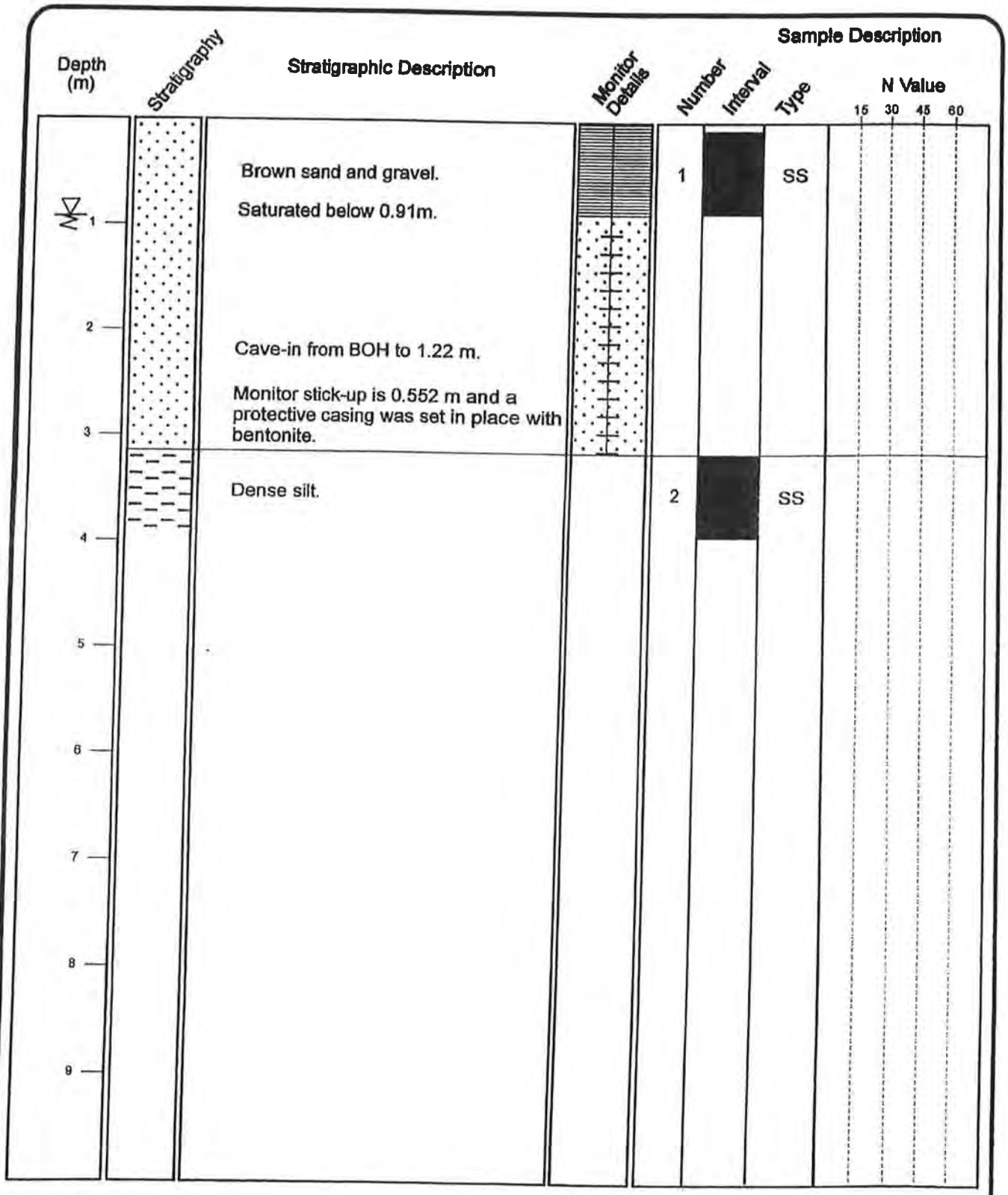
Client: Town of Longlac. Municipal landfill survey.

Project: 96016

Date Drilled: Apr. 18 1997
Geologist: M. Jones
Elevation: + 0.80 m*

Notes: This borehole was located to identify stratigraphy, depth to bedrock and to allow monitoring of ground water flow direction and quality.

* elevation in metres above selected datum



BOREHOLE LOG: 9

Client: Town of Longlac. Municipal landfill survey.

Project: 96016

Date Drilled: Apr. 18 1997
Geologist: M. Jones
Elevation: - 2.20 m*

Notes: This borehole was located to identify stratigraphy, depth to bedrock and to allow monitoring of ground water flow direction and quality.

* elevation in metres above selected datum

BOREHOLE LOG

MW10

Sheet 1 of 1

Trow Thunder Bay Branch

PROJECT **Hydrogeological Study - Longlac Landfill** PROJECT NO. **F-06196 D/E**

CLIENT **Municipality of Greenstone** DATUM **Geodetic**

DRILL TYPE/METHOD **Speedstar SD100E/HSA** DATES: Boring **June 23, 2008** Water Level **June 27/08**

DEPTH (m)	ELEVATION (m) 349.64	STRATA DESCRIPTION	STRATA PLOT	WELL LOG	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES RECOVERY (mm) or (%)	SAMPLES N VALUE (blows) or RQD (%)	OTHER TESTS
0	349.34	**ORGANICS** - loose, black, moist							
	348.88	**SANDY SILT** - loose , brown, moist to wet, trace clay, trace organics			AS	S1			
1		**SILTY SAND** - loose, brown, wet, trace clay, trace organics			AS	S2			
2	347.20				AS	S3			
		SILTY SAND (TILL) - compact to dense, brown, moist, trace to some clay, trace gravel, occasional cobbles and boulders			SS	S4A	360	26	
3					SS	S4B	250	28	
					SS	S5	560	45	
4									
5					SS	S6	580	21	
	343.85								
6		**End of Borehole**							
7									
8									

SHEAR STRENGTH
● S Field Vane Test (#=Sensitivity) ▲ Penetrometer ■ Torvane
40 80 kPa

Atterberg Limits and Moisture
W_P W W_L

● SPT N Value × Dynamic Cone
20 40 60 80

NOTES

1) For definition of symbols & terms used on logs, see sheets prior to logs.

2) 50mm PVC monitoring well installed to 5.8 m depth (as shown).

3) MW10 located at 535 835 E and 5 515 835 N. Top of MW10 elevation 350.58 m.

4) Recovery estimated at 0.16 m/min.

SAMPLE LEGEND
☒ AS Auger Sample ▨ SS Split Spoon ■ ST Shelby Tube
▥ Rock Core (eg. BQ, NQ, etc.) ▣ VN Vane Sample

OTHER TESTS
G Specific Gravity C Consolidation
H Hydrometer CD Consolidated Drained Triaxial
S Sieve Analysis CU Consolidated Undrained Triaxial
γ Unit Weight UU Unconsolidated Undrained Triaxial
P Field Permeability UC Unconfined Compression
K Lab Permeability DS Direct Shear

WATER LEVELS
↧ Apparent ↧ Measured ⏃ Artesian (see Notes)

BOREHOLE LOG

Trow Thunder Bay Branch

MW11-I

Sheet 1 of 2

PROJECT **Hydrogeological Study - Longlac Landfill** PROJECT NO. **TBEN00006196 D/E**

CLIENT **Municipality of Greenstone** DATUM **Geodetic**

DRILL TYPE/METHOD **CME 750 - Rubber Tire / HSA** DATES: Boring **Sept 21, 2009** Water Level **Sept. 21/09**

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WELL LOG	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES RECOVERY (mm) or (%)	SAMPLES N VALUE (blows) or RQD (%)	HCVL (ppm)
0	323.56	**PEAT** - very soft, dark brown, wet, roots and rootlets			AS	S1			20
1					AS	S2			55
2	321.42	**SILT** - loose, grey, wet, trace sand, trace clay			SS	S3	200	9	5
3		- trace to some clay at about 3.0 m depth			SS	S4	410	8	19
4									
5		- trace gravel, trace to some sand, trace clay at about 4.6 m depth			SS	S5	150	5	31
6	317.46	**SANDY SILT** - compact, grey, wet, trace gravel			SS	S6	360	14	160
7									

HEADSPACE COMBUSTIBLE VAPOUR LEVEL

▲ HCVL

40 80 ppm

W_P W W_L

● SPT N Value × Dynamic Cone

20 40 60 80

Continued Next Page

NOTES

1) For definition of symbols & terms used on logs, see sheets prior to logs.

2) 50mm PVC monitoring well installed to 10.07 m depth (as shown).

3) MW11-I located at 535 737 E and 5 515 330 N. Top of MW11-I elevation 324.28 m.

SAMPLE LEGEND

☒ AS Auger Sample ▨ SS Split Spoon ■ ST Shelby Tube

▥ Rock Core (eg. BQ, NQ, etc.) ▣ VN Vane Sample

OTHER TESTS

G Specific Gravity	C Consolidation
H Hydrometer	CD Consolidated Drained Triaxial
S Sieve Analysis	CU Consolidated Undrained Triaxial
γ Unit Weight	UU Unconsolidated Undrained Triaxial
P Field Permeability	UC Unconfined Compression
K Lab Permeability	DS Direct Shear

WATER LEVELS

▽ Apparent ▼ Measured ▲ Artesian (see Notes)

BOREHOLE LOG

Trow Thunder Bay Branch

MW11-I

Sheet 2 of 2

PROJECT **Hydrogeological Study - Longlac Landfill** PROJECT NO. **TBEN00006196 D/E**

CLIENT **Municipality of Greenstone** DATUM **Geodetic**

DRILL TYPE/METHOD **CME 750 - Rubber Tire / HSA** DATES: Boring **Sept 21, 2009** Water Level **Sept. 21/09**

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WELL LOG	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES RECOVERY (mm) or (%)	SAMPLES N VALUE (blows) or RQD (%)	HCVL (ppm)	HEADSPACE COMBUSTIBLE VAPOUR LEVEL
	323.56									▲ HCVL 40 80 ppm; W_P W W_L; ● SPT N Value ✕ Dynamic Cone 20 40 60 80
	315.93									
8		**SILT (TILL)** - dense, grey, moist, trace gravel, trace sand, trace clay			SS	S7	360	45	220	220
9					SS	S8	360	44	18	
10	313.50									
		End of Borehole								
11										
12										
13										
14										
15										

NOTES

1) For definition of symbols & terms used on logs, see sheets prior to logs.

2) 50mm PVC monitoring well installed to 10.07 m depth (as shown).

3) MW11-I located at 535 737 E and 5 515 330 N. Top of MW11-I elevation 324.28 m.

SAMPLE LEGEND

- ⊠ AS Auger Sample
- ▨ SS Split Spoon
- ■ ST Shelby Tube
- ▣ Rock Core (eg. BQ, NQ, etc.)
- ▣ VN Vane Sample

OTHER TESTS

G Specific Gravity	C Consolidation
H Hydrometer	CD Consolidated Drained Triaxial
S Sieve Analysis	CU Consolidated Undrained Triaxial
γ Unit Weight	UU Unconsolidated Undrained Triaxial
P Field Permeability	UC Unconfined Compression
K Lab Permeability	DS Direct Shear

WATER LEVELS

- ▽ Apparent
- ▼ Measured
- ▲ Artesian (see Notes)

BOREHOLE LOG

Trow Thunder Bay Branch

MW11-II

Sheet 1 of 1

PROJECT Hydrogeological Study - Longlac Landfill — PROJECT NO. TBEN00006196 D/E

CLIENT Municipality of Greenstone — DATUM Geodetic

DRILL TYPE/METHOD CME 750 - Rubber Tire / HSA — DATES: Boring Sept. 21, 2009 — Water Level Sept. 21/09

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WELL LOG	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES RECOVERY (mm) or (%)	SAMPLES N VALUE (blows) or RQD (%)	HCVL (ppm)
0	323.55	**PEAT** - very soft, dark brown, wet, roots and rootlets							
					AS	S1			49
2	321.41	**SILT** - loose, grey, wet, trace sand, trace to some clay			SS	S2	150	6	10
3					SS	S3	360	9	8
5	318.36				SS	S4	310	5	6
		End of Borehole							

HEADSPACE COMBUSTIBLE VAPOUR LEVEL

▲ HCVL

40 — 80 ppm

W_P W W_L

● SPT N Value × Dynamic Cone

20 — 40 — 60 — 80

NOTES

1) For definition of symbols & terms used on logs, see sheets prior to logs.

2) 50mm PVC monitoring well installed to 4.57m depth (as shown).

3) MW11-II located at 535 737 E and 5 515 330 N. Top of MW11-I elevation 324.17 m.

SAMPLE LEGEND

☒ AS Auger Sample ▨ SS Split Spoon ■ ST Shelby Tube

▯ Rock Core (eg. BQ, NQ, etc.) ▯ VN Vane Sample

OTHER TESTS

G Specific Gravity	C Consolidation
H Hydrometer	CD Consolidated Drained Triaxial
S Sieve Analysis	CU Consolidated Undrained Triaxial
γ Unit Weight	UU Unconsolidated Undrained Triaxial
P Field Permeability	UC Unconfined Compression
K Lab Permeability	DS Direct Shear

WATER LEVELS

▽ Apparent ▼ Measured ▲ Artesian (see Notes)

BOREHOLE LOG

Trow Thunder Bay Branch

MW12-I

Sheet 1 of 1

PROJECT Hydrogeological Study - Longlac Landfill — PROJECT NO. F-06196 D/E

CLIENT Municipality of Greenstone — DATUM Geodetic

DRILL TYPE/METHOD Speedstar SD100E/HSA/NQ — DATES: Boring June 24, 2008 — Water Level June 27/08

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES RECOVERY (mm) or (%)	SAMPLES N VALUE (blows) or RQD (%)
0	330.33					
	330.18	**ORGANICS** - loose, black, wet, roots and rootlets				
		SAND & GRAVEL - loose, grey, wet, occasional cobbles and boulders	AS	S1		
1						
2			SS	S2	510	21
3	327.23					
		SILTY SAND - very dense, brown, moist, trace gravel	SS	S3	360	64
	326.52					
4		**BEDROCK** - fractured greenstone with occasional quartz/carbonate stringers	NQ	S4	100%	70
5						
6			NQ	S5	100%	56
7			NQ	S6	100%	67
	322.71					
		End of Borehole				
8						

STRATA PLOT / WELL LOG

OTHER TESTS

SHEAR STRENGTH
● S Field Vane Test (#=Sensitivity)
▲ Penetrometer ■ Torvane
40 80 kPa

Atterberg Limits and Moisture
W_P W W_L

● SPT N Value × Dynamic Cone
20 40 60 80

NOTES

1) For definition of symbols & terms used on logs, see sheets prior to logs.

2) 50mm PVC monitoring well installed to 7.6 m depth (as shown).

3) MW12-I located at 535 446 E and 5 515 388 N. Top of MW12-I elevation 331.11 m.

4) Recovery estimated at 0.1 m/min.

SAMPLE LEGEND
☒ AS Auger Sample ▨ SS Split Spoon ■ ST Shelby Tube
▥ Rock Core (eg. BQ, NQ, etc.) ▣ VN Vane Sample

OTHER TESTS
G Specific Gravity — C Consolidation
H Hydrometer — CD Consolidated Drained Triaxial
S Sieve Analysis — CU Consolidated Undrained Triaxial
γ Unit Weight — UU Unconsolidated Undrained Triaxial
P Field Permeability — UC Unconfined Compression
K Lab Permeability — DS Direct Shear

WATER LEVELS
Apparent ▼ Measured ▲ Artesian (see Notes)

Trow Thunder Bay Branch

BOREHOLE LOG

MW12-II

Sheet 1 of 1

PROJECT **Hydrogeological Study - Longlac Landfill** PROJECT NO. **F-06196 D/E**

CLIENT **Municipality of Greenstone** DATUM **Geodetic**

DRILL TYPE/METHOD **Speedstar SD100E/HSA** DATES: Boring **June 24, 2008** Water Level **June 27/08**

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WELL LOG	SAMPLES: TYPE	SAMPLES: NUMBER	SAMPLES: RECOVERY (mm) or (%)	SAMPLES: N VALUE (blows) or RQD (%)	OTHER TESTS	SHEAR STRENGTH / Atterberg Limits and Moisture
0	330.20									
	330.05	**ORGANICS** - loose, black, wet, roots and rootlets								
		SAND & GRAVEL - loose, grey, wet, some silt, occasional cobbles and boulders								
3	327.15									
		End of Borehole								
8										

SHEAR STRENGTH: ✤ S Field Vane Test (#=Sensitivity) ▲ Penetrometer ■ Torvane; 40 80 kPa

Atterberg Limits and Moisture: W_P W W_L

● SPT N Value × Dynamic Cone; 20 40 60 80

NOTES

1) For definition of symbols & terms used on logs, see sheets prior to logs.

2) 50mm PVC monitoring well installed to 3.1 m depth (as shown).

3) MW12-II located at 535 445 E and 5 515 388 N. Top of MW12-II elevation 331.17 m.

4) Recovery estimated at 0.33 m/min.

SAMPLE LEGEND

☒ AS Auger Sample ▨ SS Split Spoon ■ ST Shelby Tube
▥ Rock Core (eg. BQ, NQ, etc.) ▣ VN Vane Sample

OTHER TESTS

G Specific Gravity — C Consolidation
H Hydrometer — CD Consolidated Drained Triaxial
S Sieve Analysis — CU Consolidated Undrained Triaxial
γ Unit Weight — UU Unconsolidated Undrained Triaxial
P Field Permeability — UC Unconfined Compression
K Lab Permeability — DS Direct Shear

WATER LEVELS

▽ Apparent ▼ Measured ▲ Artesian (see Notes)

APPENDIX D – Summary Tables

LIST OF TABLES

General Notes for Tables

1. Concentrations are mg/L (ppm), unless indicated otherwise.

2. ODWS: MECP Ontario Drinking Water Standards, from *Technical Support Document for Ontario Drinking Water Standards, Objectives and Guidelines,* June 2003. Exceedances are indicated in **bold** type face.

3. Background = arithmetic mean of the most recent three years from MW10. Non-detect (<) values are assumed equal to one-half of the detection limit.

4. MECP Guideline B-7, Incorporation of the Reasonable Use Concept into MOE Ground Water Management Activities (1994). Underlining indicates exceedance (current reporting period results only). Asterisk indicates that background exceeds ODWS; therefore, B-7 criterion = background.

5. PWQO: MECP Provincial Water Quality Objectives, 1994 (updated 1999). Interim PWQO criteria are bracketed. Exceedances are indicated in **bold** type face.

6. ** Indicates blind duplicate (QA/QC) sample.

7. Phosphorus levels in groundwater reported in November 2007, August 2009, August 2010, and May 2015 to September 2020 are total values (i.e., analysis of unfiltered sample).

All tables are to be read in conjunction with the accompanying report.

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Table 1: Summary of Groundwater Levels and Elevations (m)

Monitoring Well No.	Ground Surface Elevation[1,2]	Top of Pipe Elevation[1,2]	Depth to Groundwater and Elevations																											
			Nov. 21, 2006		Nov. 8, 2007		Oct. 21/08		Aug. 25/09		Oct. 30/10		May 27/11		Oct. 13/11		May 30/12		14-Aug-12		17-Oct-12		28-May-13		19-Aug-13		29-Oct-13		20-May-14		25-Aug-14		26-Oct-14	
MW1	349.15	349.69	5.47	344.22	3.23	346.46	--	--	3.33	346.36	--	--	--		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW2	317.71	318.86	1.44	317.42	1.38	317.48	1.4	317.46	1.41	317.45	1.48	317.38	1.48	317.38	1.46	317.40	1.29	317.57	1.58	317.28	1.61	317.25	1.54	317.32	1.28	317.58	1.24	317.62	1.45	317.41	1.36	317.50	1.23	317.63
MW3	317.39	318.40	1.32	317.08	1.14	317.26	1.2	317.20	1.21	317.19	1.16	317.24	1.19	317.21	1.45	316.95	1.03	317.37	1.41	316.99	1.57	316.83	1.09	317.31	1.28	317.12	1.16	317.24	1.21	317.19	1.52	316.88	1.18	317.22
MW4-I	339.73	340.26	4.88	335.38	2.69	337.57	5.5	334.76	4.03	336.23	4.43	335.83	2.65	337.61	4.17	336.09	3.65	336.61	--	--	4.59	335.67	4.52	335.74	--	--	3.79	336.47	3.7	336.56	--	--	3.68	336.58
MW4-II	339.73	339.94	3.34	336.6	2.06	337.88	2.48	337.46	2.81	337.13	3.06	336.88	2.38	337.56	2.96	336.98	1.99	337.95	--	--	3.43	336.51	2.63	337.31	--	--	2.59	337.35	2.55	337.39	--	--	2.44	337.50
MW5	350.91	351.69	8.99	342.7	2.89	348.8	6.45	345.24	6.19	345.50	7.42	344.27	3.46	348.23	6.99	344.70	2.44	349.25	--	--	7.83	343.86	4.65	347.04	--	--	5.11	346.58	5.08	346.61	--	--	5.46	346.23
MW6	342.96	343.43	10.54	332.89	9.81	333.62	9.94	333.49	10.07	333.36	10.35	333.08	9.79	333.64	10.26	333.17	9.93	333.50	9.97	333.46	10.50	332.93	10.29	333.14	9.90	333.53	10.03	333.40	10.03	333.40	10.30	333.13	9.75	333.68
MW7	337.10	337.56	7.12	330.44	4.47	333.09	5.4	332.16	6.09	331.47	7.15	330.41	5.68	331.88	6.34	331.22	5.85	332.07	5.52	332.04	6.52	331.04	7.33	330.23	5.53	332.03	5.53	332.03	6.12	331.44	5.61	331.95	5.28	332.28
MW8-I	334.91	335.59	6.35	329.24	5.06	330.53	5.35	330.24	5.60	329.99	6.21	329.38	5.15	330.44	5.93	329.66	4.06	331.53	5.72	329.87	6.43	329.16	5.52	330.07	5.30	330.29	5.30	330.29	5.07	330.52	5.75	329.84	5.21	330.38
MW8-II	334.87	335.59	DRY	N/A	5	330.59	5.28	330.31	5.54	330.05	6.16	329.43	5.1	330.49	5.90	329.69	5.02	330.57	5.67	329.92	6.32	329.27	5.48	330.11	5.25	330.34	5.25	330.34	5.02	330.57	5.77	329.82	5.18	330.41
MW9	331.39	332.43	3.1	329.33	2.05	330.38	2.27	330.16	2.45	329.98	2.80	329.63	2.05	330.38	2.66	329.77	1.78	330.65	--	--	3.15	329.28	2.26	330.17	--	--	2.14	330.29	2.09	330.34	--	--	2.23	330.20
MW10	349.64	350.58	--	--	--	--	2.32	348.26	2.30	348.28	2.76	347.82	2.36	348.22	2.92	347.66	1.18	349.40	--	--	4.34	346.24	1.91	348.67	--	--	2.30	348.28	2.26	348.32	--	--	2.32	348.26
MW11-I	323.56	324.28	--	--	--	--	--	--	0.00	324.28*	0.00	324.28*	0.00	324.28	0.00	324.28*	0.00	324.28*	--	--	0.00	324.28*	0.61	323.67*	--	--	FROZEN*	--	0.00	324.28*	--	--	0.68	323.60*
MW11-II	323.55	324.17	--	--	--	--	--	--	0.00	324.17*	0.00	324.17*	0.00	324.17	0.00	324.17*	0.48	323.70	--	--	0.00	324.17*	0.35	323.82*	--	--	FROZEN*	--	0.00	324.17*	--	--	0.26	323.91*
MW12-I	330.33	331.11	--	--	--	--	1.09	330.02	1.12	329.99	1.44	329.67	1.01	330.10	1.58	329.53	0.85	330.26	--	--	2.35	328.76	1.18	329.93	--	--	1.05	330.06	0.89	330.22	--	--	1.03	330.08
MW12-II	330.20	331.17	--	--	--	--	1.07	330.10	1.15	330.02	1.48	329.69	1.05	330.12	1.63	329.54	0.85	330.32	--	--	2.36	328.81	1.03	330.14	--	--	1.05	330.12	0.85	330.32	--	--	1.07	330.10

Monitoring Well No.	Ground Surface Elevation[3]	Top of Pipe Elevation[3]	Ground Surface Elevation[4]	Top of Pipe Elevation[4]	Ground Surface Elevation[5]	Top of Pipe Elevation[5]	Depth to Groundwater and Elevations																							
							24-May-15		20-Oct-15		26-May-16		13-Oct-16		16-May-17		24-Sep-17		15-May-18		16-Oct-18		7-May-19		29-Oct-19		12-May-20		30-Sep-20	
MW1	--	--	--	--	--	--									--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW2	317.61	318.76	317.62	318.78	317.63	318.83	1.25	317.51	1.03	317.73	1.32	317.44	1.47	317.29	1.24	317.54	--	--	1.25	317.53	1.09	317.69	Frozen	N/A	1.26	317.52	1.42	317.41	1.41	317.42
MW3	317.39	318.49	317.42	318.50	317.40	318.51	1.17	317.32	1.45	317.04	1.14	317.35	1.74	316.75	1.12	317.38	1.08	317.42	1.15	317.35	1.19	317.31	1.19	317.31	1.18	317.32	1.16	317.35	1.78	316.73
MW4-I	339.81	340.25	339.90	340.63	339.84	340.63	2.55	337.70	4.33	335.92	3.99	336.26	4.42	335.83	5.10	335.53	3.90	336.73	3.15	337.48	4.04	336.59	3.03	337.60	3.44	337.19	3.46	337.17	4.31	336.32
MW4-II	339.62	339.92	339.65	340.32	339.63	340.30	2.06	337.86	3.38	336.54	2.77	337.15	3.40	336.52	2.47	337.85	2.63	337.69	2.58	337.74	3.37	336.95	2.32	338.00	2.88	337.44	2.76	337.54	3.71	336.59
MW5	350.89	351.73	350.79	351.64	350.92	351.67	2.80	348.93	7.91	343.82	5.14	346.59	7.66	344.07	2.84	348.80	6.72	344.92	3.97	347.67	8.34	343.30	3.11	348.53	5.77	345.87	3.75	347.92	7.95	343.72
MW6	342.91	343.43	342.95	343.74	342.95	343.74	9.84	333.59	10.45	332.98	10.28	333.15	10.51	332.92	10.34	333.40	10.49	333.25	10.53	333.21	10.66	333.08	10.66	333.08	10.38	333.36	10.06	333.68	10.78	332.96
MW7	337.09	337.55	337.06	337.54	337.08	337.54	5.48	332.07	6.52	331.03	6.77	330.78	6.81	330.74	5.98	331.56	5.65	331.89	6.20	331.34	6.63	330.91	6.62	330.92	5.49	332.05	6.50	331.04	6.51	331.03
MW8-I	334.94	335.64	334.95	335.63	335.02	335.64	5.05	330.59	6.21	329.43	5.45	330.19	6.41	329.23	5.08	330.55	5.38	330.25	5.15	330.48	6.10	329.53	5.00	330.63	5.28	330.35	5.16	330.48	6.68	328.96
MW8-II	334.91	335.59	334.92	335.59	334.95	335.60	4.98	330.61	6.16	329.43	5.41	330.18	6.50	329.09	5.02	330.57	5.33	330.26	5.09	330.50	5.98	329.61	4.94	330.65	5.19	330.4	5.12	330.48	Dry	N/A
MW9	331.31	332.52	331.34	332.68	331.39	332.85	2.21	330.31	3.16	329.36	2.52	330.00	3.40	329.12	2.34	330.34	2.28	330.40	2.45	330.23	3.05	329.63	2.80	329.88	2.55	330.13	2.59	330.26	Dry	N/A
MW10	349.72	350.64	349.68	350.63	349.71	350.65	1.82	348.82	4.25	346.39	2.66	347.98	4.39	346.25	1.93	348.70	1.79	348.84	2.16	348.47	2.77	347.86	1.95	348.68	2.41	348.22	2.31	348.34	4.42	346.23
MW11-I	321.71	322.41	321.68	322.36	321.64	322.40	0.65	321.76*	0.65	321.76*	0.66	321.75*	0.67	321.74*	0.68	321.68*	0.00	322.36*	0.00	322.36*	0.53	321.83*	0.64	321.72*	0.64	321.72*	0.70	321.70*	0.00	322.40*
MW11-II	321.76	322.54	321.65	322.50	321.64	322.52	0.34	322.20*	0.73	321.81*	0.45	322.09*	0.45	322.09*	0.12	322.38*	0.48	322.02*	0.45	322.05*	0.49	322.01*	0.44	322.06*	0.38	322.12*	0.39	322.13*	0.58	321.94*
MW12-I	330.11	331.14	330.14	331.12	330.13	331.06	0.94	330.20	2.07	329.07	1.25	329.89	2.23	328.91	1.51	329.61	0.79	330.33*	0.88	330.24*	1.38	329.74	1.00	330.12	1.03	330.09	1.04	330.02	2.12	328.94
MW12-II	330.06	331.17	330.14	331.20	330.21	331.20	1.02	330.15	2.13	329.04	1.21	329.96	2.31	328.86	1.06	330.14	0.90	330.30*	1.00	330.20*	1.49	329.71	0.90	330.30*	1.17	330.03	Not Recorded	--	2.23	328.97

Notes: 1. Ground surface and top of pipe elevations at MW1 to MW9 and MW10, MW12-I & MW12-II were surveyed by Delta Survey Inc., November 20-23, 2006 and June 30, 2008, respectively.
2. Ground surface and top of pipe elevations at MW11-I and MW11-II were surveyed by EXP field staff September 22, 2009.
3. Ground surface and top of pipe elevations were surveyed by Delta Survey Inc. on June 10, 2015, and data from this survey is used to calculate groundwater elevations for 2015 and 2016.
4. Ground surface and top of pipe elevations were surveyed by Delta Survey Inc. on June 28 and 29, 2017, and data from this survey is used to calculate groundwater elevations for 2017, 2018 and 2019.
5. Ground surface and top of pipe elevations were surveyed by Delta Survey Inc. on Sep 9, 2020, and data from this survey is used to calculate groundwater elevations for 2020.
6. Depths to groundwater measured from top of riser pipe (cap removed).
7. Asterisk (*) indicates artesian conditions. Groundwater levels are above ground surface.

Table 2: Summary of Surface Water Levels and Elevations (m)

Depth to Surface Water and Elevations

SW ID.	Top of Gauge Elevation (2006)[1]	Nov. 21/06		Nov. 8/07		Oct. 21/08		Oct. 28/09		Jun. 11/10		Summer 2010		Fall 2010		May 27/11		Oct. 13/11		Oct. 17/12		Oct. 29/13		Oct. 26/14	
		Gauge Measurement	SW Elevation	Gauge Measurement	SW Elevation	Gauge Measurement	SW Elevation	Gauge Measurement	SW Elevation	Gauge Measurement	SW Elevation	Gauge Measurement	SW Elevation	Gauge Measurement	SW Elevation	Gauge Measurement	SW Elevation	Gauge Measurement	SW Elevation	Gauge Measurement	SW Elevation	Gauge Measurement	SW Elevation	Gauge Measurement	SW Elevation
SW1	N/A[2]	N/A	317.14	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SW2	334.00	0.65	333.35	0.38	333.62	0.52	333.48	0.46	333.54	0.36	333.64	N/A	N/A	0.43	333.57	0.47	333.53	0.49	333.51	N/A	N/A	N/A	N/A	N/A	N/A
SW3	333.01	0.8	332.21	N/A	N/A	1.08	331.93	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Notes: 1. "Top of Gauge" elevations surveyed by Delta Survey Inc., November 20-23, 2006.
2. "N/A" - denotes staff gauge not installed or missing.

Table 2 (continued): Summary of Surface Water Levels and Elevations (m)

Depth to

SW ID.	Top of Gauge Elevation (2015)[3]	May 24/15		Oct. 21/15		May 26/16		Oct. 4/16		May 15/17		Jun. 29/17[4]		Sep. 24/17		May 15, 2018		Oct 29, 2019		May 12,2020		Sep 30, 2020	
		Gauge Measurement	SW Elevation	Gauge Measurement	SW Elevation	Gauge Measurement	SW Elevation	Gauge Measurement	SW Elevation	Gauge Measurement	SW Elevation	Gauge Measurement	SW Elevation	Gauge Measurement	SW Elevation	Gauge Measurement	SW Elevation	Gauge Measurement	SW Elevation	Gauge Measurement	SW Elevation	Gauge Measurement	SW Elevation
SW1	318.02	N/A	N/A	0.21	317.23	0.37	317.39	0.25	317.27	0.5	317.52	N/A	317.24	0.53	317.55	Not Measured	--	0.57	317.59	0.68	317.70	0.21	317.23
SW2	335.01	N/A	N/A	0.27	333.28	0.34	333.35	0.22	333.23	0.35	333.36	N/A	333.09	0.52	333.53	Not Measured	--	0.34	333.35	0.59	333.60	Not Measured	--
SW3	333.00	N/A	N/A	0.23	332.23	N/A	N/A	N/A	N/A	N/A	N/A	N/A	333.48	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Notes: 1. "Top of Gauge" elevations surveyed by Delta Survey Inc., November 20-23, 2006.
2. "N/A" - denotes staff gauge not installed or missing.
3. "Top of Gauge" elevations surveyed by EXP personnel on October 21, 2015. Gauges installed on October 21, 2015 by EXP personnel.
4. Surface water elevations surveyed by Delta Survey Inc., on June 28 & 29, 2017.

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Table 3: Groundwater Data[1]

Parameter	ODWS	2018-2020		MW1								
		Background[3]	B-7[4]	May-97	Aug-06	Nov-06	Nov-07	Jun-08	Aug-08	Oct-08	Oct-09	Jun-10
General												
pH	6.5	7.9			7.9	7.9	7.9	8	No Sample	No Sample	7.7	No Sample
Field pH					7.92	7.83	6.18	8.18			7.47	
Conductivity (uS/cm)		460		5,835	2,910	2,200	2,030	2,420			537	
Field Conductivity					3,158	2,200	2,229	2,407			497	
Field Temperature (^{o}C)					11.9	5.8	5	6.5			6.9	
TDS	500	258	379	**3,793**	**1,660**	**1,430**	**1,100**	**1,580**			361	
TSS							1,800	1,700			800	
Hardness (as $CaCO_3$)	80	**245**	245*	**115.7**	**280**	**500**	**320**	**250**			**300**	
Organics												
DOC	5	3.4	4.21	**49**	**10.1**	**8.4**	**6.3**	**7.7**			2.7	
BOD					<2	<2	<2	<2			<2	
COD		9.7					25	33			4	
Phenols		0.0005		0.005	<0.001		<0.001					
TKN		0.23		1,030	260		200	240			0.9	
Ammonia-N		0.06		990	217	147	210	250			<0.05	
Organic Nitrogen	0.15	**0.19**	0.19*	**40**	**43**		0	0			**0.875**	
Cations (mg/L)												
Calcium		73.67		10.6	42	110	56	34			87	
Magnesium		14.8		21.6	43	54	43	40			19	
Potassium		0.42		12.8	5.8	6	4.7	5.8			0.5	
Sodium	200	1.75	101	5	12	13	7.7	10			2.4	
Anions (mg/L)												
Chloride	250	2.07	126	44.6	19	56	22	20			2	
Nitrate	10	0.15	2.61	**23.2**	**93**	**44**	**34**	**36**			0.5	
Nitrite	1	0.005	0.26	**2.7**	**15**		**7**	**5.2**			<0.01	
Orthophosphate		0.005			<0.01		<0.01					
Phosphate		0.51		<1								
Sulphate	500	0.85	250	6	12	10	9	8			5	
Alkalinity as $CaCO_3$	30	245	373	**3600**	**1130**	**855**	**818**	**997**			288	
Ion Balance (%)		3.73		-0.11	17.5	3.53	4.13	0.17			0.6	
Metals (mg/L) - Dissolved												
Aluminum	0.1	0.0146	0.057	**0.333**	0.009	<0.005	<0.005	0.007			<0.005	
Antimony	0.006	0.00025	0.003	<0.0005	<0.001	<0.001	<0.0005	<0.0005			<0.0005	
Arsenic	0.025	0.0005	0.0066	0.006	<0.001	<0.001	<0.001	<0.001			<0.001	
Barium	1	0.0153	0.26	0.014	0.053	0.077	0.054	0.039			0.024	
Beryllium	1.1	0.00024	0.28	<0.001	<0.0005	<0.0005	<0.0005	<0.0005			<0.0005	
Bismuth		0.0005			<0.001	<0.001	<0.001	<0.001			<0.001	
Boron	5	0.006	1.25	<0.005	<0.01	0.011	<0.01	0.01			<0.01	
Cadmium	0.005	0.00005	0.0013	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001			<0.0001	
Chromium	0.05	0.0025	0.014	0.035	<0.005	<0.005	<0.005	<0.005			<0.005	
Cobalt		0.00025		0.006	0.002	0.0018	0.0011	0.0014			<0.0005	
Copper	1	0.0044	0.5	0.0264	0.006	0.005	0.004	0.012			0.006	
Iron	0.3	0.072	0.19	**0.38**	<0.05	<0.05	<0.1	<0.1			<0.1	
Lead	0.01	0.00025	0.0027	0.001	<0.0005	<0.0005	<0.0005	<0.0005			<0.0005	
Manganese	0.05	0.0216	0.036	0.008	0.012	**0.12**	**0.066**	**0.1**			**0.15**	
Mercury	0.001	0.00005	0.0003		<0.0001		<0.0001					
Molybdenum		0.0003		0.009	0.001	<0.001	<0.001	0.002			<0.0001	
Nickel		0.0005		0.005	0.002	0.003	0.002	0.004			<0.0001	
Phosphorus[7]		0.49		0.16	<0.05	0.065	0.8	<0.1			<0.1	
Selenium	0.01	0.001	0.003	<0.002	<0.002	<0.002	<0.002	<0.002			<0.002	
Silicon		5.13		4.6	4.1	6.4	5.3	4.2			6	
Silver				0.00014	<0.0001	<0.0001	0.0002	<0.0001			<0.0001	
Strontium		0.058		0.0294	0.12	0.2	0.16	0.13			0.068	
Thallium		0.000025			0.00067	0.00078	0.00072	0.0007			<0.00005	
Tin		0.0005		<0.001			<0.001	<0.001			<0.001	
Titanium				0.018	<0.005	<0.005	<0.005	<0.005			<0.005	
Vanadium		0.0005		0.0152	0.001	<0.001	<0.001	<0.001			<0.001	
Zinc	5	0.003	2.5	0.002	<0.005	0.007	0.007	0.007			0.008	
VOCs												
Benzene	0.005				0.0001		<0.0001					
1,4-Dichlorobenzene	0.005				<0.0002		<0.0002					
Dichloromethane	0.05				<0.0005		<0.0005					
Toluene	0.024				0.0003		<0.0002					
Vinyl Chloride	0.02				<0.0002		<0.0002					

THB-00006196-PE - Longlac Landfill

Table 3: Groundwater Data[1]

Parameter	ODWS[2]	2018-2020		MW2																																				
		Background[3]	B-7[4]	May-97	Aug-06	Nov-06	Nov-07	Jun-08	Aug-08	Oct-08	Jun-09	Aug-09	Oct-09	Jun-10	Aug-10	Oct-10	May-11	Aug-11	Oct-11	May-12	Aug-12	Oct-12	May-13	Aug-13	Oct-13	May-14	Aug-14	Oct-14	May-15	Oct-15	May-16	Oct-16	May-17	Sep-17	May-18	Oct-18	May-19	Oct-19	May-20	Sep-20
General																																								
pH	6.5 to 8.5	7.9		7.75	8.0	8.2	8	8.1	8.2	7.9	8	7.9	7.7	8	7.8	7.94	8.03	7.91	8.07	8.04	7.86	7.67	8.03	7.91	7.78	7.87	7.99	7.99	8.05	7.95	8.03	7.96	8.02	MW Not	7.88	7.88	Frozen	8.11	8.08	8.02
Field pH					7.8	8.38		7.91	7.79	7.86	7.53	7.43	7.56	7.42	7.47	7.81	7.39	7.46	7.54	7.65	7.47	7.52	7.87	8.29	7.83	6.96	7.55	7.84	7.65	7.93	7.5	7.76	8.15	Accessible	7.34	3.6	Not Sampled	7.76	6.96	7.18
Conductivity (uS/cm)		460		525.5	397	417	395	389	398	396	398	397	397	391	398	395	395	389	401	410	410	410	400	410	400	390	410	400	400	400	400	410	400	Due To	400	410		420	440	390
Field Conductivity					406	396		367	368	400	341	164	361	432	410	385	394	392	389	357	370	375	359	354	386	357	428	432	415	401	404	408	412	Flooding	405	400		256	371	403
Field Temperature (℃)					8.5	4		6.8	5	1.9	10.3	6.1	3.2	3.6	5.5	3.5	4.7	4.9	5.9	4.6	6.4	5.9	3.6	5.1	4.1	3.5	16.5	5.4	8	4.7	8.1		3.3	In Area	9.9	3.4		1.6	5.3	5.7
TDS	500	258	379	342	240	260	282	248	260	245	265	258	261	260	258	250	230	298	278	252	250	220	270	284	196	264	236	256	282	244	480	230	242		225	275		250	320	220
TSS							2,900	14,000		4,600		2,200	30,000							7,700	17,000		28,000	18,000	14,000	9,700	16,000	6,200	22000	29000	1900										
Hardness (as $CaCO_3$)	80 to 100	**245**	245*	**214.4**	**200**	**210**	**160**	**180**	**200**	**200**	**190**	**200**	**200**	**200**	**190**		**200**	**190**	**190**	**190**	**200**	**200**	**190**	**210**	**200**	**180**	**220**	**190**	**210**	**190**	**200**	**190**	**200**		**200**	**200**		**210**	**200**	**210**
Organics																																								
DOC	5	3.4	4.21	**7**	**5.2**	**5.3**	**5.7**	**7.1**	**7.2**	**5.5**	**6.5**	**7.7**	**6.7**	**8**	**6.8**	**6.5**	**6.5**	**7.2**	**6.3**	**6.5**	**6.3**	**6.3**	**8.5**	**6.0**	**6.3**	**6**	**5.9**	**5.7**	**6.3**	**6.1**	**6.2**	**5.6**	**5.1**		**5.4**	**5.3**		**6.1**	**5.5**	**5.9**
BOD							<2	<2	<2	<2		<2	<2							<2.0	<2.0		<2.0	<2.0	<2.0	<2.0	2	<2	<2	<2.0	<2.0	<2.0								
COD		9.7					66	49	18	25	120	48	110	120	140	110	36	110	66	140	33	140	72	95	83	44	180	59	65	140	81	130	12		13	16		13	<4.0	20
Phenols		0.0005		<0.001	<0.001		<0.001		<0.001			<0.001		<0.001	<0.001	<0.001	<0.001	<0.001	0.002	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010		<0.0010	<0.0010		0.0048	<0.0010	<0.0010
TKN		0.23		0.84	2		1.8	1.5	2.4	1.1	<5	1.5	3	4	5	4	2	6	2	2.7	0.8	3.3	1.9	2.4	4	6.2	14	1.9	1	1	0.76	0.65	1.5		0.61	0.63		0.69	0.66	0.59
Ammonia-N		0.06		0.52	0.46	0.56	0.37	0.44	0.39	0.36	0.46	0.43	0.42	0.48	0.49	0.45	0.41	0.48	0.44	0.56	0.46	0.57	0.5	0.45	0.47	0.45	0.42	0.49	0.56	0.14	0.52	0.58	0.41		0.56	0.6		0.52	0.56	0.46
Organic Nitrogen	0.15	**0.19**	0.19*	**0.32**	**1.54**		**1.43**	**1.06**	**2.01**	**0.74**		**1.07**	**2.58**	**3.52**	**4.51**	**3.55**	**1.59**	**5.52**	**1.56**	**2.14**	**0.34**	**2.73**	**1.4**	**1.9**	**3.53**	**5.7**	**13.6**	**1.4**	**0.48**	**0.86**	**0.23**	<0.10	**1.1**		<0.10	<0.10		**0.18**	<0.10	0.12
Cations (mg/L)																																								
Calcium		73.67		60.7	60	62	47	53	58	58	55	58	58	59	57	56	60	56	57	56	59	60	56	62	58	54	65	56	62	54	57	56	57		59	58		62	58	61
Magnesium		14.8		15.2	13	14	9.8	12	14	13	12	13	13	13	13	13	13	13	13	13	13	13	12	13	13	12	13	12	13	13	13	13	13		14	14		15	13	14
Potassium		0.42		1.6	1.6	1.5	1	1.7	1.4	0.88	0.83	0.85	0.97	0.87	0.83	0.9	0.85	0.8	0.88	0.82	0.81	0.8	0.75	0.8	0.84	0.65	0.81	0.66	0.79	1	0.83	0.82	0.76		0.87	0.96		1.1	0.84	0.82
Sodium	200	1.75	101	21.3	17	15	18	18	13	9.3	8.1	6.7	8.1	8.4	8.2	7.9	9	6.6	7.4	8.4	7.7	6.7	7.2	6.4	5.7	6.5	4.5	5.9	5.8	5.6	4.8	5.3	5.1		5	4.9		5.8	17	7.1
Anions (mg/L)																																								
Chloride	250	2.07	126	3.3	2	2	1	1	1	<1	<1	1	<1	1	2	1	<1	1	<1	<1	<1	1	<1	1	2	1	1	<1	1	1.3	2.3	1.3	1.3		1.2	1.2		1.4	<1.0	2.3
Nitrate	10	0.15	2.61	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	0.17	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	<0.10	<0.10		<0.10	<0.10		<0.10	<0.10	<0.10
Nitrite	1	0.005	0.26	<0.2	0.01		<0.01	0.02	0.01	0.01	<0.01	0.03	0.04	0.01	0.01	0.02	0.08	<0.01	0.03	0.064	<0.01	0.047	<0.01	0.023	0.026	<0.01	<0.01	<0.01	0.012	<0.01	0.018	<0.010	0.012		<0.010	<0.010		<0.010	0.013	0.04
Orthophosphate		0.005			0.02		<0.01		<0.01			<0.01											--	<0.10	<0.01	<0.01	<0.01	0.015	<0.01	<0.01	<0.010	<0.010	<0.010		0.012	<0.010		<0.010	<0.010	<0.010
Phosphate		0.51		<1																			--	--	--				2.8	11					8.4					
Sulphate	500	0.85	250	19.8	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	2	1	<1	<1	<1	1	<1.0	1.4	1	1.2		<1.0	<1.0		<1.0	<1.0	<1.0
Alkalinity as $CaCO_3$	30-500	245	373	254	241	241	220	215	219	220	221	231	218	212	233	226	215	207	219	220	230	230	220	220	250	210	220	230	220	220	220	220	230		230	230		230	250	230
Ion Balance (%)		3.73		2.71	0.287	1.48	5.19	2.53	2.19	0.74	2.65	3.56	0.54	2	4.02	3.26	2.76	0.33	1.42	2.57	1.75	1.18	1.62	1.12	8.4	3.57	2.24	5.37	--	4.16	2.14		4.35		3.97	2.17		0.97	1.75	1.51
Metals (mg/L) - Dissolved																																								
Aluminum	0.1	0.0146	0.057	0.082	0.013	0.008	<0.005	<0.005	<0.005	<0.005	<0.005	0.035	0.007	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.007	<0.005	0.019	0.0051	<0.005	0.006	<0.005	0.0057	0.0057	0.01	<0.005	0.0095	<0.005	<0.005	<0.005		<0.005	<0.005		<0.005	<0.005	0.019
Antimony	0.006	0.00025	0.003	<0.0005		<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.00066	0.001	<0.0005	0.00097	<0.00050	<0.0005	<0.0005	<0.0005	0.00054	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		<0.0005	<0.0005		<0.0005	<0.0005	<0.0005
Arsenic	0.025	0.0005	0.0066	0.004	0.004	0.004	0.001	0.002	0.002	0.002	0.001	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.0015	<0.001	0.0021	0.002	0.0017	0.0012	0.0019	0.0013	0.0012	0.0015	0.0015	0.0017	0.0016	0.0014		0.0017	0.0015		0.0019	0.0019	0.0015
Barium	1	0.0153	0.26	0.052	0.045	0.057	0.028	0.034	0.035	0.029	0.028	0.032	0.031	0.027	0.029	0.03	0.029	0.029	0.028	0.026	0.027	0.026	0.025	0.024	0.027	0.02	0.0029	0.023	0.023	0.026	0.024	0.025	0.025		0.029	0.03		0.026	0.021	0.022
Beryllium	1.1	0.00024	0.28	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		<0.0005	<0.0005		<0.0005	<0.0005	<0.0004
Bismuth		0.0005			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0013	<0.001	<0.001	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001		<0.001	<0.001	<0.001
Boron	5	0.006	1.25	0.015	0.015	0.017	<0.01	0.014	0.023	0.016	0.011	0.018	0.013	0.023	0.015	0.019	0.015	0.014	0.025	0.014	0.012	0.015	0.018	0.022	0.017	0.014	0.0013	0.012	0.02	0.03	0.015	0.018	0.015		0.018	0.027		0.023	0.019	0.019
Cadmium	0.005	0.00005	0.0013	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0007	<0.0001	<0.0001	<0.00010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001		<0.0001	<0.0001	<0.00009
Chromium	0.05	0.0025	0.014	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005		<0.005	<0.005	<0.005
Cobalt		0.00025		0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		<0.0005	<0.0005		<0.0005	<0.0005	<0.0005
Copper	1	0.0044	0.5	0.0015	0.002	<0.001	0.001	0.003	0.001	0.002	0.002	0.003	0.002	0.003	0.002	0.004	<0.001	0.001	0.003	<0.001	0.0014	<0.001	<0.001	0.0012	<0.001	<0.001	0.0013	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001		<0.001	0.0022	<0.0009
Iron	0.3	0.072	0.19	**1.21**	**0.4**	0.066	0.19	**0.79**	**1.5**	**1.3**	0.25	**1.5**	**1**	**0.83**	**0.99**	<0.1	**1.2**	**0.93**	**0.36**	<0.1	<0.1	**0.78**	<0.1	0.25	0.29	**0.41**	<0.1	0.12	**0.54**	0.15	**1.1**	**0.31**	**0.59**		**0.89**	**1.1**		**1.2**	**0.40**	**0.51**
Lead	0.01	0.00025	0.0027	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00050	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		<0.0005	<0.0005		<0.0005	<0.0005	<0.0005
Manganese	0.05	0.0216	0.036	**0.053**	**0.055**	0.045	0.025	0.047	**0.056**	**0.055**	**0.051**	**0.058**	**0.058**	**0.062**	**0.055**	**0.057**	**0.053**	**0.064**	**0.059**	**0.062**	**0.061**	**0.081**	**0.082**	**0.083**	**0.061**	**0.084**	**0.055**	**0.077**	**0.078**	**0.062**	**0.07**	**0.069**	**0.072**		**0.062**	**0.058**		**0.066**	**0.10**	**0.076**
Mercury	0.001	0.00005	0.0003		<0.0001		<0.0001		<0.0001			<0.0001		<0.0001	<0.0001			0.0001			0.00018		--	<0.00010	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.00010	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001		<0.0001	<0.0001	<0.0001
Molybdenum		0.0003		0.026	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005	0.00051	<0.0005	0.0006	<0.00050	<0.0005	<0.0005	<0.0005	0.00054	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		<0.0005	<0.0005		<0.0005	<0.0005	<0.0005
Nickel		0.0005		0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	0.0013	<0.001	<0.001	<0.0010	<0.001	<0.001	0.0042	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001	0.0085		<0.001	<0.001	<0.001
Phosphorus[7]		0.49		<0.05	<0.05	0.052	2	<0.1	<0.1	<0.1	<0.1	1.1	<0.1	<0.1	15	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	2.8	11	1.6	5.1	17		6.2	8.4		0.92	0.61	0.31
Selenium	0.01	0.001	0.003	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002		<0.002	<0.002		<0.002	<0.002	<0.002
Silicon		5.13		7.16	7.8	8.1	6.3	7	7.7	7.5	7.2	7.5	7.9	7.4	7.3	7.2	7.5	7.1	7.3	7.2	7.3	7.6	6.8	7.9	7.3	6.7	7.6	6.8	7.6	7.1	7.3	7.1	7.2		7.6	7.9		8.1	7.9	7.5
Silver				<0.00007	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		<0.0001					
Strontium		0.058		0.182	0.17	0.16	0.13	0.16	0.18	0.16	0.16	0.16	0.16	0.17	0.16	0.17	0.16	0.18	0.18	0.16	0.18	0.21	0.22	0.23	0.18	0.21	0.17	0.21	0.21	0.18	0.19	0.18	0.19		0.18	0.18		0.19	0.21	0.2
Thallium		0.000025			<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.000050	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005		<0.00005	<0.00005		<0.00005	<0.00005	<0.00005
Tin		0.0005		<0.001			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001		<0.001	<0.001	<0.001
Titanium				0.007	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005							
Vanadium		0.0005		0.0019	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.002	<0.001	<0.001	0.001	<0.001	0.001	0.0008	0.0012	0.00089	0.00097	0.00074	0.0013	0.0005	0.00075	0.00052	<0.0005	0.001	0.00058	0.00069	0.00053	0.00053	<0.0005		0.00083	0.00051		0.00055	0.00072	<0.50
Zinc	5	0.003	2.5	<0.002	0.007	0.008	0.006	0.009	0.006	<0.005	0.006	0.014	<0.005	0.011	0.006	0.013	0.009	0.007	0.015	0.0075	0.0089	0.007	<0.005	0.0081	<0.005	<0.005	0.0092	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005		<0.005	<0.005	<0.005
VOCs																																								
Benzene	0.005						<0.0001		<0.0001			<0.0001																													
1,4-Dichlorobenzene	0.005						<0.0002		<0.0002			<0.0002																													
Dichloromethane	0.05						<0.0005		<0.0005			<0.0005																													
Toluene	0.024						<0.0002		<0.0002			<0.0002																													
Vinyl Chloride	0.02						<0.0002		<0.0002			<0.0002																													

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Table 3 (cont'd): Groundwater Data[1]

Parameter	ODWS[2]	2018-2020		MW3																																					
		Background[3]	B-7[4]	May-97	Aug-06	Nov-06	Nov-07	Jun-08	Aug-08	Oct-08	Jun-09	Aug-09	Oct-09	Jun-10	Aug-10	Oct-10	May-11	Aug-11	Oct-11	May-12	Aug-12	Oct-12	May-13	Aug-13	Oct-13	May-14	Aug-14	Oct-14	May-15	Oct-15	May-16	Oct-16	May-17	Sep-17	May-18	Oct-18	May-19	Oct-19	May-20	Sep-20
General																																									
pH	6.5 to 8.5	7.9		7.76	8.0	8.2	8.2	8.1	8.2	8.1	7.9	7.9	7.7	7.8	7.8	7.8	8.03	7.84	8.04	8.04	7.84	7.72	7.87	7.79	7.71	7.91	7.9	7.95	7.97	7.98	7.9	7.81	8.09	7.97	7.89	7.85	8.03	7.95	8.0	8.06
Field pH					7.6	8.2		7.76	7.74	7.75	7.58	7.24	7.43	7.11	7.32	7.28	7.24	7.32	7.39	7.9	7.26	7.36	7.47	8.34	7.65	6.96	7.62	7.71	7.44	7.91	7.48	7.69	7.97	8.05	6.94	7.66	7.56	7.53	7.24	7.18
Conductivity (uS/cm)		460		535.4	504	532	508	466	505	496	474	483	522	503	531	548	466	483	494	480	500	480	470	480	510	460	480	500	460	480	460	470	480	470	470	470	470	460	440	
Field Conductivity					511	524		446	501	516	412	439	471	518	543	525	442	470	478	426	453	437	412	425	435	392	501	526	496	505	454	474	477	463	496	475	445	278	374	439	
Field Temperature (^{0}C)					8.9	4		7.3	6.1	1.8	8.5	7.3	2.4	5.2	5.1	2.7	3.5	5.1	5.1	3.7	6.2	5.4	3.6	5.9	3.9	3.5	10.6	5.4	6.3	3.2	8	4.8	3.3	7.4	11	1.7	6.6	3.4	5.3	6.7	
TDS	500	258	379	348	345	333	331	300	320	305	310	310	346	326	350	342	298	324	294	232	276	244	272	264	228	256	240	268	306	246	312	260	258	205	230	285	270	230	330	270	
TSS							4,100	4,500		2,600		1,500	6,700							16,000	21,000		18,000	9,600	39,000	1,800	9,600	1,700	19000	71000	950											
Hardness (as $CaCO_3$)	80 to 100	**245**	245*	**252.5**	**250**	**290**	**240**	**240**	**260**	**250**	**230**	**250**	**270**	**250**	**260**		**250**	**240**	**250**	**240**	**250**	**240**	**240**	**250**	**260**	**230**	**240**	**230**	**220**	**220**	**220**	**240**	**220**	**230**	**220**	**230**	**240**	**230**	**230**	
Organics																																								
DOC	5	3.4	4.21	2.6	4.3	2.6	2.9	2.1	3	2	1.8	1.8	2.3	3	2.9	3.1	1.7	2.5	2	1.8	2	1.8	4.2	1.9	2.4	2.1	1.4	2.2	1.7	1.8	1.7	1.7	1.5	1.7	1.4	1.5	1.6	1.4	1.5	1.5
BOD							5	<2	<2	<2		<2	<2							<2	<2		<2.0	<2.0	2	3	<2	2	<2.0	<2.0	3										
COD		9.7					86	20	140	39	84	230	200	190	110	70	33	150	85	90	40	100	67	63	310	97	46	50	62	590	42	150	9.5	14	<4.0	8.6	<4.0	4.0	8.6	8.0	
Phenols		0.0005		<0.001	<0.001		<0.001		<0.001			<0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
TKN		0.23		0.94	1.6		3	1.7	5	1.4	3	6	3	5	5	3	2	7	3	2.9	2.9	3.3	2.6	2.5	12	7.2	3.3	2.3	1.1	1.5	0.85	0.9	1.5	1.2	0.9	0.93	0.75	0.87	0.76	0.88	
Ammonia-N		0.06		0.8	0.80	0.9	0.76	0.72	0.8	0.74	0.76	0.85	0.87	0.98	0.91	0.87	0.73	0.87	0.81	0.89	1	0.88	0.9	0.8	0.9	0.89	0.78	0.74	0.7	0.42	0.75	0.84	0.78	0.76	0.91	0.98	0.75	0.82	0.74	0.94	
Organic Nitrogen	0.15	**0.19**	0.19*	0.14	**0.80**		**2.24**	**0.98**	**4.2**	**0.66**	**2.24**	**5.15**	**2.13**	**4.02**	**4.09**	**2.13**	**1.27**	**6.13**	**2.19**	**2.01**	**1.9**	**2.42**	**1.5**	**1.7**	**11.1**	**6.3**	**2.5**	**1.5**	**0.4**	**1.1**	0.1	<0.10	**0.75**	**0.41**	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	
Cations (mg/L)																																								
Calcium		73.67		67.2	65	80	65	64	72	67	62	68	75	71	75	82	68	66	68	63	70	64	65	67	73	61	66	63	63	60	59	59	65	61	62	60	63	63	63	63	
Magnesium		14.8		20.5	20	22	18	19	19	20	18	19	20	18	18	19	19	18	19	19	19	18	19	19	19	18	19	17	18	18	17	17	18	17	18	18	17	19	19	19	
Potassium		0.42		1.6	1.5	1.7	1.5	2.2	1.8	1.2	1.2	1.2	1.2	0.88	1	0.97	1.1	1.1	1.1	1.1	1.2	1.1	1.2	1.2	1.2	1.1	1.1	1	1.2	1.2	1.1	1.1	1.1	1	1.1	1.2	1.1	1.2	1.2	1.2	
Sodium	200	1.75	101	8.8	9.4	11	9.4	12	10	8.3	8.1	9.4	7.9	7.7	7.8	6.6	8.8	8.3	8.7	9	8.5	8.8	8.7	8.4	8.2	8.5	8.6	7.8	8.6	8.3	8	8.3	8.4	8.2	8.4	8.5	8.1	9	8.9	9.2	
Anions (mg/L)																																								
Chloride	250	2.07	126	1.7	2	2	2	2	2	<1	1	<1	1	2	2	3	<1	1	2	<1	1	<1	<1	<1	2	1	<1	<1	<1	1.1	1.3	<1.0	1	1.6	1.4	1.4	1.0	1.5	<1.0	1.3	
Nitrate	10	0.15	2.61	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	
Nitrite	1	0.005	0.26	<0.2	<0.01		<0.01	<0.01	<0.01	<0.01	0.02	<0.01	0.02	<0.01	0.01	<0.01	0.07	0.07	<0.01	0.072	<0.01	<0.01	<0.01	0.035	0.02	<0.01	0.013	0.031	<0.01	<0.01	0.01	<0.010	0.019	0.012	<0.010	<0.010	<0.010	<0.010	0.015	0.015	
Orthophosphate		0.005			<0.01		<0.01		<0.01			<0.01											--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	
Phosphate		0.51		<1																			--	--	--				1.4	43						41						
Sulphate	500	0.85	250	<0.5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Alkalinity as $CaCO_3$	30-500	245	373	291	311	310	284	258	277	281	260	275	287	268	291	301	251	256	270	250	280	260	250	240	290	250	250	270	250	260	240	270	260	270	270	250	250	250	260	260	
Ion Balance (%)		3.73		3.08	7.27	1.67	4.26	2.38	1.93	1.19	1.53	0.28	0.87	1.33	1.07	0.85	4.21	1.22	0.53	0.93	0.05	0.09	3.22	6.18	2.02	0.4	1.95	4.43	--	2.24	0.96		0.49		4.05	1.52	0.23	1.17	0.44	0.24	
Metals (mg/L) - Dissolved																																								
Aluminum	0.1	0.0146	0.057	0.1	0.009	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.013	<0.005	<0.005	<0.005	<0.005	0.011	0.0072	<0.005	<0.005	<0.005	<0.0050	0.0076	0.0061	<0.005	<0.005	<0.005	0.0061	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0049	
Antimony	0.006	0.00025	0.003	<0.0005		<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0011	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00050	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.00084	<0.0005	<0.0005	<0.0005	<0.0005	
Arsenic	0.025	0.0005	0.0066	0.003	0.002	0.003	0.002	0.003	0.003	0.003	0.002	0.003	0.002	0.002	0.003	0.002	0.003	0.003	0.003	0.0015	<0.001	0.0029	0.0037	0.0030	0.0052	0.0038	0.0024	0.0017	0.0027	0.0034	0.0031	0.0027	0.0018	0.0023	0.0017	0.003	0.0034	0.0032	0.0033	0.0031	
Barium	1	0.0153	0.26	0.059	0.067	0.063	0.052	0.053	0.048	0.042	0.04	0.049	0.051	0.049	0.059	0.062	0.043	0.045	0.051	0.047	0.046	0.043	0.052	0.044	0.053	0.048	0.036	0.046	0.044	0.047	0.051	0.042	0.042	0.041	0.039	0.041	0.054	0.043	0.043	0.041	
Beryllium	1.1	0.00024	0.28	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00050	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0004	
Bismuth		0.0005			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Boron	5	0.006	1.25	0.026	0.028	0.031	0.023	0.026	0.028	0.02	0.027	0.029	0.028	0.027	0.029	0.034	0.029	0.028	0.038	0.029	0.029	0.029	0.03	0.033	0.029	0.027	0.027	0.028	0.032	0.023	0.029	0.031	0.029	0.029	0.032	0.032	0.028	0.035	0.028	0.036	
Cadmium	0.005	0.00005	0.0013	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.00012	<0.0001	<0.00010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00009	
Chromium	0.05	0.0025	0.014	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
Cobalt		0.00025		0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0012	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00050	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	
Copper	1	0.0044	0.5	0.0006	0.002	<0.001	<0.001	0.004	0.001	0.002	0.001	0.001	0.001	0.003	0.001	<0.001	0.001	<0.001	0.001	0.0012	0.0011	<0.001	<0.001	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	0.0024	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0014	<0.0009	
Iron	0.3	0.072	0.19	**1.51**	<0.05	**1.6**	**0.89**	**1.2**	**2.2**	**1.8**	**2.2**	**1.7**	**1.4**	**2**	**1.9**	<0.1	**1.9**	**1.2**	**1.2**	<0.1	<0.1	**1.3**	**1**	**0.97**	**1.7**	**1.7**	**0.62**	**0.7**	**1.1**	**0.99**	**1.2**	**0.81**	**0.69**	**1.2**	**0.48**	**1.1**	**1.4**	**1.2**	**1.5**	**1.5**	
Lead	0.01	0.00025	0.0027	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00050	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	
Manganese	0.05	0.0216	0.036	**0.089**	**0.073**	**0.11**	**0.064**	**0.079**	**0.091**	**0.092**	**0.053**	**0.08**	**0.096**	**0.12**	**0.12**	**0.14**	**0.08**	**0.081**	**0.089**	**0.073**	**0.075**	**0.076**	**0.069**	**0.074**	**0.1**	**0.074**	**0.071**	**0.059**	**0.07**	**0.077**	**0.071**	**0.072**	**0.077**	**0.083**	**0.069**	**0.071**	**0.065**	**0.063**	**0.067**	**0.062**	
Mercury	0.001	0.00005	0.0003		<0.0001		<0.0001		<0.0001			<0.0001		<0.0001	<0.0001			<0.0001			<0.0001			0.00012	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Molybdenum		0.0003		<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.014	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	0.0005	<0.0005	0.00059	<0.0005	<0.0005	<0.00050	<0.0005	0.00051	<0.0005	0.00061	0.00064	0.00066	0.00052	<0.0005	<0.0005	0.00051	<0.0005	0.00062	<0.0005	<0.0005	0.00055	<0.0005	
Nickel		0.0005		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Phosphorus[5]		0.49		<0.05	<0.050	0.055	0.9	<0.1	0.12	<0.1	<0.1	4.1	<0.1	<0.1	4		0.1	0.11	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	1.4	43	0.96	4.1	6.8	2.4	3.9	41	0.65	0.29	0.33	0.33	
Selenium	0.01	0.001	0.003	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	
Silicon		5.13		8.56	8.7	9.5	7.9	8.3	9	8.7	7.4	9.3	8.4	9	8.3	7.9	8.7	8.4	8.8	8.5	8.5	8.7	8.7	8.8	8.4	8.1	8.2	7.9	8.3	8.3	7.7	8	8.6	8.4	8.4	8.6	8.1	8.8	8.9	8.6	
Silver		0.00007		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		<0.0001								
Strontium		0.058		0.298	0.28	0.31	0.28	0.29	0.31	0.3	0.28	0.32	0.31	0.27	0.28	0.29	0.28	0.28	0.31	0.28	0.29	0.29	0.28	0.30	0.29	0.27	0.28	0.28	0.28	0.28	0.27	0.27	0.28	0.26	0.27	0.29	0.27	0.28	0.27	0.27	
Thallium		0.000025			<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.000050	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	
Tin		0.0005		<0.001			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Titanium				0.008	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005											
Vanadium		0.0005		0.0014	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	0.0007	<0.0005	0.00074	<0.0005	<0.0005	<0.00050	<0.0005	<0.0005	<0.0005	<0.0005	0.00074	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	
Zinc	5	0.003	2.5	<0.002	<0.005	0.007	0.009	0.013	0.009	0.007	0.008	<0.005	0.008	0.011	0.014	<0.005	<0.005	0.006	0.007	0.0065	0.0052	0.0071	<0.005	0.0074	0.0054	<0.005	0.0082	<0.005	<0.005	<0.005	<0.005	<0.005	0.0072	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
VOCs																																								
Benzene	0.005						<0.0001		<0.0001			<0.0001																														
1,4-Dichlorobenzene	0.005						<0.0002		<0.0002			<0.0002																														
Dichloromethane	0.05						<0.0005		<0.0005			<0.0005																														
Toluene	0.024						<0.0002		<0.0002			<0.0002																														
Vinyl Chloride	0.02						<0.0002		<0.0002			<0.0002																														

THB-00006196-PE - Longlac Landfill

Table 3 (cont'd): Groundwater Data[1]

Parameter	ODWS[2]	2018-2020		MW4-I																																
		Background[3]	B-7[4]	May-97	Aug-06	Nov-06	Nov-07	Jun-08	Aug-08	Oct-08	Jun-09	Aug-09	Oct-09	Jun-10	Oct-10	May-11	Oct-11	May-12	Oct-12	May-13	Oct-13	May-14	Oct-14	May-15	Oct-15	May-16	Oct-16	May-17	Sep-17	May-18	Oct-18	May-19	Oct-19	May-20	Sep-20
General																																				
pH	6.5 to 8.5	7.9		8.11	8.4	8.3	8.3	8.3	8.4	8.2	8.1	8	No	8.1	8.09	8.2	8.03	8.21	8.04	8.11	7.93	8.11	8.13	8.22	8.07	8.2	8.03	8.13	8.09	8.17	8.01	8.2	8.18	8.13	8.14
Field pH					8.66	8.45	6.31	7.93	8.38		7.55	7.61	Sample	7.65	7.75	7.48	7.71	7.7	7.52	7.53	7.75	7.29	7.71	7.59	7.98	7.79	7.78	8.06	7.53	7.38	4.9	7.84	8.28	8.12	7.44
Conductivity (uS/cm)		460		379.2	833	694	757	594	1,120	557	566	560		561	562	976	802	730	590	600	570	730	980	940	950	790	770	770	680	640	650	630	620	610	620
Field Conductivity					876	644	771	590	1,074		537	523		585	530	898	745	602	542	512	500	596	792	981	840	794	776	742	656	734	591	581	368	351	595
Field Temperature (^{O}C)					11.4	5.2	4.7	9	10.1		10.3	9.6		7.8	6.2	6.6	7.9	9.2	7.4	8.4	4.9	6.8	7.6	10.2	5.7	8.1	9.7	11.8	14.4	7.1	5.6	4.2	4.9	5.8	7.6
TDS	500	258	379	246	**502**	450	462	382	**680**	345	370	365		360	362	**596**	464	340	334	332	272	424	400	**624**	488	470	430	428	325	360	365	345	335	355	325
TSS							270	880		47		220						410		170	130	210	110	140	250	180										
Hardness (as $CaCO_3$)	80 to 100	**245**	245*	**294.3**	**280**	**290**	**290**	**280**	**390**	**270**	**270**	**260**		**290**		**410**	**360**	**320**	**290**	**290**	**290**	**320**	**430**	**460**	**430**	**390**	**360**	**350**	**330**	**320**	**310**	**310**	**320**	**320**	**310**
Organics																																				
DOC	5	3.4	4.21	3.8	**9.8**	**6.5**	4.6	3.1	**7.4**	2.6	2.9	2.7		3.1	2.4	**5.2**	4.3	3.9	2.7	4.6	2.2	3.4	**5.7**	**5.5**	4.7	4.5	4.1	**14**	3.7	2.8	3.1	2.5	2.5	2.2	2.4
BOD							<2	2	<2	<2		<2						<2		<2	<2	<2	<2	<2.0	<2.0	<2.0									
COD		9.7					13	32	19	39	7	21		9	12	25	23	35	8.4	14	10	9	18	20	13	12	12	63	25	5.9	7.6	<4.0	5	<4.0	6.7
Phenols		0.0005		0.001	<0.001		<0.01		<0.001			<0.001		<0.001	<0.001	<0.001	0.004	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
TKN		0.23		0.75	1		0.7	0.6	0.6	1.1	0.5	0.7		0.9	0.9	0.5	0.6	0.9	0.48	0.57	0.35	0.4	0.43	0.33	0.34	0.13	0.32	0.96	0.42	<0.10	0.24	0.16	0.35	0.15	0.19
Ammonia-N		0.06		0.51	0.46	0.61	0.19	<0.05	0.05	0.15	0.48	0.44		0.37	0.41	<0.05	0.11	<0.05	0.37	0.4	<0.05	<0.05	0.096	<0.050	0.053	<0.050	0.16	0.1	0.32	<0.050	0.14	0.084	0.084	<0.050	0.11
Organic Nitrogen	0.15	**0.19**	0.19*	**0.24**	**0.54**		**0.51**	**0.6**	**0.55**	**0.95**	0.02	**0.26**		**0.53**	**0.49**	**0.5**	**0.49**	**0.875**	0.11	**0.17**	**0.325**	**0.4**	**0.3**	**0.33**	**0.28**	0.13	0.15	**0.86**	0.1	<0.10	0.11	<0.10	**0.26**	0.15	<0.10
Cations (mg/L)																																				
Calcium		73.67		72.5	57	65	70	67	81	62	64	64		68	67	74	73	71	68	70	67	65	78	78	74	76	72	74	71	73	73	77	75	77	75
Magnesium		14.8		27.4	34	32	29	29	45	27	27	25		29	29	54	42	35	29	29	29	38	58	65	59	48	43	39	37	34	32	30	31	30	30
Potassium		0.42		4.8	99	39	50	16	130	8.7	6.5	5.5		5.8	5.3	49	21	12	6.1	5.8	6.3	29	28	30	28	13	14	18	16	11	97	7.3	6.8	6.6	6.4
Sodium	200	1.75	101	14.4	49	31	30	21	42	13	13	12		14	13	39	25	21	14	13	14	28	25	28	26	21	20	19	17	15	13	12	12	12	12
Anions (mg/L)																																				
Chloride	250	2.07	126	6.4	6	4	3	2	4	1	1	1		1	1	46	29	22	5	4	3	4	6	7	7.5	5.5	5.1	5.7	3.5	3	2.8	2.2	1.8	1.1	2.2
Nitrate	10	0.15	2.61	<0.1	0.4	0.2	0.4	<0.1	0.6	0.3	<0.1	0.1		<0.1	<0.1	0.8	0.5	0.31	<0.1	<0.1	0.2	0.23	0.48	0.4	<0.1	0.13	0.12	<0.10	<0.10	0.36	0.1	0.26	0.15	0.19	0.11
Nitrite	1	0.005	0.26	<0.2	0.01		0.04	0.03	<0.01	<0.01	0.04	0.02		0.03	0.01	<0.01	<0.01	<0.01	0.048	<0.01	<0.01	<0.01	<0.01	0.015	<0.01	<0.010	0.023	<0.010	0.013	<0.010	0.022	<0.010	0.024	<0.010	0.02
Orthophosphate		0.005			0.25		<0.01		<0.01			<0.01									0.013	<0.01	0.14	0.081	0.049	0.035	0.028	0.022	0.016	0.019	0.024	0.012	0.014	0.013	<0.01
Phosphate		0.51		<1																	--	--	--	0.18	0.35						0.11				
Sulphate	500	0.85	250	2.5	22	13	10	2	12	2	<1	<1		<1	<1	13	8	6	<1	<1	<1	<1	9	10	7.9	5.6	4.8	5	2.3	1.9	1.4	<1.0	1.4	1.4	1.2
Alkalinity as $CaCO_3$	30-500	245	373	314	475	391	408	330	**597**	315	315	320		308	313	429	378	360	320	320	320	400	**550**	**520**	**510**	430	430	420	380	370	360	340	340	340	340
Ion Balance (%)		3.73		-1.17	1.12	0.412	0.01	2.25	2.16	1.88	0.42	3.71		3.11	0.88	4.1	1.04	1.56	0.63	2.05	0.08	1.45	4.29		0.61	1.15		2.45		1.72	0.91	0.35	1.19	0.98	0.33
Metals (mg/L) - Dissolved																																				
Aluminum	0.1	0.0146	0.057	**0.462**	0.005	<0.005	<0.005	0.01	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0073	<0.005	0.0055	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0052	<0.005	0.0067
Antimony	0.006	0.00025	0.003	<0.0005		<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Arsenic	0.025	0.0005	0.0066	<0.002	0.003	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0014	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Barium	1	0.0153	0.26	0.082	0.076	0.12	0.094	0.075	0.14	0.071	0.071	0.066		0.063	0.06	0.075	0.087	0.076	0.071	0.073	0.064	0.064	0.088	0.09	0.093	0.097	0.093	0.079	0.085	0.072	0.08	0.065	0.064	0.065	0.06
Beryllium	1.1	0.00024	0.28	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0004
Bismuth		0.0005			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	5	0.006	1.25	0.052	0.19	0.11	0.09	0.068	0.29	0.051	0.056	0.083		0.058	0.054	0.18	0.14	0.088	0.059	0.059	0.063	0.16	0.25	0.33	0.28	0.21	0.17	0.15	0.12	0.097	0.081	0.066	0.063	0.054	0.056
Cadmium	0.005	0.00005	0.0013	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00009
Chromium	0.05	0.0025	0.014	0.006	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Cobalt		0.00025		0.0009	0.0018	0.0007	<0.0005	<0.0005	0.0007	<0.0005	<0.0005	<0.0005		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.00064	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper	1	0.0044	0.5	0.0017	0.001	0.002	0.001	0.007	0.006	0.003	0.001	0.002		<0.001	<0.001	0.002	0.002	0.0012	<0.001	<0.001	<0.001	0.0011	0.0018	0.0018	0.0024	0.0019	<0.001	0.0026	<0.001	<0.001	<0.001	0.0029	<0.001	<0.001	0.0018
Iron	0.3	0.072	0.19	**0.68**	0.24	<0.05	<0.1	<0.1	<0.1	<0.1	**2.2**	**2.3**		**1.3**	<0.1	<0.1	<0.1	<0.1	0.25	<0.1	<0.1	<1	<0.1	<0.1	**1.3**	<0.1	0.13	<0.1	**0.93**	<0.1	**0.66**	<0.1	<0.1	<0.1	<0.1
Lead	0.01	0.00025	0.0027	0.0011	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Manganese	0.05	0.0216	0.036	**0.141**	0.032	0.026	0.038	0.006	0.016	0.046	**0.053**	**0.051**		0.049	**0.056**	<0.002	0.035	0.0079	**0.076**	**0.068**	0.014	<0.002	0.0068	<0.002	**0.092**	0.0048	0.048	0.033	**0.16**	<0.002	**0.11**	<0.002	**0.052**	<0.002	**0.054**
Mercury	0.001	0.00005	0.0003		<0.0001		<0.0001		<0.0001			<0.0001		<0.0001							<0.0001	<0.0001	<0.0001	<0.00010	<0.00010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum		0.0003		0.005	0.058	0.051	0.03	0.024	0.017	0.017	0.014	0.015		0.017	0.016	0.013	0.014	0.011	0.0094	0.0093	0.0092	0.0077	0.0068	0.0071	0.0068	0.0067	0.0065	0.0066	0.0045	0.0046	0.0036	0.0029	0.0023	0.0024	0.0023
Nickel		0.0005		0.002	0.001	0.002	<0.001	<0.001	0.001	<0.001	<0.001	<0.001		0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0012	<0.001	<0.001	<0.001	0.0017	<0.001	0.0014	<0.001	<0.001	<0.001	<0.001	<0.001
Phosphorus[7]		0.49		0.08	0.33	0.079	0.13	<0.1	<0.1	<0.1	<0.1	0.16		<0.1	<0.1	0.17	0.12	<0.1	<0.1	0.12	<0.1	<0.1	0.17	0.18	0.35	0.092	0.11	1.6	0.26	0.13	0.11	0.071	0.039	0.04	0.026
Selenium	0.01	0.001	0.003	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002		<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Silicon		5.13		9.18	7.1	7.3	6.9	7.3	6.6	7	7.4	6.8		7.8	7.6	6.7	6.9	7	7.2	7.4	7.4	6.8	5.9	5.8	6.1	6.5	6.3	6.8	7.3	7.4	7.9	7.9	8.2	8.8	8
Silver				<0.0007	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001							
Strontium		0.058		0.387	0.36	0.44	0.44	0.48	0.5	0.46	0.46	0.43		0.46	0.44	0.42	0.49	0.45	0.48	0.51	0.48	0.43	0.48	0.45	0.46	0.53	0.5	0.45	0.47	0.47	0.49	0.47	0.48	0.49	0.47
Thallium		0.000025			<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005		<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Tin		0.0005		<0.001			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Titanium				0.028	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005									
Vanadium		0.0005		0.0032	0.002	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001	0.0007	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.00078	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Zinc	5	0.003	2.5	0.003	0.007	0.005	<0.005	0.009	0.007	0.008	0.007	<0.005		0.01	<0.005	<0.005	0.009	<0.005	0.0089	<0.005	<0.005	<0.005	0.0058	<0.005	0.0077	<0.005	<0.005	0.0075	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
VOCs																																				
Benzene	0.005						<0.0001		<0.0001			<0.0001																								
1,4-Dichlorobenzene	0.005						<0.0002		<0.0002			<0.0002																								
Dichloromethane	0.05						<0.0005		<0.0005			<0.0005																								
Toluene	0.024						<0.0002		0.0006			<0.0002																								
Vinyl Chloride	0.02						<0.0002		<0.0002			<0.0002																								

THB-00006196-PE - Longlac Landfill

Table 3 (cont'd): Groundwater Data[1]

Parameter	ODWS[2]	2018-2020		MW4-II																																	
		Background[3]	B-7[4]	May-97	Aug-06	Nov-06	Nov-07	Nov-07**	Jun-08	Aug-08	Oct-08	Jun-09	Aug-09	Oct-09	Jun-10	Oct-10	May-11	Oct-11	May-12	Oct-12	May-13	Oct-13	May-14	Oct-14	May-15	Oct-15	May-16	Oct-16	May-17	Sep-17	May-18	Oct-18	May-19	Oct-19	May-20	Sep-20
General																																					
pH	6.5 to 8.5	7.9		7.34	7.8	8.0	8.0	7.9	7.9	8.0	7.7	7.8	7.8	No	8.0	8.0	8.05	7.97	8.18	7.72	7.96	7.9	8.1	8.14	8.12	8.01	8.03	7.81	8.22	7.97	7.96	7.8	7.99	8.14	8.06	8.0
Field pH					7.11	7.5	6.1		7.26	7.36	7.11	7.18	6.98	Sample	7.3	7.4	7.3	7.38	7.56	7.20	7.42	7.38	7.13	7.83	7.25	7.64	7.7	7.5	7.79	7.36	6.91	4.67	7.96	7.54	7.24	7.17
Conductivity (uS/cm)		460		883.7	2,090	2,310	2,050	2,090	2,500	2,550	2,610	2,780	2,730		2,610	2,540	2,400	2,310	2,400	2,800	2,400	2,500	2,000	2,200	2,200	2300	1900	2,000	1,700	1,600	1,600	2,000	1,600	1,200	1,300	2,200
Field Conductivity					2,189	2,176	1,939		2,426	2,371	2,575	2,422	2,358		2,567	2,287	2,123	1,995	2,055	2,178	448	1,717	1,516	2,252	2349	2262	1830	1,854	1,533	1,323	1,170	1,791	1,097	538	778	1,963
Field Temperature (^{O}C)					12.4	8.8	8.1		7.1	10.9	6.8	10.1	9.4		6.3	8.1	6.3	8.8	7.1	8.7	7.2	6.3	4.5	8.2	10.6	6.6	7	11.5	10.3	13.1	7.2	5.7	2.8	3.7	4.8	8.9
TDS	500	258	379	**574**	**1,160**	**1,530**	**908**	**874**	**1,550**	**1,730**	**1,650**	**1,750**	**1,730**		**1,660**	**1,590**	**1,440**	**1,660**	**1,530**	**1,910**	**1,530**	**1,560**	**1,740**	**1,460**	**1820**	**1430**	**1340**	**1,200**	**1,180**	**860**	**850**	**1,160**	**930**	**590**	**680**	**1,250**
TSS							5,900	5,700	3,700		4,600		4,300						3,400		7,300	9,500	9,400	15,000	11000	3100	5200										
Hardness (as $CaCO_3$)	80 to 100	**245**	245*	**374.9**	**760**	**730**	**660**	**660**	**840**	**800**	**810**	**660**	**690**		**430**		**340**	**310**	**270**	**430**	**260**	**260**	**290**	**260**	**410**	**440**	**370**	**510**	**420**	**410**	**440**	**560**	**490**	**390**	**540**	**980**
Organics																																					
DOC	5	3.4	4.21	**5.3**	**16.7**	**25.5**	**12.9**	**12.8**	**15.6**	**14.5**	**12.1**	**20.3**	**21**		**21**	**18.8**	**13.8**	**12.8**	**10**	**15**	**9.6**	**9.6**	**7.7**	**9.5**	**8.9**	**12**	**8.1**	**11**	**8**	**7.7**	**6.9**	**9.5**	**7.3**	4.7	4.8	**15**
BOD							<2	<2	<2	<2	<2		<2						3		<2	<2	2	<2	<2.0	<2.0	2									
COD		9.7					36	37	39	45	61	53	61		70	60	47	60	37	57	34	26	20	40	21	29	24	42	28	25	9.9	28	10	13	18	34
Phenols		0.0005		<0.001	<0.001		<0.001	<0.001		<0.001			<0.001		<0.001	<0.001	<0.001	0.004	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
TKN		0.23		0.48	2.7		2.2	2	2.2	2.9	2.1	4.6	4		9	2.8	6	13	1.8	8.6	1.5	2.9	3.7	2.6	1.2	7.5	0.88	4.7	2.8	3.8	1.8	4.3	3.1	1.7	1.4	5.6
Ammonia-N		0.06		0.08	0.81	2.32	0.22	0.2	0.26	0.8	0.39	2.3	0.98		2.2	2.8	2.2	1.6	0.73	7.8	0.6	0.92	0.16	0.55	0.68	6.5	0.071	4.3	1.2	1.9	1.7	3.5	2	0.49	0.62	5.4
Organic Nitrogen	0.15	**0.19**	0.19*	**0.4**	**1.89**		**1.98**	**1.98**	**1.94**	**2.1**	**1.71**	**2.3**	**3.02**		**6.8**	0	**3.8**	**11.4**	**1.07**	**0.8**	**0.9**	**1.98**	**3.5**	**2.1**	**0.54**	**1**	**0.8**	**0.36**	**1.5**	**1.9**	<0.10	**0.79**	**1.1**	**1.2**	**0.78**	**0.28**
Cations (mg/L)																																					
Calcium		73.67		110.0	230	220	200	200	250	240	240	190	210		120	94	95	86	73	100	67	74	59	63	80	88	60	87	60	57	54	96	61	42	88	140
Magnesium		14.8		24.1	45	43	40	41	53	49	50	44	41		33	26	24	23	20	42	23	20	35	25	52	53	52	71	66	65	73	77	82	68	78	150
Potassium		0.42		2.9	19	57	79	80	140	180	170	370	330		420	470	520	560	560	530	500	570	400	460	470	380	350	320	210	230	190	300	170	160	160	210
Sodium	200	1.75	101	28.7	**240**	**260**	**210**	**220**	**240**	**240**	**230**	200	**210**		170	140	120	99	73	87	80	80	82	85	94	79	58	53	36	33	21	42	19	15	11	41
Anions (mg/L)																																					
Chloride	250	2.07	126	13.1	52	48	30	30	31	33	28	28	31		24	22	15	16	140	120	110	110	48	47	44	64	32	31	20	16	15	19	11	5.4	9.8	47
Nitrate	10	0.15	2.61	0.6	5.9	6.8	4.9	5	<0.1	8.3	8.7	4.9	4.3		4.9	4.2	6.5	7	3.4	3.3	4.2	4.8	4.33	4.75	3.78	2.94	2.84	2.75	3.32	4.03	3.81	2.72	1.83	1.61	1.96	0.92
Nitrite	1	0.005	0.26	<0.2	0.02		<0.01	<0.01	<0.01	0.02	0.01	0.01	0.05		0.03	0.08	**1.6**	0.28	0.038	**1.4**	0.15	0.21	0.102	0.07	0.226	**2.29**	0.026	**1.59**	0.201	0.506	0.581	**1.18**	**1.18**	0.257	0.176	**2.6**
Orthophosphate		0.005			<0.01		<0.01	<0.01		<0.01			<0.01									<0.01	<0.01	0.01	<0.01	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Phosphate		0.51		<1																		--	--		0.26	1.3						9.2				
Sulphate	500	0.85	250	11.8	81	108	142	145	147	146	131	88	85		8	<1	<1	2	37	21	22	80	4	6	12	2.8	38	6.5	38	30	29	<1.0	<1.0	5.7	17	<1.0
Alkalinity as $CaCO_3$	30-500	245	373	446	**1150**	**1210**	**997**	**1020**	**1220**	**1270**	**1360**	**1400**	**1410**		**1250**	**1220**	**1110**	**1090**	**880**	**1100**	**930**	**1000**	**900**	**980**	**1000**	**1100**	**910**	**980**	**810**	**780**	**840**	**1000**	**830**	**610**	**680**	**1200**
Ion Balance (%)		3.73		3.88	0.856	1.93	0.44	0.08	4.59	1.6	0.93	1.24	0.78		1.67	0.24	4.06	4.76	1.18	0.17	1.79	˜0	0.1	0.99		2.09	3.5		6.77		10.3	0.43	5.98	0.27	3.27	4.23
Metals (mg/L) - Dissolved																																					
Aluminum	0.1	0.0146	0.057	0.022	0.009	0.005	0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005	<0.005	0.007	<0.005	<0.005	<0.005	<0.005	0.0054	<0.005	<0.005	0.014	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0056	**0.38**	**0.18**
Antimony	0.006	0.00025	0.003	<0.0005		<0.001	<0.005	<0.005	<0.0005	<0.0005	<0.0005	<00005	<0.0005		0.0007	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Arsenic	0.025	0.0005	0.0066	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Barium	1	0.0153	0.26	0.036	0.11	0.18	0.15	0.15	0.25	0.25	0.24	0.39	0.41		0.29	0.28	0.27	0.29	0.25	0.33	0.23	0.27	0.19	0.23	0.25	0.22	0.18	0.19	0.12	0.12	0.094	0.2	0.095	0.068	0.079	0.15
Beryllium	1.1	0.00024	0.28	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0004
Bismuth		0.0005			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	5	0.006	1.25	0.091	0.29	0.26	0.28	0.29	0.3	0.34	0.34	0.42	0.46		0.56	0.69	0.75	0.84	0.88	0.77	0.84	0.94	0.87	0.92	1	0.77	1.1	0.88	0.78	0.92	0.79	1	0.75	0.91	0.7	1.1
Cadmium	0.005	0.00005	0.0013	<0.0001	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00009
Chromium	0.05	0.0025	0.014	0.007	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Cobalt		0.00025		0.0023	0.0047	0.0045	0.0064	0.0065	0.0069	0.0065	0.0053	0.0049	0.0054		0.0031	0.0038	0.0018	0.0021	0.0013	0.0063	0.0014	0.0013	0.0009	0.0011	0.0014	0.004	0.0012	0.0037	0.00088	0.0019	0.00055	0.0029	0.00074	0.00059	0.002	0.0076
Copper	1	0.0044	0.5	0.0022	0.01	0.013	0.008	0.007	0.015	0.015	0.01	0.015	0.017		0.015	0.014	0.01	0.011	0.0067	0.011	0.0064	0.0067	0.0048	0.0057	0.0056	0.0082	0.0049	0.0078	0.0061	0.0055	0.0037	0.0065	0.0054	0.0038	0.0048	0.0093
Iron	0.3	0.072	0.19	<0.06	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.17	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	**0.63**	0.28
Lead	0.01	0.00025	0.0027	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0012	0.00063
Manganese	0.05	0.0216	0.036	**0.252**	0.012	**0.068**	0.007	0.007	0.011	**0.093**	0.012	0.012	**0.15**		**0.076**	**0.13**	0.032	**0.065**	<0.002	**0.66**	0.026	0.022	0.0039	0.023	0.016	**0.53**	0.02	**0.52**	0.041	**0.18**	0.017	**0.42**	0.039	0.011	**0.098**	**0.96**
Mercury	0.001	0.00005	0.0003		<0.0001		<0.0001	<0.001		0.0004			<0.0001		0.0003							<0.0001	<0.0001	<0.0001	<0.00010	<0.00010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum		0.0003		0.005	<0.001	0.003	<0.001	<0.001	<0.001	0.003	0.002	0.14	0.002		0.004	0.004	0.002	0.0018	0.0014	0.0031	0.0025	0.0011	0.0022	0.0014	0.0018	0.0024	0.0017	0.0024	0.004	0.0042	0.0037	0.0018	0.0037	0.0044	0.0021	0.0029
Nickel		0.0005		0.009	<0.005	0.011	<0.001	<0.001	0.002	0.008	0.004	0.004	0.007		0.009	0.012	0.005	0.006	0.0011	0.013	0.0016	0.002	<0.001	0.0023	0.0031	0.0091	0.0014	0.0093	0.0034	0.0049	0.0017	0.0062	0.0022	0.0012	0.0017	0.013
Phosphorus[7]		0.49		<0.05	<0.05	0.058	2.2	1.9	<0.1	<0.1	<0.1	0.012	2.9		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.26	1.3	1.5	2.7	25	9.7	14	9.2	16	46	36	2
Selenium	0.01	0.001	0.003	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002		<0.002	<0.002	<0.002	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Silicon		5.13		5.45	8	7.4	7.1	7.1	6.6	7	7.1	5.5	5.8		4.5	4.5	4.4	4.8	3.8	4.8	4	3.7	3.6	3.8	4.1	4.6	4.1	5	4.2	4.3	3.5	5.3	3.5	3.5	3.7	6.3
Silver				<0.00007	<0.0001	<0.0001	0.0016	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		<0.0001							
Strontium		0.058		0.126	0.23	0.22	0.28	0.27	0.36	0.31	0.31	0.3	0.31		0.21	0.19	0.18	0.17	0.17	0.25	0.17	0.16	0.16	0.15	0.18	0.2	0.15	0.19	0.17	0.14	0.13	0.21	0.15	0.093	0.12	0.24
Thallium		0.000025			<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.00006	<0.00005	0.00006	0.00009		0.00012	0.00016	0.00012	0.0002	0.00019	0.0004	0.00015	0.00026	0.000074	0.0002	0.00015	0.00032	0.00008	0.00026	<0.00005	0.00016	0.000073	0.00019	<0.00005	0.000068	<0.00005	0.00029
Tin		0.0005		<0.001			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Titanium				<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005								
Vanadium		0.0005		0.002	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		0.001	<0.001	0.001	0.0008	0.00053	<0.0005	0.00056	0.00083	<0.0005	0.0011	0.00052	0.00056	<0.0005	0.00064	<0.0005	0.00058	<0.0005	0.00067	<0.0005	<0.0005	0.0015	0.0014
Zinc	5	0.003	2.5	<0.002	0.012	0.009	<0.005	0.008	0.015	0.009	0.007	0.006	0.006		0.01	0.006	0.007	0.006	<0.005	0.0052	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
VOCs																																					
Benzene	0.005						<0.0001	<0.0001		<0.0001			<0.0001																								
1,4-Dichlorobenzene	0.005						<0.0002	<0.0002		<0.0002			<0.0002																								
Dichloromethane	0.05						<0.0005	<0.0005		<0.0005			<0.0005																								
Toluene	0.024						<0.0002	<0.0002		<0.0002			<0.0002																								
Vinyl Chloride	0.02						<0.0002	<0.0002		<0.0002			<0.0002																								

THB-00006196-PE - Longlac Landfill

Table 3 (cont'd): Groundwater Data[1]

Parameter	ODWS[2]	2018-2020 Background[3]	2018-2020 B-7[4]	MW5 May-97	MW5 Aug-06	MW5 Nov-06	MW5 Nov-07	MW5 Jun-08	MW5 Aug-08	MW5 Oct-08	MW5 Jun-09	MW5 Aug-09	MW5 Oct-09	MW5 Jun-10	MW5 Oct-10	MW5 May-11	MW5 Oct-11	MW5 May-12	MW5 Oct-12	MW5 May-13	MW5 Oct-13	MW5 May-14	MW5 Oct-14	MW5 May-15	MW5 Oct-15	MW5 May-16	MW5 Oct-16	MW5 May-17	MW5 Sep-17	MW5 May-18	MW5 Oct-18	MW5 May-19	MW5 Oct-19	MW5 May-20	MW5 Sep-20
General																																			
pH	6.5 to 8.5	7.9		7.86	No Sample	8.1	8.2	8.2	8.2	8.1	8	8	No Sample	8.1	7.99	8.07	8.04	8.09	7.9	8.02	7.81	7.99	8.02	8.1	8	8.03	7.89	8.09	7.99	8.06	7.93	8.09	8.02	8.03	7.98
Field pH						8.25	6.2	7.9	7.83	7.73	7.54	7.57		7.45	7.41	7.35	7.47	7.56	7.42	7.42	7.34	7.17	7.69	7.41	7.82	7.88	7.64	7.72	7.49	7.12	4.66	7.64	7.55	7.46	7.31
Conductivity (uS/cm)		460		565.6		538	476	455	481	507	490	510		497	601	495	620	510	600	520	540	490	530	480	570	500	610	460	570	490	600	500	540	490	560
Field Conductivity						586	508	469	465	522	458	467		505	576	500	591	492	547	448	456	413	566	515	591	509	602	502	549	600	562	473	320	336	554
Field Temperature (^{O}C)						5.8	5.1	7.5	9	5.1		9.8		6	5.7	6.1	6.8	6.9	7.1	7.2	5.5	5.3	8.7	12.3	5.6	8.2	10	8.1	9.6	8.1	3.9	7.1	4.4	4.3	6.5
TDS	500	258	379	368		362	328	300	300	310	318	337		322	380	314	388	248	366	308	250	274	288	328	310	--	340	256	255	220	335	320	270	285	280
TSS							980	1,900		1,000		1,000						51,000	3,400	16,000	6,700	6,700	1,000	6400	2400	2900	--	--	--							
Hardness (as $CaCO_3$)	80 to 100	**245**	245*	**268.9**		**320**	**260**	**270**	**250**	**280**	**260**	**270**		**270**		**310**	**350**	**270**	**340**	**280**	**290**	**270**	**270**	**260**	**300**	**270**	**320**	**270**	**300**	**260**	**310**	**280**	**300**	**270**	**310**
Organics																																			
DOC	5	3.4	4.21	4.6		2.4	1.4	1.4	2.4	1.2	1.5	1.7		1.5	1.3	1.1	1.3	1.1	1.5	4.4	1.1	2.8	1.4	1	1.4	1.1	1.5	0.95	1.2	0.96	1.3	1	0.91	1	1.2
BOD							<2	<2	<2	<2		<2						<2	<2	<2	<2	<2.0	<2	<2.0	<2.0	<2.0	--	--	--						
COD		9.7					<4	<4	<4	<4	6	7		26	10	18	18	67	7.6	32	5.1	34	<4	9.3	7.8	8.8	<4.0	4.9	<4.0	<4.0	<4.0	<4.0	<4.0	4.6	4.3
Phenols		0.0005		0.003			<0.001		<0.001			<0.001		<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
TKN		0.23		1.15			0.7	0.7	3	0.6	1.3	1		2	1.4	2	2	3.4	0.83	1.6	3.2	<5.0	0.47	0.92	0.67	<0.10	0.34	0.6	0.27	0.1	0.85	<0.10	0.37	0.11	0.22
Ammonia-N		0.06		0.42		0.15	0.08	0.09	0.11	<0.05	0.08	<0.05		0.11	0.05	0.14	<0.05	0.05	0.17	0.09	0.071	0.057	0.13	<0.050	0.05	<0.050	0.05	0.068	<0.050	0.1	0.16	0.099	0.1	<0.050	0.066
Organic Nitrogen	0.15	**0.19**	0.19*	**0.73**			**0.62**	**0.61**	**2.89**	**0.6**	**1.22**	**1**		**1.89**	**1.35**	**1.86**	**2**	**3.35**	**0.66**	**1.51**	**3.13**	<0.1	**0.3**	**0.92**	**0.62**	<0.10	**0.29**	**0.53**	**0.27**	<0.10	**0.69**	<0.10	**0.27**	0.11	**0.16**
Cations (mg/L)																																			
Calcium		73.67		71.9		92	75	76	74	79	76	76		78	98	90	100	78	97	81	82	76	78	76	84	77	90	78	85	74	90	82	86	77	88
Magnesium		14.8		21.7		23	18	19	17	19	18	19		18	23	21	24	19	23	19	20	19	18	18	21	18	23	19	21	18	22	18	21	18	22
Potassium		0.42		3.8		3.3	1	1.9	1.4	1.2	1.2	0.8		0.92	1	1.2	1	1.2	1	1	0.88	1	0.76	0.86	1.1	0.99	1.1	0.96	0.95	0.89	1	0.9	0.93	0.86	0.96
Sodium	200	1.75	101	6.8		9.1	2.5	5.7	3.7	4.6	2.7	2.6		2.9	3.1	2.8	3.1	2.7	3.2	2.8	2.6	2.7	2.5	2.5	2.8	2.7	2.9	2.7	2.6	2.6	2.9	2.6	3.2	2.6	2.8
Anions (mg/L)																																			
Chloride	250	2.07	126	8.1		2	1	1	1	<1	1	1		1	1	<1	1	<1	<1	1	<1	1	<1	<1	1.3	1.7	1.4	<1.0	1.7	1.4	1.7	<1.0	1.8	1.0	1.6
Nitrate	10	0.15	2.61	1.3		4.8	0.2	0.1	0.2	0.8	0.2	0.5		0.3	2.6	0.3	4.5	0.27	4.4	0.61	0.42	0.15	0.32	0.11	2.25	0.32	2.77	0.25	1.7	0.13	2.32	0.24	0.36	0.15	1.37
Nitrite	1	0.005	0.26	<0.2			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	0.029	<0.01	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Orthophosphate		0.005					<0.01		<0.01			<0.01									<0.01	<0.010	0.011	<0.01	<0.01	<0.010	<0.010	0.011	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Phosphate		0.51		<1																	--	--		2.5	1	--	--	--	--		1.6				
Sulphate	500	0.85	250	8.1		6	2	2	2	3	2	3		2	4	2	4	2	4	3	2	2	2	2	3.1	1.8	3.2	1.7	2.9	1.8	4.8	1.6	1.9	1.6	2.0
Alkalinity as $CaCO_3$	30-500	245	373	272		287	263	256	262	282	269	290		266	320	262	321	270	320	270	300	270	290	260	290	240	330	240	320	280	320	270	290	280	300
Ion Balance (%)		3.73		0.32		5.15	0.17	3.97	0.38	0.02	0.39	4.3		1.47	1.65	10.5	2.36	0.36	1.28	2.14	~0	0.45	2.81		0.75	5.49	--	6.38	--	2.99	2.63	2.29	1.66	1.12	0.41
Metals (mg/L) - Dissolved																																			
Aluminum	0.1	0.0146	0.057	**0.202**		<0.005	<0.005	0.007	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005	**1**	<0.005	<0.005	<0.005	<0.005	0.0055	<0.005	<0.005	<0.005	0.0074	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.054
Antimony	0.006	0.00025	0.003	<0.0005		<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		<0.0005	<0.0005	0.0007	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Arsenic	0.025	0.0005	0.0066	<0.002		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Barium	1	0.0153	0.26	0.034		0.034	0.022	0.022	0.021	0.023	0.021	0.021		0.022	0.026	0.031	0.03	0.023	0.029	0.023	0.023	0.021	0.023	0.02	0.024	0.024	0.027	0.023	0.025	0.021	0.028	0.022	0.023	0.021	0.026
Beryllium	1.1	0.00024	0.28	<0.001		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0004
Bismuth		0.0005				<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	5	0.006	1.25	0.022		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		<0.01	<0.01	0.013	0.011	<0.01	<0.01	0.01	0.01	0.011	0.01	<0.01	0.013	0.013	<0.01	0.012	0.014	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Cadmium	0.005	0.00005	0.0013	<0.0001		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00009
Chromium	0.05	0.0025	0.014	<0.005		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Cobalt		0.00025		0.0007		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		<0.0005	<0.0005	0.0007	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper	1	0.0044	0.5	0.0014		0.003	0.001	0.006	0.004	0.002	0.003	0.002		0.003	<0.001	0.003	0.002	0.001	0.0013	<0.001	0.0029	<0.001	<0.001	<0.001	0.0015	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0028	<0.001	<0.001	<0.0009
Iron	0.3	0.072	0.19	0.19		<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	<0.1	**1**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lead	0.01	0.00025	0.0027	<0.0005		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		<0.0005	<0.0005	0.0007	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Manganese	0.05	0.0216	0.036	**0.097**		0.042	<0.002	<0.002	0.014	<0.002	<0.002	<0.002		<0.002	<0.001	0.027	<0.002	<0.002	<0.002	<0.002	0.0024	0.0022	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.0022
Mercury	0.001	0.00005	0.0003				<0.001		<0.0001			<0.0001		<0.0001						--	<0.0001	<0.0001	<0.0001	<0.00010	<0.00010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum		0.0003		0.025		0.005	0.002	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005	0.00065	<0.0005	<0.0005	<0.0005	0.00064	<0.0005	0.00051	<0.0005	0.00061	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Nickel		0.0005		0.005		0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Phosphorus[7]		0.49		<0.05		<0.050	0.9	<0.1	<0.1	<0.1	<0.1	0.7		<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	2.5	1	0.26	0.78	1.2	0.32	1.5	1.6	0.47	0.39	0.7	0.1
Selenium	0.01	0.001	0.003	<0.002		<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002		<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Silicon		5.13		6.22		6.2	5.9	6.1	6.1	6.1	6	5.9		6.1	6.7	8.5	6.7	6.2	6.7	6.1	6.1	6	5.7	6	5.9	6	6.3	6.3	6.4	6	6.4	6.1	6.6	6.5	6.5
Silver				<0.00007		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	--	<0.0001	--						
Strontium		0.058		0.0909		0.098	0.067	0.08	0.069	0.082	0.069	0.075		0.07	0.085	0.077	0.1	0.074	0.095	0.078	0.077	0.072	0.078	0.068	0.082	0.076	0.09	0.074	0.087	0.069	0.088	0.074	0.074	0.069	0.082
Thallium		0.000025				<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005		<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Tin		0.0005		<0.001			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Titanium				0.009		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005	0.05	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	--	--	--						
Vanadium		0.0005		0.0019		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.002		<0.001	<0.001	0.003	0.0013	0.00085	0.00091	0.00086	0.00088	<0.0005	0.0011	0.00064	0.0007	0.00076	0.00083	0.00077	0.00072	0.0006	0.00072	0.00074	0.00073	0.00074	0.001
Zinc	5	0.003	2.5	<0.002		0.02	<0.005	0.11	0.006	0.007	0.008	0.016		0.007	0.007	0.009	0.005	0.006	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.006	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
VOCs																																			
Benzene	0.005						<0.0001		<0.0001			<0.0001																							
1,4-Dichlorobenzene	0.005						<0.0002		<0.0002			<0.0002																							
Dichloromethane	0.05						<0.0005		<0.0005			<0.0005																							
Toluene	0.024						<0.0002		<0.0002			<0.0002																							
Vinyl Chloride	0.02						<0.0002		<0.0002			<0.0002																							

THB-00006196-PE - Longlac Landfill

Table 3 (cont'd): Groundwater Data[1]

Parameter	ODWS[2]	2018-2020		MW6																																		
		Background[3]	B-7[4]	May-97	Aug-06	Aug-06**	Nov-06	Nov-06**	Nov-07	Jun-08	Jun-08**	Aug-08	Oct-08	Jun-09	Aug-09	Oct-09	Jun-10	Aug-10	Oct-10	May-11	Aug-11	Aug-11*	Oct-11	May-12	Aug-12	Aug-12*	Oct-12	May-13	Aug-13	Aug-13*	Oct-13	Oct-13**	May-14	May-14*	Aug-14	Oct-14	Oct-14*	May-15
General																																						
pH	6.5 to 8.5	7.9		7.68	8.1	8	8	8	8.1	8.1	8.1	8.1	8	8	8	7.8	7.9	7.7	7.83	7.92	7.86	7.84	7.92	7.92	7.81	7.8	7.69	7.79	7.63	7.63	7.69	7.68	7.76	7.87	7.73	7.87	7.88	7.86
Field pH					7.82		8.16		6.17	7.7	7.7	7.92	7.92	7.69	7.76	7.56	7.34	7.2	7.28	7.16	7.26	--	7.2	7.39	6.7	--	7.04	7.06	7.68	--	7.12	--	6.82	--	7.38	7.42	--	7.07
Conductivity (uS/cm)		460		1,145	1,190	1,210	1,670	1,700	1,690	1,560	1,580	1,810	1,580	1,480	1,460	1,180	1,640	2,150	2,310	2,080	1,240	1,240	1,090	1,900	1,200	1,200	2,100	1,800	1,700	1,500	1,100	1,100	1,800	1,700	1,700	1,300	1,300	1,700
Field Conductivity					1,284		1,208		1,200	1,453	1,453	1,904	1,664	1,220	1,309	1,070	1,657	1,886	2,119	1,951	1,040	--	1,003	1,813	1,076	--	1,716	1,456	1,068	--	857	--	1,415	--	1,707	1,194	--	1518
Field Temperature (^{O}C)					9.2		5.1		4.9	9.6	9.6	8.8	5.3	14.5	9.8	5.4	6.7	7.5	5.8	7.3	7.3	--	7.2	7.3	10.6	--	7	8.3	8.5	--	5.9	--	6.6	--	15.6	9.8	--	13.7
TDS	500	258	379	**745**	**675**	**600**	**1,020**	**1,080**	**669**	**1,000**	**1,030**	**1,100**	**1,000**	**1020**	**938**	**756**	**1,040**	**1,400**	**1,410**	**1,330**	**880**	**878**	**540**	396	474	474	478	**520**	462	480	392	402	450	450	**530**	462	452	436
TSS									34,000	17,000	16,000		7,800		17,000	1,300								310	3,400	3,500	1,000	6,900	4,000	2,700	2,500	3,800	15,000	25,000	2,500	3,300	3,200	1900
Hardness (as $CaCO_3$)	80 to 100	**245**	245*	**203.2**	**280**	**290**	**290**	**290**	**300**	**290**	**250**	**200**	**210**	**190**	**170**	**370**	**380**	**340**		**380**	**410**	**410**	**470**	**380**	**340**	**340**	**410**	**410**	**410**	**380**	**420**	**410**	**400**	**410**	**460**	**390**	**410**	**330**
Organics																																						
DOC	5	3.4	4.21	**12**	**6.4**	**6.4**	**9.1**	**9.9**	4.6	**5.9**	**5.7**	**5.4**	**5.7**	5	4.2	4.7	**7.7**	**11.4**	**20.1**	**7.2**	**5.3**	**5.4**	5	**7.2**	**5.6**	**5.5**	**9.4**	**9.2**	**5.8**	**5.8**	3.9	3.9	**6.6**	**6.6**	**9.5**	4.5	4.8	4.8
BOD									<2	9	12	4	<2		<2	<2								<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2.0
COD		9.7							110	630	440	460	130	750	280	270	74	35	100	48	43	40	33	31	43	43	36	65	17	26	31	28	110	47	36	56	68	99
Phenols		0.0005		0.001	<0.001	<0.001			<0.001			<0.001			0.011		<0.001	<0.001	0.009	<0.001	<0.001	<0.001	0.003	<0.001	<0.001	<0.001	<0.001	0.0015	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
TKN		0.23		96	92	83			93	230	200	210	150	110	150	65	130	220	210	180	65	68	31	160	53	53	170	120	110	110	47	45	160	150	91	72	70	130
Ammonia-N		0.06		116	90	90.8	225	229	99.2	190	180	190	150	130	160	70	140	210	200	190	71	71	37	180	57	60	180	130	120	120	45	45	160	160	100	83	84	130
Organic Nitrogen	0.15	**0.19**	0.19*	0	**2**	0			0	**40**	**20**	**20**	0	~0	~0	~0	~0	**10**	**10**	~0	~0	~0	~0	~0	<0.1	<0.1	<0.1	~0	~0	~0	**2**	~0	~0	~0	~0	~0	~0	**1.2**
Cations (mg/L)																																						
Calcium		73.67		43.2	69	69	70	71	74	71	62	42	47	42	38	97	92	77	99	92	110	110	130	98	89	90	110	110	110	99	110	110	100	110	130	110	110	86
Magnesium		14.8		23.1	27	28	29	28	28	28	24	23	22	21	18	31	37	35	34	37	33	33	36	34	28	29	33	33	34	32	33	32	35	36	34	31	33	28
Potassium		0.42		12.3	7.5	7.9	7	7	4.1	4.8	4.9	6.8	5.9	6.3	6	5.8	6.7	6.6	8.2	7.4	5.3	5.4	5.7	6.4	4.3	4.4	8.1	5.5	5.7	5.4	4.9	4.9	6.4	6.6	7.1	4.6	4.8	5.6
Sodium	200	1.75	101	11.8	9.7	10	9.5	9.3	7.9	7.3	9	9.9	8.7	9.1	7.7	9.2	11	12	23	15	12	12	13	13	9.5	9.6	20	20	15	14	11	11	16	17	27	11	11	14
Anions (mg/L)																																						
Chloride	250	2.07	126	13.3	8	8	12	12	13	13	12	14	11	13	8	13	23	31	60	43	22	22	20	37	25	25	34	46	32	27	18	17	31	30	44	22	22	29
Nitrate	10	0.15	2.61	7.9	2.4	2.5	7.3	7.4	0.8	<0.1	1.7	0.2	<0.1	0.4	0.1	0.1	0.3	<0.1	<0.1	0.3	<0.1	<0.1	<0.1	0.22	<0.1	<0.1	2.3	0.46	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.7	<0.1	<0.1	<0.1
Nitrite	1	0.005	0.26	1	0.03	0.03			0.02	0.22	0.2	0.21	0.01	0.04	0.05	0.08	0.02	0.01	0.02	0.42	<0.01	<0.01	0.01	0.15	<0.01	<0.01	0.12	<0.01	0.013	0.019	0.025	0.025	<0.01	<0.01	0.075	<0.01	<0.01	0.052
Orthophosphate		0.005			0.02	0.02			<0.01			<0.001			<0.01													--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Phosphate		0.51		<1																								--	--	--	--	--					1.5
Sulphate	500	0.85	250	9.6	4	4	6	6	24	21	22	24	17	9	0.011	5	8	<1	<1	12	6	6	6	11	7	7	13	10	12	10	7	7	18	15	18	9	9	10
Alkalinity as $CaCO_3$	30-500	245	373	**620**	**666**	**672**	**863**	**870**	**828**	**747**	**746**	**840**	**765**	**707**	**720**	**601**	**787**	**1010**	**1060**	**946**	**604**	**609**	**562**	**870**	**610**	**610**	**970**	**830**	**730**	**650**	**580**	**580**	**880**	**830**	**770**	**650**	**650**	**790**
Ion Balance (%)		3.73		-0.76	4.19	3.84	10.5	10.8	12.7	11.2	7.52	2.06	2	4.18	0.93	1.89	4.59	2.57	0.14	4.07	3.87	3.26	2.88	6.3	6.63	5.77	3.55	0.85	5.57	9.67	¯0	¯0	3.84	6.86	2.33	2.28	3.22	
Metals (mg/L) - Dissolved																																						
Aluminum	0.1	0.0146	0.057	**1.06**	0.011	0.012	<0.005	0.006	<0.005	<0.005	<0.005	0.01	0.005	0.007	0.018	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.017	0.012	<0.005	<0.005	<0.005	<0.005
Antimony	0.006	0.00025	0.003	<0.0005			<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0007	<0.0005	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Arsenic	0.025	0.0005	0.0066	<0.002	0.002	0.002	0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.007	0.006	0.001	0.002	0.002	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Barium	1	0.0153	0.26	0.192	0.13	0.13	0.13	0.13	0.063	0.072	0.068	0.087	0.093	0.095	0.087	0.12	0.14	0.17	0.15	0.16	0.12	0.12	0.16	0.13	0.082	0.081	0.16	0.11	0.11	0.11	0.089	0.088	0.16	0.16	0.21	0.1	0.1	0.11
Beryllium	1.1	0.00024	0.28	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bismuth		0.0005			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	5	0.006	1.25	0.027	0.022	0.024	0.021	0.021	0.019	0.024	0.014	0.022	0.022	0.024	0.021	0.023	0.026	0.035	0.064	0.04	0.026	0.031	0.032	0.031	0.024	0.025	0.061	0.047	0.046	0.042	0.025	0.025	0.047	0.046	0.085	0.028	0.033	0.041
Cadmium	0.005	0.00005	0.0013	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	0.05	0.0025	0.014	0.008	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Cobalt		0.00025		0.0018	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0017	0.0018	0.0008	<0.0005	<0.0005	<0.0005	0.00053	<0.0005	<0.0005	0.0013	0.0013	0.0013	0.0013	0.00069	0.00067	0.00082	0.00089	0.0011	0.00063	0.00068	0.00061
Copper	1	0.0044	0.5	0.0025	0.001	0.001	0.001	0.001	0.002	0.002	0.008	0.006	0.004	0.003	0.004	0.002	0.004	<0.001	<0.001	0.003	<0.001	<0.001	<0.001	0.0015	<0.001	<0.001	0.0031	0.0026	0.0025	0.0024	<0.001	<0.001	0.0024	0.0023	0.003	<0.001	0.0022	0.0017
Iron	0.3	0.072	0.19	**1.47**	<0.05	<0.05	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	**1.1**	<0.1	0.11	**0.36**	**0.34**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lead	0.01	0.00025	0.0027	0.0012	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Manganese	0.05	0.0216	0.036	**0.148**	0.029	0.029	0.017	0.018	**0.13**	**0.1**	**0.091**	**0.064**	**0.065**	**0.051**	0.047	**0.08**	**0.12**	**0.12**	**0.13**	**0.13**	**0.11**	**0.1**	**0.087**	**0.12**	**0.13**	**0.13**	**0.2**	**0.24**	**0.33**	**0.31**	**0.2**	**0.2**	**0.26**	**0.27**	**0.23**	**0.21**	**0.22**	**0.23**
Mercury	0.001	0.00005	0.0003		<0.0001	<0.0001			<0.0001			<0.0001			<0.0001		<0.0001	<0.0001			<0.0001	<0.0001			<0.0001	<0.0001		--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010
Molybdenum		0.0003		0.012	0.002	0.003	0.003	0.003	0.003	0.005	0.005	0.014	0.01	0.007	0.01	0.002	0.003	0.002	0.002	0.002	0.0009	0.0008	0.0006	0.0011	0.001	0.00082	0.0011	<0.0005	0.0014	0.0014	0.00093	0.00087	0.0012	0.0012	0.00058	0.00065	0.00065	0.00074
Nickel		0.0005		0.003	<0.001	<0.001	0.002	0.002	<0.001	<0.001	<0.001	0.001	<0.001	0.001	0.001	0.002	0.002	0.004	0.004	0.003	0.002	0.002	<0.001	0.0019	0.0013	0.0015	0.0042	0.0035	0.0039	0.0032	0.0016	0.0015	0.0023	0.0024	0.0048	0.0014	0.0021	0.0021
Phosphorus[7]		0.49		<0.05	<0.05	0.056	<0.050	<0.050	3.6	<0.1	<0.1	<0.1	<0.1	<0.1	15	<0.1	<0.1	0.3	<0.1	<0.1	0.11	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.67	0.89	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	1.5
Selenium	0.01	0.001	0.003	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Silicon		5.13		8.15	5.8	5.9	6.5	6.6	5.7	5.1	4.8	2.7	2.9	8.5	2.1	6.3	4.9	7.2	7.5	6.6	7.3	7.2	7.9	5.8	5.7	5.8	6	6.9	5.5	5.1	6.2	6.1	4.7	4.7	6.5	5.6	5.7	3.3
Silver				<0.00007	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.00056	0.00043	<0.0001	<0.0001	<0.0001	<0.0001	0.00016	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Strontium		0.058		0.288	0.26	0.26	0.25	0.25	0.27	0.26	0.25	0.18	0.21	0.2	0.17	0.33	0.3	0.24	0.26	0.25	0.32	0.32	0.4	0.27	0.26	0.25	0.24	0.26	0.24	0.23	0.31	0.3	0.24	0.24	0.3	0.29	0.29	0.18
Thallium		0.000025			<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.0005	<0.00005	0.07	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.000005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Tin		0.0005		<0.001					<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Titanium				0.051	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.001	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Vanadium		0.0005		0.0046	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0006	0.0006	0.0006	<0.0005	0.001	0.00095	0.00088	0.00075	0.00067	0.00061	0.00073	0.00062	0.00052	0.00063	0.00067	0.00072	0.00077	0.00052
Zinc	5	0.003	2.5	0.005	0.006	0.012	<0.005	0.006	0.005	0.006	0.009	0.01	0.008	0.008	0.007	0.011	0.009	<0.005	0.006	0.015	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.005	<0.005	<0.005	<0.005	0.0089	<0.005	0.0059	<0.005	0.0083	<0.005
VOCs																																						
Benzene	0.005								<0.0001			<0.0001			<0.0001			0.0003			0.0001				0.00015										0.00057			--
1,4-Dichlorobenzene	0.005								<0.0002			<0.0002			<0.0002			<0.0002			<0.0002				<0.0002										<0.0002			--
Dichloromethane	0.05								<0.0005			<0.0005			<0.0005			<0.0005			<0.0005				<0.0005										<0.0005			--
Toluene	0.024								<0.0002			<0.0002			<0.0002			<0.0002			<0.0002				<0.0002										<0.0002			--
Vinyl Chloride	0.02								<0.0002			<0.0002			<0.0002			<0.0002			<0.0002				<0.0002										<0.0002			--

THB-00006196-PE - Longlac Landfill

Table 3 (cont'd): Groundwater Data[1]

Parameter	ODWS[2]	2018-2020		MW6 (continued)																	
		Background[3]	B-7[4]	May-15	May-15*	Oct-15	May-16	May-16*	Oct-16	Oct-16*	May-17	May-17*	Sep-17	Sept-17*	May-18	Oct-18	May-19	Oct-19	Oct-19*	May-20	May-20*	Sep-20
General																						
pH	6.5 to 8.5	7.9		7.86	7.89	7.72	7.8	7.86	7.62	7.64	7.59	7.75	7.77	7.77	7.75	7.8	7.89	7.85	7.84	7.9	7.93	7.88
Field pH				7.07	--	7.58	7.27		7.26	--	7.28	--	7.48	--	6.27	7.56	7.0	7.16	--	7.21	--	6.9
Conductivity (uS/cm)		460		1,700	1,500	1,500	1,400	1,300	1,700	1,700	1,800	1,600	1,300	1,300	1,200	1,200	920	1,100	1,100	1,100	1,100	1,100
Field Conductivity				1518	1518	1513	1546		1636	--	1562	--	1202	--	1104	1168	734	547	--	524	--	1196
Field Temperature (^{O}C)				13.7	--	5.1	8.6		9.6	--	8.7	--	10.4	--	8.7	3.8	6.4	6.4	--	4.8	--	7.5
TDS	500	258	379	436	382	408	**790**	**502**	**508**	**880**	**558**	**562**	450	435	390	470	485	445	460	405	385	425
TSS				1900	6400	140	2000	940														
Hardness (as $CaCO_3$)	80 to 100	**245**	245*	**330**	**330**	**380**	**410**	**410**	**470**	**460**	**450**	**480**	**430**	**430**	**360**	**370**	**320**	**350**	**350**	**240**	**240**	**480**
Organics																						
DOC	5	3.4	4.21	4.8	**5.4**	**5.3**	**5.4**	**5.3**	**5.7**	**5.8**	4.5	4.9	3.9	3.9	3.9	4.6	3.4	4.9	4.5	3.4	3.3	3.3
BOD				<2.0	<2.0	<2.0	<2.0	<2.0														
COD		9.7		99	65	16	89	96	52	21	13	15	12	15	12	12	<4.0	11	7.8	4.9	11	8.7
Phenols		0.0005		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
TKN		0.23		130	140	100	80	89	110	110	100	100	44	45	61 (1)	61	17 (1)	48 (1)	47 (1)	27	35	56
Ammonia-N		0.06		130	130	96	82	98	110	110	100	100	46	47	68 (1)	59	19 (1)	50 (1)	50 (1)	25	36	60
Organic Nitrogen	0.15	**0.19**	0.19*	**1.2**	**8.6**	**5.9**	<0.1	<0.1	<0.1	<0.1	**1.0**	<0.10	<0.10	<0.10	<0.10	**2.6**	<0.10	<0.10	<0.10	**2.4**	<0.10	<0.10
Cations (mg/L)																						
Calcium		73.67		86	86	100	110	110	130	130	120	130	120	120	97	100	110	97	98	78	78	140
Magnesium		14.8		28	28	30	33	32	36	36	34	37	33	33	28	28	13	26	26	11	11	31
Potassium		0.42		5.6	5.6	5	5.2	5	5.3	5.3	4.6	4.8	5	5	4.4	4.3	1.2	4	3.7	1.3	1.3	4.1
Sodium	200	1.75	101	14	14	14	15	15	17	17	16	17	14	14	12	12	22	23	23	34	33	16
Anions (mg/L)																						
Chloride	250	2.07	126	29	28	26	30	28	44	43	60	48	28	28	22	24	20	20	21	24	24	20
Nitrate	10	0.15	2.61	<0.1	4.7	2.12	0.7	0.6	1.75	1.72	0.38	0.16	0.56	0.63	0.14	1.77	0.29	<0.10	<0.10	0.62	0.51	3.63
Nitrite	1	0.005	0.26	0.052	<0.01	0.11	0.136	0.114	0.076	0.059	0.165	0.11	0.069	0.056	0.129	0.299	0.12	0.061	0.015	0.171	0.105	0.088
Orthophosphate		0.005		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.010	<0.010	<0.010	<0.010	0.01	<0.010	<0.010	0.041	<0.010	<0.010	<0.010	<0.010
Phosphate		0.51		1.5	1.5	0.48										0.16						
Sulphate	500	0.85	250	10	9	10	11	9.7	13	13	15	15	13	12	8.2	8.8	23	8.7	8.7	26	25	10
Alkalinity as $CaCO_3$	30-500	245	373	**790**	**740**	**710**	**670**	**690**	**810**	**800**	**780**	**740**	**670**	**670**	**630**	**630**	430	**540**	**550**	**520**	**530**	**550**
Ion Balance (%)		3.73				0.86	1.01	3.58			1.81	3.76			2.89	5.35	4.43	0.17	0.44	17.7	14.7	10.5
Metals (mg/L) - Dissolved																						
Aluminum	0.1	0.0146	0.057	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	**0.14**	<0.005	<0.005	0.0064	0.013	0.048	0.015	**1.7**
Antimony	0.006	0.00025	0.003	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0021	<0.0005	<0.0005	0.0015	0.0013	<0.0005
Arsenic	0.025	0.0005	0.0066	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Barium	1	0.0153	0.26	0.11	0.11	0.13	0.12	0.11	0.12	0.12	0.11	0.12	0.12	0.12	0.094	0.095	0.044	0.076	0.078	0.043	0.041	0.14
Beryllium	1.1	0.00024	0.28	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0004
Bismuth		0.0005		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	5	0.006	1.25	0.041	0.044	0.037	0.046	0.046	0.051	0.052	0.04	0.044	0.043	0.038	0.033	0.037	0.019	0.048	0.034	0.015	0.0015	0.031
Cadmium	0.005	0.00005	0.0013	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00009
Chromium	0.05	0.0025	0.014	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Cobalt		0.00025		0.00061	0.00058	0.00051	0.0014	0.0014	0.0023	0.0022	0.0018	0.0017	0.001	0.001	0.00067	0.00073	<0.0005	0.0006	0.00063	<0.0005	<0.0005	0.0028
Copper	1	0.0044	0.5	0.0017	0.0016	0.002	0.0019	0.0019	0.0024	0.0023	0.0037	0.0021	0.0017	0.0016	0.0012	0.0017	0.0055	0.0017	0.0019	0.0033	0.0033	0.0074
Iron	0.3	0.072	0.19	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	**2.6**
Lead	0.01	0.00025	0.0027	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.003
Manganese	0.05	0.0216	0.036	**0.23**	**0.23**	**0.2**	**0.37**	**0.36**	**0.45**	**0.45**	**0.44**	**0.45**	**0.26**	**0.26**	**0.22**	**0.25**	**0.12**	**0.23**	**0.24**	**0.099**	**0.09**	**0.46**
Mercury	0.001	0.00005	0.0003	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum		0.0003		0.00074	0.00072	0.00065	0.0008	0.00064	0.00063	0.00055	0.00078	0.00074	0.00062	0.00064	0.00067	0.00066	0.0008	0.00089	0.00088	0.0015	0.0014	<0.0005
Nickel		0.0005		0.0021	0.0021	0.0025	0.0032	0.0032	0.0047	0.0042	0.0037	0.0038	0.0026	0.0026	0.0026	0.0023	0.0016	0.0019	0.0018	0.0018	0.0017	0.006
Phosphorus[7]		0.49		1.5	1.5	0.48	3.5	1.6	1.5	0.62	0.91	0.8	0.27	0.27	0.89	0.16	0.52	1.5	1.5	0.57	3.2	0.19
Selenium	0.01	0.001	0.003	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Silicon		5.13		3.3	3.2	5.9	5.9	5.6	6.9	6.8	5.7	6.1	6.6	6.6	5.1	5.6	2.7	4.5	4.5	2.5	2.5	9.3
Silver				<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	--	--								
Strontium		0.058		0.18	0.18	0.24	0.25	0.24	0.22	0.22	0.21	0.22	0.28	0.29	0.22	0.23	0.13	0.2	0.2	0.11	0.11	0.22
Thallium		0.000025		<0.00005	<0.00005	<0.00005	0.000056	<0.00005	0.00021	<0.00018	0.00011	0.000097	0.000053	0.000057	<0.00005	0.000059	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.000093
Tin		0.0005		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Titanium				<0.005	<0.005	<0.005	<0.005	<0.005	--	--	--	--	--	--								
Vanadium		0.0005		0.00052	0.00053	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0048
Zinc	5	0.003	2.5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0064	<0.005	<0.005	<0.005	<0.005	0.0084
VOCs																						
Benzene	0.005			--	--	0.00035	--	--	0.00025	0.00025			0.0002	<0.0001		0.00024		0.00013	0.00012			<0.0001
1,4-Dichlorobenzene	0.005			--	--	<0.0002	--	--	<0.0002	<0.0002			<0.0002	<0.0005		<0.0002		<0.0002	<0.0002			<0.0002
Dichloromethane	0.05			--	--	<0.0005	--	--	<0.0005	<0.0005			<0.0005	<0.005		<0.0005		<0.0005	<0.0005			<0.0005
Toluene	0.024			--	--	<0.0002	--	--	<0.0002	<0.0002			<0.0002	<0.0001		<0.0002		<0.0002	<0.0002			0.00025
Vinyl Chloride	0.02			--	--	<0.0002	--	--	<0.0002	<0.0002			<0.0002	<0.0001		<0.0002		<0.0002	<0.0002			<0.0002

THB-00006196-PE - Longlac Landfill

Table 3 (cont'd): Groundwater Data[1]

Parameter	ODWS[2]	2018-2020		MW7																										
		Background[3]	B-7[4]	May-97	Aug-06	Nov-06	Nov-07	Jun-08	Aug-08	Oct-08	Jun-09	Jun-09*	Aug-09	Oct-09	Jun-10	Aug-10	Oct-10	May-11	Aug-11	Oct-11	May-12	Aug-12	Oct-12	May-13	Aug-13	Oct-13	May-14	Aug-14	Aug-14*	May-14	Oct-14
General																														
pH	6.5 to 8.5	7.9		7.52	7.9	7.9	7.9	8	8	7.9	7.8	7.7	7.6	7.6	7.6	7.5	7.63	7.78	7.58	7.75	7.88	7.44	7.53	7.59	7.4	7.33	7.84	7.57	7.55	7.69	7.69
Field pH					7.34	7.38	5.74	7.22	7.53	7.27	6.91	6.91	6.77	7	6.72	6.59	6.79	6.65	6.71	6.77	7.13	6	6.76	6.69	7.42	6.89	6.65	7.06	7.06	7.8	7.8
Conductivity (uS/cm)		460		1,306	1,660	1,930	1,340	923	1,170	1,270	1,390	1,420	1,740	1,830	2,330	2,530	2,530	1,710	1,860	1,990	1,200	1,800	1,800	1,500	1,600	1,500	970	1,900	2,000	1,500	1,500
Field Conductivity					1,730	1,799	1,361	797	1,214	1,194	1,362	1,362	951	1,681	2,343	2,522	2,209	1,598	1,679	1,620	1,019	1,570	1,264	1,330	1,289	1,118	793	2,087	2,087	1567	1567
Field Temperature (^{O}C)					10.8	6.4	6	7.4	10.6	5.6	12.9	12.9	9.3	6.2	7.8	7.7	5.8	7.1	8.1	7.6	8.2	10	7.6	8	7.8	6.7	6.6	14.3	14.3	6.6	6.6
TDS	500	258	379	**849**	**842**	**1,250**	**699**	**606**	**710**	**735**	**880**	**945**	**1,100**	**1,210**	**1,500**	**1,670**	**1,590**	**1,110**	**1,310**	**1,040**	**508**	**932**	**958**	**806**	**932**	**912**	**516**	**1,150**	**1,160**	**764**	**764**
TSS							2,300	900		2,500	1,000		5,800	2,300		1,900		4,100	190	3,200	--	13,000	6,400	4,600	3,300	1,300	2,700	4,100	4,500	22,000	22,000
Hardness (as $CaCO_3$)	80 to 100	**245**	245*	**560.4**	**490**	**660**	**530**	**490**	**500**	**520**	**610**	**630**	**660**	**650**	**740**	**760**		**600**	**640**	**650**	**600**	**620**	**640**	**640**	**600**	**560**	**450**	**690**	**700**	**530**	**530**
Organics																														
DOC	5	3.4	4.21	**11.3**	**37.7**	**102**	**16.4**	**6.1**	**11.8**	**9.3**	**12.7**	**12.2**	**18.3**	**20.3**	**34.1**	**35.9**	**34.8**	**15**	**23.1**	**19**	**8.8**	**26**	**22**	**25.2**	**20**	**19**	**7.9**	**29**	**29**	**16**	**16**
BOD					37	12	22	4	4	7	6		12	10		10		3	4	4	<2	5	6	<2	3	3	2	<2	<2	<2	<2
COD		9.7					48	13	36	39	44	39	71	75	98	110	100	54	75	84	--	82	76	58	49	59	21	79	75	60	60
Phenols		0.0005		<0.001	0.011		<0.001		<0.001				<0.001		<0.001	<0.001	0.004	<0.001	<0.001	0.013	--	<0.001	<0.001	0.0026	<0.001	<0.001	<0.001	0.0035	0.0036	0.0023	0.0023
TKN		0.23		2.6	45		24	3.1	17	15	10	12	32	31	49	56	59	30	41	32	--	31	27	13	17	20	3.9	22	21	13	13
Ammonia-N		0.06		0.78	42.8	57	26.8	2.4	19	16	12	11	31	36	46	52	58	30	40	36	8.8	33	24	14	16	19	2.9	22	23	12	12
Organic Nitrogen	0.15	**0.19**	0.19*	**1.82**	**2.2**		0	**0.7**	0	0	~0	**1**	**1**	~0	**3**	**4**	**1**	0	**1**	~0	~0	<0.1	**3**	~0	**1**	**1**	**1**	<0.1	<0.1	**0.7**	**0.7**
Cations (mg/L)																														
Calcium		73.67		147	120	160	150	150	140	140	170	180	180	180	190	200	190	170	160	170	160	170	170	180	160	150	130	190	190	150	150
Magnesium		14.8		46.5	46	66	36	31	38	40	42	45	51	52	67	67	64	46	55	56	47	49	51	46	48	43	29	55	53	37	37
Potassium		0.42		6.7	17	23	11	45	15	14	11	12	22	19	23	25	22	18	26	19	18	23	18	17	20	22	4.9	26	25	21	21
Sodium	200	1.75	101	36	74	89	56	22	46	44	54	60	94	99	170	190	180	110	130	110	89	110	110	120	110	100	29	140	140	92	92
Anions (mg/L)																														
Chloride	250	2.07	126	43	110	120	61	21	52	60	93	92	130	140	190	220	210	110	140	150	48	130	130	110	120	100	41	170	180	110	110
Nitrate	10	0.15	2.61	2.6	0.3	0.4	0.4	1.3	0.6	0.4	1	1.2	0.6	0.6	0.9	0.2	0.6	1.6	0.7	0.7	1.5	0.92	1.3	1.6	2.3	1	1.48	0.46	0.85	1.5	1.5
Nitrite	1	0.005	0.26	<0.2	0.04		0.04	0.14	0.1	0.09	0.13	0.15	0.04	0.04	0.03	0.02	0.02	0.06	0.03	0.02	0.046	0.035	0.031	0.026	0.16	0.065	0.069	<0.01	0.01	0.075	0.075
Orthophosphate		0.005			<0.01		<0.01		<0.01				<0.01												<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Phosphate		0.51		<1																				--	--	--	--	--	--	--	--
Sulphate	500	0.85	250	77.5	<1	1	9	14	10	4	11	11	0.011	27	45	62	65	48	55	41	23	42	40	32	38	35	16	40	38	28	28
Alkalinity as $CaCO_3$	30-500	245	373	493	**831**	**908**	**640**	488	**556**	**606**	**620**	**625**	**765**	**780**	**887**	**956**	**964**	**693**	**750**	**812**	**510**	**710**	**720**	**620**	**580**	**660**	440	**800**	**790**	**610**	**610**
Ion Balance (%)		3.73		-1.20	8.64	1.37	2.13	1.42	3.28	0.19	0.82	2.9	2.56	1.07	4.51	2.98	1.8	2.99	4.45	0.41	16.8	3.59	2.48	8.84	8.15	1.53	0.97	1.51	1.71	0.13	0.13
Metals (mg/L) - Dissolved																														
Aluminum	0.1	0.0146	0.057	0.069	0.011	0.006	<0.005	<0.005	0.015	<0.005	<0.005	<0.005	<0.005	<0.005	0.021	0.006	0.006	<0.005	0.012	0.01	<0.005	<0.005	0.013	0.008	0.012	0.0052	<0.005	0.0061	0.0068	0.0088	0.0088
Antimony	0.006	0.00025	0.003	<0.0005	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0006	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Arsenic	0.025	0.0005	0.0066	<0.002	0.008	0.022	0.008	0.002	0.007	0.008	0.002	0.002	0.011	0.014	0.021	0.022	0.012	<0.002	0.011	0.016	0.0031	<0.001	0.016	0.0088	<0.001	0.0022	<0.001	0.0015	0.0026	0.0053	0.0053
Barium	1	0.0153	0.26	0.06	0.11	0.18	0.1	0.053	0.094	0.094	0.1	0.1	0.19	0.18	0.25	0.29	0.24	0.17	0.25	0.22	0.16	0.18	0.19	0.19	0.17	0.17	0.053	0.22	0.21	0.16	0.16
Beryllium	1.1	0.00024	0.28	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bismuth		0.0005			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	5	0.006	1.25	0.166	0.64	0.9	0.51	0.25	0.39	0.39	0.46	0.5	0.77	0.93	1.4	1.6	2.1	0.83	1.5	1.5	0.75	0.98	1.1	0.89	0.77	0.68	0.26	0.83	0.84	0.53	0.53
Cadmium	0.005	0.00005	0.0013	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	0.05	0.0025	0.014	0.008	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Cobalt		0.00025		0.0066	0.0078	0.011	0.0046	0.0019	0.0045	0.0037	0.0037	0.0038	0.0061	0.0065	0.011	0.013	0.012	0.0095	0.0093	0.0093	0.0094	0.0086	0.0088	0.0097	0.0093	0.0071	0.0031	0.012	0.012	0.009	0.009
Copper	1	0.0044	0.5	0.0028	0.004	0.002	0.002	0.009	0.007	0.004	0.006	0.007	0.002	0.003	0.002	0.003	<0.001	0.006	0.002	0.002	0.0032	0.0021	0.0012	0.0012	0.0093	<0.001	0.0034	0.0025	0.0018	0.0014	0.0014
Iron	0.3	0.072	0.19	0.1	**0.4**	**9.8**	**2.3**	<0.1	**0.88**	**2.6**	**0.36**	**0.33**	**8.2**	**9.2**	**14**	**15**	**6.1**	0.16	**8.3**	**10**	**1.4**	**2.9**	**11**	**5**	<0.1	**2.4**	<0.1	**3.7**	**4.1**	**3.7**	**3.7**
Lead	0.01	0.00025	0.0027	0.0008	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Manganese	0.05	0.0216	0.036	**0.661**	**0.57**	**0.91**	**0.59**	**0.28**	**0.83**	**0.68**	**0.66**	**0.69**	**0.74**	**0.67**	**0.87**	**0.98**	**0.88**	**0.9**	**0.89**	**0.79**	**0.91**	**0.91**	**0.83**	**0.81**	**0.8**	**0.82**	**0.28**	**1.3**	**1.3**	**0.98**	**0.98**
Mercury	0.001	0.00005	0.0003		<0.0001		<0.0001		0.0001				<0.0001		<0.0001	<0.0001			<0.0001			<0.0001		--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum		0.0003		0.009	0.005	0.006	0.002	<0.001	0.002	0.002	<0.001	<0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.0012	0.0013	0.0009	0.00085	0.0007	0.00084	0.0013	0.00078	<0.0005	0.00078	0.00073	0.00066	0.00066
Nickel		0.0005		0.018	0.016	0.024	0.009	0.004	0.009	0.007	0.009	0.01	0.015	0.015	0.025	0.029	0.03	0.027	0.021	0.017	0.014	0.017	0.015	0.018	0.029	0.014	0.0054	0.022	0.021	0.015	0.015
Phosphorus[7]		0.49		<0.05	<0.050	<0.050	0.9	<0.1	<0.1	<0.1	<0.1	<0.1	2.9	<0.1	<0.1	0.5	<0.1	<0.1	0.12	<0.1	<0.1	<0.1	<0.1	<0.1	0.43	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Selenium	0.01	0.001	0.003	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Silicon		5.13		6.59	10	13	9.5	7.8	9.7	9.9	8.5	8.7	10	11	13	13	12	7.9	11	11	9.5	10	11	9.5	6.8	9	6.6	9.9	10	8.3	8.3
Silver				<0.00007	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Strontium		0.058		0.223	0.18	0.27	0.17	0.15	0.18	0.21	0.2	0.21	0.29	0.28	0.35	0.37	0.38	0.21	0.32	0.33	0.24	0.28	0.31	0.3	0.26	0.24	0.14	0.33	0.32	0.24	0.24
Thallium		0.000025			0.00016	0.00016	0.00015	0.00019	0.00007	0.0001	0.00007	0.00009	0.00008	<0.00005	0.00006	0.00006	<0.00005	0.00016	<0.00005	<0.00005	0.000077	<0.00005	0.00005	<0.00005	0.00011	0.000053	0.00009	0.000098	0.000094	0.000083	0.000083
Tin		0.0005		<0.001			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Titanium				<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Vanadium		0.0005		0.0026	<0.001	0.002	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	0.002	0.001	<0.001	<0.001	0.0009	0.0008	<0.0005	0.00075	0.00076	0.00071	<0.0005	0.00069	<0.0005	<0.0005	<0.0005	0.00088	0.00088
Zinc	5	0.003	2.5	0.003	0.007	0.009	0.005	0.013	0.009	0.008	0.008	0.009	0.009	0.007	0.008	0.007	0.007	<0.005	0.005	0.008	0.0053	0.0062	<0.005	<0.005	0.0093	<0.005	<0.005	0.0093	<0.005	0.034	0.034
VOCs																														
Benzene	0.005				0.0007		0.0009		0.0003				0.0013			0.0021			0.002			0.00094						0.001	0.0011		
1,4-Dichlorobenzene	0.005				<0.0002		<0.0002		<0.0002				<0.0002			<0.0004			<0.0004			<0.0005			<0.0005			<0.0002	<0.0002		
Dichloromethane	0.05				0.0013		<0.0005		<0.0005				<0.0005			<0.001			<0.001			<0.0013			<0.002			<0.0005	<0.0005		
Toluene	0.024				0.0004		0.0005		<0.0002				<0.0002			<0.0004			<0.0004			<0.0005			<0.0002			<0.0002	<0.0002		
Vinyl Chloride	0.02				<0.0002		<0.0002		<0.0002				0.0002			<0.0004			<0.0004			<0.0005			<0.0002			0.00021	0.00021		

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Table 3 (cont'd): Groundwater Data[1]

Parameter	ODWS[2]	2018-2020		MW7 (continued)															
		Background[3]	B-7[4]	May-15	Oct-15	Oct-15*	May-16	Oct-16	May-17	Sep-17	May-18	May-18*	Oct-18	Oct-18*	May-19	May-19*	Oct-19	May-20	Sep-20	Sep-20*
General																				
pH	6.5 to 8.5	7.9		7.83	7.52	7.67	7.46	7.41	7.82	7.65	7.62	7.57	7.51	7.29	7.58	7.59	7.59	7.72	7.8	7.55
Field pH				6.95	7.05	--	6.88	7.01	7.31	7.16	6.79	--	3.08	--	7.07	--	6.66	6.04	6.75	--
Conductivity (uS/cm)		460		920	2400	2300	2700	2700	1,400	1,600	2,100	2100	2,400	2,400	1,800	1,800	2,200	1,900	2,200	2,200
Field Conductivity				950	2256	--	2512	2572	1,318	1,386	1,455	--	1,882	--	1,618	--	2,429	1,160	2,082	--
Field Temperature (^{O}C)				9.7	6.1	--	9.9	8.9	10.5	8.9	10.5	--	3.4	--	5.9	--	4.5	8.2	7.2	--
TDS	500	258	379	**596**	**1270**	**1280**	**1520**	**1510**	**828**	**1,140**	**1,470**	**1,500**	**1,290**	**1,250**	**1,320**	**1,230**	**1,400**	**1,180**	**1,180**	**1,170**
TSS				9300	3300	2700	1400													
Hardness (as $CaCO_3$)	80 to 100	**245**	245*	**410**	**740**	**740**	**790**	**780**	**540**	**730**	**890**	**920**	**750**	**750**	**730**	**710**	**850**	**720**	**680**	**690**
Organics																				
DOC	5	3.4	4.21	4.9	**28**	**28**	**43**	**38**	**9.5**	4.9	4.9	4.9	**26**	**26**	**8.9**	**9.0**	**16**	**13**	**22**	**22**
BOD				3	3	2	4													
COD		9.7		5.2	96	72	120	130	25	19	17	13	77	76	24	23	40	39	68	67
Phenols		0.0005		<0.001	<0.001	<0.001	<0.0010	0.0025	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0011	<0.0010	<0.0010	<0.0010	<0.0010	0.0011	<0.0010
TKN		0.23		1.2	29	29	37	43	7.5	<5.0	<5.0	<5.0	23	23	10	10	22	11	25	22
Ammonia-N		0.06		0.63	27	28	38	42	5.4	0.38	0.72	0.77	20	20	7.6	7.1	15	9.4	23	23
Organic Nitrogen	0.15	**0.19**	0.19*	**0.61**	**1.4**	**1.4**	<0.10	**1.2**	**2.1**	<0.10	<0.10	<0.10	**2.5**	**2.5**	**2.6**	**2.9**	**7.5**	**1.9**	**2.3**	<0.10
Cations (mg/L)																				
Calcium		73.67		120	200	200	210	200	160	230	280	280	200	200	220	210	240	200	180	180
Magnesium		14.8		26	57	58	66	68	33	37	49	51	59	61	45	45	61	51	55	56
Potassium		0.42		3.9	29	30	45	56	14	2.8	13	13	65	68	36	36	51	39	67	68
Sodium	200	1.75	101	23	170	170	**220**	**220**	36	13	27	27	140	140	60	59	120	83	160	160
Anions (mg/L)																				
Chloride	250	2.07	126	44	230	230	**260**	250	83	21	25	23	220	220	66	66	99	120	180	170
Nitrate	10	0.15	2.61	3.03	0.67	1.16	0.7	0.58	**23.5**	**118**	**183**	**185**	**14.2**	**22.2**	**90.7**	**91.4**	**104**	**55.2**	**11.1**	**10.6**
Nitrite	1	0.005	0.26	0.081	<0.01	<0.01	0.018	0.012	0.319	0.183	0.488	0.435	0.57	0.207	0.636	0.44	0.975	0.778	0.116	0.064
Orthophosphate		0.005		<0.01	<0.01	<0.01	<0.010	0.011	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Phosphate		0.51		1.3	1.8	1.7							3.5	2.4						
Sulphate	500	0.85	250	14	42	42	52	49	22	70	110	110	36	38	89	89	120	78	35	36
Alkalinity as $CaCO_3$	30-500	245	373	410	**860**	**840**	**1000**	**1100**	**540**	290	310	300	**870**	**830**	470	470	**540**	**570**	**830**	**830**
Ion Balance (%)		3.73		--	0.66	1.83	0.99		8.19		6.83	5.44	2.65	1.05	2.27	3.87	1.64	1.89	1.51	2.26
Metals (mg/L) - Dissolved																				
Aluminum	0.1	0.0146	0.057	<0.005	0.0078	0.006	0.0078	0.009	<0.005	<0.005	<0.005	<0.005	<0.005	0.0068	<0.005	<0.005	<0.005	0.023	0.0093	0.0073
Antimony	0.006	0.00025	0.003	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Arsenic	0.025	0.0005	0.0066	<0.001	0.016	0.015	0.016	0.02	<0.001	<0.001	<0.001	<0.001	0.0037	0.0037	<0.001	<0.001	<0.001	<0.001	0.0019	0.0019
Barium	1	0.0153	0.26	0.044	0.27	0.27	0.37	0.39	0.083	0.061	0.11	0.11	0.31	0.31	0.17	0.17	0.2	0.18	0.25	0.25
Beryllium	1.1	0.00024	0.28	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0004	<0.0004
Bismuth		0.0005		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	5	0.006	1.25	0.23	1	1	1.4	1.7	0.29	0.13	0.24	0.23	0.65	0.65	0.35	0.34	0.71	0.44	1.1	1.1
Cadmium	0.005	0.00005	0.0013	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00009	<0.00009
Chromium	0.05	0.0025	0.014	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Cobalt		0.00025		0.0018	0.014	0.014	0.013	0.013	0.0014	0.00083	0.0022	0.0023	0.0099	0.01	0.006	0.006	0.0047	0.0055	0.0095	0.0094
Copper	1	0.0044	0.5	0.0022	<0.001	<0.001	<0.001	<0.001	0.0034	0.0024	0.0027	0.0027	0.0023	0.0023	0.007	0.0072	0.0079	0.0053	0.0029	0.0029
Iron	0.3	0.072	0.19	<0.1	**12**	**12**	**11**	**13**	<0.1	<0.1	<0.1	<0.1	**3.2**	**3.2**	<0.1	<0.1	<0.1	0.29	**0.49**	**0.49**
Lead	0.01	0.00025	0.0027	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Manganese	0.05	0.0216	0.036	**0.19**	**1.1**	**1.2**	**0.88**	**0.82**	**0.11**	**0.058**	**0.24**	**0.25**	**0.82**	**0.85**	**0.63**	**0.62**	**0.4**	**0.52**	**0.91**	**0.9**
Mercury	0.001	0.00005	0.0003	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.00010	<0.00010
Molybdenum		0.0003		<0.0005	0.00089	0.00093	0.001	0.00097	<0.0005	<0.0005	<0.0005	<0.0005	0.00057	0.0007	<0.0005	<0.0005	<0.0005	<0.0005	0.00066	0.00061
Nickel		0.0005		0.0046	0.023	0.023	0.026	0.025	0.0054	0.0019	0.0053	0.0055	0.021	0.021	0.012	0.012	0.016	0.013	0.022	0.022
Phosphorus[7]		0.49		1.3	1.8	1.7	0.58	1.4	1.1	2.4	2.3	6.2	3.5	2.4	0.71	0.63	0.49	0.19	0.38	0.39
Selenium	0.01	0.001	0.003	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Silicon		5.13		6.1	10	11	10	11	6.4	5.6	6	6.1	8.7	8.7	6.5	6.3	7.5	7.3	8.9	9.2
Silver				<0.0001	<0.0001	<0.0001	<0.0001													
Strontium		0.058		0.12	0.38	0.38	0.4	0.41	0.16	0.29	0.26	0.28	0.33	0.34	0.26	0.26	0.27	0.26	0.32	0.32
Thallium		0.000025		<0.00005	0.000072	0.000083	0.000078	0.000065	<0.00005	<0.00005	0.00007	0.00009	0.00013	0.00014	0.000091	0.00011	0.00023	0.00015	0.00017	0.00016
Tin		0.0005		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.003	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Titanium				<0.005	<0.005	<0.005	<0.005													
Vanadium		0.0005		<0.0005	0.0007	0.00082	0.0013	0.0015	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.00057	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Zinc	5	0.003	2.5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
VOCs																				
Benzene	0.005				0.0016	0.0016		0.0018		<0.0001			0.00051	0.0005			0.00058		0.00093	0.00096
1,4-Dichlorobenzene	0.005				<0.0002	<0.0002		<0.0002		<0.0002			<0.0004	<0.0002			<0.001		<0.001	<0.001
Dichloromethane	0.05				<0.0005	<0.0005		<0.0005		<0.0005			<0.001	<0.0005			<0.0025		<0.0025	<0.0025
Toluene	0.024				0.0002	<0.0002		<0.0002		<0.0002			<0.0004	<0.0002			<0.001		<0.001	<0.001
Vinyl Chloride	0.02				0.00021	0.00021		0.00026		<0.0002			<0.0004	<0.0002			<0.001		<0.001	<0.001

THB-00006196-PE - Longlac Landfill

Table 3 (cont'd): Groundwater Data[1]

Parameter	ODWS[2]	2018-2020		MW8-I																																				
		Background[3]	B-7[4]	May-97	Aug-06	Nov-06	Nov-07	Jun-08	Aug-08	Oct-08	Jun-09	Aug-09	Oct-09	Jun-10	Aug-10	Aug-10**	Oct-10	May-11	Aug-11	Oct-11	May-12	Aug-12	Oct-12	May-13	Aug-13	Oct-13	May-14	Aug-14	Oct-14	May-15	Oct-15	May-16	Oct-16	May-17	Sep-17	May-18	Oct-18	May-19	Oct-19	May-20	Sep-20
General																																								
pH	6.5 to 8.5	7.9		7.4	7.6	7.8	7.7	7.8	7.8	7.7	7.5	7.5	7.5	7.5	7.4	7.4	7.59	7.7	7.5	7.68	7.71	7.44	7.32	7.64	7.32	7.24	7.68	7.55	7.58	7.39	7.7	7.56	7.47	7.47	7.55	7.41	7.42	7.64	7.62	7.78	7.55
Field pH					7.01	7.13		7	7.17	7.05	6.76	6.84	6.83	6.61	6.58	--	6.83	6.54	6.58	6.61	6.88	6.44	6.69	6.87	7.74	6.74	6.67	7.08	7.08	6.7	8.25	6.88	7.15	7.05	6.94	6.42	7.09	6.99	6.73	6.81	6.55
Conductivity		460		3194	3680	3200	3580	3950	3770	3640	3,040	2,880	2,920	2,670	2,360	2,350	2,270	2,900	3,470	3,160	2,800	4,500	4,600	2,100	3,000	4,200	3,200	5,000	5,400	5,300	5,900	3,300	4,200	3,600	3,800	4,500	3,800	3,200	5,200	3,300	4,700
Field Conductivity					3972	2942		3811	3359	3541	2,794	2,480	2,496	2,665	2,376	--	1,851	2,526	3,012	2,471	2,212	3,039	3,419	1,677	2,041	2,790	1,978	+3,999	+3,999	+3,999	+3,999	2,938	+3,999	3,211	3,124	2,827	3,398	2,557	1,453	940	>3999
Field Temperature					11.4	5.6		7.8	13.5	6.5	12.4	10.6	7.5	6.5	9.1	--	5.5	6.4	8.6	8.8	6.2	10.4	8.2	7.4	7.9	6.5	5	13.6	7.9	11.7	3.4	9.4	8.9	9.9	9.3	12.3	4.6	6.1	5.1	5.9	7.6
TDS	500	258	379	**2,077**	**2,010**	**2,260**	**1,080**	**2,500**	**2,500**	**2,520**	**2,000**	**1,780**	**1,890**	**1,700**	**1,550**	**1,540**	**1,380**	**1,810**	**2,380**	**2,070**	**1,700**	**2,680**	**2,640**	**1,330**	**1,890**	**2,510**	**1,980**	**3,020**	**3,130**	**3270**	**3350**	**2,070**	**2,600**	**2,290**	**2,180**	**2,470**	**2,380**	**1,880**	**2,950**	**1,920**	**2,540**
TSS					2,900	1,600				2,000	4,100	2,200	1,800		1,500			1,300	420	810		360	900	1,200	1,000	630	390	220	390	360	1600	1000										
Hardness (as $CaCO_3$)	80 to 100	**245**	245*	**950.1**	**1,400**	**1,400**	**1,200**	**1,200**	**1,000**	**1,100**	**1,200**	**1,100**	**1,200**	**1,100**	**1,000**	**1,000**		**1,200**	**1,300**	**1,100**	**1,200**	**1,200**	**1,100**	**900**	**1,100**	**1,200**	**1,100**	**1,200**	**1,200**	**1300**	**1100**	**1,100**	**1,100**	**1,300**	**1,100**	**1,000**	**980**	**1,200**	**1,200**	**1,100**	**1,100**
Organics																																								
DOC	5	3.4	4.21	**20**	**45.8**	**28**	**35.9**	**46.2**	**37.4**	**40.9**	**29**	**26.7**	**27.3**	**24.7**	**16.3**	**16.8**	**13.4**	**28.6**	**42.7**	**31.4**	**27**	**93**	**96**	**16.2**	**36**	**76**	**43**	**95**	**100**	**87**	**98**	**37**	**67**	**45**	**45**	**60**	**58**	**33**	**82**	**38**	**75**
BOD					2	<2	<2	3	3	<2	2	<2	<2		<2			<2	2	<2	2	10	10	<2	3	6	3	8	10	9	10	4									
COD		9.7					120	140	130	130	130	90	99	73	54	56	69	88	120	110	--	230	260	46	85	210	120	250	280	240	290	93	190	120	130	190	150	89	220	100	200
Phenols		0.0005		0.003	<0.001		<0.001		<0.001			<0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.017	--	0.02	0.005	<0.001	<0.001	0.0029	0.0085	0.0058	0.034	<0.001	<0.001	0.0018	0.0027	<0.0010	<0.0050	0.0041	0.0021	0.0019	0.0029	0.0015	0.0024
TKN		0.23		12.2	19		23	22	25	20	21	23	19	20	15	15	15	17	22	20	--	29	33	13	22	35	27	63	63	69	92	34	58	29	46	58	53	33	74	39	64
Ammonia-N		0.06		9.7	10.5	14.1	20.8	22	23	21	24	22	21	19	15	15	12	15	21	20	18	30	30	14	21	30	26	59	61	59	79	36	56	27	45	56	48	33	70	37	71
Organic Nitrogen	0.15	**0.19**	0.19*	**2.5**	**8.5**		**2.2**	0	**2**	0	~0	**1**	~0	**1**	0	0	**3**	**2**	**1**	0	~0	<0.1	**3**	~0	**1**	**5**	**1.1**	**3.9**	**2.5**	**9.8**	**13**	<0.10	**1.4**	**2.5**	**0.62**	**2.0**	**4.3**	**0.61**	**3.9**	**2.4**	<0.10
Cations (mg/L)																																								
Calcium		73.67		238	270	340	270	230	200	230	280	260	250	250	240	240	230	280	270	250	290	210	190	220	270	250	250	190	200	230	160	230	190	290	200	200	190	280	200	240	200
Magnesium		14.8		86.4	190	140	140	150	130	140	120	110	130	130	110	110	100	120	140	120	110	160	160	84	110	150	130	180	170	190	170	120	150	130	130	130	120	110	180	120	160
Potassium		0.42		74.5	210	150	170	210	220	190	130	120	140	110	96	98	89	110	180	160	110	220	230	85	110	190	170	290	270	280	390	170	270	160	220	210	220	160	310	180	300
Sodium	200	1.75	101	168	**310**	160	**270**	**340**	**360**	**270**	180	160	160	120	95	96	76	170	**260**	180	130	**380**	**460**	76	170	**340**	**210**	**460**	**480**	**530**	**540**	190	**350**	**230**	**290**	**290**	**250**	190	**490**	**210**	**450**
Anions (mg/L)																																								
Chloride	250	2.07	126	**267**	**410**	180	**310**	**450**	**390**	**330**	190	180	180	130	88	89	73	190	**320**	200	130	**560**	**580**	82	210	**480**	**270**	**640**	**720**	**670**	**760**	210	**390**	**290**	**330**	**450**	**330**	200	**560**	230	**540**
Nitrate	10	0.15	2.61	0.3	1.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite	1	0.005	0.26	<0.2	0.02		<0.01	<0.01	0.01	<0.01	0.01	0.01	<0.01	0.01	<0.01	<0.01	0.01	0.03	0.07	0.01	0.012	0.012	<0.01	<0.01	0.047	0.027	<0.01	0.011	0.013	<0.01	0.223	0.011	0.018	0.042	0.015	0.012	0.011	0.022	0.056	0.022	0.028
Orthophosphate		0.005			<0.01		<0.01		<0.01			<0.01												--	<0.01	<0.01	<0.01	<0.01	0.012	<0.01	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Phosphate		0.51		<1																				--	--	--				0.28	0.24					1.3					
Sulphate	500	0.85	250	337	465	**624**	387	257	174	395	370	360	350	340	350	350	340	270	310	360	340	82	60	320	340	200	310	160	120	140	100	340	310	370	310	230	280	340	140	340	180
Alkalinity as $CaCO_3$	30-500	245	373	**729**	**1200**	**1090**	**1140**	**1290**	**1310**	**1150**	**1080**	**1030**	**1080**	**989**	**890**	**894**	**857**	**1070**	**1220**	**1120**	**1,000**	**1,500**	**1,500**	**750**	**960**	**1,500**	**1,100**	**1,700**	**1,800**	**1800**	**2100**	**1,100**	**1,400**	**1,300**	**1,300**	**1,700**	**1,400**	**1,100**	**1,900**	**1,200**	**1,700**
Ion Balance (%)		3.73		0.35	3.34	0.957	2.13	2.18	3.81	0.44	3.08	1.14	1.66	2.78	1.18	1.43	0.17	4.93	3.42	0.14	2.77	0.25	3.44	1.47	3.18	0.43	3.78	0.28	2.96		2.3	1.51		0.39		8.18	3.57	4.81	2.39	1.88	0.83
Metals (mg/L) - Dissolved																																								
Aluminum	0.1	0.0146	0.057	**0.114**	0.012	<0.005	<0.005	0.01	0.009	<0.005	<0.005	<0.005	<0.005	<0.005	0.022	<0.005	<0.005	<0.005	0.005	0.005	<0.005	0.012	0.015	<0.005	0.0075	0.011	0.0096	0.014	0.016	0.013	0.017	<0.005	0.0096	0.0075	0.0072	0.0086	0.0064	0.0058	0.013	**0.12**	0.011
Antimony	0.006	0.00025	0.003	0.0007		<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0018	0.0005	<0.0005	<0.0005	<0.0005	0.00066	0.00056	<0.0005	<0.0005	0.00054	<0.0005	0.0011	0.001	0.001	0.0011	<0.0005	0.00065	<0.0005	<0.0005	<0.0005	0.0015	<0.0005	0.00061	<0.0005	0.0006
Arsenic	0.025	0.0005	0.0066	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.001	0.001	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.0013	0.0024	0.011	0.0058	0.0067	0.0077	0.007	0.0025	0.0084	0.0088	0.0065	0.0078	0.008	0.008	0.0083	0.0068	0.0086	0.0089	0.0095	0.0084	0.0055
Barium	1	0.0153	0.26	0.482	0.12	0.1	0.11	0.12	0.11	0.11	0.091	0.084	0.089	0.071	0.066	0.068	0.061	0.095	0.12	0.11	0.087	0.15	0.25	0.098	0.15	0.25	0.19	0.29	0.31	0.32	0.32	0.2	0.3	0.21	0.25	0.25	0.25	0.19	0.35	0.22	0.29
Beryllium	1.1	0.00024	0.28	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0004
Bismuth		0.0005			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.003	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	5	0.006	1.25	0.764	1.8	1.5	1.6	1.7	1.5	1.7	1.4	1.4	1.4	1.3	1.2	1.2	1.1	1.4	1.6	1.4	1.4	1.8	1.8	0.95	1.4	1.6	1.4	2.1	1.9	2.2	2.1	1.8	2.1	1.9	2.0	2.1	2.2	2.4	3.4	2.4	2.6
Cadmium	0.005	0.00005	0.0013	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.00012	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00009
Chromium	0.05	0.0025	0.014	0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0053	<0.005	<0.005	0.0087	<0.005	<0.005	0.0057	0.005	0.0088	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Cobalt		0.00025		0.0183	0.013	0.012	0.011	0.015	0.015	0.012	0.011	0.012	0.012	0.01	0.0076	0.0078	0.0067	0.01	0.01	0.011	0.011	0.018	0.016	0.0068	0.0097	0.013	0.013	0.016	0.019	0.024	0.023	0.011	0.013	0.012	0.011	0.015	0.014	0.012	0.017	0.012	0.016
Copper	1	0.0044	0.5	0.0029	0.005	0.001	0.003	0.006	0.004	0.003	0.001	0.003	0.003	0.002	<0.001	<0.001	<0.001	0.003	0.004	0.002	0.0028	0.021	0.011	0.018	0.002	0.0019	<0.001	0.0035	0.0031	0.0033	0.0028	<0.001	<0.001	<0.001	<0.001	0.0013	<0.001	0.003	<0.001	0.0023	0.0029
Iron	0.3	0.072	0.19	**3.96**	**3.6**	**4.5**	**1.9**	**1.7**	**1.5**	**1.7**	**2.1**	**2.1**	**2.3**	**2.7**	**2.7**	**2.7**	**2.7**	**0.98**	**2.6**	**1.9**	**2.2**	**2.2**	<0.1	**6.6**	**3.7**	**5.2**	**4.9**	**5.8**	**1.8**	**4.6**	**5.8**	**3.4**	**6.5**	**5.8**	**7.5**	**5.9**	**6.3**	**6.3**	**8.4**	**5.8**	**8.1**	0.17
Lead	0.01	0.00025	0.0027	0.0051	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Manganese	0.05	0.0216	0.036	**1.56**	**1.3**	**1.6**	**1.1**	**1.2**	**1.1**	**1.2**	**1.3**	**1.3**	**1.3**	**1.4**	**1.2**	**1.2**	**1.2**	**1.3**	**1.2**	**1.3**	**1.4**	**1**	**0.75**	**0.84**	**1.1**	**1**	**1**	**0.81**	**0.84**	**0.9**	**0.76**	**0.96**	**0.82**	**1.1**	**0.79**	**0.95**	**0.99**	**1.1**	**0.91**	**1.1**	**0.9**
Mercury	0.001	0.00005	0.0003		<0.0001		<0.0001		0.0001			<0.0001		0.0002	0.0002	0.0002			0.0002			0.00026		--	0.00011	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.00010
Molybdenum		0.0003		0.007	0.002	0.001	0.001	0.001	0.002	0.001	<0.001	0.001	0.001	0.001	<0.001	<0.001	0.001	<0.001	0.001	0.001	0.0012	0.0019	0.0025	0.00052	0.0013	0.0018	0.0015	0.0032	0.0029	0.0027	0.0036	0.0018	0.0022	0.0017	0.0017	0.0018	0.0022	0.0015	0.0026	0.0016	0.0039
Nickel		0.0005		0.027	0.029	0.017	0.018	0.032	0.038	29	0.022	0.02	0.019	0.014	0.009	0.009	0.009	0.015	0.025	0.022	0.016	0.053	0.047	0.0088	0.019	0.031	0.022	0.045	0.049	0.056	0.06	0.019	0.034	0.024	0.027	0.033	0.026	0.019	0.047	0.023	0.041
Phosphorus[7]		0.49		<0.05	0.059	<0.050	1.5	<0.1	<0.1	<0.1	<0.1	1.3	<0.1	<0.1	0.9	0.9	<0.1	<0.1	0.12	<0.1	<0.1	<0.1	0.43	<0.1	<0.1	<0.1	<0.1	<0.1	0.12	0.28	0.24	0.49	1.2	0.91	0.42	0.13	1.3	0.63	0.29	0.8	0.13
Selenium	0.01	0.001	0.003	0.003	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Silicon		5.13		9.64	8.8	9.5	8.5	7.9	8.5	7.6	8.1	7.7	8.4	8.7	8	8	8.2	8.5	7.9	7.7	8.3	10	11	8	9.2	8.3	9.4	9.7	9.2	10	9	8.3	8.4	9.2	8.9	9.2	9.1	9.5	9.7	9.9	9.6
Silver				<0.00007	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Strontium		0.058		0.857	0.81	1.1	0.9	0.72	0.6	0.64	0.88	0.91	0.87	1	0.87	0.87	0.8	0.89	0.93	0.86	1	0.73	0.76	0.74	1	0.98	0.84	0.68	0.75	0.77	0.61	1	0.74	1.1	0.8	0.68	0.7	0.95	0.68	0.76	0.63
Thallium		0.000025			<0.00005	<0.00005	0.00008	0.00015	0.00006	0.00009	0.00011	<0.00005	0.0001	0.00007	<0.00005	0.00006	0.00013	0.00008	0.0001	0.0001	0.00014	0.00017	0.00013	0.000078	0.000086	0.00012	<0.0005	0.00021	0.00015	0.00012	0.00024	0.000074	0.00012	0.0001	0.000068	0.00018	0.00038	0.00011	0.11	0.00016	0.00045
Tin		0.0005		<0.001			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Titanium				0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0059	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Vanadium		0.0005		0.0031	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0006	0.0006	<0.0005	0.0016	0.002	0.00079	0.00083	0.0014	0.0008	0.018	0.003	0.0027	0.0025	0.0009	0.002	0.0013	0.0014	0.0016	0.0016	<0.0005	0.0029	0.0016	0.0019
Zinc	5	0.003	2.5	0.003	0.023	0.009	0.006	0.02	0.01	0.006	0.005	0.008	0.008	0.005	<0.005	<0.005	0.006	<0.005	0.008	<0.005	0.006	0.0055	0.0059	0.0057	0.011	0.0074	<0.0005	<0.0005	<0.0005	<0.005	0.0061	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0078	<0.005
VOCs																																								
Benzene	0.005				0.001		0.0007		0.0008			0.0005			0.0002				0.0007			0.0011						0.0012			0.0021		0.0011		0.00096		<0.001		0.0023		0.0012
1,4-Dichlorobenzene	0.005				<0.0004		<0.0002		<0.0002			<0.0002			<0.0002				<0.0004			<0.001		<0.0005				<0.0002			<0.0002		<0.0002		<0.001		<0.002		<0.002
Dichloromethane	0.05				<0.001		<0.0005		<0.0005			<0.0005			<0.0005				<0.001			<0.0025		<0.002				<0.0005			<0.0005		<0.0005		<0.0025		<0.005		<0.005
Toluene	0.024				<0.0004		<0.0002		<0.0002			<0.0002			<0.0002				<0.0004			<0.001		<0.0002				<0.0002			<0.0002		<0.0002		<0.001		<0.002		<0.002
Vinyl Chloride	0.02				<0.0004		<0.0002		<0.0002			<0.0002			<0.0002				<0.0004			<0.001		<0.0002				<0.0002			<0.0002		<0.0002		<0.001		<0.002		<0.002

THB-00006196-PE - Longlac Landfill

Table 3 (con't): Groundwater Data[1]

Parameter	ODWS[2]	2018-2020		MW8-II																																				
		Background[3]	B-7[4]	May-97	Aug-06	Nov-06	Nov-07	Jun-08	Aug-08	Oct-08	Jun-09	Aug-09	Oct-09	Jun-10	Aug-10	Oct-10	May-11	Aug-11	Oct-11	May-12	Aug-12	Oct-12	May-13	Aug-13	Oct-13	May-14	Aug-14	Oct-14	May-15	Oct-15	May-16	Oct-16	May-17	Sep-17	May-18	Oct-18	May-19	Oct-19	May-20	Sep-20
General																																								
pH	6.5 to 8.5	7.9		7.65	No	No	8.2	8.1	8.3	8.1	8	8	7.7	7.9	7.8	7.91	8.08	7.95	8.01	7.93	7.75	No	7.76	7.84	7.54	7.84	7.78	7.89	7.84	7.93	7.79	No	7.89	7.89	7.74	7.78	7.91	7.71	7.97	No
Field pH					Sample	Sample	--	7.51	7.54	8.12	7.37	7.61	7.64	7.42	7.33	7.3	7.53	7.07	7.37	7.2	7.15	Sample	7.11	7.73	7.38	7.07	7.38	7.64	7.21	--	7.47	Sample	7.76	7.71	7.15	2.58	7.43	5.87	6.05	Sample
Conductivity		460		1,187	Dry	Dry	531	553	560	537	504	586	669	767	1,150	739	621	562	723	950	950	Dry	1,300	940	890	1,300	1,000	830	870	1,100	900	Dry	570	870	1,000	990	770	1,200	880	Dry
Field Conductivity					Well	Well		727	638	725	740	549	650	679	1,042	723	567	681	645	748	772	Well	979	925	683	775	1,138	1,096	731	--	1,030	Well	595	857	547	842	770	890	865	Well
Field Temperature								10.1	15	5.4	12.3	14.2	6.3	11.8	13	5	7.1	10.4	12.1	6.6	9.6		7.7	12.8	7	6.3	12.2	6.5	11.2	--	10.2		11.7	12.2	9.6	2.5	6.4	6.5	5.9	
TDS	500	258	379	**772**			290	358	370	360	370	375	464	500	**744**	476	370	478	480	**580**	**680**		**896**	**740**	**510**	**906**	**592**	**522**	**662**	**594**	**588**		326	**515**	**570**	**510**	**530**	435	**620**	
TSS							2,000	1,600		2,500	2,200	4,700	16,000	`					1,300	4,100	2,400		3,600	2,700	8,000	2,200	220	3,300	2400	3100	980									
Hardness (as $CaCO_3$)	80 to 100	**245**	245*	**474**			**260**	**300**	**280**	**280**	**350**	**310**	**330**	**340**	**420**		**310**	**290**	**380**	**290**	**330**		**680**	**490**	**480**	**660**	**480**	**420**	**400**	**440**	**450**		**230**	**430**	**340**	**420**	**390**	**530**	**350**	
Organics																																								
DOC	5	3.4	4.21	**11.4**			4.2	4.9	**5.2**	4.9	3.8	3	3.2	3.1	**5.2**	2	2.9	2.7	2.4	3.8	3.8		**8.1**	**5.4**	4	4.5	2.9	4.2	3.2	3.1	**5.5**		2.8	3.2	4.2	3.2	3.6	3.5	4.3	
BOD							<2	<2	<2	<2	5	<2	<2					<2	<2	<2	<2		<2	<2	2	<2	<2	<2	<2.0	<2.0	<2.0									
COD		9.7					130	21	5	53	22	16	40	41	81	23	27	--	23	19	21		35	13	21	15	12	22	8	56	6.6		11	8.3	16	7.2	5.0	14	8.3	
Phenols		0.0005		0.001			<0.001		<0.001			<0.001		<0.001	<0.001	<0.0001	<0.001	--	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
TKN		0.23		1.09			1.9	1.1	1.6	2	0.8	0.9	1.5	3	3	2	3	--	2	0.99	2.1		1.8	2.2	3.5	7	1.8	1.5	0.75	1	1.8		0.8	1.2	2.4	2.4	1.3	4.0	2.1	
Ammonia-N		0.06		0.34			<0.05	0.05	<0.05	0.05	<0.05	<0.05	0.07	0.07	1.3	0.17	0.09	2.2	0.15	0.55	0.99		0.18	1.5	0.88	0.52	0.84	0.64	0.38	0.6	1.5		0.43	0.3	2.2	1.9	1.1	3.3	1.7	
Organic Nitrogen	0.15	**0.19**	0.19*	**0.75**			**1.875**	**1.05**	**1.6**	**1.95**	**0.8**	**0.9**	**1.43**	**2.93**	**1.7**	**1.83**	**2.91**	**0.8**	**1.85**	**0.44**	**1.1**		**1.62**	**0.8**	**2.62**	**6.4**	**0.9**	**0.8**	**0.37**	**0.42**	**0.34**		**0.37**	**0.91**	**0.16**	**0.5**	**0.21**	**0.63**	**0.38**	
Cations (mg/L)																																								
Calcium		73.67		136			83	95	90	87	110	95	100	100	120	110	98	89	110	92	100		200	140	140	190	140	130	120	130	130		71	130	100	120	120	150	100	
Magnesium		14.8		32.4			13	15	14	15	20	17	18	21	28	25	17	16	24	15	19		47	32	32	45	31	25	24	29	31		12	26	21	28	23	36	20	
Potassium		0.42		7.1			3	3	3	3.1	4.8	3.9	4.9	5.8	10	15	4.1	3.3	10	2.5	5.8		23	16	16	18	18	12	11	17	18		1.5	11	12	25	13	29	9.8	
Sodium	200	1.75	101	34.1			19	15	16	14	14	12	14	14	17	16	15	10	15	11	10		33	25	24	33	24	23	25	31	37		6.1	25	23	36	23	50	21	
Anions (mg/L)																																								
Chloride	250	2.07	126	76.3			2	2	4	2	7	6	9	15	31	11	12	8	16	41	41		56	32	31	81	63	35	49	80	34		11	35	48	45	23	64	34	
Nitrate	10	0.15	2.61	2.8			0.5	<0.1	1.4	1.1	0.7	0.6	0.8	1.2	1	1.1	0.8	0.6	1.2	0.8	1.2		6.1	3.3	1.9	2.25	1.81	1.13	1.1	1.75	0.67		0.41	1.58	0.64	2.13	0.46	1.36	0.61	
Nitrite	1	0.005	0.26	<0.2			<0.01	0.04	<0.01	<0.01	0.01	<0.01	0.09	<0.01	0.03	0.02	0.02	<0.01	0.03	0.21	0.056		0.34	0.051	0.1	0.023	0.058	0.054	0.021	0.086	0.021		0.062	0.047	0.095	0.068	0.1	0.379	0.068	
Orthophosphate		0.005					<0.01		<0.01			<0.01												<0.01	<0.01	<0.01	<0.01	<0.01	0.065	<0.01	<0.010		<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	
Phosphate		0.51		<1																								0.37	0.6						0.52				
Sulphate	500	0.85	250	67.6			6	3	5	5	15	12	20	40	140	37	19	6	26	63	52		160	65	55	140	49	34	29	47	69		20	60	61	51	45	72	60	
Alkalinity as $CaCO_3$	30-500	245	373	391			285	301	295	288	245	315	331	350	433	345	294	283	341	370	390		470	330	380	440	380	360	350	420	380		290	360	430	400	330	440	360	
Ion Balance (%)		3.73		0.93			1.21	4.38	1.46	2.4	17.2	0.07	0.76	4.78	13.9	3.12	2.69	2.93	3.19	22	15.5		2.95	11.1	6.38	2.49	2.56	3.87		4.44	5.68		14.6		15.3	1.03	6.5	5.29	7.56	
Metals (mg/L) - Dissolved																																								
Aluminum	0.1	0.0146	0.057	**0.167**			<0.005	<0.005	<0.005	<0.005	<0.005	0.005	<0.005	<0.005	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005	<0.005	0.0059	<0.005	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
Antimony	0.006	0.00025	0.003	0.0008			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0007	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	
Arsenic	0.025	0.0005	0.0066	<0.002			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Barium	1	0.0153	0.26	0.036			0.015	0.014	0.016	0.016	0.028	0.021	0.024	0.026	0.037	0.041	0.023	0.02	0.04	0.017	0.026		0.091	0.059	0.057	0.077	0.06	0.047	0.04	0.056	0.069		0.011	0.05	0.037	0.068	0.044	0.079	0.035	
Beryllium	1.1	0.00024	0.28	<0.001			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	
Bismuth		0.0005					<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Boron	5	0.006	1.25	0.151			0.025	0.024	0.031	0.023	0.066	0.044	0.054	0.082	0.15	0.17	0.083	0.042	0.15	0.029	0.074		0.41	0.26	0.26	0.33	0.21	0.17	0.14	0.19	0.32		0.019	0.22	0.15	0.27	0.26	0.45	0.19	
Cadmium	0.005	0.00005	0.0013	0.0001			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0004	0.00012	<0.0001		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Chromium	0.05	0.0025	0.014	0.005			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
Cobalt		0.00025		0.0038			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0007	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.00088		<0.0005	<0.0005	0.00053	0.001	0.00079	0.0014	0.00075	
Copper	1	0.0044	0.5	0.0045			0.004	0.008	0.002	0.003	0.005	0.002	0.002	0.005	0.003	0.002	0.003	0.003	0.002	0.0021	0.0043		0.0038	0.0036	0.0034	0.0033	0.0028	0.0028	0.0029	0.0035	0.0052		0.0012	0.0025	0.0029	0.0043	0.0035	0.0052	0.0076	
Iron	0.3	0.072	0.19	0.19			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
Lead	0.01	0.00025	0.0027	0.0016			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	
Manganese	0.05	0.0216	0.036	**0.339**			<0.002	<0.002	<0.002	<0.002	<0.002	0.002	**0.079**	0.002	0.007	0.01	0.005	<0.002	0.008	<0.002	0.025		0.036	0.023	**0.078**	0.034	**0.1**	0.043	0.03	**0.052**	**0.055**		<0.002	0.0024	**0.057**	**0.13**	**0.067**	**0.23**	**0.052**	
Mercury	0.001	0.00005	0.0003				<0.0001		<0.0001			<0.0001		<0.0001	0.0003			0.0001			<0.0001		--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.00010	<0.0001		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Molybdenum		0.0003		0.022			0.002	0.001	0.001	0.002	0.002	0.002	0.002	0.002	0.002	0.001	0.001	0.001	0.0013	0.0011	0.00093		0.0009	0.001	0.00061	0.00078	<0.0005	0.00063	0.00088	0.00068	0.00066		0.00057	<0.0005	0.00062	0.00053	0.00053	0.00054	0.00051	
Nickel		0.0005		0.011			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	0.003	0.01	<0.001	<0.001	0.001	<0.001	0.0018		0.002	0.0024	0.0025	0.0015	0.003	0.0017	0.0015	0.0021	0.0037		<0.001	0.0015	0.0027	0.0042	0.0027	0.0065	0.0026	
Phosphorus[7]		0.49		<0.05			0.7	<0.1	<0.1	<0.1	<0.1	0.7	<0.1	<0.1	5.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	1.1	<0.1	<0.1	<0.1	5.1	0.37	0.6	0.87		1.5	1.1	1.9	0.52	1.1	1.1	1.2	
Selenium	0.01	0.001	0.003	<0.002			<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002		<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002		<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	
Silicon		5.13		4.28			4.3	4.1	4.1	4.4	4.6	4.3	4.7	4.7	5	5	4.2	4.3	4.9	3.7	4.4		5.5	4.9	5.2	5.3	5	4.7	4.4	5.2	4.3		3.4	5.1	4.4	5.2	4.3	5.5	4.4	
Silver				<0.00007			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.00061		<0.0001	0.00029	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001									
Strontium		0.058		0.182			0.079	0.091	0.078	0.09	0.11	0.094	0.1	0.12	0.15	0.14	0.095	0.083	0.16	0.079	0.11		0.38	0.23	0.23	0.31	0.25	0.2	0.16	0.22	0.23		0.07	0.19	0.15	0.25	0.18	0.3	0.14	
Thallium		0.000025					<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005		<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005		<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	
Tin		0.0005		0.003			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Titanium				0.008			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005									
Vanadium		0.0005		0.0017			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005	0.0006		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.00067	<0.0005	<0.0005	<0.0005		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	
Zinc	5	0.003	2.5	0.003			0.015	0.011	0.006	0.008	0.01	<0.005	0.008	0.012	0.007	<0.005	0.014	0.009	<0.005	0.011	0.013		<0.005	<0.005	<0.005	0.0071	<0.005	0.0082	<0.005	<0.005	<0.005		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0058	
VOCs																																								
Benzene	0.005						<0.0001		<0.0001			<0.0001			<0.0001			<0.0001			<0.00025						<0.0001			<0.0001			<0.0001		<0.0001			
1,4-Dichlorobenzene	0.005						<0.0002		<0.0002			<0.0002			<0.0002			<0.0002			<0.0005		<0.0005				<0.0002			<0.0002			<0.0002		<0.0002			
Dichloromethane	0.05						<0.0005		<0.0005			<0.0005			<0.0005			<0.0005			<0.0013		<0.002				<0.0005			<0.0005			<0.0005		<0.0005			
Toluene	0.024						<0.0002		0.0002			<0.0002			<0.0002			<0.0002			<0.0005		<0.0002				<0.0002			<0.0002			<0.0002		<0.0002			
Vinyl Chloride	0.02						<0.0002		<0.0002			<0.0002			<0.0002			<0.0002			<0.0005		<0.0002				<0.0002			<0.0002			<0.0002		<0.0002			

THB-00006196-PE - Longlac Landfill

Table 3 (cont'd): Groundwater Data[1]

Parameter	ODWS[2]	2018-2020 Background[3]	2018-2020 B-7[4]	MW9																																								
				May-97	Aug-06	Nov-06	Nov-07	Jun-08	Aug-08	Aug-08**	Oct-08	Oct-08**	Jun-09	Aug-09	Aug-09*	Oct-09	Jun-10	Jun-10*	Oct-10	Oct-10*	May-11	May-11*	Oct-11	Oct-11*	May-12	May-12*	Oct-12	Oct-12*	May-13	May-13*	Oct-13	May-14	Oct-14	May-15	Oct-15	May-16	Oct-16	May-17	Sep-17	May-18	Oct-18	May-19	Oct-19	May-20	Sep-20
General																																													
pH	6.5 to 8.5	7.9		7.9	8.1	8.1	8	8.2	8.2	8.2	8.1	8	7.9	7.9	7.9	No	7.9	7.9	7.95	7.97	8.13	8.09	8.05	8.08	8.03	8.06	7.85	7.92	7.95	8.08	7.83	8.08	7.99	8	7.84	7.97	7.86	8.1	7.95	7.93	7.85	8.06	7.93	7.95	No
Field pH					7.64	7.82		7.64	7.44	7.44	7.59	7.59	7.33	7.65	7.65	Sample	7.15	--	7.78	--	7.46	--	7.18	--	7.37	--	7.08	--	7.28		7.82	7.39	7.89	7.31	7.63	7.57	7.6	8.13	7.63	7.79	4.65	7.82	8.05	7.61	Sample
Conductivity		460		276	461	635	581	541	486	487	472	480	571	477	482		627	628	508	507	493	490	517	521	630	620	520	510	530	530	510	460	530	520	510	530	490	520	540	610	550	450	590	510	Dry
Field Conductivity					480	599		554	460	460	488	488	583	442	442		635	--	524	--	495	--	487	--	612	--	462	--	465		447	445	599	596	559	559	495	587	572	555	528	442	357	355	Well
Field Temperature					14.9	7.4		10.5	14.3	14.3	9.3	9.3	13.2	13	13		8.4	--	8	--	6.4	--	11.4	--	9.1	--	10.4	--	5.4		9.4	4.7	7.9	9.8	2.8	7.6	12.8	6.9	13.9	13.2	4.8	5.3	9.7	6.3	
TDS	500	258	379	180	295	432	370	382	320	320	300	270	380	310	310		412	420	322	320	308	310	320	326	328	330	314	320	278	270	250	266	304	306	254	358	272	284	270	360	305	280	350	370	
TSS							4,000	3,700				1,500	1,700		790	590									350	380			960	580	490	410	120	400	160	1100									
Hardness (as $CaCO_3$)	80 to 100	**245**	245*	**132**	**270**	**350**	**380**	**300**	**250**	**260**	**260**	**260**	**330**	**260**	**250**		**350**	**350**			**290**	**290**	**280**	**280**	**330**	**320**	**280**	**270**	**300**	**280**	**270**	**270**	**280**	**290**	**260**	**280**	**250**	**300**	**280**	**280**	**290**	**260**	**320**	**300**	
Organics																																													
DOC	5	3.4	4.21	1	3	2.2	2	2.3	1.7	1.5	1.3	1.1	1.7	0.8	1		2	2	0.7	0.8	1	1.1	1.1	1.1	1.6	1.5	1.1	1.1	1.4	1.3	0.8	2	1.3	1.2	1.1	1.3	1.1	1	1.1	1.4	1.1	0.93	0.94	1.0	
BOD							<2	<2	<2	<2	<2	<2		<2	<2										<2	<2			<2	<2	<2	<2	<2	<2.0	<2.0	<2.0	0								
COD		9.7					<4	8	<4	<4	7	15	29	8	11		29	31	<4	5	--	17	18	16	7.5	8.3	6.3	4.2	8.4	6.9	<4.0	6.1	<4.0	4.8	4.2	11	15	<4.0	11	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	
Phenols		0.0005		<0.001	<0.001		<0.001		<0.001	<0.001				<0.001	<0.001		<0.001	<0.001	<0.001	<0.001	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
TKN		0.23		0.18	0.4		2	1.3	1	1.2	0.8	1.1	2.7	1.2	1		5	2	1.3	0.9	--	4	0.9	0.9	0.43	0.26	0.41	0.78	<0.5	0.75	0.81	0.67	0.46	1.1	0.18	<0.50	0.12	0.41	0.36	<0.10	0.29	0.15	0.29	0.52	
Ammonia-N		0.06		0.02	0.13	0.14	0.07	0.07	<0.05	<0.05	0.18	0.07	0.09	<0.05	<0.05		0.13	0.15	<0.05	<0.05	0.1	0.1	<0.05	<0.05	<0.05	<0.05	0.2	0.074	0.073	0.085	<0.05	<0.05	0.065	<0.050	<0.050	0.063	<0.050	<0.050	<0.050	<0.050	0.058	<0.050	<0.050	<0.050	0.058	
Organic Nitrogen	0.15	**0.19**	0.19*	**0.16**	**0.27**		**1.93**	**1.23**	**1**	**1.2**	**0.62**	**1.03**	**2.61**	**1.2**	**1**		**4.87**	**1.85**	**1.275**	**0.875**	**1.9**	**3.9**	**0.9**	**0.9**	**0.405**	**0.235**	**0.21**	**0.706**		**0.67**	**0.79**	**0.7**	**0.4**	**1.1**	**0.18**	<0.10	0.12	**0.41**	**0.36**	<0.10	**0.23**	0.15	**0.29**	**0.46**	
Cations (mg/L)																																												
Calcium		73.67		39.2	85	110	120	93	80	83	80	82	100	84	81		110	110	83	85	90	91	89	89	100	100	89	86	92	87	87	82	89	91	82	88	79	92	88	88	91	82	100	94	
Magnesium		14.8		8.28	15	20	22	17	13	14	14	14	18	12	11		19	18	14	14	15	16	15	15	18	17	14	14	16	15	14	15	15	14	13	15	13	16	15	15	14	13	16	15	
Potassium		0.42		0.6	0.52	1.2	0.61	1.4	0.47	0.48	0.67	0.69	0.56	0.42	0.38		1.1	1.1	1.1	1.1	0.54	0.55	0.71	0.7	0.61	0.58	0.78	0.64	0.58	0.56	0.63	0.51	0.62	0.54	0.9	0.63	0.86	0.49	0.68	0.49	0.83	0.44	0.68	0.58	
Sodium	200	1.75	101	2.9	3.3	6.4	2.1	5.3	2.5	2.5	2.2	2.3	2.6	2.2	2		2.3	2.3	1.7	1.7	2.1	2.1	2	2	2.9	3	1.8	1.5	2.1	2	1.3	1.6	1.4	1.8	1.7	1.6	1.6	1.9	2.1	1.5	1.8	1.3	1.6	1.7	
Anions (mg/L)																																												
Chloride	250	2.07	126	3.7	1	2	<1	2	1	<1	<1	<1	2	1	2		2	2	1	1	1	<1	2	2	2	2	1	1	2	2	1	2	2	4	2.6	3.6	1.8	5.4	3.5	7.6	2.7	1.8	4.2	3.1	
Nitrate	10	0.15	2.61	0.5	2.4	2.6	3.2	5.2	0.7	0.7	1.8	1.8	4.9	2	2		5.2	5.2	0.4	0.4	1.7	1.7	4	4	3.5	3.4	2.4	2.5	1.5	1.5	2	3.16	3.04	2.97	0.86	2.89	0.11	1.7	3.21	4.05	1.73	1.03	1.66	1.37	
Nitrite	1	0.005	0.26	<0.2	0.26		<0.01	<0.01	0.02	0.01	<0.01	<0.01	<0.01	0.01	0.01		<0.01	<0.01	0.02	0.02	0.03	<0.01	<0.01	<0.01	0.013	<0.01	0.098	0.091	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	
Orthophosphate		0.005			<0.01		<0.01		<0.01	<0.01																			--	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	
Phosphate		0.51		<1																									--	--	--			0.17	0.067						0.18				
Sulphate	500	0.85	250	6.4	7	33	13	15	6	6	8	8	19	14	14		20	21	6	6	8	8	13	13	21	21	9	9	9	9	6	12	16	16	16	18	8	17	29	38	25	10	27	27	
Alkalinity as $CaCO_3$	30-500	245	373	132	260	322	293	260	258	260	248	249	272	249	248		299	298	271	268	247	245	247	250	300	290	260	260	260	260	280	220	270	250	250	260	260	250	260	280	270	220	270	240	
Ion Balance (%)		3.73		1.64	0.758	0.25	9.52	3.32	1.68	0.04	0.21	1.13	3.42	1.69	3.04		2.4	2.71	2.31	0.71	5.57	6.99	1.92	1.22	0.41	0.07	0.41	0.47	3.27	5.91	2.45	3.58	1.9		1.27	1.53		3.62		9.97	2.65	3.83	0.97	4.94	
Metals (mg/L) - Dissolved																																												
Aluminum	0.1	0.0146	0.057	**0.161**	0.01	<0.005	**0.29**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0088	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0073	
Antimony	0.006	0.00025	0.003	<0.0005		<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	
Arsenic	0.025	0.0005	0.0066	<0.002	<.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Barium	1	0.0153	0.26	0.005	0.012	0.016	0.019	0.013	0.011	0.011	0.01	0.011	0.013	0.012	0.011		0.015	0.015	0.015	0.014	0.012	0.012	0.013	0.014	0.015	0.014	0.013	0.013	0.012	0.011	0.012	0.0095	0.013	0.011	0.013	0.012	0.012	0.012	0.015	0.01	0.015	0.0095	0.013	0.013	
Beryllium	1.1	0.00024	0.28	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	
Bismuth		0.0005			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Boron	5	0.006	1.25	0.008	0.017	0.037	0.018	0.023	0.017	0.016	0.021	0.015	0.039	0.026	0.038		0.033	0.035	0.037	0.031	0.031	0.03	0.038	0.044	0.036	0.042	0.027	0.02	0.047	0.033	0.018	0.02	0.019	0.039	0.016	0.033	0.042	0.031	0.032	0.028	0.044	0.032	0.033	0.03	
Cadmium	0.005	0.00005	0.0013	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.002	<0.0001	<0.0001		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Chromium	0.05	0.0025	0.014	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
Cobalt		0.00025		<0.0001	<0.0005	0.0025	0.0011	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0012	0.0012	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00050	<0.0005	<0.0005	
Copper	1	0.0044	0.5	0.0013	0.002	0.002	0.004	0.007	0.002	0.002	0.003	0.003	0.004	0.002	0.002		0.002	0.003	<0.001	<0.001	0.001	0.001	0.001	0.001	0.0015	0.0011	<0.001	<0.001	0.0011	<0.001	<0.001	0.0032	<0.001	0.001	0.0012	0.001	<0.001	<0.001	<0.001	0.0012	<0.001	0.0011	<0.001	0.0017	
Iron	0.3	0.072	0.19	0.08	<0.05	<0.050	**0.34**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
Lead	0.01	0.00025	0.0027	0.0007	<0.0005	<0.0005	0.00008	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	
Manganese	0.05	0.0216	0.036	<0.005	0.006	**0.34**	**0.057**	<0.002	0.035	0.036	<0.002	<0.002	<0.002	<0.002	<0.002		<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	**0.32**	**0.31**	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	**0.054**	<0.002	**0.08**	<0.002	<0.002	<0.002	0.024	<0.002	0.0021	<0.002	
Mercury	0.001	0.00005	0.0003		<0.0001		<0.0001		<0.0001	<0.0001				<0.0001	<0.0001		0.0002	0.0001											--	--	<0.0001	<0.0001	<0.0001	<0.00010	<0.00010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Molybdenum		0.0003		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	
Nickel		0.0005		<0.001	<0.001	0.003	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Phosphorus[7]		0.49		<0.05	<0.05	<0.050	1.8	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.3	0.4		<0.1	<0.1	<0.1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.17	0.6	0.94	0.92	0.49	0.17	0.15	0.18	0.83	0.12	1.5	
Selenium	0.01	0.001	0.003	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002		<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	
Silicon		5.13		2.72	4.9	4.9	5.2	4.7	4.6	4.8	4.3	4.5	4.3	4.3	4		4.6	4.6	4.3	4.3	4.2	4.3	4.6	4.8	4.8	4.6	4.6	4.5	4	4	4.4	3.7	4	4	4.4	3.8	4.6	3.8	4.5	3.5	4.4	3.4	4.3	3.8	
Silver				<0.00007	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.1	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Strontium		0.058		0.0349	0.067	0.09	0.084	0.085	0.06	0.062	0.06	0.068	0.081	0.064	0.0062		0.081	0.081	0.068	0.068	0.067	0.066	0.075	0.076	0.084	0.085	0.07	0.069	0.076	0.067	0.066	0.066	0.074	0.068	0.07	0.071	0.065	0.073	0.078	0.067	0.076	0.058	0.077	0.07	
Thallium		0.000025			<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.00011	<0.00005	<0.00005		<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	
Tin		0.0005		<0.001			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Titanium				<0.005	<0.005	<0.005	0.007	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005								
Vanadium		0.0005		0.0007	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.00054	<0.0005	0.00069	<0.0005	<0.0005	<0.0005	<0.0005	0.00051	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	
Zinc	5	0.003	2.5	<0.002	0.008	0.015	0.008	0.013	<0.005	<0.005	0.005	0.006	0.008	<0.005	<0.005		0.008	<0.005	0.006	0.007	0.01	0.009	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
VOCs																																												
Benzene	0.005						<0.0001		<0.0001	<0.0001				<0.0001	<0.0001																															
1,4-Dichlorobenzene	0.005						<0.0002		<0.0002	<0.0002				<0.0002	<0.0002																															
Dichloromethane	0.05						<0.0005		<0.0005	<0.0005				<0.0005	<0.0005																															
Toluene	0.024						<0.0002		<0.0002	<0.0002				<0.0002	<0.0002																															
Vinyl Chloride	0.02						<0.0002		<0.0002	<0.0002				<0.0002	<0.0002																															

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Table 3 (cont'd): Groundwater Data[1]

Parameter	ODWS[2]	2018-2020 Background[3]	2018-2020 B-7[4]	MW10																								
				Aug-08	Oct-08	Jun-09	Aug-09	Oct-09	Jun-10	Oct-10	May-11	Oct-11	May-12	Oct-12	May-13	Oct-13	May-14	Oct-14	May-15	Oct-15	May-16	Oct-16	May-17	Sep-17	May-18	Oct-18	May-19	Oct-19	May-20	Sep-20
General																												
pH	6.5 to 8.5	7.9		8.2	8.1	7.9	7.8	No	7.9	7.9	8	8.08	8.01	7.75	7.94	7.63	8.01	7.94	7.96	7.99	7.99	7.77	8.17	7.93	7.84	7.85	7.83	7.87	8.08	7.91
Field pH				7.48	7.75	7.29	7.33	Sample	7.16	7.41	7.46	7.27	7.34	7.18	7.32	7.26	7.25	7.41	7.22	7.61	7.51	7.57	7.85	7.68	7.46	4.23	7.81	8.46	7.27	7.06
Conductivity		460		563	546	517	532		488	522	506	563	530	550	470	560	470	540	540	530	450	490	480	460	480	440	440	500	430	470
Field Conductivity					548	464	484		482	494	495	531	498	500	432	459	414	562	543	526	490	479	466	442	453	417	428	319	360	456
Field Temperature				9.8	6.6	11.2	12		8.2	7.4	6.4	9.2	7.4	9	8.8	8	5.9	10.5	10.4	6.2	12.1	8.1	9.3	12.2	9.2	3.7	10.8	3.7	6.4	8.5
TDS	500	258	379	360	340	380	340		320	338	290	332	264	306	250	266	274	300	282	290	334	274	266	205	285	195	275	260	285	245
TSS					1,400		980						2,200		1,800	1,400	4,500	1,800	2600	2000	1500									
Hardness (as $CaCO_3$)	80 to 100	**245**	245*	**320**	**290**	**290**	**300**		**270**		**290**	**310**	**260**	**290**	**250**	**320**	**260**	**280**	**290**	**270**	**230**	**250**	**290**	**230**	**230**	**220**	**270**	**270**	**230**	**250**
Organics																														
DOC	5	3.4	4.21	4.8	3.4	2.7	2.7		3.6	3	2.6	2.3	3.1	2.9	4.2	2.4	3.2	3.5	2.7	2.6	3.5	3.2	2.9	3.2	3	4.9	2.9	2.8	3.1	3.8
BOD				<2	<2		<2						<2		<2	<2	<2	<2	<2.0	<2.0	<2.0									
COD		9.7		8	18	9	14		22	12	14	19	19	12	19	18	12	22	15	10	14	13	8.4	10	13	12	6.3	8.8	8.7	9.4
Phenols		0.0005		<0.001			<0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0011	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
TKN		0.23		1.5	0.8	1.2	0.9		<2	1.1	2	0.7	0.39	0.61	1.3	2	1.5	1.2	0.91	0.17	0.49	0.2	0.28	0.15	0.19	0.23	0.18	0.17	0.37	0.26
Ammonia-N		0.06		0.09	0.07	<0.05	<0.05		0.09	<0.05	0.09	<0.05	<0.05	0.16	0.085	<0.05	0.066	0.11	0.082	<0.050	<0.050	0.076	<0.050	<0.050	0.085	0.11	<0.050	<0.050	0.068	<0.050
Organic Nitrogen	0.15	**0.19**	0.19*	**1.41**	**0.73**	**1.2**	**0.9**		**0.91**	**1.075**	**1.91**	**0.7**	**0.365**	**0.45**	**1.215**	**1.975**	**1.4**	**1.1**	**0.83**	**0.17**	**0.49**	0.12	**0.28**	0.15	0.11	0.12	**0.18**	**0.17**	**0.31**	**0.26**
Cations (mg/L)																														
Calcium		73.67		92	85	84	90		81	87	85	91	78	87	75	94	77	82	86	80	67	74	83	69	68	65	82	81	70	76
Magnesium		14.8		21	20	18	18		16	18	18	20	17	19	15	20	17	17	19	18	14	16	20	15	14	13	16	17	14	15
Potassium		0.42		1	0.57	0.44	0.37		0.36	0.43	0.41	0.47	0.36	0.42	0.26	0.54	0.3	0.43	0.47	0.41	0.4	0.35	0.48	0.34	0.53	0.27	0.41	0.43	0.54	0.32
Sodium	200	1.75	101	4.3	2.4	2	2.1		1.9	2	2.1	2.3	1.9	2.1	1.7	2.2	1.8	2	2.1	2.1	1.7	1.8	2.2	1.7	1.7	1.6	1.8	2.0	1.6	1.8
Anions (mg/L)																														
Chloride	250	2.07	126	1	1	2	1		1	1	1	2	1	2	2	2	2	2	3	2.1	2.5	2	1.8	2	1.8	2.5	1.6	2.1	2.0	2.4
Nitrate	10	0.15	2.61	0.6	0.5	0.5	0.6		0.4	0.4	0.4	0.7	0.47	0.42	0.24	0.62	0.24	0.41	0.43	0.29	0.2	0.2	0.25	0.22	0.19	<0.10	0.17	0.19	0.15	0.14
Nitrite	1	0.005	0.26	0.01	<0.01	<0.01	<0.01		<0.01	<0.01	<0.01	<0.01	0.016	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Orthophosphate		0.005		<0.01			<0.01								<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010		<0.010	0.011	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Phosphate		0.51												--	--	--			1.3	0.43						0.51				
Sulphate	500	0.85	250	5	5	5	6		4	5	4	6	5	5	3	5	3	5	5	3.6	<1.0	1.4	1	<1.0	1.3	<1.0	<1.0	<1.0	1.0	1.3
Alkalinity as $CaCO_3$	30-500	245	373	305	303	277	294		258	279	264	301	280	290	240	300	250	290	290	280	240	260	250	250	260	240	230	260	230	250
Ion Balance (%)		3.73		2.17	2.05	0.74	0.2		1.43	1.56	3.58	0.42	3.44	0.03	1.52	1.49	1.02	2.72		1.8	2.65		6.69		6.89	4.37	7.62	2.61	0.85	0.02
Metals (mg/L) - Dissolved																														
Aluminum	0.1	0.0146	0.057	<0.005	<0.005	<0.005	<0.05		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.01	<0.005	<0.005	<0.005	<0.005	0.0062	<0.005	<0.005	<0.005	0.0079	<0.005	<0.005	0.067	0.0049
Antimony	0.006	0.00025	0.003	<0.0005	<0.0005	<0.0005	<0.0005		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Arsenic	0.025	0.0005	0.0066	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Barium	1	0.0153	0.26	0.027	0.025	0.022	0.023		0.015	0.021	0.019	0.023	0.015	0.021	0.014	0.022	0.014	0.019	0.018	0.02	0.014	0.015	0.019	0.015	0.013	0.014	0.016	0.019	0.015	0.015
Beryllium	1.1	0.00024	0.28	<0.0005	<0.0005	<0.0005	<0.0005		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0004
Bismuth		0.0005		<0.001	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	5	0.006	1.25	<0.01	<0.01	<0.01	<0.01		<0.01	<0.01	<0.01	0.014	<0.01	<0.01	<0.01	<0.01	`	<0.01	0.011	<0.01	<0.01	0.015	<0.01	<0.01	<0.01	0.011	<0.010	<0.010	<0.01	<0.01
Cadmium	0.005	0.00005	0.0013	<0.0001	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00009
Chromium	0.05	0.0025	0.014	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Cobalt		0.00025		0.001	0.001	<0.005	<0.0005		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.005	<0.005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00050	<0.0005	<0.0005	<0.0005
Copper	1	0.0044	0.5	0.005	0.004	0.005	0.005		0.007	0.003	0.003	0.003	0.0044	0.0048	0.004	0.0028	0.0031	0.0033	0.0025	0.0035	0.004	0.0038	0.0024	0.0038	0.0041	0.0061	0.003	0.0025	0.0074	0.0034
Iron	0.3	0.072	0.19	<0.1	<0.1	<0.1	<0.01		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.11	<0.1	<0.1	0.12	<0.1
Lead	0.01	0.00025	0.0027	<0.0005	<0.0005	<0.0005	<0.0005		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Manganese	0.05	0.0216	0.036	**0.37**	**0.27**	**0.098**	**0.11**		0.007	0.041	0.011	0.026	0.0069	0.034	0.0098	0.0044	**0.06**	0.029	0.0055	<0.002	0.0029	0.0037	<0.002	0.0032	0.0073	0.0051	0.0032	0.033	**0.054**	0.027
Mercury	0.001	0.00005	0.0003	<0.0001			<0.001		<0.0001							<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum		0.0003		0.001	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001	0.0006	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0006	<0.0005	0.00057	0.00055	0.00055	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Nickel		0.0005		<0.001	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Phosphorus[7]		0.49		<0.1	<0.1	<0.1	0.6		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	1.3	0.43	0.5	0.74	0.61	0.18	0.48	0.51	0.27	0.5	0.93	0.25
Selenium	0.01	0.001	0.003	<0.002	<0.002	<0.002	<0.002		<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Silicon		5.13		6.1	5.9	5.8	5.4		5.2	6	5.4	6.2	5.3	5.8	4.6	6.4	5	5.5	5.7	5.7	4.5	5.1	5.8	5.3	4.6	5	5.5	5.7	5	5
Silver				<0.0001	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		<0.0001							
Strontium		0.058		0.084	0.077	0.068	0.073		0.059	0.066	0.066	0.078	0.064	0.073	0.064	0.075	0.063	0.071	0.069	0.07	0.056	0.062	0.069	0.06	0.056	0.055	0.062	0.06	0.054	0.061
Thallium		0.000025		<0.00005	<0.00005	<0.00005	<0.00005		<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Tin		0.0005		<0.001	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Titanium				<0.005	<0.005	<0.005	<0.005		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005									
Vanadium		0.0005		<0.001	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001	0.0006	<0.0005	0.00073	<0.0005	0.00079	<0.0005	0.00091	0.0005	<0.0005	<0.0005	0.00053	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.00085	0.00065	0.00053
Zinc	5	0.003	2.5	0.008	0.005	0.008	0.007		0.01	0.008	<0.005	0.016	<0.005	0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.015	0.009	<0.005	<0.005	<0.005	<0.005	<0.005	0.0054	<0.005
VOCs																														
Benzene	0.005			<0.0001			<0.0001																							
1,4-Dichlorobenzene	0.005			<0.0002			<0.0002																							
Dichloromethane	0.05			<0.0005			<0.0005																							
Toluene	0.024			<0.0002			<0.0002																							
Vinyl Chloride	0.02			<0.0002			<0.0002																							

THB-00006196-PE - Longlac Landfill

Table 3 (cont'd): Groundwater Data[1]

Parameter	ODWS[2]	2018-2020 Background[3]	2018-2020 B-7[4]	MW11-I																							
				Oct-09	Oct-09**	Jun-10	Oct-10	May-11	Oct-11	May-12	Oct-12	May-13	Oct-13	May-14	Oct-14	May-15	Oct-15	May-16	Oct-16	May-17	Sep-17	May-18	Oct-18	May-19	Oct-19	May-20	Sep-20
General																											
pH	6.5 to 8.5	7.9		7.7	7.7	7.8	7.8	7.68	7.84	7.88	7.73	7.79	FROZEN	7.76	7.8	7.77	7.74	7.76	7.67	7.76	7.73	7.54	7.67	7.78	7.65	7.74	7.78
Field pH				7.15	--	6.92	7.03	6.87	6.96	7.25	7.08	7.43		6.8	7.22	6.99	7.28	7.16	7.28	7.38	7.35	6.87	7.62	7.26	6.82	7.59	6.81
Conductivity		460		1,500	1,490	1,510	1,510	1,510	1,460	1,300	1,400	1,400		1,400	1,400	1,500	1,500	1,400	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500
Field Conductivity				1,335	--	1,544	1,333	1,355	1,338	1,146	1,197	1,120		1,033	1,547	1,505	1,421	1,336	1,430	1,405	1,326	1,275	1,449	1,296	642	651	1,421
Field Temperature				2.4	--	4.9	2.9	4.6	4.5	4.6	4.2	5.1		5.3	7	7.9	3.8	7	4.9	4.7	6.3	10.1	2.8	5.2	4.8	2.8	4.9
TDS	500	258	379	**915**	**948**	**950**	**925**	**952**	**968**	**836**	**910**	**892**		**944**	**882**	**930**	**892**	**896**	**880**	**888**	**840**	**880**	**875**	**915**	**885**	**880**	**880**
TSS				3,800	2,500					83,000		29,000		18,000	13,000	32000	88000	9000									
Hardness (as $CaCO_3$)	80 to 100	**245**	245*	**700**		**750**		**710**	**710**	**640**	**680**	**630**		**700**	**630**	**680**	**620**	**610**	**650**	**690**	**690**	**670**	**670**	**710**	**680**	**930**	**690**
Organics																											
DOC	5	3.4	4.21	**5.2**	5	**6.5**	**5.1**	**5.2**	**5.3**	**5.6**	**6.2**	**5.9**		**6.9**	**6.3**	**5.3**	**5.7**	**5.5**	**5.8**	**5.9**	**5.7**	**6.2**	**6.1**	**5.9**	**6.3**	**5.9**	**6.1**
BOD				<2	<2					<2		<2		<2	<2	<2.0	<2.0	<2.0									
COD		9.7		23	28	190	360	130	70	69	43	24		45	220	65	51	42	34	18	18	15	20	12	20	21	21
Phenols		0.0005				<0.001	<0.001	<0.001	0.002	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
TKN		0.23		<1	1	3	10	10	8	1.6	1.3	6.3		11	14	1.1	0.69	0.45	0.13	0.26	0.52	0.25	0.42	0.39	0.33	0.36	0.54
Ammonia-N		0.06		0.08	0.07	0.18	0.23	0.16	0.11	0.11	0.19	0.11		0.12	0.16	0.069	<0.050	0.086	0.067	0.054	<0.050	0.14	0.23	<0.050	0.074	0.071	0.066
Organic Nitrogen	0.15	**0.19**	0.19*	<1	**0.93**	**2.82**	**9.77**	**9.84**	**7.89**	**1.49**	**1.11**	**6.19**		**11.2**	**14**	**1**	**0.69**	**0.36**	<0.10	**0.21**	**0.52**	0.11	**0.19**	**0.39**	**0.26**	**0.29**	**0.47**
Cations (mg/L)																											
Calcium		73.67		210		220	200	210	210	190	200	190		210	190	200	180	180	190	200	210	200	190	210	200	270	200
Magnesium		14.8		44		47	42	44	45	41	44	39		45	39	42	40	39	42	44	42	43	44	43	45	64	44
Potassium		0.42		3.6		3.8	3.9	3.7	3.6	3.1	3.4	3.2		3.7	3.3	3.6	3.4	3.3	3.7	3.7	3.8	3.8	4.1	3.8	3.6	4	3.6
Sodium	200	1.75	101	57		63	61	66	73	45	69	38		70	65	71	70	55	72	74	73	74	76	77	78	78	67
Anions (mg/L)																											
Chloride	250	2.07	126	150	150	140	130	130	120	100	110	110		110	110	110	110	110	110	120	120	120	120	120	120	120	120
Nitrate	10	0.15	2.61	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	<0.1	<0.1	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite	1	0.005	0.26	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01		<0.01	<0.01	<0.01	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Orthophosphate		0.005												<0.01	<0.01	<0.01	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.011	<0.010	<0.010
Phosphate		0.51														8.3	15						4.4				
Sulphate	500	0.85	250	130	130	130	130	120	120	110	110	110		110	120	110	110	100	110	110	110	100	97	100	96	93	97
Alkalinity as $CaCO_3$	30-500	245	373	477	476	485	**504**	**506**	492	410	460	480		490	**520**	**540**	**530**	**520**	**550**	**540**	**560**	**620**	**580**	**540**	**570**	**590**	**560**
Ion Balance (%)		3.73		0.44	1.93	4.39	0.96	3.1	5.14	4.45	7.11	2.21		6.26	1.56		1.47	2.68		2.37		2.86	0.1	4.42	1.29	13.6	0.69
Metals (mg/L) - Dissolved																											
Aluminum	0.1	0.0146	0.057	<0.005		<0.005	<0.005	0.01	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0076	<0.005	0.0062	<0.005	<0.005	<0.005	**0.54**	0.011
Antimony	0.006	0.00025	0.003	<0.0005		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Arsenic	0.025	0.0005	0.0066	<0.001		<0.001	0.002	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Barium	1	0.0153	0.26	0.14		0.13	0.18	0.13	0.13	0.11	0.13	0.1		0.12	0.11	0.11	0.1	0.11	0.11	0.11	0.11	0.11	0.13	0.12	0.12	0.11	0.11
Beryllium	1.1	0.00024	0.28	<0.0005		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0004
Bismuth		0.0005		<0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	5	0.006	1.25	0.026		0.038	0.061	0.073	0.095	0.035	0.087	0.038		0.094	0.12	0.13	0.12	0.092	0.16	0.15	0.16	0.16	0.17	0.18	0.19	0.19	0.13
Cadmium	0.005	0.00005	0.0013	<0.0001		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00009
Chromium	0.05	0.0025	0.014	<0.005		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Cobalt		0.00025		<0.0005		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00050	<0.0005	0.00065	<0.0005
Copper	1	0.0044	0.5	<0.001		0.002	<0.001	0.004	0.001	<0.001	0.0013	<0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0023	<0.001	0.002	<0.0009
Iron	0.3	0.072	0.19	**2**		**2.4**	**1.3**	**2.3**	**2.4**	**1.8**	**2.2**	**1.7**		**2.3**	**2.2**	**2.4**	**2.2**	**2.2**	**2.7**	**2.7**	**2.8**	**2.8**	**2.8**	**2.8**	**2.9**	**4.0**	**2.7**
Lead	0.01	0.00025	0.0027	<0.0005		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.001	<0.0005
Manganese	0.05	0.0216	0.036	**0.15**		**0.14**	**0.14**	**0.13**	**0.14**	**0.13**	**0.13**	**0.13**		**0.13**	**0.12**	**0.11**	**0.11**	**0.12**	**0.11**	**0.11**	**0.11**	**0.11**	**0.12**	**0.11**	**0.11**	**0.21**	**0.11**
Mercury	0.001	0.00005	0.0003			0.0005								<0.0001	<0.0001	<0.00010	<0.00010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum		0.0003		<0.001		<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Nickel		0.0005		<0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001	0.0015	0.0013	0.0013	0.0016	0.0031	0.002	0.0022	0.0021	0.0022	0.0022	0.0036	0.0019
Phosphorus[7]		0.49		<0.1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	<0.1	8.3	15	4.4	4.5	4.5	3.5	2.8	4.4	0.61	0.21	0.66	2.7
Selenium	0.01	0.001	0.003	<0.002		<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002		<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Silicon		5.13		6.3		7	6	6.3	6.2	6.9	5.9	6.4		6.4	5.6	5.9	5.6	5.8	5.5	5.9	5.8	5.8	5.8	5.9	5.9	6.8	6.1
Silver				<0.0001		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		<0.0001							
Strontium		0.058		0.22		0.23	0.23	0.22	0.24	0.22	0.22	0.22		0.22	0.21	0.21	0.21	0.21	0.21	0.22	0.21	0.22	0.23	0.22	0.21	0.25	0.21
Thallium		0.000025		<0.00005		<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005		<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Tin		0.0005		<0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Titanium				<0.005		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005	<0.005	<0.005	<0.005									
Vanadium		0.0005		<0.001		<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0023	<0.0005
Zinc	5	0.003	2.5	<0.005		0.006	0.006	<0.005	0.008	0.0063	0.0062	<0.005		0.0055	<0.005	<0.005	<0.005	<0.005	<0.005	0.015	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
VOCs																											
Benzene	0.005																										
1,4-Dichlorobenzene	0.005																										
Dichloromethane	0.05																										
Toluene	0.024																										
Vinyl Chloride	0.02																										

THB-00006196-PE - Longlac Landfill

Table 3 (cont'd): Groundwater Data[1]

Parameter	ODWS[2]	2018-2020 Background[3]	2018-2020 B-7[4]	MW11-II																					
				Oct-09	Jun-10	Oct-10	May-11	Oct-11	May-12	Oct-12	May-13	Oct-13	May-14	Oct-14	May-15	Oct-15	May-16	Oct-16	May-17	Sep-17	May-18	Oct-18	May-19	Oct-19	May-20	Sep-20
General																									
pH	6.5 to 8.5	7.9		7.7	7.9	7.87	7.89	7.95	7.91	7.79	7.76	FROZEN	7.86	7.87	7.84	7.75	7.79	7.75	7.84	7.81	7.83	7.81	7.78	7.81	7.84	7.77
Field pH				7.29	7.22	7.3	7.09	7.11	7.36	6.95	7.2		6.85	7.38	7	7.56	7.29	7.4	7.5	7.19	6.9	7.59	7.34	7.24	7.59	6.92
Conductivity		460		1,090	1,000	1,040	1,060	1,030	960	1,000	1,100		1,200	1,200	1,200	1,200	1,200	1,200	1,300	1,200	1,300	1,300	1,300	1,300	1,300	1,200
Field Conductivity				974	1,018	956	1,003	954	871	830	890		805	1,255	1,345	1,147	1,234	1,140	1,226	1,056	990	768	1,076	589	651	1,130
Field Temperature				3.1	4.1	2.9	3.8	4.1	5.5	4.4	5.8		4.7	5.7	7	4	7.2	5.3	4.5	6.6	10.5	2.2	5.1	0.5	2.8	7.0
TDS	500	258	379	**713**	**660**	**658**	**680**	**690**	**588**	**732**	**700**		**840**	**740**	**788**	**708**	**882**	**690**	**812**	**755**	**755**	**800**	**820**	**755**	**785**	**740**
TSS				30,000					8,200	--	--		24,000	14,000	42000	82000	22000									
Hardness (as $CaCO_3$)	80 to 100	**245**	245*	**540**	**530**		**550**	**520**	**510**	**510**	**520**		**610**	**560**	**610**	**530**	**620**	**560**	**640**	**570**	**560**	**580**	**620**	**620**	**610**	**600**
Organics																										
DOC	5	3.4	4.21	3.7	4	3.3	3.5	3.4	3.6	3.8	**7.3**		4.5	4.6	4.2	4	**5.3**	4.6	4.7	4.2	4.5	4.7	4.6	4.6	4.5	4.4
BOD				<2					<2		<2		<2	<2	<2.0	<2.0	<2.0									
COD		9.7		180	190	160	290	100	58	90	280		1200	7.1	200	150	86	440	15	19	10	18	12	7.5	12	11
Phenols		0.0005			<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
TKN		0.23		5	4	7	11	7	1.3	2.5	6.1		10	4.3	<1.0	0.66	0.6	<0.20	0.87	0.47	0.88	0.31	0.42	0.56	0.4	0.26
Ammonia-N		0.06		0.18	0.26	0.15	0.15	0.16	0.21	0.33	0.3		0.12	0.16	0.11	0.054	0.12	0.094	0.12	0.11	0.24	0.24	0.11	0.2	0.14	0.13
Organic Nitrogen	0.15	**0.19**	0.19*	**4.82**	**3.74**	**6.85**	**10.85**	**6.84**	**1.09**	**2.17**	**5.8**		**10.1**	**4.1**	<0.10	**0.61**	**0.48**	<0.10	**0.75**	**0.36**	**0.64**	<0.10	**0.31**	**0.36**	**0.26**	0.13
Cations (mg/L)																										
Calcium		73.67		160	160	150	160	150	150	150	160		180	170	180	160	180	160	190	170	160	170	190	180	180	180
Magnesium		14.8		33	32	31	33	32	32	32	32		39	36	38	33	40	36	42	37	35	37	37	40	38	39
Potassium		0.42		2.3	2.4	2.8	2.8	2.5	3.1	2.4	3.1		2.8	2.5	2.7	3.3	3	2.8	3	3	3.7	3.6	3.2	2.9	3.3	3.3
Sodium	200	1.75	101	6.6	11	16	22	21	22	22	22		30	25	28	25	36	29	36	30	31	32	33	36	36	37
Anions (mg/L)																										
Chloride	250	2.07	126	100	87	86	91	86	69	77	95		110	100	110	100	130	100	120	110	110	120	110	120	110	110
Nitrate	10	0.15	2.61	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	<0.1	<0.1	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite	1	0.005	0.26	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01		<0.01	<0.01	<0.01	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Orthophosphate		0.005											<0.01	<0.01	<0.01	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Phosphate		0.51													10	8.5						22				
Sulphate	500	0.85	250	120	90	92	90	86	78	79	95		100	110	110	110	130	100	120	120	130	110	110	120	110	110
Alkalinity as $CaCO_3$	30-500	245	373	318	307	333	330	330	320	350	360		360	370	370	370	420	400	410	400	440	420	420	420	430	380
Ion Balance (%)		3.73		1.87	3.04	0.23	4.47	2.68	6.5	2.29	1.13		4.64	1.05		3.56	2		2.52		7.71	3.13	0.79	0.52	0.36	2.59
Metals (mg/L) - Dissolved																										
Aluminum	0.1	0.0146	0.057	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0064		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.013	<0.005	<0.005	<0.005	0.0085	<0.0049
Antimony	0.006	0.00025	0.003	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Arsenic	0.025	0.0005	0.0066	<0.001	0.001	0.002	0.002	<0.001	<0.001	<0.001	0.0015		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0011	<0.001	0.0012	0.0013
Barium	1	0.0153	0.26	0.081	0.092	0.13	0.12	0.1	0.16	0.089	0.15		0.1	0.098	0.11	0.16	0.15	0.11	0.12	0.14	0.17	0.18	0.15	0.15	0.16	0.15
Beryllium	1.1	0.00024	0.28	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0004
Bismuth		0.0005		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	5	0.006	1.25	<0.01	<0.01	0.021	0.024	0.029	0.025	0.032	0.042		0.042	0.032	0.038	0.019	0.043	0.036	0.04	0.03	0.029	0.034	0.042	0.039	0.039	0.044
Cadmium	0.005	0.00005	0.0013	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00009
Chromium	0.05	0.0025	0.014	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Cobalt		0.00025		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper	1	0.0044	0.5	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0026	<0.001	0.002	<0.0009
Iron	0.3	0.072	0.19	**0.82**	**1.4**	<0.1	**1.3**	**1.6**	<0.1	**1.5**	**0.79**		**2**	**1.9**	**2.1**	<0.1	**2.1**	**2**	**2.4**	**1.9**	0.19	<0.1	0.0019	**1.6**	**1.9**	**1.6**
Lead	0.01	0.00025	0.0027	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Manganese	0.05	0.0216	0.036	**0.14**	**0.12**	**0.12**	**0.12**	**0.13**	**0.11**	**0.12**	**0.12**		**0.14**	**0.13**	**0.13**	**0.1**	**0.15**	**0.13**	**0.15**	**0.14**	**0.11**	**0.11**	**0.14**	**0.14**	**0.14**	**0.13**
Mercury	0.001	0.00005	0.0003		0.0002								<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum		0.0003		<0.001	<0.001	<0.001	<0.001	<0.0005	0.0008	<0.0005	0.00083		<0.0005	0.00053	<0.0005	0.0012	<0.0005	<0.0005	<0.0005	<0.0005	0.00075	0.00071	<0.0005	<0.0005	<0.0005	<0.0005
Nickel		0.0005		0.001	0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001	0.001	<0.001	<0.001	0.0011	0.0011	<0.001	<0.001	<0.001	<0.001	0.0013	<0.001
Phosphorus[7]		0.49		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	<0.1	10	8.5	5.3	39	38	35	31	22	0.81	18	32	1.4
Selenium	0.01	0.001	0.003	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002		<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Silicon		5.13		6.8	7.1	6.9	7.1	7.2	6.8	7.2	6.4		7.6	7	7.4	6	6.7	7.1	7.6	7.3	6.2	7.2	7.5	7.8	8	7.4
Silver				<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		<0.0001							
Strontium		0.058		0.18	0.17	0.18	0.18	0.19	0.18	0.18	0.2		0.21	0.2	0.2	0.2	0.23	0.2	0.23	0.21	0.21	0.22	0.21	0.21	0.21	0.21
Thallium		0.000025		<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005		<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Tin		0.0005		<0.001	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Titanium				<0.005	<0.005	<0.0005	<0.005	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005	<0.005	<0.005	<0.005									
Vanadium		0.0005		<0.001	0.001	<0.001	<0.001	<0.0005	0.00085	<0.0005	0.00075		<0.0005	<0.0005	<0.0005	0.0012	<0.0005	<0.0005	<0.0005	<0.0005	0.001	0.0014	<0.0005	<0.0005	<0.0005	0.7
Zinc	5	0.003	2.5	0.007	0.006	0.006	<0.005	0.006	<0.005	<0.005	<0.005		0.0067	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
VOCs																										
Benzene	0.005																									
1,4-Dichlorobenzene	0.005																									
Dichloromethane	0.05																									
Toluene	0.024																									
Vinyl Chloride	0.02																									

THB-00006196-PE - Longlac Landfill

Table 3 (cont'd): Groundwater Data[1]

Parameter	ODWS[2]	2018-2020		MW12-I																									
		Background[3]	B-7[4]	Aug-08	Oct-08	Jun-09	Aug-09	Oct-09	Jun-10	Oct-10	May-11	Oct-11	May-12	Oct-12	May-13	Oct-13	May-14	Oct-14	May-15	Oct-15	May-16	Oct-16	May-17	Sep-17	May-18	Oct-18	May-19	Oct-19	May-20	Sep-20
General																													
pH	6.5 to 8.5	7.9		8.3	8.1	7.9	8	No	7.9	7.99	7.87	8.01	7.91	7.96	7.93	7.65	7.89	7.91	7.91	7.86	7.96	7.84	7.85	7.88	7.71	7.82	7.8	7.9	7.92	7.93
Field pH				8.02	7.69	7.63	7.37	Sample	7.46	7.5	7.18	7.4	7.52	7.35	7.29	7.18	7.26	7.2	7.52	7.22	7.31	7.48	7.48	7.56	7.14	7.84	7.6	7.56	8.52	7.25
Conductivity		460		658	749	906	792		983	982	895	845	910	790	1,000	960	840	960	970	930	1,000	870	930	930	1,000	920	990	900	990	890
Field Conductivity				650	778	758	690		963	886	880	780	830	713	802	719	658	826	1,048	884	1,024	875	977	849	914	782	759	393	505	861
Field Temperature				7.4	5.1	10.1	7.5		6.2	6.1	6.2	8.4	6.6	6.7	5.7	4.9	6.2	8	8.3	5.8	7.2	7.3	6.4	8.6	10.2	5	4.8	7.4	1.9	6.6
TDS	500	258	379	430	475	**540**	**520**		**650**	**622**	**598**	**588**	**532**	**514**	**596**	**550**	**620**	**568**	**644**	454	**674**	**520**	**584**	**510**	**570**	485	**610**	500	**590**	**520**
TSS					700		490						610		5	310	400	530	180	480	120									
Hardness (as $CaCO_3$)	80 to 100	**245**	245*	**330**	**390**	**480**	**430**		**520**		**510**	**450**	**470**	**410**	**540**	**500**	**480**	**490**	**540**	**390**	**510**	**440**	**510**	**470**	**480**	**380**	**540**	**530**	**500**	**410**
Organics																													
DOC	5	3.4	4.21	2.3	1.4	2.1	1.9		2.7	2.1	1.8	1.8	2.2	1.7	0.2	2	2.2	1.9	2.1	1.8	2.2	1.8	2	1.7	1.8	1.8	2	1.7	1.7	1.8
BOD				<2	<2		<2						<2		<2	<2	<2	<2	<2.0	<2.0	<2.0									
COD		9.7		<4	8	<4	13		9	11	10	17	6.4	5.1	<4	11	6	7.1	5.3	4.5	17	<4.0	5.2	7.6	4	8.3	5.4	8.5	6.4	<4.0
Phenols		0.0005		<0.001			<0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.01	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
TKN		0.23		1.1	1.1	1	0.9		0.5	0.9	0.3	0.6	0.36	0.42	0.23	0.52	0.4	0.47	0.26	0.31	0.24	<0.10	0.2	0.13	0.15	0.14	0.27	0.24	0.11	0.22
Ammonia-N		0.06		0.07	0.07	0.11	0.07		<0.05	0.09	<0.05	<0.05	<0.05	0.15	0.18	<0.05	0.07	0.15	<0.050	0.071	0.073	<0.050	<0.050	<0.050	0.097	0.19	<0.050	0.095	0.064	<0.050
Organic Nitrogen	0.15	**0.19**	0.19*	**1.03**	**1.03**	**0.89**	**0.83**		~0.475	**0.81**	**0.3**	**0.6**	**0.335**	**0.27**	0.05	**0.52**	**0.3**	**0.3**	**0.26**	**0.24**	**0.16**	<0.10	**0.2**	0.13	<0.10	<0.10	**0.27**	0.15	<0.10	**0.22**
Cations (mg/L)																													
Calcium		73.67		95	110	140	130		150	150	150	130	130	120	160	140	140	140	160	110	150	130	150	140	140	110	160	160	140	120
Magnesium		14.8		23	27	32	26		33	34	33	30	32	28	34	33	33	33	35	26	34	30	33	31	33	26	33	35	34	28
Potassium		0.42		3.4	2.8	2.9	2.2		2.7	3.2	2.6	2.5	2.7	2.4	2.6	2.6	2.5	2.5	2.5	2.4	2.4	2.5	2.3	2.4	2.4	2.3	2.3	2.5	2.5	2.4
Sodium	200	1.75	101	10	11	13	10		16	18	16	12	13	10	17	15	12	15	17	7.2	18	13	18	15	13	6.6	16	16	10	7.2
Anions (mg/L)																														
Chloride	250	2.07	126	20	22	25	21		24	24	24	23	24	22	28	25	26	27	28	26	26	25	25	24	24	24	24	25	25	24
Nitrate	10	0.15	2.61	<0.1	0.1	<0.1	<0.1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.12
Nitrite	1	0.005	0.26	<0.01	<0.01	<0.01	0.01		<0.01	<0.01	0.01	<0.01	<0.01	0.013	<0.01	<0.01	<0.01	0.022	<0.01	<0.01	0.016	0.012	<0.010	<0.010	<0.010	0.01	<0.010	<0.010	<0.010	<0.010
Orthophosphate		0.005		<0.01			<0.01								--	<0.01	<0.01	<0.01	<0.01	<0.01	0.073	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Phosphate		0.51													--	--			0.1	0.069						0.041				
Sulphate	500	0.85	250	65	87	120	91		140	130	110	88	110	70	99	100	83	97	96	83	89	74	90	83	85	77	87	89	100	89
Alkalinity as $CaCO_3$	30-500	245	373	271	299	350	327		281	395	335	342	340	320	410	400	340	410	420	380	460	370	400	420	460	400	430	370	430	380
Ion Balance (%)		3.73		1.07	0.84	0	0.08		10.1	0.38	6.42	1.21	0.36	1.2	2.51	1.04	4.27	1.97	--	10.6	2.99		2.49		7.03	13.3	2.38	6.88	4.13	8.94
Metals (mg/L) - Dissolved																														
Aluminum	0.1	0.0146	0.057	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.017	0.009	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	**0.22**	0.034
Antimony	0.006	0.00025	0.003	<0.0005	<0.0005	<0.0005	<0.0005		0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Arsenic	0.025	0.0005	0.0066	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Barium	1	0.0153	0.26	0.039	0.051	0.069	0.054		0.074	0.074	0.062	0.059	0.058	0.058	0.07	0.058	0.058	0.067	0.073	0.05	0.071	0.062	0.068	0.063	0.063	0.05	0.069	0.064	0.058	0.043
Beryllium	1.1	0.00024	0.28	<0.0005	<0.0005	<0.0005	<0.0005		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0004
Bismuth		0.0005		<0.001	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	5	0.006	1.25	0.076	0.14	0.22	0.19		0.33	0.41	0.33	0.26	0.24	0.17	0.73	0.36	0.24	0.37	0.44	0.09	0.49	0.32	0.46	0.38	0.3	0.075	0.44	0.44	0.2	0.085
Cadmium	0.005	0.00005	0.0013	<0.0001	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00009
Chromium	0.05	0.0025	0.014	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Cobalt		0.00025		0.0005	0.0005	<0.0005	<0.0005		0.0007	<0.0005	<0.0005	0.0006	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.00052	<0.0005
Copper	1	0.0044	0.5	0.002	0.003	0.002	0.002		0.003	0.002	0.001	0.003	0.0016	0.0018	<0.001	0.0015	0.0024	0.0013	0.0014	0.0014	0.0017	0.0014	0.0016	0.0014	<0.001	<0.001	0.0032	0.0021	0.0088	0.0011
Iron	0.3	0.072	0.19	<0.1	<0.1	<0.1	<0.1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	**0.54**	<0.1
Lead	0.01	0.00025	0.0027	<0.0005	<0.0005	<0.0005	<0.0005		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.00084	<0.0005
Manganese	0.05	0.0216	0.036	**0.13**	**0.11**	**0.16**	**0.12**		**0.22**	**0.19**	**0.17**	**0.12**	**0.13**	**0.094**	**0.14**	**0.1**	**0.13**	**0.094**	**0.092**	**0.074**	**0.082**	**0.066**	**0.076**	**0.061**	**0.099**	**0.064**	**0.072**	**0.054**	**0.11**	0.049
Mercury	0.001	0.00005	0.0003	0.0001			<0.0001		<0.0001						--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.0001
Molybdenum		0.0003		0.007	0.004	0.002	0.002		0.001	0.002	0.001	0.0016	0.0011	0.0011	0.0011	0.0013	0.00071	0.0012	0.00098	0.0011	0.00086	0.0009	0.00087	0.00099	0.00089	0.00064	0.00064	0.00077	0.0007	0.00077
Nickel		0.0005		0.007	0.007	0.008	0.006		0.006	0.004	0.004	0.004	0.0016	0.0019	0.003	0.0045	<0.001	0.0038	0.004	<0.001	0.0035	0.003	0.0041	0.0032	0.0025	<0.001	0.0031	0.0028	0.0022	0.0015
Phosphorus[7]		0.49		<0.1	<0.1	<0.1	0.56		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	0.069	0.12	0.14	0.054	0.052	0.034	0.041	0.052	0.28	0.43	0.13
Selenium	0.01	0.001	0.003	<0.002	<0.002	<0.002	<0.002		<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Silicon		5.13		9.3	8.5	8.5	7.8		8	8.6	7.4	8.6	9.7	9.4	8	8.2	9.8	8.6	8.1	10	7.3	8.7	7.6	8.6	8.9	11	7.8	9.3	11	11
Silver				<0.0001	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.001		<0.0001							
Strontium		0.058		0.19	0.22	0.27	0.23		0.27	0.29	0.22	0.26	0.28	0.27	0.33	0.27	0.32	0.3	0.3	0.29	0.3	0.28	0.28	0.28	0.32	0.3	0.3	0.31	0.34	0.29
Thallium		0.000025		<0.00005	<0.00005	<0.00005	<0.00005		<0.00005	<0.00005	<0.00005	0.00007	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Tin		0.0005		<0.001	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Titanium				<0.005	<0.005	<0.005	<0.005		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005									
Vanadium		0.0005		<0.001	0.001	0.001	0.001		0.001	0.001	0.001	0.0011	<0.0005	0.001	0.00055	0.00097	<0.0005	0.001	0.00057	<0.0005	0.0005	0.00067	<0.0005	0.00052	<0.0005	<0.0005	0.00061	<0.0005	0.00088	<0.0005
Zinc	5	0.003	2.5	0.007	0.009	0.008	<0.005		0.008	0.012	0.009	0.034	0.0074	0.0088	<0.005	<0.005	0.0098	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0054	<0.005	0.0078	<0.005
VOCs																														
Benzene	0.005			<0.0001			<0.0001																							
1,4-Dichlorobenzene	0.005			**0.012**			<0.0002																							
Dichloromethane	0.05			<0.0005			<0.0005																							
Toluene	0.024			0.0003			<0.0002																							
Vinyl Chloride	0.02			<0.0002			<0.0002																							

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Table 3 (cont'd): Groundwater Data[1]

Parameter	ODWS[2]	2018-2020 Background[3]	2018-2020 B-7[4]	MW12-II																									
				Aug-08	Nov-08	Jun-09	Aug-09	Oct-09	Jun-10	Oct-10	May-11	Oct-11	May-12	Oct-12	May-13	Oct-13	May-14	Oct-14	May-15	Oct-15	May-16	Oct-16	May-17	Sep-17	May-18	Oct-18	May-19	Oct-19	May-20	Sep-20
General																													
pH	6.5 to 8.5	7.9		8.1	8	7.8	7.8	No	7.8	7.83	7.91	7.89	7.93	7.6	7.82	7.51	7.8	7.79	7.77	7.66	7.86	7.68	7.93	7.8	7.64	7.7	7.69	7.74	7.85	7.79
Field pH				7.54	7.36	7.12	6.92	Sample	6.94	7.1	6.89	6.94	7.34	6.82	7.07	7.53	7.01	7.2	6.99	7.22	7.16	7.23	7.45	7.32	7.12	4.52	7.4	7.44	7.29	6.95
Conductivity		460		1,080	1,080	1,080	1,110		1,040	1,070	904	1,030	940	1,000	1,100	1,100	1,000	1,100	990	1,100	970	1,100	890	1,000	1,100	1,100	1,100	1,100	1,000
Field Conductivity				1,066	1,079	1,035	1,003		1,028	949	849	908	806	842	843	778	783	1,128	1,076	1,087	976	1,019	867	930	916	993	953	411	405	1,019
Field Temperature				11.9	6	11.7	10.3		7.3	5.7	5.8	9.3	7.5	8	5.1	5.2	3.6	8.5	12.2	7.2	6.9	10.1	5	10.1	10.7	3.8	4.9	6.3	3.8	7.9
TDS	500	258	379	**640**	**710**	**725**	**720**		**680**	**650**	**568**	**708**	**542**	**684**	**630**	**612**	**694**	**692**	**716**	**628**	**656**	**640**	**514**	**570**	**610**	**620**	**675**	**595**	**690**	**670**
TSS					15,000								700		2,100	920	2,100	2,500	1400	570	780									
Hardness (as $CaCO_3$)	80 to 100	**245**	245*	**560**	**560**	**580**	**580**		**540**		**480**	**540**	**500**	**540**	**570**	**530**	**590**	**550**	**570**	**540**	**480**	**530**	**450**	**510**	**530**	**530**	**580**	**530**	**650**	**600**
Organics																													
DOC	5	3.4	4.21	3.7	2.6	2.5	2.9		2.6	2.2	1.6	2.2	2	2.3	4.2	2.1	2.2	2.6	2.1	2.6	1.9	2.1	1.5	1.9	2	2.3	2.2	1.8	2.3	2.3
BOD				<2	<2		<2						<2		<2	<2	<2	<2	<2.0	<2.0	<2.0									
COD		9.7		12	26	17	--		17	9	15	14	<4	8.4	7.7	23	7.6	6.1	<4.0	<4.0	6.2	<4.0	5.2	4.8	<4.0	6.8	<4.0	<4.0	11	5.0
Phenols		0.0005		<0.001			--		<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
TKN		0.23		5	3	1	--		<2	0.9	1	0.5	0.14	0.87	1.1	0.88	3.7	0.49	0.57	0.45	0.19	<0.10	0.15	0.29	<0.10	0.2	0.22	0.33	0.32	0.17
Ammonia-N		0.06		<0.005	<0.05	0.07	0.08		0.06	0.06	0.07	<0.05	<0.05	0.11	0.092	<0.05	<0.05	<0.05	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.051	0.069	<0.050	0.05	<0.050	0.059
Organic Nitrogen	0.15	**0.19**	0.19*	**5**	**3**	**0.93**	~0		**0.94**	**0.84**	**0.93**	**0.5**	0.115	**0.76**	**1.008**	**0.855**	**3.7**	**0.5**	**0.57**	**0.45**	**0.19**	<0.10	0.15	**0.29**	<0.10	0.13	**0.22**	**0.28**	**0.32**	0.11
Cations (mg/L)																													
Calcium		73.67		170	170	170	180		160	170	140	160	150	160	170	160	180	170	170	160	140	160	140	150	160	160	180	160	200	180
Magnesium		14.8		34	34	35	32		34	34	29	33	30	33	34	32	37	32	35	33	30	31	27	31	32	32	32	31	38	35
Potassium		0.42		2.4	1.8	1.5	1.3		1.4	1.4	1.2	1.3	1.1	1.2	1.1	1.4	1.1	1.2	1.2	1.3	1.1	1.4	0.96	1.3	1	1.3	1.1	1.3	1.1	1.4
Sodium	200	1.75	101	28	24	22	21		22	22	18	22	20	23	22	22	24	22	24	23	20	23	19	22	21	22	21	21	22	23
Anions (mg/L)																													
Chloride	250	2.07	126	30	29	28	25		25	25	22	28	21	29	27	25	29	30	28	30	22	27	18	24	24	26	23	22	24	28
Nitrate	10	0.15	2.61	0.1	0.3	0.2	0.1		<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.17	<0.1	0.21	<0.10	0.16	<0.10	0.13	0.15	0.22	<0.10	<0.10	0.11	0.25
Nitrite	1	0.005	0.26	<0.01	<0.01	<0.01	<0.01		<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.022	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Orthophosphate		0.005		<0.01			<0.01									<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Phosphate		0.51														--			0.34	0.22						0.18				
Sulphate	500	0.85	250	193	166	170	190		150	140	100	120	110	100	110	120	110	120	100	97	79	87	68	88	92	96	94	82	110	120
Alkalinity as $CaCO_3$	30-500	245	373	387	413	402	438		395	426	356	408	370	440	440	450	430	470	420	460	450	470	400	470	500	470	470	450	490	430
Ion Balance (%)		3.73		0.29	1.19	0.48	2.87		0.4	1.35	2.65	1.86	2.77	1.27	2.55	2.16	4.28	2.41		0.7	3.19		0.11		4.47	2.59	2.02	1.21	4.1	4.27
Metals (mg/L) - Dissolved																													
Aluminum	0.1	0.0146	0.057	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0091	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	**0.23**	0.077
Antimony	0.006	0.00025	0.003	<0.0005	<0.0005	<0.0005	<0.0005		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Arsenic	0.025	0.0005	0.0066	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Barium	1	0.0153	0.26	0.041	0.037	0.039	0.042		0.036	0.036	0.031	0.037	0.033	0.036	0.035	0.033	0.034	0.039	0.034	0.039	0.031	0.039	0.027	0.038	0.033	0.038	0.034	0.035	0.038	0.041
Beryllium	1.1	0.00024	0.28	<0.0005	<0.0005	<0.0005	<0.0005		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00040
Bismuth		0.0005		<0.001	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	5	0.006	1.25	0.5	0.44	0.47	0.57		0.47	0.51	0.32	0.58	0.42	0.55	0.57	0.57	0.66	0.66	0.68	0.64	0.55	0.7	0.43	0.68	0.62	0.67	0.69	0.66	0.63	0.63
Cadmium	0.005	0.00005	0.0013	<0.0001	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00009
Chromium	0.05	0.0025	0.014	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Cobalt		0.00025		0.0049	0.0009	<0.0005	0.001		<0.0005	0.0008	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.00066	<0.0005
Copper	1	0.0044	0.5	0.002	0.004	0.003	0.003		0.003	0.003	0.002	0.002	0.0014	0.0016	0.001	0.0017	0.001	0.0018	0.0012	0.0016	0.0011	0.0012	<0.001	0.0014	<0.001	0.0018	0.0037	0.0012	0.003	0.0017
Iron	0.3	0.072	0.19	<0.1	<0.1	<0.1	<0.1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	**0.38**	0.11
Lead	0.01	0.00025	0.0027	<0.0005	<0.0005	<0.0005	<0.0005		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.00068	<0.50
Manganese	0.05	0.0216	0.036	**0.48**	**0.14**	**0.11**	**0.16**		**0.086**	**0.17**	0.038	0.046	0.03	0.018	0.011	0.012	0.011	0.0085	0.0059	0.0085	<0.002	0.0036	<0.002	0.0021	0.0083	0.004	0.0036	<0.002	0.036	0.011
Mercury	0.001	0.00005	0.0003	<0.0001			<0.0001		<0.0001						--	<0.0001	<0.0001	<0.0001	<0.00010	<0.00010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum		0.0003		0.002	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005	0.00051	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Nickel		0.0005		0.007	0.001	0.002	<0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0012	<0.001	<0.001	<0.001	0.0016	0.0011
Phosphorus[7]		0.49		<0.1	<0.1	<0.1	5.1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.34	0.22	0.22	0.69	0.28	0.59	0.36	0.18	0.68	0.32	0.3	0.24
Selenium	0.01	0.001	0.003	<0.002	<0.002	<0.002	<0.002		<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Silicon		5.13		6.3	5.8	5.7	5.6		6.2	6	5.3	5.9	5.5	5.8	5.4	5.8	5.4	5.6	5.5	6.1	5	6.1	5	6.1	5.2	5.9	5.3	6	6.3	6.5
Silver				<0.0001	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		<0.0001							
Strontium		0.058		0.17	0.18	0.16	0.17		0.16	0.15	0.14	0.17	0.14	0.16	0.17	0.15	0.16	0.17	0.16	0.17	0.14	0.16	0.13	0.16	0.15	0.17	0.16	0.15	0.18	0.18
Thallium		0.000025		0.00006	<0.00005	<0.00005	0.00005		<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Tin		0.0005		<0.001	<0.001	<0.001	<0.001		<0.001	<0.0001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0025	<0.001	<0.001	<0.001	<0.001
Titanium				<0.005	<0.005	<0.005	<0.005		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005									
Vanadium		0.0005		<0.001	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0009	<0.0005
Zinc	5	0.003	2.5	0.009	0.009	0.15	<0.005		0.008	0.01	<0.005	0.007	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.018	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
VOCs																													
Benzene	0.005			<0.0001			<0.0001																						
1,4-Dichlorobenzene	0.005			<0.0002			<0.0002																						
Dichloromethane	0.05			<0.0005			<0.0005																						
Toluene	0.024			<0.0002			<0.0002																						
Vinyl Chloride	0.02			<0.0002			<0.0002																						

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Table 4: Surface Water Data[1]

Parameter	PWQO[5]	SW1																																			
		Feb-97	Aug-06	Nov-06	Nov-07	Jun-08	Aug-08	Oct-08	Jun-09	Aug-09	Oct-09	Jun-10	Aug-10	Oct-10	May-11	Aug-11	Oct-11	May-12	Aug-12	Oct-12	May-13	Aug-13	Oct-13	May-14	Aug-14	Oct-14	May-15	Oct-15	May-16	Oct-16	May-17	Sep-17	May-18	Oct-18	May-19	Oct-19	May-20	Sep-20
General																																					
pH	6.5 to 8.5	7.44	7.9	7.9	8	7.9	8.1	7.4	7.4	7.4	7.3	7.8	7.8	7.73	7.6	7.75	7.81	7.57	7.7	7.67	7.46	7.66	7.4	7.21	7.79	7.59	7.76	7.82	7.76	7.95	7.8	7.68	7.67	7.6	7.67	7.84	7.61	7.76
Field pH	6.5 to 8.5		7.62	8.38		8.21	7.95	**8.87**	7.72	7.65	7.78	7.79	7.83	8.1	7.87	7.37	7.86	7.97	7.76	7.65	7.76	8.07	8.42	7.01	7.59	8.15	7.94	8.08	7.88	7.9	7.98	8.05	7.78	4.4	8.06	8.01	7.0	7.52
Conductivity (uS/cm)		272.3	258	120	118	116	181	125	119	136	144	140	157	138	100	234	160	110	210	200	91	150	130	90	200	120	93	180	120	240	120	130	140	110	94	130	100	190
Field Conductivity			274	111		120	183	94	109	175	130	149	161	145	105	230	157	109	208	235	92	143	160	89	226	151	109	189	133	247	131	148	239	116	114	107	114	181
Field Temperature (^{O}C)	narrative		16.3	2.7		15.2	17.2	0.9	15.8	18.6	2.5	11.1	14.7	2.1	8.8	17.4	13.4	7.9	21.3	5.1	9.5	16.6	1	5.1	17.6	4.6	12.2	1.2	13.6	10.6	11.2	15.6	9	0.9	6.3	1.7	4.8	11
TSS			51	5	3	26	6	<1	1	<1	<10	2	3	<1	<1	9	<1	<1	9	1	5	3	85	7	10	16	8	26	<1	9	<1	2	2	3	3	<1	4	3
BOD			<2	<2	<2	3	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2.0	<2.0	--	<2	<2	<2	<2	<2	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2	<2	<2	<2	<2	2
COD			44	37	40	50	35	35	26	49	21	33	38	33	33	51	51	38	50	26	33	44	45	27	33	33	25	30	32	36	29	66	30	37	27	32	30	34
TDS		177	179	88	87	80	150	80	119	89	97	90	102	80	60	174	108	64	140	142	104	110	60	50	126	80	66	118	74	144	72	60	110	65	85	60	130	120
Hardness		132.9	130	62	60	60	99	67	61	73		76	82			170	83	57	120	100	50	78	68	47	110	61	50	100	64	130	57	70	68	63	48	72	48	110
Organics																																					
DOC		11.3										13.2									--	18	13	11	13	14	11	12	10	12	11	21	12	14	12	15	11	12
Phenols	0.001	<0.001	<0.001	<0.001	<0.001	**0.002**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	**0.006**	<0.001	<0.001	<0.001	--	<0.001	<0.001	<0.001	<0.001	**0.0013**	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
TKN		1.35	0.8	0.7	0.6	1.6	0.9	0.8	0.4	0.5	0.5	0.5	0.6	0.5	0.4	1.2	0.7	0.33	0.59	0.44	--	0.67	0.96	0.75	0.62	0.46	<0.20 (1)	0.34	0.53	0.36	0.3	0.43	0.23	0.33	0.31	0.34	0.38	0.42
Ammonia-N		0.08	0.05	0.11	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.098	0.63	0.46	0.08	<0.05	<0.05	0.079	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Cations (mg/L)																																					
Calcium		38.5	41	20	18	18	29	19	19	23	21	22	27	22	16	39	26	16	35	30	14.5	22.7	19	13	33	18	14	31	18	34	17	21	20	17	14	20	14	31
Magnesium		8.9	9.3	4.8	4.9	4.7	7.5	5.1	4.3	5.6	5.1	5.5	6.1	5.3	3.7	8.5	6	3.9	8.5	7.4	3.38	5.03	4.8	3.3	7.7	4.3	3.4	8	4.4	8.3	4.3	4.6	4.6	4.3	3.3	4.8	3.3	6.9
Potassium		0.7	<1	<0.2	<0.2	0.43	0.21	0.26	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	0.69	0.24	<0.2	0.21	0.35	<1	<1	0.33	0.35	0.32	<0.2	<200	0.51	0.3	0.6	0.29	0.38	0.36	<0.2	0.46	<0.2	0.31	0.37
Sodium		5.9	2.4	1.5	1.6	1.5	1.8	1.4	1.3	1.2	1.4	1.8	1.3	1.2	1.1	1.4	1.3	1	2	1.9	1.4	1.2	1.4	1.5	2.3	1.6	1.2	2	1.4	2.1	1.4	1.1	0.76	1.1	1.3	1.3	1.3	1.8
Anions (mg/L)																																					
Chloride		7.4	3	3	2	2	3	2	<5	<5	2	2	2	2	1	2	2	1	2	2	2	2	2	2	3	3	2	1.9	2	2.4	2.1	2.1	1.3	2.3	3.0	2.8	2.0	2.5
Nitrate		<0.2	<0.1	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite			<0.01	<0.01	<0.01	0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Sulphate		1	<1	1	<1	<1	<1	<1	<5	<5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1.0	<1.0	<5.0 (1)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity as $CaCO_3$		122	149	52	56	58	94	60	61	71	70	69	79	67	48	119	79	52	110	100	42	71	62	42	100	59	47	92	61	120	55	64	68	57	42	65	49	98
Ion Balance						NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	2.55	NC	NC	NC	NC	NC	NC	NC	0.7	NC	NC	NC	NC	NC	NC	NC	NC						
Metals (mg/L) - Total																																					
Aluminum (dissolved)	(0.075)	**0.16**	0.041	0.036	0.021	**0.13**	0.034	0.015	0.009	0.014	0.031	0.02	0.012	0.014	0.017	0.064	0.015	0.015	**0.11**	0.018	0.074	0.03	**0.092**	0.06	0.026	0.019	0.009	0.006	0.007	<0.001	0.011	0.024	0.008	0.008	0.011	0.007	0.008	<0.005
Antimony			<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.00057	<0.0005
Arsenic	0.1(0.005)	<0.001	0.003	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	0.003	0.001	<0.001	0.0018	0.0013	<0.001	0.0011	<0.001	<0.001	0.0013	<0.001	<0.001	0.0017	<0.001	0.0011	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0013
Barium		0.009	0.015	0.006	<0.005	0.01	0.007	<0.005	<0.005	0.006	<0.005	0.007	0.006	<0.005	<0.005	0.017	0.007	0.0039	0.0094	0.0061	0.0054	0.0071	0.0062	0.0051	0.009	0.004	0.0041	0.011	0.0052	0.0058	0.0041	0.0057	0.0039	0.0035	0.0036	0.0039	0.0037	0.0071
Beryllium		<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0004
Bismuth			<0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.002	<0.001	<0.001	<0.001	0.0012	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	(0.2)	<0.005	<0.01	<0.010	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.023	<0.01	<0.01	<0.01	<0.01	<10	<0.01	<0.01	<0.1	<0.1	<0.01	<0.01	<0.01
Cadmium	0.0002 (0.0005)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00009
Chromium	0.009	0.007	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Cobalt		0.0003	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.00072	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.00055	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper	0.005	**0.0202**	<0.001	0.002	<0.001	0.001	<0.001	0.001	0.001	<0.001	<0.001	0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0015	0.0045	<0.001	<0.001	<0.001	0.0019	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0009
Iron	0.3	**0.8**	**1**	0.14	0.1	**0.43**	0.24	<0.1	<0.1	<0.1	0.18	0.15	0.12	<0.1	<0.1	**0.72**	**0.38**	<0.1	**0.84**	**0.51**	0.13	0.22	**0.39**	0.26	**0.35**	<1	<0.1	**1.6**	<0.1	**0.36**	<0.1	0.11	<0.1	<0.1	<0.1	0.14	<0.1	**0.59**
Lead	0.02 (0.005)	0.0013	<0.0005	<0.0005	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.00075	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.00052	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Manganese		0.121	0.18	0.007	0.009	0.049	0.018	0.005	0.01	0.008	0.023	0.018	0.017	0.006	0.003	0.62	0.14	0.0042	0.21	0.19	0.083	0.05	0.11	0.017	0.058	0.0032	0.0025	0.19	0.017	0.032		0.012	0.0033	0.0056	0.0062	0.025	0.0079	0.19
Mercury	0.0002		<0.0001		<0.0001	**0.0015**				<0.0001		<0.0001	<0.0001			<0.0001			<0.0001		--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.00010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Nickel		0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Phosphorus	(0.03)	**0.05**	<0.050		0.01	**0.07**	0.015	0.009	0.01	0.01	0.003	0.004	0.007	<0.002	0.016	**0.046**	0.008	0.009	**0.035**	<0.002	0.021	<0.02	<0.1	0.011	<0.1	0.008	<0.1	<0.1	0.009	0.014	0.006	0.007	0.008	0.016	0.014	0.007	0.009	0.018
Selenium		<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	3.1	<0.002	<2.0	<2.0	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Silicon		4.25	3.9	2.5	2.2	1.4	3.2	2.2	1.1	2.3	2.5	1.7	3	2.4	1.4	4.4	2.7	1.6	4.5	4.6	1.3	2.3	2.1	1.4	<0.002	1.9	1.2	4.5	1.2	3.8	1.4	1.9	1.8	1.9	1.6	2.1	1.7	3.9
Silver		0.00012		<0.0001	<0.0001	<0.0001	<0.0001	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.00013	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00009
Strontium		0.0396	0.046	--	0.017	0.02	0.034	0.019	0.018	0.022	0.02	0.024	0.024	0.019	0.015	0.041	0.027	0.014	0.038	0.033	0.014	0.027	0.017	0.015	0.037	0.017	0.013	0.031	0.017	0.037	0.015	0.02	0.019	0.016	0.012	0.017	0.012	0.029
Thallium				<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.00008	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Tin		<0.001			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0011	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001			<0.001	<0.001	<0.001	<0.001
Titanium		0.009	<0.005		<0.005	0.009	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0091	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.024	<0.005	0.0056	<0.005	<0.005	<0.005		<0.005	<0.005	<0.005	<0.005
Vanadium		0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0013	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00005	<0.0005	<0.0005	<0.0005
Zinc	0.03 (0.02)	0.009	<0.005	0.009	<0.005	**0.022**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.006	<0.005	<0.005	<0.005	0.0071	<0.005	<0.005	0.011	<0.005	<0.005	<0.005	<0.005	<0.005	0.019	<0.005	<0.005	<0.005	<0.005

Note:

1. As of May 2015, dissolved aluminum (0.2 µ) results are reported.

THB-00006196-PE - Longlac Landfill

Table 4: Surface Water Data[1]

Parameter	PWQO[5]	SW2																																		
		May-97	Aug-06	Nov-06	Nov-07	Jun-08	Aug-08	Oct-08	Jun-09	Aug-09	Oct-09	Jun-10	Aug-10	Oct-10	May-11	Aug-11	Oct-11	May-12	Aug-12	Oct-12	May-13	Aug-13	Oct-13	May-14	Aug-14	Oct-14	May-15	Oct-15	May-16	Oct-16	May-17	Sep-17	May-18	Oct-18	May-19	Oct-19	May-20	Sep-20
General																																					
pH	6.5 to 8.5	Not	8.1	8.1	8.2	8.2	8.3	8	8.2	8.1	7.9	8.2	8.2	8.11	8.18	8.23	8.27	8.15	8.17	8.12	8.01	7.95	7.84	7.92	8.13	8.19	8.17	8.1	8.14	8.07	8.24	7.95	8.18	7.87	8.06	8.17	8.12	8.29
Field pH	6.5 to 8.5	Established	8.28	8.01		7.91	8	7.74	7.75	7.53	7.65	7.83	7.93	7.69	7.42	7.98	7.7	7.34	7.56	7.8	7.12	8.06	7.37	6.95	8.06	8.08	7.52	8.1	7.84	7.99	7.87	7.32	7.5	4.54	7.9	7.08	7.58	8.45
Conductivity (uS/cm)			1,740	2,170	1,500	1,650	1,690	1,810	1,770	1,790	1,920	2,000	1,670	1,790	1,900	1,710	1,910	1,700	1,900	1,900	2,100	2,000	2,300	2,000	2,300	2,200	2,300	2,700	2,800	2,500	2,400	1,800	2,200	1,000	1,200	2,200	1,600	2,100
Field Conductivity			1,813	2,146		1,610	1,663	1,807	1,669	1,602	1,589	1,928	1,646	1,625	1,668	1,462	1,605	1,426	1,466	1,469	1,645	1,263	1,613	1,380	2,491	2,300	2,540	2,436	2,596	2,280	2,021	1,570	1,615	1,260	921	837	620	1,888
Field Temperature (^{O}C)	narrative		21.1	6.1		16.7	21.7	5.4	18.5	18.2	3.2	15.4	17	4	17.1	19.5	14.6	13.2	22.4	7.6	16.8	17.4	2.2	11	18.7	7.4	20.6	4.2	17.3	17.2	15.9	17.9	12.8	1	5.4	6.8	12.7	9.3
TSS			160	29	110	14	3	1	5	2	<10	10	3	6	2	5	6	1	8	20	7	9	5	18	25	4	10	21	16	13	18	11	11	7	8	3	5	23
BOD			<2	4	<2	<2	2	<2	<2	<2	5	3	3	6	4	5	8	<2	2	11	--	6	2	12	4	3	2	2	<2.0	7	3	2	2	4	<2	<2	<2	15
COD			53	57	47	44	41	35	33	53	54	52	56	55	49	55	80	51	49	70	46	52	45	44	65	43	45	71	60	100	50	70	42	31	19	44	30	88
TDS			1,010	1,360	677	1,160	1,070	1,100	1,160	1,140	1,200	1,260	1,100	1,180	1,170	1,150	1,240	988	1,100	1,180	1,310	1,200	1,400	1,250	1,470	1,350	1,530	1,630	1,700	1,510	1,450	1,010	1,220	545	665	1,260	705	1,170
Hardness			590	760	580	580	600	650	590	600		690	480			550	590	580	640	590	770	660	770	770	790	730	770	710	820	630	670	520	600	230	340	650	430	520
Organics																																						
DOC												17.1									--	17	16	13	19	16	16	23	17	24	16	21	14	11	8.1	17	9.5	21
Phenols	0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	**0.034**	<0.001	<0.001	**0.0016**	--	<0.001	<0.001	<0.001	**0.0012**	**0.0031**	<0.0010	**0.0014**	<0.0010	**0.0017**	<0.0010	<0.0020	<0.0010	**0.002**	<0.0010	<0.0010	<0.0010	**0.004**
TKN			1.8	1.7	0.9	0.8	1.5	1.1	0.9	1	1.5	1.7	1.8	1.3	1.2	1.1	2.1	0.7	1.5	2.5	--	1.8	1.1	1.2	4.4	0.98	0.89	2.1	0.75	1	0.81	0.88	0.54	0.46	0.4	0.6	0.58	1.1
Ammonia-N			0.7	0.1	<0.05	0.08	0.29	0.26	0.06	0.09	0.19	0.11	0.33	<0.05	<0.05	<0.05	<0.05	<0.05	0.52	0.23	0.065	0.37	0.12	<0.05	1.1	0.081	<0.050	0.9	<0.050	0.11	<0.050	0.17	<0.050	0.094	0.15	<0.050	<0.050	<0.050
Cations (mg/L)																																						
Calcium			130	173	180	160	140	150	140	130	130	140	87	130	160	100	120	140	140	120	162	160	170	160	190	150	180	140	170	110	140	150	140	56	63	140	72	85
Magnesium			81	80.3	56	69	71	71	74	70	72	100	70	71	81	77	76	70	82	84	88.1	84	83	82	98	73	89	100	100	85	83	58	78	35	31	75	43	75
Potassium			160	142	100	140	140	150	130	120	120	160	130	120	140	130	130	140	140	140	145	150	130	130	150	130	130	150	140	130	120	90	110	71	53	110	72	110
Sodium			99	113	65	70	73	80	80	89	95	140	120	110	110	120	120	85	120	130	128	120	120	120	180	130	170	230	230	230	200	160	190	120	72	190	100	210
Anions (mg/L)																																						
Chloride			81	96	39	43	43	55	69	84	95	120	120	110	100	120	120	97	120	130	140	140	170	160	260	220	270	340	330	330	86	180	190	120	89	160	140	230
Nitrate			<0.1	<0.01	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	0.1	0.12	0.14	0.28	<0.10	0.25	<0.10
Nitrite			<0.01	<0.001	<0.001	0.05	<0.01	0.12	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	0.011	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.018	<0.010
Sulphate			305	404	211	248	269	251	260	260	250	260	210	190	210	210	200	140	210	190	210	230	280	190	290	230	220	230	210	160	36	130	180	100	87	210	130	160
Alkalinity as $CaCO_3$			593	732	575	614	631	666	649	645	696	667	519	628	679	556	673	630	650	650	720	590	720	650	600	630	680	680	800	660	710	560	690	230	380	700	550	580
Ion Balance						3.49	2.39	0.44	6.01	4.11	4.35	2.02	0.5	3.68		0.94	2.15	0.23	1.63	2.56	3.43	2.47	2.27	5.8	2.84	1.51	--	--	0.49			0.04						
Metals (mg/L) - Total																																						
Aluminum (dissolved)	(0.075)		**0.66**	0.057	**0.1**	**0.1**	0.02	0.023	0.017	0.018	0.037	0.024	0.048	0.048	0.033	0.019	0.027	0.026	0.027	0.029	0.039	0.052	0.0066	0.047	**0.095**	0.022	<0.005	0.013	0.007	<0.001	0.008	0.067	0.011	0.011	0.009	0.008	0.008	0.017
Antimony			<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Arsenic	0.1(0.005)		0.002	0.001	0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	0.001	0.001	0.001	0.0011	<0.001	<0.001	0.0011	0.001	<0.001	<0.001	0.0019	<0.001	<0.001	0.0011	0.0011	0.002	<0.001	0.0019	<0.001	<0.001	<0.001	<0.001	<0.001	0.0016
Barium			0.1	0.14	0.11	0.13	0.13	0.12	0.1	0.12	0.1	0.13	0.086	0.099	0.13	0.097	0.11	0.094	0.13	0.097	0.13	0.14	0.13	0.13	0.17	0.12	0.12	0.12	0.14	0.083	0.12	0.1	0.11	0.046	0.039	0.11	0.053	0.081
Beryllium			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00050	<0.0005	<0.0004
Bismuth			<0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001
Boron	(0.2)		**1**	**1.2**	**0.52**	**0.88**	**1.1**	**1**	**0.89**	**1.1**	**0.95**	**1.3**	**1.1**	**1.1**	**1**	**1.2**	**1.1**	**0.98**	**1.4**	**1.2**	**1.2**	**1.4**	**1.2**	**1.3**	**1.6**	**1.2**	**1.5**	**1.7**	**2**	**1.7**	**1.6**	**1.5**	**1.8**	**1.2**	**0.76**	**1.9**	**1.1**	**1.8**
Cadmium	0.0002 (0.0005)		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.0001	0.00015
Chromium	0.009		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.005	<0.005
Cobalt			0.006	0.0009	0.0006	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0006	0.0006	<0.0005	0.0005	0.00078	<0.0005	<0.0005	0.00061	<0.0005	0.00055	0.00059	0.00059	0.0007	0.0013	0.00069	0.0011	0.00059	0.0018	0.0014	0.0018	0.00087	0.00076	0.0015	0.001	0.00069
Copper	0.005		0.001	0.001	0.001	<0.001	<0.001	0.001	0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0022	<0.001	<0.001	<0.001	<0.001	<0.001	0.0021	0.0015	0.0011	0.0025	0.0012	<0.001	<0.001	0.0017	0.0019	0.0013	0.0017	0.0013	0.0018	0.0017	0.0026
Iron	0.3		**0.8**	**0.35**	**0.54**	0.23	0.1	0.2	<0.1	<0.1	0.1	0.13	<0.1	0.14	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	0.15	<0.1	0.15	<0.1	<0.1	0.1	0.18	0.24	0.23	0.2	**0.99**	0.25	<0.1	<0.1	0.13	<0.1	0.26
Lead	0.02 (0.005)		<0.0005	0.0014	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0050	<0.00050	<0.0005	0.00074
Manganese			0.18	0.43	0.23	0.14	0.21	0.35	0.07	0.15	0.33	0.18	0.017	0.16	0.17	0.083	0.057	0.1	0.23	0.13	0.18	0.23	0.15	0.2	0.52	0.15	0.073	0.25	0.13	0.28	0.11	0.4	0.15	0.016	0.042	0.23	0.073	0.13
Mercury	0.0002		<0.0001		<0.0001		<0.0001			<0.0001		<0.0001	<0.0001			<0.0001			<0.0001			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.00010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.00010
Molybdenum			0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	0.0006	0.0013	<0.0005	0.00053	0.001	0.00076	<0.0005	0.0011	0.00093	0.0013	0.0012	0.00067	0.0013	0.00088	0.0014	0.0015	0.0015	0.0016	0.00096	0.0011	0.0018	0.0014
Nickel			0.003	0.004	<0.001	0.003	0.001	0.002	0.002	0.003	0.003	0.003	0.003	0.003	0.004	0.003	0.004	0.0027	0.0031	0.0029	0.0047	0.0031	0.0038	0.0038	0.0049	0.0036	0.0066	0.0075	0.0089	0.0085	0.0098	0.0071	0.0092	0.0052	0.003	0.0079	0.0047	0.0089
Phosphorus	(0.03)		**0.13**		**0.046**	**0.035**	**0.045**	**0.05**	0.028	0.02	**0.057**	**0.065**	**0.063**	**0.064**	**0.071**	**0.09**	**0.069**	0.025	**0.049**	**0.11**	0.023	**0.062**	<0.1	**0.057**	**0.41**	**0.034**	**0.11**	**0.14**	**0.054**	**0.25**	**0.034**	**0.068**	**0.042**	0.023	0.029	0.022	0.02	**0.16**
Selenium			<0.002	<0.002	<0.001	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<2.0	<2.0	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0020	<0.002	<0.002
Silicon			4.2	5.3	4.7	3.6	4.2	4.1	3.3	3.4	3.6	4.6	5	5.2	5.1	3.8	5.5	3.6	4.6	2.6	5.3	5	4.3	4.5	5.7	4.1	3.1	6	3.7	6	3.8	4.3	4.1	2.2	2	4.6	2.5	5.8
Silver			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.00009
Strontium			0.29		0.3	0.38	0.4	0.38	0.36	0.36	0.35	0.47	0.26	0.33	0.39	0.33	0.39	0.3	0.42	0.37	0.43	0.46	0.51	0.48	0.55	0.44	0.47	0.51	0.55	0.36	0.42	0.3	0.44	0.21	0.16	0.42	0.22	0.41
Thallium				<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.000059	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.000050	<0.00005	<0.00005
Tin					<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001	<0.0010	<0.001	<0.001
Titanium			0.061		<0.005	<0.005	<0.005	<0.005	0.007	<0.005	<0.005	<0.005	<0.005	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0068	0.01	0.006	0.0077	0.0053	0.008		<0.005	<0.0050	0.0053	0.012
Vanadium			0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0009	0.0006	<0.0005	<0.0005	<0.0005	<0.0005	0.00084	0.00072	<0.0005	0.001	0.0015	0.0006	<0.0005	<0.0005	0.0014	0.0011	0.001	0.0009	0.001	0.00091	<0.0005	0.00065	0.00067	0.002
Zinc	0.03 (0.02)		<0.005	0.013	0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.005	<0.005	<0.005	0.011	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0067	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0062	<0.005	<0.005	<0.005	<0.0050	<0.005	0.019

Note:
1. As of May 2015, dissolved aluminum (0.2 µ) results are reported.

THB-00006196-PE - Longlac Landfill

Table 4 (cont'd): Surface Water Data[1]

Parameter	PWQO[5]	SW3																																			
		May-97	Aug-06	Nov-06	Nov-07	Jun-08	Aug-08	Oct-08	Jun-09	Aug-09	Oct-09	Jun-10	Aug-10	Oct-10	May-11	Aug-11	Oct-11	May-12	Aug-12	Oct-12	May-13	Aug-13	Oct-13	May-14	Aug-14	Oct-14	May-15	Oct-15	May-16	Oct-16	May-17	Sep-17	May-18	Oct-18	May-19	Oct-19	May-20	Sep-20
General																																					
pH	6.5 to 8.5	Not	7.9	8.1	8.3	8.3	8.5	8.1	8.2	8.3	7.6	8.5	8.1	8.27	8.36	8.07	8.28	8.31	8.41	7.48	8.05	7.94	7.94	7.93	7.85	8.21	8.3	7.72	8.24	7.79	7.95	7.81	7.76	7.65	7.36	8.04	8.07	No
Field pH	6.5 to 8.5	Established	8.13	8.11		8.27	**8.68**	8.08	7.73	7.86	7.65	**8.54**	8.18	8.02	7.68	7.88	8.11	7.7	**8.84**	7.6	7.5	8.08	7.66	7.41	8	8.15	7.87	7.85	7.98	7.88	7.76	7.31	7.19	4.52	7.28	7.64	7.62	Sample
Conductivity (uS/cm)			494	1,360	699	514	402	672	632	612	650	612	587	811	610	402	769	850	1,000	900	440	700	740	640	520	740	610	780	860	950	1,400	1,400	710	1,500	1,400	1,300	1,100	Dry
Field Conductivity			529	1,340		521	376	678	591	570	672	604	584	768	607	440	672	745	847	730	392	552	557	521	558	797	656	710	876	915	1,245	1,205	659	1,294	1,134	585	595	
Field Temperature (^{O}C)	narrative		21.6	2.4		17.5	24.6	4.8	18.9	18.7	3	15.2	17.7	3.8	17.3	21	15.2	14.6	24.7	10.1	17.8	18.3	2.5	10.6	18.1	6.5	18.8	1.3	17.1	20.7	13.9	18.2	9.8	0.9	6.1	8.2	12.7	
TSS			430	62	29	31	15	4	140	25	10	<1	8	3	<1	20	53	3	34	200	30	26	4	11	110	4	<1	--	24	34	23	18	8	170	9	10	7	
BOD			16	12	<2	2	5	<2	<2	<2	<2	3	3	2	<2	5	10	<2	4	59	<2	<2	<2	3	10	<2	<2.0	12	4	9	14	3	6	5	36	4	<2	
COD			72	50	32	26	25	29	27	37	29	35	37	31	33	56	110	34	86	210	23	30	28	31	130	26	20	370	36	170	92	69	63	41	190	59	30	
TDS			337	833	433	364	250	420	430	395	421	400	382	528	382	290	490	480	474	544	246	408	396	408	356	426	356	506	510	638	1,010	1,040	415	895	1,150	885	810	
Hardness			150	650	350	210	150	290	250	230		220	230			130	310	400	230	270	210	290	300	310	180	310	260	300	330	400	640	740	300	760	680	720	500	
Organics																																					
DOC												11.4									--	10	8.9	11	21	8.5	7.5	40	8.6	26	26	18	14	12	60	20	9.3	
Phenols	0.001		**0.003**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	**0.002**	<0.001	<0.001	<0.001	<0.001	<0.001	**0.017**	<0.001	<0.001	**0.0047**	**0.0024**	<0.001	<0.001	**0.0022**	**0.0023**	**0.0031**	<0.0010	**0.0055**	<0.0010	**0.005**	**0.0019**	**0.0022**	**0.0036**	**0.003**	**0.031**	**0.003**	**0.0011**	
TKN			1.9	1.4	1.1	0.6	1.3	0.5	1	0.9	1.8	0.9	1.3	0.8	0.7	2	3	0.62	2.1	40	0.6	1.3	0.69	1.2	4.4	0.75	0.65	3.6	0.75	3.7	5.2	4.2	2.2	2.1	12	1.2	1.1	
Ammonia-N			0.32	0.05	0.78	<0.05	0.08	<0.05	0.06	<0.05	1	<0.05	0.09	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	8.9	0.11	0.065	<0.05	<0.05	0.057	0.066	<0.050	0.26	<0.050	1.4	0.16	1.3	0.16	1	1.8	<0.050	0.091	
Cations (mg/L)																																					
Calcium			73	230	120	76	34	83	86	64	79	53	72	99	83	45	100	130	70	140	66.9	99	88	86	49	89	80	71	87	120	240	280	100	220	280	250	190	
Magnesium			24	39	26	22	22	22	21	23	27	24	17	22	19	15	23	31	21	34	9.96	20	20	15	19	21	18	23	27	24	20	24	12	33	12	24	18	
Potassium			39	47	17	22	21	26	26	37	40	42	27	48	23	22	39	27	31	39	11	23	28	19	32	30	22	34	41	37	30	29	18	32	25	21	15	
Sodium			32	52	14	20	19	23	19	29	35	33	14	32	13	13	24	19	120	76	13.9	25	20	22	26	20	17	31	34	26	25	32	13	35	36	29	25	
Anions (mg/L)																																					
Chloride			25	30	5	6	6	9	8	9	11	13	7	14	7	7	16	17	150	64	16	22	20	24	28	26	28	48	57	32	31	24	16	32	25	15	19	
Nitrate			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	0.11	<0.10	0.42	<0.10	<0.10	0.29	
Nitrite			0.05	<0.01	<0.01	0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	0.114	<0.010	0.116	0.011	<0.010	0.036	
Sulphate			14	287	16	22	7	35	18	17	28	34	170	77	39	16	37	100	69	81	20	14	4	88	28	38	23	11	49	170	390	490	140	350	540	230	310	
Alkalinity as $CaCO_3$			242	464	375	249	201	318	314	309	315	270	113	337	268	190	356	330	180	270	180	290	370	200	190	320	260	310	310	280	270	280	190	330	110	490	240	
Ion Balance						2.12	0.25	0.43	2.39	1.44	4.33	1.99	1.08	3.2		NC	1.35	1.04	6.02	1.48	5.91	3.63	1.75	8.47	1.94	0.08	--	--	2.52		0.53	0.83							
Metals (mg/L) - Total																																					
Aluminum (dissolved)	(0.075)		**6.6**	**0.39**	**0.83**	**0.18**	**0.39**	0.012	**0.63**	**0.27**	0.037	0.035	**0.091**	**0.1**	0.012	**0.47**	**0.44**	0.021	**0.74**	**6.8**	**1**	**0.51**	**0.11**	**0.15**	**2**	0.02	0.007	0.006	0.017	<0.001	0.015	**0.17**	0.01	0.01	0.056	0.015	<0.005	
Antimony			<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	0.0005	<0.0005	<0.0005	0.0005	0.0009	0.0006	<0.0005	0.0005	0.0006	0.0005	0.00097	0.0016	<0.0005	<0.0005	<0.0005	0.00055	0.0012	<0.0005	0.003	0.0023	0.0022	0.00095	0.0013	0.0025	0.0012	<0.0005	0.0047	0.00058	0.00089	
Arsenic	0.1(0.005)		**0.009**	0.001	<0.001	<0.001	0.001	<0.001	0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	0.002	0.002	<0.001	0.0026	**0.0064**	0.0012	0.0019	<0.001	<0.001	**0.0059**	<0.001	0.0011	**0.012**	0.002	**0.0065**	**0.0054**	0.0045	**0.0068**	0.0013	**0.01**	**0.0051**	0.0021	
Barium			0.12	0.17	0.054	0.045	0.03	0.052	0.055	0.055	0.067	0.017	0.087	0.067	0.044	0.07	0.086	0.072	0.064	0.15	0.042	0.077	0.055	0.048	0.078	0.054	0.043	0.092	0.068	0.1	0.083	0.086	0.047	0.13	0.053	0.073	0.06	
Beryllium			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00050	<0.0005	
Bismuth			<0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	
Boron	(0.2)		0.15	0.2	0.099	0.14	0.15	0.19	0.13	**0.21**	0.18	**0.21**	0.16	**0.28**	0.14	0.14	0.2	**0.23**	**0.24**	0.17	0.063	0.17	0.15	0.17	**0.22**	0.2	**0.23**	**0.4**	**0.37**	**0.67**	**0.4**	**1.0**	**0.23**	**0.33**	**0.72**	**0.71**	**0.56**	
Cadmium	0.0002 (0.0005)		0.0004	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	**0.0011**	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0002	0.00025	0.00017	<0.0001	**0.00083**	<0.00010	<0.0001	
Chromium	0.009		**0.019**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	**0.017**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0051	<0.0050	<0.005	
Cobalt			0.0054	0.0009	0.0008	<0.0005	<0.0005	<0.0005	0.0006	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0005	0.0007	<0.0005	0.00084	0.0067	0.00081	0.00068	<0.0005	<0.0005	0.0018	<0.0005	<0.005	0.0014	<0.0005	0.0012	0.0028	0.0019	0.0011	0.0019	0.0036	0.00096	0.00059	
Copper	0.005		**0.024**	0.004	0.005	0.002	0.002	0.002	0.003	0.002	<0.001	0.002	0.003	0.002	0.002	0.003	0.003	0.0019	**0.0084**	**0.041**	0.0041	0.0022	<0.001	0.0037	**0.0089**	0.0011	0.0027	**0.0068**	0.0027	**0.0053**	**0.0077**	**0.0063**	**0.0092**	**0.0062**	**0.03**	0.002	**0.0057**	
Iron	0.3		**12**	**1.2**	**1.8**	**0.54**	**0.86**	0.15	**1.4**	**0.67**	**0.9**	0.22	**0.48**	0.2	<0.1	**2.5**	**1.8**	0.27	**1.1**	**11**	**1.3**	**0.75**	0.26	**0.46**	**3.9**	<0.1	<0.1	**5.8**	**0.68**	**2.5**	**4**	**2.3**	**1.2**	**1.5**	**0.78**	**1.3**	**0.53**	
Lead	0.02 (0.005)		**0.033**	0.0033	**0.0053**	0.0006	0.0006	<0.0005	0.0018	0.0012	<0.0005	<0.0005	0.0006	0.0008	<0.0005	**0.0066**	0.0044	0.00051	0.0033	**0.032**	0.0019	0.0021	<0.0005	0.00089	**0.013**	<0.0005	0.0016	**0.0073**	0.0025	0.005	0.004	0.0032	0.0018	0.0022	**0.0071**	0.0016	0.0036	
Manganese			1.1	0.54	0.18	0.039	0.064	0.047	0.16	0.034	0.7	0.017	0.058	0.046	0.011	0.14	0.29	0.057	0.068	0.96	0.14	0.45	0.12	0.06	0.28	0.063	0.012	0.76	0.09	0.52		0.55	0.45	1	0.82	1.3		
Mercury	0.0002		<0.0001		<0.0001		<0.0001			<0.0001		<0.0001	<0.0001			<0.0001			<0.0001			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.00010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	
Molybdenum			0.002	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.002	0.002	0.002	0.001	0.0025	0.0024	0.0013	0.0056	0.0031	0.0018	0.0013	0.00053	0.0015	0.0029	0.0012	0.001	0.0013	0.0013	0.0017	0.0019	0.002	0.0015	0.0013	0.0024	0.00053	0.0014	
Nickel			0.017	0.009	0.004	0.004	0.004	0.004	0.008	0.006	0.015	0.005	0.007	0.009	0.005	0.009	0.014	0.0041	0.0052	0.017	0.0034	0.0039	0.0022	0.0041	0.011	0.002	0.0024	0.0094	0.0046	0.0054	0.005	0.0047	0.0018	0.004	0.0077	0.0041	0.0039	
Phosphorus	(0.03)		**0.56**		**0.057**	**0.036**	**0.073**	0.025	**0.084**	**0.048**	0.027	0.017	**0.063**	**0.034**	0.025	**0.16**	**0.23**	0.024	**0.27**	**1.7**	**0.064**	**0.075**	<0.1	**0.046**	**0.5**	**0.039**	<0.1	**0.53**	**0.091**	**0.53**	**0.13**	**0.1**	**0.13**	**0.14**	**0.25**	**0.074**	**0.035**	
Selenium			<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<2.0	<2.0	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0020	<0.002	
Silicon			9.5	2.2	3	0.62	0.57	1.3	0.94	0.71	0.64	0.1	0.21	1.3	0.16	2	2.6	1.2	2	13	3.1	1.6	0.48	1.3	5.3	1.6	0.39	4	0.71	2	2.6	3.6	1.8	3.5	2.8	5.9	2.3	
Silver			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.00015	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.0001	
Strontium			0.092		0.13	0.11	0.076	0.11	0.1	0.077	0.12	0.095	0.1	0.11	0.098	0.069	0.13	0.15	0.17	0.24	0.083	0.14	0.12	0.15	0.11	0.12	0.11	0.15	0.14	0.33	0.42	0.52	0.26	0.32	0.64	0.98	0.61	
Thallium				<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.00014	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	
Tin					<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0012	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001			0.0016	<0.001		
Titanium			0.31		0.078	0.014	0.03	<0.005	0.058	0.021	<0.005	<0.005	<0.005	0.006	<0.005	0.023	0.029	<0.005	0.048	0.5	0.066	0.026	<0.005	0.0088	0.13	<0.005	<0.005	0.035	0.017	0.057	0.0089	0.01	<0.005		0.01	0.0069			
Vanadium			0.012	0.001	0.002	<0.001	<0.001	<0.001	0.002	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0039	0.0025	0.00077	0.0029	0.016	0.0027	0.002	<0.0005	0.00083	0.0066	<0.0005	<0.0005	0.0036	0.0014	0.004	0.0023	0.0016	0.00061	0.0023	0.0011	0.0016	0.0005	
Zinc	0.03 (0.02)		**0.15**	**0.023**	**0.022**	0.006	<0.005	0.006	0.014	0.007	<0.005	<0.005	<0.005	0.006	<0.005	0.007	0.015	0.0084	0.012	**0.2**	0.0081	0.0079	<0.005	0.0067	**0.033**	0.0076	0.0073	**0.025**	0.0081	**0.027**	**0.24**	**0.23**	**0.14**	**0.099**	**0.67**	**0.035**	**0.096**	

Note:

1. As of May 2015, dissolved aluminum (0.2 µ) results are reported.

Table 5: Methane Readings in On-Site Buildings / Structures

Date	Building / Structure														
	Seacan Metal (Paint) Storage Container 1			Welded Metal (Battery) Storage Shed			Attendant's Hut / Shed			Garage / Bulldozer Storage			Seacan Metal (Electronics) Storage Container 2		
	Full Vapours Includes Methane (ppm)	Vapours with No Methane (ppm)	Methane Vapours (ppm)	Full Vapours Includes Methane (ppm)	Vapours with No Methane (ppm)	Methane Vapours (ppm)	Full Vapours Includes Methane (ppm)	Vapours with No Methane (ppm)	Methane Vapours (ppm)	Full Vapours Includes Methane (ppm)	Vapours with No Methane (ppm)	Methane Vapours (ppm)	Full Vapours Includes Methane (ppm)	Vapours with No Methane (ppm)	Methane Vapours (ppm)
May 23, 2015[1]	<10	22	<10	<10	25	<10	<10	<10	<10	<10	<10	<10	Not Present	Not Present	Not Present
October 20, 2015[1]	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured
May 26, 2016[2]	<10	<10	<10	45	<10	45	45	<10	45	35	<10	35	Not Present	Not Present	Not Present
October 4, 2016	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
May 16, 2017	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
September 25, 2017	<10	<10	<10	<10	<10	<10	<10	<10	<10	20	<10	10	<10*	<10*	<10*
May 15, 2018	125	90	35	130	90	40	145	125	20	190	125	65	135	85	50
October 16, 2018	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
May 7, 2019	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
October 29, 2019	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
May 12, 2020	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
October 1, 2020	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10

Notes: 1. Methane measurements were obtained in 2015 were measured using a GasTechtor, Model No. 1238

2. All methane measurements obtained in 2016 and later, were obtained using an RKI Eagle 2 gas monitor calibrated to hexane standards.

3. Asterisks * indicates that building / storage container was not sealed prior to measurement (e.g. door was open).

APPENDIX E – Laboratory Reports of Analysis

Maxxam
A Bureau Veritas Group Company

Your Project #: THB-00006196-NE
Site Location: LONGLAC LANDFILL

Attention: Jay Zhang

exp Services Inc
Thunder Bay Branch
1142 Roland St
Thunder Bay, ON
CANADA P7B 5M4

Your C.O.C. #: 663247-01-01, 663247-02-01, 663248-01-01

Report Date: 2018/05/25
Report #: R5170709
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B8B8045
Received: 2018/05/17, 14:45

Sample Matrix: Water
Samples Received: 19

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Dissolved Aluminum (0.2 u, clay free)	3	N/A	2018/05/23	CAM SOP-00447	EPA 6020B m
Alkalinity	9	N/A	2018/05/20	CAM SOP-00448	SM 23 2320 B m
Alkalinity	10	N/A	2018/05/22	CAM SOP-00448	SM 23 2320 B m
Biochemical Oxygen Demand (BOD)	3	2018/05/19	2018/05/24	CAM SOP-00427	SM 23 5210B m
Chloride by Automated Colourimetry	19	N/A	2018/05/22	CAM SOP-00463	EPA 325.2 m
Chemical Oxygen Demand	5	N/A	2018/05/22	CAM SOP-00416	SM 23 5220 D m
Chemical Oxygen Demand	8	N/A	2018/05/23	CAM SOP-00416	SM 23 5220 D m
Chemical Oxygen Demand	6	N/A	2018/05/24	CAM SOP-00416	SM 23 5220 D m
Conductivity	9	N/A	2018/05/20	CAM SOP-00414	SM 23 2510 m
Conductivity	10	N/A	2018/05/22	CAM SOP-00414	SM 23 2510 m
Dissolved Organic Carbon (DOC) (1)	16	N/A	2018/05/22	CAM SOP-00446	SM 23 5310 B m
Dissolved Organic Carbon (DOC) (1)	3	N/A	2018/05/23	CAM SOP-00446	SM 23 5310 B m
Hardness (calculated as CaCO3)	14	N/A	2018/05/23	CAM SOP 00102/00408/00447	SM 2340 B
Hardness (calculated as CaCO3)	5	N/A	2018/05/24	CAM SOP 00102/00408/00447	SM 2340 B
Mercury in Water by CVAA	6	2018/05/22	2018/05/23	CAM SOP-00453	EPA 7470A m
Mercury in Water by CVAA	1	2018/05/23	2018/05/23	CAM SOP-00453	EPA 7470A m
Mercury in Water by CVAA	11	2018/05/23	2018/05/24	CAM SOP-00453	EPA 7470A m
Mercury in Water by CVAA	1	2018/05/24	2018/05/24	CAM SOP-00453	EPA 7470A m
Dissolved Calcium and Magnesium	3	2018/05/19	2018/05/22	CAM SOP-00408	EPA 6010D m
Dissolved Metals by ICPMS	14	N/A	2018/05/23	CAM SOP-00447	EPA 6020B m
Dissolved Metals by ICPMS	2	N/A	2018/05/25	CAM SOP-00447	EPA 6020B m
Total Metals Analysis by ICPMS	3	N/A	2018/05/24	CAM SOP-00447	EPA 6020B m
Ion Balance (% Difference)	11	N/A	2018/05/23		
Ion Balance (% Difference)	5	N/A	2018/05/24		
Total Ammonia-N	11	N/A	2018/05/23	CAM SOP-00441	EPA GS I-2522-90 m

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Your Project #: THB-00006196-NE
Site Location: LONGLAC LANDFILL

Attention: Jay Zhang

exp Services Inc
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Your C.O.C. #: 663247-01-01, 663247-02-01, 663248-01-01

Report Date: 2018/05/25
Report #: R5170709
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CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B8B8045
Received: 2018/05/17, 14:45

Sample Matrix: Water
Samples Received: 19

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Total Ammonia-N	8	N/A	2018/05/24	CAM SOP-00441	EPA GS I-2522-90 m
Nitrate (NO3) and Nitrite (NO2) in Water (2)	19	N/A	2018/05/23	CAM SOP-00440	SM 23 4500-NO3I/NO2B
Organic Nitrogen	19	N/A	2018/05/24		
pH	9	N/A	2018/05/20	CAM SOP-00413	SM 4500H+ B m
pH	10	N/A	2018/05/22	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	19	N/A	2018/05/22	CAM SOP-00444	OMOE E3179 m
Orthophosphate	16	N/A	2018/05/22	CAM SOP-00461	EPA 365.1 m
Sulphate by Automated Colourimetry	19	N/A	2018/05/22	CAM SOP-00464	EPA 375.4 m
Total Dissolved Solids	19	2018/05/22	2018/05/22	CAM SOP-00428	SM 23 2540C m
Total Kjeldahl Nitrogen in Water	11	2018/05/22	2018/05/23	CAM SOP-00938	OMOE E3516 m
Total Kjeldahl Nitrogen in Water	8	2018/05/22	2018/05/24	CAM SOP-00938	OMOE E3516 m
Total Phosphorus (Colourimetric)	3	2018/05/24	2018/05/24	CAM SOP-00407	SM 23 4500 P B H m
Total Phosphorus (Colourimetric)	16	2018/05/22	2018/05/23	CAM SOP-00407	SM 23 4500 P B H m
Low Level Total Suspended Solids	3	2018/05/22	2018/05/22	CAM SOP-00428	SM 23 2540D m

Remarks:

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

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

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

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Your Project #: THB-00006196-NE
Site Location: LONGLAC LANDFILL

Attention: Jay Zhang

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CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B8B8045
Received: 2018/05/17, 14:45

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.
(1) Dissolved Organic Carbon (DOC) present in the sample should be considered as non-purgeable DOC.
(2) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Michelle Brescacin, Project Manager Assistant - National Accounts
Email: MBrescacin@maxxam.ca
Phone# (905) 817-5700

==========

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 #: B8B8045
Report Date: 2018/05/25

exp Services Inc
Client Project #: THB-00006196-NE
Site Location: LONGLAC LANDFILL
Sampler Initials: JZ

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		GSR421		GSR422			GSR423		
Sampling Date		2018/05/15 14:35		2018/05/15 14:50			2018/05/15 10:00		
COC Number		663247-01-01		663247-01-01			663247-01-01		
	UNITS	**MW2**	**QC Batch**	**MW3**	**RDL**	**QC Batch**	**MW4I**	**RDL**	**QC Batch**
Inorganics									
Total Ammonia-N	mg/L	0.56	5543077	0.91 (1)	0.050	5543077	<0.050	0.050	5541853
Total Chemical Oxygen Demand (COD)	mg/L	13	5541847	<4.0	4.0	5541847	5.9	4.0	5541847
Conductivity	umho/cm	400	5540056	470	1.0	5540302	640	1.0	5540302
Total Dissolved Solids	mg/L	225	5541107	230	10	5541107	360	10	5541107
Total Kjeldahl Nitrogen (TKN)	mg/L	0.61	5542028	0.90 (1)	0.10	5542028	<0.10	0.10	5542028
Dissolved Organic Carbon	mg/L	5.4	5539844	1.4	0.50	5539844	2.8	0.50	5539844
pH	pH	7.88	5540057	7.89		5540303	8.17		5540303
Phenols-4AAP	mg/L	<0.0010	5541499	<0.0010	0.0010	5541499	<0.0010	0.0010	5541499
Total Phosphorus	mg/L	6.2	5541635	3.9	0.40	5541635	0.13	0.020	5541635
Dissolved Sulphate (SO4)	mg/L	<1.0	5540318	<1.0	1.0	5540318	1.9	1.0	5540318
Alkalinity (Total as CaCO3)	mg/L	230	5540054	270	1.0	5540301	370	1.0	5540301
Dissolved Chloride (Cl)	mg/L	1.2	5540317	1.4	1.0	5540317	3.0	1.0	5540317
Nitrite (N)	mg/L	<0.010	5540262	<0.010	0.010	5540262	<0.010	0.010	5540262
Nitrate (N)	mg/L	<0.10	5540262	<0.10	0.10	5540262	0.36	0.10	5540262
Metals									
Mercury (Hg)	mg/L	<0.0001	5543252	<0.0001	0.0001	5543252	<0.0001	0.0001	5543103
Dissolved Aluminum (Al)	ug/L	<5.0	5539833	<5.0	5.0	5539833	<5.0	5.0	5539833
Dissolved Antimony (Sb)	ug/L	<0.50	5539833	<0.50	0.50	5539833	<0.50	0.50	5539833
Dissolved Arsenic (As)	ug/L	1.7	5539833	1.7	1.0	5539833	<1.0	1.0	5539833
Dissolved Barium (Ba)	ug/L	29	5539833	39	2.0	5539833	72	2.0	5539833
Dissolved Beryllium (Be)	ug/L	<0.50	5539833	<0.50	0.50	5539833	<0.50	0.50	5539833
Dissolved Bismuth (Bi)	ug/L	<1.0	5539833	<1.0	1.0	5539833	<1.0	1.0	5539833
Dissolved Boron (B)	ug/L	18	5539833	32	10	5539833	97	10	5539833
Dissolved Cadmium (Cd)	ug/L	<0.10	5539833	<0.10	0.10	5539833	<0.10	0.10	5539833
Dissolved Calcium (Ca)	ug/L	59000	5539833	62000	200	5539833	73000	200	5539833
Dissolved Chromium (Cr)	ug/L	<5.0	5539833	<5.0	5.0	5539833	<5.0	5.0	5539833
Dissolved Cobalt (Co)	ug/L	<0.50	5539833	<0.50	0.50	5539833	<0.50	0.50	5539833
Dissolved Copper (Cu)	ug/L	<1.0	5539833	<1.0	1.0	5539833	<1.0	1.0	5539833
Dissolved Iron (Fe)	ug/L	890	5539833	480	100	5539833	<100	100	5539833
Dissolved Lead (Pb)	ug/L	<0.50	5539833	<0.50	0.50	5539833	<0.50	0.50	5539833
Dissolved Magnesium (Mg)	ug/L	14000	5539833	18000	50	5539833	34000	50	5539833
Dissolved Manganese (Mn)	ug/L	62	5539833	69	2.0	5539833	<2.0	2.0	5539833

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) TKN < NH4: Both values fall within acceptable RPD limits for duplicates and are likely equivalent.

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Maxxam Job #: B8B8045
Report Date: 2018/05/25

exp Services Inc
Client Project #: THB-00006196-NE
Site Location: LONGLAC LANDFILL
Sampler Initials: JZ

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		GSR421		GSR422			GSR423		
Sampling Date		2018/05/15 14:35		2018/05/15 14:50			2018/05/15 10:00		
COC Number		663247-01-01		663247-01-01			663247-01-01		
	UNITS	**MW2**	**QC Batch**	**MW3**	**RDL**	**QC Batch**	**MW4I**	**RDL**	**QC Batch**
Dissolved Molybdenum (Mo)	ug/L	<0.50	5539833	<0.50	0.50	5539833	4.6	0.50	5539833
Dissolved Nickel (Ni)	ug/L	<1.0	5539833	<1.0	1.0	5539833	1.4	1.0	5539833
Dissolved Potassium (K)	ug/L	870	5539833	1100	200	5539833	11000	200	5539833
Dissolved Selenium (Se)	ug/L	<2.0	5539833	<2.0	2.0	5539833	<2.0	2.0	5539833
Dissolved Silicon (Si)	ug/L	7600	5539833	8400	50	5539833	7400	50	5539833
Dissolved Sodium (Na)	ug/L	5000	5539833	8400	100	5539833	15000	100	5539833
Dissolved Strontium (Sr)	ug/L	180	5539833	270	1.0	5539833	470	1.0	5539833
Dissolved Thallium (Tl)	ug/L	<0.050	5539833	<0.050	0.050	5539833	<0.050	0.050	5539833
Dissolved Tin (Sn)	ug/L	<1.0	5539833	<1.0	1.0	5539833	<1.0	1.0	5539833
Dissolved Vanadium (V)	ug/L	0.83	5539833	<0.50	0.50	5539833	<0.50	0.50	5539833
Dissolved Zinc (Zn)	ug/L	<5.0	5539833	<5.0	5.0	5539833	<5.0	5.0	5539833

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B8B8045
Report Date: 2018/05/25

exp Services Inc
Client Project #: THB-00006196-NE
Site Location: LONGLAC LANDFILL
Sampler Initials: JZ

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		GSR423			GSR424			GSR424		
Sampling Date		2018/05/15 10:00			2018/05/15 17:00			2018/05/15 17:00		
COC Number		663247-01-01			663247-01-01			663247-01-01		
	UNITS	**MW4I Lab-Dup**	**RDL**	**QC Batch**	**MW4II**	**RDL**	**QC Batch**	**MW4II Lab-Dup**	**RDL**	**QC Batch**
Inorganics										
Total Ammonia-N	mg/L				1.7	0.050	5541853			
Total Chemical Oxygen Demand (COD)	mg/L				9.9	4.0	5541847			
Conductivity	umho/cm				1600	1.0	5540302			
Total Dissolved Solids	mg/L				850	10	5541107			
Total Kjeldahl Nitrogen (TKN)	mg/L				1.8	0.50	5542028			
Dissolved Organic Carbon	mg/L				6.9	0.50	5539884			
pH	pH				7.96		5540303			
Phenols-4AAP	mg/L				<0.0010	0.0010	5541499			
Total Phosphorus	mg/L				14	0.40	5541635			
Dissolved Sulphate (SO4)	mg/L				29	1.0	5540318			
Alkalinity (Total as CaCO3)	mg/L				840	1.0	5540301			
Dissolved Chloride (Cl)	mg/L				15	1.0	5540317			
Nitrite (N)	mg/L				0.581	0.010	5540262			
Nitrate (N)	mg/L				3.81	0.10	5540262			
Metals										
Mercury (Hg)	mg/L	<0.0001	0.0001	5543103	<0.0001	0.0001	5543252			
Dissolved Aluminum (Al)	ug/L				<5.0	5.0	5547478	<5.0	5.0	5547478
Dissolved Antimony (Sb)	ug/L				<0.50	0.50	5547478	<0.50	0.50	5547478
Dissolved Arsenic (As)	ug/L				<1.0	1.0	5547478	<1.0	1.0	5547478
Dissolved Barium (Ba)	ug/L				94	2.0	5547478	91	2.0	5547478
Dissolved Beryllium (Be)	ug/L				<0.50	0.50	5547478	<0.50	0.50	5547478
Dissolved Bismuth (Bi)	ug/L				<1.0	1.0	5547478	<1.0	1.0	5547478
Dissolved Boron (B)	ug/L				790	10	5547478	790	10	5547478
Dissolved Cadmium (Cd)	ug/L				<0.10	0.10	5547478	<0.10	0.10	5547478
Dissolved Calcium (Ca)	ug/L				54000	200	5547478	53000	200	5547478
Dissolved Chromium (Cr)	ug/L				<5.0	5.0	5547478	<5.0	5.0	5547478
Dissolved Cobalt (Co)	ug/L				0.55	0.50	5547478	0.58	0.50	5547478
Dissolved Copper (Cu)	ug/L				3.7	1.0	5547478	3.8	1.0	5547478
Dissolved Iron (Fe)	ug/L				<100	100	5547478	<100	100	5547478
Dissolved Lead (Pb)	ug/L				<0.50	0.50	5547478	<0.50	0.50	5547478
Dissolved Magnesium (Mg)	ug/L				73000	50	5547478	72000	50	5547478
Dissolved Manganese (Mn)	ug/L				17	2.0	5547478	16	2.0	5547478

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

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Maxxam Job #: B8B8045
Report Date: 2018/05/25

exp Services Inc
Client Project #: THB-00006196-NE
Site Location: LONGLAC LANDFILL
Sampler Initials: JZ

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		GSR423			GSR424			GSR424		
Sampling Date		2018/05/15 10:00			2018/05/15 17:00			2018/05/15 17:00		
COC Number		663247-01-01			663247-01-01			663247-01-01		
	UNITS	**MW4I Lab-Dup**	**RDL**	**QC Batch**	**MW4II**	**RDL**	**QC Batch**	**MW4II Lab-Dup**	**RDL**	**QC Batch**
Dissolved Molybdenum (Mo)	ug/L				3.7	0.50	5547478	3.8	0.50	5547478
Dissolved Nickel (Ni)	ug/L				1.7	1.0	5547478	1.7	1.0	5547478
Dissolved Potassium (K)	ug/L				190000	200	5547478	190000	200	5547478
Dissolved Selenium (Se)	ug/L				<2.0	2.0	5547478	<2.0	2.0	5547478
Dissolved Silicon (Si)	ug/L				3500	50	5547478	3500	50	5547478
Dissolved Sodium (Na)	ug/L				21000	100	5547478	20000	100	5547478
Dissolved Strontium (Sr)	ug/L				130	1.0	5547478	130	1.0	5547478
Dissolved Thallium (Tl)	ug/L				0.073	0.050	5547478	0.068	0.050	5547478
Dissolved Tin (Sn)	ug/L				<1.0	1.0	5547478	<1.0	1.0	5547478
Dissolved Vanadium (V)	ug/L				<0.50	0.50	5547478	<0.50	0.50	5547478
Dissolved Zinc (Zn)	ug/L				<5.0	5.0	5547478	<5.0	5.0	5547478

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

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exp Services Inc
Client Project #: THB-00006196-NE
Site Location: LONGLAC LANDFILL
Sampler Initials: JZ

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		GSR425			GSR426			GSR426		
Sampling Date		2018/05/15 16:35			2018/05/15 16:25			2018/05/15 16:25		
COC Number		663247-01-01			663247-01-01			663247-01-01		
	UNITS	**MW5**	**RDL**	**QC Batch**	**MW6**	**RDL**	**QC Batch**	**MW6 Lab-Dup**	**RDL**	**QC Batch**
Inorganics										
Total Ammonia-N	mg/L	0.10 (1)	0.050	5541853	68 (1)	0.50	5541853			
Total Chemical Oxygen Demand (COD)	mg/L	<4.0	4.0	5543538	12	4.0	5543538			
Conductivity	umho/cm	490	1.0	5540302	1200	1.0	5540056			
Total Dissolved Solids	mg/L	220	10	5541347	390	10	5541107			
Total Kjeldahl Nitrogen (TKN)	mg/L	0.10 (1)	0.10	5542028	61 (1)	5.0	5542028			
Dissolved Organic Carbon	mg/L	0.96	0.50	5539844	3.9	0.50	5539844			
pH	pH	8.06		5540303	7.75		5540057			
Phenols-4AAP	mg/L	<0.0010	0.0010	5541499	<0.0010	0.0010	5541499			
Total Phosphorus	mg/L	1.5	0.20	5541635	0.89	0.10	5541635			
Dissolved Sulphate (SO4)	mg/L	1.8	1.0	5540318	8.2	1.0	5540318	8.5	1.0	5540318
Alkalinity (Total as CaCO3)	mg/L	280	1.0	5540301	630	1.0	5540054			
Dissolved Chloride (Cl)	mg/L	1.4	1.0	5540317	22	1.0	5540317	21	1.0	5540317
Nitrite (N)	mg/L	<0.010	0.010	5540262	0.129	0.010	5540262			
Nitrate (N)	mg/L	0.13	0.10	5540262	0.14	0.10	5540262			
Metals										
Mercury (Hg)	mg/L	<0.0001	0.0001	5543252	<0.0001	0.0001	5541513			
Dissolved Aluminum (Al)	ug/L	<5.0	5.0	5539833	140	5.0	5540320			
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	5539833	<0.50	0.50	5540320			
Dissolved Arsenic (As)	ug/L	<1.0	1.0	5539833	<1.0	1.0	5540320			
Dissolved Barium (Ba)	ug/L	21	2.0	5539833	94	2.0	5540320			
Dissolved Beryllium (Be)	ug/L	<0.50	0.50	5539833	<0.50	0.50	5540320			
Dissolved Bismuth (Bi)	ug/L	<1.0	1.0	5539833	<1.0	1.0	5540320			
Dissolved Boron (B)	ug/L	12	10	5539833	33	10	5540320			
Dissolved Cadmium (Cd)	ug/L	<0.10	0.10	5539833	<0.10	0.10	5540320			
Dissolved Calcium (Ca)	ug/L	74000	200	5539833	97000	200	5540320			
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	5539833	<5.0	5.0	5540320			
Dissolved Cobalt (Co)	ug/L	<0.50	0.50	5539833	0.67	0.50	5540320			
Dissolved Copper (Cu)	ug/L	<1.0	1.0	5539833	1.2	1.0	5540320			
Dissolved Iron (Fe)	ug/L	<100	100	5539833	<100	100	5540320			
Dissolved Lead (Pb)	ug/L	<0.50	0.50	5539833	<0.50	0.50	5540320			
Dissolved Magnesium (Mg)	ug/L	18000	50	5539833	28000	50	5540320			
Dissolved Manganese (Mn)	ug/L	<2.0	2.0	5539833	220	2.0	5540320			

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
(1) TKN < NH4: Both values fall within acceptable RPD limits for duplicates and are likely equivalent.

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Maxxam Job #: B8B8045
Report Date: 2018/05/25

exp Services Inc
Client Project #: THB-00006196-NE
Site Location: LONGLAC LANDFILL
Sampler Initials: JZ

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		GSR425			GSR426			GSR426		
Sampling Date		2018/05/15 16:35			2018/05/15 16:25			2018/05/15 16:25		
COC Number		663247-01-01			663247-01-01			663247-01-01		
	UNITS	**MW5**	**RDL**	**QC Batch**	**MW6**	**RDL**	**QC Batch**	**MW6 Lab-Dup**	**RDL**	**QC Batch**
Dissolved Molybdenum (Mo)	ug/L	<0.50	0.50	5539833	0.67	0.50	5540320			
Dissolved Nickel (Ni)	ug/L	<1.0	1.0	5539833	2.6	1.0	5540320			
Dissolved Potassium (K)	ug/L	890	200	5539833	4400	200	5540320			
Dissolved Selenium (Se)	ug/L	<2.0	2.0	5539833	<2.0	2.0	5540320			
Dissolved Silicon (Si)	ug/L	6000	50	5539833	5100	50	5540320			
Dissolved Sodium (Na)	ug/L	2600	100	5539833	12000	100	5540320			
Dissolved Strontium (Sr)	ug/L	69	1.0	5539833	220	1.0	5540320			
Dissolved Thallium (Tl)	ug/L	<0.050	0.050	5539833	<0.050	0.050	5540320			
Dissolved Tin (Sn)	ug/L	<1.0	1.0	5539833	<1.0	1.0	5540320			
Dissolved Vanadium (V)	ug/L	0.60	0.50	5539833	<0.50	0.50	5540320			
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	5539833	<5.0	5.0	5540320			

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

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exp Services Inc
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Sampler Initials: JZ

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		GSR427			GSR427		
Sampling Date		2018/05/15 16:10			2018/05/15 16:10		
COC Number		663247-01-01			663247-01-01		
	UNITS	**MW7**	**RDL**	**QC Batch**	**MW7 Lab-Dup**	**RDL**	**QC Batch**
Inorganics							
Total Ammonia-N	mg/L	0.72	0.050	5541853			
Total Chemical Oxygen Demand (COD)	mg/L	17	4.0	5543538			
Conductivity	umho/cm	2100	1.0	5540302			
Total Dissolved Solids	mg/L	1470	10	5541347			
Total Kjeldahl Nitrogen (TKN)	mg/L	<5.0 (1)	5.0	5542028			
Dissolved Organic Carbon	mg/L	4.9	0.50	5539844			
pH	pH	7.62		5540303			
Phenols-4AAP	mg/L	<0.0010	0.0010	5541499			
Total Phosphorus	mg/L	2.3	0.10	5541635			
Dissolved Sulphate (SO4)	mg/L	110	1.0	5540318			
Alkalinity (Total as CaCO3)	mg/L	310	1.0	5540301			
Dissolved Chloride (Cl)	mg/L	25	1.0	5540317			
Nitrite (N)	mg/L	0.488	0.010	5540262			
Nitrate (N)	mg/L	183	1.0	5540262			
Metals							
Mercury (Hg)	mg/L	<0.0001	0.0001	5545383	<0.0001	0.0001	5545383
Dissolved Aluminum (Al)	ug/L	<5.0	5.0	5539833			
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	5539833			
Dissolved Arsenic (As)	ug/L	<1.0	1.0	5539833			
Dissolved Barium (Ba)	ug/L	110	2.0	5539833			
Dissolved Beryllium (Be)	ug/L	<0.50	0.50	5539833			
Dissolved Bismuth (Bi)	ug/L	<1.0	1.0	5539833			
Dissolved Boron (B)	ug/L	240	10	5539833			
Dissolved Cadmium (Cd)	ug/L	<0.10	0.10	5539833			
Dissolved Calcium (Ca)	ug/L	280000	200	5539833			
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	5539833			
Dissolved Cobalt (Co)	ug/L	2.2	0.50	5539833			
Dissolved Copper (Cu)	ug/L	2.7	1.0	5539833			
Dissolved Iron (Fe)	ug/L	<100	100	5539833			
Dissolved Lead (Pb)	ug/L	<0.50	0.50	5539833			
Dissolved Magnesium (Mg)	ug/L	49000	50	5539833			

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
(1) Due to a high concentration of NOx, the sample required dilution. The detection limit was adjusted accordingly.

Maxxam Job #: B8B8045
Report Date: 2018/05/25

exp Services Inc
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LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		GSR427			GSR427		
Sampling Date		2018/05/15 16:10			2018/05/15 16:10		
COC Number		663247-01-01			663247-01-01		
	UNITS	**MW7**	**RDL**	**QC Batch**	**MW7 Lab-Dup**	**RDL**	**QC Batch**
Dissolved Manganese (Mn)	ug/L	240	2.0	5539833			
Dissolved Molybdenum (Mo)	ug/L	<0.50	0.50	5539833			
Dissolved Nickel (Ni)	ug/L	5.3	1.0	5539833			
Dissolved Potassium (K)	ug/L	13000	200	5539833			
Dissolved Selenium (Se)	ug/L	<2.0	2.0	5539833			
Dissolved Silicon (Si)	ug/L	6000	50	5539833			
Dissolved Sodium (Na)	ug/L	27000	100	5539833			
Dissolved Strontium (Sr)	ug/L	260	1.0	5539833			
Dissolved Thallium (Tl)	ug/L	0.070	0.050	5539833			
Dissolved Tin (Sn)	ug/L	<1.0	1.0	5539833			
Dissolved Vanadium (V)	ug/L	<0.50	0.50	5539833			
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	5539833			

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

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Maxxam Job #: B8B8045
Report Date: 2018/05/25

exp Services Inc
Client Project #: THB-00006196-NE
Site Location: LONGLAC LANDFILL
Sampler Initials: JZ

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		GSR428			GSR428			GSR429		
Sampling Date		2018/05/15 15:45			2018/05/15 15:45			2018/05/15 15:55		
COC Number		663247-01-01			663247-01-01			663247-01-01		
	UNITS	**MW8I**	**RDL**	**QC Batch**	**MW8I Lab-Dup**	**RDL**	**QC Batch**	**MW8II**	**RDL**	**QC Batch**
Inorganics										
Total Ammonia-N	mg/L	56	0.50	5543077				2.2	0.050	5541853
Total Chemical Oxygen Demand (COD)	mg/L	190	8.0	5541847				16	4.0	5543538
Conductivity	umho/cm	4500	1.0	5540302				1000	1.0	5540302
Total Dissolved Solids	mg/L	2470	10	5541107				570	10	5541107
Total Kjeldahl Nitrogen (TKN)	mg/L	58	2.0	5542028				2.4	0.20	5542028
Dissolved Organic Carbon	mg/L	60	2.5	5539884				4.2	0.50	5539844
pH	pH	7.41		5540303				7.74		5540303
Phenols-4AAP	mg/L	0.0041	0.0010	5541499				<0.0010	0.0010	5541499
Total Phosphorus	mg/L	0.13	0.040	5541635				1.9	0.10	5541635
Dissolved Sulphate (SO4)	mg/L	230	1.0	5540318				61	1.0	5540318
Alkalinity (Total as CaCO3)	mg/L	1700	1.0	5540301				430	1.0	5540301
Dissolved Chloride (Cl)	mg/L	450	5.0	5540317				48	1.0	5540317
Nitrite (N)	mg/L	0.012	0.010	5540262				0.095	0.010	5540262
Nitrate (N)	mg/L	<0.10	0.10	5540262				0.64	0.10	5540262
Metals										
Mercury (Hg)	mg/L	<0.0001	0.0001	5541513				<0.0001	0.0001	5541513
Dissolved Aluminum (Al)	ug/L	8.6	5.0	5539833	8.5	5.0	5539833	<5.0	5.0	5547478
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	5539833	<0.50	0.50	5539833	<0.50	0.50	5547478
Dissolved Arsenic (As)	ug/L	6.8	1.0	5539833	7.1	1.0	5539833	<1.0	1.0	5547478
Dissolved Barium (Ba)	ug/L	250	2.0	5539833	250	2.0	5539833	37	2.0	5547478
Dissolved Beryllium (Be)	ug/L	<0.50	0.50	5539833	<0.50	0.50	5539833	<0.50	0.50	5547478
Dissolved Bismuth (Bi)	ug/L	<1.0	1.0	5539833	<1.0	1.0	5539833	<1.0	1.0	5547478
Dissolved Boron (B)	ug/L	2100	10	5539833	2100	10	5539833	150	10	5547478
Dissolved Cadmium (Cd)	ug/L	<0.10	0.10	5539833	<0.10	0.10	5539833	<0.10	0.10	5547478
Dissolved Calcium (Ca)	ug/L	200000	200	5539833	200000	200	5539833	100000	200	5547478
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	5539833	<5.0	5.0	5539833	<5.0	5.0	5547478
Dissolved Cobalt (Co)	ug/L	15	0.50	5539833	16	0.50	5539833	0.53	0.50	5547478
Dissolved Copper (Cu)	ug/L	1.3	1.0	5539833	1.1	1.0	5539833	2.9	1.0	5547478
Dissolved Iron (Fe)	ug/L	6300	100	5539833	6300	100	5539833	<100	100	5547478
Dissolved Lead (Pb)	ug/L	<0.50	0.50	5539833	<0.50	0.50	5539833	<0.50	0.50	5547478
Dissolved Magnesium (Mg)	ug/L	130000	50	5539833	130000	50	5539833	21000	50	5547478
Dissolved Manganese (Mn)	ug/L	950	2.0	5539833	940	2.0	5539833	57	2.0	5547478

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

Maxxam Job #: B8B8045
Report Date: 2018/05/25

exp Services Inc
Client Project #: THB-00006196-NE
Site Location: LONGLAC LANDFILL
Sampler Initials: JZ

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		GSR428			GSR428			GSR429		
Sampling Date		2018/05/15 15:45			2018/05/15 15:45			2018/05/15 15:55		
COC Number		663247-01-01			663247-01-01			663247-01-01		
	UNITS	**MW8I**	**RDL**	**QC Batch**	**MW8I Lab-Dup**	**RDL**	**QC Batch**	**MW8II**	**RDL**	**QC Batch**
Dissolved Molybdenum (Mo)	ug/L	1.8	0.50	5539833	1.7	0.50	5539833	0.62	0.50	5547478
Dissolved Nickel (Ni)	ug/L	33	1.0	5539833	32	1.0	5539833	2.7	1.0	5547478
Dissolved Potassium (K)	ug/L	210000	1000	5539833	210000	1000	5539833	12000	200	5547478
Dissolved Selenium (Se)	ug/L	<2.0	2.0	5539833	<2.0	2.0	5539833	<2.0	2.0	5547478
Dissolved Silicon (Si)	ug/L	9200	50	5539833	9200	50	5539833	4400	50	5547478
Dissolved Sodium (Na)	ug/L	290000	100	5539833	290000	100	5539833	23000	100	5547478
Dissolved Strontium (Sr)	ug/L	680	1.0	5539833	680	1.0	5539833	150	1.0	5547478
Dissolved Thallium (Tl)	ug/L	0.18	0.050	5539833	0.17	0.050	5539833	<0.050	0.050	5547478
Dissolved Tin (Sn)	ug/L	<1.0	1.0	5539833	<1.0	1.0	5539833	<1.0	1.0	5547478
Dissolved Vanadium (V)	ug/L	1.6	0.50	5539833	1.8	0.50	5539833	<0.50	0.50	5547478
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	5539833	<5.0	5.0	5539833	<5.0	5.0	5547478

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

Maxxam Job #: B8B8045
Report Date: 2018/05/25

exp Services Inc
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LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		GSR430			GSR431			GSR431		
Sampling Date		2018/05/15 17:15			2018/05/15 16:55			2018/05/15 16:55		
COC Number		663247-01-01			663247-02-01			663247-02-01		
	UNITS	**MW9**	**RDL**	**QC Batch**	**MW10**	**RDL**	**QC Batch**	**MW10 Lab-Dup**	**RDL**	**QC Batch**
Inorganics										
Total Ammonia-N	mg/L	<0.050	0.050	5541853	0.085	0.050	5541853			
Total Chemical Oxygen Demand (COD)	mg/L	<4.0	4.0	5541847	13	4.0	5541847			
Conductivity	umho/cm	610	1.0	5540302	480	1.0	5540062			
Total Dissolved Solids	mg/L	360	10	5541107	285	10	5541107			
Total Kjeldahl Nitrogen (TKN)	mg/L	<0.10	0.10	5542028	0.19	0.10	5542028			
Dissolved Organic Carbon	mg/L	1.4	0.50	5539844	3.0	0.50	5539844			
pH	pH	7.93		5540303	7.84		5540064			
Phenols-4AAP	mg/L	<0.0010	0.0010	5541499	<0.0010	0.0010	5541795			
Total Phosphorus	mg/L	0.15	0.020	5541635	0.48	0.040	5541635			
Dissolved Sulphate (SO4)	mg/L	38	1.0	5540318	1.3	1.0	5540318			
Alkalinity (Total as CaCO3)	mg/L	280	1.0	5540301	260	1.0	5540061			
Dissolved Chloride (Cl)	mg/L	7.6	1.0	5540317	1.8	1.0	5540317			
Nitrite (N)	mg/L	<0.010	0.010	5540262	<0.010	0.010	5540262	<0.010	0.010	5540262
Nitrate (N)	mg/L	4.05	0.10	5540262	0.19	0.10	5540262	0.18	0.10	5540262
Metals										
Mercury (Hg)	mg/L	<0.0001	0.0001	5543252	<0.0001	0.0001	5543252			
Dissolved Aluminum (Al)	ug/L	<5.0	5.0	5539833	<5.0	5.0	5540320			
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	5539833	<0.50	0.50	5540320			
Dissolved Arsenic (As)	ug/L	<1.0	1.0	5539833	<1.0	1.0	5540320			
Dissolved Barium (Ba)	ug/L	10	2.0	5539833	13	2.0	5540320			
Dissolved Beryllium (Be)	ug/L	<0.50	0.50	5539833	<0.50	0.50	5540320			
Dissolved Bismuth (Bi)	ug/L	<1.0	1.0	5539833	<1.0	1.0	5540320			
Dissolved Boron (B)	ug/L	28	10	5539833	<10	10	5540320			
Dissolved Cadmium (Cd)	ug/L	<0.10	0.10	5539833	<0.10	0.10	5540320			
Dissolved Calcium (Ca)	ug/L	88000	200	5539833	68000	200	5540320			
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	5539833	<5.0	5.0	5540320			
Dissolved Cobalt (Co)	ug/L	<0.50	0.50	5539833	<0.50	0.50	5540320			
Dissolved Copper (Cu)	ug/L	1.2	1.0	5539833	4.1	1.0	5540320			
Dissolved Iron (Fe)	ug/L	<100	100	5539833	<100	100	5540320			
Dissolved Lead (Pb)	ug/L	<0.50	0.50	5539833	<0.50	0.50	5540320			
Dissolved Magnesium (Mg)	ug/L	15000	50	5539833	14000	50	5540320			
Dissolved Manganese (Mn)	ug/L	<2.0	2.0	5539833	7.3	2.0	5540320			

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

Maxxam Job #: B8B8045
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LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		GSR430			GSR431			GSR431		
Sampling Date		2018/05/15 17:15			2018/05/15 16:55			2018/05/15 16:55		
COC Number		663247-01-01			663247-02-01			663247-02-01		
	UNITS	**MW9**	**RDL**	**QC Batch**	**MW10**	**RDL**	**QC Batch**	**MW10 Lab-Dup**	**RDL**	**QC Batch**
Dissolved Molybdenum (Mo)	ug/L	<0.50	0.50	5539833	<0.50	0.50	5540320			
Dissolved Nickel (Ni)	ug/L	<1.0	1.0	5539833	<1.0	1.0	5540320			
Dissolved Potassium (K)	ug/L	490	200	5539833	530	200	5540320			
Dissolved Selenium (Se)	ug/L	<2.0	2.0	5539833	<2.0	2.0	5540320			
Dissolved Silicon (Si)	ug/L	3500	50	5539833	4600	50	5540320			
Dissolved Sodium (Na)	ug/L	1500	100	5539833	1700	100	5540320			
Dissolved Strontium (Sr)	ug/L	67	1.0	5539833	56	1.0	5540320			
Dissolved Thallium (Tl)	ug/L	<0.050	0.050	5539833	<0.050	0.050	5540320			
Dissolved Tin (Sn)	ug/L	<1.0	1.0	5539833	<1.0	1.0	5540320			
Dissolved Vanadium (V)	ug/L	<0.50	0.50	5539833	<0.50	0.50	5540320			
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	5539833	<5.0	5.0	5540320			

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
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Sampler Initials: JZ

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		GSR432			GSR433		
Sampling Date		2018/05/15 15:05			2018/05/15 15:15		
COC Number		663247-02-01			663247-02-01		
	UNITS	**MW11I**	**RDL**	**QC Batch**	**MW11II**	**RDL**	**QC Batch**
Inorganics							
Total Ammonia-N	mg/L	0.14	0.050	5541853	0.24	0.050	5543077
Total Chemical Oxygen Demand (COD)	mg/L	15	4.0	5541847	10	4.0	5541847
Conductivity	umho/cm	1500	1.0	5540056	1300	1.0	5540302
Total Dissolved Solids	mg/L	880	10	5541107	755	10	5541347
Total Kjeldahl Nitrogen (TKN)	mg/L	0.25	0.10	5542028	0.88	0.20	5542028
Dissolved Organic Carbon	mg/L	6.2	0.50	5539844	4.5	0.50	5539844
pH	pH	7.54		5540057	7.83		5540303
Phenols-4AAP	mg/L	<0.0010	0.0010	5541499	<0.0010	0.0010	5541499
Total Phosphorus	mg/L	2.8	0.20	5541635	31	2.0	5541635
Dissolved Sulphate (SO4)	mg/L	100	1.0	5540318	130	1.0	5540318
Alkalinity (Total as CaCO3)	mg/L	620	1.0	5540054	440	1.0	5540301
Dissolved Chloride (Cl)	mg/L	120	1.0	5540317	110	1.0	5540317
Nitrite (N)	mg/L	<0.010	0.010	5540262	<0.010	0.010	5540262
Nitrate (N)	mg/L	<0.10	0.10	5540262	<0.10	0.10	5540262
Metals							
Mercury (Hg)	mg/L	<0.0001	0.0001	5541513	<0.0001	0.0001	5543252
Dissolved Aluminum (Al)	ug/L	6.2	5.0	5540320	13	5.0	5540320
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	5540320	<0.50	0.50	5540320
Dissolved Arsenic (As)	ug/L	<1.0	1.0	5540320	<1.0	1.0	5540320
Dissolved Barium (Ba)	ug/L	110	2.0	5540320	170	2.0	5540320
Dissolved Beryllium (Be)	ug/L	<0.50	0.50	5540320	<0.50	0.50	5540320
Dissolved Bismuth (Bi)	ug/L	<1.0	1.0	5540320	<1.0	1.0	5540320
Dissolved Boron (B)	ug/L	160	10	5540320	29	10	5540320
Dissolved Cadmium (Cd)	ug/L	<0.10	0.10	5540320	<0.10	0.10	5540320
Dissolved Calcium (Ca)	ug/L	200000	200	5540320	160000	200	5540320
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	5540320	<5.0	5.0	5540320
Dissolved Cobalt (Co)	ug/L	<0.50	0.50	5540320	<0.50	0.50	5540320
Dissolved Copper (Cu)	ug/L	<1.0	1.0	5540320	<1.0	1.0	5540320
Dissolved Iron (Fe)	ug/L	2800	100	5540320	190	100	5540320
Dissolved Lead (Pb)	ug/L	<0.50	0.50	5540320	<0.50	0.50	5540320
Dissolved Magnesium (Mg)	ug/L	43000	50	5540320	35000	50	5540320
Dissolved Manganese (Mn)	ug/L	110	2.0	5540320	110	2.0	5540320
Dissolved Molybdenum (Mo)	ug/L	<0.50	0.50	5540320	0.75	0.50	5540320

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B8B8045
Report Date: 2018/05/25

exp Services Inc
Client Project #: THB-00006196-NE
Site Location: LONGLAC LANDFILL
Sampler Initials: JZ

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		GSR432			GSR433		
Sampling Date		2018/05/15 15:05			2018/05/15 15:15		
COC Number		663247-02-01			663247-02-01		
	UNITS	**MW11I**	**RDL**	**QC Batch**	**MW11II**	**RDL**	**QC Batch**
Dissolved Nickel (Ni)	ug/L	2.2	1.0	5540320	<1.0	1.0	5540320
Dissolved Potassium (K)	ug/L	3800	200	5540320	3700	200	5540320
Dissolved Selenium (Se)	ug/L	<2.0	2.0	5540320	<2.0	2.0	5540320
Dissolved Silicon (Si)	ug/L	5800	50	5540320	6200	50	5540320
Dissolved Sodium (Na)	ug/L	74000	100	5540320	31000	100	5540320
Dissolved Strontium (Sr)	ug/L	220	1.0	5540320	210	1.0	5540320
Dissolved Thallium (Tl)	ug/L	<0.050	0.050	5540320	<0.050	0.050	5540320
Dissolved Tin (Sn)	ug/L	<1.0	1.0	5540320	<1.0	1.0	5540320
Dissolved Vanadium (V)	ug/L	<0.50	0.50	5540320	1.0	0.50	5540320
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	5540320	<5.0	5.0	5540320

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B8B8045
Report Date: 2018/05/25

exp Services Inc
Client Project #: THB-00006196-NE
Site Location: LONGLAC LANDFILL
Sampler Initials: JZ

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		GSR434			GSR434		
Sampling Date		2018/05/15 15:30			2018/05/15 15:30		
COC Number		663247-02-01			663247-02-01		
	UNITS	**MW12I**	**RDL**	**QC Batch**	**MW12I Lab-Dup**	**RDL**	**QC Batch**
Inorganics							
Total Ammonia-N	mg/L	0.097	0.050	5543077			
Total Chemical Oxygen Demand (COD)	mg/L	4.0	4.0	5541847			
Conductivity	umho/cm	1000	1.0	5540062			
Total Dissolved Solids	mg/L	570	10	5541107			
Total Kjeldahl Nitrogen (TKN)	mg/L	0.15	0.10	5542028			
Dissolved Organic Carbon	mg/L	1.8	0.50	5539844			
pH	pH	7.71		5540064			
Phenols-4AAP	mg/L	<0.0010	0.0010	5541499			
Total Phosphorus	mg/L	0.034	0.020	5541635			
Dissolved Sulphate (SO4)	mg/L	85	1.0	5540318			
Alkalinity (Total as CaCO3)	mg/L	460	1.0	5540061			
Dissolved Chloride (Cl)	mg/L	24	1.0	5540317			
Nitrite (N)	mg/L	<0.010	0.010	5540262			
Nitrate (N)	mg/L	<0.10	0.10	5540262			
Metals							
Mercury (Hg)	mg/L	<0.0001	0.0001	5543252	<0.0001	0.0001	5543252
Dissolved Aluminum (Al)	ug/L	<5.0	5.0	5539833			
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	5539833			
Dissolved Arsenic (As)	ug/L	<1.0	1.0	5539833			
Dissolved Barium (Ba)	ug/L	63	2.0	5539833			
Dissolved Beryllium (Be)	ug/L	<0.50	0.50	5539833			
Dissolved Bismuth (Bi)	ug/L	<1.0	1.0	5539833			
Dissolved Boron (B)	ug/L	300	10	5539833			
Dissolved Cadmium (Cd)	ug/L	<0.10	0.10	5539833			
Dissolved Calcium (Ca)	ug/L	140000	200	5539833			
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	5539833			
Dissolved Cobalt (Co)	ug/L	<0.50	0.50	5539833			
Dissolved Copper (Cu)	ug/L	<1.0	1.0	5539833			
Dissolved Iron (Fe)	ug/L	<100	100	5539833			
Dissolved Lead (Pb)	ug/L	<0.50	0.50	5539833			
Dissolved Magnesium (Mg)	ug/L	33000	50	5539833			
Dissolved Manganese (Mn)	ug/L	99	2.0	5539833			

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

Maxxam Job #: B8B8045
Report Date: 2018/05/25

exp Services Inc
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Site Location: LONGLAC LANDFILL
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LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		GSR434			GSR434		
Sampling Date		2018/05/15 15:30			2018/05/15 15:30		
COC Number		663247-02-01			663247-02-01		
	UNITS	**MW12I**	**RDL**	**QC Batch**	**MW12I Lab-Dup**	**RDL**	**QC Batch**
Dissolved Molybdenum (Mo)	ug/L	0.89	0.50	5539833			
Dissolved Nickel (Ni)	ug/L	2.5	1.0	5539833			
Dissolved Potassium (K)	ug/L	2400	200	5539833			
Dissolved Selenium (Se)	ug/L	<2.0	2.0	5539833			
Dissolved Silicon (Si)	ug/L	8900	50	5539833			
Dissolved Sodium (Na)	ug/L	13000	100	5539833			
Dissolved Strontium (Sr)	ug/L	320	1.0	5539833			
Dissolved Thallium (Tl)	ug/L	<0.050	0.050	5539833			
Dissolved Tin (Sn)	ug/L	<1.0	1.0	5539833			
Dissolved Vanadium (V)	ug/L	<0.50	0.50	5539833			
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	5539833			

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

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B8B8045
Report Date: 2018/05/25

exp Services Inc
Client Project #: THB-00006196-NE
Site Location: LONGLAC LANDFILL
Sampler Initials: JZ

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		GSR435			GSR435			GSR436		
Sampling Date		2018/05/15 15:35			2018/05/15 15:35			2018/05/15 16:40		
COC Number		663247-02-01			663247-02-01			663247-02-01		
	UNITS	**MW12II**	**RDL**	**QC Batch**	**MW12II Lab-Dup**	**RDL**	**QC Batch**	**MW13**	**RDL**	**QC Batch**
Inorganics										
Total Ammonia-N	mg/L	0.051	0.050	5541853				0.77	0.050	5543077
Total Chemical Oxygen Demand (COD)	mg/L	<4.0	4.0	5541847				13	4.0	5541847
Conductivity	umho/cm	1100	1.0	5540056				2100	1.0	5540302
Total Dissolved Solids	mg/L	610	10	5541107				1500	10	5541107
Total Kjeldahl Nitrogen (TKN)	mg/L	<0.10	0.10	5542028				<5.0 (1)	5.0	5542028
Dissolved Organic Carbon	mg/L	2.0	0.50	5539844	2.0	0.50	5539844	4.9	0.50	5539884
pH	pH	7.64		5540057				7.57		5540303
Phenols-4AAP	mg/L	<0.0010	0.0010	5541499				<0.0010	0.0010	5541499
Total Phosphorus	mg/L	0.36	0.040	5541635				1.9	0.10	5541635
Dissolved Sulphate (SO4)	mg/L	92	1.0	5540318				110	1.0	5540318
Alkalinity (Total as CaCO3)	mg/L	500	1.0	5540054				300	1.0	5540301
Dissolved Chloride (Cl)	mg/L	24	1.0	5540317				23	1.0	5540317
Nitrite (N)	mg/L	<0.010	0.010	5540262				0.435	0.010	5540262
Nitrate (N)	mg/L	0.15	0.10	5540262				185	1.0	5540262
Metals										
Mercury (Hg)	mg/L	<0.0001	0.0001	5541716				<0.0001	0.0001	5541513
Dissolved Aluminum (Al)	ug/L	<5.0	5.0	5539833				<5.0	5.0	5540320
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	5539833				<0.50	0.50	5540320
Dissolved Arsenic (As)	ug/L	<1.0	1.0	5539833				<1.0	1.0	5540320
Dissolved Barium (Ba)	ug/L	33	2.0	5539833				110	2.0	5540320
Dissolved Beryllium (Be)	ug/L	<0.50	0.50	5539833				<0.50	0.50	5540320
Dissolved Bismuth (Bi)	ug/L	<1.0	1.0	5539833				<1.0	1.0	5540320
Dissolved Boron (B)	ug/L	620	10	5539833				230	10	5540320
Dissolved Cadmium (Cd)	ug/L	<0.10	0.10	5539833				<0.10	0.10	5540320
Dissolved Calcium (Ca)	ug/L	160000	200	5539833				280000	200	5540320
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	5539833				<5.0	5.0	5540320
Dissolved Cobalt (Co)	ug/L	<0.50	0.50	5539833				2.3	0.50	5540320
Dissolved Copper (Cu)	ug/L	<1.0	1.0	5539833				2.7	1.0	5540320
Dissolved Iron (Fe)	ug/L	<100	100	5539833				<100	100	5540320
Dissolved Lead (Pb)	ug/L	<0.50	0.50	5539833				<0.50	0.50	5540320
Dissolved Magnesium (Mg)	ug/L	32000	50	5539833				51000	50	5540320
Dissolved Manganese (Mn)	ug/L	8.3	2.0	5539833				250	2.0	5540320

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
(1) Due to a high concentration of NOx, the sample required dilution. The detection limit was adjusted accordingly.

Maxxam Job #: B8B8045
Report Date: 2018/05/25

exp Services Inc
Client Project #: THB-00006196-NE
Site Location: LONGLAC LANDFILL
Sampler Initials: JZ

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		GSR435			GSR435			GSR436		
Sampling Date		2018/05/15 15:35			2018/05/15 15:35			2018/05/15 16:40		
COC Number		663247-02-01			663247-02-01			663247-02-01		
	UNITS	**MW12II**	**RDL**	**QC Batch**	**MW12II Lab-Dup**	**RDL**	**QC Batch**	**MW13**	**RDL**	**QC Batch**
Dissolved Molybdenum (Mo)	ug/L	<0.50	0.50	5539833				<0.50	0.50	5540320
Dissolved Nickel (Ni)	ug/L	1.2	1.0	5539833				5.5	1.0	5540320
Dissolved Potassium (K)	ug/L	1000	200	5539833				13000	200	5540320
Dissolved Selenium (Se)	ug/L	<2.0	2.0	5539833				<2.0	2.0	5540320
Dissolved Silicon (Si)	ug/L	5200	50	5539833				6100	50	5540320
Dissolved Sodium (Na)	ug/L	21000	100	5539833				27000	100	5540320
Dissolved Strontium (Sr)	ug/L	150	1.0	5539833				280	1.0	5540320
Dissolved Thallium (Tl)	ug/L	<0.050	0.050	5539833				0.090	0.050	5540320
Dissolved Tin (Sn)	ug/L	<1.0	1.0	5539833				<1.0	1.0	5540320
Dissolved Vanadium (V)	ug/L	<0.50	0.50	5539833				<0.50	0.50	5540320
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	5539833				<5.0	5.0	5540320

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

Maxxam Job #: B8B8045
Report Date: 2018/05/25

exp Services Inc
Client Project #: THB-00006196-NE
Site Location: LONGLAC LANDFILL
Sampler Initials: JZ

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		GSR436		
Sampling Date		2018/05/15 16:40		
COC Number		663247-02-01		
	UNITS	**MW13 Lab-Dup**	**RDL**	**QC Batch**
Inorganics				
Conductivity	umho/cm	2100	1.0	5540302
pH	pH	7.59		5540303
Alkalinity (Total as CaCO3)	mg/L	300	1.0	5540301
Metals				
Dissolved Aluminum (Al)	ug/L	<5.0	5.0	5540320
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	5540320
Dissolved Arsenic (As)	ug/L	<1.0	1.0	5540320
Dissolved Barium (Ba)	ug/L	100	2.0	5540320
Dissolved Beryllium (Be)	ug/L	<0.50	0.50	5540320
Dissolved Bismuth (Bi)	ug/L	<1.0	1.0	5540320
Dissolved Boron (B)	ug/L	220	10	5540320
Dissolved Cadmium (Cd)	ug/L	<0.10	0.10	5540320
Dissolved Calcium (Ca)	ug/L	280000	200	5540320
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	5540320
Dissolved Cobalt (Co)	ug/L	2.3	0.50	5540320
Dissolved Copper (Cu)	ug/L	2.6	1.0	5540320
Dissolved Iron (Fe)	ug/L	<100	100	5540320
Dissolved Lead (Pb)	ug/L	<0.50	0.50	5540320
Dissolved Magnesium (Mg)	ug/L	49000	50	5540320
Dissolved Manganese (Mn)	ug/L	240	2.0	5540320
Dissolved Molybdenum (Mo)	ug/L	<0.50	0.50	5540320
Dissolved Nickel (Ni)	ug/L	5.6	1.0	5540320
Dissolved Potassium (K)	ug/L	12000	200	5540320
Dissolved Selenium (Se)	ug/L	<2.0	2.0	5540320
Dissolved Silicon (Si)	ug/L	6000	50	5540320
Dissolved Sodium (Na)	ug/L	26000	100	5540320
Dissolved Strontium (Sr)	ug/L	270	1.0	5540320
Dissolved Thallium (Tl)	ug/L	0.084	0.050	5540320
Dissolved Tin (Sn)	ug/L	<1.0	1.0	5540320
Dissolved Vanadium (V)	ug/L	<0.50	0.50	5540320
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	5540320

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

Maxxam Job #: B8B8045
Report Date: 2018/05/25

exp Services Inc
Client Project #: THB-00006196-NE
Site Location: LONGLAC LANDFILL
Sampler Initials: JZ

LANDFILL STANDARDS SCH 5 - SW COMP. LIST (WATER)

Maxxam ID		GSR437			GSR437			GSR438		
Sampling Date		2018/05/15 14:20			2018/05/15 14:20			2018/05/15 17:25		
COC Number		663248-01-01			663248-01-01			663248-01-01		
	UNITS	**SW1**	**RDL**	**QC Batch**	**SW1 Lab-Dup**	**RDL**	**QC Batch**	**SW2**	**RDL**	**QC Batch**
Inorganics										
Total Ammonia-N	mg/L	<0.050	0.050	5543077	<0.050	0.050	5543077	<0.050	0.050	5543077
Total BOD	mg/L	<2	2	5539800				2	2	5539800
Total Chemical Oxygen Demand (COD)	mg/L	30	4.0	5541847	30	4.0	5541847	42	4.0	5541847
Conductivity	umho/cm	140	1.0	5540062				2200	1.0	5540062
Total Dissolved Solids	mg/L	110	10	5541107				1220	10	5541107
Total Kjeldahl Nitrogen (TKN)	mg/L	0.23	0.10	5542028	0.22	0.10	5542028	0.54	0.10	5542028
pH	pH	7.67		5540064				8.18		5540064
Phenols-4AAP	mg/L	<0.0010	0.0010	5541499				<0.0010	0.0010	5541795
Total Phosphorus	mg/L	0.008	0.004	5545398				0.042	0.004	5545398
Total Suspended Solids	mg/L	2	1	5541587				11	1	5541587
Dissolved Sulphate (SO4)	mg/L	<1.0	1.0	5540325				180	1.0	5540325
Alkalinity (Total as CaCO3)	mg/L	68	1.0	5540061				690	1.0	5540061
Dissolved Chloride (Cl)	mg/L	1.3	1.0	5540324				190	2.0	5540324
Nitrite (N)	mg/L	<0.010	0.010	5540262				<0.010	0.010	5540262
Nitrate (N)	mg/L	<0.10	0.10	5540262				0.12	0.10	5540262
Metals										
Mercury (Hg)	mg/L	<0.0001	0.0001	5543252				<0.0001	0.0001	5543252
Total Antimony (Sb)	ug/L	<0.50	0.50	5543033				<0.50	0.50	5543033
Total Arsenic (As)	ug/L	<1.0	1.0	5543033				<1.0	1.0	5543033
Total Barium (Ba)	ug/L	3.9	2.0	5543033				110	2.0	5543033
Total Beryllium (Be)	ug/L	<0.50	0.50	5543033				<0.50	0.50	5543033
Total Bismuth (Bi)	ug/L	<1.0	1.0	5543033				<1.0	1.0	5543033
Total Boron (B)	ug/L	<10	10	5543033				1800	10	5543033
Total Cadmium (Cd)	ug/L	<0.10	0.10	5543033				<0.10	0.10	5543033
Total Calcium (Ca)	ug/L	20000	200	5543033				140000	200	5543033
Total Cesium (Cs)	ug/L	<0.20	0.20	5543033				<0.20	0.20	5543033
Total Chromium (Cr)	ug/L	<5.0	5.0	5543033				<5.0	5.0	5543033
Total Cobalt (Co)	ug/L	<0.50	0.50	5543033				1.8	0.50	5543033
Total Copper (Cu)	ug/L	<1.0	1.0	5543033				1.3	1.0	5543033
Total Iron (Fe)	ug/L	<100	100	5543033				250	100	5543033
Total Lead (Pb)	ug/L	<0.50	0.50	5543033				<0.50	0.50	5543033
Total Magnesium (Mg)	ug/L	4600	50	5543033				78000	50	5543033

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

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B8B8045
Report Date: 2018/05/25

exp Services Inc
Client Project #: THB-00006196-NE
Site Location: LONGLAC LANDFILL
Sampler Initials: JZ

LANDFILL STANDARDS SCH 5 - SW COMP. LIST (WATER)

Maxxam ID		GSR437			GSR437			GSR438		
Sampling Date		2018/05/15 14:20			2018/05/15 14:20			2018/05/15 17:25		
COC Number		663248-01-01			663248-01-01			663248-01-01		
	UNITS	**SW1**	**RDL**	**QC Batch**	**SW1 Lab-Dup**	**RDL**	**QC Batch**	**SW2**	**RDL**	**QC Batch**
Total Manganese (Mn)	ug/L	3.3	2.0	5543033				150	2.0	5543033
Total Molybdenum (Mo)	ug/L	<0.50	0.50	5543033				1.5	0.50	5543033
Total Nickel (Ni)	ug/L	<1.0	1.0	5543033				9.2	1.0	5543033
Total Potassium (K)	ug/L	360	200	5543033				110000	200	5543033
Total Selenium (Se)	ug/L	<2.0	2.0	5543033				<2.0	2.0	5543033
Total Silicon (Si)	ug/L	1800	50	5543033				4100	50	5543033
Total Silver (Ag)	ug/L	<0.10	0.10	5543033				<0.10	0.10	5543033
Total Sodium (Na)	ug/L	760	100	5543033				190000	100	5543033
Total Strontium (Sr)	ug/L	19	1.0	5543033				440	1.0	5543033
Total Thallium (Tl)	ug/L	<0.050	0.050	5543033				<0.050	0.050	5543033
Total Titanium (Ti)	ug/L	<5.0	5.0	5543033				8.0	5.0	5543033
Total Vanadium (V)	ug/L	<0.50	0.50	5543033				1.0	0.50	5543033
Total Zinc (Zn)	ug/L	<5.0	5.0	5543033				<5.0	5.0	5543033

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

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Maxxam Job #: B8B8045
Report Date: 2018/05/25

exp Services Inc
Client Project #: THB-00006196-NE
Site Location: LONGLAC LANDFILL
Sampler Initials: JZ

LANDFILL STANDARDS SCH 5 - SW COMP. LIST (WATER)

Maxxam ID		GSR439		
Sampling Date		2018/05/15 17:35		
COC Number		663248-01-01		
	UNITS	**SW3**	**RDL**	**QC Batch**
Inorganics				
Total Ammonia-N	mg/L	0.16	0.050	5541853
Total BOD	mg/L	6	2	5539800
Total Chemical Oxygen Demand (COD)	mg/L	63	4.0	5543538
Conductivity	umho/cm	710	1.0	5540062
Total Dissolved Solids	mg/L	415	10	5541107
Total Kjeldahl Nitrogen (TKN)	mg/L	2.2	0.10	5542028
pH	pH	7.76		5540064
Phenols-4AAP	mg/L	0.0036	0.0010	5541499
Total Phosphorus	mg/L	0.13	0.02	5545398
Total Suspended Solids	mg/L	8	1	5541587
Dissolved Sulphate (SO4)	mg/L	140	1.0	5540205
Alkalinity (Total as CaCO3)	mg/L	190	1.0	5540061
Dissolved Chloride (Cl)	mg/L	16	1.0	5540203
Nitrite (N)	mg/L	<0.010	0.010	5540262
Nitrate (N)	mg/L	<0.10	0.10	5540262
Metals				
Mercury (Hg)	mg/L	<0.0001	0.0001	5543252
Total Antimony (Sb)	ug/L	1.2	0.50	5543033
Total Arsenic (As)	ug/L	6.8	1.0	5543033
Total Barium (Ba)	ug/L	47	2.0	5543033
Total Beryllium (Be)	ug/L	<0.50	0.50	5543033
Total Bismuth (Bi)	ug/L	<1.0	1.0	5543033
Total Boron (B)	ug/L	230	10	5543033
Total Cadmium (Cd)	ug/L	0.17	0.10	5543033
Total Calcium (Ca)	ug/L	100000	200	5543033
Total Cesium (Cs)	ug/L	<0.20	0.20	5543033
Total Chromium (Cr)	ug/L	<5.0	5.0	5543033
Total Cobalt (Co)	ug/L	1.1	0.50	5543033
Total Copper (Cu)	ug/L	9.2	1.0	5543033
Total Iron (Fe)	ug/L	1200	100	5543033
Total Lead (Pb)	ug/L	1.8	0.50	5543033
Total Magnesium (Mg)	ug/L	12000	50	5543033
Total Manganese (Mn)	ug/L	450	2.0	5543033

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B8B8045
Report Date: 2018/05/25

exp Services Inc
Client Project #: THB-00006196-NE
Site Location: LONGLAC LANDFILL
Sampler Initials: JZ

LANDFILL STANDARDS SCH 5 - SW COMP. LIST (WATER)

Maxxam ID		GSR439		
Sampling Date		2018/05/15 17:35		
COC Number		663248-01-01		
	UNITS	**SW3**	**RDL**	**QC Batch**
Total Molybdenum (Mo)	ug/L	1.5	0.50	5543033
Total Nickel (Ni)	ug/L	1.8	1.0	5543033
Total Potassium (K)	ug/L	18000	200	5543033
Total Selenium (Se)	ug/L	<2.0	2.0	5543033
Total Silicon (Si)	ug/L	1800	50	5543033
Total Silver (Ag)	ug/L	<0.10	0.10	5543033
Total Sodium (Na)	ug/L	13000	100	5543033
Total Strontium (Sr)	ug/L	260	1.0	5543033
Total Thallium (Tl)	ug/L	<0.050	0.050	5543033
Total Titanium (Ti)	ug/L	<5.0	5.0	5543033
Total Vanadium (V)	ug/L	0.61	0.50	5543033
Total Zinc (Zn)	ug/L	140	5.0	5543033

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B8B8045
Report Date: 2018/05/25

exp Services Inc
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Sampler Initials: JZ

RESULTS OF ANALYSES OF WATER

Maxxam ID		GSR421	GSR422	GSR423	GSR424	GSR425	GSR426		
Sampling Date		2018/05/15 14:35	2018/05/15 14:50	2018/05/15 10:00	2018/05/15 17:00	2018/05/15 16:35	2018/05/15 16:25		
COC Number		663247-01-01	663247-01-01	663247-01-01	663247-01-01	663247-01-01	663247-01-01		
	UNITS	**MW2**	**MW3**	**MW4I**	**MW4II**	**MW5**	**MW6**	**RDL**	**QC Batch**
Calculated Parameters									
Hardness (CaCO3)	mg/L	200	230	320	440	260	360	1.0	5537741
Ion Balance (% Difference)	%	3.97	4.05	1.72	10.3	2.99	2.89	N/A	5537742
Total Organic Nitrogen	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	5538597
Inorganics									
Orthophosphate (P)	mg/L	0.012	<0.010	0.019	<0.010	<0.010	0.010	0.010	5540319

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

Maxxam ID		GSR426			GSR427	GSR428	GSR429	GSR430		
Sampling Date		2018/05/15 16:25			2018/05/15 16:10	2018/05/15 15:45	2018/05/15 15:55	2018/05/15 17:15		
COC Number		663247-01-01			663247-01-01	663247-01-01	663247-01-01	663247-01-01		
	UNITS	**MW6 Lab-Dup**	**RDL**	**QC Batch**	**MW7**	**MW8I**	**MW8II**	**MW9**	**RDL**	**QC Batch**
Calculated Parameters										
Hardness (CaCO3)	mg/L				890	1000	340	280	1.0	5537741
Ion Balance (% Difference)	%				6.83	8.18	15.3	9.97	N/A	5537742
Total Organic Nitrogen	mg/L				<0.10	2.0	0.16	<0.10	0.10	5538597
Inorganics										
Orthophosphate (P)	mg/L	<0.010	0.010	5540319	<0.010	<0.010	<0.010	<0.010	0.010	5540319

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

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Maxxam Job #: B8B8045
Report Date: 2018/05/25

exp Services Inc
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RESULTS OF ANALYSES OF WATER

Maxxam ID		GSR431	GSR432	GSR433		GSR434	GSR435		
Sampling Date		2018/05/15 16:55	2018/05/15 15:05	2018/05/15 15:15		2018/05/15 15:30	2018/05/15 15:35		
COC Number		663247-02-01	663247-02-01	663247-02-01		663247-02-01	663247-02-01		
	UNITS	**MW10**	**MW11I**	**MW11II**	**QC Batch**	**MW12I**	**MW12II**	**RDL**	**QC Batch**
Calculated Parameters									
Hardness (CaCO3)	mg/L	230	670	560	5537741	480	530	1.0	5538596
Ion Balance (% Difference)	%	6.89	2.86	7.71	5537742	7.03	4.47	N/A	5537742
Total Organic Nitrogen	mg/L	0.11	0.11	0.64	5538597	<0.10	<0.10	0.10	5538597
Inorganics									
Orthophosphate (P)	mg/L	<0.010	<0.010	<0.010	5540319	<0.010	<0.010	0.010	5540319

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

Maxxam ID		GSR436			GSR437	GSR438	GSR439		
Sampling Date		2018/05/15 16:40			2018/05/15 14:20	2018/05/15 17:25	2018/05/15 17:35		
COC Number		663247-02-01			663248-01-01	663248-01-01	663248-01-01		
	UNITS	**MW13**	**RDL**	**QC Batch**	**SW1**	**SW2**	**SW3**	**RDL**	**QC Batch**
Calculated Parameters									
Hardness (CaCO3)	mg/L	920	1.0	5538596	68	600	300	1.0	5538596
Ion Balance (% Difference)	%	5.44	N/A	5537742					
Total Organic Nitrogen	mg/L	<0.10	0.10	5538597	0.23	0.54	2.1	0.10	5538597
Inorganics									
Dissolved Organic Carbon	mg/L				12	14	14	0.50	5539844
Orthophosphate (P)	mg/L	<0.010	0.010	5540319					

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

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ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		GSR437	GSR438	GSR439			GSR439		
Sampling Date		2018/05/15 14:20	2018/05/15 17:25	2018/05/15 17:35			2018/05/15 17:35		
COC Number		663248-01-01	663248-01-01	663248-01-01			663248-01-01		
	UNITS	**SW1**	**SW2**	**SW3**	**RDL**	**QC Batch**	**SW3 Lab-Dup**	**RDL**	**QC Batch**
Metals									
Dissolved (0.2u) Aluminum (Al)	ug/L	8	11	10	5	5541456	11	5	5541456
Dissolved Calcium (Ca)	mg/L	20	120	100	0.050	5540187			
Dissolved Magnesium (Mg)	mg/L	4.4	69	12	0.050	5540187			

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

Maxxam Job #: B8B8045
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exp Services Inc
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TEST SUMMARY

Maxxam ID: GSR421
Sample ID: MW2
Matrix: Water

Collected: 2018/05/15
Shipped:
Received: 2018/05/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5540054	N/A	2018/05/20	Yogesh Patel
Chloride by Automated Colourimetry	KONE	5540317	N/A	2018/05/22	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	5541847	N/A	2018/05/22	Shivani Shivani
Conductivity	AT	5540056	N/A	2018/05/20	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5539844	N/A	2018/05/22	Nimarta Singh
Hardness (calculated as CaCO3)		5537741	N/A	2018/05/23	Automated Statchk
Mercury in Water by CVAA	CV/AA	5543252	2018/05/23	2018/05/24	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5539833	N/A	2018/05/23	Thao Nguyen
Ion Balance (% Difference)	CALC	5537742	N/A	2018/05/23	Automated Statchk
Total Ammonia-N	LACH/NH4	5543077	N/A	2018/05/24	Parminder Sangha
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5540262	N/A	2018/05/23	Chandra Nandlal
Organic Nitrogen	CALC	5538597	N/A	2018/05/24	Automated Statchk
pH	AT	5540057	N/A	2018/05/20	Yogesh Patel
Phenols (4AAP)	TECH/PHEN	5541499	N/A	2018/05/22	Zahid Soikot
Orthophosphate	KONE	5540319	N/A	2018/05/22	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5540318	N/A	2018/05/22	Alina Dobreanu
Total Dissolved Solids	BAL	5541107	2018/05/22	2018/05/22	Jingwei (Alvin) Shi
Total Kjeldahl Nitrogen in Water	SKAL	5542028	2018/05/22	2018/05/24	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	5541635	2018/05/22	2018/05/23	Amanpreet Sappal

Maxxam ID: GSR422
Sample ID: MW3
Matrix: Water

Collected: 2018/05/15
Shipped:
Received: 2018/05/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5540301	N/A	2018/05/22	Surinder Rai
Chloride by Automated Colourimetry	KONE	5540317	N/A	2018/05/22	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	5541847	N/A	2018/05/22	Shivani Shivani
Conductivity	AT	5540302	N/A	2018/05/22	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5539844	N/A	2018/05/22	Nimarta Singh
Hardness (calculated as CaCO3)		5537741	N/A	2018/05/23	Automated Statchk
Mercury in Water by CVAA	CV/AA	5543252	2018/05/23	2018/05/24	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5539833	N/A	2018/05/23	Thao Nguyen
Ion Balance (% Difference)	CALC	5537742	N/A	2018/05/23	Automated Statchk
Total Ammonia-N	LACH/NH4	5543077	N/A	2018/05/24	Parminder Sangha
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5540262	N/A	2018/05/23	Chandra Nandlal
Organic Nitrogen	CALC	5538597	N/A	2018/05/24	Automated Statchk
pH	AT	5540303	N/A	2018/05/22	Surinder Rai
Phenols (4AAP)	TECH/PHEN	5541499	N/A	2018/05/22	Zahid Soikot
Orthophosphate	KONE	5540319	N/A	2018/05/22	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5540318	N/A	2018/05/22	Alina Dobreanu
Total Dissolved Solids	BAL	5541107	2018/05/22	2018/05/22	Jingwei (Alvin) Shi
Total Kjeldahl Nitrogen in Water	SKAL	5542028	2018/05/22	2018/05/23	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	5541635	2018/05/22	2018/05/23	Amanpreet Sappal

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TEST SUMMARY

Maxxam ID: GSR423
Sample ID: MW4I
Matrix: Water

Collected: 2018/05/15
Shipped:
Received: 2018/05/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5540301	N/A	2018/05/22	Surinder Rai
Chloride by Automated Colourimetry	KONE	5540317	N/A	2018/05/22	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	5541847	N/A	2018/05/22	Shivani Shivani
Conductivity	AT	5540302	N/A	2018/05/22	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5539844	N/A	2018/05/22	Nimarta Singh
Hardness (calculated as CaCO3)		5537741	N/A	2018/05/23	Automated Statchk
Mercury in Water by CVAA	CV/AA	5543103	2018/05/23	2018/05/23	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5539833	N/A	2018/05/23	Thao Nguyen
Ion Balance (% Difference)	CALC	5537742	N/A	2018/05/23	Automated Statchk
Total Ammonia-N	LACH/NH4	5541853	N/A	2018/05/23	Parminder Sangha
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5540262	N/A	2018/05/23	Chandra Nandlal
Organic Nitrogen	CALC	5538597	N/A	2018/05/24	Automated Statchk
pH	AT	5540303	N/A	2018/05/22	Surinder Rai
Phenols (4AAP)	TECH/PHEN	5541499	N/A	2018/05/22	Zahid Soikot
Orthophosphate	KONE	5540319	N/A	2018/05/22	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5540318	N/A	2018/05/22	Alina Dobreanu
Total Dissolved Solids	BAL	5541107	2018/05/22	2018/05/22	Jingwei (Alvin) Shi
Total Kjeldahl Nitrogen in Water	SKAL	5542028	2018/05/22	2018/05/23	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	5541635	2018/05/22	2018/05/23	Amanpreet Sappal

Maxxam ID: GSR423 Dup
Sample ID: MW4I
Matrix: Water

Collected: 2018/05/15
Shipped:
Received: 2018/05/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Mercury in Water by CVAA	CV/AA	5543103	2018/05/23	2018/05/23	Ron Morrison

Maxxam ID: GSR424
Sample ID: MW4II
Matrix: Water

Collected: 2018/05/15
Shipped:
Received: 2018/05/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5540301	N/A	2018/05/22	Surinder Rai
Chloride by Automated Colourimetry	KONE	5540317	N/A	2018/05/22	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	5541847	N/A	2018/05/22	Shivani Shivani
Conductivity	AT	5540302	N/A	2018/05/22	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5539884	N/A	2018/05/23	Nimarta Singh
Hardness (calculated as CaCO3)		5537741	N/A	2018/05/23	Automated Statchk
Mercury in Water by CVAA	CV/AA	5543252	2018/05/23	2018/05/24	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5547478	N/A	2018/05/25	Arefa Dabhad
Ion Balance (% Difference)	CALC	5537742	N/A	2018/05/23	Automated Statchk
Total Ammonia-N	LACH/NH4	5541853	N/A	2018/05/23	Parminder Sangha
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5540262	N/A	2018/05/23	Chandra Nandlal
Organic Nitrogen	CALC	5538597	N/A	2018/05/24	Automated Statchk

Maxxam Job #: B8B8045
Report Date: 2018/05/25

exp Services Inc
Client Project #: THB-00006196-NE
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TEST SUMMARY

Maxxam ID: GSR424
Sample ID: MW4II
Matrix: Water

Collected: 2018/05/15
Shipped:
Received: 2018/05/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
pH	AT	5540303	N/A	2018/05/22	Surinder Rai
Phenols (4AAP)	TECH/PHEN	5541499	N/A	2018/05/22	Zahid Soikot
Orthophosphate	KONE	5540319	N/A	2018/05/22	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5540318	N/A	2018/05/22	Alina Dobreanu
Total Dissolved Solids	BAL	5541107	2018/05/22	2018/05/22	Jingwei (Alvin) Shi
Total Kjeldahl Nitrogen in Water	SKAL	5542028	2018/05/22	2018/05/24	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	5541635	2018/05/22	2018/05/23	Amanpreet Sappal

Maxxam ID: GSR424 Dup
Sample ID: MW4II
Matrix: Water

Collected: 2018/05/15
Shipped:
Received: 2018/05/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Metals by ICPMS	ICP/MS	5547478	N/A	2018/05/25	Arefa Dabhad

Maxxam ID: GSR425
Sample ID: MW5
Matrix: Water

Collected: 2018/05/15
Shipped:
Received: 2018/05/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5540301	N/A	2018/05/22	Surinder Rai
Chloride by Automated Colourimetry	KONE	5540317	N/A	2018/05/22	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	5543538	N/A	2018/05/24	Shivani Shivani
Conductivity	AT	5540302	N/A	2018/05/22	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5539844	N/A	2018/05/22	Nimarta Singh
Hardness (calculated as CaCO3)		5537741	N/A	2018/05/23	Automated Statchk
Mercury in Water by CVAA	CV/AA	5543252	2018/05/23	2018/05/24	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5539833	N/A	2018/05/23	Thao Nguyen
Ion Balance (% Difference)	CALC	5537742	N/A	2018/05/23	Automated Statchk
Total Ammonia-N	LACH/NH4	5541853	N/A	2018/05/23	Parminder Sangha
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5540262	N/A	2018/05/23	Chandra Nandlal
Organic Nitrogen	CALC	5538597	N/A	2018/05/24	Automated Statchk
pH	AT	5540303	N/A	2018/05/22	Surinder Rai
Phenols (4AAP)	TECH/PHEN	5541499	N/A	2018/05/22	Zahid Soikot
Orthophosphate	KONE	5540319	N/A	2018/05/22	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5540318	N/A	2018/05/22	Alina Dobreanu
Total Dissolved Solids	BAL	5541347	2018/05/22	2018/05/22	Jingwei (Alvin) Shi
Total Kjeldahl Nitrogen in Water	SKAL	5542028	2018/05/22	2018/05/23	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	5541635	2018/05/22	2018/05/23	Amanpreet Sappal

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Maxxam Job #: B8B8045
Report Date: 2018/05/25

exp Services Inc
Client Project #: THB-00006196-NE
Site Location: LONGLAC LANDFILL
Sampler Initials: JZ

TEST SUMMARY

Maxxam ID: GSR426
Sample ID: MW6
Matrix: Water

Collected: 2018/05/15
Shipped:
Received: 2018/05/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5540054	N/A	2018/05/20	Yogesh Patel
Chloride by Automated Colourimetry	KONE	5540317	N/A	2018/05/22	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	5543538	N/A	2018/05/24	Shivani Shivani
Conductivity	AT	5540056	N/A	2018/05/20	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5539844	N/A	2018/05/22	Nimarta Singh
Hardness (calculated as CaCO3)		5537741	N/A	2018/05/24	Automated Statchk
Mercury in Water by CVAA	CV/AA	5541513	2018/05/22	2018/05/23	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5540320	N/A	2018/05/23	Thao Nguyen
Ion Balance (% Difference)	CALC	5537742	N/A	2018/05/24	Automated Statchk
Total Ammonia-N	LACH/NH4	5541853	N/A	2018/05/23	Parminder Sangha
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5540262	N/A	2018/05/23	Chandra Nandlal
Organic Nitrogen	CALC	5538597	N/A	2018/05/24	Automated Statchk
pH	AT	5540057	N/A	2018/05/20	Yogesh Patel
Phenols (4AAP)	TECH/PHEN	5541499	N/A	2018/05/22	Zahid Soikot
Orthophosphate	KONE	5540319	N/A	2018/05/22	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5540318	N/A	2018/05/22	Alina Dobreanu
Total Dissolved Solids	BAL	5541107	2018/05/22	2018/05/22	Jingwei (Alvin) Shi
Total Kjeldahl Nitrogen in Water	SKAL	5542028	2018/05/22	2018/05/24	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	5541635	2018/05/22	2018/05/23	Amanpreet Sappal

Maxxam ID: GSR426 Dup
Sample ID: MW6
Matrix: Water

Collected: 2018/05/15
Shipped:
Received: 2018/05/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chloride by Automated Colourimetry	KONE	5540317	N/A	2018/05/22	Deonarine Ramnarine
Orthophosphate	KONE	5540319	N/A	2018/05/22	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5540318	N/A	2018/05/22	Alina Dobreanu

Maxxam ID: GSR427
Sample ID: MW7
Matrix: Water

Collected: 2018/05/15
Shipped:
Received: 2018/05/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5540301	N/A	2018/05/22	Surinder Rai
Chloride by Automated Colourimetry	KONE	5540317	N/A	2018/05/22	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	5543538	N/A	2018/05/24	Shivani Shivani
Conductivity	AT	5540302	N/A	2018/05/22	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5539844	N/A	2018/05/22	Nimarta Singh
Hardness (calculated as CaCO3)		5537741	N/A	2018/05/23	Automated Statchk
Mercury in Water by CVAA	CV/AA	5545383	2018/05/24	2018/05/24	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5539833	N/A	2018/05/23	Thao Nguyen
Ion Balance (% Difference)	CALC	5537742	N/A	2018/05/23	Automated Statchk
Total Ammonia-N	LACH/NH4	5541853	N/A	2018/05/23	Parminder Sangha

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Maxxam Job #: B8B8045
Report Date: 2018/05/25

exp Services Inc
Client Project #: THB-00006196-NE
Site Location: LONGLAC LANDFILL
Sampler Initials: JZ

TEST SUMMARY

Maxxam ID: GSR427
Sample ID: MW7
Matrix: Water

Collected: 2018/05/15
Shipped:
Received: 2018/05/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5540262	N/A	2018/05/23	Chandra Nandlal
Organic Nitrogen	CALC	5538597	N/A	2018/05/24	Automated Statchk
pH	AT	5540303	N/A	2018/05/22	Surinder Rai
Phenols (4AAP)	TECH/PHEN	5541499	N/A	2018/05/22	Zahid Soikot
Orthophosphate	KONE	5540319	N/A	2018/05/22	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5540318	N/A	2018/05/22	Alina Dobreanu
Total Dissolved Solids	BAL	5541347	2018/05/22	2018/05/22	Jingwei (Alvin) Shi
Total Kjeldahl Nitrogen in Water	SKAL	5542028	2018/05/22	2018/05/24	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	5541635	2018/05/22	2018/05/23	Amanpreet Sappal

Maxxam ID: GSR427 Dup
Sample ID: MW7
Matrix: Water

Collected: 2018/05/15
Shipped:
Received: 2018/05/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Mercury in Water by CVAA	CV/AA	5545383	2018/05/24	2018/05/24	Ron Morrison

Maxxam ID: GSR428
Sample ID: MW8I
Matrix: Water

Collected: 2018/05/15
Shipped:
Received: 2018/05/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5540301	N/A	2018/05/22	Surinder Rai
Chloride by Automated Colourimetry	KONE	5540317	N/A	2018/05/22	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	5541847	N/A	2018/05/24	Shivani Shivani
Conductivity	AT	5540302	N/A	2018/05/22	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5539884	N/A	2018/05/23	Nimarta Singh
Hardness (calculated as CaCO3)		5537741	N/A	2018/05/23	Automated Statchk
Mercury in Water by CVAA	CV/AA	5541513	2018/05/22	2018/05/23	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5539833	N/A	2018/05/23	Thao Nguyen
Ion Balance (% Difference)	CALC	5537742	N/A	2018/05/23	Automated Statchk
Total Ammonia-N	LACH/NH4	5543077	N/A	2018/05/24	Parminder Sangha
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5540262	N/A	2018/05/23	Chandra Nandlal
Organic Nitrogen	CALC	5538597	N/A	2018/05/24	Automated Statchk
pH	AT	5540303	N/A	2018/05/22	Surinder Rai
Phenols (4AAP)	TECH/PHEN	5541499	N/A	2018/05/22	Zahid Soikot
Orthophosphate	KONE	5540319	N/A	2018/05/22	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5540318	N/A	2018/05/22	Alina Dobreanu
Total Dissolved Solids	BAL	5541107	2018/05/22	2018/05/22	Jingwei (Alvin) Shi
Total Kjeldahl Nitrogen in Water	SKAL	5542028	2018/05/22	2018/05/24	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	5541635	2018/05/22	2018/05/23	Amanpreet Sappal

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Maxxam Job #: B8B8045
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Site Location: LONGLAC LANDFILL
Sampler Initials: JZ

TEST SUMMARY

Maxxam ID: GSR428 Dup
Sample ID: MW8I
Matrix: Water

Collected: 2018/05/15
Shipped:
Received: 2018/05/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Metals by ICPMS	ICP/MS	5539833	N/A	2018/05/23	Thao Nguyen

Maxxam ID: GSR429
Sample ID: MW8II
Matrix: Water

Collected: 2018/05/15
Shipped:
Received: 2018/05/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5540301	N/A	2018/05/22	Surinder Rai
Chloride by Automated Colourimetry	KONE	5540317	N/A	2018/05/22	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	5543538	N/A	2018/05/24	Shivani Shivani
Conductivity	AT	5540302	N/A	2018/05/22	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5539844	N/A	2018/05/22	Nimarta Singh
Hardness (calculated as CaCO3)		5537741	N/A	2018/05/23	Brad Newman
Mercury in Water by CVAA	CV/AA	5541513	2018/05/22	2018/05/23	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5547478	N/A	2018/05/25	Arefa Dabhad
Ion Balance (% Difference)	CALC	5537742	N/A	2018/05/23	Brad Newman
Total Ammonia-N	LACH/NH4	5541853	N/A	2018/05/23	Parminder Sangha
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5540262	N/A	2018/05/23	Chandra Nandlal
Organic Nitrogen	CALC	5538597	N/A	2018/05/24	Automated Statchk
pH	AT	5540303	N/A	2018/05/22	Surinder Rai
Phenols (4AAP)	TECH/PHEN	5541499	N/A	2018/05/22	Zahid Soikot
Orthophosphate	KONE	5540319	N/A	2018/05/22	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5540318	N/A	2018/05/22	Alina Dobreanu
Total Dissolved Solids	BAL	5541107	2018/05/22	2018/05/22	Jingwei (Alvin) Shi
Total Kjeldahl Nitrogen in Water	SKAL	5542028	2018/05/22	2018/05/24	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	5541635	2018/05/22	2018/05/23	Amanpreet Sappal

Maxxam ID: GSR430
Sample ID: MW9
Matrix: Water

Collected: 2018/05/15
Shipped:
Received: 2018/05/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5540301	N/A	2018/05/22	Surinder Rai
Chloride by Automated Colourimetry	KONE	5540317	N/A	2018/05/22	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	5541847	N/A	2018/05/23	Shivani Shivani
Conductivity	AT	5540302	N/A	2018/05/22	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5539844	N/A	2018/05/22	Nimarta Singh
Hardness (calculated as CaCO3)		5537741	N/A	2018/05/23	Automated Statchk
Mercury in Water by CVAA	CV/AA	5543252	2018/05/23	2018/05/24	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5539833	N/A	2018/05/23	Thao Nguyen
Ion Balance (% Difference)	CALC	5537742	N/A	2018/05/23	Automated Statchk
Total Ammonia-N	LACH/NH4	5541853	N/A	2018/05/23	Parminder Sangha
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5540262	N/A	2018/05/23	Chandra Nandlal
Organic Nitrogen	CALC	5538597	N/A	2018/05/24	Automated Statchk

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Maxxam Job #: B8B8045
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Client Project #: THB-00006196-NE
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TEST SUMMARY

Maxxam ID: GSR430
Sample ID: MW9
Matrix: Water

Collected: 2018/05/15
Shipped:
Received: 2018/05/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
pH	AT	5540303	N/A	2018/05/22	Surinder Rai
Phenols (4AAP)	TECH/PHEN	5541499	N/A	2018/05/22	Zahid Soikot
Orthophosphate	KONE	5540319	N/A	2018/05/22	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5540318	N/A	2018/05/22	Alina Dobreanu
Total Dissolved Solids	BAL	5541107	2018/05/22	2018/05/22	Jingwei (Alvin) Shi
Total Kjeldahl Nitrogen in Water	SKAL	5542028	2018/05/22	2018/05/23	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	5541635	2018/05/22	2018/05/23	Amanpreet Sappal

Maxxam ID: GSR431
Sample ID: MW10
Matrix: Water

Collected: 2018/05/15
Shipped:
Received: 2018/05/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5540061	N/A	2018/05/20	Yogesh Patel
Chloride by Automated Colourimetry	KONE	5540317	N/A	2018/05/22	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	5541847	N/A	2018/05/23	Shivani Shivani
Conductivity	AT	5540062	N/A	2018/05/20	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5539844	N/A	2018/05/22	Nimarta Singh
Hardness (calculated as CaCO3)		5537741	N/A	2018/05/24	Automated Statchk
Mercury in Water by CVAA	CV/AA	5543252	2018/05/23	2018/05/24	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5540320	N/A	2018/05/23	Thao Nguyen
Ion Balance (% Difference)	CALC	5537742	N/A	2018/05/24	Automated Statchk
Total Ammonia-N	LACH/NH4	5541853	N/A	2018/05/23	Parminder Sangha
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5540262	N/A	2018/05/23	Chandra Nandlal
Organic Nitrogen	CALC	5538597	N/A	2018/05/24	Automated Statchk
pH	AT	5540064	N/A	2018/05/20	Yogesh Patel
Phenols (4AAP)	TECH/PHEN	5541795	N/A	2018/05/22	Zahid Soikot
Orthophosphate	KONE	5540319	N/A	2018/05/22	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5540318	N/A	2018/05/22	Alina Dobreanu
Total Dissolved Solids	BAL	5541107	2018/05/22	2018/05/22	Jingwei (Alvin) Shi
Total Kjeldahl Nitrogen in Water	SKAL	5542028	2018/05/22	2018/05/23	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	5541635	2018/05/22	2018/05/23	Amanpreet Sappal

Maxxam ID: GSR431 Dup
Sample ID: MW10
Matrix: Water

Collected: 2018/05/15
Shipped:
Received: 2018/05/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5540262	N/A	2018/05/23	Chandra Nandlal

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TEST SUMMARY

Maxxam ID: GSR432
Sample ID: MW11I
Matrix: Water

Collected: 2018/05/15
Shipped:
Received: 2018/05/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5540054	N/A	2018/05/20	Yogesh Patel
Chloride by Automated Colourimetry	KONE	5540317	N/A	2018/05/22	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	5541847	N/A	2018/05/23	Shivani Shivani
Conductivity	AT	5540056	N/A	2018/05/20	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5539844	N/A	2018/05/22	Nimarta Singh
Hardness (calculated as CaCO3)		5537741	N/A	2018/05/24	Automated Statchk
Mercury in Water by CVAA	CV/AA	5541513	2018/05/22	2018/05/23	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5540320	N/A	2018/05/23	Thao Nguyen
Ion Balance (% Difference)	CALC	5537742	N/A	2018/05/24	Automated Statchk
Total Ammonia-N	LACH/NH4	5541853	N/A	2018/05/23	Parminder Sangha
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5540262	N/A	2018/05/23	Chandra Nandlal
Organic Nitrogen	CALC	5538597	N/A	2018/05/24	Automated Statchk
pH	AT	5540057	N/A	2018/05/20	Yogesh Patel
Phenols (4AAP)	TECH/PHEN	5541499	N/A	2018/05/22	Zahid Soikot
Orthophosphate	KONE	5540319	N/A	2018/05/22	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5540318	N/A	2018/05/22	Alina Dobreanu
Total Dissolved Solids	BAL	5541107	2018/05/22	2018/05/22	Jingwei (Alvin) Shi
Total Kjeldahl Nitrogen in Water	SKAL	5542028	2018/05/22	2018/05/23	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	5541635	2018/05/22	2018/05/23	Amanpreet Sappal

Maxxam ID: GSR433
Sample ID: MW11II
Matrix: Water

Collected: 2018/05/15
Shipped:
Received: 2018/05/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5540301	N/A	2018/05/22	Surinder Rai
Chloride by Automated Colourimetry	KONE	5540317	N/A	2018/05/22	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	5541847	N/A	2018/05/23	Shivani Shivani
Conductivity	AT	5540302	N/A	2018/05/22	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5539844	N/A	2018/05/22	Nimarta Singh
Hardness (calculated as CaCO3)		5537741	N/A	2018/05/24	Automated Statchk
Mercury in Water by CVAA	CV/AA	5543252	2018/05/23	2018/05/24	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5540320	N/A	2018/05/23	Thao Nguyen
Ion Balance (% Difference)	CALC	5537742	N/A	2018/05/24	Automated Statchk
Total Ammonia-N	LACH/NH4	5543077	N/A	2018/05/24	Parminder Sangha
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5540262	N/A	2018/05/23	Chandra Nandlal
Organic Nitrogen	CALC	5538597	N/A	2018/05/24	Automated Statchk
pH	AT	5540303	N/A	2018/05/22	Surinder Rai
Phenols (4AAP)	TECH/PHEN	5541499	N/A	2018/05/22	Zahid Soikot
Orthophosphate	KONE	5540319	N/A	2018/05/22	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5540318	N/A	2018/05/22	Alina Dobreanu
Total Dissolved Solids	BAL	5541347	2018/05/22	2018/05/22	Jingwei (Alvin) Shi
Total Kjeldahl Nitrogen in Water	SKAL	5542028	2018/05/22	2018/05/23	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	5541635	2018/05/22	2018/05/23	Amanpreet Sappal

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Sampler Initials: JZ

TEST SUMMARY

Maxxam ID: GSR434
Sample ID: MW12I
Matrix: Water

Collected: 2018/05/15
Shipped:
Received: 2018/05/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5540061	N/A	2018/05/20	Yogesh Patel
Chloride by Automated Colourimetry	KONE	5540317	N/A	2018/05/22	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	5541847	N/A	2018/05/23	Shivani Shivani
Conductivity	AT	5540062	N/A	2018/05/20	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5539844	N/A	2018/05/22	Nimarta Singh
Hardness (calculated as CaCO3)		5538596	N/A	2018/05/23	Automated Statchk
Mercury in Water by CVAA	CV/AA	5543252	2018/05/23	2018/05/24	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5539833	N/A	2018/05/23	Thao Nguyen
Ion Balance (% Difference)	CALC	5537742	N/A	2018/05/23	Automated Statchk
Total Ammonia-N	LACH/NH4	5543077	N/A	2018/05/24	Parminder Sangha
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5540262	N/A	2018/05/23	Chandra Nandlal
Organic Nitrogen	CALC	5538597	N/A	2018/05/24	Automated Statchk
pH	AT	5540064	N/A	2018/05/20	Yogesh Patel
Phenols (4AAP)	TECH/PHEN	5541499	N/A	2018/05/22	Zahid Soikot
Orthophosphate	KONE	5540319	N/A	2018/05/22	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5540318	N/A	2018/05/22	Alina Dobreanu
Total Dissolved Solids	BAL	5541107	2018/05/22	2018/05/22	Jingwei (Alvin) Shi
Total Kjeldahl Nitrogen in Water	SKAL	5542028	2018/05/22	2018/05/23	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	5541635	2018/05/22	2018/05/23	Amanpreet Sappal

Maxxam ID: GSR434 Dup
Sample ID: MW12I
Matrix: Water

Collected: 2018/05/15
Shipped:
Received: 2018/05/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Mercury in Water by CVAA	CV/AA	5543252	2018/05/23	2018/05/24	Ron Morrison

Maxxam ID: GSR435
Sample ID: MW12II
Matrix: Water

Collected: 2018/05/15
Shipped:
Received: 2018/05/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5540054	N/A	2018/05/20	Yogesh Patel
Chloride by Automated Colourimetry	KONE	5540317	N/A	2018/05/22	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	5541847	N/A	2018/05/23	Shivani Shivani
Conductivity	AT	5540056	N/A	2018/05/20	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5539844	N/A	2018/05/22	Nimarta Singh
Hardness (calculated as CaCO3)		5538596	N/A	2018/05/23	Automated Statchk
Mercury in Water by CVAA	CV/AA	5541716	2018/05/22	2018/05/23	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5539833	N/A	2018/05/23	Thao Nguyen
Ion Balance (% Difference)	CALC	5537742	N/A	2018/05/23	Automated Statchk
Total Ammonia-N	LACH/NH4	5541853	N/A	2018/05/23	Parminder Sangha
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5540262	N/A	2018/05/23	Chandra Nandlal
Organic Nitrogen	CALC	5538597	N/A	2018/05/24	Automated Statchk

Maxxam Job #: B8B8045
Report Date: 2018/05/25

exp Services Inc
Client Project #: THB-00006196-NE
Site Location: LONGLAC LANDFILL
Sampler Initials: JZ

TEST SUMMARY

Maxxam ID: GSR435
Sample ID: MW12II
Matrix: Water

Collected: 2018/05/15
Shipped:
Received: 2018/05/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
pH	AT	5540057	N/A	2018/05/20	Yogesh Patel
Phenols (4AAP)	TECH/PHEN	5541499	N/A	2018/05/22	Zahid Soikot
Orthophosphate	KONE	5540319	N/A	2018/05/22	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5540318	N/A	2018/05/22	Alina Dobreanu
Total Dissolved Solids	BAL	5541107	2018/05/22	2018/05/22	Jingwei (Alvin) Shi
Total Kjeldahl Nitrogen in Water	SKAL	5542028	2018/05/22	2018/05/23	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	5541635	2018/05/22	2018/05/23	Amanpreet Sappal

Maxxam ID: GSR435 Dup
Sample ID: MW12II
Matrix: Water

Collected: 2018/05/15
Shipped:
Received: 2018/05/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5539844	N/A	2018/05/22	Nimarta Singh

Maxxam ID: GSR436
Sample ID: MW13
Matrix: Water

Collected: 2018/05/15
Shipped:
Received: 2018/05/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5540301	N/A	2018/05/22	Surinder Rai
Chloride by Automated Colourimetry	KONE	5540317	N/A	2018/05/22	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	5541847	N/A	2018/05/23	Shivani Shivani
Conductivity	AT	5540302	N/A	2018/05/22	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5539884	N/A	2018/05/23	Nimarta Singh
Hardness (calculated as CaCO3)		5538596	N/A	2018/05/24	Automated Statchk
Mercury in Water by CVAA	CV/AA	5541513	2018/05/22	2018/05/23	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5540320	N/A	2018/05/23	Thao Nguyen
Ion Balance (% Difference)	CALC	5537742	N/A	2018/05/24	Automated Statchk
Total Ammonia-N	LACH/NH4	5543077	N/A	2018/05/24	Parminder Sangha
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5540262	N/A	2018/05/23	Chandra Nandlal
Organic Nitrogen	CALC	5538597	N/A	2018/05/24	Automated Statchk
pH	AT	5540303	N/A	2018/05/22	Surinder Rai
Phenols (4AAP)	TECH/PHEN	5541499	N/A	2018/05/22	Zahid Soikot
Orthophosphate	KONE	5540319	N/A	2018/05/22	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5540318	N/A	2018/05/22	Alina Dobreanu
Total Dissolved Solids	BAL	5541107	2018/05/22	2018/05/22	Jingwei (Alvin) Shi
Total Kjeldahl Nitrogen in Water	SKAL	5542028	2018/05/22	2018/05/24	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	5541635	2018/05/22	2018/05/23	Amanpreet Sappal

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Maxxam Job #: B8B8045
Report Date: 2018/05/25

exp Services Inc
Client Project #: THB-00006196-NE
Site Location: LONGLAC LANDFILL
Sampler Initials: JZ

TEST SUMMARY

Maxxam ID: GSR436 Dup
Sample ID: MW13
Matrix: Water

Collected: 2018/05/15
Shipped:
Received: 2018/05/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5540301	N/A	2018/05/22	Surinder Rai
Conductivity	AT	5540302	N/A	2018/05/22	Surinder Rai
Dissolved Metals by ICPMS	ICP/MS	5540320	N/A	2018/05/23	Thao Nguyen
pH	AT	5540303	N/A	2018/05/22	Surinder Rai

Maxxam ID: GSR437
Sample ID: SW1
Matrix: Water

Collected: 2018/05/15
Shipped:
Received: 2018/05/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	5541456	N/A	2018/05/23	Thao Nguyen
Alkalinity	AT	5540061	N/A	2018/05/20	Yogesh Patel
Biochemical Oxygen Demand (BOD)	DO	5539800	2018/05/19	2018/05/24	Prakash Piya
Chloride by Automated Colourimetry	KONE	5540324	N/A	2018/05/22	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	5541847	N/A	2018/05/22	Shivani Shivani
Conductivity	AT	5540062	N/A	2018/05/20	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5539844	N/A	2018/05/22	Nimarta Singh
Hardness (calculated as CaCO3)		5538596	N/A	2018/05/23	Automated Statchk
Mercury in Water by CVAA	CV/AA	5543252	2018/05/23	2018/05/24	Ron Morrison
Dissolved Calcium and Magnesium	ICP	5540187	2018/05/19	2018/05/22	Jolly John
Total Metals Analysis by ICPMS	ICP/MS	5543033	N/A	2018/05/24	Thao Nguyen
Total Ammonia-N	LACH/NH4	5543077	N/A	2018/05/24	Parminder Sangha
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5540262	N/A	2018/05/23	Chandra Nandlal
Organic Nitrogen	CALC	5538597	N/A	2018/05/24	Automated Statchk
pH	AT	5540064	N/A	2018/05/20	Yogesh Patel
Phenols (4AAP)	TECH/PHEN	5541499	N/A	2018/05/22	Zahid Soikot
Sulphate by Automated Colourimetry	KONE	5540325	N/A	2018/05/22	Deonarine Ramnarine
Total Dissolved Solids	BAL	5541107	2018/05/22	2018/05/22	Jingwei (Alvin) Shi
Total Kjeldahl Nitrogen in Water	SKAL	5542028	2018/05/22	2018/05/23	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	5545398	2018/05/24	2018/05/24	Amanpreet Sappal
Low Level Total Suspended Solids	BAL	5541587	2018/05/22	2018/05/22	Nusrat Naz

Maxxam ID: GSR437 Dup
Sample ID: SW1
Matrix: Water

Collected: 2018/05/15
Shipped:
Received: 2018/05/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chemical Oxygen Demand	SPEC	5541847	N/A	2018/05/22	Shivani Shivani
Total Ammonia-N	LACH/NH4	5543077	N/A	2018/05/24	Parminder Sangha
Total Kjeldahl Nitrogen in Water	SKAL	5542028	2018/05/22	2018/05/23	Rajni Tyagi

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Maxxam Job #: B8B8045
Report Date: 2018/05/25

exp Services Inc
Client Project #: THB-00006196-NE
Site Location: LONGLAC LANDFILL
Sampler Initials: JZ

TEST SUMMARY

Maxxam ID: GSR438
Sample ID: SW2
Matrix: Water

Collected: 2018/05/15
Shipped:
Received: 2018/05/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	5541456	N/A	2018/05/23	Thao Nguyen
Alkalinity	AT	5540061	N/A	2018/05/20	Yogesh Patel
Biochemical Oxygen Demand (BOD)	DO	5539800	2018/05/19	2018/05/24	Prakash Piya
Chloride by Automated Colourimetry	KONE	5540324	N/A	2018/05/22	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	5541847	N/A	2018/05/23	Shivani Shivani
Conductivity	AT	5540062	N/A	2018/05/20	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5539844	N/A	2018/05/22	Nimarta Singh
Hardness (calculated as CaCO3)		5538596	N/A	2018/05/23	Automated Statchk
Mercury in Water by CVAA	CV/AA	5543252	2018/05/23	2018/05/24	Ron Morrison
Dissolved Calcium and Magnesium	ICP	5540187	2018/05/19	2018/05/22	Jolly John
Total Metals Analysis by ICPMS	ICP/MS	5543033	N/A	2018/05/24	Thao Nguyen
Total Ammonia-N	LACH/NH4	5543077	N/A	2018/05/24	Parminder Sangha
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5540262	N/A	2018/05/23	Chandra Nandlal
Organic Nitrogen	CALC	5538597	N/A	2018/05/24	Automated Statchk
pH	AT	5540064	N/A	2018/05/20	Yogesh Patel
Phenols (4AAP)	TECH/PHEN	5541795	N/A	2018/05/22	Zahid Soikot
Sulphate by Automated Colourimetry	KONE	5540325	N/A	2018/05/22	Deonarine Ramnarine
Total Dissolved Solids	BAL	5541107	2018/05/22	2018/05/22	Jingwei (Alvin) Shi
Total Kjeldahl Nitrogen in Water	SKAL	5542028	2018/05/22	2018/05/23	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	5545398	2018/05/24	2018/05/24	Amanpreet Sappal
Low Level Total Suspended Solids	BAL	5541587	2018/05/22	2018/05/22	Nusrat Naz

Maxxam ID: GSR439
Sample ID: SW3
Matrix: Water

Collected: 2018/05/15
Shipped:
Received: 2018/05/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	5541456	N/A	2018/05/23	Thao Nguyen
Alkalinity	AT	5540061	N/A	2018/05/20	Yogesh Patel
Biochemical Oxygen Demand (BOD)	DO	5539800	2018/05/19	2018/05/24	Prakash Piya
Chloride by Automated Colourimetry	KONE	5540203	N/A	2018/05/22	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	5543538	N/A	2018/05/24	Shivani Shivani
Conductivity	AT	5540062	N/A	2018/05/20	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5539844	N/A	2018/05/22	Nimarta Singh
Hardness (calculated as CaCO3)		5538596	N/A	2018/05/23	Automated Statchk
Mercury in Water by CVAA	CV/AA	5543252	2018/05/23	2018/05/24	Ron Morrison
Dissolved Calcium and Magnesium	ICP	5540187	2018/05/19	2018/05/22	Jolly John
Total Metals Analysis by ICPMS	ICP/MS	5543033	N/A	2018/05/24	Thao Nguyen
Total Ammonia-N	LACH/NH4	5541853	N/A	2018/05/23	Parminder Sangha
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5540262	N/A	2018/05/23	Chandra Nandlal
Organic Nitrogen	CALC	5538597	N/A	2018/05/24	Automated Statchk
pH	AT	5540064	N/A	2018/05/20	Yogesh Patel
Phenols (4AAP)	TECH/PHEN	5541499	N/A	2018/05/22	Zahid Soikot
Sulphate by Automated Colourimetry	KONE	5540205	N/A	2018/05/22	Deonarine Ramnarine

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Maxxam Job #: B8B8045
Report Date: 2018/05/25

exp Services Inc
Client Project #: THB-00006196-NE
Site Location: LONGLAC LANDFILL
Sampler Initials: JZ

TEST SUMMARY

Maxxam ID: GSR439
Sample ID: SW3
Matrix: Water

Collected: 2018/05/15
Shipped:
Received: 2018/05/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Dissolved Solids	BAL	5541107	2018/05/22	2018/05/22	Jingwei (Alvin) Shi
Total Kjeldahl Nitrogen in Water	SKAL	5542028	2018/05/22	2018/05/24	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	5545398	2018/05/24	2018/05/24	Amanpreet Sappal
Low Level Total Suspended Solids	BAL	5541587	2018/05/22	2018/05/22	Nusrat Naz

Maxxam ID: GSR439 Dup
Sample ID: SW3
Matrix: Water

Collected: 2018/05/15
Shipped:
Received: 2018/05/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	5541456	N/A	2018/05/23	Thao Nguyen

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GENERAL COMMENTS

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

Package 1	4.0°C
Package 2	1.7°C
Package 3	4.7°C
Package 4	5.7°C
Package 5	5.3°C
Package 6	4.3°C
Package 7	3.0°C
Package 8	4.0°C
Package 9	2.7°C
Package 10	1.3°C
Package 11	1.7°C

Sample GSR421 [MW2] : ortho-Phosphate > Total Phosphorus: Both values fall within the method uncertainty for duplicates and are likely equivalent.

Sample GSR422 [MW3] : TKN < Ammonia: Both values fall within the method uncertainty for duplicates and are likely equivalent.

Sample GSR423 [MW4I] : ortho-Phosphate > Total Phosphorus: Both values fall within the method uncertainty for duplicates and are likely equivalent.

Sample GSR424 [MW4II] : Elevated ion balance confirmed by re-analysis

Sample GSR425 [MW5] : TKN < Ammonia: Both values fall within the method uncertainty for duplicates and are likely equivalent.

Sample GSR426 [MW6] : TKN < Ammonia: Both values fall within the method uncertainty for duplicates and are likely equivalent.

Sample GSR429 [MW8II] : Elevated ion balance confirmed by re-analysis

Sample GSR435 [MW12II] : TKN < Ammonia: Both values fall within the method uncertainty for duplicates and are likely equivalent.

Results relate only to the items tested.

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Maxxam Job #: B8B8045
Report Date: 2018/05/25

QUALITY ASSURANCE REPORT

exp Services Inc
Client Project #: THB-00006196-NE
Site Location: LONGLAC LANDFILL
Sampler Initials: JZ

			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
5539800	Total BOD	2018/05/24					<2	mg/L	NC	30	91	80 - 120
5539833	Dissolved Aluminum (Al)	2018/05/23	104	80 - 120	99	80 - 120	<5.0	ug/L	1.2	20		
5539833	Dissolved Antimony (Sb)	2018/05/23	112	80 - 120	104	80 - 120	<0.50	ug/L	NC	20		
5539833	Dissolved Arsenic (As)	2018/05/23	104	80 - 120	99	80 - 120	<1.0	ug/L	5.3	20		
5539833	Dissolved Barium (Ba)	2018/05/23	100	80 - 120	100	80 - 120	<2.0	ug/L	0.018	20		
5539833	Dissolved Beryllium (Be)	2018/05/23	105	80 - 120	100	80 - 120	<0.50	ug/L	NC	20		
5539833	Dissolved Bismuth (Bi)	2018/05/23	92	80 - 120	95	80 - 120	<1.0	ug/L	NC	20		
5539833	Dissolved Boron (B)	2018/05/23	NC	80 - 120	100	80 - 120	<10	ug/L	0.50	20		
5539833	Dissolved Cadmium (Cd)	2018/05/23	102	80 - 120	102	80 - 120	<0.10	ug/L	NC	20		
5539833	Dissolved Calcium (Ca)	2018/05/23	NC	80 - 120	98	80 - 120	<200	ug/L	0.43	20		
5539833	Dissolved Chromium (Cr)	2018/05/23	99	80 - 120	97	80 - 120	<5.0	ug/L	NC	20		
5539833	Dissolved Cobalt (Co)	2018/05/23	98	80 - 120	99	80 - 120	<0.50	ug/L	0.81	20		
5539833	Dissolved Copper (Cu)	2018/05/23	102	80 - 120	101	80 - 120	<1.0	ug/L	17	20		
5539833	Dissolved Iron (Fe)	2018/05/23	104	80 - 120	103	80 - 120	<100	ug/L	0.68	20		
5539833	Dissolved Lead (Pb)	2018/05/23	94	80 - 120	96	80 - 120	<0.50	ug/L	NC	20		
5539833	Dissolved Magnesium (Mg)	2018/05/23	NC	80 - 120	101	80 - 120	<50	ug/L	1.2	20		
5539833	Dissolved Manganese (Mn)	2018/05/23	NC	80 - 120	100	80 - 120	<2.0	ug/L	0.57	20		
5539833	Dissolved Molybdenum (Mo)	2018/05/23	110	80 - 120	103	80 - 120	<0.50	ug/L	6.1	20		
5539833	Dissolved Nickel (Ni)	2018/05/23	96	80 - 120	97	80 - 120	<1.0	ug/L	3.5	20		
5539833	Dissolved Potassium (K)	2018/05/23	NC	80 - 120	102	80 - 120	<200	ug/L	0.13	20		
5539833	Dissolved Selenium (Se)	2018/05/23	102	80 - 120	97	80 - 120	<2.0	ug/L	NC	20		
5539833	Dissolved Silicon (Si)	2018/05/23	104	80 - 120	98	80 - 120	<50	ug/L	0.092	20		
5539833	Dissolved Sodium (Na)	2018/05/23	NC	80 - 120	100	80 - 120	<100	ug/L	0.52	20		
5539833	Dissolved Strontium (Sr)	2018/05/23	NC	80 - 120	99	80 - 120	<1.0	ug/L	0.084	20		
5539833	Dissolved Thallium (Tl)	2018/05/23	94	80 - 120	95	80 - 120	<0.050	ug/L	2.8	20		
5539833	Dissolved Tin (Sn)	2018/05/23	109	80 - 120	102	80 - 120	<1.0	ug/L	NC	20		
5539833	Dissolved Vanadium (V)	2018/05/23	103	80 - 120	100	80 - 120	<0.50	ug/L	13	20		
5539833	Dissolved Zinc (Zn)	2018/05/23	98	80 - 120	99	80 - 120	<5.0	ug/L	NC	20		
5539844	Dissolved Organic Carbon	2018/05/22	92	80 - 120	94	80 - 120	<0.50	mg/L	2.6	20		
5539884	Dissolved Organic Carbon	2018/05/23	92	80 - 120	95	80 - 120	<0.50	mg/L	1.0	20		
5540054	Alkalinity (Total as CaCO3)	2018/05/20			94	85 - 115	<1.0	mg/L	0.65	20		

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Maxxam Job #: B8B8045
Report Date: 2018/05/25

QUALITY ASSURANCE REPORT(CONT'D)

exp Services Inc
Client Project #: THB-00006196-NE
Site Location: LONGLAC LANDFILL
Sampler Initials: JZ

			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
5540056	Conductivity	2018/05/20			99	85 - 115	<1.0	umho/cm	0.082	25		
5540057	pH	2018/05/20			102	98 - 103			0.53	N/A		
5540061	Alkalinity (Total as CaCO3)	2018/05/20			93	85 - 115	<1.0	mg/L	0.66	20		
5540062	Conductivity	2018/05/20			100	85 - 115	<1.0	umho/cm	0	25		
5540064	pH	2018/05/20			101	98 - 103			0.28	N/A		
5540187	Dissolved Calcium (Ca)	2018/05/22	NC	80 - 120	97	80 - 120	<0.050	mg/L	0.54	25		
5540187	Dissolved Magnesium (Mg)	2018/05/22	NC	80 - 120	97	80 - 120	<0.050	mg/L	0.98	25		
5540203	Dissolved Chloride (Cl)	2018/05/22	106	80 - 120	103	80 - 120	<1.0	mg/L	0.023	20		
5540205	Dissolved Sulphate (SO4)	2018/05/22	91	75 - 125	101	80 - 120	<1.0	mg/L	1.3	20		
5540262	Nitrate (N)	2018/05/23	99	80 - 120	98	80 - 120	<0.10	mg/L	5.4	20		
5540262	Nitrite (N)	2018/05/23	98	80 - 120	97	80 - 120	<0.010	mg/L	NC	20		
5540301	Alkalinity (Total as CaCO3)	2018/05/22			100	85 - 115	<1.0	mg/L	0.97	20		
5540302	Conductivity	2018/05/22			101	85 - 115	<1.0	umho/cm	0.49	25		
5540303	pH	2018/05/22			101	98 - 103			0.36	N/A		
5540317	Dissolved Chloride (Cl)	2018/05/22	NC	80 - 120	101	80 - 120	<1.0	mg/L	0.69	20		
5540318	Dissolved Sulphate (SO4)	2018/05/22	98	75 - 125	95	80 - 120	<1.0	mg/L	4.0	20		
5540319	Orthophosphate (P)	2018/05/22	108	75 - 125	102	80 - 120	<0.010	mg/L	3.2	25		
5540320	Dissolved Aluminum (Al)	2018/05/23	108	80 - 120	98	80 - 120	<5.0	ug/L	NC	20		
5540320	Dissolved Antimony (Sb)	2018/05/23	111	80 - 120	102	80 - 120	<0.50	ug/L	NC	20		
5540320	Dissolved Arsenic (As)	2018/05/23	103	80 - 120	99	80 - 120	<1.0	ug/L	NC	20		
5540320	Dissolved Barium (Ba)	2018/05/23	103	80 - 120	100	80 - 120	<2.0	ug/L	6.7	20		
5540320	Dissolved Beryllium (Be)	2018/05/23	104	80 - 120	99	80 - 120	<0.50	ug/L	NC	20		
5540320	Dissolved Bismuth (Bi)	2018/05/23	95	80 - 120	93	80 - 120	<1.0	ug/L	NC	20		
5540320	Dissolved Boron (B)	2018/05/23	106	80 - 120	96	80 - 120	<10	ug/L	5.3	20		
5540320	Dissolved Cadmium (Cd)	2018/05/23	105	80 - 120	99	80 - 120	<0.10	ug/L	NC	20		
5540320	Dissolved Calcium (Ca)	2018/05/23	NC	80 - 120	98	80 - 120	<200	ug/L	2.5	20		
5540320	Dissolved Chromium (Cr)	2018/05/23	101	80 - 120	97	80 - 120	<5.0	ug/L	NC	20		
5540320	Dissolved Cobalt (Co)	2018/05/23	100	80 - 120	97	80 - 120	<0.50	ug/L	0.17	20		

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Maxxam Job #: B8B8045
Report Date: 2018/05/25

QUALITY ASSURANCE REPORT(CONT'D)

exp Services Inc
Client Project #: THB-00006196-NE
Site Location: LONGLAC LANDFILL
Sampler Initials: JZ

			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
5540320	Dissolved Copper (Cu)	2018/05/23	101	80 - 120	99	80 - 120	<1.0	ug/L	3.4	20		
5540320	Dissolved Iron (Fe)	2018/05/23	105	80 - 120	101	80 - 120	<100	ug/L	NC	20		
5540320	Dissolved Lead (Pb)	2018/05/23	97	80 - 120	95	80 - 120	<0.50	ug/L	NC	20		
5540320	Dissolved Magnesium (Mg)	2018/05/23	NC	80 - 120	98	80 - 120	<50	ug/L	4.4	20		
5540320	Dissolved Manganese (Mn)	2018/05/23	101	80 - 120	98	80 - 120	<2.0	ug/L	3.7	20		
5540320	Dissolved Molybdenum (Mo)	2018/05/23	111	80 - 120	100	80 - 120	<0.50	ug/L	NC	20		
5540320	Dissolved Nickel (Ni)	2018/05/23	99	80 - 120	97	80 - 120	<1.0	ug/L	2.9	20		
5540320	Dissolved Potassium (K)	2018/05/23	103	80 - 120	99	80 - 120	<200	ug/L	4.8	20		
5540320	Dissolved Selenium (Se)	2018/05/23	101	80 - 120	98	80 - 120	<2.0	ug/L	NC	20		
5540320	Dissolved Silicon (Si)	2018/05/23	100	80 - 120	96	80 - 120	<50	ug/L	1.6	20		
5540320	Dissolved Sodium (Na)	2018/05/23	NC	80 - 120	98	80 - 120	<100	ug/L	4.5	20		
5540320	Dissolved Strontium (Sr)	2018/05/23	100	80 - 120	99	80 - 120	<1.0	ug/L	4.5	20		
5540320	Dissolved Thallium (Tl)	2018/05/23	97	80 - 120	95	80 - 120	<0.050	ug/L	6.9	20		
5540320	Dissolved Tin (Sn)	2018/05/23	108	80 - 120	100	80 - 120	<1.0	ug/L	NC	20		
5540320	Dissolved Vanadium (V)	2018/05/23	104	80 - 120	99	80 - 120	<0.50	ug/L	NC	20		
5540320	Dissolved Zinc (Zn)	2018/05/23	100	80 - 120	97	80 - 120	<5.0	ug/L	NC	20		
5540324	Dissolved Chloride (Cl)	2018/05/22	108	80 - 120	103	80 - 120	<1.0	mg/L	2.5	20		
5540325	Dissolved Sulphate (SO4)	2018/05/22	112	75 - 125	101	80 - 120	<1.0	mg/L	0.56	20		
5541107	Total Dissolved Solids	2018/05/22					<10	mg/L	11	25	98	90 - 110
5541347	Total Dissolved Solids	2018/05/22					<10	mg/L	0	25	100	90 - 110
5541456	Dissolved (0.2u) Aluminum (Al)	2018/05/23	85	80 - 120	101	80 - 120	<5	ug/L	2.5	20		
5541499	Phenols-4AAP	2018/05/22	95	80 - 120	97	80 - 120	<0.0010	mg/L	NC	20		
5541513	Mercury (Hg)	2018/05/23	114	75 - 125	104	80 - 120	<0.0001	mg/L	NC	20		
5541587	Total Suspended Solids	2018/05/22					<1	mg/L	0	25	97	85 - 115
5541635	Total Phosphorus	2018/05/23	101	80 - 120	104	80 - 120	<0.020	mg/L	1.6	20	101	80 - 120
5541716	Mercury (Hg)	2018/05/23	99	75 - 125	94	80 - 120	<0.0001	mg/L	NC	20		
5541795	Phenols-4AAP	2018/05/22	95	80 - 120	97	80 - 120	<0.0010	mg/L	NC	20		
5541847	Total Chemical Oxygen Demand (COD)	2018/05/22	101	80 - 120	103	80 - 120	<4.0	mg/L	1.2	20		
5541853	Total Ammonia-N	2018/05/23	94	75 - 125	100	80 - 120	<0.050	mg/L	NC	20		
5542028	Total Kjeldahl Nitrogen (TKN)	2018/05/23	100	80 - 120	109	80 - 120	<0.10	mg/L	4.4	20	108	80 - 120
5543033	Total Antimony (Sb)	2018/05/24	104	80 - 120	103	80 - 120	<0.50	ug/L				

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Maxxam Job #: B8B8045
Report Date: 2018/05/25

QUALITY ASSURANCE REPORT(CONT'D)

exp Services Inc
Client Project #: THB-00006196-NE
Site Location: LONGLAC LANDFILL
Sampler Initials: JZ

			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
5543033	Total Arsenic (As)	2018/05/24	96	80 - 120	96	80 - 120	<1.0	ug/L				
5543033	Total Barium (Ba)	2018/05/24	97	80 - 120	98	80 - 120	<2.0	ug/L				
5543033	Total Beryllium (Be)	2018/05/24	99	80 - 120	96	80 - 120	<0.50	ug/L				
5543033	Total Bismuth (Bi)	2018/05/24	92	80 - 120	90	80 - 120	<1.0	ug/L				
5543033	Total Boron (B)	2018/05/24	98	80 - 120	98	80 - 120	<10	ug/L				
5543033	Total Cadmium (Cd)	2018/05/24	101	80 - 120	100	80 - 120	<0.10	ug/L				
5543033	Total Calcium (Ca)	2018/05/24	NC	80 - 120	95	80 - 120	<200	ug/L				
5543033	Total Cesium (Cs)	2018/05/24	94	80 - 120	95	80 - 120	<0.20	ug/L				
5543033	Total Chromium (Cr)	2018/05/24	94	80 - 120	94	80 - 120	<5.0	ug/L				
5543033	Total Cobalt (Co)	2018/05/24	94	80 - 120	93	80 - 120	<0.50	ug/L				
5543033	Total Copper (Cu)	2018/05/24	96	80 - 120	96	80 - 120	<1.0	ug/L				
5543033	Total Iron (Fe)	2018/05/24	98	80 - 120	97	80 - 120	<100	ug/L				
5543033	Total Lead (Pb)	2018/05/24	95	80 - 120	94	80 - 120	<0.50	ug/L	NC	20		
5543033	Total Magnesium (Mg)	2018/05/24	97	80 - 120	96	80 - 120	<50	ug/L				
5543033	Total Manganese (Mn)	2018/05/24	97	80 - 120	95	80 - 120	<2.0	ug/L				
5543033	Total Molybdenum (Mo)	2018/05/24	102	80 - 120	101	80 - 120	<0.50	ug/L				
5543033	Total Nickel (Ni)	2018/05/24	93	80 - 120	93	80 - 120	<1.0	ug/L				
5543033	Total Potassium (K)	2018/05/24	98	80 - 120	97	80 - 120	<200	ug/L				
5543033	Total Selenium (Se)	2018/05/24	100	80 - 120	98	80 - 120	<2.0	ug/L				
5543033	Total Silicon (Si)	2018/05/24	98	80 - 120	95	80 - 120	<50	ug/L				
5543033	Total Silver (Ag)	2018/05/24	99	80 - 120	97	80 - 120	<0.10	ug/L				
5543033	Total Sodium (Na)	2018/05/24	97	80 - 120	95	80 - 120	<100	ug/L				
5543033	Total Strontium (Sr)	2018/05/24	99	80 - 120	96	80 - 120	<1.0	ug/L				
5543033	Total Thallium (Tl)	2018/05/24	94	80 - 120	93	80 - 120	<0.050	ug/L				
5543033	Total Titanium (Ti)	2018/05/24	100	80 - 120	101	80 - 120	<5.0	ug/L				
5543033	Total Vanadium (V)	2018/05/24	96	80 - 120	95	80 - 120	<0.50	ug/L				
5543033	Total Zinc (Zn)	2018/05/24	97	80 - 120	98	80 - 120	<5.0	ug/L				
5543077	Total Ammonia-N	2018/05/24	104	75 - 125	102	80 - 120	<0.050	mg/L	NC	20		
5543103	Mercury (Hg)	2018/05/23	116	75 - 125	113	80 - 120	<0.0001	mg/L	NC	20		
5543252	Mercury (Hg)	2018/05/24	96	75 - 125	94	80 - 120	<0.0001	mg/L	NC	20		
5543538	Total Chemical Oxygen Demand (COD)	2018/05/24	96	80 - 120	103	80 - 120	<4.0	mg/L	1.7	20		

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Maxxam Job #: B8B8045
Report Date: 2018/05/25

QUALITY ASSURANCE REPORT(CONT'D)

exp Services Inc
Client Project #: THB-00006196-NE
Site Location: LONGLAC LANDFILL
Sampler Initials: JZ

			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
5545383	Mercury (Hg)	2018/05/24	94	75 - 125	91	80 - 120	<0.0001	mg/L	NC	20		
5545398	Total Phosphorus	2018/05/24	90	80 - 120	99	80 - 120	<0.004	mg/L	NC	20	89	80 - 120
5547478	Dissolved Aluminum (Al)	2018/05/25	107	80 - 120	101	80 - 120	<5.0	ug/L	NC	20		
5547478	Dissolved Antimony (Sb)	2018/05/25	105	80 - 120	97	80 - 120	<0.50	ug/L	NC	20		
5547478	Dissolved Arsenic (As)	2018/05/25	102	80 - 120	99	80 - 120	<1.0	ug/L	NC	20		
5547478	Dissolved Barium (Ba)	2018/05/25	103	80 - 120	100	80 - 120	<2.0	ug/L	3.1	20		
5547478	Dissolved Beryllium (Be)	2018/05/25	109	80 - 120	100	80 - 120	<0.50	ug/L	NC	20		
5547478	Dissolved Bismuth (Bi)	2018/05/25	98	80 - 120	91	80 - 120	<1.0	ug/L	NC	20		
5547478	Dissolved Boron (B)	2018/05/25	NC	80 - 120	97	80 - 120	<10	ug/L	1.2	20		
5547478	Dissolved Cadmium (Cd)	2018/05/25	107	80 - 120	101	80 - 120	<0.10	ug/L	NC	20		
5547478	Dissolved Calcium (Ca)	2018/05/25	NC	80 - 120	101	80 - 120	<200	ug/L	0.49	20		
5547478	Dissolved Chromium (Cr)	2018/05/25	103	80 - 120	101	80 - 120	<5.0	ug/L	NC	20		
5547478	Dissolved Cobalt (Co)	2018/05/25	105	80 - 120	104	80 - 120	<0.50	ug/L	6.6	20		
5547478	Dissolved Copper (Cu)	2018/05/25	109	80 - 120	105	80 - 120	<1.0	ug/L	3.6	20		
5547478	Dissolved Iron (Fe)	2018/05/25	101	80 - 120	99	80 - 120	<100	ug/L	NC	20		
5547478	Dissolved Lead (Pb)	2018/05/25	100	80 - 120	95	80 - 120	<0.50	ug/L	NC	20		
5547478	Dissolved Magnesium (Mg)	2018/05/25	NC	80 - 120	99	80 - 120	<50	ug/L	2.1	20		
5547478	Dissolved Manganese (Mn)	2018/05/25	97	80 - 120	94	80 - 120	<2.0	ug/L	4.1	20		
5547478	Dissolved Molybdenum (Mo)	2018/05/25	112	80 - 120	102	80 - 120	<0.50	ug/L	1.1	20		
5547478	Dissolved Nickel (Ni)	2018/05/25	99	80 - 120	97	80 - 120	<1.0	ug/L	2.7	20		
5547478	Dissolved Potassium (K)	2018/05/25	NC	80 - 120	101	80 - 120	<200	ug/L	0.12	20		
5547478	Dissolved Selenium (Se)	2018/05/25	104	80 - 120	100	80 - 120	<2.0	ug/L	NC	20		
5547478	Dissolved Silicon (Si)	2018/05/25	107	80 - 120	102	80 - 120	<50	ug/L	0.58	20		
5547478	Dissolved Sodium (Na)	2018/05/25	97	80 - 120	98	80 - 120	<100	ug/L	3.2	20		
5547478	Dissolved Strontium (Sr)	2018/05/25	103	80 - 120	97	80 - 120	<1.0	ug/L	3.3	20		
5547478	Dissolved Thallium (Tl)	2018/05/25	102	80 - 120	97	80 - 120	<0.050	ug/L	7.1	20		
5547478	Dissolved Tin (Sn)	2018/05/25	109	80 - 120	101	80 - 120	<1.0	ug/L	NC	20		
5547478	Dissolved Vanadium (V)	2018/05/25	108	80 - 120	100	80 - 120	<0.50	ug/L	NC	20		

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Maxxam Job #: B8B8045
Report Date: 2018/05/25

QUALITY ASSURANCE REPORT(CONT'D)

exp Services Inc
Client Project #: THB-00006196-NE
Site Location: LONGLAC LANDFILL
Sampler Initials: JZ

			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
5547478	Dissolved Zinc (Zn)	2018/05/25	102	80 - 120	99	80 - 120	<5.0	ug/L	NC	20		

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.

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

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

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exp Services Inc
Client Project #: THB-00006196-NE
Site Location: LONGLAC LANDFILL
Sampler Initials: JZ

VALIDATION SIGNATURE PAGE

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

Brad Newman, Scientific Service Specialist

Ewa Pranjic, M.Sc., C.Chem, Scientific Specialist

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

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CHAIN OF CUSTODY RECORD

Page 1 of 3

BOD

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#17501 exp Services Inc	Company Name:		Quotation #:	B75391	Maxxam Job #:	Bottle Order #: 663247
Attention:	accounts payable	Attention:	Jay Zhang	P.O. #:			
Address:	1142 Roland St Thunder Bay ON P7B 5M4	Address:		Project:	THB-00006196-NE	COC #: C#663247-01-01	Project Manager: Michelle Brescacin
Tel:	(807) 623-9495 x Fax: (807) 623-8070 x	Tel:	(807) 623-9495 x Fax:	Project Name:			
Email:	thunderbay@exp.com; Karen.Burke@exp.com;AP@ex	Email:	jay.zhang@exp.com	Site #:	Longlac Landfill		
				Sampled By:	JZ/MS		

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011): ☐ Table 1 ☐ Res/Park ☐ Medium/Fine ☐ Table 2 ☐ Ind/Comm ☐ Coarse ☐ Table 3 ☐ Agri/Other ☐ For RSC ☐ Table ___

Other Regulations: ☐ CCME ☐ Sanitary Sewer Bylaw ☐ Reg 558 ☐ Storm Sewer Bylaw ☐ MISA ☐ Municipality ___ ☐ PWQO ☒ Other ODWS

Special Instructions

Include Criteria on Certificate of Analysis (Y/N)? ___

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects

Regular (Standard) TAT: ☒
(will be applied if Rush TAT is not specified):
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: ___ Time Required: ___ ☐
Rush Confirmation Number: ___ *(call lab for #)*

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Hg / Cr VI	Landfill Standards Sch 5 - GW Comp. List	Ion Balance (% Difference)	Hardness	Organic Nitrogen	Orthophosphate	Extra Dissolved Metals Parameters	# of Bottles	Comments
1		MW2	May 15	14:35	GW	X	X	X	X	X	X	X	7	
2		MW3	May 15	14:50	GW	X	X	X	X	X	X	X	7	
3		MW4I	May 15	10:00	GW	X	X	X	X	X	X	X	7	
4		MW4II	May 15	17:00	GW	X	X	X	X	X	X	X	7	
5		MW5	May 15	16:35	GW	X	X	X	X	X	X	X	7	
6		MW6	May 15	16:25	GW	X	X	X	X	X	X	X	7	
7		MW7	May 15	16:10	GW	X	X	X	X	X	X	X	7	
8		MW8I	May 15	15:45	GW	X	X	X	X	X	X	X	7	
9		MW8II	May 15	15:55	GW	X	X	X	X	X	X	X	7	
10		MW9	May 15	17:15	GW	X	X	X	X	X	X	X	7	Recd in Thunder Bay.

17-May-18 14:45
Michelle Brescacin
B8B8045
GID ENV-648

BOD

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Laboratory Use Only			
Jay Zhang	18/05/17	2:00pm	MBrescacin Michelle Brescacin	18/05/17	14:45		Time Sensitive	Temperature (°C) on Recei: Refer to ACTR	Custody Seal Present / Intact	Yes / No
Jay Zhang				18/05/17	08:50					

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO MAXXAM'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.MAXXAM.CA/TERMS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT HTTP://MAXXAM.CA/WP-CONTENT/UPLOADS/ONTARIO-COC.PDF.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

White: Maxxa Yellow: Client

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CHAIN OF CUSTODY RECORD

Page 23 of 3

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#17501 exp Services Inc	Company Name:		Quotation #:	B75391	Maxxam Job #:	Bottle Order #:
Attention:	accounts payable	Attention:	Jay Zhang	P.O. #:			663247
Address:	1142 Roland St Thunder Bay ON P7B 5M4	Address:		Project:	THB-00006196-NE	COC #:	Project Manager:
Tel:	(807) 623-9495 x Fax: (807) 623-8070 x	Tel:	(807) 623-9495 x Fax:	Project Name:		C#663247-02-01	Michelle Brescacin
Email:	thunderbay@exp.com; Karen.Burke@exp.com;AP@ex	Email:	jay.zhang@exp.com	Site #:	Longlac Landfill		
				Sampled By:	JZ/MS		

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011)
- ☐ Table 1 ☐ Res/Park ☐ Medium/Fine
- ☐ Table 2 ☐ Ind/Comm ☐ Coarse
- ☐ Table 3 ☐ Agri/Other ☐ For RSC
- ☐ Table ___

Other Regulations
- ☐ CCME ☐ Sanitary Sewer Bylaw
- ☐ Reg 558 ☐ Storm Sewer Bylaw
- ☐ MISA Municipality ___
- ☐ PWQO
- ☒ Other ODWS

Special Instructions

Include Criteria on Certificate of Analysis (Y/N)? ___

ANALYSIS REQUESTED (PLEASE BE SPECIFIC)

Turnaround Time (TAT) Required:

Please provide advance notice for rush projects

Regular (Standard) TAT: ☒
(will be applied if Rush TAT is not specified):
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: ___ Time Required: ___ ☐
Rush Confirmation Number: ___ *(call lab for #)*

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals/(Hg)/Cr VI	Landfill Standards Sch 5 - GW Comp. List	Ion Balance (% Difference)	Hardness	Organic Nitrogen	Orthophosphate	Extra Dissolved Metals Parameters					# of Bottles	Comments
1		MW10	May 15	16:55	GW	X	X	X	X	X	X	X					7	
2		MW11I	May 15	15:05	GW	X	X	X	X	X	X	X					7	
3		MW11II	May 15	15:15	GW	X	X	X	X	X	X	X					7	
4		MW12I	May 15	15:30	GW	X	X	X	X	X	X	X					7	
5		MW12II	May 15	15:35	GW	X	X	X	X	X	X	X					7	
6		MW13	May 15	16:40	GW	X	X	X	X	X	X	X					7	
7					GW													
8					GW													
9					GW													
10					GW													

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
Jay Zhang	18/05/17	2:00pm	MBrescacin Michelle Brescacin	18/05/17	14:45	
Jay Zhang			See page 1			

Laboratory Use Only

Time Sensitive	Temperature (°C) on Recei	Custody Seal	Yes	No
	Refer to ACTR	Present		
		Intact		

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO MAXXAM'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.MAXXAM.CA/TERMS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT HTTP://MAXXAM.CA/WP-CONTENT/UPLOADS/ONTARIO-COC.PDF.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

White: Maxxa Yellow: Client

Maxxam Analytics International Corporation o/a Maxxam Analytics

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A Bureau Veritas Group Company

Maxxam Analytics International Corporation o/a Maxxam Analytics
6740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel:(905) 817-5700 Toll-free:800-563-6266 Fax:(905) 817-5777 www.maxxam.ca

CHAIN OF CUSTODY RECORD

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#17501 exp Services Inc	Company Name:		Quotation #:	B75391	Maxxam Job #:	Bottle Order #:
Attention:	accounts payable	Attention:	Jay Zhang	P.O. #:			663248
Address:	1142 Roland St Thunder Bay ON P7B 5M4	Address:		Project:	THB-00006196-NE	COC #:	Project Manager:
Tel:	(807) 623-9495 x Fax: (807) 623-8070 x	Tel:	(807) 623-9495 x Fax:	Project Name:		C#663248-01-01	Michelle Brescacin
Email:	thunderbay@exp.com; Karen.Burke@exp.com;AP@ex	Email:	jay.zhang@exp.com	Site #:	Longlac Landfill		
				Sampled By:	JZ/MS		

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011)
- ☐ Table 1 ☐ Res/Park ☐ Medium/Fine
- ☐ Table 2 ☐ Ind/Comm ☐ Coarse
- ☐ Table 3 ☐ Agri/Other ☐ For RSC
- ☐ Table ___

Other Regulations
- ☐ CCME ☐ Sanitary Sewer Bylaw
- ☐ Reg 558 ☐ Storm Sewer Bylaw
- ☐ MISA Municipality ___
- ☑ PWQO
- ☐ Other ___

Special Instructions

Include Criteria on Certificate of Analysis (Y/N)? ___

ANALYSIS REQUESTED (PLEASE BE SPECIFIC)

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects

Regular (Standard) TAT: ☒
(will be applied if Rush TAT is not specified):
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: ___ Time Required: ___ ☐
Rush Confirmation Number: ___ *(call lab for #)*

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Hg / Cr VI	Landfill Standards Sch 5 - SW Comp List	Dissolved Aluminum (0.2 u, clay free)	Organic Nitrogen	Dissolved Organic Carbon (DOC)	Extra Total Metals Parameters	Hardness (including Ca, Mg, Na, K)	# of Bottles	Comments
1		SW1	May 15	14:20	SW	X	X	X	X	X	X	X	9	
2		SW2	May 15	17:25	SW	X	X	X	X	X	X	X	9	
3		SW3	May 15	17:35	SW	X	X	X	X	X	X	X	9	
4														
5														
6														
7														
8														
9														
10														

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
Jay Zhang Jay Zhang	18/05/17	2:00pm	MBrescacin Michelle Brescacin See - RSC 1	18/05/17	14:45	

Laboratory Use Only

Time Sensitive	Temperature (°C) on Recei	Custody Seal	Yes	No
	Refer to ACTR	Present		
		Intact		

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** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT HTTP://MAXXAM.CA/WP-CONTENT/UPLOADS/ONTARIO-COC.PDF.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

White: Maxxa Yellow: Client

Maxxam Analytics International Corporation o/a Maxxam Analytics

Maxxam
A Bureau Veritas Group Company

Your Project #: THB-00006196-NE
Site Location: Longlac Landfill - Fall Sampling Event

Attention: Jay Zhang

exp Services Inc
Thunder Bay Branch
1142 Roland St
Thunder Bay, ON
CANADA P7B 5M4

Your C.O.C. #: 684820-01-01, 684820-02-01, 684821-01-01

Report Date: 2018/10/26
Report #: R5458222
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B8R7295
Received: 2018/10/18, 15:00

Sample Matrix: Water
Samples Received: 19

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Dissolved Aluminum (0.2 u, clay free)	2	N/A	2018/10/22	CAM SOP-00447	EPA 6020B m
Dissolved Aluminum (0.2 u, clay free)	1	N/A	2018/10/25	CAM SOP-00447	EPA 6020B m
Alkalinity	18	N/A	2018/10/21	CAM SOP-00448	SM 23 2320 B m
Alkalinity	1	N/A	2018/10/22	CAM SOP-00448	SM 23 2320 B m
Biochemical Oxygen Demand (BOD)	3	2018/10/19	2018/10/24	CAM SOP-00427	SM 23 5210B m
Chloride by Automated Colourimetry	19	N/A	2018/10/23	CAM SOP-00463	EPA 325.2 m
Chemical Oxygen Demand	19	N/A	2018/10/24	CAM SOP-00416	SM 23 5220 D m
Conductivity	18	N/A	2018/10/21	CAM SOP-00414	SM 23 2510 m
Conductivity	1	N/A	2018/10/22	CAM SOP-00414	SM 23 2510 m
Dissolved Organic Carbon (DOC) (1)	18	N/A	2018/10/21	CAM SOP-00446	SM 23 5310 B m
Dissolved Organic Carbon (DOC) (1)	1	N/A	2018/10/23	CAM SOP-00446	SM 23 5310 B m
Hardness (calculated as CaCO3)	16	N/A	2018/10/23	CAM SOP 00102/00408/00447	SM 2340 B
Hardness (calculated as CaCO3)	3	N/A	2018/10/24	CAM SOP 00102/00408/00447	SM 2340 B
Mercury in Water by CVAA	19	2018/10/22	2018/10/23	CAM SOP-00453	EPA 7470A m
Dissolved Calcium and Magnesium	2	2018/10/20	2018/10/22	CAM SOP-00408	EPA 6010D m
Dissolved Calcium and Magnesium	1	2018/10/23	2018/10/24	CAM SOP-00408	EPA 6010D m
Dissolved Metals by ICPMS	11	N/A	2018/10/22	CAM SOP-00447	EPA 6020B m
Dissolved Metals by ICPMS	4	N/A	2018/10/23	CAM SOP-00447	EPA 6020B m
Dissolved Metals by ICPMS	1	N/A	2018/10/26	CAM SOP-00447	EPA 6020B m
Total Metals Analysis by ICPMS	3	N/A	2018/10/22	CAM SOP-00447	EPA 6020B m
Ion Balance (% Difference)	16	N/A	2018/10/24		
Total Ammonia-N	19	N/A	2018/10/24	CAM SOP-00441	EPA GS I-2522-90 m
Nitrate (NO3) and Nitrite (NO2) in Water (2)	10	N/A	2018/10/22	CAM SOP-00440	SM 23 4500-NO3I/NO2B
Nitrate (NO3) and Nitrite (NO2) in Water (2)	1	N/A	2018/10/23	CAM SOP-00440	SM 23 4500-NO3I/NO2B
Nitrate (NO3) and Nitrite (NO2) in Water (2)	8	N/A	2018/10/24	CAM SOP-00440	SM 23 4500-NO3I/NO2B

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Your Project #: THB-00006196-NE
Site Location: Longlac Landfill - Fall Sampling Event

Attention: Jay Zhang

exp Services Inc
Thunder Bay Branch
1142 Roland St
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CANADA P7B 5M4

Your C.O.C. #: 684820-01-01, 684820-02-01, 684821-01-01

Report Date: 2018/10/26
Report #: R5458222
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B8R7295
Received: 2018/10/18, 15:00

Sample Matrix: Water
Samples Received: 19

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Organic Nitrogen	19	N/A	2018/10/24		
pH	18	N/A	2018/10/21	CAM SOP-00413	SM 4500H+ B m
pH	1	N/A	2018/10/22	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	16	N/A	2018/10/22	CAM SOP-00444	OMOE E3179 m
Phenols (4AAP)	3	N/A	2018/10/23	CAM SOP-00444	OMOE E3179 m
Orthophosphate	16	N/A	2018/10/22	CAM SOP-00461	EPA 365.1 m
Sulphate by Automated Colourimetry	16	N/A	2018/10/22	CAM SOP-00464	EPA 375.4 m
Sulphate by Automated Colourimetry	3	N/A	2018/10/23	CAM SOP-00464	EPA 375.4 m
Total Dissolved Solids	3	2018/10/20	2018/10/22	CAM SOP-00428	SM 23 2540C m
Total Dissolved Solids	10	2018/10/22	2018/10/23	CAM SOP-00428	SM 23 2540C m
Total Dissolved Solids	6	2018/10/23	2018/10/24	CAM SOP-00428	SM 23 2540C m
Total Kjeldahl Nitrogen in Water	19	2018/10/22	2018/10/23	CAM SOP-00938	OMOE E3516 m
Total Phosphorus (Colourimetric)	3	2018/10/22	2018/10/23	CAM SOP-00407	SM 23 4500 P B H m
Total Phosphorus (Colourimetric)	16	2018/10/22	2018/10/23	CAM SOP-00407	SM 23 4500 P B H m
Low Level Total Suspended Solids	3	2018/10/22	2018/10/23	CAM SOP-00428	SM 23 2540D m
Volatile Organic Compounds in Water	5	N/A	2018/10/23	CAM SOP-00226	EPA 8260C m

Remarks:

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

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

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report.

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Your Project #: THB-00006196-NE
Site Location: Longlac Landfill - Fall Sampling Event

Attention: Jay Zhang

exp Services Inc
Thunder Bay Branch
1142 Roland St
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CANADA P7B 5M4

Your C.O.C. #: 684820-01-01, 684820-02-01, 684821-01-01

Report Date: 2018/10/26
Report #: R5458222
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B8R7295
Received: 2018/10/18, 15:00

Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Maxxam, unless otherwise agreed in writing. Maxxam is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

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

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

(1) Dissolved Organic Carbon (DOC) present in the sample should be considered as non-purgeable DOC.
(2) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Michelle Brescacin, Project Manager Assistant - National Accounts
Email: MBrescacin@maxxam.ca
Phone# (905) 817-5700

==========

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

Maxxam Job #: B8R7295
Report Date: 2018/10/26

exp Services Inc
Client Project #: THB-00006196-NE
Site Location: Longlac Landfill - Fall Sampling Event
Sampler Initials: KK

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		IBJ169			IBJ169		
Sampling Date		2018/10/16 13:53			2018/10/16 13:53		
COC Number		684820-01-01			684820-01-01		
	UNITS	**MW2**	**RDL**	**QC Batch**	**MW2 Lab-Dup**	**RDL**	**QC Batch**
Inorganics							
Total Ammonia-N	mg/L	0.60	0.050	5796356			
Total Chemical Oxygen Demand (COD)	mg/L	16	4.0	5796407			
Conductivity	umho/cm	410	1.0	5794469			
Total Dissolved Solids	mg/L	275	10	5793512			
Total Kjeldahl Nitrogen (TKN)	mg/L	0.63	0.10	5796366			
Dissolved Organic Carbon	mg/L	5.3	0.50	5794601			
pH	pH	7.88		5794470			
Phenols-4AAP	mg/L	<0.0010	0.0010	5795428	<0.0010	0.0010	5795428
Total Phosphorus	mg/L	8.4	0.40	5796145			
Dissolved Sulphate (SO4)	mg/L	<1.0	1.0	5794476			
Alkalinity (Total as CaCO3)	mg/L	230	1.0	5794468			
Dissolved Chloride (Cl-)	mg/L	1.2	1.0	5794475			
Nitrite (N)	mg/L	<0.010	0.010	5794612			
Nitrate (N)	mg/L	<0.10	0.10	5794612			
Metals							
Mercury (Hg)	mg/L	<0.0001	0.0001	5795962			
Dissolved Aluminum (Al)	ug/L	<5.0	5.0	5794741			
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	5794741			
Dissolved Arsenic (As)	ug/L	1.5	1.0	5794741			
Dissolved Barium (Ba)	ug/L	30	2.0	5794741			
Dissolved Beryllium (Be)	ug/L	<0.50	0.50	5794741			
Dissolved Bismuth (Bi)	ug/L	<1.0	1.0	5794741			
Dissolved Boron (B)	ug/L	27	10	5794741			
Dissolved Cadmium (Cd)	ug/L	<0.10	0.10	5794741			
Dissolved Calcium (Ca)	ug/L	58000	200	5794741			
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	5794741			
Dissolved Cobalt (Co)	ug/L	<0.50	0.50	5794741			
Dissolved Copper (Cu)	ug/L	<1.0	1.0	5794741			
Dissolved Iron (Fe)	ug/L	1100	100	5794741			
Dissolved Lead (Pb)	ug/L	<0.50	0.50	5794741			
Dissolved Magnesium (Mg)	ug/L	14000	50	5794741			
Dissolved Manganese (Mn)	ug/L	58	2.0	5794741			

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

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Maxxam Job #: B8R7295
Report Date: 2018/10/26

exp Services Inc
Client Project #: THB-00006196-NE
Site Location: Longlac Landfill - Fall Sampling Event
Sampler Initials: KK

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		IBJ169			IBJ169		
Sampling Date		2018/10/16 13:53			2018/10/16 13:53		
COC Number		684820-01-01			684820-01-01		
	UNITS	**MW2**	**RDL**	**QC Batch**	**MW2 Lab-Dup**	**RDL**	**QC Batch**
Dissolved Molybdenum (Mo)	ug/L	<0.50	0.50	5794741			
Dissolved Nickel (Ni)	ug/L	8.5	1.0	5794741			
Dissolved Potassium (K)	ug/L	960	200	5794741			
Dissolved Selenium (Se)	ug/L	<2.0	2.0	5794741			
Dissolved Silicon (Si)	ug/L	7900	50	5794741			
Dissolved Sodium (Na)	ug/L	4900	100	5794741			
Dissolved Strontium (Sr)	ug/L	180	1.0	5794741			
Dissolved Thallium (Tl)	ug/L	<0.050	0.050	5794741			
Dissolved Tin (Sn)	ug/L	<1.0	1.0	5794741			
Dissolved Vanadium (V)	ug/L	0.51	0.50	5794741			
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	5794741			

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

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Maxxam Job #: B8R7295
Report Date: 2018/10/26

exp Services Inc
Client Project #: THB-00006196-NE
Site Location: Longlac Landfill - Fall Sampling Event
Sampler Initials: KK

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		IBJ170			IBJ170			IBJ171		
Sampling Date		2018/10/16 16:10			2018/10/16 16:10			2018/10/16 10:17		
COC Number		684820-01-01			684820-01-01			684820-01-01		
	UNITS	**MW3**	**RDL**	**QC Batch**	**MW3 Lab-Dup**	**RDL**	**QC Batch**	**MW4I**	**RDL**	**QC Batch**
Inorganics										
Total Ammonia-N	mg/L	0.98 (1)	0.050	5796356				0.14	0.050	5796356
Total Chemical Oxygen Demand (COD)	mg/L	8.6	4.0	5796407				7.6	4.0	5796407
Conductivity	umho/cm	470	1.0	5794466				650	1.0	5794466
Total Dissolved Solids	mg/L	285	10	5793512				365	10	5793560
Total Kjeldahl Nitrogen (TKN)	mg/L	0.93 (1)	0.10	5796366				0.24	0.10	5796366
Dissolved Organic Carbon	mg/L	1.5	0.50	5794601				3.1	0.50	5794601
pH	pH	7.85		5794467				8.01		5794467
Phenols-4AAP	mg/L	<0.0010	0.0010	5795406				<0.0010	0.0010	5795406
Total Phosphorus	mg/L	41	0.40	5796145				0.11	0.020	5796145
Dissolved Sulphate (SO4)	mg/L	<1.0	1.0	5794476				1.4	1.0	5794476
Alkalinity (Total as CaCO3)	mg/L	250	1.0	5794465				360	1.0	5794465
Dissolved Chloride (Cl-)	mg/L	1.4	1.0	5794475				2.8	1.0	5794475
Nitrite (N)	mg/L	<0.010	0.010	5794518				0.022	0.010	5794518
Nitrate (N)	mg/L	<0.10	0.10	5794518				0.10	0.10	5794518
Metals										
Mercury (Hg)	mg/L	<0.0001	0.0001	5795962				<0.0001	0.0001	5795962
Dissolved Aluminum (Al)	ug/L	<5.0	5.0	5794741	<5.0	5.0	5794741	<5.0	5.0	5794741
Dissolved Antimony (Sb)	ug/L	0.84	0.50	5794741	0.54	0.50	5794741	<0.50	0.50	5794741
Dissolved Arsenic (As)	ug/L	3.0	1.0	5794741	3.1	1.0	5794741	<1.0	1.0	5794741
Dissolved Barium (Ba)	ug/L	41	2.0	5794741	41	2.0	5794741	80	2.0	5794741
Dissolved Beryllium (Be)	ug/L	<0.50	0.50	5794741	<0.50	0.50	5794741	<0.50	0.50	5794741
Dissolved Bismuth (Bi)	ug/L	<1.0	1.0	5794741	<1.0	1.0	5794741	<1.0	1.0	5794741
Dissolved Boron (B)	ug/L	32	10	5794741	32	10	5794741	81	10	5794741
Dissolved Cadmium (Cd)	ug/L	<0.10	0.10	5794741	<0.10	0.10	5794741	<0.10	0.10	5794741
Dissolved Calcium (Ca)	ug/L	60000	200	5794741	61000	200	5794741	73000	200	5794741
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	5794741	<5.0	5.0	5794741	<5.0	5.0	5794741
Dissolved Cobalt (Co)	ug/L	<0.50	0.50	5794741	<0.50	0.50	5794741	<0.50	0.50	5794741
Dissolved Copper (Cu)	ug/L	<1.0	1.0	5794741	<1.0	1.0	5794741	<1.0	1.0	5794741
Dissolved Iron (Fe)	ug/L	1100	100	5794741	1100	100	5794741	660	100	5794741
Dissolved Lead (Pb)	ug/L	<0.50	0.50	5794741	<0.50	0.50	5794741	<0.50	0.50	5794741
Dissolved Magnesium (Mg)	ug/L	18000	50	5794741	18000	50	5794741	32000	50	5794741
Dissolved Manganese (Mn)	ug/L	71	2.0	5794741	70	2.0	5794741	110	2.0	5794741

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
(1) TKN < NH4: Both values fall within acceptable RPD limits for duplicates and are likely equivalent.

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Maxxam Job #: B8R7295
Report Date: 2018/10/26

exp Services Inc
Client Project #: THB-00006196-NE
Site Location: Longlac Landfill - Fall Sampling Event
Sampler Initials: KK

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		IBJ170			IBJ170			IBJ171		
Sampling Date		2018/10/16 16:10			2018/10/16 16:10			2018/10/16 10:17		
COC Number		684820-01-01			684820-01-01			684820-01-01		
	UNITS	**MW3**	**RDL**	**QC Batch**	**MW3 Lab-Dup**	**RDL**	**QC Batch**	**MW4I**	**RDL**	**QC Batch**
Dissolved Molybdenum (Mo)	ug/L	0.62	0.50	5794741	0.58	0.50	5794741	3.6	0.50	5794741
Dissolved Nickel (Ni)	ug/L	<1.0	1.0	5794741	<1.0	1.0	5794741	<1.0	1.0	5794741
Dissolved Potassium (K)	ug/L	1200	200	5794741	1200	200	5794741	9700	200	5794741
Dissolved Selenium (Se)	ug/L	<2.0	2.0	5794741	<2.0	2.0	5794741	<2.0	2.0	5794741
Dissolved Silicon (Si)	ug/L	8600	50	5794741	8600	50	5794741	7900	50	5794741
Dissolved Sodium (Na)	ug/L	8500	100	5794741	8500	100	5794741	13000	100	5794741
Dissolved Strontium (Sr)	ug/L	290	1.0	5794741	290	1.0	5794741	490	1.0	5794741
Dissolved Thallium (Tl)	ug/L	<0.050	0.050	5794741	<0.050	0.050	5794741	<0.050	0.050	5794741
Dissolved Tin (Sn)	ug/L	<1.0	1.0	5794741	<1.0	1.0	5794741	<1.0	1.0	5794741
Dissolved Vanadium (V)	ug/L	<0.50	0.50	5794741	<0.50	0.50	5794741	<0.50	0.50	5794741
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	5794741	<5.0	5.0	5794741	<5.0	5.0	5794741

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

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Maxxam Job #: B8R7295
Report Date: 2018/10/26

exp Services Inc
Client Project #: THB-00006196-NE
Site Location: Longlac Landfill - Fall Sampling Event
Sampler Initials: KK

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		IBJ171			IBJ172			IBJ173		
Sampling Date		2018/10/16 10:17			2018/10/16 15:40			2018/10/16 15:00		
COC Number		684820-01-01			684820-01-01			684820-01-01		
	UNITS	**MW4I Lab-Dup**	**RDL**	**QC Batch**	**MW4II**	**RDL**	**QC Batch**	**MW5**	**RDL**	**QC Batch**
Inorganics										
Total Ammonia-N	mg/L				3.5	0.050	5796356	0.16	0.050	5796356
Total Chemical Oxygen Demand (COD)	mg/L				28	4.0	5796407	<4.0	4.0	5796407
Conductivity	umho/cm				2000	1.0	5794469	600	1.0	5794469
Total Dissolved Solids	mg/L	365	10	5793560	1160	10	5793560	335	10	5793560
Total Kjeldahl Nitrogen (TKN)	mg/L				4.3	0.20	5796366	0.85	0.10	5796366
Dissolved Organic Carbon	mg/L				9.5	0.50	5794601	1.3	0.50	5794601
pH	pH				7.80		5794470	7.93		5794470
Phenols-4AAP	mg/L				<0.0010	0.0010	5795406	<0.0010	0.0010	5795465
Total Phosphorus	mg/L	0.10	0.020	5796145	9.2	0.40	5796145	1.6	0.10	5796145
Dissolved Sulphate (SO4)	mg/L				<1.0	1.0	5794806	4.8	1.0	5794476
Alkalinity (Total as CaCO3)	mg/L				1000	1.0	5794468	320	1.0	5794468
Dissolved Chloride (Cl-)	mg/L				19	1.0	5794805	1.7	1.0	5794475
Nitrite (N)	mg/L				1.18	0.010	5794612	<0.010	0.010	5794612
Nitrate (N)	mg/L				2.72	0.10	5794612	2.32	0.10	5794612
Metals										
Mercury (Hg)	mg/L				<0.0001	0.0001	5795858	<0.0001	0.0001	5795962
Dissolved Aluminum (Al)	ug/L				<5.0	5.0	5794741	<5.0	5.0	5794741
Dissolved Antimony (Sb)	ug/L				<0.50	0.50	5794741	<0.50	0.50	5794741
Dissolved Arsenic (As)	ug/L				<1.0	1.0	5794741	<1.0	1.0	5794741
Dissolved Barium (Ba)	ug/L				200	2.0	5794741	28	2.0	5794741
Dissolved Beryllium (Be)	ug/L				<0.50	0.50	5794741	<0.50	0.50	5794741
Dissolved Bismuth (Bi)	ug/L				<1.0	1.0	5794741	<1.0	1.0	5794741
Dissolved Boron (B)	ug/L				1000	10	5794741	14	10	5794741
Dissolved Cadmium (Cd)	ug/L				<0.10	0.10	5794741	<0.10	0.10	5794741
Dissolved Calcium (Ca)	ug/L				96000	200	5794741	90000	200	5794741
Dissolved Chromium (Cr)	ug/L				<5.0	5.0	5794741	<5.0	5.0	5794741
Dissolved Cobalt (Co)	ug/L				2.9	0.50	5794741	<0.50	0.50	5794741
Dissolved Copper (Cu)	ug/L				6.5	1.0	5794741	<1.0	1.0	5794741
Dissolved Iron (Fe)	ug/L				<100	100	5794741	<100	100	5794741
Dissolved Lead (Pb)	ug/L				<0.50	0.50	5794741	<0.50	0.50	5794741
Dissolved Magnesium (Mg)	ug/L				77000	50	5794741	22000	50	5794741
Dissolved Manganese (Mn)	ug/L				420	2.0	5794741	<2.0	2.0	5794741

RDL = Reportable Detection Limit
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Maxxam Job #: B8R7295
Report Date: 2018/10/26

exp Services Inc
Client Project #: THB-00006196-NE
Site Location: Longlac Landfill - Fall Sampling Event
Sampler Initials: KK

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		IBJ171			IBJ172			IBJ173		
Sampling Date		2018/10/16 10:17			2018/10/16 15:40			2018/10/16 15:00		
COC Number		684820-01-01			684820-01-01			684820-01-01		
	UNITS	**MW4I Lab-Dup**	**RDL**	**QC Batch**	**MW4II**	**RDL**	**QC Batch**	**MW5**	**RDL**	**QC Batch**
Dissolved Molybdenum (Mo)	ug/L				1.8	0.50	5794741	<0.50	0.50	5794741
Dissolved Nickel (Ni)	ug/L				6.2	1.0	5794741	<1.0	1.0	5794741
Dissolved Potassium (K)	ug/L				300000	1000	5794741	1000	200	5794741
Dissolved Selenium (Se)	ug/L				<2.0	2.0	5794741	<2.0	2.0	5794741
Dissolved Silicon (Si)	ug/L				5300	50	5794741	6400	50	5794741
Dissolved Sodium (Na)	ug/L				42000	100	5794741	2900	100	5794741
Dissolved Strontium (Sr)	ug/L				210	1.0	5794741	88	1.0	5794741
Dissolved Thallium (Tl)	ug/L				0.19	0.050	5794741	<0.050	0.050	5794741
Dissolved Tin (Sn)	ug/L				<1.0	1.0	5794741	<1.0	1.0	5794741
Dissolved Vanadium (V)	ug/L				0.67	0.50	5794741	0.72	0.50	5794741
Dissolved Zinc (Zn)	ug/L				<5.0	5.0	5794741	<5.0	5.0	5794741

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
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Maxxam Job #: B8R7295
Report Date: 2018/10/26

exp Services Inc
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Sampler Initials: KK

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		IBJ174			IBJ175			IBJ175		
Sampling Date		2018/10/16 14:50			2018/10/16 08:55			2018/10/16 08:55		
COC Number		684820-01-01			684820-01-01			684820-01-01		
	UNITS	**MW6**	**RDL**	**QC Batch**	**MW7**	**RDL**	**QC Batch**	**MW7 Lab-Dup**	**RDL**	**QC Batch**
Inorganics										
Total Ammonia-N	mg/L	59	0.25	5796356	20	0.050	5796356			
Total Chemical Oxygen Demand (COD)	mg/L	12	4.0	5796407	77	4.0	5796407			
Conductivity	umho/cm	1200	1.0	5794466	2400	1.0	5794466	2400	1.0	5794466
Total Dissolved Solids	mg/L	470	10	5793560	1290	10	5793560			
Total Kjeldahl Nitrogen (TKN)	mg/L	61	2.0	5796366	23	1.0	5796366			
Dissolved Organic Carbon	mg/L	4.6	0.50	5794601	26	0.50	5794601	26	0.50	5794601
pH	pH	7.80		5794467	7.51		5794467	7.50		5794467
Phenols-4AAP	mg/L	<0.0010	0.0010	5795417	<0.0010	0.0010	5795428			
Total Phosphorus	mg/L	0.16	0.10	5796145	3.5	0.40	5796145			
Dissolved Sulphate (SO4)	mg/L	8.8	1.0	5794476	36	1.0	5794472			
Alkalinity (Total as CaCO3)	mg/L	630	1.0	5794465	870	1.0	5794465	870	1.0	5794465
Dissolved Chloride (Cl-)	mg/L	24	1.0	5794475	220	2.0	5794471			
Nitrite (N)	mg/L	0.299	0.010	5794518	0.570	0.010	5794518			
Nitrate (N)	mg/L	1.77	0.10	5794518	14.2	0.10	5794518			
Metals										
Mercury (Hg)	mg/L	<0.0001	0.0001	5795858	<0.0001	0.0001	5795962			
Dissolved Aluminum (Al)	ug/L	<5.0	5.0	5794741	<5.0	5.0	5794741			
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	5794741	<0.50	0.50	5794741			
Dissolved Arsenic (As)	ug/L	<1.0	1.0	5794741	3.7	1.0	5794741			
Dissolved Barium (Ba)	ug/L	95	2.0	5794741	310	2.0	5794741			
Dissolved Beryllium (Be)	ug/L	<0.50	0.50	5794741	<0.50	0.50	5794741			
Dissolved Bismuth (Bi)	ug/L	<1.0	1.0	5794741	<1.0	1.0	5794741			
Dissolved Boron (B)	ug/L	37	10	5794741	650	10	5794741			
Dissolved Cadmium (Cd)	ug/L	<0.10	0.10	5794741	<0.10	0.10	5794741			
Dissolved Calcium (Ca)	ug/L	100000	200	5794741	200000	200	5794741			
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	5794741	<5.0	5.0	5794741			
Dissolved Cobalt (Co)	ug/L	0.73	0.50	5794741	9.9	0.50	5794741			
Dissolved Copper (Cu)	ug/L	1.7	1.0	5794741	2.3	1.0	5794741			
Dissolved Iron (Fe)	ug/L	<100	100	5794741	3200	100	5794741			
Dissolved Lead (Pb)	ug/L	<0.50	0.50	5794741	<0.50	0.50	5794741			
Dissolved Magnesium (Mg)	ug/L	28000	50	5794741	59000	50	5794741			
Dissolved Manganese (Mn)	ug/L	250	2.0	5794741	820	2.0	5794741			

RDL = Reportable Detection Limit
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Report Date: 2018/10/26

exp Services Inc
Client Project #: THB-00006196-NE
Site Location: Longlac Landfill - Fall Sampling Event
Sampler Initials: KK

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		IBJ174			IBJ175			IBJ175		
Sampling Date		2018/10/16 14:50			2018/10/16 08:55			2018/10/16 08:55		
COC Number		684820-01-01			684820-01-01			684820-01-01		
	UNITS	**MW6**	**RDL**	**QC Batch**	**MW7**	**RDL**	**QC Batch**	**MW7 Lab-Dup**	**RDL**	**QC Batch**
Dissolved Molybdenum (Mo)	ug/L	0.66	0.50	5794741	0.57	0.50	5794741			
Dissolved Nickel (Ni)	ug/L	2.3	1.0	5794741	21	1.0	5794741			
Dissolved Potassium (K)	ug/L	4300	200	5794741	65000	200	5794741			
Dissolved Selenium (Se)	ug/L	<2.0	2.0	5794741	<2.0	2.0	5794741			
Dissolved Silicon (Si)	ug/L	5600	50	5794741	8700	50	5794741			
Dissolved Sodium (Na)	ug/L	12000	100	5794741	140000	100	5794741			
Dissolved Strontium (Sr)	ug/L	230	1.0	5794741	330	1.0	5794741			
Dissolved Thallium (Tl)	ug/L	0.059	0.050	5794741	0.13	0.050	5794741			
Dissolved Tin (Sn)	ug/L	<1.0	1.0	5794741	<1.0	1.0	5794741			
Dissolved Vanadium (V)	ug/L	<0.50	0.50	5794741	<0.50	0.50	5794741			
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	5794741	<5.0	5.0	5794741			

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
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Maxxam Job #: B8R7295
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exp Services Inc
Client Project #: THB-00006196-NE
Site Location: Longlac Landfill - Fall Sampling Event
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LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		IBJ176			IBJ178		IBJ179		
Sampling Date		2018/10/16 08:16			2018/10/16 10:42		2018/10/16 11:05		
COC Number		684820-01-01			684820-01-01		684820-01-01		
	UNITS	**MW8I**	**RDL**	**QC Batch**	**MW8II**	**QC Batch**	**MW9**	**RDL**	**QC Batch**
Inorganics									
Total Ammonia-N	mg/L	48	0.25	5796356	1.9	5796356	0.058	0.050	5796356
Total Chemical Oxygen Demand (COD)	mg/L	150	4.0	5796407	7.2	5796407	<4.0	4.0	5796407
Conductivity	umho/cm	3800	1.0	5794469	990	5794466	550	1.0	5794466
Total Dissolved Solids	mg/L	2380	10	5793560	510	5793560	305	10	5793560
Total Kjeldahl Nitrogen (TKN)	mg/L	53	2.0	5796366	2.4	5796366	0.29	0.10	5796366
Dissolved Organic Carbon	mg/L	58	0.50	5794601	3.2	5794601	1.1	0.50	5794601
pH	pH	7.42		5794470	7.78	5794467	7.85		5794467
Phenols-4AAP	mg/L	0.0021	0.0010	5795428	<0.0010	5795406	<0.0010	0.0010	5795417
Total Phosphorus	mg/L	1.3	0.40	5796145	0.52	5796145	0.18	0.10	5796145
Dissolved Sulphate (SO4)	mg/L	280	1.0	5794806	51	5794476	25	1.0	5794472
Alkalinity (Total as CaCO3)	mg/L	1400	1.0	5794468	400	5794465	270	1.0	5794465
Dissolved Chloride (Cl-)	mg/L	330	4.0	5794805	45	5794475	2.7	1.0	5794471
Nitrite (N)	mg/L	0.011	0.010	5794612	0.068	5794518	<0.010	0.010	5794518
Nitrate (N)	mg/L	<0.10	0.10	5794612	2.13	5794518	1.73	0.10	5794518
Metals									
Mercury (Hg)	mg/L	<0.0001	0.0001	5795962	<0.0001	5795962	<0.0001	0.0001	5795962
Dissolved Aluminum (Al)	ug/L	6.4	5.0	5794741	<5.0	5794741	<5.0	5.0	5794741
Dissolved Antimony (Sb)	ug/L	1.5	0.50	5794741	<0.50	5794741	<0.50	0.50	5794741
Dissolved Arsenic (As)	ug/L	8.6	1.0	5794741	<1.0	5794741	<1.0	1.0	5794741
Dissolved Barium (Ba)	ug/L	250	2.0	5794741	68	5794741	15	2.0	5794741
Dissolved Beryllium (Be)	ug/L	<0.50	0.50	5794741	<0.50	5794741	<0.50	0.50	5794741
Dissolved Bismuth (Bi)	ug/L	<1.0	1.0	5794741	<1.0	5794741	<1.0	1.0	5794741
Dissolved Boron (B)	ug/L	2200	10	5794741	270	5794741	44	10	5794741
Dissolved Cadmium (Cd)	ug/L	<0.10	0.10	5794741	<0.10	5794741	<0.10	0.10	5794741
Dissolved Calcium (Ca)	ug/L	190000	200	5794741	120000	5794741	91000	200	5794741
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	5794741	<5.0	5794741	<5.0	5.0	5794741
Dissolved Cobalt (Co)	ug/L	14	0.50	5794741	1.0	5794741	<0.50	0.50	5794741
Dissolved Copper (Cu)	ug/L	<1.0	1.0	5794741	4.3	5794741	<1.0	1.0	5794741
Dissolved Iron (Fe)	ug/L	6300	100	5794741	<100	5794741	<100	100	5794741
Dissolved Lead (Pb)	ug/L	<0.50	0.50	5794741	<0.50	5794741	<0.50	0.50	5794741
Dissolved Magnesium (Mg)	ug/L	120000	50	5794741	28000	5794741	14000	50	5794741
Dissolved Manganese (Mn)	ug/L	990	2.0	5794741	130	5794741	24	2.0	5794741
Dissolved Molybdenum (Mo)	ug/L	2.2	0.50	5794741	0.53	5794741	<0.50	0.50	5794741

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B8R7295
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exp Services Inc
Client Project #: THB-00006196-NE
Site Location: Longlac Landfill - Fall Sampling Event
Sampler Initials: KK

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		IBJ176			IBJ178		IBJ179		
Sampling Date		2018/10/16 08:16			2018/10/16 10:42		2018/10/16 11:05		
COC Number		684820-01-01			684820-01-01		684820-01-01		
	UNITS	**MW8I**	**RDL**	**QC Batch**	**MW8II**	**QC Batch**	**MW9**	**RDL**	**QC Batch**
Dissolved Nickel (Ni)	ug/L	26	1.0	5794741	4.2	5794741	<1.0	1.0	5794741
Dissolved Potassium (K)	ug/L	220000	1000	5794741	25000	5794741	830	200	5794741
Dissolved Selenium (Se)	ug/L	<2.0	2.0	5794741	<2.0	5794741	<2.0	2.0	5794741
Dissolved Silicon (Si)	ug/L	9100	50	5794741	5200	5794741	4400	50	5794741
Dissolved Sodium (Na)	ug/L	250000	100	5794741	36000	5794741	1800	100	5794741
Dissolved Strontium (Sr)	ug/L	700	1.0	5794741	250	5794741	76	1.0	5794741
Dissolved Thallium (Tl)	ug/L	0.38	0.050	5794741	<0.050	5794741	<0.050	0.050	5794741
Dissolved Tin (Sn)	ug/L	<1.0	1.0	5794741	<1.0	5794741	<1.0	1.0	5794741
Dissolved Vanadium (V)	ug/L	1.6	0.50	5794741	<0.50	5794741	<0.50	0.50	5794741
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	5794741	<5.0	5794741	<5.0	5.0	5794741

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B8R7295
Report Date: 2018/10/26

exp Services Inc
Client Project #: THB-00006196-NE
Site Location: Longlac Landfill - Fall Sampling Event
Sampler Initials: KK

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		IBJ180			IBJ180		
Sampling Date		2018/10/16 15:20			2018/10/16 15:20		
COC Number		684820-02-01			684820-02-01		
	UNITS	**MW10**	**RDL**	**QC Batch**	**MW10 Lab-Dup**	**RDL**	**QC Batch**
Inorganics							
Total Ammonia-N	mg/L	0.11	0.050	5796356			
Total Chemical Oxygen Demand (COD)	mg/L	12	4.0	5796407			
Conductivity	umho/cm	440	1.0	5794469			
Total Dissolved Solids	mg/L	195	10	5793539			
Total Kjeldahl Nitrogen (TKN)	mg/L	0.23	0.10	5796366			
Dissolved Organic Carbon	mg/L	4.9	0.50	5794601			
pH	pH	7.85		5794470			
Phenols-4AAP	mg/L	<0.0010	0.0010	5795417			
Total Phosphorus	mg/L	0.51	0.20	5796145			
Dissolved Sulphate (SO4)	mg/L	<1.0	1.0	5794806			
Alkalinity (Total as CaCO3)	mg/L	240	1.0	5794468			
Dissolved Chloride (Cl-)	mg/L	2.5	1.0	5794805			
Nitrite (N)	mg/L	<0.010	0.010	5794612			
Nitrate (N)	mg/L	<0.10	0.10	5794612			
Metals							
Mercury (Hg)	mg/L	<0.0001	0.0001	5795962	<0.0001	0.0001	5795962
Dissolved Aluminum (Al)	ug/L	7.9	5.0	5794741			
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	5794741			
Dissolved Arsenic (As)	ug/L	<1.0	1.0	5794741			
Dissolved Barium (Ba)	ug/L	14	2.0	5794741			
Dissolved Beryllium (Be)	ug/L	<0.50	0.50	5794741			
Dissolved Bismuth (Bi)	ug/L	<1.0	1.0	5794741			
Dissolved Boron (B)	ug/L	11	10	5794741			
Dissolved Cadmium (Cd)	ug/L	<0.10	0.10	5794741			
Dissolved Calcium (Ca)	ug/L	65000	200	5794741			
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	5794741			
Dissolved Cobalt (Co)	ug/L	<0.50	0.50	5794741			
Dissolved Copper (Cu)	ug/L	6.1	1.0	5794741			
Dissolved Iron (Fe)	ug/L	110	100	5794741			
Dissolved Lead (Pb)	ug/L	<0.50	0.50	5794741			
Dissolved Magnesium (Mg)	ug/L	13000	50	5794741			
Dissolved Manganese (Mn)	ug/L	5.1	2.0	5794741			

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

Maxxam Job #: B8R7295
Report Date: 2018/10/26

exp Services Inc
Client Project #: THB-00006196-NE
Site Location: Longlac Landfill - Fall Sampling Event
Sampler Initials: KK

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		IBJ180			IBJ180		
Sampling Date		2018/10/16 15:20			2018/10/16 15:20		
COC Number		684820-02-01			684820-02-01		
	UNITS	**MW10**	**RDL**	**QC Batch**	**MW10 Lab-Dup**	**RDL**	**QC Batch**
Dissolved Molybdenum (Mo)	ug/L	<0.50	0.50	5794741			
Dissolved Nickel (Ni)	ug/L	<1.0	1.0	5794741			
Dissolved Potassium (K)	ug/L	270	200	5794741			
Dissolved Selenium (Se)	ug/L	<2.0	2.0	5794741			
Dissolved Silicon (Si)	ug/L	5000	50	5794741			
Dissolved Sodium (Na)	ug/L	1600	100	5794741			
Dissolved Strontium (Sr)	ug/L	55	1.0	5794741			
Dissolved Thallium (Tl)	ug/L	<0.050	0.050	5794741			
Dissolved Tin (Sn)	ug/L	<1.0	1.0	5794741			
Dissolved Vanadium (V)	ug/L	<0.50	0.50	5794741			
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	5794741			

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

Maxxam Job #: B8R7295
Report Date: 2018/10/26

exp Services Inc
Client Project #: THB-00006196-NE
Site Location: Longlac Landfill - Fall Sampling Event
Sampler Initials: KK

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		IBJ181			IBJ181		
Sampling Date		2018/10/16 13:00			2018/10/16 13:00		
COC Number		684820-02-01			684820-02-01		
	UNITS	**MW11I**	**RDL**	**QC Batch**	**MW11I Lab-Dup**	**RDL**	**QC Batch**
Inorganics							
Total Ammonia-N	mg/L	0.24	0.050	5796356			
Total Chemical Oxygen Demand (COD)	mg/L	18	4.0	5796407			
Conductivity	umho/cm	1300	1.0	5794469			
Total Dissolved Solids	mg/L	800	10	5793539			
Total Kjeldahl Nitrogen (TKN)	mg/L	0.31	0.10	5796366			
Dissolved Organic Carbon	mg/L	4.7	0.50	5794601			
pH	pH	7.81		5794470			
Phenols-4AAP	mg/L	<0.0010	0.0010	5795433			
Total Phosphorus	mg/L	22	1.0	5796145			
Dissolved Sulphate (SO4)	mg/L	110	1.0	5794476			
Alkalinity (Total as CaCO3)	mg/L	420	1.0	5794468			
Dissolved Chloride (Cl-)	mg/L	120	1.0	5794475			
Nitrite (N)	mg/L	<0.010	0.010	5794612			
Nitrate (N)	mg/L	<0.10	0.10	5794612			
Metals							
Mercury (Hg)	mg/L	<0.0001	0.0001	5795858	<0.0001	0.0001	5795858
Dissolved Aluminum (Al)	ug/L	<5.0	5.0	5794741			
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	5794741			
Dissolved Arsenic (As)	ug/L	<1.0	1.0	5794741			
Dissolved Barium (Ba)	ug/L	180	2.0	5794741			
Dissolved Beryllium (Be)	ug/L	<0.50	0.50	5794741			
Dissolved Bismuth (Bi)	ug/L	<1.0	1.0	5794741			
Dissolved Boron (B)	ug/L	34	10	5794741			
Dissolved Cadmium (Cd)	ug/L	<0.10	0.10	5794741			
Dissolved Calcium (Ca)	ug/L	170000	200	5794741			
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	5794741			
Dissolved Cobalt (Co)	ug/L	<0.50	0.50	5794741			
Dissolved Copper (Cu)	ug/L	<1.0	1.0	5794741			
Dissolved Iron (Fe)	ug/L	<100	100	5794741			
Dissolved Lead (Pb)	ug/L	<0.50	0.50	5794741			
Dissolved Magnesium (Mg)	ug/L	37000	50	5794741			
Dissolved Manganese (Mn)	ug/L	110	2.0	5794741			

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

Maxxam Job #: B8R7295
Report Date: 2018/10/26

exp Services Inc
Client Project #: THB-00006196-NE
Site Location: Longlac Landfill - Fall Sampling Event
Sampler Initials: KK

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		IBJ181			IBJ181		
Sampling Date		2018/10/16 13:00			2018/10/16 13:00		
COC Number		684820-02-01			684820-02-01		
	UNITS	**MW11I**	**RDL**	**QC Batch**	**MW11I Lab-Dup**	**RDL**	**QC Batch**
Dissolved Molybdenum (Mo)	ug/L	0.71	0.50	5794741			
Dissolved Nickel (Ni)	ug/L	<1.0	1.0	5794741			
Dissolved Potassium (K)	ug/L	3600	200	5794741			
Dissolved Selenium (Se)	ug/L	<2.0	2.0	5794741			
Dissolved Silicon (Si)	ug/L	7200	50	5794741			
Dissolved Sodium (Na)	ug/L	32000	100	5794741			
Dissolved Strontium (Sr)	ug/L	220	1.0	5794741			
Dissolved Thallium (Tl)	ug/L	<0.050	0.050	5794741			
Dissolved Tin (Sn)	ug/L	<1.0	1.0	5794741			
Dissolved Vanadium (V)	ug/L	1.4	0.50	5794741			
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	5794741			

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Maxxam Job #: B8R7295
Report Date: 2018/10/26

exp Services Inc
Client Project #: THB-00006196-NE
Site Location: Longlac Landfill - Fall Sampling Event
Sampler Initials: KK

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		IBJ182			IBJ183		
Sampling Date		2018/10/16 12:50			2018/10/16 15:55		
COC Number		684820-02-01			684820-02-01		
	UNITS	**MW11II**	**RDL**	**QC Batch**	**MW12I**	**RDL**	**QC Batch**
Inorganics							
Total Ammonia-N	mg/L	0.23	0.050	5796356	0.19	0.050	5796356
Total Chemical Oxygen Demand (COD)	mg/L	20	4.0	5796407	8.3	4.0	5796407
Conductivity	umho/cm	1500	1.0	5794469	920	1.0	5794466
Total Dissolved Solids	mg/L	875	10	5793539	485	10	5798461
Total Kjeldahl Nitrogen (TKN)	mg/L	0.42	0.10	5796366	0.14	0.10	5796366
Dissolved Organic Carbon	mg/L	6.1	0.50	5795785	1.8	0.50	5794601
pH	pH	7.67		5794470	7.82		5794467
Phenols-4AAP	mg/L	<0.0010	0.0010	5795433	<0.0010	0.0010	5795433
Total Phosphorus	mg/L	4.4	1.0	5796145	0.041	0.040	5796145
Dissolved Sulphate (SO4)	mg/L	97	1.0	5794806	77	1.0	5794476
Alkalinity (Total as CaCO3)	mg/L	580	1.0	5794468	400	1.0	5794465
Dissolved Chloride (Cl-)	mg/L	120	1.0	5794805	24	1.0	5794475
Nitrite (N)	mg/L	<0.010	0.010	5794612	0.010	0.010	5794518
Nitrate (N)	mg/L	<0.10	0.10	5794612	<0.10	0.10	5794518
Metals							
Mercury (Hg)	mg/L	<0.0001	0.0001	5795858	<0.0001	0.0001	5795962
Dissolved Aluminum (Al)	ug/L	<5.0	5.0	5794741	<5.0	5.0	5804619
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	5794741	<0.50	0.50	5804619
Dissolved Arsenic (As)	ug/L	<1.0	1.0	5794741	<1.0	1.0	5804619
Dissolved Barium (Ba)	ug/L	130	2.0	5794741	50	2.0	5804619
Dissolved Beryllium (Be)	ug/L	<0.50	0.50	5794741	<0.50	0.50	5804619
Dissolved Bismuth (Bi)	ug/L	<1.0	1.0	5794741	<1.0	1.0	5804619
Dissolved Boron (B)	ug/L	170	10	5794741	75	10	5804619
Dissolved Cadmium (Cd)	ug/L	<0.10	0.10	5794741	<0.10	0.10	5804619
Dissolved Calcium (Ca)	ug/L	190000	200	5794741	110000	200	5804619
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	5794741	<5.0	5.0	5804619
Dissolved Cobalt (Co)	ug/L	<0.50	0.50	5794741	<0.50	0.50	5804619
Dissolved Copper (Cu)	ug/L	<1.0	1.0	5794741	<1.0	1.0	5804619
Dissolved Iron (Fe)	ug/L	2800	100	5794741	<100	100	5804619
Dissolved Lead (Pb)	ug/L	<0.50	0.50	5794741	<0.50	0.50	5804619
Dissolved Magnesium (Mg)	ug/L	44000	50	5794741	26000	50	5804619
Dissolved Manganese (Mn)	ug/L	120	2.0	5794741	64	2.0	5804619
Dissolved Molybdenum (Mo)	ug/L	<0.50	0.50	5794741	0.64	0.50	5804619

RDL = Reportable Detection Limit
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Maxxam Job #: B8R7295
Report Date: 2018/10/26

exp Services Inc
Client Project #: THB-00006196-NE
Site Location: Longlac Landfill - Fall Sampling Event
Sampler Initials: KK

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		IBJ182			IBJ183		
Sampling Date		2018/10/16 12:50			2018/10/16 15:55		
COC Number		684820-02-01			684820-02-01		
	UNITS	**MW11II**	**RDL**	**QC Batch**	**MW12I**	**RDL**	**QC Batch**
Dissolved Nickel (Ni)	ug/L	2.1	1.0	5794741	<1.0	1.0	5804619
Dissolved Potassium (K)	ug/L	4100	200	5794741	2300	200	5804619
Dissolved Selenium (Se)	ug/L	<2.0	2.0	5794741	<2.0	2.0	5804619
Dissolved Silicon (Si)	ug/L	5800	50	5794741	11000	50	5804619
Dissolved Sodium (Na)	ug/L	76000	100	5794741	6600	100	5804619
Dissolved Strontium (Sr)	ug/L	230	1.0	5794741	300	1.0	5804619
Dissolved Thallium (Tl)	ug/L	<0.050	0.050	5794741	<0.050	0.050	5804619
Dissolved Tin (Sn)	ug/L	<1.0	1.0	5794741	<1.0	1.0	5804619
Dissolved Vanadium (V)	ug/L	<0.50	0.50	5794741	<0.50	0.50	5804619
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	5794741	<5.0	5.0	5804619

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B8R7295
Report Date: 2018/10/26

exp Services Inc
Client Project #: THB-00006196-NE
Site Location: Longlac Landfill - Fall Sampling Event
Sampler Initials: KK

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		IBJ184			IBJ184			IBJ185		
Sampling Date		2018/10/16 12:10			2018/10/16 12:10			2018/10/16 08:15		
COC Number		684820-02-01			684820-02-01			684820-02-01		
	UNITS	**MW12II**	**RDL**	**QC Batch**	**MW12II Lab-Dup**	**RDL**	**QC Batch**	**MW13**	**RDL**	**QC Batch**
Inorganics										
Total Ammonia-N	mg/L	0.069	0.050	5796356				20	0.050	5796356
Total Chemical Oxygen Demand (COD)	mg/L	6.8	4.0	5796407				76	4.0	5796407
Conductivity	umho/cm	1100	1.0	5794466				2400	1.0	5794630
Total Dissolved Solids	mg/L	620	10	5795752				1250	10	5795752
Total Kjeldahl Nitrogen (TKN)	mg/L	0.20	0.10	5796366				23	1.0	5796366
Dissolved Organic Carbon	mg/L	2.3	0.50	5794601				26	0.50	5794601
pH	pH	7.70		5794467				7.29		5794632
Phenols-4AAP	mg/L	<0.0010	0.0010	5795433				0.0011	0.0010	5795433
Total Phosphorus	mg/L	0.18	0.10	5796145				2.4	1.0	5796145
Dissolved Sulphate (SO4)	mg/L	96	1.0	5794476				38	1.0	5794476
Alkalinity (Total as CaCO3)	mg/L	470	1.0	5794465				830	1.0	5794627
Dissolved Chloride (Cl-)	mg/L	26	1.0	5794475				220	2.0	5794475
Nitrite (N)	mg/L	<0.010	0.010	5794833	<0.010	0.010	5794833	0.207	0.010	5794612
Nitrate (N)	mg/L	0.22	0.10	5794833	0.21	0.10	5794833	22.2	0.50	5794612
Metals										
Mercury (Hg)	mg/L	<0.0001	0.0001	5795858				<0.0001	0.0001	5795858
Dissolved Aluminum (Al)	ug/L	<5.0	5.0	5794741				6.8	5.0	5794741
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	5794741				<0.50	0.50	5794741
Dissolved Arsenic (As)	ug/L	<1.0	1.0	5794741				3.7	1.0	5794741
Dissolved Barium (Ba)	ug/L	38	2.0	5794741				310	2.0	5794741
Dissolved Beryllium (Be)	ug/L	<0.50	0.50	5794741				<0.50	0.50	5794741
Dissolved Bismuth (Bi)	ug/L	<1.0	1.0	5794741				<1.0	1.0	5794741
Dissolved Boron (B)	ug/L	670	10	5794741				650	10	5794741
Dissolved Cadmium (Cd)	ug/L	<0.10	0.10	5794741				<0.10	0.10	5794741
Dissolved Calcium (Ca)	ug/L	160000	200	5794741				200000	200	5794741
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	5794741				<5.0	5.0	5794741
Dissolved Cobalt (Co)	ug/L	<0.50	0.50	5794741				10	0.50	5794741
Dissolved Copper (Cu)	ug/L	1.8	1.0	5794741				2.3	1.0	5794741
Dissolved Iron (Fe)	ug/L	<100	100	5794741				3200	100	5794741
Dissolved Lead (Pb)	ug/L	<0.50	0.50	5794741				<0.50	0.50	5794741
Dissolved Magnesium (Mg)	ug/L	32000	50	5794741				61000	50	5794741
Dissolved Manganese (Mn)	ug/L	4.0	2.0	5794741				850	2.0	5794741

RDL = Reportable Detection Limit
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Maxxam Job #: B8R7295
Report Date: 2018/10/26

exp Services Inc
Client Project #: THB-00006196-NE
Site Location: Longlac Landfill - Fall Sampling Event
Sampler Initials: KK

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		IBJ184			IBJ184			IBJ185		
Sampling Date		2018/10/16 12:10			2018/10/16 12:10			2018/10/16 08:15		
COC Number		684820-02-01			684820-02-01			684820-02-01		
	UNITS	**MW12II**	**RDL**	**QC Batch**	**MW12II Lab-Dup**	**RDL**	**QC Batch**	**MW13**	**RDL**	**QC Batch**
Dissolved Molybdenum (Mo)	ug/L	<0.50	0.50	5794741				0.70	0.50	5794741
Dissolved Nickel (Ni)	ug/L	<1.0	1.0	5794741				21	1.0	5794741
Dissolved Potassium (K)	ug/L	1300	200	5794741				68000	200	5794741
Dissolved Selenium (Se)	ug/L	<2.0	2.0	5794741				<2.0	2.0	5794741
Dissolved Silicon (Si)	ug/L	5900	50	5794741				8700	50	5794741
Dissolved Sodium (Na)	ug/L	22000	100	5794741				140000	100	5794741
Dissolved Strontium (Sr)	ug/L	170	1.0	5794741				340	1.0	5794741
Dissolved Thallium (Tl)	ug/L	<0.050	0.050	5794741				0.14	0.050	5794741
Dissolved Tin (Sn)	ug/L	2.5	1.0	5794741				3.0	1.0	5794741
Dissolved Vanadium (V)	ug/L	<0.50	0.50	5794741				0.57	0.50	5794741
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	5794741				<5.0	5.0	5794741

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

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Maxxam Job #: B8R7295
Report Date: 2018/10/26

exp Services Inc
Client Project #: THB-00006196-NE
Site Location: Longlac Landfill - Fall Sampling Event
Sampler Initials: KK

LANDFILL STANDARDS SCH 5 - SW COMP. LIST (WATER)

Maxxam ID		IBJ186			IBJ186			IBJ187		
Sampling Date		2018/10/16 16:20			2018/10/16 16:20			2018/10/16 11:28		
COC Number		684821-01-01			684821-01-01			684821-01-01		
	UNITS	**SW1**	**RDL**	**QC Batch**	**SW1 Lab-Dup**	**RDL**	**QC Batch**	**SW2**	**RDL**	**QC Batch**
Inorganics										
Total Ammonia-N	mg/L	0.074	0.050	5796356	0.054	0.050	5796356	0.094	0.050	5796356
Total BOD	mg/L	<2	2	5792514				4	2	5792514
Total Chemical Oxygen Demand (COD)	mg/L	37	4.0	5796407				31	4.0	5796407
Conductivity	umho/cm	110	1.0	5794469				1000	1.0	5794469
Total Dissolved Solids	mg/L	65	10	5795752				545	10	5795752
Total Kjeldahl Nitrogen (TKN)	mg/L	0.33	0.10	5796366				0.46	0.10	5796366
pH	pH	7.60		5794470				7.87		5794470
Phenols-4AAP	mg/L	<0.0010	0.0010	5795433				0.0020	0.0010	5795433
Total Phosphorus	mg/L	0.016	0.004	5796157				0.023	0.004	5797085
Total Suspended Solids	mg/L	3	1	5795780				7	1	5795780
Dissolved Sulphate (SO4)	mg/L	<1.0	1.0	5794618				100	1.0	5794622
Alkalinity (Total as CaCO3)	mg/L	57	1.0	5794468				230	1.0	5794468
Dissolved Chloride (Cl-)	mg/L	2.3	1.0	5794617				120	1.0	5794621
Nitrite (N)	mg/L	<0.010	0.010	5794612				<0.010	0.010	5794612
Nitrate (N)	mg/L	<0.10	0.10	5794612				0.14	0.10	5794612
Metals										
Mercury (Hg)	mg/L	<0.0001	0.0001	5795962				<0.0001	0.0001	5795858
Total Antimony (Sb)	ug/L	<0.50	0.50	5795405	<0.50	0.50	5795405	<0.50	0.50	5795405
Total Arsenic (As)	ug/L	<1.0	1.0	5795405	<1.0	1.0	5795405	<1.0	1.0	5795405
Total Barium (Ba)	ug/L	3.5	2.0	5795405	3.1	2.0	5795405	46	2.0	5795405
Total Beryllium (Be)	ug/L	<0.50	0.50	5795405	<0.50	0.50	5795405	<0.50	0.50	5795405
Total Bismuth (Bi)	ug/L	<1.0	1.0	5795405	<1.0	1.0	5795405	<1.0	1.0	5795405
Total Boron (B)	ug/L	<10	10	5795405	<10	10	5795405	1200	10	5795405
Total Cadmium (Cd)	ug/L	<0.10	0.10	5795405	<0.10	0.10	5795405	<0.10	0.10	5795405
Total Calcium (Ca)	ug/L	17000	200	5795405	16000	200	5795405	56000	200	5795405
Total Chromium (Cr)	ug/L	<5.0	5.0	5795405	<5.0	5.0	5795405	<5.0	5.0	5795405
Total Cobalt (Co)	ug/L	<0.50	0.50	5795405	<0.50	0.50	5795405	0.87	0.50	5795405
Total Copper (Cu)	ug/L	<1.0	1.0	5795405	<1.0	1.0	5795405	1.7	1.0	5795405
Total Iron (Fe)	ug/L	<100	100	5795405	<100	100	5795405	<100	100	5795405
Total Lead (Pb)	ug/L	<0.50	0.50	5795405	<0.50	0.50	5795405	<0.50	0.50	5795405
Total Magnesium (Mg)	ug/L	4300	50	5795405	4000	50	5795405	35000	50	5795405
Total Manganese (Mn)	ug/L	5.6	2.0	5795405	5.5	2.0	5795405	16	2.0	5795405

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
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Maxxam Job #: B8R7295
Report Date: 2018/10/26

exp Services Inc
Client Project #: THB-00006196-NE
Site Location: Longlac Landfill - Fall Sampling Event
Sampler Initials: KK

LANDFILL STANDARDS SCH 5 - SW COMP. LIST (WATER)

Maxxam ID		IBJ186			IBJ186			IBJ187		
Sampling Date		2018/10/16 16:20			2018/10/16 16:20			2018/10/16 11:28		
COC Number		684821-01-01			684821-01-01			684821-01-01		
	UNITS	**SW1**	**RDL**	**QC Batch**	**SW1 Lab-Dup**	**RDL**	**QC Batch**	**SW2**	**RDL**	**QC Batch**
Total Molybdenum (Mo)	ug/L	<0.50	0.50	5795405	<0.50	0.50	5795405	1.6	0.50	5795405
Total Nickel (Ni)	ug/L	<1.0	1.0	5795405	<1.0	1.0	5795405	5.2	1.0	5795405
Total Potassium (K)	ug/L	<200	200	5795405	<200	200	5795405	71000	200	5795405
Total Selenium (Se)	ug/L	<2.0	2.0	5795405	<2.0	2.0	5795405	<2.0	2.0	5795405
Total Silicon (Si)	ug/L	1900	50	5795405	1900	50	5795405	2200	50	5795405
Total Silver (Ag)	ug/L	<0.10	0.10	5795405	<0.10	0.10	5795405	<0.10	0.10	5795405
Total Sodium (Na)	ug/L	1100	100	5795405	1000	100	5795405	120000	100	5795405
Total Strontium (Sr)	ug/L	16	1.0	5795405	16	1.0	5795405	210	1.0	5795405
Total Thallium (Tl)	ug/L	<0.050	0.050	5795405	<0.050	0.050	5795405	<0.050	0.050	5795405
Total Vanadium (V)	ug/L	<0.50	0.50	5795405	<0.50	0.50	5795405	0.91	0.50	5795405
Total Zinc (Zn)	ug/L	19	5.0	5795405	18	5.0	5795405	<5.0	5.0	5795405

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LANDFILL STANDARDS SCH 5 - SW COMP. LIST (WATER)

Maxxam ID		IBJ187			IBJ188		
Sampling Date		2018/10/16 11:28			2018/10/16 11:20		
COC Number		684821-01-01			684821-01-01		
	UNITS	**SW2 Lab-Dup**	**RDL**	**QC Batch**	**SW3**	**RDL**	**QC Batch**
Inorganics							
Total Ammonia-N	mg/L				1.0	0.050	5796356
Total BOD	mg/L				5	2	5792514
Total Chemical Oxygen Demand (COD)	mg/L	34	4.0	5796407	41	4.0	5796407
Conductivity	umho/cm				1500	1.0	5794466
Total Dissolved Solids	mg/L				895	10	5798461
Total Kjeldahl Nitrogen (TKN)	mg/L	0.41	0.10	5796366	2.1	0.10	5796366
pH	pH				7.65		5794467
Phenols-4AAP	mg/L	0.0020	0.0010	5795433	0.0030	0.0010	5795433
Total Phosphorus	mg/L				0.14	0.008	5797085
Total Suspended Solids	mg/L				170	1	5795780
Dissolved Sulphate (SO4)	mg/L				350	2.0	5794622
Alkalinity (Total as CaCO3)	mg/L				330	1.0	5794465
Dissolved Chloride (Cl-)	mg/L				32	1.0	5794621
Nitrite (N)	mg/L				0.116	0.010	5794518
Nitrate (N)	mg/L				0.42	0.10	5794518
Metals							
Mercury (Hg)	mg/L				<0.0001	0.0001	5795962
Total Antimony (Sb)	ug/L				<0.50	0.50	5795405
Total Arsenic (As)	ug/L				1.3	1.0	5795405
Total Barium (Ba)	ug/L				130	2.0	5795405
Total Beryllium (Be)	ug/L				<0.50	0.50	5795405
Total Bismuth (Bi)	ug/L				<1.0	1.0	5795405
Total Boron (B)	ug/L				330	10	5795405
Total Cadmium (Cd)	ug/L				<0.10	0.10	5795405
Total Calcium (Ca)	ug/L				220000	200	5795405
Total Chromium (Cr)	ug/L				<5.0	5.0	5795405
Total Cobalt (Co)	ug/L				1.9	0.50	5795405
Total Copper (Cu)	ug/L				6.2	1.0	5795405
Total Iron (Fe)	ug/L				1500	100	5795405
Total Lead (Pb)	ug/L				2.2	0.50	5795405
Total Magnesium (Mg)	ug/L				33000	50	5795405
Total Manganese (Mn)	ug/L				1000	2.0	5795405

RDL = Reportable Detection Limit
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LANDFILL STANDARDS SCH 5 - SW COMP. LIST (WATER)

Maxxam ID		IBJ187			IBJ188		
Sampling Date		2018/10/16 11:28			2018/10/16 11:20		
COC Number		684821-01-01			684821-01-01		
	UNITS	**SW2 Lab-Dup**	**RDL**	**QC Batch**	**SW3**	**RDL**	**QC Batch**
Total Molybdenum (Mo)	ug/L				1.3	0.50	5795405
Total Nickel (Ni)	ug/L				4.0	1.0	5795405
Total Potassium (K)	ug/L				32000	200	5795405
Total Selenium (Se)	ug/L				<2.0	2.0	5795405
Total Silicon (Si)	ug/L				3500	50	5795405
Total Silver (Ag)	ug/L				<0.10	0.10	5795405
Total Sodium (Na)	ug/L				35000	100	5795405
Total Strontium (Sr)	ug/L				320	1.0	5795405
Total Thallium (Tl)	ug/L				<0.050	0.050	5795405
Total Vanadium (V)	ug/L				2.3	0.50	5795405
Total Zinc (Zn)	ug/L				99	5.0	5795405

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Maxxam Job #: B8R7295
Report Date: 2018/10/26

exp Services Inc
Client Project #: THB-00006196-NE
Site Location: Longlac Landfill - Fall Sampling Event
Sampler Initials: KK

RESULTS OF ANALYSES OF WATER

Maxxam ID		IBJ169	IBJ170	IBJ171		IBJ172		IBJ173		
Sampling Date		2018/10/16 13:53	2018/10/16 16:10	2018/10/16 10:17		2018/10/16 15:40		2018/10/16 15:00		
COC Number		684820-01-01	684820-01-01	684820-01-01		684820-01-01		684820-01-01		
	UNITS	**MW2**	**MW3**	**MW4I**	**QC Batch**	**MW4II**	**QC Batch**	**MW5**	**RDL**	**QC Batch**
Calculated Parameters										
Hardness (CaCO3)	mg/L	200	220	310	5792211	560	5792211	310	1.0	5792211
Ion Balance (% Difference)	%	2.17	1.52	0.910	5792212	0.430	5792212	2.63	N/A	5792212
Total Organic Nitrogen	mg/L	<0.10	<0.10	0.11	5792714	0.79	5792714	0.69	0.10	5792714
Inorganics										
Orthophosphate (P)	mg/L	<0.010	<0.010	0.024	5794477	<0.010	5794807	<0.010	0.010	5794477

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

Maxxam ID		IBJ174		IBJ175		IBJ176		IBJ178		
Sampling Date		2018/10/16 14:50		2018/10/16 08:55		2018/10/16 08:16		2018/10/16 10:42		
COC Number		684820-01-01		684820-01-01		684820-01-01		684820-01-01		
	UNITS	**MW6**	**QC Batch**	**MW7**	**QC Batch**	**MW8I**	**QC Batch**	**MW8II**	**RDL**	**QC Batch**
Calculated Parameters										
Hardness (CaCO3)	mg/L	370	5792211	750	5792211	980	5792211	420	1.0	5792211
Ion Balance (% Difference)	%	5.35	5792212	2.65	5792212	3.57	5792212	1.03	N/A	5792212
Total Organic Nitrogen	mg/L	2.6	5792714	2.5	5792714	4.3	5792714	0.50	0.10	5792714
Inorganics										
Orthophosphate (P)	mg/L	<0.010	5794477	<0.010	5794473	<0.010	5794807	<0.010	0.010	5794477

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

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RESULTS OF ANALYSES OF WATER

Maxxam ID		IBJ179		IBJ180		IBJ181		IBJ182		
Sampling Date		2018/10/16 11:05		2018/10/16 15:20		2018/10/16 13:00		2018/10/16 12:50		
COC Number		684820-01-01		684820-02-01		684820-02-01		684820-02-01		
	UNITS	**MW9**	**QC Batch**	**MW10**	**QC Batch**	**MW11I**	**QC Batch**	**MW11II**	**RDL**	**QC Batch**
Calculated Parameters										
Hardness (CaCO3)	mg/L	290	5792211	220	5792211	580	5792211	670	1.0	5792211
Ion Balance (% Difference)	%	2.65	5792212	4.37	5792212	3.13	5792212	0.100	N/A	5792212
Total Organic Nitrogen	mg/L	0.23	5792714	0.12	5792714	<0.10	5792714	0.19	0.10	5792714
Inorganics										
Orthophosphate (P)	mg/L	<0.010	5794473	<0.010	5794807	<0.010	5794477	<0.010	0.010	5794807

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

Maxxam ID		IBJ183	IBJ184	IBJ185			IBJ186	IBJ187		
Sampling Date		2018/10/16 15:55	2018/10/16 12:10	2018/10/16 08:15			2018/10/16 16:20	2018/10/16 11:28		
COC Number		684820-02-01	684820-02-01	684820-02-01			684821-01-01	684821-01-01		
	UNITS	**MW12I**	**MW12II**	**MW13**	**RDL**	**QC Batch**	**SW1**	**SW2**	**RDL**	**QC Batch**
Calculated Parameters										
Hardness (CaCO3)	mg/L	380	530	750	1.0	5792211	63	230	1.0	5792211
Ion Balance (% Difference)	%	13.3	2.59	1.05	N/A	5792212				
Total Organic Nitrogen	mg/L	<0.10	0.13	2.5	0.10	5792714	0.26	0.36	0.10	5792714
Inorganics										
Dissolved Organic Carbon	mg/L						14	11	0.50	5794601
Orthophosphate (P)	mg/L	<0.010	<0.010	<0.010	0.010	5794477				

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

Maxxam ID		IBJ188		
Sampling Date		2018/10/16 11:20		
COC Number		684821-01-01		
	UNITS	**SW3**	**RDL**	**QC Batch**
Calculated Parameters				
Hardness (CaCO3)	mg/L	760	1.0	5792211
Total Organic Nitrogen	mg/L	1.0	0.10	5792714
Inorganics				
Dissolved Organic Carbon	mg/L	12	0.50	5794601

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		IBJ186	IBJ187		IBJ188			IBJ188		
Sampling Date		2018/10/16 16:20	2018/10/16 11:28		2018/10/16 11:20			2018/10/16 11:20		
COC Number		684821-01-01	684821-01-01		684821-01-01			684821-01-01		
	UNITS	**SW1**	**SW2**	**QC Batch**	**SW3**	**RDL**	**QC Batch**	**SW3 Lab-Dup**	**RDL**	**QC Batch**
Metals										
Dissolved (0.2u) Aluminum (Al)	ug/L	8	<5	5794835	12	5	5798153	12	5	5798153
Dissolved Calcium (Ca)	mg/L	18	44	5794841	250	0.050	5798135			
Dissolved Magnesium (Mg)	mg/L	4.5	30	5794841	35	0.050	5798135			

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Maxxam Job #: B8R7295
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Sampler Initials: KK

VOLATILE ORGANICS BY GC/MS (WATER)

Maxxam ID		IBJ174		IBJ175		IBJ176		IBJ178		
Sampling Date		2018/10/16 14:50		2018/10/16 08:55		2018/10/16 08:16		2018/10/16 10:42		
COC Number		684820-01-01		684820-01-01		684820-01-01		684820-01-01		
	UNITS	**MW6**	**RDL**	**MW7**	**RDL**	**MW8I**	**RDL**	**MW8II**	**RDL**	**QC Batch**
Volatile Organics										
Acetone (2-Propanone)	ug/L	<10	10	<20	20	<100	100	<10	10	5793701
Benzene	ug/L	0.24	0.10	0.51	0.20	<1.0	1.0	<0.10	0.10	5793701
Bromodichloromethane	ug/L	<0.10	0.10	<0.20	0.20	<1.0	1.0	<0.10	0.10	5793701
Bromoform	ug/L	<0.20	0.20	<0.40	0.40	<2.0	2.0	<0.20	0.20	5793701
Bromomethane	ug/L	<0.50	0.50	<1.0	1.0	<5.0	5.0	<0.50	0.50	5793701
Carbon Tetrachloride	ug/L	<0.10	0.10	<0.20	0.20	<1.0	1.0	<0.10	0.10	5793701
Chlorobenzene	ug/L	<0.10	0.10	<0.20	0.20	<1.0	1.0	<0.10	0.10	5793701
Chloroform	ug/L	<0.10	0.10	<0.20	0.20	<1.0	1.0	<0.10	0.10	5793701
Dibromochloromethane	ug/L	<0.20	0.20	<0.40	0.40	<2.0	2.0	<0.20	0.20	5793701
1,2-Dichlorobenzene	ug/L	<0.20	0.20	<0.40	0.40	<2.0	2.0	<0.20	0.20	5793701
1,3-Dichlorobenzene	ug/L	<0.20	0.20	<0.40	0.40	<2.0	2.0	<0.20	0.20	5793701
1,4-Dichlorobenzene	ug/L	<0.20	0.20	<0.40	0.40	<2.0	2.0	<0.20	0.20	5793701
Dichlorodifluoromethane (FREON 12)	ug/L	<0.50	0.50	<1.0	1.0	<5.0	5.0	<0.50	0.50	5793701
1,1-Dichloroethane	ug/L	<0.10	0.10	<0.20	0.20	<1.0	1.0	<0.10	0.10	5793701
1,2-Dichloroethane	ug/L	<0.20	0.20	<0.40	0.40	<2.0	2.0	<0.20	0.20	5793701
1,1-Dichloroethylene	ug/L	<0.10	0.10	<0.20	0.20	<1.0	1.0	<0.10	0.10	5793701
cis-1,2-Dichloroethylene	ug/L	<0.10	0.10	<0.20	0.20	<1.0	1.0	<0.10	0.10	5793701
trans-1,2-Dichloroethylene	ug/L	<0.10	0.10	<0.20	0.20	<1.0	1.0	<0.10	0.10	5793701
1,2-Dichloropropane	ug/L	<0.10	0.10	<0.20	0.20	<1.0	1.0	<0.10	0.10	5793701
cis-1,3-Dichloropropene	ug/L	<0.20	0.20	<0.40	0.40	<2.0	2.0	<0.20	0.20	5793701
trans-1,3-Dichloropropene	ug/L	<0.20	0.20	<0.40	0.40	<2.0	2.0	<0.20	0.20	5793701
Ethylbenzene	ug/L	0.11	0.10	<0.20	0.20	<1.0	1.0	<0.10	0.10	5793701
Ethylene Dibromide	ug/L	<0.20	0.20	<0.40	0.40	<2.0	2.0	<0.20	0.20	5793701
Hexane	ug/L	<0.50	0.50	<1.0	1.0	<5.0	5.0	<0.50	0.50	5793701
Methylene Chloride(Dichloromethane)	ug/L	<0.50	0.50	<1.0	1.0	<5.0	5.0	<0.50	0.50	5793701
Methyl Ethyl Ketone (2-Butanone)	ug/L	<5.0	5.0	<10	10	<50	50	<5.0	5.0	5793701
Methyl Isobutyl Ketone	ug/L	<5.0	5.0	<10	10	<50	50	<5.0	5.0	5793701
Methyl t-butyl ether (MTBE)	ug/L	<0.20	0.20	0.62	0.40	4.2	2.0	<0.20	0.20	5793701
Styrene	ug/L	<0.20	0.20	<0.40	0.40	<2.0	2.0	<0.20	0.20	5793701
1,1,1,2-Tetrachloroethane	ug/L	<0.20	0.20	<0.40	0.40	<2.0	2.0	<0.20	0.20	5793701
1,1,2,2-Tetrachloroethane	ug/L	<0.20	0.20	<0.40	0.40	<2.0	2.0	<0.20	0.20	5793701
Tetrachloroethylene	ug/L	<0.10	0.10	<0.20	0.20	<1.0	1.0	<0.10	0.10	5793701
Toluene	ug/L	<0.20	0.20	<0.40	0.40	<2.0	2.0	<0.20	0.20	5793701

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B8R7295
Report Date: 2018/10/26

exp Services Inc
Client Project #: THB-00006196-NE
Site Location: Longlac Landfill - Fall Sampling Event
Sampler Initials: KK

VOLATILE ORGANICS BY GC/MS (WATER)

Maxxam ID		IBJ174		IBJ175		IBJ176		IBJ178		
Sampling Date		2018/10/16 14:50		2018/10/16 08:55		2018/10/16 08:16		2018/10/16 10:42		
COC Number		684820-01-01		684820-01-01		684820-01-01		684820-01-01		
	UNITS	**MW6**	**RDL**	**MW7**	**RDL**	**MW8I**	**RDL**	**MW8II**	**RDL**	**QC Batch**
1,1,1-Trichloroethane	ug/L	<0.10	0.10	<0.20	0.20	<1.0	1.0	<0.10	0.10	5793701
1,1,2-Trichloroethane	ug/L	<0.20	0.20	<0.40	0.40	<2.0	2.0	<0.20	0.20	5793701
Trichloroethylene	ug/L	<0.10	0.10	<0.20	0.20	<1.0	1.0	<0.10	0.10	5793701
Trichlorofluoromethane (FREON 11)	ug/L	<0.20	0.20	<0.40	0.40	<2.0	2.0	<0.20	0.20	5793701
Vinyl Chloride	ug/L	<0.20	0.20	<0.40	0.40	<2.0	2.0	<0.20	0.20	5793701
p+m-Xylene	ug/L	<0.10	0.10	<0.20	0.20	<1.0	1.0	<0.10	0.10	5793701
o-Xylene	ug/L	<0.10	0.10	<0.20	0.20	<1.0	1.0	<0.10	0.10	5793701
Total Xylenes	ug/L	<0.10	0.10	<0.20	0.20	<1.0	1.0	<0.10	0.10	5793701
Surrogate Recovery (%)										
4-Bromofluorobenzene	%	106		102		98		99		5793701
D4-1,2-Dichloroethane	%	104		102		99		100		5793701
D8-Toluene	%	96		98		97		99		5793701

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Maxxam Job #: B8R7295
Report Date: 2018/10/26

exp Services Inc
Client Project #: THB-00006196-NE
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VOLATILE ORGANICS BY GC/MS (WATER)

Maxxam ID		IBJ185		
Sampling Date		2018/10/16 08:15		
COC Number		684820-02-01		
	UNITS	**MW13**	**RDL**	**QC Batch**
Volatile Organics				
Acetone (2-Propanone)	ug/L	<10	10	5793701
Benzene	ug/L	0.50	0.10	5793701
Bromodichloromethane	ug/L	<0.10	0.10	5793701
Bromoform	ug/L	<0.20	0.20	5793701
Bromomethane	ug/L	<0.50	0.50	5793701
Carbon Tetrachloride	ug/L	<0.10	0.10	5793701
Chlorobenzene	ug/L	<0.10	0.10	5793701
Chloroform	ug/L	<0.10	0.10	5793701
Dibromochloromethane	ug/L	<0.20	0.20	5793701
1,2-Dichlorobenzene	ug/L	<0.20	0.20	5793701
1,3-Dichlorobenzene	ug/L	<0.20	0.20	5793701
1,4-Dichlorobenzene	ug/L	<0.20	0.20	5793701
Dichlorodifluoromethane (FREON 12)	ug/L	<0.50	0.50	5793701
1,1-Dichloroethane	ug/L	0.12	0.10	5793701
1,2-Dichloroethane	ug/L	<0.20	0.20	5793701
1,1-Dichloroethylene	ug/L	<0.10	0.10	5793701
cis-1,2-Dichloroethylene	ug/L	0.16	0.10	5793701
trans-1,2-Dichloroethylene	ug/L	<0.10	0.10	5793701
1,2-Dichloropropane	ug/L	<0.10	0.10	5793701
cis-1,3-Dichloropropene	ug/L	<0.20	0.20	5793701
trans-1,3-Dichloropropene	ug/L	<0.20	0.20	5793701
Ethylbenzene	ug/L	0.14	0.10	5793701
Ethylene Dibromide	ug/L	<0.20	0.20	5793701
Hexane	ug/L	<0.50	0.50	5793701
Methylene Chloride(Dichloromethane)	ug/L	<0.50	0.50	5793701
Methyl Ethyl Ketone (2-Butanone)	ug/L	<5.0	5.0	5793701
Methyl Isobutyl Ketone	ug/L	<5.0	5.0	5793701
Methyl t-butyl ether (MTBE)	ug/L	0.57	0.20	5793701
Styrene	ug/L	<0.20	0.20	5793701
1,1,1,2-Tetrachloroethane	ug/L	<0.20	0.20	5793701
1,1,2,2-Tetrachloroethane	ug/L	<0.20	0.20	5793701
Tetrachloroethylene	ug/L	<0.10	0.10	5793701
Toluene	ug/L	<0.20	0.20	5793701

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B8R7295
Report Date: 2018/10/26

exp Services Inc
Client Project #: THB-00006196-NE
Site Location: Longlac Landfill - Fall Sampling Event
Sampler Initials: KK

VOLATILE ORGANICS BY GC/MS (WATER)

Maxxam ID		IBJ185		
Sampling Date		2018/10/16 08:15		
COC Number		684820-02-01		
	UNITS	**MW13**	**RDL**	**QC Batch**
1,1,1-Trichloroethane	ug/L	<0.10	0.10	5793701
1,1,2-Trichloroethane	ug/L	<0.20	0.20	5793701
Trichloroethylene	ug/L	<0.10	0.10	5793701
Trichlorofluoromethane (FREON 11)	ug/L	<0.20	0.20	5793701
Vinyl Chloride	ug/L	<0.20	0.20	5793701
p+m-Xylene	ug/L	<0.10	0.10	5793701
o-Xylene	ug/L	<0.10	0.10	5793701
Total Xylenes	ug/L	<0.10	0.10	5793701
Surrogate Recovery (%)				
4-Bromofluorobenzene	%	106		5793701
D4-1,2-Dichloroethane	%	102		5793701
D8-Toluene	%	98		5793701

RDL = Reportable Detection Limit
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Maxxam Job #: B8R7295
Report Date: 2018/10/26

exp Services Inc
Client Project #: THB-00006196-NE
Site Location: Longlac Landfill - Fall Sampling Event
Sampler Initials: KK

TEST SUMMARY

Maxxam ID: IBJ169
Sample ID: MW2
Matrix: Water

Collected: 2018/10/16
Shipped:
Received: 2018/10/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5794468	N/A	2018/10/21	Surinder Rai
Chloride by Automated Colourimetry	KONE	5794475	N/A	2018/10/23	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	5796407	N/A	2018/10/24	Nimarta Singh
Conductivity	AT	5794469	N/A	2018/10/21	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5794601	N/A	2018/10/21	Nimarta Singh
Hardness (calculated as CaCO3)		5792211	N/A	2018/10/23	Automated Statchk
Mercury in Water by CVAA	CV/AA	5795962	2018/10/22	2018/10/23	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5794741	N/A	2018/10/23	Thao Nguyen
Ion Balance (% Difference)	CALC	5792212	N/A	2018/10/24	Automated Statchk
Total Ammonia-N	LACH/NH4	5796356	N/A	2018/10/24	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5794612	N/A	2018/10/22	Chandra Nandlal
Organic Nitrogen	CALC	5792714	N/A	2018/10/24	Automated Statchk
pH	AT	5794470	N/A	2018/10/21	Surinder Rai
Phenols (4AAP)	TECH/PHEN	5795428	N/A	2018/10/22	Bramdeo Motiram
Orthophosphate	KONE	5794477	N/A	2018/10/22	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5794476	N/A	2018/10/22	Alina Dobreanu
Total Dissolved Solids	BAL	5793512	2018/10/22	2018/10/23	Mandeep Kaur
Total Kjeldahl Nitrogen in Water	SKAL	5796366	2018/10/22	2018/10/23	Shivani Shivani
Total Phosphorus (Colourimetric)	LACH/P	5796145	2018/10/22	2018/10/23	Amanpreet Sappal

Maxxam ID: IBJ169 Dup
Sample ID: MW2
Matrix: Water

Collected: 2018/10/16
Shipped:
Received: 2018/10/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Phenols (4AAP)	TECH/PHEN	5795428	N/A	2018/10/22	Bramdeo Motiram

Maxxam ID: IBJ170
Sample ID: MW3
Matrix: Water

Collected: 2018/10/16
Shipped:
Received: 2018/10/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5794465	N/A	2018/10/21	Surinder Rai
Chloride by Automated Colourimetry	KONE	5794475	N/A	2018/10/23	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	5796407	N/A	2018/10/24	Nimarta Singh
Conductivity	AT	5794466	N/A	2018/10/21	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5794601	N/A	2018/10/21	Nimarta Singh
Hardness (calculated as CaCO3)		5792211	N/A	2018/10/23	Automated Statchk
Mercury in Water by CVAA	CV/AA	5795962	2018/10/22	2018/10/23	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5794741	N/A	2018/10/22	Thao Nguyen
Ion Balance (% Difference)	CALC	5792212	N/A	2018/10/24	Automated Statchk
Total Ammonia-N	LACH/NH4	5796356	N/A	2018/10/24	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5794518	N/A	2018/10/24	Chandra Nandlal
Organic Nitrogen	CALC	5792714	N/A	2018/10/24	Ewa Pranjic

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Maxxam Job #: B8R7295
Report Date: 2018/10/26

exp Services Inc
Client Project #: THB-00006196-NE
Site Location: Longlac Landfill - Fall Sampling Event
Sampler Initials: KK

TEST SUMMARY

Maxxam ID: IBJ170
Sample ID: MW3
Matrix: Water

Collected: 2018/10/16
Shipped:
Received: 2018/10/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
pH	AT	5794467	N/A	2018/10/21	Surinder Rai
Phenols (4AAP)	TECH/PHEN	5795406	N/A	2018/10/22	Bramdeo Motiram
Orthophosphate	KONE	5794477	N/A	2018/10/22	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5794476	N/A	2018/10/22	Alina Dobreanu
Total Dissolved Solids	BAL	5793512	2018/10/22	2018/10/23	Mandeep Kaur
Total Kjeldahl Nitrogen in Water	SKAL	5796366	2018/10/22	2018/10/23	Shivani Shivani
Total Phosphorus (Colourimetric)	LACH/P	5796145	2018/10/22	2018/10/23	Amanpreet Sappal

Maxxam ID: IBJ170 Dup
Sample ID: MW3
Matrix: Water

Collected: 2018/10/16
Shipped:
Received: 2018/10/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Metals by ICPMS	ICP/MS	5794741	N/A	2018/10/22	Thao Nguyen

Maxxam ID: IBJ171
Sample ID: MW4I
Matrix: Water

Collected: 2018/10/16
Shipped:
Received: 2018/10/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5794465	N/A	2018/10/21	Surinder Rai
Chloride by Automated Colourimetry	KONE	5794475	N/A	2018/10/23	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	5796407	N/A	2018/10/24	Nimarta Singh
Conductivity	AT	5794466	N/A	2018/10/21	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5794601	N/A	2018/10/21	Nimarta Singh
Hardness (calculated as CaCO3)		5792211	N/A	2018/10/23	Automated Statchk
Mercury in Water by CVAA	CV/AA	5795962	2018/10/22	2018/10/23	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5794741	N/A	2018/10/22	Thao Nguyen
Ion Balance (% Difference)	CALC	5792212	N/A	2018/10/24	Automated Statchk
Total Ammonia-N	LACH/NH4	5796356	N/A	2018/10/24	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5794518	N/A	2018/10/24	Chandra Nandlal
Organic Nitrogen	CALC	5792714	N/A	2018/10/24	Automated Statchk
pH	AT	5794467	N/A	2018/10/21	Surinder Rai
Phenols (4AAP)	TECH/PHEN	5795406	N/A	2018/10/22	Bramdeo Motiram
Orthophosphate	KONE	5794477	N/A	2018/10/22	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5794476	N/A	2018/10/22	Alina Dobreanu
Total Dissolved Solids	BAL	5793560	2018/10/22	2018/10/23	Niket Kumar Patel
Total Kjeldahl Nitrogen in Water	SKAL	5796366	2018/10/22	2018/10/23	Shivani Shivani
Total Phosphorus (Colourimetric)	LACH/P	5796145	2018/10/22	2018/10/23	Amanpreet Sappal

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Maxxam Job #: B8R7295
Report Date: 2018/10/26

exp Services Inc
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Sampler Initials: KK

TEST SUMMARY

Maxxam ID: IBJ171 Dup
Sample ID: MW4I
Matrix: Water

Collected: 2018/10/16
Shipped:
Received: 2018/10/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Dissolved Solids	BAL	5793560	2018/10/22	2018/10/23	Niket Kumar Patel
Total Phosphorus (Colourimetric)	LACH/P	5796145	2018/10/22	2018/10/23	Amanpreet Sappal

Maxxam ID: IBJ172
Sample ID: MW4II
Matrix: Water

Collected: 2018/10/16
Shipped:
Received: 2018/10/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5794468	N/A	2018/10/21	Surinder Rai
Chloride by Automated Colourimetry	KONE	5794805	N/A	2018/10/23	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	5796407	N/A	2018/10/24	Nimarta Singh
Conductivity	AT	5794469	N/A	2018/10/21	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5794601	N/A	2018/10/21	Nimarta Singh
Hardness (calculated as CaCO3)		5792211	N/A	2018/10/23	Automated Statchk
Mercury in Water by CVAA	CV/AA	5795858	2018/10/22	2018/10/23	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5794741	N/A	2018/10/23	Thao Nguyen
Ion Balance (% Difference)	CALC	5792212	N/A	2018/10/24	Automated Statchk
Total Ammonia-N	LACH/NH4	5796356	N/A	2018/10/24	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5794612	N/A	2018/10/22	Chandra Nandlal
Organic Nitrogen	CALC	5792714	N/A	2018/10/24	Automated Statchk
pH	AT	5794470	N/A	2018/10/21	Surinder Rai
Phenols (4AAP)	TECH/PHEN	5795406	N/A	2018/10/22	Bramdeo Motiram
Orthophosphate	KONE	5794807	N/A	2018/10/22	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5794806	N/A	2018/10/22	Alina Dobreanu
Total Dissolved Solids	BAL	5793560	2018/10/22	2018/10/23	Niket Kumar Patel
Total Kjeldahl Nitrogen in Water	SKAL	5796366	2018/10/22	2018/10/23	Shivani Shivani
Total Phosphorus (Colourimetric)	LACH/P	5796145	2018/10/22	2018/10/23	Amanpreet Sappal

Maxxam ID: IBJ173
Sample ID: MW5
Matrix: Water

Collected: 2018/10/16
Shipped:
Received: 2018/10/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5794468	N/A	2018/10/21	Surinder Rai
Chloride by Automated Colourimetry	KONE	5794475	N/A	2018/10/23	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	5796407	N/A	2018/10/24	Nimarta Singh
Conductivity	AT	5794469	N/A	2018/10/21	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5794601	N/A	2018/10/21	Nimarta Singh
Hardness (calculated as CaCO3)		5792211	N/A	2018/10/23	Automated Statchk
Mercury in Water by CVAA	CV/AA	5795962	2018/10/22	2018/10/23	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5794741	N/A	2018/10/22	Thao Nguyen
Ion Balance (% Difference)	CALC	5792212	N/A	2018/10/24	Automated Statchk
Total Ammonia-N	LACH/NH4	5796356	N/A	2018/10/24	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5794612	N/A	2018/10/22	Chandra Nandlal

Maxxam Job #: B8R7295
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exp Services Inc
Client Project #: THB-00006196-NE
Site Location: Longlac Landfill - Fall Sampling Event
Sampler Initials: KK

TEST SUMMARY

Maxxam ID: IBJ173
Sample ID: MW5
Matrix: Water

Collected: 2018/10/16
Shipped:
Received: 2018/10/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Organic Nitrogen	CALC	5792714	N/A	2018/10/24	Automated Statchk
pH	AT	5794470	N/A	2018/10/21	Surinder Rai
Phenols (4AAP)	TECH/PHEN	5795465	N/A	2018/10/22	Bramdeo Motiram
Orthophosphate	KONE	5794477	N/A	2018/10/22	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5794476	N/A	2018/10/22	Alina Dobreanu
Total Dissolved Solids	BAL	5793560	2018/10/22	2018/10/23	Niket Kumar Patel
Total Kjeldahl Nitrogen in Water	SKAL	5796366	2018/10/22	2018/10/23	Shivani Shivani
Total Phosphorus (Colourimetric)	LACH/P	5796145	2018/10/22	2018/10/23	Amanpreet Sappal

Maxxam ID: IBJ174
Sample ID: MW6
Matrix: Water

Collected: 2018/10/16
Shipped:
Received: 2018/10/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5794465	N/A	2018/10/21	Surinder Rai
Chloride by Automated Colourimetry	KONE	5794475	N/A	2018/10/23	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	5796407	N/A	2018/10/24	Nimarta Singh
Conductivity	AT	5794466	N/A	2018/10/21	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5794601	N/A	2018/10/21	Nimarta Singh
Hardness (calculated as CaCO3)		5792211	N/A	2018/10/23	Automated Statchk
Mercury in Water by CVAA	CV/AA	5795858	2018/10/22	2018/10/23	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5794741	N/A	2018/10/22	Thao Nguyen
Ion Balance (% Difference)	CALC	5792212	N/A	2018/10/24	Automated Statchk
Total Ammonia-N	LACH/NH4	5796356	N/A	2018/10/24	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5794518	N/A	2018/10/24	Chandra Nandlal
Organic Nitrogen	CALC	5792714	N/A	2018/10/24	Automated Statchk
pH	AT	5794467	N/A	2018/10/21	Surinder Rai
Phenols (4AAP)	TECH/PHEN	5795417	N/A	2018/10/23	Bramdeo Motiram
Orthophosphate	KONE	5794477	N/A	2018/10/22	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5794476	N/A	2018/10/22	Alina Dobreanu
Total Dissolved Solids	BAL	5793560	2018/10/22	2018/10/23	Niket Kumar Patel
Total Kjeldahl Nitrogen in Water	SKAL	5796366	2018/10/22	2018/10/23	Shivani Shivani
Total Phosphorus (Colourimetric)	LACH/P	5796145	2018/10/22	2018/10/23	Amanpreet Sappal
Volatile Organic Compounds in Water	P&T/MS	5793701	N/A	2018/10/23	Michael Leschinsky

Maxxam ID: IBJ175
Sample ID: MW7
Matrix: Water

Collected: 2018/10/16
Shipped:
Received: 2018/10/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5794465	N/A	2018/10/21	Surinder Rai
Chloride by Automated Colourimetry	KONE	5794471	N/A	2018/10/23	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	5796407	N/A	2018/10/24	Nimarta Singh
Conductivity	AT	5794466	N/A	2018/10/21	Surinder Rai

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Maxxam Job #: B8R7295
Report Date: 2018/10/26

exp Services Inc
Client Project #: THB-00006196-NE
Site Location: Longlac Landfill - Fall Sampling Event
Sampler Initials: KK

TEST SUMMARY

Maxxam ID: IBJ175
Sample ID: MW7
Matrix: Water

Collected: 2018/10/16
Shipped:
Received: 2018/10/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5794601	N/A	2018/10/21	Nimarta Singh
Hardness (calculated as CaCO3)		5792211	N/A	2018/10/23	Automated Statchk
Mercury in Water by CVAA	CV/AA	5795962	2018/10/22	2018/10/23	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5794741	N/A	2018/10/22	Thao Nguyen
Ion Balance (% Difference)	CALC	5792212	N/A	2018/10/24	Automated Statchk
Total Ammonia-N	LACH/NH4	5796356	N/A	2018/10/24	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5794518	N/A	2018/10/24	Chandra Nandlal
Organic Nitrogen	CALC	5792714	N/A	2018/10/24	Automated Statchk
pH	AT	5794467	N/A	2018/10/21	Surinder Rai
Phenols (4AAP)	TECH/PHEN	5795428	N/A	2018/10/22	Bramdeo Motiram
Orthophosphate	KONE	5794473	N/A	2018/10/22	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5794472	N/A	2018/10/22	Alina Dobreanu
Total Dissolved Solids	BAL	5793560	2018/10/22	2018/10/23	Niket Kumar Patel
Total Kjeldahl Nitrogen in Water	SKAL	5796366	2018/10/22	2018/10/23	Shivani Shivani
Total Phosphorus (Colourimetric)	LACH/P	5796145	2018/10/22	2018/10/23	Amanpreet Sappal
Volatile Organic Compounds in Water	P&T/MS	5793701	N/A	2018/10/23	Michael Leschinsky

Maxxam ID: IBJ175 Dup
Sample ID: MW7
Matrix: Water

Collected: 2018/10/16
Shipped:
Received: 2018/10/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5794465	N/A	2018/10/21	Surinder Rai
Conductivity	AT	5794466	N/A	2018/10/21	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5794601	N/A	2018/10/21	Nimarta Singh
pH	AT	5794467	N/A	2018/10/21	Surinder Rai

Maxxam ID: IBJ176
Sample ID: MW8I
Matrix: Water

Collected: 2018/10/16
Shipped:
Received: 2018/10/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5794468	N/A	2018/10/21	Surinder Rai
Chloride by Automated Colourimetry	KONE	5794805	N/A	2018/10/23	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	5796407	N/A	2018/10/24	Nimarta Singh
Conductivity	AT	5794469	N/A	2018/10/21	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5794601	N/A	2018/10/21	Nimarta Singh
Hardness (calculated as CaCO3)		5792211	N/A	2018/10/23	Automated Statchk
Mercury in Water by CVAA	CV/AA	5795962	2018/10/22	2018/10/23	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5794741	N/A	2018/10/23	Thao Nguyen
Ion Balance (% Difference)	CALC	5792212	N/A	2018/10/24	Automated Statchk
Total Ammonia-N	LACH/NH4	5796356	N/A	2018/10/24	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5794612	N/A	2018/10/22	Chandra Nandlal
Organic Nitrogen	CALC	5792714	N/A	2018/10/24	Automated Statchk

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Maxxam Job #: B8R7295
Report Date: 2018/10/26

exp Services Inc
Client Project #: THB-00006196-NE
Site Location: Longlac Landfill - Fall Sampling Event
Sampler Initials: KK

TEST SUMMARY

Maxxam ID: IBJ176
Sample ID: MW8I
Matrix: Water

Collected: 2018/10/16
Shipped:
Received: 2018/10/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
pH	AT	5794470	N/A	2018/10/21	Surinder Rai
Phenols (4AAP)	TECH/PHEN	5795428	N/A	2018/10/22	Bramdeo Motiram
Orthophosphate	KONE	5794807	N/A	2018/10/22	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5794806	N/A	2018/10/22	Alina Dobreanu
Total Dissolved Solids	BAL	5793560	2018/10/22	2018/10/23	Niket Kumar Patel
Total Kjeldahl Nitrogen in Water	SKAL	5796366	2018/10/22	2018/10/23	Shivani Shivani
Total Phosphorus (Colourimetric)	LACH/P	5796145	2018/10/22	2018/10/23	Amanpreet Sappal
Volatile Organic Compounds in Water	P&T/MS	5793701	N/A	2018/10/23	Michael Leschinsky

Maxxam ID: IBJ178
Sample ID: MW8II
Matrix: Water

Collected: 2018/10/16
Shipped:
Received: 2018/10/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5794465	N/A	2018/10/21	Surinder Rai
Chloride by Automated Colourimetry	KONE	5794475	N/A	2018/10/23	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	5796407	N/A	2018/10/24	Nimarta Singh
Conductivity	AT	5794466	N/A	2018/10/21	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5794601	N/A	2018/10/21	Nimarta Singh
Hardness (calculated as CaCO3)		5792211	N/A	2018/10/23	Automated Statchk
Mercury in Water by CVAA	CV/AA	5795962	2018/10/22	2018/10/23	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5794741	N/A	2018/10/22	Thao Nguyen
Ion Balance (% Difference)	CALC	5792212	N/A	2018/10/24	Automated Statchk
Total Ammonia-N	LACH/NH4	5796356	N/A	2018/10/24	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5794518	N/A	2018/10/24	Chandra Nandlal
Organic Nitrogen	CALC	5792714	N/A	2018/10/24	Automated Statchk
pH	AT	5794467	N/A	2018/10/21	Surinder Rai
Phenols (4AAP)	TECH/PHEN	5795406	N/A	2018/10/22	Bramdeo Motiram
Orthophosphate	KONE	5794477	N/A	2018/10/22	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5794476	N/A	2018/10/22	Alina Dobreanu
Total Dissolved Solids	BAL	5793560	2018/10/22	2018/10/23	Niket Kumar Patel
Total Kjeldahl Nitrogen in Water	SKAL	5796366	2018/10/22	2018/10/23	Shivani Shivani
Total Phosphorus (Colourimetric)	LACH/P	5796145	2018/10/22	2018/10/23	Amanpreet Sappal
Volatile Organic Compounds in Water	P&T/MS	5793701	N/A	2018/10/23	Michael Leschinsky

Maxxam ID: IBJ179
Sample ID: MW9
Matrix: Water

Collected: 2018/10/16
Shipped:
Received: 2018/10/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5794465	N/A	2018/10/21	Surinder Rai
Chloride by Automated Colourimetry	KONE	5794471	N/A	2018/10/23	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	5796407	N/A	2018/10/24	Nimarta Singh
Conductivity	AT	5794466	N/A	2018/10/21	Surinder Rai

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Maxxam Job #: B8R7295
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exp Services Inc
Client Project #: THB-00006196-NE
Site Location: Longlac Landfill - Fall Sampling Event
Sampler Initials: KK

TEST SUMMARY

Maxxam ID: IBJ179
Sample ID: MW9
Matrix: Water

Collected: 2018/10/16
Shipped:
Received: 2018/10/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5794601	N/A	2018/10/21	Nimarta Singh
Hardness (calculated as CaCO3)		5792211	N/A	2018/10/23	Automated Statchk
Mercury in Water by CVAA	CV/AA	5795962	2018/10/22	2018/10/23	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5794741	N/A	2018/10/22	Thao Nguyen
Ion Balance (% Difference)	CALC	5792212	N/A	2018/10/24	Automated Statchk
Total Ammonia-N	LACH/NH4	5796356	N/A	2018/10/24	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5794518	N/A	2018/10/24	Chandra Nandlal
Organic Nitrogen	CALC	5792714	N/A	2018/10/24	Automated Statchk
pH	AT	5794467	N/A	2018/10/21	Surinder Rai
Phenols (4AAP)	TECH/PHEN	5795417	N/A	2018/10/23	Bramdeo Motiram
Orthophosphate	KONE	5794473	N/A	2018/10/22	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5794472	N/A	2018/10/22	Alina Dobreanu
Total Dissolved Solids	BAL	5793560	2018/10/22	2018/10/23	Niket Kumar Patel
Total Kjeldahl Nitrogen in Water	SKAL	5796366	2018/10/22	2018/10/23	Shivani Shivani
Total Phosphorus (Colourimetric)	LACH/P	5796145	2018/10/22	2018/10/23	Amanpreet Sappal

Maxxam ID: IBJ180
Sample ID: MW10
Matrix: Water

Collected: 2018/10/16
Shipped:
Received: 2018/10/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5794468	N/A	2018/10/21	Surinder Rai
Chloride by Automated Colourimetry	KONE	5794805	N/A	2018/10/23	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	5796407	N/A	2018/10/24	Nimarta Singh
Conductivity	AT	5794469	N/A	2018/10/21	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5794601	N/A	2018/10/21	Nimarta Singh
Hardness (calculated as CaCO3)		5792211	N/A	2018/10/23	Automated Statchk
Mercury in Water by CVAA	CV/AA	5795962	2018/10/22	2018/10/23	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5794741	N/A	2018/10/23	Thao Nguyen
Ion Balance (% Difference)	CALC	5792212	N/A	2018/10/24	Automated Statchk
Total Ammonia-N	LACH/NH4	5796356	N/A	2018/10/24	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5794612	N/A	2018/10/22	Chandra Nandlal
Organic Nitrogen	CALC	5792714	N/A	2018/10/24	Automated Statchk
pH	AT	5794470	N/A	2018/10/21	Surinder Rai
Phenols (4AAP)	TECH/PHEN	5795417	N/A	2018/10/23	Bramdeo Motiram
Orthophosphate	KONE	5794807	N/A	2018/10/22	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5794806	N/A	2018/10/22	Alina Dobreanu
Total Dissolved Solids	BAL	5793539	2018/10/20	2018/10/22	Niket Kumar Patel
Total Kjeldahl Nitrogen in Water	SKAL	5796366	2018/10/22	2018/10/23	Shivani Shivani
Total Phosphorus (Colourimetric)	LACH/P	5796145	2018/10/22	2018/10/23	Amanpreet Sappal

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Maxxam Job #: B8R7295
Report Date: 2018/10/26

exp Services Inc
Client Project #: THB-00006196-NE
Site Location: Longlac Landfill - Fall Sampling Event
Sampler Initials: KK

TEST SUMMARY

Maxxam ID: IBJ180 Dup
Sample ID: MW10
Matrix: Water

Collected: 2018/10/16
Shipped:
Received: 2018/10/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Mercury in Water by CVAA	CV/AA	5795962	2018/10/22	2018/10/23	Ron Morrison

Maxxam ID: IBJ181
Sample ID: MW11I
Matrix: Water

Collected: 2018/10/16
Shipped:
Received: 2018/10/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5794468	N/A	2018/10/21	Surinder Rai
Chloride by Automated Colourimetry	KONE	5794475	N/A	2018/10/23	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	5796407	N/A	2018/10/24	Nimarta Singh
Conductivity	AT	5794469	N/A	2018/10/21	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5794601	N/A	2018/10/21	Nimarta Singh
Hardness (calculated as CaCO3)		5792211	N/A	2018/10/23	Automated Statchk
Mercury in Water by CVAA	CV/AA	5795858	2018/10/22	2018/10/23	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5794741	N/A	2018/10/22	Thao Nguyen
Ion Balance (% Difference)	CALC	5792212	N/A	2018/10/24	Automated Statchk
Total Ammonia-N	LACH/NH4	5796356	N/A	2018/10/24	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5794612	N/A	2018/10/22	Chandra Nandlal
Organic Nitrogen	CALC	5792714	N/A	2018/10/24	Automated Statchk
pH	AT	5794470	N/A	2018/10/21	Surinder Rai
Phenols (4AAP)	TECH/PHEN	5795433	N/A	2018/10/22	Bramdeo Motiram
Orthophosphate	KONE	5794477	N/A	2018/10/22	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5794476	N/A	2018/10/22	Alina Dobreanu
Total Dissolved Solids	BAL	5793539	2018/10/20	2018/10/22	Niket Kumar Patel
Total Kjeldahl Nitrogen in Water	SKAL	5796366	2018/10/22	2018/10/23	Shivani Shivani
Total Phosphorus (Colourimetric)	LACH/P	5796145	2018/10/22	2018/10/23	Amanpreet Sappal

Maxxam ID: IBJ181 Dup
Sample ID: MW11I
Matrix: Water

Collected: 2018/10/16
Shipped:
Received: 2018/10/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Mercury in Water by CVAA	CV/AA	5795858	2018/10/22	2018/10/23	Ron Morrison

Maxxam ID: IBJ182
Sample ID: MW11II
Matrix: Water

Collected: 2018/10/16
Shipped:
Received: 2018/10/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5794468	N/A	2018/10/21	Surinder Rai
Chloride by Automated Colourimetry	KONE	5794805	N/A	2018/10/23	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	5796407	N/A	2018/10/24	Nimarta Singh
Conductivity	AT	5794469	N/A	2018/10/21	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5795785	N/A	2018/10/23	Nimarta Singh

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Maxxam Job #: B8R7295
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exp Services Inc
Client Project #: THB-00006196-NE
Site Location: Longlac Landfill - Fall Sampling Event
Sampler Initials: KK

TEST SUMMARY

Maxxam ID: IBJ182
Sample ID: MW11II
Matrix: Water

Collected: 2018/10/16
Shipped:
Received: 2018/10/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hardness (calculated as CaCO3)		5792211	N/A	2018/10/23	Automated Statchk
Mercury in Water by CVAA	CV/AA	5795858	2018/10/22	2018/10/23	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5794741	N/A	2018/10/22	Thao Nguyen
Ion Balance (% Difference)	CALC	5792212	N/A	2018/10/24	Automated Statchk
Total Ammonia-N	LACH/NH4	5796356	N/A	2018/10/24	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5794612	N/A	2018/10/22	Chandra Nandlal
Organic Nitrogen	CALC	5792714	N/A	2018/10/24	Automated Statchk
pH	AT	5794470	N/A	2018/10/21	Surinder Rai
Phenols (4AAP)	TECH/PHEN	5795433	N/A	2018/10/22	Bramdeo Motiram
Orthophosphate	KONE	5794807	N/A	2018/10/22	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5794806	N/A	2018/10/22	Alina Dobreanu
Total Dissolved Solids	BAL	5793539	2018/10/20	2018/10/22	Niket Kumar Patel
Total Kjeldahl Nitrogen in Water	SKAL	5796366	2018/10/22	2018/10/23	Shivani Shivani
Total Phosphorus (Colourimetric)	LACH/P	5796145	2018/10/22	2018/10/23	Amanpreet Sappal

Maxxam ID: IBJ183
Sample ID: MW12I
Matrix: Water

Collected: 2018/10/16
Shipped:
Received: 2018/10/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5794465	N/A	2018/10/21	Surinder Rai
Chloride by Automated Colourimetry	KONE	5794475	N/A	2018/10/23	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	5796407	N/A	2018/10/24	Nimarta Singh
Conductivity	AT	5794466	N/A	2018/10/21	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5794601	N/A	2018/10/21	Nimarta Singh
Hardness (calculated as CaCO3)		5792211	N/A	2018/10/23	Automated Statchk
Mercury in Water by CVAA	CV/AA	5795962	2018/10/22	2018/10/23	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5804619	N/A	2018/10/26	Thao Nguyen
Ion Balance (% Difference)	CALC	5792212	N/A	2018/10/24	Automated Statchk
Total Ammonia-N	LACH/NH4	5796356	N/A	2018/10/24	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5794518	N/A	2018/10/24	Chandra Nandlal
Organic Nitrogen	CALC	5792714	N/A	2018/10/24	Automated Statchk
pH	AT	5794467	N/A	2018/10/21	Surinder Rai
Phenols (4AAP)	TECH/PHEN	5795433	N/A	2018/10/22	Bramdeo Motiram
Orthophosphate	KONE	5794477	N/A	2018/10/22	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5794476	N/A	2018/10/22	Alina Dobreanu
Total Dissolved Solids	BAL	5798461	2018/10/23	2018/10/24	Jingwei (Alvin) Shi
Total Kjeldahl Nitrogen in Water	SKAL	5796366	2018/10/22	2018/10/23	Shivani Shivani
Total Phosphorus (Colourimetric)	LACH/P	5796145	2018/10/22	2018/10/23	Amanpreet Sappal

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Maxxam Job #: B8R7295
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exp Services Inc
Client Project #: THB-00006196-NE
Site Location: Longlac Landfill - Fall Sampling Event
Sampler Initials: KK

TEST SUMMARY

Maxxam ID: IBJ184
Sample ID: MW12II
Matrix: Water

Collected: 2018/10/16
Shipped:
Received: 2018/10/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5794465	N/A	2018/10/21	Surinder Rai
Chloride by Automated Colourimetry	KONE	5794475	N/A	2018/10/23	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	5796407	N/A	2018/10/24	Nimarta Singh
Conductivity	AT	5794466	N/A	2018/10/21	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5794601	N/A	2018/10/21	Nimarta Singh
Hardness (calculated as CaCO3)		5792211	N/A	2018/10/23	Automated Statchk
Mercury in Water by CVAA	CV/AA	5795858	2018/10/22	2018/10/23	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5794741	N/A	2018/10/22	Thao Nguyen
Ion Balance (% Difference)	CALC	5792212	N/A	2018/10/24	Automated Statchk
Total Ammonia-N	LACH/NH4	5796356	N/A	2018/10/24	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5794833	N/A	2018/10/23	Chandra Nandlal
Organic Nitrogen	CALC	5792714	N/A	2018/10/24	Automated Statchk
pH	AT	5794467	N/A	2018/10/21	Surinder Rai
Phenols (4AAP)	TECH/PHEN	5795433	N/A	2018/10/22	Bramdeo Motiram
Orthophosphate	KONE	5794477	N/A	2018/10/22	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5794476	N/A	2018/10/22	Alina Dobreanu
Total Dissolved Solids	BAL	5795752	2018/10/23	2018/10/24	Massarat Jan
Total Kjeldahl Nitrogen in Water	SKAL	5796366	2018/10/22	2018/10/23	Shivani Shivani
Total Phosphorus (Colourimetric)	LACH/P	5796145	2018/10/22	2018/10/23	Amanpreet Sappal

Maxxam ID: IBJ184 Dup
Sample ID: MW12II
Matrix: Water

Collected: 2018/10/16
Shipped:
Received: 2018/10/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5794833	N/A	2018/10/23	Chandra Nandlal

Maxxam ID: IBJ185
Sample ID: MW13
Matrix: Water

Collected: 2018/10/16
Shipped:
Received: 2018/10/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5794627	N/A	2018/10/22	Surinder Rai
Chloride by Automated Colourimetry	KONE	5794475	N/A	2018/10/23	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	5796407	N/A	2018/10/24	Nimarta Singh
Conductivity	AT	5794630	N/A	2018/10/22	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5794601	N/A	2018/10/21	Nimarta Singh
Hardness (calculated as CaCO3)		5792211	N/A	2018/10/23	Automated Statchk
Mercury in Water by CVAA	CV/AA	5795858	2018/10/22	2018/10/23	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5794741	N/A	2018/10/22	Thao Nguyen
Ion Balance (% Difference)	CALC	5792212	N/A	2018/10/24	Automated Statchk
Total Ammonia-N	LACH/NH4	5796356	N/A	2018/10/24	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5794612	N/A	2018/10/22	Chandra Nandlal
Organic Nitrogen	CALC	5792714	N/A	2018/10/24	Automated Statchk

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Maxxam Job #: B8R7295
Report Date: 2018/10/26

exp Services Inc
Client Project #: THB-00006196-NE
Site Location: Longlac Landfill - Fall Sampling Event
Sampler Initials: KK

TEST SUMMARY

Maxxam ID: IBJ185
Sample ID: MW13
Matrix: Water

Collected: 2018/10/16
Shipped:
Received: 2018/10/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
pH	AT	5794632	N/A	2018/10/22	Surinder Rai
Phenols (4AAP)	TECH/PHEN	5795433	N/A	2018/10/22	Bramdeo Motiram
Orthophosphate	KONE	5794477	N/A	2018/10/22	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5794476	N/A	2018/10/22	Alina Dobreanu
Total Dissolved Solids	BAL	5795752	2018/10/23	2018/10/24	Massarat Jan
Total Kjeldahl Nitrogen in Water	SKAL	5796366	2018/10/22	2018/10/23	Shivani Shivani
Total Phosphorus (Colourimetric)	LACH/P	5796145	2018/10/22	2018/10/23	Amanpreet Sappal
Volatile Organic Compounds in Water	P&T/MS	5793701	N/A	2018/10/23	Michael Leschinsky

Maxxam ID: IBJ186
Sample ID: SW1
Matrix: Water

Collected: 2018/10/16
Shipped:
Received: 2018/10/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	5794835	N/A	2018/10/22	Thao Nguyen
Alkalinity	AT	5794468	N/A	2018/10/21	Surinder Rai
Biochemical Oxygen Demand (BOD)	DO	5792514	2018/10/19	2018/10/24	Nusrat Naz
Chloride by Automated Colourimetry	KONE	5794617	N/A	2018/10/23	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	5796407	N/A	2018/10/24	Nimarta Singh
Conductivity	AT	5794469	N/A	2018/10/21	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5794601	N/A	2018/10/21	Nimarta Singh
Hardness (calculated as CaCO3)		5792211	N/A	2018/10/24	Automated Statchk
Mercury in Water by CVAA	CV/AA	5795962	2018/10/22	2018/10/23	Ron Morrison
Dissolved Calcium and Magnesium	ICP	5794841	2018/10/20	2018/10/22	Suban Kanapathippllai
Total Metals Analysis by ICPMS	ICP/MS	5795405	N/A	2018/10/22	Thao Nguyen
Total Ammonia-N	LACH/NH4	5796356	N/A	2018/10/24	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5794612	N/A	2018/10/22	Chandra Nandlal
Organic Nitrogen	CALC	5792714	N/A	2018/10/24	Automated Statchk
pH	AT	5794470	N/A	2018/10/21	Surinder Rai
Phenols (4AAP)	TECH/PHEN	5795433	N/A	2018/10/22	Bramdeo Motiram
Sulphate by Automated Colourimetry	KONE	5794618	N/A	2018/10/23	Alina Dobreanu
Total Dissolved Solids	BAL	5795752	2018/10/23	2018/10/24	Massarat Jan
Total Kjeldahl Nitrogen in Water	SKAL	5796366	2018/10/22	2018/10/23	Shivani Shivani
Total Phosphorus (Colourimetric)	LACH/P	5796157	2018/10/22	2018/10/23	Amanpreet Sappal
Low Level Total Suspended Solids	BAL	5795780	2018/10/22	2018/10/23	Mandeep Kaur

Maxxam ID: IBJ186 Dup
Sample ID: SW1
Matrix: Water

Collected: 2018/10/16
Shipped:
Received: 2018/10/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Metals Analysis by ICPMS	ICP/MS	5795405	N/A	2018/10/22	Thao Nguyen
Total Ammonia-N	LACH/NH4	5796356	N/A	2018/10/24	Charles Opoku-Ware

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Maxxam Job #: B8R7295
Report Date: 2018/10/26

exp Services Inc
Client Project #: THB-00006196-NE
Site Location: Longlac Landfill - Fall Sampling Event
Sampler Initials: KK

TEST SUMMARY

Maxxam ID: IBJ187
Sample ID: SW2
Matrix: Water

Collected: 2018/10/16
Shipped:
Received: 2018/10/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	5794835	N/A	2018/10/22	Thao Nguyen
Alkalinity	AT	5794468	N/A	2018/10/21	Surinder Rai
Biochemical Oxygen Demand (BOD)	DO	5792514	2018/10/19	2018/10/24	Nusrat Naz
Chloride by Automated Colourimetry	KONE	5794621	N/A	2018/10/23	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	5796407	N/A	2018/10/24	Nimarta Singh
Conductivity	AT	5794469	N/A	2018/10/21	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5794601	N/A	2018/10/21	Nimarta Singh
Hardness (calculated as CaCO3)		5792211	N/A	2018/10/24	Automated Statchk
Mercury in Water by CVAA	CV/AA	5795858	2018/10/22	2018/10/23	Ron Morrison
Dissolved Calcium and Magnesium	ICP	5794841	2018/10/20	2018/10/22	Suban Kanapathippllai
Total Metals Analysis by ICPMS	ICP/MS	5795405	N/A	2018/10/22	Thao Nguyen
Total Ammonia-N	LACH/NH4	5796356	N/A	2018/10/24	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5794612	N/A	2018/10/22	Chandra Nandlal
Organic Nitrogen	CALC	5792714	N/A	2018/10/24	Automated Statchk
pH	AT	5794470	N/A	2018/10/21	Surinder Rai
Phenols (4AAP)	TECH/PHEN	5795433	N/A	2018/10/22	Bramdeo Motiram
Sulphate by Automated Colourimetry	KONE	5794622	N/A	2018/10/23	Alina Dobreanu
Total Dissolved Solids	BAL	5795752	2018/10/23	2018/10/24	Massarat Jan
Total Kjeldahl Nitrogen in Water	SKAL	5796366	2018/10/22	2018/10/23	Shivani Shivani
Total Phosphorus (Colourimetric)	LACH/P	5797085	2018/10/22	2018/10/23	Amanpreet Sappal
Low Level Total Suspended Solids	BAL	5795780	2018/10/22	2018/10/23	Mandeep Kaur

Maxxam ID: IBJ187 Dup
Sample ID: SW2
Matrix: Water

Collected: 2018/10/16
Shipped:
Received: 2018/10/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chemical Oxygen Demand	SPEC	5796407	N/A	2018/10/24	Nimarta Singh
Phenols (4AAP)	TECH/PHEN	5795433	N/A	2018/10/22	Bramdeo Motiram
Total Kjeldahl Nitrogen in Water	SKAL	5796366	2018/10/22	2018/10/23	Shivani Shivani

Maxxam ID: IBJ188
Sample ID: SW3
Matrix: Water

Collected: 2018/10/16
Shipped:
Received: 2018/10/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	5798153	N/A	2018/10/25	Arefa Dabhad
Alkalinity	AT	5794465	N/A	2018/10/21	Surinder Rai
Biochemical Oxygen Demand (BOD)	DO	5792514	2018/10/19	2018/10/24	Nusrat Naz
Chloride by Automated Colourimetry	KONE	5794621	N/A	2018/10/23	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	5796407	N/A	2018/10/24	Nimarta Singh
Conductivity	AT	5794466	N/A	2018/10/21	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5794601	N/A	2018/10/21	Nimarta Singh
Hardness (calculated as CaCO3)		5792211	N/A	2018/10/24	Automated Statchk

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Maxxam Job #: B8R7295
Report Date: 2018/10/26

exp Services Inc
Client Project #: THB-00006196-NE
Site Location: Longlac Landfill - Fall Sampling Event
Sampler Initials: KK

TEST SUMMARY

Maxxam ID: IBJ188
Sample ID: SW3
Matrix: Water

Collected: 2018/10/16
Shipped:
Received: 2018/10/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Mercury in Water by CVAA	CV/AA	5795962	2018/10/22	2018/10/23	Ron Morrison
Dissolved Calcium and Magnesium	ICP	5798135	2018/10/23	2018/10/24	Azita Fazaeli
Total Metals Analysis by ICPMS	ICP/MS	5795405	N/A	2018/10/22	Thao Nguyen
Total Ammonia-N	LACH/NH4	5796356	N/A	2018/10/24	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5794518	N/A	2018/10/24	Chandra Nandlal
Organic Nitrogen	CALC	5792714	N/A	2018/10/24	Automated Statchk
pH	AT	5794467	N/A	2018/10/21	Surinder Rai
Phenols (4AAP)	TECH/PHEN	5795433	N/A	2018/10/22	Bramdeo Motiram
Sulphate by Automated Colourimetry	KONE	5794622	N/A	2018/10/23	Alina Dobreanu
Total Dissolved Solids	BAL	5798461	2018/10/23	2018/10/24	Jingwei (Alvin) Shi
Total Kjeldahl Nitrogen in Water	SKAL	5796366	2018/10/22	2018/10/23	Shivani Shivani
Total Phosphorus (Colourimetric)	LACH/P	5797085	2018/10/22	2018/10/23	Amanpreet Sappal
Low Level Total Suspended Solids	BAL	5795780	2018/10/22	2018/10/23	Mandeep Kaur

Maxxam ID: IBJ188 Dup
Sample ID: SW3
Matrix: Water

Collected: 2018/10/16
Shipped:
Received: 2018/10/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	5798153	N/A	2018/10/25	Arefa Dabhad

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GENERAL COMMENTS

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

Package 1	1.7°C
Package 2	-1.7°C
Package 3	-1.3°C
Package 4	-1.0°C

Sample IBJ170 [MW3] : TKN < Ammonia: Both values fall within the method uncertainty for duplicates and are likely equivalent.

Sample IBJ175 [MW7] : VOC Water Analysis: Due to foaming, sample required dilution. The detection limits were adjusted accordingly.

Sample IBJ176 [MW8I] : VOC Water Analysis: Due to foaming, sample required dilution. The detection limits were adjusted accordingly.

Sample IBJ183 [MW12I] : TKN < Ammonia: Both values fall within the method uncertainty for duplicates and are likely equivalent.
Elevated ion balance result was confirmed by reanalysis.

Results relate only to the items tested.

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Maxxam Job #: B8R7295
Report Date: 2018/10/26

QUALITY ASSURANCE REPORT

exp Services Inc
Client Project #: THB-00006196-NE
Site Location: Longlac Landfill - Fall Sampling Event
Sampler Initials: KK

			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
5793701	4-Bromofluorobenzene	2018/10/23	101	70 - 130	102	70 - 130	100	%				
5793701	D4-1,2-Dichloroethane	2018/10/23	98	70 - 130	98	70 - 130	99	%				
5793701	D8-Toluene	2018/10/23	100	70 - 130	100	70 - 130	98	%				
5792514	Total BOD	2018/10/24					<2	mg/L	NC	30	102	80 - 120
5793512	Total Dissolved Solids	2018/10/23					<10	mg/L	0	25	97	90 - 110
5793539	Total Dissolved Solids	2018/10/22					<10	mg/L	2.4	25	98	90 - 110
5793560	Total Dissolved Solids	2018/10/23					<10	mg/L	0	25	100	90 - 110
5793701	1,1,1,2-Tetrachloroethane	2018/10/23	114	70 - 130	113	70 - 130	<0.20	ug/L				
5793701	1,1,1-Trichloroethane	2018/10/23	111	70 - 130	110	70 - 130	<0.10	ug/L				
5793701	1,1,2,2-Tetrachloroethane	2018/10/23	114	70 - 130	111	70 - 130	<0.20	ug/L				
5793701	1,1,2-Trichloroethane	2018/10/23	106	70 - 130	104	70 - 130	<0.20	ug/L				
5793701	1,1-Dichloroethane	2018/10/23	105	70 - 130	104	70 - 130	<0.10	ug/L				
5793701	1,1-Dichloroethylene	2018/10/23	103	70 - 130	102	70 - 130	<0.10	ug/L				
5793701	1,2-Dichlorobenzene	2018/10/23	108	70 - 130	106	70 - 130	<0.20	ug/L				
5793701	1,2-Dichloroethane	2018/10/23	103	70 - 130	101	70 - 130	<0.20	ug/L				
5793701	1,2-Dichloropropane	2018/10/23	104	70 - 130	102	70 - 130	<0.10	ug/L				
5793701	1,3-Dichlorobenzene	2018/10/23	109	70 - 130	109	70 - 130	<0.20	ug/L				
5793701	1,4-Dichlorobenzene	2018/10/23	110	70 - 130	109	70 - 130	<0.20	ug/L				
5793701	Acetone (2-Propanone)	2018/10/23	101	60 - 140	97	60 - 140	<10	ug/L				
5793701	Benzene	2018/10/23	105	70 - 130	105	70 - 130	<0.10	ug/L				
5793701	Bromodichloromethane	2018/10/23	113	70 - 130	112	70 - 130	<0.10	ug/L				
5793701	Bromoform	2018/10/23	100	70 - 130	97	70 - 130	<0.20	ug/L				
5793701	Bromomethane	2018/10/23	67	60 - 140	61	60 - 140	<0.50	ug/L				
5793701	Carbon Tetrachloride	2018/10/23	116	70 - 130	115	70 - 130	<0.10	ug/L				
5793701	Chlorobenzene	2018/10/23	105	70 - 130	104	70 - 130	<0.10	ug/L				
5793701	Chloroform	2018/10/23	106	70 - 130	104	70 - 130	<0.10	ug/L				
5793701	cis-1,2-Dichloroethylene	2018/10/23	107	70 - 130	105	70 - 130	<0.10	ug/L				
5793701	cis-1,3-Dichloropropene	2018/10/23	110	70 - 130	109	70 - 130	<0.20	ug/L				
5793701	Dibromochloromethane	2018/10/23	118	70 - 130	115	70 - 130	<0.20	ug/L				
5793701	Dichlorodifluoromethane (FREON 12)	2018/10/23	102	60 - 140	109	60 - 140	<0.50	ug/L				
5793701	Ethylbenzene	2018/10/23	106	70 - 130	107	70 - 130	<0.10	ug/L	NC	30		

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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
5793701	Ethylene Dibromide	2018/10/23	108	70 - 130	106	70 - 130	<0.20	ug/L				
5793701	Hexane	2018/10/23	78	70 - 130	101	70 - 130	<0.50	ug/L				
5793701	Methyl Ethyl Ketone (2-Butanone)	2018/10/23	100	60 - 140	100	60 - 140	<5.0	ug/L				
5793701	Methyl Isobutyl Ketone	2018/10/23	109	70 - 130	106	70 - 130	<5.0	ug/L				
5793701	Methyl t-butyl ether (MTBE)	2018/10/23	106	70 - 130	102	70 - 130	<0.20	ug/L				
5793701	Methylene Chloride(Dichloromethane)	2018/10/23	101	70 - 130	101	70 - 130	<0.50	ug/L				
5793701	o-Xylene	2018/10/23	110	70 - 130	108	70 - 130	<0.10	ug/L				
5793701	p+m-Xylene	2018/10/23	109	70 - 130	110	70 - 130	<0.10	ug/L				
5793701	Styrene	2018/10/23	110	70 - 130	109	70 - 130	<0.20	ug/L				
5793701	Tetrachloroethylene	2018/10/23	104	70 - 130	106	70 - 130	<0.10	ug/L				
5793701	Toluene	2018/10/23	105	70 - 130	104	70 - 130	<0.20	ug/L				
5793701	Total Xylenes	2018/10/23					<0.10	ug/L				
5793701	trans-1,2-Dichloroethylene	2018/10/23	105	70 - 130	105	70 - 130	<0.10	ug/L				
5793701	trans-1,3-Dichloropropene	2018/10/23	111	70 - 130	112	70 - 130	<0.20	ug/L				
5793701	Trichloroethylene	2018/10/23	105	70 - 130	104	70 - 130	<0.10	ug/L				
5793701	Trichlorofluoromethane (FREON 11)	2018/10/23	107	70 - 130	107	70 - 130	<0.20	ug/L				
5793701	Vinyl Chloride	2018/10/23	101	70 - 130	101	70 - 130	<0.20	ug/L				
5794465	Alkalinity (Total as CaCO3)	2018/10/21			96	85 - 115	<1.0	mg/L	0.076	20		
5794466	Conductivity	2018/10/21			101	85 - 115	<1.0	umho/cm	0	25		
5794467	pH	2018/10/21			102	98 - 103			0.14	N/A		
5794468	Alkalinity (Total as CaCO3)	2018/10/21			96	85 - 115	<1.0	mg/L	0.20	20		
5794469	Conductivity	2018/10/21			100	85 - 115	<1.0	umho/cm	0.26	25		
5794470	pH	2018/10/21			102	98 - 103			0.84	N/A		
5794471	Dissolved Chloride (Cl-)	2018/10/23	111	80 - 120	104	80 - 120	<1.0	mg/L	0.39	20		
5794472	Dissolved Sulphate (SO4)	2018/10/22	NC	75 - 125	104	80 - 120	<1.0	mg/L	0.095	20		
5794473	Orthophosphate (P)	2018/10/22	102	75 - 125	100	80 - 120	<0.010	mg/L	NC	25		
5794475	Dissolved Chloride (Cl-)	2018/10/23	NC	80 - 120	104	80 - 120	<1.0	mg/L	0.0098	20		
5794476	Dissolved Sulphate (SO4)	2018/10/22	104	75 - 125	105	80 - 120	<1.0	mg/L	0.73	20		
5794477	Orthophosphate (P)	2018/10/22	115	75 - 125	100	80 - 120	<0.010	mg/L	NC	25		

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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
5794518	Nitrate (N)	2018/10/24	103	80 - 120	102	80 - 120	<0.10	mg/L	NC	20		
5794518	Nitrite (N)	2018/10/24	104	80 - 120	102	80 - 120	<0.010	mg/L	NC	20		
5794601	Dissolved Organic Carbon	2018/10/21	NC	80 - 120	97	80 - 120	<0.50	mg/L	0.27	20		
5794612	Nitrate (N)	2018/10/22	103	80 - 120	104	80 - 120	<0.10	mg/L	NC	20		
5794612	Nitrite (N)	2018/10/22	92	80 - 120	96	80 - 120	<0.010	mg/L	NC	20		
5794617	Dissolved Chloride (Cl-)	2018/10/23	NC	80 - 120	103	80 - 120	<1.0	mg/L	1.4	20		
5794618	Dissolved Sulphate (SO4)	2018/10/23	108	75 - 125	101	80 - 120	<1.0	mg/L	1.8	20		
5794621	Dissolved Chloride (Cl-)	2018/10/23	NC	80 - 120	103	80 - 120	<1.0	mg/L	1.2	20		
5794622	Dissolved Sulphate (SO4)	2018/10/23	NC	75 - 125	102	80 - 120	<1.0	mg/L	0.0061	20		
5794627	Alkalinity (Total as CaCO3)	2018/10/22			96	85 - 115	<1.0	mg/L	0.91	20		
5794630	Conductivity	2018/10/22			101	85 - 115	<1.0	umho/cm	0	25		
5794632	pH	2018/10/22			102	98 - 103			0.45	N/A		
5794741	Dissolved Aluminum (Al)	2018/10/22	100	80 - 120	100	80 - 120	<5.0	ug/L	NC	20		
5794741	Dissolved Antimony (Sb)	2018/10/22	108	80 - 120	104	80 - 120	<0.50	ug/L	NC	20		
5794741	Dissolved Arsenic (As)	2018/10/22	100	80 - 120	100	80 - 120	<1.0	ug/L	2.6	20		
5794741	Dissolved Barium (Ba)	2018/10/22	107	80 - 120	106	80 - 120	<2.0	ug/L	0.45	20		
5794741	Dissolved Beryllium (Be)	2018/10/22	102	80 - 120	100	80 - 120	<0.50	ug/L	NC	20		
5794741	Dissolved Bismuth (Bi)	2018/10/22	97	80 - 120	95	80 - 120	<1.0	ug/L	NC	20		
5794741	Dissolved Boron (B)	2018/10/22	99	80 - 120	100	80 - 120	<10	ug/L	0.44	20		
5794741	Dissolved Cadmium (Cd)	2018/10/22	103	80 - 120	101	80 - 120	<0.10	ug/L	NC	20		
5794741	Dissolved Calcium (Ca)	2018/10/22	NC	80 - 120	97	80 - 120	<200	ug/L	0.27	20		
5794741	Dissolved Chromium (Cr)	2018/10/22	99	80 - 120	97	80 - 120	<5.0	ug/L	NC	20		
5794741	Dissolved Cobalt (Co)	2018/10/22	98	80 - 120	98	80 - 120	<0.50	ug/L	NC	20		
5794741	Dissolved Copper (Cu)	2018/10/22	101	80 - 120	100	80 - 120	<1.0	ug/L	NC	20		
5794741	Dissolved Iron (Fe)	2018/10/22	100	80 - 120	98	80 - 120	<100	ug/L	0.037	20		
5794741	Dissolved Lead (Pb)	2018/10/22	98	80 - 120	97	80 - 120	<0.50	ug/L	NC	20		
5794741	Dissolved Magnesium (Mg)	2018/10/22	100	80 - 120	98	80 - 120	<50	ug/L	0.78	20		
5794741	Dissolved Manganese (Mn)	2018/10/22	101	80 - 120	99	80 - 120	<2.0	ug/L	1.9	20		
5794741	Dissolved Molybdenum (Mo)	2018/10/22	106	80 - 120	103	80 - 120	<0.50	ug/L	7.0	20		
5794741	Dissolved Nickel (Ni)	2018/10/22	98	80 - 120	97	80 - 120	<1.0	ug/L	NC	20		

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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
5794741	Dissolved Potassium (K)	2018/10/22	104	80 - 120	100	80 - 120	<200	ug/L	0.83	20		
5794741	Dissolved Selenium (Se)	2018/10/22	98	80 - 120	99	80 - 120	<2.0	ug/L	NC	20		
5794741	Dissolved Silicon (Si)	2018/10/22	100	80 - 120	100	80 - 120	<50	ug/L	0.034	20		
5794741	Dissolved Sodium (Na)	2018/10/22	98	80 - 120	97	80 - 120	<100	ug/L	0.15	20		
5794741	Dissolved Strontium (Sr)	2018/10/22	103	80 - 120	102	80 - 120	<1.0	ug/L	0.84	20		
5794741	Dissolved Thallium (Tl)	2018/10/22	98	80 - 120	96	80 - 120	<0.050	ug/L	NC	20		
5794741	Dissolved Tin (Sn)	2018/10/22	106	80 - 120	103	80 - 120	<1.0	ug/L	NC	20		
5794741	Dissolved Vanadium (V)	2018/10/22	102	80 - 120	99	80 - 120	<0.50	ug/L	NC	20		
5794741	Dissolved Zinc (Zn)	2018/10/22	99	80 - 120	97	80 - 120	<5.0	ug/L	NC	20		
5794805	Dissolved Chloride (Cl-)	2018/10/23	NC	80 - 120	103	80 - 120	<1.0	mg/L	0.23	20		
5794806	Dissolved Sulphate (SO4)	2018/10/22	NC	75 - 125	103	80 - 120	<1.0	mg/L	0.85	20		
5794807	Orthophosphate (P)	2018/10/22	103	75 - 125	100	80 - 120	<0.010	mg/L	NC	25		
5794833	Nitrate (N)	2018/10/23	103	80 - 120	103	80 - 120	<0.10	mg/L	3.8	20		
5794833	Nitrite (N)	2018/10/23	101	80 - 120	101	80 - 120	<0.010	mg/L	NC	20		
5794835	Dissolved (0.2u) Aluminum (Al)	2018/10/22	103	80 - 120	101	80 - 120	<5	ug/L	12	20		
5794841	Dissolved Calcium (Ca)	2018/10/22	NC	80 - 120	95	80 - 120	<0.050	mg/L				
5794841	Dissolved Magnesium (Mg)	2018/10/22	NC	80 - 120	97	80 - 120	<0.050	mg/L				
5795405	Total Antimony (Sb)	2018/10/22	104	80 - 120	105	80 - 120	<0.50	ug/L	NC	20		
5795405	Total Arsenic (As)	2018/10/22	98	80 - 120	99	80 - 120	<1.0	ug/L	NC	20		
5795405	Total Barium (Ba)	2018/10/22	105	80 - 120	104	80 - 120	<2.0	ug/L	12	20		
5795405	Total Beryllium (Be)	2018/10/22	101	80 - 120	101	80 - 120	<0.50	ug/L	NC	20		
5795405	Total Bismuth (Bi)	2018/10/22	92	80 - 120	94	80 - 120	<1.0	ug/L	NC	20		
5795405	Total Boron (B)	2018/10/22	97	80 - 120	100	80 - 120	<10	ug/L	NC	20		
5795405	Total Cadmium (Cd)	2018/10/22	100	80 - 120	100	80 - 120	<0.10	ug/L	NC	20		
5795405	Total Calcium (Ca)	2018/10/22	97	80 - 120	97	80 - 120	<200	ug/L	1.7	20		
5795405	Total Chromium (Cr)	2018/10/22	96	80 - 120	98	80 - 120	<5.0	ug/L	NC	20		
5795405	Total Cobalt (Co)	2018/10/22	96	80 - 120	96	80 - 120	<0.50	ug/L	NC	20		
5795405	Total Copper (Cu)	2018/10/22	100	80 - 120	100	80 - 120	<1.0	ug/L	NC	20		
5795405	Total Iron (Fe)	2018/10/22	95	80 - 120	97	80 - 120	<100	ug/L	NC	20		
5795405	Total Lead (Pb)	2018/10/22	96	80 - 120	97	80 - 120	<0.50	ug/L	NC	20		
5795405	Total Magnesium (Mg)	2018/10/22	97	80 - 120	99	80 - 120	<50	ug/L	6.3	20		

Maxxam Job #: B8R7295
Report Date: 2018/10/26

QUALITY ASSURANCE REPORT(CONT'D)

exp Services Inc
Client Project #: THB-00006196-NE
Site Location: Longlac Landfill - Fall Sampling Event
Sampler Initials: KK

			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
5795405	Total Manganese (Mn)	2018/10/22	96	80 - 120	98	80 - 120	<2.0	ug/L	2.4	20		
5795405	Total Molybdenum (Mo)	2018/10/22	101	80 - 120	102	80 - 120	<0.50	ug/L	NC	20		
5795405	Total Nickel (Ni)	2018/10/22	95	80 - 120	97	80 - 120	<1.0	ug/L	NC	20		
5795405	Total Potassium (K)	2018/10/22	99	80 - 120	101	80 - 120	<200	ug/L	NC	20		
5795405	Total Selenium (Se)	2018/10/22	104	80 - 120	102	80 - 120	<2.0	ug/L	NC	20		
5795405	Total Silicon (Si)	2018/10/22	99	80 - 120	99	80 - 120	<50	ug/L	0.35	20		
5795405	Total Silver (Ag)	2018/10/22	98	80 - 120	99	80 - 120	<0.10	ug/L	NC	20		
5795405	Total Sodium (Na)	2018/10/22	96	80 - 120	98	80 - 120	<100	ug/L	3.8	20		
5795405	Total Strontium (Sr)	2018/10/22	98	80 - 120	99	80 - 120	<1.0	ug/L	0.77	20		
5795405	Total Thallium (Tl)	2018/10/22	95	80 - 120	96	80 - 120	<0.050	ug/L	NC	20		
5795405	Total Vanadium (V)	2018/10/22	97	80 - 120	99	80 - 120	<0.50	ug/L	NC	20		
5795405	Total Zinc (Zn)	2018/10/22	99	80 - 120	101	80 - 120	<5.0	ug/L	6.1	20		
5795406	Phenols-4AAP	2018/10/22	98	80 - 120	98	80 - 120	<0.0010	mg/L	NC	20		
5795417	Phenols-4AAP	2018/10/22	97	80 - 120	100	80 - 120	<0.0010	mg/L	NC	20		
5795428	Phenols-4AAP	2018/10/22	97	80 - 120	99	80 - 120	<0.0010	mg/L	NC	20		
5795433	Phenols-4AAP	2018/10/22	94	80 - 120	99	80 - 120	<0.0010	mg/L	0	20		
5795465	Phenols-4AAP	2018/10/22	95	80 - 120	98	80 - 120	<0.0010	mg/L	NC	20		
5795752	Total Dissolved Solids	2018/10/24					<10	mg/L	1.9	25	97	90 - 110
5795780	Total Suspended Solids	2018/10/23					<1	mg/L	0	25	98	85 - 115
5795785	Dissolved Organic Carbon	2018/10/23	92	80 - 120	94	80 - 120	<0.50	mg/L	0.98	20		
5795858	Mercury (Hg)	2018/10/23	90	75 - 125	92	80 - 120	<0.0001	mg/L	NC	20		
5795962	Mercury (Hg)	2018/10/23	90	75 - 125	93	80 - 120	<0.0001	mg/L	NC	20		
5796145	Total Phosphorus	2018/10/23	99	80 - 120	100	80 - 120	<0.020	mg/L	7.3	20	101	80 - 120
5796157	Total Phosphorus	2018/10/23	83	80 - 120	94	80 - 120	<0.004	mg/L	NC	20	95	80 - 120
5796356	Total Ammonia-N	2018/10/24	91	75 - 125	102	80 - 120	<0.050	mg/L	NC	20		
5796366	Total Kjeldahl Nitrogen (TKN)	2018/10/23	97	80 - 120	100	80 - 120	<0.10	mg/L	11	20	95	80 - 120
5796407	Total Chemical Oxygen Demand (COD)	2018/10/24	94	80 - 120	105	80 - 120	<4.0	mg/L	8.8	20		
5797085	Total Phosphorus	2018/10/23	97	80 - 120	97	80 - 120	<0.004	mg/L	NC	20	97	N/A
5798135	Dissolved Calcium (Ca)	2018/10/24	NC	80 - 120	102	80 - 120	<0.050	mg/L				
5798135	Dissolved Magnesium (Mg)	2018/10/24	NC	80 - 120	101	80 - 120	<0.050	mg/L				
5798153	Dissolved (0.2u) Aluminum (Al)	2018/10/25	105	80 - 120	101	80 - 120	<5	ug/L	2.8	20		

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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
5798461	Total Dissolved Solids	2018/10/24					<10	mg/L	7.2	25	97	90 - 110
5804619	Dissolved Aluminum (Al)	2018/10/26	105	80 - 120	102	80 - 120	<5.0	ug/L	6.0	20		
5804619	Dissolved Antimony (Sb)	2018/10/26	109	80 - 120	103	80 - 120	<0.50	ug/L	NC	20		
5804619	Dissolved Arsenic (As)	2018/10/26	101	80 - 120	100	80 - 120	<1.0	ug/L	18	20		
5804619	Dissolved Barium (Ba)	2018/10/26	103	80 - 120	102	80 - 120	<2.0	ug/L	3.5	20		
5804619	Dissolved Beryllium (Be)	2018/10/26	104	80 - 120	100	80 - 120	<0.50	ug/L	NC	20		
5804619	Dissolved Bismuth (Bi)	2018/10/26	93	80 - 120	93	80 - 120	<1.0	ug/L	NC	20		
5804619	Dissolved Boron (B)	2018/10/26	103	80 - 120	101	80 - 120	<10	ug/L	1.6	20		
5804619	Dissolved Cadmium (Cd)	2018/10/26	103	80 - 120	100	80 - 120	<0.10	ug/L	NC	20		
5804619	Dissolved Calcium (Ca)	2018/10/26	NC	80 - 120	99	80 - 120	<200	ug/L	1.0	20		
5804619	Dissolved Chromium (Cr)	2018/10/26	98	80 - 120	97	80 - 120	<5.0	ug/L	NC	20		
5804619	Dissolved Cobalt (Co)	2018/10/26	98	80 - 120	97	80 - 120	<0.50	ug/L	0.66	20		
5804619	Dissolved Copper (Cu)	2018/10/26	101	80 - 120	100	80 - 120	<1.0	ug/L	6.6	20		
5804619	Dissolved Iron (Fe)	2018/10/26	101	80 - 120	100	80 - 120	<100	ug/L	NC	20		
5804619	Dissolved Lead (Pb)	2018/10/26	95	80 - 120	93	80 - 120	<0.50	ug/L	NC	20		
5804619	Dissolved Magnesium (Mg)	2018/10/26	98	80 - 120	99	80 - 120	<50	ug/L	0.44	20		
5804619	Dissolved Manganese (Mn)	2018/10/26	98	80 - 120	98	80 - 120	<2.0	ug/L	0.066	20		
5804619	Dissolved Molybdenum (Mo)	2018/10/26	106	80 - 120	101	80 - 120	<0.50	ug/L	4.3	20		
5804619	Dissolved Nickel (Ni)	2018/10/26	97	80 - 120	97	80 - 120	<1.0	ug/L	2.0	20		
5804619	Dissolved Potassium (K)	2018/10/26	100	80 - 120	100	80 - 120	<200	ug/L	2.1	20		
5804619	Dissolved Selenium (Se)	2018/10/26	103	80 - 120	101	80 - 120	<2.0	ug/L	NC	20		
5804619	Dissolved Silicon (Si)	2018/10/26	100	80 - 120	99	80 - 120	<50	ug/L	1.9	20		
5804619	Dissolved Sodium (Na)	2018/10/26	NC	80 - 120	97	80 - 120	<100	ug/L	0.41	20		
5804619	Dissolved Strontium (Sr)	2018/10/26	NC	80 - 120	97	80 - 120	<1.0	ug/L	0.77	20		
5804619	Dissolved Thallium (Tl)	2018/10/26	95	80 - 120	94	80 - 120	<0.050	ug/L	NC	20		
5804619	Dissolved Tin (Sn)	2018/10/26	105	80 - 120	101	80 - 120	<1.0	ug/L	NC	20		
5804619	Dissolved Vanadium (V)	2018/10/26	102	80 - 120	98	80 - 120	<0.50	ug/L	NC	20		

Maxxam Job #: B8R7295
Report Date: 2018/10/26

QUALITY ASSURANCE REPORT(CONT'D)

exp Services Inc
Client Project #: THB-00006196-NE
Site Location: Longlac Landfill - Fall Sampling Event
Sampler Initials: KK

			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
5804619	Dissolved Zinc (Zn)	2018/10/26	98	80 - 120	97	80 - 120	<5.0	ug/L	7.1	20		

N/A = Not Applicable

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

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

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

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

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

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

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

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

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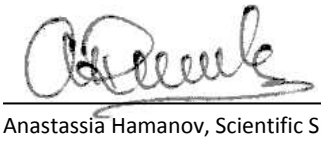
Maxxam Job #: B8R7295
Report Date: 2018/10/26

exp Services Inc
Client Project #: THB-00006196-NE
Site Location: Longlac Landfill - Fall Sampling Event
Sampler Initials: KK

VALIDATION SIGNATURE PAGE

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



Anastassia Hamanov, Scientific Specialist

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

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CHAIN OF CUSTODY RECORD

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#17501 exp Services Inc	Company Name:		Quotation #:	B75391	Maxxam Job #:	Bottle Order #: 684820
Attention:	accounts payable	Attention:	Jay Zhang Kristof Karpiuk	P.O. #:			
Address:	1142 Roland St Thunder Bay ON P7B 5M4	Address:		Project:	THB-00006196-NE		
Tel:	(807) 623-9495 Fax: (807) 623-8070	Tel:	(807) 623-9495 Fax:	Project Name:		COC #: C#684820-01-01	Project Manager: Michelle Brescacin
Email:	thunderbay@exp.com; Karen.Burke@exp.com;AP@ex	Email:	jay.zhang@exp.com Kristof.karpiuk@exp.com	Site #:	Longlac Landfill		
				Sampled By:			

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011)
- ☐ Table 1 ☐ Res/Park ☐ Medium/Fine
- ☐ Table 2 ☐ Ind/Comm ☐ Coarse
- ☐ Table 3 ☐ Agri/Other ☐ For RSC
- ☐ Table ___

Other Regulations
- ☐ CCME ☐ Sanitary Sewer Bylaw
- ☐ Reg 558 ☐ Storm Sewer Bylaw
- ☐ MISA Municipality ___
- ☐ PWQO
- ☒ Other ODWS

Special Instructions

Include Criteria on Certificate of Analysis (Y/N)? ___

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects

Regular (Standard) TAT: ☒
(will be applied if Rush TAT is not specified)
Standard TAT = 5-7 Working days for most tests..
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: ___ Time Required: ___ ☐
Rush Confirmation Number: ___ *(call lab for #)*

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Cr VI	Landfill Standards Sch 5 - GW Comp. List	Ion Balance (% Difference)	Organic Nitrogen	Orthophosphate	Hardness	Extra Dissolved Metals Parameters	Volatile Organic Compounds in Water				# of Bottles	Comments
1		MW2	Oct 16 18	1:53pm	GW	X	X	X	X	X	X	X					7	
2		MW3	Oct 16 18	4:10pm	GW	X	X	X	X	X	X	X					7	
3		MW4I	Oct 16 18	10:17am	GW	X	X	X	X	X	X	X					7	
4		MW4II	Oct 16 18	3:40pm	GW	X	X	X	X	X	X	X					7	
5		MW5	Oct 16 18	3:00pm	GW	X	X	X	X	X	X	X					7	
6		MW6	Oct 16 18	2:50pm	GW	X	X	X	X	X	X	X	X				10	
7		MW7	Oct 16 18	8:55am	GW	X	X	X	X	X	X	X	X				10	
8		MW8I	Oct 16 18	8:16am	GW	X	X	X	X	X	X	X	X				10	
9		MW8II	Oct 16 18	10:42am	GW	X	X	X	X	X	X	X	X				10	
10		MW9	Oct 16 18	11:05pm	GW	X	X	X	X	X	X	X					7	

18-Oct-18 18:00
Michelle Brescacin
B8R7295
GID ENV-1162

HT

RECEIVED TBay

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
Kristof Karpiuk	18/10/18	11:10am	MBrescacin Michelle Brescacin	18/10/18	13:00	
			Julie Gauthier Julie Gauthier	18/10/19	09:45	

Laboratory Use Only

Time Sensitive	Temperature (°C) on Recei	Custody Seal Present	Yes	No
	1 2 1 2 -2 1 -1 1 -3	Intact		N/A
	-4 1 0 1 0 -0 1 -1 1 -3			
	1 2 1 2			
	2 1 3 1 2			
	1 1 1 1			
	2 1 1 1			

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO MAXXAM'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.MAXXAM.CA/TERMS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT HTTP://MAXXAM.CA/WP-CONTENT/UPLOADS/ONTARIO-COC.PDF.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

White: Maxxa Yellow: Client

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6740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel:(905) 817-5700 Toll-free:800-563-6266 Fax:(905) 817-5777 www.maxxam.ca

CHAIN OF CUSTODY RECORD

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#17501 exp Services Inc	Company Name:		Quotation #:	B75391	Maxxam Job #:	Bottle Order #:
Attention:	accounts payable	Attention:	Jay Zhang & Kristof Harpiuk	P.O. #:			684820
Address:	1142 Roland St Thunder Bay ON P7B 5M4	Address:		Project:	THB-00006196-NE	COC #:	Project Manager:
Tel:	(807) 623-9495 Fax: (807) 623-8070	Tel:	(807) 623-9495 Fax:	Project Name:		C#684820-02-01	Michelle Brescacin
Email:	thunderbay@exp.com; Karen.Burke@exp.com;AP@ex	Email:	jay.zhang@exp.com Kristof.Harpiuk@exp.com	Site #:	Longlac Landfill		
				Sampled By:			

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011)
☐ Table 1 ☐ Res/Park ☐ Medium/Fine
☐ Table 2 ☐ Ind/Comm ☐ Coarse
☐ Table 3 ☐ Agri/Other ☐ For RSC
☐ Table ___

Other Regulations
☐ CCME ☐ Sanitary Sewer Bylaw
☐ Reg 558 ☐ Storm Sewer Bylaw
☐ MISA Municipality ___
☐ PWQO
☒ Other ODWS

Special Instructions

Include Criteria on Certificate of Analysis (Y/N)? ___

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects

Regular (Standard) TAT: ☒
(will be applied if Rush TAT is not specified):
Standard TAT = 5-7 Working days for most tests...
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: ___ Time Required: ___ ☐
Rush Confirmation Number: ___ *(call lab for #)*

ANALYSIS REQUESTED (PLEASE BE SPECIFIC)

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): (Metals / HG / Cr VI)	Landfill Standards Sch 5 - GW Comp. List	Ion Balance (% Difference)	Organic Nitrogen	Orthophosphate	Hardness	Extra Dissolved Metals Parameters	Volatile Organic Compounds in Water				# of Bottles	Comments
1		MW10	Oct16/18	3:20pm	GW	X	X	X	X	X	X	X					7	
2		MW11I	Oct16/18	1:00pm	GW	X	X	X	X	X	X	X					7	
3		MW11II	Oct16/18	12:50pm	GW	X	X	X	X	X	X	X					7	
4		MW12I	Oct16/18	3:55pm	GW	X	X	X	X	X	X	X					7	
5		MW12II	Oct16/18	12:10pm	GW	X	X	X	X	X	X	X					7	
6		MW13	Oct16/18	8:15am	GW	X	X	X	X	X	X	X	X				10	
7					GW													
8					GW													
9					GW													
10					GW													

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Laboratory Use Only				
Kristof Harpiuk	18/10/18	11:15am	Del page 1 pg page one				Time Sensitive	Temperature (°C) on Recei	Custody Seal	Yes	No
									Present		
									Intact		

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO MAXXAM'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.MAXXAM.CA/TERMS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT HTTP://MAXXAM.CA/WP-CONTENT/UPLOADS/ONTARIO-COC.PDF.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

White: Maxxa Yellow: Client

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A Bureau Veritas Group Company

Maxxam Analytics International Corporation o/a Maxxam Analytics
6740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel:(905) 817-5700 Toll-free:800-563-6266 Fax:(905) 817-5777 www.maxxam.ca

CHAIN OF CUSTODY RECORD

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#17501 exp Services Inc	Company Name:		Quotation #:	B75391	Maxxam Job #:	Bottle Order #:
Attention:	accounts payable	Attention:	Jay Zhang / Kristof Karpiuk	P.O. #:			684821
Address:	1142 Roland St Thunder Bay ON P7B 5M4	Address:		Project:	THB-00006196-NE	COC #:	Project Manager:
Tel:	(807) 623-9495 Fax: (807) 623-8070	Tel:	(807) 623-9495 Fax:	Project Name:		C#684821-01-01	Michelle Brescacin
Email:	thunderbay@exp.com; Karen.Burke@exp.com;AP@ex	Email:	jay.zhang@exp.com Kristof.Karpiuk@exp.com	Site #:	Longlac Landfill		
				Sampled By:			

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011)
- ☐ Table 1 ☐ Res/Park ☐ Medium/Fine
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- ☐ Table 3 ☐ Agri/Other ☐ For RSC
- ☐ Table ___

Other Regulations
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- ☐ MISA Municipality ___
- ☒ PWQO
- ☐ Other ___

Special Instructions

Include Criteria on Certificate of Analysis (Y/N)? ___

ANALYSIS REQUESTED (PLEASE BE SPECIFIC)

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects

Regular (Standard) TAT: ☒
(will be applied if Rush TAT is not specified)
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: ___ Time Required: ___ ☐
Rush Confirmation Number: ___ *(call lab for #)*

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Cr VI	Landfill Standards Sch 5 - SW Comp. List	Dissolved Aluminum (0.2 u, clay free)	Organic Nitrogen	Dissolved Organic Carbon (DOC)	Extra Total Metals Parameters	Hardness (including Ca, Mg, Na, K)	# of Bottles	Comments
1		SW1	4:20pm	Oct 16/18	SW	X	X	X	X	X	X	X	9	
2		SW2	Oct16/18	11:29am	SW	X	X	X	X	X	X	X	9	
3		SW3	Oct16/18	11:20am	SW	X	X	X	X	X	X	X	9	
4														
5														
6														
7														
8														
9														
10														

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Laboratory Use Only				
Kristof Karpiuk	18/10/18	11:15am	Doj page 1 Sdc page one				Time Sensitive	Temperature (°C) on Recei	Custody Seal	Yes	No
									Present		
									Intact		

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SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

White: Maxxa Yellow: Client

Maxxam Analytics International Corporation o/a Maxxam Analytics

Your Project #: THB-00006196-OE
Site#: Longlac Landfill
Site Location: Longlac Landfill - Spring Sampling Event

Attention: Kristof Karpiuk

exp Services Inc
Thunder Bay Branch
1142 Roland St
Thunder Bay, ON
CANADA P7B 5M4

Your C.O.C. #: 715306-01-01, 715306-03-01, 715307-01-01

Report Date: 2019/05/16
Report #: R5714619
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B9C5104
Received: 2019/05/09, 14:15

Sample Matrix: Water
Samples Received: 18

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Dissolved Aluminum (0.2 u, clay free)	3	N/A	2019/05/13	CAM SOP-00447	EPA 6020B m
Alkalinity	17	N/A	2019/05/12	CAM SOP-00448	SM 23 2320 B m
Alkalinity	1	N/A	2019/05/13	CAM SOP-00448	SM 23 2320 B m
Biochemical Oxygen Demand (BOD)	3	2019/05/10	2019/05/15	CAM SOP-00427	SM 23 5210B m
Chloride by Automated Colourimetry	3	N/A	2019/05/13	CAM SOP-00463	SM 4500-Cl E m
Chloride by Automated Colourimetry	15	N/A	2019/05/14	CAM SOP-00463	SM 4500-Cl E m
Chemical Oxygen Demand	18	N/A	2019/05/14	CAM SOP-00416	SM 23 5220 D m
Conductivity	17	N/A	2019/05/12	CAM SOP-00414	SM 23 2510 m
Conductivity	1	N/A	2019/05/13	CAM SOP-00414	SM 23 2510 m
Dissolved Organic Carbon (DOC) (1)	17	N/A	2019/05/13	CAM SOP-00446	SM 23 5310 B m
Dissolved Organic Carbon (DOC) (1)	1	N/A	2019/05/14	CAM SOP-00446	SM 23 5310 B m
Hardness (calculated as CaCO3)	10	N/A	2019/05/14	CAM SOP 00102/00408/00447	SM 2340 B
Hardness (calculated as CaCO3)	5	N/A	2019/05/15	CAM SOP 00102/00408/00447	SM 2340 B
Hardness (calculated as CaCO3)	3	N/A	2019/05/16	CAM SOP 00102/00408/00447	SM 2340 B
Mercury in Water by CVAA	18	2019/05/15	2019/05/15	CAM SOP-00453	EPA 7470A m
Dissolved Calcium and Magnesium	3	2019/05/11	2019/05/15	CAM SOP-00408	EPA 6010D m
Dissolved Metals by ICPMS	15	N/A	2019/05/14	CAM SOP-00447	EPA 6020B m
Total Metals Analysis by ICPMS	3	N/A	2019/05/15	CAM SOP-00447	EPA 6020B m
Ion Balance (% Difference)	5	N/A	2019/05/14		
Ion Balance (% Difference)	10	N/A	2019/05/15		
Total Ammonia-N	6	N/A	2019/05/14	CAM SOP-00441	EPA GS I-2522-90 m
Total Ammonia-N	12	N/A	2019/05/15	CAM SOP-00441	EPA GS I-2522-90 m
Nitrate (NO3) and Nitrite (NO2) in Water (2)	18	N/A	2019/05/12	CAM SOP-00440	SM 23 4500-NO3I/NO2B
Organic Nitrogen	16	N/A	2019/05/15		
Organic Nitrogen	2	N/A	2019/05/16		
pH	17	2019/05/10	2019/05/12	CAM SOP-00413	SM 4500H+ B m

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Your Project #: THB-00006196-OE
Site#: Longlac Landfill
Site Location: Longlac Landfill - Spring Sampling Event

Attention: Kristof Karpiuk

exp Services Inc
Thunder Bay Branch
1142 Roland St
Thunder Bay, ON
CANADA P7B 5M4

Your C.O.C. #: 715306-01-01, 715306-03-01, 715307-01-01

Report Date: 2019/05/16
Report #: R5714619
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B9C5104
Received: 2019/05/09, 14:15

Sample Matrix: Water
Samples Received: 18

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
pH	1	2019/05/10	2019/05/13	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	18	N/A	2019/05/13	CAM SOP-00444	OMOE E3179 m
Orthophosphate	15	N/A	2019/05/13	CAM SOP-00461	EPA 365.1 m
Sulphate by Automated Colourimetry	18	N/A	2019/05/13	CAM SOP-00464	EPA 375.4 m
Total Dissolved Solids	7	2019/05/10	2019/05/13	CAM SOP-00428	SM 23 2540C m
Total Dissolved Solids	3	2019/05/11	2019/05/13	CAM SOP-00428	SM 23 2540C m
Total Dissolved Solids	8	2019/05/13	2019/05/14	CAM SOP-00428	SM 23 2540C m
Total Kjeldahl Nitrogen in Water	10	2019/05/13	2019/05/14	CAM SOP-00938	OMOE E3516 m
Total Kjeldahl Nitrogen in Water	8	2019/05/13	2019/05/15	CAM SOP-00938	OMOE E3516 m
Total Phosphorus (Colourimetric)	3	2019/05/13	2019/05/14	CAM SOP-00407	SM 23 4500 P B H m
Total Phosphorus (Colourimetric)	5	2019/05/13	2019/05/16	CAM SOP-00407	SM 23 4500 P B H m
Total Phosphorus (Colourimetric)	10	2019/05/14	2019/05/14	CAM SOP-00407	SM 23 4500 P B H m
Low Level Total Suspended Solids	3	2019/05/10	2019/05/13	CAM SOP-00428	SM 23 2540D m

Remarks:

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

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

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

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Your Project #: THB-00006196-OE
Site#: Longlac Landfill
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Attention: Kristof Karpiuk

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MAXXAM JOB #: B9C5104
Received: 2019/05/09, 14:15

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Maxxam, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.
(1) Dissolved Organic Carbon (DOC) present in the sample should be considered as non-purgeable DOC.
(2) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Michelle Brescacin, Project Manager Assistant
Email: MBrescacin@maxxam.ca
Phone# (807)344-4220
==========
This report has been generated and distributed using a secure automated process.
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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Maxxam Job #: B9C5104
Report Date: 2019/05/16

exp Services Inc
Client Project #: THB-00006196-OE
Site Location: Longlac Landfill - Spring Sampling Event
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		JRH117			JRH117		
Sampling Date		2019/05/07 11:05			2019/05/07 11:05		
COC Number		715306-01-01			715306-01-01		
	UNITS	**MW3**	**RDL**	**QC Batch**	**MW3 Lab-Dup**	**RDL**	**QC Batch**
Inorganics							
Total Ammonia-N	mg/L	0.75	0.050	6118279			
Total Chemical Oxygen Demand (COD)	mg/L	<4.0	4.0	6116380			
Conductivity	umho/cm	470	1.0	6115753			
Total Dissolved Solids	mg/L	270	10	6115815			
Total Kjeldahl Nitrogen (TKN)	mg/L	0.75	0.10	6118943			
Dissolved Organic Carbon	mg/L	1.6	0.50	6117015	1.6	0.50	6117015
pH	pH	8.03		6115755			
Phenols-4AAP	mg/L	<0.0010	0.0010	6117992	<0.0010	0.0010	6117992
Total Phosphorus	mg/L	0.65	0.10	6118307			
Dissolved Sulphate (SO4)	mg/L	<1.0	1.0	6115721			
Alkalinity (Total as CaCO3)	mg/L	250	1.0	6115750			
Dissolved Chloride (Cl-)	mg/L	1.0	1.0	6115714			
Nitrite (N)	mg/L	<0.010	0.010	6115767			
Nitrate (N)	mg/L	<0.10	0.10	6115767			
Metals							
Mercury (Hg)	mg/L	<0.0001	0.0001	6122227			
Dissolved Aluminum (Al)	ug/L	<5.0	5.0	6118813			
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	6118813			
Dissolved Arsenic (As)	ug/L	3.4	1.0	6118813			
Dissolved Barium (Ba)	ug/L	54	2.0	6118813			
Dissolved Beryllium (Be)	ug/L	<0.50	0.50	6118813			
Dissolved Bismuth (Bi)	ug/L	<1.0	1.0	6118813			
Dissolved Boron (B)	ug/L	28	10	6118813			
Dissolved Cadmium (Cd)	ug/L	<0.10	0.10	6118813			
Dissolved Calcium (Ca)	ug/L	63000	200	6118813			
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	6118813			
Dissolved Cobalt (Co)	ug/L	<0.50	0.50	6118813			
Dissolved Copper (Cu)	ug/L	<1.0	1.0	6118813			
Dissolved Iron (Fe)	ug/L	1400	100	6118813			
Dissolved Lead (Pb)	ug/L	<0.50	0.50	6118813			
Dissolved Magnesium (Mg)	ug/L	17000	50	6118813			
Dissolved Manganese (Mn)	ug/L	65	2.0	6118813			
Dissolved Molybdenum (Mo)	ug/L	<0.50	0.50	6118813			

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

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Maxxam Job #: B9C5104
Report Date: 2019/05/16

exp Services Inc
Client Project #: THB-00006196-OE
Site Location: Longlac Landfill - Spring Sampling Event
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		JRH117			JRH117		
Sampling Date		2019/05/07 11:05			2019/05/07 11:05		
COC Number		715306-01-01			715306-01-01		
	UNITS	**MW3**	**RDL**	**QC Batch**	**MW3 Lab-Dup**	**RDL**	**QC Batch**
Dissolved Nickel (Ni)	ug/L	<1.0	1.0	6118813			
Dissolved Potassium (K)	ug/L	1100	200	6118813			
Dissolved Selenium (Se)	ug/L	<2.0	2.0	6118813			
Dissolved Silicon (Si)	ug/L	8100	50	6118813			
Dissolved Sodium (Na)	ug/L	8100	100	6118813			
Dissolved Strontium (Sr)	ug/L	270	1.0	6118813			
Dissolved Thallium (Tl)	ug/L	<0.050	0.050	6118813			
Dissolved Tin (Sn)	ug/L	<1.0	1.0	6118813			
Dissolved Vanadium (V)	ug/L	<0.50	0.50	6118813			
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	6118813			

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

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Maxxam Job #: B9C5104
Report Date: 2019/05/16

exp Services Inc
Client Project #: THB-00006196-OE
Site Location: Longlac Landfill - Spring Sampling Event
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		JRH118			JRH119		
Sampling Date		2019/05/07 21:35			2019/05/07 21:15		
COC Number		715306-01-01			715306-01-01		
	UNITS	**MW4I**	**RDL**	**QC Batch**	**MW4II**	**RDL**	**QC Batch**
Inorganics							
Total Ammonia-N	mg/L	0.084	0.050	6118279	2.0	0.050	6118279
Total Chemical Oxygen Demand (COD)	mg/L	<4.0	4.0	6116380	10	4.0	6116380
Conductivity	umho/cm	630	1.0	6115753	1600	1.0	6115753
Total Dissolved Solids	mg/L	345	10	6115815	930	10	6115815
Total Kjeldahl Nitrogen (TKN)	mg/L	0.16	0.10	6118497	3.1	0.10	6118943
Dissolved Organic Carbon	mg/L	2.5	0.50	6117009	7.3	0.50	6117009
pH	pH	8.20		6115755	7.99		6115755
Phenols-4AAP	mg/L	<0.0010	0.0010	6117992	<0.0010	0.0010	6117992
Total Phosphorus	mg/L	0.071	0.020	6118307	16	0.40	6118307
Dissolved Sulphate (SO4)	mg/L	<1.0	1.0	6115721	<1.0	1.0	6115721
Alkalinity (Total as CaCO3)	mg/L	340	1.0	6115750	830	1.0	6115750
Dissolved Chloride (Cl-)	mg/L	2.2	1.0	6115714	11	1.0	6115714
Nitrite (N)	mg/L	<0.010	0.010	6115767	1.18	0.010	6115807
Nitrate (N)	mg/L	0.26	0.10	6115767	1.83	0.10	6115807
Metals							
Mercury (Hg)	mg/L	<0.0001	0.0001	6122260	<0.0001	0.0001	6122227
Dissolved Aluminum (Al)	ug/L	<5.0	5.0	6118813	<5.0	5.0	6118813
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	6118813	<0.50	0.50	6118813
Dissolved Arsenic (As)	ug/L	<1.0	1.0	6118813	<1.0	1.0	6118813
Dissolved Barium (Ba)	ug/L	65	2.0	6118813	95	2.0	6118813
Dissolved Beryllium (Be)	ug/L	<0.50	0.50	6118813	<0.50	0.50	6118813
Dissolved Bismuth (Bi)	ug/L	<1.0	1.0	6118813	<1.0	1.0	6118813
Dissolved Boron (B)	ug/L	66	10	6118813	750	10	6118813
Dissolved Cadmium (Cd)	ug/L	<0.10	0.10	6118813	<0.10	0.10	6118813
Dissolved Calcium (Ca)	ug/L	77000	200	6118813	61000	200	6118813
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	6118813	<5.0	5.0	6118813
Dissolved Cobalt (Co)	ug/L	<0.50	0.50	6118813	0.74	0.50	6118813
Dissolved Copper (Cu)	ug/L	2.9	1.0	6118813	5.4	1.0	6118813
Dissolved Iron (Fe)	ug/L	<100	100	6118813	<100	100	6118813
Dissolved Lead (Pb)	ug/L	<0.50	0.50	6118813	<0.50	0.50	6118813
Dissolved Magnesium (Mg)	ug/L	30000	50	6118813	82000	50	6118813
Dissolved Manganese (Mn)	ug/L	<2.0	2.0	6118813	39	2.0	6118813
Dissolved Molybdenum (Mo)	ug/L	2.9	0.50	6118813	3.7	0.50	6118813

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B9C5104
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exp Services Inc
Client Project #: THB-00006196-OE
Site Location: Longlac Landfill - Spring Sampling Event
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		JRH118			JRH119		
Sampling Date		2019/05/07 21:35			2019/05/07 21:15		
COC Number		715306-01-01			715306-01-01		
	UNITS	**MW4I**	**RDL**	**QC Batch**	**MW4II**	**RDL**	**QC Batch**
Dissolved Nickel (Ni)	ug/L	<1.0	1.0	6118813	2.2	1.0	6118813
Dissolved Potassium (K)	ug/L	7300	200	6118813	170000	200	6118813
Dissolved Selenium (Se)	ug/L	<2.0	2.0	6118813	<2.0	2.0	6118813
Dissolved Silicon (Si)	ug/L	7900	50	6118813	3500	50	6118813
Dissolved Sodium (Na)	ug/L	12000	100	6118813	19000	100	6118813
Dissolved Strontium (Sr)	ug/L	470	1.0	6118813	150	1.0	6118813
Dissolved Thallium (Tl)	ug/L	<0.050	0.050	6118813	<0.050	0.050	6118813
Dissolved Tin (Sn)	ug/L	<1.0	1.0	6118813	<1.0	1.0	6118813
Dissolved Vanadium (V)	ug/L	<0.50	0.50	6118813	<0.50	0.50	6118813
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	6118813	<5.0	5.0	6118813

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B9C5104
Report Date: 2019/05/16

exp Services Inc
Client Project #: THB-00006196-OE
Site Location: Longlac Landfill - Spring Sampling Event
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		JRH120			JRH120		
Sampling Date		2019/05/08 09:50			2019/05/08 09:50		
COC Number		715306-01-01			715306-01-01		
	UNITS	**MW5**	**RDL**	**QC Batch**	**MW5 Lab-Dup**	**RDL**	**QC Batch**
Inorganics							
Total Ammonia-N	mg/L	0.099	0.050	6118279			
Total Chemical Oxygen Demand (COD)	mg/L	<4.0	4.0	6116380			
Conductivity	umho/cm	500	1.0	6115753			
Total Dissolved Solids	mg/L	320	10	6115815			
Total Kjeldahl Nitrogen (TKN)	mg/L	<0.10	0.10	6118289			
Dissolved Organic Carbon	mg/L	1.0	0.50	6117009			
pH	pH	8.09		6115755			
Phenols-4AAP	mg/L	<0.0010	0.0010	6117992			
Total Phosphorus	mg/L	0.47	0.10	6118307			
Dissolved Sulphate (SO4)	mg/L	1.6	1.0	6115721			
Alkalinity (Total as CaCO3)	mg/L	270	1.0	6115750			
Dissolved Chloride (Cl-)	mg/L	<1.0	1.0	6115714			
Nitrite (N)	mg/L	<0.010	0.010	6115767			
Nitrate (N)	mg/L	0.24	0.10	6115767			
Metals							
Mercury (Hg)	mg/L	<0.0001	0.0001	6122260	<0.0001	0.0001	6122260
Dissolved Aluminum (Al)	ug/L	<5.0	5.0	6118813			
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	6118813			
Dissolved Arsenic (As)	ug/L	<1.0	1.0	6118813			
Dissolved Barium (Ba)	ug/L	22	2.0	6118813			
Dissolved Beryllium (Be)	ug/L	<0.50	0.50	6118813			
Dissolved Bismuth (Bi)	ug/L	<1.0	1.0	6118813			
Dissolved Boron (B)	ug/L	<10	10	6118813			
Dissolved Cadmium (Cd)	ug/L	<0.10	0.10	6118813			
Dissolved Calcium (Ca)	ug/L	82000	200	6118813			
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	6118813			
Dissolved Cobalt (Co)	ug/L	<0.50	0.50	6118813			
Dissolved Copper (Cu)	ug/L	2.8	1.0	6118813			
Dissolved Iron (Fe)	ug/L	<100	100	6118813			
Dissolved Lead (Pb)	ug/L	<0.50	0.50	6118813			
Dissolved Magnesium (Mg)	ug/L	18000	50	6118813			
Dissolved Manganese (Mn)	ug/L	<2.0	2.0	6118813			
Dissolved Molybdenum (Mo)	ug/L	<0.50	0.50	6118813			

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

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Maxxam Job #: B9C5104
Report Date: 2019/05/16

exp Services Inc
Client Project #: THB-00006196-OE
Site Location: Longlac Landfill - Spring Sampling Event
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		JRH120			JRH120		
Sampling Date		2019/05/08 09:50			2019/05/08 09:50		
COC Number		715306-01-01			715306-01-01		
	UNITS	**MW5**	**RDL**	**QC Batch**	**MW5 Lab-Dup**	**RDL**	**QC Batch**
Dissolved Nickel (Ni)	ug/L	<1.0	1.0	6118813			
Dissolved Potassium (K)	ug/L	900	200	6118813			
Dissolved Selenium (Se)	ug/L	<2.0	2.0	6118813			
Dissolved Silicon (Si)	ug/L	6100	50	6118813			
Dissolved Sodium (Na)	ug/L	2600	100	6118813			
Dissolved Strontium (Sr)	ug/L	74	1.0	6118813			
Dissolved Thallium (Tl)	ug/L	<0.050	0.050	6118813			
Dissolved Tin (Sn)	ug/L	<1.0	1.0	6118813			
Dissolved Vanadium (V)	ug/L	0.74	0.50	6118813			
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	6118813			

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

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exp Services Inc
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Site Location: Longlac Landfill - Spring Sampling Event
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		JRH121			JRH122			JRH122		
Sampling Date		2019/05/08 10:50			2019/05/07 19:30			2019/05/07 19:30		
COC Number		715306-01-01			715306-01-01			715306-01-01		
	UNITS	**MW6**	**RDL**	**QC Batch**	**MW7**	**RDL**	**QC Batch**	**MW7 Lab-Dup**	**RDL**	**QC Batch**
Inorganics										
Total Ammonia-N	mg/L	19 (1)	0.050	6118279	7.6	0.050	6119298			
Total Chemical Oxygen Demand (COD)	mg/L	<4.0	4.0	6116380	24	4.0	6118622			
Conductivity	umho/cm	920	1.0	6115753	1800	1.0	6115914	1800	1.0	6115914
Total Dissolved Solids	mg/L	485	10	6115815	1320	10	6115815			
Total Kjeldahl Nitrogen (TKN)	mg/L	17 (1)	0.50	6118943	10	2.0	6118305			
Dissolved Organic Carbon	mg/L	3.4	0.50	6117009	8.9	0.50	6117009			
pH	pH	7.89		6115755	7.58		6115916	7.57		6115916
Phenols-4AAP	mg/L	<0.0010	0.0010	6117992	<0.0010	0.0010	6117989			
Total Phosphorus	mg/L	0.52	0.10	6118307	0.71	0.040	6119924			
Dissolved Sulphate (SO4)	mg/L	23	1.0	6115721	89	1.0	6117145			
Alkalinity (Total as CaCO3)	mg/L	430	1.0	6115750	470	1.0	6115913	470	1.0	6115913
Dissolved Chloride (Cl-)	mg/L	20	1.0	6115714	66	1.0	6117143			
Nitrite (N)	mg/L	0.120	0.010	6115807	0.636	0.010	6115807			
Nitrate (N)	mg/L	0.29	0.10	6115807	90.7	5.0	6115807			
Metals										
Mercury (Hg)	mg/L	<0.0001	0.0001	6122227	<0.0001	0.0001	6122456			
Dissolved Aluminum (Al)	ug/L	<5.0	5.0	6118813	<5.0	5.0	6118867			
Dissolved Antimony (Sb)	ug/L	2.1	0.50	6118813	<0.50	0.50	6118867			
Dissolved Arsenic (As)	ug/L	<1.0	1.0	6118813	<1.0	1.0	6118867			
Dissolved Barium (Ba)	ug/L	44	2.0	6118813	170	2.0	6118867			
Dissolved Beryllium (Be)	ug/L	<0.50	0.50	6118813	<0.50	0.50	6118867			
Dissolved Bismuth (Bi)	ug/L	<1.0	1.0	6118813	<1.0	1.0	6118867			
Dissolved Boron (B)	ug/L	19	10	6118813	350	10	6118867			
Dissolved Cadmium (Cd)	ug/L	<0.10	0.10	6118813	<0.10	0.10	6118867			
Dissolved Calcium (Ca)	ug/L	110000	200	6118813	220000	200	6118867			
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	6118813	<5.0	5.0	6118867			
Dissolved Cobalt (Co)	ug/L	<0.50	0.50	6118813	6.0	0.50	6118867			
Dissolved Copper (Cu)	ug/L	5.5	1.0	6118813	7.0	1.0	6118867			
Dissolved Iron (Fe)	ug/L	<100	100	6118813	<100	100	6118867			
Dissolved Lead (Pb)	ug/L	<0.50	0.50	6118813	<0.50	0.50	6118867			
Dissolved Magnesium (Mg)	ug/L	13000	50	6118813	45000	50	6118867			
Dissolved Manganese (Mn)	ug/L	120	2.0	6118813	630	2.0	6118867			

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
(1) TKN < NH4: Both values fall within acceptable RPD limits for duplicates and are likely equivalent.

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Maxxam Job #: B9C5104
Report Date: 2019/05/16

exp Services Inc
Client Project #: THB-00006196-OE
Site Location: Longlac Landfill - Spring Sampling Event
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		JRH121			JRH122			JRH122		
Sampling Date		2019/05/08 10:50			2019/05/07 19:30			2019/05/07 19:30		
COC Number		715306-01-01			715306-01-01			715306-01-01		
	UNITS	**MW6**	**RDL**	**QC Batch**	**MW7**	**RDL**	**QC Batch**	**MW7 Lab-Dup**	**RDL**	**QC Batch**
Dissolved Molybdenum (Mo)	ug/L	0.80	0.50	6118813	<0.50	0.50	6118867			
Dissolved Nickel (Ni)	ug/L	1.6	1.0	6118813	12	1.0	6118867			
Dissolved Potassium (K)	ug/L	1200	200	6118813	36000	200	6118867			
Dissolved Selenium (Se)	ug/L	<2.0	2.0	6118813	<2.0	2.0	6118867			
Dissolved Silicon (Si)	ug/L	2700	50	6118813	6500	50	6118867			
Dissolved Sodium (Na)	ug/L	22000	100	6118813	60000	100	6118867			
Dissolved Strontium (Sr)	ug/L	130	1.0	6118813	260	1.0	6118867			
Dissolved Thallium (Tl)	ug/L	<0.050	0.050	6118813	0.091	0.050	6118867			
Dissolved Tin (Sn)	ug/L	<1.0	1.0	6118813	<1.0	1.0	6118867			
Dissolved Vanadium (V)	ug/L	<0.50	0.50	6118813	<0.50	0.50	6118867			
Dissolved Zinc (Zn)	ug/L	6.4	5.0	6118813	<5.0	5.0	6118867			

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

Maxxam Job #: B9C5104
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exp Services Inc
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LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		JRH123			JRH124		
Sampling Date		2019/05/07 18:35			2019/05/07 18:55		
COC Number		715306-01-01			715306-01-01		
	UNITS	**MW8I**	**RDL**	**QC Batch**	**MW8II**	**RDL**	**QC Batch**
Inorganics							
Total Ammonia-N	mg/L	33	0.50	6119298	1.1	0.050	6119298
Total Chemical Oxygen Demand (COD)	mg/L	89	4.0	6118622	5.0	4.0	6118622
Conductivity	umho/cm	3200	1.0	6115753	770	1.0	6115753
Total Dissolved Solids	mg/L	1880	10	6115815	530	10	6117295
Total Kjeldahl Nitrogen (TKN)	mg/L	33	1.0	6118305	1.3	0.10	6118305
Dissolved Organic Carbon	mg/L	33	0.50	6117009	3.6	0.50	6117009
pH	pH	7.64		6115755	7.91		6115755
Phenols-4AAP	mg/L	0.0019	0.0010	6117989	<0.0010	0.0010	6117989
Total Phosphorus	mg/L	0.63	0.10	6119924	1.1	0.040	6119924
Dissolved Sulphate (SO4)	mg/L	340	2.0	6115721	45	1.0	6115721
Alkalinity (Total as CaCO3)	mg/L	1100	1.0	6115750	330	1.0	6115750
Dissolved Chloride (Cl-)	mg/L	200	2.0	6115714	23	1.0	6115714
Nitrite (N)	mg/L	0.022	0.010	6115807	0.100	0.010	6115807
Nitrate (N)	mg/L	<0.10	0.10	6115807	0.46	0.10	6115807
Metals							
Mercury (Hg)	mg/L	<0.0001	0.0001	6122456	<0.0001	0.0001	6122557
Dissolved Aluminum (Al)	ug/L	5.8	5.0	6118867	<5.0	5.0	6118867
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	6118867	<0.50	0.50	6118867
Dissolved Arsenic (As)	ug/L	8.9	1.0	6118867	<1.0	1.0	6118867
Dissolved Barium (Ba)	ug/L	190	2.0	6118867	44	2.0	6118867
Dissolved Beryllium (Be)	ug/L	<0.50	0.50	6118867	<0.50	0.50	6118867
Dissolved Bismuth (Bi)	ug/L	<1.0	1.0	6118867	<1.0	1.0	6118867
Dissolved Boron (B)	ug/L	2400	10	6118867	260	10	6118867
Dissolved Cadmium (Cd)	ug/L	<0.10	0.10	6118867	<0.10	0.10	6118867
Dissolved Calcium (Ca)	ug/L	280000	200	6118867	120000	200	6118867
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	6118867	<5.0	5.0	6118867
Dissolved Cobalt (Co)	ug/L	12	0.50	6118867	0.79	0.50	6118867
Dissolved Copper (Cu)	ug/L	3.0	1.0	6118867	3.5	1.0	6118867
Dissolved Iron (Fe)	ug/L	8400	100	6118867	<100	100	6118867
Dissolved Lead (Pb)	ug/L	<0.50	0.50	6118867	<0.50	0.50	6118867
Dissolved Magnesium (Mg)	ug/L	110000	50	6118867	23000	50	6118867
Dissolved Manganese (Mn)	ug/L	1100	2.0	6118867	67	2.0	6118867
Dissolved Molybdenum (Mo)	ug/L	1.5	0.50	6118867	0.53	0.50	6118867

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B9C5104
Report Date: 2019/05/16

exp Services Inc
Client Project #: THB-00006196-OE
Site Location: Longlac Landfill - Spring Sampling Event
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		JRH123			JRH124		
Sampling Date		2019/05/07 18:35			2019/05/07 18:55		
COC Number		715306-01-01			715306-01-01		
	UNITS	**MW8I**	**RDL**	**QC Batch**	**MW8II**	**RDL**	**QC Batch**
Dissolved Nickel (Ni)	ug/L	19	1.0	6118867	2.7	1.0	6118867
Dissolved Potassium (K)	ug/L	160000	200	6118867	13000	200	6118867
Dissolved Selenium (Se)	ug/L	<2.0	2.0	6118867	<2.0	2.0	6118867
Dissolved Silicon (Si)	ug/L	9500	50	6118867	4300	50	6118867
Dissolved Sodium (Na)	ug/L	190000	100	6118867	23000	100	6118867
Dissolved Strontium (Sr)	ug/L	950	1.0	6118867	180	1.0	6118867
Dissolved Thallium (Tl)	ug/L	0.11	0.050	6118867	<0.050	0.050	6118867
Dissolved Tin (Sn)	ug/L	<1.0	1.0	6118867	<1.0	1.0	6118867
Dissolved Vanadium (V)	ug/L	1.0	0.50	6118867	<0.50	0.50	6118867
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	6118867	<5.0	5.0	6118867

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B9C5104
Report Date: 2019/05/16

exp Services Inc
Client Project #: THB-00006196-OE
Site Location: Longlac Landfill - Spring Sampling Event
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		JRH124			JRH125		
Sampling Date		2019/05/07 18:55			2019/05/07 14:30		
COC Number		715306-01-01			715306-01-01		
	UNITS	**MW8II Lab-Dup**	**RDL**	**QC Batch**	**MW11I**	**RDL**	**QC Batch**
Inorganics							
Total Ammonia-N	mg/L				<0.050	0.050	6119255
Total Chemical Oxygen Demand (COD)	mg/L				12	4.0	6118622
Conductivity	umho/cm				1500	1.0	6115753
Total Dissolved Solids	mg/L				915	10	6117295
Total Kjeldahl Nitrogen (TKN)	mg/L				0.39	0.10	6118305
Dissolved Organic Carbon	mg/L				5.9	0.50	6117009
pH	pH				7.78		6115755
Phenols-4AAP	mg/L	<0.0010	0.0010	6117989	<0.0010	0.0010	6117989
Total Phosphorus	mg/L				0.61	0.040	6119924
Dissolved Sulphate (SO4)	mg/L				100	1.0	6115721
Alkalinity (Total as CaCO3)	mg/L				540	1.0	6115750
Dissolved Chloride (Cl-)	mg/L				120	1.0	6115714
Nitrite (N)	mg/L				<0.010	0.010	6115767
Nitrate (N)	mg/L				<0.10	0.10	6115767
Metals							
Mercury (Hg)	mg/L				<0.0001	0.0001	6122557
Dissolved Aluminum (Al)	ug/L				<5.0	5.0	6118867
Dissolved Antimony (Sb)	ug/L				<0.50	0.50	6118867
Dissolved Arsenic (As)	ug/L				<1.0	1.0	6118867
Dissolved Barium (Ba)	ug/L				120	2.0	6118867
Dissolved Beryllium (Be)	ug/L				<0.50	0.50	6118867
Dissolved Bismuth (Bi)	ug/L				<1.0	1.0	6118867
Dissolved Boron (B)	ug/L				180	10	6118867
Dissolved Cadmium (Cd)	ug/L				<0.10	0.10	6118867
Dissolved Calcium (Ca)	ug/L				210000	200	6118867
Dissolved Chromium (Cr)	ug/L				<5.0	5.0	6118867
Dissolved Cobalt (Co)	ug/L				<0.50	0.50	6118867
Dissolved Copper (Cu)	ug/L				2.3	1.0	6118867
Dissolved Iron (Fe)	ug/L				2800	100	6118867
Dissolved Lead (Pb)	ug/L				<0.50	0.50	6118867
Dissolved Magnesium (Mg)	ug/L				43000	50	6118867
Dissolved Manganese (Mn)	ug/L				110	2.0	6118867
Dissolved Molybdenum (Mo)	ug/L				<0.50	0.50	6118867

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

Maxxam Job #: B9C5104
Report Date: 2019/05/16

exp Services Inc
Client Project #: THB-00006196-OE
Site Location: Longlac Landfill - Spring Sampling Event
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		JRH124			JRH125		
Sampling Date		2019/05/07 18:55			2019/05/07 14:30		
COC Number		715306-01-01			715306-01-01		
	UNITS	**MW8II Lab-Dup**	**RDL**	**QC Batch**	**MW11I**	**RDL**	**QC Batch**
Dissolved Nickel (Ni)	ug/L				2.2	1.0	6118867
Dissolved Potassium (K)	ug/L				3800	200	6118867
Dissolved Selenium (Se)	ug/L				<2.0	2.0	6118867
Dissolved Silicon (Si)	ug/L				5900	50	6118867
Dissolved Sodium (Na)	ug/L				77000	100	6118867
Dissolved Strontium (Sr)	ug/L				220	1.0	6118867
Dissolved Thallium (Tl)	ug/L				<0.050	0.050	6118867
Dissolved Tin (Sn)	ug/L				<1.0	1.0	6118867
Dissolved Vanadium (V)	ug/L				<0.50	0.50	6118867
Dissolved Zinc (Zn)	ug/L				<5.0	5.0	6118867

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Maxxam Job #: B9C5104
Report Date: 2019/05/16

exp Services Inc
Client Project #: THB-00006196-OE
Site Location: Longlac Landfill - Spring Sampling Event
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		JRH126			JRH127			JRH127		
Sampling Date		2019/05/07 14:10			2019/05/08 12:05			2019/05/08 12:05		
COC Number		715306-01-01			715306-03-01			715306-03-01		
	UNITS	**MW11II**	**RDL**	**QC Batch**	**MW12I**	**RDL**	**QC Batch**	**MW12I Lab-Dup**	**RDL**	**QC Batch**
Inorganics										
Total Ammonia-N	mg/L	0.11	0.050	6119298	<0.050	0.050	6119298			
Total Chemical Oxygen Demand (COD)	mg/L	12	4.0	6118622	5.4	4.0	6118622	<4.0	4.0	6118622
Conductivity	umho/cm	1300	1.0	6115914	990	1.0	6115914			
Total Dissolved Solids	mg/L	820	10	6117295	610	10	6117295			
Total Kjeldahl Nitrogen (TKN)	mg/L	0.42	0.10	6118305	0.27	0.10	6118305			
Dissolved Organic Carbon	mg/L	4.6	0.50	6117009	2.0	0.50	6117009			
pH	pH	7.78		6115916	7.80		6115916			
Phenols-4AAP	mg/L	<0.0010	0.0010	6117989	<0.0010	0.0010	6117992			
Total Phosphorus	mg/L	0.81	0.10	6119924	0.052	0.020	6119924			
Dissolved Sulphate (SO4)	mg/L	110	1.0	6117145	87	1.0	6117145	85	1.0	6117145
Alkalinity (Total as CaCO3)	mg/L	420	1.0	6115913	430	1.0	6115913			
Dissolved Chloride (Cl-)	mg/L	110	1.0	6117143	24	1.0	6117143	24	1.0	6117143
Nitrite (N)	mg/L	<0.010	0.010	6115807	<0.010	0.010	6115807			
Nitrate (N)	mg/L	<0.10	0.10	6115807	<0.10	0.10	6115807			
Metals										
Mercury (Hg)	mg/L	<0.0001	0.0001	6122260	<0.0001	0.0001	6122557			
Dissolved Aluminum (Al)	ug/L	<5.0	5.0	6118867	<5.0	5.0	6118867			
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	6118867	<0.50	0.50	6118867			
Dissolved Arsenic (As)	ug/L	1.1	1.0	6118867	<1.0	1.0	6118867			
Dissolved Barium (Ba)	ug/L	150	2.0	6118867	69	2.0	6118867			
Dissolved Beryllium (Be)	ug/L	<0.50	0.50	6118867	<0.50	0.50	6118867			
Dissolved Bismuth (Bi)	ug/L	<1.0	1.0	6118867	<1.0	1.0	6118867			
Dissolved Boron (B)	ug/L	42	10	6118867	440	10	6118867			
Dissolved Cadmium (Cd)	ug/L	<0.10	0.10	6118867	<0.10	0.10	6118867			
Dissolved Calcium (Ca)	ug/L	190000	200	6118867	160000	200	6118867			
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	6118867	<5.0	5.0	6118867			
Dissolved Cobalt (Co)	ug/L	<0.50	0.50	6118867	<0.50	0.50	6118867			
Dissolved Copper (Cu)	ug/L	2.6	1.0	6118867	3.2	1.0	6118867			
Dissolved Iron (Fe)	ug/L	1900	100	6118867	<100	100	6118867			
Dissolved Lead (Pb)	ug/L	<0.50	0.50	6118867	<0.50	0.50	6118867			
Dissolved Magnesium (Mg)	ug/L	37000	50	6118867	33000	50	6118867			
Dissolved Manganese (Mn)	ug/L	140	2.0	6118867	72	2.0	6118867			
Dissolved Molybdenum (Mo)	ug/L	<0.50	0.50	6118867	0.64	0.50	6118867			

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Maxxam Job #: B9C5104
Report Date: 2019/05/16

exp Services Inc
Client Project #: THB-00006196-OE
Site Location: Longlac Landfill - Spring Sampling Event
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		JRH126			JRH127			JRH127		
Sampling Date		2019/05/07 14:10			2019/05/08 12:05			2019/05/08 12:05		
COC Number		715306-01-01			715306-03-01			715306-03-01		
	UNITS	**MW11II**	**RDL**	**QC Batch**	**MW12I**	**RDL**	**QC Batch**	**MW12I Lab-Dup**	**RDL**	**QC Batch**
Dissolved Nickel (Ni)	ug/L	<1.0	1.0	6118867	3.1	1.0	6118867			
Dissolved Potassium (K)	ug/L	3200	200	6118867	2300	200	6118867			
Dissolved Selenium (Se)	ug/L	<2.0	2.0	6118867	<2.0	2.0	6118867			
Dissolved Silicon (Si)	ug/L	7500	50	6118867	7800	50	6118867			
Dissolved Sodium (Na)	ug/L	33000	100	6118867	16000	100	6118867			
Dissolved Strontium (Sr)	ug/L	210	1.0	6118867	300	1.0	6118867			
Dissolved Thallium (Tl)	ug/L	<0.050	0.050	6118867	<0.050	0.050	6118867			
Dissolved Tin (Sn)	ug/L	<1.0	1.0	6118867	<1.0	1.0	6118867			
Dissolved Vanadium (V)	ug/L	<0.50	0.50	6118867	0.61	0.50	6118867			
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	6118867	5.4	5.0	6118867			

RDL = Reportable Detection Limit
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Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		JRH128			JRH129		
Sampling Date		2019/05/07 16:35			2019/05/08 11:29		
COC Number		715306-03-01			715306-03-01		
	UNITS	**MW12II**	**RDL**	**QC Batch**	**MW9**	**RDL**	**QC Batch**
Inorganics							
Total Ammonia-N	mg/L	<0.050	0.050	6119298	<0.050	0.050	6119298
Total Chemical Oxygen Demand (COD)	mg/L	<4.0	4.0	6118622	<4.0	4.0	6118622
Conductivity	umho/cm	1100	1.0	6115914	450	1.0	6115753
Total Dissolved Solids	mg/L	675	10	6117295	280	10	6117295
Total Kjeldahl Nitrogen (TKN)	mg/L	0.22	0.10	6118305	0.15	0.10	6118305
Dissolved Organic Carbon	mg/L	2.2	0.50	6117009	0.93	0.50	6117009
pH	pH	7.69		6115916	8.06		6115755
Phenols-4AAP	mg/L	<0.0010	0.0010	6117992	<0.0010	0.0010	6117992
Total Phosphorus	mg/L	0.68	0.040	6119924	0.83	0.10	6119924
Dissolved Sulphate (SO4)	mg/L	94	1.0	6115721	10	1.0	6115721
Alkalinity (Total as CaCO3)	mg/L	470	1.0	6115913	220	1.0	6115750
Dissolved Chloride (Cl-)	mg/L	23	1.0	6115714	1.8	1.0	6115714
Nitrite (N)	mg/L	<0.010	0.010	6115807	<0.010	0.010	6115767
Nitrate (N)	mg/L	<0.10	0.10	6115807	1.03	0.10	6115767
Metals							
Mercury (Hg)	mg/L	<0.0001	0.0001	6122456	<0.0001	0.0001	6122456
Dissolved Aluminum (Al)	ug/L	<5.0	5.0	6118867	<5.0	5.0	6118867
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	6118867	<0.50	0.50	6118867
Dissolved Arsenic (As)	ug/L	<1.0	1.0	6118867	<1.0	1.0	6118867
Dissolved Barium (Ba)	ug/L	34	2.0	6118867	9.5	2.0	6118867
Dissolved Beryllium (Be)	ug/L	<0.50	0.50	6118867	<0.50	0.50	6118867
Dissolved Bismuth (Bi)	ug/L	<1.0	1.0	6118867	<1.0	1.0	6118867
Dissolved Boron (B)	ug/L	690	10	6118867	32	10	6118867
Dissolved Cadmium (Cd)	ug/L	<0.10	0.10	6118867	<0.10	0.10	6118867
Dissolved Calcium (Ca)	ug/L	180000	200	6118867	82000	200	6118867
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	6118867	<5.0	5.0	6118867
Dissolved Cobalt (Co)	ug/L	<0.50	0.50	6118867	<0.50	0.50	6118867
Dissolved Copper (Cu)	ug/L	3.7	1.0	6118867	1.1	1.0	6118867
Dissolved Iron (Fe)	ug/L	<100	100	6118867	<100	100	6118867
Dissolved Lead (Pb)	ug/L	<0.50	0.50	6118867	<0.50	0.50	6118867
Dissolved Magnesium (Mg)	ug/L	32000	50	6118867	13000	50	6118867
Dissolved Manganese (Mn)	ug/L	3.6	2.0	6118867	<2.0	2.0	6118867
Dissolved Molybdenum (Mo)	ug/L	<0.50	0.50	6118867	<0.50	0.50	6118867

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B9C5104
Report Date: 2019/05/16

exp Services Inc
Client Project #: THB-00006196-OE
Site Location: Longlac Landfill - Spring Sampling Event
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LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		JRH128			JRH129		
Sampling Date		2019/05/07 16:35			2019/05/08 11:29		
COC Number		715306-03-01			715306-03-01		
	UNITS	**MW12II**	**RDL**	**QC Batch**	**MW9**	**RDL**	**QC Batch**
Dissolved Nickel (Ni)	ug/L	<1.0	1.0	6118867	<1.0	1.0	6118867
Dissolved Potassium (K)	ug/L	1100	200	6118867	440	200	6118867
Dissolved Selenium (Se)	ug/L	<2.0	2.0	6118867	<2.0	2.0	6118867
Dissolved Silicon (Si)	ug/L	5300	50	6118867	3400	50	6118867
Dissolved Sodium (Na)	ug/L	21000	100	6118867	1300	100	6118867
Dissolved Strontium (Sr)	ug/L	160	1.0	6118867	58	1.0	6118867
Dissolved Thallium (Tl)	ug/L	<0.050	0.050	6118867	<0.050	0.050	6118867
Dissolved Tin (Sn)	ug/L	<1.0	1.0	6118867	<1.0	1.0	6118867
Dissolved Vanadium (V)	ug/L	<0.50	0.50	6118867	<0.50	0.50	6118867
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	6118867	<5.0	5.0	6118867

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B9C5104
Report Date: 2019/05/16

exp Services Inc
Client Project #: THB-00006196-OE
Site Location: Longlac Landfill - Spring Sampling Event
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		JRH130			JRH131		
Sampling Date		2019/05/08 08:35			2019/05/07 21:40		
COC Number		715306-03-01			715306-03-01		
	UNITS	**MW10**	**RDL**	**QC Batch**	**MW13**	**RDL**	**QC Batch**
Inorganics							
Total Ammonia-N	mg/L	<0.050	0.050	6119298	7.1	0.050	6119265
Total Chemical Oxygen Demand (COD)	mg/L	6.3	4.0	6118622	23	4.0	6118622
Conductivity	umho/cm	440	1.0	6115914	1800	1.0	6115914
Total Dissolved Solids	mg/L	275	10	6117295	1230	10	6117295
Total Kjeldahl Nitrogen (TKN)	mg/L	0.18	0.10	6118305	10	2.0	6118305
Dissolved Organic Carbon	mg/L	2.9	0.50	6117009	9.0	0.50	6117009
pH	pH	7.83		6115916	7.59		6115916
Phenols-4AAP	mg/L	<0.0010	0.0010	6117992	<0.0010	0.0010	6117989
Total Phosphorus	mg/L	0.27	0.040	6119924	0.63	0.040	6119924
Dissolved Sulphate (SO4)	mg/L	<1.0	1.0	6117145	89	1.0	6117145
Alkalinity (Total as CaCO3)	mg/L	230	1.0	6115913	470	1.0	6115913
Dissolved Chloride (Cl-)	mg/L	1.6	1.0	6117143	66	1.0	6117143
Nitrite (N)	mg/L	<0.010	0.010	6115807	0.440	0.010	6115807
Nitrate (N)	mg/L	0.17	0.10	6115807	91.4	5.0	6115807
Metals							
Mercury (Hg)	mg/L	<0.0001	0.0001	6122456	<0.0001	0.0001	6122456
Dissolved Aluminum (Al)	ug/L	<5.0	5.0	6118867	<5.0	5.0	6118867
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	6118867	<0.50	0.50	6118867
Dissolved Arsenic (As)	ug/L	<1.0	1.0	6118867	<1.0	1.0	6118867
Dissolved Barium (Ba)	ug/L	16	2.0	6118867	170	2.0	6118867
Dissolved Beryllium (Be)	ug/L	<0.50	0.50	6118867	<0.50	0.50	6118867
Dissolved Bismuth (Bi)	ug/L	<1.0	1.0	6118867	<1.0	1.0	6118867
Dissolved Boron (B)	ug/L	<10	10	6118867	340	10	6118867
Dissolved Cadmium (Cd)	ug/L	<0.10	0.10	6118867	<0.10	0.10	6118867
Dissolved Calcium (Ca)	ug/L	82000	200	6118867	210000	200	6118867
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	6118867	<5.0	5.0	6118867
Dissolved Cobalt (Co)	ug/L	<0.50	0.50	6118867	6.0	0.50	6118867
Dissolved Copper (Cu)	ug/L	3.0	1.0	6118867	7.2	1.0	6118867
Dissolved Iron (Fe)	ug/L	<100	100	6118867	<100	100	6118867
Dissolved Lead (Pb)	ug/L	<0.50	0.50	6118867	<0.50	0.50	6118867
Dissolved Magnesium (Mg)	ug/L	16000	50	6118867	45000	50	6118867
Dissolved Manganese (Mn)	ug/L	3.2	2.0	6118867	620	2.0	6118867
Dissolved Molybdenum (Mo)	ug/L	<0.50	0.50	6118867	<0.50	0.50	6118867

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B9C5104
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exp Services Inc
Client Project #: THB-00006196-OE
Site Location: Longlac Landfill - Spring Sampling Event
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		JRH130			JRH131		
Sampling Date		2019/05/08 08:35			2019/05/07 21:40		
COC Number		715306-03-01			715306-03-01		
	UNITS	**MW10**	**RDL**	**QC Batch**	**MW13**	**RDL**	**QC Batch**
Dissolved Nickel (Ni)	ug/L	<1.0	1.0	6118867	12	1.0	6118867
Dissolved Potassium (K)	ug/L	410	200	6118867	36000	200	6118867
Dissolved Selenium (Se)	ug/L	<2.0	2.0	6118867	<2.0	2.0	6118867
Dissolved Silicon (Si)	ug/L	5500	50	6118867	6300	50	6118867
Dissolved Sodium (Na)	ug/L	1800	100	6118867	59000	100	6118867
Dissolved Strontium (Sr)	ug/L	62	1.0	6118867	260	1.0	6118867
Dissolved Thallium (Tl)	ug/L	<0.050	0.050	6118867	0.11	0.050	6118867
Dissolved Tin (Sn)	ug/L	<1.0	1.0	6118867	<1.0	1.0	6118867
Dissolved Vanadium (V)	ug/L	<0.50	0.50	6118867	<0.50	0.50	6118867
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	6118867	<5.0	5.0	6118867

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B9C5104
Report Date: 2019/05/16

exp Services Inc
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Site Location: Longlac Landfill - Spring Sampling Event
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - SW COMP. LIST (WATER)

Maxxam ID		JRH132		JRH133			JRH133		
Sampling Date		2019/05/07 11:25		2019/05/07 20:00			2019/05/07 20:00		
COC Number		715307-01-01		715307-01-01			715307-01-01		
	UNITS	**SW1**	**QC Batch**	**SW2**	**RDL**	**QC Batch**	**SW2 Lab-Dup**	**RDL**	**QC Batch**
Inorganics									
Total Ammonia-N	mg/L	0.077	6119298	0.15	0.050	6119298			
Total BOD	mg/L	<2	6115659	<2	2	6115659			
Total Chemical Oxygen Demand (COD)	mg/L	27	6118622	19	4.0	6118622			
Conductivity	umho/cm	94	6115744	1200	1.0	6115753			
Total Dissolved Solids	mg/L	85	6117337	665	10	6117337			
Total Kjeldahl Nitrogen (TKN)	mg/L	0.31	6118305	0.40	0.10	6118305	0.38	0.10	6118305
pH	pH	7.67	6115746	8.06		6115755			
Phenols-4AAP	mg/L	<0.0010	6117992	<0.0010	0.0010	6117992			
Total Phosphorus	mg/L	0.014	6118646	0.029	0.004	6118646			
Total Suspended Solids	mg/L	3	6116274	8	1	6116274			
Dissolved Sulphate (SO4)	mg/L	<1.0	6115813	87	1.0	6115813			
Alkalinity (Total as CaCO3)	mg/L	42	6115738	380	1.0	6115750			
Dissolved Chloride (Cl-)	mg/L	3.0	6115812	89	1.0	6115812			
Nitrite (N)	mg/L	<0.010	6115807	<0.010	0.010	6115807			
Nitrate (N)	mg/L	<0.10	6115807	0.28	0.10	6115807			
Metals									
Mercury (Hg)	mg/L	<0.0001	6122456	<0.0001	0.0001	6122456			
Total Aluminum (Al)	ug/L	26	6120708	16	5.0	6120708			
Total Antimony (Sb)	ug/L	<0.50	6120708	<0.50	0.50	6120708			
Total Arsenic (As)	ug/L	<1.0	6120708	<1.0	1.0	6120708			
Total Barium (Ba)	ug/L	3.6	6120708	39	2.0	6120708			
Total Beryllium (Be)	ug/L	<0.50	6120708	<0.50	0.50	6120708			
Total Bismuth (Bi)	ug/L	<1.0	6120708	<1.0	1.0	6120708			
Total Boron (B)	ug/L	<10	6120708	760	10	6120708			
Total Cadmium (Cd)	ug/L	<0.10	6120708	<0.10	0.10	6120708			
Total Calcium (Ca)	ug/L	14000	6120708	63000	200	6120708			
Total Chromium (Cr)	ug/L	<5.0	6120708	<5.0	5.0	6120708			
Total Cobalt (Co)	ug/L	<0.50	6120708	0.76	0.50	6120708			
Total Copper (Cu)	ug/L	<1.0	6120708	1.3	1.0	6120708			
Total Iron (Fe)	ug/L	<100	6120708	<100	100	6120708			
Total Lead (Pb)	ug/L	<0.50	6120708	<0.50	0.50	6120708			
Total Lithium (Li)	ug/L	<5.0	6120708	7.3	5.0	6120708			
Total Magnesium (Mg)	ug/L	3300	6120708	31000	50	6120708			

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QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

Maxxam Job #: B9C5104
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Site Location: Longlac Landfill - Spring Sampling Event
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - SW COMP. LIST (WATER)

Maxxam ID		JRH132		JRH133			JRH133		
Sampling Date		2019/05/07 11:25		2019/05/07 20:00			2019/05/07 20:00		
COC Number		715307-01-01		715307-01-01			715307-01-01		
	UNITS	**SW1**	**QC Batch**	**SW2**	**RDL**	**QC Batch**	**SW2 Lab-Dup**	**RDL**	**QC Batch**
Total Manganese (Mn)	ug/L	6.2	6120708	42	2.0	6120708			
Total Molybdenum (Mo)	ug/L	<0.50	6120708	0.96	0.50	6120708			
Total Nickel (Ni)	ug/L	<1.0	6120708	3.0	1.0	6120708			
Total Potassium (K)	ug/L	460	6120708	53000	200	6120708			
Total Selenium (Se)	ug/L	<2.0	6120708	<2.0	2.0	6120708			
Total Silicon (Si)	ug/L	1600	6120708	2000	50	6120708			
Total Silver (Ag)	ug/L	<0.10	6120708	<0.10	0.10	6120708			
Total Sodium (Na)	ug/L	1300	6120708	72000	100	6120708			
Total Strontium (Sr)	ug/L	12	6120708	160	1.0	6120708			
Total Tellurium (Te)	ug/L	<1.0	6120708	<1.0	1.0	6120708			
Total Thallium (Tl)	ug/L	<0.050	6120708	<0.050	0.050	6120708			
Total Tin (Sn)	ug/L	<1.0	6120708	<1.0	1.0	6120708			
Total Titanium (Ti)	ug/L	<5.0	6120708	<5.0	5.0	6120708			
Total Tungsten (W)	ug/L	<1.0	6120708	<1.0	1.0	6120708			
Total Uranium (U)	ug/L	<0.10	6120708	0.50	0.10	6120708			
Total Vanadium (V)	ug/L	<0.50	6120708	<0.50	0.50	6120708			
Total Zinc (Zn)	ug/L	<5.0	6120708	<5.0	5.0	6120708			
Total Zirconium (Zr)	ug/L	<1.0	6120708	<1.0	1.0	6120708			

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

Maxxam Job #: B9C5104
Report Date: 2019/05/16

exp Services Inc
Client Project #: THB-00006196-OE
Site Location: Longlac Landfill - Spring Sampling Event
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - SW COMP. LIST (WATER)

Maxxam ID		JRH134		
Sampling Date		2019/05/07 17:20		
COC Number		715307-01-01		
	UNITS	**SW3**	**RDL**	**QC Batch**
Inorganics				
Total Ammonia-N	mg/L	1.8	0.050	6119298
Total BOD	mg/L	36	2	6115659
Total Chemical Oxygen Demand (COD)	mg/L	190	8.0	6118622
Conductivity	umho/cm	1400	1.0	6115753
Total Dissolved Solids	mg/L	1150	10	6117337
Total Kjeldahl Nitrogen (TKN)	mg/L	12	0.50	6118305
pH	pH	7.36		6115755
Phenols-4AAP	mg/L	0.031	0.0010	6117992
Total Phosphorus	mg/L	0.25	0.02	6118646
Total Suspended Solids	mg/L	9	1	6116274
Dissolved Sulphate (SO4)	mg/L	540	5.0	6115813
Alkalinity (Total as CaCO3)	mg/L	110	1.0	6115750
Dissolved Chloride (Cl-)	mg/L	25	1.0	6115812
Nitrite (N)	mg/L	0.011	0.010	6115807
Nitrate (N)	mg/L	<0.10	0.10	6115807
Metals				
Mercury (Hg)	mg/L	<0.0001	0.0001	6122456
Total Aluminum (Al)	ug/L	210	5.0	6120708
Total Antimony (Sb)	ug/L	4.7	0.50	6120708
Total Arsenic (As)	ug/L	10	1.0	6120708
Total Barium (Ba)	ug/L	53	2.0	6120708
Total Beryllium (Be)	ug/L	<0.50	0.50	6120708
Total Bismuth (Bi)	ug/L	<1.0	1.0	6120708
Total Boron (B)	ug/L	720	10	6120708
Total Cadmium (Cd)	ug/L	0.83	0.10	6120708
Total Calcium (Ca)	ug/L	280000	200	6120708
Total Chromium (Cr)	ug/L	5.1	5.0	6120708
Total Cobalt (Co)	ug/L	3.6	0.50	6120708
Total Copper (Cu)	ug/L	30	1.0	6120708
Total Iron (Fe)	ug/L	780	100	6120708
Total Lead (Pb)	ug/L	7.1	0.50	6120708
Total Lithium (Li)	ug/L	8.6	5.0	6120708
Total Magnesium (Mg)	ug/L	12000	50	6120708

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B9C5104
Report Date: 2019/05/16

exp Services Inc
Client Project #: THB-00006196-OE
Site Location: Longlac Landfill - Spring Sampling Event
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - SW COMP. LIST (WATER)

Maxxam ID		JRH134		
Sampling Date		2019/05/07 17:20		
COC Number		715307-01-01		
	UNITS	**SW3**	**RDL**	**QC Batch**
Total Manganese (Mn)	ug/L	820	2.0	6120708
Total Molybdenum (Mo)	ug/L	2.4	0.50	6120708
Total Nickel (Ni)	ug/L	7.7	1.0	6120708
Total Potassium (K)	ug/L	25000	200	6120708
Total Selenium (Se)	ug/L	<2.0	2.0	6120708
Total Silicon (Si)	ug/L	2800	50	6120708
Total Silver (Ag)	ug/L	<0.10	0.10	6120708
Total Sodium (Na)	ug/L	36000	100	6120708
Total Strontium (Sr)	ug/L	640	1.0	6120708
Total Tellurium (Te)	ug/L	<1.0	1.0	6120708
Total Thallium (Tl)	ug/L	<0.050	0.050	6120708
Total Tin (Sn)	ug/L	1.6	1.0	6120708
Total Titanium (Ti)	ug/L	10	5.0	6120708
Total Tungsten (W)	ug/L	<1.0	1.0	6120708
Total Uranium (U)	ug/L	0.35	0.10	6120708
Total Vanadium (V)	ug/L	1.1	0.50	6120708
Total Zinc (Zn)	ug/L	670	5.0	6120708
Total Zirconium (Zr)	ug/L	<1.0	1.0	6120708

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B9C5104
Report Date: 2019/05/16

exp Services Inc
Client Project #: THB-00006196-OE
Site Location: Longlac Landfill - Spring Sampling Event
Sampler Initials: EF

RESULTS OF ANALYSES OF WATER

Maxxam ID		JRH117	JRH118	JRH119	JRH120	JRH121		
Sampling Date		2019/05/07 11:05	2019/05/07 21:35	2019/05/07 21:15	2019/05/08 09:50	2019/05/08 10:50		
COC Number		715306-01-01	715306-01-01	715306-01-01	715306-01-01	715306-01-01		
	UNITS	**MW3**	**MW4I**	**MW4II**	**MW5**	**MW6**	**RDL**	**QC Batch**
Calculated Parameters								
Hardness (CaCO3)	mg/L	230	310	490	280	320	1.0	6115392
Ion Balance (% Difference)	%	0.230	0.350	5.98	2.29	4.43	N/A	6115262
Total Organic Nitrogen	mg/L	<0.10	<0.10	1.1	<0.10	<0.10	0.10	6115264
Inorganics								
Orthophosphate (P)	mg/L	<0.010	0.012	<0.010	<0.010	<0.010	0.010	6115723

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

Maxxam ID		JRH122		JRH123	JRH124	JRH125		JRH126		
Sampling Date		2019/05/07 19:30		2019/05/07 18:35	2019/05/07 18:55	2019/05/07 14:30		2019/05/07 14:10		
COC Number		715306-01-01		715306-01-01	715306-01-01	715306-01-01		715306-01-01		
	UNITS	**MW7**	**QC Batch**	**MW8I**	**MW8II**	**MW11I**	**QC Batch**	**MW11II**	**RDL**	**QC Batch**
Calculated Parameters										
Hardness (CaCO3)	mg/L	730	6115392	1200	390	710	6115392	620	1.0	6115392
Ion Balance (% Difference)	%	2.27	6115262	4.81	6.50	4.42	6115262	0.790	N/A	6115262
Total Organic Nitrogen	mg/L	2.6	6115264	0.61	0.21	0.39	6115264	0.31	0.10	6115264
Inorganics										
Orthophosphate (P)	mg/L	<0.010	6117146	<0.010	<0.010	<0.010	6115723	<0.010	0.010	6117146

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

Maxxam Job #: B9C5104
Report Date: 2019/05/16

exp Services Inc
Client Project #: THB-00006196-OE
Site Location: Longlac Landfill - Spring Sampling Event
Sampler Initials: EF

RESULTS OF ANALYSES OF WATER

Maxxam ID		JRH127			JRH127			JRH128	JRH129		
Sampling Date		2019/05/08 12:05			2019/05/08 12:05			2019/05/07 16:35	2019/05/08 11:29		
COC Number		715306-03-01			715306-03-01			715306-03-01	715306-03-01		
	UNITS	**MW12I**	**RDL**	**QC Batch**	**MW12I Lab-Dup**	**RDL**	**QC Batch**	**MW12II**	**MW9**	**RDL**	**QC Batch**
Calculated Parameters											
Hardness (CaCO3)	mg/L	540	1.0	6115392				580	260	1.0	6115392
Ion Balance (% Difference)	%	2.38	N/A	6115262				2.02	3.83	N/A	6115262
Total Organic Nitrogen	mg/L	0.27	0.10	6115264				0.22	0.15	0.10	6115264
Inorganics											
Orthophosphate (P)	mg/L	<0.010	0.010	6117146	<0.010	0.010	6117146	<0.010	<0.010	0.010	6115723

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

Maxxam ID		JRH130	JRH131			JRH132	JRH133		
Sampling Date		2019/05/08 08:35	2019/05/07 21:40			2019/05/07 11:25	2019/05/07 20:00		
COC Number		715306-03-01	715306-03-01			715307-01-01	715307-01-01		
	UNITS	**MW10**	**MW13**	**RDL**	**QC Batch**	**SW1**	**SW2**	**RDL**	**QC Batch**
Calculated Parameters									
Hardness (CaCO3)	mg/L	270	710	1.0	6115392	48	340	1.0	6115392
Ion Balance (% Difference)	%	7.62	3.87	N/A	6115262				
Total Organic Nitrogen	mg/L	0.18	2.9	0.10	6115264	0.23	0.25	0.10	6115264
Inorganics									
Dissolved Organic Carbon	mg/L					12	8.1	0.50	6117009
Orthophosphate (P)	mg/L	<0.010	<0.010	0.010	6117146				

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

Maxxam Job #: B9C5104
Report Date: 2019/05/16

exp Services Inc
Client Project #: THB-00006196-OE
Site Location: Longlac Landfill - Spring Sampling Event
Sampler Initials: EF

RESULTS OF ANALYSES OF WATER

Maxxam ID		JRH133			JRH134		
Sampling Date		2019/05/07 20:00			2019/05/07 17:20		
COC Number		715307-01-01			715307-01-01		
	UNITS	**SW2 Lab-Dup**	**RDL**	**QC Batch**	**SW3**	**RDL**	**QC Batch**
Calculated Parameters							
Hardness (CaCO3)	mg/L				680	1.0	6115392
Total Organic Nitrogen	mg/L				9.9	0.10	6115264
Inorganics							
Dissolved Organic Carbon	mg/L	8.1	0.50	6117009	60	0.50	6117009

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

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Maxxam Job #: B9C5104
Report Date: 2019/05/16

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ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		JRH132	JRH133	JRH134		
Sampling Date		2019/05/07 11:25	2019/05/07 20:00	2019/05/07 17:20		
COC Number		715307-01-01	715307-01-01	715307-01-01		
	UNITS	**SW1**	**SW2**	**SW3**	**RDL**	**QC Batch**
Metals						
Dissolved (0.2u) Aluminum (Al)	ug/L	11	9	56	5	6117163
Dissolved Calcium (Ca)	mg/L	14	73	250	0.050	6117164
Dissolved Magnesium (Mg)	mg/L	3.4	38	11	0.050	6117164

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B9C5104
Report Date: 2019/05/16

exp Services Inc
Client Project #: THB-00006196-OE
Site Location: Longlac Landfill - Spring Sampling Event
Sampler Initials: EF

TEST SUMMARY

Maxxam ID: JRH117
Sample ID: MW3
Matrix: Water

Collected: 2019/05/07
Shipped:
Received: 2019/05/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	6115750	N/A	2019/05/12	Yogesh Patel
Chloride by Automated Colourimetry	KONE	6115714	N/A	2019/05/14	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	6116380	N/A	2019/05/14	Viorica Rotaru
Conductivity	AT	6115753	N/A	2019/05/12	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6117015	N/A	2019/05/14	Mandeep Kaur
Hardness (calculated as CaCO3)		6115392	N/A	2019/05/15	Automated Statchk
Mercury in Water by CVAA	CV/AA	6122227	2019/05/15	2019/05/15	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	6118813	N/A	2019/05/14	Matthew Ritenburg
Ion Balance (% Difference)	CALC	6115262	N/A	2019/05/15	Automated Statchk
Total Ammonia-N	LACH/NH4	6118279	N/A	2019/05/14	Bernard Antwi
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6115767	N/A	2019/05/12	Amanpreet Sappal
Organic Nitrogen	CALC	6115264	N/A	2019/05/15	Automated Statchk
pH	AT	6115755	2019/05/10	2019/05/12	Yogesh Patel
Phenols (4AAP)	TECH/PHEN	6117992	N/A	2019/05/13	Bramdeo Motiram
Orthophosphate	KONE	6115723	N/A	2019/05/13	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	6115721	N/A	2019/05/13	Alina Dobreanu
Total Dissolved Solids	BAL	6115815	2019/05/10	2019/05/13	Xinyue (Sarah) Hou
Total Kjeldahl Nitrogen in Water	SKAL	6118943	2019/05/13	2019/05/15	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	6118307	2019/05/13	2019/05/16	Louise Harding

Maxxam ID: JRH117 Dup
Sample ID: MW3
Matrix: Water

Collected: 2019/05/07
Shipped:
Received: 2019/05/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6117015	N/A	2019/05/14	Mandeep Kaur
Phenols (4AAP)	TECH/PHEN	6117992	N/A	2019/05/13	Bramdeo Motiram

Maxxam ID: JRH118
Sample ID: MW4I
Matrix: Water

Collected: 2019/05/07
Shipped:
Received: 2019/05/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	6115750	N/A	2019/05/12	Yogesh Patel
Chloride by Automated Colourimetry	KONE	6115714	N/A	2019/05/14	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	6116380	N/A	2019/05/14	Viorica Rotaru
Conductivity	AT	6115753	N/A	2019/05/12	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6117009	N/A	2019/05/13	Mandeep Kaur
Hardness (calculated as CaCO3)		6115392	N/A	2019/05/15	Automated Statchk
Mercury in Water by CVAA	CV/AA	6122260	2019/05/15	2019/05/15	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	6118813	N/A	2019/05/14	Matthew Ritenburg
Ion Balance (% Difference)	CALC	6115262	N/A	2019/05/15	Automated Statchk
Total Ammonia-N	LACH/NH4	6118279	N/A	2019/05/15	Bernard Antwi
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6115767	N/A	2019/05/12	Amanpreet Sappal
Organic Nitrogen	CALC	6115264	N/A	2019/05/15	Automated Statchk

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Maxxam Job #: B9C5104
Report Date: 2019/05/16

exp Services Inc
Client Project #: THB-00006196-OE
Site Location: Longlac Landfill - Spring Sampling Event
Sampler Initials: EF

TEST SUMMARY

Maxxam ID: JRH118
Sample ID: MW4I
Matrix: Water

Collected: 2019/05/07
Shipped:
Received: 2019/05/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
pH	AT	6115755	2019/05/10	2019/05/12	Yogesh Patel
Phenols (4AAP)	TECH/PHEN	6117992	N/A	2019/05/13	Bramdeo Motiram
Orthophosphate	KONE	6115723	N/A	2019/05/13	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	6115721	N/A	2019/05/13	Alina Dobreanu
Total Dissolved Solids	BAL	6115815	2019/05/10	2019/05/13	Xinyue (Sarah) Hou
Total Kjeldahl Nitrogen in Water	SKAL	6118497	2019/05/13	2019/05/14	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	6118307	2019/05/13	2019/05/16	Louise Harding

Maxxam ID: JRH119
Sample ID: MW4II
Matrix: Water

Collected: 2019/05/07
Shipped:
Received: 2019/05/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	6115750	N/A	2019/05/12	Yogesh Patel
Chloride by Automated Colourimetry	KONE	6115714	N/A	2019/05/14	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	6116380	N/A	2019/05/14	Viorica Rotaru
Conductivity	AT	6115753	N/A	2019/05/12	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6117009	N/A	2019/05/13	Mandeep Kaur
Hardness (calculated as CaCO3)		6115392	N/A	2019/05/15	Automated Statchk
Mercury in Water by CVAA	CV/AA	6122227	2019/05/15	2019/05/15	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	6118813	N/A	2019/05/14	Matthew Ritenburg
Ion Balance (% Difference)	CALC	6115262	N/A	2019/05/15	Automated Statchk
Total Ammonia-N	LACH/NH4	6118279	N/A	2019/05/14	Bernard Antwi
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6115807	N/A	2019/05/12	Amanpreet Sappal
Organic Nitrogen	CALC	6115264	N/A	2019/05/15	Automated Statchk
pH	AT	6115755	2019/05/10	2019/05/12	Yogesh Patel
Phenols (4AAP)	TECH/PHEN	6117992	N/A	2019/05/13	Bramdeo Motiram
Orthophosphate	KONE	6115723	N/A	2019/05/13	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	6115721	N/A	2019/05/13	Alina Dobreanu
Total Dissolved Solids	BAL	6115815	2019/05/10	2019/05/13	Xinyue (Sarah) Hou
Total Kjeldahl Nitrogen in Water	SKAL	6118943	2019/05/13	2019/05/15	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	6118307	2019/05/13	2019/05/16	Louise Harding

Maxxam ID: JRH120
Sample ID: MW5
Matrix: Water

Collected: 2019/05/08
Shipped:
Received: 2019/05/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	6115750	N/A	2019/05/12	Yogesh Patel
Chloride by Automated Colourimetry	KONE	6115714	N/A	2019/05/14	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	6116380	N/A	2019/05/14	Viorica Rotaru
Conductivity	AT	6115753	N/A	2019/05/12	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6117009	N/A	2019/05/13	Mandeep Kaur
Hardness (calculated as CaCO3)		6115392	N/A	2019/05/15	Automated Statchk
Mercury in Water by CVAA	CV/AA	6122260	2019/05/15	2019/05/15	Ron Morrison

Maxxam Job #: B9C5104
Report Date: 2019/05/16

exp Services Inc
Client Project #: THB-00006196-OE
Site Location: Longlac Landfill - Spring Sampling Event
Sampler Initials: EF

TEST SUMMARY

Maxxam ID: JRH120
Sample ID: MW5
Matrix: Water

Collected: 2019/05/08
Shipped:
Received: 2019/05/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Metals by ICPMS	ICP/MS	6118813	N/A	2019/05/14	Matthew Ritenburg
Ion Balance (% Difference)	CALC	6115262	N/A	2019/05/15	Automated Statchk
Total Ammonia-N	LACH/NH4	6118279	N/A	2019/05/14	Bernard Antwi
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6115767	N/A	2019/05/12	Amanpreet Sappal
Organic Nitrogen	CALC	6115264	N/A	2019/05/15	Automated Statchk
pH	AT	6115755	2019/05/10	2019/05/12	Yogesh Patel
Phenols (4AAP)	TECH/PHEN	6117992	N/A	2019/05/13	Bramdeo Motiram
Orthophosphate	KONE	6115723	N/A	2019/05/13	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	6115721	N/A	2019/05/13	Alina Dobreanu
Total Dissolved Solids	BAL	6115815	2019/05/10	2019/05/13	Xinyue (Sarah) Hou
Total Kjeldahl Nitrogen in Water	SKAL	6118289	2019/05/13	2019/05/14	Shivani Shivani
Total Phosphorus (Colourimetric)	LACH/P	6118307	2019/05/13	2019/05/16	Louise Harding

Maxxam ID: JRH120 Dup
Sample ID: MW5
Matrix: Water

Collected: 2019/05/08
Shipped:
Received: 2019/05/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Mercury in Water by CVAA	CV/AA	6122260	2019/05/15	2019/05/15	Ron Morrison

Maxxam ID: JRH121
Sample ID: MW6
Matrix: Water

Collected: 2019/05/08
Shipped:
Received: 2019/05/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	6115750	N/A	2019/05/12	Yogesh Patel
Chloride by Automated Colourimetry	KONE	6115714	N/A	2019/05/14	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	6116380	N/A	2019/05/14	Viorica Rotaru
Conductivity	AT	6115753	N/A	2019/05/12	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6117009	N/A	2019/05/13	Mandeep Kaur
Hardness (calculated as CaCO3)		6115392	N/A	2019/05/15	Automated Statchk
Mercury in Water by CVAA	CV/AA	6122227	2019/05/15	2019/05/15	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	6118813	N/A	2019/05/14	Matthew Ritenburg
Ion Balance (% Difference)	CALC	6115262	N/A	2019/05/15	Automated Statchk
Total Ammonia-N	LACH/NH4	6118279	N/A	2019/05/14	Bernard Antwi
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6115807	N/A	2019/05/12	Amanpreet Sappal
Organic Nitrogen	CALC	6115264	N/A	2019/05/15	Automated Statchk
pH	AT	6115755	2019/05/10	2019/05/12	Yogesh Patel
Phenols (4AAP)	TECH/PHEN	6117992	N/A	2019/05/13	Bramdeo Motiram
Orthophosphate	KONE	6115723	N/A	2019/05/13	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	6115721	N/A	2019/05/13	Alina Dobreanu
Total Dissolved Solids	BAL	6115815	2019/05/10	2019/05/13	Xinyue (Sarah) Hou
Total Kjeldahl Nitrogen in Water	SKAL	6118943	2019/05/13	2019/05/15	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	6118307	2019/05/13	2019/05/16	Louise Harding

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Maxxam Job #: B9C5104
Report Date: 2019/05/16

exp Services Inc
Client Project #: THB-00006196-OE
Site Location: Longlac Landfill - Spring Sampling Event
Sampler Initials: EF

TEST SUMMARY

Maxxam ID: JRH122
Sample ID: MW7
Matrix: Water

Collected: 2019/05/07
Shipped:
Received: 2019/05/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	6115913	N/A	2019/05/12	Yogesh Patel
Chloride by Automated Colourimetry	KONE	6117143	N/A	2019/05/14	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	6118622	N/A	2019/05/14	Viorica Rotaru
Conductivity	AT	6115914	N/A	2019/05/12	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6117009	N/A	2019/05/13	Mandeep Kaur
Hardness (calculated as CaCO3)		6115392	N/A	2019/05/14	Automated Statchk
Mercury in Water by CVAA	CV/AA	6122456	2019/05/15	2019/05/15	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	6118867	N/A	2019/05/14	Matthew Ritenburg
Ion Balance (% Difference)	CALC	6115262	N/A	2019/05/15	Automated Statchk
Total Ammonia-N	LACH/NH4	6119298	N/A	2019/05/15	Chandra Nandlal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6115807	N/A	2019/05/12	Amanpreet Sappal
Organic Nitrogen	CALC	6115264	N/A	2019/05/16	Automated Statchk
pH	AT	6115916	2019/05/10	2019/05/12	Yogesh Patel
Phenols (4AAP)	TECH/PHEN	6117989	N/A	2019/05/13	Bramdeo Motiram
Orthophosphate	KONE	6117146	N/A	2019/05/13	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	6117145	N/A	2019/05/13	Alina Dobreanu
Total Dissolved Solids	BAL	6115815	2019/05/10	2019/05/13	Xinyue (Sarah) Hou
Total Kjeldahl Nitrogen in Water	SKAL	6118305	2019/05/13	2019/05/15	Shivani Shivani
Total Phosphorus (Colourimetric)	LACH/P	6119924	2019/05/14	2019/05/14	Louise Harding

Maxxam ID: JRH122 Dup
Sample ID: MW7
Matrix: Water

Collected: 2019/05/07
Shipped:
Received: 2019/05/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	6115913	N/A	2019/05/12	Yogesh Patel
Conductivity	AT	6115914	N/A	2019/05/12	Yogesh Patel
pH	AT	6115916	2019/05/10	2019/05/12	Yogesh Patel

Maxxam ID: JRH123
Sample ID: MW8I
Matrix: Water

Collected: 2019/05/07
Shipped:
Received: 2019/05/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	6115750	N/A	2019/05/12	Yogesh Patel
Chloride by Automated Colourimetry	KONE	6115714	N/A	2019/05/14	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	6118622	N/A	2019/05/14	Viorica Rotaru
Conductivity	AT	6115753	N/A	2019/05/12	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6117009	N/A	2019/05/13	Mandeep Kaur
Hardness (calculated as CaCO3)		6115392	N/A	2019/05/14	Automated Statchk
Mercury in Water by CVAA	CV/AA	6122456	2019/05/15	2019/05/15	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	6118867	N/A	2019/05/14	Matthew Ritenburg
Ion Balance (% Difference)	CALC	6115262	N/A	2019/05/14	Automated Statchk
Total Ammonia-N	LACH/NH4	6119298	N/A	2019/05/15	Chandra Nandlal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6115807	N/A	2019/05/12	Amanpreet Sappal

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Maxxam Job #: B9C5104
Report Date: 2019/05/16

exp Services Inc
Client Project #: THB-00006196-OE
Site Location: Longlac Landfill - Spring Sampling Event
Sampler Initials: EF

TEST SUMMARY

Maxxam ID: JRH123
Sample ID: MW8I
Matrix: Water

Collected: 2019/05/07
Shipped:
Received: 2019/05/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Organic Nitrogen	CALC	6115264	N/A	2019/05/15	Automated Statchk
pH	AT	6115755	2019/05/10	2019/05/12	Yogesh Patel
Phenols (4AAP)	TECH/PHEN	6117989	N/A	2019/05/13	Bramdeo Motiram
Orthophosphate	KONE	6115723	N/A	2019/05/13	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	6115721	N/A	2019/05/13	Alina Dobreanu
Total Dissolved Solids	BAL	6115815	2019/05/10	2019/05/13	Xinyue (Sarah) Hou
Total Kjeldahl Nitrogen in Water	SKAL	6118305	2019/05/13	2019/05/15	Shivani Shivani
Total Phosphorus (Colourimetric)	LACH/P	6119924	2019/05/14	2019/05/14	Louise Harding

Maxxam ID: JRH124
Sample ID: MW8II
Matrix: Water

Collected: 2019/05/07
Shipped:
Received: 2019/05/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	6115750	N/A	2019/05/12	Yogesh Patel
Chloride by Automated Colourimetry	KONE	6115714	N/A	2019/05/14	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	6118622	N/A	2019/05/14	Viorica Rotaru
Conductivity	AT	6115753	N/A	2019/05/12	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6117009	N/A	2019/05/13	Mandeep Kaur
Hardness (calculated as CaCO3)		6115392	N/A	2019/05/14	Automated Statchk
Mercury in Water by CVAA	CV/AA	6122557	2019/05/15	2019/05/15	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	6118867	N/A	2019/05/14	Matthew Ritenburg
Ion Balance (% Difference)	CALC	6115262	N/A	2019/05/14	Automated Statchk
Total Ammonia-N	LACH/NH4	6119298	N/A	2019/05/15	Chandra Nandlal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6115807	N/A	2019/05/12	Amanpreet Sappal
Organic Nitrogen	CALC	6115264	N/A	2019/05/15	Automated Statchk
pH	AT	6115755	2019/05/10	2019/05/12	Yogesh Patel
Phenols (4AAP)	TECH/PHEN	6117989	N/A	2019/05/13	Bramdeo Motiram
Orthophosphate	KONE	6115723	N/A	2019/05/13	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	6115721	N/A	2019/05/13	Alina Dobreanu
Total Dissolved Solids	BAL	6117295	2019/05/13	2019/05/14	Xinyue (Sarah) Hou
Total Kjeldahl Nitrogen in Water	SKAL	6118305	2019/05/13	2019/05/14	Shivani Shivani
Total Phosphorus (Colourimetric)	LACH/P	6119924	2019/05/14	2019/05/14	Louise Harding

Maxxam ID: JRH124 Dup
Sample ID: MW8II
Matrix: Water

Collected: 2019/05/07
Shipped:
Received: 2019/05/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Phenols (4AAP)	TECH/PHEN	6117989	N/A	2019/05/13	Bramdeo Motiram

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Maxxam Job #: B9C5104
Report Date: 2019/05/16

exp Services Inc
Client Project #: THB-00006196-OE
Site Location: Longlac Landfill - Spring Sampling Event
Sampler Initials: EF

TEST SUMMARY

Maxxam ID: JRH125
Sample ID: MW11I
Matrix: Water

Collected: 2019/05/07
Shipped:
Received: 2019/05/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	6115750	N/A	2019/05/12	Yogesh Patel
Chloride by Automated Colourimetry	KONE	6115714	N/A	2019/05/14	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	6118622	N/A	2019/05/14	Viorica Rotaru
Conductivity	AT	6115753	N/A	2019/05/12	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6117009	N/A	2019/05/13	Mandeep Kaur
Hardness (calculated as CaCO3)		6115392	N/A	2019/05/14	Automated Statchk
Mercury in Water by CVAA	CV/AA	6122557	2019/05/15	2019/05/15	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	6118867	N/A	2019/05/14	Matthew Ritenburg
Ion Balance (% Difference)	CALC	6115262	N/A	2019/05/14	Automated Statchk
Total Ammonia-N	LACH/NH4	6119255	N/A	2019/05/14	Chandra Nandlal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6115767	N/A	2019/05/12	Amanpreet Sappal
Organic Nitrogen	CALC	6115264	N/A	2019/05/15	Automated Statchk
pH	AT	6115755	2019/05/10	2019/05/12	Yogesh Patel
Phenols (4AAP)	TECH/PHEN	6117989	N/A	2019/05/13	Bramdeo Motiram
Orthophosphate	KONE	6115723	N/A	2019/05/13	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	6115721	N/A	2019/05/13	Alina Dobreanu
Total Dissolved Solids	BAL	6117295	2019/05/13	2019/05/14	Xinyue (Sarah) Hou
Total Kjeldahl Nitrogen in Water	SKAL	6118305	2019/05/13	2019/05/14	Shivani Shivani
Total Phosphorus (Colourimetric)	LACH/P	6119924	2019/05/14	2019/05/14	Louise Harding

Maxxam ID: JRH126
Sample ID: MW11II
Matrix: Water

Collected: 2019/05/07
Shipped:
Received: 2019/05/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	6115913	N/A	2019/05/12	Yogesh Patel
Chloride by Automated Colourimetry	KONE	6117143	N/A	2019/05/14	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	6118622	N/A	2019/05/14	Viorica Rotaru
Conductivity	AT	6115914	N/A	2019/05/12	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6117009	N/A	2019/05/13	Mandeep Kaur
Hardness (calculated as CaCO3)		6115392	N/A	2019/05/14	Automated Statchk
Mercury in Water by CVAA	CV/AA	6122260	2019/05/15	2019/05/15	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	6118867	N/A	2019/05/14	Matthew Ritenburg
Ion Balance (% Difference)	CALC	6115262	N/A	2019/05/15	Automated Statchk
Total Ammonia-N	LACH/NH4	6119298	N/A	2019/05/15	Chandra Nandlal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6115807	N/A	2019/05/12	Amanpreet Sappal
Organic Nitrogen	CALC	6115264	N/A	2019/05/15	Automated Statchk
pH	AT	6115916	2019/05/10	2019/05/12	Yogesh Patel
Phenols (4AAP)	TECH/PHEN	6117989	N/A	2019/05/13	Bramdeo Motiram
Orthophosphate	KONE	6117146	N/A	2019/05/13	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	6117145	N/A	2019/05/13	Alina Dobreanu
Total Dissolved Solids	BAL	6117295	2019/05/13	2019/05/14	Xinyue (Sarah) Hou
Total Kjeldahl Nitrogen in Water	SKAL	6118305	2019/05/13	2019/05/15	Shivani Shivani
Total Phosphorus (Colourimetric)	LACH/P	6119924	2019/05/14	2019/05/14	Louise Harding

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Maxxam Job #: B9C5104
Report Date: 2019/05/16

exp Services Inc
Client Project #: THB-00006196-OE
Site Location: Longlac Landfill - Spring Sampling Event
Sampler Initials: EF

TEST SUMMARY

Maxxam ID: JRH127
Sample ID: MW12I
Matrix: Water

Collected: 2019/05/08
Shipped:
Received: 2019/05/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	6115913	N/A	2019/05/12	Yogesh Patel
Chloride by Automated Colourimetry	KONE	6117143	N/A	2019/05/14	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	6118622	N/A	2019/05/14	Viorica Rotaru
Conductivity	AT	6115914	N/A	2019/05/12	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6117009	N/A	2019/05/13	Mandeep Kaur
Hardness (calculated as CaCO3)		6115392	N/A	2019/05/14	Automated Statchk
Mercury in Water by CVAA	CV/AA	6122557	2019/05/15	2019/05/15	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	6118867	N/A	2019/05/14	Matthew Ritenburg
Ion Balance (% Difference)	CALC	6115262	N/A	2019/05/15	Automated Statchk
Total Ammonia-N	LACH/NH4	6119298	N/A	2019/05/15	Chandra Nandlal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6115807	N/A	2019/05/12	Amanpreet Sappal
Organic Nitrogen	CALC	6115264	N/A	2019/05/15	Automated Statchk
pH	AT	6115916	2019/05/10	2019/05/12	Yogesh Patel
Phenols (4AAP)	TECH/PHEN	6117992	N/A	2019/05/13	Bramdeo Motiram
Orthophosphate	KONE	6117146	N/A	2019/05/13	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	6117145	N/A	2019/05/13	Alina Dobreanu
Total Dissolved Solids	BAL	6117295	2019/05/13	2019/05/14	Xinyue (Sarah) Hou
Total Kjeldahl Nitrogen in Water	SKAL	6118305	2019/05/13	2019/05/14	Shivani Shivani
Total Phosphorus (Colourimetric)	LACH/P	6119924	2019/05/14	2019/05/14	Louise Harding

Maxxam ID: JRH127 Dup
Sample ID: MW12I
Matrix: Water

Collected: 2019/05/08
Shipped:
Received: 2019/05/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chloride by Automated Colourimetry	KONE	6117143	N/A	2019/05/14	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	6118622	N/A	2019/05/14	Viorica Rotaru
Orthophosphate	KONE	6117146	N/A	2019/05/13	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	6117145	N/A	2019/05/13	Alina Dobreanu

Maxxam ID: JRH128
Sample ID: MW12II
Matrix: Water

Collected: 2019/05/07
Shipped:
Received: 2019/05/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	6115913	N/A	2019/05/12	Yogesh Patel
Chloride by Automated Colourimetry	KONE	6115714	N/A	2019/05/14	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	6118622	N/A	2019/05/14	Viorica Rotaru
Conductivity	AT	6115914	N/A	2019/05/12	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6117009	N/A	2019/05/13	Mandeep Kaur
Hardness (calculated as CaCO3)		6115392	N/A	2019/05/14	Automated Statchk
Mercury in Water by CVAA	CV/AA	6122456	2019/05/15	2019/05/15	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	6118867	N/A	2019/05/14	Matthew Ritenburg
Ion Balance (% Difference)	CALC	6115262	N/A	2019/05/14	Automated Statchk
Total Ammonia-N	LACH/NH4	6119298	N/A	2019/05/15	Chandra Nandlal

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exp Services Inc
Client Project #: THB-00006196-OE
Site Location: Longlac Landfill - Spring Sampling Event
Sampler Initials: EF

TEST SUMMARY

Maxxam ID: JRH128
Sample ID: MW12II
Matrix: Water

Collected: 2019/05/07
Shipped:
Received: 2019/05/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6115807	N/A	2019/05/12	Amanpreet Sappal
Organic Nitrogen	CALC	6115264	N/A	2019/05/15	Automated Statchk
pH	AT	6115916	2019/05/10	2019/05/12	Yogesh Patel
Phenols (4AAP)	TECH/PHEN	6117992	N/A	2019/05/13	Bramdeo Motiram
Orthophosphate	KONE	6115723	N/A	2019/05/13	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	6115721	N/A	2019/05/13	Alina Dobreanu
Total Dissolved Solids	BAL	6117295	2019/05/13	2019/05/14	Xinyue (Sarah) Hou
Total Kjeldahl Nitrogen in Water	SKAL	6118305	2019/05/13	2019/05/14	Shivani Shivani
Total Phosphorus (Colourimetric)	LACH/P	6119924	2019/05/14	2019/05/14	Louise Harding

Maxxam ID: JRH129
Sample ID: MW9
Matrix: Water

Collected: 2019/05/08
Shipped:
Received: 2019/05/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	6115750	N/A	2019/05/12	Yogesh Patel
Chloride by Automated Colourimetry	KONE	6115714	N/A	2019/05/14	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	6118622	N/A	2019/05/14	Viorica Rotaru
Conductivity	AT	6115753	N/A	2019/05/12	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6117009	N/A	2019/05/13	Mandeep Kaur
Hardness (calculated as CaCO3)		6115392	N/A	2019/05/14	Automated Statchk
Mercury in Water by CVAA	CV/AA	6122456	2019/05/15	2019/05/15	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	6118867	N/A	2019/05/14	Matthew Ritenburg
Ion Balance (% Difference)	CALC	6115262	N/A	2019/05/14	Automated Statchk
Total Ammonia-N	LACH/NH4	6119298	N/A	2019/05/15	Chandra Nandlal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6115767	N/A	2019/05/12	Amanpreet Sappal
Organic Nitrogen	CALC	6115264	N/A	2019/05/15	Automated Statchk
pH	AT	6115755	2019/05/10	2019/05/12	Yogesh Patel
Phenols (4AAP)	TECH/PHEN	6117992	N/A	2019/05/13	Bramdeo Motiram
Orthophosphate	KONE	6115723	N/A	2019/05/13	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	6115721	N/A	2019/05/13	Alina Dobreanu
Total Dissolved Solids	BAL	6117295	2019/05/13	2019/05/14	Xinyue (Sarah) Hou
Total Kjeldahl Nitrogen in Water	SKAL	6118305	2019/05/13	2019/05/14	Shivani Shivani
Total Phosphorus (Colourimetric)	LACH/P	6119924	2019/05/14	2019/05/14	Louise Harding

Maxxam ID: JRH130
Sample ID: MW10
Matrix: Water

Collected: 2019/05/08
Shipped:
Received: 2019/05/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	6115913	N/A	2019/05/12	Yogesh Patel
Chloride by Automated Colourimetry	KONE	6117143	N/A	2019/05/14	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	6118622	N/A	2019/05/14	Viorica Rotaru
Conductivity	AT	6115914	N/A	2019/05/12	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6117009	N/A	2019/05/13	Mandeep Kaur

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exp Services Inc
Client Project #: THB-00006196-OE
Site Location: Longlac Landfill - Spring Sampling Event
Sampler Initials: EF

TEST SUMMARY

Maxxam ID: JRH130
Sample ID: MW10
Matrix: Water

Collected: 2019/05/08
Shipped:
Received: 2019/05/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hardness (calculated as CaCO3)		6115392	N/A	2019/05/14	Automated Statchk
Mercury in Water by CVAA	CV/AA	6122456	2019/05/15	2019/05/15	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	6118867	N/A	2019/05/14	Matthew Ritenburg
Ion Balance (% Difference)	CALC	6115262	N/A	2019/05/15	Automated Statchk
Total Ammonia-N	LACH/NH4	6119298	N/A	2019/05/15	Chandra Nandlal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6115807	N/A	2019/05/12	Amanpreet Sappal
Organic Nitrogen	CALC	6115264	N/A	2019/05/15	Automated Statchk
pH	AT	6115916	2019/05/10	2019/05/12	Yogesh Patel
Phenols (4AAP)	TECH/PHEN	6117992	N/A	2019/05/13	Bramdeo Motiram
Orthophosphate	KONE	6117146	N/A	2019/05/13	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	6117145	N/A	2019/05/13	Alina Dobreanu
Total Dissolved Solids	BAL	6117295	2019/05/13	2019/05/14	Xinyue (Sarah) Hou
Total Kjeldahl Nitrogen in Water	SKAL	6118305	2019/05/13	2019/05/14	Shivani Shivani
Total Phosphorus (Colourimetric)	LACH/P	6119924	2019/05/14	2019/05/14	Louise Harding

Maxxam ID: JRH131
Sample ID: MW13
Matrix: Water

Collected: 2019/05/07
Shipped:
Received: 2019/05/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	6115913	N/A	2019/05/12	Yogesh Patel
Chloride by Automated Colourimetry	KONE	6117143	N/A	2019/05/14	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	6118622	N/A	2019/05/14	Viorica Rotaru
Conductivity	AT	6115914	N/A	2019/05/12	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6117009	N/A	2019/05/13	Mandeep Kaur
Hardness (calculated as CaCO3)		6115392	N/A	2019/05/14	Automated Statchk
Mercury in Water by CVAA	CV/AA	6122456	2019/05/15	2019/05/15	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	6118867	N/A	2019/05/14	Matthew Ritenburg
Ion Balance (% Difference)	CALC	6115262	N/A	2019/05/15	Automated Statchk
Total Ammonia-N	LACH/NH4	6119265	N/A	2019/05/14	Bernard Antwi
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6115807	N/A	2019/05/12	Amanpreet Sappal
Organic Nitrogen	CALC	6115264	N/A	2019/05/16	Automated Statchk
pH	AT	6115916	2019/05/10	2019/05/12	Yogesh Patel
Phenols (4AAP)	TECH/PHEN	6117989	N/A	2019/05/13	Bramdeo Motiram
Orthophosphate	KONE	6117146	N/A	2019/05/13	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	6117145	N/A	2019/05/13	Alina Dobreanu
Total Dissolved Solids	BAL	6117295	2019/05/13	2019/05/14	Xinyue (Sarah) Hou
Total Kjeldahl Nitrogen in Water	SKAL	6118305	2019/05/13	2019/05/15	Shivani Shivani
Total Phosphorus (Colourimetric)	LACH/P	6119924	2019/05/14	2019/05/14	Louise Harding

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Maxxam Job #: B9C5104
Report Date: 2019/05/16

exp Services Inc
Client Project #: THB-00006196-OE
Site Location: Longlac Landfill - Spring Sampling Event
Sampler Initials: EF

TEST SUMMARY

Maxxam ID: JRH132
Sample ID: SW1
Matrix: Water

Collected: 2019/05/07
Shipped:
Received: 2019/05/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	6117163	N/A	2019/05/13	Prempal Bhatti
Alkalinity	AT	6115738	N/A	2019/05/13	Yogesh Patel
Biochemical Oxygen Demand (BOD)	DO	6115659	2019/05/10	2019/05/15	Althea Gonzalez
Chloride by Automated Colourimetry	KONE	6115812	N/A	2019/05/13	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	6118622	N/A	2019/05/14	Viorica Rotaru
Conductivity	AT	6115744	N/A	2019/05/13	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6117009	N/A	2019/05/13	Mandeep Kaur
Hardness (calculated as CaCO3)		6115392	N/A	2019/05/16	Automated Statchk
Mercury in Water by CVAA	CV/AA	6122456	2019/05/15	2019/05/15	Ron Morrison
Dissolved Calcium and Magnesium	ICP	6117164	2019/05/11	2019/05/15	Azita Fazaeli
Total Metals Analysis by ICPMS	ICP/MS	6120708	N/A	2019/05/15	Arefa Dabhad
Total Ammonia-N	LACH/NH4	6119298	N/A	2019/05/15	Chandra Nandlal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6115807	N/A	2019/05/12	Amanpreet Sappal
Organic Nitrogen	CALC	6115264	N/A	2019/05/15	Automated Statchk
pH	AT	6115746	2019/05/10	2019/05/13	Yogesh Patel
Phenols (4AAP)	TECH/PHEN	6117992	N/A	2019/05/13	Bramdeo Motiram
Sulphate by Automated Colourimetry	KONE	6115813	N/A	2019/05/13	Deonarine Ramnarine
Total Dissolved Solids	BAL	6117337	2019/05/11	2019/05/13	Nilam Borole
Total Kjeldahl Nitrogen in Water	SKAL	6118305	2019/05/13	2019/05/14	Shivani Shivani
Total Phosphorus (Colourimetric)	LACH/P	6118646	2019/05/13	2019/05/14	Louise Harding
Low Level Total Suspended Solids	BAL	6116274	2019/05/10	2019/05/13	Nilam Borole

Maxxam ID: JRH133
Sample ID: SW2
Matrix: Water

Collected: 2019/05/07
Shipped:
Received: 2019/05/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	6117163	N/A	2019/05/13	Prempal Bhatti
Alkalinity	AT	6115750	N/A	2019/05/12	Yogesh Patel
Biochemical Oxygen Demand (BOD)	DO	6115659	2019/05/10	2019/05/15	Althea Gonzalez
Chloride by Automated Colourimetry	KONE	6115812	N/A	2019/05/13	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	6118622	N/A	2019/05/14	Viorica Rotaru
Conductivity	AT	6115753	N/A	2019/05/12	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6117009	N/A	2019/05/13	Mandeep Kaur
Hardness (calculated as CaCO3)		6115392	N/A	2019/05/16	Automated Statchk
Mercury in Water by CVAA	CV/AA	6122456	2019/05/15	2019/05/15	Ron Morrison
Dissolved Calcium and Magnesium	ICP	6117164	2019/05/11	2019/05/15	Azita Fazaeli
Total Metals Analysis by ICPMS	ICP/MS	6120708	N/A	2019/05/15	Arefa Dabhad
Total Ammonia-N	LACH/NH4	6119298	N/A	2019/05/15	Chandra Nandlal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6115807	N/A	2019/05/12	Amanpreet Sappal
Organic Nitrogen	CALC	6115264	N/A	2019/05/15	Automated Statchk
pH	AT	6115755	2019/05/10	2019/05/12	Yogesh Patel
Phenols (4AAP)	TECH/PHEN	6117992	N/A	2019/05/13	Bramdeo Motiram
Sulphate by Automated Colourimetry	KONE	6115813	N/A	2019/05/13	Deonarine Ramnarine
Total Dissolved Solids	BAL	6117337	2019/05/11	2019/05/13	Nilam Borole

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Maxxam Job #: B9C5104
Report Date: 2019/05/16

exp Services Inc
Client Project #: THB-00006196-OE
Site Location: Longlac Landfill - Spring Sampling Event
Sampler Initials: EF

TEST SUMMARY

Maxxam ID: JRH133
Sample ID: SW2
Matrix: Water

Collected: 2019/05/07
Shipped:
Received: 2019/05/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Kjeldahl Nitrogen in Water	SKAL	6118305	2019/05/13	2019/05/14	Shivani Shivani
Total Phosphorus (Colourimetric)	LACH/P	6118646	2019/05/13	2019/05/14	Louise Harding
Low Level Total Suspended Solids	BAL	6116274	2019/05/10	2019/05/13	Nilam Borole

Maxxam ID: JRH133 Dup
Sample ID: SW2
Matrix: Water

Collected: 2019/05/07
Shipped:
Received: 2019/05/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6117009	N/A	2019/05/13	Mandeep Kaur
Total Kjeldahl Nitrogen in Water	SKAL	6118305	2019/05/13	2019/05/14	Shivani Shivani

Maxxam ID: JRH134
Sample ID: SW3
Matrix: Water

Collected: 2019/05/07
Shipped:
Received: 2019/05/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	6117163	N/A	2019/05/13	Prempal Bhatti
Alkalinity	AT	6115750	N/A	2019/05/12	Yogesh Patel
Biochemical Oxygen Demand (BOD)	DO	6115659	2019/05/10	2019/05/15	Althea Gonzalez
Chloride by Automated Colourimetry	KONE	6115812	N/A	2019/05/13	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	6118622	N/A	2019/05/14	Viorica Rotaru
Conductivity	AT	6115753	N/A	2019/05/12	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6117009	N/A	2019/05/13	Mandeep Kaur
Hardness (calculated as CaCO3)		6115392	N/A	2019/05/16	Automated Statchk
Mercury in Water by CVAA	CV/AA	6122456	2019/05/15	2019/05/15	Ron Morrison
Dissolved Calcium and Magnesium	ICP	6117164	2019/05/11	2019/05/15	Azita Fazaeli
Total Metals Analysis by ICPMS	ICP/MS	6120708	N/A	2019/05/15	Arefa Dabhad
Total Ammonia-N	LACH/NH4	6119298	N/A	2019/05/15	Chandra Nandlal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6115807	N/A	2019/05/12	Amanpreet Sappal
Organic Nitrogen	CALC	6115264	N/A	2019/05/15	Automated Statchk
pH	AT	6115755	2019/05/10	2019/05/12	Yogesh Patel
Phenols (4AAP)	TECH/PHEN	6117992	N/A	2019/05/13	Bramdeo Motiram
Sulphate by Automated Colourimetry	KONE	6115813	N/A	2019/05/13	Deonarine Ramnarine
Total Dissolved Solids	BAL	6117337	2019/05/11	2019/05/13	Nilam Borole
Total Kjeldahl Nitrogen in Water	SKAL	6118305	2019/05/13	2019/05/15	Shivani Shivani
Total Phosphorus (Colourimetric)	LACH/P	6118646	2019/05/13	2019/05/14	Louise Harding
Low Level Total Suspended Solids	BAL	6116274	2019/05/10	2019/05/13	Nilam Borole

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exp Services Inc
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Sampler Initials: EF

GENERAL COMMENTS

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

Package 1	-0.7°C
Package 2	1.3°C
Package 3	1.0°C
Package 4	1.0°C

Sample JRH121 [MW6] : TKN < Ammonia: Both values fall within the method uncertainty for duplicates and are likely equivalent.

Results relate only to the items tested.

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Maxxam Job #: B9C5104
Report Date: 2019/05/16

QUALITY ASSURANCE REPORT

exp Services Inc
Client Project #: THB-00006196-OE
Site Location: Longlac Landfill - Spring Sampling Event
Sampler Initials: EF

			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
6115659	Total BOD	2019/05/15					<2	mg/L	NC	30	92	80 - 120
6115714	Dissolved Chloride (Cl-)	2019/05/14	NC	80 - 120	102	80 - 120	<1.0	mg/L	2.0	20		
6115721	Dissolved Sulphate (SO4)	2019/05/13	NC	75 - 125	104	80 - 120	<1.0	mg/L	0.24	20		
6115723	Orthophosphate (P)	2019/05/13	107	75 - 125	101	80 - 120	<0.010	mg/L	NC	25		
6115738	Alkalinity (Total as CaCO3)	2019/05/13			96	85 - 115	<1.0	mg/L	1.2	20		
6115744	Conductivity	2019/05/13			102	85 - 115	<1.0	umho/cm	0.33	25		
6115746	pH	2019/05/13			102	98 - 103			0.51	N/A		
6115750	Alkalinity (Total as CaCO3)	2019/05/12			94	85 - 115	<1.0	mg/L	0.84	20		
6115753	Conductivity	2019/05/12			103	85 - 115	1.1, RDL=1.0	umho/cm	0.13	25		
6115755	pH	2019/05/12			102	98 - 103			0.50	N/A		
6115767	Nitrate (N)	2019/05/12	100	80 - 120	100	80 - 120	<0.10	mg/L	NC	20		
6115767	Nitrite (N)	2019/05/12	104	80 - 120	103	80 - 120	<0.010	mg/L	1.0	20		
6115807	Nitrate (N)	2019/05/12	99	80 - 120	98	80 - 120	<0.10	mg/L	NC	20		
6115807	Nitrite (N)	2019/05/12	104	80 - 120	102	80 - 120	<0.010	mg/L	NC	20		
6115812	Dissolved Chloride (Cl-)	2019/05/13	105	80 - 120	105	80 - 120	<1.0	mg/L	0.35	20		
6115813	Dissolved Sulphate (SO4)	2019/05/13	99	75 - 125	102	80 - 120	<1.0	mg/L	0.40	20		
6115815	Total Dissolved Solids	2019/05/13					<10	mg/L	0.70	25	95	90 - 110
6115913	Alkalinity (Total as CaCO3)	2019/05/12			95	85 - 115	<1.0	mg/L	0.16	20		
6115914	Conductivity	2019/05/12			101	85 - 115	<1.0	umho/cm	0.38	25		
6115916	pH	2019/05/12			102	98 - 103			0.081	N/A		
6116274	Total Suspended Solids	2019/05/13					<1	mg/L	25	25	101	85 - 115
6116380	Total Chemical Oxygen Demand (COD)	2019/05/14	90	80 - 120	100	80 - 120	<4.0	mg/L	13	20		
6117009	Dissolved Organic Carbon	2019/05/13	91	80 - 120	95	80 - 120	<0.50	mg/L	0.16	20		
6117015	Dissolved Organic Carbon	2019/05/14	96	80 - 120	100	80 - 120	<0.50	mg/L	1.6	20		
6117143	Dissolved Chloride (Cl-)	2019/05/14	NC	80 - 120	103	80 - 120	<1.0	mg/L	0.25	20		
6117145	Dissolved Sulphate (SO4)	2019/05/13	NC	75 - 125	105	80 - 120	<1.0	mg/L	2.3	20		
6117146	Orthophosphate (P)	2019/05/13	110	75 - 125	101	80 - 120	<0.010	mg/L	NC	25		
6117163	Dissolved (0.2u) Aluminum (Al)	2019/05/13	107	80 - 120	108	80 - 120	<5	ug/L	NC	20		
6117164	Dissolved Calcium (Ca)	2019/05/15	NC	80 - 120	99	80 - 120	<0.050	mg/L				
6117164	Dissolved Magnesium (Mg)	2019/05/15	NC	80 - 120	98	80 - 120	<0.050	mg/L				

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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
6117295	Total Dissolved Solids	2019/05/14					<10	mg/L	1.0	25	98	90 - 110
6117337	Total Dissolved Solids	2019/05/13					<10	mg/L	3.8	25	100	90 - 110
6117989	Phenols-4AAP	2019/05/13	96	80 - 120	96	80 - 120	<0.0010	mg/L	NC	20		
6117992	Phenols-4AAP	2019/05/13	96	80 - 120	97	80 - 120	<0.0010	mg/L	NC	20		
6118279	Total Ammonia-N	2019/05/14	98	75 - 125	101	80 - 120	<0.050	mg/L	1.5	20		
6118289	Total Kjeldahl Nitrogen (TKN)	2019/05/14	95	80 - 120	99	80 - 120	<0.10	mg/L	9.8	20	97	80 - 120
6118305	Total Kjeldahl Nitrogen (TKN)	2019/05/14	93	80 - 120	95	80 - 120	<0.10	mg/L	5.1	20	95	80 - 120
6118307	Total Phosphorus	2019/05/16	99	80 - 120	105	80 - 120	<0.020	mg/L	NC	20	100	80 - 120
6118497	Total Kjeldahl Nitrogen (TKN)	2019/05/14	NC	80 - 120	104	80 - 120	<0.10	mg/L	3.8	20	104	80 - 120
6118622	Total Chemical Oxygen Demand (COD)	2019/05/14	100	80 - 120	100	80 - 120	<4.0	mg/L	NC	20		
6118646	Total Phosphorus	2019/05/14	122 (1)	80 - 120	115	80 - 120	<0.004	mg/L	2.1	20	110	80 - 120
6118813	Dissolved Aluminum (Al)	2019/05/14	99	80 - 120	102	80 - 120	<5.0	ug/L	14	20		
6118813	Dissolved Antimony (Sb)	2019/05/14	102	80 - 120	99	80 - 120	<0.50	ug/L	NC	20		
6118813	Dissolved Arsenic (As)	2019/05/14	100	80 - 120	97	80 - 120	<1.0	ug/L	3.9	20		
6118813	Dissolved Barium (Ba)	2019/05/14	100	80 - 120	99	80 - 120	<2.0	ug/L	0.85	20		
6118813	Dissolved Beryllium (Be)	2019/05/14	100	80 - 120	96	80 - 120	<0.50	ug/L	NC	20		
6118813	Dissolved Bismuth (Bi)	2019/05/14	96	80 - 120	95	80 - 120	<1.0	ug/L	NC	20		
6118813	Dissolved Boron (B)	2019/05/14	99	80 - 120	97	80 - 120	<10	ug/L	1.1	20		
6118813	Dissolved Cadmium (Cd)	2019/05/14	102	80 - 120	99	80 - 120	<0.10	ug/L	NC	20		
6118813	Dissolved Calcium (Ca)	2019/05/14	NC	80 - 120	104	80 - 120	<200	ug/L	0.51	20		
6118813	Dissolved Chromium (Cr)	2019/05/14	98	80 - 120	97	80 - 120	<5.0	ug/L	NC	20		
6118813	Dissolved Cobalt (Co)	2019/05/14	98	80 - 120	98	80 - 120	<0.50	ug/L	1.3	20		
6118813	Dissolved Copper (Cu)	2019/05/14	101	80 - 120	98	80 - 120	<1.0	ug/L	3.0	20		
6118813	Dissolved Iron (Fe)	2019/05/14	99	80 - 120	98	80 - 120	<100	ug/L	0.11	20		
6118813	Dissolved Lead (Pb)	2019/05/14	98	80 - 120	96	80 - 120	<0.50	ug/L	NC	20		
6118813	Dissolved Magnesium (Mg)	2019/05/14	96	80 - 120	96	80 - 120	<50	ug/L	0.19	20		
6118813	Dissolved Manganese (Mn)	2019/05/14	NC	80 - 120	98	80 - 120	<2.0	ug/L	0.34	20		
6118813	Dissolved Molybdenum (Mo)	2019/05/14	106	80 - 120	99	80 - 120	<0.50	ug/L	5.7	20		
6118813	Dissolved Nickel (Ni)	2019/05/14	96	80 - 120	96	80 - 120	<1.0	ug/L	3.7	20		
6118813	Dissolved Potassium (K)	2019/05/14	100	80 - 120	97	80 - 120	<200	ug/L	0.52	20		
6118813	Dissolved Selenium (Se)	2019/05/14	102	80 - 120	100	80 - 120	<2.0	ug/L	NC	20		
6118813	Dissolved Silicon (Si)	2019/05/14	101	80 - 120	99	80 - 120	<50	ug/L	0.33	20		

Maxxam Job #: B9C5104
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QUALITY ASSURANCE REPORT(CONT'D)

exp Services Inc
Client Project #: THB-00006196-OE
Site Location: Longlac Landfill - Spring Sampling Event
Sampler Initials: EF

			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
6118813	Dissolved Sodium (Na)	2019/05/14	95	80 - 120	93	80 - 120	<100	ug/L	0.35	20		
6118813	Dissolved Strontium (Sr)	2019/05/14	100	80 - 120	99	80 - 120	<1.0	ug/L	0.075	20		
6118813	Dissolved Thallium (Tl)	2019/05/14	97	80 - 120	96	80 - 120	<0.050	ug/L	3.8	20		
6118813	Dissolved Tin (Sn)	2019/05/14	102	80 - 120	99	80 - 120	<1.0	ug/L	NC	20		
6118813	Dissolved Vanadium (V)	2019/05/14	100	80 - 120	99	80 - 120	<0.50	ug/L	1.1	20		
6118813	Dissolved Zinc (Zn)	2019/05/14	100	80 - 120	99	80 - 120	<5.0	ug/L	NC	20		
6118867	Dissolved Aluminum (Al)	2019/05/14	99	80 - 120	98	80 - 120	<5.0	ug/L				
6118867	Dissolved Antimony (Sb)	2019/05/14	100	80 - 120	98	80 - 120	<0.50	ug/L				
6118867	Dissolved Arsenic (As)	2019/05/14	102	80 - 120	99	80 - 120	<1.0	ug/L				
6118867	Dissolved Barium (Ba)	2019/05/14	95	80 - 120	97	80 - 120	<2.0	ug/L				
6118867	Dissolved Beryllium (Be)	2019/05/14	101	80 - 120	98	80 - 120	<0.50	ug/L				
6118867	Dissolved Bismuth (Bi)	2019/05/14	96	80 - 120	95	80 - 120	<1.0	ug/L				
6118867	Dissolved Boron (B)	2019/05/14	100	80 - 120	98	80 - 120	<10	ug/L				
6118867	Dissolved Cadmium (Cd)	2019/05/14	100	80 - 120	98	80 - 120	<0.10	ug/L				
6118867	Dissolved Calcium (Ca)	2019/05/14	NC	80 - 120	102	80 - 120	<200	ug/L				
6118867	Dissolved Chromium (Cr)	2019/05/14	101	80 - 120	98	80 - 120	<5.0	ug/L				
6118867	Dissolved Cobalt (Co)	2019/05/14	100	80 - 120	99	80 - 120	<0.50	ug/L				
6118867	Dissolved Copper (Cu)	2019/05/14	99	80 - 120	98	80 - 120	<1.0	ug/L				
6118867	Dissolved Iron (Fe)	2019/05/14	100	80 - 120	99	80 - 120	<100	ug/L				
6118867	Dissolved Lead (Pb)	2019/05/14	96	80 - 120	96	80 - 120	<0.50	ug/L	NC	20		
6118867	Dissolved Magnesium (Mg)	2019/05/14	NC	80 - 120	97	80 - 120	<50	ug/L				
6118867	Dissolved Manganese (Mn)	2019/05/14	NC	80 - 120	99	80 - 120	<2.0	ug/L				
6118867	Dissolved Molybdenum (Mo)	2019/05/14	105	80 - 120	99	80 - 120	<0.50	ug/L				
6118867	Dissolved Nickel (Ni)	2019/05/14	98	80 - 120	97	80 - 120	<1.0	ug/L				
6118867	Dissolved Potassium (K)	2019/05/14	99	80 - 120	97	80 - 120	<200	ug/L				
6118867	Dissolved Selenium (Se)	2019/05/14	101	80 - 120	99	80 - 120	<2.0	ug/L				
6118867	Dissolved Silicon (Si)	2019/05/14	100	80 - 120	98	80 - 120	<50	ug/L				
6118867	Dissolved Sodium (Na)	2019/05/14	NC	80 - 120	94	80 - 120	<100	ug/L				
6118867	Dissolved Strontium (Sr)	2019/05/14	NC	80 - 120	98	80 - 120	<1.0	ug/L				
6118867	Dissolved Thallium (Tl)	2019/05/14	96	80 - 120	94	80 - 120	<0.050	ug/L				
6118867	Dissolved Tin (Sn)	2019/05/14	103	80 - 120	97	80 - 120	<1.0	ug/L				
6118867	Dissolved Vanadium (V)	2019/05/14	103	80 - 120	99	80 - 120	<0.50	ug/L				

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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
6118867	Dissolved Zinc (Zn)	2019/05/14	99	80 - 120	99	80 - 120	<5.0	ug/L				
6118943	Total Kjeldahl Nitrogen (TKN)	2019/05/15	98	80 - 120	91	80 - 120	<0.10	mg/L	11	20	88	80 - 120
6119255	Total Ammonia-N	2019/05/14	89	75 - 125	100	80 - 120	<0.050	mg/L	0.45	20		
6119265	Total Ammonia-N	2019/05/14	97	75 - 125	95	80 - 120	<0.050	mg/L	NC	20		
6119298	Total Ammonia-N	2019/05/15	99	75 - 125	100	80 - 120	<0.050	mg/L	0.45	20		
6119924	Total Phosphorus	2019/05/14	NC	80 - 120	100	80 - 120	<0.020	mg/L	1.3	20	101	80 - 120
6120708	Total Aluminum (Al)	2019/05/15	102	80 - 120	100	80 - 120	<5.0	ug/L	0.15	20		
6120708	Total Antimony (Sb)	2019/05/15	106	80 - 120	103	80 - 120	<0.50	ug/L				
6120708	Total Arsenic (As)	2019/05/15	101	80 - 120	100	80 - 120	<1.0	ug/L				
6120708	Total Barium (Ba)	2019/05/15	98	80 - 120	97	80 - 120	<2.0	ug/L				
6120708	Total Beryllium (Be)	2019/05/15	100	80 - 120	101	80 - 120	<0.50	ug/L				
6120708	Total Bismuth (Bi)	2019/05/15	101	80 - 120	100	80 - 120	<1.0	ug/L				
6120708	Total Boron (B)	2019/05/15	91	80 - 120	91	80 - 120	<10	ug/L				
6120708	Total Cadmium (Cd)	2019/05/15	102	80 - 120	103	80 - 120	<0.10	ug/L				
6120708	Total Calcium (Ca)	2019/05/15	NC	80 - 120	101	80 - 120	<200	ug/L				
6120708	Total Chromium (Cr)	2019/05/15	96	80 - 120	95	80 - 120	<5.0	ug/L				
6120708	Total Cobalt (Co)	2019/05/15	98	80 - 120	99	80 - 120	<0.50	ug/L				
6120708	Total Copper (Cu)	2019/05/15	104	80 - 120	101	80 - 120	<1.0	ug/L				
6120708	Total Iron (Fe)	2019/05/15	99	80 - 120	101	80 - 120	<100	ug/L				
6120708	Total Lead (Pb)	2019/05/15	102	80 - 120	101	80 - 120	<0.50	ug/L				
6120708	Total Lithium (Li)	2019/05/15	111	80 - 120	111	80 - 120	<5.0	ug/L				
6120708	Total Magnesium (Mg)	2019/05/15	101	80 - 120	101	80 - 120	<50	ug/L				
6120708	Total Manganese (Mn)	2019/05/15	98	80 - 120	99	80 - 120	<2.0	ug/L				
6120708	Total Molybdenum (Mo)	2019/05/15	98	80 - 120	98	80 - 120	<0.50	ug/L				
6120708	Total Nickel (Ni)	2019/05/15	96	80 - 120	97	80 - 120	<1.0	ug/L				
6120708	Total Potassium (K)	2019/05/15	100	80 - 120	98	80 - 120	<200	ug/L				
6120708	Total Selenium (Se)	2019/05/15	106	80 - 120	106	80 - 120	<2.0	ug/L				
6120708	Total Silicon (Si)	2019/05/15	101	80 - 120	98	80 - 120	<50	ug/L				
6120708	Total Silver (Ag)	2019/05/15	99	80 - 120	99	80 - 120	<0.10	ug/L				
6120708	Total Sodium (Na)	2019/05/15	NC	80 - 120	100	80 - 120	<100	ug/L				
6120708	Total Strontium (Sr)	2019/05/15	98	80 - 120	98	80 - 120	<1.0	ug/L				
6120708	Total Tellurium (Te)	2019/05/15	107	80 - 120	105	80 - 120	<1.0	ug/L				

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
6120708	Total Thallium (Tl)	2019/05/15	103	80 - 120	100	80 - 120	<0.050	ug/L				
6120708	Total Tin (Sn)	2019/05/15	105	80 - 120	103	80 - 120	<1.0	ug/L				
6120708	Total Titanium (Ti)	2019/05/15	101	80 - 120	100	80 - 120	<5.0	ug/L				
6120708	Total Tungsten (W)	2019/05/15	102	80 - 120	102	80 - 120	<1.0	ug/L				
6120708	Total Uranium (U)	2019/05/15	103	80 - 120	106	80 - 120	<0.10	ug/L				
6120708	Total Vanadium (V)	2019/05/15	96	80 - 120	96	80 - 120	<0.50	ug/L				
6120708	Total Zinc (Zn)	2019/05/15	100	80 - 120	101	80 - 120	<5.0	ug/L				
6120708	Total Zirconium (Zr)	2019/05/15	105	80 - 120	102	80 - 120	<1.0	ug/L				
6122227	Mercury (Hg)	2019/05/15	102	75 - 125	96	80 - 120	<0.0001	mg/L	NC	20		
6122260	Mercury (Hg)	2019/05/15	109	75 - 125	104	80 - 120	<0.0001	mg/L	NC	20		
6122456	Mercury (Hg)	2019/05/15	92	75 - 125	89	80 - 120	<0.0001	mg/L	NC	20		
6122557	Mercury (Hg)	2019/05/15	89	75 - 125	94	80 - 120	<0.0001	mg/L	NC	20		

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.

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

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

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

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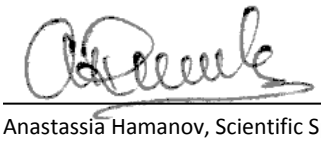
Maxxam Job #: B9C5104
Report Date: 2019/05/16

exp Services Inc
Client Project #: THB-00006196-OE
Site Location: Longlac Landfill - Spring Sampling Event
Sampler Initials: EF

VALIDATION SIGNATURE PAGE

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



Anastassia Hamanov, Scientific Specialist

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

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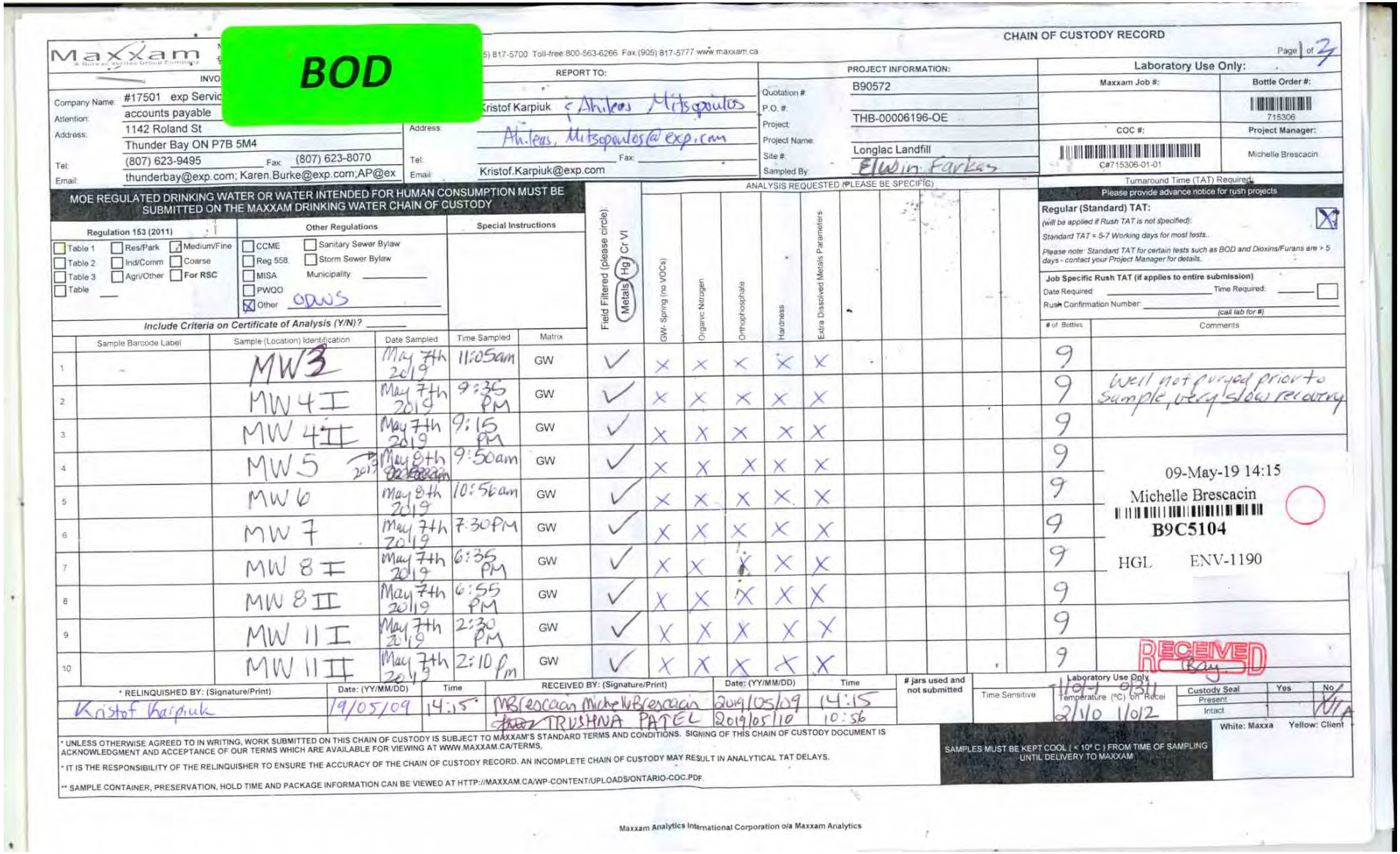

BOD

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CHAIN OF CUSTODY RECORD

Page 1 of 2

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INVO

Company Name: #17501 exp Servic
Attention: accounts payable
Address: 1142 Roland St
Thunder Bay ON P7B 5M4
Tel: (807) 623-9495 Fax: (807) 623-8070
Email: thunderbay@exp.com; Karen.Burke@exp.com;AP@ex

REPORT TO:

Kristof Karpiuk < Athleas Mitsopoulos
Address: Ath.leas, Mitsopoulos@exp.com
Tel: Fax:
Email: Kristof.Karpiuk@exp.com

PROJECT INFORMATION:

Quotation #: B90572
P.O. #:
Project: THB-00006196-OE
Project Name: Longlac Landfill
Site #:
Sampled By: Elwin Farkas

Laboratory Use Only:

Maxxam Job #:
Bottle Order #: 715306
COC #: C#715306-01-01
Project Manager: Michelle Brescacin

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011)
☐ Table 1 ☐ Res/Park ☑ Medium/Fine
☐ Table 2 ☐ Ind/Comm ☐ Coarse
☐ Table 3 ☐ Agri/Other ☐ For RSC
☐ Table ___

Other Regulations
☐ CCME ☐ Sanitary Sewer Bylaw
☐ Reg 558 ☐ Storm Sewer Bylaw
☐ MISA Municipality
☐ PWQO
☒ Other ODWS

Special Instructions

Include Criteria on Certificate of Analysis (Y/N)?

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects
Regular (Standard) TAT: ☒
(will be applied if Rush TAT is not specified)
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.
Job Specific Rush TAT (if applies to entire submission)
Date Required: Time Required: ☐
Rush Confirmation Number: (call lab for #)

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Hg / Cr VI	GW- Spring (no VOCs)	Organic Nitrogen	Orthophosphate	Hardness	Extra Dissolved Metals Parameters	# of Bottles	Comments
1		MW3	May 7th 2019	11:05am	GW	✓	X	X	X	X	X	9	
2		MW 4 I	May 7th 2019	9:35 PM	GW	✓	X	X	X	X	X	9	well not purged prior to sample, very slow recovery
3		MW 4 II	May 7th 2019	9:15 PM	GW	✓	X	X	X	X	X	9	
4		MW 5	May 8th 2019	9:50am	GW	✓	X	X	X	X	X	9	
5		MW 6	May 8th 2019	10:56am	GW	✓	X	X	X	X	X	9	
6		MW 7	May 7th 2019	7:30PM	GW	✓	X	X	X	X	X	9	
7		MW 8 I	May 7th 2019	6:35 PM	GW	✓	X	X	X	X	X	9	
8		MW 8 II	May 7th 2019	6:55 PM	GW	✓	X	X	X	X	X	9	
9		MW 11 I	May 7th 2019	2:30 PM	GW	✓	X	X	X	X	X	9	
10		MW 11 II	May 7th 2019	2:10 pm	GW	✓	X	X	X	X	X	9	

09-May-19 14:15
Michelle Brescacin
B9C5104
HGL ENV-1190

RECEIVED
May

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time
Kristof Karpiuk	19/05/09	14:15	MBrescacin Michelle Brescacin	2019/05/09	14:15
			~~TRUSHNA~~ PATEL	2019/05/10	10:56

jars used and not submitted

Time Sensitive

Laboratory Use Only
Temperature (°C) on Recei: 1/0/1 9/3/1 / 2/1/0 1/0/2
Custody Seal: Present / Intact — Yes / No: N/A

White: Maxxa Yellow: Client

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** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT HTTP://MAXXAM.CA/WP-CONTENT/UPLOADS/ONTARIO-COC.PDF

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

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CHAIN OF CUSTODY RECORD

Page 2 of 3

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#17501 exp Services Inc	Company Name:		Quotation #:	B90572	Maxxam Job #:	Bottle Order #: 715306
Attention:	accounts payable	Attention:	Kristof Karpiuk & Ahikas Mitsopoulos	P.O. #:			
Address:	1142 Roland St Thunder Bay ON P7B 5M4	Address:	Ahikas.Mitsopoulos@exp.com	Project:	THB-00006196-OE	COC #:	Project Manager:
Tel:	(807) 623-9495 Fax: (807) 623-8070	Tel:	Fax:	Project Name:		C#715306-03-01	Michelle Brescacin
Email:	thunderbay@exp.com; Karen.Burke@exp.com;AP@ex	Email:	Kristof.Karpiuk@exp.com	Site #:	Longlac Landfill		
				Sampled By:	Elwin Farkas		

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011)	Other Regulations	Special Instructions
☐ Table 1 ☐ Res/Park ☐ Medium/Fine ☐ Table 2 ☐ Ind/Comm ☐ Coarse ☐ Table 3 ☐ Agri/Other ☐ For RSC ☐ Table ___	☐ CCME ☐ Sanitary Sewer Bylaw ☐ Reg 558 ☐ Storm Sewer Bylaw ☐ MISA Municipality ___ ☐ PWQO ☒ Other ODWS	

Include Criteria on Certificate of Analysis (Y/N)? ___

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects
Regular (Standard) TAT: ☒
(will be applied if Rush TAT is not specified)
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: ___ Time Required: ___ ☐
Rush Confirmation Number: ___ *(call lab for #)*

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Hg / Cr VI	ANALYSIS REQUESTED (PLEASE BE SPECIFIC): GW- Spring (no VOCs)	Organic Nitrogen	Orthophosphate	Hardness	Extra Dissolved Metals Parameters					# of Bottles	Comments
1		MW 12 I	May 8 2019	12:05 PM	GW	✓	X	X	X	X	X					9	
2		MW 12 II	May 7 2019	4:35 PM	GW	✓	X	X	X	X	X					9	
3		MW 9	May 8 2019	11:29am	GW	✓	X	X	X	X	X					9	
4		MW 10	May 8 2019	8:35am	GW	✓	X	X	X	X	X					9	
5		MW 13	May 7 2019	9:40 PM	GW	✓	X	X	X	X	X					9	
6					GW												
7					GW												
8					GW												
9					GW												
10					GW												

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Laboratory Use Only: Time Sensitive	Temperature (°C) on Recei	Custody Seal	Yes	No
Kristof Karpiuk	19/05/09		(SEE PAGE 1)						Present		
									Intact		

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO MAXXAM'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.MAXXAM.CA/TERMS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT HTTP://MAXXAM.CA/WP-CONTENT/UPLOADS/ONTARIO-COC.PDF.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

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CHAIN OF CUSTODY RECORD

Page 37 of 37

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#17501 exp Services Inc	Company Name:		Quotation #:	B90572	Maxxam Job #:	Bottle Order #:
Attention:	accounts payable	Attention:	Kristof Karpiuk / Athleas Mitsopoulos	P.O. #:			715307
Address:	1142 Roland St Thunder Bay ON P7B 5M4	Address:	Athleas.Mitsopoulos@exp.com	Project:	THB-00006196-OE	COC #:	Project Manager:
Tel:	(807) 623-9495 Fax: (807) 623-8070	Tel:	Fax:	Project Name:		C#715307-01-01	Michelle Brescacin
Email:	thunderbay@exp.com; Karen.Burke@exp.com;AP@ex	Email:	Kristof.Karpiuk@exp.com	Site #:	Longlac Landfill		
				Sampled By:	Elwin Farkas		

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011)	Other Regulations	Special Instructions
☐ Table 1 ☐ Res/Park ☐ Medium/Fine ☐ Table 2 ☐ Ind/Comm ☐ Coarse ☐ Table 3 ☐ Agri/Other ☐ For RSC ☐ Table ___	☐ CCME ☐ Sanitary Sewer Bylaw ☐ Reg 558 ☐ Storm Sewer Bylaw ☐ MISA Municipality ___ ☒ PWQO ☐ Other ___	

Include Criteria on Certificate of Analysis (Y/N)? ___

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals (Hg) / Cr VI	SW - Spring	Extra Total Metals Parameters							# of Bottles	Comments
1		SW1	MAY 7th 2019	11:25 AM	SW	✓	X	X							9	
2		SW2	MAY 7th 2019	8:00 Pm	SW	✓	X	X							9	
3		SW3	MAY 7th 2019	5:20 PM	SW	✓	X	X							9	
4																
5																
6																
7																
8																
9																
10																

ANALYSIS REQUESTED (PLEASE BE SPECIFIC)

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects

Regular (Standard) TAT: ☒
(will be applied if Rush TAT is not specified)
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: ___ Time Required: ___ ☐
Rush Confirmation Number: ___ *(call lab for #)*

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Laboratory Use Only				
Kristof Karpiuk	19/05/09		SEE PAGE 1				Time Sensitive	Temperature (°C) on Recei	Custody Seal	Yes	No
									Present		
									Intact		

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SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

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Maxxam Analytics International Corporation o/a Maxxam Analytics

Your Project #: THB-00006196-OE
Site#: Longlac Landfill
Site Location: Longlac Landfill - Fall Sampling Event

Attention: Ahileas Mitsopoulos

exp Services Inc
Thunder Bay Branch
1142 Roland St
Thunder Bay, ON
CANADA P7B 5M4

Your C.O.C. #: 741948-03-01, 741948-02-01, 741949-01-01

Report Date: 2019/11/08
Report #: R5957711
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9U7686
Received: 2019/10/31, 11:40

Sample Matrix: Water
Samples Received: 19

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Dissolved Aluminum (0.2 u, clay free)	1	N/A	2019/11/04	CAM SOP-00447	EPA 6020B m
Dissolved Aluminum (0.2 u, clay free)	2	N/A	2019/11/05	CAM SOP-00447	EPA 6020B m
Alkalinity	15	N/A	2019/11/04	CAM SOP-00448	SM 23 2320 B m
Alkalinity	4	N/A	2019/11/05	CAM SOP-00448	SM 23 2320 B m
Biochemical Oxygen Demand (BOD)	3	2019/11/02	2019/11/07	CAM SOP-00427	SM 23 5210B m
Chloride by Automated Colourimetry	13	N/A	2019/11/04	CAM SOP-00463	SM 23 4500-Cl E m
Chloride by Automated Colourimetry	6	N/A	2019/11/06	CAM SOP-00463	SM 23 4500-Cl E m
Chemical Oxygen Demand	18	N/A	2019/11/05	CAM SOP-00416	SM 23 5220 D m
Chemical Oxygen Demand	1	N/A	2019/11/07	CAM SOP-00416	SM 23 5220 D m
Conductivity	15	N/A	2019/11/04	CAM SOP-00414	SM 23 2510 m
Conductivity	4	N/A	2019/11/05	CAM SOP-00414	SM 23 2510 m
Dissolved Organic Carbon (DOC) (1)	1	N/A	2019/11/02	CAM SOP-00446	SM 23 5310 B m
Dissolved Organic Carbon (DOC) (1)	18	N/A	2019/11/03	CAM SOP-00446	SM 23 5310 B m
Hardness (calculated as CaCO3)	1	N/A	2019/11/04	CAM SOP 00102/00408/00447	SM 2340 B
Hardness (calculated as CaCO3)	2	N/A	2019/11/05	CAM SOP 00102/00408/00447	SM 2340 B
Hardness (calculated as CaCO3)	5	N/A	2019/11/06	CAM SOP 00102/00408/00447	SM 2340 B
Hardness (calculated as CaCO3)	1	N/A	2019/11/07	CAM SOP 00102/00408/00447	SM 2340 B
Hardness (calculated as CaCO3)	10	N/A	2019/11/08	CAM SOP 00102/00408/00447	SM 2340 B
Mercury in Water by CVAA	5	2019/11/04	2019/11/05	CAM SOP-00453	EPA 7470A m
Mercury in Water by CVAA	14	2019/11/04	2019/11/06	CAM SOP-00453	EPA 7470A m
Dissolved Calcium and Magnesium	1	2019/11/02	2019/11/04	CAM SOP-00408	EPA 6010D m
Dissolved Calcium and Magnesium	2	2019/11/04	2019/11/05	CAM SOP-00408	EPA 6010D m
Dissolved Metals by ICPMS	9	N/A	2019/11/05	CAM SOP-00447	EPA 6020B m

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Your Project #: THB-00006196-OE
Site#: Longlac Landfill
Site Location: Longlac Landfill - Fall Sampling Event

Attention: Ahileas Mitsopoulos

exp Services Inc
Thunder Bay Branch
1142 Roland St
Thunder Bay, ON
CANADA P7B 5M4

Your C.O.C. #: 741948-03-01, 741948-02-01, 741949-01-01

Report Date: 2019/11/08
Report #: R5957711
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9U7686
Received: 2019/10/31, 11:40

Sample Matrix: Water
Samples Received: 19

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Dissolved Metals by ICPMS	7	N/A	2019/11/06	CAM SOP-00447	EPA 6020B m
Total Metals Analysis by ICPMS	1	N/A	2019/11/06	CAM SOP-00447	EPA 6020B m
Total Metals Analysis by ICPMS	2	N/A	2019/11/08	CAM SOP-00447	EPA 6020B m
Ion Balance (% Difference)	3	N/A	2019/11/06		
Ion Balance (% Difference)	3	N/A	2019/11/07		
Ion Balance (% Difference)	10	N/A	2019/11/08		
Total Ammonia-N	15	N/A	2019/11/05	CAM SOP-00441	USGS I-2522-90 m
Total Ammonia-N	4	N/A	2019/11/06	CAM SOP-00441	USGS I-2522-90 m
Nitrate (NO3) and Nitrite (NO2) in Water (2)	19	N/A	2019/11/07	CAM SOP-00440	SM 23 4500-NO3I/NO2B
Organic Nitrogen	19	N/A	2019/11/08		
pH	15	2019/11/02	2019/11/04	CAM SOP-00413	SM 4500H+ B m
pH	4	2019/11/02	2019/11/05	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	19	N/A	2019/11/05	CAM SOP-00444	OMOE E3179 m
Orthophosphate	15	N/A	2019/11/05	CAM SOP-00461	EPA 365.1 m
Orthophosphate	1	N/A	2019/11/07	CAM SOP-00461	EPA 365.1 m
Sulphate by Automated Colourimetry	13	N/A	2019/11/04	CAM SOP-00464	EPA 375.4 m
Sulphate by Automated Colourimetry	6	N/A	2019/11/06	CAM SOP-00464	EPA 375.4 m
Total Dissolved Solids	4	2019/11/02	2019/11/05	CAM SOP-00428	SM 23 2540C m
Total Dissolved Solids	12	2019/11/04	2019/11/05	CAM SOP-00428	SM 23 2540C m
Total Dissolved Solids	3	2019/11/05	2019/11/06	CAM SOP-00428	SM 23 2540C m
Total Kjeldahl Nitrogen in Water	5	2019/11/04	2019/11/07	CAM SOP-00938	OMOE E3516 m
Total Kjeldahl Nitrogen in Water	14	2019/11/04	2019/11/08	CAM SOP-00938	OMOE E3516 m
Total Phosphorus (Colourimetric)	3	2019/11/05	2019/11/05	CAM SOP-00407	SM 23 4500 P B H m
Total Phosphorus (Colourimetric)	15	2019/11/05	2019/11/05	CAM SOP-00407	SM 23 4500 P B H m
Total Phosphorus (Colourimetric)	1	2019/11/06	2019/11/06	CAM SOP-00407	SM 23 4500 P B H m
Low Level Total Suspended Solids	3	2019/11/05	2019/11/06	CAM SOP-00428	SM 23 2540D m
Volatile Organic Compounds in Water	5	N/A	2019/11/06	CAM SOP-00226	EPA 8260C m

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Your Project #: THB-00006196-OE
Site#: Longlac Landfill
Site Location: Longlac Landfill - Fall Sampling Event

Attention: Ahileas Mitsopoulos

exp Services Inc
Thunder Bay Branch
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Your C.O.C. #: 741948-03-01, 741948-02-01, 741949-01-01

Report Date: 2019/11/08
Report #: R5957711
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9U7686
Received: 2019/10/31, 11:40

Remarks:

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

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

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

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

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
(1) Dissolved Organic Carbon (DOC) present in the sample should be considered as non-purgeable DOC.
(2) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Michelle Huth, Project Manager Assistant
Email: Michelle.Huth@bvlabs.com
Phone# (807)344-4220

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BV Labs Job #: B9U7686
Report Date: 2019/11/08

exp Services Inc
Client Project #: THB-00006196-OE
Site Location: Longlac Landfill - Fall Sampling Event
Sampler Initials: CP

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

BV Labs ID		LES546		LES547			LES547		
Sampling Date		2019/10/29 17:45		2019/10/29 18:05			2019/10/29 18:05		
COC Number		741948-03-01		741948-03-01			741948-03-01		
	UNITS	**MW2**	**QC Batch**	**MW3**	**RDL**	**QC Batch**	**MW3 Lab-Dup**	**RDL**	**QC Batch**
Inorganics									
Total Ammonia-N	mg/L	0.52	6423037	0.82	0.050	6423031			
Total Chemical Oxygen Demand (COD)	mg/L	13	6422707	4.0	4.0	6422725			
Conductivity	umho/cm	420	6421588	470	1.0	6421539			
Total Dissolved Solids	mg/L	250	6421977	230	10	6421977			
Total Kjeldahl Nitrogen (TKN)	mg/L	0.69	6422749	0.87	0.10	6422749			
Dissolved Organic Carbon	mg/L	6.1	6421535	1.4	0.50	6421535	1.4	0.50	6421535
pH	pH	8.11	6421589	7.95		6421540			
Phenols-4AAP	mg/L	0.0048	6422286	<0.0010	0.0010	6422288			
Total Phosphorus	mg/L	0.92	6424963	0.29	0.040	6424963			
Dissolved Sulphate (SO4)	mg/L	<1.0	6421669	<1.0	1.0	6421662			
Alkalinity (Total as CaCO3)	mg/L	230	6421585	250	1.0	6421538			
Dissolved Chloride (Cl-)	mg/L	1.4	6421667	1.5	1.0	6421659			
Nitrite (N)	mg/L	<0.010	6421548	<0.010	0.010	6421548			
Nitrate (N)	mg/L	<0.10	6421548	<0.10	0.10	6421548			
Metals									
Mercury (Hg)	mg/L	<0.0001	6422989	<0.0001	0.0001	6422989			
Dissolved Aluminum (Al)	ug/L	<5.0	6421949	<5.0	5.0	6421949			
Dissolved Antimony (Sb)	ug/L	<0.50	6421949	<0.50	0.50	6421949			
Dissolved Arsenic (As)	ug/L	1.9	6421949	3.2	1.0	6421949			
Dissolved Barium (Ba)	ug/L	26	6421949	43	2.0	6421949			
Dissolved Beryllium (Be)	ug/L	<0.50	6421949	<0.50	0.50	6421949			
Dissolved Bismuth (Bi)	ug/L	<1.0	6421949	<1.0	1.0	6421949			
Dissolved Boron (B)	ug/L	23	6421949	35	10	6421949			
Dissolved Cadmium (Cd)	ug/L	<0.10	6421949	<0.10	0.10	6421949			
Dissolved Calcium (Ca)	ug/L	62000	6421949	63000	200	6421949			
Dissolved Chromium (Cr)	ug/L	<5.0	6421949	<5.0	5.0	6421949			
Dissolved Cobalt (Co)	ug/L	<0.50	6421949	<0.50	0.50	6421949			
Dissolved Copper (Cu)	ug/L	<1.0	6421949	<1.0	1.0	6421949			
Dissolved Iron (Fe)	ug/L	1200	6421949	1200	100	6421949			
Dissolved Lead (Pb)	ug/L	<0.50	6421949	<0.50	0.50	6421949			
Dissolved Magnesium (Mg)	ug/L	15000	6421949	19000	50	6421949			
Dissolved Manganese (Mn)	ug/L	66	6421949	63	2.0	6421949			

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

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BV Labs Job #: B9U7686
Report Date: 2019/11/08

exp Services Inc
Client Project #: THB-00006196-OE
Site Location: Longlac Landfill - Fall Sampling Event
Sampler Initials: CP

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

BV Labs ID		LES546		LES547			LES547		
Sampling Date		2019/10/29 17:45		2019/10/29 18:05			2019/10/29 18:05		
COC Number		741948-03-01		741948-03-01			741948-03-01		
	UNITS	**MW2**	**QC Batch**	**MW3**	**RDL**	**QC Batch**	**MW3 Lab-Dup**	**RDL**	**QC Batch**
Dissolved Molybdenum (Mo)	ug/L	<0.50	6421949	<0.50	0.50	6421949			
Dissolved Nickel (Ni)	ug/L	<1.0	6421949	<1.0	1.0	6421949			
Dissolved Potassium (K)	ug/L	1100	6421949	1200	200	6421949			
Dissolved Selenium (Se)	ug/L	<2.0	6421949	<2.0	2.0	6421949			
Dissolved Silicon (Si)	ug/L	8100	6421949	8800	50	6421949			
Dissolved Sodium (Na)	ug/L	5800	6421949	9000	100	6421949			
Dissolved Strontium (Sr)	ug/L	190	6421949	270	1.0	6421949			
Dissolved Thallium (Tl)	ug/L	<0.050	6421949	<0.050	0.050	6421949			
Dissolved Tin (Sn)	ug/L	<1.0	6421949	<1.0	1.0	6421949			
Dissolved Vanadium (V)	ug/L	0.55	6421949	<0.50	0.50	6421949			
Dissolved Zinc (Zn)	ug/L	<5.0	6421949	<5.0	5.0	6421949			

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
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BV Labs Job #: B9U7686
Report Date: 2019/11/08

exp Services Inc
Client Project #: THB-00006196-OE
Site Location: Longlac Landfill - Fall Sampling Event
Sampler Initials: CP

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

BV Labs ID		LES548			LES548			LES549		
Sampling Date		2019/10/29 09:25			2019/10/29 09:25			2019/10/29 09:45		
COC Number		741948-03-01			741948-03-01			741948-03-01		
	UNITS	**MW4I**	**RDL**	**QC Batch**	**MW4I Lab-Dup**	**RDL**	**QC Batch**	**MW4II**	**RDL**	**QC Batch**
Inorganics										
Total Ammonia-N	mg/L	0.084	0.050	6423037				0.49	0.050	6423037
Total Chemical Oxygen Demand (COD)	mg/L	5.0	4.0	6423160	8.2	4.0	6423160	13	4.0	6422707
Conductivity	umho/cm	620	1.0	6421588				1200	1.0	6421588
Total Dissolved Solids	mg/L	335	10	6421977				590	10	6421768
Total Kjeldahl Nitrogen (TKN)	mg/L	0.35	0.10	6422749				1.7	0.10	6422749
Dissolved Organic Carbon	mg/L	2.5	0.50	6421535				4.7	0.50	6421535
pH	pH	8.18		6421589				8.14		6421589
Phenols-4AAP	mg/L	<0.0010	0.0010	6422286				<0.0010	0.0010	6422286
Total Phosphorus	mg/L	0.039	0.020	6424963				46	0.20	6424963
Dissolved Sulphate (SO4)	mg/L	1.4	1.0	6421669				5.7	1.0	6421669
Alkalinity (Total as CaCO3)	mg/L	340	1.0	6421585				610	1.0	6421585
Dissolved Chloride (Cl-)	mg/L	1.8	1.0	6421667				5.4	1.0	6421667
Nitrite (N)	mg/L	0.024	0.010	6421548				0.257	0.010	6421548
Nitrate (N)	mg/L	0.15	0.10	6421548				1.61	0.10	6421548
Metals										
Mercury (Hg)	mg/L	<0.0001	0.0001	6422989				<0.0001	0.0001	6422989
Dissolved Aluminum (Al)	ug/L	5.2	5.0	6421949				5.6	5.0	6421949
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	6421949				<0.50	0.50	6421949
Dissolved Arsenic (As)	ug/L	<1.0	1.0	6421949				<1.0	1.0	6421949
Dissolved Barium (Ba)	ug/L	64	2.0	6421949				68	2.0	6421949
Dissolved Beryllium (Be)	ug/L	<0.50	0.50	6421949				<0.50	0.50	6421949
Dissolved Bismuth (Bi)	ug/L	<1.0	1.0	6421949				<1.0	1.0	6421949
Dissolved Boron (B)	ug/L	63	10	6421949				910	10	6421949
Dissolved Cadmium (Cd)	ug/L	<0.10	0.10	6421949				<0.10	0.10	6421949
Dissolved Calcium (Ca)	ug/L	75000	200	6421949				42000	200	6421949
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	6421949				<5.0	5.0	6421949
Dissolved Cobalt (Co)	ug/L	<0.50	0.50	6421949				0.59	0.50	6421949
Dissolved Copper (Cu)	ug/L	<1.0	1.0	6421949				3.8	1.0	6421949
Dissolved Iron (Fe)	ug/L	<100	100	6421949				<100	100	6421949
Dissolved Lead (Pb)	ug/L	<0.50	0.50	6421949				<0.50	0.50	6421949
Dissolved Magnesium (Mg)	ug/L	31000	50	6421949				68000	50	6421949
Dissolved Manganese (Mn)	ug/L	52	2.0	6421949				11	2.0	6421949

RDL = Reportable Detection Limit
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Lab-Dup = Laboratory Initiated Duplicate

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BV Labs Job #: B9U7686
Report Date: 2019/11/08

exp Services Inc
Client Project #: THB-00006196-OE
Site Location: Longlac Landfill - Fall Sampling Event
Sampler Initials: CP

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

BV Labs ID		LES548			LES548			LES549		
Sampling Date		2019/10/29 09:25			2019/10/29 09:25			2019/10/29 09:45		
COC Number		741948-03-01			741948-03-01			741948-03-01		
	UNITS	**MW4I**	**RDL**	**QC Batch**	**MW4I Lab-Dup**	**RDL**	**QC Batch**	**MW4II**	**RDL**	**QC Batch**
Dissolved Molybdenum (Mo)	ug/L	2.3	0.50	6421949				4.4	0.50	6421949
Dissolved Nickel (Ni)	ug/L	<1.0	1.0	6421949				1.2	1.0	6421949
Dissolved Potassium (K)	ug/L	6800	200	6421949				160000	200	6421949
Dissolved Selenium (Se)	ug/L	<2.0	2.0	6421949				<2.0	2.0	6421949
Dissolved Silicon (Si)	ug/L	8200	50	6421949				3500	50	6421949
Dissolved Sodium (Na)	ug/L	12000	100	6421949				15000	100	6421949
Dissolved Strontium (Sr)	ug/L	480	1.0	6421949				93	1.0	6421949
Dissolved Thallium (Tl)	ug/L	<0.050	0.050	6421949				0.068	0.050	6421949
Dissolved Tin (Sn)	ug/L	<1.0	1.0	6421949				<1.0	1.0	6421949
Dissolved Vanadium (V)	ug/L	<0.50	0.50	6421949				<0.50	0.50	6421949
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	6421949				<5.0	5.0	6421949

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

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LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

BV Labs ID		LES550			LES551		
Sampling Date		2019/10/29 10:55			2019/10/29 12:00		
COC Number		741948-03-01			741948-03-01		
	UNITS	**MW5**	**RDL**	**QC Batch**	**MW6**	**RDL**	**QC Batch**
Inorganics							
Total Ammonia-N	mg/L	0.10	0.050	6423037	50 (1)	0.50	6423031
Total Chemical Oxygen Demand (COD)	mg/L	<4.0	4.0	6422707	11	4.0	6422707
Conductivity	umho/cm	540	1.0	6421539	1100	1.0	6421539
Total Dissolved Solids	mg/L	270	10	6421768	445	10	6421977
Total Kjeldahl Nitrogen (TKN)	mg/L	0.37	0.10	6422749	48 (1)	5.0	6422749
Dissolved Organic Carbon	mg/L	0.91	0.50	6421535	4.9	0.50	6421499
pH	pH	8.02		6421540	7.85		6421540
Phenols-4AAP	mg/L	<0.0010	0.0010	6422288	<0.0010	0.0010	6422286
Total Phosphorus	mg/L	0.39	0.040	6424963	1.5	0.10	6424963
Dissolved Sulphate (SO4)	mg/L	1.9	1.0	6421669	8.7	1.0	6421669
Alkalinity (Total as CaCO3)	mg/L	290	1.0	6421538	540	1.0	6421538
Dissolved Chloride (Cl-)	mg/L	1.8	1.0	6421667	20	1.0	6421667
Nitrite (N)	mg/L	<0.010	0.010	6421546	0.061	0.010	6421548
Nitrate (N)	mg/L	0.36	0.10	6421546	<0.10	0.10	6421548
Metals							
Mercury (Hg)	mg/L	<0.0001	0.0001	6422989	<0.0001	0.0001	6422989
Dissolved Aluminum (Al)	ug/L	<5.0	5.0	6421818	6.4	5.0	6421949
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	6421818	<0.50	0.50	6421949
Dissolved Arsenic (As)	ug/L	<1.0	1.0	6421818	<1.0	1.0	6421949
Dissolved Barium (Ba)	ug/L	23	2.0	6421818	76	2.0	6421949
Dissolved Beryllium (Be)	ug/L	<0.50	0.50	6421818	<0.50	0.50	6421949
Dissolved Bismuth (Bi)	ug/L	<1.0	1.0	6421818	<1.0	1.0	6421949
Dissolved Boron (B)	ug/L	<10	10	6421818	48	10	6421949
Dissolved Cadmium (Cd)	ug/L	<0.10	0.10	6421818	<0.10	0.10	6421949
Dissolved Calcium (Ca)	ug/L	86000	200	6421818	97000	200	6421949
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	6421818	<5.0	5.0	6421949
Dissolved Cobalt (Co)	ug/L	<0.50	0.50	6421818	0.60	0.50	6421949
Dissolved Copper (Cu)	ug/L	<1.0	1.0	6421818	1.7	1.0	6421949
Dissolved Iron (Fe)	ug/L	<100	100	6421818	<100	100	6421949
Dissolved Lead (Pb)	ug/L	<0.50	0.50	6421818	<0.50	0.50	6421949
Dissolved Magnesium (Mg)	ug/L	21000	50	6421818	26000	50	6421949
Dissolved Manganese (Mn)	ug/L	<2.0	2.0	6421818	230	2.0	6421949

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) TKN < NH4: Both values fall within acceptable RPD limits for duplicates and are likely equivalent.

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

BV Labs ID		LES550			LES551		
Sampling Date		2019/10/29 10:55			2019/10/29 12:00		
COC Number		741948-03-01			741948-03-01		
	UNITS	**MW5**	**RDL**	**QC Batch**	**MW6**	**RDL**	**QC Batch**
Dissolved Molybdenum (Mo)	ug/L	<0.50	0.50	6421818	0.89	0.50	6421949
Dissolved Nickel (Ni)	ug/L	<1.0	1.0	6421818	1.9	1.0	6421949
Dissolved Potassium (K)	ug/L	930	200	6421818	4000	200	6421949
Dissolved Selenium (Se)	ug/L	<2.0	2.0	6421818	<2.0	2.0	6421949
Dissolved Silicon (Si)	ug/L	6600	50	6421818	4500	50	6421949
Dissolved Sodium (Na)	ug/L	3200	100	6421818	23000	100	6421949
Dissolved Strontium (Sr)	ug/L	74	1.0	6421818	200	1.0	6421949
Dissolved Thallium (Tl)	ug/L	<0.050	0.050	6421818	<0.050	0.050	6421949
Dissolved Tin (Sn)	ug/L	<1.0	1.0	6421818	<1.0	1.0	6421949
Dissolved Vanadium (V)	ug/L	0.73	0.50	6421818	<0.50	0.50	6421949
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	6421818	<5.0	5.0	6421949

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

BV Labs ID		LES551			LES552		
Sampling Date		2019/10/29 12:00			2019/10/29 11:55		
COC Number		741948-03-01			741948-03-01		
	UNITS	**MW6 Lab-Dup**	**RDL**	**QC Batch**	**MW7**	**RDL**	**QC Batch**
Inorganics							
Total Ammonia-N	mg/L				15	0.050	6423037
Total Chemical Oxygen Demand (COD)	mg/L				40	4.0	6422725
Conductivity	umho/cm				2200	1.0	6421539
Total Dissolved Solids	mg/L				1400	10	6421768
Total Kjeldahl Nitrogen (TKN)	mg/L				22	5.0	6422749
Dissolved Organic Carbon	mg/L				16	0.50	6421535
pH	pH				7.59		6421540
Phenols-4AAP	mg/L				<0.0010	0.0010	6422288
Total Phosphorus	mg/L				0.49	0.040	6424963
Dissolved Sulphate (SO4)	mg/L				120	1.0	6421676
Alkalinity (Total as CaCO3)	mg/L				540	1.0	6421538
Dissolved Chloride (Cl-)	mg/L				99	1.0	6421674
Nitrite (N)	mg/L				0.975	0.010	6421546
Nitrate (N)	mg/L				104	1.0	6421546
Metals							
Mercury (Hg)	mg/L	<0.0001	0.0001	6422989	<0.0001	0.0001	6422989
Dissolved Aluminum (Al)	ug/L				<5.0	5.0	6421949
Dissolved Antimony (Sb)	ug/L				<0.50	0.50	6421949
Dissolved Arsenic (As)	ug/L				<1.0	1.0	6421949
Dissolved Barium (Ba)	ug/L				200	2.0	6421949
Dissolved Beryllium (Be)	ug/L				<0.50	0.50	6421949
Dissolved Bismuth (Bi)	ug/L				<1.0	1.0	6421949
Dissolved Boron (B)	ug/L				710	10	6421949
Dissolved Cadmium (Cd)	ug/L				<0.10	0.10	6421949
Dissolved Calcium (Ca)	ug/L				240000	200	6421949
Dissolved Chromium (Cr)	ug/L				<5.0	5.0	6421949
Dissolved Cobalt (Co)	ug/L				4.7	0.50	6421949
Dissolved Copper (Cu)	ug/L				7.9	1.0	6421949
Dissolved Iron (Fe)	ug/L				<100	100	6421949
Dissolved Lead (Pb)	ug/L				<0.50	0.50	6421949
Dissolved Magnesium (Mg)	ug/L				61000	50	6421949
Dissolved Manganese (Mn)	ug/L				400	2.0	6421949

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

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

BV Labs ID		LES551			LES552		
Sampling Date		2019/10/29 12:00			2019/10/29 11:55		
COC Number		741948-03-01			741948-03-01		
	UNITS	**MW6 Lab-Dup**	**RDL**	**QC Batch**	**MW7**	**RDL**	**QC Batch**
Dissolved Molybdenum (Mo)	ug/L				<0.50	0.50	6421949
Dissolved Nickel (Ni)	ug/L				16	1.0	6421949
Dissolved Potassium (K)	ug/L				51000	200	6421949
Dissolved Selenium (Se)	ug/L				<2.0	2.0	6421949
Dissolved Silicon (Si)	ug/L				7500	50	6421949
Dissolved Sodium (Na)	ug/L				120000	100	6421949
Dissolved Strontium (Sr)	ug/L				270	1.0	6421949
Dissolved Thallium (Tl)	ug/L				0.23	0.050	6421949
Dissolved Tin (Sn)	ug/L				<1.0	1.0	6421949
Dissolved Vanadium (V)	ug/L				<0.50	0.50	6421949
Dissolved Zinc (Zn)	ug/L				<5.0	5.0	6421949

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

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

BV Labs ID		LES552			LES553		
Sampling Date		2019/10/29 11:55			2019/10/29 13:20		
COC Number		741948-03-01			741948-03-01		
	UNITS	**MW7 Lab-Dup**	**RDL**	**QC Batch**	**MW8I**	**RDL**	**QC Batch**
Inorganics							
Total Ammonia-N	mg/L				70	1.0	6423037
Total Chemical Oxygen Demand (COD)	mg/L				220	12	6422725
Conductivity	umho/cm				5200	1.0	6421539
Total Dissolved Solids	mg/L				2950	10	6421768
Total Kjeldahl Nitrogen (TKN)	mg/L				74	5.0	6422749
Dissolved Organic Carbon	mg/L				82	2.5	6421535
pH	pH				7.62		6421540
Phenols-4AAP	mg/L	<0.0010	0.0010	6422288	0.0029	0.0010	6422288
Total Phosphorus	mg/L				0.29	0.040	6424963
Dissolved Sulphate (SO4)	mg/L				140	1.0	6421676
Alkalinity (Total as CaCO3)	mg/L				1900	1.0	6421538
Dissolved Chloride (Cl-)	mg/L				560	8.0	6421674
Nitrite (N)	mg/L				0.056	0.010	6421546
Nitrate (N)	mg/L				<0.10	0.10	6421546
Metals							
Mercury (Hg)	mg/L				<0.0001	0.0001	6422989
Dissolved Aluminum (Al)	ug/L				13	5.0	6421949
Dissolved Antimony (Sb)	ug/L				0.61	0.50	6421949
Dissolved Arsenic (As)	ug/L				9.5	1.0	6421949
Dissolved Barium (Ba)	ug/L				350	2.0	6421949
Dissolved Beryllium (Be)	ug/L				<0.50	0.50	6421949
Dissolved Bismuth (Bi)	ug/L				<1.0	1.0	6421949
Dissolved Boron (B)	ug/L				3400	10	6421949
Dissolved Cadmium (Cd)	ug/L				<0.10	0.10	6421949
Dissolved Calcium (Ca)	ug/L				200000	200	6421949
Dissolved Chromium (Cr)	ug/L				<5.0	5.0	6421949
Dissolved Cobalt (Co)	ug/L				17	0.50	6421949
Dissolved Copper (Cu)	ug/L				<1.0	1.0	6421949
Dissolved Iron (Fe)	ug/L				5800	100	6421949
Dissolved Lead (Pb)	ug/L				<0.50	0.50	6421949
Dissolved Magnesium (Mg)	ug/L				180000	50	6421949
Dissolved Manganese (Mn)	ug/L				910	2.0	6421949

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

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

BV Labs ID		LES552			LES553		
Sampling Date		2019/10/29 11:55			2019/10/29 13:20		
COC Number		741948-03-01			741948-03-01		
	UNITS	**MW7 Lab-Dup**	**RDL**	**QC Batch**	**MW8I**	**RDL**	**QC Batch**
Dissolved Molybdenum (Mo)	ug/L				2.6	0.50	6421949
Dissolved Nickel (Ni)	ug/L				47	1.0	6421949
Dissolved Potassium (K)	ug/L				310000	1000	6421949
Dissolved Selenium (Se)	ug/L				<2.0	2.0	6421949
Dissolved Silicon (Si)	ug/L				9700	50	6421949
Dissolved Sodium (Na)	ug/L				490000	500	6421949
Dissolved Strontium (Sr)	ug/L				680	1.0	6421949
Dissolved Thallium (Tl)	ug/L				0.11	0.050	6421949
Dissolved Tin (Sn)	ug/L				<1.0	1.0	6421949
Dissolved Vanadium (V)	ug/L				2.9	0.50	6421949
Dissolved Zinc (Zn)	ug/L				<5.0	5.0	6421949

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

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

BV Labs ID		LES554			LES555		LES557		
Sampling Date		2019/10/29 13:30			2019/10/29 14:55		2019/10/29 10:20		
COC Number		741948-03-01			741948-03-01		741948-02-01		
	UNITS	**MW8II**	**RDL**	**QC Batch**	**MW9**	**QC Batch**	**MW10**	**RDL**	**QC Batch**
Inorganics									
Total Ammonia-N	mg/L	3.3	0.050	6423031	<0.050	6423037	<0.050	0.050	6423488
Total Chemical Oxygen Demand (COD)	mg/L	14	4.0	6422725	<4.0	6422725	8.8	4.0	6422707
Conductivity	umho/cm	1200	1.0	6421539	590	6421539	500	1.0	6421539
Total Dissolved Solids	mg/L	435	10	6421768	350	6421768	260	10	6421768
Total Kjeldahl Nitrogen (TKN)	mg/L	4.0	0.20	6422749	0.29	6422749	0.17	0.10	6422750
Dissolved Organic Carbon	mg/L	3.5	0.50	6421535	0.94	6421535	2.8	0.50	6421535
pH	pH	7.71		6421540	7.93	6421540	7.87		6421540
Phenols-4AAP	mg/L	<0.0010	0.0010	6422286	<0.0010	6422286	<0.0010	0.0010	6422286
Total Phosphorus	mg/L	1.1	0.040	6424963	0.12	6424963	0.50	0.040	6424963
Dissolved Sulphate (SO4)	mg/L	72	1.0	6421669	27	6421676	<1.0	1.0	6421983
Alkalinity (Total as CaCO3)	mg/L	440	1.0	6421538	270	6421538	260	1.0	6421538
Dissolved Chloride (Cl-)	mg/L	64	1.0	6421667	4.2	6421674	2.1	1.0	6421982
Nitrite (N)	mg/L	0.379	0.010	6421548	<0.010	6421546	<0.010	0.010	6421546
Nitrate (N)	mg/L	1.36	0.10	6421548	1.66	6421546	0.19	0.10	6421546
Metals									
Mercury (Hg)	mg/L	<0.0001	0.0001	6422989	<0.0001	6422989	<0.0001	0.0001	6422993
Dissolved Aluminum (Al)	ug/L	<5.0	5.0	6421949	<5.0	6421949	<5.0	5.0	6422674
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	6421949	<0.50	6421949	<0.50	0.50	6422674
Dissolved Arsenic (As)	ug/L	<1.0	1.0	6421949	<1.0	6421949	<1.0	1.0	6422674
Dissolved Barium (Ba)	ug/L	79	2.0	6421949	13	6421949	19	2.0	6422674
Dissolved Beryllium (Be)	ug/L	<0.50	0.50	6421949	<0.50	6421949	<0.50	0.50	6422674
Dissolved Bismuth (Bi)	ug/L	<1.0	1.0	6421949	<1.0	6421949	<1.0	1.0	6422674
Dissolved Boron (B)	ug/L	450	10	6421949	33	6421949	<10	10	6422674
Dissolved Cadmium (Cd)	ug/L	<0.10	0.10	6421949	<0.10	6421949	<0.10	0.10	6422674
Dissolved Calcium (Ca)	ug/L	150000	200	6421949	100000	6421949	81000	200	6422674
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	6421949	<5.0	6421949	<5.0	5.0	6422674
Dissolved Cobalt (Co)	ug/L	1.4	0.50	6421949	<0.50	6421949	<0.50	0.50	6422674
Dissolved Copper (Cu)	ug/L	5.2	1.0	6421949	<1.0	6421949	2.5	1.0	6422674
Dissolved Iron (Fe)	ug/L	<100	100	6421949	<100	6421949	<100	100	6422674
Dissolved Lead (Pb)	ug/L	<0.50	0.50	6421949	<0.50	6421949	<0.50	0.50	6422674
Dissolved Magnesium (Mg)	ug/L	36000	50	6421949	16000	6421949	17000	50	6422674
Dissolved Manganese (Mn)	ug/L	230	2.0	6421949	2.1	6421949	33	2.0	6422674
Dissolved Molybdenum (Mo)	ug/L	0.54	0.50	6421949	<0.50	6421949	<0.50	0.50	6422674

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

BV Labs ID		LES554			LES555		LES557		
Sampling Date		2019/10/29 13:30			2019/10/29 14:55		2019/10/29 10:20		
COC Number		741948-03-01			741948-03-01		741948-02-01		
	UNITS	**MW8II**	**RDL**	**QC Batch**	**MW9**	**QC Batch**	**MW10**	**RDL**	**QC Batch**
Dissolved Nickel (Ni)	ug/L	6.5	1.0	6421949	<1.0	6421949	<1.0	1.0	6422674
Dissolved Potassium (K)	ug/L	29000	200	6421949	680	6421949	430	200	6422674
Dissolved Selenium (Se)	ug/L	<2.0	2.0	6421949	<2.0	6421949	<2.0	2.0	6422674
Dissolved Silicon (Si)	ug/L	5500	50	6421949	4300	6421949	5700	50	6422674
Dissolved Sodium (Na)	ug/L	50000	100	6421949	1600	6421949	2000	100	6422674
Dissolved Strontium (Sr)	ug/L	300	1.0	6421949	77	6421949	60	1.0	6422674
Dissolved Thallium (Tl)	ug/L	<0.050	0.050	6421949	<0.050	6421949	<0.050	0.050	6422674
Dissolved Tin (Sn)	ug/L	<1.0	1.0	6421949	<1.0	6421949	<1.0	1.0	6422674
Dissolved Vanadium (V)	ug/L	<0.50	0.50	6421949	<0.50	6421949	0.85	0.50	6422674
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	6421949	<5.0	6421949	<5.0	5.0	6422674

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

BV Labs ID		LES557			LES558		
Sampling Date		2019/10/29 10:20			2019/10/30 09:30		
COC Number		741948-02-01			741948-02-01		
	UNITS	**MW10 Lab-Dup**	**RDL**	**QC Batch**	**MW11I**	**RDL**	**QC Batch**
Inorganics							
Total Ammonia-N	mg/L				0.074	0.050	6423375
Total Chemical Oxygen Demand (COD)	mg/L				20	4.0	6422707
Conductivity	umho/cm	500	1.0	6421539	1500	1.0	6421539
Total Dissolved Solids	mg/L				885	10	6421768
Total Kjeldahl Nitrogen (TKN)	mg/L				0.33	0.10	6422750
Dissolved Organic Carbon	mg/L				6.3	0.50	6421535
pH	pH	7.92		6421540	7.65		6421540
Phenols-4AAP	mg/L	<0.0010	0.0010	6422286	<0.0010	0.0010	6422288
Total Phosphorus	mg/L				0.21	0.040	6424963
Dissolved Sulphate (SO4)	mg/L	<1.0	1.0	6421983	96	1.0	6421669
Alkalinity (Total as CaCO3)	mg/L	270	1.0	6421538	570	1.0	6421538
Dissolved Chloride (Cl-)	mg/L	2.2	1.0	6421982	120	1.0	6421667
Nitrite (N)	mg/L				<0.010	0.010	6421548
Nitrate (N)	mg/L				<0.10	0.10	6421548
Metals							
Mercury (Hg)	mg/L				<0.0001	0.0001	6422989
Dissolved Aluminum (Al)	ug/L				<5.0	5.0	6422685
Dissolved Antimony (Sb)	ug/L				<0.50	0.50	6422685
Dissolved Arsenic (As)	ug/L				<1.0	1.0	6422685
Dissolved Barium (Ba)	ug/L				120	2.0	6422685
Dissolved Beryllium (Be)	ug/L				<0.50	0.50	6422685
Dissolved Bismuth (Bi)	ug/L				<1.0	1.0	6422685
Dissolved Boron (B)	ug/L				190	10	6422685
Dissolved Cadmium (Cd)	ug/L				<0.10	0.10	6422685
Dissolved Calcium (Ca)	ug/L				200000	200	6422685
Dissolved Chromium (Cr)	ug/L				<5.0	5.0	6422685
Dissolved Cobalt (Co)	ug/L				<0.50	0.50	6422685
Dissolved Copper (Cu)	ug/L				<1.0	1.0	6422685
Dissolved Iron (Fe)	ug/L				2900	100	6422685
Dissolved Lead (Pb)	ug/L				<0.50	0.50	6422685
Dissolved Magnesium (Mg)	ug/L				45000	50	6422685
Dissolved Manganese (Mn)	ug/L				110	2.0	6422685

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

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

BV Labs ID		LES557			LES558		
Sampling Date		2019/10/29 10:20			2019/10/30 09:30		
COC Number		741948-02-01			741948-02-01		
	UNITS	**MW10 Lab-Dup**	**RDL**	**QC Batch**	**MW11I**	**RDL**	**QC Batch**
Dissolved Molybdenum (Mo)	ug/L				<0.50	0.50	6422685
Dissolved Nickel (Ni)	ug/L				2.2	1.0	6422685
Dissolved Potassium (K)	ug/L				3600	200	6422685
Dissolved Selenium (Se)	ug/L				<2.0	2.0	6422685
Dissolved Silicon (Si)	ug/L				5900	50	6422685
Dissolved Sodium (Na)	ug/L				78000	100	6422685
Dissolved Strontium (Sr)	ug/L				210	1.0	6422685
Dissolved Thallium (Tl)	ug/L				<0.050	0.050	6422685
Dissolved Tin (Sn)	ug/L				<1.0	1.0	6422685
Dissolved Vanadium (V)	ug/L				<0.50	0.50	6422685
Dissolved Zinc (Zn)	ug/L				<5.0	5.0	6422685

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

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

BV Labs ID		LES559			LES560		LES561		
Sampling Date		2019/10/30 09:40			2019/10/30 08:50		2019/10/29 16:05		
COC Number		741948-02-01			741948-02-01		741948-02-01		
	UNITS	**MW11 II**	**RDL**	**QC Batch**	**MW12 I**	**QC Batch**	**MW12 II**	**RDL**	**QC Batch**
Inorganics									
Total Ammonia-N	mg/L	0.20	0.050	6423375	0.095	6423375	0.050	0.050	6423375
Total Chemical Oxygen Demand (COD)	mg/L	7.5	4.0	6422707	8.5	6422707	<4.0	4.0	6422707
Conductivity	umho/cm	1300	1.0	6421539	900	6421539	1000	1.0	6421539
Total Dissolved Solids	mg/L	755	10	6421768	500	6421768	595	10	6421768
Total Kjeldahl Nitrogen (TKN)	mg/L	0.56	0.10	6422750	0.24	6422750	0.33	0.10	6422750
Dissolved Organic Carbon	mg/L	4.6	0.50	6421535	1.7	6421535	1.8	0.50	6421535
pH	pH	7.81		6421540	7.90	6421540	7.74		6421540
Phenols-4AAP	mg/L	<0.0010	0.0010	6422286	<0.0010	6422288	<0.0010	0.0010	6422286
Total Phosphorus	mg/L	18	0.20	6424963	0.28	6424963	0.32	0.040	6424963
Dissolved Sulphate (SO4)	mg/L	120	1.0	6421676	89	6421676	82	1.0	6421676
Alkalinity (Total as CaCO3)	mg/L	420	1.0	6421538	370	6421538	450	1.0	6421538
Dissolved Chloride (Cl-)	mg/L	120	1.0	6421674	25	6421674	22	1.0	6421674
Nitrite (N)	mg/L	<0.010	0.010	6421546	<0.010	6421548	<0.010	0.010	6421548
Nitrate (N)	mg/L	<0.10	0.10	6421546	<0.10	6421548	<0.10	0.10	6421548
Metals									
Mercury (Hg)	mg/L	<0.0001	0.0001	6422993	<0.0001	6422993	<0.0001	0.0001	6422989
Dissolved Aluminum (Al)	ug/L	<5.0	5.0	6422685	<5.0	6422685	<5.0	5.0	6421949
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	6422685	<0.50	6422685	<0.50	0.50	6421949
Dissolved Arsenic (As)	ug/L	<1.0	1.0	6422685	<1.0	6422685	<1.0	1.0	6421949
Dissolved Barium (Ba)	ug/L	150	2.0	6422685	64	6422685	35	2.0	6421949
Dissolved Beryllium (Be)	ug/L	<0.50	0.50	6422685	<0.50	6422685	<0.50	0.50	6421949
Dissolved Bismuth (Bi)	ug/L	<1.0	1.0	6422685	<1.0	6422685	<1.0	1.0	6421949
Dissolved Boron (B)	ug/L	39	10	6422685	440	6422685	660	10	6421949
Dissolved Cadmium (Cd)	ug/L	<0.10	0.10	6422685	<0.10	6422685	<0.10	0.10	6421949
Dissolved Calcium (Ca)	ug/L	180000	200	6422685	160000	6422685	160000	200	6421949
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	6422685	<5.0	6422685	<5.0	5.0	6421949
Dissolved Cobalt (Co)	ug/L	<0.50	0.50	6422685	<0.50	6422685	<0.50	0.50	6421949
Dissolved Copper (Cu)	ug/L	<1.0	1.0	6422685	2.1	6422685	1.2	1.0	6421949
Dissolved Iron (Fe)	ug/L	1600	100	6422685	<100	6422685	<100	100	6421949
Dissolved Lead (Pb)	ug/L	<0.50	0.50	6422685	<0.50	6422685	<0.50	0.50	6421949
Dissolved Magnesium (Mg)	ug/L	40000	50	6422685	35000	6422685	31000	50	6421949
Dissolved Manganese (Mn)	ug/L	140	2.0	6422685	54	6422685	<2.0	2.0	6421949
Dissolved Molybdenum (Mo)	ug/L	<0.50	0.50	6422685	0.77	6422685	<0.50	0.50	6421949

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

BV Labs ID		LES559			LES560		LES561		
Sampling Date		2019/10/30 09:40			2019/10/30 08:50		2019/10/29 16:05		
COC Number		741948-02-01			741948-02-01		741948-02-01		
	UNITS	**MW11 II**	**RDL**	**QC Batch**	**MW12 I**	**QC Batch**	**MW12 II**	**RDL**	**QC Batch**
Dissolved Nickel (Ni)	ug/L	<1.0	1.0	6422685	2.8	6422685	<1.0	1.0	6421949
Dissolved Potassium (K)	ug/L	2900	200	6422685	2500	6422685	1300	200	6421949
Dissolved Selenium (Se)	ug/L	<2.0	2.0	6422685	<2.0	6422685	<2.0	2.0	6421949
Dissolved Silicon (Si)	ug/L	7800	50	6422685	9300	6422685	6000	50	6421949
Dissolved Sodium (Na)	ug/L	36000	100	6422685	16000	6422685	21000	100	6421949
Dissolved Strontium (Sr)	ug/L	210	1.0	6422685	310	6422685	150	1.0	6421949
Dissolved Thallium (Tl)	ug/L	<0.050	0.050	6422685	<0.050	6422685	<0.050	0.050	6421949
Dissolved Tin (Sn)	ug/L	<1.0	1.0	6422685	<1.0	6422685	<1.0	1.0	6421949
Dissolved Vanadium (V)	ug/L	<0.50	0.50	6422685	<0.50	6422685	<0.50	0.50	6421949
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	6422685	<5.0	6422685	<5.0	5.0	6421949

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

BV Labs ID		LES561			LES562		
Sampling Date		2019/10/29 16:05			2019/10/29 08:00		
COC Number		741948-02-01			741948-02-01		
	UNITS	**MW12 II Lab-Dup**	**RDL**	**QC Batch**	**MW13**	**RDL**	**QC Batch**
Inorganics							
Total Ammonia-N	mg/L				50 (1)	0.50	6423488
Total Chemical Oxygen Demand (COD)	mg/L				7.8	4.0	6422707
Conductivity	umho/cm				1100	1.0	6421539
Total Dissolved Solids	mg/L				460	10	6421768
Total Kjeldahl Nitrogen (TKN)	mg/L				47 (1)	2.0	6422750
Dissolved Organic Carbon	mg/L				4.5	0.50	6421535
pH	pH				7.84		6421540
Phenols-4AAP	mg/L				<0.0010	0.0010	6422286
Total Phosphorus	mg/L				1.5	0.10	6427364
Dissolved Sulphate (SO4)	mg/L				8.7	1.0	6421669
Alkalinity (Total as CaCO3)	mg/L				550	1.0	6421538
Dissolved Chloride (Cl-)	mg/L				21	1.0	6421667
Nitrite (N)	mg/L	<0.010	0.010	6421548	0.015	0.010	6421546
Nitrate (N)	mg/L	<0.10	0.10	6421548	<0.10	0.10	6421546
Metals							
Mercury (Hg)	mg/L				<0.0001	0.0001	6422989
Dissolved Aluminum (Al)	ug/L				13	5.0	6422685
Dissolved Antimony (Sb)	ug/L				<0.50	0.50	6422685
Dissolved Arsenic (As)	ug/L				<1.0	1.0	6422685
Dissolved Barium (Ba)	ug/L				78	2.0	6422685
Dissolved Beryllium (Be)	ug/L				<0.50	0.50	6422685
Dissolved Bismuth (Bi)	ug/L				<1.0	1.0	6422685
Dissolved Boron (B)	ug/L				34	10	6422685
Dissolved Cadmium (Cd)	ug/L				<0.10	0.10	6422685
Dissolved Calcium (Ca)	ug/L				98000	200	6422685
Dissolved Chromium (Cr)	ug/L				<5.0	5.0	6422685
Dissolved Cobalt (Co)	ug/L				0.63	0.50	6422685
Dissolved Copper (Cu)	ug/L				1.9	1.0	6422685
Dissolved Iron (Fe)	ug/L				<100	100	6422685
Dissolved Lead (Pb)	ug/L				<0.50	0.50	6422685
Dissolved Magnesium (Mg)	ug/L				26000	50	6422685

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
(1) TKN < NH4: Both values fall within acceptable RPD limits for duplicates and are likely equivalent.

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BV Labs Job #: B9U7686
Report Date: 2019/11/08

exp Services Inc
Client Project #: THB-00006196-OE
Site Location: Longlac Landfill - Fall Sampling Event
Sampler Initials: CP

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

BV Labs ID		LES561			LES562		
Sampling Date		2019/10/29 16:05			2019/10/29 08:00		
COC Number		741948-02-01			741948-02-01		
	UNITS	**MW12 II Lab-Dup**	**RDL**	**QC Batch**	**MW13**	**RDL**	**QC Batch**
Dissolved Manganese (Mn)	ug/L				240	2.0	6422685
Dissolved Molybdenum (Mo)	ug/L				0.88	0.50	6422685
Dissolved Nickel (Ni)	ug/L				1.8	1.0	6422685
Dissolved Potassium (K)	ug/L				3700	200	6422685
Dissolved Selenium (Se)	ug/L				<2.0	2.0	6422685
Dissolved Silicon (Si)	ug/L				4500	50	6422685
Dissolved Sodium (Na)	ug/L				23000	100	6422685
Dissolved Strontium (Sr)	ug/L				200	1.0	6422685
Dissolved Thallium (Tl)	ug/L				<0.050	0.050	6422685
Dissolved Tin (Sn)	ug/L				<1.0	1.0	6422685
Dissolved Vanadium (V)	ug/L				<0.50	0.50	6422685
Dissolved Zinc (Zn)	ug/L				<5.0	5.0	6422685

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

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Report Date: 2019/11/08

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LANDFILL STANDARDS SCH 5 - SW COMP. LIST (WATER)

BV Labs ID		LES564			LES564			LES565		
Sampling Date		2019/10/29 18:25			2019/10/29 18:25			2019/10/29 14:30		
COC Number		741949-01-01			741949-01-01			741949-01-01		
	UNITS	**SW1**	**RDL**	**QC Batch**	**SW1 Lab-Dup**	**RDL**	**QC Batch**	**SW2**	**RDL**	**QC Batch**
Inorganics										
Total Ammonia-N	mg/L	<0.050	0.050	6423488	<0.050	0.050	6423488	<0.050	0.050	6423488
Total BOD	mg/L	<2	2	6421422				4	2	6421422
Total Chemical Oxygen Demand (COD)	mg/L	32	4.0	6422707				59	4.0	6422707
Conductivity	umho/cm	130	1.0	6421539				1300	1.0	6421539
Total Dissolved Solids	mg/L	60	10	6425838				885	10	6425838
Total Kjeldahl Nitrogen (TKN)	mg/L	0.34	0.10	6422750				1.2	0.10	6422750
pH	pH	7.84		6421540				8.04		6421540
Phenols-4AAP	mg/L	<0.0010	0.0010	6422288				0.0030	0.0010	6422288
Total Phosphorus	mg/L	0.007	0.004	6425197				0.074	0.004	6425197
Total Suspended Solids	mg/L	<1	1	6421978				10	1	6421978
Dissolved Sulphate (SO4)	mg/L	<1.0	1.0	6421662				230	1.0	6421662
Alkalinity (Total as CaCO3)	mg/L	65	1.0	6421538				490	1.0	6421538
Dissolved Chloride (Cl-)	mg/L	2.8	1.0	6421659				15	1.0	6421659
Nitrite (N)	mg/L	<0.010	0.010	6421548				<0.010	0.010	6421546
Nitrate (N)	mg/L	<0.10	0.10	6421548				<0.10	0.10	6421546
Metals										
Mercury (Hg)	mg/L	<0.0001	0.0001	6422993				<0.0001	0.0001	6422989
Total Aluminum (Al)	ug/L	11	5.0	6425247				50	5.0	6425247
Total Antimony (Sb)	ug/L	<0.50	0.50	6425247				0.58	0.50	6425247
Total Arsenic (As)	ug/L	<1.0	1.0	6425247				5.1	1.0	6425247
Total Barium (Ba)	ug/L	3.9	2.0	6425247				73	2.0	6425247
Total Beryllium (Be)	ug/L	<0.50	0.50	6425247				<0.50	0.50	6425247
Total Bismuth (Bi)	ug/L	<1.0	1.0	6425247				<1.0	1.0	6425247
Total Boron (B)	ug/L	<10	10	6425247				710	10	6425247
Total Cadmium (Cd)	ug/L	<0.10	0.10	6425247				<0.10	0.10	6425247
Total Calcium (Ca)	ug/L	20000	200	6425247				250000	200	6425247
Total Chromium (Cr)	ug/L	<5.0	5.0	6425247				<5.0	5.0	6425247
Total Cobalt (Co)	ug/L	<0.50	0.50	6425247				0.96	0.50	6425247
Total Copper (Cu)	ug/L	<1.0	1.0	6425247				2.0	1.0	6425247
Total Iron (Fe)	ug/L	140	100	6425247				1300	100	6425247
Total Lead (Pb)	ug/L	<0.50	0.50	6425247				1.6	0.50	6425247
Total Lithium (Li)	ug/L	<5.0	5.0	6425247				<5.0	5.0	6425247
Total Magnesium (Mg)	ug/L	4800	50	6425247				24000	50	6425247

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

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BV Labs Job #: B9U7686
Report Date: 2019/11/08

exp Services Inc
Client Project #: THB-00006196-OE
Site Location: Longlac Landfill - Fall Sampling Event
Sampler Initials: CP

LANDFILL STANDARDS SCH 5 - SW COMP. LIST (WATER)

BV Labs ID		LES564			LES564			LES565		
Sampling Date		2019/10/29 18:25			2019/10/29 18:25			2019/10/29 14:30		
COC Number		741949-01-01			741949-01-01			741949-01-01		
	UNITS	**SW1**	**RDL**	**QC Batch**	**SW1 Lab-Dup**	**RDL**	**QC Batch**	**SW2**	**RDL**	**QC Batch**
Total Manganese (Mn)	ug/L	25	2.0	6425247				1300	2.0	6425247
Total Molybdenum (Mo)	ug/L	<0.50	0.50	6425247				0.53	0.50	6425247
Total Nickel (Ni)	ug/L	<1.0	1.0	6425247				4.1	1.0	6425247
Total Potassium (K)	ug/L	<200	200	6425247				21000	200	6425247
Total Selenium (Se)	ug/L	<2.0	2.0	6425247				<2.0	2.0	6425247
Total Silicon (Si)	ug/L	2100	50	6425247				5900	50	6425247
Total Silver (Ag)	ug/L	<0.10	0.10	6425247				<0.10	0.10	6425247
Total Sodium (Na)	ug/L	1300	100	6425247				29000	100	6425247
Total Strontium (Sr)	ug/L	17	1.0	6425247				980	1.0	6425247
Total Tellurium (Te)	ug/L	<1.0	1.0	6425247				<1.0	1.0	6425247
Total Thallium (Tl)	ug/L	<0.050	0.050	6425247				<0.050	0.050	6425247
Total Tin (Sn)	ug/L	<1.0	1.0	6425247				<1.0	1.0	6425247
Total Titanium (Ti)	ug/L	<5.0	5.0	6425247				6.9	5.0	6425247
Total Tungsten (W)	ug/L	<1.0	1.0	6425247				<1.0	1.0	6425247
Total Uranium (U)	ug/L	<0.10	0.10	6425247				0.32	0.10	6425247
Total Vanadium (V)	ug/L	<0.50	0.50	6425247				1.6	0.50	6425247
Total Zinc (Zn)	ug/L	<5.0	5.0	6425247				35	5.0	6425247
Total Zirconium (Zr)	ug/L	<1.0	1.0	6425247				1.0	1.0	6425247

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

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LANDFILL STANDARDS SCH 5 - SW COMP. LIST (WATER)

BV Labs ID		LES566			LES566		
Sampling Date		2019/10/29 14:10			2019/10/29 14:10		
COC Number		741949-01-01			741949-01-01		
	UNITS	**SW3**	**RDL**	**QC Batch**	**SW3 Lab-Dup**	**RDL**	**QC Batch**
Inorganics							
Total Ammonia-N	mg/L	<0.050	0.050	6423488			
Total BOD	mg/L	<2	2	6421422			
Total Chemical Oxygen Demand (COD)	mg/L	44	4.0	6422707	49	4.0	6422707
Conductivity	umho/cm	2200	1.0	6421588	2200	1.0	6421588
Total Dissolved Solids	mg/L	1260	10	6425838			
Total Kjeldahl Nitrogen (TKN)	mg/L	0.60	0.10	6422750			
pH	pH	8.17		6421589	8.16		6421589
Phenols-4AAP	mg/L	<0.0010	0.0010	6422286			
Total Phosphorus	mg/L	0.022	0.004	6425197			
Total Suspended Solids	mg/L	3	1	6421978			
Dissolved Sulphate (SO4)	mg/L	210	1.0	6421662			
Alkalinity (Total as CaCO3)	mg/L	700	1.0	6421585	700	1.0	6421585
Dissolved Chloride (Cl-)	mg/L	160	2.0	6421659			
Nitrite (N)	mg/L	<0.010	0.010	6421546			
Nitrate (N)	mg/L	<0.10	0.10	6421546			
Metals							
Mercury (Hg)	mg/L	<0.0001	0.0001	6422993			
Total Aluminum (Al)	ug/L	19	5.0	6427171			
Total Antimony (Sb)	ug/L	<0.50	0.50	6427171			
Total Arsenic (As)	ug/L	<1.0	1.0	6427171			
Total Barium (Ba)	ug/L	110	2.0	6427171			
Total Beryllium (Be)	ug/L	<0.50	0.50	6427171			
Total Bismuth (Bi)	ug/L	<1.0	1.0	6427171			
Total Boron (B)	ug/L	1900	10	6427171			
Total Cadmium (Cd)	ug/L	<0.10	0.10	6427171			
Total Calcium (Ca)	ug/L	140000	200	6427171			
Total Chromium (Cr)	ug/L	<5.0	5.0	6427171			
Total Cobalt (Co)	ug/L	1.5	0.50	6427171			
Total Copper (Cu)	ug/L	1.8	1.0	6427171			
Total Iron (Fe)	ug/L	130	100	6427171			
Total Lead (Pb)	ug/L	<0.50	0.50	6427171			
Total Lithium (Li)	ug/L	15	5.0	6427171			
Total Magnesium (Mg)	ug/L	75000	50	6427171			

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

LANDFILL STANDARDS SCH 5 - SW COMP. LIST (WATER)

BV Labs ID		LES566			LES566		
Sampling Date		2019/10/29 14:10			2019/10/29 14:10		
COC Number		741949-01-01			741949-01-01		
	UNITS	**SW3**	**RDL**	**QC Batch**	**SW3 Lab-Dup**	**RDL**	**QC Batch**
Total Manganese (Mn)	ug/L	230	2.0	6427171			
Total Molybdenum (Mo)	ug/L	1.1	0.50	6427171			
Total Nickel (Ni)	ug/L	7.9	1.0	6427171			
Total Potassium (K)	ug/L	110000	200	6427171			
Total Selenium (Se)	ug/L	<2.0	2.0	6427171			
Total Silicon (Si)	ug/L	4600	50	6427171			
Total Silver (Ag)	ug/L	<0.10	0.10	6427171			
Total Sodium (Na)	ug/L	190000	100	6427171			
Total Strontium (Sr)	ug/L	420	1.0	6427171			
Total Tellurium (Te)	ug/L	<1.0	1.0	6427171			
Total Thallium (Tl)	ug/L	<0.050	0.050	6427171			
Total Tin (Sn)	ug/L	<1.0	1.0	6427171			
Total Titanium (Ti)	ug/L	<5.0	5.0	6427171			
Total Tungsten (W)	ug/L	<1.0	1.0	6427171			
Total Uranium (U)	ug/L	0.94	0.10	6427171			
Total Vanadium (V)	ug/L	0.65	0.50	6427171			
Total Zinc (Zn)	ug/L	<5.0	5.0	6427171			
Total Zirconium (Zr)	ug/L	<1.0	1.0	6427171			

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

BV Labs Job #: B9U7686
Report Date: 2019/11/08

exp Services Inc
Client Project #: THB-00006196-OE
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Sampler Initials: CP

RESULTS OF ANALYSES OF WATER

BV Labs ID		LES546		LES547		LES548	LES549	LES550		
Sampling Date		2019/10/29 17:45		2019/10/29 18:05		2019/10/29 09:25	2019/10/29 09:45	2019/10/29 10:55		
COC Number		741948-03-01		741948-03-01		741948-03-01	741948-03-01	741948-03-01		
	UNITS	**MW2**	**QC Batch**	**MW3**	**QC Batch**	**MW4I**	**MW4II**	**MW5**	**RDL**	**QC Batch**
Calculated Parameters										
Hardness (CaCO3)	mg/L	210	6419733	240	6419733	320	390	300	1.0	6419733
Ion Balance (% Difference)	%	0.970	6419734	1.17	6419734	1.19	0.270	1.66	N/A	6419734
Total Organic Nitrogen	mg/L	0.18	6419866	<0.10	6419866	0.26	1.2	0.27	0.10	6419866
Inorganics										
Orthophosphate (P)	mg/L	<0.010	6421670	<0.010	6426352	0.014	<0.010	<0.010	0.010	6421670

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

BV Labs ID		LES551		LES552	LES553		LES554		
Sampling Date		2019/10/29 12:00		2019/10/29 11:55	2019/10/29 13:20		2019/10/29 13:30		
COC Number		741948-03-01		741948-03-01	741948-03-01		741948-03-01		
	UNITS	**MW6**	**QC Batch**	**MW7**	**MW8I**	**QC Batch**	**MW8II**	**RDL**	**QC Batch**
Calculated Parameters									
Hardness (CaCO3)	mg/L	350	6420068	850	1200	6420068	530	1.0	6420068
Ion Balance (% Difference)	%	0.170	6419734	1.64	2.39	6419734	5.29	N/A	6419734
Total Organic Nitrogen	mg/L	<0.10	6419866	7.5	3.9	6419866	0.63	0.10	6419866
Inorganics									
Orthophosphate (P)	mg/L	0.041	6421670	<0.010	<0.010	6421677	<0.010	0.010	6421670

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

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BV Labs Job #: B9U7686
Report Date: 2019/11/08

exp Services Inc
Client Project #: THB-00006196-OE
Site Location: Longlac Landfill - Fall Sampling Event
Sampler Initials: CP

RESULTS OF ANALYSES OF WATER

BV Labs ID		LES555		LES557			LES557		
Sampling Date		2019/10/29 14:55		2019/10/29 10:20			2019/10/29 10:20		
COC Number		741948-03-01		741948-02-01			741948-02-01		
	UNITS	**MW9**	**QC Batch**	**MW10**	**RDL**	**QC Batch**	**MW10 Lab-Dup**	**RDL**	**QC Batch**
Calculated Parameters									
Hardness (CaCO3)	mg/L	320	6420068	270	1.0	6420068			
Ion Balance (% Difference)	%	0.970	6419734	2.61	N/A	6419734			
Total Organic Nitrogen	mg/L	0.29	6419866	0.17	0.10	6419866			
Inorganics									
Orthophosphate (P)	mg/L	<0.010	6421677	<0.010	0.010	6421984	<0.010	0.010	6421984

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

BV Labs ID		LES558		LES559	LES560	LES561		LES562		
Sampling Date		2019/10/30 09:30		2019/10/30 09:40	2019/10/30 08:50	2019/10/29 16:05		2019/10/29 08:00		
COC Number		741948-02-01		741948-02-01	741948-02-01	741948-02-01		741948-02-01		
	UNITS	**MW11I**	**QC Batch**	**MW11 II**	**MW12 I**	**MW12 II**	**QC Batch**	**MW13**	**RDL**	**QC Batch**
Calculated Parameters										
Hardness (CaCO3)	mg/L	680	6420068	620	530	530	6420068	350	1.0	6420068
Ion Balance (% Difference)	%	1.29	6419734	0.520	6.88	1.21	6419734	0.440	N/A	6419734
Total Organic Nitrogen	mg/L	0.26	6419866	0.36	0.15	0.28	6419866	<0.10	0.10	6419866
Inorganics										
Orthophosphate (P)	mg/L	0.011	6421670	<0.010	<0.010	<0.010	6421677	<0.010	0.010	6421670

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

BV Labs ID		LES564	LES565	LES566		
Sampling Date		2019/10/29 18:25	2019/10/29 14:30	2019/10/29 14:10		
COC Number		741949-01-01	741949-01-01	741949-01-01		
	UNITS	**SW1**	**SW2**	**SW3**	**RDL**	**QC Batch**
Calculated Parameters						
Hardness (CaCO3)	mg/L	72	720	650	1.0	6420068
Total Organic Nitrogen	mg/L	0.34	1.2	0.60	0.10	6419866
Inorganics						
Dissolved Organic Carbon	mg/L	15	20	17	0.50	6421535

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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BV Labs Job #: B9U7686
Report Date: 2019/11/08

exp Services Inc
Client Project #: THB-00006196-OE
Site Location: Longlac Landfill - Fall Sampling Event
Sampler Initials: CP

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

BV Labs ID		LES564		LES565		LES566		
Sampling Date		2019/10/29 18:25		2019/10/29 14:30		2019/10/29 14:10		
COC Number		741949-01-01		741949-01-01		741949-01-01		
	UNITS	**SW1**	**QC Batch**	**SW2**	**QC Batch**	**SW3**	**RDL**	**QC Batch**
Metals								
Dissolved (0.2u) Aluminum (Al)	ug/L	7	6422858	15	6421607	8	5	6422858
Dissolved Calcium (Ca)	mg/L	21	6422864	250	6420800	130	0.050	6422864
Dissolved Magnesium (Mg)	mg/L	5.0	6422864	24	6420800	76	0.050	6422864

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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VOLATILE ORGANICS BY GC/MS (WATER)

BV Labs ID		LES551		LES552		LES553		LES554		
Sampling Date		2019/10/29 12:00		2019/10/29 11:55		2019/10/29 13:20		2019/10/29 13:30		
COC Number		741948-03-01		741948-03-01		741948-03-01		741948-03-01		
	UNITS	**MW6**	**RDL**	**MW7**	**RDL**	**MW8I**	**RDL**	**MW8II**	**RDL**	**QC Batch**
Volatile Organics										
Acetone (2-Propanone)	ug/L	<10	10	<50	50	<100	100	<10	10	6422136
Benzene	ug/L	0.13	0.10	0.58	0.50	2.3	1.0	<0.10	0.10	6422136
Bromodichloromethane	ug/L	<0.10	0.10	<0.50	0.50	<1.0	1.0	<0.10	0.10	6422136
Bromoform	ug/L	<0.20	0.20	<1.0	1.0	<2.0	2.0	<0.20	0.20	6422136
Bromomethane	ug/L	<0.50	0.50	<2.5	2.5	<5.0	5.0	<0.50	0.50	6422136
Carbon Tetrachloride	ug/L	<0.10	0.10	<0.50	0.50	<1.0	1.0	<0.10	0.10	6422136
Chlorobenzene	ug/L	<0.10	0.10	<0.50	0.50	<1.0	1.0	<0.10	0.10	6422136
Chloroform	ug/L	<0.10	0.10	<0.50	0.50	<1.0	1.0	<0.10	0.10	6422136
Dibromochloromethane	ug/L	<0.20	0.20	<1.0	1.0	<2.0	2.0	<0.20	0.20	6422136
1,2-Dichlorobenzene	ug/L	<0.20	0.20	<1.0	1.0	<2.0	2.0	<0.20	0.20	6422136
1,3-Dichlorobenzene	ug/L	<0.20	0.20	<1.0	1.0	<2.0	2.0	<0.20	0.20	6422136
1,4-Dichlorobenzene	ug/L	<0.20	0.20	<1.0	1.0	<2.0	2.0	<0.20	0.20	6422136
Dichlorodifluoromethane (FREON 12)	ug/L	<0.50	0.50	<2.5	2.5	<5.0	5.0	<0.50	0.50	6422136
1,1-Dichloroethane	ug/L	<0.10	0.10	<0.50	0.50	1.0	1.0	<0.10	0.10	6422136
1,2-Dichloroethane	ug/L	<0.20	0.20	<1.0	1.0	<2.0	2.0	<0.20	0.20	6422136
1,1-Dichloroethylene	ug/L	<0.10	0.10	<0.50	0.50	<1.0	1.0	<0.10	0.10	6422136
cis-1,2-Dichloroethylene	ug/L	<0.10	0.10	<0.50	0.50	<1.0	1.0	<0.10	0.10	6422136
trans-1,2-Dichloroethylene	ug/L	<0.10	0.10	<0.50	0.50	<1.0	1.0	<0.10	0.10	6422136
1,2-Dichloropropane	ug/L	<0.10	0.10	<0.50	0.50	<1.0	1.0	<0.10	0.10	6422136
cis-1,3-Dichloropropene	ug/L	<0.20	0.20	<1.0	1.0	<2.0	2.0	<0.20	0.20	6422136
trans-1,3-Dichloropropene	ug/L	<0.20	0.20	<1.0	1.0	<2.0	2.0	<0.20	0.20	6422136
Ethylbenzene	ug/L	<0.10	0.10	<0.50	0.50	<1.0	1.0	<0.10	0.10	6422136
Ethylene Dibromide	ug/L	<0.20	0.20	<1.0	1.0	<2.0	2.0	<0.20	0.20	6422136
Hexane	ug/L	<0.50	0.50	<2.5	2.5	<5.0	5.0	<0.50	0.50	6422136
Methylene Chloride(Dichloromethane)	ug/L	<0.50	0.50	<2.5	2.5	<5.0	5.0	<0.50	0.50	6422136
Methyl Ethyl Ketone (2-Butanone)	ug/L	<5.0	5.0	<25	25	<50	50	<5.0	5.0	6422136
Methyl Isobutyl Ketone	ug/L	<5.0	5.0	<25	25	<50	50	<5.0	5.0	6422136
Methyl t-butyl ether (MTBE)	ug/L	<0.20	0.20	<1.0	1.0	6.6	2.0	0.24	0.20	6422136
Styrene	ug/L	<0.20	0.20	<1.0	1.0	<2.0	2.0	<0.20	0.20	6422136
1,1,1,2-Tetrachloroethane	ug/L	<0.20	0.20	<1.0	1.0	<2.0	2.0	<0.20	0.20	6422136
1,1,2,2-Tetrachloroethane	ug/L	<0.20	0.20	<1.0	1.0	<2.0	2.0	<0.20	0.20	6422136
Tetrachloroethylene	ug/L	<0.10	0.10	<0.50	0.50	<1.0	1.0	<0.10	0.10	6422136
Toluene	ug/L	<0.20	0.20	<1.0	1.0	<2.0	2.0	<0.20	0.20	6422136

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

BV Labs Job #: B9U7686
Report Date: 2019/11/08

exp Services Inc
Client Project #: THB-00006196-OE
Site Location: Longlac Landfill - Fall Sampling Event
Sampler Initials: CP

VOLATILE ORGANICS BY GC/MS (WATER)

BV Labs ID		LES551		LES552		LES553		LES554		
Sampling Date		2019/10/29 12:00		2019/10/29 11:55		2019/10/29 13:20		2019/10/29 13:30		
COC Number		741948-03-01		741948-03-01		741948-03-01		741948-03-01		
	UNITS	**MW6**	**RDL**	**MW7**	**RDL**	**MW8I**	**RDL**	**MW8II**	**RDL**	**QC Batch**
1,1,1-Trichloroethane	ug/L	<0.10	0.10	<0.50	0.50	<1.0	1.0	<0.10	0.10	6422136
1,1,2-Trichloroethane	ug/L	<0.20	0.20	<1.0	1.0	<2.0	2.0	<0.20	0.20	6422136
Trichloroethylene	ug/L	<0.10	0.10	<0.50	0.50	<1.0	1.0	<0.10	0.10	6422136
Trichlorofluoromethane (FREON 11)	ug/L	<0.20	0.20	<1.0	1.0	<2.0	2.0	<0.20	0.20	6422136
Vinyl Chloride	ug/L	<0.20	0.20	<1.0	1.0	<2.0	2.0	<0.20	0.20	6422136
p+m-Xylene	ug/L	<0.10	0.10	<0.50	0.50	<1.0	1.0	<0.10	0.10	6422136
o-Xylene	ug/L	<0.10	0.10	<0.50	0.50	<1.0	1.0	<0.10	0.10	6422136
Total Xylenes	ug/L	<0.10	0.10	<0.50	0.50	<1.0	1.0	<0.10	0.10	6422136
Surrogate Recovery (%)										
4-Bromofluorobenzene	%	98		98		97		96		6422136
D4-1,2-Dichloroethane	%	109		106		104		106		6422136
D8-Toluene	%	101		101		102		100		6422136

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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VOLATILE ORGANICS BY GC/MS (WATER)

BV Labs ID		LES562		
Sampling Date		2019/10/29 08:00		
COC Number		741948-02-01		
	UNITS	**MW13**	**RDL**	**QC Batch**
Volatile Organics				
Acetone (2-Propanone)	ug/L	<10	10	6422136
Benzene	ug/L	0.12	0.10	6422136
Bromodichloromethane	ug/L	<0.10	0.10	6422136
Bromoform	ug/L	<0.20	0.20	6422136
Bromomethane	ug/L	<0.50	0.50	6422136
Carbon Tetrachloride	ug/L	<0.10	0.10	6422136
Chlorobenzene	ug/L	<0.10	0.10	6422136
Chloroform	ug/L	<0.10	0.10	6422136
Dibromochloromethane	ug/L	<0.20	0.20	6422136
1,2-Dichlorobenzene	ug/L	<0.20	0.20	6422136
1,3-Dichlorobenzene	ug/L	<0.20	0.20	6422136
1,4-Dichlorobenzene	ug/L	<0.20	0.20	6422136
Dichlorodifluoromethane (FREON 12)	ug/L	<0.50	0.50	6422136
1,1-Dichloroethane	ug/L	<0.10	0.10	6422136
1,2-Dichloroethane	ug/L	<0.20	0.20	6422136
1,1-Dichloroethylene	ug/L	<0.10	0.10	6422136
cis-1,2-Dichloroethylene	ug/L	<0.10	0.10	6422136
trans-1,2-Dichloroethylene	ug/L	<0.10	0.10	6422136
1,2-Dichloropropane	ug/L	<0.10	0.10	6422136
cis-1,3-Dichloropropene	ug/L	<0.20	0.20	6422136
trans-1,3-Dichloropropene	ug/L	<0.20	0.20	6422136
Ethylbenzene	ug/L	<0.10	0.10	6422136
Ethylene Dibromide	ug/L	<0.20	0.20	6422136
Hexane	ug/L	<0.50	0.50	6422136
Methylene Chloride(Dichloromethane)	ug/L	<0.50	0.50	6422136
Methyl Ethyl Ketone (2-Butanone)	ug/L	<5.0	5.0	6422136
Methyl Isobutyl Ketone	ug/L	<5.0	5.0	6422136
Methyl t-butyl ether (MTBE)	ug/L	<0.20	0.20	6422136
Styrene	ug/L	<0.20	0.20	6422136
1,1,1,2-Tetrachloroethane	ug/L	<0.20	0.20	6422136
1,1,2,2-Tetrachloroethane	ug/L	<0.20	0.20	6422136
Tetrachloroethylene	ug/L	<0.10	0.10	6422136
Toluene	ug/L	<0.20	0.20	6422136

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

VOLATILE ORGANICS BY GC/MS (WATER)

BV Labs ID		LES562		
Sampling Date		2019/10/29 08:00		
COC Number		741948-02-01		
	UNITS	**MW13**	**RDL**	**QC Batch**
1,1,1-Trichloroethane	ug/L	<0.10	0.10	6422136
1,1,2-Trichloroethane	ug/L	<0.20	0.20	6422136
Trichloroethylene	ug/L	<0.10	0.10	6422136
Trichlorofluoromethane (FREON 11)	ug/L	<0.20	0.20	6422136
Vinyl Chloride	ug/L	<0.20	0.20	6422136
p+m-Xylene	ug/L	<0.10	0.10	6422136
o-Xylene	ug/L	<0.10	0.10	6422136
Total Xylenes	ug/L	<0.10	0.10	6422136
Surrogate Recovery (%)				
4-Bromofluorobenzene	%	103		6422136
D4-1,2-Dichloroethane	%	107		6422136
D8-Toluene	%	99		6422136

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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BV Labs Job #: B9U7686
Report Date: 2019/11/08

exp Services Inc
Client Project #: THB-00006196-OE
Site Location: Longlac Landfill - Fall Sampling Event
Sampler Initials: CP

TEST SUMMARY

BV Labs ID: LES546
Sample ID: MW2
Matrix: Water

Collected: 2019/10/29
Shipped:
Received: 2019/10/31

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	6421585	N/A	2019/11/05	Surinder Rai
Chloride by Automated Colourimetry	KONE	6421667	N/A	2019/11/04	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	6422707	N/A	2019/11/05	Viorica Rotaru
Conductivity	AT	6421588	N/A	2019/11/05	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6421535	N/A	2019/11/03	Nimarta Singh
Hardness (calculated as CaCO3)		6419733	N/A	2019/11/08	Automated Statchk
Mercury in Water by CVAA	CV/AA	6422989	2019/11/04	2019/11/06	Medhat Nasr
Dissolved Metals by ICPMS	ICP/MS	6421949	N/A	2019/11/06	Matthew Ritenburg
Ion Balance (% Difference)	CALC	6419734	N/A	2019/11/08	Automated Statchk
Total Ammonia-N	LACH/NH4	6423037	N/A	2019/11/05	Mazin Wakai
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6421548	N/A	2019/11/07	Chandra Nandlal
Organic Nitrogen	CALC	6419866	N/A	2019/11/08	Automated Statchk
pH	AT	6421589	2019/11/02	2019/11/05	Surinder Rai
Phenols (4AAP)	TECH/PHEN	6422286	N/A	2019/11/05	Bramdeo Motiram
Orthophosphate	KONE	6421670	N/A	2019/11/05	Deonarine Ramnarine
Sulphate by Automated Colourimetry	KONE	6421669	N/A	2019/11/04	Deonarine Ramnarine
Total Dissolved Solids	BAL	6421977	2019/11/02	2019/11/05	Shivani Desai
Total Kjeldahl Nitrogen in Water	SKAL	6422749	2019/11/04	2019/11/07	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	6424963	2019/11/05	2019/11/05	Shivani Shivani

BV Labs ID: LES547
Sample ID: MW3
Matrix: Water

Collected: 2019/10/29
Shipped:
Received: 2019/10/31

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	6421538	N/A	2019/11/04	Surinder Rai
Chloride by Automated Colourimetry	KONE	6421659	N/A	2019/11/04	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	6422725	N/A	2019/11/05	Viorica Rotaru
Conductivity	AT	6421539	N/A	2019/11/04	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6421535	N/A	2019/11/03	Nimarta Singh
Hardness (calculated as CaCO3)		6419733	N/A	2019/11/08	Automated Statchk
Mercury in Water by CVAA	CV/AA	6422989	2019/11/04	2019/11/06	Medhat Nasr
Dissolved Metals by ICPMS	ICP/MS	6421949	N/A	2019/11/05	Matthew Ritenburg
Ion Balance (% Difference)	CALC	6419734	N/A	2019/11/08	Automated Statchk
Total Ammonia-N	LACH/NH4	6423031	N/A	2019/11/05	Mazin Wakai
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6421548	N/A	2019/11/07	Chandra Nandlal
Organic Nitrogen	CALC	6419866	N/A	2019/11/08	Automated Statchk
pH	AT	6421540	2019/11/02	2019/11/04	Surinder Rai
Phenols (4AAP)	TECH/PHEN	6422288	N/A	2019/11/05	Bramdeo Motiram
Orthophosphate	KONE	6426352	N/A	2019/11/07	Deonarine Ramnarine
Sulphate by Automated Colourimetry	KONE	6421662	N/A	2019/11/04	Deonarine Ramnarine
Total Dissolved Solids	BAL	6421977	2019/11/02	2019/11/05	Shivani Desai
Total Kjeldahl Nitrogen in Water	SKAL	6422749	2019/11/04	2019/11/07	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	6424963	2019/11/05	2019/11/05	Shivani Shivani

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TEST SUMMARY

BV Labs ID: LES547 Dup
Sample ID: MW3
Matrix: Water
Collected: 2019/10/29
Shipped:
Received: 2019/10/31

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6421535	N/A	2019/11/03	Nimarta Singh

BV Labs ID: LES548
Sample ID: MW4I
Matrix: Water
Collected: 2019/10/29
Shipped:
Received: 2019/10/31

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	6421585	N/A	2019/11/05	Surinder Rai
Chloride by Automated Colourimetry	KONE	6421667	N/A	2019/11/04	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	6423160	N/A	2019/11/05	Viorica Rotaru
Conductivity	AT	6421588	N/A	2019/11/05	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6421535	N/A	2019/11/03	Nimarta Singh
Hardness (calculated as CaCO3)		6419733	N/A	2019/11/08	Automated Statchk
Mercury in Water by CVAA	CV/AA	6422989	2019/11/04	2019/11/06	Medhat Nasr
Dissolved Metals by ICPMS	ICP/MS	6421949	N/A	2019/11/05	Matthew Ritenburg
Ion Balance (% Difference)	CALC	6419734	N/A	2019/11/08	Automated Statchk
Total Ammonia-N	LACH/NH4	6423037	N/A	2019/11/05	Mazin Wakai
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6421548	N/A	2019/11/07	Chandra Nandlal
Organic Nitrogen	CALC	6419866	N/A	2019/11/08	Automated Statchk
pH	AT	6421589	2019/11/02	2019/11/05	Surinder Rai
Phenols (4AAP)	TECH/PHEN	6422286	N/A	2019/11/05	Bramdeo Motiram
Orthophosphate	KONE	6421670	N/A	2019/11/05	Deonarine Ramnarine
Sulphate by Automated Colourimetry	KONE	6421669	N/A	2019/11/04	Deonarine Ramnarine
Total Dissolved Solids	BAL	6421977	2019/11/02	2019/11/05	Shivani Desai
Total Kjeldahl Nitrogen in Water	SKAL	6422749	2019/11/04	2019/11/08	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	6424963	2019/11/05	2019/11/05	Shivani Shivani

BV Labs ID: LES548 Dup
Sample ID: MW4I
Matrix: Water
Collected: 2019/10/29
Shipped:
Received: 2019/10/31

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chemical Oxygen Demand	SPEC	6423160	N/A	2019/11/05	Viorica Rotaru

BV Labs ID: LES549
Sample ID: MW4II
Matrix: Water
Collected: 2019/10/29
Shipped:
Received: 2019/10/31

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	6421585	N/A	2019/11/05	Surinder Rai
Chloride by Automated Colourimetry	KONE	6421667	N/A	2019/11/04	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	6422707	N/A	2019/11/05	Viorica Rotaru
Conductivity	AT	6421588	N/A	2019/11/05	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6421535	N/A	2019/11/03	Nimarta Singh

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BV Labs Job #: B9U7686
Report Date: 2019/11/08

exp Services Inc
Client Project #: THB-00006196-OE
Site Location: Longlac Landfill - Fall Sampling Event
Sampler Initials: CP

TEST SUMMARY

BV Labs ID: LES549
Sample ID: MW4II
Matrix: Water

Collected: 2019/10/29
Shipped:
Received: 2019/10/31

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hardness (calculated as CaCO3)		6419733	N/A	2019/11/08	Automated Statchk
Mercury in Water by CVAA	CV/AA	6422989	2019/11/04	2019/11/06	Medhat Nasr
Dissolved Metals by ICPMS	ICP/MS	6421949	N/A	2019/11/05	Matthew Ritenburg
Ion Balance (% Difference)	CALC	6419734	N/A	2019/11/08	Automated Statchk
Total Ammonia-N	LACH/NH4	6423037	N/A	2019/11/05	Mazin Wakai
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6421548	N/A	2019/11/07	Chandra Nandlal
Organic Nitrogen	CALC	6419866	N/A	2019/11/08	Automated Statchk
pH	AT	6421589	2019/11/02	2019/11/05	Surinder Rai
Phenols (4AAP)	TECH/PHEN	6422286	N/A	2019/11/05	Bramdeo Motiram
Orthophosphate	KONE	6421670	N/A	2019/11/05	Deonarine Ramnarine
Sulphate by Automated Colourimetry	KONE	6421669	N/A	2019/11/04	Deonarine Ramnarine
Total Dissolved Solids	BAL	6421768	2019/11/04	2019/11/05	Xinyue (Sarah) Hou
Total Kjeldahl Nitrogen in Water	SKAL	6422749	2019/11/04	2019/11/07	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	6424963	2019/11/05	2019/11/05	Shivani Shivani

BV Labs ID: LES550
Sample ID: MW5
Matrix: Water

Collected: 2019/10/29
Shipped:
Received: 2019/10/31

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	6421538	N/A	2019/11/04	Surinder Rai
Chloride by Automated Colourimetry	KONE	6421667	N/A	2019/11/04	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	6422707	N/A	2019/11/05	Viorica Rotaru
Conductivity	AT	6421539	N/A	2019/11/04	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6421535	N/A	2019/11/03	Nimarta Singh
Hardness (calculated as CaCO3)		6419733	N/A	2019/11/06	Automated Statchk
Mercury in Water by CVAA	CV/AA	6422989	2019/11/04	2019/11/06	Medhat Nasr
Dissolved Metals by ICPMS	ICP/MS	6421818	N/A	2019/11/05	Prempal Bhatti
Ion Balance (% Difference)	CALC	6419734	N/A	2019/11/06	Automated Statchk
Total Ammonia-N	LACH/NH4	6423037	N/A	2019/11/05	Mazin Wakai
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6421546	N/A	2019/11/07	Chandra Nandlal
Organic Nitrogen	CALC	6419866	N/A	2019/11/08	Automated Statchk
pH	AT	6421540	2019/11/02	2019/11/04	Surinder Rai
Phenols (4AAP)	TECH/PHEN	6422288	N/A	2019/11/05	Bramdeo Motiram
Orthophosphate	KONE	6421670	N/A	2019/11/05	Deonarine Ramnarine
Sulphate by Automated Colourimetry	KONE	6421669	N/A	2019/11/04	Deonarine Ramnarine
Total Dissolved Solids	BAL	6421768	2019/11/04	2019/11/05	Xinyue (Sarah) Hou
Total Kjeldahl Nitrogen in Water	SKAL	6422749	2019/11/04	2019/11/07	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	6424963	2019/11/05	2019/11/05	Shivani Shivani

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TEST SUMMARY

BV Labs ID: LES551
Sample ID: MW6
Matrix: Water

Collected: 2019/10/29
Shipped:
Received: 2019/10/31

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	6421538	N/A	2019/11/04	Surinder Rai
Chloride by Automated Colourimetry	KONE	6421667	N/A	2019/11/04	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	6422707	N/A	2019/11/05	Viorica Rotaru
Conductivity	AT	6421539	N/A	2019/11/04	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6421499	N/A	2019/11/02	Nimarta Singh
Hardness (calculated as CaCO3)		6420068	N/A	2019/11/08	Automated Statchk
Mercury in Water by CVAA	CV/AA	6422989	2019/11/04	2019/11/06	Medhat Nasr
Dissolved Metals by ICPMS	ICP/MS	6421949	N/A	2019/11/05	Matthew Ritenburg
Ion Balance (% Difference)	CALC	6419734	N/A	2019/11/08	Automated Statchk
Total Ammonia-N	LACH/NH4	6423031	N/A	2019/11/05	Mazin Wakai
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6421548	N/A	2019/11/07	Chandra Nandlal
Organic Nitrogen	CALC	6419866	N/A	2019/11/08	Automated Statchk
pH	AT	6421540	2019/11/02	2019/11/04	Surinder Rai
Phenols (4AAP)	TECH/PHEN	6422286	N/A	2019/11/05	Bramdeo Motiram
Orthophosphate	KONE	6421670	N/A	2019/11/05	Deonarine Ramnarine
Sulphate by Automated Colourimetry	KONE	6421669	N/A	2019/11/04	Deonarine Ramnarine
Total Dissolved Solids	BAL	6421977	2019/11/02	2019/11/05	Shivani Desai
Total Kjeldahl Nitrogen in Water	SKAL	6422749	2019/11/04	2019/11/08	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	6424963	2019/11/05	2019/11/05	Shivani Shivani
Volatile Organic Compounds in Water	P&T/MS	6422136	N/A	2019/11/06	Gladys Guerrero

BV Labs ID: LES551 Dup
Sample ID: MW6
Matrix: Water

Collected: 2019/10/29
Shipped:
Received: 2019/10/31

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Mercury in Water by CVAA	CV/AA	6422989	2019/11/04	2019/11/06	Medhat Nasr

BV Labs ID: LES552
Sample ID: MW7
Matrix: Water

Collected: 2019/10/29
Shipped:
Received: 2019/10/31

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	6421538	N/A	2019/11/04	Surinder Rai
Chloride by Automated Colourimetry	KONE	6421674	N/A	2019/11/06	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	6422725	N/A	2019/11/05	Viorica Rotaru
Conductivity	AT	6421539	N/A	2019/11/04	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6421535	N/A	2019/11/03	Nimarta Singh
Hardness (calculated as CaCO3)		6420068	N/A	2019/11/08	Automated Statchk
Mercury in Water by CVAA	CV/AA	6422989	2019/11/04	2019/11/06	Medhat Nasr
Dissolved Metals by ICPMS	ICP/MS	6421949	N/A	2019/11/05	Matthew Ritenburg
Ion Balance (% Difference)	CALC	6419734	N/A	2019/11/08	Automated Statchk
Total Ammonia-N	LACH/NH4	6423037	N/A	2019/11/05	Mazin Wakai
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6421546	N/A	2019/11/07	Chandra Nandlal

BV Labs Job #: B9U7686
Report Date: 2019/11/08

exp Services Inc
Client Project #: THB-00006196-OE
Site Location: Longlac Landfill - Fall Sampling Event
Sampler Initials: CP

TEST SUMMARY

BV Labs ID: LES552
Sample ID: MW7
Matrix: Water

Collected: 2019/10/29
Shipped:
Received: 2019/10/31

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Organic Nitrogen	CALC	6419866	N/A	2019/11/08	Automated Statchk
pH	AT	6421540	2019/11/02	2019/11/04	Surinder Rai
Phenols (4AAP)	TECH/PHEN	6422288	N/A	2019/11/05	Bramdeo Motiram
Orthophosphate	KONE	6421677	N/A	2019/11/05	Deonarine Ramnarine
Sulphate by Automated Colourimetry	KONE	6421676	N/A	2019/11/06	Deonarine Ramnarine
Total Dissolved Solids	BAL	6421768	2019/11/04	2019/11/05	Xinyue (Sarah) Hou
Total Kjeldahl Nitrogen in Water	SKAL	6422749	2019/11/04	2019/11/08	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	6424963	2019/11/05	2019/11/05	Shivani Shivani
Volatile Organic Compounds in Water	P&T/MS	6422136	N/A	2019/11/06	Gladys Guerrero

BV Labs ID: LES552 Dup
Sample ID: MW7
Matrix: Water

Collected: 2019/10/29
Shipped:
Received: 2019/10/31

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Phenols (4AAP)	TECH/PHEN	6422288	N/A	2019/11/05	Bramdeo Motiram

BV Labs ID: LES553
Sample ID: MW8I
Matrix: Water

Collected: 2019/10/29
Shipped:
Received: 2019/10/31

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	6421538	N/A	2019/11/04	Surinder Rai
Chloride by Automated Colourimetry	KONE	6421674	N/A	2019/11/06	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	6422725	N/A	2019/11/07	Viorica Rotaru
Conductivity	AT	6421539	N/A	2019/11/04	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6421535	N/A	2019/11/03	Nimarta Singh
Hardness (calculated as CaCO3)		6420068	N/A	2019/11/08	Automated Statchk
Mercury in Water by CVAA	CV/AA	6422989	2019/11/04	2019/11/06	Medhat Nasr
Dissolved Metals by ICPMS	ICP/MS	6421949	N/A	2019/11/06	Matthew Ritenburg
Ion Balance (% Difference)	CALC	6419734	N/A	2019/11/08	Automated Statchk
Total Ammonia-N	LACH/NH4	6423037	N/A	2019/11/05	Mazin Wakai
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6421546	N/A	2019/11/07	Chandra Nandlal
Organic Nitrogen	CALC	6419866	N/A	2019/11/08	Automated Statchk
pH	AT	6421540	2019/11/02	2019/11/04	Surinder Rai
Phenols (4AAP)	TECH/PHEN	6422288	N/A	2019/11/05	Bramdeo Motiram
Orthophosphate	KONE	6421677	N/A	2019/11/05	Deonarine Ramnarine
Sulphate by Automated Colourimetry	KONE	6421676	N/A	2019/11/06	Deonarine Ramnarine
Total Dissolved Solids	BAL	6421768	2019/11/04	2019/11/05	Xinyue (Sarah) Hou
Total Kjeldahl Nitrogen in Water	SKAL	6422749	2019/11/04	2019/11/08	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	6424963	2019/11/05	2019/11/05	Shivani Shivani
Volatile Organic Compounds in Water	P&T/MS	6422136	N/A	2019/11/06	Gladys Guerrero

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BV Labs Job #: B9U7686
Report Date: 2019/11/08

exp Services Inc
Client Project #: THB-00006196-OE
Site Location: Longlac Landfill - Fall Sampling Event
Sampler Initials: CP

TEST SUMMARY

BV Labs ID: LES554
Sample ID: MW8II
Matrix: Water

Collected: 2019/10/29
Shipped:
Received: 2019/10/31

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	6421538	N/A	2019/11/04	Surinder Rai
Chloride by Automated Colourimetry	KONE	6421667	N/A	2019/11/04	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	6422725	N/A	2019/11/05	Viorica Rotaru
Conductivity	AT	6421539	N/A	2019/11/04	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6421535	N/A	2019/11/03	Nimarta Singh
Hardness (calculated as CaCO3)		6420068	N/A	2019/11/08	Automated Statchk
Mercury in Water by CVAA	CV/AA	6422989	2019/11/04	2019/11/06	Medhat Nasr
Dissolved Metals by ICPMS	ICP/MS	6421949	N/A	2019/11/05	Matthew Ritenburg
Ion Balance (% Difference)	CALC	6419734	N/A	2019/11/08	Automated Statchk
Total Ammonia-N	LACH/NH4	6423031	N/A	2019/11/05	Mazin Wakai
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6421548	N/A	2019/11/07	Chandra Nandlal
Organic Nitrogen	CALC	6419866	N/A	2019/11/08	Automated Statchk
pH	AT	6421540	2019/11/02	2019/11/04	Surinder Rai
Phenols (4AAP)	TECH/PHEN	6422286	N/A	2019/11/05	Bramdeo Motiram
Orthophosphate	KONE	6421670	N/A	2019/11/05	Deonarine Ramnarine
Sulphate by Automated Colourimetry	KONE	6421669	N/A	2019/11/04	Deonarine Ramnarine
Total Dissolved Solids	BAL	6421768	2019/11/04	2019/11/05	Xinyue (Sarah) Hou
Total Kjeldahl Nitrogen in Water	SKAL	6422749	2019/11/04	2019/11/08	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	6424963	2019/11/05	2019/11/05	Shivani Shivani
Volatile Organic Compounds in Water	P&T/MS	6422136	N/A	2019/11/06	Gladys Guerrero

BV Labs ID: LES555
Sample ID: MW9
Matrix: Water

Collected: 2019/10/29
Shipped:
Received: 2019/10/31

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	6421538	N/A	2019/11/04	Surinder Rai
Chloride by Automated Colourimetry	KONE	6421674	N/A	2019/11/06	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	6422725	N/A	2019/11/05	Viorica Rotaru
Conductivity	AT	6421539	N/A	2019/11/04	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6421535	N/A	2019/11/03	Nimarta Singh
Hardness (calculated as CaCO3)		6420068	N/A	2019/11/08	Automated Statchk
Mercury in Water by CVAA	CV/AA	6422989	2019/11/04	2019/11/06	Medhat Nasr
Dissolved Metals by ICPMS	ICP/MS	6421949	N/A	2019/11/05	Matthew Ritenburg
Ion Balance (% Difference)	CALC	6419734	N/A	2019/11/08	Automated Statchk
Total Ammonia-N	LACH/NH4	6423037	N/A	2019/11/05	Mazin Wakai
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6421546	N/A	2019/11/07	Chandra Nandlal
Organic Nitrogen	CALC	6419866	N/A	2019/11/08	Automated Statchk
pH	AT	6421540	2019/11/02	2019/11/04	Surinder Rai
Phenols (4AAP)	TECH/PHEN	6422286	N/A	2019/11/05	Bramdeo Motiram
Orthophosphate	KONE	6421677	N/A	2019/11/05	Deonarine Ramnarine
Sulphate by Automated Colourimetry	KONE	6421676	N/A	2019/11/06	Deonarine Ramnarine
Total Dissolved Solids	BAL	6421768	2019/11/04	2019/11/05	Xinyue (Sarah) Hou
Total Kjeldahl Nitrogen in Water	SKAL	6422749	2019/11/04	2019/11/07	Rajni Tyagi

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BV Labs Job #: B9U7686
Report Date: 2019/11/08

exp Services Inc
Client Project #: THB-00006196-OE
Site Location: Longlac Landfill - Fall Sampling Event
Sampler Initials: CP

TEST SUMMARY

BV Labs ID: LES555
Sample ID: MW9
Matrix: Water

Collected: 2019/10/29
Shipped:
Received: 2019/10/31

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Phosphorus (Colourimetric)	LACH/P	6424963	2019/11/05	2019/11/05	Shivani Shivani

BV Labs ID: LES557
Sample ID: MW10
Matrix: Water

Collected: 2019/10/29
Shipped:
Received: 2019/10/31

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	6421538	N/A	2019/11/04	Surinder Rai
Chloride by Automated Colourimetry	KONE	6421982	N/A	2019/11/04	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	6422707	N/A	2019/11/05	Viorica Rotaru
Conductivity	AT	6421539	N/A	2019/11/04	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6421535	N/A	2019/11/03	Nimarta Singh
Hardness (calculated as CaCO3)		6420068	N/A	2019/11/07	Automated Statchk
Mercury in Water by CVAA	CV/AA	6422993	2019/11/04	2019/11/05	Medhat Nasr
Dissolved Metals by ICPMS	ICP/MS	6422674	N/A	2019/11/06	Prempal Bhatti
Ion Balance (% Difference)	CALC	6419734	N/A	2019/11/07	Automated Statchk
Total Ammonia-N	LACH/NH4	6423488	N/A	2019/11/05	Mazin Wakai
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6421546	N/A	2019/11/07	Chandra Nandlal
Organic Nitrogen	CALC	6419866	N/A	2019/11/08	Automated Statchk
pH	AT	6421540	2019/11/02	2019/11/04	Surinder Rai
Phenols (4AAP)	TECH/PHEN	6422286	N/A	2019/11/05	Bramdeo Motiram
Orthophosphate	KONE	6421984	N/A	2019/11/05	Deonarine Ramnarine
Sulphate by Automated Colourimetry	KONE	6421983	N/A	2019/11/04	Deonarine Ramnarine
Total Dissolved Solids	BAL	6421768	2019/11/04	2019/11/05	Xinyue (Sarah) Hou
Total Kjeldahl Nitrogen in Water	SKAL	6422750	2019/11/04	2019/11/08	Shivani Shivani
Total Phosphorus (Colourimetric)	LACH/P	6424963	2019/11/05	2019/11/05	Shivani Shivani

BV Labs ID: LES557 Dup
Sample ID: MW10
Matrix: Water

Collected: 2019/10/29
Shipped:
Received: 2019/10/31

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	6421538	N/A	2019/11/04	Surinder Rai
Chloride by Automated Colourimetry	KONE	6421982	N/A	2019/11/04	Deonarine Ramnarine
Conductivity	AT	6421539	N/A	2019/11/04	Surinder Rai
pH	AT	6421540	2019/11/02	2019/11/04	Surinder Rai
Phenols (4AAP)	TECH/PHEN	6422286	N/A	2019/11/05	Bramdeo Motiram
Orthophosphate	KONE	6421984	N/A	2019/11/05	Deonarine Ramnarine
Sulphate by Automated Colourimetry	KONE	6421983	N/A	2019/11/04	Deonarine Ramnarine

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BV Labs Job #: B9U7686
Report Date: 2019/11/08

exp Services Inc
Client Project #: THB-00006196-OE
Site Location: Longlac Landfill - Fall Sampling Event
Sampler Initials: CP

TEST SUMMARY

BV Labs ID: LES558
Sample ID: MW11I
Matrix: Water

Collected: 2019/10/30
Shipped:
Received: 2019/10/31

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	6421538	N/A	2019/11/04	Surinder Rai
Chloride by Automated Colourimetry	KONE	6421667	N/A	2019/11/04	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	6422707	N/A	2019/11/05	Viorica Rotaru
Conductivity	AT	6421539	N/A	2019/11/04	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6421535	N/A	2019/11/03	Nimarta Singh
Hardness (calculated as CaCO3)		6420068	N/A	2019/11/06	Automated Statchk
Mercury in Water by CVAA	CV/AA	6422989	2019/11/04	2019/11/06	Medhat Nasr
Dissolved Metals by ICPMS	ICP/MS	6422685	N/A	2019/11/06	Arefa Dabhad
Ion Balance (% Difference)	CALC	6419734	N/A	2019/11/06	Automated Statchk
Total Ammonia-N	LACH/NH4	6423375	N/A	2019/11/06	Mazin Wakai
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6421548	N/A	2019/11/07	Chandra Nandlal
Organic Nitrogen	CALC	6419866	N/A	2019/11/08	Automated Statchk
pH	AT	6421540	2019/11/02	2019/11/04	Surinder Rai
Phenols (4AAP)	TECH/PHEN	6422288	N/A	2019/11/05	Bramdeo Motiram
Orthophosphate	KONE	6421670	N/A	2019/11/05	Deonarine Ramnarine
Sulphate by Automated Colourimetry	KONE	6421669	N/A	2019/11/04	Deonarine Ramnarine
Total Dissolved Solids	BAL	6421768	2019/11/04	2019/11/05	Xinyue (Sarah) Hou
Total Kjeldahl Nitrogen in Water	SKAL	6422750	2019/11/04	2019/11/08	Shivani Shivani
Total Phosphorus (Colourimetric)	LACH/P	6424963	2019/11/05	2019/11/05	Shivani Shivani

BV Labs ID: LES559
Sample ID: MW11 II
Matrix: Water

Collected: 2019/10/30
Shipped:
Received: 2019/10/31

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	6421538	N/A	2019/11/04	Surinder Rai
Chloride by Automated Colourimetry	KONE	6421674	N/A	2019/11/06	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	6422707	N/A	2019/11/05	Viorica Rotaru
Conductivity	AT	6421539	N/A	2019/11/04	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6421535	N/A	2019/11/03	Nimarta Singh
Hardness (calculated as CaCO3)		6420068	N/A	2019/11/06	Automated Statchk
Mercury in Water by CVAA	CV/AA	6422993	2019/11/04	2019/11/05	Medhat Nasr
Dissolved Metals by ICPMS	ICP/MS	6422685	N/A	2019/11/06	Arefa Dabhad
Ion Balance (% Difference)	CALC	6419734	N/A	2019/11/07	Automated Statchk
Total Ammonia-N	LACH/NH4	6423375	N/A	2019/11/06	Mazin Wakai
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6421546	N/A	2019/11/07	Chandra Nandlal
Organic Nitrogen	CALC	6419866	N/A	2019/11/08	Automated Statchk
pH	AT	6421540	2019/11/02	2019/11/04	Surinder Rai
Phenols (4AAP)	TECH/PHEN	6422286	N/A	2019/11/05	Bramdeo Motiram
Orthophosphate	KONE	6421677	N/A	2019/11/05	Deonarine Ramnarine
Sulphate by Automated Colourimetry	KONE	6421676	N/A	2019/11/06	Deonarine Ramnarine
Total Dissolved Solids	BAL	6421768	2019/11/04	2019/11/05	Xinyue (Sarah) Hou
Total Kjeldahl Nitrogen in Water	SKAL	6422750	2019/11/04	2019/11/08	Shivani Shivani
Total Phosphorus (Colourimetric)	LACH/P	6424963	2019/11/05	2019/11/05	Shivani Shivani

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BV Labs Job #: B9U7686
Report Date: 2019/11/08

exp Services Inc
Client Project #: THB-00006196-OE
Site Location: Longlac Landfill - Fall Sampling Event
Sampler Initials: CP

TEST SUMMARY

BV Labs ID: LES560
Sample ID: MW12 I
Matrix: Water

Collected: 2019/10/30
Shipped:
Received: 2019/10/31

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	6421538	N/A	2019/11/04	Surinder Rai
Chloride by Automated Colourimetry	KONE	6421674	N/A	2019/11/06	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	6422707	N/A	2019/11/05	Viorica Rotaru
Conductivity	AT	6421539	N/A	2019/11/04	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6421535	N/A	2019/11/03	Nimarta Singh
Hardness (calculated as CaCO3)		6420068	N/A	2019/11/06	Automated Statchk
Mercury in Water by CVAA	CV/AA	6422993	2019/11/04	2019/11/05	Medhat Nasr
Dissolved Metals by ICPMS	ICP/MS	6422685	N/A	2019/11/06	Arefa Dabhad
Ion Balance (% Difference)	CALC	6419734	N/A	2019/11/07	Automated Statchk
Total Ammonia-N	LACH/NH4	6423375	N/A	2019/11/06	Mazin Wakai
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6421548	N/A	2019/11/07	Chandra Nandlal
Organic Nitrogen	CALC	6419866	N/A	2019/11/08	Automated Statchk
pH	AT	6421540	2019/11/02	2019/11/04	Surinder Rai
Phenols (4AAP)	TECH/PHEN	6422288	N/A	2019/11/05	Bramdeo Motiram
Orthophosphate	KONE	6421677	N/A	2019/11/05	Deonarine Ramnarine
Sulphate by Automated Colourimetry	KONE	6421676	N/A	2019/11/06	Deonarine Ramnarine
Total Dissolved Solids	BAL	6421768	2019/11/04	2019/11/05	Xinyue (Sarah) Hou
Total Kjeldahl Nitrogen in Water	SKAL	6422750	2019/11/04	2019/11/08	Shivani Shivani
Total Phosphorus (Colourimetric)	LACH/P	6424963	2019/11/05	2019/11/05	Shivani Shivani

BV Labs ID: LES561
Sample ID: MW12 II
Matrix: Water

Collected: 2019/10/29
Shipped:
Received: 2019/10/31

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	6421538	N/A	2019/11/04	Surinder Rai
Chloride by Automated Colourimetry	KONE	6421674	N/A	2019/11/06	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	6422707	N/A	2019/11/05	Viorica Rotaru
Conductivity	AT	6421539	N/A	2019/11/04	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6421535	N/A	2019/11/03	Nimarta Singh
Hardness (calculated as CaCO3)		6420068	N/A	2019/11/08	Automated Statchk
Mercury in Water by CVAA	CV/AA	6422989	2019/11/04	2019/11/06	Medhat Nasr
Dissolved Metals by ICPMS	ICP/MS	6421949	N/A	2019/11/05	Matthew Ritenburg
Ion Balance (% Difference)	CALC	6419734	N/A	2019/11/08	Automated Statchk
Total Ammonia-N	LACH/NH4	6423375	N/A	2019/11/06	Mazin Wakai
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6421548	N/A	2019/11/07	Chandra Nandlal
Organic Nitrogen	CALC	6419866	N/A	2019/11/08	Automated Statchk
pH	AT	6421540	2019/11/02	2019/11/04	Surinder Rai
Phenols (4AAP)	TECH/PHEN	6422286	N/A	2019/11/05	Bramdeo Motiram
Orthophosphate	KONE	6421677	N/A	2019/11/05	Deonarine Ramnarine
Sulphate by Automated Colourimetry	KONE	6421676	N/A	2019/11/06	Deonarine Ramnarine
Total Dissolved Solids	BAL	6421768	2019/11/04	2019/11/05	Xinyue (Sarah) Hou
Total Kjeldahl Nitrogen in Water	SKAL	6422750	2019/11/04	2019/11/08	Shivani Shivani
Total Phosphorus (Colourimetric)	LACH/P	6424963	2019/11/05	2019/11/05	Shivani Shivani

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TEST SUMMARY

BV Labs ID: LES561 Dup
Sample ID: MW12 II
Matrix: Water

Collected: 2019/10/29
Shipped:
Received: 2019/10/31

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6421548	N/A	2019/11/07	Chandra Nandlal

BV Labs ID: LES562
Sample ID: MW13
Matrix: Water

Collected: 2019/10/29
Shipped:
Received: 2019/10/31

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	6421538	N/A	2019/11/04	Surinder Rai
Chloride by Automated Colourimetry	KONE	6421667	N/A	2019/11/04	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	6422707	N/A	2019/11/05	Viorica Rotaru
Conductivity	AT	6421539	N/A	2019/11/04	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6421535	N/A	2019/11/03	Nimarta Singh
Hardness (calculated as CaCO3)		6420068	N/A	2019/11/06	Automated Statchk
Mercury in Water by CVAA	CV/AA	6422989	2019/11/04	2019/11/06	Medhat Nasr
Dissolved Metals by ICPMS	ICP/MS	6422685	N/A	2019/11/06	Arefa Dabhad
Ion Balance (% Difference)	CALC	6419734	N/A	2019/11/06	Automated Statchk
Total Ammonia-N	LACH/NH4	6423488	N/A	2019/11/05	Mazin Wakai
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6421546	N/A	2019/11/07	Chandra Nandlal
Organic Nitrogen	CALC	6419866	N/A	2019/11/08	Automated Statchk
pH	AT	6421540	2019/11/02	2019/11/04	Surinder Rai
Phenols (4AAP)	TECH/PHEN	6422286	N/A	2019/11/05	Bramdeo Motiram
Orthophosphate	KONE	6421670	N/A	2019/11/05	Deonarine Ramnarine
Sulphate by Automated Colourimetry	KONE	6421669	N/A	2019/11/04	Deonarine Ramnarine
Total Dissolved Solids	BAL	6421768	2019/11/04	2019/11/05	Xinyue (Sarah) Hou
Total Kjeldahl Nitrogen in Water	SKAL	6422750	2019/11/04	2019/11/08	Shivani Shivani
Total Phosphorus (Colourimetric)	LACH/P	6427364	2019/11/06	2019/11/06	Shivani Shivani
Volatile Organic Compounds in Water	P&T/MS	6422136	N/A	2019/11/06	Gladys Guerrero

BV Labs ID: LES564
Sample ID: SW1
Matrix: Water

Collected: 2019/10/29
Shipped:
Received: 2019/10/31

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	6422858	N/A	2019/11/05	Arefa Dabhad
Alkalinity	AT	6421538	N/A	2019/11/04	Surinder Rai
Biochemical Oxygen Demand (BOD)	DO	6421422	2019/11/02	2019/11/07	Navjot Kaur Gill
Chloride by Automated Colourimetry	KONE	6421659	N/A	2019/11/04	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	6422707	N/A	2019/11/05	Viorica Rotaru
Conductivity	AT	6421539	N/A	2019/11/04	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6421535	N/A	2019/11/03	Nimarta Singh
Hardness (calculated as CaCO3)		6420068	N/A	2019/11/05	Automated Statchk
Mercury in Water by CVAA	CV/AA	6422993	2019/11/04	2019/11/05	Medhat Nasr
Dissolved Calcium and Magnesium	ICP	6422864	2019/11/04	2019/11/05	Suban Kanapathippllai
Total Metals Analysis by ICPMS	ICP/MS	6425247	N/A	2019/11/08	Arefa Dabhad

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TEST SUMMARY

BV Labs ID: LES564
Sample ID: SW1
Matrix: Water

Collected: 2019/10/29
Shipped:
Received: 2019/10/31

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Ammonia-N	LACH/NH4	6423488	N/A	2019/11/05	Mazin Wakai
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6421548	N/A	2019/11/07	Chandra Nandlal
Organic Nitrogen	CALC	6419866	N/A	2019/11/08	Automated Statchk
pH	AT	6421540	2019/11/02	2019/11/04	Surinder Rai
Phenols (4AAP)	TECH/PHEN	6422288	N/A	2019/11/05	Bramdeo Motiram
Sulphate by Automated Colourimetry	KONE	6421662	N/A	2019/11/04	Deonarine Ramnarine
Total Dissolved Solids	BAL	6425838	2019/11/05	2019/11/06	Jingwei (Alvin) Shi
Total Kjeldahl Nitrogen in Water	SKAL	6422750	2019/11/04	2019/11/08	Shivani Shivani
Total Phosphorus (Colourimetric)	LACH/P	6425197	2019/11/05	2019/11/05	Shivani Shivani
Low Level Total Suspended Solids	BAL	6421978	2019/11/05	2019/11/06	Massarat Jan

BV Labs ID: LES564 Dup
Sample ID: SW1
Matrix: Water

Collected: 2019/10/29
Shipped:
Received: 2019/10/31

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Ammonia-N	LACH/NH4	6423488	N/A	2019/11/05	Mazin Wakai

BV Labs ID: LES565
Sample ID: SW2
Matrix: Water

Collected: 2019/10/29
Shipped:
Received: 2019/10/31

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	6421607	N/A	2019/11/04	Arefa Dabhad
Alkalinity	AT	6421538	N/A	2019/11/04	Surinder Rai
Biochemical Oxygen Demand (BOD)	DO	6421422	2019/11/02	2019/11/07	Navjot Kaur Gill
Chloride by Automated Colourimetry	KONE	6421659	N/A	2019/11/04	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	6422707	N/A	2019/11/05	Viorica Rotaru
Conductivity	AT	6421539	N/A	2019/11/04	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6421535	N/A	2019/11/03	Nimarta Singh
Hardness (calculated as CaCO3)		6420068	N/A	2019/11/04	Automated Statchk
Mercury in Water by CVAA	CV/AA	6422989	2019/11/04	2019/11/06	Medhat Nasr
Dissolved Calcium and Magnesium	ICP	6420800	2019/11/02	2019/11/04	Suban Kanapathippllai
Total Metals Analysis by ICPMS	ICP/MS	6425247	N/A	2019/11/08	Arefa Dabhad
Total Ammonia-N	LACH/NH4	6423488	N/A	2019/11/05	Mazin Wakai
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6421546	N/A	2019/11/07	Chandra Nandlal
Organic Nitrogen	CALC	6419866	N/A	2019/11/08	Automated Statchk
pH	AT	6421540	2019/11/02	2019/11/04	Surinder Rai
Phenols (4AAP)	TECH/PHEN	6422288	N/A	2019/11/05	Bramdeo Motiram
Sulphate by Automated Colourimetry	KONE	6421662	N/A	2019/11/04	Deonarine Ramnarine
Total Dissolved Solids	BAL	6425838	2019/11/05	2019/11/06	Jingwei (Alvin) Shi
Total Kjeldahl Nitrogen in Water	SKAL	6422750	2019/11/04	2019/11/08	Shivani Shivani
Total Phosphorus (Colourimetric)	LACH/P	6425197	2019/11/05	2019/11/05	Shivani Shivani
Low Level Total Suspended Solids	BAL	6421978	2019/11/05	2019/11/06	Massarat Jan

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TEST SUMMARY

BV Labs ID: LES566
Sample ID: SW3
Matrix: Water

Collected: 2019/10/29
Shipped:
Received: 2019/10/31

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	6422858	N/A	2019/11/05	Arefa Dabhad
Alkalinity	AT	6421585	N/A	2019/11/05	Surinder Rai
Biochemical Oxygen Demand (BOD)	DO	6421422	2019/11/02	2019/11/07	Navjot Kaur Gill
Chloride by Automated Colourimetry	KONE	6421659	N/A	2019/11/04	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	6422707	N/A	2019/11/05	Viorica Rotaru
Conductivity	AT	6421588	N/A	2019/11/05	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6421535	N/A	2019/11/03	Nimarta Singh
Hardness (calculated as CaCO3)		6420068	N/A	2019/11/05	Automated Statchk
Mercury in Water by CVAA	CV/AA	6422993	2019/11/04	2019/11/05	Medhat Nasr
Dissolved Calcium and Magnesium	ICP	6422864	2019/11/04	2019/11/05	Suban Kanapathippllai
Total Metals Analysis by ICPMS	ICP/MS	6427171	N/A	2019/11/06	Matthew Ritenburg
Total Ammonia-N	LACH/NH4	6423488	N/A	2019/11/05	Mazin Wakai
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6421546	N/A	2019/11/07	Chandra Nandlal
Organic Nitrogen	CALC	6419866	N/A	2019/11/08	Automated Statchk
pH	AT	6421589	2019/11/02	2019/11/05	Surinder Rai
Phenols (4AAP)	TECH/PHEN	6422286	N/A	2019/11/05	Bramdeo Motiram
Sulphate by Automated Colourimetry	KONE	6421662	N/A	2019/11/04	Deonarine Ramnarine
Total Dissolved Solids	BAL	6425838	2019/11/05	2019/11/06	Jingwei (Alvin) Shi
Total Kjeldahl Nitrogen in Water	SKAL	6422750	2019/11/04	2019/11/08	Shivani Shivani
Total Phosphorus (Colourimetric)	LACH/P	6425197	2019/11/05	2019/11/05	Shivani Shivani
Low Level Total Suspended Solids	BAL	6421978	2019/11/05	2019/11/06	Massarat Jan

BV Labs ID: LES566 Dup
Sample ID: SW3
Matrix: Water

Collected: 2019/10/29
Shipped:
Received: 2019/10/31

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	6421585	N/A	2019/11/05	Surinder Rai
Chemical Oxygen Demand	SPEC	6422707	N/A	2019/11/05	Viorica Rotaru
Conductivity	AT	6421588	N/A	2019/11/05	Surinder Rai
pH	AT	6421589	2019/11/02	2019/11/05	Surinder Rai

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GENERAL COMMENTS

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

Package 1	-2.0°C
Package 2	-1.0°C
Package 3	0.0°C
Package 4	0.3°C
Package 5	-1.0°C
Package 6	-3.3°C
Package 7	-3.0°C
Package 8	-3.7°C
Package 9	-5.7°C
Package 10	-2.0°C

Sample LES551 [MW6] : TKN < Ammonia: Both values fall within the method uncertainty for duplicates and are likely equivalent.

Sample LES552 [MW7] : VOC Water Analysis: Due to foaming, sample required dilution. The detection limits were adjusted accordingly.

Sample LES553 [MW8I] : VOC Water Analysis: Due to foaming, sample required dilution. The detection limits were adjusted accordingly.

Sample LES562 [MW13] : TKN < Ammonia: Both values fall within the method uncertainty for duplicates and are likely equivalent.

Results relate only to the items tested.

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QUALITY ASSURANCE REPORT

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
6422136	4-Bromofluorobenzene	2019/11/06	99	70 - 130	100	70 - 130	98	%				
6422136	D4-1,2-Dichloroethane	2019/11/06	105	70 - 130	106	70 - 130	106	%				
6422136	D8-Toluene	2019/11/06	101	70 - 130	100	70 - 130	101	%				
6420800	Dissolved Calcium (Ca)	2019/11/04	NC	80 - 120	98	80 - 120	<0.050	mg/L	0.33	25		
6420800	Dissolved Magnesium (Mg)	2019/11/04	NC	80 - 120	96	80 - 120	<0.050	mg/L	0	25		
6421422	Total BOD	2019/11/07					<2	mg/L	4.4	30	97	80 - 120
6421499	Dissolved Organic Carbon	2019/11/02	95	80 - 120	96	80 - 120	<0.50	mg/L	0.92	20		
6421535	Dissolved Organic Carbon	2019/11/03	95	80 - 120	96	80 - 120	<0.50	mg/L	1.7	20		
6421538	Alkalinity (Total as CaCO3)	2019/11/04			94	85 - 115	<1.0	mg/L	1.9	20		
6421539	Conductivity	2019/11/04			100	85 - 115	<1.0	umho/cm	0.61	25		
6421540	pH	2019/11/04			102	98 - 103			0.71	N/A		
6421546	Nitrate (N)	2019/11/07	101	80 - 120	101	80 - 120	<0.10	mg/L	0.76	20		
6421546	Nitrite (N)	2019/11/07	104	80 - 120	103	80 - 120	<0.010	mg/L	6.9	20		
6421548	Nitrate (N)	2019/11/07	103	80 - 120	103	80 - 120	<0.10	mg/L	NC	20		
6421548	Nitrite (N)	2019/11/07	107	80 - 120	105	80 - 120	<0.010	mg/L	NC	20		
6421585	Alkalinity (Total as CaCO3)	2019/11/05			94	85 - 115	<1.0	mg/L	0.61	20		
6421588	Conductivity	2019/11/05			101	85 - 115	<1.0	umho/cm	0	25		
6421589	pH	2019/11/05			102	98 - 103			0.13	N/A		
6421607	Dissolved (0.2u) Aluminum (Al)	2019/11/04	98	80 - 120	97	80 - 120	<5	ug/L	2.4	20		
6421659	Dissolved Chloride (Cl-)	2019/11/04	111	80 - 120	103	80 - 120	<1.0	mg/L	NC	20		
6421662	Dissolved Sulphate (SO4)	2019/11/04	99	75 - 125	102	80 - 120	<1.0	mg/L	NC	20		
6421667	Dissolved Chloride (Cl-)	2019/11/04	119	80 - 120	104	80 - 120	<1.0	mg/L	2.3	20		
6421669	Dissolved Sulphate (SO4)	2019/11/04	136 (1)	75 - 125	102	80 - 120	<1.0	mg/L	NC	20		
6421670	Orthophosphate (P)	2019/11/05	114	75 - 125	100	80 - 120	<0.010	mg/L	NC	25		
6421674	Dissolved Chloride (Cl-)	2019/11/06	NC	80 - 120	101	80 - 120	<1.0	mg/L	0.26	20		
6421676	Dissolved Sulphate (SO4)	2019/11/06	NC	75 - 125	103	80 - 120	<1.0	mg/L	1.4	20		
6421677	Orthophosphate (P)	2019/11/05	101	75 - 125	101	80 - 120	<0.010	mg/L	NC	25		
6421768	Total Dissolved Solids	2019/11/05					<10	mg/L	0.98	25	98	90 - 110
6421818	Dissolved Aluminum (Al)	2019/11/05	101	80 - 120	100	80 - 120	<5.0	ug/L				

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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
6421818	Dissolved Antimony (Sb)	2019/11/05	100	80 - 120	99	80 - 120	<0.50	ug/L				
6421818	Dissolved Arsenic (As)	2019/11/05	98	80 - 120	99	80 - 120	<1.0	ug/L	2.1	20		
6421818	Dissolved Barium (Ba)	2019/11/05	97	80 - 120	94	80 - 120	<2.0	ug/L				
6421818	Dissolved Beryllium (Be)	2019/11/05	96	80 - 120	93	80 - 120	<0.50	ug/L				
6421818	Dissolved Bismuth (Bi)	2019/11/05	96	80 - 120	96	80 - 120	<1.0	ug/L				
6421818	Dissolved Boron (B)	2019/11/05	94	80 - 120	93	80 - 120	<10	ug/L				
6421818	Dissolved Cadmium (Cd)	2019/11/05	98	80 - 120	98	80 - 120	<0.10	ug/L				
6421818	Dissolved Calcium (Ca)	2019/11/05	NC	80 - 120	101	80 - 120	<200	ug/L				
6421818	Dissolved Chromium (Cr)	2019/11/05	98	80 - 120	99	80 - 120	<5.0	ug/L				
6421818	Dissolved Cobalt (Co)	2019/11/05	98	80 - 120	100	80 - 120	<0.50	ug/L				
6421818	Dissolved Copper (Cu)	2019/11/05	102	80 - 120	101	80 - 120	<1.0	ug/L				
6421818	Dissolved Iron (Fe)	2019/11/05	98	80 - 120	100	80 - 120	<100	ug/L				
6421818	Dissolved Lead (Pb)	2019/11/05	96	80 - 120	96	80 - 120	<0.50	ug/L				
6421818	Dissolved Magnesium (Mg)	2019/11/05	97	80 - 120	100	80 - 120	<50	ug/L				
6421818	Dissolved Manganese (Mn)	2019/11/05	94	80 - 120	96	80 - 120	<2.0	ug/L				
6421818	Dissolved Molybdenum (Mo)	2019/11/05	104	80 - 120	103	80 - 120	<0.50	ug/L				
6421818	Dissolved Nickel (Ni)	2019/11/05	92	80 - 120	95	80 - 120	<1.0	ug/L				
6421818	Dissolved Potassium (K)	2019/11/05	99	80 - 120	100	80 - 120	<200	ug/L				
6421818	Dissolved Selenium (Se)	2019/11/05	98	80 - 120	98	80 - 120	<2.0	ug/L				
6421818	Dissolved Silicon (Si)	2019/11/05	103	80 - 120	102	80 - 120	<50	ug/L				
6421818	Dissolved Sodium (Na)	2019/11/05	96	80 - 120	104	80 - 120	100, RDL=100	ug/L				
6421818	Dissolved Strontium (Sr)	2019/11/05	97	80 - 120	95	80 - 120	<1.0	ug/L				
6421818	Dissolved Thallium (Tl)	2019/11/05	99	80 - 120	95	80 - 120	<0.050	ug/L				
6421818	Dissolved Tin (Sn)	2019/11/05	101	80 - 120	100	80 - 120	<1.0	ug/L				
6421818	Dissolved Vanadium (V)	2019/11/05	99	80 - 120	98	80 - 120	<0.50	ug/L				
6421818	Dissolved Zinc (Zn)	2019/11/05	97	80 - 120	98	80 - 120	<5.0	ug/L				
6421949	Dissolved Aluminum (Al)	2019/11/05	96	80 - 120	98	80 - 120	<5.0	ug/L	11	20		
6421949	Dissolved Antimony (Sb)	2019/11/05	100	80 - 120	99	80 - 120	<0.50	ug/L	10	20		
6421949	Dissolved Arsenic (As)	2019/11/05	94	80 - 120	99	80 - 120	<1.0	ug/L	2.0	20		
6421949	Dissolved Barium (Ba)	2019/11/05	NC	80 - 120	95	80 - 120	<2.0	ug/L	2.2	20		
6421949	Dissolved Beryllium (Be)	2019/11/05	97	80 - 120	99	80 - 120	<0.50	ug/L	NC	20		

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
6421949	Dissolved Bismuth (Bi)	2019/11/05	91	80 - 120	94	80 - 120	<1.0	ug/L				
6421949	Dissolved Boron (B)	2019/11/05	NC	80 - 120	101	80 - 120	<10	ug/L	1.7	20		
6421949	Dissolved Cadmium (Cd)	2019/11/05	96	80 - 120	96	80 - 120	<0.10	ug/L	NC	20		
6421949	Dissolved Calcium (Ca)	2019/11/05	NC	80 - 120	99	80 - 120	<200	ug/L	0.88	20		
6421949	Dissolved Chromium (Cr)	2019/11/05	94	80 - 120	98	80 - 120	<5.0	ug/L	NC	20		
6421949	Dissolved Cobalt (Co)	2019/11/05	93	80 - 120	97	80 - 120	<0.50	ug/L	1.4	20		
6421949	Dissolved Copper (Cu)	2019/11/05	96	80 - 120	95	80 - 120	<1.0	ug/L	NC	20		
6421949	Dissolved Iron (Fe)	2019/11/05	NC	80 - 120	100	80 - 120	<100	ug/L	0.52	20		
6421949	Dissolved Lead (Pb)	2019/11/05	93	80 - 120	96	80 - 120	<0.50	ug/L	NC	20		
6421949	Dissolved Magnesium (Mg)	2019/11/05	NC	80 - 120	99	80 - 120	<50	ug/L	0.23	20		
6421949	Dissolved Manganese (Mn)	2019/11/05	93	80 - 120	98	80 - 120	<2.0	ug/L	1.2	20		
6421949	Dissolved Molybdenum (Mo)	2019/11/05	101	80 - 120	99	80 - 120	<0.50	ug/L	NC	20		
6421949	Dissolved Nickel (Ni)	2019/11/05	91	80 - 120	96	80 - 120	<1.0	ug/L	0.18	20		
6421949	Dissolved Potassium (K)	2019/11/05	NC	80 - 120	100	80 - 120	<200	ug/L	0.60	20		
6421949	Dissolved Selenium (Se)	2019/11/05	92	80 - 120	100	80 - 120	<2.0	ug/L	NC	20		
6421949	Dissolved Silicon (Si)	2019/11/05	98	80 - 120	99	80 - 120	<50	ug/L	1.7	20		
6421949	Dissolved Sodium (Na)	2019/11/05	NC	80 - 120	99	80 - 120	<100	ug/L	0.27	20		
6421949	Dissolved Strontium (Sr)	2019/11/05	NC	80 - 120	99	80 - 120	<1.0	ug/L	1.1	20		
6421949	Dissolved Thallium (Tl)	2019/11/05	92	80 - 120	95	80 - 120	<0.050	ug/L	NC	20		
6421949	Dissolved Tin (Sn)	2019/11/05	99	80 - 120	99	80 - 120	<1.0	ug/L				
6421949	Dissolved Vanadium (V)	2019/11/05	96	80 - 120	98	80 - 120	<0.50	ug/L	7.4	20		
6421949	Dissolved Zinc (Zn)	2019/11/05	93	80 - 120	97	80 - 120	<5.0	ug/L	NC	20		
6421977	Total Dissolved Solids	2019/11/05					<10	mg/L	8.9	25	98	90 - 110
6421978	Total Suspended Solids	2019/11/06					<1	mg/L	6.5	25	98	85 - 115
6421982	Dissolved Chloride (Cl-)	2019/11/04	117	80 - 120	104	80 - 120	<1.0	mg/L	6.1	20		
6421983	Dissolved Sulphate (SO4)	2019/11/04	123	75 - 125	98	80 - 120	<1.0	mg/L	NC	20		
6421984	Orthophosphate (P)	2019/11/05	115	75 - 125	101	80 - 120	<0.010	mg/L	NC	25		
6422136	1,1,1,2-Tetrachloroethane	2019/11/06	100	70 - 130	105	70 - 130	<0.20	ug/L	NC	30		
6422136	1,1,1-Trichloroethane	2019/11/06	NC	70 - 130	106	70 - 130	<0.10	ug/L	NC	30		
6422136	1,1,2,2-Tetrachloroethane	2019/11/06	93	70 - 130	102	70 - 130	<0.20	ug/L	NC	30		
6422136	1,1,2-Trichloroethane	2019/11/06	92	70 - 130	100	70 - 130	<0.20	ug/L	NC	30		

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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
6422136	1,1-Dichloroethane	2019/11/06	101	70 - 130	103	70 - 130	<0.10	ug/L	NC	30		
6422136	1,1-Dichloroethylene	2019/11/06	95	70 - 130	98	70 - 130	<0.10	ug/L	NC	30		
6422136	1,2-Dichlorobenzene	2019/11/06	97	70 - 130	102	70 - 130	<0.20	ug/L	NC	30		
6422136	1,2-Dichloroethane	2019/11/06	102	70 - 130	108	70 - 130	<0.20	ug/L	NC	30		
6422136	1,2-Dichloropropane	2019/11/06	97	70 - 130	101	70 - 130	<0.10	ug/L	NC	30		
6422136	1,3-Dichlorobenzene	2019/11/06	101	70 - 130	105	70 - 130	<0.20	ug/L	NC	30		
6422136	1,4-Dichlorobenzene	2019/11/06	101	70 - 130	105	70 - 130	<0.20	ug/L	NC	30		
6422136	Acetone (2-Propanone)	2019/11/06	110	60 - 140	114	60 - 140	<10	ug/L	NC	30		
6422136	Benzene	2019/11/06	99	70 - 130	99	70 - 130	<0.10	ug/L	NC	30		
6422136	Bromodichloromethane	2019/11/06	101	70 - 130	107	70 - 130	<0.10	ug/L	NC	30		
6422136	Bromoform	2019/11/06	99	70 - 130	107	70 - 130	<0.20	ug/L	NC	30		
6422136	Bromomethane	2019/11/06	103	60 - 140	97	60 - 140	<0.50	ug/L	NC	30		
6422136	Carbon Tetrachloride	2019/11/06	108	70 - 130	108	70 - 130	<0.10	ug/L	NC	30		
6422136	Chlorobenzene	2019/11/06	96	70 - 130	100	70 - 130	<0.10	ug/L	NC	30		
6422136	Chloroform	2019/11/06	102	70 - 130	104	70 - 130	<0.10	ug/L	NC	30		
6422136	cis-1,2-Dichloroethylene	2019/11/06	100	70 - 130	101	70 - 130	<0.10	ug/L	NC	30		
6422136	cis-1,3-Dichloropropene	2019/11/06	101	70 - 130	106	70 - 130	<0.20	ug/L	NC	30		
6422136	Dibromochloromethane	2019/11/06	100	70 - 130	108	70 - 130	<0.20	ug/L	NC	30		
6422136	Dichlorodifluoromethane (FREON 12)	2019/11/06	86	60 - 140	90	60 - 140	<0.50	ug/L	NC	30		
6422136	Ethylbenzene	2019/11/06	101	70 - 130	103	70 - 130	<0.10	ug/L	NC	30		
6422136	Ethylene Dibromide	2019/11/06	94	70 - 130	103	70 - 130	<0.20	ug/L	NC	30		
6422136	Hexane	2019/11/06	108	70 - 130	107	70 - 130	<0.50	ug/L	NC	30		
6422136	Methyl Ethyl Ketone (2-Butanone)	2019/11/06	96	60 - 140	104	60 - 140	<5.0	ug/L	NC	30		
6422136	Methyl Isobutyl Ketone	2019/11/06	95	70 - 130	106	70 - 130	<5.0	ug/L	NC	30		
6422136	Methyl t-butyl ether (MTBE)	2019/11/06	94	70 - 130	105	70 - 130	<0.20	ug/L	NC	30		
6422136	Methylene Chloride(Dichloromethane)	2019/11/06	94	70 - 130	98	70 - 130	<0.50	ug/L	NC	30		
6422136	o-Xylene	2019/11/06	100	70 - 130	103	70 - 130	<0.10	ug/L	5.9	30		
6422136	p+m-Xylene	2019/11/06	103	70 - 130	104	70 - 130	<0.10	ug/L	15	30		
6422136	Styrene	2019/11/06	99	70 - 130	104	70 - 130	<0.20	ug/L	NC	30		
6422136	Tetrachloroethylene	2019/11/06	99	70 - 130	101	70 - 130	<0.10	ug/L	NC	30		
6422136	Toluene	2019/11/06	97	70 - 130	97	70 - 130	<0.20	ug/L	NC	30		

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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
6422136	Total Xylenes	2019/11/06					<0.10	ug/L	12	30		
6422136	trans-1,2-Dichloroethylene	2019/11/06	101	70 - 130	100	70 - 130	<0.10	ug/L	NC	30		
6422136	trans-1,3-Dichloropropene	2019/11/06	103	70 - 130	108	70 - 130	<0.20	ug/L	NC	30		
6422136	Trichloroethylene	2019/11/06	NC	70 - 130	100	70 - 130	<0.10	ug/L	1.7	30		
6422136	Trichlorofluoromethane (FREON 11)	2019/11/06	94	70 - 130	98	70 - 130	<0.20	ug/L	NC	30		
6422136	Vinyl Chloride	2019/11/06	87	70 - 130	90	70 - 130	<0.20	ug/L	NC	30		
6422286	Phenols-4AAP	2019/11/05	101	80 - 120	101	80 - 120	<0.0010	mg/L	NC	20		
6422288	Phenols-4AAP	2019/11/05	101	80 - 120	100	80 - 120	<0.0010	mg/L	NC	20		
6422674	Dissolved Aluminum (Al)	2019/11/06	101	80 - 120	102	80 - 120	<5.0	ug/L	NC	20		
6422674	Dissolved Antimony (Sb)	2019/11/06	100	80 - 120	97	80 - 120	<0.50	ug/L	6.2	20		
6422674	Dissolved Arsenic (As)	2019/11/06	98	80 - 120	99	80 - 120	<1.0	ug/L	NC	20		
6422674	Dissolved Barium (Ba)	2019/11/06	95	80 - 120	97	80 - 120	<2.0	ug/L	0.63	20		
6422674	Dissolved Beryllium (Be)	2019/11/06	93	80 - 120	94	80 - 120	<0.50	ug/L	NC	20		
6422674	Dissolved Bismuth (Bi)	2019/11/06	93	80 - 120	97	80 - 120	<1.0	ug/L				
6422674	Dissolved Boron (B)	2019/11/06	94	80 - 120	95	80 - 120	<10	ug/L	2.0	20		
6422674	Dissolved Cadmium (Cd)	2019/11/06	97	80 - 120	97	80 - 120	<0.10	ug/L	10	20		
6422674	Dissolved Calcium (Ca)	2019/11/06	NC	80 - 120	103	80 - 120	<200	ug/L	2.0	20		
6422674	Dissolved Chromium (Cr)	2019/11/06	95	80 - 120	96	80 - 120	<5.0	ug/L	NC	20		
6422674	Dissolved Cobalt (Co)	2019/11/06	98	80 - 120	101	80 - 120	<0.50	ug/L	0.66	20		
6422674	Dissolved Copper (Cu)	2019/11/06	99	80 - 120	103	80 - 120	<1.0	ug/L	1.8	20		
6422674	Dissolved Iron (Fe)	2019/11/06	98	80 - 120	98	80 - 120	<100	ug/L	NC	20		
6422674	Dissolved Lead (Pb)	2019/11/06	91	80 - 120	96	80 - 120	<0.50	ug/L	NC	20		
6422674	Dissolved Magnesium (Mg)	2019/11/06	NC	80 - 120	103	80 - 120	<50	ug/L	1.1	20		
6422674	Dissolved Manganese (Mn)	2019/11/06	92	80 - 120	94	80 - 120	<2.0	ug/L	0.59	20		
6422674	Dissolved Molybdenum (Mo)	2019/11/06	104	80 - 120	98	80 - 120	<0.50	ug/L	6.4	20		
6422674	Dissolved Nickel (Ni)	2019/11/06	93	80 - 120	98	80 - 120	<1.0	ug/L	1.8	20		
6422674	Dissolved Potassium (K)	2019/11/06	100	80 - 120	101	80 - 120	<200	ug/L	1.0	20		
6422674	Dissolved Selenium (Se)	2019/11/06	97	80 - 120	100	80 - 120	<2.0	ug/L	NC	20		
6422674	Dissolved Silicon (Si)	2019/11/06	102	80 - 120	100	80 - 120	<50	ug/L	5.2	20		
6422674	Dissolved Sodium (Na)	2019/11/06	NC	80 - 120	103	80 - 120	<100	ug/L	1.5	20		
6422674	Dissolved Strontium (Sr)	2019/11/06	NC	80 - 120	94	80 - 120	<1.0	ug/L	1.0	20		

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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
6422674	Dissolved Thallium (Tl)	2019/11/06	94	80 - 120	98	80 - 120	<0.050	ug/L	4.1	20		
6422674	Dissolved Tin (Sn)	2019/11/06	101	80 - 120	99	80 - 120	<1.0	ug/L				
6422674	Dissolved Vanadium (V)	2019/11/06	95	80 - 120	96	80 - 120	<0.50	ug/L	NC	20		
6422674	Dissolved Zinc (Zn)	2019/11/06	95	80 - 120	99	80 - 120	<5.0	ug/L	0.033	20		
6422685	Dissolved Aluminum (Al)	2019/11/06	97	80 - 120	99	80 - 120	<5.0	ug/L				
6422685	Dissolved Antimony (Sb)	2019/11/06	97	80 - 120	98	80 - 120	<0.50	ug/L				
6422685	Dissolved Arsenic (As)	2019/11/06	99	80 - 120	98	80 - 120	<1.0	ug/L	1.1	20		
6422685	Dissolved Barium (Ba)	2019/11/06	92	80 - 120	91	80 - 120	<2.0	ug/L				
6422685	Dissolved Beryllium (Be)	2019/11/06	99	80 - 120	100	80 - 120	<0.50	ug/L				
6422685	Dissolved Bismuth (Bi)	2019/11/06	97	80 - 120	96	80 - 120	<1.0	ug/L				
6422685	Dissolved Boron (B)	2019/11/06	97	80 - 120	100	80 - 120	<10	ug/L	3.1	20		
6422685	Dissolved Cadmium (Cd)	2019/11/06	97	80 - 120	97	80 - 120	<0.10	ug/L	NC	20		
6422685	Dissolved Calcium (Ca)	2019/11/06	NC	80 - 120	98	80 - 120	<200	ug/L	0.16	20		
6422685	Dissolved Chromium (Cr)	2019/11/06	93	80 - 120	92	80 - 120	<5.0	ug/L	NC	20		
6422685	Dissolved Cobalt (Co)	2019/11/06	97	80 - 120	98	80 - 120	<0.50	ug/L				
6422685	Dissolved Copper (Cu)	2019/11/06	96	80 - 120	96	80 - 120	<1.0	ug/L	16	20		
6422685	Dissolved Iron (Fe)	2019/11/06	98	80 - 120	97	80 - 120	<100	ug/L	2.5	20		
6422685	Dissolved Lead (Pb)	2019/11/06	94	80 - 120	97	80 - 120	<0.50	ug/L	NC	20		
6422685	Dissolved Magnesium (Mg)	2019/11/06	NC	80 - 120	103	80 - 120	<50	ug/L	0.59	20		
6422685	Dissolved Manganese (Mn)	2019/11/06	97	80 - 120	96	80 - 120	<2.0	ug/L	1.0	20		
6422685	Dissolved Molybdenum (Mo)	2019/11/06	95	80 - 120	95	80 - 120	<0.50	ug/L				
6422685	Dissolved Nickel (Ni)	2019/11/06	93	80 - 120	94	80 - 120	<1.0	ug/L	NC	20		
6422685	Dissolved Potassium (K)	2019/11/06	98	80 - 120	98	80 - 120	<200	ug/L	1.1	20		
6422685	Dissolved Selenium (Se)	2019/11/06	98	80 - 120	100	80 - 120	<2.0	ug/L				
6422685	Dissolved Silicon (Si)	2019/11/06	97	80 - 120	99	80 - 120	<50	ug/L				
6422685	Dissolved Sodium (Na)	2019/11/06	97	80 - 120	98	80 - 120	<100	ug/L	2.4	20		
6422685	Dissolved Strontium (Sr)	2019/11/06	97	80 - 120	95	80 - 120	<1.0	ug/L				
6422685	Dissolved Thallium (Tl)	2019/11/06	97	80 - 120	100	80 - 120	<0.050	ug/L				
6422685	Dissolved Tin (Sn)	2019/11/06	98	80 - 120	98	80 - 120	<1.0	ug/L				
6422685	Dissolved Vanadium (V)	2019/11/06	94	80 - 120	94	80 - 120	<0.50	ug/L				
6422685	Dissolved Zinc (Zn)	2019/11/06	96	80 - 120	97	80 - 120	<5.0	ug/L	NC	20		

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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
6422707	Total Chemical Oxygen Demand (COD)	2019/11/05	96	80 - 120	98	80 - 120	<4.0	mg/L	9.6	20		
6422725	Total Chemical Oxygen Demand (COD)	2019/11/05	94	80 - 120	104	80 - 120	<4.0	mg/L	8.2	20		
6422749	Total Kjeldahl Nitrogen (TKN)	2019/11/07	102	80 - 120	102	80 - 120	<0.10	mg/L	4.5	20	101	80 - 120
6422750	Total Kjeldahl Nitrogen (TKN)	2019/11/08	94	80 - 120	98	80 - 120	<0.10	mg/L	6.6	20	92	80 - 120
6422858	Dissolved (0.2u) Aluminum (Al)	2019/11/05	101	80 - 120	101	80 - 120	<5	ug/L	8.0	20		
6422864	Dissolved Calcium (Ca)	2019/11/05	NC	80 - 120	103	80 - 120	<0.050	mg/L	1.4	25		
6422864	Dissolved Magnesium (Mg)	2019/11/05	NC	80 - 120	100	80 - 120	<0.050	mg/L	1.3	25		
6422989	Mercury (Hg)	2019/11/06	94	75 - 125	98	80 - 120	<0.0001	mg/L	NC	20		
6422993	Mercury (Hg)	2019/11/05	86	75 - 125	98	80 - 120	<0.0001	mg/L	NC	20		
6423031	Total Ammonia-N	2019/11/05	98	75 - 125	101	80 - 120	<0.050	mg/L	NC	20		
6423037	Total Ammonia-N	2019/11/05	102	75 - 125	101	80 - 120	<0.050	mg/L	6.2	20		
6423160	Total Chemical Oxygen Demand (COD)	2019/11/05	103	80 - 120	104	80 - 120	<4.0	mg/L	NC	20		
6423375	Total Ammonia-N	2019/11/06	96	75 - 125	102	80 - 120	<0.050	mg/L	NC	20		
6423488	Total Ammonia-N	2019/11/05	100	75 - 125	100	80 - 120	<0.050	mg/L	NC	20		
6424963	Total Phosphorus	2019/11/06	90	80 - 120	98	80 - 120	<0.020	mg/L	0	20	96	80 - 120
6425197	Total Phosphorus	2019/11/05	87	80 - 120	99	80 - 120	<0.004	mg/L	18	20	90	80 - 120
6425247	Total Aluminum (Al)	2019/11/08	109	80 - 120	98	80 - 120	<5.0	ug/L				
6425247	Total Antimony (Sb)	2019/11/08	106	80 - 120	100	80 - 120	<0.50	ug/L				
6425247	Total Arsenic (As)	2019/11/08	100	80 - 120	100	80 - 120	<1.0	ug/L				
6425247	Total Barium (Ba)	2019/11/08	95	80 - 120	98	80 - 120	<2.0	ug/L				
6425247	Total Beryllium (Be)	2019/11/08	92	80 - 120	91	80 - 120	<0.50	ug/L				
6425247	Total Bismuth (Bi)	2019/11/08	85	80 - 120	93	80 - 120	<1.0	ug/L				
6425247	Total Boron (B)	2019/11/08	93	80 - 120	87	80 - 120	<10	ug/L				
6425247	Total Cadmium (Cd)	2019/11/08	97	80 - 120	97	80 - 120	<0.10	ug/L				
6425247	Total Calcium (Ca)	2019/11/08	NC	80 - 120	98	80 - 120	<200	ug/L				
6425247	Total Chromium (Cr)	2019/11/08	94	80 - 120	95	80 - 120	<5.0	ug/L				
6425247	Total Cobalt (Co)	2019/11/08	93	80 - 120	99	80 - 120	<0.50	ug/L				
6425247	Total Copper (Cu)	2019/11/08	103	80 - 120	101	80 - 120	<1.0	ug/L				
6425247	Total Iron (Fe)	2019/11/08	91	80 - 120	96	80 - 120	<100	ug/L				
6425247	Total Lead (Pb)	2019/11/08	88	80 - 120	95	80 - 120	<0.50	ug/L				
6425247	Total Lithium (Li)	2019/11/08	105	80 - 120	105	80 - 120	<5.0	ug/L				

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
6425247	Total Magnesium (Mg)	2019/11/08	NC	80 - 120	98	80 - 120	<50	ug/L				
6425247	Total Manganese (Mn)	2019/11/08	NC	80 - 120	96	80 - 120	<2.0	ug/L	0.29	20		
6425247	Total Molybdenum (Mo)	2019/11/08	106	80 - 120	98	80 - 120	<0.50	ug/L				
6425247	Total Nickel (Ni)	2019/11/08	90	80 - 120	98	80 - 120	<1.0	ug/L				
6425247	Total Potassium (K)	2019/11/08	101	80 - 120	97	80 - 120	<200	ug/L				
6425247	Total Selenium (Se)	2019/11/08	99	80 - 120	101	80 - 120	<2.0	ug/L				
6425247	Total Silicon (Si)	2019/11/08	105	80 - 120	95	80 - 120	<50	ug/L				
6425247	Total Silver (Ag)	2019/11/08	90	80 - 120	94	80 - 120	<0.10	ug/L				
6425247	Total Sodium (Na)	2019/11/08	NC	80 - 120	99	80 - 120	<100	ug/L				
6425247	Total Strontium (Sr)	2019/11/08	NC	80 - 120	97	80 - 120	<1.0	ug/L				
6425247	Total Tellurium (Te)	2019/11/08	101	80 - 120	101	80 - 120	<1.0	ug/L				
6425247	Total Thallium (Tl)	2019/11/08	87	80 - 120	96	80 - 120	<0.050	ug/L				
6425247	Total Tin (Sn)	2019/11/08	103	80 - 120	98	80 - 120	<1.0	ug/L				
6425247	Total Titanium (Ti)	2019/11/08	102	80 - 120	97	80 - 120	<5.0	ug/L				
6425247	Total Tungsten (W)	2019/11/08	99	80 - 120	100	80 - 120	<1.0	ug/L				
6425247	Total Uranium (U)	2019/11/08	91	80 - 120	93	80 - 120	<0.10	ug/L				
6425247	Total Vanadium (V)	2019/11/08	99	80 - 120	98	80 - 120	<0.50	ug/L				
6425247	Total Zinc (Zn)	2019/11/08	94	80 - 120	101	80 - 120	<5.0	ug/L	NC	20		
6425247	Total Zirconium (Zr)	2019/11/08	108	80 - 120	102	80 - 120	<1.0	ug/L				
6425838	Total Dissolved Solids	2019/11/06					<10	mg/L	NC	25	97	90 - 110
6426352	Orthophosphate (P)	2019/11/07	115	75 - 125	100	80 - 120	<0.010	mg/L	1.3	25		
6427171	Total Aluminum (Al)	2019/11/06	100	80 - 120	97	80 - 120	<5.0	ug/L	12	20		
6427171	Total Antimony (Sb)	2019/11/06	100	80 - 120	99	80 - 120	<0.50	ug/L	NC	20		
6427171	Total Arsenic (As)	2019/11/06	98	80 - 120	100	80 - 120	<1.0	ug/L	NC	20		
6427171	Total Barium (Ba)	2019/11/06	95	80 - 120	97	80 - 120	<2.0	ug/L	0.26	20		
6427171	Total Beryllium (Be)	2019/11/06	100	80 - 120	102	80 - 120	<0.50	ug/L	NC	20		
6427171	Total Bismuth (Bi)	2019/11/06	86	80 - 120	91	80 - 120	<1.0	ug/L	NC	20		
6427171	Total Boron (B)	2019/11/06	96	80 - 120	99	80 - 120	<10	ug/L	1.1	20		
6427171	Total Cadmium (Cd)	2019/11/06	96	80 - 120	98	80 - 120	<0.10	ug/L	NC	20		
6427171	Total Calcium (Ca)	2019/11/06	NC	80 - 120	101	80 - 120	<200	ug/L	1.5	20		
6427171	Total Chromium (Cr)	2019/11/06	95	80 - 120	98	80 - 120	<5.0	ug/L	NC	20		

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
6427171	Total Cobalt (Co)	2019/11/06	93	80 - 120	97	80 - 120	<0.50	ug/L	0.14	20		
6427171	Total Copper (Cu)	2019/11/06	97	80 - 120	100	80 - 120	<1.0	ug/L	11	20		
6427171	Total Iron (Fe)	2019/11/06	95	80 - 120	98	80 - 120	<100	ug/L	1.5	20		
6427171	Total Lead (Pb)	2019/11/06	91	80 - 120	94	80 - 120	<0.50	ug/L	NC	20		
6427171	Total Lithium (Li)	2019/11/06	97	80 - 120	100	80 - 120	<5.0	ug/L	3.1	20		
6427171	Total Magnesium (Mg)	2019/11/06	NC	80 - 120	98	80 - 120	<50	ug/L	0.26	20		
6427171	Total Manganese (Mn)	2019/11/06	NC	80 - 120	96	80 - 120	<2.0	ug/L	2.2	20		
6427171	Total Molybdenum (Mo)	2019/11/06	100	80 - 120	99	80 - 120	<0.50	ug/L	5.6	20		
6427171	Total Nickel (Ni)	2019/11/06	92	80 - 120	96	80 - 120	<1.0	ug/L	NC	20		
6427171	Total Potassium (K)	2019/11/06	96	80 - 120	99	80 - 120	<200	ug/L	1.0	20		
6427171	Total Selenium (Se)	2019/11/06	97	80 - 120	101	80 - 120	<2.0	ug/L	NC	20		
6427171	Total Silicon (Si)	2019/11/06	94	80 - 120	97	80 - 120	<50	ug/L	1.7	20		
6427171	Total Silver (Ag)	2019/11/06	95	80 - 120	97	80 - 120	<0.10	ug/L	NC	20		
6427171	Total Sodium (Na)	2019/11/06	NC	80 - 120	100	80 - 120	<100	ug/L	0.95	20		
6427171	Total Strontium (Sr)	2019/11/06	NC	80 - 120	96	80 - 120	<1.0	ug/L	1.2	20		
6427171	Total Tellurium (Te)	2019/11/06	98	80 - 120	100	80 - 120	<1.0	ug/L	NC	20		
6427171	Total Thallium (Tl)	2019/11/06	91	80 - 120	95	80 - 120	<0.050	ug/L	NC	20		
6427171	Total Tin (Sn)	2019/11/06	99	80 - 120	97	80 - 120	<1.0	ug/L	NC	20		
6427171	Total Titanium (Ti)	2019/11/06	98	80 - 120	96	80 - 120	<5.0	ug/L	NC	20		
6427171	Total Tungsten (W)	2019/11/06	96	80 - 120	98	80 - 120	<1.0	ug/L	NC	20		
6427171	Total Uranium (U)	2019/11/06	85	80 - 120	86	80 - 120	<0.10	ug/L	7.0	20		
6427171	Total Vanadium (V)	2019/11/06	97	80 - 120	97	80 - 120	<0.50	ug/L	NC	20		
6427171	Total Zinc (Zn)	2019/11/06	93	80 - 120	99	80 - 120	<5.0	ug/L	9.4	20		
6427171	Total Zirconium (Zr)	2019/11/06	102	80 - 120	100	80 - 120	<1.0	ug/L	NC	20		

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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
6427364	Total Phosphorus	2019/11/06	90	80 - 120	87	80 - 120	<0.020	mg/L	8.4	20	89	80 - 120

N/A = Not Applicable

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

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

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

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

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

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

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

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

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

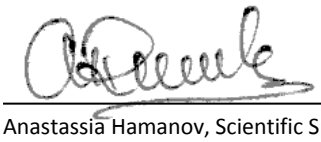
Bureau Veritas Laboratories 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

BV Labs Job #: B9U7686
Report Date: 2019/11/08

exp Services Inc
Client Project #: THB-00006196-OE
Site Location: Longlac Landfill - Fall Sampling Event
Sampler Initials: CP

VALIDATION SIGNATURE PAGE

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



Anastassia Hamanov, Scientific Specialist

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

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

BOD

Bureau Veritas Labs
6740 Campobello R... ee:800-563-6266 Fax:(905) 817-5777 www.bvlabs.com

31-Oct-19 11:40
Michelle Huth
B9U7686

URE ENV-706

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Only:
Company Name:	#17501 exp Services Inc			Quotation #:	B90572	Bottle Order #:
Attention:	accounts payable	Attention:	Ahileas Mitsopoulos + Kristof Karpiuk	P.O. #:		741948
Address:	1142 Roland St	Address:	please c/c connor.porter@exp.com Kristof.Karpiuk@exp.com	Project:	THB-00006196-OE	Project Manager:
	Thunder Bay ON P7B 5M4			Project Name:		
Tel:	(807) 623-9495 Fax: (807) 623-8070	Tel:	Fax:	Site #:	Longlac Landfill	Michelle Huth
Email:	thunderbay@exp.com; Karen.Burke@exp.com;AP@ex	Email:	ahileas.mitsopoulos@exp.com, Kristof.Karpiuk@exp.co	Sampled By:	Connor Porter + Kristof Karpiuk	C#741948-03-01

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE BV LABS DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011)	Other Regulations	Special Instructions
☐ Table 1 ☐ Res/Park ☐ Medium/Fine	☐ CCME ☐ Sanitary Sewer Bylaw	
☐ Table 2 ☐ Ind/Comm ☐ Coarse	☐ Reg 558 ☐ Storm Sewer Bylaw	
☐ Table 3 ☐ Agri/Other ☐ For RSC	☐ MISA Municipality	
☐ Table	☐ PWQO	
	☒ Other OPWS	

Include Criteria on Certificate of Analysis (Y/N)? ____

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects

Regular (Standard) TAT:
(will be applied if Rush TAT is not specified):
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: ____ Time Required: ____
Rush Confirmation Number: ____ *(call lab for #)*

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Hg / Cr VI	Organic Nitrogen	Orthophosphate	Hardness	GW- Fall (no VOCs)	Extra Dissolved Metals Parameters	Volatile Organic Compounds in Water	Landfill Standards Sch 5 - GW Comp. List	# of Bottles	Comments
1		MW2	10/29/19	5:45pm	GW	X	X	X	X	X	X		X	8	Landfill Standards Sch 5 GW Comp List was added - may not be called "GW-Fall (No VOCs)"
2		MW3	10/29/19	6:05pm	GW	X	X	X	X	X	X		X	8	
3		MW4 I	10/29/19	9:25am	GW	X	X	X	X	X	X		X	8	
4		MW4 II	10/29/19	9:45am	GW	X	X	X	X	X	X		X	8	
5		MW5	10/29/19	10:55am	GW	X	X	X	X	X	X		X	8	
6		MW6	10/29/19	12:00pm	GW	X	X	X	X	X	X	X	X	11	
7		MW7	10/29/19	11:55am	GW	X	X	X	X	X	X	X	X	11	
8		MW8 I	10/29/19	1:20pm	GW	X	X	X	X	X	X	X	X	11	
9		MW8 II	10/29/19	1:30pm	GW	X	X	X	X	X	X	X	X	11	
10		MW9	10/29/19	2:55pm	GW	X	X	X	X	X	X		X	8	

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
Connor Porter CONNOR PORTER	19/10/31	11:40	Michelle Huth Michelle Huth	2019/10/31	11:40	
			[illegible] IDW2	2019/11/01	11:50	

Laboratory Use Only

Time Sensitive	Temperature (°C) on Recei	Custody Seal	Yes	No
	Refer to ACTR.	Present		
		Intact		N.A.

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BV LABS' STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVLABS.COM/TERMS-AND-CONDITIONS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT WWW.BVLABS.COM/RESOURCES/CHAIN-OF-CUSTODY-FORMS.

Refer to ACTR

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BV LABS

White: BV Labs Yellow: Client

Bureau Veritas Canada (2019) Inc.

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

CHAIN OF CUSTODY RECORD

Page 2 of 3

INVOICE TO:	REPORT TO:	PROJECT INFORMATION:	Laboratory Use Only:
Company Name: #17501 exp Services Inc	Company Name:	Quotation #: B90572	BV Labs Job #: / Bottle Order #: 741948
Attention: accounts payable	Attention: Ahileas Mitsopoulos + Kristof Karpiuk	P.O. #:	
Address: 1142 Roland St, Thunder Bay ON P7B 5M4	Address: please c/c connor.porter@exp.com	Project: THB-00006196-OE	COC #: C#741948-02-01
Tel: (807) 623-9495 Fax: (807) 623-8070	Tel: Fax:	Project Name:	Project Manager: Michelle Huth
Email: thunderbay@exp.com; Karen.Burke@exp.com;AP@ex	Email: ahileas.mitsopoulos@exp.com, Kristof.Karpiuk@exp.co	Site #: Longlac Landfill	
		Sampled By: Connor Porter + Kristof Karpiuk	

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE BV LABS DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011): ☐ Table 1 ☐ Res/Park ☐ Medium/Fine ☐ Table 2 ☐ Ind/Comm ☐ Coarse ☐ Table 3 ☐ Agri/Other ☐ For RSC ☐ Table ___

Other Regulations: ☐ CCME ☐ Sanitary Sewer Bylaw ☐ Reg 558 ☐ Storm Sewer Bylaw ☐ MISA Municipality ___ ☐ PWQO ☒ Other ODWS

Special Instructions:

Include Criteria on Certificate of Analysis (Y/N)? ___

ANALYSIS REQUESTED (PLEASE BE SPECIFIC)

Turnaround Time (TAT) Required: Please provide advance notice for rush projects

Regular (Standard) TAT: ☒ (will be applied if Rush TAT is not specified): Standard TAT = 5-7 Working days for most tests. Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission) Date Required: ___ Time Required: ___ Rush Confirmation Number: ___ (call lab for #)

#	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Hg / Cr VI	Organic Nitrogen	Orthophosphate	Hardness	GW- Fall (no VOCs)	Extra Dissolved Metals Parameters	Volatile Organic Compounds in Water	Landfill Standards Sch 5 GW Comp. List				# of Bottles	Comments
1		MW 10	10/29/19	10:20am	GW	X	X	X	X	X	X		X				8	Landfill Standards Sch 5 GW Comp List was added - may now be called "GW-Fall(No Vo..."
2		MW 11 I	10/30/19	9:30am	GW	X	X	X	X	X	X		X				8	
3		MW 11 II	10/30/19	9:40am	GW	X	X	X	X	X	X		X				8	
4		MW 12 I	10/30/19	8:50am	GW	X	X	X	X	X	X		X				8	
5		MW 12 II	10/29/19	4:05pm	GW	X	X	X	X	X	X		X				8	
6		MW 13	10/29/19	8:00am	GW	X	X	X	X	X	X	X	X				11	
7					GW													
8					GW													
9					GW													
10					GW													

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
Connor Porter CONNOR PORTER	19/10/31		See page 1 / See page 1			

Laboratory Use Only: Time Sensitive | Temperature (°C) on Recei | Custody Seal Present / Intact | Yes | No

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BV LABS' STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVLABS.COM/TERMS-AND-CONDITIONS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT WWW.BVLABS.COM/RESOURCES/CHAIN-OF-CUSTODY-FORMS.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BV LABS

White: BV Labs Yellow: Client

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

CHAIN OF CUSTODY RECORD

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#17501 exp Services Inc	Company Name:	EXP Services ~~Inc~~ Inc.	Quotation #:	B90572	BV Labs Job #:	Bottle Order #: 741949
Attention:	accounts payable	Attention:	Accounts Payable	P.O. #:			
Address:	1142 Roland St Thunder Bay ON P7B 5M4	Address:	Connor Porter connor.porter@exp.com Kristof Karpuk Kristof.Karpuk@exp.com	Project:	THB-00006196-OE	COC #:	Project Manager:
Tel:	(807) 623-9495 Fax: (807) 623-8070	Tel:	Ahileas Mitsopoulos Ahileas.Mitsopoulos@exp.com	Project Name:		C#741949-01-01	Michelle Huth
Email:	thunderbay@exp.com; Karen.Burke@exp.com;AP@ex	Email:	thunderbay@exp.com; Karen.Burke@exp.com;AP@ex	Site #:	Longlac Landfill		
				Sampled By:	Connor Porter + Kristof Karpuk		

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE BV LABS DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011)
- ☐ Table 1 ☐ Res/Park ☐ Medium/Fine
- ☐ Table 2 ☐ Ind/Comm ☐ Coarse
- ☐ Table 3 ☐ Agri/Other ☐ For RSC
- ☐ Table ___

Other Regulations
- ☐ CCME ☐ Sanitary Sewer Bylaw
- ☐ Reg 558 ☐ Storm Sewer Bylaw
- ☐ MISA Municipality ___
- ☒ PWQO
- ☐ Other ___

Special Instructions

Include Criteria on Certificate of Analysis (Y/N)? ___

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects

Regular (Standard) TAT: ☒
(will be applied if Rush TAT is not specified):
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: ___ Time Required: ___ ☐
Rush Confirmation Number: ___
(call lab for #)

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Cr VI	Dissolved Aluminum (0.2 u, clay free)	Organic Nitrogen	Dissolved Organic Carbon (DOC)	Extra Total Metals Parameters	Hardness (calculated as CaCO3)	Total Metals Analysis by ICPMS	SW - Spring/Fall	Landfill Standards Sch 5 - SW Comp List			# of Bottles	Comments
1		SW 1	10/29/19	6:25pm	SW	X	x	x	x	x	x	x	x	X			9	Landfill Standard Sch 5 - SW Comp List was added - may now be called "SW-Spring/Fall"
2		SW 2	10/29/19	2:30pm	SW	X	x	x	x	x	x	x	x	X			9	
3		SW 3	10/29/19	2:10pm	SW	X	x	x	x	x	x	x	x	X			9	
4																		
5																		
6																		
7																		
8																		
9																		
10																		

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Laboratory Use Only: Time Sensitive	Temperature (°C) on Recei	Custody Seal Present	Yes	No
Connor Porter CONNOR PORTER	19/10/31		see page 1						Intact		

See Page 1

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BV LABS' STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVLABS.COM/TERMS-AND-CONDITIONS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT WWW.BVLABS.COM/RESOURCES/CHAIN-OF-CUSTODY-FORMS.

SAMPLES MUST BE KEPT COOL (< 10° C.) FROM TIME OF SAMPLING UNTIL DELIVERY TO BV LABS

White: BV Labs Yellow: Client

Bureau Veritas Canada (2019) Inc.

Your Project #: THB-00006196-PE
Site Location: LONGLAC LANDFILL - SPRING SAMPLING EVENT

Attention: Ahileas Mitsopoulos

exp Services Inc
Thunder Bay Branch
1142 Roland St
Thunder Bay, ON
CANADA P7B 5M4

Your C.O.C. #: 770944-01-01, 770944-02-01, C#770946-01-01

Report Date: 2020/12/18
Report #: R6455258
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

BV LABS JOB #: C0C0144
Received: 2020/05/14, 15:09

Sample Matrix: Water
Samples Received: 19

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Dissolved Aluminum (0.2 u, clay free)	3	N/A	2020/05/21	CAM SOP-00447	EPA 6020B m
Alkalinity	11	N/A	2020/05/20	CAM SOP-00448	SM 23 2320 B m
Alkalinity	4	N/A	2020/05/21	CAM SOP-00448	SM 23 2320 B m
Alkalinity	4	N/A	2020/05/22	CAM SOP-00448	SM 23 2320 B m
Biochemical Oxygen Demand (BOD)	3	2020/05/16	2020/05/21	CAM SOP-00427	SM 23 5210B m
Chloride by Automated Colourimetry	14	N/A	2020/05/20	CAM SOP-00463	SM 23 4500-Cl E m
Chloride by Automated Colourimetry	5	N/A	2020/05/21	CAM SOP-00463	SM 23 4500-Cl E m
Chemical Oxygen Demand	19	N/A	2020/05/25	CAM SOP-00416	SM 23 5220 D m
Conductivity	11	N/A	2020/05/20	CAM SOP-00414	SM 23 2510 m
Conductivity	4	N/A	2020/05/21	CAM SOP-00414	SM 23 2510 m
Conductivity	4	N/A	2020/05/22	CAM SOP-00414	SM 23 2510 m
Dissolved Organic Carbon (DOC) (1)	3	N/A	2020/05/23	CAM SOP-00446	SM 23 5310 B m
Dissolved Organic Carbon (DOC) (1)	16	N/A	2020/05/24	CAM SOP-00446	SM 23 5310 B m
Hardness (calculated as CaCO3)	3	N/A	2020/05/21	CAM SOP 00102/00408/00447	SM 2340 B
Hardness (calculated as CaCO3)	16	N/A	2020/05/25	CAM SOP 00102/00408/00447	SM 2340 B
Mercury in Water by CVAA	13	2020/05/21	2020/05/21	CAM SOP-00453	EPA 7470A m
Mercury in Water by CVAA	6	2020/05/22	2020/05/22	CAM SOP-00453	EPA 7470A m
Dissolved Calcium and Magnesium	3	2020/05/20	2020/05/21	CAM SOP-00408	EPA 6010D m
Dissolved Metals by ICPMS	15	N/A	2020/05/22	CAM SOP-00447	EPA 6020B m
Dissolved Metals by ICPMS	1	N/A	2020/05/29	CAM SOP-00447	EPA 6020B m
Total Metals Analysis by ICPMS	1	N/A	2020/05/23	CAM SOP-00447	EPA 6020B m
Total Metals Analysis by ICPMS	2	N/A	2020/05/27	CAM SOP-00447	EPA 6020B m
Ion Balance (% Difference)	16	N/A	2020/05/25		
Total Ammonia-N	19	N/A	2020/05/25	CAM SOP-00441	USGS I-2522-90 m
Nitrate (NO3) and Nitrite (NO2) in Water (2)	3	N/A	2020/05/20	CAM SOP-00440	SM 23 4500-NO3I/NO2B

Your Project #: THB-00006196-PE
Site Location: LONGLAC LANDFILL - SPRING SAMPLING EVENT

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1142 Roland St
Thunder Bay, ON
CANADA P7B 5M4

Your C.O.C. #: 770944-01-01, 770944-02-01, C#770946-01-01

Report Date: 2020/12/18
Report #: R6455258
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

BV LABS JOB #: C0C0144
Received: 2020/05/14, 15:09

Sample Matrix: Water
Samples Received: 19

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Nitrate (NO3) and Nitrite (NO2) in Water (2)	14	N/A	2020/05/21	CAM SOP-00440	SM 23 4500-NO3I/NO2B
Nitrate (NO3) and Nitrite (NO2) in Water (2)	2	N/A	2020/05/22	CAM SOP-00440	SM 23 4500-NO3I/NO2B
Organic Nitrogen	19	N/A	2020/05/25		
pH	11	2020/05/19	2020/05/20	CAM SOP-00413	SM 4500H+ B m
pH	2	2020/05/19	2020/05/21	CAM SOP-00413	SM 4500H+ B m
pH	4	2020/05/19	2020/05/22	CAM SOP-00413	SM 4500H+ B m
pH	2	2020/05/21	2020/05/21	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	6	N/A	2020/05/19	CAM SOP-00444	OMOE E3179 m
Phenols (4AAP)	13	N/A	2020/05/20	CAM SOP-00444	OMOE E3179 m
Orthophosphate	16	N/A	2020/05/22	CAM SOP-00461	EPA 365.1 m
Sulphate by Automated Colourimetry	14	N/A	2020/05/20	CAM SOP-00464	EPA 375.4 m
Sulphate by Automated Colourimetry	5	N/A	2020/05/21	CAM SOP-00464	EPA 375.4 m
Total Dissolved Solids	19	2020/05/21	2020/05/22	CAM SOP-00428	SM 23 2540C m
Total Kjeldahl Nitrogen in Water	6	2020/05/22	2020/05/25	CAM SOP-00938	OMOE E3516 m
Total Kjeldahl Nitrogen in Water	13	2020/05/25	2020/05/25	CAM SOP-00938	OMOE E3516 m
Total Phosphorus (Colourimetric)	3	2020/05/25	2020/05/25	CAM SOP-00407	SM 23 4500 P B H m
Total Phosphorus (Colourimetric)	16	2020/05/25	2020/05/25	CAM SOP-00407	SM 23 4500 P B H m
Low Level Total Suspended Solids	1	2020/05/21	2020/05/22	CAM SOP-00428	SM 23 2540D m
Low Level Total Suspended Solids	2	2020/05/22	2020/05/22	CAM SOP-00428	SM 23 2540D m

Remarks:

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

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

Your Project #: THB-00006196-PE
Site Location: LONGLAC LANDFILL - SPRING SAMPLING EVENT

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CANADA P7B 5M4

Your C.O.C. #: 770944-01-01, 770944-02-01, C#770946-01-01

Report Date: 2020/12/18
Report #: R6455258
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

BV LABS JOB #: C0C0144
Received: 2020/05/14, 15:09

accounted for when stating conformity to the referenced standard.

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

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

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
(1) Dissolved Organic Carbon (DOC) present in the sample should be considered as non-purgeable DOC.
(2) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Julie Clement, Technical Account Manager
Email: Julie.CLEMENT@bvlabs.com
Phone# (613)868-6079
==========
BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

BV Labs Job #: C0C0144
Report Date: 2020/12/18

exp Services Inc
Client Project #: THB-00006196-PE
Site Location: LONGLAC LANDFILL - SPRING SAMPLING EVENT
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

BV Labs ID					MQN962			MQN963		
Sampling Date					2020/05/12 13:10			2020/05/12 13:50		
COC Number					770944-01-01			770944-01-01		
	UNITS	**Criteria**	**MAC**	**A/O**	**MW-2**	**RDL**	**QC Batch**	**MW-3**	**RDL**	**QC Batch**
Inorganics										
Total Ammonia-N	mg/L	-	-	-	0.56	0.050	6746349	0.74	0.050	6746349
Total Chemical Oxygen Demand (COD)	mg/L	-	-	-	<4.0	4.0	6745521	8.6	4.0	6738454
Conductivity	umho/cm	-	-	-	440	1.0	6730817	460	1.0	6730817
Total Dissolved Solids	mg/L	-	-	500	320	10	6731252	330	10	6731252
Total Kjeldahl Nitrogen (TKN)	mg/L	-	-	-	0.66	0.10	6745524	0.76	0.10	6745524
Dissolved Organic Carbon	mg/L	-	-	5	5.5	0.40	6741202	1.5	0.40	6741237
pH	pH	6.5:8.5	-	6.5:8.5	8.08		6730819	8.00		6730819
Phenols-4AAP	mg/L	0.001	-	-	<0.0010	0.0010	6729828	<0.0010	0.0010	6729834
Total Phosphorus	mg/L	0.01	-	-	0.61	0.10	6745720	0.33	0.040	6745720
Dissolved Sulphate (SO4)	mg/L	-	-	500	<1.0	1.0	6730639	<1.0	1.0	6730639
Alkalinity (Total as CaCO3)	mg/L	-	-	30:500	250	1.0	6730814	260	1.0	6730814
Dissolved Chloride (Cl-)	mg/L	-	-	250	<1.0	1.0	6730636	<1.0	1.0	6730636
Nitrite (N)	mg/L	-	1	-	0.013	0.010	6733858	0.015	0.010	6733858
Nitrate (N)	mg/L	-	10	-	<0.10	0.10	6733858	<0.10	0.10	6733858
Metals										
Mercury (Hg)	mg/L	0.0002	0.001	-	<0.00010	0.00010	6734079	<0.00010	0.00010	6737691
Dissolved Aluminum (Al)	ug/L	-	-	100	<5.0	5.0	6730422	<5.0	5.0	6730422
Dissolved Antimony (Sb)	ug/L	20	6	-	<0.50	0.50	6730422	<0.50	0.50	6730422
Dissolved Arsenic (As)	ug/L	100	10	-	1.9	1.0	6730422	3.3	1.0	6730422
Dissolved Barium (Ba)	ug/L	-	1000	-	21	2.0	6730422	43	2.0	6730422
Dissolved Beryllium (Be)	ug/L	11	-	-	<0.50	0.50	6730422	<0.50	0.50	6730422
Dissolved Bismuth (Bi)	ug/L	-	-	-	<1.0	1.0	6730422	<1.0	1.0	6730422
Dissolved Boron (B)	ug/L	200	5000	-	19	10	6730422	28	10	6730422
Dissolved Cadmium (Cd)	ug/L	0.2	5	-	<0.10	0.10	6730422	<0.10	0.10	6730422
Dissolved Calcium (Ca)	ug/L	-	-	-	58000	200	6730422	63000	200	6730422
Dissolved Chromium (Cr)	ug/L	-	50	-	<5.0	5.0	6730422	<5.0	5.0	6730422
Dissolved Cobalt (Co)	ug/L	0.9	-	-	<0.50	0.50	6730422	<0.50	0.50	6730422
Dissolved Copper (Cu)	ug/L	5	-	1000	2.2	1.0	6730422	1.4	1.0	6730422
Dissolved Iron (Fe)	ug/L	300	-	300	400	100	6730422	1500	100	6730422

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

Criteria: Ontario Provincial Water Quality Objectives
Ref. to MOEE Water Management document dated Feb.1999

MAC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [MAC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively
(Made under the Ontario Safe Drinking Water Act, 2002)

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

BV Labs Job #: C0C0144
Report Date: 2020/12/18

exp Services Inc
Client Project #: THB-00006196-PE
Site Location: LONGLAC LANDFILL - SPRING SAMPLING EVENT
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

BV Labs ID					MQN962			MQN963		
Sampling Date					2020/05/12 13:10			2020/05/12 13:50		
COC Number					770944-01-01			770944-01-01		
	UNITS	**Criteria**	**MAC**	**A/O**	**MW-2**	**RDL**	**QC Batch**	**MW-3**	**RDL**	**QC Batch**
Dissolved Lead (Pb)	ug/L	5	10	-	<0.50	0.50	6730422	<0.50	0.50	6730422
Dissolved Magnesium (Mg)	ug/L	-	-	-	13000	50	6730422	19000	50	6730422
Dissolved Manganese (Mn)	ug/L	-	-	50	100	2.0	6730422	67	2.0	6730422
Dissolved Molybdenum (Mo)	ug/L	40	-	-	<0.50	0.50	6730422	0.55	0.50	6730422
Dissolved Nickel (Ni)	ug/L	25	-	-	<1.0	1.0	6730422	<1.0	1.0	6730422
Dissolved Potassium (K)	ug/L	-	-	-	840	200	6730422	1200	200	6730422
Dissolved Selenium (Se)	ug/L	100	50	-	<2.0	2.0	6730422	<2.0	2.0	6730422
Dissolved Silicon (Si)	ug/L	-	-	-	7900	50	6730422	8900	50	6730422
Dissolved Sodium (Na)	ug/L	-	-	200000	17000	100	6730422	8900	100	6730422
Dissolved Strontium (Sr)	ug/L	-	-	-	210	1.0	6730422	270	1.0	6730422
Dissolved Thallium (Tl)	ug/L	0.3	-	-	<0.050	0.050	6730422	<0.050	0.050	6730422
Dissolved Tin (Sn)	ug/L	-	-	-	<1.0	1.0	6730422	<1.0	1.0	6730422
Dissolved Vanadium (V)	ug/L	6	-	-	0.72	0.50	6730422	<0.50	0.50	6730422
Dissolved Zinc (Zn)	ug/L	30	-	5000	<5.0	5.0	6730422	<5.0	5.0	6730422

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: Ontario Provincial Water Quality Objectives
Ref. to MOEE Water Management document dated Feb.1999
MAC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [MAC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively
(Made under the Ontario Safe Drinking Water Act, 2002)

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BV Labs Job #: C0C0144
Report Date: 2020/12/18

exp Services Inc
Client Project #: THB-00006196-PE
Site Location: LONGLAC LANDFILL - SPRING SAMPLING EVENT
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

BV Labs ID					MQN964			MQN964		
Sampling Date					2020/05/12 18:30			2020/05/12 18:30		
COC Number					770944-01-01			770944-01-01		
	UNITS	**Criteria**	**MAC**	**A/O**	**MW-4I**	**RDL**	**QC Batch**	**MW-4I Lab-Dup**	**RDL**	**QC Batch**
Inorganics										
Total Ammonia-N	mg/L	-	-	-	<0.050	0.050	6746349			
Total Chemical Oxygen Demand (COD)	mg/L	-	-	-	<4.0	4.0	6745521			
Conductivity	umho/cm	-	-	-	610	1.0	6730817			
Total Dissolved Solids	mg/L	-	-	500	355	10	6731252			
Total Kjeldahl Nitrogen (TKN)	mg/L	-	-	-	0.15	0.10	6745524			
Dissolved Organic Carbon	mg/L	-	-	5	2.2	0.40	6741237			
pH	pH	6.5:8.5	-	6.5:8.5	8.13		6730819			
Phenols-4AAP	mg/L	0.001	-	-	<0.0010	0.0010	6729821			
Total Phosphorus	mg/L	0.01	-	-	0.040	0.020	6745720			
Dissolved Sulphate (SO4)	mg/L	-	-	500	1.4	1.0	6730639	1.2	1.0	6730639
Alkalinity (Total as CaCO3)	mg/L	-	-	30:500	340	1.0	6730814			
Dissolved Chloride (Cl-)	mg/L	-	-	250	1.1	1.0	6730636	1.4	1.0	6730636
Nitrite (N)	mg/L	-	1	-	<0.010	0.010	6733858			
Nitrate (N)	mg/L	-	10	-	0.19	0.10	6733858			
Metals										
Mercury (Hg)	mg/L	0.0002	0.001	-	<0.00010	0.00010	6734079	<0.00010	0.00010	6734079
Dissolved Aluminum (Al)	ug/L	-	-	100	<5.0	5.0	6730422			
Dissolved Antimony (Sb)	ug/L	20	6	-	<0.50	0.50	6730422			
Dissolved Arsenic (As)	ug/L	100	10	-	<1.0	1.0	6730422			
Dissolved Barium (Ba)	ug/L	-	1000	-	65	2.0	6730422			
Dissolved Beryllium (Be)	ug/L	11	-	-	<0.50	0.50	6730422			
Dissolved Bismuth (Bi)	ug/L	-	-	-	<1.0	1.0	6730422			
Dissolved Boron (B)	ug/L	200	5000	-	54	10	6730422			
Dissolved Cadmium (Cd)	ug/L	0.2	5	-	<0.10	0.10	6730422			
Dissolved Calcium (Ca)	ug/L	-	-	-	77000	200	6730422			
Dissolved Chromium (Cr)	ug/L	-	50	-	<5.0	5.0	6730422			
Dissolved Cobalt (Co)	ug/L	0.9	-	-	<0.50	0.50	6730422			
Dissolved Copper (Cu)	ug/L	5	-	1000	<1.0	1.0	6730422			

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
Criteria: Ontario Provincial Water Quality Objectives
Ref. to MOEE Water Management document dated Feb.1999
MAC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [MAC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively
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BV Labs Job #: C0C0144
Report Date: 2020/12/18

exp Services Inc
Client Project #: THB-00006196-PE
Site Location: LONGLAC LANDFILL - SPRING SAMPLING EVENT
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

BV Labs ID					MQN964			MQN964		
Sampling Date					2020/05/12 18:30			2020/05/12 18:30		
COC Number					770944-01-01			770944-01-01		
	UNITS	**Criteria**	**MAC**	**A/O**	**MW-4I**	**RDL**	**QC Batch**	**MW-4I Lab-Dup**	**RDL**	**QC Batch**
Dissolved Iron (Fe)	ug/L	300	-	300	<100	100	6730422			
Dissolved Lead (Pb)	ug/L	5	10	-	<0.50	0.50	6730422			
Dissolved Magnesium (Mg)	ug/L	-	-	-	30000	50	6730422			
Dissolved Manganese (Mn)	ug/L	-	-	50	<2.0	2.0	6730422			
Dissolved Molybdenum (Mo)	ug/L	40	-	-	2.4	0.50	6730422			
Dissolved Nickel (Ni)	ug/L	25	-	-	<1.0	1.0	6730422			
Dissolved Potassium (K)	ug/L	-	-	-	6600	200	6730422			
Dissolved Selenium (Se)	ug/L	100	50	-	<2.0	2.0	6730422			
Dissolved Silicon (Si)	ug/L	-	-	-	8800	50	6730422			
Dissolved Sodium (Na)	ug/L	-	-	200000	12000	100	6730422			
Dissolved Strontium (Sr)	ug/L	-	-	-	490	1.0	6730422			
Dissolved Thallium (Tl)	ug/L	0.3	-	-	<0.050	0.050	6730422			
Dissolved Tin (Sn)	ug/L	-	-	-	<1.0	1.0	6730422			
Dissolved Vanadium (V)	ug/L	6	-	-	<0.50	0.50	6730422			
Dissolved Zinc (Zn)	ug/L	30	-	5000	<5.0	5.0	6730422			

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
Criteria: Ontario Provincial Water Quality Objectives
Ref. to MOEE Water Management document dated Feb.1999
MAC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [MAC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively
(Made under the Ontario Safe Drinking Water Act, 2002)

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BV Labs Job #: C0C0144
Report Date: 2020/12/18

exp Services Inc
Client Project #: THB-00006196-PE
Site Location: LONGLAC LANDFILL - SPRING SAMPLING EVENT
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

BV Labs ID					MQN965			MQN966		
Sampling Date					2020/05/12 18:05			2020/05/12 19:50		
COC Number					770944-01-01			770944-01-01		
	UNITS	**Criteria**	**MAC**	**A/O**	**MW-4II**	**RDL**	**QC Batch**	**MW-5**	**RDL**	**QC Batch**
Inorganics										
Total Ammonia-N	mg/L	-	-	-	0.62	0.050	6746349	<0.050	0.050	6746349
Total Chemical Oxygen Demand (COD)	mg/L	-	-	-	18	4.0	6738454	4.6	4.0	6745521
Conductivity	umho/cm	-	-	-	1300	1.0	6730817	490	1.0	6730817
Total Dissolved Solids	mg/L	-	-	500	680	10	6731252	285	10	6731252
Total Kjeldahl Nitrogen (TKN)	mg/L	-	-	-	1.4	0.10	6745524	0.11	0.10	6745524
Dissolved Organic Carbon	mg/L	-	-	5	4.8	0.40	6741237	1.0	0.40	6741202
pH	pH	6.5:8.5	-	6.5:8.5	8.06		6730819	8.03		6730819
Phenols-4AAP	mg/L	0.001	-	-	<0.0010	0.0010	6729834	<0.0010	0.0010	6729821
Total Phosphorus	mg/L	0.01	-	-	36	5.0	6745720	0.70	0.10	6745720
Dissolved Sulphate (SO4)	mg/L	-	-	500	17	1.0	6730639	1.6	1.0	6730639
Alkalinity (Total as CaCO3)	mg/L	-	-	30:500	680	1.0	6730814	280	1.0	6730814
Dissolved Chloride (Cl-)	mg/L	-	-	250	9.8	1.0	6730636	1.0	1.0	6730636
Nitrite (N)	mg/L	-	1	-	0.176	0.010	6733858	<0.010	0.010	6733858
Nitrate (N)	mg/L	-	10	-	1.96	0.10	6733858	0.15	0.10	6733858
Metals										
Mercury (Hg)	mg/L	0.0002	0.001	-	<0.00010	0.00010	6737389	<0.00010	0.00010	6734079
Dissolved Aluminum (Al)	ug/L	-	-	100	380	5.0	6730422	<5.0	5.0	6730422
Dissolved Antimony (Sb)	ug/L	20	6	-	<0.50	0.50	6730422	<0.50	0.50	6730422
Dissolved Arsenic (As)	ug/L	100	10	-	<1.0	1.0	6730422	<1.0	1.0	6730422
Dissolved Barium (Ba)	ug/L	-	1000	-	79	2.0	6730422	21	2.0	6730422
Dissolved Beryllium (Be)	ug/L	11	-	-	<0.50	0.50	6730422	<0.50	0.50	6730422
Dissolved Bismuth (Bi)	ug/L	-	-	-	<1.0	1.0	6730422	<1.0	1.0	6730422
Dissolved Boron (B)	ug/L	200	5000	-	700	10	6730422	<10	10	6730422
Dissolved Cadmium (Cd)	ug/L	0.2	5	-	<0.10	0.10	6730422	<0.10	0.10	6730422
Dissolved Calcium (Ca)	ug/L	-	-	-	88000	200	6730422	77000	200	6730422
Dissolved Chromium (Cr)	ug/L	-	50	-	<5.0	5.0	6730422	<5.0	5.0	6730422
Dissolved Cobalt (Co)	ug/L	0.9	-	-	2.0	0.50	6730422	<0.50	0.50	6730422
Dissolved Copper (Cu)	ug/L	5	-	1000	4.8	1.0	6730422	<1.0	1.0	6730422
Dissolved Iron (Fe)	ug/L	300	-	300	630	100	6730422	<100	100	6730422

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: Ontario Provincial Water Quality Objectives
Ref. to MOEE Water Management document dated Feb.1999
MAC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [MAC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively
(Made under the Ontario Safe Drinking Water Act, 2002)

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BV Labs Job #: C0C0144
Report Date: 2020/12/18

exp Services Inc
Client Project #: THB-00006196-PE
Site Location: LONGLAC LANDFILL - SPRING SAMPLING EVENT
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

BV Labs ID					MQN965			MQN966		
Sampling Date					2020/05/12 18:05			2020/05/12 19:50		
COC Number					770944-01-01			770944-01-01		
	UNITS	**Criteria**	**MAC**	**A/O**	**MW-4II**	**RDL**	**QC Batch**	**MW-5**	**RDL**	**QC Batch**
Dissolved Lead (Pb)	ug/L	5	10	-	1.2	0.50	6730422	<0.50	0.50	6730422
Dissolved Magnesium (Mg)	ug/L	-	-	-	78000	50	6730422	18000	50	6730422
Dissolved Manganese (Mn)	ug/L	-	-	50	98	2.0	6730422	<2.0	2.0	6730422
Dissolved Molybdenum (Mo)	ug/L	40	-	-	2.1	0.50	6730422	<0.50	0.50	6730422
Dissolved Nickel (Ni)	ug/L	25	-	-	1.7	1.0	6730422	<1.0	1.0	6730422
Dissolved Potassium (K)	ug/L	-	-	-	160000	200	6730422	860	200	6730422
Dissolved Selenium (Se)	ug/L	100	50	-	<2.0	2.0	6730422	<2.0	2.0	6730422
Dissolved Silicon (Si)	ug/L	-	-	-	3700	50	6730422	6500	50	6730422
Dissolved Sodium (Na)	ug/L	-	-	200000	11000	100	6730422	2600	100	6730422
Dissolved Strontium (Sr)	ug/L	-	-	-	120	1.0	6730422	69	1.0	6730422
Dissolved Thallium (Tl)	ug/L	0.3	-	-	<0.050	0.050	6730422	<0.050	0.050	6730422
Dissolved Tin (Sn)	ug/L	-	-	-	<1.0	1.0	6730422	<1.0	1.0	6730422
Dissolved Vanadium (V)	ug/L	6	-	-	1.5	0.50	6730422	0.74	0.50	6730422
Dissolved Zinc (Zn)	ug/L	30	-	5000	<5.0	5.0	6730422	<5.0	5.0	6730422

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: Ontario Provincial Water Quality Objectives
Ref. to MOEE Water Management document dated Feb.1999
MAC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [MAC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively
(Made under the Ontario Safe Drinking Water Act, 2002)

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

BV Labs ID					MQN967			MQN968		
Sampling Date					2020/05/12 17:30			2020/05/12 16:25		
COC Number					770944-01-01			770944-01-01		
	UNITS	**Criteria**	**MAC**	**A/O**	**MW-6**	**RDL**	**QC Batch**	**MW-7**	**RDL**	**QC Batch**
Inorganics										
Total Ammonia-N	mg/L	-	-	-	25	0.050	6746349	9.4	0.050	6746349
Total Chemical Oxygen Demand (COD)	mg/L	-	-	-	4.9	4.0	6738454	39	4.0	6738454
Conductivity	umho/cm	-	-	-	1100	1.0	6730817	1900	1.0	6730817
Total Dissolved Solids	mg/L	-	-	500	405	10	6731252	1180	10	6731252
Total Kjeldahl Nitrogen (TKN)	mg/L	-	-	-	27	2.0	6738351	11	5.0	6738351
Dissolved Organic Carbon	mg/L	-	-	5	3.4	0.40	6741237	13	0.40	6741237
pH	pH	6.5:8.5	-	6.5:8.5	7.90		6730819	7.72		6730819
Phenols-4AAP	mg/L	0.001	-	-	<0.0010	0.0010	6729834	<0.0010	0.0010	6729821
Total Phosphorus	mg/L	0.01	-	-	0.57	0.10	6745720	0.19	0.040	6745720
Dissolved Sulphate (SO4)	mg/L	-	-	500	26	1.0	6730634	78	1.0	6730634
Alkalinity (Total as CaCO3)	mg/L	-	-	30:500	520	1.0	6730814	570	1.0	6730814
Dissolved Chloride (Cl-)	mg/L	-	-	250	24	1.0	6730631	120	1.0	6730631
Nitrite (N)	mg/L	-	1	-	0.171	0.010	6733858	0.778	0.010	6730602
Nitrate (N)	mg/L	-	10	-	0.62	0.10	6733858	55.2	0.50	6730602
Metals										
Mercury (Hg)	mg/L	0.0002	0.001	-	<0.00010	0.00010	6734079	<0.00010	0.00010	6734079
Dissolved Aluminum (Al)	ug/L	-	-	100	48	5.0	6759829	23	5.0	6730422
Dissolved Antimony (Sb)	ug/L	20	6	-	1.5	0.50	6759829	<0.50	0.50	6730422
Dissolved Arsenic (As)	ug/L	100	10	-	<1.0	1.0	6759829	<1.0	1.0	6730422
Dissolved Barium (Ba)	ug/L	-	1000	-	43	2.0	6759829	180	2.0	6730422
Dissolved Beryllium (Be)	ug/L	11	-	-	<0.50	0.50	6759829	<0.50	0.50	6730422
Dissolved Bismuth (Bi)	ug/L	-	-	-	<1.0	1.0	6759829	<1.0	1.0	6730422
Dissolved Boron (B)	ug/L	200	5000	-	15	10	6759829	440	10	6730422
Dissolved Cadmium (Cd)	ug/L	0.2	5	-	<0.10	0.10	6759829	<0.10	0.10	6730422
Dissolved Calcium (Ca)	ug/L	-	-	-	78000	200	6759829	200000	200	6730422
Dissolved Chromium (Cr)	ug/L	-	50	-	<5.0	5.0	6759829	<5.0	5.0	6730422
Dissolved Cobalt (Co)	ug/L	0.9	-	-	<0.50	0.50	6759829	5.5	0.50	6730422
Dissolved Copper (Cu)	ug/L	5	-	1000	3.3	1.0	6759829	5.3	1.0	6730422
Dissolved Iron (Fe)	ug/L	300	-	300	<100	100	6759829	290	100	6730422

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

Criteria: Ontario Provincial Water Quality Objectives
Ref. to MOEE Water Management document dated Feb.1999

MAC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [MAC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively
(Made under the Ontario Safe Drinking Water Act, 2002)

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BV Labs Job #: C0C0144
Report Date: 2020/12/18

exp Services Inc
Client Project #: THB-00006196-PE
Site Location: LONGLAC LANDFILL - SPRING SAMPLING EVENT
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

BV Labs ID					MQN967			MQN968		
Sampling Date					2020/05/12 17:30			2020/05/12 16:25		
COC Number					770944-01-01			770944-01-01		
	UNITS	**Criteria**	**MAC**	**A/O**	**MW-6**	**RDL**	**QC Batch**	**MW-7**	**RDL**	**QC Batch**
Dissolved Lead (Pb)	ug/L	5	10	-	<0.50	0.50	6759829	<0.50	0.50	6730422
Dissolved Magnesium (Mg)	ug/L	-	-	-	11000	50	6759829	51000	50	6730422
Dissolved Manganese (Mn)	ug/L	-	-	50	99	2.0	6759829	520	2.0	6730422
Dissolved Molybdenum (Mo)	ug/L	40	-	-	1.5	0.50	6759829	<0.50	0.50	6730422
Dissolved Nickel (Ni)	ug/L	25	-	-	1.8	1.0	6759829	13	1.0	6730422
Dissolved Potassium (K)	ug/L	-	-	-	1300	200	6759829	39000	200	6730422
Dissolved Selenium (Se)	ug/L	100	50	-	<2.0	2.0	6759829	<2.0	2.0	6730422
Dissolved Silicon (Si)	ug/L	-	-	-	2500	50	6759829	7300	50	6730422
Dissolved Sodium (Na)	ug/L	-	-	200000	34000	100	6759829	83000	100	6730422
Dissolved Strontium (Sr)	ug/L	-	-	-	110	1.0	6759829	260	1.0	6730422
Dissolved Thallium (Tl)	ug/L	0.3	-	-	<0.050	0.050	6759829	0.15	0.050	6730422
Dissolved Tin (Sn)	ug/L	-	-	-	<1.0	1.0	6759829	<1.0	1.0	6730422
Dissolved Vanadium (V)	ug/L	6	-	-	<0.50	0.50	6759829	<0.50	0.50	6730422
Dissolved Zinc (Zn)	ug/L	30	-	5000	<5.0	5.0	6759829	<5.0	5.0	6730422

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: Ontario Provincial Water Quality Objectives
Ref. to MOEE Water Management document dated Feb.1999
MAC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [MAC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively
(Made under the Ontario Safe Drinking Water Act, 2002)

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LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

BV Labs ID					MQN968			MQN969		
Sampling Date					2020/05/12 16:25			2020/05/12 20:55		
COC Number					770944-01-01			770944-01-01		
	UNITS	**Criteria**	**MAC**	**A/O**	**MW-7 Lab-Dup**	**RDL**	**QC Batch**	**MW-8I**	**RDL**	**QC Batch**
Inorganics										
Total Ammonia-N	mg/L	-	-	-				37	0.25	6746349
Total Chemical Oxygen Demand (COD)	mg/L	-	-	-				100	4.0	6738454
Conductivity	umho/cm	-	-	-				3300	1.0	6730625
Total Dissolved Solids	mg/L	-	-	500				1920	10	6731252
Total Kjeldahl Nitrogen (TKN)	mg/L	-	-	-				39	2.0	6738351
Dissolved Organic Carbon	mg/L	-	-	5	13	0.40	6741237	38	0.40	6741202
pH	pH	6.5:8.5	-	6.5:8.5				7.78		6730626
Phenols-4AAP	mg/L	0.001	-	-				0.0015	0.0010	6729828
Total Phosphorus	mg/L	0.01	-	-				0.80	0.10	6745720
Dissolved Sulphate (SO4)	mg/L	-	-	500				340	2.0	6730634
Alkalinity (Total as CaCO3)	mg/L	-	-	30:500				1200	1.0	6730624
Dissolved Chloride (Cl-)	mg/L	-	-	250				230	3.0	6730631
Nitrite (N)	mg/L	-	1	-				0.022	0.010	6733858
Nitrate (N)	mg/L	-	10	-				<0.10	0.10	6733858
Metals										
Mercury (Hg)	mg/L	0.0002	0.001	-				<0.00010	0.00010	6734079
Dissolved Aluminum (Al)	ug/L	-	-	100				120	5.0	6730422
Dissolved Antimony (Sb)	ug/L	20	6	-				<0.50	0.50	6730422
Dissolved Arsenic (As)	ug/L	100	10	-				8.4	1.0	6730422
Dissolved Barium (Ba)	ug/L	-	1000	-				220	2.0	6730422
Dissolved Beryllium (Be)	ug/L	11	-	-				<0.50	0.50	6730422
Dissolved Bismuth (Bi)	ug/L	-	-	-				<1.0	1.0	6730422
Dissolved Boron (B)	ug/L	200	5000	-				2400	10	6730422
Dissolved Cadmium (Cd)	ug/L	0.2	5	-				<0.10	0.10	6730422
Dissolved Calcium (Ca)	ug/L	-	-	-				240000	200	6730422
Dissolved Chromium (Cr)	ug/L	-	50	-				<5.0	5.0	6730422
Dissolved Cobalt (Co)	ug/L	0.9	-	-				12	0.50	6730422
Dissolved Copper (Cu)	ug/L	5	-	1000				2.3	1.0	6730422

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
Criteria: Ontario Provincial Water Quality Objectives
Ref. to MOEE Water Management document dated Feb.1999
MAC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [MAC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively
(Made under the Ontario Safe Drinking Water Act, 2002)

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BV Labs Job #: C0C0144
Report Date: 2020/12/18

exp Services Inc
Client Project #: THB-00006196-PE
Site Location: LONGLAC LANDFILL - SPRING SAMPLING EVENT
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

BV Labs ID					MQN968			MQN969		
Sampling Date					2020/05/12 16:25			2020/05/12 20:55		
COC Number					770944-01-01			770944-01-01		
	UNITS	**Criteria**	**MAC**	**A/O**	**MW-7 Lab-Dup**	**RDL**	**QC Batch**	**MW-8I**	**RDL**	**QC Batch**
Dissolved Iron (Fe)	ug/L	300	-	300				8100	100	6730422
Dissolved Lead (Pb)	ug/L	5	10	-				<0.50	0.50	6730422
Dissolved Magnesium (Mg)	ug/L	-	-	-				120000	50	6730422
Dissolved Manganese (Mn)	ug/L	-	-	50				1100	2.0	6730422
Dissolved Molybdenum (Mo)	ug/L	40	-	-				1.6	0.50	6730422
Dissolved Nickel (Ni)	ug/L	25	-	-				23	1.0	6730422
Dissolved Potassium (K)	ug/L	-	-	-				180000	200	6730422
Dissolved Selenium (Se)	ug/L	100	50	-				<2.0	2.0	6730422
Dissolved Silicon (Si)	ug/L	-	-	-				9900	50	6730422
Dissolved Sodium (Na)	ug/L	-	-	200000				210000	100	6730422
Dissolved Strontium (Sr)	ug/L	-	-	-				760	1.0	6730422
Dissolved Thallium (Tl)	ug/L	0.3	-	-				0.16	0.050	6730422
Dissolved Tin (Sn)	ug/L	-	-	-				<1.0	1.0	6730422
Dissolved Vanadium (V)	ug/L	6	-	-				1.6	0.50	6730422
Dissolved Zinc (Zn)	ug/L	30	-	5000				7.8	5.0	6730422

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
Criteria: Ontario Provincial Water Quality Objectives
Ref. to MOEE Water Management document dated Feb.1999
MAC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [MAC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively
(Made under the Ontario Safe Drinking Water Act, 2002)

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BV Labs Job #: C0C0144
Report Date: 2020/12/18

exp Services Inc
Client Project #: THB-00006196-PE
Site Location: LONGLAC LANDFILL - SPRING SAMPLING EVENT
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

BV Labs ID					MQN970			MQN970		
Sampling Date					2020/05/12 20:35			2020/05/12 20:35		
COC Number					770944-01-01			770944-01-01		
	UNITS	**Criteria**	**MAC**	**A/O**	**MW-8II**	**RDL**	**QC Batch**	**MW-8II Lab-Dup**	**RDL**	**QC Batch**
Inorganics										
Total Ammonia-N	mg/L	-	-	-	1.7	0.050	6746349			
Total Chemical Oxygen Demand (COD)	mg/L	-	-	-	8.3	4.0	6745521			
Conductivity	umho/cm	-	-	-	880	1.0	6730817			
Total Dissolved Solids	mg/L	-	-	500	620	10	6731252			
Total Kjeldahl Nitrogen (TKN)	mg/L	-	-	-	2.1	0.10	6745524			
Dissolved Organic Carbon	mg/L	-	-	5	4.3	0.40	6741202			
pH	pH	6.5:8.5	-	6.5:8.5	7.97		6730819			
Phenols-4AAP	mg/L	0.001	-	-	<0.0010	0.0010	6729828			
Total Phosphorus	mg/L	0.01	-	-	1.2	0.10	6745720			
Dissolved Sulphate (SO4)	mg/L	-	-	500	60	1.0	6730634			
Alkalinity (Total as CaCO3)	mg/L	-	-	30:500	360	1.0	6730814			
Dissolved Chloride (Cl-)	mg/L	-	-	250	34	1.0	6730631			
Nitrite (N)	mg/L	-	1	-	0.068	0.010	6733858			
Nitrate (N)	mg/L	-	10	-	0.61	0.10	6733858			
Metals										
Mercury (Hg)	mg/L	0.0002	0.001	-	<0.00010	0.00010	6737691	<0.00010	0.00010	6737691
Dissolved Aluminum (Al)	ug/L	-	-	100	<5.0	5.0	6730422			
Dissolved Antimony (Sb)	ug/L	20	6	-	<0.50	0.50	6730422			
Dissolved Arsenic (As)	ug/L	100	10	-	<1.0	1.0	6730422			
Dissolved Barium (Ba)	ug/L	-	1000	-	35	2.0	6730422			
Dissolved Beryllium (Be)	ug/L	11	-	-	<0.50	0.50	6730422			
Dissolved Bismuth (Bi)	ug/L	-	-	-	<1.0	1.0	6730422			
Dissolved Boron (B)	ug/L	200	5000	-	190	10	6730422			
Dissolved Cadmium (Cd)	ug/L	0.2	5	-	<0.10	0.10	6730422			
Dissolved Calcium (Ca)	ug/L	-	-	-	100000	200	6730422			
Dissolved Chromium (Cr)	ug/L	-	50	-	<5.0	5.0	6730422			
Dissolved Cobalt (Co)	ug/L	0.9	-	-	0.75	0.50	6730422			
Dissolved Copper (Cu)	ug/L	5	-	1000	7.6	1.0	6730422			

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
Criteria: Ontario Provincial Water Quality Objectives
Ref. to MOEE Water Management document dated Feb.1999
MAC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [MAC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively
(Made under the Ontario Safe Drinking Water Act, 2002)

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LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

BV Labs ID					MQN970			MQN970		
Sampling Date					2020/05/12 20:35			2020/05/12 20:35		
COC Number					770944-01-01			770944-01-01		
	UNITS	**Criteria**	**MAC**	**A/O**	**MW-8II**	**RDL**	**QC Batch**	**MW-8II Lab-Dup**	**RDL**	**QC Batch**
Dissolved Iron (Fe)	ug/L	300	-	300	<100	100	6730422			
Dissolved Lead (Pb)	ug/L	5	10	-	<0.50	0.50	6730422			
Dissolved Magnesium (Mg)	ug/L	-	-	-	20000	50	6730422			
Dissolved Manganese (Mn)	ug/L	-	-	50	52	2.0	6730422			
Dissolved Molybdenum (Mo)	ug/L	40	-	-	0.51	0.50	6730422			
Dissolved Nickel (Ni)	ug/L	25	-	-	2.6	1.0	6730422			
Dissolved Potassium (K)	ug/L	-	-	-	9800	200	6730422			
Dissolved Selenium (Se)	ug/L	100	50	-	<2.0	2.0	6730422			
Dissolved Silicon (Si)	ug/L	-	-	-	4400	50	6730422			
Dissolved Sodium (Na)	ug/L	-	-	200000	21000	100	6730422			
Dissolved Strontium (Sr)	ug/L	-	-	-	140	1.0	6730422			
Dissolved Thallium (Tl)	ug/L	0.3	-	-	<0.050	0.050	6730422			
Dissolved Tin (Sn)	ug/L	-	-	-	<1.0	1.0	6730422			
Dissolved Vanadium (V)	ug/L	6	-	-	<0.50	0.50	6730422			
Dissolved Zinc (Zn)	ug/L	30	-	5000	5.8	5.0	6730422			

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
Criteria: Ontario Provincial Water Quality Objectives
Ref. to MOEE Water Management document dated Feb.1999
MAC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [MAC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively
(Made under the Ontario Safe Drinking Water Act, 2002)

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

BV Labs ID					MQN971			MQN971		
Sampling Date					2020/05/12 19:39			2020/05/12 19:39		
COC Number					770944-01-01			770944-01-01		
	UNITS	**Criteria**	**MAC**	**A/O**	**MW-9**	**RDL**	**QC Batch**	**MW-9 Lab-Dup**	**RDL**	**QC Batch**
Inorganics										
Total Ammonia-N	mg/L	-	-	-	0.058	0.050	6746349			
Total Chemical Oxygen Demand (COD)	mg/L	-	-	-	<4.0	4.0	6745521			
Conductivity	umho/cm	-	-	-	510	1.0	6730817			
Total Dissolved Solids	mg/L	-	-	500	370	10	6731252			
Total Kjeldahl Nitrogen (TKN)	mg/L	-	-	-	0.52	0.10	6745524			
Dissolved Organic Carbon	mg/L	-	-	5	1.0	0.40	6741202			
pH	pH	6.5:8.5	-	6.5:8.5	7.95		6730819			
Phenols-4AAP	mg/L	0.001	-	-	<0.0010	0.0010	6729828			
Total Phosphorus	mg/L	0.01	-	-	1.5	0.10	6745720			
Dissolved Sulphate (SO4)	mg/L	-	-	500	27	1.0	6730639			
Alkalinity (Total as CaCO3)	mg/L	-	-	30:500	240	1.0	6730814			
Dissolved Chloride (Cl-)	mg/L	-	-	250	3.1	1.0	6730636			
Nitrite (N)	mg/L	-	1	-	<0.010	0.010	6733858			
Nitrate (N)	mg/L	-	10	-	1.37	0.10	6733858			
Metals										
Mercury (Hg)	mg/L	0.0002	0.001	-	<0.00010	0.00010	6737389			
Dissolved Aluminum (Al)	ug/L	-	-	100	7.3	5.0	6730422	9.0	5.0	6730422
Dissolved Antimony (Sb)	ug/L	20	6	-	<0.50	0.50	6730422	<0.50	0.50	6730422
Dissolved Arsenic (As)	ug/L	100	10	-	<1.0	1.0	6730422	<1.0	1.0	6730422
Dissolved Barium (Ba)	ug/L	-	1000	-	13	2.0	6730422	12	2.0	6730422
Dissolved Beryllium (Be)	ug/L	11	-	-	<0.50	0.50	6730422	<0.50	0.50	6730422
Dissolved Bismuth (Bi)	ug/L	-	-	-	<1.0	1.0	6730422	<1.0	1.0	6730422
Dissolved Boron (B)	ug/L	200	5000	-	30	10	6730422	29	10	6730422
Dissolved Cadmium (Cd)	ug/L	0.2	5	-	<0.10	0.10	6730422	<0.10	0.10	6730422
Dissolved Calcium (Ca)	ug/L	-	-	-	94000	200	6730422	94000	200	6730422
Dissolved Chromium (Cr)	ug/L	-	50	-	<5.0	5.0	6730422	<5.0	5.0	6730422
Dissolved Cobalt (Co)	ug/L	0.9	-	-	<0.50	0.50	6730422	<0.50	0.50	6730422
Dissolved Copper (Cu)	ug/L	5	-	1000	1.7	1.0	6730422	1.7	1.0	6730422

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
Criteria: Ontario Provincial Water Quality Objectives
Ref. to MOEE Water Management document dated Feb.1999
MAC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [MAC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively
(Made under the Ontario Safe Drinking Water Act, 2002)

BV Labs Job #: C0C0144
Report Date: 2020/12/18

exp Services Inc
Client Project #: THB-00006196-PE
Site Location: LONGLAC LANDFILL - SPRING SAMPLING EVENT
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

BV Labs ID					MQN971			MQN971		
Sampling Date					2020/05/12 19:39			2020/05/12 19:39		
COC Number					770944-01-01			770944-01-01		
	UNITS	**Criteria**	**MAC**	**A/O**	**MW-9**	**RDL**	**QC Batch**	**MW-9 Lab-Dup**	**RDL**	**QC Batch**
Dissolved Iron (Fe)	ug/L	300	-	300	<100	100	6730422	<100	100	6730422
Dissolved Lead (Pb)	ug/L	5	10	-	<0.50	0.50	6730422	<0.50	0.50	6730422
Dissolved Magnesium (Mg)	ug/L	-	-	-	15000	50	6730422	15000	50	6730422
Dissolved Manganese (Mn)	ug/L	-	-	50	<2.0	2.0	6730422	<2.0	2.0	6730422
Dissolved Molybdenum (Mo)	ug/L	40	-	-	<0.50	0.50	6730422	<0.50	0.50	6730422
Dissolved Nickel (Ni)	ug/L	25	-	-	<1.0	1.0	6730422	<1.0	1.0	6730422
Dissolved Potassium (K)	ug/L	-	-	-	580	200	6730422	580	200	6730422
Dissolved Selenium (Se)	ug/L	100	50	-	<2.0	2.0	6730422	<2.0	2.0	6730422
Dissolved Silicon (Si)	ug/L	-	-	-	3800	50	6730422	3900	50	6730422
Dissolved Sodium (Na)	ug/L	-	-	200000	1700	100	6730422	1700	100	6730422
Dissolved Strontium (Sr)	ug/L	-	-	-	70	1.0	6730422	71	1.0	6730422
Dissolved Thallium (Tl)	ug/L	0.3	-	-	<0.050	0.050	6730422	<0.050	0.050	6730422
Dissolved Tin (Sn)	ug/L	-	-	-	<1.0	1.0	6730422	<1.0	1.0	6730422
Dissolved Vanadium (V)	ug/L	6	-	-	<0.50	0.50	6730422	<0.50	0.50	6730422
Dissolved Zinc (Zn)	ug/L	30	-	5000	<5.0	5.0	6730422	<5.0	5.0	6730422

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
Criteria: Ontario Provincial Water Quality Objectives
Ref. to MOEE Water Management document dated Feb.1999
MAC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [MAC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively
(Made under the Ontario Safe Drinking Water Act, 2002)

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LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

BV Labs ID					MQN972		MQN973		
Sampling Date					2020/05/12 19:05		2020/05/12 14:45		
COC Number					770944-02-01		770944-02-01		
	UNITS	**Criteria**	**MAC**	**A/O**	**MW-10**	**QC Batch**	**MW-11I**	**RDL**	**QC Batch**
Inorganics									
Total Ammonia-N	mg/L	-	-	-	0.068	6746349	0.071	0.050	6746349
Total Chemical Oxygen Demand (COD)	mg/L	-	-	-	8.7	6745521	21	4.0	6738454
Conductivity	umho/cm	-	-	-	430	6730845	1500	1.0	6733847
Total Dissolved Solids	mg/L	-	-	500	285	6731252	880	10	6731252
Total Kjeldahl Nitrogen (TKN)	mg/L	-	-	-	0.37	6745524	0.36	0.10	6738351
Dissolved Organic Carbon	mg/L	-	-	5	3.1	6734722	5.9	0.40	6741237
pH	pH	6.5:8.5	-	6.5:8.5	8.08	6730847	7.74		6733849
Phenols-4AAP	mg/L	0.001	-	-	<0.0010	6729828	<0.0010	0.0010	6729828
Total Phosphorus	mg/L	0.01	-	-	0.93	6745720	0.66	0.040	6745720
Dissolved Sulphate (SO4)	mg/L	-	-	500	1.0	6730639	93	1.0	6732587
Alkalinity (Total as CaCO3)	mg/L	-	-	30:500	230	6730827	590	1.0	6733845
Dissolved Chloride (Cl-)	mg/L	-	-	250	2.0	6730636	120	1.0	6732582
Nitrite (N)	mg/L	-	1	-	<0.010	6733858	<0.010	0.010	6733857
Nitrate (N)	mg/L	-	10	-	0.15	6733858	<0.10	0.10	6733857
Metals									
Mercury (Hg)	mg/L	0.0002	0.001	-	<0.00010	6734079	<0.00010	0.00010	6734079
Dissolved Aluminum (Al)	ug/L	-	-	100	67	6730422	540	5.0	6730422
Dissolved Antimony (Sb)	ug/L	20	6	-	<0.50	6730422	<0.50	0.50	6730422
Dissolved Arsenic (As)	ug/L	100	10	-	<1.0	6730422	<1.0	1.0	6730422
Dissolved Barium (Ba)	ug/L	-	1000	-	15	6730422	110	2.0	6730422
Dissolved Beryllium (Be)	ug/L	11	-	-	<0.50	6730422	<0.50	0.50	6730422
Dissolved Bismuth (Bi)	ug/L	-	-	-	<1.0	6730422	<1.0	1.0	6730422
Dissolved Boron (B)	ug/L	200	5000	-	<10	6730422	190	10	6730422
Dissolved Cadmium (Cd)	ug/L	0.2	5	-	<0.10	6730422	<0.10	0.10	6730422
Dissolved Calcium (Ca)	ug/L	-	-	-	70000	6730422	270000	200	6730422
Dissolved Chromium (Cr)	ug/L	-	50	-	<5.0	6730422	<5.0	5.0	6730422
Dissolved Cobalt (Co)	ug/L	0.9	-	-	<0.50	6730422	0.65	0.50	6730422
Dissolved Copper (Cu)	ug/L	5	-	1000	7.4	6730422	2.0	1.0	6730422
Dissolved Iron (Fe)	ug/L	300	-	300	120	6730422	4000	100	6730422

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: Ontario Provincial Water Quality Objectives
Ref. to MOEE Water Management document dated Feb.1999
MAC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [MAC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively
(Made under the Ontario Safe Drinking Water Act, 2002)

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

BV Labs ID					MQN972		MQN973		
Sampling Date					2020/05/12 19:05		2020/05/12 14:45		
COC Number					770944-02-01		770944-02-01		
	UNITS	**Criteria**	**MAC**	**A/O**	**MW-10**	**QC Batch**	**MW-11I**	**RDL**	**QC Batch**
Dissolved Lead (Pb)	ug/L	5	10	-	<0.50	6730422	1.0	0.50	6730422
Dissolved Magnesium (Mg)	ug/L	-	-	-	14000	6730422	64000	50	6730422
Dissolved Manganese (Mn)	ug/L	-	-	50	54	6730422	210	2.0	6730422
Dissolved Molybdenum (Mo)	ug/L	40	-	-	<0.50	6730422	<0.50	0.50	6730422
Dissolved Nickel (Ni)	ug/L	25	-	-	<1.0	6730422	3.6	1.0	6730422
Dissolved Potassium (K)	ug/L	-	-	-	540	6730422	4000	200	6730422
Dissolved Selenium (Se)	ug/L	100	50	-	<2.0	6730422	<2.0	2.0	6730422
Dissolved Silicon (Si)	ug/L	-	-	-	5000	6730422	6800	50	6730422
Dissolved Sodium (Na)	ug/L	-	-	200000	1600	6730422	78000	100	6730422
Dissolved Strontium (Sr)	ug/L	-	-	-	54	6730422	250	1.0	6730422
Dissolved Thallium (Tl)	ug/L	0.3	-	-	<0.050	6730422	<0.050	0.050	6730422
Dissolved Tin (Sn)	ug/L	-	-	-	<1.0	6730422	<1.0	1.0	6730422
Dissolved Vanadium (V)	ug/L	6	-	-	0.65	6730422	2.3	0.50	6730422
Dissolved Zinc (Zn)	ug/L	30	-	5000	5.4	6730422	<5.0	5.0	6730422

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: Ontario Provincial Water Quality Objectives
Ref. to MOEE Water Management document dated Feb.1999
MAC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [MAC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively
(Made under the Ontario Safe Drinking Water Act, 2002)

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LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

BV Labs ID					MQN974			MQN975		
Sampling Date					2020/05/12 15:15			2020/05/12 15:49		
COC Number					770944-02-01			770944-02-01		
	UNITS	**Criteria**	**MAC**	**A/O**	**MW-11II**	**RDL**	**QC Batch**	**MW-12I**	**RDL**	**QC Batch**
Inorganics										
Total Ammonia-N	mg/L	-	-	-	0.14	0.050	6746349	0.064	0.050	6746349
Total Chemical Oxygen Demand (COD)	mg/L	-	-	-	12	4.0	6745521	6.4	4.0	6745521
Conductivity	umho/cm	-	-	-	1300	1.0	6733847	990	1.0	6730845
Total Dissolved Solids	mg/L	-	-	500	785	10	6731252	590	10	6731252
Total Kjeldahl Nitrogen (TKN)	mg/L	-	-	-	0.40	0.10	6745524	0.11	0.10	6745524
Dissolved Organic Carbon	mg/L	-	-	5	4.5	0.40	6741237	1.7	0.40	6741237
pH	pH	6.5:8.5	-	6.5:8.5	7.84		6733849	7.92		6730847
Phenols-4AAP	mg/L	0.001	-	-	<0.0010	0.0010	6729834	<0.0010	0.0010	6729821
Total Phosphorus	mg/L	0.01	-	-	32	5.0	6745720	0.43	0.040	6745720
Dissolved Sulphate (SO4)	mg/L	-	-	500	110	1.0	6732587	100	1.0	6730639
Alkalinity (Total as CaCO3)	mg/L	-	-	30:500	430	1.0	6733845	430	1.0	6730827
Dissolved Chloride (Cl-)	mg/L	-	-	250	110	1.0	6732582	25	1.0	6730636
Nitrite (N)	mg/L	-	1	-	<0.010	0.010	6733857	<0.010	0.010	6730863
Nitrate (N)	mg/L	-	10	-	<0.10	0.10	6733857	<0.10	0.10	6730863
Metals										
Mercury (Hg)	mg/L	0.0002	0.001	-	<0.00010	0.00010	6734079	<0.00010	0.00010	6734079
Dissolved Aluminum (Al)	ug/L	-	-	100	8.5	5.0	6730422	220	5.0	6730422
Dissolved Antimony (Sb)	ug/L	20	6	-	<0.50	0.50	6730422	<0.50	0.50	6730422
Dissolved Arsenic (As)	ug/L	100	10	-	1.2	1.0	6730422	<1.0	1.0	6730422
Dissolved Barium (Ba)	ug/L	-	1000	-	160	2.0	6730422	58	2.0	6730422
Dissolved Beryllium (Be)	ug/L	11	-	-	<0.50	0.50	6730422	<0.50	0.50	6730422
Dissolved Bismuth (Bi)	ug/L	-	-	-	<1.0	1.0	6730422	<1.0	1.0	6730422
Dissolved Boron (B)	ug/L	200	5000	-	39	10	6730422	200	10	6730422
Dissolved Cadmium (Cd)	ug/L	0.2	5	-	<0.10	0.10	6730422	<0.10	0.10	6730422
Dissolved Calcium (Ca)	ug/L	-	-	-	180000	200	6730422	140000	200	6730422
Dissolved Chromium (Cr)	ug/L	-	50	-	<5.0	5.0	6730422	<5.0	5.0	6730422
Dissolved Cobalt (Co)	ug/L	0.9	-	-	<0.50	0.50	6730422	0.52	0.50	6730422
Dissolved Copper (Cu)	ug/L	5	-	1000	2.0	1.0	6730422	8.8	1.0	6730422
Dissolved Iron (Fe)	ug/L	300	-	300	1900	100	6730422	540	100	6730422

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

Criteria: Ontario Provincial Water Quality Objectives
Ref. to MOEE Water Management document dated Feb.1999

MAC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [MAC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively
(Made under the Ontario Safe Drinking Water Act, 2002)

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LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

BV Labs ID					MQN974			MQN975		
Sampling Date					2020/05/12 15:15			2020/05/12 15:49		
COC Number					770944-02-01			770944-02-01		
	UNITS	**Criteria**	**MAC**	**A/O**	**MW-11II**	**RDL**	**QC Batch**	**MW-12I**	**RDL**	**QC Batch**
Dissolved Lead (Pb)	ug/L	5	10	-	<0.50	0.50	6730422	0.84	0.50	6730422
Dissolved Magnesium (Mg)	ug/L	-	-	-	38000	50	6730422	34000	50	6730422
Dissolved Manganese (Mn)	ug/L	-	-	50	140	2.0	6730422	110	2.0	6730422
Dissolved Molybdenum (Mo)	ug/L	40	-	-	<0.50	0.50	6730422	0.70	0.50	6730422
Dissolved Nickel (Ni)	ug/L	25	-	-	1.3	1.0	6730422	2.2	1.0	6730422
Dissolved Potassium (K)	ug/L	-	-	-	3300	200	6730422	2500	200	6730422
Dissolved Selenium (Se)	ug/L	100	50	-	<2.0	2.0	6730422	<2.0	2.0	6730422
Dissolved Silicon (Si)	ug/L	-	-	-	8000	50	6730422	11000	50	6730422
Dissolved Sodium (Na)	ug/L	-	-	200000	36000	100	6730422	10000	100	6730422
Dissolved Strontium (Sr)	ug/L	-	-	-	210	1.0	6730422	340	1.0	6730422
Dissolved Thallium (Tl)	ug/L	0.3	-	-	<0.050	0.050	6730422	<0.050	0.050	6730422
Dissolved Tin (Sn)	ug/L	-	-	-	<1.0	1.0	6730422	<1.0	1.0	6730422
Dissolved Vanadium (V)	ug/L	6	-	-	<0.50	0.50	6730422	0.88	0.50	6730422
Dissolved Zinc (Zn)	ug/L	30	-	5000	<5.0	5.0	6730422	7.8	5.0	6730422

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: Ontario Provincial Water Quality Objectives
Ref. to MOEE Water Management document dated Feb.1999
MAC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [MAC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively
(Made under the Ontario Safe Drinking Water Act, 2002)

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

BV Labs ID					MQN975			MQN976		
Sampling Date					2020/05/12 15:49			2020/05/12 16:20		
COC Number					770944-02-01			770944-02-01		
	UNITS	**Criteria**	**MAC**	**A/O**	**MW-12I Lab-Dup**	**RDL**	**QC Batch**	**MW-12II**	**RDL**	**QC Batch**
Inorganics										
Total Ammonia-N	mg/L	-	-	-				<0.050	0.050	6746349
Total Chemical Oxygen Demand (COD)	mg/L	-	-	-				11	4.0	6745521
Conductivity	umho/cm	-	-	-				1100	1.0	6730845
Total Dissolved Solids	mg/L	-	-	500	620	10	6731252	690	10	6731252
Total Kjeldahl Nitrogen (TKN)	mg/L	-	-	-				0.32	0.10	6745524
Dissolved Organic Carbon	mg/L	-	-	5				2.3	0.40	6741202
pH	pH	6.5:8.5	-	6.5:8.5				7.85		6730847
Phenols-4AAP	mg/L	0.001	-	-				<0.0010	0.0010	6729828
Total Phosphorus	mg/L	0.01	-	-				0.30	0.040	6745720
Dissolved Sulphate (SO4)	mg/L	-	-	500				110	1.0	6730639
Alkalinity (Total as CaCO3)	mg/L	-	-	30:500				490	1.0	6730827
Dissolved Chloride (Cl-)	mg/L	-	-	250				24	1.0	6730636
Nitrite (N)	mg/L	-	1	-				<0.010	0.010	6730863
Nitrate (N)	mg/L	-	10	-				0.11	0.10	6730863
Metals										
Mercury (Hg)	mg/L	0.0002	0.001	-				<0.00010	0.00010	6737389
Dissolved Aluminum (Al)	ug/L	-	-	100				230	5.0	6730422
Dissolved Antimony (Sb)	ug/L	20	6	-				<0.50	0.50	6730422
Dissolved Arsenic (As)	ug/L	100	10	-				<1.0	1.0	6730422
Dissolved Barium (Ba)	ug/L	-	1000	-				38	2.0	6730422
Dissolved Beryllium (Be)	ug/L	11	-	-				<0.50	0.50	6730422
Dissolved Bismuth (Bi)	ug/L	-	-	-				<1.0	1.0	6730422
Dissolved Boron (B)	ug/L	200	5000	-				630	10	6730422
Dissolved Cadmium (Cd)	ug/L	0.2	5	-				<0.10	0.10	6730422
Dissolved Calcium (Ca)	ug/L	-	-	-				200000	200	6730422
Dissolved Chromium (Cr)	ug/L	-	50	-				<5.0	5.0	6730422
Dissolved Cobalt (Co)	ug/L	0.9	-	-				0.66	0.50	6730422
Dissolved Copper (Cu)	ug/L	5	-	1000				3.0	1.0	6730422

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
Criteria: Ontario Provincial Water Quality Objectives
Ref. to MOEE Water Management document dated Feb.1999
MAC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [MAC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively
(Made under the Ontario Safe Drinking Water Act, 2002)

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BV Labs Job #: C0C0144
Report Date: 2020/12/18

exp Services Inc
Client Project #: THB-00006196-PE
Site Location: LONGLAC LANDFILL - SPRING SAMPLING EVENT
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

BV Labs ID					MQN975			MQN976		
Sampling Date					2020/05/12 15:49			2020/05/12 16:20		
COC Number					770944-02-01			770944-02-01		
	UNITS	**Criteria**	**MAC**	**A/O**	**MW-12I Lab-Dup**	**RDL**	**QC Batch**	**MW-12II**	**RDL**	**QC Batch**
Dissolved Iron (Fe)	ug/L	300	-	300				380	100	6730422
Dissolved Lead (Pb)	ug/L	5	10	-				0.68	0.50	6730422
Dissolved Magnesium (Mg)	ug/L	-	-	-				38000	50	6730422
Dissolved Manganese (Mn)	ug/L	-	-	50				36	2.0	6730422
Dissolved Molybdenum (Mo)	ug/L	40	-	-				<0.50	0.50	6730422
Dissolved Nickel (Ni)	ug/L	25	-	-				1.6	1.0	6730422
Dissolved Potassium (K)	ug/L	-	-	-				1100	200	6730422
Dissolved Selenium (Se)	ug/L	100	50	-				<2.0	2.0	6730422
Dissolved Silicon (Si)	ug/L	-	-	-				6300	50	6730422
Dissolved Sodium (Na)	ug/L	-	-	200000				22000	100	6730422
Dissolved Strontium (Sr)	ug/L	-	-	-				180	1.0	6730422
Dissolved Thallium (Tl)	ug/L	0.3	-	-				<0.050	0.050	6730422
Dissolved Tin (Sn)	ug/L	-	-	-				<1.0	1.0	6730422
Dissolved Vanadium (V)	ug/L	6	-	-				0.90	0.50	6730422
Dissolved Zinc (Zn)	ug/L	30	-	5000				<5.0	5.0	6730422

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
Criteria: Ontario Provincial Water Quality Objectives
Ref. to MOEE Water Management document dated Feb.1999
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LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

BV Labs ID					MQN976			MQN977		
Sampling Date					2020/05/12 16:20			2020/05/12 16:50		
COC Number					770944-02-01			770944-02-01		
	UNITS	**Criteria**	**MAC**	**A/O**	**MW-12II Lab-Dup**	**RDL**	**QC Batch**	**MW-13**	**RDL**	**QC Batch**
Inorganics										
Total Ammonia-N	mg/L	-	-	-				36 (1)	0.25	6746349
Total Chemical Oxygen Demand (COD)	mg/L	-	-	-				11	4.0	6738454
Conductivity	umho/cm	-	-	-				1100	1.0	6730845
Total Dissolved Solids	mg/L	-	-	500				385	10	6731252
Total Kjeldahl Nitrogen (TKN)	mg/L	-	-	-				35 (1)	2.0	6738351
Dissolved Organic Carbon	mg/L	-	-	5				3.3	0.40	6741237
pH	pH	6.5:8.5	-	6.5:8.5				7.93		6730847
Phenols-4AAP	mg/L	0.001	-	-				<0.0010	0.0010	6729821
Total Phosphorus	mg/L	0.01	-	-				3.2	1.0	6745720
Dissolved Sulphate (SO4)	mg/L	-	-	500				25	1.0	6730639
Alkalinity (Total as CaCO3)	mg/L	-	-	30:500				530	1.0	6730827
Dissolved Chloride (Cl-)	mg/L	-	-	250				24	1.0	6730636
Nitrite (N)	mg/L	-	1	-				0.105	0.010	6730863
Nitrate (N)	mg/L	-	10	-				0.51	0.10	6730863
Metals										
Mercury (Hg)	mg/L	0.0002	0.001	-	<0.00010	0.00010	6737389	<0.00010	0.00010	6734079
Dissolved Aluminum (Al)	ug/L	-	-	100				15	5.0	6730422
Dissolved Antimony (Sb)	ug/L	20	6	-				1.3	0.50	6730422
Dissolved Arsenic (As)	ug/L	100	10	-				<1.0	1.0	6730422
Dissolved Barium (Ba)	ug/L	-	1000	-				41	2.0	6730422
Dissolved Beryllium (Be)	ug/L	11	-	-				<0.50	0.50	6730422
Dissolved Bismuth (Bi)	ug/L	-	-	-				<1.0	1.0	6730422
Dissolved Boron (B)	ug/L	200	5000	-				15	10	6730422
Dissolved Cadmium (Cd)	ug/L	0.2	5	-				<0.10	0.10	6730422
Dissolved Calcium (Ca)	ug/L	-	-	-				78000	200	6730422
Dissolved Chromium (Cr)	ug/L	-	50	-				<5.0	5.0	6730422
Dissolved Cobalt (Co)	ug/L	0.9	-	-				<0.50	0.50	6730422

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
Criteria: Ontario Provincial Water Quality Objectives
Ref. to MOEE Water Management document dated Feb.1999
MAC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [MAC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively
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(1) TKN < NH4: Both values fall within acceptable RPD limits for duplicates and are likely equivalent.

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LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

BV Labs ID					MQN976			MQN977		
Sampling Date					2020/05/12 16:20			2020/05/12 16:50		
COC Number					770944-02-01			770944-02-01		
	UNITS	**Criteria**	**MAC**	**A/O**	**MW-12II Lab-Dup**	**RDL**	**QC Batch**	**MW-13**	**RDL**	**QC Batch**
Dissolved Copper (Cu)	ug/L	5	-	1000				3.3	1.0	6730422
Dissolved Iron (Fe)	ug/L	300	-	300				<100	100	6730422
Dissolved Lead (Pb)	ug/L	5	10	-				<0.50	0.50	6730422
Dissolved Magnesium (Mg)	ug/L	-	-	-				11000	50	6730422
Dissolved Manganese (Mn)	ug/L	-	-	50				90	2.0	6730422
Dissolved Molybdenum (Mo)	ug/L	40	-	-				1.4	0.50	6730422
Dissolved Nickel (Ni)	ug/L	25	-	-				1.7	1.0	6730422
Dissolved Potassium (K)	ug/L	-	-	-				1300	200	6730422
Dissolved Selenium (Se)	ug/L	100	50	-				<2.0	2.0	6730422
Dissolved Silicon (Si)	ug/L	-	-	-				2500	50	6730422
Dissolved Sodium (Na)	ug/L	-	-	200000				33000	100	6730422
Dissolved Strontium (Sr)	ug/L	-	-	-				110	1.0	6730422
Dissolved Thallium (Tl)	ug/L	0.3	-	-				<0.050	0.050	6730422
Dissolved Tin (Sn)	ug/L	-	-	-				<1.0	1.0	6730422
Dissolved Vanadium (V)	ug/L	6	-	-				<0.50	0.50	6730422
Dissolved Zinc (Zn)	ug/L	30	-	5000				<5.0	5.0	6730422

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
Criteria: Ontario Provincial Water Quality Objectives
Ref. to MOEE Water Management document dated Feb.1999
MAC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [MAC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively
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LANDFILL STANDARDS SCH 5 - SW COMP. LIST (WATER)

BV Labs ID					MQN988			MQN988		
Sampling Date					2020/05/12 12:25			2020/05/12 12:25		
COC Number					C#770946-01-01			C#770946-01-01		
	UNITS	**Criteria**	**MAC**	**A/O**	**SW1**	**RDL**	**QC Batch**	**SW1 Lab-Dup**	**RDL**	**QC Batch**
Inorganics										
Total Ammonia-N	mg/L	-	-	-	<0.050	0.050	6746349	0.083	0.050	6746349
Total BOD	mg/L	-	-	-	<2	2	6728673			
Total Chemical Oxygen Demand (COD)	mg/L	-	-	-	30	4.0	6738454			
Conductivity	umho/cm	-	-	-	100	1.0	6730817			
Total Dissolved Solids	mg/L	-	-	500	130	10	6731252			
Total Kjeldahl Nitrogen (TKN)	mg/L	-	-	-	0.38	0.10	6738351			
pH	pH	6.5:8.5	-	6.5:8.5	7.61		6730819			
Phenols-4AAP	mg/L	0.001	-	-	<0.0010	0.0010	6729828			
Total Phosphorus	mg/L	0.01	-	-	0.009	0.004	6745697			
Total Suspended Solids	mg/L	-	-	-	4	1	6734353			
Dissolved Sulphate (SO4)	mg/L	-	-	500	<1.0	1.0	6730860			
Alkalinity (Total as CaCO3)	mg/L	-	-	30:500	49	1.0	6730814			
Dissolved Chloride (Cl-)	mg/L	-	-	250	2.0	1.0	6730855			
Nitrite (N)	mg/L	-	1	-	<0.010	0.010	6733858			
Nitrate (N)	mg/L	-	10	-	<0.10	0.10	6733858			
Metals										
Mercury (Hg)	mg/L	0.0002	0.001	-	<0.00010	0.00010	6734079			
Total Antimony (Sb)	ug/L	20	6	-	0.57	0.50	6737483			
Total Arsenic (As)	ug/L	100	10	-	<1.0	1.0	6737483			
Total Barium (Ba)	ug/L	-	1000	-	3.7	2.0	6737483			
Total Beryllium (Be)	ug/L	11	-	-	<0.50	0.50	6737483			
Total Bismuth (Bi)	ug/L	-	-	-	<1.0	1.0	6737483			
Total Boron (B)	ug/L	200	5000	-	<10	10	6737483			
Total Cadmium (Cd)	ug/L	0.2	5	-	<0.10	0.10	6737483			
Total Calcium (Ca)	ug/L	-	-	-	14000	200	6737483			
Total Chromium (Cr)	ug/L	-	50	-	<5.0	5.0	6737483			
Total Cobalt (Co)	ug/L	0.9	-	-	<0.50	0.50	6737483			
Total Copper (Cu)	ug/L	5	-	1000	<1.0	1.0	6737483			

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
Criteria: Ontario Provincial Water Quality Objectives
Ref. to MOEE Water Management document dated Feb.1999
MAC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [MAC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively
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BV Labs Job #: C0C0144
Report Date: 2020/12/18

exp Services Inc
Client Project #: THB-00006196-PE
Site Location: LONGLAC LANDFILL - SPRING SAMPLING EVENT
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - SW COMP. LIST (WATER)

BV Labs ID					MQN988			MQN988		
Sampling Date					2020/05/12 12:25			2020/05/12 12:25		
COC Number					C#770946-01-01			C#770946-01-01		
	UNITS	**Criteria**	**MAC**	**A/O**	**SW1**	**RDL**	**QC Batch**	**SW1 Lab-Dup**	**RDL**	**QC Batch**
Total Iron (Fe)	ug/L	300	-	300	<100	100	6737483			
Total Lead (Pb)	ug/L	5	10	-	<0.50	0.50	6737483			
Total Magnesium (Mg)	ug/L	-	-	-	3300	50	6737483			
Total Manganese (Mn)	ug/L	-	-	50	7.9	2.0	6737483			
Total Molybdenum (Mo)	ug/L	40	-	-	<0.50	0.50	6737483			
Total Nickel (Ni)	ug/L	25	-	-	<1.0	1.0	6737483			
Total Potassium (K)	ug/L	-	-	-	310	200	6737483			
Total Selenium (Se)	ug/L	100	50	-	<2.0	2.0	6737483			
Total Silicon (Si)	ug/L	-	-	-	1700	50	6737483			
Total Silver (Ag)	ug/L	0.1	-	-	<0.10	0.10	6737483			
Total Sodium (Na)	ug/L	-	-	200000	1300	100	6737483			
Total Strontium (Sr)	ug/L	-	-	-	12	1.0	6737483			
Total Thallium (Tl)	ug/L	0.3	-	-	<0.050	0.050	6737483			
Total Tin (Sn)	ug/L	-	-	-	<1.0	1.0	6737483			
Total Titanium (Ti)	ug/L	-	-	-	<5.0	5.0	6737483			
Total Vanadium (V)	ug/L	6	-	-	<0.50	0.50	6737483			
Total Zinc (Zn)	ug/L	30	-	5000	<5.0	5.0	6737483			

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
Criteria: Ontario Provincial Water Quality Objectives
Ref. to MOEE Water Management document dated Feb.1999
MAC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [MAC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively
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LANDFILL STANDARDS SCH 5 - SW COMP. LIST (WATER)

BV Labs ID					MQN989			MQN989		
Sampling Date					2020/05/12 16:55			2020/05/12 16:55		
COC Number					C#770946-01-01			C#770946-01-01		
	UNITS	**Criteria**	**MAC**	**A/O**	**SW2**	**RDL**	**QC Batch**	**SW2 Lab-Dup**	**RDL**	**QC Batch**
Inorganics										
Total Ammonia-N	mg/L	-	-	-	<0.050	0.050	6746349			
Total BOD	mg/L	-	-	-	<2	2	6728673			
Total Chemical Oxygen Demand (COD)	mg/L	-	-	-	30	4.0	6745521			
Conductivity	umho/cm	-	-	-	1600	1.0	6730625			
Total Dissolved Solids	mg/L	-	-	500	705	10	6731252			
Total Kjeldahl Nitrogen (TKN)	mg/L	-	-	-	0.58	0.10	6745524			
pH	pH	6.5:8.5	-	6.5:8.5	8.12		6730626			
Phenols-4AAP	mg/L	0.001	-	-	<0.0010	0.0010	6729834	<0.0010	0.0010	6729834
Total Phosphorus	mg/L	0.01	-	-	0.020	0.004	6745697			
Total Suspended Solids	mg/L	-	-	-	5	1	6734262			
Dissolved Sulphate (SO4)	mg/L	-	-	500	130	1.0	6730860			
Alkalinity (Total as CaCO3)	mg/L	-	-	30:500	550	1.0	6730624			
Dissolved Chloride (Cl-)	mg/L	-	-	250	140	1.0	6730855			
Nitrite (N)	mg/L	-	1	-	0.018	0.010	6733858			
Nitrate (N)	mg/L	-	10	-	0.25	0.10	6733858			
Metals										
Mercury (Hg)	mg/L	0.0002	0.001	-	<0.00010	0.00010	6734079			
Total Antimony (Sb)	ug/L	20	6	-	<0.50	0.50	6748634			
Total Arsenic (As)	ug/L	100	10	-	<1.0	1.0	6748634			
Total Barium (Ba)	ug/L	-	1000	-	53	2.0	6748634			
Total Beryllium (Be)	ug/L	11	-	-	<0.50	0.50	6748634			
Total Bismuth (Bi)	ug/L	-	-	-	<1.0	1.0	6748634			
Total Boron (B)	ug/L	200	5000	-	1100	10	6748634			
Total Cadmium (Cd)	ug/L	0.2	5	-	<0.10	0.10	6748634			
Total Calcium (Ca)	ug/L	-	-	-	72000	200	6748634			
Total Chromium (Cr)	ug/L	-	50	-	<5.0	5.0	6748634			
Total Cobalt (Co)	ug/L	0.9	-	-	1.0	0.50	6748634			
Total Copper (Cu)	ug/L	5	-	1000	1.7	1.0	6748634			

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
Criteria: Ontario Provincial Water Quality Objectives
Ref. to MOEE Water Management document dated Feb.1999
MAC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [MAC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively
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BV Labs Job #: C0C0144
Report Date: 2020/12/18

exp Services Inc
Client Project #: THB-00006196-PE
Site Location: LONGLAC LANDFILL - SPRING SAMPLING EVENT
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - SW COMP. LIST (WATER)

BV Labs ID					MQN989			MQN989		
Sampling Date					2020/05/12 16:55			2020/05/12 16:55		
COC Number					C#770946-01-01			C#770946-01-01		
	UNITS	**Criteria**	**MAC**	**A/O**	**SW2**	**RDL**	**QC Batch**	**SW2 Lab-Dup**	**RDL**	**QC Batch**
Total Iron (Fe)	ug/L	300	-	300	<100	100	6748634			
Total Lead (Pb)	ug/L	5	10	-	<0.50	0.50	6748634			
Total Magnesium (Mg)	ug/L	-	-	-	43000	50	6748634			
Total Manganese (Mn)	ug/L	-	-	50	73	2.0	6748634			
Total Molybdenum (Mo)	ug/L	40	-	-	1.8	0.50	6748634			
Total Nickel (Ni)	ug/L	25	-	-	4.7	1.0	6748634			
Total Potassium (K)	ug/L	-	-	-	72000	200	6748634			
Total Selenium (Se)	ug/L	100	50	-	<2.0	2.0	6748634			
Total Silicon (Si)	ug/L	-	-	-	2500	50	6748634			
Total Silver (Ag)	ug/L	0.1	-	-	<0.10	0.10	6748634			
Total Sodium (Na)	ug/L	-	-	200000	100000	100	6748634			
Total Strontium (Sr)	ug/L	-	-	-	220	1.0	6748634			
Total Thallium (Tl)	ug/L	0.3	-	-	<0.050	0.050	6748634			
Total Tin (Sn)	ug/L	-	-	-	<1.0	1.0	6748634			
Total Titanium (Ti)	ug/L	-	-	-	5.3	5.0	6748634			
Total Vanadium (V)	ug/L	6	-	-	0.67	0.50	6748634			
Total Zinc (Zn)	ug/L	30	-	5000	<5.0	5.0	6748634			

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
Criteria: Ontario Provincial Water Quality Objectives
Ref. to MOEE Water Management document dated Feb.1999
MAC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [MAC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively
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BV Labs Job #: C0C0144
Report Date: 2020/12/18

exp Services Inc
Client Project #: THB-00006196-PE
Site Location: LONGLAC LANDFILL - SPRING SAMPLING EVENT
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - SW COMP. LIST (WATER)

BV Labs ID					MQN990			MQN990		
Sampling Date					2020/05/12 17:30			2020/05/12 17:30		
COC Number					C#770946-01-01			C#770946-01-01		
	UNITS	**Criteria**	**MAC**	**A/O**	**SW3**	**RDL**	**QC Batch**	**SW3 Lab-Dup**	**RDL**	**QC Batch**
Inorganics										
Total Ammonia-N	mg/L	-	-	-	0.091	0.050	6746349			
Total BOD	mg/L	-	-	-	<2	2	6728673			
Total Chemical Oxygen Demand (COD)	mg/L	-	-	-	30	4.0	6745521	29	4.0	6745521
Conductivity	umho/cm	-	-	-	1100	1.0	6730817			
Total Dissolved Solids	mg/L	-	-	500	810	10	6731252			
Total Kjeldahl Nitrogen (TKN)	mg/L	-	-	-	1.1	0.10	6745524	1.1	0.10	6745524
pH	pH	6.5:8.5	-	6.5:8.5	8.07		6730819			
Phenols-4AAP	mg/L	0.001	-	-	0.0011	0.0010	6729821			
Total Phosphorus	mg/L	0.01	-	-	0.035	0.004	6745697			
Total Suspended Solids	mg/L	-	-	-	7	1	6734262			
Dissolved Sulphate (SO4)	mg/L	-	-	500	310	1.0	6730860			
Alkalinity (Total as CaCO3)	mg/L	-	-	30:500	240	1.0	6730814			
Dissolved Chloride (Cl-)	mg/L	-	-	250	19	1.0	6730855			
Nitrite (N)	mg/L	-	1	-	0.036	0.010	6733858			
Nitrate (N)	mg/L	-	10	-	0.29	0.10	6733858			
Metals										
Mercury (Hg)	mg/L	0.0002	0.001	-	<0.00010	0.00010	6737389			
Total Antimony (Sb)	ug/L	20	6	-	0.89	0.50	6748634			
Total Arsenic (As)	ug/L	100	10	-	2.1	1.0	6748634			
Total Barium (Ba)	ug/L	-	1000	-	60	2.0	6748634			
Total Beryllium (Be)	ug/L	11	-	-	<0.50	0.50	6748634			
Total Bismuth (Bi)	ug/L	-	-	-	<1.0	1.0	6748634			
Total Boron (B)	ug/L	200	5000	-	560	10	6748634			
Total Cadmium (Cd)	ug/L	0.2	5	-	<0.10	0.10	6748634			
Total Calcium (Ca)	ug/L	-	-	-	190000	200	6748634			
Total Chromium (Cr)	ug/L	-	50	-	<5.0	5.0	6748634			
Total Cobalt (Co)	ug/L	0.9	-	-	0.59	0.50	6748634			
Total Copper (Cu)	ug/L	5	-	1000	5.7	1.0	6748634			

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
Criteria: Ontario Provincial Water Quality Objectives
Ref. to MOEE Water Management document dated Feb.1999
MAC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [MAC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively
(Made under the Ontario Safe Drinking Water Act, 2002)

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BV Labs Job #: C0C0144
Report Date: 2020/12/18

exp Services Inc
Client Project #: THB-00006196-PE
Site Location: LONGLAC LANDFILL - SPRING SAMPLING EVENT
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - SW COMP. LIST (WATER)

BV Labs ID					MQN990			MQN990		
Sampling Date					2020/05/12 17:30			2020/05/12 17:30		
COC Number					C#770946-01-01			C#770946-01-01		
	UNITS	**Criteria**	**MAC**	**A/O**	**SW3**	**RDL**	**QC Batch**	**SW3 Lab-Dup**	**RDL**	**QC Batch**
Total Iron (Fe)	ug/L	300	-	300	530	100	6748634			
Total Lead (Pb)	ug/L	5	10	-	3.6	0.50	6748634			
Total Magnesium (Mg)	ug/L	-	-	-	18000	50	6748634			
Total Manganese (Mn)	ug/L	-	-	50	190	2.0	6748634			
Total Molybdenum (Mo)	ug/L	40	-	-	1.4	0.50	6748634			
Total Nickel (Ni)	ug/L	25	-	-	3.9	1.0	6748634			
Total Potassium (K)	ug/L	-	-	-	15000	200	6748634			
Total Selenium (Se)	ug/L	100	50	-	<2.0	2.0	6748634			
Total Silicon (Si)	ug/L	-	-	-	2300	50	6748634			
Total Silver (Ag)	ug/L	0.1	-	-	<0.10	0.10	6748634			
Total Sodium (Na)	ug/L	-	-	200000	25000	100	6748634			
Total Strontium (Sr)	ug/L	-	-	-	610	1.0	6748634			
Total Thallium (Tl)	ug/L	0.3	-	-	<0.050	0.050	6748634			
Total Tin (Sn)	ug/L	-	-	-	<1.0	1.0	6748634			
Total Titanium (Ti)	ug/L	-	-	-	<5.0	5.0	6748634			
Total Vanadium (V)	ug/L	6	-	-	0.50	0.50	6748634			
Total Zinc (Zn)	ug/L	30	-	5000	96	5.0	6748634			

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
Criteria: Ontario Provincial Water Quality Objectives
Ref. to MOEE Water Management document dated Feb.1999
MAC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [MAC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively
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BV Labs Job #: C0C0144
Report Date: 2020/12/18

exp Services Inc
Client Project #: THB-00006196-PE
Site Location: LONGLAC LANDFILL - SPRING SAMPLING EVENT
Sampler Initials: EF

RESULTS OF ANALYSES OF WATER

BV Labs ID			MQN962	MQN963	MQN964			MQN964		
Sampling Date			2020/05/12 13:10	2020/05/12 13:50	2020/05/12 18:30			2020/05/12 18:30		
COC Number			770944-01-01	770944-01-01	770944-01-01			770944-01-01		
	UNITS	**A/O**	**MW-2**	**MW-3**	**MW-4I**	**RDL**	**QC Batch**	**MW-4I Lab-Dup**	**RDL**	**QC Batch**
Calculated Parameters										
Hardness (CaCO3)	mg/L	80:100	200	230	320	1.0	6729230			
Ion Balance (% Difference)	%	-	1.75	0.440	0.980	N/A	6729235			
Total Organic Nitrogen	mg/L	0.15	<0.10	<0.10	0.15	0.10	6729243			
Inorganics										
Orthophosphate (P)	mg/L	-	<0.010	<0.010	0.013	0.010	6730641	0.013	0.010	6730641

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [MAC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively
(Made under the Ontario Safe Drinking Water Act, 2002)
N/A = Not Applicable

BV Labs ID			MQN965	MQN966		MQN967	MQN968	MQN969		
Sampling Date			2020/05/12 18:05	2020/05/12 19:50		2020/05/12 17:30	2020/05/12 16:25	2020/05/12 20:55		
COC Number			770944-01-01	770944-01-01		770944-01-01	770944-01-01	770944-01-01		
	UNITS	**A/O**	**MW-4II**	**MW-5**	**QC Batch**	**MW-6**	**MW-7**	**MW-8I**	**RDL**	**QC Batch**
Calculated Parameters										
Hardness (CaCO3)	mg/L	80:100	540	270	6729230	240	720	1100	1.0	6729230
Ion Balance (% Difference)	%	-	3.27	1.12	6729235	17.7	1.89	1.88	N/A	6729235
Total Organic Nitrogen	mg/L	0.15	0.78	0.11	6729243	2.4	1.9	2.4	0.10	6729243
Inorganics										
Orthophosphate (P)	mg/L	-	<0.010	<0.010	6730641	<0.010	<0.010	<0.010	0.010	6730635

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [MAC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively
(Made under the Ontario Safe Drinking Water Act, 2002)
N/A = Not Applicable

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BV Labs Job #: C0C0144
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Client Project #: THB-00006196-PE
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Sampler Initials: EF

RESULTS OF ANALYSES OF WATER

BV Labs ID			MQN970		MQN971	MQN972		MQN973		
Sampling Date			2020/05/12 20:35		2020/05/12 19:39	2020/05/12 19:05		2020/05/12 14:45		
COC Number			770944-01-01		770944-01-01	770944-02-01		770944-02-01		
	UNITS	**A/O**	**MW-8II**	**QC Batch**	**MW-9**	**MW-10**	**QC Batch**	**MW-11I**	**RDL**	**QC Batch**
Calculated Parameters										
Hardness (CaCO3)	mg/L	80:100	350	6729230	300	230	6729230	930	1.0	6729230
Ion Balance (% Difference)	%	-	7.56	6729235	4.94	0.850	6729235	13.6	N/A	6729235
Total Organic Nitrogen	mg/L	0.15	0.38	6729243	0.46	0.31	6729243	0.29	0.10	6729243
Inorganics										
Orthophosphate (P)	mg/L	-	<0.010	6730635	<0.010	<0.010	6730641	<0.010	0.010	6732590

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [MAC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively
(Made under the Ontario Safe Drinking Water Act, 2002)
N/A = Not Applicable

BV Labs ID			MQN974		MQN975	MQN976	MQN977		
Sampling Date			2020/05/12 15:15		2020/05/12 15:49	2020/05/12 16:20	2020/05/12 16:50		
COC Number			770944-02-01		770944-02-01	770944-02-01	770944-02-01		
	UNITS	**A/O**	**MW-11II**	**QC Batch**	**MW-12I**	**MW-12II**	**MW-13**	**RDL**	**QC Batch**
Calculated Parameters									
Hardness (CaCO3)	mg/L	80:100	610	6729230	500	650	240	1.0	6729230
Ion Balance (% Difference)	%	-	0.360	6729235	4.13	4.10	14.7	N/A	6729235
Total Organic Nitrogen	mg/L	0.15	0.26	6729243	<0.10	0.32	<0.10	0.10	6729243
Inorganics									
Orthophosphate (P)	mg/L	-	<0.010	6732590	<0.010	<0.010	<0.010	0.010	6730641

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [MAC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively
(Made under the Ontario Safe Drinking Water Act, 2002)
N/A = Not Applicable

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BV Labs Job #: C0C0144
Report Date: 2020/12/18

exp Services Inc
Client Project #: THB-00006196-PE
Site Location: LONGLAC LANDFILL - SPRING SAMPLING EVENT
Sampler Initials: EF

RESULTS OF ANALYSES OF WATER

BV Labs ID			MQN988		MQN989	MQN990		
Sampling Date			2020/05/12 12:25		2020/05/12 16:55	2020/05/12 17:30		
COC Number			C#770946-01-01		C#770946-01-01	C#770946-01-01		
	UNITS	**A/O**	**SW1**	**QC Batch**	**SW2**	**SW3**	**RDL**	**QC Batch**
Calculated Parameters								
Hardness (CaCO3)	mg/L	80:100	48	6729230	430	500	1.0	6729231
Total Organic Nitrogen	mg/L	0.15	0.38	6729243	0.58	1.0	0.10	6729243
Inorganics								
Dissolved Organic Carbon	mg/L	5	11	6741237	9.5	9.3	0.40	6741237

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [MAC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively
(Made under the Ontario Safe Drinking Water Act, 2002)

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BV Labs Job #: C0C0144
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Client Project #: THB-00006196-PE
Site Location: LONGLAC LANDFILL - SPRING SAMPLING EVENT
Sampler Initials: EF

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

BV Labs ID				MQN988	MQN989	MQN990		
Sampling Date				2020/05/12 12:25	2020/05/12 16:55	2020/05/12 17:30		
COC Number				C#770946-01-01	C#770946-01-01	C#770946-01-01		
	UNITS	**Criteria**	**A/O**	**SW1**	**SW2**	**SW3**	**RDL**	**QC Batch**
Metals								
Dissolved (0.2u) Aluminum (Al)	ug/L	15	100	8	8	<5	5	6732695
Dissolved Calcium (Ca)	mg/L	-	-	14	90	170	0.050	6732698
Dissolved Magnesium (Mg)	mg/L	-	-	3.3	50	16	0.050	6732698

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: Ontario Provincial Water Quality Objectives
Ref. to MOEE Water Management document dated Feb.1999
A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [MAC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively
(Made under the Ontario Safe Drinking Water Act, 2002)

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TEST SUMMARY

BV Labs ID: MQN962
Sample ID: MW-2
Matrix: Water

Collected: 2020/05/12
Shipped:
Received: 2020/05/14

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	6730814	N/A	2020/05/20	Surinder Rai
Chloride by Automated Colourimetry	KONE	6730636	N/A	2020/05/20	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	6745521	N/A	2020/05/25	Viorica Rotaru
Conductivity	AT	6730817	N/A	2020/05/20	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6741202	N/A	2020/05/24	Nimarta Singh
Hardness (calculated as CaCO3)		6729230	N/A	2020/05/25	Automated Statchk
Mercury in Water by CVAA	CV/AA	6734079	2020/05/21	2020/05/21	Meghaben Patel
Dissolved Metals by ICPMS	ICP/MS	6730422	N/A	2020/05/22	Nan Raykha
Ion Balance (% Difference)	CALC	6729235	N/A	2020/05/25	Automated Statchk
Total Ammonia-N	LACH/NH4	6746349	N/A	2020/05/25	Amanpreet Sappal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6733858	N/A	2020/05/21	Chandra Nandlal
Organic Nitrogen	CALC	6729243	N/A	2020/05/25	Automated Statchk
pH	AT	6730819	2020/05/19	2020/05/20	Surinder Rai
Phenols (4AAP)	TECH/PHEN	6729828	N/A	2020/05/20	Bramdeo Motiram
Orthophosphate	KONE	6730641	N/A	2020/05/22	Deonarine Ramnarine
Sulphate by Automated Colourimetry	KONE	6730639	N/A	2020/05/20	Deonarine Ramnarine
Total Dissolved Solids	BAL	6731252	2020/05/21	2020/05/22	Shivani Desai
Total Kjeldahl Nitrogen in Water	SKAL	6745524	2020/05/25	2020/05/25	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	6745720	2020/05/25	2020/05/25	Shivani Shivani

BV Labs ID: MQN963
Sample ID: MW-3
Matrix: Water

Collected: 2020/05/12
Shipped:
Received: 2020/05/14

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	6730814	N/A	2020/05/20	Surinder Rai
Chloride by Automated Colourimetry	KONE	6730636	N/A	2020/05/20	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	6738454	N/A	2020/05/25	Viorica Rotaru
Conductivity	AT	6730817	N/A	2020/05/20	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6741237	N/A	2020/05/23	Nimarta Singh
Hardness (calculated as CaCO3)		6729230	N/A	2020/05/25	Automated Statchk
Mercury in Water by CVAA	CV/AA	6737691	2020/05/22	2020/05/22	Meghaben Patel
Dissolved Metals by ICPMS	ICP/MS	6730422	N/A	2020/05/22	Nan Raykha
Ion Balance (% Difference)	CALC	6729235	N/A	2020/05/25	Automated Statchk
Total Ammonia-N	LACH/NH4	6746349	N/A	2020/05/25	Amanpreet Sappal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6733858	N/A	2020/05/21	Chandra Nandlal
Organic Nitrogen	CALC	6729243	N/A	2020/05/25	Automated Statchk
pH	AT	6730819	2020/05/19	2020/05/20	Surinder Rai
Phenols (4AAP)	TECH/PHEN	6729834	N/A	2020/05/20	Bramdeo Motiram
Orthophosphate	KONE	6730641	N/A	2020/05/22	Deonarine Ramnarine
Sulphate by Automated Colourimetry	KONE	6730639	N/A	2020/05/20	Deonarine Ramnarine
Total Dissolved Solids	BAL	6731252	2020/05/21	2020/05/22	Shivani Desai
Total Kjeldahl Nitrogen in Water	SKAL	6745524	2020/05/25	2020/05/25	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	6745720	2020/05/25	2020/05/25	Shivani Shivani

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TEST SUMMARY

BV Labs ID: MQN964
Sample ID: MW-4I
Matrix: Water

Collected: 2020/05/12
Shipped:
Received: 2020/05/14

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	6730814	N/A	2020/05/20	Surinder Rai
Chloride by Automated Colourimetry	KONE	6730636	N/A	2020/05/20	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	6745521	N/A	2020/05/25	Viorica Rotaru
Conductivity	AT	6730817	N/A	2020/05/20	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6741237	N/A	2020/05/24	Nimarta Singh
Hardness (calculated as CaCO3)		6729230	N/A	2020/05/25	Automated Statchk
Mercury in Water by CVAA	CV/AA	6734079	2020/05/21	2020/05/21	Meghaben Patel
Dissolved Metals by ICPMS	ICP/MS	6730422	N/A	2020/05/22	Nan Raykha
Ion Balance (% Difference)	CALC	6729235	N/A	2020/05/25	Automated Statchk
Total Ammonia-N	LACH/NH4	6746349	N/A	2020/05/25	Amanpreet Sappal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6733858	N/A	2020/05/21	Chandra Nandlal
Organic Nitrogen	CALC	6729243	N/A	2020/05/25	Automated Statchk
pH	AT	6730819	2020/05/19	2020/05/20	Surinder Rai
Phenols (4AAP)	TECH/PHEN	6729821	N/A	2020/05/19	Bramdeo Motiram
Orthophosphate	KONE	6730641	N/A	2020/05/22	Deonarine Ramnarine
Sulphate by Automated Colourimetry	KONE	6730639	N/A	2020/05/20	Deonarine Ramnarine
Total Dissolved Solids	BAL	6731252	2020/05/21	2020/05/22	Shivani Desai
Total Kjeldahl Nitrogen in Water	SKAL	6745524	2020/05/25	2020/05/25	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	6745720	2020/05/25	2020/05/25	Shivani Shivani

BV Labs ID: MQN964 Dup
Sample ID: MW-4I
Matrix: Water

Collected: 2020/05/12
Shipped:
Received: 2020/05/14

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chloride by Automated Colourimetry	KONE	6730636	N/A	2020/05/20	Deonarine Ramnarine
Mercury in Water by CVAA	CV/AA	6734079	2020/05/21	2020/05/21	Meghaben Patel
Orthophosphate	KONE	6730641	N/A	2020/05/22	Deonarine Ramnarine
Sulphate by Automated Colourimetry	KONE	6730639	N/A	2020/05/20	Deonarine Ramnarine

BV Labs ID: MQN965
Sample ID: MW-4II
Matrix: Water

Collected: 2020/05/12
Shipped:
Received: 2020/05/14

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	6730814	N/A	2020/05/20	Surinder Rai
Chloride by Automated Colourimetry	KONE	6730636	N/A	2020/05/20	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	6738454	N/A	2020/05/25	Viorica Rotaru
Conductivity	AT	6730817	N/A	2020/05/20	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6741237	N/A	2020/05/24	Nimarta Singh
Hardness (calculated as CaCO3)		6729230	N/A	2020/05/25	Automated Statchk
Mercury in Water by CVAA	CV/AA	6737389	2020/05/22	2020/05/22	Meghaben Patel
Dissolved Metals by ICPMS	ICP/MS	6730422	N/A	2020/05/22	Nan Raykha
Ion Balance (% Difference)	CALC	6729235	N/A	2020/05/25	Automated Statchk

TEST SUMMARY

BV Labs ID: MQN965
Sample ID: MW-4II
Matrix: Water

Collected: 2020/05/12
Shipped:
Received: 2020/05/14

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Ammonia-N	LACH/NH4	6746349	N/A	2020/05/25	Amanpreet Sappal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6733858	N/A	2020/05/21	Chandra Nandlal
Organic Nitrogen	CALC	6729243	N/A	2020/05/25	Automated Statchk
pH	AT	6730819	2020/05/19	2020/05/20	Surinder Rai
Phenols (4AAP)	TECH/PHEN	6729834	N/A	2020/05/20	Bramdeo Motiram
Orthophosphate	KONE	6730641	N/A	2020/05/22	Deonarine Ramnarine
Sulphate by Automated Colourimetry	KONE	6730639	N/A	2020/05/20	Deonarine Ramnarine
Total Dissolved Solids	BAL	6731252	2020/05/21	2020/05/22	Shivani Desai
Total Kjeldahl Nitrogen in Water	SKAL	6745524	2020/05/25	2020/05/25	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	6745720	2020/05/25	2020/05/25	Shivani Shivani

BV Labs ID: MQN966
Sample ID: MW-5
Matrix: Water

Collected: 2020/05/12
Shipped:
Received: 2020/05/14

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	6730814	N/A	2020/05/20	Surinder Rai
Chloride by Automated Colourimetry	KONE	6730636	N/A	2020/05/20	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	6745521	N/A	2020/05/25	Viorica Rotaru
Conductivity	AT	6730817	N/A	2020/05/20	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6741202	N/A	2020/05/24	Nimarta Singh
Hardness (calculated as CaCO3)		6729230	N/A	2020/05/25	Automated Statchk
Mercury in Water by CVAA	CV/AA	6734079	2020/05/21	2020/05/21	Meghaben Patel
Dissolved Metals by ICPMS	ICP/MS	6730422	N/A	2020/05/22	Nan Raykha
Ion Balance (% Difference)	CALC	6729235	N/A	2020/05/25	Automated Statchk
Total Ammonia-N	LACH/NH4	6746349	N/A	2020/05/25	Amanpreet Sappal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6733858	N/A	2020/05/21	Chandra Nandlal
Organic Nitrogen	CALC	6729243	N/A	2020/05/25	Automated Statchk
pH	AT	6730819	2020/05/19	2020/05/20	Surinder Rai
Phenols (4AAP)	TECH/PHEN	6729821	N/A	2020/05/19	Bramdeo Motiram
Orthophosphate	KONE	6730641	N/A	2020/05/22	Deonarine Ramnarine
Sulphate by Automated Colourimetry	KONE	6730639	N/A	2020/05/20	Deonarine Ramnarine
Total Dissolved Solids	BAL	6731252	2020/05/21	2020/05/22	Shivani Desai
Total Kjeldahl Nitrogen in Water	SKAL	6745524	2020/05/25	2020/05/25	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	6745720	2020/05/25	2020/05/25	Shivani Shivani

BV Labs ID: MQN967
Sample ID: MW-6
Matrix: Water

Collected: 2020/05/12
Shipped:
Received: 2020/05/14

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	6730814	N/A	2020/05/20	Surinder Rai
Chloride by Automated Colourimetry	KONE	6730631	N/A	2020/05/20	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	6738454	N/A	2020/05/25	Viorica Rotaru

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TEST SUMMARY

BV Labs ID: MQN967
Sample ID: MW-6
Matrix: Water

Collected: 2020/05/12
Shipped:
Received: 2020/05/14

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Conductivity	AT	6730817	N/A	2020/05/20	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6741237	N/A	2020/05/24	Nimarta Singh
Hardness (calculated as CaCO3)		6729230	N/A	2020/05/25	Automated Statchk
Mercury in Water by CVAA	CV/AA	6734079	2020/05/21	2020/05/21	Meghaben Patel
Dissolved Metals by ICPMS	ICP/MS	6759829	N/A	2020/05/29	John Bowman
Ion Balance (% Difference)	CALC	6729235	N/A	2020/05/25	Automated Statchk
Total Ammonia-N	LACH/NH4	6746349	N/A	2020/05/25	Amanpreet Sappal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6733858	N/A	2020/05/21	Chandra Nandlal
Organic Nitrogen	CALC	6729243	N/A	2020/05/25	Automated Statchk
pH	AT	6730819	2020/05/19	2020/05/20	Surinder Rai
Phenols (4AAP)	TECH/PHEN	6729834	N/A	2020/05/20	Bramdeo Motiram
Orthophosphate	KONE	6730635	N/A	2020/05/22	Deonarine Ramnarine
Sulphate by Automated Colourimetry	KONE	6730634	N/A	2020/05/20	Deonarine Ramnarine
Total Dissolved Solids	BAL	6731252	2020/05/21	2020/05/22	Shivani Desai
Total Kjeldahl Nitrogen in Water	SKAL	6738351	2020/05/22	2020/05/25	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	6745720	2020/05/25	2020/05/25	Shivani Shivani

BV Labs ID: MQN968
Sample ID: MW-7
Matrix: Water

Collected: 2020/05/12
Shipped:
Received: 2020/05/14

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	6730814	N/A	2020/05/20	Surinder Rai
Chloride by Automated Colourimetry	KONE	6730631	N/A	2020/05/20	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	6738454	N/A	2020/05/25	Viorica Rotaru
Conductivity	AT	6730817	N/A	2020/05/20	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6741237	N/A	2020/05/23	Nimarta Singh
Hardness (calculated as CaCO3)		6729230	N/A	2020/05/25	Automated Statchk
Mercury in Water by CVAA	CV/AA	6734079	2020/05/21	2020/05/21	Meghaben Patel
Dissolved Metals by ICPMS	ICP/MS	6730422	N/A	2020/05/22	Nan Raykha
Ion Balance (% Difference)	CALC	6729235	N/A	2020/05/25	Automated Statchk
Total Ammonia-N	LACH/NH4	6746349	N/A	2020/05/25	Amanpreet Sappal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6730602	N/A	2020/05/21	Chandra Nandlal
Organic Nitrogen	CALC	6729243	N/A	2020/05/25	Automated Statchk
pH	AT	6730819	2020/05/19	2020/05/20	Surinder Rai
Phenols (4AAP)	TECH/PHEN	6729821	N/A	2020/05/19	Bramdeo Motiram
Orthophosphate	KONE	6730635	N/A	2020/05/22	Deonarine Ramnarine
Sulphate by Automated Colourimetry	KONE	6730634	N/A	2020/05/20	Deonarine Ramnarine
Total Dissolved Solids	BAL	6731252	2020/05/21	2020/05/22	Shivani Desai
Total Kjeldahl Nitrogen in Water	SKAL	6738351	2020/05/22	2020/05/25	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	6745720	2020/05/25	2020/05/25	Shivani Shivani

TEST SUMMARY

BV Labs ID: MQN968 Dup
Sample ID: MW-7
Matrix: Water

Collected: 2020/05/12
Shipped:
Received: 2020/05/14

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6741237	N/A	2020/05/23	Nimarta Singh

BV Labs ID: MQN969
Sample ID: MW-8I
Matrix: Water

Collected: 2020/05/12
Shipped:
Received: 2020/05/14

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	6730624	N/A	2020/05/21	Surinder Rai
Chloride by Automated Colourimetry	KONE	6730631	N/A	2020/05/20	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	6738454	N/A	2020/05/25	Viorica Rotaru
Conductivity	AT	6730625	N/A	2020/05/21	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6741202	N/A	2020/05/24	Nimarta Singh
Hardness (calculated as CaCO3)		6729230	N/A	2020/05/25	Automated Statchk
Mercury in Water by CVAA	CV/AA	6734079	2020/05/21	2020/05/21	Meghaben Patel
Dissolved Metals by ICPMS	ICP/MS	6730422	N/A	2020/05/22	Nan Raykha
Ion Balance (% Difference)	CALC	6729235	N/A	2020/05/25	Automated Statchk
Total Ammonia-N	LACH/NH4	6746349	N/A	2020/05/25	Amanpreet Sappal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6733858	N/A	2020/05/21	Chandra Nandlal
Organic Nitrogen	CALC	6729243	N/A	2020/05/25	Automated Statchk
pH	AT	6730626	2020/05/19	2020/05/21	Surinder Rai
Phenols (4AAP)	TECH/PHEN	6729828	N/A	2020/05/20	Bramdeo Motiram
Orthophosphate	KONE	6730635	N/A	2020/05/22	Deonarine Ramnarine
Sulphate by Automated Colourimetry	KONE	6730634	N/A	2020/05/20	Deonarine Ramnarine
Total Dissolved Solids	BAL	6731252	2020/05/21	2020/05/22	Shivani Desai
Total Kjeldahl Nitrogen in Water	SKAL	6738351	2020/05/22	2020/05/25	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	6745720	2020/05/25	2020/05/25	Shivani Shivani

BV Labs ID: MQN970
Sample ID: MW-8II
Matrix: Water

Collected: 2020/05/12
Shipped:
Received: 2020/05/14

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	6730814	N/A	2020/05/20	Surinder Rai
Chloride by Automated Colourimetry	KONE	6730631	N/A	2020/05/20	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	6745521	N/A	2020/05/25	Viorica Rotaru
Conductivity	AT	6730817	N/A	2020/05/20	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6741202	N/A	2020/05/24	Nimarta Singh
Hardness (calculated as CaCO3)		6729230	N/A	2020/05/25	Automated Statchk
Mercury in Water by CVAA	CV/AA	6737691	2020/05/22	2020/05/22	Meghaben Patel
Dissolved Metals by ICPMS	ICP/MS	6730422	N/A	2020/05/22	Nan Raykha
Ion Balance (% Difference)	CALC	6729235	N/A	2020/05/25	Automated Statchk
Total Ammonia-N	LACH/NH4	6746349	N/A	2020/05/25	Amanpreet Sappal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6733858	N/A	2020/05/21	Chandra Nandlal
Organic Nitrogen	CALC	6729243	N/A	2020/05/25	Automated Statchk

BV Labs Job #: C0C0144
Report Date: 2020/12/18

exp Services Inc
Client Project #: THB-00006196-PE
Site Location: LONGLAC LANDFILL - SPRING SAMPLING EVENT
Sampler Initials: EF

TEST SUMMARY

BV Labs ID: MQN970
Sample ID: MW-8II
Matrix: Water

Collected: 2020/05/12
Shipped:
Received: 2020/05/14

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
pH	AT	6730819	2020/05/19	2020/05/20	Surinder Rai
Phenols (4AAP)	TECH/PHEN	6729828	N/A	2020/05/20	Bramdeo Motiram
Orthophosphate	KONE	6730635	N/A	2020/05/22	Deonarine Ramnarine
Sulphate by Automated Colourimetry	KONE	6730634	N/A	2020/05/20	Deonarine Ramnarine
Total Dissolved Solids	BAL	6731252	2020/05/21	2020/05/22	Shivani Desai
Total Kjeldahl Nitrogen in Water	SKAL	6745524	2020/05/25	2020/05/25	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	6745720	2020/05/25	2020/05/25	Shivani Shivani

BV Labs ID: MQN970 Dup
Sample ID: MW-8II
Matrix: Water

Collected: 2020/05/12
Shipped:
Received: 2020/05/14

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Mercury in Water by CVAA	CV/AA	6737691	2020/05/22	2020/05/22	Meghaben Patel

BV Labs ID: MQN971
Sample ID: MW-9
Matrix: Water

Collected: 2020/05/12
Shipped:
Received: 2020/05/14

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	6730814	N/A	2020/05/20	Surinder Rai
Chloride by Automated Colourimetry	KONE	6730636	N/A	2020/05/20	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	6745521	N/A	2020/05/25	Viorica Rotaru
Conductivity	AT	6730817	N/A	2020/05/20	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6741202	N/A	2020/05/24	Nimarta Singh
Hardness (calculated as CaCO3)		6729230	N/A	2020/05/25	Automated Statchk
Mercury in Water by CVAA	CV/AA	6737389	2020/05/22	2020/05/22	Meghaben Patel
Dissolved Metals by ICPMS	ICP/MS	6730422	N/A	2020/05/22	Nan Raykha
Ion Balance (% Difference)	CALC	6729235	N/A	2020/05/25	Automated Statchk
Total Ammonia-N	LACH/NH4	6746349	N/A	2020/05/25	Amanpreet Sappal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6733858	N/A	2020/05/21	Chandra Nandlal
Organic Nitrogen	CALC	6729243	N/A	2020/05/25	Automated Statchk
pH	AT	6730819	2020/05/19	2020/05/20	Surinder Rai
Phenols (4AAP)	TECH/PHEN	6729828	N/A	2020/05/20	Bramdeo Motiram
Orthophosphate	KONE	6730641	N/A	2020/05/22	Deonarine Ramnarine
Sulphate by Automated Colourimetry	KONE	6730639	N/A	2020/05/20	Deonarine Ramnarine
Total Dissolved Solids	BAL	6731252	2020/05/21	2020/05/22	Shivani Desai
Total Kjeldahl Nitrogen in Water	SKAL	6745524	2020/05/25	2020/05/25	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	6745720	2020/05/25	2020/05/25	Shivani Shivani

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TEST SUMMARY

BV Labs ID: MQN971 Dup
Sample ID: MW-9
Matrix: Water

Collected: 2020/05/12
Shipped:
Received: 2020/05/14

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Metals by ICPMS	ICP/MS	6730422	N/A	2020/05/22	Nan Raykha

BV Labs ID: MQN972
Sample ID: MW-10
Matrix: Water

Collected: 2020/05/12
Shipped:
Received: 2020/05/14

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	6730827	N/A	2020/05/22	Surinder Rai
Chloride by Automated Colourimetry	KONE	6730636	N/A	2020/05/20	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	6745521	N/A	2020/05/25	Viorica Rotaru
Conductivity	AT	6730845	N/A	2020/05/22	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6734722	N/A	2020/05/23	Nimarta Singh
Hardness (calculated as CaCO3)		6729230	N/A	2020/05/25	Automated Statchk
Mercury in Water by CVAA	CV/AA	6734079	2020/05/21	2020/05/21	Meghaben Patel
Dissolved Metals by ICPMS	ICP/MS	6730422	N/A	2020/05/22	Nan Raykha
Ion Balance (% Difference)	CALC	6729235	N/A	2020/05/25	Automated Statchk
Total Ammonia-N	LACH/NH4	6746349	N/A	2020/05/25	Amanpreet Sappal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6733858	N/A	2020/05/21	Chandra Nandlal
Organic Nitrogen	CALC	6729243	N/A	2020/05/25	Automated Statchk
pH	AT	6730847	2020/05/19	2020/05/22	Surinder Rai
Phenols (4AAP)	TECH/PHEN	6729828	N/A	2020/05/20	Bramdeo Motiram
Orthophosphate	KONE	6730641	N/A	2020/05/22	Deonarine Ramnarine
Sulphate by Automated Colourimetry	KONE	6730639	N/A	2020/05/20	Deonarine Ramnarine
Total Dissolved Solids	BAL	6731252	2020/05/21	2020/05/22	Shivani Desai
Total Kjeldahl Nitrogen in Water	SKAL	6745524	2020/05/25	2020/05/25	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	6745720	2020/05/25	2020/05/25	Shivani Shivani

BV Labs ID: MQN973
Sample ID: MW-11I
Matrix: Water

Collected: 2020/05/12
Shipped:
Received: 2020/05/14

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	6733845	N/A	2020/05/21	Surinder Rai
Chloride by Automated Colourimetry	KONE	6732582	N/A	2020/05/21	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	6738454	N/A	2020/05/25	Viorica Rotaru
Conductivity	AT	6733847	N/A	2020/05/21	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6741237	N/A	2020/05/24	Nimarta Singh
Hardness (calculated as CaCO3)		6729230	N/A	2020/05/25	Automated Statchk
Mercury in Water by CVAA	CV/AA	6734079	2020/05/21	2020/05/21	Meghaben Patel
Dissolved Metals by ICPMS	ICP/MS	6730422	N/A	2020/05/22	Nan Raykha
Ion Balance (% Difference)	CALC	6729235	N/A	2020/05/25	Automated Statchk
Total Ammonia-N	LACH/NH4	6746349	N/A	2020/05/25	Amanpreet Sappal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6733857	N/A	2020/05/22	Chandra Nandlal
Organic Nitrogen	CALC	6729243	N/A	2020/05/25	Automated Statchk

TEST SUMMARY

BV Labs ID: MQN973
Sample ID: MW-11I
Matrix: Water

Collected: 2020/05/12
Shipped:
Received: 2020/05/14

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
pH	AT	6733849	2020/05/21	2020/05/21	Surinder Rai
Phenols (4AAP)	TECH/PHEN	6729828	N/A	2020/05/20	Bramdeo Motiram
Orthophosphate	KONE	6732590	N/A	2020/05/22	Deonarine Ramnarine
Sulphate by Automated Colourimetry	KONE	6732587	N/A	2020/05/21	Deonarine Ramnarine
Total Dissolved Solids	BAL	6731252	2020/05/21	2020/05/22	Shivani Desai
Total Kjeldahl Nitrogen in Water	SKAL	6738351	2020/05/22	2020/05/25	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	6745720	2020/05/25	2020/05/25	Shivani Shivani

BV Labs ID: MQN974
Sample ID: MW-11II
Matrix: Water

Collected: 2020/05/12
Shipped:
Received: 2020/05/14

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	6733845	N/A	2020/05/21	Surinder Rai
Chloride by Automated Colourimetry	KONE	6732582	N/A	2020/05/21	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	6745521	N/A	2020/05/25	Viorica Rotaru
Conductivity	AT	6733847	N/A	2020/05/21	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6741237	N/A	2020/05/24	Nimarta Singh
Hardness (calculated as CaCO3)		6729230	N/A	2020/05/25	Automated Statchk
Mercury in Water by CVAA	CV/AA	6734079	2020/05/21	2020/05/21	Meghaben Patel
Dissolved Metals by ICPMS	ICP/MS	6730422	N/A	2020/05/22	Nan Raykha
Ion Balance (% Difference)	CALC	6729235	N/A	2020/05/25	Automated Statchk
Total Ammonia-N	LACH/NH4	6746349	N/A	2020/05/25	Amanpreet Sappal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6733857	N/A	2020/05/22	Chandra Nandlal
Organic Nitrogen	CALC	6729243	N/A	2020/05/25	Automated Statchk
pH	AT	6733849	2020/05/21	2020/05/21	Surinder Rai
Phenols (4AAP)	TECH/PHEN	6729834	N/A	2020/05/20	Bramdeo Motiram
Orthophosphate	KONE	6732590	N/A	2020/05/22	Deonarine Ramnarine
Sulphate by Automated Colourimetry	KONE	6732587	N/A	2020/05/21	Deonarine Ramnarine
Total Dissolved Solids	BAL	6731252	2020/05/21	2020/05/22	Shivani Desai
Total Kjeldahl Nitrogen in Water	SKAL	6745524	2020/05/25	2020/05/25	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	6745720	2020/05/25	2020/05/25	Shivani Shivani

BV Labs ID: MQN975
Sample ID: MW-12I
Matrix: Water

Collected: 2020/05/12
Shipped:
Received: 2020/05/14

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	6730827	N/A	2020/05/22	Surinder Rai
Chloride by Automated Colourimetry	KONE	6730636	N/A	2020/05/20	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	6745521	N/A	2020/05/25	Viorica Rotaru
Conductivity	AT	6730845	N/A	2020/05/22	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6741237	N/A	2020/05/24	Nimarta Singh
Hardness (calculated as CaCO3)		6729230	N/A	2020/05/25	Automated Statchk

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TEST SUMMARY

BV Labs ID: MQN975
Sample ID: MW-12I
Matrix: Water

Collected: 2020/05/12
Shipped:
Received: 2020/05/14

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Mercury in Water by CVAA	CV/AA	6734079	2020/05/21	2020/05/21	Meghaben Patel
Dissolved Metals by ICPMS	ICP/MS	6730422	N/A	2020/05/22	Nan Raykha
Ion Balance (% Difference)	CALC	6729235	N/A	2020/05/25	Automated Statchk
Total Ammonia-N	LACH/NH4	6746349	N/A	2020/05/25	Amanpreet Sappal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6730863	N/A	2020/05/20	Chandra Nandlal
Organic Nitrogen	CALC	6729243	N/A	2020/05/25	Automated Statchk
pH	AT	6730847	2020/05/19	2020/05/22	Surinder Rai
Phenols (4AAP)	TECH/PHEN	6729821	N/A	2020/05/19	Bramdeo Motiram
Orthophosphate	KONE	6730641	N/A	2020/05/22	Deonarine Ramnarine
Sulphate by Automated Colourimetry	KONE	6730639	N/A	2020/05/20	Deonarine Ramnarine
Total Dissolved Solids	BAL	6731252	2020/05/21	2020/05/22	Shivani Desai
Total Kjeldahl Nitrogen in Water	SKAL	6745524	2020/05/25	2020/05/25	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	6745720	2020/05/25	2020/05/25	Shivani Shivani

BV Labs ID: MQN975 Dup
Sample ID: MW-12I
Matrix: Water

Collected: 2020/05/12
Shipped:
Received: 2020/05/14

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Dissolved Solids	BAL	6731252	2020/05/21	2020/05/22	Shivani Desai

BV Labs ID: MQN976
Sample ID: MW-12II
Matrix: Water

Collected: 2020/05/12
Shipped:
Received: 2020/05/14

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	6730827	N/A	2020/05/22	Surinder Rai
Chloride by Automated Colourimetry	KONE	6730636	N/A	2020/05/20	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	6745521	N/A	2020/05/25	Viorica Rotaru
Conductivity	AT	6730845	N/A	2020/05/22	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6741202	N/A	2020/05/24	Nimarta Singh
Hardness (calculated as CaCO3)		6729230	N/A	2020/05/25	Automated Statchk
Mercury in Water by CVAA	CV/AA	6737389	2020/05/22	2020/05/22	Meghaben Patel
Dissolved Metals by ICPMS	ICP/MS	6730422	N/A	2020/05/22	Nan Raykha
Ion Balance (% Difference)	CALC	6729235	N/A	2020/05/25	Automated Statchk
Total Ammonia-N	LACH/NH4	6746349	N/A	2020/05/25	Amanpreet Sappal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6730863	N/A	2020/05/20	Chandra Nandlal
Organic Nitrogen	CALC	6729243	N/A	2020/05/25	Automated Statchk
pH	AT	6730847	2020/05/19	2020/05/22	Surinder Rai
Phenols (4AAP)	TECH/PHEN	6729828	N/A	2020/05/20	Bramdeo Motiram
Orthophosphate	KONE	6730641	N/A	2020/05/22	Deonarine Ramnarine
Sulphate by Automated Colourimetry	KONE	6730639	N/A	2020/05/20	Deonarine Ramnarine
Total Dissolved Solids	BAL	6731252	2020/05/21	2020/05/22	Shivani Desai
Total Kjeldahl Nitrogen in Water	SKAL	6745524	2020/05/25	2020/05/25	Rajni Tyagi

TEST SUMMARY

BV Labs ID: MQN976 **Collected:** 2020/05/12
Sample ID: MW-12II **Shipped:**
Matrix: Water **Received:** 2020/05/14

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Phosphorus (Colourimetric)	LACH/P	6745720	2020/05/25	2020/05/25	Shivani Shivani

BV Labs ID: MQN976 Dup **Collected:** 2020/05/12
Sample ID: MW-12II **Shipped:**
Matrix: Water **Received:** 2020/05/14

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Mercury in Water by CVAA	CV/AA	6737389	2020/05/22	2020/05/22	Meghaben Patel

BV Labs ID: MQN977 **Collected:** 2020/05/12
Sample ID: MW-13 **Shipped:**
Matrix: Water **Received:** 2020/05/14

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	6730827	N/A	2020/05/22	Surinder Rai
Chloride by Automated Colourimetry	KONE	6730636	N/A	2020/05/20	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	6738454	N/A	2020/05/25	Viorica Rotaru
Conductivity	AT	6730845	N/A	2020/05/22	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6741237	N/A	2020/05/24	Nimarta Singh
Hardness (calculated as CaCO3)		6729230	N/A	2020/05/25	Automated Statchk
Mercury in Water by CVAA	CV/AA	6734079	2020/05/21	2020/05/21	Meghaben Patel
Dissolved Metals by ICPMS	ICP/MS	6730422	N/A	2020/05/22	Nan Raykha
Ion Balance (% Difference)	CALC	6729235	N/A	2020/05/25	Automated Statchk
Total Ammonia-N	LACH/NH4	6746349	N/A	2020/05/25	Amanpreet Sappal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6730863	N/A	2020/05/20	Chandra Nandlal
Organic Nitrogen	CALC	6729243	N/A	2020/05/25	Automated Statchk
pH	AT	6730847	2020/05/19	2020/05/22	Surinder Rai
Phenols (4AAP)	TECH/PHEN	6729821	N/A	2020/05/19	Bramdeo Motiram
Orthophosphate	KONE	6730641	N/A	2020/05/22	Deonarine Ramnarine
Sulphate by Automated Colourimetry	KONE	6730639	N/A	2020/05/20	Deonarine Ramnarine
Total Dissolved Solids	BAL	6731252	2020/05/21	2020/05/22	Shivani Desai
Total Kjeldahl Nitrogen in Water	SKAL	6738351	2020/05/22	2020/05/25	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	6745720	2020/05/25	2020/05/25	Shivani Shivani

BV Labs ID: MQN988 **Collected:** 2020/05/12
Sample ID: SW1 **Shipped:**
Matrix: Water **Received:** 2020/05/14

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	6732695	N/A	2020/05/21	Arefa Dabhad
Alkalinity	AT	6730814	N/A	2020/05/20	Surinder Rai
Biochemical Oxygen Demand (BOD)	DO	6728673	2020/05/16	2020/05/21	Navjot Kaur Gill
Chloride by Automated Colourimetry	KONE	6730855	N/A	2020/05/21	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	6738454	N/A	2020/05/25	Viorica Rotaru

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TEST SUMMARY

BV Labs ID: MQN988
Sample ID: SW1
Matrix: Water

Collected: 2020/05/12
Shipped:
Received: 2020/05/14

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Conductivity	AT	6730817	N/A	2020/05/20	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6741237	N/A	2020/05/24	Nimarta Singh
Hardness (calculated as CaCO3)		6729230	N/A	2020/05/21	Automated Statchk
Mercury in Water by CVAA	CV/AA	6734079	2020/05/21	2020/05/21	Meghaben Patel
Dissolved Calcium and Magnesium	ICP	6732698	2020/05/20	2020/05/21	Suban Kanapathippllai
Total Metals Analysis by ICPMS	ICP/MS	6737483	N/A	2020/05/23	Arefa Dabhad
Total Ammonia-N	LACH/NH4	6746349	N/A	2020/05/25	Amanpreet Sappal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6733858	N/A	2020/05/21	Chandra Nandlal
Organic Nitrogen	CALC	6729243	N/A	2020/05/25	Automated Statchk
pH	AT	6730819	2020/05/19	2020/05/20	Surinder Rai
Phenols (4AAP)	TECH/PHEN	6729828	N/A	2020/05/20	Bramdeo Motiram
Sulphate by Automated Colourimetry	KONE	6730860	N/A	2020/05/21	Deonarine Ramnarine
Total Dissolved Solids	BAL	6731252	2020/05/21	2020/05/22	Shivani Desai
Total Kjeldahl Nitrogen in Water	SKAL	6738351	2020/05/22	2020/05/25	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	6745697	2020/05/25	2020/05/25	Shivani Shivani
Low Level Total Suspended Solids	BAL	6734353	2020/05/21	2020/05/22	Jingwei (Alvin) Shi

BV Labs ID: MQN988 Dup
Sample ID: SW1
Matrix: Water

Collected: 2020/05/12
Shipped:
Received: 2020/05/14

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Ammonia-N	LACH/NH4	6746349	N/A	2020/05/25	Amanpreet Sappal

BV Labs ID: MQN989
Sample ID: SW2
Matrix: Water

Collected: 2020/05/12
Shipped:
Received: 2020/05/14

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	6732695	N/A	2020/05/21	Arefa Dabhad
Alkalinity	AT	6730624	N/A	2020/05/21	Surinder Rai
Biochemical Oxygen Demand (BOD)	DO	6728673	2020/05/16	2020/05/21	Navjot Kaur Gill
Chloride by Automated Colourimetry	KONE	6730855	N/A	2020/05/21	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	6745521	N/A	2020/05/25	Viorica Rotaru
Conductivity	AT	6730625	N/A	2020/05/21	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6741237	N/A	2020/05/24	Nimarta Singh
Hardness (calculated as CaCO3)		6729231	N/A	2020/05/21	Automated Statchk
Mercury in Water by CVAA	CV/AA	6734079	2020/05/21	2020/05/21	Meghaben Patel
Dissolved Calcium and Magnesium	ICP	6732698	2020/05/20	2020/05/21	Suban Kanapathippllai
Total Metals Analysis by ICPMS	ICP/MS	6748634	N/A	2020/05/27	Nan Raykha
Total Ammonia-N	LACH/NH4	6746349	N/A	2020/05/25	Amanpreet Sappal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6733858	N/A	2020/05/21	Chandra Nandlal
Organic Nitrogen	CALC	6729243	N/A	2020/05/25	Automated Statchk
pH	AT	6730626	2020/05/19	2020/05/21	Surinder Rai

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TEST SUMMARY

BV Labs ID: MQN989
Sample ID: SW2
Matrix: Water

Collected: 2020/05/12
Shipped:
Received: 2020/05/14

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Phenols (4AAP)	TECH/PHEN	6729834	N/A	2020/05/20	Bramdeo Motiram
Sulphate by Automated Colourimetry	KONE	6730860	N/A	2020/05/21	Deonarine Ramnarine
Total Dissolved Solids	BAL	6731252	2020/05/21	2020/05/22	Shivani Desai
Total Kjeldahl Nitrogen in Water	SKAL	6745524	2020/05/25	2020/05/25	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	6745697	2020/05/25	2020/05/25	Shivani Shivani
Low Level Total Suspended Solids	BAL	6734262	2020/05/22	2020/05/22	Jingwei (Alvin) Shi

BV Labs ID: MQN989 Dup
Sample ID: SW2
Matrix: Water

Collected: 2020/05/12
Shipped:
Received: 2020/05/14

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Phenols (4AAP)	TECH/PHEN	6729834	N/A	2020/05/20	Bramdeo Motiram

BV Labs ID: MQN990
Sample ID: SW3
Matrix: Water

Collected: 2020/05/12
Shipped:
Received: 2020/05/14

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	6732695	N/A	2020/05/21	Arefa Dabhad
Alkalinity	AT	6730814	N/A	2020/05/20	Surinder Rai
Biochemical Oxygen Demand (BOD)	DO	6728673	2020/05/16	2020/05/21	Navjot Kaur Gill
Chloride by Automated Colourimetry	KONE	6730855	N/A	2020/05/21	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	6745521	N/A	2020/05/25	Viorica Rotaru
Conductivity	AT	6730817	N/A	2020/05/20	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6741237	N/A	2020/05/24	Nimarta Singh
Hardness (calculated as CaCO3)		6729231	N/A	2020/05/21	Automated Statchk
Mercury in Water by CVAA	CV/AA	6737389	2020/05/22	2020/05/22	Meghaben Patel
Dissolved Calcium and Magnesium	ICP	6732698	2020/05/20	2020/05/21	Suban Kanapathippllai
Total Metals Analysis by ICPMS	ICP/MS	6748634	N/A	2020/05/27	Nan Raykha
Total Ammonia-N	LACH/NH4	6746349	N/A	2020/05/25	Amanpreet Sappal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6733858	N/A	2020/05/21	Chandra Nandlal
Organic Nitrogen	CALC	6729243	N/A	2020/05/25	Automated Statchk
pH	AT	6730819	2020/05/19	2020/05/20	Surinder Rai
Phenols (4AAP)	TECH/PHEN	6729821	N/A	2020/05/19	Bramdeo Motiram
Sulphate by Automated Colourimetry	KONE	6730860	N/A	2020/05/21	Deonarine Ramnarine
Total Dissolved Solids	BAL	6731252	2020/05/21	2020/05/22	Shivani Desai
Total Kjeldahl Nitrogen in Water	SKAL	6745524	2020/05/25	2020/05/25	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	6745697	2020/05/25	2020/05/25	Shivani Shivani
Low Level Total Suspended Solids	BAL	6734262	2020/05/22	2020/05/22	Jingwei (Alvin) Shi

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BV Labs Job #: C0C0144
Report Date: 2020/12/18

exp Services Inc
Client Project #: THB-00006196-PE
Site Location: LONGLAC LANDFILL - SPRING SAMPLING EVENT
Sampler Initials: EF

TEST SUMMARY

BV Labs ID: MQN990 Dup
Sample ID: SW3
Matrix: Water

Collected: 2020/05/12
Shipped:
Received: 2020/05/14

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chemical Oxygen Demand	SPEC	6745521	N/A	2020/05/25	Viorica Rotaru
Total Kjeldahl Nitrogen in Water	SKAL	6745524	2020/05/25	2020/05/25	Rajni Tyagi

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GENERAL COMMENTS

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

Package 1	2.3°C
Package 2	7.0°C
Package 3	1.3°C
Package 4	3.0°C

Revised report 2020/12/17: Additional metals parameters reported

Sample MQN964 [MW-4I] : ortho-Phosphate > Total Phosphorus: Both values fall within the method uncertainty for duplicates and are likely equivalent.

Sample MQN977 [MW-13] : TKN < Ammonia: Both values fall within the method uncertainty for duplicates and are likely equivalent.

Results relate only to the items tested.

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BV Labs Job #: C0C0144
Report Date: 2020/12/18

QUALITY ASSURANCE REPORT

exp Services Inc
Client Project #: THB-00006196-PE
Site Location: LONGLAC LANDFILL - SPRING SAMPLING EVENT
Sampler Initials: EF

			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
6728673	Total BOD	2020/05/21					<2	mg/L	NC	30	103	80 - 120
6729821	Phenols-4AAP	2020/05/19	97	80 - 120	94	80 - 120	<0.0010	mg/L	NC	20		
6729828	Phenols-4AAP	2020/05/20	92	80 - 120	98	80 - 120	<0.0010	mg/L	NC	20		
6729834	Phenols-4AAP	2020/05/20	95	80 - 120	97	80 - 120	<0.0010	mg/L	NC	20		
6730422	Dissolved Aluminum (Al)	2020/05/22	102	80 - 120	99	80 - 120	<5.0	ug/L	NC	20		
6730422	Dissolved Antimony (Sb)	2020/05/22	113	80 - 120	102	80 - 120	<0.50	ug/L	NC	20		
6730422	Dissolved Arsenic (As)	2020/05/22	109	80 - 120	100	80 - 120	<1.0	ug/L	NC	20		
6730422	Dissolved Barium (Ba)	2020/05/22	109	80 - 120	97	80 - 120	<2.0	ug/L	4.1	20		
6730422	Dissolved Beryllium (Be)	2020/05/22	105	80 - 120	96	80 - 120	<0.50	ug/L	NC	20		
6730422	Dissolved Bismuth (Bi)	2020/05/22	106	80 - 120	98	80 - 120	<1.0	ug/L	NC	20		
6730422	Dissolved Boron (B)	2020/05/22	104	80 - 120	97	80 - 120	<10	ug/L	3.7	20		
6730422	Dissolved Cadmium (Cd)	2020/05/22	110	80 - 120	100	80 - 120	<0.10	ug/L	NC	20		
6730422	Dissolved Calcium (Ca)	2020/05/22	NC	80 - 120	101	80 - 120	<200	ug/L	0.54	20		
6730422	Dissolved Chromium (Cr)	2020/05/22	109	80 - 120	98	80 - 120	<5.0	ug/L	NC	20		
6730422	Dissolved Cobalt (Co)	2020/05/22	105	80 - 120	100	80 - 120	<0.50	ug/L	NC	20		
6730422	Dissolved Copper (Cu)	2020/05/22	111	80 - 120	101	80 - 120	<1.0	ug/L	1.5	20		
6730422	Dissolved Iron (Fe)	2020/05/22	104	80 - 120	98	80 - 120	<100	ug/L	NC	20		
6730422	Dissolved Lead (Pb)	2020/05/22	108	80 - 120	98	80 - 120	<0.50	ug/L	NC	20		
6730422	Dissolved Magnesium (Mg)	2020/05/22	106	80 - 120	98	80 - 120	<50	ug/L	0.11	20		
6730422	Dissolved Manganese (Mn)	2020/05/22	108	80 - 120	98	80 - 120	<2.0	ug/L	NC	20		
6730422	Dissolved Molybdenum (Mo)	2020/05/22	111	80 - 120	96	80 - 120	<0.50	ug/L	NC	20		
6730422	Dissolved Nickel (Ni)	2020/05/22	102	80 - 120	95	80 - 120	<1.0	ug/L	NC	20		
6730422	Dissolved Potassium (K)	2020/05/22	113	80 - 120	103	80 - 120	<200	ug/L	0.33	20		
6730422	Dissolved Selenium (Se)	2020/05/22	103	80 - 120	97	80 - 120	<2.0	ug/L	NC	20		
6730422	Dissolved Silicon (Si)	2020/05/22	105	80 - 120	105	80 - 120	<50	ug/L	2.2	20		
6730422	Dissolved Sodium (Na)	2020/05/22	109	80 - 120	98	80 - 120	<100	ug/L	0.36	20		
6730422	Dissolved Strontium (Sr)	2020/05/22	106	80 - 120	96	80 - 120	<1.0	ug/L	1.2	20		
6730422	Dissolved Thallium (Tl)	2020/05/22	107	80 - 120	99	80 - 120	<0.050	ug/L	NC	20		
6730422	Dissolved Tin (Sn)	2020/05/22	113	80 - 120	103	80 - 120	<1.0	ug/L	NC	20		
6730422	Dissolved Vanadium (V)	2020/05/22	105	80 - 120	97	80 - 120	<0.50	ug/L	NC	20		
6730422	Dissolved Zinc (Zn)	2020/05/22	106	80 - 120	97	80 - 120	<5.0	ug/L	NC	20		

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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
6730602	Nitrate (N)	2020/05/21	109	80 - 120	102	80 - 120	<0.10	mg/L	NC	20		
6730602	Nitrite (N)	2020/05/21	113	80 - 120	107	80 - 120	<0.010	mg/L	NC	20		
6730624	Alkalinity (Total as CaCO3)	2020/05/21			96	85 - 115	<1.0	mg/L	0.27	20		
6730625	Conductivity	2020/05/21			101	85 - 115	<1.0	umho/cm	0.33	25		
6730626	pH	2020/05/21			101	98 - 103			0.30	N/A		
6730631	Dissolved Chloride (Cl-)	2020/05/20	NC	80 - 120	101	80 - 120	<1.0	mg/L	3.7	20		
6730634	Dissolved Sulphate (SO4)	2020/05/20	NC	75 - 125	103	80 - 120	<1.0	mg/L	0.71	20		
6730635	Orthophosphate (P)	2020/05/22	112	75 - 125	100	80 - 120	<0.010	mg/L	NC	25		
6730636	Dissolved Chloride (Cl-)	2020/05/20	119	80 - 120	102	80 - 120	<1.0	mg/L	NC	20		
6730639	Dissolved Sulphate (SO4)	2020/05/20	112	75 - 125	100	80 - 120	<1.0	mg/L	14	20		
6730641	Orthophosphate (P)	2020/05/22	108	75 - 125	103	80 - 120	<0.010	mg/L	1.3	25		
6730814	Alkalinity (Total as CaCO3)	2020/05/20			96	85 - 115	<1.0	mg/L	0.77	20		
6730817	Conductivity	2020/05/20			101	85 - 115	<1.0	umho/cm	0.47	25		
6730819	pH	2020/05/20			102	98 - 103			0.025	N/A		
6730827	Alkalinity (Total as CaCO3)	2020/05/21			95	85 - 115	<1.0	mg/L	1.7	20		
6730845	Conductivity	2020/05/21			102	85 - 115	<1.0	umho/cm	0.69	25		
6730847	pH	2020/05/21			101	98 - 103			0.38	N/A		
6730855	Dissolved Chloride (Cl-)	2020/05/21	116	80 - 120	100	80 - 120	<1.0	mg/L	3.0	20		
6730860	Dissolved Sulphate (SO4)	2020/05/21	NC	75 - 125	100	80 - 120	<1.0	mg/L	0.078	20		
6730863	Nitrate (N)	2020/05/20	NC	80 - 120	102	80 - 120	<0.10	mg/L	0.87	20		
6730863	Nitrite (N)	2020/05/20	106	80 - 120	107	80 - 120	<0.010	mg/L	2.3	20		
6731252	Total Dissolved Solids	2020/05/22					<10	mg/L	5.0	25	98	90 - 110
6732582	Dissolved Chloride (Cl-)	2020/05/21	NC	80 - 120	101	80 - 120	<1.0	mg/L	0.047	20		
6732587	Dissolved Sulphate (SO4)	2020/05/21	NC	75 - 125	102	80 - 120	<1.0	mg/L	0.83	20		
6732590	Orthophosphate (P)	2020/05/22	111	75 - 125	101	80 - 120	<0.010	mg/L	NC	25		
6732695	Dissolved (0.2u) Aluminum (Al)	2020/05/21	104	80 - 120	96	80 - 120	<5	ug/L	0.10	20		
6732698	Dissolved Calcium (Ca)	2020/05/21	NC	80 - 120	99	80 - 120	<0.050	mg/L				
6732698	Dissolved Magnesium (Mg)	2020/05/21	91	80 - 120	96	80 - 120	<0.050	mg/L				

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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
6733845	Alkalinity (Total as CaCO3)	2020/05/21			99	85 - 115	<1.0	mg/L	1.5	20		
6733847	Conductivity	2020/05/21			103	85 - 115	<1.0	umho/cm	0.17	25		
6733849	pH	2020/05/21			101	98 - 103			0.16	N/A		
6733857	Nitrate (N)	2020/05/22	101	80 - 120	102	80 - 120	<0.10	mg/L	0.28	20		
6733857	Nitrite (N)	2020/05/22	107	80 - 120	108	80 - 120	<0.010	mg/L	NC	20		
6733858	Nitrate (N)	2020/05/21	104	80 - 120	104	80 - 120	<0.10	mg/L	NC	20		
6733858	Nitrite (N)	2020/05/21	106	80 - 120	108	80 - 120	<0.010	mg/L				
6734079	Mercury (Hg)	2020/05/21	93	75 - 125	92	80 - 120	<0.00010	mg/L	NC	20		
6734262	Total Suspended Solids	2020/05/22					<1	mg/L	16	25	95	85 - 115
6734353	Total Suspended Solids	2020/05/22					<1	mg/L	NC	25	101	85 - 115
6734722	Dissolved Organic Carbon	2020/05/22	91	80 - 120	98	80 - 120	<0.40	mg/L	0.44	20		
6737389	Mercury (Hg)	2020/05/22	92	75 - 125	96	80 - 120	<0.00010	mg/L	NC	20		
6737483	Total Antimony (Sb)	2020/05/23	105	80 - 120	102	80 - 120	<0.50	ug/L				
6737483	Total Arsenic (As)	2020/05/23	97	80 - 120	99	80 - 120	<1.0	ug/L				
6737483	Total Barium (Ba)	2020/05/23	96	80 - 120	95	80 - 120	<2.0	ug/L				
6737483	Total Beryllium (Be)	2020/05/23	82	80 - 120	84	80 - 120	<0.50	ug/L				
6737483	Total Bismuth (Bi)	2020/05/23	88	80 - 120	92	80 - 120	<1.0	ug/L				
6737483	Total Boron (B)	2020/05/23	77 (1)	80 - 120	80	80 - 120	<10	ug/L				
6737483	Total Cadmium (Cd)	2020/05/23	98	80 - 120	98	80 - 120	<0.10	ug/L				
6737483	Total Calcium (Ca)	2020/05/23	NC	80 - 120	91	80 - 120	<200	ug/L				
6737483	Total Chromium (Cr)	2020/05/23	89	80 - 120	94	80 - 120	<5.0	ug/L	NC	20		
6737483	Total Cobalt (Co)	2020/05/23	90	80 - 120	96	80 - 120	<0.50	ug/L				
6737483	Total Copper (Cu)	2020/05/23	97	80 - 120	99	80 - 120	1.2, RDL=1.0	ug/L				
6737483	Total Iron (Fe)	2020/05/23	83	80 - 120	91	80 - 120	<100	ug/L				
6737483	Total Lead (Pb)	2020/05/23	92	80 - 120	96	80 - 120	<0.50	ug/L				
6737483	Total Magnesium (Mg)	2020/05/23	NC	80 - 120	91	80 - 120	<50	ug/L				
6737483	Total Manganese (Mn)	2020/05/23	NC	80 - 120	93	80 - 120	<2.0	ug/L				
6737483	Total Molybdenum (Mo)	2020/05/23	101	80 - 120	99	80 - 120	<0.50	ug/L				
6737483	Total Nickel (Ni)	2020/05/23	88	80 - 120	93	80 - 120	<1.0	ug/L				
6737483	Total Potassium (K)	2020/05/23	91	80 - 120	93	80 - 120	<200	ug/L				

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
6737483	Total Selenium (Se)	2020/05/23	98	80 - 120	98	80 - 120	<2.0	ug/L				
6737483	Total Silicon (Si)	2020/05/23	91	80 - 120	91	80 - 120	<50	ug/L				
6737483	Total Silver (Ag)	2020/05/23	95	80 - 120	97	80 - 120	<0.10	ug/L				
6737483	Total Sodium (Na)	2020/05/23	NC	80 - 120	93	80 - 120	<100	ug/L				
6737483	Total Strontium (Sr)	2020/05/23	NC	80 - 120	93	80 - 120	<1.0	ug/L				
6737483	Total Thallium (Tl)	2020/05/23	90	80 - 120	96	80 - 120	<0.050	ug/L				
6737483	Total Tin (Sn)	2020/05/23	102	80 - 120	101	80 - 120	<1.0	ug/L				
6737483	Total Titanium (Ti)	2020/05/23	95	80 - 120	95	80 - 120	<5.0	ug/L				
6737483	Total Vanadium (V)	2020/05/23	95	80 - 120	95	80 - 120	<0.50	ug/L				
6737483	Total Zinc (Zn)	2020/05/23	91	80 - 120	100	80 - 120	<5.0	ug/L				
6737691	Mercury (Hg)	2020/05/22	92	75 - 125	96	80 - 120	<0.00010	mg/L	NC	20		
6738351	Total Kjeldahl Nitrogen (TKN)	2020/05/25	119	80 - 120	91	80 - 120	<0.10	mg/L	2.5	20		
6738454	Total Chemical Oxygen Demand (COD)	2020/05/25	106	80 - 120	104	80 - 120	<4.0	mg/L	10	20		
6741202	Dissolved Organic Carbon	2020/05/24	NC	80 - 120	98	80 - 120	<0.40	mg/L	0.34	20		
6741237	Dissolved Organic Carbon	2020/05/23	93	80 - 120	97	80 - 120	<0.40	mg/L	0.53	20		
6745521	Total Chemical Oxygen Demand (COD)	2020/05/25	100	80 - 120	102	80 - 120	<4.0	mg/L	4.1	20		
6745524	Total Kjeldahl Nitrogen (TKN)	2020/05/25	115	80 - 120	96	80 - 120	<0.10	mg/L	4.3	20	93	80 - 120
6745697	Total Phosphorus	2020/05/25	97	80 - 120	93	80 - 120	<0.004	mg/L	12	20	88	N/A
6745720	Total Phosphorus	2020/05/25	95	80 - 120	98	80 - 120	<0.020	mg/L	0	20	100	80 - 120
6746349	Total Ammonia-N	2020/05/25	96	75 - 125	99	80 - 120	<0.050	mg/L	NC	20		
6748634	Total Antimony (Sb)	2020/05/27	99	80 - 120	100	80 - 120	<0.50	ug/L	6.7	20		
6748634	Total Arsenic (As)	2020/05/27	98	80 - 120	98	80 - 120	<1.0	ug/L	NC	20		
6748634	Total Barium (Ba)	2020/05/27	96	80 - 120	98	80 - 120	<2.0	ug/L	2.8	20		
6748634	Total Beryllium (Be)	2020/05/27	92	80 - 120	92	80 - 120	<0.50	ug/L	NC	20		
6748634	Total Bismuth (Bi)	2020/05/27	94	80 - 120	95	80 - 120	<1.0	ug/L	NC	20		
6748634	Total Boron (B)	2020/05/27	82	80 - 120	87	80 - 120	<10	ug/L	4.8	20		
6748634	Total Cadmium (Cd)	2020/05/27	97	80 - 120	98	80 - 120	<0.10	ug/L	9.7	20		
6748634	Total Calcium (Ca)	2020/05/27	NC	80 - 120	99	80 - 120	<200	ug/L	2.2	20		
6748634	Total Chromium (Cr)	2020/05/27	93	80 - 120	93	80 - 120	<5.0	ug/L	NC	20		
6748634	Total Cobalt (Co)	2020/05/27	96	80 - 120	96	80 - 120	<0.50	ug/L	3.9	20		
6748634	Total Copper (Cu)	2020/05/27	94	80 - 120	95	80 - 120	<1.0	ug/L	3.5	20		

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
6748634	Total Iron (Fe)	2020/05/27	99	80 - 120	97	80 - 120	<100	ug/L	2.1	20		
6748634	Total Lead (Pb)	2020/05/27	94	80 - 120	99	80 - 120	<0.50	ug/L	NC	20		
6748634	Total Magnesium (Mg)	2020/05/27	97	80 - 120	95	80 - 120	<50	ug/L	5.9	20		
6748634	Total Manganese (Mn)	2020/05/27	96	80 - 120	96	80 - 120	<2.0	ug/L	0.62	20		
6748634	Total Molybdenum (Mo)	2020/05/27	94	80 - 120	94	80 - 120	<0.50	ug/L	3.0	20		
6748634	Total Nickel (Ni)	2020/05/27	93	80 - 120	93	80 - 120	<1.0	ug/L	4.4	20		
6748634	Total Potassium (K)	2020/05/27	98	80 - 120	99	80 - 120	<200	ug/L	0.66	20		
6748634	Total Selenium (Se)	2020/05/27	97	80 - 120	101	80 - 120	<2.0	ug/L	3.8	20		
6748634	Total Silicon (Si)	2020/05/27	96	80 - 120	96	80 - 120	<50	ug/L	1.8	20		
6748634	Total Silver (Ag)	2020/05/27	95	80 - 120	95	80 - 120	<0.10	ug/L	NC	20		
6748634	Total Sodium (Na)	2020/05/27	NC	80 - 120	97	80 - 120	<100	ug/L	1.4	20		
6748634	Total Strontium (Sr)	2020/05/27	NC	80 - 120	95	80 - 120	<1.0	ug/L	0.56	20		
6748634	Total Thallium (Tl)	2020/05/27	94	80 - 120	96	80 - 120	<0.050	ug/L	NC	20		
6748634	Total Tin (Sn)	2020/05/27	97	80 - 120	98	80 - 120	<1.0	ug/L	NC	20		
6748634	Total Titanium (Ti)	2020/05/27	92	80 - 120	98	80 - 120	<5.0	ug/L	0.30	20		
6748634	Total Vanadium (V)	2020/05/27	94	80 - 120	92	80 - 120	<0.50	ug/L	9.5	20		
6748634	Total Zinc (Zn)	2020/05/27	95	80 - 120	97	80 - 120	<5.0	ug/L	2.8	20		
6759829	Dissolved Aluminum (Al)	2020/05/29	116	80 - 120	102	80 - 120	<5.0	ug/L				
6759829	Dissolved Antimony (Sb)	2020/05/29	116	80 - 120	103	80 - 120	<0.50	ug/L	20	20		
6759829	Dissolved Arsenic (As)	2020/05/29	112	80 - 120	100	80 - 120	<1.0	ug/L	NC	20		
6759829	Dissolved Barium (Ba)	2020/05/29	110	80 - 120	99	80 - 120	<2.0	ug/L	3.4	20		
6759829	Dissolved Beryllium (Be)	2020/05/29	112	80 - 120	100	80 - 120	<0.50	ug/L	NC	20		
6759829	Dissolved Bismuth (Bi)	2020/05/29	105	80 - 120	95	80 - 120	<1.0	ug/L				
6759829	Dissolved Boron (B)	2020/05/29	116	80 - 120	104	80 - 120	<10	ug/L	1.0	20		
6759829	Dissolved Cadmium (Cd)	2020/05/29	114	80 - 120	102	80 - 120	<0.10	ug/L	NC	20		
6759829	Dissolved Calcium (Ca)	2020/05/29	NC	80 - 120	102	80 - 120	<200	ug/L				
6759829	Dissolved Chromium (Cr)	2020/05/29	111	80 - 120	100	80 - 120	<5.0	ug/L	NC	20		
6759829	Dissolved Cobalt (Co)	2020/05/29	110	80 - 120	100	80 - 120	<0.50	ug/L	NC	20		
6759829	Dissolved Copper (Cu)	2020/05/29	112	80 - 120	101	80 - 120	<1.0	ug/L	6.9	20		
6759829	Dissolved Iron (Fe)	2020/05/29	110	80 - 120	100	80 - 120	<100	ug/L				
6759829	Dissolved Lead (Pb)	2020/05/29	108	80 - 120	98	80 - 120	<0.50	ug/L	NC	20		

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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
6759829	Dissolved Magnesium (Mg)	2020/05/29	109	80 - 120	99	80 - 120	<50	ug/L				
6759829	Dissolved Manganese (Mn)	2020/05/29	111	80 - 120	100	80 - 120	<2.0	ug/L				
6759829	Dissolved Molybdenum (Mo)	2020/05/29	117	80 - 120	102	80 - 120	<0.50	ug/L	9.8	20		
6759829	Dissolved Nickel (Ni)	2020/05/29	109	80 - 120	100	80 - 120	<1.0	ug/L	NC	20		
6759829	Dissolved Potassium (K)	2020/05/29	111	80 - 120	100	80 - 120	<200	ug/L				
6759829	Dissolved Selenium (Se)	2020/05/29	113	80 - 120	100	80 - 120	<2.0	ug/L	NC	20		
6759829	Dissolved Silicon (Si)	2020/05/29	115	80 - 120	103	80 - 120	<50	ug/L				
6759829	Dissolved Sodium (Na)	2020/05/29	NC	80 - 120	99	80 - 120	<100	ug/L	0.76	20		
6759829	Dissolved Strontium (Sr)	2020/05/29	NC	80 - 120	100	80 - 120	<1.0	ug/L				
6759829	Dissolved Thallium (Tl)	2020/05/29	108	80 - 120	98	80 - 120	<0.050	ug/L	NC	20		
6759829	Dissolved Tin (Sn)	2020/05/29	115	80 - 120	103	80 - 120	<1.0	ug/L				
6759829	Dissolved Vanadium (V)	2020/05/29	114	80 - 120	102	80 - 120	<0.50	ug/L	15	20		
6759829	Dissolved Zinc (Zn)	2020/05/29	111	80 - 120	100	80 - 120	<5.0	ug/L	NC	20		

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.

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

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

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

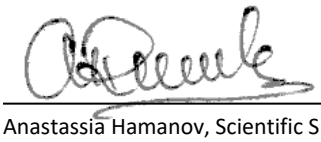
Bureau Veritas Laboratories 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

BV Labs Job #: C0C0144
Report Date: 2020/12/18

exp Services Inc
Client Project #: THB-00006196-PE
Site Location: LONGLAC LANDFILL - SPRING SAMPLING EVENT
Sampler Initials: EF

VALIDATION SIGNATURE PAGE

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



Anastassia Hamanov, Scientific Specialist

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

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Bureau Veritas Laboratories
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14-May-20 15:09
Julie Clement
C0C0144
URE ENV-1311

Page 1 of 3

Only:

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Bottle Order #:
Company Name:	#17501 exp Services Inc	Company Name:		Quotation #:	B90572	770944
Attention:	accounts payable	Attention:	Ahileas Mitsopoulos, Michael Soramaki	P.O. #:		
Address:	1142 Roland St Thunder Bay ON P7B 5M4	Address:		Project:	THB-00006196-PE	
Tel:	(807) 623-9495 Fax: (807) 623-8070	Tel:	Fax:	Project Name:		COC #: / Project Manager:
Email:	thunderbay@exp.com; Karen.Burke@exp.com; AP@ex	Email:	ahileas.mitsopoulos@exp.com, connor.porter@exp.com	Site #:	Longlac Landfill	C#770944-01-01 / Julie Clement
				Sampled By:	EP	

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE BV LABS DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011): ☐ Table 1 ☐ Res/Park ☐ Medium/Fine ☐ Table 2 ☐ Ind/Comm ☐ Coarse ☐ Table 3 ☐ Agri/Other ☐ For RSC ☐ Table ___

Other Regulations: ☐ CCME ☐ Sanitary Sewer Bylaw ☐ Reg 558 ☐ Storm Sewer Bylaw ☐ MISA Municipality ___ ☐ PWQO ☒ Other ODWS

Special Instructions:

Include Criteria on Certificate of Analysis (Y/N)? ___

Field Filtered (please circle): Metals / Hg / Cr VI

ANALYSIS REQUESTED (PLEASE BE SPECIFIC)

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects

Regular (Standard) TAT: ☒
(will be applied if Rush TAT is not specified):
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: ___ Time Required: ___ ☐
Rush Confirmation Number: ___ *(call lab for #)*

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	GW Spring sched5 (no VOCs)	Organic Nitrogen	Orthophosphate	Hardness (calculated as CaCO3)	Extra Dissolved Metals Parameters	# of Bottles	Comments
1		MW-2	May 12, 2020	1:10 PM	GW	X	X	X	X	X	8	
2		MW-3	May 12, 2020	1:50 PM	GW	X	X	X	X	X	8	
3		MW-4I	May 12, 2020	6:30 PM	GW	X	X	X	X	X	8	
4		MW-4II	May 12, 2020	6:05 PM	GW	X	X	X	X	X	8	
5		MW-5	May 12, 2020	7:50 PM	GW	X	X	X	X	X	8	
6		MW-6	May 12, 2020	5:30 PM	GW	X	X	X	X	X	8	
7		MW-7	May 12, 2020	4:25 PM	GW	X	X	X	X	X	8	
8		MW-8I	May 12, 2020	8:55 PM	GW	X	X	X	X	X	8	
9		MW-8II	May 12, 2020	8:35 PM	GW	X	X	X	X	X	8	RECEIVED T.Bay
10		MW-9	May 12, 2020	9:39 PM	GW	X	X	X	X	X	8	7/7/7 0/2/2, 4/2/3

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
Michael Soramaki	20/05/14	1:40PM	James Kapperich	2020/05/14	15:09	
			Ashlie Richman	2020/05/15	09:03	

Laboratory Use Only

Time Sensitive	Temperature (°C) on Recei	Custody Seal	Yes	No
	3/2/2	Present		
		Intact		N/A

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BV LABS' STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVLABS.COM/TERMS-AND-CONDITIONS. Ashlie Surname

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT WWW.BVLABS.COM/RESOURCES/CHAIN-OF-CUSTODY-FORMS.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BV LABS

White: BV Labs Yellow: Client

REFER TO ACTK

Bureau Veritas Canada (2019) Inc.

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

CHAIN OF CUSTODY RECORD

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#17501 exp Services Inc	Company Name:		Quotation #:	B90572	BV Labs Job #:	Bottle Order #: 770944
Attention:	accounts payable	Attention:	Ahileas Mitsopoulos, Michael Soramaki	P.O. #:			
Address:	1142 Roland St, Thunder Bay ON P7B 5M4	Address:		Project:	THB-00006196-PE	COC #: C#770944-02-01	Project Manager: Julie Clement
Tel:	(807) 623-9495 Fax: (807) 623-8070	Tel:	Fax:	Project Name:			
Email:	thunderbay@exp.com; Karen.Burke@exp.com;AP@ex	Email:	ahileas.mitsopoulos@exp.com, connor.porter@exp.com	Site #:	Longlac Landfill		
				Sampled By:	EF		

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE BV LABS DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011): ☐ Table 1 ☐ Res/Park ☐ Medium/Fine ☐ Table 2 ☐ Ind/Comm ☐ Coarse ☐ Table 3 ☐ Agri/Other ☐ For RSC ☐ Table ___

Other Regulations: ☐ CCME ☐ Sanitary Sewer Bylaw ☐ Reg 558 ☐ Storm Sewer Bylaw ☐ MISA Municipality ___ ☐ PWQO ☒ Other ODWS

Special Instructions:

Include Criteria on Certificate of Analysis (Y/N)? ___

ANALYSIS REQUESTED (PLEASE BE SPECIFIC)

#	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Hg / Cr VI	GW Spring sched5 (no VOCs)	Organic Nitrogen	Orthophosphate	Hardness (calculated as CaCO3)	Extra Dissolved Metals Parameters	# of Bottles	Comments
1		MW-10	May 12, 2020	7:05 PM	GW		X	X	X	X	X	8	
2		MW-11 I	May 12, 2020	2:45 PM	GW		X	X	X	X	X	8	
3		MW-11 II	May 12, 2020	3:15 PM	GW		X	X	X	X	X	8	
4		MW-12 I	May 12, 2020	3:44 PM	GW		X	X	X	X	X	8	
5		MW-12 II	May 12, 2020	4:20 PM	GW		X	X	X	X	X	8	
6		MW-13	May 12, 2020	4:50 PM	GW		X	X	X	X	X	8	
7												~~8~~ MS	
8													
9													
10													

Turnaround Time (TAT) Required: Please provide advance notice for rush projects

Regular (Standard) TAT: ☒
(will be applied if Rush TAT is not specified)
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: ___ Time Required: ___
Rush Confirmation Number: ___ (call lab for #)

RECEIVED TBay

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
Michael Soramaki	20/05/14	1:00PM	James Klepperich (See Page 1)	2020/05/14	15:09	

Laboratory Use Only: Time Sensitive | Temperature (°C) on Recei | Custody Seal: Present Yes / No ✓; Intact N/A

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BV LABS' STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGEMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVLABS.COM/TERMS-AND-CONDITIONS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT WWW.BVLABS.COM/RESOURCES/CHAIN-OF-CUSTODY-FORMS.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BV LABS

White: BV Labs Yellow: Client

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

14-May-20 15:09

Julie Clement

C0C0144

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		
Company Name:	#17501 exp Services Inc	Company Name:		Quotation #:	B90572	Bottle Order #:
Attention:	accounts payable	Attention:	Ahileas Mitsopoulos, Michael Soramaki	P.O. #:		770946
Address:	1142 Roland St Thunder Bay ON P7B 5M4	Address:		Project:	THB-00006196-PE	Project Manager:
Tel:	(807) 623-9495 Fax: (807) 623-8070	Tel:	Fax:	Project Name:	URE ENV-1311	
Email:	thunderbay@exp.com; Karen.Burke@exp.com;AP@ex	Email:	ahileas.mitsopoulos@exp.com, connor.porter@exp.com	Site #:	Longlac Landfill	C#770946-01-01
				Sampled By:	EF	Julie Clement

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE BV LABS DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011)
- ☐ Table 1 ☐ Res/Park ☐ Medium/Fine
- ☐ Table 2 ☐ Ind/Comm ☐ Coarse
- ☐ Table 3 ☐ Agri/Other ☐ For RSC
- ☐ Table ___

Other Regulations
- ☐ CCME ☐ Sanitary Sewer Bylaw
- ☐ Reg 558: ☐ Storm Sewer Bylaw
- ☐ MISA Municipality ___
- ☒ PWQO
- ☐ Other ___

Special Instructions

Include Criteria on Certificate of Analysis (Y/N)? ___

Field Filtered (please circle): Metals (Hg) Cr VI

ANALYSIS REQUESTED (PLEASE BE SPECIFIC)

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	SW Spring sched 5	Organic Nitrogen	Dissolved Organic Carbon (DOC)	Ca, Mg, Na, K	Hardness (calculated as CaCO3)	Dissolved Aluminum (0.2 u, clay free)	Extra Total Metals Parameters	# of Bottles	Comments
1		SW1	May 12, 2020	12:25 PM	SW	X	X	X	X	X	X	X	10	
2		SW2	May 12, 2020	4:55PM	SW	X	X	X	X	X	X	X	10	
3		SW3	May 12, 2020	5:30PM	SW	X	X	X	X	X	X	X	10	
4														
5														
6														
7														
8														
9														
10														

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects

Regular (Standard) TAT: ☒
(will be applied if Rush TAT is not specified)
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: ___ Time Required: ___ ☐
Rush Confirmation Number: ___ *(call lab for #)*

RECEIVED T Bay

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
Michael Soramaki	20/05/14	1:00PM	James Kingsley See Page 1	2020/05/14	15:09	

Laboratory Use Only

Time Sensitive	Temperature (°C) on Rece	Custody Seal	Yes	No
		Present		✓
		Intact		N/A

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BV LABS' STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVLABS.COM/TERMS-AND-CONDITIONS.

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** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT WWW.BVLABS.COM/RESOURCES/CHAIN-OF-CUSTODY-FORMS.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BV LABS

White: BV Labs Yellow: Client

Bureau Veritas Canada (2019) Inc.

Your Project #: THB-00006196-PE
Site Location: LONGLAC LF

Attention: Ahileas Mitsopoulos

exp Services Inc
Thunder Bay Branch
1142 Roland St
Thunder Bay, ON
CANADA P7B 5M4

Your C.O.C. #: 791207-01-01, 791207-02-01, C#791210-01-01

Report Date: 2020/12/17
Report #: R6453943
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

BV LABS JOB #: C0P9015
Received: 2020/10/02, 16:55

Sample Matrix: Water
Samples Received: 16

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Dissolved Aluminum (0.2 u, clay free)	2	N/A	2020/10/07	CAM SOP-00447	EPA 6020B m
Alkalinity	2	N/A	2020/10/06	CAM SOP-00448	SM 23 2320 B m
Alkalinity	13	N/A	2020/10/07	CAM SOP-00448	SM 23 2320 B m
Alkalinity	1	N/A	2020/10/08	CAM SOP-00448	SM 23 2320 B m
Biochemical Oxygen Demand (BOD)	2	2020/10/03	2020/10/08	CAM SOP-00427	SM 23 5210B m
Chloride by Automated Colourimetry	16	N/A	2020/10/07	CAM SOP-00463	SM 23 4500-Cl E m
Chemical Oxygen Demand	16	N/A	2020/10/11	CAM SOP-00416	SM 23 5220 D m
Conductivity	2	N/A	2020/10/06	CAM SOP-00414	SM 23 2510 m
Conductivity	13	N/A	2020/10/07	CAM SOP-00414	SM 23 2510 m
Conductivity	1	N/A	2020/10/08	CAM SOP-00414	SM 23 2510 m
Dissolved Organic Carbon (DOC) (1)	13	N/A	2020/10/07	CAM SOP-00446	SM 23 5310 B m
Dissolved Organic Carbon (DOC) (1)	3	N/A	2020/10/08	CAM SOP-00446	SM 23 5310 B m
Hardness (calculated as CaCO3)	5	N/A	2020/10/06	CAM SOP 00102/00408/00447	SM 2340 B
Hardness (calculated as CaCO3)	6	N/A	2020/10/07	CAM SOP 00102/00408/00447	SM 2340 B
Hardness (calculated as CaCO3)	5	N/A	2020/10/08	CAM SOP 00102/00408/00447	SM 2340 B
Mercury in Water by CVAA	16	2020/10/08	2020/10/08	CAM SOP-00453	EPA 7470A m
Dissolved Calcium and Magnesium	2	2020/10/06	2020/10/07	CAM SOP-00408	EPA 6010D m
Dissolved Metals by ICPMS	8	N/A	2020/10/06	CAM SOP-00447	EPA 6020B m
Dissolved Metals by ICPMS	5	N/A	2020/10/07	CAM SOP-00447	EPA 6020B m
Dissolved Metals by ICPMS	1	N/A	2020/10/08	CAM SOP-00447	EPA 6020B m
Total Metals Analysis by ICPMS	2	N/A	2020/10/08	CAM SOP-00447	EPA 6020B m
Ion Balance (% Difference)	8	N/A	2020/10/07		
Ion Balance (% Difference)	6	N/A	2020/10/08		
Total Ammonia-N	16	N/A	2020/10/08	CAM SOP-00441	USGS I-2522-90 m

Your Project #: THB-00006196-PE
Site Location: LONGLAC LF

Attention: Ahileas Mitsopoulos

exp Services Inc
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Your C.O.C. #: 791207-01-01, 791207-02-01, C#791210-01-01

Report Date: 2020/12/17
Report #: R6453943
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

BV LABS JOB #: C0P9015
Received: 2020/10/02, 16:55

Sample Matrix: Water
Samples Received: 16

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Nitrate (NO3) and Nitrite (NO2) in Water (2)	3	N/A	2020/10/07	CAM SOP-00440	SM 23 4500-NO3I/NO2B
Nitrate (NO3) and Nitrite (NO2) in Water (2)	13	N/A	2020/10/08	CAM SOP-00440	SM 23 4500-NO3I/NO2B
Organic Nitrogen	16	N/A	2020/10/10		
pH	2	2020/10/05	2020/10/06	CAM SOP-00413	SM 4500H+ B m
pH	13	2020/10/06	2020/10/07	CAM SOP-00413	SM 4500H+ B m
pH	1	2020/10/06	2020/10/08	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	8	N/A	2020/10/06	CAM SOP-00444	OMOE E3179 m
Phenols (4AAP)	8	N/A	2020/10/07	CAM SOP-00444	OMOE E3179 m
Orthophosphate	5	N/A	2020/10/07	CAM SOP-00461	EPA 365.1 m
Orthophosphate	9	N/A	2020/10/08	CAM SOP-00461	EPA 365.1 m
Sulphate by Automated Colourimetry	16	N/A	2020/10/07	CAM SOP-00464	EPA 375.4 m
Total Dissolved Solids	16	2020/10/07	2020/10/08	CAM SOP-00428	SM 23 2540C m
Total Kjeldahl Nitrogen in Water	8	2020/10/07	2020/10/10	CAM SOP-00938	OMOE E3516 m
Total Kjeldahl Nitrogen in Water	8	2020/10/07	2020/10/09	CAM SOP-00938	OMOE E3516 m
Total Phosphorus (Colourimetric)	2	2020/10/08	2020/10/08	CAM SOP-00407	SM 23 4500 P B H m
Total Phosphorus (Colourimetric)	2	2020/10/07	2020/10/07	CAM SOP-00407	SM 23 4500 P B H m
Total Phosphorus (Colourimetric)	12	2020/10/07	2020/10/08	CAM SOP-00407	SM 23 4500 P B H m
Low Level Total Suspended Solids	2	2020/10/07	2020/10/08	CAM SOP-00428	SM 23 2540D m
Volatile Organic Compounds in Water	3	N/A	2020/10/07	CAM SOP-00226	EPA 8260C m
Volatile Organic Compounds in Water	1	N/A	2020/10/08	CAM SOP-00226	EPA 8260C m

Remarks:

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

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in BV Labs profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and BV Labs in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless

Your Project #: THB-00006196-PE
Site Location: LONGLAC LF

Attention: Ahileas Mitsopoulos

exp Services Inc
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Your C.O.C. #: 791207-01-01, 791207-02-01, C#791210-01-01

Report Date: 2020/12/17
Report #: R6453943
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

BV LABS JOB #: C0P9015
Received: 2020/10/02, 16:55

indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

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

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

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
(1) Dissolved Organic Carbon (DOC) present in the sample should be considered as non-purgeable DOC.
(2) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Julie Clement, Technical Account Manager
Email: Julie.CLEMENT@bvlabs.com
Phone# (613)868-6079
==========
BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

BV Labs ID		NUK392			NUK393		
Sampling Date		2020/09/30 08:40			2020/09/30 09:20		
COC Number		791207-01-01			791207-01-01		
	UNITS	**MW2**	**RDL**	**QC Batch**	**MW3**	**RDL**	**QC Batch**
Inorganics							
Total Ammonia-N	mg/L	0.46	0.050	6988508	0.94 (1)	0.050	6988508
Total Chemical Oxygen Demand (COD)	mg/L	20	4.0	6987811	8.0	4.0	6987811
Conductivity	umho/cm	390	1.0	6985324	440	1.0	6985324
Total Dissolved Solids	mg/L	220	10	6987773	270	10	6987773
Total Kjeldahl Nitrogen (TKN)	mg/L	0.59	0.10	6987782	0.88 (1)	0.10	6987782
Dissolved Organic Carbon	mg/L	5.9	0.40	6985149	1.5	0.40	6985149
pH	pH	8.02		6985331	8.06		6985331
Phenols-4AAP	mg/L	<0.0010	0.0010	6984904	<0.0010	0.0010	6984890
Total Phosphorus	mg/L	0.31	0.020	6987806	0.33	0.10	6987345
Dissolved Sulphate (SO4)	mg/L	<1.0	1.0	6983658	<1.0	1.0	6985722
Alkalinity (Total as CaCO3)	mg/L	230	1.0	6985334	260	1.0	6985334
Dissolved Chloride (Cl-)	mg/L	2.3	1.0	6983659	1.3	1.0	6985706
Nitrite (N)	mg/L	0.040	0.010	6985704	0.015	0.010	6985704
Nitrate (N)	mg/L	<0.10	0.10	6985704	<0.10	0.10	6985704
Metals							
Mercury (Hg)	mg/L	<0.00010	0.00010	6989765	<0.00010	0.00010	6989769
Dissolved Aluminum (Al)	ug/L	19	4.9	6985396	<4.9	4.9	6985396
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	6985396	<0.50	0.50	6985396
Dissolved Arsenic (As)	ug/L	1.5	1.0	6985396	3.1	1.0	6985396
Dissolved Barium (Ba)	ug/L	22	2.0	6985396	41	2.0	6985396
Dissolved Beryllium (Be)	ug/L	<0.40	0.40	6985396	<0.40	0.40	6985396
Dissolved Bismuth (Bi)	ug/L	<1.0	1.0	6985396	<1.0	1.0	6985396
Dissolved Boron (B)	ug/L	19	10	6985396	36	10	6985396
Dissolved Cadmium (Cd)	ug/L	<0.090	0.090	6985396	<0.090	0.090	6985396
Dissolved Calcium (Ca)	ug/L	61000	200	6985396	63000	200	6985396
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	6985396	<5.0	5.0	6985396
Dissolved Cobalt (Co)	ug/L	<0.50	0.50	6985396	<0.50	0.50	6985396
Dissolved Copper (Cu)	ug/L	<0.90	0.90	6985396	<0.90	0.90	6985396
Dissolved Iron (Fe)	ug/L	510	100	6985396	1500	100	6985396
Dissolved Lead (Pb)	ug/L	<0.50	0.50	6985396	<0.50	0.50	6985396
Dissolved Magnesium (Mg)	ug/L	14000	50	6985396	19000	50	6985396
Dissolved Manganese (Mn)	ug/L	76	2.0	6985396	62	2.0	6985396

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) TKN < NH4: Both values fall within acceptable RPD limits for duplicates and are likely equivalent.

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LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

BV Labs ID		NUK392			NUK393		
Sampling Date		2020/09/30 08:40			2020/09/30 09:20		
COC Number		791207-01-01			791207-01-01		
	UNITS	**MW2**	**RDL**	**QC Batch**	**MW3**	**RDL**	**QC Batch**
Dissolved Molybdenum (Mo)	ug/L	<0.50	0.50	6985396	<0.50	0.50	6985396
Dissolved Nickel (Ni)	ug/L	<1.0	1.0	6985396	<1.0	1.0	6985396
Dissolved Potassium (K)	ug/L	820	200	6985396	1200	200	6985396
Dissolved Selenium (Se)	ug/L	<2.0	2.0	6985396	<2.0	2.0	6985396
Dissolved Silicon (Si)	ug/L	7500	50	6985396	8600	50	6985396
Dissolved Sodium (Na)	ug/L	7100	100	6985396	9200	100	6985396
Dissolved Strontium (Sr)	ug/L	200	1.0	6985396	270	1.0	6985396
Dissolved Thallium (Tl)	ug/L	<0.050	0.050	6985396	<0.050	0.050	6985396
Dissolved Tin (Sn)	ug/L	<1.0	1.0	6985396	<1.0	1.0	6985396
Dissolved Vanadium (V)	ug/L	<0.50	0.50	6985396	<0.50	0.50	6985396
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	6985396	<5.0	5.0	6985396

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

BV Labs Job #: C0P9015
Report Date: 2020/12/17

exp Services Inc
Client Project #: THB-00006196-PE
Site Location: LONGLAC LF
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

BV Labs ID		NUK394			NUK394		
Sampling Date		2020/09/30 15:30			2020/09/30 15:30		
COC Number		791207-01-01			791207-01-01		
	UNITS	**MW4I**	**RDL**	**QC Batch**	**MW4I Lab-Dup**	**RDL**	**QC Batch**
Inorganics							
Total Ammonia-N	mg/L	0.11	0.050	6988508			
Total Chemical Oxygen Demand (COD)	mg/L	6.7	4.0	6987811			
Conductivity	umho/cm	620	1.0	6985324			
Total Dissolved Solids	mg/L	325	10	6987773	315	10	6987773
Total Kjeldahl Nitrogen (TKN)	mg/L	0.19	0.10	6987782	0.18	0.10	6987782
Dissolved Organic Carbon	mg/L	2.4	0.40	6985149			
pH	pH	8.14		6985331			
Phenols-4AAP	mg/L	<0.0010	0.0010	6984897			
Total Phosphorus	mg/L	0.026	0.020	6987806			
Dissolved Sulphate (SO4)	mg/L	1.2	1.0	6985722			
Alkalinity (Total as CaCO3)	mg/L	340	1.0	6985334			
Dissolved Chloride (Cl-)	mg/L	2.2	1.0	6985706			
Nitrite (N)	mg/L	0.020	0.010	6985370			
Nitrate (N)	mg/L	0.11	0.10	6985370			
Metals							
Mercury (Hg)	mg/L	<0.00010	0.00010	6989765			
Dissolved Aluminum (Al)	ug/L	6.7	4.9	6985396			
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	6985396			
Dissolved Arsenic (As)	ug/L	<1.0	1.0	6985396			
Dissolved Barium (Ba)	ug/L	60	2.0	6985396			
Dissolved Beryllium (Be)	ug/L	<0.40	0.40	6985396			
Dissolved Bismuth (Bi)	ug/L	<1.0	1.0	6985396			
Dissolved Boron (B)	ug/L	56	10	6985396			
Dissolved Cadmium (Cd)	ug/L	<0.090	0.090	6985396			
Dissolved Calcium (Ca)	ug/L	75000	200	6985396			
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	6985396			
Dissolved Cobalt (Co)	ug/L	<0.50	0.50	6985396			
Dissolved Copper (Cu)	ug/L	1.8	0.90	6985396			
Dissolved Iron (Fe)	ug/L	<100	100	6985396			
Dissolved Lead (Pb)	ug/L	<0.50	0.50	6985396			
Dissolved Magnesium (Mg)	ug/L	30000	50	6985396			
Dissolved Manganese (Mn)	ug/L	54	2.0	6985396			

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

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LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

BV Labs ID		NUK394			NUK394		
Sampling Date		2020/09/30 15:30			2020/09/30 15:30		
COC Number		791207-01-01			791207-01-01		
	UNITS	**MW4I**	**RDL**	**QC Batch**	**MW4I Lab-Dup**	**RDL**	**QC Batch**
Dissolved Molybdenum (Mo)	ug/L	2.3	0.50	6985396			
Dissolved Nickel (Ni)	ug/L	<1.0	1.0	6985396			
Dissolved Potassium (K)	ug/L	6400	200	6985396			
Dissolved Selenium (Se)	ug/L	<2.0	2.0	6985396			
Dissolved Silicon (Si)	ug/L	8000	50	6985396			
Dissolved Sodium (Na)	ug/L	12000	100	6985396			
Dissolved Strontium (Sr)	ug/L	470	1.0	6985396			
Dissolved Thallium (Tl)	ug/L	<0.050	0.050	6985396			
Dissolved Tin (Sn)	ug/L	<1.0	1.0	6985396			
Dissolved Vanadium (V)	ug/L	<0.50	0.50	6985396			
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	6985396			

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

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

BV Labs Job #: C0P9015
Report Date: 2020/12/17

exp Services Inc
Client Project #: THB-00006196-PE
Site Location: LONGLAC LF
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

BV Labs ID		NUK395			NUK396		
Sampling Date		2020/09/30 16:00			2020/09/30 14:00		
COC Number		791207-01-01			791207-01-01		
	UNITS	**MW4II**	**RDL**	**QC Batch**	**MW5**	**RDL**	**QC Batch**
Inorganics							
Total Ammonia-N	mg/L	5.4	0.050	6988508	0.066	0.050	6988508
Total Chemical Oxygen Demand (COD)	mg/L	34	4.0	6987811	4.3	4.0	6987811
Conductivity	umho/cm	2200	1.0	6985324	560	1.0	6985324
Total Dissolved Solids	mg/L	1250	10	6987773	280	10	6982647
Total Kjeldahl Nitrogen (TKN)	mg/L	5.6	1.0	6987782	0.22	0.10	6987782
Dissolved Organic Carbon	mg/L	15	0.40	6985149	1.2	0.40	6985149
pH	pH	8.00		6985331	7.98		6985331
Phenols-4AAP	mg/L	<0.0010	0.0010	6984890	<0.0010	0.0010	6984890
Total Phosphorus	mg/L	2.0	0.10	6987806	0.10	0.020	6987806
Dissolved Sulphate (SO4)	mg/L	<1.0	1.0	6983658	2.0	1.0	6985722
Alkalinity (Total as CaCO3)	mg/L	1200	1.0	6985334	300	1.0	6985334
Dissolved Chloride (Cl-)	mg/L	47	1.0	6983659	1.6	1.0	6985706
Nitrite (N)	mg/L	2.60	0.010	6985704	<0.010	0.010	6985704
Nitrate (N)	mg/L	0.92	0.10	6985704	1.37	0.10	6985704
Metals							
Mercury (Hg)	mg/L	<0.00010	0.00010	6989765	<0.00010	0.00010	6989765
Dissolved Aluminum (Al)	ug/L	180	4.9	6985396	54	4.9	6985386
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	6985396	<0.50	0.50	6985386
Dissolved Arsenic (As)	ug/L	<1.0	1.0	6985396	<1.0	1.0	6985386
Dissolved Barium (Ba)	ug/L	150	2.0	6985396	26	2.0	6985386
Dissolved Beryllium (Be)	ug/L	<0.40	0.40	6985396	<0.40	0.40	6985386
Dissolved Bismuth (Bi)	ug/L	<1.0	1.0	6985396	<1.0	1.0	6985386
Dissolved Boron (B)	ug/L	1100	10	6985396	<10	10	6985386
Dissolved Cadmium (Cd)	ug/L	<0.090	0.090	6985396	<0.090	0.090	6985386
Dissolved Calcium (Ca)	ug/L	140000	200	6985396	88000	200	6985386
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	6985396	<5.0	5.0	6985386
Dissolved Cobalt (Co)	ug/L	7.6	0.50	6985396	<0.50	0.50	6985386
Dissolved Copper (Cu)	ug/L	9.3	0.90	6985396	<0.90	0.90	6985386
Dissolved Iron (Fe)	ug/L	280	100	6985396	<100	100	6985386
Dissolved Lead (Pb)	ug/L	0.63	0.50	6985396	<0.50	0.50	6985386
Dissolved Magnesium (Mg)	ug/L	150000	50	6985396	22000	50	6985386
Dissolved Manganese (Mn)	ug/L	960	2.0	6985396	2.2	2.0	6985386
Dissolved Molybdenum (Mo)	ug/L	2.9	0.50	6985396	<0.50	0.50	6985386

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

BV Labs ID		NUK395			NUK396		
Sampling Date		2020/09/30 16:00			2020/09/30 14:00		
COC Number		791207-01-01			791207-01-01		
	UNITS	**MW4II**	**RDL**	**QC Batch**	**MW5**	**RDL**	**QC Batch**
Dissolved Nickel (Ni)	ug/L	13	1.0	6985396	<1.0	1.0	6985386
Dissolved Potassium (K)	ug/L	210000	1000	6985396	960	200	6985386
Dissolved Selenium (Se)	ug/L	<2.0	2.0	6985396	<2.0	2.0	6985386
Dissolved Silicon (Si)	ug/L	6300	50	6985396	6500	50	6985386
Dissolved Sodium (Na)	ug/L	41000	100	6985396	2800	100	6985386
Dissolved Strontium (Sr)	ug/L	240	1.0	6985396	82	1.0	6985386
Dissolved Thallium (Tl)	ug/L	0.29	0.050	6985396	<0.050	0.050	6985386
Dissolved Tin (Sn)	ug/L	<1.0	1.0	6985396	<1.0	1.0	6985386
Dissolved Vanadium (V)	ug/L	1.4	0.50	6985396	1.0	0.50	6985386
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	6985396	<5.0	5.0	6985386

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

BV Labs ID		NUK397			NUK398		
Sampling Date		2020/09/30 13:00			2020/09/30 11:50		
COC Number		791207-01-01			791207-01-01		
	UNITS	**MW6**	**RDL**	**QC Batch**	**MW7**	**RDL**	**QC Batch**
Inorganics							
Total Ammonia-N	mg/L	60 (1)	0.50	6988508	23	0.050	6988508
Total Chemical Oxygen Demand (COD)	mg/L	8.7	4.0	6987811	68	4.0	6987811
Conductivity	umho/cm	1100	1.0	6985324	2200	1.0	6985324
Total Dissolved Solids	mg/L	425	10	6987773	1180	10	6987773
Total Kjeldahl Nitrogen (TKN)	mg/L	56 (1)	2.0	6987782	25	2.0	6987782
Dissolved Organic Carbon	mg/L	3.3	0.40	6985645	22	0.40	6985149
pH	pH	7.88		6985331	7.80		6985331
Phenols-4AAP	mg/L	<0.0010	0.0010	6984904	0.0011	0.0010	6984904
Total Phosphorus	mg/L	0.19	0.020	6987806	0.38	0.020	6987806
Dissolved Sulphate (SO4)	mg/L	10	1.0	6983658	35	1.0	6985722
Alkalinity (Total as CaCO3)	mg/L	550	1.0	6985334	830	1.0	6985334
Dissolved Chloride (Cl-)	mg/L	20	1.0	6983659	180	2.0	6985706
Nitrite (N)	mg/L	0.088	0.010	6985704	0.116	0.010	6985704
Nitrate (N)	mg/L	3.63	0.10	6985704	11.1	0.10	6985704
Metals							
Mercury (Hg)	mg/L	<0.00010	0.00010	6989765	<0.00010	0.00010	6989765
Dissolved Aluminum (Al)	ug/L	1700	4.9	6985427	9.3	4.9	6985427
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	6985427	<0.50	0.50	6985427
Dissolved Arsenic (As)	ug/L	<1.0	1.0	6985427	1.9	1.0	6985427
Dissolved Barium (Ba)	ug/L	140	2.0	6985427	250	2.0	6985427
Dissolved Beryllium (Be)	ug/L	<0.40	0.40	6985427	<0.40	0.40	6985427
Dissolved Bismuth (Bi)	ug/L	<1.0	1.0	6985427	<1.0	1.0	6985427
Dissolved Boron (B)	ug/L	31	10	6985427	1100	10	6985427
Dissolved Cadmium (Cd)	ug/L	<0.090	0.090	6985427	<0.090	0.090	6985427
Dissolved Calcium (Ca)	ug/L	140000	200	6985427	180000	200	6985427
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	6985427	<5.0	5.0	6985427
Dissolved Cobalt (Co)	ug/L	2.8	0.50	6985427	9.5	0.50	6985427
Dissolved Copper (Cu)	ug/L	7.4	0.90	6985427	2.9	0.90	6985427
Dissolved Iron (Fe)	ug/L	2600	100	6985427	490	100	6985427
Dissolved Lead (Pb)	ug/L	3.0	0.50	6985427	<0.50	0.50	6985427
Dissolved Magnesium (Mg)	ug/L	31000	50	6985427	55000	50	6985427
Dissolved Manganese (Mn)	ug/L	460	2.0	6985427	910	2.0	6985427

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) TKN < NH4: Both values fall within acceptable RPD limits for duplicates and are likely equivalent.

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LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

BV Labs ID		NUK397			NUK398		
Sampling Date		2020/09/30 13:00			2020/09/30 11:50		
COC Number		791207-01-01			791207-01-01		
	UNITS	**MW6**	**RDL**	**QC Batch**	**MW7**	**RDL**	**QC Batch**
Dissolved Molybdenum (Mo)	ug/L	<0.50	0.50	6985427	0.66	0.50	6985427
Dissolved Nickel (Ni)	ug/L	6.0	1.0	6985427	22	1.0	6985427
Dissolved Potassium (K)	ug/L	4100	200	6985427	67000	200	6985427
Dissolved Selenium (Se)	ug/L	<2.0	2.0	6985427	<2.0	2.0	6985427
Dissolved Silicon (Si)	ug/L	9300	50	6985427	8900	50	6985427
Dissolved Sodium (Na)	ug/L	16000	100	6985427	160000	100	6985427
Dissolved Strontium (Sr)	ug/L	220	1.0	6985427	320	1.0	6985427
Dissolved Thallium (Tl)	ug/L	0.093	0.050	6985427	0.17	0.050	6985427
Dissolved Tin (Sn)	ug/L	<1.0	1.0	6985427	<1.0	1.0	6985427
Dissolved Vanadium (V)	ug/L	4.8	0.50	6985427	<0.50	0.50	6985427
Dissolved Zinc (Zn)	ug/L	8.4	5.0	6985427	<5.0	5.0	6985427

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

BV Labs ID		NUK399			NUK400		
Sampling Date		2020/09/30 11:25			2020/09/30 15:00		
COC Number		791207-01-01			791207-01-01		
	UNITS	**MW8I**	**RDL**	**QC Batch**	**MW10**	**RDL**	**QC Batch**
Inorganics							
Total Ammonia-N	mg/L	71 (1)	0.50	6988508	<0.050	0.050	6988508
Total Chemical Oxygen Demand (COD)	mg/L	200	12	6987811	9.4	4.0	6987811
Conductivity	umho/cm	4700	1.0	6986264	470	1.0	6985324
Total Dissolved Solids	mg/L	2540	10	6987773	245	10	6987773
Total Kjeldahl Nitrogen (TKN)	mg/L	64 (1)	5.0	6987782	0.26	0.10	6987782
Dissolved Organic Carbon	mg/L	75	0.40	6985149	3.8	0.40	6985149
pH	pH	7.55		6986269	7.91		6985331
Phenols-4AAP	mg/L	0.0024	0.0010	6984904	<0.0010	0.0010	6984904
Total Phosphorus	mg/L	0.13	0.020	6987806	0.25	0.020	6987806
Dissolved Sulphate (SO4)	mg/L	180	1.0	6985722	1.3	1.0	6985722
Alkalinity (Total as CaCO3)	mg/L	1700	1.0	6986262	250	1.0	6985334
Dissolved Chloride (Cl-)	mg/L	540	5.0	6985706	2.4	1.0	6985706
Nitrite (N)	mg/L	0.028	0.010	6985704	<0.010	0.010	6985704
Nitrate (N)	mg/L	<0.10	0.10	6985704	0.14	0.10	6985704
Metals							
Mercury (Hg)	mg/L	<0.00010	0.00010	6989765	<0.00010	0.00010	6989765
Dissolved Aluminum (Al)	ug/L	11	4.9	6985427	4.9	4.9	6985386
Dissolved Antimony (Sb)	ug/L	0.60	0.50	6985427	<0.50	0.50	6985386
Dissolved Arsenic (As)	ug/L	5.5	1.0	6985427	<1.0	1.0	6985386
Dissolved Barium (Ba)	ug/L	290	2.0	6985427	15	2.0	6985386
Dissolved Beryllium (Be)	ug/L	<0.40	0.40	6985427	<0.40	0.40	6985386
Dissolved Bismuth (Bi)	ug/L	<1.0	1.0	6985427	<1.0	1.0	6985386
Dissolved Boron (B)	ug/L	2600	10	6985427	<10	10	6985386
Dissolved Cadmium (Cd)	ug/L	<0.090	0.090	6985427	<0.090	0.090	6985386
Dissolved Calcium (Ca)	ug/L	200000	200	6985427	76000	200	6985386
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	6985427	<5.0	5.0	6985386
Dissolved Cobalt (Co)	ug/L	16	0.50	6985427	<0.50	0.50	6985386
Dissolved Copper (Cu)	ug/L	2.9	0.90	6985427	3.4	0.90	6985386
Dissolved Iron (Fe)	ug/L	170	100	6985427	<100	100	6985386
Dissolved Lead (Pb)	ug/L	<0.50	0.50	6985427	<0.50	0.50	6985386
Dissolved Magnesium (Mg)	ug/L	160000	50	6985427	15000	50	6985386
Dissolved Manganese (Mn)	ug/L	900	2.0	6985427	27	2.0	6985386

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) TKN < NH4: Both values fall within acceptable RPD limits for duplicates and are likely equivalent.

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

BV Labs ID		NUK399			NUK400		
Sampling Date		2020/09/30 11:25			2020/09/30 15:00		
COC Number		791207-01-01			791207-01-01		
	UNITS	**MW8I**	**RDL**	**QC Batch**	**MW10**	**RDL**	**QC Batch**
Dissolved Molybdenum (Mo)	ug/L	3.9	0.50	6985427	<0.50	0.50	6985386
Dissolved Nickel (Ni)	ug/L	41	1.0	6985427	<1.0	1.0	6985386
Dissolved Potassium (K)	ug/L	300000	1000	6985427	320	200	6985386
Dissolved Selenium (Se)	ug/L	<2.0	2.0	6985427	<2.0	2.0	6985386
Dissolved Silicon (Si)	ug/L	9600	50	6985427	5000	50	6985386
Dissolved Sodium (Na)	ug/L	450000	100	6985427	1800	100	6985386
Dissolved Strontium (Sr)	ug/L	630	1.0	6985427	61	1.0	6985386
Dissolved Thallium (Tl)	ug/L	0.45	0.050	6985427	<0.050	0.050	6985386
Dissolved Tin (Sn)	ug/L	<1.0	1.0	6985427	<1.0	1.0	6985386
Dissolved Vanadium (V)	ug/L	1.9	0.50	6985427	0.53	0.50	6985386
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	6985427	<5.0	5.0	6985386

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

BV Labs ID		NUK400			NUK401		
Sampling Date		2020/09/30 15:00			2020/09/30 10:05		
COC Number		791207-01-01			791207-01-01		
	UNITS	**MW10 Lab-Dup**	**RDL**	**QC Batch**	**MW11I**	**RDL**	**QC Batch**
Inorganics							
Total Ammonia-N	mg/L				0.066	0.050	6988508
Total Chemical Oxygen Demand (COD)	mg/L				21	4.0	6987811
Conductivity	umho/cm				1500	1.0	6985324
Total Dissolved Solids	mg/L				880	10	6987773
Total Kjeldahl Nitrogen (TKN)	mg/L				0.54	0.10	6987782
Dissolved Organic Carbon	mg/L	3.5	0.40	6985149	6.1	0.40	6985149
pH	pH				7.78		6985331
Phenols-4AAP	mg/L				<0.0010	0.0010	6984904
Total Phosphorus	mg/L				2.7	0.040	6987806
Dissolved Sulphate (SO4)	mg/L				97	1.0	6985722
Alkalinity (Total as CaCO3)	mg/L				560	1.0	6985334
Dissolved Chloride (Cl-)	mg/L				120	1.0	6985706
Nitrite (N)	mg/L				<0.010	0.010	6985704
Nitrate (N)	mg/L				<0.10	0.10	6985704
Metals							
Mercury (Hg)	mg/L				<0.00010	0.00010	6989765
Dissolved Aluminum (Al)	ug/L				11	4.9	6985386
Dissolved Antimony (Sb)	ug/L				<0.50	0.50	6985386
Dissolved Arsenic (As)	ug/L				<1.0	1.0	6985386
Dissolved Barium (Ba)	ug/L				110	2.0	6985386
Dissolved Beryllium (Be)	ug/L				<0.40	0.40	6985386
Dissolved Bismuth (Bi)	ug/L				<1.0	1.0	6985386
Dissolved Boron (B)	ug/L				130	10	6985386
Dissolved Cadmium (Cd)	ug/L				<0.090	0.090	6985386
Dissolved Calcium (Ca)	ug/L				200000	200	6985386
Dissolved Chromium (Cr)	ug/L				<5.0	5.0	6985386
Dissolved Cobalt (Co)	ug/L				<0.50	0.50	6985386
Dissolved Copper (Cu)	ug/L				<0.90	0.90	6985386
Dissolved Iron (Fe)	ug/L				2700	100	6985386
Dissolved Lead (Pb)	ug/L				<0.50	0.50	6985386
Dissolved Magnesium (Mg)	ug/L				44000	50	6985386
Dissolved Manganese (Mn)	ug/L				110	2.0	6985386

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

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

BV Labs ID		NUK400			NUK401		
Sampling Date		2020/09/30 15:00			2020/09/30 10:05		
COC Number		791207-01-01			791207-01-01		
	UNITS	**MW10 Lab-Dup**	**RDL**	**QC Batch**	**MW11I**	**RDL**	**QC Batch**
Dissolved Molybdenum (Mo)	ug/L				<0.50	0.50	6985386
Dissolved Nickel (Ni)	ug/L				1.9	1.0	6985386
Dissolved Potassium (K)	ug/L				3600	200	6985386
Dissolved Selenium (Se)	ug/L				<2.0	2.0	6985386
Dissolved Silicon (Si)	ug/L				6100	50	6985386
Dissolved Sodium (Na)	ug/L				67000	100	6985386
Dissolved Strontium (Sr)	ug/L				210	1.0	6985386
Dissolved Thallium (Tl)	ug/L				<0.050	0.050	6985386
Dissolved Tin (Sn)	ug/L				<1.0	1.0	6985386
Dissolved Vanadium (V)	ug/L				<0.50	0.50	6985386
Dissolved Zinc (Zn)	ug/L				<5.0	5.0	6985386

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

BV Labs Job #: C0P9015
Report Date: 2020/12/17

exp Services Inc
Client Project #: THB-00006196-PE
Site Location: LONGLAC LF
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

BV Labs ID		NUK401			NUK405		
Sampling Date		2020/09/30 10:05			2020/09/30 10:40		
COC Number		791207-01-01			791207-02-01		
	UNITS	**MW11I Lab-Dup**	**RDL**	**QC Batch**	**MW11 II**	**RDL**	**QC Batch**
Inorganics							
Total Ammonia-N	mg/L				0.13	0.050	6988508
Total Chemical Oxygen Demand (COD)	mg/L				11	4.0	6987811
Conductivity	umho/cm				1200	1.0	6985324
Total Dissolved Solids	mg/L				740	10	6987773
Total Kjeldahl Nitrogen (TKN)	mg/L				0.26	0.10	6987782
Dissolved Organic Carbon	mg/L				4.4	0.40	6985149
pH	pH				7.77		6985331
Phenols-4AAP	mg/L	<0.0010	0.0010	6984904	<0.0010	0.0010	6984897
Total Phosphorus	mg/L				1.4	0.040	6987806
Dissolved Sulphate (SO4)	mg/L				110	1.0	6983658
Alkalinity (Total as CaCO3)	mg/L				380	1.0	6985334
Dissolved Chloride (Cl-)	mg/L				110	1.0	6983659
Nitrite (N)	mg/L				<0.010	0.010	6985364
Nitrate (N)	mg/L				<0.10	0.10	6985364
Metals							
Mercury (Hg)	mg/L	<0.00010	0.00010	6989765	<0.00010	0.00010	6989769
Dissolved Aluminum (Al)	ug/L				<4.9	4.9	6985386
Dissolved Antimony (Sb)	ug/L				<0.50	0.50	6985386
Dissolved Arsenic (As)	ug/L				1.3	1.0	6985386
Dissolved Barium (Ba)	ug/L				150	2.0	6985386
Dissolved Beryllium (Be)	ug/L				<0.40	0.40	6985386
Dissolved Bismuth (Bi)	ug/L				<1.0	1.0	6985386
Dissolved Boron (B)	ug/L				44	10	6985386
Dissolved Cadmium (Cd)	ug/L				<0.090	0.090	6985386
Dissolved Calcium (Ca)	ug/L				180000	200	6985386
Dissolved Chromium (Cr)	ug/L				<5.0	5.0	6985386
Dissolved Cobalt (Co)	ug/L				<0.50	0.50	6985386
Dissolved Copper (Cu)	ug/L				<0.90	0.90	6985386
Dissolved Iron (Fe)	ug/L				1600	100	6985386
Dissolved Lead (Pb)	ug/L				<0.50	0.50	6985386
Dissolved Magnesium (Mg)	ug/L				39000	50	6985386
Dissolved Manganese (Mn)	ug/L				130	2.0	6985386

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

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LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

BV Labs ID		NUK401			NUK405		
Sampling Date		2020/09/30 10:05			2020/09/30 10:40		
COC Number		791207-01-01			791207-02-01		
	UNITS	**MW11I Lab-Dup**	**RDL**	**QC Batch**	**MW11 II**	**RDL**	**QC Batch**
Dissolved Molybdenum (Mo)	ug/L				<0.50	0.50	6985386
Dissolved Nickel (Ni)	ug/L				<1.0	1.0	6985386
Dissolved Potassium (K)	ug/L				3300	200	6985386
Dissolved Selenium (Se)	ug/L				<2.0	2.0	6985386
Dissolved Silicon (Si)	ug/L				7400	50	6985386
Dissolved Sodium (Na)	ug/L				37000	100	6985386
Dissolved Strontium (Sr)	ug/L				210	1.0	6985386
Dissolved Thallium (Tl)	ug/L				<0.050	0.050	6985386
Dissolved Tin (Sn)	ug/L				<1.0	1.0	6985386
Dissolved Vanadium (V)	ug/L				0.70	0.50	6985386
Dissolved Zinc (Zn)	ug/L				<5.0	5.0	6985386

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

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

BV Labs ID		NUK406			NUK406		
Sampling Date		2020/09/30 17:40			2020/09/30 17:40		
COC Number		791207-02-01			791207-02-01		
	UNITS	**MW12 I**	**RDL**	**QC Batch**	**MW12 I Lab-Dup**	**RDL**	**QC Batch**
Inorganics							
Total Ammonia-N	mg/L	<0.050	0.050	6988508			
Total Chemical Oxygen Demand (COD)	mg/L	<4.0	4.0	6987811			
Conductivity	umho/cm	890	1.0	6985324			
Total Dissolved Solids	mg/L	520	10	6987773			
Total Kjeldahl Nitrogen (TKN)	mg/L	0.22	0.10	6987782			
Dissolved Organic Carbon	mg/L	1.8	0.40	6985149			
pH	pH	7.93		6985331			
Phenols-4AAP	mg/L	<0.0010	0.0010	6984904			
Total Phosphorus	mg/L	0.13	0.020	6987806			
Dissolved Sulphate (SO4)	mg/L	89	1.0	6985722			
Alkalinity (Total as CaCO3)	mg/L	380	1.0	6985334			
Dissolved Chloride (Cl-)	mg/L	24	1.0	6985706			
Nitrite (N)	mg/L	<0.010	0.010	6985704			
Nitrate (N)	mg/L	0.12	0.10	6985704			
Metals							
Mercury (Hg)	mg/L	<0.00010	0.00010	6989765			
Dissolved Aluminum (Al)	ug/L	34	4.9	6985396	33	4.9	6985396
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	6985396	<0.50	0.50	6985396
Dissolved Arsenic (As)	ug/L	<1.0	1.0	6985396	<1.0	1.0	6985396
Dissolved Barium (Ba)	ug/L	43	2.0	6985396	42	2.0	6985396
Dissolved Beryllium (Be)	ug/L	<0.40	0.40	6985396	<0.40	0.40	6985396
Dissolved Bismuth (Bi)	ug/L	<1.0	1.0	6985396	<1.0	1.0	6985396
Dissolved Boron (B)	ug/L	85	10	6985396	86	10	6985396
Dissolved Cadmium (Cd)	ug/L	<0.090	0.090	6985396	<0.090	0.090	6985396
Dissolved Calcium (Ca)	ug/L	120000	200	6985396	110000	200	6985396
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	6985396	<5.0	5.0	6985396
Dissolved Cobalt (Co)	ug/L	<0.50	0.50	6985396	<0.50	0.50	6985396
Dissolved Copper (Cu)	ug/L	1.1	0.90	6985396	1.2	0.90	6985396
Dissolved Iron (Fe)	ug/L	<100	100	6985396	<100	100	6985396
Dissolved Lead (Pb)	ug/L	<0.50	0.50	6985396	<0.50	0.50	6985396
Dissolved Magnesium (Mg)	ug/L	28000	50	6985396	28000	50	6985396
Dissolved Manganese (Mn)	ug/L	49	2.0	6985396	48	2.0	6985396

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

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

BV Labs ID		NUK406			NUK406		
Sampling Date		2020/09/30 17:40			2020/09/30 17:40		
COC Number		791207-02-01			791207-02-01		
	UNITS	**MW12 I**	**RDL**	**QC Batch**	**MW12 I Lab-Dup**	**RDL**	**QC Batch**
Dissolved Molybdenum (Mo)	ug/L	0.77	0.50	6985396	0.78	0.50	6985396
Dissolved Nickel (Ni)	ug/L	1.5	1.0	6985396	2.0	1.0	6985396
Dissolved Potassium (K)	ug/L	2400	200	6985396	2300	200	6985396
Dissolved Selenium (Se)	ug/L	<2.0	2.0	6985396	<2.0	2.0	6985396
Dissolved Silicon (Si)	ug/L	11000	50	6985396	11000	50	6985396
Dissolved Sodium (Na)	ug/L	7200	100	6985396	7100	100	6985396
Dissolved Strontium (Sr)	ug/L	290	1.0	6985396	290	1.0	6985396
Dissolved Thallium (Tl)	ug/L	<0.050	0.050	6985396	<0.050	0.050	6985396
Dissolved Tin (Sn)	ug/L	<1.0	1.0	6985396	<1.0	1.0	6985396
Dissolved Vanadium (V)	ug/L	<0.50	0.50	6985396	<0.50	0.50	6985396
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	6985396	<5.0	5.0	6985396

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

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

BV Labs ID		NUK407			NUK408		
Sampling Date		2020/09/30 18:05			2020/09/30 11:50		
COC Number		791207-02-01			791207-02-01		
	UNITS	**MW12 II**	**RDL**	**QC Batch**	**MW13**	**RDL**	**QC Batch**
Inorganics							
Total Ammonia-N	mg/L	0.059	0.050	6988508	23 (1)	0.050	6988508
Total Chemical Oxygen Demand (COD)	mg/L	5.0	4.0	6987811	67	4.0	6987811
Conductivity	umho/cm	1000	1.0	6985324	2200	1.0	6983812
Total Dissolved Solids	mg/L	670	10	6987773	1170	10	6987773
Total Kjeldahl Nitrogen (TKN)	mg/L	0.17	0.10	6987782	22 (1)	2.0	6987782
Dissolved Organic Carbon	mg/L	2.8	0.40	6985149	22	0.40	6985645
pH	pH	7.79		6985331	7.55		6983761
Phenols-4AAP	mg/L	<0.0010	0.0010	6984897	<0.0010	0.0010	6984897
Total Phosphorus	mg/L	0.24	0.020	6987806	0.39	0.10	6987345
Dissolved Sulphate (SO4)	mg/L	120	1.0	6985722	36	1.0	6983658
Alkalinity (Total as CaCO3)	mg/L	430	1.0	6985334	830	1.0	6983722
Dissolved Chloride (Cl-)	mg/L	28	1.0	6985706	170	2.0	6983659
Nitrite (N)	mg/L	<0.010	0.010	6985704	0.064	0.010	6983594
Nitrate (N)	mg/L	0.25	0.10	6985704	10.6	0.10	6983594
Metals							
Mercury (Hg)	mg/L	<0.00010	0.00010	6989765	<0.00010	0.00010	6989765
Dissolved Aluminum (Al)	ug/L	77	4.9	6985386	7.3	4.9	6985427
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	6985386	<0.50	0.50	6985427
Dissolved Arsenic (As)	ug/L	<1.0	1.0	6985386	1.9	1.0	6985427
Dissolved Barium (Ba)	ug/L	41	2.0	6985386	250	2.0	6985427
Dissolved Beryllium (Be)	ug/L	<0.40	0.40	6985386	<0.40	0.40	6985427
Dissolved Bismuth (Bi)	ug/L	<1.0	1.0	6985386	<1.0	1.0	6985427
Dissolved Boron (B)	ug/L	630	10	6985386	1100	10	6985427
Dissolved Cadmium (Cd)	ug/L	<0.090	0.090	6985386	<0.090	0.090	6985427
Dissolved Calcium (Ca)	ug/L	180000	200	6985386	180000	200	6985427
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	6985386	<5.0	5.0	6985427
Dissolved Cobalt (Co)	ug/L	<0.50	0.50	6985386	9.4	0.50	6985427
Dissolved Copper (Cu)	ug/L	1.7	0.90	6985386	2.9	0.90	6985427
Dissolved Iron (Fe)	ug/L	110	100	6985386	490	100	6985427
Dissolved Lead (Pb)	ug/L	<0.50	0.50	6985386	<0.50	0.50	6985427
Dissolved Magnesium (Mg)	ug/L	35000	50	6985386	56000	50	6985427
Dissolved Manganese (Mn)	ug/L	11	2.0	6985386	900	2.0	6985427

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) TKN < NH4: Both values fall within acceptable RPD limits for duplicates and are likely equivalent.

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

BV Labs ID		NUK407			NUK408		
Sampling Date		2020/09/30 18:05			2020/09/30 11:50		
COC Number		791207-02-01			791207-02-01		
	UNITS	**MW12 II**	**RDL**	**QC Batch**	**MW13**	**RDL**	**QC Batch**
Dissolved Molybdenum (Mo)	ug/L	<0.50	0.50	6985386	0.61	0.50	6985427
Dissolved Nickel (Ni)	ug/L	1.1	1.0	6985386	22	1.0	6985427
Dissolved Potassium (K)	ug/L	1400	200	6985386	68000	200	6985427
Dissolved Selenium (Se)	ug/L	<2.0	2.0	6985386	<2.0	2.0	6985427
Dissolved Silicon (Si)	ug/L	6500	50	6985386	9200	50	6985427
Dissolved Sodium (Na)	ug/L	23000	100	6985386	160000	100	6985427
Dissolved Strontium (Sr)	ug/L	180	1.0	6985386	320	1.0	6985427
Dissolved Thallium (Tl)	ug/L	<0.050	0.050	6985386	0.16	0.050	6985427
Dissolved Tin (Sn)	ug/L	<1.0	1.0	6985386	<1.0	1.0	6985427
Dissolved Vanadium (V)	ug/L	<0.50	0.50	6985386	<0.50	0.50	6985427
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	6985386	<5.0	5.0	6985427

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

BV Labs ID		NUK408		
Sampling Date		2020/09/30 11:50		
COC Number		791207-02-01		
	UNITS	**MW13 Lab-Dup**	**RDL**	**QC Batch**
Inorganics				
Conductivity	umho/cm	2200	1.0	6983812
pH	pH	7.55		6983761
Alkalinity (Total as CaCO3)	mg/L	840	1.0	6983722

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

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BV Labs Job #: C0P9015
Report Date: 2020/12/17

exp Services Inc
Client Project #: THB-00006196-PE
Site Location: LONGLAC LF
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - SW COMP. LIST (WATER)

BV Labs ID		NUK409			NUK409		
Sampling Date		2020/09/30 12:25			2020/09/30 12:25		
COC Number		C#791210-01-01			C#791210-01-01		
	UNITS	**SW1**	**RDL**	**QC Batch**	**SW1 Lab-Dup**	**RDL**	**QC Batch**
Inorganics							
Total Ammonia-N	mg/L	<0.050	0.050	6988508	<0.050	0.050	6988508
Total BOD	mg/L	2	2	6980979			
Total Chemical Oxygen Demand (COD)	mg/L	34	4.0	6987811	34	4.0	6987811
Conductivity	umho/cm	190	1.0	6985324			
Total Dissolved Solids	mg/L	120	10	6982647			
Total Kjeldahl Nitrogen (TKN)	mg/L	0.42	0.10	6987782			
pH	pH	7.76		6985331			
Phenols-4AAP	mg/L	<0.0010	0.0010	6984897			
Total Phosphorus	mg/L	0.018	0.004	6989961			
Total Suspended Solids	mg/L	3	1	6987757			
Dissolved Sulphate (SO4)	mg/L	<1.0	1.0	6985722			
Alkalinity (Total as CaCO3)	mg/L	98	1.0	6985334			
Dissolved Chloride (Cl-)	mg/L	2.5	1.0	6985706			
Nitrite (N)	mg/L	<0.010	0.010	6985704			
Nitrate (N)	mg/L	<0.10	0.10	6985704			
Metals							
Mercury (Hg)	mg/L	<0.00010	0.00010	6989765			
Total Antimony (Sb)	ug/L	<0.50	0.50	6990069			
Total Arsenic (As)	ug/L	1.3	1.0	6990069			
Total Barium (Ba)	ug/L	7.1	2.0	6990069			
Total Beryllium (Be)	ug/L	<0.40	0.40	6990069			
Total Bismuth (Bi)	ug/L	<1.0	1.0	6990069			
Total Boron (B)	ug/L	<10	10	6990069			
Total Cadmium (Cd)	ug/L	<0.090	0.090	6990069			
Total Chromium (Cr)	ug/L	<5.0	5.0	6990069			
Total Cobalt (Co)	ug/L	<0.50	0.50	6990069			
Total Copper (Cu)	ug/L	<0.90	0.90	6990069			
Total Iron (Fe)	ug/L	590	100	6990069			
Total Lead (Pb)	ug/L	<0.50	0.50	6990069			
Total Manganese (Mn)	ug/L	190	2.0	6990069			
Total Molybdenum (Mo)	ug/L	<0.50	0.50	6990069			
Total Nickel (Ni)	ug/L	<1.0	1.0	6990069			
Total Potassium (K)	ug/L	370	200	6990069			

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

LANDFILL STANDARDS SCH 5 - SW COMP. LIST (WATER)

BV Labs ID		NUK409			NUK409		
Sampling Date		2020/09/30 12:25			2020/09/30 12:25		
COC Number		C#791210-01-01			C#791210-01-01		
	UNITS	**SW1**	**RDL**	**QC Batch**	**SW1 Lab-Dup**	**RDL**	**QC Batch**
Total Selenium (Se)	ug/L	<2.0	2.0	6990069			
Total Silicon (Si)	ug/L	3900	50	6990069			
Total Silver (Ag)	ug/L	<0.090	0.090	6990069			
Total Sodium (Na)	ug/L	1800	100	6990069			
Total Strontium (Sr)	ug/L	29	1.0	6990069			
Total Thallium (Tl)	ug/L	<0.050	0.050	6990069			
Total Tin (Sn)	ug/L	<1.0	1.0	6990069			
Total Titanium (Ti)	ug/L	<5.0	5.0	6990069			
Total Vanadium (V)	ug/L	<0.50	0.50	6990069			
Total Zinc (Zn)	ug/L	<5.0	5.0	6990069			

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

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LANDFILL STANDARDS SCH 5 - SW COMP. LIST (WATER)

BV Labs ID		NUK410		
Sampling Date		2020/09/30 16:30		
COC Number		C#791210-01-01		
	UNITS	**SW2**	**RDL**	**QC Batch**
Inorganics				
Total Ammonia-N	mg/L	<0.050	0.050	6988508
Total BOD	mg/L	15	2	6980979
Total Chemical Oxygen Demand (COD)	mg/L	88	4.0	6987811
Conductivity	umho/cm	2100	1.0	6983523
Total Dissolved Solids	mg/L	1170	10	6982647
Total Kjeldahl Nitrogen (TKN)	mg/L	1.1	0.10	6987782
pH	pH	8.29		6983530
Phenols-4AAP	mg/L	0.0040	0.0010	6984904
Total Phosphorus	mg/L	0.16	0.02	6989961
Total Suspended Solids	mg/L	23	1	6982671
Dissolved Sulphate (SO4)	mg/L	160	1.0	6983632
Alkalinity (Total as CaCO3)	mg/L	580	1.0	6983515
Dissolved Chloride (Cl-)	mg/L	230	3.0	6983620
Nitrite (N)	mg/L	<0.010	0.010	6983594
Nitrate (N)	mg/L	<0.10	0.10	6983594
Metals				
Mercury (Hg)	mg/L	<0.00010	0.00010	6989765
Total Antimony (Sb)	ug/L	<0.50	0.50	6990069
Total Arsenic (As)	ug/L	1.6	1.0	6990069
Total Barium (Ba)	ug/L	81	2.0	6990069
Total Beryllium (Be)	ug/L	<0.40	0.40	6990069
Total Bismuth (Bi)	ug/L	<1.0	1.0	6990069
Total Boron (B)	ug/L	1800	10	6990069
Total Cadmium (Cd)	ug/L	0.15	0.090	6990069
Total Chromium (Cr)	ug/L	<5.0	5.0	6990069
Total Cobalt (Co)	ug/L	0.69	0.50	6990069
Total Copper (Cu)	ug/L	2.6	0.90	6990069
Total Iron (Fe)	ug/L	260	100	6990069
Total Lead (Pb)	ug/L	0.74	0.50	6990069
Total Manganese (Mn)	ug/L	130	2.0	6990069
Total Molybdenum (Mo)	ug/L	1.4	0.50	6990069
Total Nickel (Ni)	ug/L	8.9	1.0	6990069
Total Potassium (K)	ug/L	110000	200	6990069

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

LANDFILL STANDARDS SCH 5 - SW COMP. LIST (WATER)

BV Labs ID		NUK410		
Sampling Date		2020/09/30 16:30		
COC Number		C#791210-01-01		
	UNITS	**SW2**	**RDL**	**QC Batch**
Total Selenium (Se)	ug/L	<2.0	2.0	6990069
Total Silicon (Si)	ug/L	5800	50	6990069
Total Silver (Ag)	ug/L	<0.090	0.090	6990069
Total Sodium (Na)	ug/L	210000	100	6990069
Total Strontium (Sr)	ug/L	410	1.0	6990069
Total Thallium (Tl)	ug/L	<0.050	0.050	6990069
Total Tin (Sn)	ug/L	<1.0	1.0	6990069
Total Titanium (Ti)	ug/L	12	5.0	6990069
Total Vanadium (V)	ug/L	2.0	0.50	6990069
Total Zinc (Zn)	ug/L	19	5.0	6990069

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

BV Labs Job #: C0P9015
Report Date: 2020/12/17

exp Services Inc
Client Project #: THB-00006196-PE
Site Location: LONGLAC LF
Sampler Initials: EF

RESULTS OF ANALYSES OF WATER

BV Labs ID		NUK392		NUK393	NUK394		NUK395		
Sampling Date		2020/09/30 08:40		2020/09/30 09:20	2020/09/30 15:30		2020/09/30 16:00		
COC Number		791207-01-01		791207-01-01	791207-01-01		791207-01-01		
	UNITS	**MW2**	**QC Batch**	**MW3**	**MW4I**	**QC Batch**	**MW4II**	**RDL**	**QC Batch**
Calculated Parameters									
Hardness (CaCO3)	mg/L	210	6981445	230	310	6981445	980	1.0	6981445
Ion Balance (% Difference)	%	1.51	6981750	0.240	0.330	6981750	4.23	N/A	6981750
Total Organic Nitrogen	mg/L	0.12	6981687	<0.10	<0.10	6981687	0.28	0.10	6981687
Inorganics									
Orthophosphate (P)	mg/L	<0.010	6983637	<0.010	<0.010	6985715	<0.010	0.010	6983637

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

BV Labs ID		NUK396		NUK397		NUK398	NUK399	NUK400		
Sampling Date		2020/09/30 14:00		2020/09/30 13:00		2020/09/30 11:50	2020/09/30 11:25	2020/09/30 15:00		
COC Number		791207-01-01		791207-01-01		791207-01-01	791207-01-01	791207-01-01		
	UNITS	**MW5**	**QC Batch**	**MW6**	**QC Batch**	**MW7**	**MW8I**	**MW10**	**RDL**	**QC Batch**
Calculated Parameters										
Hardness (CaCO3)	mg/L	310	6981445	480	6981445	680	1100	250	1.0	6981445
Ion Balance (% Difference)	%	0.410	6981750	10.5	6981750	1.51	0.830	0.0200	N/A	6981750
Total Organic Nitrogen	mg/L	0.16	6981687	<0.10	6981687	2.3	<0.10	0.26	0.10	6981687
Inorganics										
Orthophosphate (P)	mg/L	<0.010	6985715	<0.010	6983637	<0.010	<0.010	<0.010	0.010	6985715

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

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BV Labs Job #: C0P9015
Report Date: 2020/12/17

exp Services Inc
Client Project #: THB-00006196-PE
Site Location: LONGLAC LF
Sampler Initials: EF

RESULTS OF ANALYSES OF WATER

BV Labs ID		NUK401		NUK405		NUK406	NUK407		
Sampling Date		2020/09/30 10:05		2020/09/30 10:40		2020/09/30 17:40	2020/09/30 18:05		
COC Number		791207-01-01		791207-02-01		791207-02-01	791207-02-01		
	UNITS	**MW11I**	**QC Batch**	**MW11 II**	**QC Batch**	**MW12 I**	**MW12 II**	**RDL**	**QC Batch**
Calculated Parameters									
Hardness (CaCO3)	mg/L	690	6981445	600	6981445	410	600	1.0	6981445
Ion Balance (% Difference)	%	0.690	6981750	2.59	6981750	8.94	4.27	N/A	6981750
Total Organic Nitrogen	mg/L	0.47	6981687	0.13	6981687	0.22	0.11	0.10	6981687
Inorganics									
Orthophosphate (P)	mg/L	<0.010	6985715	<0.010	6983637	<0.010	<0.010	0.010	6985715

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

BV Labs ID		NUK408			NUK409		NUK410		
Sampling Date		2020/09/30 11:50			2020/09/30 12:25		2020/09/30 16:30		
COC Number		791207-02-01			C#791210-01-01		C#791210-01-01		
	UNITS	**MW13**	**RDL**	**QC Batch**	**SW1**	**QC Batch**	**SW2**	**RDL**	**QC Batch**
Calculated Parameters									
Hardness (CaCO3)	mg/L	690	1.0	6981445	110	6981445	520	1.0	6981445
Ion Balance (% Difference)	%	2.26	N/A	6981750					
Total Organic Nitrogen	mg/L	<0.10	0.10	6981687	0.42	6981687	1.1	0.10	6981687
Inorganics									
Dissolved Organic Carbon	mg/L				12	6985149	21	0.40	6985645
Orthophosphate (P)	mg/L	<0.010	0.010	6983637					

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

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BV Labs Job #: C0P9015
Report Date: 2020/12/17

exp Services Inc
Client Project #: THB-00006196-PE
Site Location: LONGLAC LF
Sampler Initials: EF

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

BV Labs ID		NUK409	NUK410			NUK410		
Sampling Date		2020/09/30 12:25	2020/09/30 16:30			2020/09/30 16:30		
COC Number		C#791210-01-01	C#791210-01-01			C#791210-01-01		
	UNITS	**SW1**	**SW2**	**RDL**	**QC Batch**	**SW2 Lab-Dup**	**RDL**	**QC Batch**
Metals								
Dissolved (0.2u) Aluminum (Al)	ug/L	<5	17	5	6985497	18	5	6985497
Dissolved Calcium (Ca)	mg/L	31	85	0.050	6985320			
Dissolved Magnesium (Mg)	mg/L	6.9	75	0.050	6985320			

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

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VOLATILE ORGANICS BY GC/MS (WATER)

BV Labs ID		NUK397		NUK398	NUK398		NUK399		
Sampling Date		2020/09/30 13:00		2020/09/30 11:50	2020/09/30 11:50		2020/09/30 11:25		
COC Number		791207-01-01		791207-01-01	791207-01-01		791207-01-01		
	UNITS	**MW6**	**RDL**	**MW7**	**MW7 Lab-Dup**	**RDL**	**MW8I**	**RDL**	**QC Batch**
Volatile Organics									
Acetone (2-Propanone)	ug/L	<10	10	<50	<50	50	<100	100	6985183
Benzene	ug/L	<0.10	0.10	0.93	0.93	0.50	1.2	1.0	6985183
Bromodichloromethane	ug/L	<0.10	0.10	<0.50	<0.50	0.50	<1.0	1.0	6985183
Bromoform	ug/L	<0.20	0.20	<1.0	<1.0	1.0	<2.0	2.0	6985183
Bromomethane	ug/L	<0.50	0.50	<2.5	<2.5	2.5	<5.0	5.0	6985183
Carbon Tetrachloride	ug/L	<0.10	0.10	<0.50	<0.50	0.50	<1.0	1.0	6985183
Chlorobenzene	ug/L	<0.10	0.10	<0.50	<0.50	0.50	<1.0	1.0	6985183
Chloroform	ug/L	<0.10	0.10	<0.50	<0.50	0.50	<1.0	1.0	6985183
Dibromochloromethane	ug/L	<0.20	0.20	<1.0	<1.0	1.0	<2.0	2.0	6985183
1,2-Dichlorobenzene	ug/L	<0.20	0.20	<1.0	<1.0	1.0	<2.0	2.0	6985183
1,3-Dichlorobenzene	ug/L	<0.20	0.20	<1.0	<1.0	1.0	<2.0	2.0	6985183
1,4-Dichlorobenzene	ug/L	<0.20	0.20	<1.0	<1.0	1.0	<2.0	2.0	6985183
Dichlorodifluoromethane (FREON 12)	ug/L	<0.50	0.50	<2.5	<2.5	2.5	<5.0	5.0	6985183
1,1-Dichloroethane	ug/L	<0.10	0.10	<0.50	<0.50	0.50	<1.0	1.0	6985183
1,2-Dichloroethane	ug/L	<0.20	0.20	<1.0	<1.0	1.0	<2.0	2.0	6985183
1,1-Dichloroethylene	ug/L	<0.10	0.10	<0.50	<0.50	0.50	<1.0	1.0	6985183
cis-1,2-Dichloroethylene	ug/L	<0.10	0.10	<0.50	<0.50	0.50	<1.0	1.0	6985183
trans-1,2-Dichloroethylene	ug/L	<0.10	0.10	<0.50	<0.50	0.50	<1.0	1.0	6985183
1,2-Dichloropropane	ug/L	<0.10	0.10	<0.50	<0.50	0.50	<1.0	1.0	6985183
cis-1,3-Dichloropropene	ug/L	<0.20	0.20	<1.0	<1.0	1.0	<2.0	2.0	6985183
trans-1,3-Dichloropropene	ug/L	<0.20	0.20	<1.0	<1.0	1.0	<2.0	2.0	6985183
Ethylbenzene	ug/L	0.12	0.10	<0.50	<0.50	0.50	<1.0	1.0	6985183
Ethylene Dibromide	ug/L	<0.20	0.20	<1.0	<1.0	1.0	<2.0	2.0	6985183
Hexane	ug/L	<0.50	0.50	<2.5	<2.5	2.5	<5.0	5.0	6985183
Methylene Chloride(Dichloromethane)	ug/L	<0.50	0.50	<2.5	<2.5	2.5	<5.0	5.0	6985183
Methyl Ethyl Ketone (2-Butanone)	ug/L	<5.0	5.0	<25	<25	25	<50	50	6985183
Methyl Isobutyl Ketone	ug/L	<5.0	5.0	<25	<25	25	<50	50	6985183
Methyl t-butyl ether (MTBE)	ug/L	<0.20	0.20	<1.0	<1.0	1.0	6.4	2.0	6985183
Styrene	ug/L	<0.20	0.20	<1.0	<1.0	1.0	<2.0	2.0	6985183
1,1,1,2-Tetrachloroethane	ug/L	<0.20	0.20	<1.0	<1.0	1.0	<2.0	2.0	6985183
1,1,2,2-Tetrachloroethane	ug/L	<0.20	0.20	<1.0	<1.0	1.0	<2.0	2.0	6985183
Tetrachloroethylene	ug/L	<0.10	0.10	<0.50	<0.50	0.50	<1.0	1.0	6985183
Toluene	ug/L	0.25	0.20	<1.0	<1.0	1.0	<2.0	2.0	6985183

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

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BV Labs Job #: C0P9015
Report Date: 2020/12/17

exp Services Inc
Client Project #: THB-00006196-PE
Site Location: LONGLAC LF
Sampler Initials: EF

VOLATILE ORGANICS BY GC/MS (WATER)

BV Labs ID		NUK397		NUK398	NUK398		NUK399		
Sampling Date		2020/09/30 13:00		2020/09/30 11:50	2020/09/30 11:50		2020/09/30 11:25		
COC Number		791207-01-01		791207-01-01	791207-01-01		791207-01-01		
	UNITS	**MW6**	**RDL**	**MW7**	**MW7 Lab-Dup**	**RDL**	**MW8I**	**RDL**	**QC Batch**
1,1,1-Trichloroethane	ug/L	<0.10	0.10	<0.50	<0.50	0.50	<1.0	1.0	6985183
1,1,2-Trichloroethane	ug/L	<0.20	0.20	<1.0	<1.0	1.0	<2.0	2.0	6985183
Trichloroethylene	ug/L	<0.10	0.10	<0.50	<0.50	0.50	<1.0	1.0	6985183
Trichlorofluoromethane (FREON 11)	ug/L	<0.20	0.20	<1.0	<1.0	1.0	<2.0	2.0	6985183
Vinyl Chloride	ug/L	<0.20	0.20	<1.0	<1.0	1.0	<2.0	2.0	6985183
p+m-Xylene	ug/L	<0.10	0.10	<0.50	<0.50	0.50	<1.0	1.0	6985183
o-Xylene	ug/L	<0.10	0.10	<0.50	<0.50	0.50	<1.0	1.0	6985183
Total Xylenes	ug/L	<0.10	0.10	<0.50	<0.50	0.50	<1.0	1.0	6985183
Surrogate Recovery (%)									
4-Bromofluorobenzene	%	103		98	95		99		6985183
D4-1,2-Dichloroethane	%	100		104	101		97		6985183
D8-Toluene	%	100		98	98		100		6985183

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

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VOLATILE ORGANICS BY GC/MS (WATER)

BV Labs ID		NUK408		
Sampling Date		2020/09/30 11:50		
COC Number		791207-02-01		
	UNITS	**MW13**	**RDL**	**QC Batch**
Volatile Organics				
Acetone (2-Propanone)	ug/L	<50	50	6985183
Benzene	ug/L	0.96	0.50	6985183
Bromodichloromethane	ug/L	<0.50	0.50	6985183
Bromoform	ug/L	<1.0	1.0	6985183
Bromomethane	ug/L	<2.5	2.5	6985183
Carbon Tetrachloride	ug/L	<0.50	0.50	6985183
Chlorobenzene	ug/L	<0.50	0.50	6985183
Chloroform	ug/L	<0.50	0.50	6985183
Dibromochloromethane	ug/L	<1.0	1.0	6985183
1,2-Dichlorobenzene	ug/L	<1.0	1.0	6985183
1,3-Dichlorobenzene	ug/L	<1.0	1.0	6985183
1,4-Dichlorobenzene	ug/L	<1.0	1.0	6985183
Dichlorodifluoromethane (FREON 12)	ug/L	<2.5	2.5	6985183
1,1-Dichloroethane	ug/L	<0.50	0.50	6985183
1,2-Dichloroethane	ug/L	<1.0	1.0	6985183
1,1-Dichloroethylene	ug/L	<0.50	0.50	6985183
cis-1,2-Dichloroethylene	ug/L	<0.50	0.50	6985183
trans-1,2-Dichloroethylene	ug/L	<0.50	0.50	6985183
1,2-Dichloropropane	ug/L	<0.50	0.50	6985183
cis-1,3-Dichloropropene	ug/L	<1.0	1.0	6985183
trans-1,3-Dichloropropene	ug/L	<1.0	1.0	6985183
Ethylbenzene	ug/L	<0.50	0.50	6985183
Ethylene Dibromide	ug/L	<1.0	1.0	6985183
Hexane	ug/L	<2.5	2.5	6985183
Methylene Chloride(Dichloromethane)	ug/L	<2.5	2.5	6985183
Methyl Ethyl Ketone (2-Butanone)	ug/L	<25	25	6985183
Methyl Isobutyl Ketone	ug/L	<25	25	6985183
Methyl t-butyl ether (MTBE)	ug/L	<1.0	1.0	6985183
Styrene	ug/L	<1.0	1.0	6985183
1,1,1,2-Tetrachloroethane	ug/L	<1.0	1.0	6985183
1,1,2,2-Tetrachloroethane	ug/L	<1.0	1.0	6985183
Tetrachloroethylene	ug/L	<0.50	0.50	6985183
Toluene	ug/L	<1.0	1.0	6985183

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

VOLATILE ORGANICS BY GC/MS (WATER)

BV Labs ID		NUK408		
Sampling Date		2020/09/30 11:50		
COC Number		791207-02-01		
	UNITS	**MW13**	**RDL**	**QC Batch**
1,1,1-Trichloroethane	ug/L	<0.50	0.50	6985183
1,1,2-Trichloroethane	ug/L	<1.0	1.0	6985183
Trichloroethylene	ug/L	<0.50	0.50	6985183
Trichlorofluoromethane (FREON 11)	ug/L	<1.0	1.0	6985183
Vinyl Chloride	ug/L	<1.0	1.0	6985183
p+m-Xylene	ug/L	<0.50	0.50	6985183
o-Xylene	ug/L	<0.50	0.50	6985183
Total Xylenes	ug/L	<0.50	0.50	6985183
Surrogate Recovery (%)				
4-Bromofluorobenzene	%	99		6985183
D4-1,2-Dichloroethane	%	97		6985183
D8-Toluene	%	98		6985183

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

TEST SUMMARY

BV Labs ID: NUK392
Sample ID: MW2
Matrix: Water

Collected: 2020/09/30
Shipped:
Received: 2020/10/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	6985334	N/A	2020/10/07	Yogesh Patel
Chloride by Automated Colourimetry	KONE	6983659	N/A	2020/10/07	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	6987811	N/A	2020/10/11	Nimarta Singh
Conductivity	AT	6985324	N/A	2020/10/07	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6985149	N/A	2020/10/07	Nimarta Singh
Hardness (calculated as CaCO3)		6981445	N/A	2020/10/08	Automated Statchk
Mercury in Water by CVAA	CV/AA	6989765	2020/10/08	2020/10/08	Meghaben Patel
Dissolved Metals by ICPMS	ICP/MS	6985396	N/A	2020/10/07	Azita Fazaeli
Ion Balance (% Difference)	CALC	6981750	N/A	2020/10/08	Automated Statchk
Total Ammonia-N	LACH/NH4	6988508	N/A	2020/10/08	Amanpreet Sappal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6985704	N/A	2020/10/08	Chandra Nandlal
Organic Nitrogen	CALC	6981687	N/A	2020/10/10	Automated Statchk
pH	AT	6985331	2020/10/06	2020/10/07	Yogesh Patel
Phenols (4AAP)	TECH/PHEN	6984904	N/A	2020/10/06	Bramdeo Motiram
Orthophosphate	KONE	6983637	N/A	2020/10/07	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	6983658	N/A	2020/10/07	Deonarine Ramnarine
Total Dissolved Solids	BAL	6987773	2020/10/07	2020/10/08	Shivani Desai
Total Kjeldahl Nitrogen in Water	SKAL	6987782	2020/10/07	2020/10/09	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	6987806	2020/10/07	2020/10/08	Shivani Shivani

BV Labs ID: NUK393
Sample ID: MW3
Matrix: Water

Collected: 2020/09/30
Shipped:
Received: 2020/10/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	6985334	N/A	2020/10/07	Yogesh Patel
Chloride by Automated Colourimetry	KONE	6985706	N/A	2020/10/07	Alina Dobreanu
Chemical Oxygen Demand	SPEC	6987811	N/A	2020/10/11	Nimarta Singh
Conductivity	AT	6985324	N/A	2020/10/07	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6985149	N/A	2020/10/07	Nimarta Singh
Hardness (calculated as CaCO3)		6981445	N/A	2020/10/08	Automated Statchk
Mercury in Water by CVAA	CV/AA	6989769	2020/10/08	2020/10/08	Meghaben Patel
Dissolved Metals by ICPMS	ICP/MS	6985396	N/A	2020/10/07	Azita Fazaeli
Ion Balance (% Difference)	CALC	6981750	N/A	2020/10/08	Automated Statchk
Total Ammonia-N	LACH/NH4	6988508	N/A	2020/10/08	Amanpreet Sappal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6985704	N/A	2020/10/08	Chandra Nandlal
Organic Nitrogen	CALC	6981687	N/A	2020/10/10	Automated Statchk
pH	AT	6985331	2020/10/06	2020/10/07	Yogesh Patel
Phenols (4AAP)	TECH/PHEN	6984890	N/A	2020/10/07	Bramdeo Motiram
Orthophosphate	KONE	6985715	N/A	2020/10/08	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	6985722	N/A	2020/10/07	Deonarine Ramnarine
Total Dissolved Solids	BAL	6987773	2020/10/07	2020/10/08	Shivani Desai
Total Kjeldahl Nitrogen in Water	SKAL	6987782	2020/10/07	2020/10/10	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	6987345	2020/10/07	2020/10/07	Shivani Shivani

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BV Labs Job #: C0P9015
Report Date: 2020/12/17

exp Services Inc
Client Project #: THB-00006196-PE
Site Location: LONGLAC LF
Sampler Initials: EF

TEST SUMMARY

BV Labs ID: NUK394
Sample ID: MW4I
Matrix: Water

Collected: 2020/09/30
Shipped:
Received: 2020/10/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	6985334	N/A	2020/10/07	Yogesh Patel
Chloride by Automated Colourimetry	KONE	6985706	N/A	2020/10/07	Alina Dobreanu
Chemical Oxygen Demand	SPEC	6987811	N/A	2020/10/11	Nimarta Singh
Conductivity	AT	6985324	N/A	2020/10/07	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6985149	N/A	2020/10/07	Nimarta Singh
Hardness (calculated as CaCO3)		6981445	N/A	2020/10/08	Automated Statchk
Mercury in Water by CVAA	CV/AA	6989765	2020/10/08	2020/10/08	Meghaben Patel
Dissolved Metals by ICPMS	ICP/MS	6985396	N/A	2020/10/07	Azita Fazaeli
Ion Balance (% Difference)	CALC	6981750	N/A	2020/10/08	Automated Statchk
Total Ammonia-N	LACH/NH4	6988508	N/A	2020/10/08	Amanpreet Sappal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6985370	N/A	2020/10/08	Chandra Nandlal
Organic Nitrogen	CALC	6981687	N/A	2020/10/10	Automated Statchk
pH	AT	6985331	2020/10/06	2020/10/07	Yogesh Patel
Phenols (4AAP)	TECH/PHEN	6984897	N/A	2020/10/07	Bramdeo Motiram
Orthophosphate	KONE	6985715	N/A	2020/10/08	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	6985722	N/A	2020/10/07	Deonarine Ramnarine
Total Dissolved Solids	BAL	6987773	2020/10/07	2020/10/08	Shivani Desai
Total Kjeldahl Nitrogen in Water	SKAL	6987782	2020/10/07	2020/10/09	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	6987806	2020/10/07	2020/10/08	Shivani Shivani

BV Labs ID: NUK394 Dup
Sample ID: MW4I
Matrix: Water

Collected: 2020/09/30
Shipped:
Received: 2020/10/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Dissolved Solids	BAL	6987773	2020/10/07	2020/10/08	Shivani Desai
Total Kjeldahl Nitrogen in Water	SKAL	6987782	2020/10/07	2020/10/09	Rajni Tyagi

BV Labs ID: NUK395
Sample ID: MW4II
Matrix: Water

Collected: 2020/09/30
Shipped:
Received: 2020/10/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	6985334	N/A	2020/10/07	Yogesh Patel
Chloride by Automated Colourimetry	KONE	6983659	N/A	2020/10/07	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	6987811	N/A	2020/10/11	Nimarta Singh
Conductivity	AT	6985324	N/A	2020/10/07	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6985149	N/A	2020/10/07	Nimarta Singh
Hardness (calculated as CaCO3)		6981445	N/A	2020/10/08	Automated Statchk
Mercury in Water by CVAA	CV/AA	6989765	2020/10/08	2020/10/08	Meghaben Patel
Dissolved Metals by ICPMS	ICP/MS	6985396	N/A	2020/10/08	Azita Fazaeli
Ion Balance (% Difference)	CALC	6981750	N/A	2020/10/08	Automated Statchk
Total Ammonia-N	LACH/NH4	6988508	N/A	2020/10/08	Amanpreet Sappal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6985704	N/A	2020/10/08	Chandra Nandlal

BV Labs Job #: C0P9015
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exp Services Inc
Client Project #: THB-00006196-PE
Site Location: LONGLAC LF
Sampler Initials: EF

TEST SUMMARY

BV Labs ID: NUK395
Sample ID: MW4II
Matrix: Water

Collected: 2020/09/30
Shipped:
Received: 2020/10/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Organic Nitrogen	CALC	6981687	N/A	2020/10/10	Automated Statchk
pH	AT	6985331	2020/10/06	2020/10/07	Yogesh Patel
Phenols (4AAP)	TECH/PHEN	6984890	N/A	2020/10/07	Bramdeo Motiram
Orthophosphate	KONE	6983637	N/A	2020/10/07	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	6983658	N/A	2020/10/07	Deonarine Ramnarine
Total Dissolved Solids	BAL	6987773	2020/10/07	2020/10/08	Shivani Desai
Total Kjeldahl Nitrogen in Water	SKAL	6987782	2020/10/07	2020/10/10	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	6987806	2020/10/07	2020/10/08	Shivani Shivani

BV Labs ID: NUK396
Sample ID: MW5
Matrix: Water

Collected: 2020/09/30
Shipped:
Received: 2020/10/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	6985334	N/A	2020/10/07	Yogesh Patel
Chloride by Automated Colourimetry	KONE	6985706	N/A	2020/10/07	Alina Dobreanu
Chemical Oxygen Demand	SPEC	6987811	N/A	2020/10/11	Nimarta Singh
Conductivity	AT	6985324	N/A	2020/10/07	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6985149	N/A	2020/10/07	Nimarta Singh
Hardness (calculated as CaCO3)		6981445	N/A	2020/10/06	Automated Statchk
Mercury in Water by CVAA	CV/AA	6989765	2020/10/08	2020/10/08	Meghaben Patel
Dissolved Metals by ICPMS	ICP/MS	6985386	N/A	2020/10/06	Nan Raykha
Ion Balance (% Difference)	CALC	6981750	N/A	2020/10/07	Automated Statchk
Total Ammonia-N	LACH/NH4	6988508	N/A	2020/10/08	Amanpreet Sappal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6985704	N/A	2020/10/08	Chandra Nandlal
Organic Nitrogen	CALC	6981687	N/A	2020/10/10	Automated Statchk
pH	AT	6985331	2020/10/06	2020/10/07	Yogesh Patel
Phenols (4AAP)	TECH/PHEN	6984890	N/A	2020/10/07	Bramdeo Motiram
Orthophosphate	KONE	6985715	N/A	2020/10/08	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	6985722	N/A	2020/10/07	Deonarine Ramnarine
Total Dissolved Solids	BAL	6982647	2020/10/07	2020/10/08	Margesh Majmunda
Total Kjeldahl Nitrogen in Water	SKAL	6987782	2020/10/07	2020/10/09	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	6987806	2020/10/07	2020/10/08	Shivani Shivani

BV Labs ID: NUK397
Sample ID: MW6
Matrix: Water

Collected: 2020/09/30
Shipped:
Received: 2020/10/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	6985334	N/A	2020/10/07	Yogesh Patel
Chloride by Automated Colourimetry	KONE	6983659	N/A	2020/10/07	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	6987811	N/A	2020/10/11	Nimarta Singh
Conductivity	AT	6985324	N/A	2020/10/07	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6985645	N/A	2020/10/08	Nimarta Singh

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TEST SUMMARY

BV Labs ID: NUK397
Sample ID: MW6
Matrix: Water

Collected: 2020/09/30
Shipped:
Received: 2020/10/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hardness (calculated as CaCO3)		6981445	N/A	2020/10/07	Automated Statchk
Mercury in Water by CVAA	CV/AA	6989765	2020/10/08	2020/10/08	Meghaben Patel
Dissolved Metals by ICPMS	ICP/MS	6985427	N/A	2020/10/06	Nan Raykha
Ion Balance (% Difference)	CALC	6981750	N/A	2020/10/07	Automated Statchk
Total Ammonia-N	LACH/NH4	6988508	N/A	2020/10/08	Amanpreet Sappal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6985704	N/A	2020/10/08	Chandra Nandlal
Organic Nitrogen	CALC	6981687	N/A	2020/10/10	Automated Statchk
pH	AT	6985331	2020/10/06	2020/10/07	Yogesh Patel
Phenols (4AAP)	TECH/PHEN	6984904	N/A	2020/10/06	Bramdeo Motiram
Orthophosphate	KONE	6983637	N/A	2020/10/07	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	6983658	N/A	2020/10/07	Deonarine Ramnarine
Total Dissolved Solids	BAL	6987773	2020/10/07	2020/10/08	Shivani Desai
Total Kjeldahl Nitrogen in Water	SKAL	6987782	2020/10/07	2020/10/10	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	6987806	2020/10/07	2020/10/08	Shivani Shivani
Volatile Organic Compounds in Water	P&T/MS	6985183	N/A	2020/10/07	Dina Wang

BV Labs ID: NUK398
Sample ID: MW7
Matrix: Water

Collected: 2020/09/30
Shipped:
Received: 2020/10/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	6985334	N/A	2020/10/07	Yogesh Patel
Chloride by Automated Colourimetry	KONE	6985706	N/A	2020/10/07	Alina Dobreanu
Chemical Oxygen Demand	SPEC	6987811	N/A	2020/10/11	Nimarta Singh
Conductivity	AT	6985324	N/A	2020/10/07	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6985149	N/A	2020/10/07	Nimarta Singh
Hardness (calculated as CaCO3)		6981445	N/A	2020/10/07	Automated Statchk
Mercury in Water by CVAA	CV/AA	6989765	2020/10/08	2020/10/08	Meghaben Patel
Dissolved Metals by ICPMS	ICP/MS	6985427	N/A	2020/10/06	Nan Raykha
Ion Balance (% Difference)	CALC	6981750	N/A	2020/10/07	Automated Statchk
Total Ammonia-N	LACH/NH4	6988508	N/A	2020/10/08	Amanpreet Sappal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6985704	N/A	2020/10/08	Chandra Nandlal
Organic Nitrogen	CALC	6981687	N/A	2020/10/10	Automated Statchk
pH	AT	6985331	2020/10/06	2020/10/07	Yogesh Patel
Phenols (4AAP)	TECH/PHEN	6984904	N/A	2020/10/06	Bramdeo Motiram
Orthophosphate	KONE	6985715	N/A	2020/10/08	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	6985722	N/A	2020/10/07	Deonarine Ramnarine
Total Dissolved Solids	BAL	6987773	2020/10/07	2020/10/08	Shivani Desai
Total Kjeldahl Nitrogen in Water	SKAL	6987782	2020/10/07	2020/10/10	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	6987806	2020/10/07	2020/10/08	Shivani Shivani
Volatile Organic Compounds in Water	P&T/MS	6985183	N/A	2020/10/08	Dina Wang

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TEST SUMMARY

BV Labs ID: NUK398 Dup
Sample ID: MW7
Matrix: Water

Collected: 2020/09/30
Shipped:
Received: 2020/10/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Volatile Organic Compounds in Water	P&T/MS	6985183	N/A	2020/10/08	Dina Wang

BV Labs ID: NUK399
Sample ID: MW8I
Matrix: Water

Collected: 2020/09/30
Shipped:
Received: 2020/10/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	6986262	N/A	2020/10/08	Yogesh Patel
Chloride by Automated Colourimetry	KONE	6985706	N/A	2020/10/07	Alina Dobreanu
Chemical Oxygen Demand	SPEC	6987811	N/A	2020/10/11	Nimarta Singh
Conductivity	AT	6986264	N/A	2020/10/08	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6985149	N/A	2020/10/07	Nimarta Singh
Hardness (calculated as CaCO3)		6981445	N/A	2020/10/07	Automated Statchk
Mercury in Water by CVAA	CV/AA	6989765	2020/10/08	2020/10/08	Meghaben Patel
Dissolved Metals by ICPMS	ICP/MS	6985427	N/A	2020/10/07	Nan Raykha
Ion Balance (% Difference)	CALC	6981750	N/A	2020/10/08	Automated Statchk
Total Ammonia-N	LACH/NH4	6988508	N/A	2020/10/08	Amanpreet Sappal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6985704	N/A	2020/10/08	Chandra Nandlal
Organic Nitrogen	CALC	6981687	N/A	2020/10/10	Automated Statchk
pH	AT	6986269	2020/10/06	2020/10/08	Yogesh Patel
Phenols (4AAP)	TECH/PHEN	6984904	N/A	2020/10/06	Bramdeo Motiram
Orthophosphate	KONE	6985715	N/A	2020/10/08	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	6985722	N/A	2020/10/07	Deonarine Ramnarine
Total Dissolved Solids	BAL	6987773	2020/10/07	2020/10/08	Shivani Desai
Total Kjeldahl Nitrogen in Water	SKAL	6987782	2020/10/07	2020/10/10	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	6987806	2020/10/07	2020/10/08	Shivani Shivani
Volatile Organic Compounds in Water	P&T/MS	6985183	N/A	2020/10/07	Dina Wang

BV Labs ID: NUK400
Sample ID: MW10
Matrix: Water

Collected: 2020/09/30
Shipped:
Received: 2020/10/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	6985334	N/A	2020/10/07	Yogesh Patel
Chloride by Automated Colourimetry	KONE	6985706	N/A	2020/10/07	Alina Dobreanu
Chemical Oxygen Demand	SPEC	6987811	N/A	2020/10/11	Nimarta Singh
Conductivity	AT	6985324	N/A	2020/10/07	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6985149	N/A	2020/10/07	Nimarta Singh
Hardness (calculated as CaCO3)		6981445	N/A	2020/10/06	Automated Statchk
Mercury in Water by CVAA	CV/AA	6989765	2020/10/08	2020/10/08	Meghaben Patel
Dissolved Metals by ICPMS	ICP/MS	6985386	N/A	2020/10/06	Nan Raykha
Ion Balance (% Difference)	CALC	6981750	N/A	2020/10/07	Automated Statchk
Total Ammonia-N	LACH/NH4	6988508	N/A	2020/10/08	Amanpreet Sappal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6985704	N/A	2020/10/08	Chandra Nandlal

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TEST SUMMARY

BV Labs ID: NUK400
Sample ID: MW10
Matrix: Water

Collected: 2020/09/30
Shipped:
Received: 2020/10/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Organic Nitrogen	CALC	6981687	N/A	2020/10/10	Automated Statchk
pH	AT	6985331	2020/10/06	2020/10/07	Yogesh Patel
Phenols (4AAP)	TECH/PHEN	6984904	N/A	2020/10/06	Bramdeo Motiram
Orthophosphate	KONE	6985715	N/A	2020/10/08	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	6985722	N/A	2020/10/07	Deonarine Ramnarine
Total Dissolved Solids	BAL	6987773	2020/10/07	2020/10/08	Shivani Desai
Total Kjeldahl Nitrogen in Water	SKAL	6987782	2020/10/07	2020/10/09	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	6987806	2020/10/07	2020/10/08	Shivani Shivani

BV Labs ID: NUK400 Dup
Sample ID: MW10
Matrix: Water

Collected: 2020/09/30
Shipped:
Received: 2020/10/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6985149	N/A	2020/10/07	Nimarta Singh

BV Labs ID: NUK401
Sample ID: MW11I
Matrix: Water

Collected: 2020/09/30
Shipped:
Received: 2020/10/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	6985334	N/A	2020/10/07	Yogesh Patel
Chloride by Automated Colourimetry	KONE	6985706	N/A	2020/10/07	Alina Dobreanu
Chemical Oxygen Demand	SPEC	6987811	N/A	2020/10/11	Nimarta Singh
Conductivity	AT	6985324	N/A	2020/10/07	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6985149	N/A	2020/10/07	Nimarta Singh
Hardness (calculated as CaCO3)		6981445	N/A	2020/10/06	Automated Statchk
Mercury in Water by CVAA	CV/AA	6989765	2020/10/08	2020/10/08	Meghaben Patel
Dissolved Metals by ICPMS	ICP/MS	6985386	N/A	2020/10/06	Nan Raykha
Ion Balance (% Difference)	CALC	6981750	N/A	2020/10/07	Automated Statchk
Total Ammonia-N	LACH/NH4	6988508	N/A	2020/10/08	Amanpreet Sappal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6985704	N/A	2020/10/08	Chandra Nandlal
Organic Nitrogen	CALC	6981687	N/A	2020/10/10	Automated Statchk
pH	AT	6985331	2020/10/06	2020/10/07	Yogesh Patel
Phenols (4AAP)	TECH/PHEN	6984904	N/A	2020/10/06	Bramdeo Motiram
Orthophosphate	KONE	6985715	N/A	2020/10/08	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	6985722	N/A	2020/10/07	Deonarine Ramnarine
Total Dissolved Solids	BAL	6987773	2020/10/07	2020/10/08	Shivani Desai
Total Kjeldahl Nitrogen in Water	SKAL	6987782	2020/10/07	2020/10/10	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	6987806	2020/10/07	2020/10/08	Shivani Shivani

BV Labs Job #: C0P9015
Report Date: 2020/12/17

exp Services Inc
Client Project #: THB-00006196-PE
Site Location: LONGLAC LF
Sampler Initials: EF

TEST SUMMARY

BV Labs ID: NUK401 Dup
Sample ID: MW11I
Matrix: Water

Collected: 2020/09/30
Shipped:
Received: 2020/10/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Mercury in Water by CVAA	CV/AA	6989765	2020/10/08	2020/10/08	Meghaben Patel
Phenols (4AAP)	TECH/PHEN	6984904	N/A	2020/10/06	Bramdeo Motiram

BV Labs ID: NUK405
Sample ID: MW11 II
Matrix: Water

Collected: 2020/09/30
Shipped:
Received: 2020/10/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	6985334	N/A	2020/10/07	Yogesh Patel
Chloride by Automated Colourimetry	KONE	6983659	N/A	2020/10/07	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	6987811	N/A	2020/10/11	Nimarta Singh
Conductivity	AT	6985324	N/A	2020/10/07	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6985149	N/A	2020/10/07	Nimarta Singh
Hardness (calculated as CaCO3)		6981445	N/A	2020/10/06	Automated Statchk
Mercury in Water by CVAA	CV/AA	6989769	2020/10/08	2020/10/08	Meghaben Patel
Dissolved Metals by ICPMS	ICP/MS	6985386	N/A	2020/10/06	Nan Raykha
Ion Balance (% Difference)	CALC	6981750	N/A	2020/10/07	Automated Statchk
Total Ammonia-N	LACH/NH4	6988508	N/A	2020/10/08	Amanpreet Sappal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6985364	N/A	2020/10/07	Chandra Nandlal
Organic Nitrogen	CALC	6981687	N/A	2020/10/10	Automated Statchk
pH	AT	6985331	2020/10/06	2020/10/07	Yogesh Patel
Phenols (4AAP)	TECH/PHEN	6984897	N/A	2020/10/07	Bramdeo Motiram
Orthophosphate	KONE	6983637	N/A	2020/10/07	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	6983658	N/A	2020/10/07	Deonarine Ramnarine
Total Dissolved Solids	BAL	6987773	2020/10/07	2020/10/08	Shivani Desai
Total Kjeldahl Nitrogen in Water	SKAL	6987782	2020/10/07	2020/10/09	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	6987806	2020/10/07	2020/10/08	Shivani Shivani

BV Labs ID: NUK406
Sample ID: MW12 I
Matrix: Water

Collected: 2020/09/30
Shipped:
Received: 2020/10/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	6985334	N/A	2020/10/07	Yogesh Patel
Chloride by Automated Colourimetry	KONE	6985706	N/A	2020/10/07	Alina Dobreanu
Chemical Oxygen Demand	SPEC	6987811	N/A	2020/10/11	Nimarta Singh
Conductivity	AT	6985324	N/A	2020/10/07	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6985149	N/A	2020/10/07	Nimarta Singh
Hardness (calculated as CaCO3)		6981445	N/A	2020/10/08	Automated Statchk
Mercury in Water by CVAA	CV/AA	6989765	2020/10/08	2020/10/08	Meghaben Patel
Dissolved Metals by ICPMS	ICP/MS	6985396	N/A	2020/10/07	Azita Fazaeli
Ion Balance (% Difference)	CALC	6981750	N/A	2020/10/08	Automated Statchk
Total Ammonia-N	LACH/NH4	6988508	N/A	2020/10/08	Amanpreet Sappal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6985704	N/A	2020/10/08	Chandra Nandlal

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TEST SUMMARY

BV Labs ID: NUK406
Sample ID: MW12 I
Matrix: Water

Collected: 2020/09/30
Shipped:
Received: 2020/10/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Organic Nitrogen	CALC	6981687	N/A	2020/10/10	Automated Statchk
pH	AT	6985331	2020/10/06	2020/10/07	Yogesh Patel
Phenols (4AAP)	TECH/PHEN	6984904	N/A	2020/10/06	Bramdeo Motiram
Orthophosphate	KONE	6985715	N/A	2020/10/08	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	6985722	N/A	2020/10/07	Deonarine Ramnarine
Total Dissolved Solids	BAL	6987773	2020/10/07	2020/10/08	Shivani Desai
Total Kjeldahl Nitrogen in Water	SKAL	6987782	2020/10/07	2020/10/09	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	6987806	2020/10/07	2020/10/08	Shivani Shivani

BV Labs ID: NUK406 Dup
Sample ID: MW12 I
Matrix: Water

Collected: 2020/09/30
Shipped:
Received: 2020/10/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Metals by ICPMS	ICP/MS	6985396	N/A	2020/10/07	Azita Fazaeli

BV Labs ID: NUK407
Sample ID: MW12 II
Matrix: Water

Collected: 2020/09/30
Shipped:
Received: 2020/10/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	6985334	N/A	2020/10/07	Yogesh Patel
Chloride by Automated Colourimetry	KONE	6985706	N/A	2020/10/07	Alina Dobreanu
Chemical Oxygen Demand	SPEC	6987811	N/A	2020/10/11	Nimarta Singh
Conductivity	AT	6985324	N/A	2020/10/07	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6985149	N/A	2020/10/07	Nimarta Singh
Hardness (calculated as CaCO3)		6981445	N/A	2020/10/06	Automated Statchk
Mercury in Water by CVAA	CV/AA	6989765	2020/10/08	2020/10/08	Meghaben Patel
Dissolved Metals by ICPMS	ICP/MS	6985386	N/A	2020/10/06	Nan Raykha
Ion Balance (% Difference)	CALC	6981750	N/A	2020/10/07	Automated Statchk
Total Ammonia-N	LACH/NH4	6988508	N/A	2020/10/08	Amanpreet Sappal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6985704	N/A	2020/10/08	Chandra Nandlal
Organic Nitrogen	CALC	6981687	N/A	2020/10/10	Automated Statchk
pH	AT	6985331	2020/10/06	2020/10/07	Yogesh Patel
Phenols (4AAP)	TECH/PHEN	6984897	N/A	2020/10/07	Bramdeo Motiram
Orthophosphate	KONE	6985715	N/A	2020/10/08	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	6985722	N/A	2020/10/07	Deonarine Ramnarine
Total Dissolved Solids	BAL	6987773	2020/10/07	2020/10/08	Shivani Desai
Total Kjeldahl Nitrogen in Water	SKAL	6987782	2020/10/07	2020/10/10	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	6987806	2020/10/07	2020/10/08	Shivani Shivani

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BV Labs Job #: C0P9015
Report Date: 2020/12/17

exp Services Inc
Client Project #: THB-00006196-PE
Site Location: LONGLAC LF
Sampler Initials: EF

TEST SUMMARY

BV Labs ID: NUK408
Sample ID: MW13
Matrix: Water

Collected: 2020/09/30
Shipped:
Received: 2020/10/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	6983722	N/A	2020/10/06	Yogesh Patel
Chloride by Automated Colourimetry	KONE	6983659	N/A	2020/10/07	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	6987811	N/A	2020/10/11	Nimarta Singh
Conductivity	AT	6983812	N/A	2020/10/06	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6985645	N/A	2020/10/08	Nimarta Singh
Hardness (calculated as CaCO3)		6981445	N/A	2020/10/07	Automated Statchk
Mercury in Water by CVAA	CV/AA	6989765	2020/10/08	2020/10/08	Meghaben Patel
Dissolved Metals by ICPMS	ICP/MS	6985427	N/A	2020/10/06	Nan Raykha
Ion Balance (% Difference)	CALC	6981750	N/A	2020/10/07	Automated Statchk
Total Ammonia-N	LACH/NH4	6988508	N/A	2020/10/08	Amanpreet Sappal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6983594	N/A	2020/10/07	Chandra Nandlal
Organic Nitrogen	CALC	6981687	N/A	2020/10/10	Automated Statchk
pH	AT	6983761	2020/10/05	2020/10/06	Yogesh Patel
Phenols (4AAP)	TECH/PHEN	6984897	N/A	2020/10/07	Bramdeo Motiram
Orthophosphate	KONE	6983637	N/A	2020/10/07	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	6983658	N/A	2020/10/07	Deonarine Ramnarine
Total Dissolved Solids	BAL	6987773	2020/10/07	2020/10/08	Shivani Desai
Total Kjeldahl Nitrogen in Water	SKAL	6987782	2020/10/07	2020/10/10	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	6987345	2020/10/07	2020/10/07	Shivani Shivani
Volatile Organic Compounds in Water	P&T/MS	6985183	N/A	2020/10/07	Dina Wang

BV Labs ID: NUK408 Dup
Sample ID: MW13
Matrix: Water

Collected: 2020/09/30
Shipped:
Received: 2020/10/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	6983722	N/A	2020/10/06	Yogesh Patel
Conductivity	AT	6983812	N/A	2020/10/06	Yogesh Patel
pH	AT	6983761	2020/10/05	2020/10/06	Yogesh Patel

BV Labs ID: NUK409
Sample ID: SW1
Matrix: Water

Collected: 2020/09/30
Shipped:
Received: 2020/10/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	6985497	N/A	2020/10/07	Arefa Dabhad
Alkalinity	AT	6985334	N/A	2020/10/07	Yogesh Patel
Biochemical Oxygen Demand (BOD)	DO	6980979	2020/10/03	2020/10/08	Navjot Kaur Gill
Chloride by Automated Colourimetry	KONE	6985706	N/A	2020/10/07	Alina Dobreanu
Chemical Oxygen Demand	SPEC	6987811	N/A	2020/10/11	Nimarta Singh
Conductivity	AT	6985324	N/A	2020/10/07	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6985149	N/A	2020/10/07	Nimarta Singh
Hardness (calculated as CaCO3)		6981445	N/A	2020/10/07	Automated Statchk
Mercury in Water by CVAA	CV/AA	6989765	2020/10/08	2020/10/08	Meghaben Patel

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TEST SUMMARY

BV Labs ID: NUK409
Sample ID: SW1
Matrix: Water

Collected: 2020/09/30
Shipped:
Received: 2020/10/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Calcium and Magnesium	ICP	6985320	2020/10/06	2020/10/07	Suban Kanapathippllai
Total Metals Analysis by ICPMS	ICP/MS	6990069	N/A	2020/10/08	Daniel Teclu
Total Ammonia-N	LACH/NH4	6988508	N/A	2020/10/08	Amanpreet Sappal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6985704	N/A	2020/10/08	Chandra Nandlal
Organic Nitrogen	CALC	6981687	N/A	2020/10/10	Automated Statchk
pH	AT	6985331	2020/10/06	2020/10/07	Yogesh Patel
Phenols (4AAP)	TECH/PHEN	6984897	N/A	2020/10/07	Bramdeo Motiram
Sulphate by Automated Colourimetry	KONE	6985722	N/A	2020/10/07	Deonarine Ramnarine
Total Dissolved Solids	BAL	6982647	2020/10/07	2020/10/08	Margesh Majmunda
Total Kjeldahl Nitrogen in Water	SKAL	6987782	2020/10/07	2020/10/09	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	6989961	2020/10/08	2020/10/08	Shivani Shivani
Low Level Total Suspended Solids	BAL	6987757	2020/10/07	2020/10/08	Margesh Majmunda

BV Labs ID: NUK409 Dup
Sample ID: SW1
Matrix: Water

Collected: 2020/09/30
Shipped:
Received: 2020/10/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chemical Oxygen Demand	SPEC	6987811	N/A	2020/10/11	Nimarta Singh
Total Ammonia-N	LACH/NH4	6988508	N/A	2020/10/08	Amanpreet Sappal

BV Labs ID: NUK410
Sample ID: SW2
Matrix: Water

Collected: 2020/09/30
Shipped:
Received: 2020/10/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	6985497	N/A	2020/10/07	Arefa Dabhad
Alkalinity	AT	6983515	N/A	2020/10/06	Yogesh Patel
Biochemical Oxygen Demand (BOD)	DO	6980979	2020/10/03	2020/10/08	Navjot Kaur Gill
Chloride by Automated Colourimetry	KONE	6983620	N/A	2020/10/07	Alina Dobreanu
Chemical Oxygen Demand	SPEC	6987811	N/A	2020/10/11	Nimarta Singh
Conductivity	AT	6983523	N/A	2020/10/06	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6985645	N/A	2020/10/08	Nimarta Singh
Hardness (calculated as CaCO3)		6981445	N/A	2020/10/07	Automated Statchk
Mercury in Water by CVAA	CV/AA	6989765	2020/10/08	2020/10/08	Meghaben Patel
Dissolved Calcium and Magnesium	ICP	6985320	2020/10/06	2020/10/07	Suban Kanapathippllai
Total Metals Analysis by ICPMS	ICP/MS	6990069	N/A	2020/10/08	Daniel Teclu
Total Ammonia-N	LACH/NH4	6988508	N/A	2020/10/08	Amanpreet Sappal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6983594	N/A	2020/10/07	Chandra Nandlal
Organic Nitrogen	CALC	6981687	N/A	2020/10/10	Automated Statchk
pH	AT	6983530	2020/10/05	2020/10/06	Yogesh Patel
Phenols (4AAP)	TECH/PHEN	6984904	N/A	2020/10/06	Bramdeo Motiram
Sulphate by Automated Colourimetry	KONE	6983632	N/A	2020/10/07	Deonarine Ramnarine
Total Dissolved Solids	BAL	6982647	2020/10/07	2020/10/08	Margesh Majmunda

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BV Labs Job #: C0P9015
Report Date: 2020/12/17

exp Services Inc
Client Project #: THB-00006196-PE
Site Location: LONGLAC LF
Sampler Initials: EF

TEST SUMMARY

BV Labs ID: NUK410
Sample ID: SW2
Matrix: Water

Collected: 2020/09/30
Shipped:
Received: 2020/10/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Kjeldahl Nitrogen in Water	SKAL	6987782	2020/10/07	2020/10/09	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	6989961	2020/10/08	2020/10/08	Shivani Shivani
Low Level Total Suspended Solids	BAL	6982671	2020/10/07	2020/10/08	Massarat Jan

BV Labs ID: NUK410 Dup
Sample ID: SW2
Matrix: Water

Collected: 2020/09/30
Shipped:
Received: 2020/10/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	6985497	N/A	2020/10/07	Arefa Dabhad

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GENERAL COMMENTS

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

Package 1	6.0°C
Package 2	6.0°C
Package 3	4.0°C
Package 4	4.7°C

Revised report 2020/12/17: Additional metals parameters reported

VOC Water Analysis: Due to foaming, most of the samples required dilution. The detection limits were adjusted accordingly.

Results relate only to the items tested.

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QUALITY ASSURANCE REPORT

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
6985183	4-Bromofluorobenzene	2020/10/07	101	70 - 130	101	70 - 130	99	%				
6985183	D4-1,2-Dichloroethane	2020/10/07	97	70 - 130	96	70 - 130	95	%				
6985183	D8-Toluene	2020/10/07	99	70 - 130	99	70 - 130	100	%				
6980979	Total BOD	2020/10/08					<2	mg/L	NC	30	93	80 - 120
6982647	Total Dissolved Solids	2020/10/08					<10	mg/L	2.2	25	95	90 - 110
6982671	Total Suspended Solids	2020/10/08					<1	mg/L	0	25	99	85 - 115
6983515	Alkalinity (Total as CaCO3)	2020/10/06			96	85 - 115	<1.0	mg/L	0.53	20		
6983523	Conductivity	2020/10/06			101	85 - 115	<1.0	umho/cm	0	25		
6983530	pH	2020/10/06			102	98 - 103			0.73	N/A		
6983594	Nitrate (N)	2020/10/07	97	80 - 120	102	80 - 120	<0.10	mg/L	NC	20		
6983594	Nitrite (N)	2020/10/07	101	80 - 120	106	80 - 120	<0.010	mg/L	NC	20		
6983620	Dissolved Chloride (Cl-)	2020/10/07	NC	80 - 120	101	80 - 120	<1.0	mg/L	2.7	20		
6983632	Dissolved Sulphate (SO4)	2020/10/07	NC	75 - 125	103	80 - 120	<1.0	mg/L	1.2	20		
6983637	Orthophosphate (P)	2020/10/07	98	75 - 125	98	80 - 120	<0.010	mg/L	NC	25		
6983658	Dissolved Sulphate (SO4)	2020/10/07	145 (1)	75 - 125	105	80 - 120	<1.0	mg/L	NC	20		
6983659	Dissolved Chloride (Cl-)	2020/10/07	118	80 - 120	102	80 - 120	<1.0	mg/L	1.3	20		
6983722	Alkalinity (Total as CaCO3)	2020/10/06			95	85 - 115	<1.0	mg/L	0.21	20		
6983761	pH	2020/10/06			102	98 - 103			0.083	N/A		
6983812	Conductivity	2020/10/06			101	85 - 115	<1.0	umho/cm	0	25		
6984890	Phenols-4AAP	2020/10/07	107	80 - 120	97	80 - 120	<0.0010	mg/L	NC	20		
6984897	Phenols-4AAP	2020/10/07	105	80 - 120	98	80 - 120	<0.0010	mg/L	NC	20		
6984904	Phenols-4AAP	2020/10/06	102	80 - 120	102	80 - 120	<0.0010	mg/L	NC	20		
6985149	Dissolved Organic Carbon	2020/10/07	93	80 - 120	98	80 - 120	<0.40	mg/L	8.6	20		
6985183	1,1,1,2-Tetrachloroethane	2020/10/08	102	70 - 130	90	70 - 130	<0.20	ug/L	NC	30		
6985183	1,1,1-Trichloroethane	2020/10/08	87	70 - 130	81	70 - 130	<0.10	ug/L	NC	30		
6985183	1,1,2,2-Tetrachloroethane	2020/10/08	106	70 - 130	95	70 - 130	<0.20	ug/L	NC	30		
6985183	1,1,2-Trichloroethane	2020/10/08	100	70 - 130	91	70 - 130	<0.20	ug/L	NC	30		
6985183	1,1-Dichloroethane	2020/10/08	85	70 - 130	82	70 - 130	<0.10	ug/L	NC	30		
6985183	1,1-Dichloroethylene	2020/10/08	86	70 - 130	86	70 - 130	<0.10	ug/L	NC	30		

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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
6985183	1,2-Dichlorobenzene	2020/10/08	92	70 - 130	91	70 - 130	<0.20	ug/L	NC	30		
6985183	1,2-Dichloroethane	2020/10/08	85	70 - 130	81	70 - 130	<0.20	ug/L	NC	30		
6985183	1,2-Dichloropropane	2020/10/08	91	70 - 130	85	70 - 130	<0.10	ug/L	NC	30		
6985183	1,3-Dichlorobenzene	2020/10/08	89	70 - 130	89	70 - 130	<0.20	ug/L	NC	30		
6985183	1,4-Dichlorobenzene	2020/10/08	91	70 - 130	90	70 - 130	<0.20	ug/L	NC	30		
6985183	Acetone (2-Propanone)	2020/10/08	95	60 - 140	96	60 - 140	<10	ug/L	NC	30		
6985183	Benzene	2020/10/08	91	70 - 130	84	70 - 130	<0.10	ug/L	0.86	30		
6985183	Bromodichloromethane	2020/10/08	98	70 - 130	89	70 - 130	<0.10	ug/L	NC	30		
6985183	Bromoform	2020/10/08	115	70 - 130	104	70 - 130	<0.20	ug/L	NC	30		
6985183	Bromomethane	2020/10/08	86	60 - 140	83	60 - 140	<0.50	ug/L	NC	30		
6985183	Carbon Tetrachloride	2020/10/08	89	70 - 130	83	70 - 130	<0.10	ug/L	NC	30		
6985183	Chlorobenzene	2020/10/08	93	70 - 130	88	70 - 130	<0.10	ug/L	NC	30		
6985183	Chloroform	2020/10/08	89	70 - 130	84	70 - 130	<0.10	ug/L	NC	30		
6985183	cis-1,2-Dichloroethylene	2020/10/08	89	70 - 130	85	70 - 130	<0.10	ug/L	NC	30		
6985183	cis-1,3-Dichloropropene	2020/10/08	93	70 - 130	87	70 - 130	<0.20	ug/L	NC	30		
6985183	Dibromochloromethane	2020/10/08	107	70 - 130	97	70 - 130	<0.20	ug/L	NC	30		
6985183	Dichlorodifluoromethane (FREON 12)	2020/10/08	48 (2)	60 - 140	80	60 - 140	<0.50	ug/L	NC	30		
6985183	Ethylbenzene	2020/10/08	93	70 - 130	86	70 - 130	<0.10	ug/L	NC	30		
6985183	Ethylene Dibromide	2020/10/08	98	70 - 130	90	70 - 130	<0.20	ug/L	NC	30		
6985183	Hexane	2020/10/08	81	70 - 130	86	70 - 130	<0.50	ug/L	NC	30		
6985183	Methyl Ethyl Ketone (2-Butanone)	2020/10/08	93	60 - 140	89	60 - 140	<5.0	ug/L	NC	30		
6985183	Methyl Isobutyl Ketone	2020/10/08	102	70 - 130	91	70 - 130	<5.0	ug/L	NC	30		
6985183	Methyl t-butyl ether (MTBE)	2020/10/08	87	70 - 130	85	70 - 130	<0.20	ug/L	NC	30		
6985183	Methylene Chloride(Dichloromethane)	2020/10/08	87	70 - 130	83	70 - 130	<0.50	ug/L	NC	30		
6985183	o-Xylene	2020/10/08	96	70 - 130	87	70 - 130	<0.10	ug/L	NC	30		
6985183	p+m-Xylene	2020/10/08	94	70 - 130	86	70 - 130	<0.10	ug/L	NC	30		
6985183	Styrene	2020/10/08	97	70 - 130	91	70 - 130	<0.20	ug/L	NC	30		
6985183	Tetrachloroethylene	2020/10/08	89	70 - 130	85	70 - 130	<0.10	ug/L	NC	30		
6985183	Toluene	2020/10/08	91	70 - 130	85	70 - 130	<0.20	ug/L	NC	30		
6985183	Total Xylenes	2020/10/08					<0.10	ug/L	NC	30		
6985183	trans-1,2-Dichloroethylene	2020/10/08	88	70 - 130	84	70 - 130	<0.10	ug/L	NC	30		

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
6985183	trans-1,3-Dichloropropene	2020/10/08	96	70 - 130	88	70 - 130	<0.20	ug/L	NC	30		
6985183	Trichloroethylene	2020/10/08	89	70 - 130	84	70 - 130	<0.10	ug/L	NC	30		
6985183	Trichlorofluoromethane (FREON 11)	2020/10/08	84	70 - 130	88	70 - 130	<0.20	ug/L	NC	30		
6985183	Vinyl Chloride	2020/10/08	73	70 - 130	85	70 - 130	<0.20	ug/L	NC	30		
6985320	Dissolved Calcium (Ca)	2020/10/07	NC	80 - 120	102	80 - 120	<0.050	mg/L				
6985320	Dissolved Magnesium (Mg)	2020/10/07	NC	80 - 120	100	80 - 120	<0.050	mg/L				
6985324	Conductivity	2020/10/07			101	85 - 115	<1.0	umho/cm	0	25		
6985331	pH	2020/10/07			102	98 - 103			0.58	N/A		
6985334	Alkalinity (Total as CaCO3)	2020/10/07			95	85 - 115	<1.0	mg/L	1.1	20		
6985364	Nitrate (N)	2020/10/07	98	80 - 120	100	80 - 120	<0.10	mg/L	NC	20		
6985364	Nitrite (N)	2020/10/07	106	80 - 120	107	80 - 120	<0.010	mg/L	NC	20		
6985370	Nitrate (N)	2020/10/08	NC	80 - 120	103	80 - 120	<0.10	mg/L	0.26	20		
6985370	Nitrite (N)	2020/10/08	105	80 - 120	106	80 - 120	<0.010	mg/L	1.2	20		
6985386	Dissolved Aluminum (Al)	2020/10/06	104	80 - 120	101	80 - 120	<4.9	ug/L				
6985386	Dissolved Antimony (Sb)	2020/10/06	106	80 - 120	100	80 - 120	<0.50	ug/L				
6985386	Dissolved Arsenic (As)	2020/10/06	102	80 - 120	98	80 - 120	<1.0	ug/L	NC	20		
6985386	Dissolved Barium (Ba)	2020/10/06	104	80 - 120	99	80 - 120	<2.0	ug/L				
6985386	Dissolved Beryllium (Be)	2020/10/06	105	80 - 120	99	80 - 120	<0.40	ug/L				
6985386	Dissolved Bismuth (Bi)	2020/10/06	95	80 - 120	97	80 - 120	<1.0	ug/L				
6985386	Dissolved Boron (B)	2020/10/06	96	80 - 120	92	80 - 120	<10	ug/L				
6985386	Dissolved Cadmium (Cd)	2020/10/06	102	80 - 120	98	80 - 120	<0.090	ug/L				
6985386	Dissolved Calcium (Ca)	2020/10/06	NC	80 - 120	100	80 - 120	<200	ug/L				
6985386	Dissolved Chromium (Cr)	2020/10/06	99	80 - 120	96	80 - 120	<5.0	ug/L				
6985386	Dissolved Cobalt (Co)	2020/10/06	100	80 - 120	97	80 - 120	<0.50	ug/L				
6985386	Dissolved Copper (Cu)	2020/10/06	102	80 - 120	98	80 - 120	<0.90	ug/L				
6985386	Dissolved Iron (Fe)	2020/10/06	100	80 - 120	96	80 - 120	<100	ug/L				
6985386	Dissolved Lead (Pb)	2020/10/06	96	80 - 120	98	80 - 120	<0.50	ug/L				
6985386	Dissolved Magnesium (Mg)	2020/10/06	98	80 - 120	99	80 - 120	<50	ug/L				
6985386	Dissolved Manganese (Mn)	2020/10/06	99	80 - 120	97	80 - 120	<2.0	ug/L				
6985386	Dissolved Molybdenum (Mo)	2020/10/06	104	80 - 120	99	80 - 120	<0.50	ug/L				

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
6985386	Dissolved Nickel (Ni)	2020/10/06	97	80 - 120	96	80 - 120	<1.0	ug/L				
6985386	Dissolved Potassium (K)	2020/10/06	100	80 - 120	97	80 - 120	<200	ug/L				
6985386	Dissolved Selenium (Se)	2020/10/06	100	80 - 120	99	80 - 120	<2.0	ug/L				
6985386	Dissolved Silicon (Si)	2020/10/06	102	80 - 120	101	80 - 120	<50	ug/L				
6985386	Dissolved Sodium (Na)	2020/10/06	NC	80 - 120	99	80 - 120	<100	ug/L				
6985386	Dissolved Strontium (Sr)	2020/10/06	98	80 - 120	97	80 - 120	<1.0	ug/L				
6985386	Dissolved Thallium (Tl)	2020/10/06	97	80 - 120	97	80 - 120	<0.050	ug/L				
6985386	Dissolved Tin (Sn)	2020/10/06	104	80 - 120	100	80 - 120	<1.0	ug/L				
6985386	Dissolved Vanadium (V)	2020/10/06	102	80 - 120	99	80 - 120	<0.50	ug/L				
6985386	Dissolved Zinc (Zn)	2020/10/06	99	80 - 120	99	80 - 120	<5.0	ug/L				
6985396	Dissolved Aluminum (Al)	2020/10/07	97	80 - 120	100	80 - 120	<4.9	ug/L	3.4	20		
6985396	Dissolved Antimony (Sb)	2020/10/07	101	80 - 120	99	80 - 120	<0.50	ug/L	NC	20		
6985396	Dissolved Arsenic (As)	2020/10/07	100	80 - 120	99	80 - 120	<1.0	ug/L	NC	20		
6985396	Dissolved Barium (Ba)	2020/10/07	98	80 - 120	99	80 - 120	<2.0	ug/L	2.8	20		
6985396	Dissolved Beryllium (Be)	2020/10/07	97	80 - 120	96	80 - 120	<0.40	ug/L	NC	20		
6985396	Dissolved Bismuth (Bi)	2020/10/07	90	80 - 120	91	80 - 120	<1.0	ug/L	NC	20		
6985396	Dissolved Boron (B)	2020/10/07	96	80 - 120	96	80 - 120	<10	ug/L	0.31	20		
6985396	Dissolved Cadmium (Cd)	2020/10/07	99	80 - 120	97	80 - 120	<0.090	ug/L	NC	20		
6985396	Dissolved Calcium (Ca)	2020/10/07	NC	80 - 120	102	80 - 120	<200	ug/L	3.0	20		
6985396	Dissolved Chromium (Cr)	2020/10/07	100	80 - 120	99	80 - 120	<5.0	ug/L	NC	20		
6985396	Dissolved Cobalt (Co)	2020/10/07	98	80 - 120	99	80 - 120	<0.50	ug/L	NC	20		
6985396	Dissolved Copper (Cu)	2020/10/07	100	80 - 120	101	80 - 120	<0.90	ug/L	6.2	20		
6985396	Dissolved Iron (Fe)	2020/10/07	98	80 - 120	97	80 - 120	<100	ug/L	NC	20		
6985396	Dissolved Lead (Pb)	2020/10/07	93	80 - 120	94	80 - 120	<0.50	ug/L	NC	20		
6985396	Dissolved Magnesium (Mg)	2020/10/07	NC	80 - 120	101	80 - 120	<50	ug/L	0.45	20		
6985396	Dissolved Manganese (Mn)	2020/10/07	98	80 - 120	98	80 - 120	<2.0	ug/L	1.0	20		
6985396	Dissolved Molybdenum (Mo)	2020/10/07	102	80 - 120	100	80 - 120	<0.50	ug/L	2.2	20		
6985396	Dissolved Nickel (Ni)	2020/10/07	97	80 - 120	98	80 - 120	<1.0	ug/L	NC	20		
6985396	Dissolved Potassium (K)	2020/10/07	101	80 - 120	100	80 - 120	<200	ug/L	1.5	20		
6985396	Dissolved Selenium (Se)	2020/10/07	96	80 - 120	97	80 - 120	<2.0	ug/L	NC	20		
6985396	Dissolved Silicon (Si)	2020/10/07	95	80 - 120	100	80 - 120	<50	ug/L	2.8	20		

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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
6985396	Dissolved Sodium (Na)	2020/10/07	103	80 - 120	102	80 - 120	<100	ug/L	1.2	20		
6985396	Dissolved Strontium (Sr)	2020/10/07	97	80 - 120	97	80 - 120	<1.0	ug/L	1.5	20		
6985396	Dissolved Thallium (Tl)	2020/10/07	94	80 - 120	94	80 - 120	<0.050	ug/L	NC	20		
6985396	Dissolved Tin (Sn)	2020/10/07	100	80 - 120	98	80 - 120	<1.0	ug/L	NC	20		
6985396	Dissolved Vanadium (V)	2020/10/07	102	80 - 120	101	80 - 120	<0.50	ug/L	NC	20		
6985396	Dissolved Zinc (Zn)	2020/10/07	97	80 - 120	98	80 - 120	<5.0	ug/L	NC	20		
6985427	Dissolved Aluminum (Al)	2020/10/06	NC	80 - 120	100	80 - 120	<4.9	ug/L	1.8	20		
6985427	Dissolved Antimony (Sb)	2020/10/06	105	80 - 120	103	80 - 120	<0.50	ug/L	4.8	20		
6985427	Dissolved Arsenic (As)	2020/10/06	102	80 - 120	99	80 - 120	<1.0	ug/L	NC	20		
6985427	Dissolved Barium (Ba)	2020/10/06	102	80 - 120	102	80 - 120	<2.0	ug/L	1.5	20		
6985427	Dissolved Beryllium (Be)	2020/10/06	99	80 - 120	101	80 - 120	<0.40	ug/L	NC	20		
6985427	Dissolved Bismuth (Bi)	2020/10/06	95	80 - 120	97	80 - 120	<1.0	ug/L	NC	20		
6985427	Dissolved Boron (B)	2020/10/06	92	80 - 120	94	80 - 120	<10	ug/L	3.4	20		
6985427	Dissolved Cadmium (Cd)	2020/10/06	101	80 - 120	100	80 - 120	<0.090	ug/L	NC	20		
6985427	Dissolved Calcium (Ca)	2020/10/06	NC	80 - 120	99	80 - 120	<200	ug/L	1.2	20		
6985427	Dissolved Chromium (Cr)	2020/10/06	98	80 - 120	98	80 - 120	<5.0	ug/L	NC	20		
6985427	Dissolved Cobalt (Co)	2020/10/06	100	80 - 120	99	80 - 120	<0.50	ug/L	NC	20		
6985427	Dissolved Copper (Cu)	2020/10/06	98	80 - 120	99	80 - 120	<0.90	ug/L	NC	20		
6985427	Dissolved Iron (Fe)	2020/10/06	99	80 - 120	98	80 - 120	<100	ug/L	NC	20		
6985427	Dissolved Lead (Pb)	2020/10/06	98	80 - 120	96	80 - 120	<0.50	ug/L	NC	20		
6985427	Dissolved Magnesium (Mg)	2020/10/06	101	80 - 120	103	80 - 120	<50	ug/L	0.26	20		
6985427	Dissolved Manganese (Mn)	2020/10/06	99	80 - 120	99	80 - 120	<2.0	ug/L	NC	20		
6985427	Dissolved Molybdenum (Mo)	2020/10/06	107	80 - 120	100	80 - 120	<0.50	ug/L	0.85	20		
6985427	Dissolved Nickel (Ni)	2020/10/06	97	80 - 120	97	80 - 120	<1.0	ug/L	NC	20		
6985427	Dissolved Potassium (K)	2020/10/06	NC	80 - 120	99	80 - 120	<200	ug/L	1.5	20		
6985427	Dissolved Selenium (Se)	2020/10/06	100	80 - 120	98	80 - 120	<2.0	ug/L	1.5	20		
6985427	Dissolved Silicon (Si)	2020/10/06	99	80 - 120	98	80 - 120	<50	ug/L	0.60	20		
6985427	Dissolved Sodium (Na)	2020/10/06	NC	80 - 120	99	80 - 120	<100	ug/L	0.38	20		
6985427	Dissolved Strontium (Sr)	2020/10/06	NC	80 - 120	99	80 - 120	<1.0	ug/L	0.90	20		
6985427	Dissolved Thallium (Tl)	2020/10/06	99	80 - 120	98	80 - 120	<0.050	ug/L	NC	20		
6985427	Dissolved Tin (Sn)	2020/10/06	104	80 - 120	102	80 - 120	<1.0	ug/L	NC	20		

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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
6985427	Dissolved Vanadium (V)	2020/10/06	101	80 - 120	100	80 - 120	<0.50	ug/L	2.8	20		
6985427	Dissolved Zinc (Zn)	2020/10/06	100	80 - 120	101	80 - 120	<5.0	ug/L	NC	20		
6985497	Dissolved (0.2u) Aluminum (Al)	2020/10/07	99	80 - 120	99	80 - 120	<5	ug/L	2.7	20		
6985645	Dissolved Organic Carbon	2020/10/08	92	80 - 120	95	80 - 120	<0.40	mg/L	5.1	20		
6985704	Nitrate (N)	2020/10/08	100	80 - 120	100	80 - 120	<0.10	mg/L	NC	20		
6985704	Nitrite (N)	2020/10/08	107	80 - 120	106	80 - 120	<0.010	mg/L	NC	20		
6985706	Dissolved Chloride (Cl-)	2020/10/07	NC	80 - 120	103	80 - 120	<1.0	mg/L	3.4	20		
6985715	Orthophosphate (P)	2020/10/08	103	75 - 125	101	80 - 120	<0.010	mg/L	NC	25		
6985722	Dissolved Sulphate (SO4)	2020/10/07	NC	75 - 125	104	80 - 120	<1.0	mg/L	1.5	20		
6986262	Alkalinity (Total as CaCO3)	2020/10/08			94	85 - 115	<1.0	mg/L	0.066	20		
6986264	Conductivity	2020/10/08			100	85 - 115	<1.0	umho/cm	0.34	25		
6986269	pH	2020/10/08			102	98 - 103			1.3	N/A		
6987345	Total Phosphorus	2020/10/07	100	80 - 120	101	80 - 120	<0.020	mg/L	1.8	20	99	80 - 120
6987757	Total Suspended Solids	2020/10/08					<1	mg/L	14	25	96	85 - 115
6987773	Total Dissolved Solids	2020/10/08					<10	mg/L	3.1	25	98	90 - 110
6987782	Total Kjeldahl Nitrogen (TKN)	2020/10/09	99	80 - 120	100	80 - 120	<0.10	mg/L	6.0	20	97	80 - 120
6987806	Total Phosphorus	2020/10/08	95	80 - 120	98	80 - 120	<0.020	mg/L	0.79	20	97	80 - 120
6987811	Total Chemical Oxygen Demand (COD)	2020/10/11	94	80 - 120	102	80 - 120	<4.0	mg/L	2.0	20		
6988508	Total Ammonia-N	2020/10/08	100	75 - 125	102	80 - 120	<0.050	mg/L	NC	20		
6989765	Mercury (Hg)	2020/10/08	102	75 - 125	98	80 - 120	<0.00010	mg/L	NC	20		
6989769	Mercury (Hg)	2020/10/08	102	75 - 125	97	80 - 120	<0.00010	mg/L	NC	20		
6989961	Total Phosphorus	2020/10/08	NC	80 - 120	92	80 - 120	<0.004	mg/L	0.27	20	89	80 - 120
6990069	Total Antimony (Sb)	2020/10/08	100	80 - 120	96	80 - 120	<0.50	ug/L	NC	20		
6990069	Total Arsenic (As)	2020/10/08	97	80 - 120	94	80 - 120	<1.0	ug/L	NC	20		
6990069	Total Barium (Ba)	2020/10/08	95	80 - 120	93	80 - 120	<2.0	ug/L				
6990069	Total Beryllium (Be)	2020/10/08	101	80 - 120	97	80 - 120	<0.40	ug/L				
6990069	Total Bismuth (Bi)	2020/10/08	93	80 - 120	88	80 - 120	<1.0	ug/L				
6990069	Total Boron (B)	2020/10/08	94	80 - 120	91	80 - 120	<10	ug/L				
6990069	Total Cadmium (Cd)	2020/10/08	98	80 - 120	95	80 - 120	<0.090	ug/L	NC	20		
6990069	Total Chromium (Cr)	2020/10/08	94	80 - 120	90	80 - 120	<5.0	ug/L	NC	20		

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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
6990069	Total Cobalt (Co)	2020/10/08	95	80 - 120	93	80 - 120	<0.50	ug/L	NC	20		
6990069	Total Copper (Cu)	2020/10/08	98	80 - 120	93	80 - 120	<0.90	ug/L	2.3	20		
6990069	Total Iron (Fe)	2020/10/08	95	80 - 120	94	80 - 120	<100	ug/L				
6990069	Total Lead (Pb)	2020/10/08	94	80 - 120	94	80 - 120	<0.50	ug/L	NC	20		
6990069	Total Manganese (Mn)	2020/10/08	91	80 - 120	90	80 - 120	<2.0	ug/L	2.8	20		
6990069	Total Molybdenum (Mo)	2020/10/08	100	80 - 120	97	80 - 120	<0.50	ug/L	3.5	20		
6990069	Total Nickel (Ni)	2020/10/08	92	80 - 120	90	80 - 120	<1.0	ug/L	NC	20		
6990069	Total Potassium (K)	2020/10/08	96	80 - 120	93	80 - 120	<200	ug/L				
6990069	Total Selenium (Se)	2020/10/08	101	80 - 120	99	80 - 120	<2.0	ug/L	NC	20		
6990069	Total Silicon (Si)	2020/10/08	96	80 - 120	94	80 - 120	<50	ug/L				
6990069	Total Silver (Ag)	2020/10/08	99	80 - 120	94	80 - 120	<0.090	ug/L	NC	20		
6990069	Total Sodium (Na)	2020/10/08	93	80 - 120	94	80 - 120	<100	ug/L				
6990069	Total Strontium (Sr)	2020/10/08	90	80 - 120	90	80 - 120	<1.0	ug/L				
6990069	Total Thallium (Tl)	2020/10/08	94	80 - 120	95	80 - 120	<0.050	ug/L				
6990069	Total Tin (Sn)	2020/10/08	97	80 - 120	94	80 - 120	<1.0	ug/L	NC	20		
6990069	Total Titanium (Ti)	2020/10/08	93	80 - 120	92	80 - 120	<5.0	ug/L	NC	20		
6990069	Total Vanadium (V)	2020/10/08	92	80 - 120	90	80 - 120	<0.50	ug/L				

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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
6990069	Total Zinc (Zn)	2020/10/08	98	80 - 120	102	80 - 120	<5.0	ug/L	0.52	20		

N/A = Not Applicable

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

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

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

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

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

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

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

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

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

(2) The recovery was below the lower control limit. This may represent a low bias in some results for this specific analyte.

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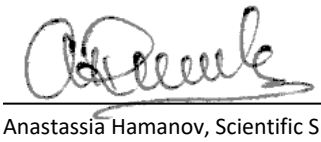
BV Labs Job #: C0P9015
Report Date: 2020/12/17

exp Services Inc
Client Project #: THB-00006196-PE
Site Location: LONGLAC LF
Sampler Initials: EF

VALIDATION SIGNATURE PAGE

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



Anastassia Hamanov, Scientific Specialist

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

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Page 1 of 3

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02-Oct-20 16:55
Julie Clement
C0P9015
ENV 1401

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:	
Company Name:	#17501 exp Services Inc	Company Name:		Quotation #:	B90572
Attention:	Accounts Payable	Attention:	Ahileas Mitsopoulos Sharif Nawyaz	P.O. #:	
Address:	1142 Roland St	Address:		Project:	THB-00006196-PE
	Thunder Bay ON P7B 5M4			Project Name:	Longlac LF
Tel:	(807) 623-9495 Fax: (807) 623-8070	Tel:	Fax:	Site #:	
Email:	thunderbay@exp.com; Karen.Burke@exp.com;AP@ex	Email:	ahileas.mitsopoulos@exp.com	Sampled By:	Elwin Farkas

Bottle Order #: 791207
COC #: C#791207-01-01
Project Manager: Julie Clement

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE BV LABS DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011)	Other Regulations	Special Instructions
☐ Table 1 ☐ Res/Park ☐ Medium/Fine	☐ CCME ☐ Sanitary Sewer Bylaw	
☐ Table 2 ☐ Ind/Comm ☐ Coarse	☐ Reg 558 ☐ Storm Sewer Bylaw	
☐ Table 3 ☐ Agri/Other ☐ For RSC	☐ MISA Municipality	
☐ Table ___	☐ PWQO ☐ Reg 406 Table	
	☒ Other OPWS	

Include Criteria on Certificate of Analysis (Y/N)? ______

ANALYSIS REQUESTED (PLEASE BE SPECIFIC)

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects
Regular (Standard) TAT: ☒
(will be applied if Rush TAT is not specified)
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.
Job Specific Rush TAT (if applies to entire submission) ☐
Date Required: ______ Time Required: ______
Rush Confirmation Number: ______ (call lab for #)

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Hg / Cr VI	Organic Nitrogen	Orthophosphate	Hardness (calculated as CaCO3)	Extra Dissolved Metals Parameters	Landfill Standards Sch 5 - GW Comp NO VOCs	GW- Fall (with VOCs)					# of Bottles	Comments
1		MW2	9-30-20	8:40AM	GW	X	X	X	X	X	X						11	
2		MW3	9-30-20	9:20AM	GW	X	X	X	X	X	X						11	
3		MW4I	9-30-20	3:30PM	GW	X	X	X	X	X	X						11	
4		MW4II	9-30-20	4:00PM	GW	X	X	X	X	X	X						11	
5		MW5	9-30-20	2:00PM	GW	X	X	X	X	X	X						11	
6		MW6	9-30-20	1:00PM	GW	X	X	X	X	X	X	X					14	Rec'd In Thunder Bay
7		MW7	9-30-20	11:50AM	GW	X	X	X	X	X	X	X					14	
8		MW8I	9-30-20	11:25AM	GW	X	X	X	X	X	X	X					14	
9		MW10	9-30-20	3:00PM	GW	X	X	X	X	X	X						11	
10		MW11I	9-30-20	10:05AM	GW	X	X	X	X	X	X						11	

*RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Time Sensitive	Laboratory Use Only
Elwin Farkas	2020 Oct 2		Sharif Nawyaz	2020/10/02	13:00			Temperature (°C) on Recei: SEE ACTR
			James Klapperich	2020/10/02	16:51			

Cooling media present

Custody Seal	Yes	No
Present		
Intact		N/A

White: BV Labs Yellow: Client

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BV LABS' STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVLABS.COM/TERMS-AND-CONDITIONS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT WWW.BVLABS.COM/RESOURCES/CHAIN-OF-CUSTODY-FORMS.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BV LABS

Refer to ACTR

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6740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel (905) 817-5700 Toll-free 800-563-6266 Fax (905) 817-5777 www.bvlabs.com

CHAIN OF CUSTODY RECORD

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#17501 exp Services Inc	Company Name:		Quotation #:	B90572	BV Labs Job #:	Bottle Order #: 791207
Attention:	Accounts Payable	Attention:	Ahileas Mitsopoulos & Sharif Xenayaz	P.O. #:			
Address:	1142 Roland St Thunder Bay ON P7B 5M4	Address:		Project:	THB-00006196-PE	COC #: C#791207-02-01	Project Manager: Julie Clement
Tel:	(807) 623-9495 Fax: (807) 623-8070	Tel:	Fax:	Project Name:	Longlac LF		
Email:	thunderbay@exp.com; Karen.Burke@exp.com;AP@ex	Email:	ahileas.mitsopoulos@exp.com	Site #:			
				Sampled By:	Elwin Farkas		

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE BV LABS DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011): ☐ Table 1 ☐ Res/Park ☐ Medium/Fine; ☐ Table 2 ☐ Ind/Comm ☐ Coarse; ☐ Table 3 ☐ Agri/Other ☐ For RSC; ☐ Table ___

Other Regulations: ☐ CCME ☐ Sanitary Sewer Bylaw; ☐ Reg 558 ☐ Storm Sewer Bylaw; ☐ MISA Municipality ___; ☐ PWQO ☐ Reg 406 Table ___; ☒ Other OPWS

Special Instructions

Include Criteria on Certificate of Analysis (Y/N)? ___

ANALYSIS REQUESTED (PLEASE BE SPECIFIC)

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects

Regular (Standard) TAT: ☒
(will be applied if Rush TAT is not specified):
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: ___ Time Required: ___ ☐
Rush Confirmation Number: ___ *(call lab for #)*

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Hg / Cr VI	Organic Nitrogen	Orthophosphate	Hardness (calculated as CaCO3)	Extra Dissolved Metals Parameters	Landfill Standards Sch 5 - GW Comp NO VOCs	GW- Full (with VOCs)					# of Bottles	Comments
1		MW 11 II	9-30-20	10:40AM	GW	X	X	X	X	X	X						11	
2		MW 12 I	9-30-20	5:40PM	GW	X	X	X	X	X	X						11	
3		MW 12 II	9-30-20	6:05PM	GW	X	X	X	X	X	X						11	
4		MW 13	9-30-20	11:50	GW	X	X	X	X	X	X	X					11	
5					GW													
6					GW													
7					GW													
8					GW													
9					GW													
10					GW													

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Laboratory Use Only: Time Sensitive	Temperature (°C) on Recei	Custody Seal	Yes	No
Elwin Farkas Elwin Farkas	2020 oct 2		Start ~~Laboratory~~ SEE PAGE 1	2020/10/02	13:00				Present		
									Intact		

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BV LABS' STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVLABS.COM/TERMS-AND-CONDITIONS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT WWW.BVLABS.COM/RESOURCES/CHAIN-OF-CUSTODY-FORMS.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BV LABS

White: BV Labs Yellow: Client

See page 1

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

CHAIN OF CUSTODY RECORD

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#17501 exp Services Inc	Company Name:		Quotation #:	B90572	BV Labs Job #:	Bottle Order #: 791210
Attention:	Accounts Payable	Attention:	Ahileas Mitsopoulos & Sharif Nawyaz	P.O. #:			
Address:	1142 Roland St Thunder Bay ON P7B 5M4	Address:		Project:	THB-00006196-PE		
Tel:	(807) 623-9495 Fax: (807) 623-8070	Tel:	Fax:	Project Name:	Longlac LF	COC #: C#791210-01-01	Project Manager: Julie Clement
Email:	thunderbay@exp.com; Karen.Burke@exp.com;AP@ex	Email:	ahileas.mitsopoulos@exp.com	Site #:			
				Sampled By:	Elwin Farkas		

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE BV LABS DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011)
- ☐ Table 1 ☐ Res/Park ☐ Medium/Fine
- ☐ Table 2 ☐ Ind/Comm ☐ Coarse
- ☐ Table 3 ☐ Agri/Other ☐ For RSC
- ☐ Table ___

Other Regulations
- ☐ CCME ☐ Sanitary Sewer Bylaw
- ☐ Reg 558 ☐ Storm Sewer Bylaw
- ☐ MISA Municipality ___
- ☐ PWQO ☐ Reg 406 Table
- ☒ Other OPWS PWQO

Special Instructions

Include Criteria on Certificate of Analysis (Y/N)? ___

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects

Regular (Standard) TAT: ☒
(will be applied if Rush TAT is not specified)
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: ___ Time Required: ___ ☐
Rush Confirmation Number: ___ *(call lab for #)*

ANALYSIS REQUESTED (PLEASE BE SPECIFIC)

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle) Metals (Hg) Cr VI	Landfill Standards Sch 5 - SW Comp List	Organic Nitrogen	Dissolved Organic Carbon (DOC)	Hardness (calculated as CaCO3)	Dissolved Aluminum (0.2 u. clay free)	Extra Total Metals Parameters	SW Full	Total metal Analysis by ICPMS			# of Bottles	Comments
1		[redacted]	[redacted]	—	~~SW~~													
2		[redacted]	—	—	~~SW~~													
3		[redacted]	—	—	~~SW~~													
4		SW1	9-30-20	12:25PM	SW	Yes	x	x	x	x	x	x	x	x			12	Mercury field filtered
5		SW2	9-30-20	4:30PM	SW	Yes	x	x	x	x	x	x	x	x			12	Mercury field filtered.
6					~~SW~~													
7																		
8																		
9																		
10																		

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Laboratory Use Only: Time Sensitive	Temperature (°C) on Recei	Custody Seal	Yes	No
Elwin Farkas Elwin Farkas	[redacted] 2020-10-2		Sharif Nawyaz (SEE PAGE 1)	2020/10/02	13:00				Present		
									Intact		

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BV LABS' STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVLABS.COM/TERMS-AND-CONDITIONS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT WWW.BVLABS.COM/RESOURCES/CHAIN-OF-CUSTODY-FORMS.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BV LABS

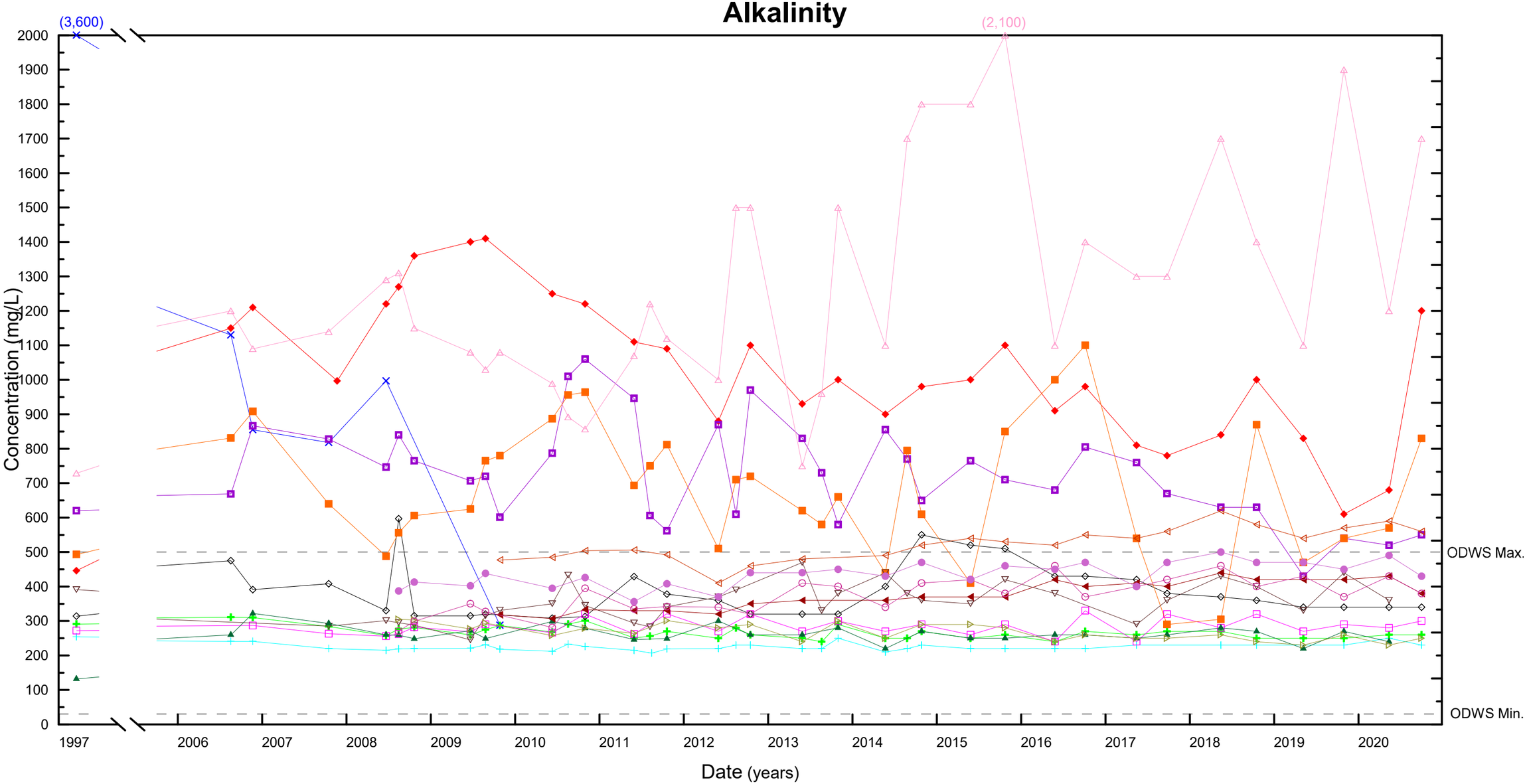
White: BV Labs Yellow: Client

Bureau Veritas Canada (2019) Inc.

See page 1

APPENDIX F – Graphs of Concentration versus Time

Alkalinity



Legend

MW1	MW8-I
MW2	MW8-II
MW3	MW9
MW4-I	MW10
MW4-II	MW11-I
MW5	MW11-II
MW6	MW12-I
MW7	MW12-II

Note 1) ODWS: Ontario Drinking Water Standard rev 2001.
2) Drawing to be read in conjunction with accompanying report.

exp.

Thunder Bay, Ontario

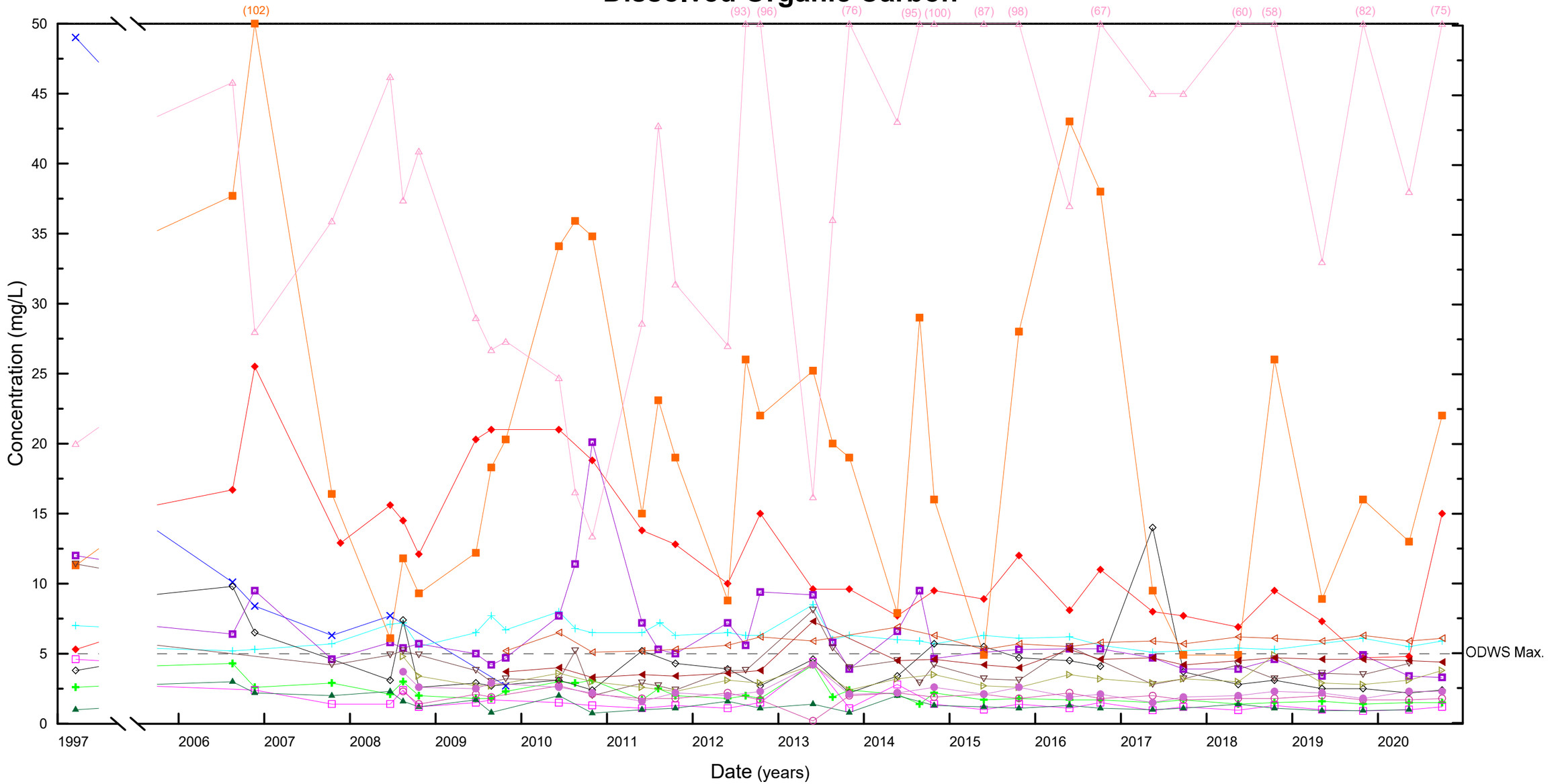
Figure F-1

Alkalinity

2018 to 2020 Environmental Quality Monitoring Report
Longlac Landfill
Municipality of Greenstone

REF. NO.:	THB-00006196-PE
SCALE:	N/A
DRAWN BY:	MS
CHECKED BY:	AM
DATE:	April 8, 2021

Dissolved Organic Carbon



Legend

MW1	MW8-I
MW2	MW8-II
MW3	MW9
MW4-I	MW10
MW4-II	MW11-I
MW5	MW11-II
MW6	MW12-I
MW7	MW12-II

Note 1) ODWS: Ontario Drinking Water Standard rev 2001.
2) Drawing to be read in conjunction with accompanying report.

exp.

Thunder Bay, Ontario

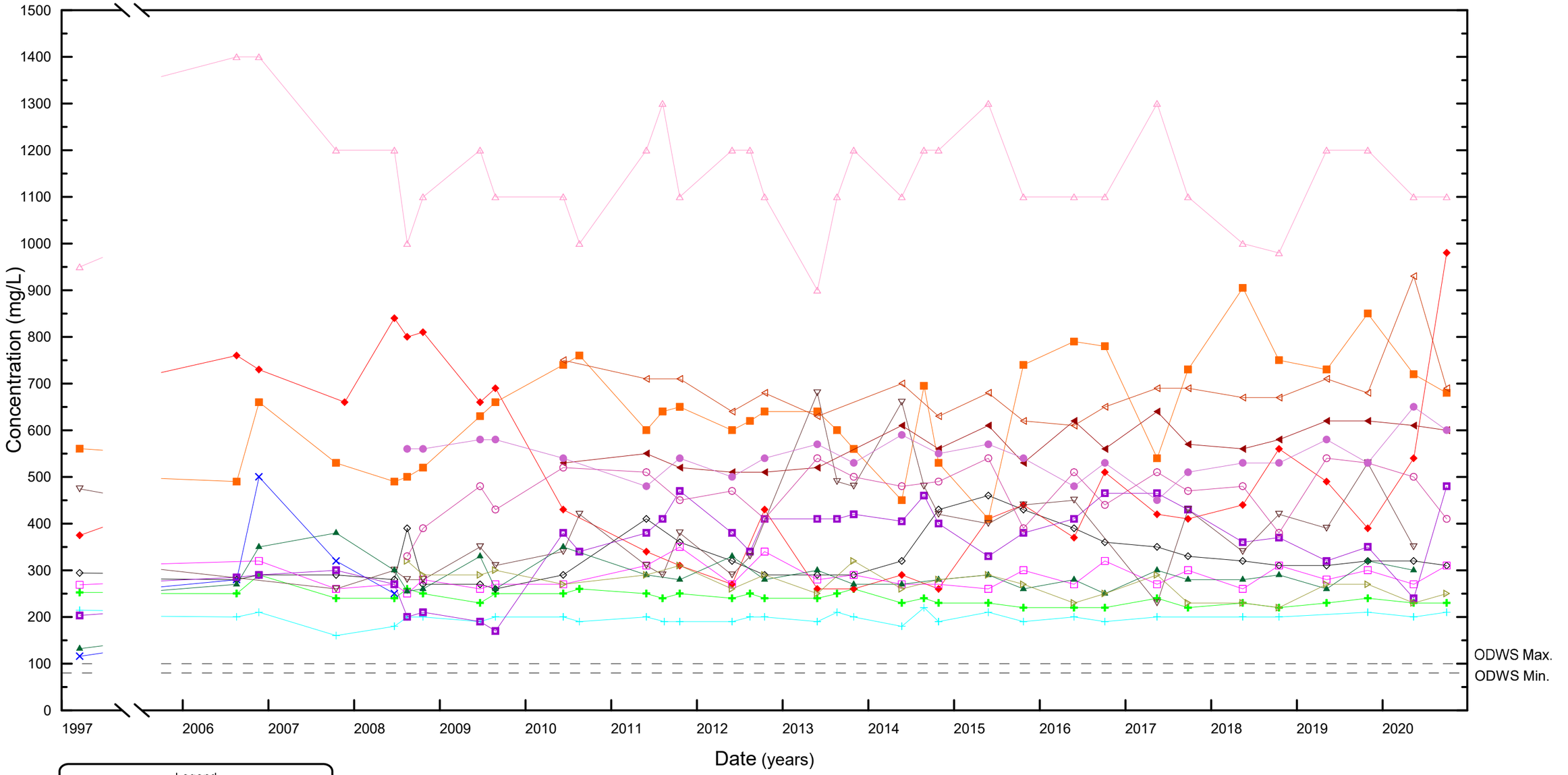
Figure F-2

DOC

2018 to 2020 Environmental Quality Monitoring Report
Longlac Landfill
Municipality of Greenstone

REF. NO.:	THB-00006196-PE
SCALE:	N/A
DRAWN BY:	MS
CHECKED BY:	AM
DATE:	April 8, 2021

Hardness



Legend

MW1	MW8-I
MW2	MW8-II
MW3	MW9
MW4-I	MW10
MW4-II	MW11-I
MW5	MW11-II
MW6	MW12-I
MW7	MW12-II

Note 1) ODWS: Ontario Drinking Water Standard rev 2001.
2) Drawing to be read in conjunction with accompanying report.

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Thunder Bay, Ontario

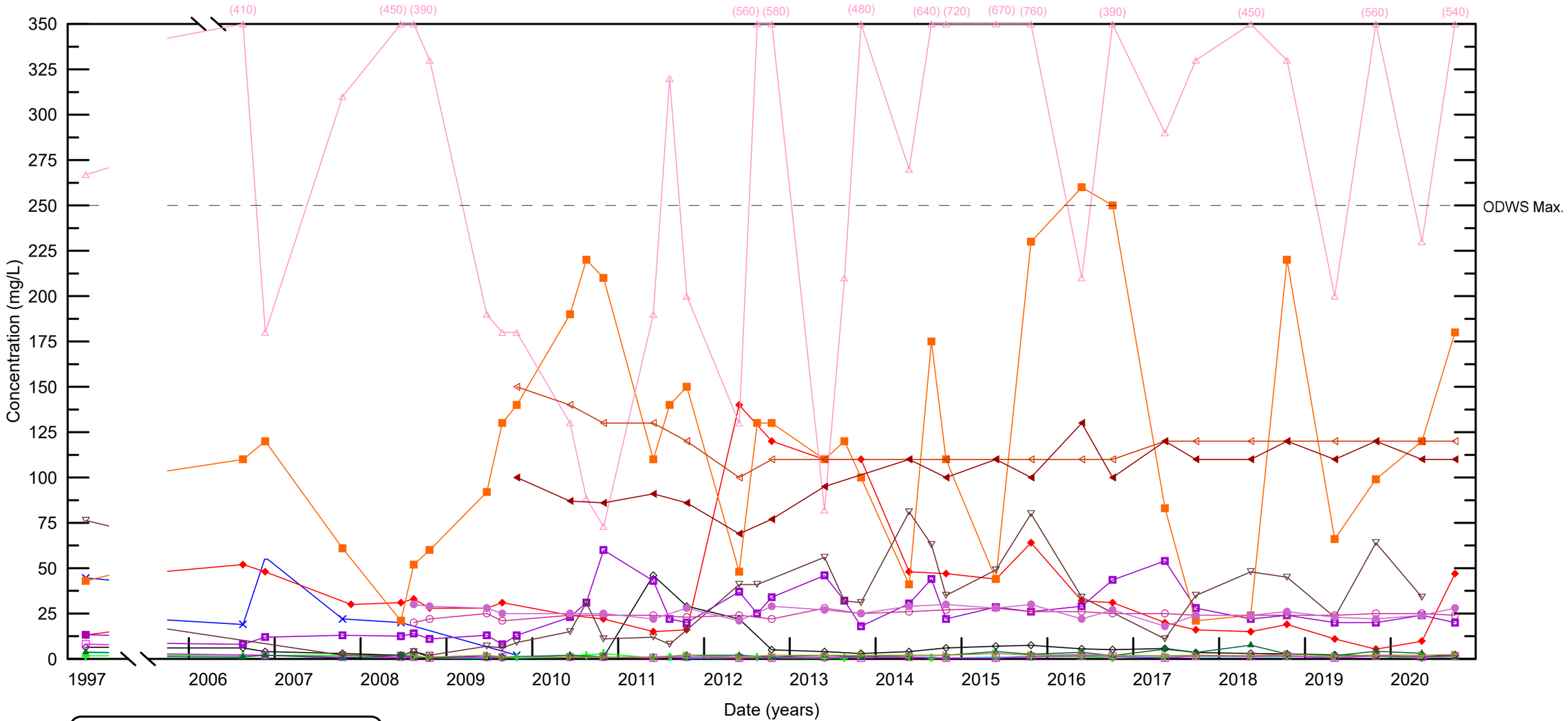
Figure F-3

Hardness

2018 to 2020 Environmental Quality Monitoring Report
Longlac Landfill
Municipality of Greenstone

REF. NO.:	THB-00006196-PE
SCALE:	N/A
DRAWN BY:	MS
CHECKED BY:	AM
DATE:	April 8, 2021

Chloride



Legend

- MW1
- MW2
- MW3
- MW4-I
- MW4-II
- MW5
- MW6
- MW7
- MW8-I
- MW8-II
- MW9
- MW10
- MW11-I
- MW11-II
- MW12-I
- MW12-II

Note 1) OWDS: Ontario Drinking Water Standard rev 2001.
2) Drawing to be read in conjunction with accompanying report.

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Thunder Bay, Ontario

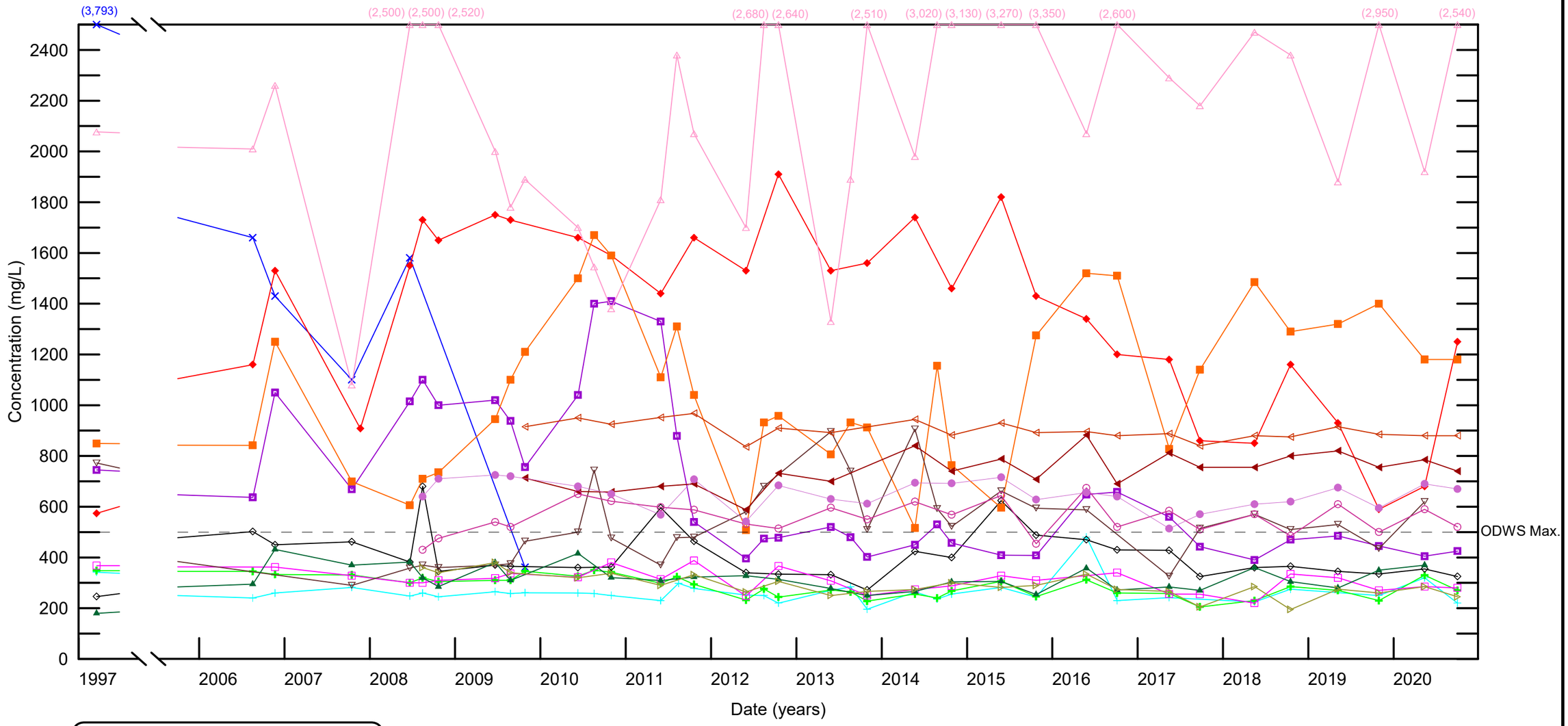
FIGURE F-4

Chloride

2018 to 2020 Environmental Quality Monitoring Report
Longlac Landfill
Municipality of Greenstone

REF. NO.:	THB-00006196-PE
SCALE:	N/A
DRAWN BY:	MS
CHECKED BY:	AM
DATE:	April 8, 2021

Total Dissolved Solids



Legend

MW1	MW8-I
MW2	MW8-II
MW3	MW9
MW4-I	MW10
MW4-II	MW11-I
MW5	MW11-II
MW6	MW12-I
MW7	MW12-II

Note 1) OWDS Ontario Drinking Water Standard, rev 2001
2) Drawing to be read in conjunction with accompanying report.

exp.

Thunder Bay, Ontario

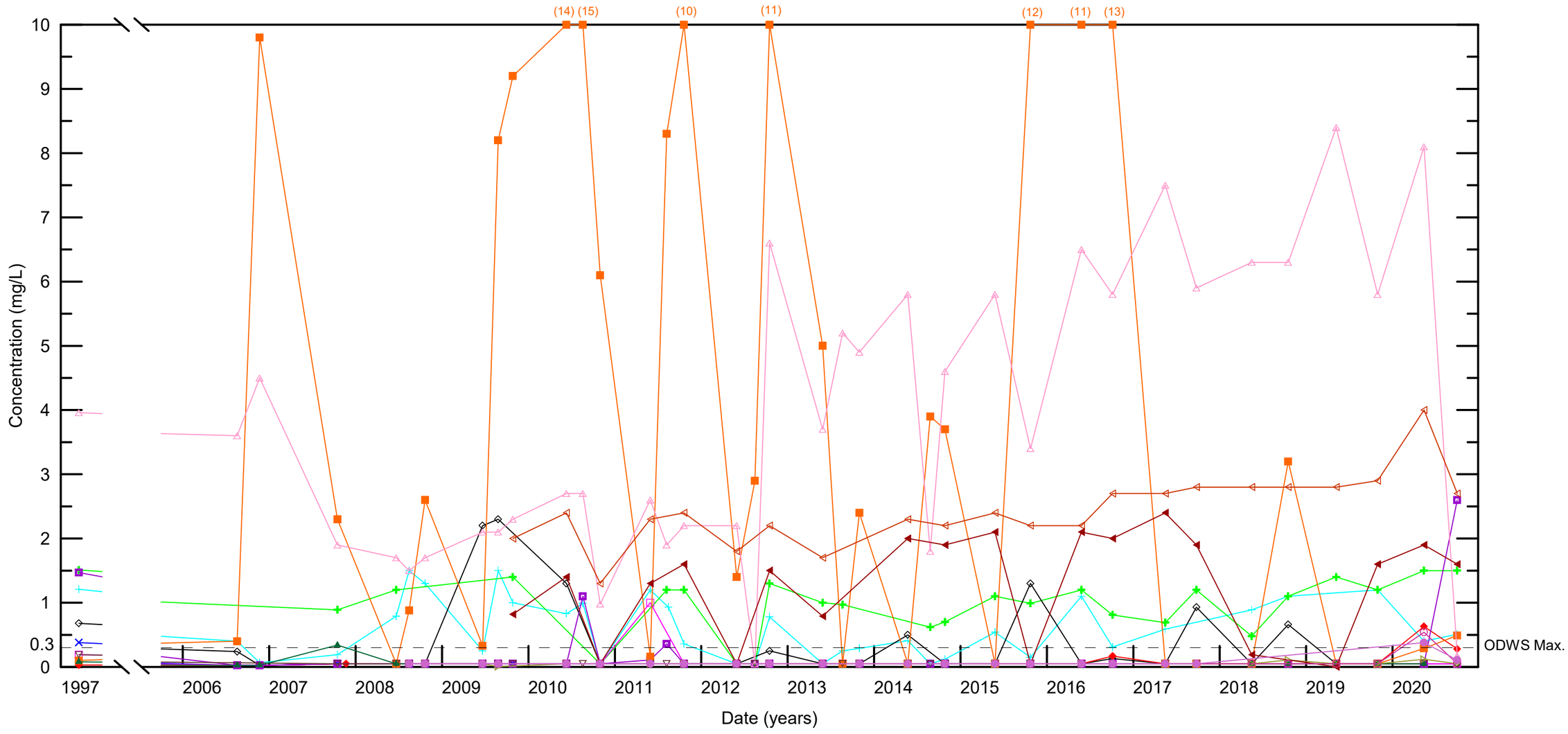
FIGURE F-5

Total Dissolved Solids

2018 to 2020 Environmental Quality Monitoring Report
Longlac Landfill
Municipality of Greenstone

REF. NO.:	THB-00006196-PE
SCALE:	N/A
DRAWN BY:	MS
CHECKED BY:	AM
DATE:	April 8, 2021

Iron



Legend

MW1	MW8-I
MW2	MW8-II
MW3	MW9
MW4-I	MW10
MW4-II	MW11-I
MW5	MW11-II
MW6	MW12-I
MW7	MW12-II

Note 1) OWDS Ontario Drinking Water Standard, rev 2001.
2) Drawing to be read in conjunction with accompanying report.

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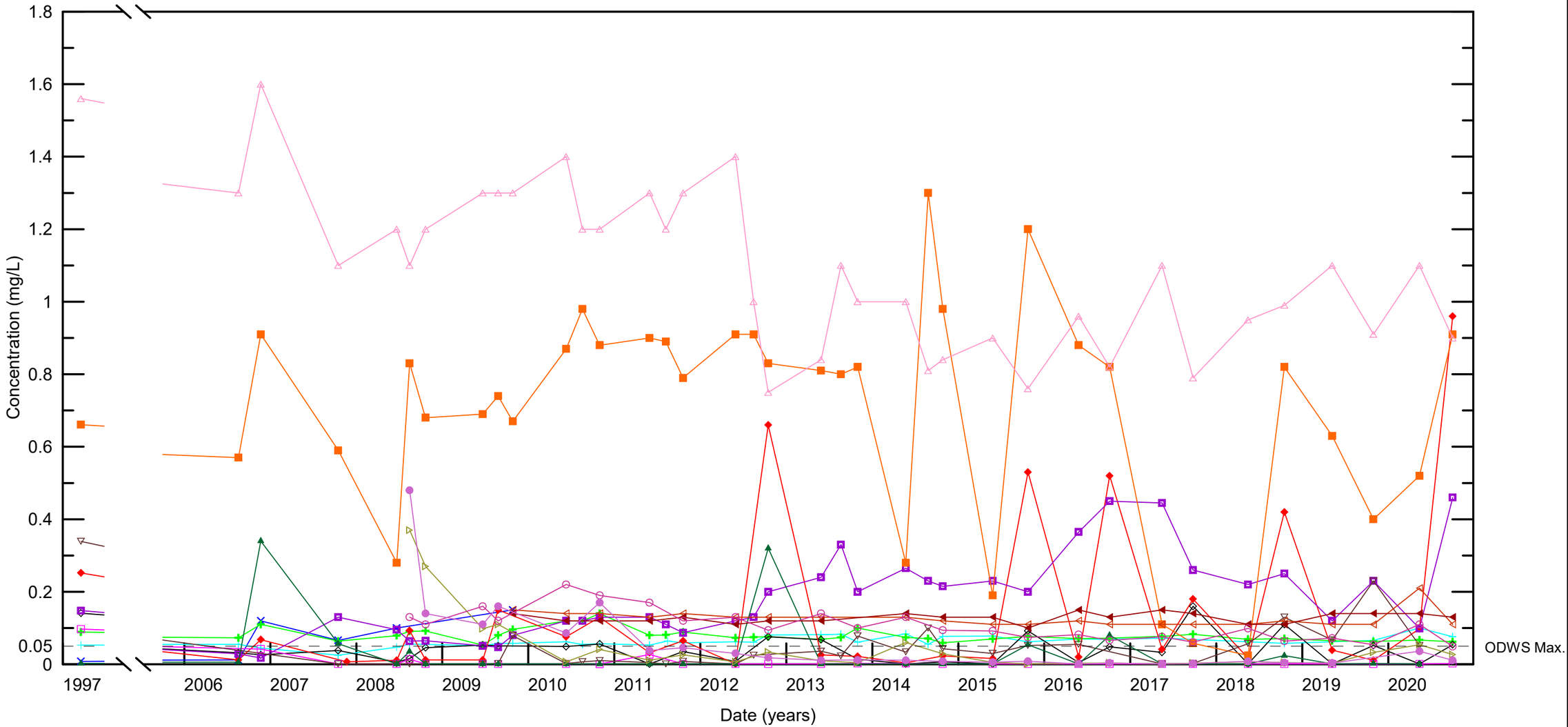
Thunder Bay, Ontario

FIGURE F-6

Iron
2018 to 2020 Environmental Quality Monitoring Report
Longlac Landfill
Municipality of Greenstone

REF. NO.:	THB-00006196-PE
SCALE:	N/A
DRAWN BY:	MS
CHECKED BY:	AM
DATE:	April 8, 2021

Manganese



Legend

- MW1
- MW2
- MW3
- MW4-I
- MW4-II
- MW5
- MW6
- MW7
- MW8-I
- MW8-II
- MW9
- MW10
- MW11-I
- MW11-II
- MW12-I
- MW12-II

Note 1) OWDS: Ontario Drinking Water Standard rev 2001.
2) Drawing to be read in conjunction with accompanying report.

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Thunder Bay, Ontario

FIGURE F-7

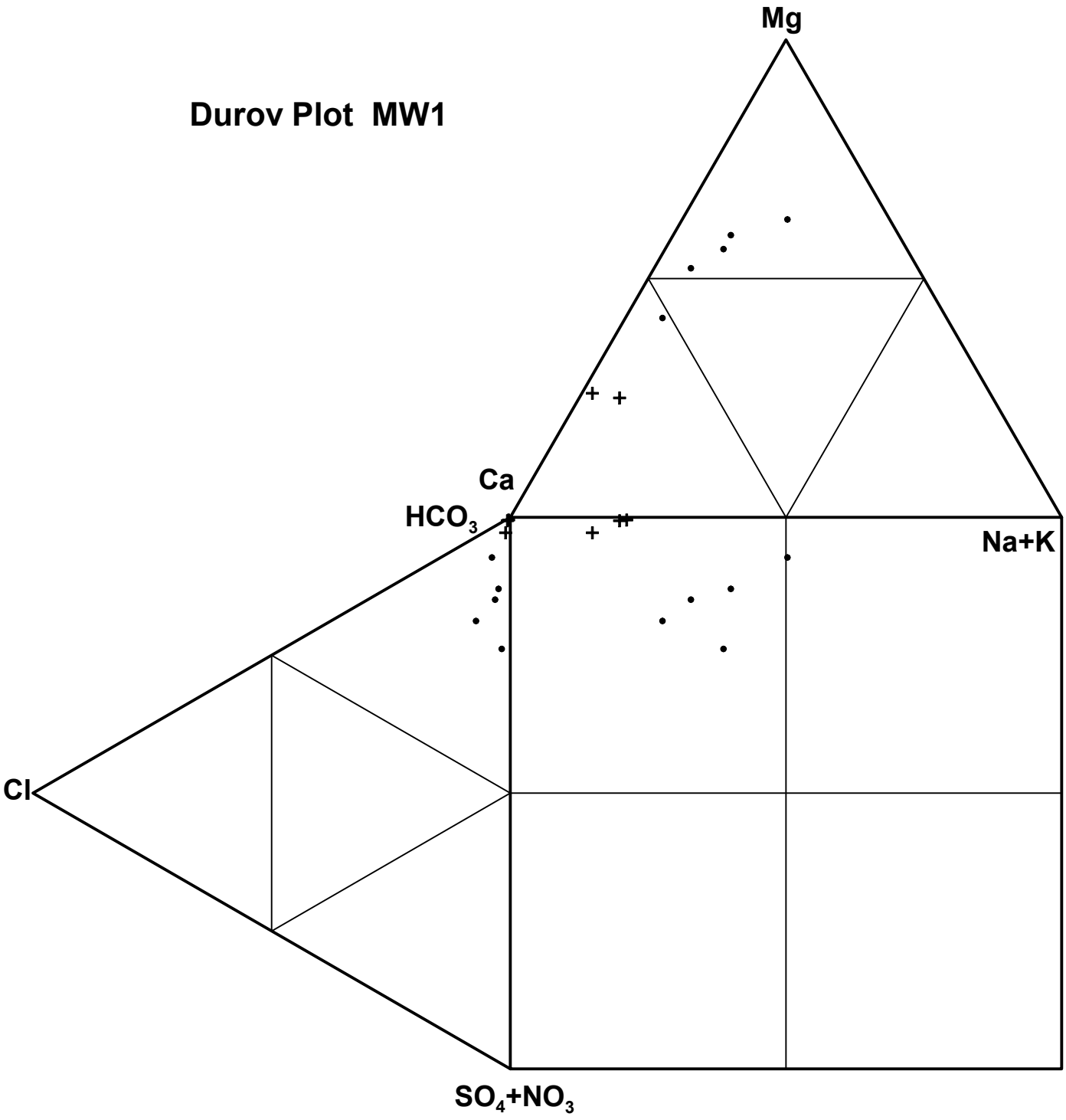
Manganese

2018 to 2020 Environmental Quality Monitoring Report
Longlac Landfill
Municipality of Greenstone

REF. NO.:	THB-00006196-PE
SCALE:	N/A
DRAWN BY:	MS
CHECKED BY:	AM
DATE:	April 8, 2021

APPENDIX G - Durov Plots

Durov Plot MW1



Legend

+ 2009-11 Data Point

• Up to 2008 Data Points

Drawing to be read in conjunction with accompanying report.

exp.

Thunder Bay, Ontario

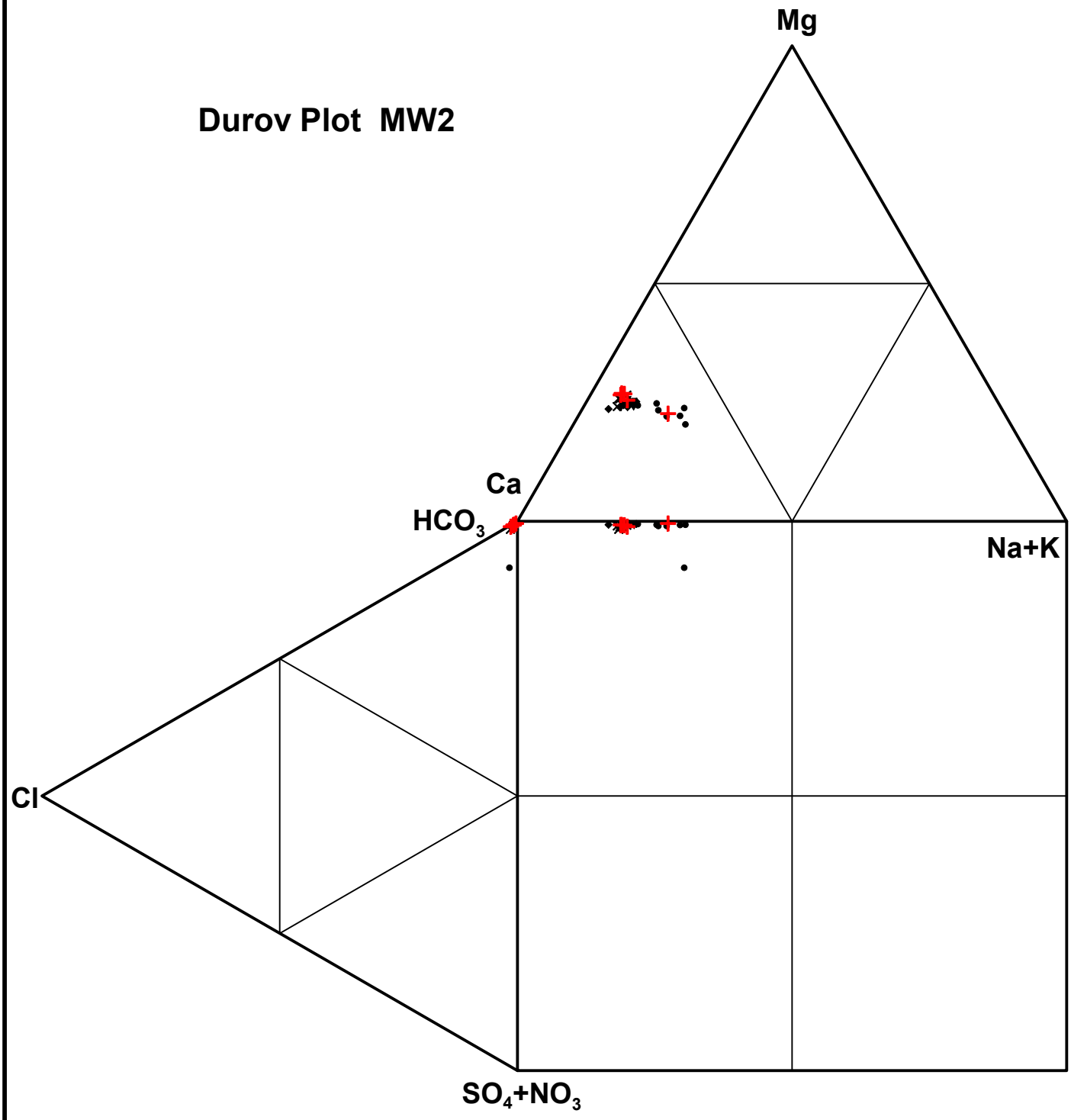
Figure G-1

Monitoring Well MW1

2018 to 2020 Environmental Quality Monitoring Report
Longlac Landfill
Municipality of Greenstone

REF. NO.:	THB-00006196-PE
SCALE:	N/A
DRAWN BY:	MS
CHECKED BY:	AM
DATE:	April 9, 2021

Durov Plot MW2



Legend

+	2018-20 Data Point
×	2015-17 Data Point
◆	2012-14 Data Point
▼	2009-11 Data Point
•	Up to 2008 Data Point

Drawing to be read in conjunction with accompanying report.

exp. Thunder Bay, Ontario

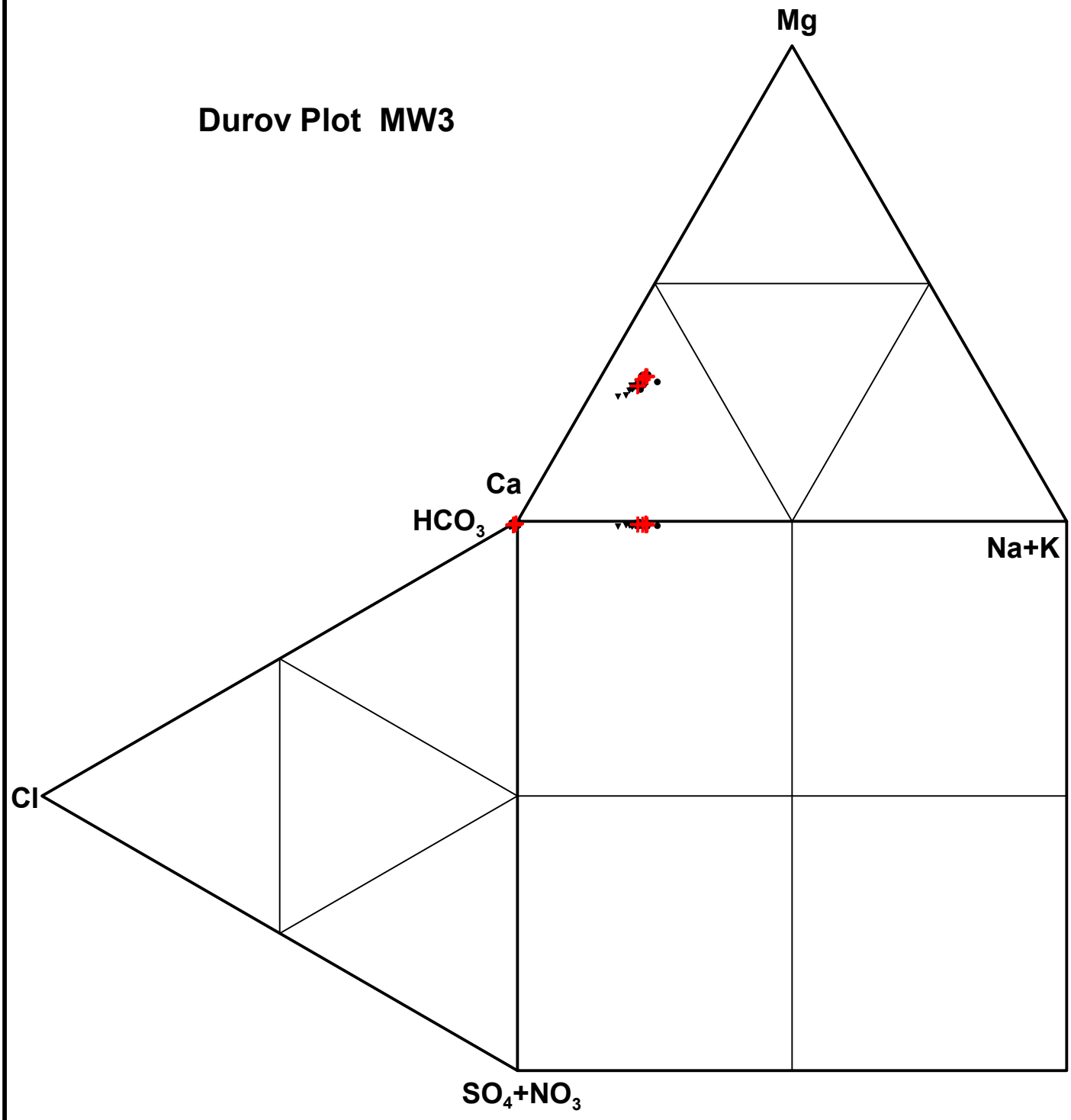
Figure G-2

Monitoring Well MW2

2018 to 2020 Environmental Quality Monitoring Report
Longlac Landfill
Municipality of Greenstone

REF. NO.:	THB-00006196-PE
SCALE:	N/A
DRAWN BY:	MS
CHECKED BY:	AM
DATE:	April 9, 2021

Durov Plot MW3



Legend

+	2018-20 Data Point
×	2015-17 Data Point
◆	2012-14 Data Point
▼	2009-11 Data Point
•	Up to 2008 Data Point

Drawing to be read in conjunction with accompanying report.

exp.

Thunder Bay, Ontario

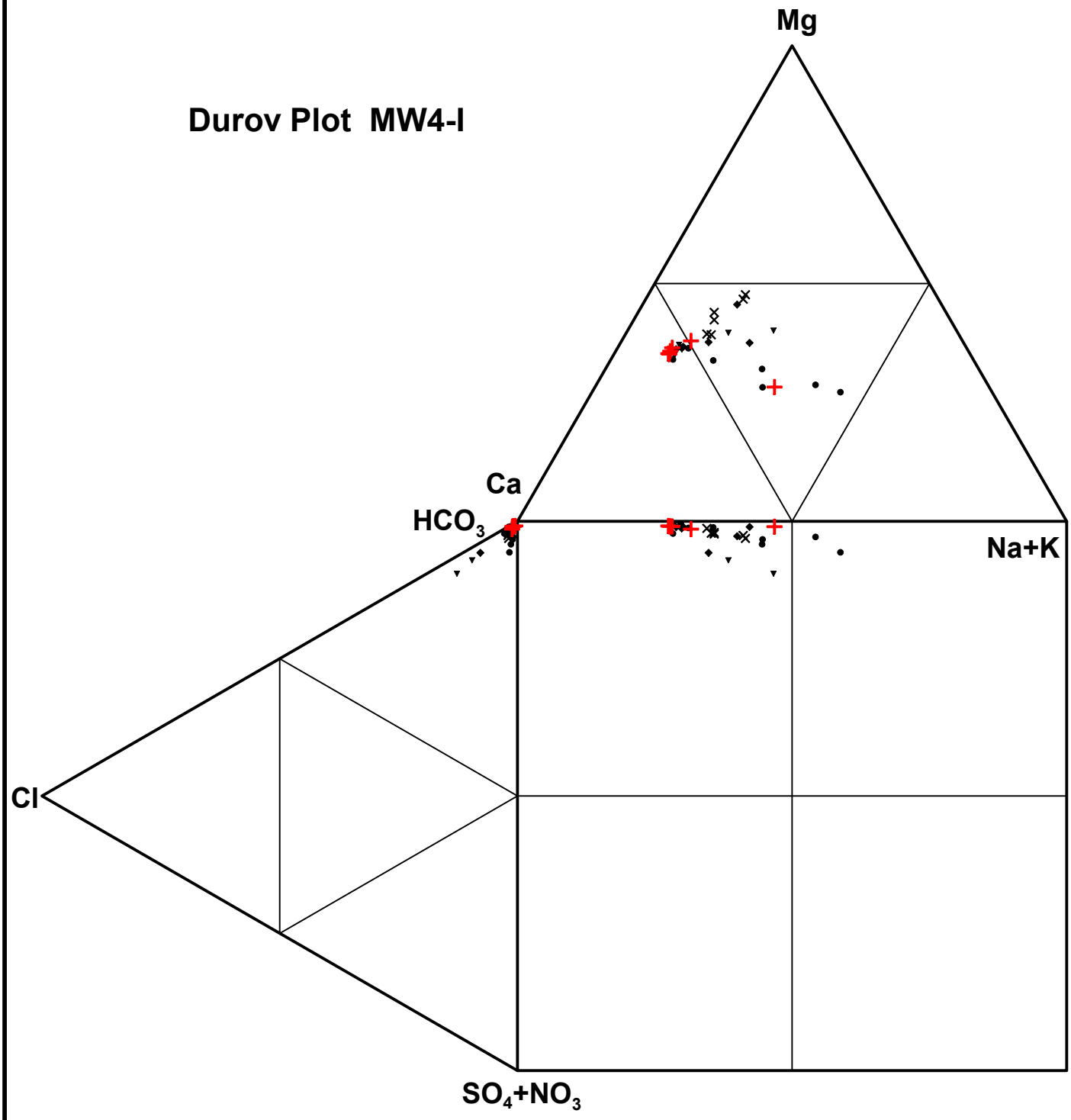
Figure G-3

Monitoring Well MW3

2018 to 2020 Environmental Quality Monitoring Report
Longlac Landfill
Municipality of Greenstone

REF. NO.:	THB-00006196-PE
SCALE:	N/A
DRAWN BY:	MS
CHECKED BY:	AM
DATE:	April 9, 2021

Durov Plot MW4-I



Legend

+ 2018-20 Data Point

× 2015-17 Data Point

◆ 2012-14 Data Point

▼ 2009-11 Data Point

• Up to 2008 Data Point

Drawing to be read in conjunction with accompanying report.

exp.

Thunder Bay, Ontario

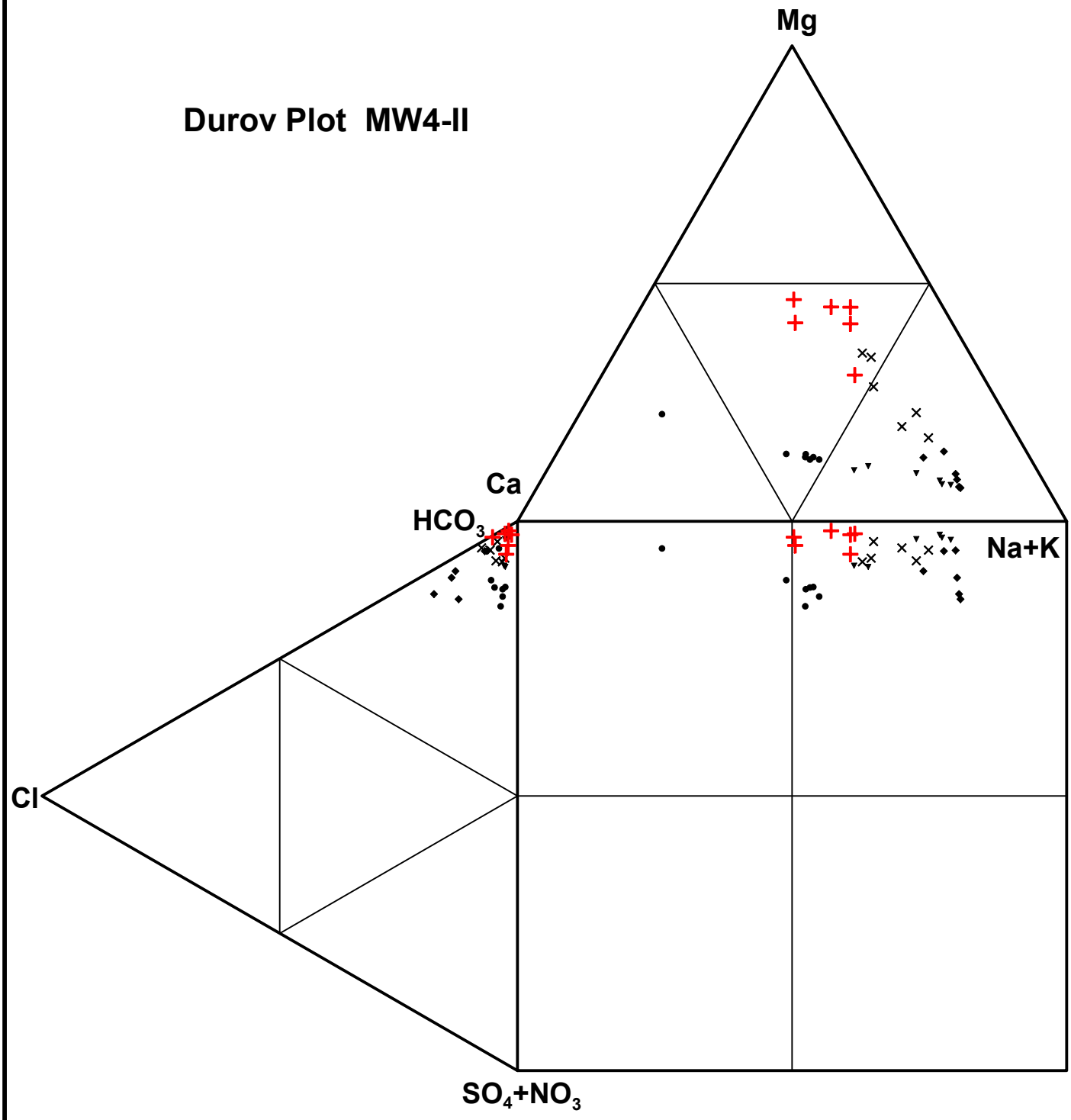
Figure G-4

Monitoring Well MW4-I

2018 to 2020 Environmental Quality Monitoring Report
Longlac Landfill
Municipality of Greenstone

REF. NO.:	THB-00006196-PE
SCALE:	N/A
DRAWN BY:	MS
CHECKED BY:	AM
DATE:	April 9, 2021

Durov Plot MW4-II



Legend

- + 2018-20 Data Point
- × 2015-17 Data Point
- ◆ 2012-14 Data Point
- ▼ 2009-11 Data Point
- • Up to 2008 Data Point

Drawing to be read in conjunction with accompanying report.

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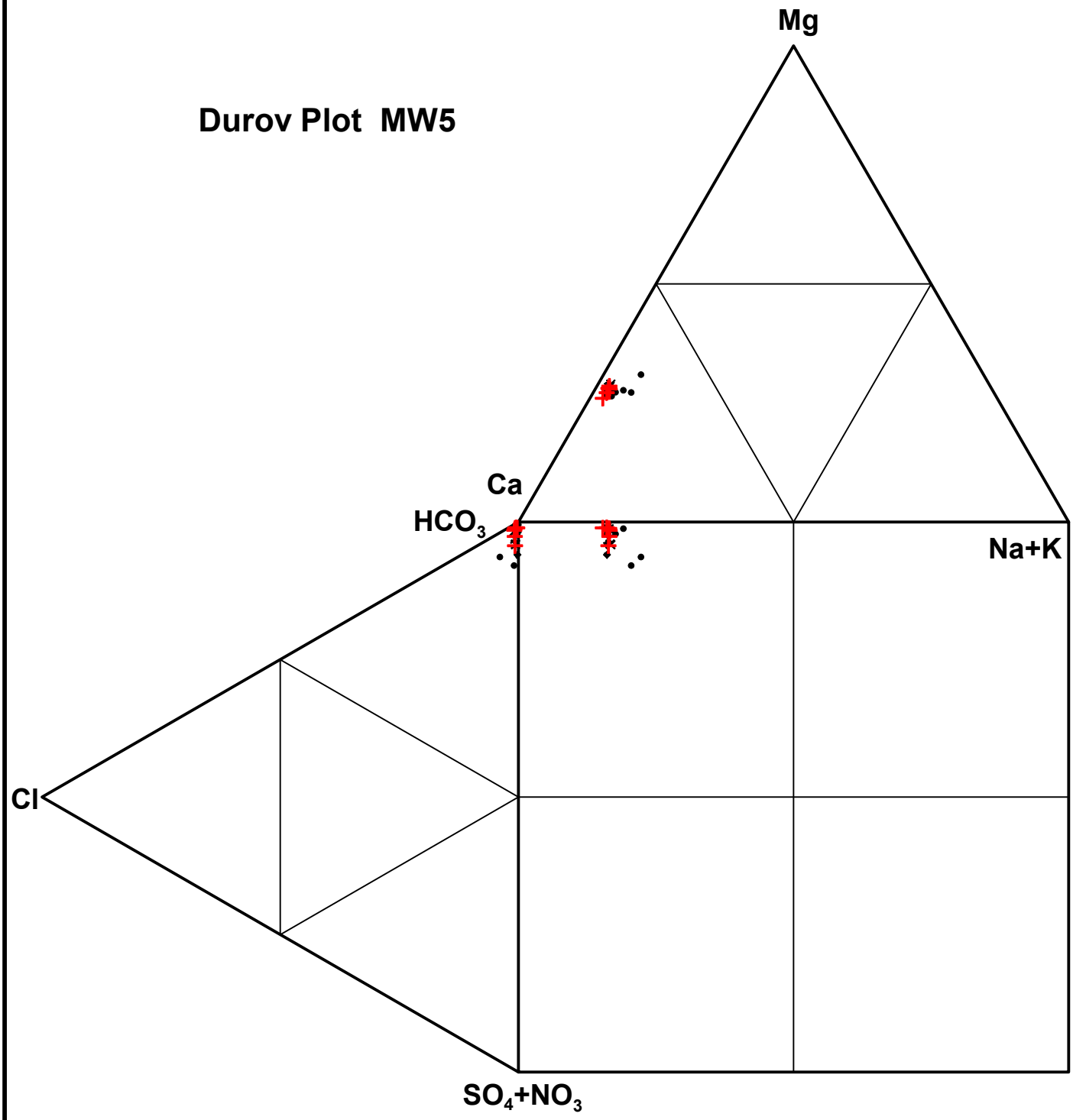
Figure G-5

Monitoring Well MW4-II

2018 to 2020 Environmental Quality Monitoring Report
Longlac Landfill
Municipality of Greenstone

REF. NO.:	THB-00006196-PE
SCALE:	N/A
DRAWN BY:	MS
CHECKED BY:	AM
DATE:	April 9, 2021

Durov Plot MW5



Legend

+	2018-20 Data Point
×	2015-17 Data Point
◆	2012-14 Data Point
▼	2009-11 Data Point
•	Up to 2008 Data Point

Drawing to be read in conjunction with accompanying report.

exp.

Thunder Bay, Ontario

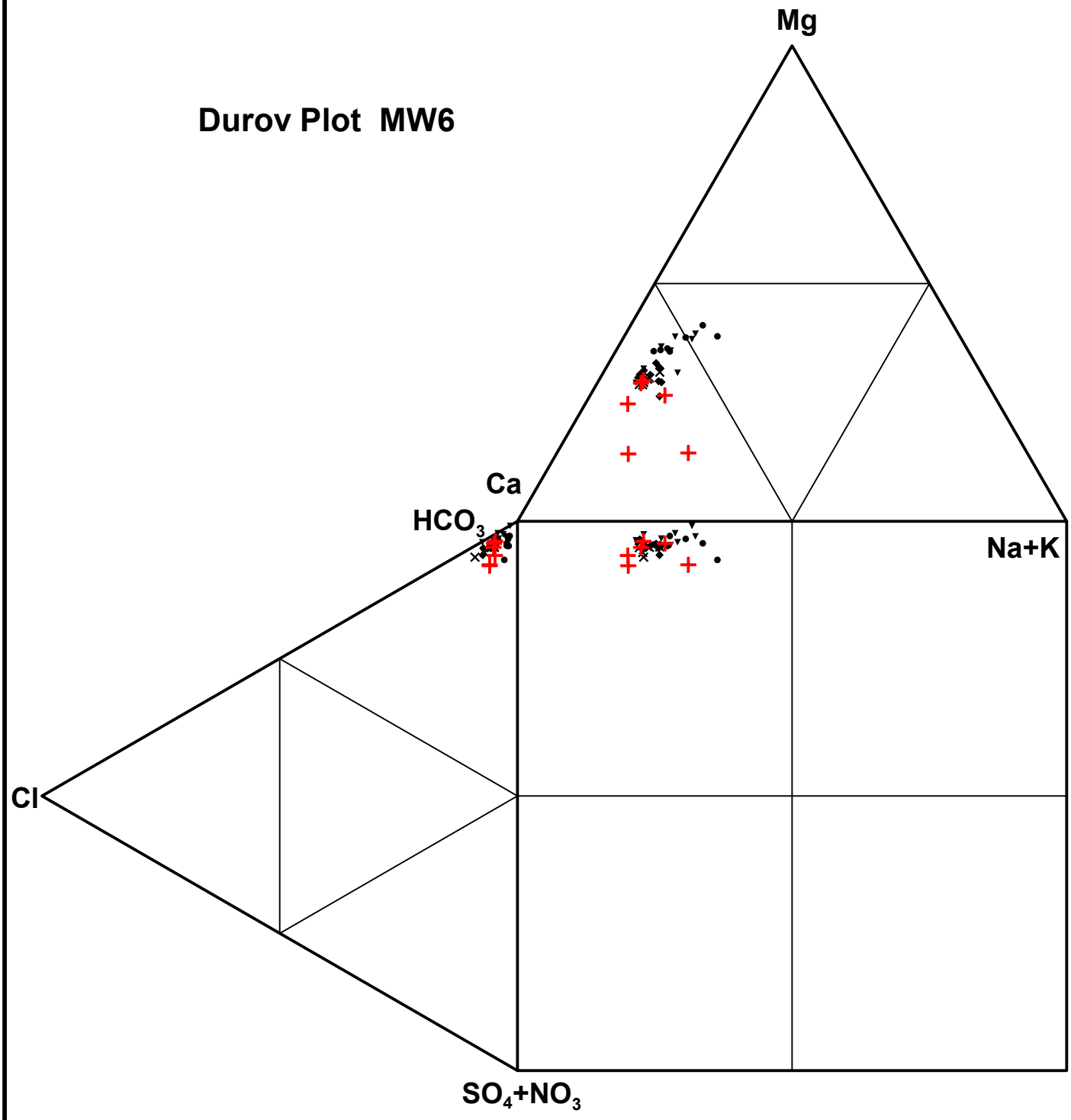
Figure G-6

Monitoring Well MW5

2018 to 2020 Environmental Quality Monitoring Report
Longlac Landfill
Municipality of Greenstone

REF. NO.:	THB-00006196-PE
SCALE:	N/A
DRAWN BY:	MS
CHECKED BY:	AM
DATE:	April 9, 2021

Durov Plot MW6



Legend

- + 2018-20 Data Point
- × 2015-17 Data Point
- ◆ 2012-14 Data Point
- ▼ 2009-11 Data Point
- • Up to 2008 Data Point

Drawing to be read in conjunction with accompanying report.

exp. Thunder Bay, Ontario

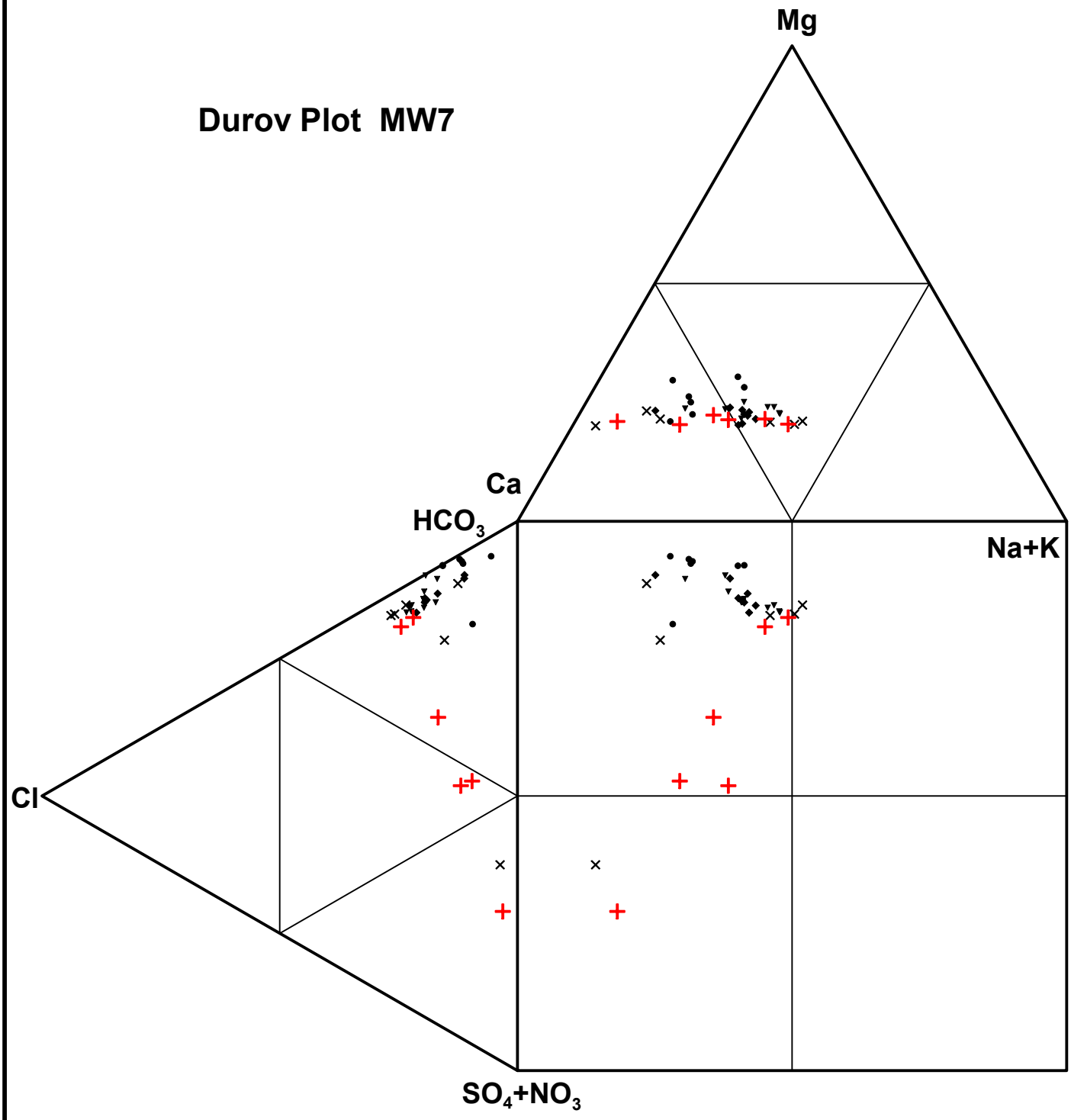
Figure G-7

Monitoring Well MW6

2018 to 2020 Environmental Quality Monitoring Report
Longlac Landfill
Municipality of Greenstone

REF. NO.:	THB-00006196-PE
SCALE:	N/A
DRAWN BY:	MS
CHECKED BY:	AM
DATE:	April 9, 2021

Durov Plot MW7



Legend

- + 2018-20 Data Point
- × 2015-17 Data Point
- ◆ 2012-14 Data Point
- ▼ 2009-11 Data Point
- • Up to 2008 Data Point

Drawing to be read in conjunction with accompanying report.

exp.

Thunder Bay, Ontario

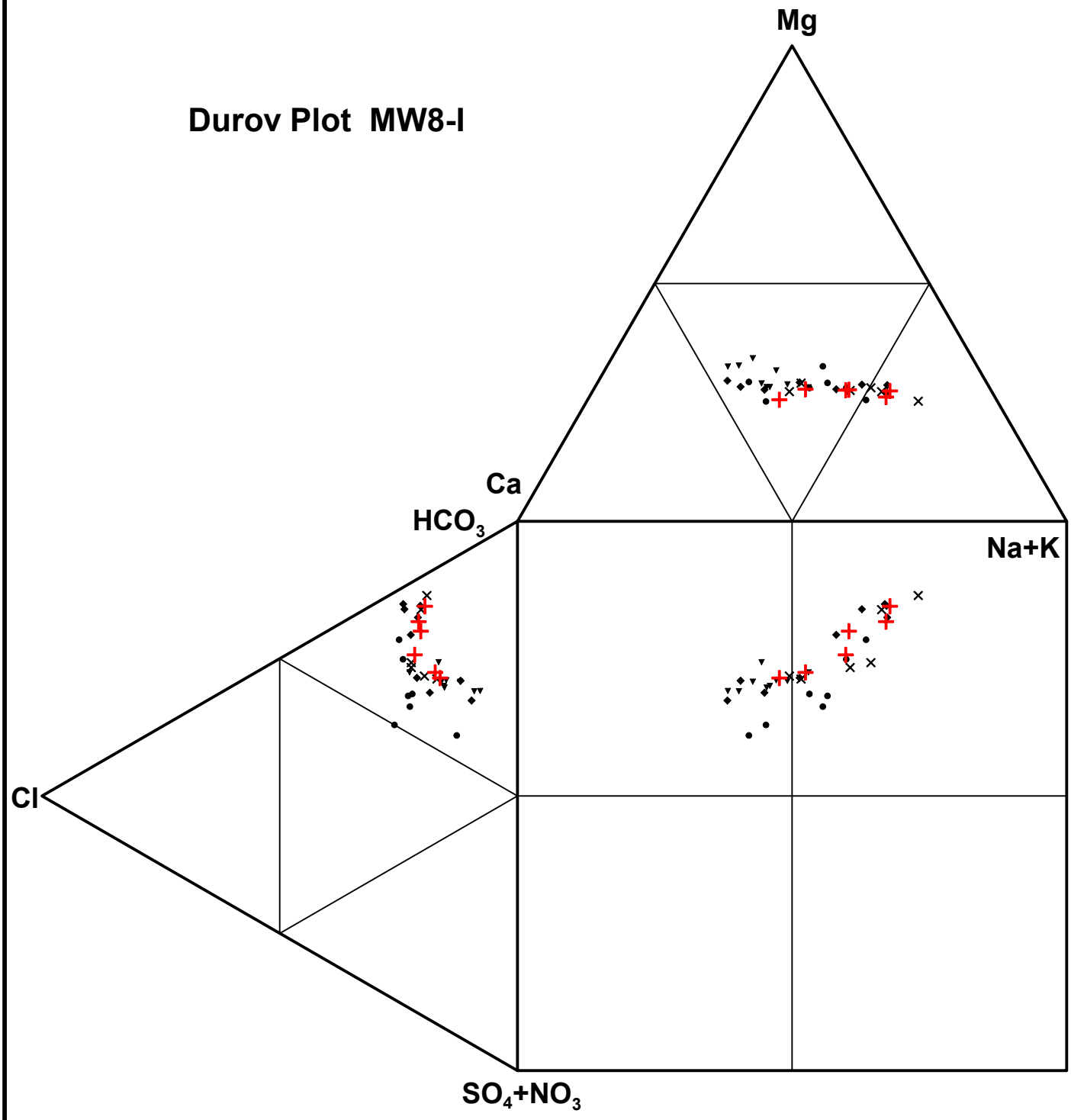
Figure G-8

Monitoring Well MW7

2018 to 2020 Environmental Quality Monitoring Report
Longlac Landfill
Municipality of Greenstone

REF. NO.:	THB-00006196-PE
SCALE:	N/A
DRAWN BY:	MS
CHECKED BY:	AM
DATE:	April 9, 2021

Durov Plot MW8-I



Legend

- + 2018-20 Data Point
- × 2015-17 Data Point
- ◆ 2012-14 Data Point
- ▼ 2009-11 Data Point
- • Up to 2008 Data Point

Drawing to be read in conjunction with accompanying report.

exp.

Thunder Bay, Ontario

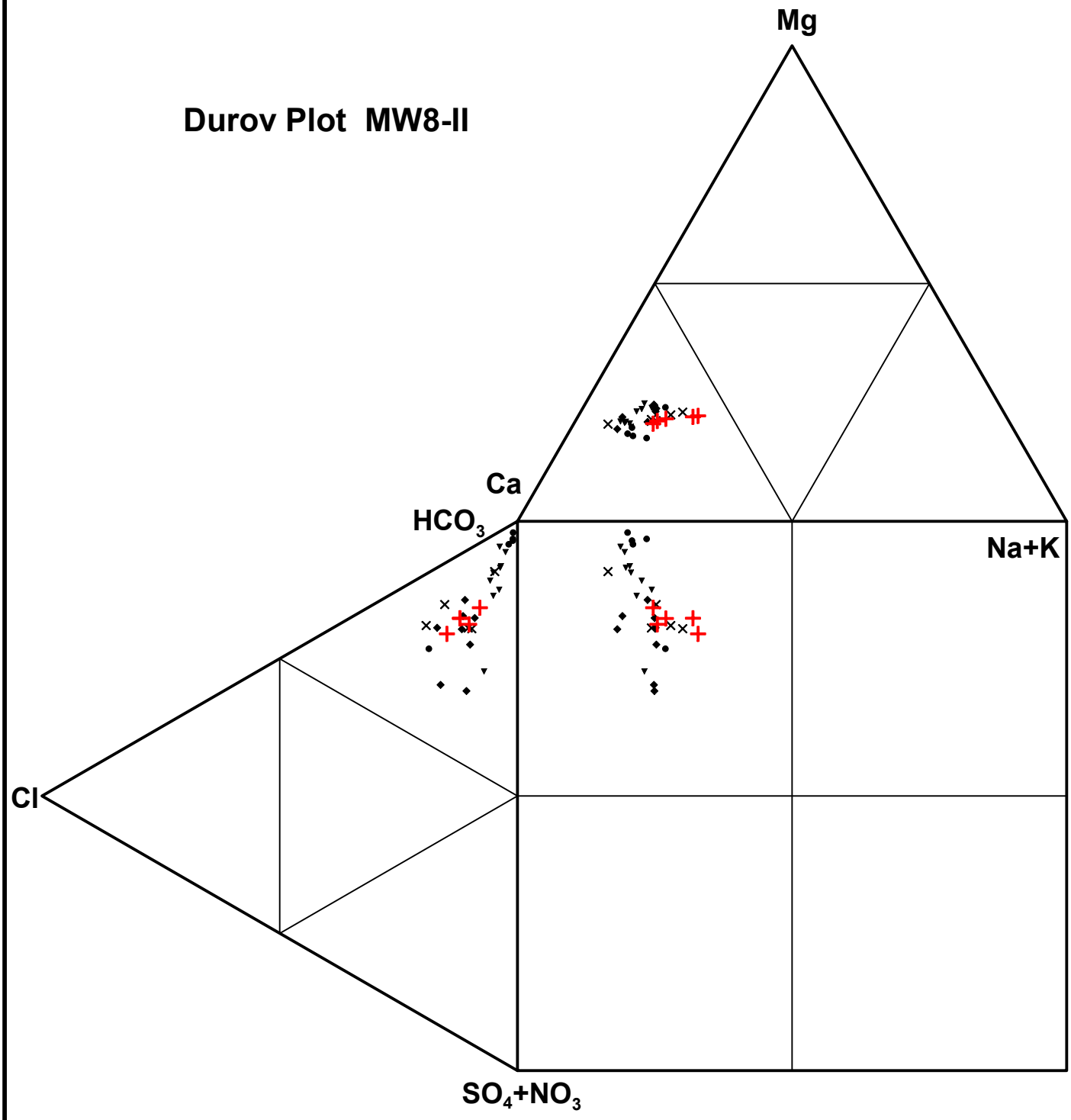
Figure G-9

Monitoring Well MW8-I

2018 to 2020 Environmental Quality Monitoring Report
Longlac Landfill
Municipality of Greenstone

REF. NO.:	THB-00006196-PE
SCALE:	N/A
DRAWN BY:	MS
CHECKED BY:	AM
DATE:	April 9, 2021

Durov Plot MW8-II



Legend

- + 2018-20 Data Point
- × 2015-17 Data Point
- ◆ 2012-14 Data Point
- ▼ 2009-11 Data Point
- • Up to 2008 Data Point

Drawing to be read in conjunction with accompanying report.

exp.

Thunder Bay, Ontario

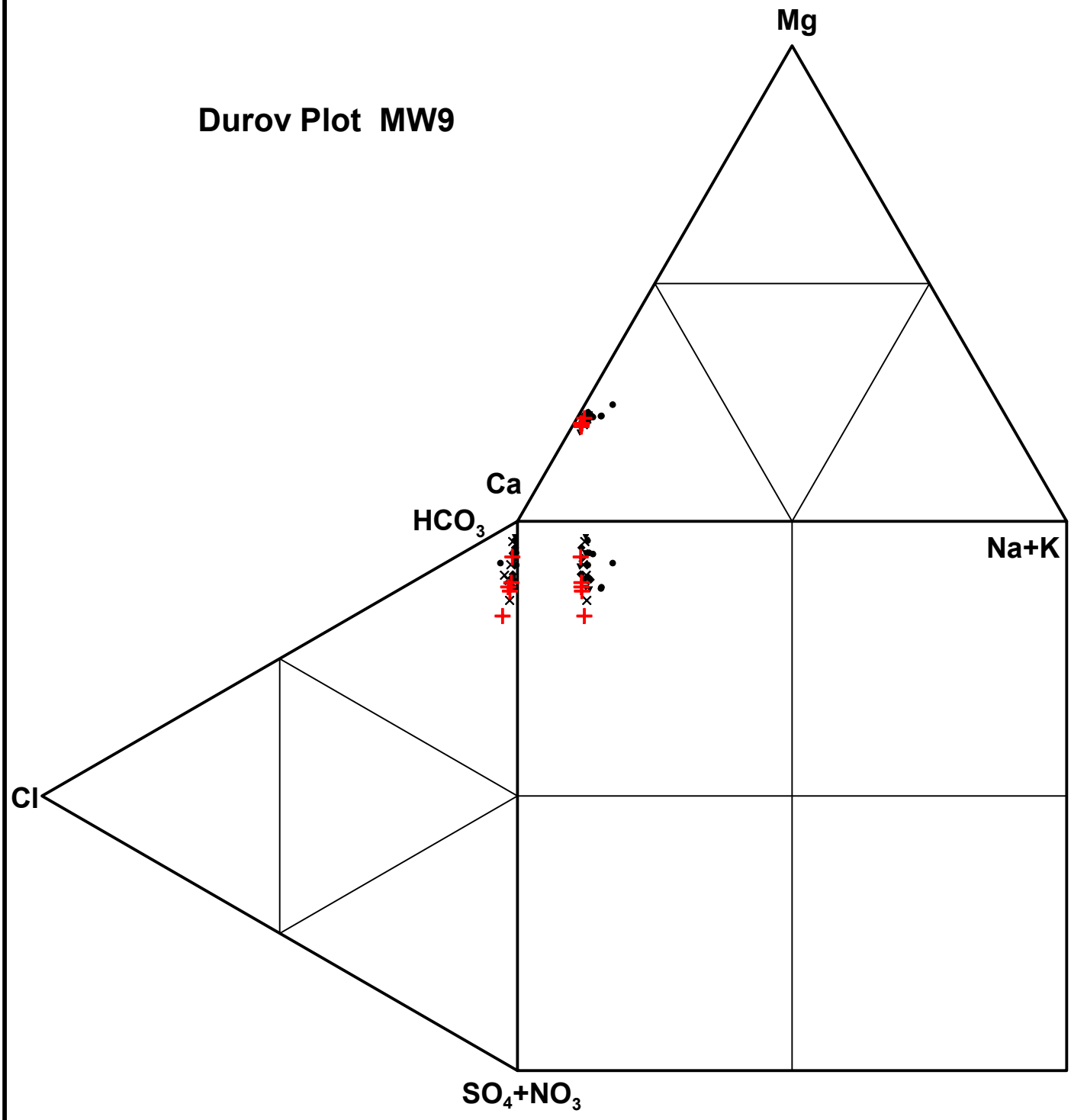
Figure G-10

Monitoring Well MW8-II

2018 to 2020 Environmental Quality Monitoring Report
Longlac Landfill
Municipality of Greenstone

REF. NO.:	THB-00006196-PE
SCALE:	N/A
DRAWN BY:	MS
CHECKED BY:	AM
DATE:	April 9, 2021

Durov Plot MW9



Legend

- + 2018-20 Data Point
- × 2015-17 Data Point
- ◆ 2012-14 Data Point
- ▼ 2009-11 Data Point
- • Up to 2008 Data Point

Drawing to be read in conjunction with accompanying report.

exp. Thunder Bay, Ontario

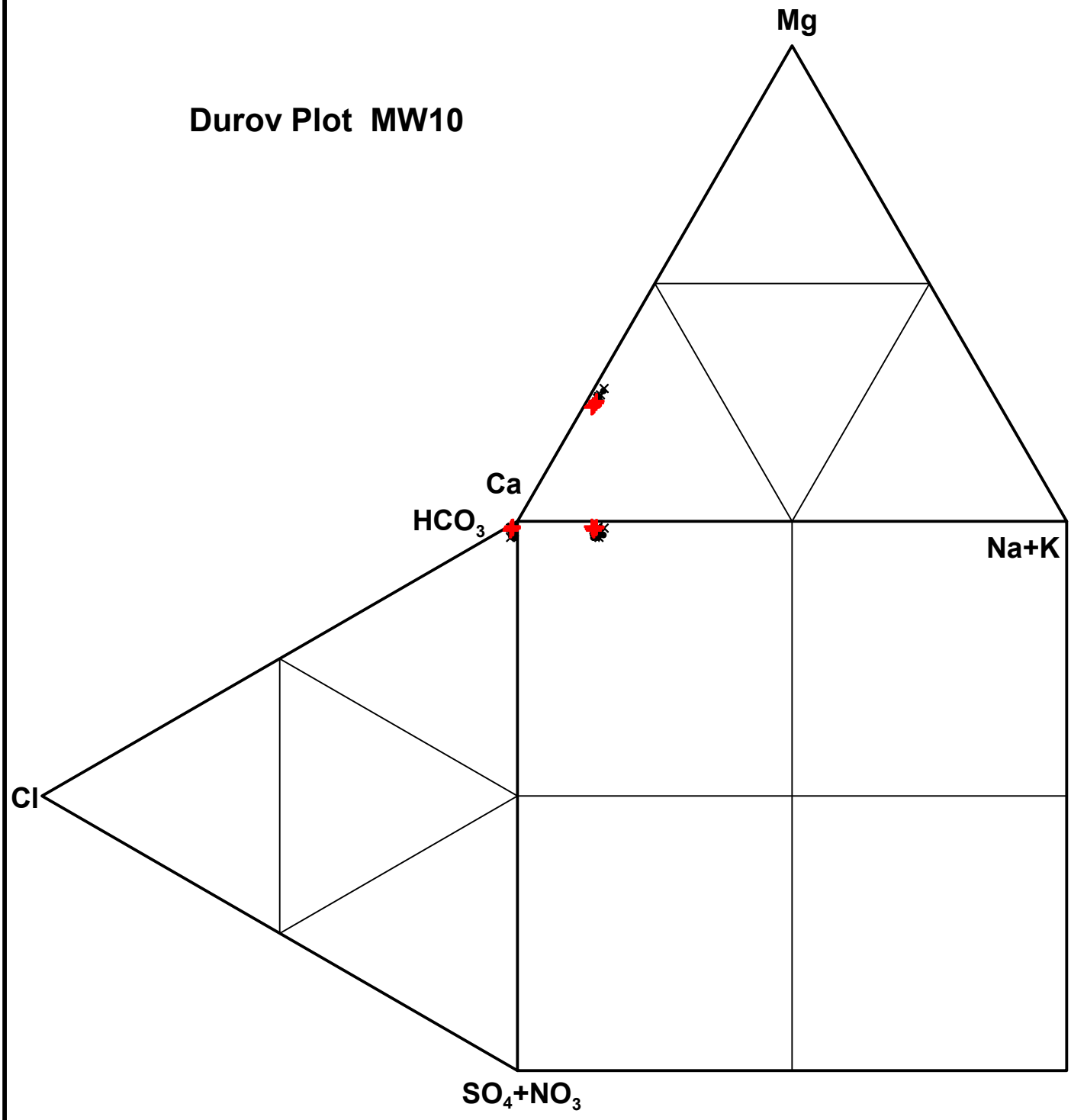
Figure G-11

Monitoring Well MW9

2018 to 2020 Environmental Quality Monitoring Report
Longlac Landfill
Municipality of Greenstone

REF. NO.:	THB-00006196-PE
SCALE:	N/A
DRAWN BY:	MS
CHECKED BY:	AM
DATE:	April 9, 2021

Durov Plot MW10



Legend

+ 2018-20 Data Point

× 2015-17 Data Point

◆ 2012-14 Data Point

▼ 2009-11 Data Point

• Up to 2008 Data Point

Drawing to be read in conjunction with accompanying report.

exp.

Thunder Bay, Ontario

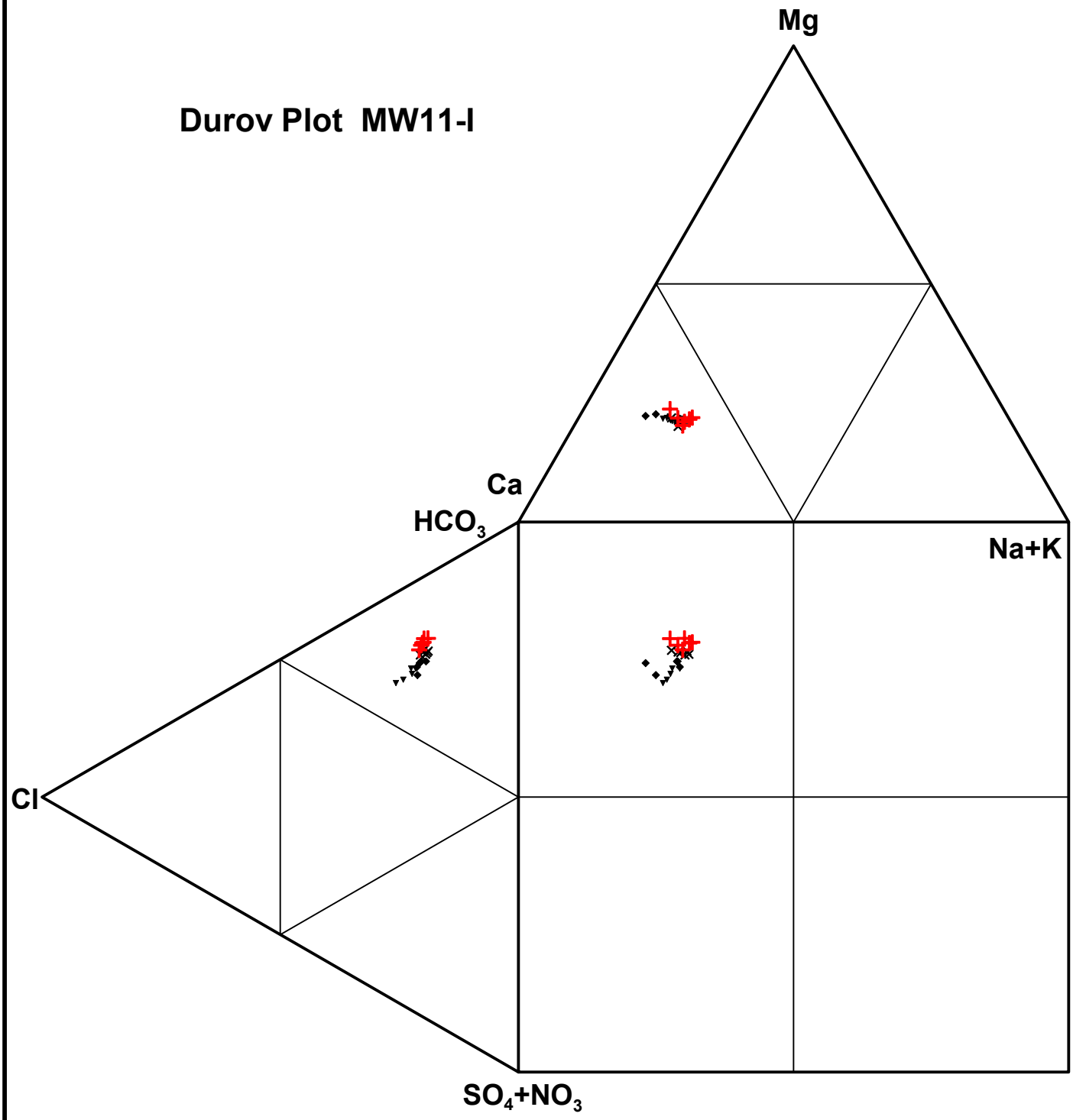
Figure G-12

Monitoring Well MW10

2018 to 2020 Environmental Quality Monitoring Report
Longlac Landfill
Municipality of Greenstone

REF. NO.:	THB-00006196-PE
SCALE:	N/A
DRAWN BY:	MS
CHECKED BY:	AM
DATE:	April 9, 2021

Durov Plot MW11-I



Legend

+	2018-20 Data Point
×	2015-17 Data Point
◆	2012-14 Data Point
▼	2009-11 Data Point
•	Up to 2008 Data Point

Drawing to be read in conjunction with accompanying report.

exp.

Thunder Bay, Ontario

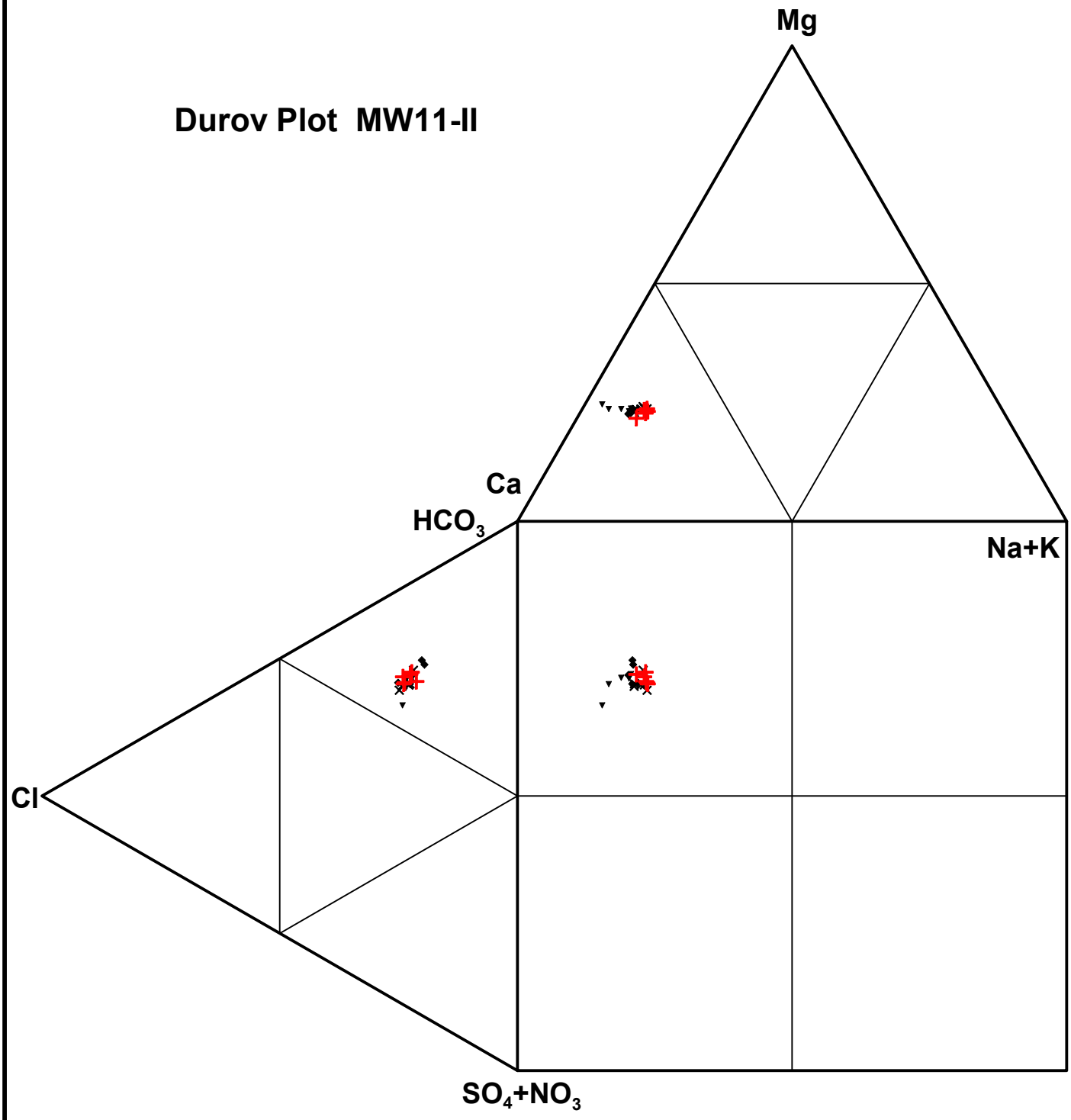
Figure G-13

Monitoring Well MW11-I

2018 to 2020 Environmental Quality Monitoring Report
Longlac Landfill
Municipality of Greenstone

REF. NO.:	THB-00006196-PE
SCALE:	N/A
DRAWN BY:	MS
CHECKED BY:	AM
DATE:	April 9, 2021

Durov Plot MW11-II



Legend

+	2018-20 Data Point
×	2015-17 Data Point
◆	2012-14 Data Point
▼	2009-11 Data Point
•	Up to 2008 Data Point

Drawing to be read in conjunction with accompanying report.

exp. Thunder Bay, Ontario

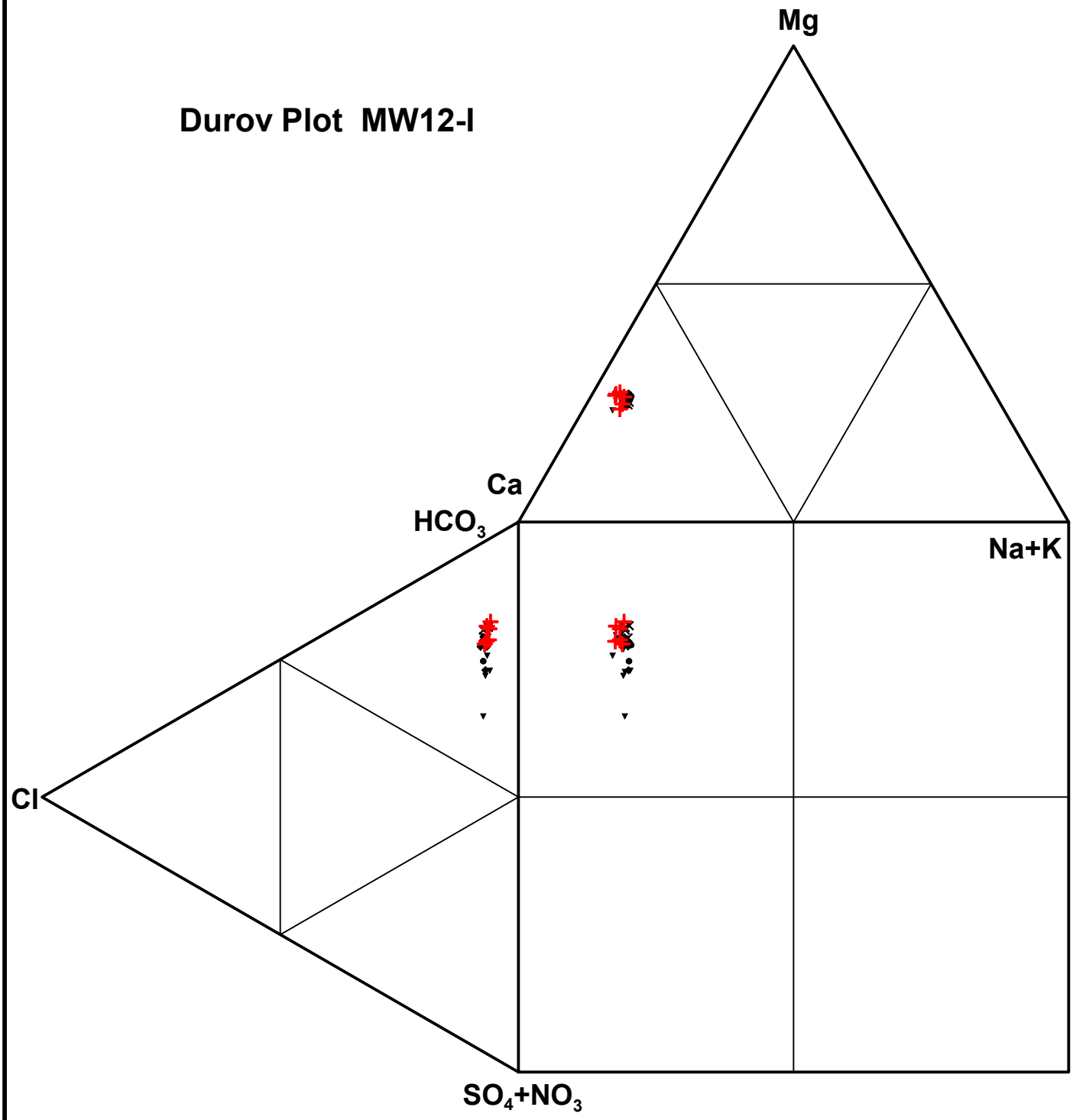
Figure G-14

Monitoring Well MW11-II

2018 to 2020 Environmental Quality Monitoring Report
Longlac Landfill
Municipality of Greenstone

REF. NO.:	THB-00006196-PE
SCALE:	N/A
DRAWN BY:	MS
CHECKED BY:	AM
DATE:	April 9, 2021

Durov Plot MW12-I



Legend

+	2018-20 Data Point
×	2015-17 Data Point
◆	2012-14 Data Point
▼	2009-11 Data Point
•	Up to 2008 Data Point

Drawing to be read in conjunction with accompanying report.

exp. Thunder Bay, Ontario

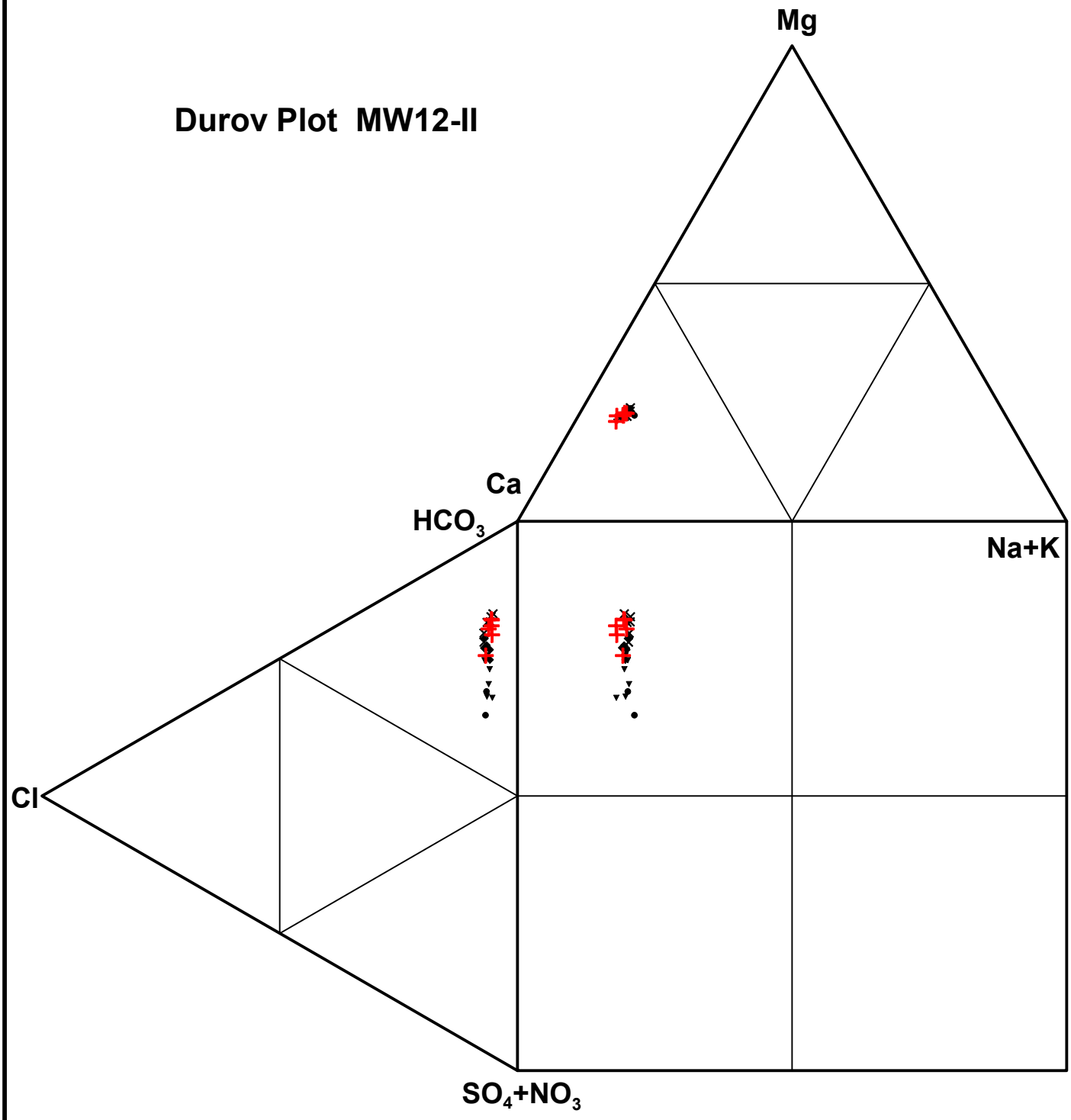
Figure G-15

Monitoring Well MW12-I

2018 to 2020 Environmental Quality Monitoring Report
Longlac Landfill
Municipality of Greenstone

REF. NO.:	THB-00006196-PE
SCALE:	N/A
DRAWN BY:	MS
CHECKED BY:	AM
DATE:	April 9, 2021

Durov Plot MW12-II



Legend

- + 2018-20 Data Point
- × 2015-17 Data Point
- ◆ 2012-14 Data Point
- ▼ 2009-11 Data Point
- • Up to 2008 Data Point

Drawing to be read in conjunction with accompanying report.

exp. Thunder Bay, Ontario

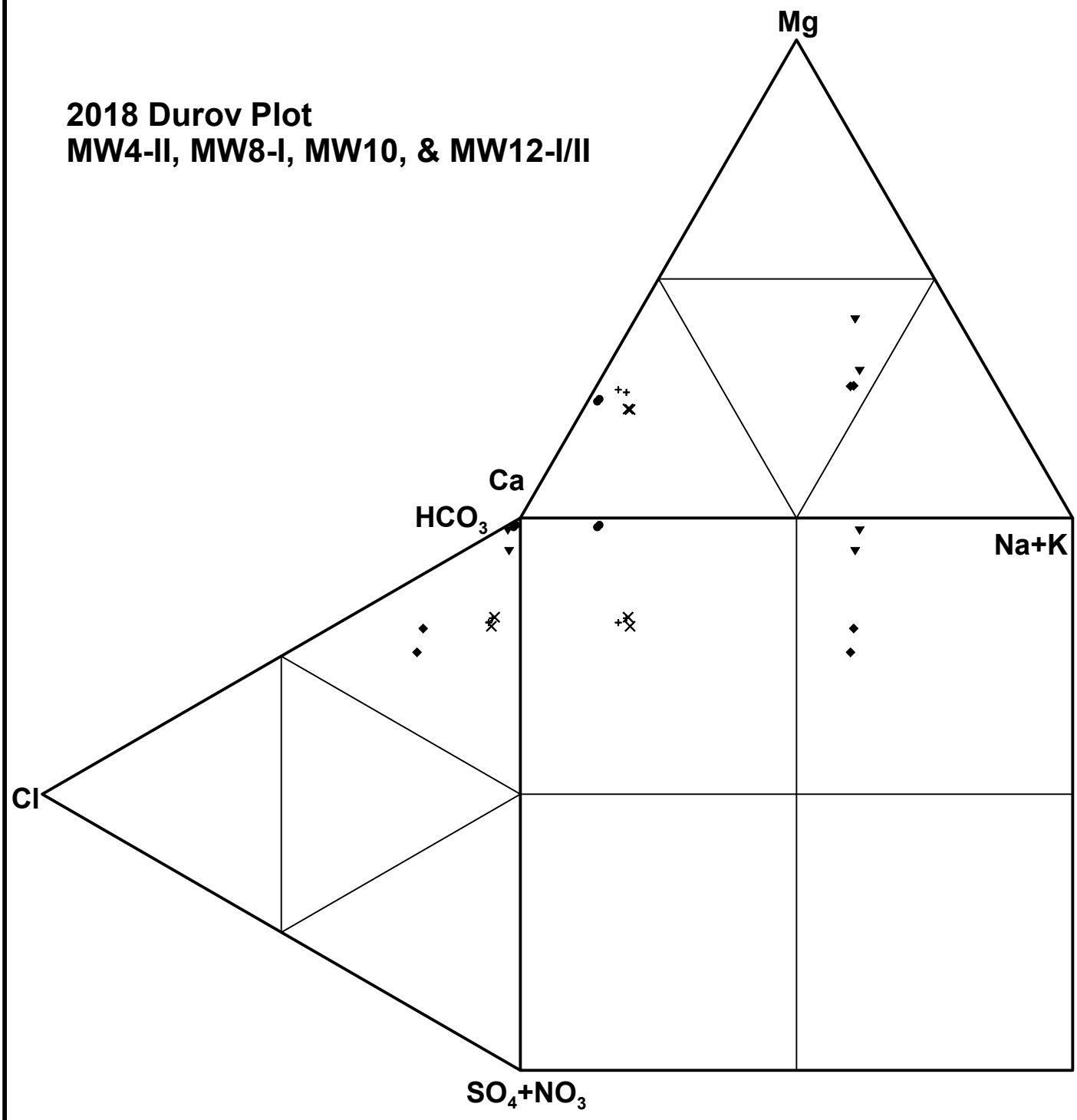
Figure G-16

Monitoring Well MW12-II

2018 to 2020 Environmental Quality Monitoring Report
Longlac Landfill
Municipality of Greenstone

REF. NO.:	THB-00006196-PE
SCALE:	N/A
DRAWN BY:	MS
CHECKED BY:	AM
DATE:	April 9, 2021

2018 Durov Plot
MW4-II, MW8-I, MW10, & MW12-I/II



Legend

- MW4-II Data Point
- MW8-I Data Point
- MW10 Data Point
- MW12-I Data Point
- MW12-II Data Point

Drawing to be read in conjunction with accompanying report.

exp.

Thunder Bay, Ontario

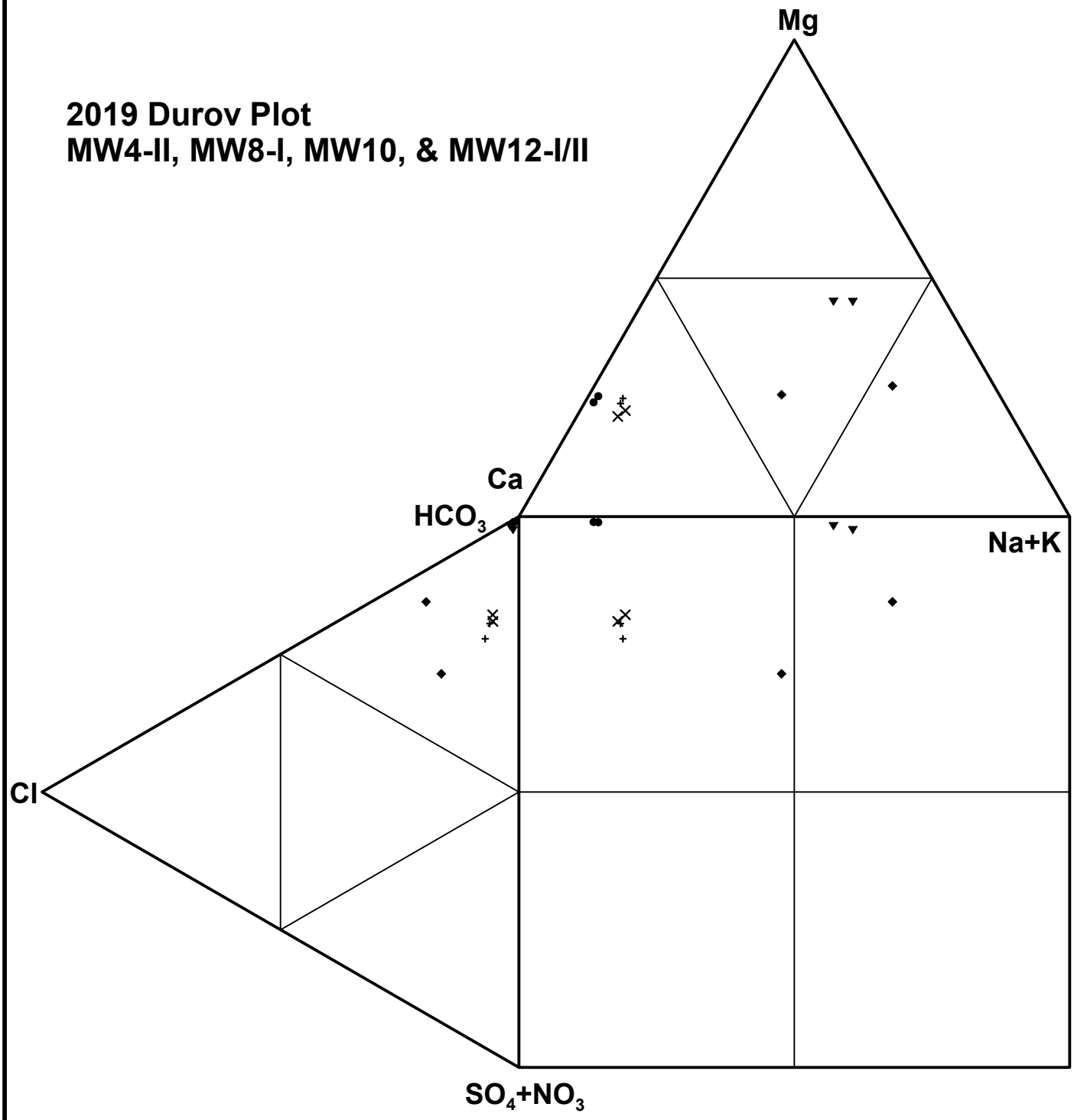
Figure G-17

2018 Comparison of MW4-II, MW8-I, MW10, & MW12-I/II

2018 to 2020 Environmental Quality Monitoring Report
Longlac Landfill
Municipality of Greenstone

REF. NO.:	THB-00006196-PE
SCALE:	N/A
DRAWN BY:	MS
CHECKED BY:	Am
DATE:	April 9, 2021

2019 Durov Plot
MW4-II, MW8-I, MW10, & MW12-I/II



Legend

- MW4-II Data Point
- MW8-I Data Point
- MW10 Data Point
- MW12-I Data Point
- MW12-II Data Point

Drawing to be read in conjunction with accompanying report.

exp.

Thunder Bay, Ontario

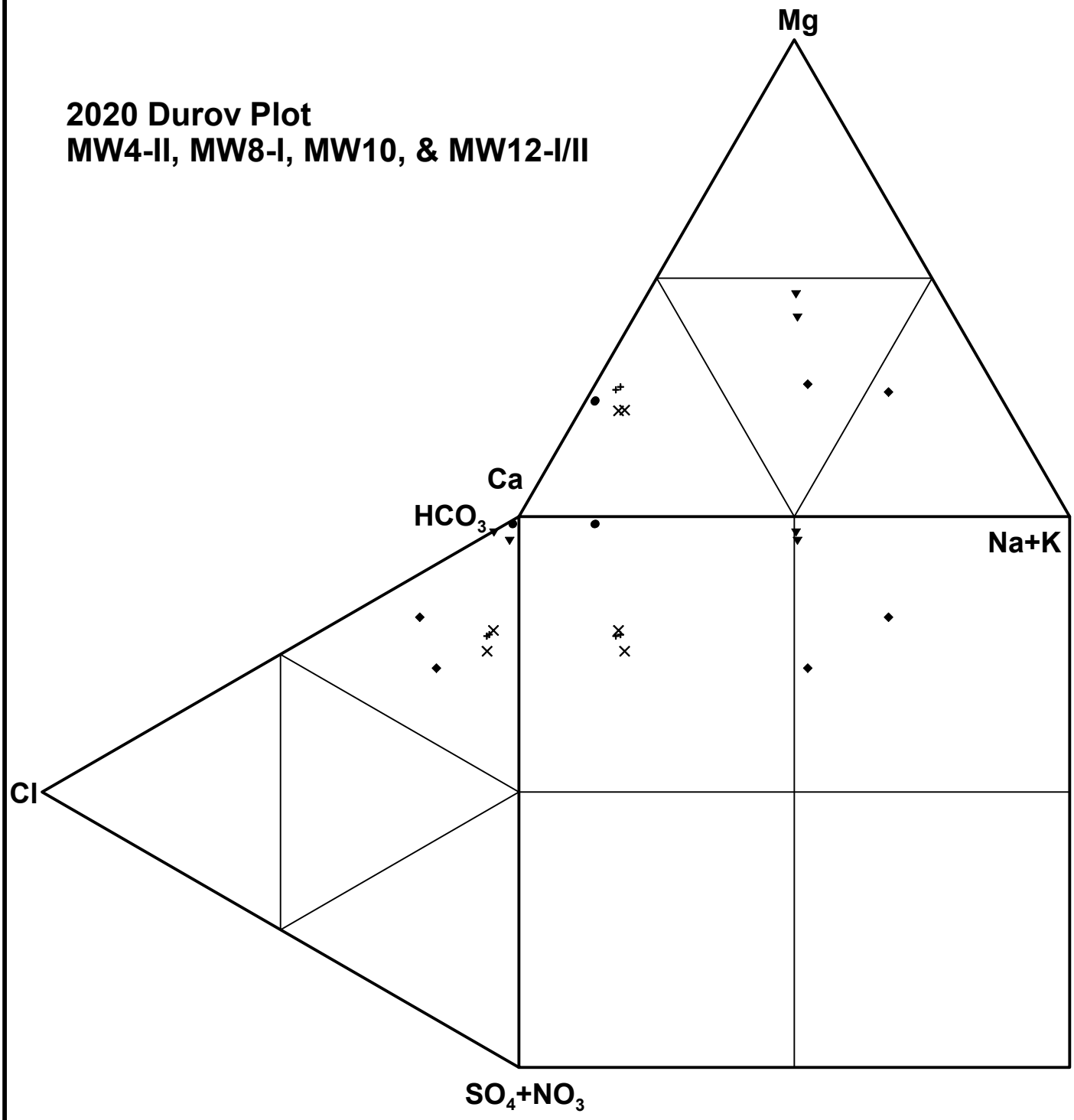
Figure G-18

2019 Comparison of MW4-II, MW8-I, MW10, & MW12-I/II

2018 to 2020 Environmental Quality Monitoring Report
Longlac Landfill
Municipality of Greenstone

REF. NO.:	THB-00006196-PE
SCALE:	N/A
DRAWN BY:	MS
CHECKED BY:	AM
DATE:	April 18, 2018

2020 Durov Plot
MW4-II, MW8-I, MW10, & MW12-I/II



Legend

- MW4-II Data Point
- MW8-I Data Point
- MW10 Data Point
- MW12-I Data Point
- MW12-II Data Point

Drawing to be read in conjunction with accompanying report.

exp.

Thunder Bay, Ontario

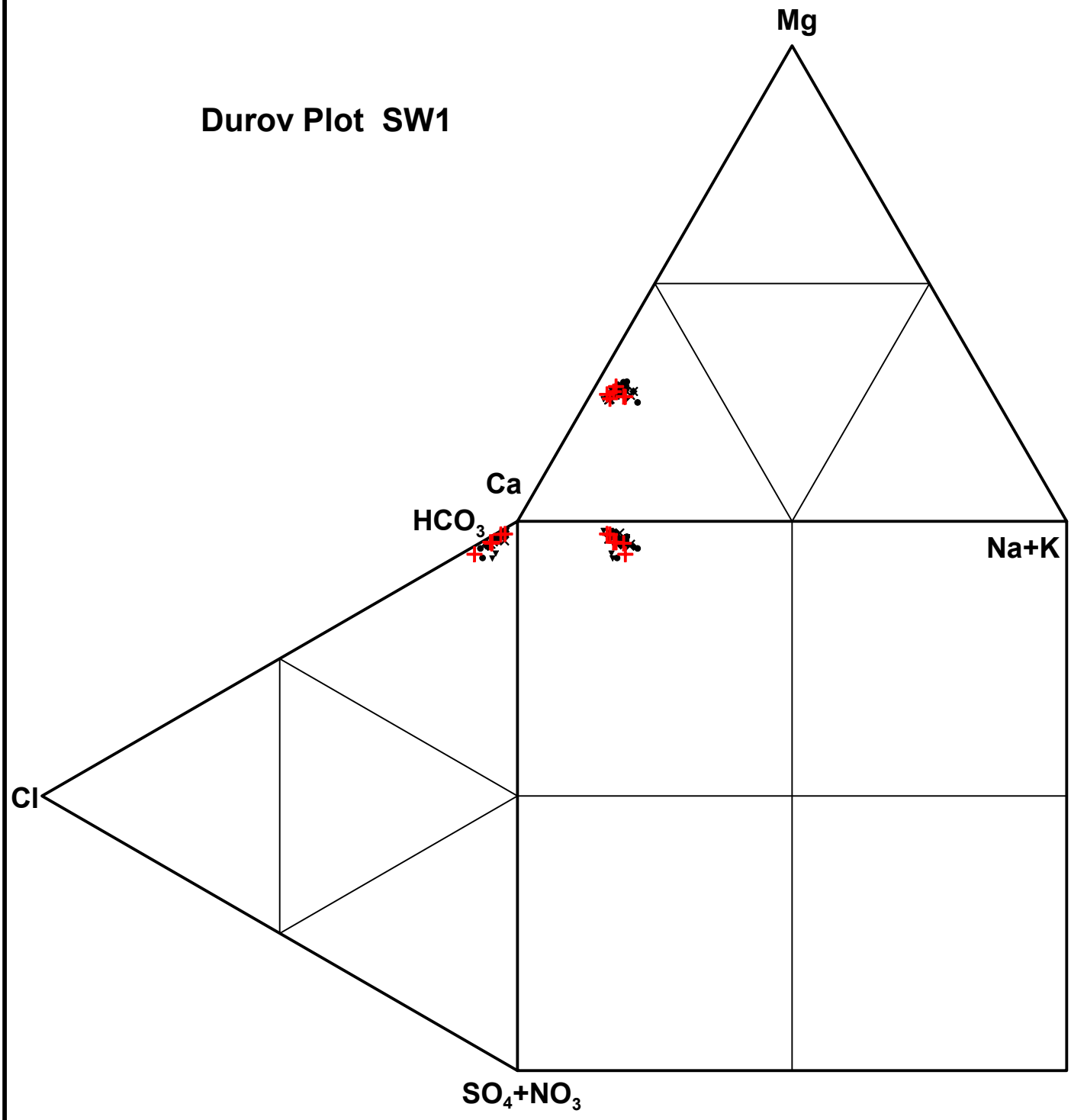
Figure G-19

2020 Comparison of MW4-II, MW8-I, MW10, & MW12-I/II

2018 to 2020 Environmental Quality Monitoring Report
Longlac Landfill
Municipality of Greenstone

REF. NO.:	THB-00006196-PE
SCALE:	N/A
DRAWN BY:	MS
CHECKED BY:	AM
DATE:	April 9, 2021

Durov Plot SW1



Legend

+	2018-20 Data Point
×	2015-17 Data Point
◆	2012-14 Data Point
▼	2009-11 Data Point
•	Up to 2008 Data Point

Drawing to be read in conjunction with accompanying report.

exp.

Thunder Bay, Ontario

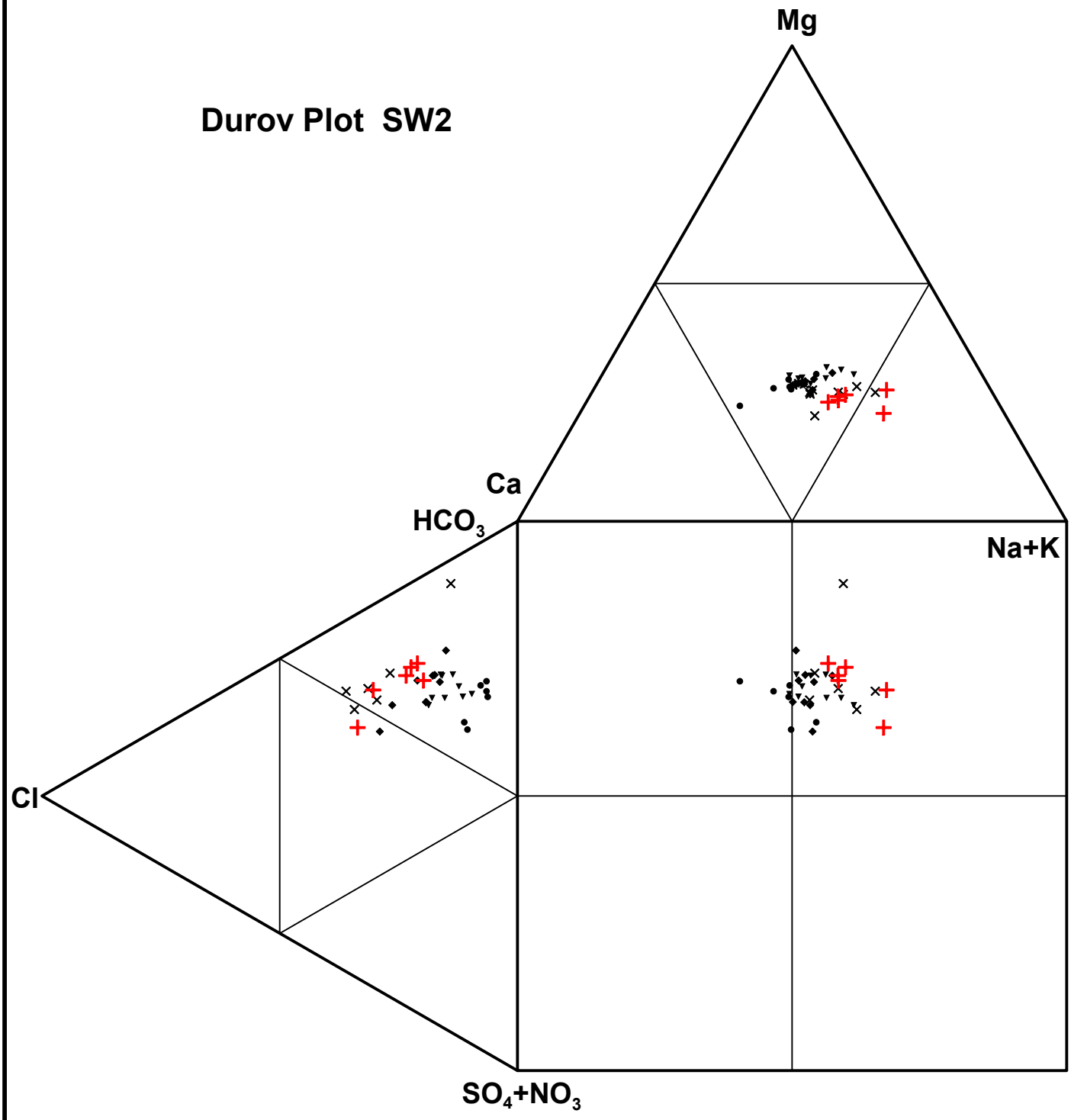
Figure G-20

Monitoring Well SW1

2018 to 2020 Environmental Quality Monitoring Report
Longlac Landfill
Municipality of Greenstone

REF. NO.:	THB-00006196-PE
SCALE:	N/A
DRAWN BY:	MS
CHECKED BY:	AM
DATE:	April 9, 2021

Durov Plot SW2



Legend

- + 2018-20 Data Point
- × 2015-17 Data Point
- ◆ 2012-14 Data Point
- ▼ 2009-11 Data Point
- • Up to 2008 Data Point

Drawing to be read in conjunction with accompanying report.

exp.

Thunder Bay, Ontario

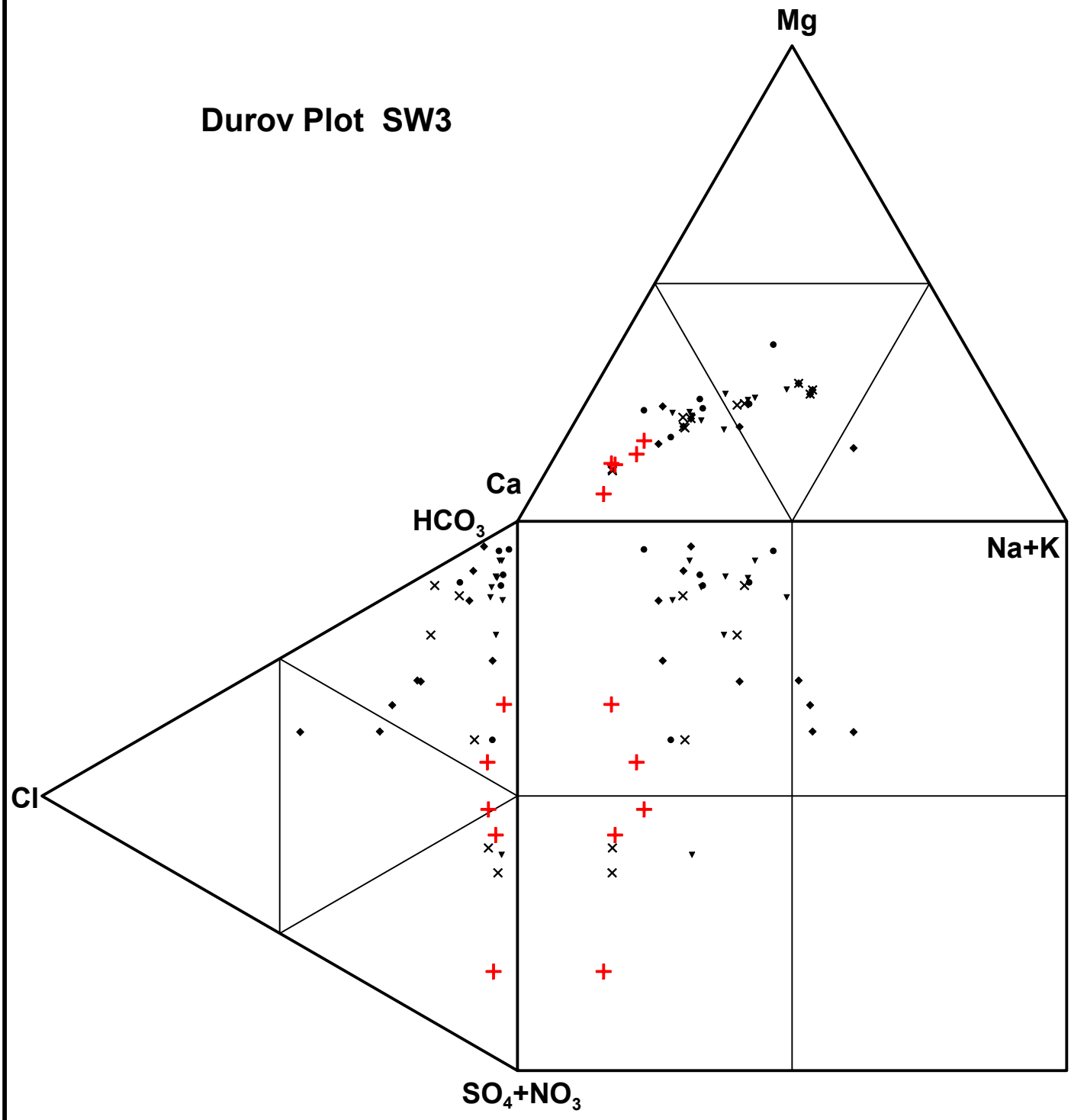
Figure G-21

Monitoring Well SW2

2018 to 2020 Environmental Quality Monitoring Report
Longlac Landfill
Municipality of Greenstone

REF. NO.:	THB-00006196-PE
SCALE:	N/A
DRAWN BY:	MS
CHECKED BY:	AM
DATE:	April 9, 2021

Durov Plot SW3



Legend

- + 2018-20 Data Point
- × 2015-17 Data Point
- ◆ 2012-14 Data Point
- ▼ 2009-11 Data Point
- • Up to 2008 Data Point

Drawing to be read in conjunction with accompanying report.

exp.

Thunder Bay, Ontario

Figure G-22

Monitoring Well SW3

2018 to 2020 Environmental Quality Monitoring Report
Longlac Landfill
Municipality of Greenstone

REF. NO.:	THB-00006196-PE
SCALE:	N/A
DRAWN BY:	MS
CHECKED BY:	AM
DATE:	April 9, 2021

APPENDIX H – Household Hazardous Waste Documentation

MOVEMENT DOCUMENT / MANIFEST
DOCUMENT DE MOUVEMENT / MANIFESTE

This Movement document/manifest conforms to all federal and provincial environmental legislation.
Ce document de mouvement/manifeste est conforme aux législations fédérale et provinciale sur l'environnement.

W0776591

MX197337-3

Movement Document / Manifest Reference No.
N° de référence du document de mouvement/manifeste

A Generator / consignor / Producteur / expéditeur

Registration No. / Provincial ID No. / N° d'immatriculation - d'id. provincial: ON6582704

Company name / Nom de l'entreprise: THE CORPORATION OF THE MUNICIPALITY OF GREENSTONE

Mailing address / Adresse postale: CRIB ROAD EXTENSION
City / Ville: LONGLAC
Province: ON
Postal code / Code postal: P0T 2A0

E-mail / Courrier électronique:
Tel. No. / N° de tél.: 807-000-0000

Shipping site address / Adresse du lieu de l'expédition: Crib Road

City / Ville: Longlac
Province: ON
Postal code / Code postal: P0T 2A0

Intended Receiver / consignee / Réceptionnaire / destinataire prévu: GFL Environmental Inc (Thunde
Registration No. / Provincial ID No. / N° d'immatriculation - d'id. provincial: A591104

Mailing address / Adresse postale: 26 Haniak Road
City / Ville: Rosslyn
Province: ON
Postal code / Code postal: P7K 0C8

E-mail / Courrier électronique: darryshok@gflenv.com
Tel. No. / N° de tél.: 807-939-2994

Receiving site address / Adresse du lieu de destination: 26 Haniak Road

City / Ville: Rosslyn
Province: ON
Postal code / Code postal: P7K 0S0

B Carrier / Transporteur

Registration No. / Provincial ID No. / N° d'immatriculation - d'id. provincial: A9135

Company name / Nom de l'entreprise: GFL ENVIRONMENTAL INC. (THUNDER BAY)

Mailing address / Adresse postale: 26 HANIAK ROAD
City / Ville: ROSSLYN
Province: ON
Postal code / Code postal: P7K 0C8

E-mail / Courrier électronique: darryshok@gflenv.com
Tel. No. / N° de tél.: 807-939-2994

Vehicle / Véhicule	Registration No. / N° d'immatriculation	Prov.
Trailer - Rail car No. 1 / 1e remorque - wagon	457044	ON
Trailer - Rail car No. 2 / 2e remorque - wagon	—	

Port of entry / Point d'entrée: International use only
Port of exit / Point de sortie: International use only

Carrier Certification : I certify that I have received waste or recyclable material from the generator / consignor for delivery to the receiver / consignee as set out in Part A and that the information contained in Part B is complete and correct.
Attestation du transporteur : J'atteste avoir reçu les déchets ou matières recyclables du producteur / expéditeur en vue de leur livraison au réceptionnaire / destinataire, tels qu'ils figurent à la partie A et que les renseignements inscrits à la partie B sont exacts et complets.

Name of authorized person (print) / Nom de l'agent autorisé (caractères d'imprimerie): Odi Luiega
Tel. No. / N° de tél.: 807 939 2994
Signature:
Year / Année: 20 | Month / Mois: 10 | Day / Jour: 29

C Receiver / consignee / Réceptionnaire / destinataire

Registration No. / Provincial ID No. / N° d'immatriculation - d'id. provincial:

Reference Nos. of other movement document(s)/manifest(s) used / N° de référence des autres documents de mouvement/manifestes utilisés:

Receiver / consignee information same as in Part A / Les renseignements du réceptionnaire / destinataire sont les mêmes qu'à la Partie A
☐ Yes / Oui ☐ No, complete the box below / Non, remplir la case ci-dessous

Company name / Nom de l'entreprise:
Mailing address / Adresse postale:
City / Ville:
Province:
Postal code / Code postal:
E-mail / Courrier électronique:
Tel. No. / N° de tél.:
Receiving site address / Adresse du lieu de destination:

Date received / Date de réception — Year / Année | Month / Mois | Day / Jour
Time / Heure ☐ A.M. ☐ P.M.

If waste or recyclable material to be transferred, specify intended company name/ Si les déchets ou matières recyclables doivent être transférés, préciser le nom du destinataire:
Registration No./Provincial ID No. / N° d'immatriculation/d'id provincial:

(i) Prov. code / Code prov.	Shipping name / Appellation réglementaire	Class / Classe Sub. class(es) / Classe(s) sub.	UN No. / N° NU	Packing / risk gr. / Gr. d'emballage / de risque	Quantity shipped / Quantité expédiée	Units / L or / ou Kg / Unités	Packaging / Contenant No. / N°	Packaging / Contenant Codes Int – est.	Phys. state / État phys.
(i) 263I	ADHESIVES	3	UN1133	II	25	KG	01	07	L
(ii) 331I	AEROSOLS	2.1	UN1950	N/R	20	KG	01	07	G
(iii) 331I	PROPANE	2 1	UN1978	N/R	55	KG	01	07	G
(iv) 145L	paint (non TDGA regulated)	N/R	N/R	N/R	750	KG	02	07	L

30X

Quantity received / Quantité reçue	Units / L or / ou Kg / Unités	Comments / Commentaires	Handling Code / Code de manutention	Shipment / Envoi Accepted / Accepté	Shipment / Envoi Refused / Refusé	Decont. Pack. / Cont.	Decont. Veh. / Véh.

(i) Notice No. / N° de notification	Notice Line No / N° de ligne de la notification	Shipment / Envoi	Of / De	D or R code / Code D ou R	C code / Code C	Basel Annex VIII or OECD Code / Annexe VIII de Bâle ou Code OCDE	H code / Code H	Y code / Code Y	National code in country of / Code du pays: Export / Exportation	Import / Importation	Customs code(s) / Code(s) de douanes
(i)											
(ii)											
(iii)											
(iv)											

International use only

If handling code "Other" (specify) / Si code de manutention « autre » (spécifier):

Receiver / consignee certification : I certify that the information contained in Part C is correct and complete. / **Attestation du réceptionnaire / destinataire :** J'atteste que tous les renseignements à la partie C sont exacts et complets.

Name of authorized person (print) / Nom de l'agent autorisé (caractère d'imprimerie):
Signature:
Tel. No. / N° de tél.:

Special handling / Manutention spéciale: ☐ Attached /Ci-joint: ☐ As follows/ Ci-contre
24 Hour Number: 1-888-213-2220

Generator / consignor certification: I certify that the information contained in Part A is correct and complete. I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labelled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.
Attestation du producteur / expéditeur: J'atteste que tous les renseignements à la partie A sont exacts et complets. Je déclare que le contenu de ce chargement est décrit ci-dessus de façon complète et exacte par la désignation officielle de transport et qu'il est convenablement classé, emballé, marqué, étiqueté, muni de plaques-étiquettes et à tous égards bien conditionné pour être transporté conformément aux réglementations internationales et nationales applicables.

Name of authorized person (print) / Nom de l'agent autorisé (caractère d'imprimerie): RICK MIRON
Tel. No. / N° de tél.:
Signature:

Date shipped / Date d'expédition — Year / Année: 20 | Month / Mois: 10 | Day / Jour: 29 | Time / Heure: ☐ A.M. ☐ P.M.
Scheduled arrival date / Date d'arrivée prévue — Year / Année: 20 | Month / Mois: 10 | Day / Jour: 30

Retained by Consignor
Gardée par l'expéditeur

Copy / Copie 2 (green / verte)

MOVEMENT DOCUMENT / MANIFEST
DOCUMENT DE MOUVEMENT / MANIFESTE

This Movement document/manifest conforms to all federal and provincial environmental legislation.
Ce document de mouvement/manifeste est conforme aux législations fédérale et provinciale sur l'environnement.

W0776591

MX197339-9

Movement Document / Manifest Reference No.
N° de référence du document de mouvement/manifeste

A Generator / consignor — Producteur / expéditeur — Registration No. / Provincial ID No. — N° d'immatriculation - d'id. provincial 1: ON6582704

Company name / Nom de l'entreprise: THE CORPORATION OF THE MUNICIPALITY OF GREENSTONE

Mailing address / Adresse postale: CRIB ROAD EXTENSION — City / Ville: LONGLAC — Province: ON — Postal code / Code postal: P0T 2A0

E-mail / Courrier électronique — Tel. No. / N° de tél.: 807-000-0000

Shipping site address / Adresse du lieu de l'expédition: Crib Road

City / Ville: Longlac — Province: ON — Postal code / Code postal: P0T 2A0

Intended Receiver / consignee — Réceptionnaire / destinataire prévu: 2 GFL Environmental Inc (Thunda — Registration No. / Provincial ID No. — N° d'immatriculation - d'id. provincial: A591104

Mailing address / Adresse postale: 26 Haniak Road Rosslyn, ON — City / Ville — Province — Postal code / Code postal: P7K 0C8

E-mail / Courrier électronique: darryshok@gflenv.com — Tel. No. / N° de tél.: 807-939-2994

Receiving site address / Adresse du lieu de destination: 26 Haniak Road

City / Ville: Rosslyn — Province: ON — Postal code / Code postal: P7K 0S8

B Carrier — Transporteur — Registration No. / Provincial ID No. — N° d'immatriculation - d'id. provincial 23: A9135

Company name / Nom de l'entreprise: GFL ENVIRONMENTAL INC. (THUNDER BAY)

Mailing address / Adresse postale: 26 HANIAK ROAD, ROSSLYN, ON — City / Ville — Province — Postal code / Code postal: P7K 0C8

E-mail / Courrier électronique: darryshok@gflenv.com — Tel. No. / N° de tél.: 807-939-2994

Vehicle / Véhicule	Registration No. / N° d'immatriculation	Prov. 24
Trailer - Rail car No. 1 / 1e remorque - wagon	45 704H	ON
Trailer - Rail car No. 2 / 2e remorque - wagon	—	—

Port of entry / Point d'entrée: international use only — Port of exit / Point de sortie: international use only 25

Carrier Certification: *I certify that I have received waste or recyclable material from the generator / consignor for delivery to the receiver / consignee as set out in Part A and that the information contained in Part B is complete and correct.* **Attestation du transporteur:** *J'atteste avoir reçu les déchets ou matières recyclables du producteur / expéditeur en vue de leur livraison au réceptionnaire / destinataire, tels qu'ils figurent à la partie A et que les renseignements inscrits à la partie B sont exacts et complets.* 26

Name of authorized person (print) / Nom de l'agent autorisé (caractères d'imprimerie): Joel Arega — Tel. No. / N° de tél.: 807,939XXXX — Signature

Year / Année: 2010 — Month / Mois: 29 — Day / Jour

C Receiver / consignee — Réceptionnaire / destinataire — Registration No. / Provincial ID No. — N° d'immatriculation - d'id. provincial 28

Reference Nos. of other movement document(s)/manifest(s) used / N° de référence des autres documents de mouvement/manifestes utilisés 27

Receiver / consignee information same as in Part A
Les renseignements du réceptionnaire / destinataire sont les mêmes qu'à la Partie A
☐ Yes / Oui ☐ No, complete the box below / Non, remplir la case ci-dessous

Company name / Nom de l'entreprise

Mailing address / Adresse postale

City / Ville — Province — Postal code / Code postal

E-mail / Courrier électronique — Tel. No. / N° de tél. ( )

Receiving site address / Adresse du lieu de destination

Date received / Date de réception — Year / Année — Month / Mois — Day / Jour — Time / Heure 29 — ☐ A.M. ☐ P.M.

If waste or recyclable material to be transferred, specify intended company name/ Si les déchets ou matières recyclables doivent être transférés, préciser le nom du destinataire 30 — Registration No./Provincial ID No. / N° d'immatriculation/d'id provincial

(i)	Prov. code / Code prov. 3	Shipping name / Appellation réglementaire 4	Class / Classe 5 — Sub. class(es) / Classe(s) sub.	UN No. / N° NU 6	Packing / risk gr. / Gr. d'emballage / de risque 7	Quantity shipped / Quantité expédiée	Units / Unités 8	Packaging / Contenant — No. / N°	Packaging / Contenant — Code / Code	Phys. state / État phys. 10
(i)	263L	organic solids (non TDGA regulated)	N/R	N/R	N/R	75	KG	01	07	S
(ii)	252L	WASTE OILS	NR	NR	NR	205	L	01	01	L
(iii)	145I	PAINT	3	UN1263	III	280	kg	03	01	L
(iv)	242B	PESTICIDES, LIQUID TOXIC NOS 2-40	6.1	UN3902	II	20	kg	01	01	L

	Quantity received / Quantité reçue	Units / Unités 31	Comments / Commentaires 32	Handling Code / Code de manutention 33	Shipment / Envoi — Accepted / Accepté 34	Shipment / Envoi — Refused / Refusé	Decont. — Pack. / Cont. 35	Decont. — Veh. / Véh.
(i)								
(ii)								
(iii)								
(iv)								

	Notice No. / N° de notification 11	Notice Line No. / N° de ligne de la notification	Shipment / Envoi 12	Of / De	D or R code / Code D ou R 13	C code / Code C 14	Basel Annex VIII or OECD Code / Annexe VIII de Bâle ou Code OCDE 15	H code / Code H 16	Y code / Code Y 17	National code in country of / Code du pays — Export / Exportation 18	Import / Importation	Customs code(s) / Code(s) de douanes 19
(i)												
(ii)												
(iii)												
(iv)												

International use only

If handling code "Other" (specify) / Si code de manutention « autre » (spécifier) 36

Receiver / consignee certification: I certify that the information contained in Part C is correct and complete. / **Attestation du réceptionnaire / destinataire:** *J'atteste que tous les renseignements à la partie C sont exacts et complets.* 37

Name of authorized person (print) / Nom de l'agent autorisé (caractère d'imprimerie)

Signature — Tel. No. / N° de tél. ( )

Special handling / Manutention spéciale 22 — ☐ Attached / Ci-joint: ☐ As follows / Ci-contre

24 Hour Number: 1-888-213-2220

Generator / consignor certification: I certify that the information contained in Part A is correct and complete. I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labelled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.
Attestation du producteur / expéditeur: *J'atteste que tous les renseignements à la partie A sont exacts et complets. Je déclare que le contenu de ce chargement est décrit ci-dessus de façon complète et exacte par la désignation officielle de transport et qu'il est convenablement classé, emballé, marqué, étiqueté, muni de plaques-étiquettes et à tous égards bien conditionné pour être transporté conformément aux réglementations internationales et nationales applicables.* 20

Name of authorized person (print) / Nom de l'agent autorisé (caractère d'imprimerie): Rick Mirau — Tel. No. / N° de tél. ( )

Signature

21 Date shipped / Date d'expédition — Year / Année: 2010 — Month / Mois: 29 — Day / Jour — Time / Heure: 8:00 — ☐ A.M. ☐ P.M.

Scheduled arrival date / Date d'arrivée prévue — Year / Année: 2010 — Month / Mois: 30 — Day / Jour

Retained by Consignor
Gardée par l'expéditeur

Copy / Copie 2 (green / verte)