



Laxton Waste Disposal Site
2023 Annual Monitoring Report

Prepared for:
City of Kawartha Lakes

Prepared by:
Azimuth Environmental
Consulting, Inc.

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Environmental Assessments & Approvals

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City of Kawartha Lakes
Waste Management Department
322 Kent St. West
Lindsay, ON
K9V 4T7

Attention: Ms. Kayla Pantaleo
Regulatory Compliance Officer

**Re: 2023 Annual Monitoring Report
Laxton Waste Disposal Site**

Dear Kayla:

Azimuth Environmental Consulting, Inc. (Azimuth) is pleased to provide the 2023 Annual Monitoring Report (AMR) for the Laxton Waste Disposal Site (Site). The data and interpretation included is to provide a summary of the 2023 monitoring data with comparison to the historical data and accurate assessment of the current state of the landfill Site. This report has been prepared in compliance with the existing Environmental Compliance Approval (ECA) and applicable Provincial standards. This assessment also interprets the longer-term trends at the Site such that an appropriate monitoring program can be recommended.

The Laxton Landfill Site continues to have no significant influence on the surrounding environment. The continued absence of detectable landfill gas at the Site would suggest that ongoing gas monitoring is not warranted assuming appropriate precautions are present.

If there are any questions regarding the content of the report, do not hesitate to contact the undersigned.



Yours truly,

AZIMUTH ENVIRONMENTAL CONSULTING, INC.



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Senior Hydrogeologist

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Attach:



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Executive Summary

The Laxton Landfill Site (Site) is located approximately two (2) kilometres west of Highway 35 at 3225 Monck Road, within the geographic Township of Laxton, in the City of Kawartha Lakes. The Site is currently operational and is able to accept municipal waste, non-hazardous solid industrial wastes, commercial waste and leaf and yard waste. The Site also operates as a transfer facility such that it can accept household hazardous waste (HHW), leaf and yard wastes, metals, and electronic equipment (WEEE). However, it is noted that HHW is not currently accepted at the transfer facility as the proper infrastructure is not present for proper handling and storage.

The Site has an approved capacity of 125,000 m³ with a remaining capacity of 3,547 m³ or 3% of the Site volume. Based on the average annual fill rate of approximately 3,000 to 5,000 m³, the landfill's remaining capacity is estimated to be reached between 0.7 to 1.2 years from July 2023 (i.e., April 2024 to October 2024). The Site has a licensed waste footprint of 2.5 ha within the 29 ha Site.

The Site is located along an ice contact sand and gravel formation that extends along a southwest – northeast axis that is surrounded by low lying peat wetland areas. Given the local topography, the height of these deposits appears to be vertically limited; however, the presence of the sand and gravel pit to the southwest and northeast would indicate that the thickness may have been historically greater in that area. The soils underlying the Site are granular varying from coarse sands and gravel to silty fine sands that extend to a bedrock contact which was observed at MW10 & MW19 to be approximately 17 to 23 m below ground surface (mbgs). Peat deposits are present away from the waste mound into the wetland areas that surround the landfill with depths up to approximately 2 m. As the water table at the Site is relatively shallow, the majority of monitoring points at the Site are also shallow.

Despite weak hydraulic gradients at the Site, ground water flow has been shown over the years to be toward the southeast and northeast. There is some variance in flow paths due to the variance in pond levels north of the waste mound as a result of changing beaver dam conditions. Shallow ground water around the site flows through Peat bogs which allow very slow water movement. Despite this overall easterly ground water flow path, some degree of radial dispersion from the waste mound occurs. The shallow surface water tributary to the north and east of the waste mound represents the local ground water discharge feature. The lack of leachate influence observed in the ground water indicates that the radial flow extent from the landfill Site is quite limited.



In general, the ground water chemistry has remained relatively consistent over the past decade. This would be anticipated in this granular geologic setting given that the landfill Site has been in operation for the past four decades. However, there is a more recent slight localized hydraulic gradient to the southeast, relative to the generally flat gradients observed historically at the Site.

The extent of this southeastern gradient is limited a short distance south of the waste mound with the primary regional flow path still being interpreted to be northeast along the more granular esker deposits. The geochemical trend noted at MW16-I supports this interpretation. An additional monitoring well nest that was installed northeast of the waste mound in March, 2023 (MW20-I, MW20-II) to confirm ground water flow paths and potential leachate influence north of the waste mound at the Site boundary. The MW20 well nest has been incorporated into the monitoring program in 2023 and is planned to be surveyed in 2024 to better confirm ground water flow.

Although ground water discharge is within the local tributary north and east of the landfill, the impacts would appear to be quite limited. Any elevated parameters in the tributary are related to the natural wetland water quality rather than leachate. This is evident through the minimal concentrations for chloride, ammonia and boron. Provincial Water Quality Objectives (PWQO) exceedances were noted in 2023, similar to previous years; however, these exceedances are attributed to the wetland water quality and associated geochemically reduced conditions readily mobilizing natural earth elements such as iron.

The results for 2023 gas monitoring program are consistent with previous years. Given the lack of detections, limited land use that surrounds the landfill and limited unsaturated thickness surrounding the waste mound to facilitate methane migration, methane monitoring is not warranted at this Site. It is recommended that this monitoring component be eliminated. Despite this, an appropriate due diligence measure would be to ensure Site staff continue to utilize a hand-held combustible gas meter within any on-Site, enclosed structures to ensure landfill gases do not accumulate in those structures.

Based on the findings of the 2023 annual monitoring, as well as previous reporting and recommendations, it is proposed that the 2024 monitoring program for the Site remain similar to previous years with a few changes. Monitor MW2 should be removed from the program due to redundancy along the eastern waste edge. As well, MW10 is the lone bedrock monitoring well and yields water quality results more reflective of a more naturally mineralized water. Therefore, continued monitoring of MW10 does not provide meaningful data to the monitoring program, and should be discontinued from the



program. MW20-I and MW20-II were installed in March 2023 and have become part of the sampling program for 2023 and onwards.

It is noted that due to the consistency in ground and surface water quality at the Site it is recommended that surface water sampling be reduced to semi-annual (spring and fall) to reflect both the wet and dry periods of the year. This frequency corresponds with the existing ground water monitoring program. Also, SWG has been dry or contains very little water so that collecting a sample from this station has not been possible during the last sixteen monitoring events. It is recommended that this station be eliminated from the surface water monitoring and trigger programs as there is no defined channel or depression and it has not been observed to actively flow into SWC2 at any time by Azimuth field staff.

Finally, the lack of organic detections at the Site would indicate that removal of organic analyses from the surface water program and reducing the frequency to annual at select ground water monitors would be sufficient.



1.0 Introduction

The City of Kawartha Lakes (City) is responsible for the operation and maintenance of the Laxton Landfill Site (Site) in accordance with the original Provisional Environmental Compliance Approval (ECA) (No. A321304) issued by the Ministry of Environment, Conservation & Parks (MECP) February 14, 1980 and last amended October 29, 2012. The following report provides a summary of the 2023 monitoring data with comparison to the historical data set such that accurate assessment of the current state of the landfill Site is provided with respect to compliance with the existing ECA and applicable Provincial standards.

1.1 Site Background

For the purposes of efficiency and consistency, much of the background information provided within this report has been referenced from previous Site reports, all of which have been referenced in Section 8.0.

The Site is located approximately two (2) kilometers west of Highway 35 at 3225 Monck Road, within the geographic Township of Laxton, in the City of Kawartha Lakes (Figure 1). The Site is 29 hectares in size which includes the 2.5 hectare waste disposal area (Figure 2). The boundary of the Site is irregularly shaped and is bordered by a swath of mixed forest. A wetland (and an associated watercourse flowing east) is present centrally in the Site, north of the waste mound. A gravel pit is situated along the western limit of the Site and a Public Works Yard is present along its southern boundary at Monck Road. An Ontario Hydro easement crosses the Site in a southwest to northeast orientation. Following the most recent amendment to the ECA (Appendix G), the Site is approved to accept municipal waste, non-hazardous solid industrial wastes, commercial waste and leaf and yard waste. The Site also operates as a transfer facility such that it is approved to accept household hazardous waste (HHW), leaf and yard wastes, metals and electronic equipment (WEEE). However, it is noted that HHW is not currently accepted at the transfer facility as the proper infrastructure is not present for proper handling and storage. The Site relies on natural attenuation for Leachate and landfill gases so that there are no off-site impacts. The City has recently submitted an ECA application for volumetric expansion of the Site within the current waste footprint.

Table 1 below, provides an operational summary of the history of the Laxton Landfill Site.



Table 1: History of the Laxton Landfill Site

Date	Event
1973	Site opened as a landfill site and was operated by the Township of Laxton
1992	County of Victoria assumed responsibility for the operations of the Site
2001	City of Kawartha Lakes assumed responsibility for the operations of the Site
2002-2003	Several monitoring wells were installed at the Site MW1 to MW14. The intent of these wells was to establish potential ground water impacts within and surrounding the landfill site. As well, surface water locations SWA to SWF were established to evaluate potential leachate influences on the tributary that is location to the north of the landfill site.
2006	An additional leachate monitoring well was installed (MW15-06)
2007	MW16-07 was installed to further investigate RUC compliance at the eastern property boundary
2009	MW17-09 and MW18-09 were installed as drive point monitoring wells to investigate shallow ground water impacts to the north of the landfill.
2012	MW19 was installed to provide a monitoring well within the deep overburden.
2023	MW20-I and MW20-II were installed to provide a monitoring well within the shallow and deep overburden northeast of the mound.

2.0 Geology

According to Chapman and Putnam (1984), the Laxton Landfill Site is located within the physiographic region called the Carden Plain. The Carden Plain is located between the Kawartha Lakes and Lake Couchiching and is comprised of a limestone plain with very little overburden deposits. During the last glaciation, this area was inundated by Lake Algonquin (no longer present today), and as a result some beaches and offshore sand deposits from this historic lake are found in this area.

Based on previous reporting, as well as geological mapping of the area, it is apparent the Site is located along an ice contact sand and gravel formation that extends along a



southwest – northeast axis that is surrounded by low lying wetland areas. Given the local topography, the height of these deposits appears to be vertically limited; however, the presence of the sand and gravel pit to the southwest and northeast would indicate that the thickness may have been historically greater in that area. The soils underlying the Site are stated to be granular, varying from coarse sands and gravel to silty fine sands that extend to a bedrock contact. At the Site, the bedrock contact was observed to be approximately 17 to 23 m below ground surface (mbgs) at MW10 & MW19, respectively. Peat deposits are also present around the landfill and in the wetland areas that surround the landfill with depths up to approximately 2 m. Since the water table at the Site is relatively shallow, the majority of the monitoring points at the Site are also shallow.

The Laxton Landfill Site is at a geologic transition point (ice-contact deposits) between an upland area that has a greater thickness of glaciofluvial sand and gravel deposits (~25 m) than an adjacent lower lying “wetland area”. The overburden sediments are much finer grained to the south of the landfill, while coarser deposits are found beneath the landfill itself (i.e., MW10 & MW19 - Appendix F). It is noted that this distribution is typical of an ice-contact deposition or esker complex as the coarser materials are situated along the centre of this geologic feature. Regional mapping suggests the esker orientation is northeast to southwest through the Site, which accounts for the sand and gravel pits located immediately northeast and southwest of the Site.

Equally important to the Site's geochemistry, is the presence of a peat bog surrounding the landfill Site. A peat thickness of up to 2 m was reported during the drilling of MW12, MW13, MW14, MW16, MW17 and MW18. Peat forms in wetland conditions, where a near permanent inundation of shallow surface water is present, which obstructs the flow of oxygen from the atmosphere. This lack of oxygen slows the rate of decomposition (i.e., anaerobic conditions) and creates a naturally geochemically reduced condition. The peat development takes many years to accumulate, and essentially, biomass production exceeds the rate of decay propagating the development of a peat bog. Traditionally, soils that occur beneath peat bogs are oxygen- and nutrient-poor, in addition to being much more acidic than other wetland environments.

The underlying bedrock in the immediate area is stated to range between Precambrian Gneisses (OGS, 1991) and Ordovician age limestone (Armstrong & Dodge, 2007). The well log for MW10 indicates the bedrock below the Site is of granitic origin. The elevated fluoride concentrations in the water quality from this location is likely natural and related to the bedrock mineralogy. The mapping also indicates that the Site is located near a transition point between the Paleozoic limestone and Precambrian bedrock.



Additional information provided in the 2009 annual report (Cambium, 2010) regarding the regional geology indicated the presence of a buried bedrock ridge that extends northeastward. A review of some local well records would support this as most of the local well logs indicate limited overburden thickness (<3 m) with the exception of immediately below the Site.

3.0 Hydrogeologic Interpretation

The ground water flow system underlying the Site is controlled by the local geology. Ground water flows principally through both the underlying sand and gravel unit from the esker as well as the more regional silty fine sand aquifer, which due to their high permeability forms the pathway of least resistance. Literature and previous reporting confirm these units are underlain by Pre-Cambrian bedrock, although local MECP well records indicate some locations have limestone and shale atop the Pre-Cambrian contact. As the Site is currently operated as a natural attenuation facility, the wastes are deposited atop the native overburden materials, as such; there is an expected hydraulic connection between the waste mound and underlying aquifer system. A significant amount of low permeable interim and final cover has been emplaced across the site to reduce infiltration and leachate generation.

The ground water elevations have been monitored from 2002 to present. The water elevation data (Appendix C) suggest that the ground water table shows minimal seasonal variation (i.e., <1.5 m) at the Site. The hydraulic gradient is also quite muted at this Site with a differential lateral hydraulic head of less than 1 m over the entire Site (Figures 3 & 4). A description of the monitoring wells present at the Site is provided in Table 2 below.



Table 2: Monitoring Well Details

Monitor	Depth (m)	Screened Unit	Location
MW1	6.1	Medium Sand / Gravel	Waste Perimeter
MW2	6.1	Medium Sand / Gravel	Waste Perimeter
MW3	5.5	Medium Sand / Gravel	Waste Perimeter
MW4	7.6	Silty Fine Sand	Waste Mound
MW6	6.1	Coarse to Fine Sand	Waste Perimeter
MW7	6.1	Coarse to Fine Sand	Waste Mound
MW8	6.1	Coarse to Fine Sand	Waste Mound
MW10	25.6	Bedrock	Waste Perimeter
MW12	6.0	Silty Fine Sand	Downgradient
MW13	6.1	Silty Fine Sand	Downgradient
MW14	6.1	Silty Fine Sand	Background
MW15	4.9	Refuse	Waste Mound
MW16	4.6	Very Fine Sand	Downgradient
MW16-I	13.2	Silty Sand	Downgradient
MW17	3.0	Sand	Upgradient
MW18	3.0	Sand	Upgradient
MW19	16.8	Very Fine Sand	Downgradient
MW20-I	8.5	Sand	Waste Perimeter
MW20-II	5.5	Sand	Waste Perimeter

The permeable soils limit the lateral hydraulic gradient present around the Site. However, the lateral gradient; although slight, is interpreted to be predominantly toward the southeast and northeast.

Previous interpretations have stated that a ground water divide extends along the southern extent of the waste mound which likely corresponds to the centre line of the esker complex. Given the relative elevation of the landfill compared to the surrounding low-lying wetland areas, ground water originating from the landfill would migrate in a radial direction from the waste area into the silty-fine sand aquifer. The regional ground water flow is in an easterly to northeasterly direction based on the measured ground water elevations and geological setting. The presence of a buried bedrock trough extending to the northeast is likely a submerged extension of the ice contact formation that is present beneath the landfill Site. This is supported by the fact that sand and gravel pits are located along this axis in both directions. As such, the coarser grained materials within this feature likely provide a migration pathway for leachate influenced ground water migrating from the Site in this direction.



More recently, a slightly increased concentration trend to the south (MW12, MW13, MW16, MW16-I & MW19) is present. When reviewing the conditions at the Site, specifically those immediately north of the waste mound over the past few years, it is noted that MW17 had become inaccessible over the past six years due to elevated surface water levels resulting from a beaver dam in proximity to SWC. Although surface water levels within the pond area lowered enough to obtain a ground water sample from MW17 in October 2019. As the overburden material is known to be granular, there is a likely hydraulic connection between the surface water levels and the underlying ground water conditions, such that this flooding north of the waste mound has the ability to slightly skew the local hydraulic gradients. The elevation of the surface water in proximity to MW17 is likely at or above 271.14 m above mean sea level (mASL). This elevation is approximately 0.8 m above the historical average ground water elevation at MW17. Given the ground water elevation differentials (hydraulic gradient) are typically less than 0.2 m across the Site, this increase in the gradients to the south, at least locally alter the ground water flow patterns in proximity to the waste mound.

Based on the hydraulic properties, ground water velocities were calculated, with the results summarized in Table 3 below. These are noted to be reflective of the general overall conditions at the Site.

Table 3: Ground Water Flow Velocities

Hydrogeologic Unit	Hydraulic Conductivity (m/s)**	Lateral Gradient (m/m)***	Porosity	Ground Water Velocity (m/yr)
Sand and Gravel*	1.6×10^{-4} **	0.002	0.25	40
Silty Sand	1.2×10^{-6} **	0.002	0.25	0.3

Notes: *Ice contact deposits

**Based on average Hazen permeabilities presented in Hydroterra, 2002

***Gradient calculated based on October 2023 GW elevations

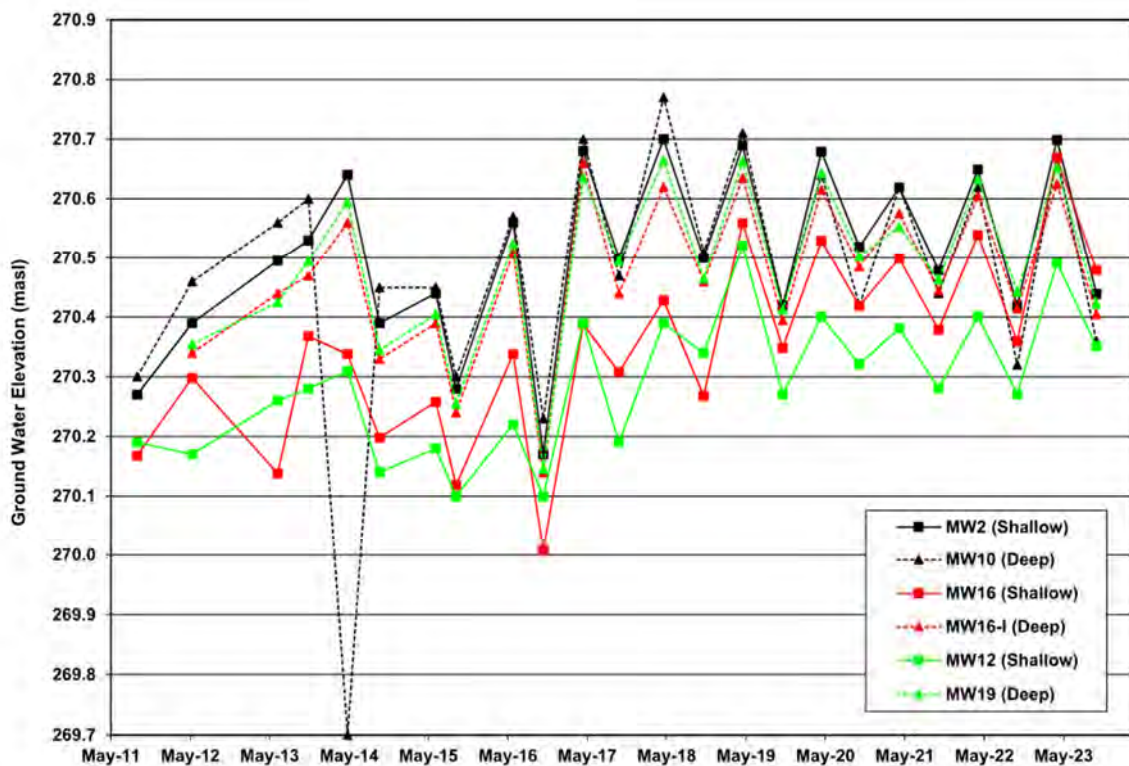
Given the northeast extent of the coarse sand and gravel deposits and ground water flow rates presented above, it is apparent that these deposits provide the primary pathway for potential leachate migration from the Site. As preferential groundwater flow exists within this coarse sand and gravel unit, the overall concentration of any leachate influenced parameters would be potentially further diluted through the advection and mixing processes within this faster flowing sand and gravel unit. As such, attenuation within this unit would limit the extent of leachate impacts downgradient of the waste mound.

Characterization of vertical gradients between the shallow and deep overburden at the Site is determined through the nest present at MW16 (MW16 – shallow, MW16-I –



deep), as well as comparison between MW12 (shallow) and MW19 (deep), which are in proximity to each other. Similarly, MW2 was compared to MW10 (bedrock). As illustrated in the graph below, the ground water elevation differences between these vertical pairs of monitoring wells are very low. However, a small but consistent upward vertical gradient is present between the shallow and deep (overburden and bedrock) for most locations over time. MW2 & MW10 have shown a more pronounced and consistent downward gradient over the past several years. The newly installed MW20-I and MW20-II monitoring wells are to be surveyed in 2024, and thus have not been included in the graphic below.

Graphic 1: Vertical Ground Water Gradients



4.0 Summary of 2023 Monitoring Program

The 2023 monitoring program for the Site was undertaken by Azimuth Environmental Consulting, Inc. (Azimuth) and The City of Kawartha Lakes (City) staff. Azimuth completed the Spring (April), and Fall (October) monitoring events. This included collection of ground and surface water samples, and gas monitoring during these events as well as January and February. City staff completed the Summer (August) inspection and collection of surface water samples and gas monitoring.



This program (which includes 19 monitoring wells, five surface water locations and two gas monitors) was similar to what had been completed over the past several years. For reference, the ground water, surface water and gas monitor locations are illustrated on Figure 2 (Appendix A).

Prior to sampling at each ground water monitor, static water levels were measured. Ground water samples were then collected upon purging at least three well volumes of water (or until the monitor was dry and sufficient recovery allowed for collection of a non-stagnant sample) from each monitor using dedicated check valve pumps and tubing. Ground water samples for metals and DOC analysis were also field-filtered using disposable 0.45 µm filters.

Surface water samples were collected at a depth about equal to half of the surface water features total depth (where possible), while minimizing the potential for sediment entrainment as samples were not field filtered.

In 2023, the analytical testing was completed by Caduceon Environmental Laboratories (Caduceon) of Richmond Hill or Kingston, Ontario. It is noted that Caduceon is accredited by the Canadian Association for Environmental Analytical Laboratories. Unabbreviated Laboratory Certificates of Analyses for all testing are presented in Appendix I, while the data has also been summarized with the historical data in Appendix B. Also, for a more detailed description of the field protocols employed for all monitoring activities associated with the 2023 monitoring program, the City's standard field protocols have been included in Appendix H.

4.1 2023 QA/QC Samples

As part of the routine sampling program for the Site, duplicate samples were collected and analyzed for quality assurance purposes. In 2023, four QA/QC samples were collected out of 40 samples. The laboratory was not advised of the sample duplication prior to analysis of these samples. Results are provided in Appendix B and were found to be within acceptable limits, thus the overall data quality is considered sufficient.

4.2 Ground Water & Leachate

4.2.1 Ground Water & Leachate Flow

Water level measurements were obtained prior to any disturbance of the static piezometric surface using an electronic water level meter (accuracy of +/-0.2 cm). The water level data collected in 2023 was generally consistent with the historical data set.



The 2023 ground water elevations, as well as the historical data set have been included in Appendix C.

The long-term trend in the water elevation data shows that the measurements at all monitoring locations fall within a general one meter range from ~270 mASL to 271 mASL, with the exception of MW13 during the Fall 2019 event, which is considered an anomaly.

The other important point to this interpretation as identified above (Section 3.0) is that there is a small lateral hydraulic gradient and therefore little actual off-site ground water movement.

As noted previously, contouring of the measured water level data demonstrates the direction of ground water flow in the vicinity of the waste (Figures 3 & 4), which is similar to previous years with a generally south eastern flow path which is interpreted to shift towards the northeast along the buried bedrock trough. The data is generally consistent between the Spring and Fall.

4.2.2 Background Ground Water Quality

The background ground water chemistry has historically been monitored at MW8 which targets the shallow overburden unit within the ice-contact formation immediately southwest of the waste area (Figure 2). However, given the fact the water quality at this location has become influenced by leachate, likely owing to the radial dispersion extending from the waste mound, a new background location (MW14) was implemented previously as part of the 2015 monitoring report. As noted above, ground water flow is east to northeast so MW14 is out of the direct flow from the landfill; but is also sufficiently removed from the waste mound so not to be influenced by the radial dispersive flow detected within this system. As such, it represents the most appropriate background location within the current monitoring well network. The same has historically been noted to be true with the MW13 monitoring location, which is situated immediately northeast of MW14; however, this location has become leachate influenced over the past five years owing to the shift in ground water flow direction towards the south with the development of the beaver pond north of the waste mound.

The background water quality can be characterized as a calcium / magnesium carbonate dominated water. The calcium content is twice the magnesium content. As a result, the water quality is naturally hard. The water quality has a low level of mineralization, which has resulted in consistent concentrations for most parameters. The water quality does show a geochemically reduced signature typical of an anoxic peat wetland environment and as a result the iron solubility limit is increased in this reduced state. The



organic nitrogen (i.e., TKN minus ammonia) and phosphorous concentrations indicative of decaying vegetation reflect the peat environment present at this Site. Iron parameters routinely exceed the Ontario Drinking Water Quality Standards (ODWQS, 2006). However, these parameters are determined to be naturally sourced and are commonly found within the ground water within the Canadian Shield and associated peat environments. This is confirmed through the lack of any elevated leachate indicator parameter and the consistency in the data over time, including the data collected in 2023 (Appendix D).

4.2.3 Leachate Quality

Presently, the best available estimate of leachate quality at the Laxton Landfill Site is the analytical data obtained from MW4. This monitor is screened immediately below the waste (Figure 2). The concentration of selective leachate parameters within the waste area for all samples collected between 2008 and 2023 has been illustrated in the time trend graphs provided in Appendix D. Summary tables are also included in Section 4.2.4, which summarize the average concentrations for several leachate indicator parameters.

For the Laxton Landfill Site, the leachate strength is relatively low despite it still being an active Site; but this is likely due to the fact that the landfill has a relatively small footprint and receives a limited waste volume per annum. The dominant geochemical signature remains as a calcium carbonate saturated water. However, the leachate signature for the Laxton Landfill Site shows geochemically reduced conditions as noted below. Several parameter concentrations are elevated over the background water quality and it is these differences that are used to define the leachate influence in the surrounding environment.

One of the most significant deviations noted between the leachate and natural background levels is with respect to nitrogen species (i.e., Total Kjeldahl Nitrogen [TKN] and total ammonia [as N]). TKN is a measure of the total nitrogen in the system (organic nitrogen + ammonia). An elevation in TKN concentration relative to ammonia concentration would be typical of the peat environment present at this Site, where the organic nitrogen (natural source) would represent the primary nitrogen species. An elevated concentration of both TKN and ammonia is indicative of a geochemically reducing environment, as is typical of ground water conditions in the immediate vicinity of any landfill Site. It is noted that bog environments such as present around the Site do contain measurable concentrations of natural ammonia as a result of the geochemically reduced conditions present in this environment as noted at MW18 (upgradient). As such, it is important to review parameter concentrations relative to other leachate indicator parameters to determine potential for leachate source vs. natural.



The presence of TKN and ammonia within a landfill environment is primarily due to the consumption of available dissolved oxygen within the subsurface by bacteriological activity. This reaction is catalyzed by the large quantity of organic matter (organic carbon source for energy-producing reactions) occurring within the waste mass. The microbial activity is limited by the available oxygen which is often depleted within the landfill mass and hence the use of alternative sources of oxygen by facilitative bacteria (i.e., reduction of oxygenated species [NO_3 to NH_4 and SO_4 to SO_2] dissolved in the leachate). This accounts for the evaluation of both nitrogen and sulphate parameters when assessing leachate impacts. The high water table condition and organic rich environment of the bog replicate this poor-oxygen environment and accounts for the detectable concentration of ammonia and TKN, albeit significantly diminished from a landfill setting.

These geochemically reducing conditions will also allow for valence changes in many earth metal species which tends to increase the measured concentration of metal ions. This is evident at this Site with the significantly elevated iron and manganese concentrations (see Table 4 – Section 4.2.4). The mineral rich waters from the landfill have an elevated total dissolved solids (TDS) and also show an elevated chemical oxygen demand (COD) as a result of the reduced conditions and presence of organics. Dissolved organic carbon (DOC) provides a similar measure of the carbon / organic rich waters from the landfill. All three of these general parameters are indirect measurements of the landfill geochemistry. Other traditional landfill parameters are often elevated such as chloride, and boron, but to a much lesser extent than the COD, TDS and DOC concentrations owing to their relative presence / availability in the waste stream.

Boron is also a more definable leachate parameter given its elevated concentration in the leachate and relatively minimal concentrations in the background water quality. This parameter is also highly mobile and has been identified as one of the parameters in some of the downgradient locations that has indicated more notable shifts in concentrations relating to the previously discussed hydraulic gradient shifts associated with the beaver pond.

A final characteristic of the leachate quality at MW4 is its relative consistency over time. Although some variability and more recent (2016 – present) declining trends have been noted for certain parameters, the overall water quality has remained similar for the past 15 years. The declining concentration trends are likely the result of the active waste area being further from the northeastern end of the waste mound. Similarly, there has also been more cover material added in the northeast over time which may lower the leachate generation in that area. Finally, the flooded conditions immediately north of this area discussed in Section 3.0 may contribute to localized alterations in the ground water flow



patterns that could influence the chemistry with more dilute background water quality flowing towards this location from the north.

In summary, the Laxton Landfill Site will continue to yield a relatively consistent geochemical signature because it maintains a quasi steady state condition. This is due to low annual landfill tonnages and active microbial population that breaks leachate down. Over time, the carbon-rich source present in the landfill will be depleted which will result in geochemical changes bringing conditions in line with the background.

Despite some subtle declining trends which are likely due to localized changes in landfilling and water levels, the overall leachate quality is consistent. Therefore, the effect the Laxton Landfill Site has on its surrounding environment would continue to be relatively steady and minor throughout the operational lifespan of the Site and will likely show a slow decline over time.

The leachate indicator parameters (LIPs) identified for this Site in 2023, are similar to 2022 and are as follows:

- | | | |
|----------------------------------|------------------------|--------------|
| • Total Dissolved Solids (TDS) | • Calcium | • Alkalinity |
| • Chemical Oxygen Demand (COD) | • Chloride | • Iron |
| • Dissolved Organic Carbon (DOC) | • Manganese | • Sodium |
| • Total Kjeldahl Nitrogen (TKN) | • Potassium | • Sulphate |
| • Boron | • Ammonia ¹ | |

4.2.4 Downgradient Ground Water Quality

Currently the ground water quality downgradient of the Laxton Landfill Site is monitored via 16 locations, with many of these locations immediately adjacent to the waste area. These monitoring wells target three aquifer units including shallow wells within the silty sand (12), deep sand and gravel (3), as well as a single well screened within the underlying bedrock.

The Site is located in a stagnant area which can be characterized as marshy / boggy lands and slow ground water movement. The abundance of peat materials in the Site vicinity attests to this condition. The slow movement and organic-rich peat materials create a naturally geochemically reduced environment, which also portrays an elevated dissolved organic signature sometimes associated with high nitrogen levels. This natural condition can be confused with the geochemically reduced conditions created by the landfill setting

¹ Unionized ammonia for surface water assessment



and therefore caution must be exercised in interpreting results. The peat will also readily sorb organic compounds and further attenuate the leachate plume as discussed below.

The geochemically reducing conditions generated within the landfill have also created additional indicators which affect the overall water quality at the Site. These reduced conditions allow for the valence changes of naturally occurring earth elements such as iron and manganese, which as a result cause them to be more soluble and present at more elevated concentrations within the groundwater. However, the landfill also generates an ammonia signature and slightly elevated chlorides. Another parameter which is likely solely attributable to the landfill is boron. Although boron is elevated in the leachate it is consistently below detection limits at most downgradient locations. The absence of these particular components of the landfill leachate signature in the surrounding monitoring network is indicative of natural water quality instead of leachate. Thus, while downgradient locations may show elevated iron and manganese concentrations as well as elevated DOC, they represent the natural peat environment when absent of an elevated more definable LIP's ammonia and boron.

A review of the geochemical database has indicated that the water quality at the Site has generally consistent water quality, unless influenced by leachate. A summary of the average concentrations for leachate indicator parameters in the surrounding wells at the Site is provided in Table 4 below. The values in this table are averages over the previous five years (2019– 2023) to represent the most recent data.

As can be observed, downgradient leachate influence is negligible at most locations, with the exception of MW1, MW2, MW3 & MW7 which have the most elevated leachate indicator concentrations (*i.e.*, ammonia, potassium & boron). MW6, which was historically included in this list has shown declining trends for most leachate indicator parameters since 2016, although many have stabilized the past few years. Increasing trends were noted at this location starting in 2018 for COD and DOC. The water quality trends are interpreted to be related to the elevated ponding levels to the north of the waste mound which began around 2016. Over this period ground water elevations in the northern monitoring wells (MW6, MW17 & MW18) indicated a slight increase given the likely hydraulic connection between the shallow water table and surface water in this area; however, samples have not been able to be collected from MW17 (since 2019) & MW18 (since 2021) owing to these locations not being accessible due to the presence of the pond. This small increase would have altered the local hydraulic gradients limiting the northern radial flow potential towards MW6 from the waste mound. The increasing trends for DOC and COD could also be related to this shift in conditions with the flooding around this well creating a natural surficial source for these parameters.



It is noted that these perimeter locations are in proximity to the toe of the waste such that leachate influence is expected. These results support the previously interpreted potential ground water flow direction to the northeast as MW3 represents the closest downgradient monitor along the ice contact formation. With the active waste area now being in closest proximity to MW7, increased concentrations for a number of parameters have been noted and will likely continue for the duration of filling in this area. However, the trends are relatively muted owing to the low tonnages of waste accepted at the landfill and low source input. Similarly, with the movement of landfilling to the southwest, MW1 began to show leachate influence in 2015, which relates to the proximity of waste to this location as well as the interpreted northeastern flow pattern such that any southern flow component is likely shifted north within the bedrock trough such that concentrations are more elevated at that location than monitors further east.

For use of COD as an indicator parameter, which is the quantity of chemical to oxidize the water, the conditions must be carefully assessed in a peat rich environment because of the natural organic content potentially present in the water samples. For example, elevated COD concentrations at MW17 and MW18 are present in the absence of most other leachate indicator parameters. Given these two monitoring wells are the shallowest in the monitoring well network and located within a wetland area, it is likely that these concentrations are reflective of surficial wetland quality influence rather than leachate. The same would be true for the DOC values which are mentioned below. Finally, the elevated ammonia concentration at MW18 is not interpreted to be sourced to the landfill; as other leachate indicator parameters not attributable to the anoxic wetland conditions are not similarly elevated (*i.e.*, boron, calcium, sodium & chloride).

Given the more recent trends observed at MW12, MW13, MW16, MW16-I and MW19 (see below) as a result of leachate influence and the lack of a similar trend at MW18, the elevated ammonia at MW18 is more likely naturally sourced to the wetland conditions.



Table 4: Average Leachate Indicator Parameter Concentrations

Parameters	ODWQS	Background	Leachate	Downgradient (in order of proximity to waste)															
		MW14	MW4	MW8	MW1	MW2	MW3	MW6	MW10*	MW7	MW16-I	MW16	MW20-I	MW20-II	MW19	MW17	MW13	MW12	MW18
Alkalinity	500	103	579	157	159	179	244	284	144	211	158	211	235	135	139	174	134	154	140
Calcium		29	198	50	56	56	69	96	134	63	45	59	69	36	36	44	38	40	34
Chloride	250	3	3	18	17	16	13	2	5	30	13	14	19	2	10	3	11	14	2
DOC	5	2	16	18	7	6	10	16	4	11	5	6	5	9	4	15	3	4	14
Iron	0.3	1	86	0.01	0.01	0.1	16	5	3	5	0.05	0.2	4	2	0.01	2	0.4	1	13
COD		7	97	51	19	14	29	42	8	41	12	197	35	78	9	147	9	51	41
Manganese	0.05	0.01	8	2	1	2	3	0.5	0.2	2	0.2	0.3	1	1	0.1	0.1	0.02	0.1	0.2
Sodium	200	2	10	7	27	23	19	3	8	34	20	16	18	2	18	2	11	20	3
Sulphate	500	14	19	7	59	37	25	20	258	41	32	30	46	7	29	2	25	31	1
TDS	500	122	622	213	267	255	308	314	493	321	222	270	308	139	192	179	182	217	143
Ammonia		0.03	10	0.1	0.2	0.5	3	0.2	0.2	3	0.1	0.2	0.1	0.2	0.1	1	0.04	0.1	1
TKN		0.1	12	1	1	1	3	1	0.3	4	0.3	3	0.3	1	0.2	4	0.2	1	2
Boron	5	0.02	1	0.1	1	1	1	0.1	0.1	1	1	0.5	1	0.03	1	0.02	0.3	1	0.03
Potassium		2	18	25	4	4	10	3	2	12	3	4	5	2	3	1	3	3	1

* - Bedrock

Bold and highlighting indicates ODWQS exceedance

Average data from 2019 to 2023



The dilute leachate influence observed at the perimeter locations has historically been interpreted to be the result of radial dispersion the limited horizontal hydraulic and concentration gradients observed at the Site and the attenuative capacity of the natural peat layer. Any leachate influence aside from the leachate wells is observed to be relatively weak.

The one other item to note is the differing water quality observed within the bedrock (MW10), which is located at the toe of the waste. This location has several elevated leachate indicator parameters; however, there is a notable absence of chloride, ammonia and boron, which are dominant in both MW3 & MW4. The one exception is October 2023, where TKN and ammonia concentrations were elevated above the historical range. Given there were not similar increases for other LIP's, including boron, it is unlikely these elevations are the result of leachate influence and therefore are likely anomalous. This trend will be monitored in 2024 to further assess any developing trends. MW10 also has fluoride, sulphate and strontium concentrations that are higher than that observed in the leachate, which indicate that the water quality within the bedrock is naturally mineralized and unique from the overlying ground waters.

New monitoring wells MW20-I and MW20-II, located east of the waste mound at the eastern property limits (City owned road allowance) were sampled in 2023 during both monitoring events and showed relatively consistent concentrations between sampling events. The water quality at these locations is similar to other wells found south and southeast at similar distances from the waste mound with low but measurable leachate presence. The deeper monitor has elevated boron concentrations.

As there appears to be a slight but measurable leachate influence in the downgradient wells, it was important to look at any potential trending over time with respect to leachate parameter concentrations such that it could be determined how the leachate plume originating from the Site has evolved and will continue to evolve over time. This trending is very important in being able to determine an appropriate monitoring program for the Site and has been illustrated at all monitoring locations in the graphs presented in Appendix D.

As can be observed in these graphs, the ground water chemistry has remained relatively consistent for the last fourteen years, although some subtle, but upward trends are noted at the waste mound perimeter wells MW1, MW2, MW3 and MW7 (although more consistent recently), more distant locations at MW12, MW13 and MW16, as well as the two deep overburden monitoring wells MW16-I and MW19, all of which have been occurring for the past six to ten years. Some declining trends are also observed for chloride over the same period which may relate to an overall shift in leachate signature.



It is also noted that they all show more consistent trends with respect to boron which would support a defined but weak leachate source with distance from the waste mound. Most of these trends are relatively recent, which developed between 2014 to 2016 but still continue, most prominently at MW13 and may be attributed to the slight alteration of the hydraulic conditions resulting from the beaver pond located near SWC.

As discussed in Section 3.0, these flooded conditions create an increased hydraulic gradient which is directing ground water flow patterns further south, although the overall flow patterns beyond this localized condition is expected to follow the interpreted regional flow direction to the east to northeast. Another possibility for these trends could be that they are reflective of the movement of the active waste area further southwest such that they are now in a more downgradient location relative to the newly emplaced wastes. MW16-I targets the deep overburden and the trends were more limited in the shallow unit at MW16, although the hydrogeological interpretation for the Site would suggest the deeper, more granular material represents the primary flow path for ground water beneath the Site. The trends at MW12, MW13 and MW19 could have a similar rationale as at MW1 and MW2 with the alterations to hydraulic conditions or movement of the active waste area. The fact that similar trends have not been observed at MW14 would indicate these trends do not reflect an overall or regional southern flow path.

Although semi-annual monitoring has been completed at all locations historically, seasonal variation is minimal at the Site and the variation is limited to some occasional minor concentration elevations during the fall monitoring events for COD, TKN and ammonia.

In addition to the above assessment, all 2023 downgradient values were compared to ODWQS in the chemistry summary tables (Appendix B) and indicated relatively similar results to previous years. These exceedances included hardness, alkalinity, iron, manganese, TDS and DOC. Of these parameters, hardness is only observed to exceed in the bedrock monitor and is wide spread in the environment given the dominant calcium carbonate geochemical signature in the natural ground water. In geochemically reduced environments naturally occurring earth elements (i.e., iron and manganese) can show elevated parameter concentrations; however, these are more reflective of the valence state than in a dissolved phase plume migrating from the landfill. The DOC, iron and manganese reflect the geochemically reduced conditions associated with both the leachate plume and natural wetland conditions, such that the source is not easily distinguishable. As noted in the MW14 geochemistry, iron is naturally present at the background monitoring location. As suggested above, the elevated DOC, iron and manganese measured at MW17 and MW18 is considered to be naturally occurring, while the same could be true of the iron and DOC exceedance at MW16.



4.2.5 Perfluorinated Chemicals (PFC) Sampling Results

Azimuth undertook PFAS sampling as part of the routine October 2023 monitoring program at the Site to address MECP comments relating to potential expansion of the landfill volume. Given the significant laboratory cost associated with PFAS analysis (\$450/sample), locations at the Site were targeted to select locations representing a reference leachate (MW4), background (MW14), as well as perimeter (MW3, MW6, MW10) and downgradient (MW12, MW13, MW16, MW16-1, MW20-I and MW20-II) locations. Additional locations to the north (MW17 & MW18), were also targeted but unable to be accessed to the flooding in that area due to the beaver pond.

The results, which have been appended, indicate the most parameter detections and elevated concentrations at MW3, which although is not the designated leachate monitor (MW4), is located immediately downgradient of the waste mound such that these elevations are not unexpected and align general water quality at this location which indicates a definable leachate influence. Beyond these locations, detections were also noted at a number of downgradient locations to the east / southeast with slightly lower concentrations to those observed at MW3. The following table provides a summary of these results.

Table 5: PFAS Results Summary

Monitor No.	Location	Total PFAS Concentration (µg/L)	No. of Parameters Detected
MW3	Perimeter - Downgradient	0.664	9
MW4	Leachate	0.156	4
MW6	Perimeter - Upgradient	0.066	2
MW8	Upgradient	<1.1	0
MW10	Bedrock	<1.1	0
MW12	Downgradient - Shallow	0.216	5
MW13	Downgradient - Shallow	0.106	4
MW14	Background	<1.1	0
MW16-I	Downgradient - Deep	0.276	6
MW16	Downgradient - Shallow	0.302	7
MW20-I	Downgradient - Deep	0.258	6
MW20-II	Downgradient - Shallow	<1.1	0

Bold indicates MECP Guideline of 0.07 µg/L

Overall, the presence and concentration of PFAS falls in line with the interpretation of general water quality at the Site where leachate influence is observed southeast and east of the mound, with declining trends away from the waste mound. The results from the newest monitors to the east MW20 indicate that leachate presence is observed deeper in the overburden profile at the bedrock contact, but is absent in the shallow monitor. It is



interpreted that shallow ground water flow patterns are more likely controlled by the beaver pond directing shallow flow to the south, while the deeper monitor may be more isolated from these influences such that the leachate is migrating deeper in the profile and is directed more by the more regional flow patterns which were illustrated in historically monitoring reports prior to the development of the beaver pond. The general water quality at this location indicates a similar differential with more elevated leachate indicator parameter concentrations observed at MW20-I relative to MW20-II, most notably with boron that has concentrations of 0.7 and 0.03 mg/L respectively. Beyond boron, the overall water quality would indicate a dilute leachate signature comparable to other downgradient monitors. Comparison to Reasonable Use (RU) criteria for the Site indicate similar parameter exceedances as the other boundary locations with exceedances of DOC and manganese, while TDS exceeded in the April, 2023 monitoring event. As noted in the annual monitoring reports, parameters such as DOC and manganese have been consistently above RU criteria in the past but are interpreted to be mainly sourced to the naturally anoxic conditions of the wetland that surrounds the landfill.

The other item of note is the lack of detections at MW10, which is a downgradient perimeter location, but targets the deeper underlying bedrock unit. Historically, it has been interpreted that the elevations of some leachate indicator parameters were more readily sourced to natural mineralization within the bedrock. This was mainly due to the elevations of fluoride, sulphate and strontium concentrations, which did not correlate with the remaining overburden monitoring wells at the Site. The PFAS results would further support this interpretation such that the previous recommendations to remove this monitoring well and future targeting of the bedrock aquifer for monitoring as the preferentially pathway is interpreted to be within the overburden unit.

4.2.6 Reasonable Use Policy

Calculations with respect to MECP's Reasonable Use Concept (RUC) B-7 were performed using the 2023 monitoring program results at MW14 as the reference background location for the Site.

The MECP's Reasonable Use Concept states that, in accordance with the appropriate criteria for particular uses, a change in quality of the ground water on an adjacent property will be accepted only as follows:

"The quality cannot be degraded by an amount in excess of 50% of the difference between background and the Ontario Drinking Water Standards for non-health related parameters and in excess of 25% of the difference between background and the ODWS for health related parameters. Background is considered to be the



*quality of the ground water prior to any man made contamination.”, MOE
Procedure B-7-1, (MOE, 1994a)*

The maximum concentration of a particular contaminant that is considered acceptable in the ground water beneath an adjacent property is calculated in accordance with the following relationship:

$$C_m = C_b + x (C_r - C_b)$$

where:

- C_m = maximum concentration accepted
- C_b = background concentration
- C_r = Maximum concentration permitted in accordance with the Ontario Drinking Water Quality Standards
- x = a constant that reduces the contamination to a level that is considered by the MECP to have a negligible effect on water use. (i.e., 0.5 for non-health related parameters & 0.25 for health related parameters).

In 2023, the RUC values were calculated using the values of the background concentration (C_b). The maximum allowable concentration (C_m) of any particular parameter was calculated using the background concentration of that parameter from a monitor upgradient of the Site, the designated ODWQS value for that parameter, and a constant that reflects whether the parameter is health or aesthetic-related as defined by the ODWQS. Where background concentrations were less than the laboratory method detection limit, the method detection limit was used as the background value. The calculated C_m values for the Site were set as the RUC values. It is noted that iron has been excluded from this assessment as the background concentration already exceeds ODWQS.

As this assessment is based on compliance at the downgradient property boundaries, MW3, MW12, MW13, MW16, MW16-I, MW17, MW18, MW19 as well as the newest monitors along the eastern boundary MW20-I & MW20-II were used as these locations are the furthest east and southeast locations at the Site. Specific exceedances for RUC are illustrated in the following table and chemistry summary chemistry tables (Appendix B), including manganese, DOC, and TDS. These exceedances and concentrations were similar to previous years with similar concentration ranges.



Table 6: Reasonable Use Exceedance Summary Table

Location	Boundary	Parameter	ODWQS	RUP	Concentrations Exceeding RUP*	
					Spring 2023	Fall 2023
MW3	East	DOC	5	3.4	<u>5.6</u>	<u>11.5</u>
		TDS	500	308	321	367
		Manganese	0.05	0.03	<u>2.73</u>	<u>3.61</u>
		Alkalinity	500	301	<u>251</u>	319
		Barium	1	0.33	0.284	0.393
MW12	East	DOC	5	3.4	4	3.7
		Manganese	0.05	0.03	<u>0.091</u>	<u>0.06</u>
MW13	East	DOC	5	3.4	4.3	2.9
MW16	East	DOC	5	3.4	<u>5.3</u>	4.4
		Manganese	0.05	0.03	<u>0.407</u>	<u>0.359</u>
MW16-I	East	DOC	5	3.4	4.7	4.1
		Manganese	0.05	0.03	<u>0.193</u>	<u>0.194</u>
MW17	North	Monitor Not Sampled - Flooded/Submerged				
MW18	North	Monitor Not Sampled - Flooded/Submerged				
MW19	East	DOC	5	3.4	4.3	2.9
		Manganese	0.05	0.03	<u>0.072</u>	<u>0.064</u>
MW20-I	East	DOC	5	3.4	<u>5.1</u>	<u>12.7</u>
		Manganese	0.05	0.03	<u>0.701</u>	<u>0.621</u>
MW20-II	East	DOC	5	3.4	4.0	<u>6.5</u>
		Manganese	0.05	0.03	<u>1.61</u>	<u>1.03</u>

Notes: All values are in mg/L

* - Concentrations in bold exceed RUP and Underline for ODWQS

The use of these parameters as leachate indicators is not entirely applicable in a peat-rich naturally reduced environment. DOC concentrations are typically naturally elevated in such peat rich environments due to the elevated decomposition of natural organic matter, while manganese can be natural in source (*i.e.*, geochemically reduced conditions increase dissolution of naturally occurring earth elements). As such we recommend manganese not be considered a compliance parameter for the Site. Concentrations of other indicator parameters (*e.g.*, boron & chloride) are all well below RUC limits in downgradient monitoring locations. Of particular importance is chloride since it is a conservative tracer for ground water migration. The dilution of this parameter in downgradient monitors suggests that the landfill influence is greatly diminished away from the waste mound. Thus, the parameters noted above are not likely related to the landfill geochemistry.



The remaining alkalinity, TDS and barium exceedances were limited to MW3. It is noted that these exceedances were only marginally above the RUC limit, which has been consistent in previous monitoring events, such that they do not represent a consistent upward trend. As similar concentrations were not observed further east towards the City owned road allowance property boundary (*i.e.*, MW16 & MW20), these conditions are localized and do not represent off-site exceedances.

4.3 Surface Water

The purpose of this monitoring network has been to establish any potential influence the landfill may be having on the water quality of the tributary as this feature may represent a ground water discharge location downgradient of the landfill. Monitoring locations SWA, SWC2², SWD, SWF, and SWG represent locations along the tributary north of the waste mound with SWA representing a background location.

Table 6 summarizes average concentrations of leachate indicator parameters between up- and downstream monitoring locations along the tributary. The elevated TSS concentrations would indicate sediment entrainment is likely influencing metals and a few other parameter concentrations as elevations of iron, manganese, COD and DOC are present without corresponding elevations or more dominant leachate indicator parameters such as boron, ammonia or chloride. As such, this summary would indicate there is no definable difference in upstream and downstream water quality owing to leachate influence.

As shown in the time trend chemistry graphs provided in Appendix D, surface water quality over time is relatively variable over time with some seasonal variation observed, most notably at SWC; the overall variability is attributed in part to the sediment laden samples due to the stagnant nature of the surrounding wetland complex.

It is also noted that as discussed previously, the geochemically reduced conditions associated with the wetland environment would likely cause elevated concentrations for naturally occurring earth metals. At sufficient levels, the microbial activity will deplete the available oxygen and potentially influence the metal valence for iron and manganese. The warm summer conditions appear to influence these reactions. The elevated DOC, which is also found at all monitoring locations, is likely more the result of the peat rich environment opposed to leachate influence.

² Replaced SWC located on the west side of the Hydro corridor. SWC2 is positioned on the east side of the Hydro corridor.



Table 7: Average Leachate Indicator Parameter Concentrations at Surface Water Locations

Parameters	PWQO	Background	Leachate	Downstream (in order along tributary)			
		SWA	MW4	SWD	SWF	SWG	SWC2
Alkalinity		114	579	131	127	169	156
Calcium		29	198	33	33	51	41
Chloride		3	3	2	1	7	3
DOC		18	16	17	15	12	14
Iron	0.3	1	86	1	1	54	6
COD		49	97	81	42	57	35
Manganese		0.2	8	0.1	0.1	2	0.2
Sodium		2	10	1	2	5	3
Sulphate		5	19	3	7	4	8
TDS		123	622	136	135	239	170
Ammonia		0.1	10	0.2	0.4	0.1	0.2
TKN		1	12	3	1	1	1
Boron	0.2	0.02	1	0.02	0.01	0.05	0.1
TSS		20	622	105	48	181	17
Potassium		1	18	2	1	3	1

Bold & Highlighting indicates PWQO exceedance

Average data from 2019 to 2023

In addition to the average concentration data presented above, the 2023 results (Appendix B) also confirm the downstream water quality (SWC2) is relatively similar to that of the upstream (SWA). PWQO was exceeded at the downstream locations for several parameters including iron, total phosphorus, cadmium, lead, zinc and copper. It should be noted that all parameters listed above have also been shown to exceed historically in the background water quality with exceedances associated with elevated TSS concentrations such that sediment entrainment is creating the elevated concentrations. Thus, as with previous years, the overall water quality within the surface water indicates no obvious leachate influence resulting from the operations of the landfill.

4.3.1 Comparison of Ground Water to PWQO / CWQG

As included in the appended chemistry summary tables, comparison has been done with PWQO, as well as CWQG, where PWQO is not available or CWQG is more appropriate (*i.e.*, boron, PWQO interim value). A number of parameter exceedances are observed including boron, chromium, cadmium, copper, cobalt, aluminum, iron, phosphorus and zinc. Concentrations are generally more elevated at locations that are adjacent to the waste mound, with diminished concentrations and exceedance frequencies at more distant locations. Boron is a more defined leachate parameter as is evidenced by the concentration trends both spatially across the Site and over time. The zinc exceedances are more focused at MW17 and MW18, which are drive point constructions comprised of



galvanized metal fittings, which are the most likely sourced for this parameter. The remaining parameters are also noted to be exceeded on occasion at MW14, which is the background location, although much more infrequently and more limited concentrations. This would indicate these parameters are observed to some degree naturally, albeit at low levels.

The presence of these metals above PWQO/CWQG in ground water surrounding the Site is not unexpected given the overall leachate influence observed at most locations, albeit reduced with distance from waste mound. However, these concentrations are not interpreted to be influencing the surrounding surface water at the Site. Based on the overall interpretation of surface water quality at the Site presented in previous monitoring reports, there is no significant change between up and downstream water quality at the Site. Numerous PWQO/CWQG parameter exceedances have been observed in surface water at the Site; however, exceedances and concentration ranges are found to be similar between up and downstream locations, with these exceedances attributable to sediment entrainment as exceedances are almost exclusively observed when there is a measurable total suspended solids (TSS) concentration. This is consistent in both the up and downstream locations, which supports sediment entrainment as the source of exceedances opposed to being landfill derived. Further, the major ion chemistry tends to remain consistent during the exceedance sampling events, with no meaningful elevations of definable leachate indicator parameters in the downstream locations. The expectation is for these metals exceedances to be sourced to the landfill, there would need to be a similar scale elevation in most other major ion concentrations, which does not occur. This would indicate that the attenuative capacity of the Site is sufficient to limit leachate impacts to the surrounding environment. It is interpreted that this will continue in an expanded configuration as there will be an overall maintenance of annual waste volumes.

The fact there is no visible seepage areas along the waste mound or toe or waste mound would suggest there is limited potential for a meaningful ground water contribution occurring to the adjacent surface water. Also, with the development of the beaver pond north of the waste mound, there has been more limited presence of surface water south / southeast downgradient of the waste mound, which would support a limited potential for leachate impacts to surface water in this area.

4.4 Organic Contamination Evaluation

As part of the monitoring program in 2023, volatile organic compounds (VOC) sampling was completed at MW3, MW4, MW6, MW16-I & SWF in conjunction with the general chemistry sampling at each of the locations. MW17 as not sampled in 2023 as it was not accessible. All VOC detections for ground water and surface water sampling locations are summarized below in Table 8.



Table 8: 2023 VOC Detections

Parameter	ODWQS	MDL	MW4 (Spring)	MW4 (Fall)
Benzene	100	0.5	0.6	1

MDL - minimum detection limit

All measurements in µg/L

bold indicates ODWQS exceedance

It is noted that these detections and concentrations are similar to what has been observed at this leachate location historically. However, trace detections for other parameters have been periodically observed historically.

Given these trace detections (no detections exceeded ODWQS criteria) and lack of meaningful historical VOC presence within the leachate and ground water at the Site, there is unlikely a meaningful organic source within the waste mound and that these parameters have been actively degraded over time. As such, the continued monitoring for these parameters could be curtailed to an annual screening from the leachate well (MW4) and select downgradient monitors (MW3 & MW16-I).

4.5 Trigger Mechanism Evaluation

An updated Trigger Mechanism & Contingency Plan was prepared and submitted in as part of the 2016 Laxton Annual Monitoring Report (Azimuth, 2017). The purpose of the revised Trigger Mechanism & Contingency Plan was to update the original program developed in 2007 based on the increase data set associated with the landfill monitoring program. This revision was also completed such that the trigger criteria can be more streamlined to ensure the program is properly followed and trigger exceedances are more readily identified such that appropriate mitigation measures can be employed if conditions warrant.

Similar to the historic program, the proposed trigger criteria includes both ground water and surface water components, which are as follows.

4.5.1 Ground Water Trigger Program

The ground water trigger locations have been established at downgradient monitoring locations MW3, MW12, MW16, MW16-I and MW19.



Table 9: Ground Water Trigger Limits

Parameter	ODWQS	Trigger Limit
Chloride	250	128
Boron	5.0	1.3
TDS	500	340

All concentrations in mg/L

4.5.2 Surface Water Trigger Program

The surface water trigger locations have been established at downstream monitoring locations SWF and SWG as they represent downgradient locations prior to the cumulative downstream location SWC2.

Table 10: Surface Water Trigger Limits

Parameter	PWQO	Trigger Limit
Chloride	-	128
Boron	0.2	0.11
Unionized Ammonia	0.02	0.011

All concentrations in mg/L

A trigger exceedance of the above criteria for both ground and surface water locations occurs when the concentrations of the trigger parameter exceed the trigger levels during two consecutive sampling events, at which time confirmatory monitoring will be implemented.

A single parameter exceedance for TDS was observed at MW3 during the October monitoring event (367 mg/L). As the April monitoring event was below the trigger concentration limit, the trigger program was not activated and no further actions are required.

4.6 Graphical Analysis

An alternate evaluation technique (to identify unique waters) can be undertaken to compare the major ion chemistry of different water sources or waters that have been mixed with two or more sources. For this analysis, the 2023 ratios of major ion data (for all monitoring points) were compared for the current monitoring network. The major ion data were plotted on Piper diagrams, which show the geochemical signatures and trends. Generally, the data from a common source should cluster in one location on the diagram. Any deviation from this cluster can be easily observed and evaluated as a possible trend



or influence from an alternate source (*i.e.*, leachate). The Piper diagrams are shown in Appendix L.

Overall, the diagrams show that the geochemical signatures correlate with the general discussion on water quality presented previously in this report. MW4, which illustrates the leachate signature for the Site shows a more carbonate / bicarbonate dominated result than the remaining locations. MW3, MW6, MW8 and MW18 were the monitors that more closely match the leachate signature.

The other notable trend is at MW10, which indicates a much different signature, with a stronger sulphate influence. This would support the source of this being a more mineralized bedrock water quality, uninfluenced by leachate.

Although not typically observed in surface water due to more meteoric conditions, all surface water locations indicated very similar signatures which would confirm the consistency in water quality between the up and downstream locations and any leachate impact is negligible.

4.7 Landfill Gas Monitoring

The landfill gas monitoring program at the Site includes methane gas measurements at two (2) dedicated gas monitoring wells (GP-1 & GP-2), which are located south of the active waste area (Figure 2). Measurements were completed on five occasions throughout 2023 including under frozen ground conditions in January and February which would represent conditions most conducive for methane migration and detection due to limited atmospheric venting. The results for 2023 are summarized in Appendix C, along with the results collected since 2015 and indicate that there have been no detections over this period. Given the lack of detections and limited sensitive land uses that surround the landfill, methane monitoring is not warranted at this Site. It is recommended that this monitoring component could be eliminated.

5.0 Site Operations

As the Site is active, it is accessed by the public at the main entrance gate and information signage exists which states the hours of operation, permitted users, and types of waste accepted at the Site.

The hours of operation for the Site in 2023 were unchanged from previous years:

Winter – October 16 to April 30

Thursday: 11:00 AM to 5:00 PM

Sunday: 12:00 PM to 4:00 PM



Summer – May 1 to October 15

Thursday: 11:00 AM to 5:00 PM

Sunday: 11:00 AM to 5:00 PM

Holiday Mondays: 11:00 AM to 5:00 PM

5.1 Site Maintenance

The City conducted regular litter and debris collection programs as necessary throughout the 2023 operating year. The Site inspection logs are included in Appendix E, which were completed as part of April, July and October monitoring events. These reports indicated that similar to previous years, the area north of the landfill was noted to be flooded due to beaver activity such that MW17 was under water. Also, litter was noted in the wetland surrounding the waste area, which is regularly addressed by City staff throughout the year during their inspections. No issues with on-site monitoring wells were noted in the inspection forms aside from MW17 and MW18 not being accessible in 2023 due to the beaver pond.

5.2 2023 Waste Volumes / Site Capacity

The Site has an approved capacity of 125,000 m³ with a remaining capacity of 3,547 m³ or 3% of the Site volume. This was derived from a topographic survey completed in July 2023. Based on the average annual fill rate of approximately 3,000 to 5,000 m³, the landfill's remaining capacity is estimated to be reached between 0.7 to 1.2 years from July 2023 (i.e., April 2024 to October 2024).

5.3 Recyclable Materials Summary

The Site operates as a waste disposal and recycling transfer site. According to City records, the following amounts of recyclable materials were received at the Site in 2023

Table 11: Summary of Recyclable / Diversion Materials Received in 2023

Item	Number of Units	Units
Paper	14.1	Tonnes
Containers	10.5	Tonnes
Metal	0	Tonnes
Textiles	1.71	Tonnes
Leaf and Yard Waste	213	Tonnes
Electronics	13.9	Tonnes

Based on the diversion quantities listed above, and 1,118 tonnes of waste received in 2023, the total divertible material received at the Site in 2023 was approximately



253 tonnes. Of the material received at the Site, approximately 23% of the material was diverted, which is similar to previous years.

5.4 Compost Operations

As completed in previous years, the City has utilized unfinished compost mixed with sand or sandy soil at a ratio of one (1) part compost to three (3) parts sand in place of topsoil. Prior to these applications, the mixture was tested for slump, permeability, and O.Reg. 347/90 and O.Reg. 153/04 Table 9 site condition standards (SCS). Table 9 SCS is applied because a water body (i.e., wetland) is situated at the north end of the Site. Because the “unfinished compost” is reported to consist of leaf and yard cuttings only there is no expectation for an increase in vermin activity. Any compost used on Site in 2023 was used to mix with soil for alternative daily cover or of interim cover only.

6.0 Conclusions

Based on the interpretation presented in the above sections, the environmental setting at the Laxton Landfill Site is relatively well understood and appears to have a minimal influence on the surrounding environment based on the past 45 years of operations. The presence of a peat bog surrounding the Laxton Landfill Site serves to mitigate leachate strength and migration such that there is no significant off site impacts. The peat bog slows surface and ground water flow to the point where the dispersive and advective flows have a similar magnitude of influence. The slow movement and organic-rich peat materials create a naturally geochemically reduced environment which also portrays an elevated dissolved organic signature. This natural condition can be confused with the reduced conditions created by the landfill. However, at the Laxton Landfill, natural conditions are dominant in effecting the chemistry of the ground water and surface water around the site.

The geochemically reducing conditions generated within the landfill have allowed naturally occurring parameters to become elevated in concentrations which are unrelated to the landfill operations, including iron and manganese. However, the landfill also generates an ammonia signature and has detectable boron and chloride concentrations, albeit below Provincial standards. The absence of these two particular components of the landfill leachate signature, distinguish that signature from the natural setting. While downgradient locations may show elevated iron and manganese concentrations, as well as elevated DOC; they represent the natural peat environment when absent of elevated ammonia, boron and chloride concentrations. These natural conditions have been observed in many surrounding locations as well as within the tributary and the potential for significant off site leachate impact is considered minimal.



Based on the data and physiography and underlying geology, the regional flow path is eastwards and northeastwards. It is apparent that flow from the waste mound does create some degree of radial migration or dispersion, which is evidenced by the geochemical data. However, the extent of this radial flow / dispersion is observed to be limited. Similarly, the developing trends observed at several southeastern monitoring locations indicate that the presence of the beaver pond near SWC have locally shifted the hydraulic gradients at the Site, by increasing the surface water levels immediately north of the waste mound approximately 1 m above grade. This alteration causes a slight shift in water quality to the southeast through increasing localized ground water flow in this direction. Despite these localized conditions, the more regional flow path likely follows the axis of the granular ice contact deposits to the northeast.

The general consistency observed in the historic data set for the current monitoring network would indicate that leachate impacts are quite limited, especially beyond the proximal monitoring points. Some RUC exceedances (manganese, DOC and TDS) are noted within many of the distant and boundary wells; however, these are mainly limited to elevated concentrations of naturally occurring earth elements (iron and manganese) and natural organic sources (DOC) attributable to the surrounding peat deposits and not the landfill. Therefore, the site is deemed to be in compliance.

The data collected thus far at the Site from the existing monitoring network, which includes 19 monitoring wells and 5 surface water locations does not indicate significant leachate influence beyond the perimeter of the waste such that significant elevations are not expected to extend much beyond the eastern extent of the landfill.

The trigger mechanism evaluation in 2023 indicated compliance with respect to surface and ground water at the Site, as per the Trigger Mechanism program presented in the 2016 Annual Monitoring Report.

Although ground water discharge is likely within the tributary north and east of the landfill, the impacts would appear to be quite limited with a number of the elevated leachate indicator parameters more likely related to the natural wetland water quality rather than leachate. This is evident through the minimal concentrations for chloride, ammonia and boron and is likely mitigated by the peat rich environment present at or near the ground surface. Also, SWG has been dry or containing very little water so that collecting a sample from this station has not been possible during the last fourteen monitoring events. SWG is not within an observable defined surface water channel and is a stagnant pool when able to be sampled. It is recommended that this station be eliminated from the surface water monitoring and trigger programs as it has not been observed to actively flow into SWC2 at any time by Azimuth field staff.



The results for 2023 gas monitoring program are consistent with previous years. Given the lack of detections and limited sensitive land uses that surround the landfill, it is questioned whether methane monitoring is warranted at this Site. It is recommended that this monitoring component could be eliminated.

7.0 Recommendations

The monitoring program recommended for 2024 is identified in Table 12 (below) and is based on the current data set and Site understanding, as well as previous Site assessments and is similar to what was presented in past two annual monitoring reports. Overall, the Site is effectively monitored through the shallow and deep overburden monitoring wells. These wells provide the most representative locations for establishing leachate impacts downgradient of the landfill. It is suggested that MW2 could be considered for removal from the program as it represents a redundant location along the eastern side of the landfill, while MW15 should be removed from the program given it is routinely dry. Finally, MW10 is screened over 20 m below the remaining monitoring well network. Given this depth, differing water signature and the fact there is a lack of leachate influence observed at this location, its continued monitoring is viewed as unnecessary at present. MW20-I and 20-II will continue to be monitored as part of the monitoring program moving forward, with surveying of the locations to help refine the understanding of ground water flow patterns east of the waste mound.

The current surface water monitoring network is sufficient for determining potential leachate impacts. However, it is also noted that the general stability of the ground and surface water quality at the Site would allow for a reduction in surface water frequency to semi-annual with samples being collected in the Spring and Fall to reflect both the wet and dry periods of the year, while corresponding with the existing ground water monitoring program. Station SWG should no longer be monitored as it does not provide meaningful data as it is routinely dry or a stagnant pool which has not been observed to contribute surface water to SWC2.

The analytical package is recommended to remain the same as in 2024; however, the VOC parameters should be eliminated or at least reduced to an annual frequency at select monitoring wells (proposed in Table 12 below) and SWF eliminated from the program given the lack of meaningful organic detections in the past.

It is recommended that the gas monitoring component should be eliminated.

The following table outlines the proposed monitoring program for 2024.



Table 12: Proposed 2024 Monitoring Program

Monitoring Station	Frequency	Parameters
<u>Ground Water</u> MW1, <u>MW2</u> , MW3*, MW4*, MW6, MW7, MW8, <u>MW10</u> , MW12, MW13, MW14, <u>MW15</u> , MW16, MW16-I*, MW17, MW18, MW19, MW20-I & MW20-II	Semi-Annual (April / May & September / October)	DOC, phenols, conductivity, hardness, TKN, fluoride, sulphate, chloride, phosphorous, nitrate, nitrite, ammonia, alkalinity, calcium, magnesium, potassium, sodium manganese, copper, lead, molybdenum, zinc, barium, boron, cadmium, chromium, iron, aluminum, arsenic, cobalt, nickel, silver, strontium, vanadium, pH, COD, TDS * VOCs – annual during Fall event Water Level Measurements
<u>Surface Water</u> SWA, SWC2, SWD, SWF & <u>SWG</u>	Semi-Annual (April / May & September / October)	BOD, phenols, DOC, TKN, fluoride, nitrate, nitrite, ammonia, alkalinity, hardness, chloride, phosphorous, sulphate, aluminum, antimony, arsenic, barium, boron, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, mercury, molybdenum, nickel, potassium, selenium, silver, sodium, strontium, thallium, vanadium, zinc, pH, conductivity, TSS, TDS, COD, turbidity

Notes: **Bold** and underlined monitoring locations should be removed from the program



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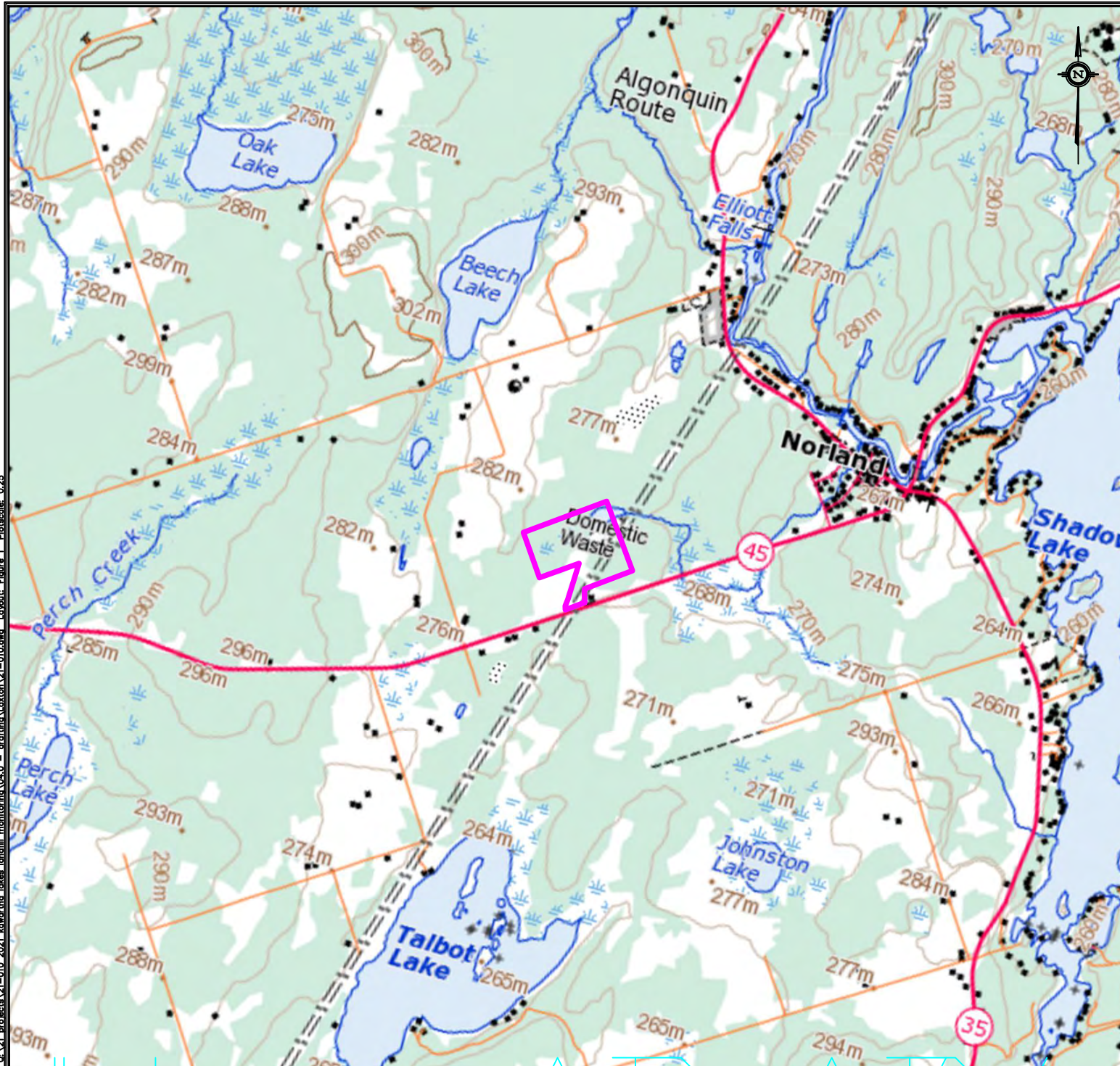
APPENDICES

- Appendix A: Figures**
 - Appendix B: Chemistry Summary Tables**
 - Appendix C: Ground Water Elevation & Landfill Gas Tables**
 - Appendix D: Chemistry Over Time Graphs**
 - Appendix E: Site Inspection Forms**
 - Appendix F: Borehole Logs**
 - Appendix G: ECA and MECP Communications**
 - Appendix H: Sampling Protocols**
 - Appendix I: Laboratory Certificate of Analysis**
 - Appendix J: MECP Landfill Reporting Submission Forms**
 - Appendix K: Surface Water Photos**
 - Appendix L: Piper Diagrams**
-
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APPENDIX A

Figures



LEGEND:
 Approx. Property Boundary

HORIZONTAL SCALE 1: 40,000

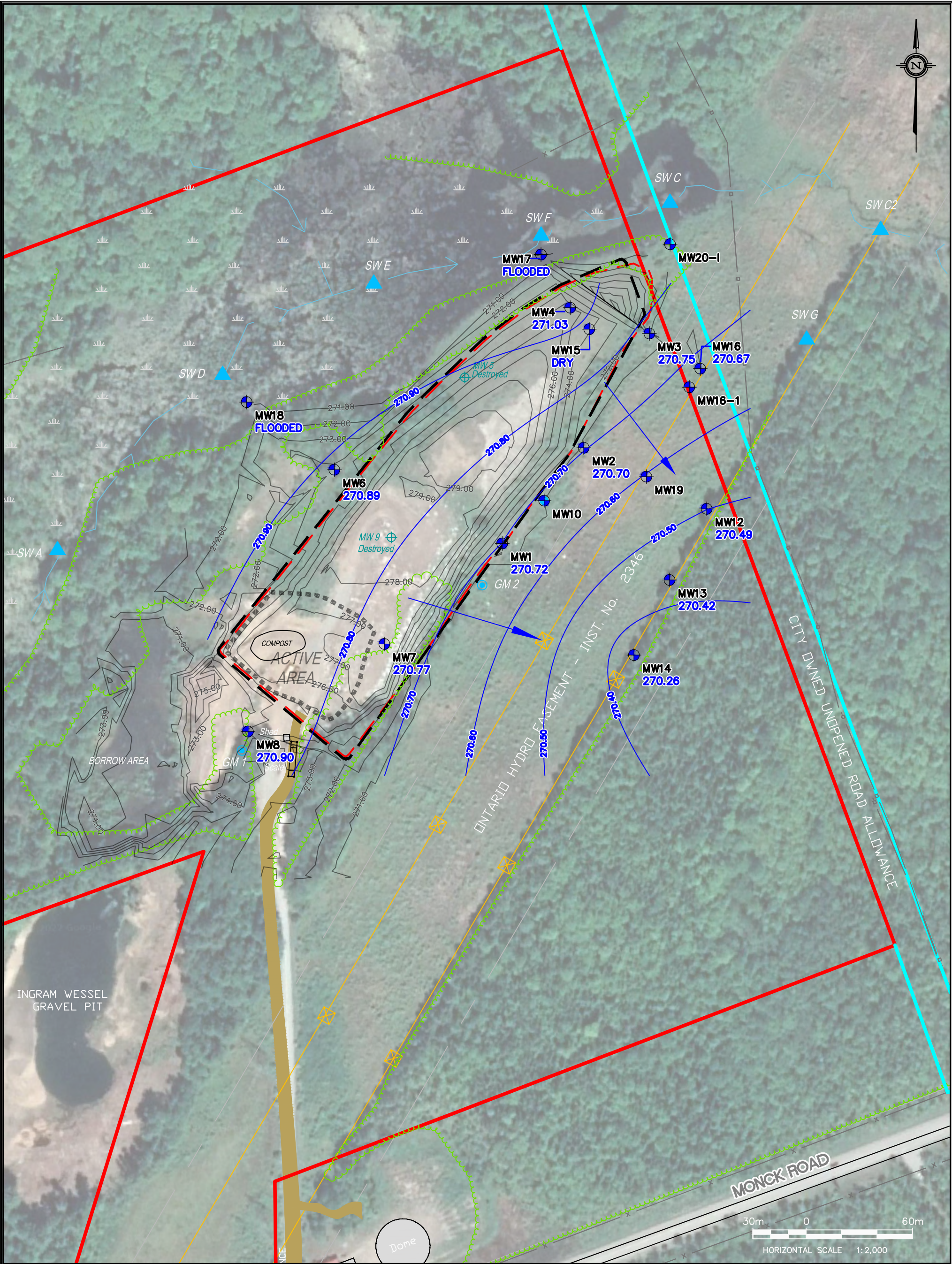
AZIMUTH ENVIRONMENTAL CONSULTING, INC.

Study Area Location

Laxton Waste Disposal Site
City of Kawartha Lakes, ON

DATE ISSUED: May 2024	Figure No. 1
CREATED BY: JLM	
PROJECT NO.: 24-010	
REFERENCE: Gazetteer Canada	

Printed by: ALU on May 22, 2024 at 11:15am
File: Q:\21 projects\21-010 2021 Kawartha Lakes Landfill Monitoring\04.0 - Drafting\Laxton\20-010.dwg Layout: Figure 1 PlotScale: 0.25



LEGEND:

Approx. Property Boundary

City Owned Unopened Road Allowance

Monitoring Well - Destroyed

Monitoring Well

Surface Water Sampling Locations

Gas Probe

Proposed Monitoring Well Nest

Existing Limit of Refuse

Approved Limit of Refuse

Active Area

Inferred Direction of Ground Water Flow

Ground Water Elevation (April 2023)

0.1m Ground Water Contours

DAYSTAMP: Q:\20 Projects\20-010 2020 Kawartha Lakes Landfill Monitoring\04.0 - Drafting\Laxton\20-010.dwg

AZIMUTH ENVIRONMENTAL CONSULTING, INC.

Shallow Overburden Ground Water Elevations
April 2023

Laxton Waste Disposal Site
City of Kawartha Lakes, ON

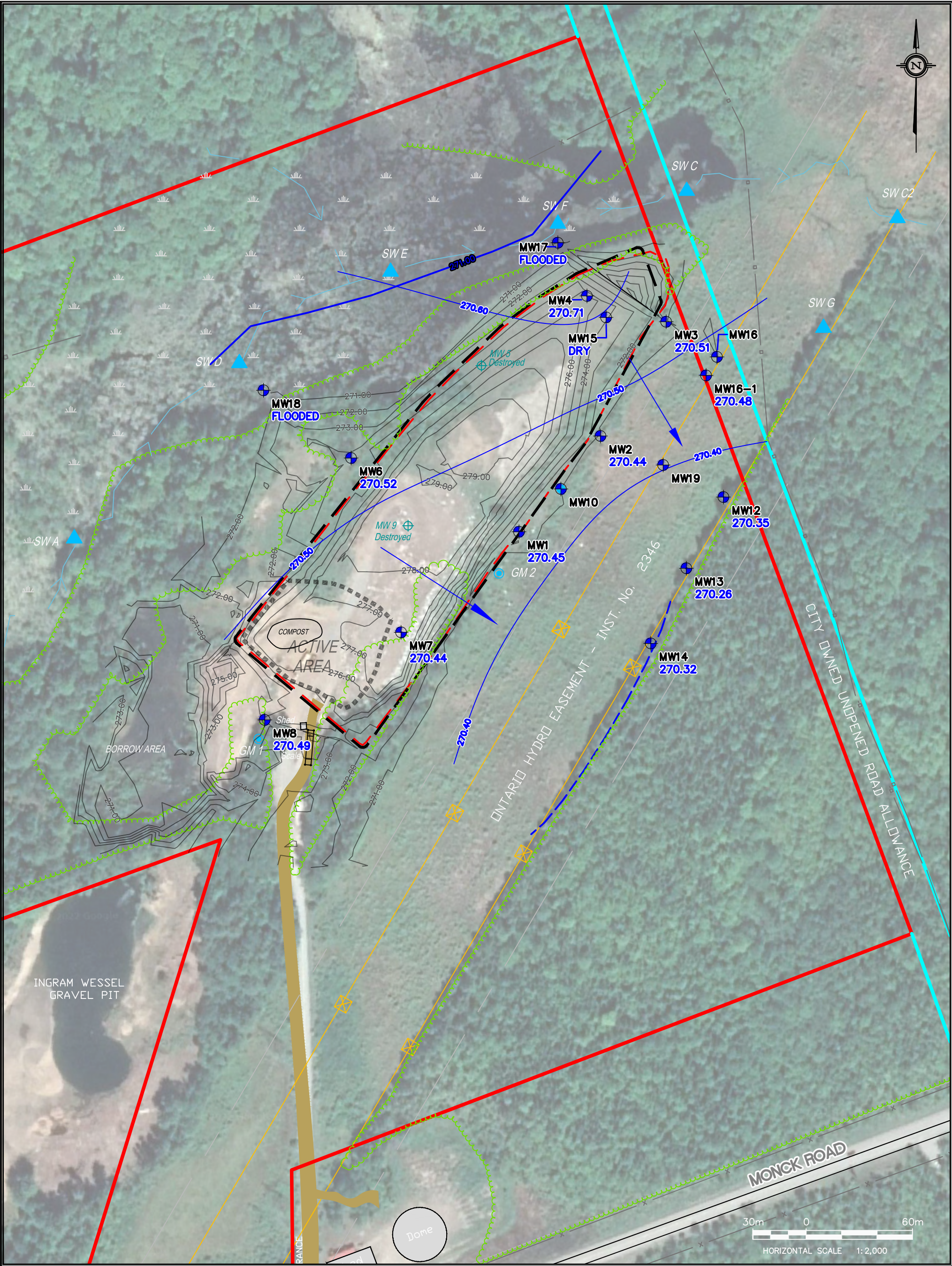
DATE ISSUED: May 2024

CREATED BY: JLM

PROJECT NO.: 24-010

REFERENCE: Cambium Environmental

Figure No.
3



LEGEND:

- Approx. Property Boundary
- City Owned Unopened Road Allowance
- Monitoring Well - Destroyed
- Monitoring Well
- Surface Water Sampling Locations
- Gas Probe
- Proposed Monitoring Well Nest
- Existing Limit of Refuse
- Approved Limit of Refuse
- Active Area
- Inferred Direction of Ground Water Flow
- Ground Water Elevation (October 2023)
- 0.10m Ground Water Contours



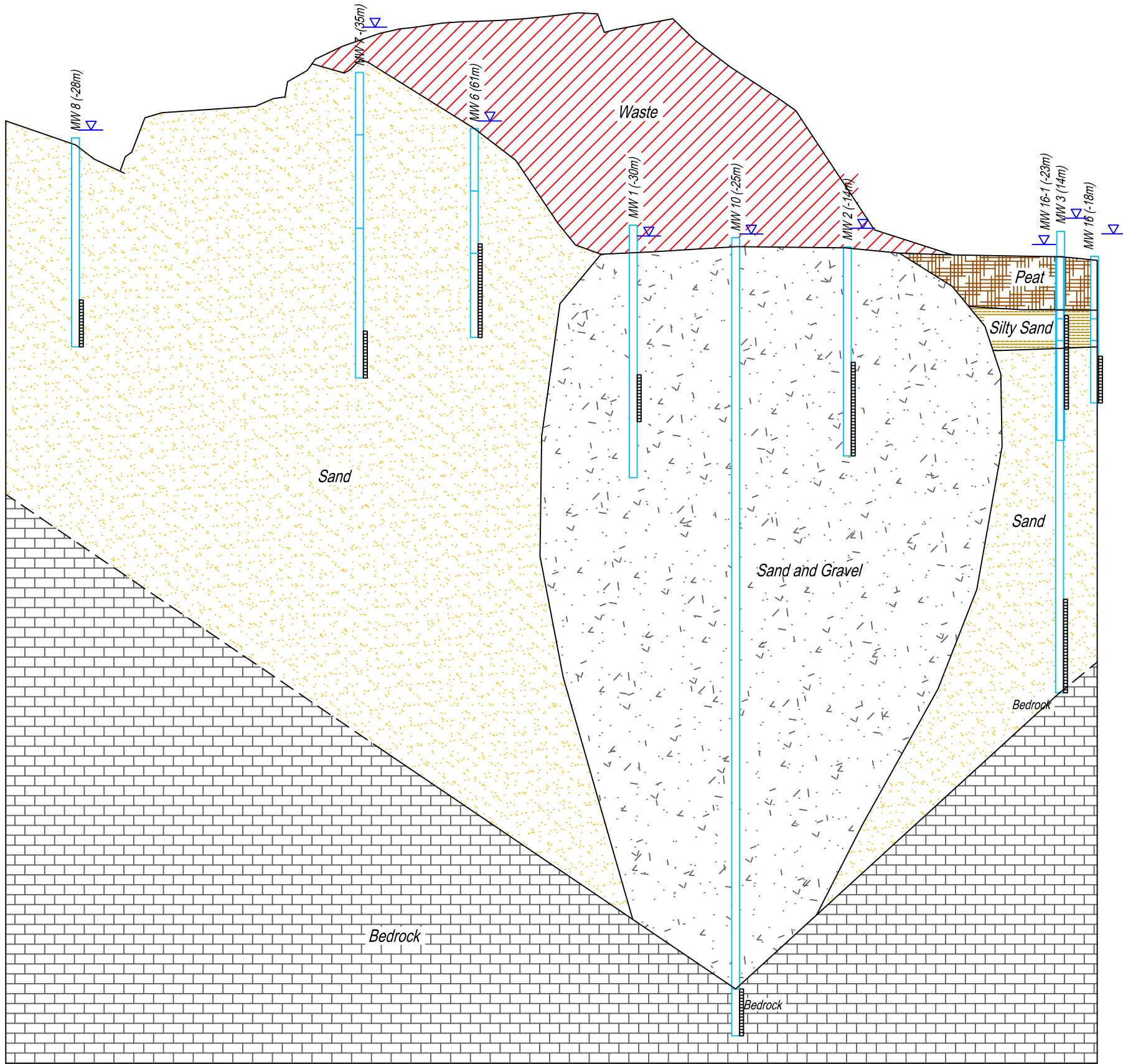
Shallow Overburden Ground Water Elevations
October 2023

Laxton Waste Disposal Site
City of Kawartha Lakes, ON

DATE ISSUED:	May 2024	Figure No. 4
CREATED BY:	JLM	
PROJECT NO.:	24-010	
REFERENCE:	Cambium Environmental	

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- LEGEND:**
- Ground Water Elevation (April 2023)
 - Screen
 - Peat
 - Sand
 - Sand and Gravel
 - Sandy Silt
 - Silty Sand
 - Bedrock
 - Waste

10x Vertical Exaggeration
Not to Scale



Cross Section
A-A'

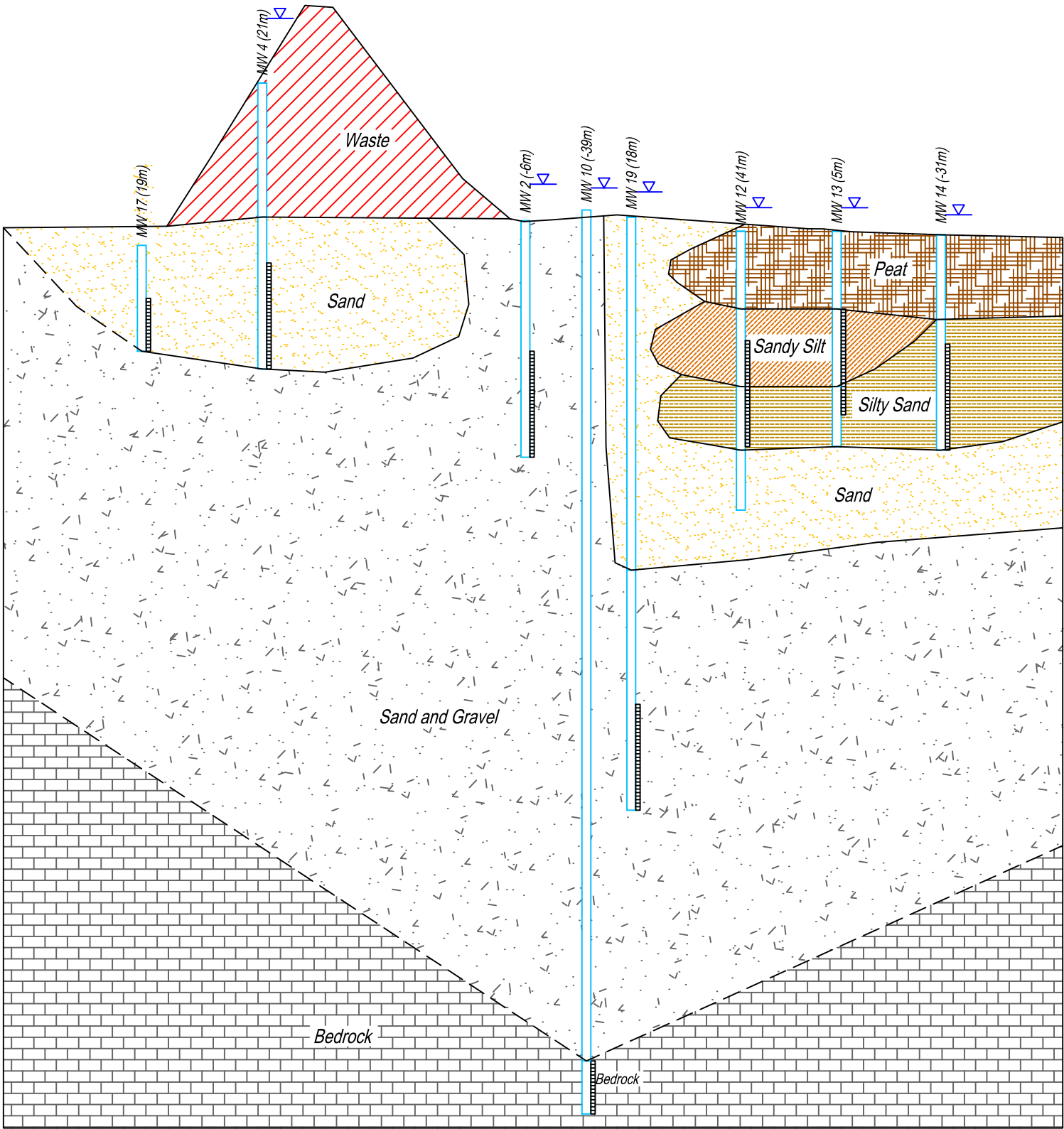
Laxton Waste Disposal Site
City of Kawartha Lakes, ON

DATE ISSUED:	May 2024	Figure No. 5
CREATED BY:	JLM	
PROJECT NO.:	24-010	
REFERENCE:		

Plotted by: ALJ on May 22, 2024 at 11:19am
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Plotted by: ALJ on May 22, 2024 at 11:19am
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DAYSTAMP: Q:\20 Projects\20-010 2020 Kawartha Lakes Landfill Monitoring\04.0 - Drafting\Laxton\20-010.dwg



LEGEND:

- Ground Water Elevation (April 2023)
- Screen
- Peat
- Sand
- Sand and Gravel
- Sandy Silt
- Silty Sand
- Bedrock
- Waste

10x Vertical Exaggeration
Not to Scale



Cross Section
B-B'

Laxton Waste Disposal Site
City of Kawartha Lakes, ON

DATE ISSUED:	May 2024	Figure No.
CREATED BY:	JLM	6
PROJECT NO.:	24-010	
REFERENCE:		



APPENDIX B

Chemistry Summary Tables

Summary of Ground Water Quality - General Chemistry
Laxton Waste Disposal Site

Parameter	ODWQS	PWQO / CWQG	RUP	MW1	MW1	MW1	MW1	MW1	MW1	MW1	MW1	MW1	MW1	MW1	MW1
				30-May-08	01-Oct-08	24-Jun-09	24-Aug-09	04-Jun-10	05-Oct-10	26-May-11	07-Sep-11	30-May-12	01-Nov-12	10-Jun-13	30-Oct-13
Alkalinity (as CaCO3)	500		301	100	101.28	92	90	89	97	90	90	86	96	88	95
Calcium	NV			31	27.6	29	30	25	32	26	26	26	26	30.5	32.8
Chloride	250	<u>120</u>	126	3	3.6	3	3	3	2	2	2	2	2	2.8	3
Oxygen Demand - Chemical (COD)	NV			<2	3	< 2	< 2	3	3	8	8	7.1	7.5	< 5	< 5
Conductivity (µS/cm)	NV			257	239	224	221	199	198	210	207	210	210	256	251
Organic Carbon - Dissolved (DOC)	5		3.4	2	2.182	2	2	2	2	1.4	1.3	1.2	1.1	2.1	2.3
Fluoride	1.5		0.80	<0.1	<0.1	< 0.1	< 0.1	< 0.1	< 0.1	<0.1	0.06	<0.10	<0.10	0.2	< 0.1
Hardness (as CaCO3)	500		309	124	111.7	114	116	97.5	121	100	99	98	100	119	125
Iron	0.3	0.3		1.2	<0.1	< 0.1	< 0.1	0.2	< 0.1	<0.100	1.4	<0.10	<0.10	< 0.005	< 0.005
Magnesium	NV			11	10.4	10	10	8	10	9.1	8.3	8.3	8.9	10.4	10.6
Manganese	0.050		0.03	0.15	<0.01	< 0.01	< 0.01	< 0.01	< 0.01	<0.002	0.1	<0.0020	<0.0020	< 0.001	< 0.001
Mercury	0.001	0.0002	0.0003	<0.00002	<0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	0.00002	<0.00001	<0.00001	<0.00001	< 0.00002	< 0.00002
Nitrate as N	10	<u>13</u>	2.5	0.5	0.6	0.3	0.4	0.1	0.2	0.2	0.2	0.15	0.19	0.6	0.6
Nitrite as N	1	<u>0.06</u>	0.29	<0.1	<0.1	< 0.1	< 0.1	< 0.1	< 0.1	<0.01	<0.01	<0.010	<0.010	< 0.1	< 0.1
pH	6.5 - 8.5			6.6	7.2	7.26	7.06	7.29	7.18	7.45	7.06	7.01	6.9	7.12	7.25
Phenols	NV	0.001		<0.001	<0.001	< 0.001	< 0.001	< 0.001	< 0.001	<0.001	0.001	<0.0010	<0.0010	< 0.001	< 0.001
Phosphorus	NV	0.03		0.02	<0.01	< 0.01	0.01	< 0.01	< 0.02	-	-	<0.10	<0.10	0.04	0.03
Potassium	NV			2.2	2.42	2.3	2.3	1.9	2.3	2	2.2	2	2.2	2.2	2.3
Sodium	200		101	3	2.96	3	3	2	2	2	1.9	1.9	2	2.7	2.7
Sulphate	500		257	31	17.2	21	18	18	16	13	13	15	10	31	17
Solids - Total Dissolved (TDS)	500		308	167	155.35	146	144	130	129	118	119	115	118	135	128
Total Kjeldahl Nitrogen (TKN)	NV			<0.1	0.2	< 0.1	0.2	0.1	0.1	0.1	<0.2	<0.10	<0.10	0.2	< 0.1
Total Ammonia as N (NH ₃ + NH ₄)	NV			<0.1	<0.1	0.04	< 0.01	< 0.01	< 0.01	<0.05	<0.02	0.02	0.03	< 0.005	0.009
Aluminum	0.10	0.08	0.06	<0.01	0.088	< 0.01	< 0.01	0.23	0.02	<0.005	0.44	0.0052	<0.0050	0.02	0.02
Antimony	0.006	0.02	0.002	<0.01	<0.01	< 0.01	< 0.01	< 0.01	< 0.01	<0.0005	<0.0005	<0.00050	0.0019	< 0.0001	< 0.0001
Arsenic	0.025	0.005	0.006	<0.01	<0.01	< 0.01	< 0.01	< 0.005	< 0.005	<0.001	<0.001	<0.0010	<0.0010	< 0.0001	< 0.0001
Barium	1		0.33	<0.1	<0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.086	0.11	0.081	0.088	0.11	0.113
Beryllium	NV	0.011		<0.1	<0.1	< 0.1	< 0.1	< 0.1	< 0.1	<0.0005	<0.0005	<0.00050	<0.00050	< 0.002	< 0.002
Boron	5	<u>1.3</u>	1.3	<0.1	<0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.017	0.02	0.031	0.022	0.044	0.039
Cadmium	0.005	0.0001	0.001	<0.0001	<0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	<0.0001	<0.0001	<0.00010	<0.00010	< 0.00002	< 0.00002
Chromium	0.05	0.001	0.013	0.0001	0.000274	< 0.0001	0.0003	0.0007	0.0002	<0.005	<0.005	<0.0050	<0.0050	< 0.002	0.0027
Cobalt	NV	0.0009		<0.0003	<0.0003	< 0.0003	< 0.0003	< 0.0003	0.0004	<0.0005	0.0025	<0.00050	<0.00050	< 0.0001	< 0.005
Copper	1	0.005	0.50	<0.0001	0.0045	0.0011	0.0031	0.0057	0.0015	0.002	0.008	0.0018	0.0024	0.0017	0.0012
Lead	0.01	0.003	0.003	<0.001	<0.001	< 0.001	< 0.001	< 0.001	< 0.001	<0.0005	0.0018	<0.00050	<0.00050	< 0.00002	< 0.00002
Molybdenum	NV	0.04		0.002	<0.002	< 0.002	< 0.002	< 0.002	< 0.002	<0.001	<0.0005	<0.00050	0.00091	0.0001	< 0.0001
Nickel	NV	0.025		<0.01	<0.01	< 0.01	< 0.01	< 0.01	< 0.01	<0.001	0.002	<0.0010	<0.0010	< 0.01	< 0.01
Selenium	0.01	0.1	0.003	<0.01	<0.01	< 0.01	< 0.01	< 0.01	< 0.01	<0.002	<0.002	<0.0020	<0.0020	< 0.001	< 0.001
Silver	NV	0.0001		<0.0001	<0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	<0.0001	<0.0001	<0.00010	<0.00010	< 0.00002	< 0.00002
Strontium	NV			0.211	0.1808	0.172	0.19	0.169	0.194	0.18	0.17	0.17	0.18	-	-
Thallium	NV	0.0003		<0.0003	<0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	<0.00005	<0.00005	<0.000050	<0.000050	< 0.00005	< 0.00005
Vanadium	NV	0.006		<0.001	<0.001	< 0.001	< 0.001	< 0.001	< 0.001	<0.001	0.0022	<0.00050	<0.00050	0.0014	0.0009
Zinc	5	0.02	2.5	<0.01	<0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.006	<0.005	0.0063	0.0053	< 0.005	< 0.005
Field Conductivity (µS/cm)	NV			-	-	-	-	-	-	-	-	274	240	246	370
Field pH (units)	6.5 - 8.5			-	-	-	-	-	-	-	-	8.21	8	7.03	6.75
Field Temperature (°C)	NV			-	-	-	-	-	-	-	-	9.6	7.3	10.2	9.8

ODWQS - Ontario Drinking Water Quality Objectives

PWQO - Provincial Water Quality Objectives

CWQG - Canadian Water Quality Guidelines (underlined value) - long term criteria

RUP - Reasonable Use Policy Criteria

Bold / Grey Highlighting - ODWQS Exceedance

Red / Bold - PWQO Exceedance

Bold / Underlined - RUP Exceedance

Bold / Red Highlighting - PWQO / CWQG Exceedance

all results in mg/L unless otherwise stated

Summary of Ground Water Quality - General Chemistry
Laxton Waste Disposal Site

Parameter	ODWQS	PWQO / CWQG	RUP	MW1 29-Apr-14	MW1 23-Sep-14	MW1 09-Jun-15	MW1 10-Sep-15	MW1 31-May-16	MW1 17-Oct-16	MW1 19-Apr-17	MW1 17-Oct-17	MW1 24-Apr-18	MW1 26-Sep-18	MW1 17-Apr-19	MW1 18-Oct-19
Alkalinity (as CaCO3)	500		301	113	109	224	186	232	214	187	228	201	192	150	146
Calcium	NV			56.4	44.2	66.8	69.7	119	75.6	78.5	62.9	69.7	49.9	47.5	41.9
Chloride	250	<u>120</u>	126	13.1	15.4	15.7	45.3	120	88.3	53.5	39.4	32.5	20.6	16.2	12.8
Oxygen Demand - Chemical (COD)	NV			5	5	21	6	24	15	20	18	25	17	17	15
Conductivity (µS/cm)	NV			411	356	591	600	1010	797	800	683	613	545	458	404
Organic Carbon - Dissolved (DOC)	5		3.4	4.2	3.6	8	3.2	5.5	5.2	7.6	7.8	8.9	8	6.2	7.2
Fluoride	1.5		0.80	0.1	< 0.1	0.1	< 0.1	0.1	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Hardness (as CaCO3)	500		309	214	168	263	266	452	277	292	227	249	179	164	150
Iron	0.3	0.3		< 0.005	< 0.005	< 0.005	0.01	0.009	0.005	< 0.005	0.007	0.01	< 0.005	< 0.005	< 0.005
Magnesium	NV			17.6	14	23.3	22.3	37.3	21.5	23.2	16.9	18.3	13.1	11.1	10.9
Manganese	0.050		0.03	< 0.001	0.004	0.112	0.172	0.334	0.272	0.437	0.495	0.705	0.499	0.585	0.575
Mercury	0.001	0.0002	0.0003	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Nitrate as N	10	<u>13</u>	2.5	0.8	0.5	< 0.1	< 0.1	0.3	< 0.1	1.5	< 0.05	0.81	< 0.05	0.12	< 0.05
Nitrite as N	1	<u>0.06</u>	0.29	< 0.1	< 0.1	0.1	0.1	< 0.1	< 0.1	0.3	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
pH	6.5 - 8.5			7.33	7.15	7.31	7.28	7.03	7.39	7.26	7.14	7.32	7.43	7.15	7.48
Phenols	NV	0.001		< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.005	< 0.001	0.002	< 0.001	0.002	< 0.002	< 0.002
Phosphorus	NV	0.03		0.08	0.06	< 0.01	< 0.01	0.03	0.04	< 0.1	< 0.1	< 0.1	< 0.1	0.23	0.04
Potassium	NV			2.9	2.9	2.8	3.5	4.6	3.9	3.4	4	3.8	3.8	2.8	3.5
Sodium	200		101	5	6.1	19.2	20.6	59.5	52.2	55.6	57.1	53	47.6	26.2	28.4
Sulphate	500		257	71	40	60	51	124	60	133	49	90	58	52	35
Solids - Total Dissolved (TDS)	500		308	237	190	323	324	606	430	468	367	389	308	246	221
Total Kjeldahl Nitrogen (TKN)	NV			0.5	0.2	0.4	0.5	0.5	0.6	0.6	0.6	0.6	0.4	0.4	1
Total Ammonia as N (NH ₃ + NH ₄)	NV			0.01	0.05	0.02	0.02	0.04	0.07	0.04	0.09	0.1	0.08	0.1	0.07
Aluminum	0.10	0.08	0.06	0.02	0.02	0.02	0.02	0.03	0.02	0.02	0.04	0.05	0.03	0.03	0.04
Antimony	0.006	0.02	0.002	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.0003	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.0002
Arsenic	0.025	0.005	0.006	0.0001	< 0.0001	< 0.0001	0.0003	0.0004	0.0002	0.0003	0.0003	0.0004	0.0002	0.0002	< 0.0001
Barium	1		0.33	0.184	0.149	0.228	0.255	0.468	0.276	0.294	0.295	0.264	0.195	0.16	0.151
Beryllium	NV	0.011		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Boron	5	<u>1.3</u>	1.3	0.095	0.232	0.603	0.543	0.927	0.597	0.508	1	0.94	1.18	0.775	1.2
Cadmium	0.005	0.0001	0.001	< 0.00002	0.00002	0.00005	0.00009	0.00015	0.00007	0.000133	0.000098	0.000116	0.00009	0.000103	0.000097
Chromium	0.05	0.001	0.013	< 0.0002	0.0042	0.0034	0.0094	< 0.0002	0.0028	0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.001
Cobalt	NV	0.0009		< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.006	< 0.005	< 0.005	0.0031	0.006	< 0.005	< 0.005
Copper	1	0.005	0.50	0.003	0.0034	0.0079	0.0081	0.0123	0.0071	0.0086	0.0099	0.0125	0.0097	0.0088	0.0099
Lead	0.01	0.003	0.003	0.00003	< 0.00002	< 0.00002	0.00002	< 0.00004	< 0.00002	< 0.00002	< 0.00002	< 0.00002	0.00002	0.00002	0.00003
Molybdenum	NV	0.04		0.0001	< 0.0001	< 0.0001	0.0005	0.0004	0.0003	0.0003	0.0004	0.0004	0.0004	0.0004	0.0005
Nickel	NV	0.025		< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Selenium	0.01	0.1	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
Silver	NV	0.0001		< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.0001	< 0.0001	< 0.0001
Strontium	NV			-	0.324	0.478	0.478	0.839	0.508	0.496	0.381	0.436	0.329	0.289	0.277
Thallium	NV	0.0003		0.00008	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Vanadium	NV	0.006		0.0021	0.0029	0.0022	0.0033	0.002	0.0011	0.0018	0.0007	0.0012	0.0002	0.0001	0.0002
Zinc	5	0.02	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
Field Conductivity (µS/cm)	NV			-	-	476	507	895	690	643	585	710	485	500	350
Field pH (units)	6.5 - 8.5			-	-	6.75	6.69	6.49	7.04	7.3	7.59	7.06	7.01	7.35	6.9
Field Temperature (°C)	NV			-	-	11.33	13.01	10.15	12.5	9	12.4	7.9	13.2	9.3	12.3

ODWQS - Ontario Drinking Water Quality Objectives

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RUP - Reasonable Use Policy Criteria

Bold / Grey Highlighting - ODWQS Exceedance

Red / Bold - PWQO Exceedance

Bold / Underlined - RUP Exceedance

Bold / Red Highlighting - PWQO / CWQG Exceedance

all results in mg/L unless otherwise stated

Summary of Ground Water Quality - General Chemistry
Laxton Waste Disposal Site

Parameter	ODWQS	PWQO / CWQG	RUP	MW1 21-Apr-20	MW1 13-Oct-20	MW1 15-Apr-21	MW1 13-Oct-21	MW1 12-Apr-22	MW1 16-Oct-22	MW1 26-Apr-23	MW1 11-Oct-23	MW2 30-May-08	MW2 01-Oct-08	MW2 24-Jun-09	MW2 24-Aug-09
Alkalinity (as CaCO3)	500		301	168	158	133	163	168	162	154	190	157	134.35	158	127
Calcium	NV			80.6	55	50.1	59.8	53.6	47.4	61.3	58	47	38.6	52	45
Chloride	250	<u>120</u>	126	28.1	19.6	13.4	19.6	14.5	12.1	16.5	15	8	7.6	7	5
Oxygen Demand - Chemical (COD)	NV			29		11	24	31	15	5	22	2	5	6	4
Conductivity (µS/cm)	NV			635	495	418	475	462	461	479	501	374	336	371	314
Organic Carbon - Dissolved (DOC)	5		3.4	9.1	7.5	7.5	6.4	6.1	7	6.7	6.5	2	2.688	2	2
Fluoride	1.5		0.80	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Hardness (as CaCO3)	500		309	271	174	168	203	184	162	203	195	173	143	179	154
Iron	0.3	0.3		< 0.005	< 0.005	< 0.005	0.006	0.005	< 0.005	< 0.005	0.012	< 0.1	0.1183	< 0.1	< 0.1
Magnesium	NV			17	8.84	10.5	13.1	12.2	10.7	12	12.1	14	11.2	12	10
Manganese	0.050		0.03	1.48	0.933	1	1.16	1.2	1.09	1.6	1.56	0.9	0.7657	1.25	0.76
Mercury	0.001	0.0002	0.0003	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Nitrate as N	10	<u>13</u>	2.5	1.07	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.26	< 0.05	0.2	0.2	< 0.1	0.5
Nitrite as N	1	<u>0.06</u>	0.29	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.1	< 0.1	< 0.1	< 0.1
pH	6.5 - 8.5			7.21	7.38	7.39	6.84	7.41	7.2	7.1	6.77	6.56	7.09	7.13	6.96
Phenols	NV	0.001		< 0.002	< 0.002	< 0.002	< 0.001	< 0.001	< 0.001	< 0.001	0.001	< 0.001	< 0.001	< 0.001	< 0.001
Phosphorus	NV	0.03		< 0.1	< 0.1	0.02	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.01	< 0.01	< 0.01	0.02
Potassium	NV			4	3.7	3.2	3.9	3.3	3.6	3.7	4	3.5	3.86	4.1	3.8
Sodium	200		101	31.4	31.8	26	28.4	24.8	24	22.8	26.5	8	9.51	11	9
Sulphate	500		257	112	57	49	56	51	49	72	60	34	34.2	35	31
Solids - Total Dissolved (TDS)	500		308	376	271	233	279	262	245	282	259	243	218.4	241	204
Total Kjeldahl Nitrogen (TKN)	NV			0.5	0.4	0.3	0.4	0.7	0.4	0.4	0.9	< 0.1	0.2	0.3	0.2
Total Ammonia as N (NH ₃ + NH ₄)	NV			0.04	0.07	0.03	0.08	0.22	0.09	0.12	0.7	< 0.1	< 0.1	0.18	0.14
Aluminum	0.10	0.08	0.06	0.05	0.04	0.03	0.03	0.01	< 0.01	0.02	0.04	< 0.01	0.0223	< 0.01	< 0.01
Antimony	0.006	0.02	0.002	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.0001	< 0.0001	0.0001	< 0.01	< 0.01	< 0.01	< 0.01
Arsenic	0.025	0.005	0.006	0.0003	0.0003	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	< 0.01	< 0.01	< 0.01	< 0.01
Barium	1		0.33	0.278	0.191	0.173	0.214	0.188	0.168	0.21	0.207	0.2	0.1368	0.2	0.1
Beryllium	NV	0.011		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.0001	< 0.1	< 0.1	< 0.1	< 0.1
Boron	5	<u>1.3</u>	1.3	1.89	1.73	1.14	1.6	1.35	1.24	1.12	1.42	0.2	0.1818	< 0.1	< 0.1
Cadmium	0.005	0.0001	0.001	0.000152	0.000114	0.000104	0.000096	0.00012	0.000136	0.000129	0.00011	0.0001	0.000115	0.0001	< 0.0001
Chromium	0.05	0.001	0.013	< 0.001	< 0.001	< 0.001	0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.0001	0.000559	0.0002	0.0002
Cobalt	NV	0.0009		< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.0058	0.0016	0.01302	0.0013	0.0011
Copper	1	0.005	0.50	0.0126	0.014	0.0113	0.01	0.0095	0.0097	0.0084	0.0093	0.0034	0.003725	0.0038	0.0035
Lead	0.01	0.003	0.003	0.00013	< 0.00002	0.00005	0.00007	0.00005	0.00004	< 0.00002	0.00002	< 0.001	< 0.001	< 0.001	< 0.001
Molybdenum	NV	0.04		0.0004	0.0006	0.0005	0.0004	0.0005	0.0006	0.0006	0.0006	< 0.002	< 0.002	< 0.002	< 0.002
Nickel	NV	0.025		< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.0051	< 0.01	< 0.01	< 0.01	< 0.01
Selenium	0.01	0.1	0.003	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.01	< 0.01	< 0.01	< 0.01
Silver	NV	0.0001		< 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	NV			0.445	0.302	0.283	0.363	0.308	0.278	0.348	0.339	0.306	0.265	0.335	0.211
Thallium	NV	0.0003		< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.0005	0.000316	0.0006	0.0005
Vanadium	NV	0.006		0.0001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0001	0.0002	< 0.001	< 0.001	< 0.001	< 0.001
Zinc	5	0.02	2.5	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.01	< 0.01	< 0.01	< 0.01
Field Conductivity (µS/cm)	NV			670	415	510	545	395	380	395	375	-	-	-	-
Field pH (units)	6.5 - 8.5			7.06	7.03	7.58	6.84	7.02	6.87	7.02	6.9	-	-	-	-
Field Temperature (°C)	NV			6.6	12.2	8.1	13.1	10.6	11.2	10.3	13.1	-	-	-	-

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all results in mg/L unless otherwise stated

Summary of Ground Water Quality - General Chemistry
Laxton Waste Disposal Site

Parameter	ODWQS	PWQO / CWQG	RUP	MW2 04-Jun-10	MW2 05-Oct-10	MW2 26-May-11	MW2 07-Sep-11	MW2 30-May-12	MW2 01-Nov-12	MW2 10-Jun-13	MW2 30-Oct-13	MW2 29-Apr-14	MW2 23-Sep-14	MW2 09-Jun-15	MW2 11-Sep-15
Alkalinity (as CaCO3)	500		301	160	123	143	111	170	110	163	117	188	136	160	139
Calcium	NV			49	47	47	37	53	37	61.6	50.7	61.2	64.1	59.1	51.9
Chloride	250	<u>120</u>	126	8	4	5	4	7	3	6.4	4.2	6.9	13.6	11	8.9
Oxygen Demand - Chemical (COD)	NV			5	4	10	6	7.6	7	< 5	5	8	6	17	109
Conductivity (µS/cm)	NV			346	266	327	265	380	260	428	349	442	447	404	403
Organic Carbon - Dissolved (DOC)	5		3.4	2	2	2.2	1.6	2.4	1.5	4.4	3.1	4.6	4.7	4.6	49.5
Fluoride	1.5		0.80	< 0.1	< 0.1	<0.1	0.05	<0.10	<0.10	0.2	< 0.1	0.1	< 0.1	0.1	0.1
Hardness (as CaCO3)	500		309	166	156	160	120	180	120	204	165	200	207	197	167
Iron	0.3	0.3		< 0.1	< 0.1	<0.100	<0.1	<0.10	<0.10	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.006
Magnesium	NV			11	9	9.5	7.5	10	7.4	12.2	9.26	11.4	11.3	11.9	9
Manganese	0.050		0.03	1.08	0.98	1.2	0.84	1.4	0.92	1.73	1.4	1.47	1.59	1.49	15.8
Mercury	0.001	0.0002	0.0003	< 0.00002	< 0.00002	0.00001	<0.00001	<0.00001	<0.00001	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Nitrate as N	10	<u>13</u>	2.5	< 0.1	< 0.1	<0.1	<0.1	<0.10	<0.10	0.1	0.6	0.2	0.2	< 0.1	6.3
Nitrite as N	1	<u>0.06</u>	0.29	< 0.1	< 0.1	<0.1	<0.1	<0.010	<0.010	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
pH	6.5 - 8.5			7.12	7.1	7.21	6.87	7	6.77	7.08	7.04	7.29	7.15	7.39	7.04
Phenols	NV	0.001		< 0.001	< 0.001	<0.001	0.002	<0.0010	<0.0010	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Phosphorus	NV	0.03		< 0.01	< 0.02	-	-	<0.10	<0.10	1.57	0.23	0.03	0.22	0.66	0.01
Potassium	NV			3.6	3.8	3.5	3.6	3.9	3.7	4	3.9	4	4.7	3.5	4.5
Sodium	200		101	6	5	5.2	4.9	5.3	5.2	7.5	5.7	4.5	8.4	5	8.5
Sulphate	500		257	27	28	17	20	24	18	42	41	30	66	32	17
Solids - Total Dissolved (TDS)	500		308	225	173	184	155	214	151	234	189	233	252	220	228
Total Kjeldahl Nitrogen (TKN)	NV			0.3	0.3	0.6	<1	0.52	0.21	0.4	0.2	0.5	0.4	0.6	3.5
Total Ammonia as N (NH ₃ + NH ₄)	NV			0.15	0.16	0.17	0.14	0.1	0.22	0.232	0.152	0.17	0.26	0.16	0.38
Aluminum	0.10	0.08	0.06	< 0.01	< 0.01	0.012	0.006	0.0054	0.0082	0.03	0.02	0.02	0.02	0.02	0.03
Antimony	0.006	0.02	0.002	< 0.01	< 0.01	<0.0005	<0.0005	<0.00050	<0.00050	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Arsenic	0.025	0.005	0.006	< 0.005	< 0.005	<0.001	<0.001	<0.0010	<0.0010	0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.0007
Barium	1		0.33	0.2	0.1	0.15	0.13	0.17	0.13	0.22	0.176	0.182	0.206	0.18	0.159
Beryllium	NV	0.011		< 0.1	< 0.1	<0.0005	<0.0005	<0.00050	<0.00050	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Boron	5	<u>1.3</u>	1.3	0.2	< 0.1	0.15	0.1	0.18	0.12	0.222	0.164	0.117	0.239	0.182	0.08
Cadmium	0.005	0.0001	0.001	0.0002	< 0.0001	<0.0001	<0.0001	<0.00010	<0.00010	0.00012	0.00006	0.0001	0.0001	0.00006	0.00021
Chromium	0.05	0.001	0.013	0.0002	0.0003	<0.005	<0.005	<0.0050	<0.0050	< 0.002	0.0255	< 0.0002	0.0042	0.0026	< 0.0002
Cobalt	NV	0.0009		0.0014	0.0014	0.0015	<0.0005	0.0018	0.0011	0.0024	< 0.005	< 0.005	< 0.005	< 0.005	0.041
Copper	1	0.005	0.50	0.0035	0.0028	0.004	0.002	0.004	0.0031	0.0048	0.0027	0.0029	0.0042	0.0032	0.0272
Lead	0.01	0.003	0.003	< 0.001	< 0.001	<0.0005	<0.0005	<0.00050	<0.00050	< 0.00002	< 0.00002	0.00004	< 0.00002	< 0.00002	< 0.00002
Molybdenum	NV	0.04		< 0.002	< 0.002	<0.001	<0.0005	<0.00050	<0.00050	0.0003	0.0003	0.0003	< 0.0001	< 0.0001	0.0003
Nickel	NV	0.025		< 0.01	< 0.01	0.004	0.004	0.0052	0.003	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.03
Selenium	0.01	0.1	0.003	< 0.01	< 0.01	<0.002	<0.002	<0.0020	<0.0020	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Silver	NV	0.0001		< 0.0001	< 0.0001	<0.0001	<0.0001	<0.00010	<0.00010	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Strontium	NV			0.319	0.245	0.28	0.22	0.31	0.22	-	-	-	0.387	0.361	-
Thallium	NV	0.0003		0.0009	0.0007	<0.00005	<0.00005	<0.000050	<0.000050	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.00011
Vanadium	NV	0.006		< 0.001	< 0.001	<0.001	<0.0005	<0.00050	0.00085	0.003	0.0007	0.0031	0.0033	0.0017	0.0031
Zinc	5	0.02	2.5	< 0.01	< 0.01	0.009	<0.005	0.011	<0.0050	< 0.005	< 0.005	< 0.005	0.006	< 0.005	< 0.005
Field Conductivity (µS/cm)	NV			-	-	-	-	726	330	4.28	350	-	-	337	-
Field pH (units)	6.5 - 8.5			-	-	-	-	7.59	7.42	6.97	6.53	-	-	6.83	-
Field Temperature (°C)	NV			-	-	-	-	9.3	8.2	8	11	-	-	11.61	-

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all results in mg/L unless otherwise stated

Summary of Ground Water Quality - General Chemistry
Laxton Waste Disposal Site

Parameter	ODWQS	PWQO / CWQG	RUP	MW2	MW2	MW2	MW2	MW2	MW2	MW2	MW2	MW2	MW2	MW2	MW2
				31-May-16	17-Oct-16	19-Apr-17	17-Oct-17	24-Apr-18	26-Sep-18	17-Apr-19	18-Oct-19	21-Apr-20	13-Oct-20	15-Apr-21	13-Oct-21
Alkalinity (as CaCO3)	500		301	200	143	212	197	220	191	156	201	194	121	172	179
Calcium	NV			86.2	63.4	83.4	71.5	69.9	59	43.9	59.3	67.6	37.7	61.4	57.6
Chloride	250	<u>120</u>	126	25	30.5	39.8	25.4	19.7	21.7	11.3	19.4	19.6	15.4	14.8	19.2
Oxygen Demand - Chemical (COD)	NV			11	7	14	18	14	12	14	16	18		< 5	17
Conductivity (µS/cm)	NV			549	464	612	568	491	524	392	542	514	359	460	469
Organic Carbon - Dissolved (DOC)	5		3.4	4.4	3.8	5.4	5.5	5.3	6.8	4.4	6.6	6.6	3.9	7.3	5.8
Fluoride	1.5		0.80	0.1	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Hardness (as CaCO3)	500		309	179	210	277	241	233	207	147	205	224	121	204	192
Iron	0.3	0.3		0.006	0.026	< 0.005	0.011	0.005	< 0.005	< 0.005	0.007	< 0.005	0.759	0.03	0.025
Magnesium	NV			15.6	12.5	16.7	15.1	14.1	14.4	9.1	13.7	13.3	6.51	12.2	11.7
Manganese	0.050		0.03	2.41	1.72	2.48	2.16	2.15	1.87	1.24	1.96	2.27	1.25	1.82	1.9
Mercury	0.001	0.0002	0.0003	<0.00002	<0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Nitrate as N	10	<u>13</u>	2.5	<0.1	<0.1	< 0.1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nitrite as N	1	<u>0.06</u>	0.29	<0.1	<0.1	0.4	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
pH	6.5 - 8.5			7.09	7.43	7.23	7.15	7.35	7.36	7.13	7.48	7.21	7.43	7.34	6.85
Phenols	NV	0.001		<0.001	<0.001	< 0.001	0.003	< 0.001	0.003	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.001
Phosphorus	NV	0.03		<0.1	0.39	< 0.1	< 0.1	< 0.1	0.47	0.18	< 0.1	< 0.1	0.19	0.13	0.13
Potassium	NV			5.3	4.3	4.5	4.7	4.5	4.8	3.3	5.3	4.8	3.6	4.5	4.8
Sodium	200		101	16.8	8.8	15.9	22.6	25.9	24.5	20.3	34.1	24.9	17.2	22.5	26.8
Sulphate	500		257	45	46	43	44	28	43	24	43	37	31	31	40
Solids - Total Dissolved (TDS)	500		308	317	254	334	304	297	284	207	298	286	186	252	270
Total Kjeldahl Nitrogen (TKN)	NV			0.6	1.2	0.8	0.5	0.5	0.5	0.5	0.8	0.7	0.4	0.5	0.6
Total Ammonia as N (NH ₃ + NH ₄)	NV			0.38	0.28	0.28	0.26	0.32	0.23	0.24	0.38	0.4	0.27	0.29	0.32
Aluminum	0.10	0.08	0.06	0.03	0.03	0.03	0.04	0.05	0.05	0.03	0.06	0.05	0.22	0.05	0.03
Antimony	0.006	0.02	0.002	<0.0001	0.0003	< 0.0001	0.0001	< 0.0001	0.0001	< 0.0001	0.0003	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Arsenic	0.025	0.005	0.006	0.0002	<0.0001	0.0002	0.0002	0.0002	0.0002	0.0002	< 0.0001	0.0002	0.0005	0.0002	0.0002
Barium	1		0.33	0.296	0.205	0.274	0.297	0.234	0.206	0.137	0.215	0.228	0.137	0.208	0.207
Beryllium	NV	0.011		<0.002	<0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Boron	5	<u>1.3</u>	1.3	0.376	0.227	0.355	0.562	0.444	0.597	0.415	1.21	0.969	0.553	1.04	1.13
Cadmium	0.005	0.0001	0.001	0.0001	0.00009	0.000128	0.000088	0.0001	0.000093	0.000077	0.000116	0.000115	0.000078	0.000098	0.000104
Chromium	0.05	0.001	0.013	<0.0002	0.0016	< 0.001	< 0.001	0.001	< 0.001	< 0.001	0.001	0.001	0.001	< 0.001	0.001
Cobalt	NV	0.0009		<0.005	0.006	0.006	< 0.005	0.0028	0.007	< 0.005	< 0.005	0.006	< 0.005	0.005	< 0.005
Copper	1	0.005	0.50	0.0051	0.0025	0.0059	0.0053	0.0059	0.0061	0.0053	0.0087	0.0078	0.0105	0.0087	0.0089
Lead	0.01	0.003	0.003	<0.00002	<0.00002	< 0.00002	< 0.00002	< 0.00002	0.00002	0.00002	0.00002	< 0.00002	0.00089	0.00007	0.00008
Molybdenum	NV	0.04		0.0005	0.0004	0.0004	0.0005	0.0005	0.0005	0.0006	0.0006	0.0005	0.0006	0.0005	0.0006
Nickel	NV	0.025		<0.01	<0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Selenium	0.01	0.1	0.003	<0.0001	<0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Silver	NV	0.0001		<0.00002	<0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Strontium	NV			0.503	0.371	0.454	0.381	0.387	0.38	0.248	0.386	0.375	0.216	0.353	0.352
Thallium	NV	0.0003		<0.00005	<0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Vanadium	NV	0.006		0.0015	0.0008	0.0017	0.0005	0.0013	0.0002	0.0001	0.0002	0.0001	0.0022	0.0002	0.0002
Zinc	5	0.02	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
Field Conductivity (µS/cm)	NV			494	425	475	503	590	440	440	470	555	275	560	500
Field pH (units)	6.5 - 8.5			6.73	7.15	7.25	7.64	7.07	6.92	7.33	6.81	7.03	7.12	7.5	6.82
Field Temperature (°C)	NV			9.61	11.8	8.7	12.9	8.3	13.2	8.4	12.1	7.5	12	7.1	13.5

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all results in mg/L unless otherwise stated

Summary of Ground Water Quality - General Chemistry
Laxton Waste Disposal Site

Parameter	ODWQS	PWQO / CWQG	RUP	MW2 12-Apr-22	MW2 16-Oct-22	MW2 26-Apr-23	MW2 11-Oct-23	MW3 01-Oct-08	MW3 24-Jun-09	MW3 24-Aug-09	MW3 04-Jun-10	MW3 05-Oct-10	MW3 26-May-11	MW3 07-Sep-11	MW3 30-May-12
Alkalinity (as CaCO3)	500		301	213	154	207	194	272	264	246	266	188	277	208	260
Calcium	NV			65.1	46	61.2	60.6	68.6	81	77	73	59	81	65	75
Chloride	250	<u>120</u>	126	12.7	16.9	15.3	17.1	23.8	16	16	9	9	7	10	7
Oxygen Demand - Chemical (COD)	NV			17	8	< 5	23	21	18	15	26	11	33	20	22
Conductivity (µS/cm)	NV			500	445	507	509	650	608	581	547	393	592	481	580
Organic Carbon - Dissolved (DOC)	5		3.4	6.1	4.7	5.6	6	8.465	8	6	6	5	7.2	4.5	6.2
Fluoride	1.5		0.80	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.1	< 0.1	0.1	< 0.10
Hardness (as CaCO3)	500		309	218	156	204	202	231	268	250	240	188	270	200	240
Iron	0.3	0.3		< 0.005	< 0.005	< 0.005	0.008	13.71	17.8	14.6	13.5	19.5	18	0.4	18
Magnesium	NV			13.4	10.1	12.3	12.4	14.4	16	14	14	10	16	10	12
Manganese	0.050		0.03	2.2	1.63	1.83	2.11	4.92	5.06	4.77	2.79	2.73	4.4	3.3	4
Mercury	0.001	0.0002	0.0003	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	0.00001	< 0.00001	< 0.00001
Nitrate as N	10	<u>13</u>	2.5	< 0.05	< 0.05	< 0.05	0.06	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.10
Nitrite as N	1	<u>0.06</u>	0.29	< 0.05	< 0.05	< 0.05	< 0.05	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.01	< 0.01	< 0.010
pH	6.5 - 8.5			7.36	7.15	7.17	6.83	6.87	7	6.78	6.92	6.89	7.04	6.79	7.02
Phenols	NV	0.001		0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.001	< 0.0010
Phosphorus	NV	0.03		< 0.1	< 0.1	< 0.1	< 0.1	< 0.01	0.02	0.02	0.01	0.02	-	-	< 0.10
Potassium	NV			4.5	4.2	4.3	4.7	14.8	13.7	15.5	12.3	13.2	12	14	13
Sodium	200		101	20.9	19.3	20.5	24.3	26.1	21	22	13	13	11	13	10
Sulphate	500		257	31	43	37	53	50.4	50	48	33	34	20	29	27
Solids - Total Dissolved (TDS)	500		308	279	235	277	263	422.5	395	378	356	255	360	294	349
Total Kjeldahl Nitrogen (TKN)	NV			1	1.2	0.6	0.6	3.8	3.9	4	3	2.9	3.2	4	3
Total Ammonia as N (NH ₃ + NH ₄)	NV			0.8	0.97	0.43	0.43	3.3	2.98	3.45	2.37	1.28	2.8	2.6	2.7
Aluminum	0.10	0.08	0.06	0.02	< 0.01	0.02	0.03	0.0198	0.01	< 0.01	< 0.01	0.03	0.011	< 0.005	0.0087
Antimony	0.006	0.02	0.002	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.0005	< 0.0005	< 0.00050
Arsenic	0.025	0.005	0.006	0.0002	0.0001	0.0002	0.0002	< 0.01	< 0.01	< 0.01	< 0.005	< 0.005	< 0.001	< 0.001	< 0.0010
Barium	1		0.33	0.23	0.166	0.211	0.219	0.20099	0.3	0.3	0.3	0.3	0.31	0.27	0.29
Beryllium	NV	0.011		< 0.002	< 0.002	< 0.002	< 0.0001	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.0005	< 0.0005	< 0.00050
Boron	5	<u>1.3</u>	1.3	1.12	0.788	1.01	1.2	0.327	< 0.1	0.3	0.3	< 0.1	0.4	0.23	0.31
Cadmium	0.005	0.0001	0.001	0.000106	0.000095	0.000096	0.000127	0.000366	0.0004	0.0004	0.0003	0.0004	< 0.0001	< 0.0001	< 0.00010
Chromium	0.05	0.001	0.013	< 0.001	< 0.001	< 0.001	< 0.001	0.001038	0.0007	0.0006	0.0007	0.0009	< 0.005	< 0.005	< 0.0050
Cobalt	NV	0.0009		0.005	0.005	< 0.005	0.0078	0.003552	0.0042	0.0026	0.0039	0.0037	0.0059	0.0051	0.006
Copper	1	0.005	0.50	0.0076	0.0065	0.007	0.0086	0.000934	< 0.0001	0.0001	0.0001	0.0015	0.002	< 0.001	0.0013
Lead	0.01	0.003	0.003	0.00014	0.00003	< 0.00002	< 0.00002	0.003516	0.004	0.005	0.001	0.002	< 0.0005	< 0.0005	< 0.00050
Molybdenum	NV	0.04		0.0006	0.0006	0.0005	0.0006	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.001	0.0012	0.00059
Nickel	NV	0.025		< 0.01	< 0.01	< 0.01	0.0081	0.001836	< 0.01	< 0.01	< 0.01	< 0.01	0.002	0.004	0.0021
Selenium	0.01	0.1	0.003	< 0.001	< 0.001	< 0.001	< 0.001	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.002	< 0.002	< 0.0020
Silver	NV	0.0001		< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.000137	0.0002	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.00010
Strontium	NV			0.374	0.281	0.364	0.359	0.421	0.469	0.385	0.421	0.256	0.45	0.31	0.39
Thallium	NV	0.0003		< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.002401	0.0019	0.0014	0.0026	0.0013	< 0.00005	< 0.00005	< 0.000050
Vanadium	NV	0.006		0.0002	0.0002	0.0001	0.0002	0.002986	0.003	0.002	0.002	0.003	0.002	< 0.0005	0.0016
Zinc	5	0.02	2.5	< 0.005	< 0.005	< 0.005	< 0.005	< 0.01	< 0.01	< 0.01	< 0.01	0.01	0.011	< 0.005	0.0061
Field Conductivity (µS/cm)	NV			420	360	395	380	-	-	-	-	-	-	-	717
Field pH (units)	6.5 - 8.5			7.16	6.92	6.85	7	-	-	-	-	-	-	-	6.77
Field Temperature (°C)	NV			9.4	11.6	10	13.3	-	-	-	-	-	-	-	8.7

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Bold / Underlined - RUP Exceedance
Bold / Red Highlighting - PWQO / CWQG Exceedance
all results in mg/L unless otherwise stated

Summary of Ground Water Quality - General Chemistry
Laxton Waste Disposal Site

Parameter	ODWQS	PWQO / CWQG	RUP	MW3	MW3	MW3	MW3	MW3	MW3	MW3	MW3	MW3	MW3	MW3	MW3
				01-Nov-12	10-Jun-13	30-Oct-13	29-Apr-14	23-Sep-14	23-Sep-14	09-Jun-15	10-Sep-15	31-May-16	17-Oct-16	19-Apr-17	17-Oct-17
Alkalinity (as CaCO3)	500		301	180	277	210	206	187	196	249	205	237	219	257	258
Calcium	NV			54	89	47.5	64.1	56.6	53.6	81.3	67.4	88.6	70.1	82.1	83
Chloride	250	<u>120</u>	126	5	8.7	7.8	3.8	7.2	7.5	8.6	10.8	15.1	13.4	16.6	17.4
Oxygen Demand - Chemical (COD)	NV			27	24	26	17	135	8	54	84	26	13	26	35
Conductivity (µS/cm)	NV			440	628	421	472	443	435	595	509	580	546	632	606
Organic Carbon - Dissolved (DOC)	5		3.4	6.4	10.4	10.5	7.3	8	5.2	7.3	6.3	6.7	6	8.9	9.8
Fluoride	1.5		0.80	<0.10	0.2	< 0.1	0.1	< 0.1	0.09	0.1	0.1	0.2	0.1	< 0.1	< 0.1
Hardness (as CaCO3)	500		309	190	291	173	232	184	176	260	210	285	228	286	269
Iron	0.3	0.3		14	12.5	14.8	11.8	19.2	17	28.1	23.2	20	10.7	16	13.7
Magnesium	NV			13	16.7	13.2	17.4	10.4	10.3	13.7	10.1	15.5	12.9	19.6	14.9
Manganese	0.050		0.03	2.3	5.06	2.77	2.05	2.73	2.55	4.02	3.35	4	3.2	3.37	4.13
Mercury	0.001	0.0002	0.0003	<0.00001	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00001	< 0.00002	< 0.00002	<0.00002	<0.00002	< 0.00002	< 0.00002
Nitrate as N	10	<u>13</u>	2.5	<0.10	< 0.1	< 0.1	< 0.1	< 0.1	< 0.03	< 0.1	< 0.1	0.1	<0.1	< 0.1	< 0.05
Nitrite as N	1	<u>0.06</u>	0.29	<0.010	< 0.1	< 0.1	< 0.1	< 0.1	< 0.06	< 0.1	< 0.1	<0.1	<0.1	< 0.1	< 0.05
pH	6.5 - 8.5			6.59	6.83	6.77	7.08	6.85	7.64	7.16	7.29	6.91	7.33	7.08	6.93
Phenols	NV	0.001		<0.0010	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	<0.001	<0.001	< 0.001	0.005
Phosphorus	NV	0.03		<0.10	0.08	0.25	0.02	0.12	0.02	0.47	0.07	0.31	0.09	< 0.1	< 0.1
Potassium	NV			8.7	12.1	6.7	6.2	9.3	9.96	11	11.5	11.1	10	7.2	13.1
Sodium	200		101	15	13.1	16.1	11.7	11.9	11.3	7.7	13.6	17.8	16.3	14.8	20.5
Sulphate	500		257	48	45	18	26	35	24	48	38	42	32	45	21
Solids - Total Dissolved (TDS)	500		308	287	373	253	268	267	234	356	305	340	304	361	333
Total Kjeldahl Nitrogen (TKN)	NV			2.7	3	1.5	1.5	2.3	2.4	3.9	3.4	3.3	2.9	2.1	3.3
Total Ammonia as N (NH ₃ + NH ₄)	NV			1.4	2.87	0.815	1.06	2.02	2	3.04	2.66	2.84	2.64	1.66	2.76
Aluminum	0.10	0.08	0.06	0.015	0.03	0.03	0.03	0.02	< 0.01	0.03	0.02	0.03	0.03	0.03	0.04
Antimony	0.006	0.02	0.002	<0.00050	< 0.0001	< 0.0001	< 0.0001	< 0.0001	-	< 0.0001	< 0.0001	< 0.0001	0.0002	< 0.0001	< 0.0001
Arsenic	0.025	0.005	0.006	<0.0010	0.0006	0.0003	0.0003	0.0005	0.0006	0.0004	0.0006	0.0004	0.0002	0.0003	0.0004
Barium	1		0.33	0.24	0.376	0.236	0.18	0.231	0.231	0.304	0.287	0.323	0.239	0.28	0.408
Beryllium	NV	0.011		<0.00050	< 0.002	< 0.002	< 0.002	< 0.002	0.000023	< 0.002	< 0.002	<0.002	<0.002	< 0.002	< 0.002
Boron	5	<u>1.3</u>	1.3	0.18	0.378	0.292	0.194	0.25	0.235	0.333	0.327	0.43	0.323	0.347	0.419
Cadmium	0.005	0.0001	0.001	<0.00010	0.00003	< 0.00002	< 0.00002	< 0.00002	0.000004	< 0.00002	< 0.00002	<0.00002	<0.00002	< 0.000014	< 0.000014
Chromium	0.05	0.001	0.013	<0.0050	0.011	0.0064	< 0.0002	0.0063	0.00135	0.005	0.0111	<0.0002	0.0024	< 0.001	< 0.001
Cobalt	NV	0.0009		0.0053	0.0068	0.008	0.006	0.006	0.00474	0.009	0.006	<0.005	0.007	0.01	< 0.005
Copper	1	0.005	0.50	<0.0010	0.0017	0.0014	0.0008	0.0008	0.00106	< 0.0001	0.0003	0.0003	<0.0001	0.0013	0.0007
Lead	0.01	0.003	0.003	<0.00050	0.00003	< 0.00002	0.00002	< 0.00002	0.00002	< 0.00002	< 0.00002	<0.00002	<0.00002	< 0.00002	< 0.00002
Molybdenum	NV	0.04		<0.00050	0.0005	0.0003	0.0003	0.0001	0.00041	0.0002	0.0006	0.0006	0.0005	0.0004	0.0004
Nickel	NV	0.025		0.0016	< 0.01	< 0.01	< 0.01	< 0.01	0.0027	< 0.01	< 0.01	<0.01	<0.01	< 0.01	< 0.01
Selenium	0.01	0.1	0.003	<0.0020	< 0.001	< 0.001	< 0.001	< 0.001	-	< 0.001	< 0.001	<0.001	<0.001	< 0.001	< 0.001
Silver	NV	0.0001		<0.00010	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.000002	< 0.00002	< 0.00002	<0.00002	<0.00002	< 0.00002	< 0.00002
Strontium	NV			0.33	-	-	-	0.339	0.298	0.448	0.35	0.526	0.418	0.542	0.453
Thallium	NV	0.0003		<0.000050	< 0.00005	< 0.00005	< 0.00005	< 0.00005	-	< 0.00005	< 0.00005	<0.00005	<0.00005	< 0.00005	< 0.00005
Vanadium	NV	0.006		0.0026	0.0057	0.0036	0.0063	0.0069	0.00243	0.0046	0.0057	0.0038	0.0019	0.0041	0.0028
Zinc	5	0.02	2.5	<0.0050	< 0.005	< 0.005	< 0.005	< 0.005	0.005	< 0.005	< 0.005	<0.005	<0.005	< 0.005	< 0.005
Field Conductivity (µS/cm)	NV			570	682	460	-	-	-	543	454	590	505	503	570
Field pH (units)	6.5 - 8.5			6.86	7.02	6.15	-	-	-	6.46	6.58	6.2	6.84	6.84	7.59
Field Temperature (°C)	NV			7.9	10.1	9.3	-	-	-	10.56	13.68	10.22	11.4	8.6	12

ODWQS - Ontario Drinking Water Quality Objectives

PWQO - Provincial Water Quality Objectives

CWQG - Canadian Water Quality Guidelines (underlined value) - long term criteria

RUP - Reasonable Use Policy Criteria

Bold / Grey Highlighting - ODWQS Exceedance

Red / Bold - PWQO Exceedance

Bold / Underlined - RUP Exceedance

Bold / Red Highlighting - PWQO / CWQG Exceedance

all results in mg/L unless otherwise stated

Summary of Ground Water Quality - General Chemistry
Laxton Waste Disposal Site

Parameter	ODWQS	PWQO / CWQG	RUP	MW3 24-Apr-18	MW3 26-Sep-18	MW3 17-Apr-19	MW3 18-Oct-19	MW3 21-Apr-20	MW3 13-Oct-20	MW3 15-Apr-21	MW3 13-Oct-21	MW3 12-Apr-22	MW3 16-Oct-22	MW3 26-Apr-23	MW3 11-Oct-23
Alkalinity (as CaCO3)	500		301	187	207	192	221	320	185	232	231	276	210	251	319
Calcium	NV			55.9	63.2	50.1	59.7	94.2	53.6	75.4	73.9	70.5	55.3	71	88.9
Chloride	250	<u>120</u>	126	9.7	16.9	10.4	12.1	13.5	9.7	12.8	19	8.2	11.7	13.3	23.8
Oxygen Demand - Chemical (COD)	NV			33	70	27	25	35		42	37	35	24	17	18
Conductivity (µS/cm)	NV			391	529	451	508	716	449	558	563	582	520	579	706
Organic Carbon - Dissolved (DOC)	5		3.4	9.7	8.6	9.8	9.8	12.1	7.9	12.7	9.8	10.4	7.6	5.6	11.5
Fluoride	1.5		0.80	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	<0.1
Hardness (as CaCO3)	500		309	194	215	176	202	311	168	252	233	243	180	235	286
Iron	0.3	0.3		12.1	7.16	11.3	9.05	18.7	9.87	21.2	21	16.7	12.4	18	19.9
Magnesium	NV			13.3	13.9	12.3	12.8	18.3	8.21	15.4	11.7	16.3	10.2	14	15.6
Manganese	0.050		0.03	2.25	2.94	1.89	2.7	3.98	2.19	2.9	2.65	2.69	2.24	2.73	3.61
Mercury	0.001	0.0002	0.0003	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	<0.00002
Nitrate as N	10	<u>13</u>	2.5	< 0.05	< 0.05	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.06	< 0.05	0.07	<0.05
Nitrite as N	1	<u>0.06</u>	0.29	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	<0.05
pH	6.5 - 8.5			7.04	7.29	6.78	7.34	7.07	7.22	6.92	6.79	7.21	7.11	7.01	6.79
Phenols	NV	0.001		< 0.001	0.003	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.001	< 0.001	< 0.001	< 0.001	<0.001
Phosphorus	NV	0.03		< 0.1	< 0.1	0.27	0.06	< 0.1	< 0.1	0.07	0.08	< 0.1	< 0.1	< 0.1	<0.1
Potassium	NV			5.4	9.7	4.6	10.2	10.6	9.4	8.4	12.6	7.2	10.4	8.8	12.9
Sodium	200		101	11.5	14.8	10.8	18.3	20.9	16.2	20.1	25.7	15.3	16.7	16.6	30.8
Sulphate	500		257	17	36	19	16	27	22	25	34	23	28	26	34
Solids - Total Dissolved (TDS)	500		308	228	289	237	276	403	245	303	324	328	277	321	367
Total Kjeldahl Nitrogen (TKN)	NV			1.2	1.3	1.2	2.5	3.8	2.3	3.1	5.6	2.6	4	3.2	4.5
Total Ammonia as N (NH ₃ + NH ₄)	NV			0.79	0.99	0.95	2.13	3.54	2.08	2.94	4.82	2.17	3.41	2.99	5.35
Aluminum	0.10	0.08	0.06	0.04	0.05	0.04	0.06	0.05	0.04	0.06	0.04	0.05	0.01	0.02	0.06
Antimony	0.006	0.02	0.002	< 0.0001	< 0.0001	< 0.0001	0.0004	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	<0.0001
Arsenic	0.025	0.005	0.006	0.0002	0.0004	0.0004	< 0.0001	0.0005	0.0005	0.0004	0.0006	0.0005	0.0004	0.0004	0.0006
Barium	1		0.33	0.214	0.227	0.167	0.232	0.356	0.211	0.296	0.333	0.259	0.244	0.284	0.393
Beryllium	NV	0.011		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	<0.0001
Boron	5	<u>1.3</u>	1.3	0.234	0.336	0.276	0.519	0.64	0.5	0.685	0.918	0.541	0.583	0.656	1.18
Cadmium	0.005	0.0001	0.001	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	<0.000015
Chromium	0.05	0.001	0.013	0.001	0.001	0.001	0.002	0.001	0.001	0.001	0.001	< 0.001	< 0.001	< 0.001	<0.001
Cobalt	NV	0.0009		0.004	< 0.005	< 0.005	< 0.005	0.005	< 0.005	< 0.005	0.006	< 0.005	< 0.005	0.005	0.0091
Copper	1	0.005	0.50	0.0006	0.0009	0.0007	0.0005	0.0009	0.0006	0.002	0.0009	0.0008	0.0017	0.0006	0.001
Lead	0.01	0.003	0.003	< 0.00002	0.00003	0.00002	< 0.00002	< 0.00002	< 0.00002	0.00007	0.0001	0.00005	0.00003	< 0.00002	0.00003
Molybdenum	NV	0.04		0.0002	0.0004	0.0002	0.0005	0.0004	0.0004	0.0004	0.0006	0.0004	0.0006	0.0005	0.0006
Nickel	NV	0.025		< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.0027
Selenium	0.01	0.1	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
Silver	NV	0.0001		< 0.00002	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	<0.0001
Strontium	NV			0.364	0.417	0.332	0.393	0.528	0.304	0.45	0.365	0.445	0.305	0.424	0.479
Thallium	NV	0.0003		< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	<0.00005
Vanadium	NV	0.006		0.0039	0.0011	0.003	0.0018	0.0023	0.0021	0.0031	0.0027	0.0035	0.0022	0.0024	0.0031
Zinc	5	0.02	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
Field Conductivity (µS/cm)	NV			510	475	500	460	745	405	700	680	480	435	470	535
Field pH (units)	6.5 - 8.5			6.66	6.75	6.8	6.71	6.75	6.76	7.14	6.75	6.52	6.79	6.73	6.75
Field Temperature (°C)	NV			8.7	12	8.4	10.8	5.9	11.7	7	12.9	10.5	11.4	9.4	12.8

ODWQS - Ontario Drinking Water Quality Objectives
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RUP - Reasonable Use Policy Criteria
Bold / Grey Highlighting - ODWQS Exceedance
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Bold / Underlined - RUP Exceedance
Bold / Red Highlighting - PWQO / CWQG Exceedance
all results in mg/L unless otherwise stated

Summary of Ground Water Quality - General Chemistry
Laxton Waste Disposal Site

Parameter	ODWQS	PWQO / CWQG	RUP	MW4	MW4	MW4	MW4	MW4	MW4	MW4	MW4	MW4	MW4	MW4	MW4
				30-May-08	01-Oct-08	24-Jun-09	24-Aug-09	07-Jun-10	05-Oct-10	26-May-11	07-Sep-11	30-May-12	01-Nov-12	10-Jun-13	30-Oct-13
Alkalinity (as CaCO3)	500		301	1060	1090	1060	1140	1120	1070	1060	1110	1100	1100	1050	990
Calcium	NV			224	206	243	243	285	254	220	230	240	220	264	245
Chloride	250	<u>120</u>	126	78	83.2	78	90	95	83	87	100	80	100	65.8	53.7
Oxygen Demand - Chemical (COD)	NV			2	15	15	164	133	125	240	220	220	250	233	239
Conductivity (µS/cm)	NV			1960	2100	2090	2170	1860	1990	2280	2260	2200	2100	2040	1590
Organic Carbon - Dissolved (DOC)	5		3.4	49	32.49	60	53	59	61	70.2	61.1	56	77	64.8	61.6
Fluoride	1.5		0.80	<0.1	<0.1	< 0.1	< 0.1	< 0.1	0.1	0.1	0.11	0.12	0.12	0.2	< 0.1
Hardness (as CaCO3)	500		309	742	711	784	804	909	814	720	770	770	730	813	745
Iron	0.3	0.3		14.5	92.5	49	102	130	147	120	33	120	120	127	121
Magnesium	NV			44	47.8	43	48	48	44	41	47	41	44	37.3	32.2
Manganese	0.050		0.03	11.8	16.2	13.3	15	15	11.1	15	19	14	23	13.6	17.6
Mercury	0.001	0.0002	0.0003	<0.00002	<0.00002	< 0.00002	0.00004	< 0.00002	< 0.00002	0.00002	0.00002	<0.00001	<0.00001	< 0.00002	< 0.00002
Nitrate as N	10	<u>13</u>	2.5	<0.1	<0.1	< 0.1	< 0.1	< 0.1	< 0.1	<0.1	<0.1	<0.10	<0.10	0.2	< 0.1
Nitrite as N	1	<u>0.06</u>	0.29	<0.1	<0.1	< 0.1	< 0.1	< 0.1	< 0.1	<0.01	<0.01	0.015	<0.010	< 0.1	< 0.1
pH	6.5 - 8.5			6.45	6.67	6.73	6.65	6.7	6.73	6.87	6.64	7.03	6.84	6.76	6.81
Phenols	NV	0.001		0.002	0.004	0.006	0.01	0.009	0.006	0.003	0.019	0.015	<0.0010	0.003	< 0.001
Phosphorus	NV	0.03		0.03	<0.01	0.03	3.57	0.04	< 0.1	-	-	<0.10	<0.10	1.55	2.83
Potassium	NV			57.9	61.2	62	68.2	69.9	61.9	62	69	62	59	56.3	49.4
Sodium	200		101	97	102	92	108	107	92	100	120	110	110	94.2	72.8
Sulphate	500		257	21	25	49	40	46	43	<1	<1	<1	<1	26	26
Solids - Total Dissolved (TDS)	500		308	1270	1370	1360	1410	1210	1290	1370	1360	1380	1410	1250	1210
Total Kjeldahl Nitrogen (TKN)	NV			45.6	50.2	56.8	59.4	53.3	59.3	56	47	52	50	60.5	45.5
Total Ammonia as N (NH ₃ + NH ₄)	NV			40.6	42.6	37.6	54.9	45.4	49.4	60	48	43	47	47.6	15.8
Aluminum	0.10	0.08	0.06	0.02	0.12	0.08	11.4	0.09	0.11	0.1	0.025	0.11	0.078	0.21	0.15
Antimony	0.006	0.02	0.002	<0.01	<0.01	< 0.01	< 0.01	< 0.01	< 0.01	<0.0005	<0.0005	<0.00050	<0.00050	0.0001	< 0.0001
Arsenic	0.025	0.005	0.006	<0.01	<0.01	< 0.01	< 0.01	< 0.005	0.006	0.007	0.001	0.0065	0.0069	0.0151	0.0111
Barium	1		0.33	0.2	0.73	0.7	1.1	1.2	0.9	1.1	0.62	1.1	1.3	0.989	0.946
Beryllium	NV	0.011		<0.1	<0.1	< 0.1	< 0.1	< 0.1	< 0.1	<0.0005	<0.0005	<0.00050	<0.00050	< 0.002	< 0.002
Boron	5	<u>1.3</u>	1.3	1.1	1.11	1.1	1.2	1.6	0.9	1.1	1.1	1.1	0.97	1.17	1.21
Cadmium	0.005	0.0001	0.001	0.0003	0.0015	0.0014	0.002	0.0016	0.0017	<0.0001	<0.0001	<0.00010	<0.00010	< 0.00002	< 0.00002
Chromium	0.05	0.001	0.013	0.0013	0.0029	0.0025	0.0235	0.0029	0.0036	0.006	0.006	<0.0050	<0.0050	0.002	0.0389
Cobalt	NV	0.0009		0.0214	0.00259	0.0204	0.0306	0.0225	0.0246	0.034	0.051	0.038	0.023	0.027	0.046
Copper	1	0.005	0.50	0.0005	<0.0001	< 0.0001	0.0234	< 0.0001	< 0.0001	0.001	<0.001	<0.0010	<0.0010	0.0008	0.0009
Lead	0.01	0.003	0.003	0.005	0.01583	0.017	0.024	0.008	0.01	<0.0005	<0.0005	<0.00050	<0.00050	0.00006	< 0.00002
Molybdenum	NV	0.04		<0.002	0.002575	< 0.002	0.004	0.002	0.002	0.002	0.0053	0.0022	0.0011	0.0024	0.0026
Nickel	NV	0.025		<0.01	<0.01	< 0.01	0.02	< 0.01	< 0.01	0.006	0.012	0.0037	0.0066	< 0.01	< 0.01
Selenium	0.01	0.1	0.003	<0.01	<0.01	< 0.01	< 0.01	< 0.01	< 0.01	<0.002	<0.002	<0.0020	<0.0020	0.002	0.002
Silver	NV	0.0001		0.0006	0.000533	0.0007	0.0008	0.0006	0.0009	<0.0001	<0.0001	<0.00010	<0.00010	0.00002	0.00002
Strontium	NV			1.13	1.26	1.28	1.3	1.22	1.17	1.3	1.4	1.3	1.6	-	-
Thallium	NV	0.0003		0.0054	0.006163	0.0047	0.0045	0.0077	0.0069	<0.00005	<0.00005	<0.000050	<0.000050	< 0.00005	< 0.00005
Vanadium	NV	0.006		0.005	0.017187	0.017	0.064	0.018	0.022	0.022	0.0042	0.024	0.026	0.0314	0.0274
Zinc	5	0.02	2.5	<0.01	0.0123	0.01	0.04	< 0.01	0.02	0.01	<0.005	0.0065	<0.0050	0.008	0.011
Field Conductivity (µS/cm)	NV			-	-	-	-	-	-	-	-	2570	2800	2440	2300
Field pH (units)	6.5 - 8.5			-	-	-	-	-	-	-	-	6.73	6.53	6.53	6.33
Field Temperature (°C)	NV			-	-	-	-	-	-	-	-	11	8	14	9.6

ODWQS - Ontario Drinking Water Quality Objectives

PWQO - Provincial Water Quality Objectives

CWQG - Canadian Water Quality Guidelines (underlined value) - long term criteria

RUP - Reasonable Use Policy Criteria

Bold / Grey Highlighting - ODWQS Exceedance

Red / Bold - PWQO Exceedance

Bold / Underlined - RUP Exceedance

Bold / Red Highlighting - PWQO / CWQG Exceedance

all results in mg/L unless otherwise stated

Summary of Ground Water Quality - General Chemistry
Laxton Waste Disposal Site

Parameter	ODWQS	PWQO / CWQG	RUP	MW4	MW4	MW4	MW4	MW4	MW4	MW4	MW4	MW4	MW4	MW4	MW4
				29-Apr-14	23-Sep-14	09-Jun-15	10-Sep-15	30-May-16	17-Oct-16	19-Apr-17	17-Oct-17	24-Apr-18	26-Sep-18	17-Apr-19	18-Oct-19
Alkalinity (as CaCO3)	500		301	788	1070	1130	1160	753	873	679	672	702	594	594	582
Calcium	NV			256	257	268	249	158	241	221	218	215	178	204	203
Chloride	250	<u>120</u>	126	8.3	97.4	111	117	10.5	2.7	10.8	7.7	25.5	5.3	5.6	3.3
Oxygen Demand - Chemical (COD)	NV			111	305	242	337	164	115	127	113	144	91	106	94
Conductivity (µS/cm)	NV			1490	2260	2370	2470	1410	1720	1280	1290	1310	1130	1180	1160
Organic Carbon - Dissolved (DOC)	5		3.4	33.2	51.8	88.1	2800	18.7	28.2	15.9	22	18.9	22	21.1	29.9
Fluoride	1.5		0.80	0.1	< 0.1	0.1	0.1	0.2	0.2	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Hardness (as CaCO3)	500		309	714	791	862	818	458	712	614	603	646	507	562	563
Iron	0.3	0.3		100	157	125	124	95	108	105	97.4	119	97.1	91.4	96.3
Magnesium	NV			18.2	36.4	46.7	47.4	15	26.4	15.1	14	26.5	15.2	12.7	13.5
Manganese	0.050		0.03	6.87	13.8	16.8	22.1	5.33	10.5	9.08	9.65	16	10.3	6.44	9.36
Mercury	0.001	0.0002	0.0003	< 0.00002	< 0.00002	< 0.00002	0.00003	<0.00002	<0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Nitrate as N	10	<u>13</u>	2.5	< 0.1	< 0.1	< 0.1	< 0.1	0.1	<0.1	< 0.1	1.56	< 0.05	< 0.05	0.05	< 0.05
Nitrite as N	1	<u>0.06</u>	0.29	< 0.1	< 0.1	0.1	0.1	<0.1	<0.1	0.8	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
pH	6.5 - 8.5			6.85	6.85	7	6.93	6.85	7.49	7.08	6.72	7.03	7.07	6.63	7.1
Phenols	NV	0.001		< 0.001	< 0.001	0.002	< 0.001	<0.001	<0.001	< 0.001	0.005	< 0.001	0.014	< 0.002	< 0.002
Phosphorus	NV	0.03		0.05	1.39	1.57	0.16	0.36	0.41	< 0.1	< 0.1	< 0.1	< 0.1	1.63	0.84
Potassium	NV			32.4	55	63.6	64.2	22.9	40	25.8	27	32.9	23.2	20	23.7
Sodium	200		101	28.9	110	134	156	22	60.7	17.8	15	49.1	16.4	13.3	11.1
Sulphate	500		257	24	21	19	17	12	27	8	14	19	19	21	33
Solids - Total Dissolved (TDS)	500		308	978	1440	1520	1550	824	973	845	730	826	639	655	661
Total Kjeldahl Nitrogen (TKN)	NV			23.8	44.2	51	51.1	27.2	31.2	22.6	18.7	18.1	13.7	14	13.8
Total Ammonia as N (NH ₃ + NH ₄)	NV			23.2	41.9	43.8	42.8	23.9	31.2	17	16.2	16.5	11.4	12.1	11.3
Aluminum	0.10	0.08	0.06	0.13	0.15	0.17	0.17	0.09	0.15	0.13	0.12	0.14	0.12	0.12	0.14
Antimony	0.006	0.02	0.002	< 0.0001	< 0.0001	0.0001	0.0002	<0.0001	0.0003	< 0.0001	0.0001	< 0.0001	< 0.0001	< 0.0001	0.0061
Arsenic	0.025	0.005	0.006	0.0097	0.0182	0.0145	0.024	0.0051	0.0092	0.0099	0.0058	0.0115	0.0056	0.0055	< 0.0001
Barium	1		0.33	0.534	0.969	0.974	1.19	0.313	0.65	0.436	0.52	0.554	0.344	0.33	0.361
Beryllium	NV	0.011		< 0.002	< 0.002	< 0.002	< 0.002	<0.002	<0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Boron	5	<u>1.3</u>	1.3	0.972	0.966	0.982	0.969	0.657	0.971	0.65	0.677	0.728	0.57	0.66	0.577
Cadmium	0.005	0.0001	0.001	< 0.00002	< 0.00002	< 0.00002	0.00002	<0.00002	<0.00002	< 0.000014	< 0.000014	< 0.000015	< 0.000015	< 0.000015	< 0.000015
Chromium	0.05	0.001	0.013	< 0.0002	0.0388	0.0286	0.067	<0.0002	0.0131	< 0.001	< 0.001	0.005	0.004	0.003	0.004
Cobalt	NV	0.0009		0.022	0.038	0.048	0.059	0.018	0.031	0.025	0.02	0.0127	0.024	0.01	0.018
Copper	1	0.005	0.50	0.0007	0.0017	0.0006	0.0021	<0.0001	<0.0001	0.0001	0.0002	0.0016	0.0004	0.0006	0.0004
Lead	0.01	0.003	0.003	0.00003	< 0.00002	< 0.00002	0.00013	<0.00002	<0.00002	< 0.00002	< 0.00002	0.00006	< 0.00002	0.00003	< 0.00004
Molybdenum	NV	0.04		0.0014	0.0011	0.0013	0.0029	0.0015	0.0017	0.0016	0.0015	0.0015	0.0012	0.0007	0.0014
Nickel	NV	0.025		< 0.01	< 0.01	< 0.01	< 0.01	<0.01	<0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Selenium	0.01	0.1	0.003	< 0.001	0.004	0.005	0.005	<0.001	0.003	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Silver	NV	0.0001		< 0.00002	< 0.00002	< 0.00002	0.00004	<0.00002	0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.0001	< 0.0001	< 0.0001
Strontium	NV			-	1.58	1.57	1.64	0.726	1.31	1.06	0.994	1.18	0.95	0.94	1.02
Thallium	NV	0.0003		< 0.00005	< 0.00005	< 0.00005	0.00025	<0.00005	<0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Vanadium	NV	0.006		0.0259	0.0546	0.0373	0.0529	0.0179	0.0179	0.0183	0.0135	0.0214	0.0119	0.0116	0.0137
Zinc	5	0.02	2.5	0.01	0.012	0.011	0.01	0.006	0.006	0.008	< 0.005	0.006	< 0.005	< 0.005	< 0.005
Field Conductivity (µS/cm)	NV			-	-	3350	3430	1330	1670	1180	1205	1410	1170	1490	1095
Field pH (units)	6.5 - 8.5			-	-	6.43	6.43	8.3	6.65	6.64	7.42	6.52	6.45	6.55	6.53
Field Temperature (°C)	NV			-	-	12.83	12.23	11.01	10.6	8.5	10.3	10.6	11.1	9.9	9.3

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Red / Bold - PWQO Exceedance

Bold / Underlined - RUP Exceedance

Bold / Red Highlighting - PWQO / CWQG Exceedance

all results in mg/L unless otherwise stated

Summary of Ground Water Quality - General Chemistry
Laxton Waste Disposal Site

Parameter	ODWQS	PWQO / CWQG	RUP	MW4	MW4	MW4	MW4	MW4	MW4	MW4	MW4	MW6	MW6	MW6	MW6
				21-Apr-20	13-Oct-20	15-Apr-21	13-Oct-21	12-Apr-22	16-Oct-22	26-Apr-23	11-Oct-23	30-May-08	01-Oct-08	24-Jun-09	24-Aug-09
Alkalinity (as CaCO3)	500		301	574	580	530	550	634	605	586	554	313	291.66	364	374
Calcium	NV			204	189	205	207	218	183	179	192	138	140	171	199
Chloride	250	<u>120</u>	126	2.1	3.6	1.8	2.8	3	2.4	1.5	1.4	4.2	4.3	5	4
Oxygen Demand - Chemical (COD)	NV			108		111	103	97	96	77	85	8	15	15	16
Conductivity (µS/cm)	NV			1090	1150	1060	1040	1160	1160	1120	1020	746	873	890	978
Organic Carbon - Dissolved (DOC)	5		3.4	20.7	14.7	21.6	14.3	13.2	6	8.1	12.9	6	7.991	7	6
Fluoride	1.5		0.80	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Hardness (as CaCO3)	500		309	550	530	551	556	591	510	543	514	419	419	505	575
Iron	0.3	0.3		96.9	86.7	106	96.3	87.3	99.2	7.97	94.6	< 0.1	1.7089	0.3	1.7
Magnesium	NV			9.65	13.9	9.32	9.3	11.2	12.9	14.4	8.26	18	16.8	19	19
Manganese	0.050		0.03	6.24	12.5	6.38	6.23	4.66	9.31	8.82	6.11	0.2	0.7877	0.74	0.69
Mercury	0.001	0.0002	0.0003	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	0.00002	< 0.00002	< 0.00002	< 0.00002
Nitrate as N	10	<u>13</u>	2.5	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.17	0.08	2.2	0.4	1.2	0.8
Nitrite as N	1	<u>0.06</u>	0.29	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.1	< 0.1	< 0.1	< 0.1
pH	6.5 - 8.5			6.81	6.96	6.73	6.63	7.19	6.86	6.79	6.73	6.87	6.81	7.06	6.8
Phenols	NV	0.001		< 0.002	< 0.002	< 0.002	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.001	< 0.001	< 0.001	< 0.001
Phosphorus	NV	0.03		< 0.1	< 0.1	0.63	1.04	< 0.1	< 0.1	< 0.1	< 0.1	< 0.01	< 0.01	< 0.01	0.01
Potassium	NV			16.1	20.9	16.9	16.2	16.9	17.2	16.3	14.6	16.3	14.2	14.8	14.2
Sodium	200		101	6.5	18.3	5.9	6.2	8.1	10	10.9	5	12	12	11	9
Sulphate	500		257	8	27	12	12	17	26	17	14	129	199.3	151	189
Solids - Total Dissolved (TDS)	500		308	609	646	587	602	675	636	608	543	485	567.45	579	636
Total Kjeldahl Nitrogen (TKN)	NV			11.1	11.7	10.2	11.8	14.3	12.2	9.6	10	0.7	1.7	0.9	1.4
Total Ammonia as N (NH ₃ + NH ₄)	NV			9.02	9.66	9.05	9.29	12.3	9.62	7.79	9.15	0.1	1.58	0.53	0.72
Aluminum	0.10	0.08	0.06	0.29	0.1	0.13	0.13	0.13	0.1	0.06	0.12	< 0.01	0.02231	< 0.01	< 0.01
Antimony	0.006	0.02	0.002	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.0001	< 0.0001	< 0.0001	< 0.01	< 0.01	< 0.01	< 0.01
Arsenic	0.025	0.005	0.006	0.0048	0.0064	0.0055	0.0051	0.0045	0.0067	0.007	0.0054	< 0.01	< 0.01	< 0.01	< 0.01
Barium	1		0.33	0.3	0.355	0.288	0.287	0.315	0.287	0.109	0.26	< 0.1	< 0.1	< 0.1	< 0.1
Beryllium	NV	0.011		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.0001	< 0.1	< 0.1	< 0.1	< 0.1
Boron	5	<u>1.3</u>	1.3	0.524	0.677	0.43	0.462	0.671	0.388	0.367	0.421	0.4	0.528	< 0.1	0.3
Cadmium	0.005	0.0001	0.001	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000012	< 0.000012	< 0.000015	< 0.0001	0.000166	< 0.0001	< 0.0001
Chromium	0.05	0.001	0.013	0.004	0.008	0.002	0.003	< 0.001	0.002	0.003	0.003	0.0003	0.000957	0.0006	0.0006
Cobalt	NV	0.0009		0.019	0.022	0.021	0.015	0.009	0.019	0.045	0.0197	0.0005	0.00248	0.0017	0.0021
Copper	1	0.005	0.50	0.0007	0.0003	0.0012	0.0003	0.0004	0.0003	0.0002	0.0004	0.0016	0.002544	0.0019	0.0038
Lead	0.01	0.003	0.003	0.00009	< 0.00004	0.00006	0.00006	< 0.00004	< 0.00004	< 0.00004	< 0.00002	< 0.001	< 0.001	< 0.001	< 0.001
Molybdenum	NV	0.04		0.0009	0.0018	0.0009	0.0008	0.0008	0.0014	0.0015	0.0009	< 0.002	< 0.002	< 0.002	< 0.002
Nickel	NV	0.025		< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.0011	< 0.01	< 0.01	< 0.01	< 0.01
Selenium	0.01	0.1	0.003	< 0.001	< 0.001	< 0.001	0.001	< 0.001	0.002	< 0.001	< 0.001	< 0.01	< 0.01	< 0.01	< 0.01
Silver	NV	0.0001		< 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	NV			0.77	0.919	0.813	0.859	0.946	0.848	0.827	0.78	0.671	0.795	0.861	1.05
Thallium	NV	0.0003		< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.0003	0.000319	0.0004	0.0004
Vanadium	NV	0.006		0.0115	0.0141	0.0132	0.0121	0.0104	0.0139	0.0128	0.012	< 0.001	< 0.001	< 0.001	< 0.001
Zinc	5	0.02	2.5	< 0.005	0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.01	< 0.01	< 0.01	< 0.01
Field Conductivity (µS/cm)	NV			1270	680	1220	1285	1085	965	890	785	-	-	-	-
Field pH (units)	6.5 - 8.5			6.66	6.22	6.96	6.64	6.32	6.4	6.65	6.4	-	-	-	-
Field Temperature (°C)	NV			6.8	9.8	7.8	10.9	11.1	10.1	9	10.4	-	-	-	-

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Red / Bold - PWQO Exceedance

Bold / Underlined - RUP Exceedance

Bold / Red Highlighting - PWQO / CWQG Exceedance

all results in mg/L unless otherwise stated

Summary of Ground Water Quality - General Chemistry
Laxton Waste Disposal Site

Parameter	ODWQS	PWQO / CWQG	RUP	MW6	MW6	MW6	MW6	MW6	MW6	MW6	MW6	MW6	MW6	MW6	MW6
				07-Jun-10	05-Oct-10	26-May-11	07-Sep-11	30-May-12	01-Nov-12	10-Jun-13	30-Oct-13	29-Apr-14	23-Sep-14	15-Jun-15	11-Sep-15
Alkalinity (as CaCO3)	500		301	386	382	338	384	350	380	202	274	340	311	256	297
Calcium	NV			195	216	150	210	180	190	120	163	157	165	143	191
Chloride	250	<u>120</u>	126	6	7	5	6	6	6	3.2	3.7	3.6	3.8	6.1	5.3
Oxygen Demand - Chemical (COD)	NV			22	19	20	29	25	29	11	20	19	18	35	20
Conductivity (µS/cm)	NV			874	1000	909	1120	1000	970	732	887	848	936	965	1040
Organic Carbon - Dissolved (DOC)	5		3.4	7	8	7.3	6.6	7.1	7.8	13.2	12	8.2	10.8	3.6	8.6
Fluoride	1.5		0.80	< 0.1	< 0.1	<0.1	0.09	<0.10	<0.10	0.2	< 0.1	0.1	< 0.1	0.1	0.1
Hardness (as CaCO3)	500		309	571	642	460	630	520	560	355	472	465	481	415	553
Iron	0.3	0.3		6.2	8.2	1.4	2.4	4.9	7.3	0.238	2.37	0.039	1.46	2.43	15.1
Magnesium	NV			21	25	19	24	17	21	13.1	16	17.8	16.8	14.2	18.5
Manganese	0.050		0.03	1.83	1.6	1.3	2.1	0.93	2.1	0.66	1.65	0.041	1.41	1.32	1.67
Mercury	0.001	0.0002	0.0003	< 0.00002	< 0.00002	0.00002	<0.00001	<0.00001	<0.00001	< 0.00002	< 0.00002	< 0.00002	< 0.00002	<0.00002	< 0.00002
Nitrate as N	10	<u>13</u>	2.5	0.4	0.2	1	0.1	0.3	<0.10	2.7	0.4	1.8	0.1	0.1	< 0.1
Nitrite as N	1	<u>0.06</u>	0.29	< 0.1	< 0.1	0.24	<0.01	<0.010	<0.010	0.2	< 0.1	< 0.1	< 0.1	<0.1	0.1
pH	6.5 - 8.5			6.78	6.87	7.22	6.83	7.22	6.95	6.89	6.9	7.49	7	7.14	7.21
Phenols	NV	0.001		< 0.001	< 0.001	<0.001	0.003	<0.0010	<0.0010	< 0.001	< 0.001	< 0.001	< 0.001	<0.001	< 0.001
Phosphorus	NV	0.03		< 0.01	< 0.02	-	-	<0.10	<0.10	0.01	0.03	< 0.01	0.08	0.02	0.01
Potassium	NV			14.9	16.8	12	17	13	16	9.6	12.7	10.7	12.5	10.9	13.4
Sodium	200		101	9	9	7.3	10	7.5	9.7	6.2	9.9	12.6	9.3	7.9	9.7
Sulphate	500		257	156	250	140	260	190	210	151	160	116	184	224	278
Solids - Total Dissolved (TDS)	500		308	568	653	563	783	641	702	438	535	530	584	564	713
Total Kjeldahl Nitrogen (TKN)	NV			1.6	3.4	1.4	2.8	2	2.5	0.9	1.3	0.5	2.3	1.7	2.2
Total Ammonia as N (NH ₃ + NH ₄)	NV			1.49	2.4	1.1	2.7	1.7	3	0.295	1.16	0.02	2.03	1.53	1.81
Aluminum	0.10	0.08	0.06	< 0.01	0.03	<0.005	<0.005	0.0052	0.0057	0.05	0.05	0.03	0.04	0.03	0.05
Antimony	0.006	0.02	0.002	< 0.01	< 0.01	<0.0005	<0.0005	<0.00050	<0.00050	< 0.0001	< 0.0001	0.0002	< 0.0001	<0.0001	< 0.0001
Arsenic	0.025	0.005	0.006	< 0.005	< 0.005	<0.001	<0.001	<0.0010	<0.0010	0.0002	< 0.0001	0.0001	0.0002	< 0.002	0.0003
Barium	1		0.33	0.1	0.2	0.11	0.22	0.14	0.21	0.079	0.139	0.045	0.093	0.106	0.18
Beryllium	NV	0.011		< 0.1	< 0.1	<0.0005	<0.0005	<0.00050	<0.00050	< 0.002	< 0.002	< 0.002	< 0.002	<0.002	< 0.002
Boron	5	<u>1.3</u>	1.3	0.5	0.1	0.28	0.49	0.42	0.48	0.434	0.953	0.485	0.877	0.61	0.656
Cadmium	0.005	0.0001	0.001	0.0002	0.0002	<0.0001	<0.0001	<0.00010	<0.00010	0.00006	0.00006	0.00003	0.00011	0.00007	0.00007
Chromium	0.05	0.001	0.013	0.0008	0.0009	<0.005	<0.005	<0.0050	<0.0050	< 0.002	0.0199	< 0.0002	0.0096	0.0033	0.0107
Cobalt	NV	0.0009		0.0036	0.0039	0.0031	0.0052	0.0029	0.0037	0.0008	< 0.005	< 0.005	< 0.005	<0.005	0.006
Copper	1	0.005	0.50	0.0031	0.0021	0.004	0.002	0.0029	0.003	0.0028	0.0035	0.0019	0.0038	0.0018	0.0025
Lead	0.01	0.003	0.003	< 0.001	< 0.001	<0.0005	<0.0005	<0.00050	<0.00050	0.00012	< 0.00002	0.00004	< 0.00002	<0.00002	< 0.00002
Molybdenum	NV	0.04		< 0.002	< 0.002	<0.001	<0.0005	0.00056	<0.00050	0.0004	0.0006	0.0014	0.0005	0.0005	0.0006
Nickel	NV	0.025		< 0.01	< 0.01	0.002	0.002	0.0026	0.0024	< 0.01	< 0.01	< 0.01	< 0.01	<0.01	< 0.01
Selenium	0.01	0.1	0.003	< 0.01	< 0.01	<0.002	<0.002	<0.0020	<0.0020	< 0.001	< 0.001	< 0.001	< 0.001	<0.001	< 0.001
Silver	NV	0.0001		< 0.0001	< 0.0001	<0.0001	<0.0001	0.00012	<0.00010	< 0.00002	< 0.00002	< 0.00002	< 0.00002	<0.00002	< 0.00002
Strontium	NV			1.07	1.2	0.94	1.2	1	1.1	-	-	-	0.995	0.797	0.978
Thallium	NV	0.0003		0.001	0.0008	<0.00005	<0.00005	<0.000050	<0.000050	< 0.00005	< 0.00005	< 0.00005	< 0.00005	<0.00005	< 0.00005
Vanadium	NV	0.006		< 0.001	< 0.001	<0.001	<0.0005	0.00096	0.0018	0.0034	0.0029	0.007	0.0098	0.003	0.0059
Zinc	5	0.02	2.5	< 0.01	< 0.01	0.007	<0.005	0.0079	<0.0050	< 0.005	< 0.005	< 0.005	< 0.005	<0.005	< 0.005
Field Conductivity (µS/cm)	NV			-	-	-	-	1033	1200	704	850	-	-	595	848
Field pH (units)	6.5 - 8.5			-	-	-	-	6.7	6.96	6.72	6.54	-	-	5.68	6.43
Field Temperature (°C)	NV			-	-	-	-	11.5	7.5	9.9	8	-	-	12.84	11.24

ODWQS - Ontario Drinking Water Quality Objectives

PWQO - Provincial Water Quality Objectives

CWQG - Canadian Water Quality Guidelines (underlined value) - long term criteria

RUP - Reasonable Use Policy Criteria

Bold / Grey Highlighting - ODWQS Exceedance

Red / Bold - PWQO Exceedance

Bold / Underlined - RUP Exceedance

Bold / Red Highlighting - PWQO / CWQG Exceedance

all results in mg/L unless otherwise stated

Summary of Ground Water Quality - General Chemistry
Laxton Waste Disposal Site

Parameter	ODWQS	PWQO / CWQG	RUP	MW6 30-May-16	MW6 17-Oct-16	MW6 19-Apr-17	MW6 17-Oct-17	MW6 24-Apr-18	MW6 26-Sep-18	MW6 17-Apr-19	MW6 18-Oct-19	MW6 21-Apr-20	MW6 21-Apr-20	MW6 13-Oct-20	MW6 15-Apr-21
Alkalinity (as CaCO3)	500		301	238	271	214	155	248	238	248	270	241	234	312	282
Calcium	NV			123	143	106	126	96.6	68	81.8	86.3	86.1	87.8	105	112
Chloride	250	<u>120</u>	126	3.6	5.7	2.8	2.5	1.7	3	2.4	2.7	1.8	1.8	2.4	1.6
Oxygen Demand - Chemical (COD)	NV			18	267	16	27	23	41	38	47	38	41		42
Conductivity (µS/cm)	NV			646	913	596	749	513	487	528	536	529	522	623	621
Organic Carbon - Dissolved (DOC)	5		3.4	5.4	7	5.2	9.4	8.7	15.8	14.7	19.6	16	15.8	17.5	15.6
Fluoride	1.5		0.80	0.1	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.1	< 0.1	< 0.1	< 0.1	< 0.1
Hardness (as CaCO3)	500		309	355	419	302	359	289	223	269	301	281	286	326	346
Iron	0.3	0.3		1.06	5.43	0.416	2.39	0.822	5.75	6.04	10.5	4.12	4.2	7.71	3.01
Magnesium	NV			11.8	14.9	8.87	10.7	11.6	12.8	15.7	20.8	16	16.1	15.5	16
Manganese	0.050		0.03	0.258	1.34	0.132	0.797	0.127	0.47	0.495	0.644	0.52	0.53	0.723	0.625
Mercury	0.001	0.0002	0.0003	<0.00002	<0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Nitrate as N	10	<u>13</u>	2.5	1.2	0.3	1.5	< 0.05	0.52	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nitrite as N	1	<u>0.06</u>	0.29	0.1	<0.1	0.2	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
pH	6.5 - 8.5			7.07	7.28	7.46	6.8	7.33	7.26	7.06	7.47	7.16	7.18	7.27	7.16
Phenols	NV	0.001		<0.001	<0.001	< 0.001	0.007	< 0.001	0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Phosphorus	NV	0.03		<0.01	0.05	< 0.1	< 0.1	< 0.1	< 0.1	0.31	0.01	< 0.1	< 0.1	< 0.1	0.04
Potassium	NV			9	11.1	6.8	8.7	5.7	4.5	3.8	4.5	3.4	3.4	3.6	3.2
Sodium	200		101	7.2	9.8	6.5	10.1	5.1	3.4	2.2	2.5	3.3	3.3	2.5	3.4
Sulphate	500		257	98	215	87	195	37	27	17	7	33	34	10	30
Solids - Total Dissolved (TDS)	500		308	403	572	355	451	308	268	279	298	293	292	335	339
Total Kjeldahl Nitrogen (TKN)	NV			0.6	4.3	0.3	0.9	0.3	0.8	0.6	0.4	0.6	0.6	0.8	0.6
Total Ammonia as N (NH ₃ + NH ₄)	NV			0.31	1.14	0.09	0.62	0.11	0.21	0.16	0.35	0.14	0.13	0.28	0.15
Aluminum	0.10	0.08	0.06	0.03	0.04	0.03	0.06	0.05	0.05	0.05	0.06	0.05	0.05	0.07	0.08
Antimony	0.006	0.02	0.002	0.0001	0.0003	< 0.0001	< 0.0001	< 0.0001	0.0001	< 0.0001	0.0004	< 0.0001	< 0.0001	< 0.0001	0.0001
Arsenic	0.025	0.005	0.006	0.0001	0.0002	< 0.0001	0.0001	0.0002	0.0003	0.0003	0.0001	0.0002	0.0003	0.0004	0.0003
Barium	1		0.33	0.06	0.109	0.046	0.128	0.047	0.057	0.052	0.058	0.046	0.047	0.058	0.058
Beryllium	NV	0.011		<0.002	<0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Boron	5	<u>1.3</u>	1.3	0.237	0.491	0.28	0.308	0.141	0.112	0.093	0.09	0.108	0.109	0.106	0.1
Cadmium	0.005	0.0001	0.001	<0.00002	0.00005	0.000025	0.000065	0.000061	0.000073	0.000053	0.000075	0.000164	0.00016	0.000069	0.000117
Chromium	0.05	0.001	0.013	<0.0002	0.0039	< 0.001	< 0.001	< 0.001	0.001	< 0.001	0.003	0.001	0.001	0.002	< 0.001
Cobalt	NV	0.0009		<0.005	<0.005	< 0.005	< 0.005	0.0006	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Copper	1	0.005	0.50	0.001	0.0008	0.0009	0.0015	0.0022	0.0032	0.0024	0.0034	0.0024	0.0023	0.0031	0.0042
Lead	0.01	0.003	0.003	<0.00002	<0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	0.00003	< 0.00002	< 0.00002	< 0.00002	0.00003
Molybdenum	NV	0.04		0.0006	0.0004	0.0006	0.0002	0.0003	0.0004	0.0004	0.0006	0.0004	0.0004	0.0005	0.0004
Nickel	NV	0.025		<0.01	<0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Selenium	0.01	0.1	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
Silver	NV	0.0001		<0.00002	<0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Strontium	NV			0.547	0.779	0.362	0.615	0.44	0.299	0.305	0.339	0.321	0.324	0.331	0.416
Thallium	NV	0.0003		<0.00005	<0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Vanadium	NV	0.006		0.0021	0.002	0.0022	0.0012	0.0019	0.002	0.0021	0.0033	0.0018	0.0017	0.0033	0.0019
Zinc	5	0.02	2.5	<0.005	<0.005	< 0.005	< 0.005	0.013	0.01	0.006	< 0.005	0.01	0.008	< 0.005	0.008
Field Conductivity (µS/cm)	NV			568	760	480	560	620	425	610	495	550	550	540	710
Field pH (units)	6.5 - 8.5			7.32	6.72	7.15	7.4	6.87	6.67	7.03	6.9	6.96	6.96	6.66	7.37
Field Temperature (°C)	NV			9.76	10.5	8.5	10.5	9.1	10.9	9.9	9.4	6.3	6.3	9.3	7.6

ODWQS - Ontario Drinking Water Quality Objectives
PWQO - Provincial Water Quality Objectives
CWQG - Canadian Water Quality Guidelines (underlined value) - long term criteria
RUP - Reasonable Use Policy Criteria
Bold / Grey Highlighting - ODWQS Exceedance
Red / Bold - PWQO Exceedance
Bold / Underlined - RUP Exceedance
Bold / Red Highlighting - PWQO / CWQG Exceedance
all results in mg/L unless otherwise stated

Summary of Ground Water Quality - General Chemistry

Laxton Waste Disposal Site

Parameter	ODWQS	PWQO / CWQG	RUP	MW6 13-Oct-21	MW6 12-Apr-22	MW6 16-Oct-22	MW6 26-Apr-23	MW6 11-Oct-23
Alkalinity (as CaCO3)	500		301	334	265	329	227	377
Calcium	NV			124	88.5	96.6	77.3	116
Chloride	250	<u>120</u>	126	2.7	1.1	1.3	1.1	1.4
Oxygen Demand - Chemical (COD)	NV			49	47	49	20	44
Conductivity (µS/cm)	NV			651	524	640	507	686
Organic Carbon - Dissolved (DOC)	5		3.4	15.6	15.9	14.2	9.4	17
Fluoride	1.5		0.80	< 0.1	< 0.1	< 0.1	< 0.1	<0.1
Hardness (as CaCO3)	500		309	379	272	307	231	367
Iron	0.3	0.3		3.9	5.58	3.45	1.38	3.43
Magnesium	NV			16.9	12.3	15.9	9.1	18.8
Manganese	0.050		0.03	0.732	0.313	0.419	0.166	0.502
Mercury	0.001	0.0002	0.0003	< 0.00002	< 0.00002	< 0.00002	< 0.00002	<0.00002
Nitrate as N	10	<u>13</u>	2.5	< 0.05	0.15	< 0.05	< 0.05	<0.05
Nitrite as N	1	<u>0.06</u>	0.29	< 0.05	< 0.05	< 0.05	< 0.05	<0.05
pH	6.5 - 8.5			7.01	7.38	7.25	7.38	6.96
Phenols	NV	0.001		< 0.001	< 0.001	< 0.001	< 0.001	<0.001
Phosphorus	NV	0.03		0.04	< 0.1	< 0.1	< 0.1	<0.1
Potassium	NV			3	2.9	2.7	2.3	3.1
Sodium	200		101	2.7	2.9	2.2	5.1	2
Sulphate	500		257	11	19	5	42	10
Solids - Total Dissolved (TDS)	500		308	365	293	325	274	356
Total Kjeldahl Nitrogen (TKN)	NV			0.9	1.2	0.8	0.7	0.8
Total Ammonia as N (NH ₃ + NH ₄)	NV			0.23	0.42	0.23	0.13	0.37
Aluminum	0.10	0.08	0.06	0.07	0.03	0.03	0.03	0.08
Antimony	0.006	0.02	0.002	0.0002	0.0001	< 0.0001	0.0002	0.0002
Arsenic	0.025	0.005	0.006	0.0004	0.0003	0.0004	0.0002	0.0003
Barium	1		0.33	0.061	0.049	0.049	0.034	0.063
Beryllium	NV	0.011		< 0.002	< 0.002	< 0.002	< 0.002	<0.0001
Boron	5	<u>1.3</u>	1.3	0.086	0.094	0.082	0.144	0.08
Cadmium	0.005	0.0001	0.001	0.000076	0.000089	0.000068	0.00008	0.000099
Chromium	0.05	0.001	0.013	0.002	< 0.001	< 0.001	< 0.001	0.001
Cobalt	NV	0.0009		< 0.005	< 0.005	< 0.005	< 0.005	0.0034
Copper	1	0.005	0.50	0.004	0.0024	0.0032	0.0022	0.0036
Lead	0.01	0.003	0.003	0.00004	< 0.00002	< 0.00002	< 0.00002	<0.00002
Molybdenum	NV	0.04		0.0005	0.0006	0.0006	0.0006	0.0005
Nickel	NV	0.025		< 0.01	< 0.01	< 0.01	< 0.01	0.0028
Selenium	0.01	0.1	0.003	< 0.001	< 0.001	< 0.001	< 0.001	<0.001
Silver	NV	0.0001		< 0.0001	< 0.0001	< 0.0001	< 0.0001	<0.0001
Strontium	NV			0.591	0.502	0.615	0.392	0.767
Thallium	NV	0.0003		< 0.00005	< 0.00005	< 0.00005	< 0.00005	<0.00005
Vanadium	NV	0.006		0.0032	0.0028	0.0035	0.0018	0.0029
Zinc	5	0.02	2.5	0.005	0.005	< 0.005	0.008	0.007
Field Conductivity (µS/cm)	NV			675	420	500	380	430
Field pH (units)	6.5 - 8.5			6.71	6.71	6.72	7.35	6.74
Field Temperature (°C)	NV			10.2	10	9	7.7	9.4

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Bold / Grey Highlighting - ODWQS Exceedance

Red / Bold - PWQO Exceedance

Bold / Underlined - RUP Exceedance

Bold / Red Highlighting - PWQO / CWQG Exceedance

all results in mg/L unless otherwise stated

Summary of Ground Water Quality - General
Chemistry
Laxton Waste Disposal Site

Parameter	ODWQS	PWQO / CWQG	RUP	MW7	MW7	MW7	MW7	MW7	MW7	MW7	MW7	MW7	MW7	MW7	MW7
				30-May-08	01-Oct-08	24-Jun-09	24-Aug-09	04-Jun-10	05-Oct-10	26-May-11	07-Sep-11	30-May-12	01-Nov-12	10-Jun-13	30-Oct-13
Alkalinity (as CaCO3)	500		301	77	89.53	64	82	90	108	81	96	86	120	88	124
Calcium	NV			26	26.7	24	29	28	40	26	31	26	41	30.6	53.2
Chloride	250	<u>120</u>	126	11	8.4	9	8	7	5	4	4	6	12	9.8	17
Oxygen Demand - Chemical (COD)	NV			<2	7	< 2	< 2	4	4	9	6	13	12	22	9
Conductivity (µS/cm)	NV			217	230	186	214	222	236	204	227	200	320	244	389
Organic Carbon - Dissolved (DOC)	5		3.4	2	2.15	2	2	2	2	2	1.8	2	1.8	4.2	4.4
Fluoride	1.5		0.80	<0.1	<0.1	< 0.1	< 0.1	< 0.1	< 0.1	<0.1	0.05	<0.10	<0.10	0.2	< 0.1
Hardness (as CaCO3)	500		309	93	99.1	84.6	101	98.9	140	91	110	90	150	108	184
Iron	0.3	0.3		<0.1	<0.1	< 0.1	26.3	< 0.1	< 0.1	<0.1	<0.1	<0.10	<0.10	0.014	0.013
Magnesium	NV			7	7.88	6	7	7	10	6.5	7.7	6.4	11	7.75	12.3
Manganese	0.050		0.03	<0.01	<0.01	< 0.01	1.95	< 0.01	< 0.01	<0.002	0.004	<0.0020	0.0072	0.001	< 0.001
Mercury	0.001	0.0002	0.0003	<0.00002	<0.00002	0.00002	0.00002	< 0.00002	< 0.00002	0.00002	<0.00001	<0.00001	0.00001	< 0.00002	< 0.00002
Nitrate as N	10	<u>13</u>	2.5	1.3	0.4	0.7	0.4	0.9	0.8	0.7	0.7	0.75	3.1	1.4	3.2
Nitrite as N	1	<u>0.06</u>	0.29	<0.1	<0.1	< 0.1	< 0.1	< 0.1	< 0.1	<0.01	<0.01	<0.010	<0.010	< 0.1	< 0.1
pH	6.5 - 8.5			6.4	6.82	7.12	6.79	7.08	6.98	7.02	6.78	7.02	6.8	7.12	6.94
Phenols	NV	0.001		<0.001	<0.001	< 0.001	< 0.001	< 0.001	< 0.001	<0.001	0.001	<0.0010	<0.0010	< 0.001	< 0.001
Phosphorus	NV	0.03		0.01	<0.01	< 0.01	2.56	< 0.01	< 0.02	-	-	<0.10	<0.10	1.14	0.31
Potassium	NV			2.6	2.6	2.6	2.8	2.4	2.8	2.4	2.7	2.3	3.2	2.4	3.1
Sodium	200		101	5	5.78	6	6	5	4	3.6	3.9	3	5.5	4.7	8.4
Sulphate	500		257	15	15.7	15	15	17	17	13	13	11	16	12	22
Solids - Total Dissolved (TDS)	500		308	141	149.5	121	139	144	153	114	131	117	186	127	205
Total Kjeldahl Nitrogen (TKN)	NV			<0.1	0.2	0.1	0.3	0.2	0.2	0.3	<2	0.61	0.28	0.2	0.2
Total Ammonia as N (NH ₃ + NH ₄)	NV			<0.1	<0.1	0.09	0.02	< 0.01	0.02	<0.01	<0.01	0.05	0.04	0.021	0.027
Aluminum	0.10	0.08	0.06	<0.01	0.04661	< 0.01	9.72	0.01	< 0.01	0.006	0.008	0.0093	0.021	0.02	0.03
Antimony	0.006	0.02	0.002	<0.01	<0.01	< 0.01	< 0.01	< 0.01	< 0.01	<0.0005	<0.0005	<0.00050	<0.00050	< 0.0001	< 0.0001
Arsenic	0.025	0.005	0.006	<0.01	<0.01	< 0.01	< 0.01	< 0.005	< 0.005	<0.001	<0.001	<0.0010	<0.0010	< 0.0001	< 0.0001
Barium	1		0.33	<0.1	<0.1	< 0.1	0.4	< 0.1	0.1	0.089	0.11	0.083	0.16	0.108	0.184
Beryllium	NV	0.011		<0.1	<0.1	< 0.1	< 0.1	< 0.1	< 0.1	<0.0005	<0.0005	<0.00050	<0.00050	< 0.002	< 0.002
Boron	5	1.3	1.3	<0.1	<0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.028	0.02	0.024	0.045	0.033	0.089
Cadmium	0.005	0.0001	0.001	<0.0001	<0.0001	< 0.0001	0.001	< 0.0001	< 0.0001	<0.0001	<0.0001	<0.00010	<0.00010	0.00002	< 0.00002
Chromium	0.05	0.001	0.013	0.0002	0.000749	0.0002	0.0205	0.0007	0.0003	<0.005	<0.005	<0.0050	<0.0050	< 0.002	0.003
Cobalt	NV	0.0009		<0.0003	<0.0003	< 0.0003	0.0304	< 0.0003	< 0.0003	<0.0005	<0.0005	<0.00050	<0.00050	< 0.0001	< 0.005
Copper	1	0.005	0.50	0.0021	0.002015	0.0016	0.128	0.002	0.0026	0.002	0.002	0.0022	0.0025	0.0024	0.0025
Lead	0.01	0.003	0.003	<0.001	<0.001	< 0.001	0.026	< 0.001	< 0.001	<0.0005	<0.0005	<0.00050	<0.00050	< 0.00002	< 0.00002
Molybdenum	NV	0.04		<0.002	<0.002	< 0.002	< 0.002	< 0.002	< 0.002	<0.001	<0.0005	<0.00050	<0.00050	0.0002	0.0001
Nickel	NV	0.025		<0.01	<0.01	< 0.01	0.03	< 0.01	< 0.01	<0.001	<0.001	<0.0010	<0.0010	< 0.01	< 0.01
Selenium	0.01	0.1	0.003	<0.01	<0.01	< 0.01	< 0.01	< 0.01	< 0.01	<0.002	<0.002	<0.0020	<0.0020	< 0.001	< 0.001
Silver	NV	0.0001		<0.0001	<0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	<0.0001	<0.0001	<0.00010	<0.00010	< 0.00002	< 0.00002
Strontium	NV			0.168	0.1698	0.142	0.199	0.176	0.225	0.16	0.2	0.16	0.28	-	-
Thallium	NV	0.0003		<0.0003	<0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	<0.00005	<0.00005	<0.000050	<0.000050	< 0.00005	< 0.00005
Vanadium	NV	0.006		<0.001	<0.001	< 0.001	0.053	< 0.001	< 0.001	<0.001	<0.0005	<0.00050	0.00067	0.0018	0.0009
Zinc	5	0.02	2.5	<0.01	0.010432	< 0.01	0.1	< 0.01	< 0.01	0.012	<0.005	0.013	0.014	0.009	0.014
Field Conductivity (µs/cm)	NV			-	-	-	-	-	-	-	-	283	340	257	380
Field pH (units)	6.5 - 8.5			-	-	-	-	-	-	-	-	7.73	7.61	9.03	6.63
Field Temperature (°C)	NV			-	-	-	-	-	-	-	-	11.3	8.8	11.5	11

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Summary of Ground Water Quality - General
Chemistry
Laxton Waste Disposal Site

Parameter	ODWQS	PWQO / CWQG	RUP	MW7	MW7	MW7	MW7	MW7	MW7	MW7	MW7	MW7	MW7	MW7	MW7
				29-Apr-14	23-Sep-14	15-Jun-15	10-Sep-15	30-May-16	17-Oct-16	19-Apr-17	17-Oct-17	24-Apr-18	26-Sep-18	17-Apr-19	18-Oct-19
Alkalinity (as CaCO3)	500		301	103	241	179	232	Insufficient Water to Sample	Dry	Well Broken	Well Broken	150	Protective Casing Seized	144	201
Calcium	NV			49.1	91.4	56.1	75.3					45.8		39.4	60.5
Chloride	250	<u>120</u>	126	28.2	50.9	22	31.1					16.1		13.8	43.5
Oxygen Demand - Chemical (COD)	NV			12	13	39	25					42		41	38
Conductivity (µS/cm)	NV			378	686	452	602					381		403	580
Organic Carbon - Dissolved (DOC)	5		3.4	4.6	9	7.2	7.7					9		10.6	13.5
Fluoride	1.5		0.80	0.1	< 0.1	0.1	0.1					< 0.1		< 0.1	< 0.1
Hardness (as CaCO3)	500		309	163	307	183	245					147		129	198
Iron	0.3	0.3		< 0.005	0.065	0.36	1.23					2.28		2.05	4.31
Magnesium	NV			9.79	19	10.5	13.8					7.88		7.3	11.3
Manganese	0.050		0.03	< 0.001	2.27	6.36	7.32					2.54		2.04	3.24
Mercury	0.001	0.0002	0.0003	< 0.00002	< 0.00002	< 0.00002	< 0.00002					< 0.00002		< 0.00002	< 0.00002
Nitrate as N	10	<u>13</u>	2.5	2.6	0.2	0.1	< 0.1					< 0.05		< 0.05	< 0.05
Nitrite as N	1	<u>0.06</u>	0.29	< 0.1	< 0.1	< 0.1	0.1					< 0.05		< 0.05	< 0.05
pH	6.5 - 8.5			7.23	6.98	7.26	7.14					7.25		7.05	7.26
Phenols	NV	0.001		< 0.001	< 0.001	< 0.001	< 0.001					< 0.001		< 0.002	< 0.002
Phosphorus	NV	0.03		< 0.01	0.2	0.39	0.2					< 0.1		0.44	0.41
Potassium	NV			4.1	5	4.6	5.7					7.7		7.2	10.7
Sodium	200		101	12.7	20.7	16.7	24.9					22.9		24	36.8
Sulphate	500		257	24	24	14	26					29		24	15
Solids - Total Dissolved (TDS)	500		308	202	359	238	326					226		208	308
Total Kjeldahl Nitrogen (TKN)	NV			0.5	0.5	0.8	1.2					1.3		1.7	2.2
Total Ammonia as N (NH ₃ + NH ₄)	NV			0.01	0.2	0.57	0.72					0.8		1.03	1.47
Aluminum	0.10	0.08	0.06	0.02	0.03	0.03	0.04					0.03		0.03	0.06
Antimony	0.006	0.02	0.002	< 0.0001	< 0.0001	0.0002	0.0001					< 0.0001		0.0001	0.0008
Arsenic	0.025	0.005	0.006	0.0001	0.0005	0.0004	0.0011					0.0002		0.0008	< 0.0001
Barium	1		0.33	0.169	0.324	0.204	0.294					0.197		0.178	0.318
Beryllium	NV	0.011		< 0.002	< 0.002	< 0.002	< 0.002					< 0.002		< 0.002	< 0.002
Boron	5	<u>1.3</u>	1.3	0.237	0.664	0.162	0.334					0.568		0.69	0.558
Cadmium	0.005	0.0001	0.001	0.00002	0.00029	0.00015	0.00021					< 0.000015		< 0.000015	0.000017
Chromium	0.05	0.001	0.013	< 0.0002	0.0059	0.0026	0.0105					0.002		0.001	0.002
Cobalt	NV	0.0009		< 0.005	0.015	0.032	0.034					0.0064		0.007	0.007
Copper	1	0.005	0.50	0.0034	0.01	0.0047	0.0077					0.0008		0.0023	0.0018
Lead	0.01	0.003	0.003	0.00004	0.00003	< 0.00002	0.00004					< 0.00002		0.00004	0.00003
Molybdenum	NV	0.04		0.0002	0.0027	0.0011	0.001					0.0007		0.0007	0.0005
Nickel	NV	0.025		< 0.01	0.01	0.01	< 0.01					< 0.01		< 0.01	< 0.01
Selenium	0.01	0.1	0.003	< 0.001	< 0.001	< 0.001	0.002					< 0.001		< 0.001	< 0.001
Silver	NV	0.0001		< 0.00002	< 0.00002	< 0.00002	< 0.00002					< 0.00002		< 0.0001	< 0.0001
Strontium	NV			-	0.632	0.362	0.439					0.249		0.223	0.356
Thallium	NV	0.0003		0.0001	< 0.00005	< 0.00005	0.00007					< 0.00005		< 0.00005	< 0.00005
Vanadium	NV	0.006		0.0024	0.0071	0.0026	0.0042					0.0016		0.0012	0.0011
Zinc	5	<u>0.02</u>	2.5	0.01	0.021	0.008	0.01					0.006		< 0.005	< 0.005
Field Conductivity (µs/cm)	NV			-	-	357	513					450		450	500
Field pH (units)	6.5 - 8.5			-	-	6.59	6.46					6.6		7.31	6.47
Field Temperature (°C)	NV			-	-	15.46	12.33					15.8		14.6	11.3

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Summary of Ground Water Quality - General
Chemistry
Laxton Waste Disposal Site

Parameter	ODWQS	PWQO / CWQG	RUP	DUP					DUP						
				MW7 22-Apr-20	MW7 13-Oct-20	MW7 15-Apr-21	MW7 13-Oct-21	MW7 12-Apr-22	MW7 16-Oct-22	MW7 26-Apr-23	MW7 26-Apr-23	MW7 11-Oct-23	MW7 11-Oct-23	MW8 30-May-08	MW8 01-Oct-08
Alkalinity (as CaCO3)	500		301	150	212	181	180	200	227	225	227	286	295	26	37.05
Calcium	NV			44.7	62.9	58.9	61.8	51.3	69.2	67.7	71.1	83.2	84.5	5	9.64
Chloride	250	<u>120</u>	126	21.5	35.8	26.7	43.2	17.2	38.3	26	26.1	34.2	34.7	<1	1
Oxygen Demand - Chemical (COD)	NV			33		69	29	48	36	29	22	53	55	<2	<2
Conductivity (µS/cm)	NV			446	604	549	561	506	678	618	624	724	745	63	93.7
Organic Carbon - Dissolved (DOC)	5		3.4	12.3	12.9	17	7.7	11.9	7.1	7.8	10.1	11.8	10.8	<1	1.109
Fluoride	1.5		0.80	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	<0.1	<0.1	<0.1	<0.1
Hardness (as CaCO3)	500		309	145	196	192	200	171	229	220	229	270	275	20	36.6
Iron	0.3	0.3		2.48	4.63	3.3	3.75	3.12	5.34	4.96	5.25	7.91	8.18	<0.1	<0.1
Magnesium	NV			8.14	9.52	10.8	11.1	10.4	13.6	12.4	12.4	15.2	15.4	2	3.04
Manganese	0.050		0.03	1.87	2.64	2.33	2.16	1.54	1.95	1.7	1.79	2.05	2.07	<0.01	<0.01
Mercury	0.001	0.0002	0.0003	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Nitrate as N	10	<u>13</u>	2.5	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	<0.05	0.07	0.4	<0.1
Nitrite as N	1	<u>0.06</u>	0.29	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	<0.05	<0.05	<0.1	<0.1
pH	6.5 - 8.5			7.48	7.21	7.07	6.88	7.35	7.13	7.12	7.15	6.84	6.88	6.27	6.66
Phenols	NV	0.001		< 0.002	< 0.002	< 0.002	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	<0.001	<0.001	<0.001	<0.001
Phosphorus	NV	0.03		0.13	< 0.1	0.09	0.19	< 0.1	< 0.1	< 0.1	< 0.1	<0.1	<0.1	0.01	<0.01
Potassium	NV			10.3	12.1	10.7	11.8	10.1	12.7	12.2	12.3	14.9	15.2	1	1.49
Sodium	200		101	37.5	38.8	41.3	33.5	28.9	29	34.6	34.5	34.6	35	2	2.23
Sulphate	500		257	33	33	45	43	36	51	57	57	48	52	5	7.8
Solids - Total Dissolved (TDS)	500		308	252	330	312	322	283	363	351	356	377	389	41	60.9
Total Kjeldahl Nitrogen (TKN)	NV			2.9	3.8	3.5	3.9	4.3	5.2	4.2	4.3	6	5.7	<0.1	0.1
Total Ammonia as N (NH ₃ + NH ₄)	NV			2.22	2.94	2.95	3.34	3.58	4.45	3.61	3.59	6.19	5.91	<0.1	<0.1
Aluminum	0.10	0.08	0.06	0.04	0.06	0.04	0.04	0.02	0.02	0.02	0.02	0.07	0.07	<0.01	0.0186
Antimony	0.006	0.02	0.002	< 0.0001	< 0.0001	< 0.0001	0.0001	< 0.0001	< 0.0001	0.0001	0.0001	0.0001	0.0002	<0.01	<0.01
Arsenic	0.025	0.005	0.006	0.0008	0.0013	0.0007	0.0006	0.0007	0.0006	0.0008	0.0008	0.0008	0.0009	<0.01	<0.01
Barium	1		0.33	0.258	0.362	0.337	0.354	0.279	0.367	0.352	0.371	0.422	0.429	<0.1	<0.1
Beryllium	NV	0.011		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	<0.0001	<0.0001	<0.1	<0.1
Boron	5	<u>1.3</u>	1.3	1.04	0.737	1.47	0.766	1.22	0.846	1.37	1.37	1.13	1.15	<0.1	<0.1
Cadmium	0.005	0.0001	0.001	< 0.000015	0.00003	< 0.000015	< 0.000015	< 0.000015	0.000011	< 0.000010	< 0.000010	0.000028	0.00003	<0.0001	0.000108
Chromium	0.05	0.001	0.013	0.008	0.004	0.002	0.002	< 0.001	< 0.001	0.002	0.002	0.002	0.002	0.0003	0.001288
Cobalt	NV	0.0009		0.007	0.006	0.007	0.006	0.005	0.007	0.006	0.008	0.0104	0.011	<0.0003	<0.0003
Copper	1	0.005	0.50	0.0083	0.0034	0.0031	0.0014	0.0023	0.0012	0.0007	0.0009	0.0015	0.0018	0.0011	0.00074
Lead	0.01	0.003	0.003	0.00006	0.00024	0.00007	0.00005	0.00003	0.00003	0.00003	0.00002	0.00004	0.00004	<0.001	<0.001
Molybdenum	NV	0.04		0.0008	0.0005	0.0006	0.0005	0.0006	0.0005	0.0005	0.0005	0.0005	0.0005	<0.002	<0.002
Nickel	NV	0.025		0.02	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.0041	0.0044	<0.01	<0.01
Selenium	0.01	0.1	0.003	< 0.001	< 0.001	< 0.001	0.001	< 0.001	0.001	< 0.001	< 0.001	<0.001	<0.001	<0.01	<0.01
Silver	NV	0.0001		< 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	NV			0.251	0.335	0.328	0.349	0.286	0.382	0.37	0.369	0.439	0.446	0.049	0.1018
Thallium	NV	0.0003		< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	<0.00005	<0.00005	<0.0003	<0.0003
Vanadium	NV	0.006		0.0015	0.0016	0.0015	0.001	0.0013	0.0011	0.0013	0.0013	0.0015	0.0017	<0.001	<0.001
Zinc	5	0.02	2.5	< 0.005	< 0.005	0.005	0.005	< 0.005	< 0.005	0.006	< 0.005	0.005	<0.005	<0.01	<0.01
Field Conductivity (µs/cm)	NV			505	465	640	605	460	530	500	500	540	540	-	-
Field pH (units)	6.5 - 8.5			7.04	6.9	7.42	6.74	6.41	6.71	7.4	7.4	6.63	6.63	-	-
Field Temperature (°C)	NV			10.6	12.9	10.7	13.3	13.8	11.2	10.2	10.2	10.8	10.8	-	-

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Summary of Ground Water Quality - General
Chemistry
Laxton Waste Disposal Site

Parameter	ODWQS	PWQO / CWQG	RUP	MW8	MW8	MW8	MW8	MW8	MW8	MW8	MW8	MW8	MW8	MW8	MW8
				24-Jun-09	24-Aug-09	07-Jun-10	05-Oct-10	26-May-11	07-Sep-11	30-May-12	01-Nov-12	10-Jun-13	30-Oct-13	29-Apr-14	23-Sep-14
Alkalinity (as CaCO3)	500		301	50	47	176	159	252	165	140	120	78	100	139	171
Calcium	NV			17	18	49	51	63	45	41	38	29.1	38.5	51.9	59.3
Chloride	250	<u>120</u>	126	2	2	5	3	4	4	7	6	7.6	8.1	8.9	7.2
Oxygen Demand - Chemical (COD)	NV			< 2	< 2	15	11	30	47	64	61	31	100	109	112
Conductivity (µS/cm)	NV			129	132	304	284	482	346	310	300	224	314	403	487
Organic Carbon - Dissolved (DOC)	5		3.4	1	1	6	5	9.5	14.9	22	22	16.5	41.5	49.5	67.6
Fluoride	1.5		0.80	< 0.1	< 0.1	< 0.1	< 0.1	<0.1	0.06	<0.10	<0.10	0.2	0.2	0.1	< 0.1
Hardness (as CaCO3)	500		309	63	65.5	185	188	240	170	150	140	100	130	167	202
Iron	0.3	0.3		< 0.1	< 0.1	< 0.1	< 0.1	<0.1	<0.1	<0.10	<0.10	< 0.005	0.014	0.006	< 0.005
Magnesium	NV			5	5	15	15	20	14	12	11	6.7	8.28	9	13
Manganese	0.050		0.03	< 0.01	0.03	0.87	0.31	0.22	0.19	0.49	0.85	1.98	8.79	15.8	27.2
Mercury	0.001	0.0002	0.0003	< 0.00002	< 0.00002	< 0.00002	< 0.00002	0.00002	0.00001	<0.00001	<0.00001	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Nitrate as N	10	<u>13</u>	2.5	< 0.1	< 0.1	< 0.1	< 0.1	<0.1	1	0.58	3.4	3	8	6.3	7.6
Nitrite as N	1	<u>0.06</u>	0.29	< 0.1	< 0.1	< 0.1	< 0.1	<0.01	0.04	0.051	0.13	< 0.1	0.1	< 0.1	< 0.1
pH	6.5 - 8.5			6.84	6.83	6.95	7.2	7.5	7.03	6.9	6.7	6.81	6.62	7.04	6.79
Phenols	NV	0.001		< 0.001	0.001	< 0.001	< 0.001	<0.001	0.003	<0.0010	<0.0010	< 0.001	< 0.001	< 0.001	< 0.001
Phosphorus	NV	0.03		< 0.01	0.01	< 0.01	< 0.02	-	-	<0.10	< 0.10	0.11	0.27	0.01	0.14
Potassium	NV			1.9	1.8	3.2	2.8	2.8	2.4	2.8	2.9	2.4	3.4	4.5	4.5
Sodium	200		101	2	2	2	2	1.9	1.5	2.8	3.4	3.3	7.6	8.5	7
Sulphate	500		257	15	15	8	8	2	7	7	7	9	17	17	17
Solids - Total Dissolved (TDS)	500		308	84	86	198	185	256	190	190	189	120	188	228	272
Total Kjeldahl Nitrogen (TKN)	NV			< 0.1	< 0.1	0.4	0.3	0.5	1.2	1	1.2	1.1	2.5	3.5	3.4
Total Ammonia as N (NH ₃ + NH ₄)	NV			0.04	< 0.01	0.12	0.05	0.02	<0.02	<0.01	0.05	0.026	0.088	0.38	0.28
Aluminum	0.10	0.08	0.06	< 0.01	< 0.01	0.01	< 0.01	0.009	0.013	0.016	0.013	0.02	0.04	0.03	0.03
Antimony	0.006	0.02	0.002	< 0.01	< 0.01	< 0.01	< 0.01	<0.0005	<0.0005	<0.00050	<0.00050	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Arsenic	0.025	0.005	0.006	< 0.01	< 0.01	< 0.005	< 0.005	<0.001	<0.001	<0.0010	<0.0010	0.0002	0.0004	0.0007	0.0012
Barium	1		0.33	< 0.1	< 0.1	< 0.1	< 0.1	0.089	0.064	0.074	0.084	0.081	0.14	0.159	0.173
Beryllium	NV	0.011		< 0.1	< 0.1	< 0.1	< 0.1	<0.0005	<0.0005	<0.00050	<0.00050	< 0.002	< 0.002	< 0.002	< 0.002
Boron	5	1.3	1.3	< 0.1	< 0.1	< 0.1	< 0.1	0.018	0.01	0.024	0.022	0.024	0.061	0.08	0.119
Cadmium	0.005	0.0001	0.001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	<0.0001	<0.0001	<0.00010	<0.00010	0.00009	0.00014	0.00021	0.00028
Chromium	0.05	0.001	0.013	0.0003	0.0003	0.0002	0.0002	<0.005	<0.005	<0.0050	<0.0050	< 0.002	0.0031	< 0.0002	0.0043
Cobalt	NV	0.0009		< 0.0003	0.0005	0.021	0.0089	0.0077	0.007	0.014	0.014	0.0127	0.032	0.041	0.068
Copper	1	0.005	0.50	0.0012	0.0013	0.0038	0.005	0.007	0.013	0.02	0.023	0.0224	0.0262	0.0272	0.0404
Lead	0.01	0.003	0.003	< 0.001	< 0.001	< 0.001	< 0.001	<0.0005	<0.0005	<0.00050	<0.00050	0.00004	< 0.00002	< 0.00002	< 0.00002
Molybdenum	NV	0.04		< 0.002	< 0.002	< 0.002	< 0.002	<0.001	0.0005	<0.00050	<0.00050	0.0002	0.0001	0.0003	0.0003
Nickel	NV	0.025		< 0.01	< 0.01	< 0.01	< 0.01	0.002	0.006	0.015	0.015	0.02	0.02	0.03	0.05
Selenium	0.01	0.1	0.003	< 0.01	< 0.01	< 0.01	< 0.01	<0.002	<0.002	<0.0020	<0.0020	< 0.001	< 0.001	< 0.001	0.002
Silver	NV	0.0001		< 0.0001	< 0.0001	< 0.0001	< 0.0001	<0.0001	<0.0001	<0.00010	<0.00010	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Strontium	NV			0.153	0.158	0.516	0.444	0.63	0.47	0.45	0.44	-	-	-	0.809
Thallium	NV	0.0003		< 0.0003	< 0.0003	0.0012	< 0.0003	<0.00005	<0.00005	<0.000050	<0.000050	< 0.00005	0.00006	0.00011	0.00006
Vanadium	NV	0.006		< 0.001	< 0.001	< 0.001	< 0.001	<0.001	<0.0005	0.00051	<0.00050	0.0018	0.001	0.0031	0.0043
Zinc	5	0.02	2.5	< 0.01	< 0.01	0.02	< 0.01	0.011	<0.005	0.0057	<0.0050	< 0.005	0.006	< 0.005	0.005
Field Conductivity (µs/cm)	NV			-	-	-	-	-	-	365	360	268	420	-	-
Field pH (units)	6.5 - 8.5			-	-	-	-	-	-	6.59	7.68	6.41	6.47	-	-
Field Temperature (°C)	NV			-	-	-	-	-	-	12.1	8.6	10.9	10.7	-	-

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Bold / Grey Highlighting - ODWQS Exceedance
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Bold / Underlined - RUP Exceedance
Bold / Red Highlighting - PWQO / CWQG Exceedance
all results in mg/L unless otherwise stated

Summary of Ground Water Quality - General
Chemistry
Laxton Waste Disposal Site

Parameter	ODWQS	PWQO / CWQG	RUP	MW8	MW8	MW8	MW8	MW8	MW8	MW8	MW8	MW8	MW8	MW8	MW8
				09-Jun-15	10-Sep-15	30-May-16	17-Oct-16	19-Apr-17	17-Oct-17	24-Apr-18	26-Sep-18	17-Apr-19	18-Oct-19	21-Apr-20	13-Oct-20
Alkalinity (as CaCO3)	500		301	159	175	144	157	123	140	58	85	49	110	140	185
Calcium	NV			40.3	53.6	29.1	55.8	36.7	46.8	26.8	14.2	44.8	22.4	47.5	62.1
Chloride	250	<u>120</u>	126	6.1	6.4	2.7	5.4	6.9	8.4	50.3	14.5	106	9.4	4.8	5.1
Oxygen Demand - Chemical (COD)	NV			92	95	60	79	42	55	20	27	13	33	63	
Conductivity (µS/cm)	NV			392	493	345	481	357	429	294	249	519	295	351	448
Organic Carbon - Dissolved (DOC)	5		3.4	28.4	46.7	21.6	28.3	16.8	20.8	6.4	11.9	3.3	15.6	23.5	25.6
Fluoride	1.5		0.80	0.1	< 0.1	0.2	0.1	0.2	0.1	< 0.1	0.1	< 0.1	0.2	< 0.1	< 0.1
Hardness (as CaCO3)	500		309	167	217	120	204	135	168	96	50	153	76	158	195
Iron	0.3	0.3		< 0.005	0.007	0.006	0.006	< 0.005	0.013	0.01	0.118	0.015	0.009	0.021	< 0.005
Magnesium	NV			16.2	20.3	11.5	15.7	10.6	12.3	7.03	3.62	9.95	4.85	9.57	9.57
Manganese	0.050		0.03	19.1	21.6	10.9	10.1	6.97	6.49	3.89	1.8	3.05	1.15	3.93	4.36
Mercury	0.001	0.0002	0.0003	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Nitrate as N	10	<u>13</u>	2.5	3	10.6	3	14.2	8.3	10.5	0.23	1.07	0.4	2.66	3.77	4.44
Nitrite as N	1	<u>0.06</u>	0.29	0.2	< 0.1	< 0.1	0.2	0.2	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.07
pH	6.5 - 8.5			7.08	7.15	7.03	7.18	7.14	6.96	7	7.16	6.69	7.26	7.09	7.3
Phenols	NV	0.001		< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.007	< 0.001	0.003	< 0.002	< 0.002	< 0.002	< 0.002
Phosphorus	NV	0.03		0.06	0.09	0.04	0.04	< 0.1	< 0.1	< 0.1	< 0.1	0.35	0.1	< 0.1	< 0.1
Potassium	NV			4.7	6.3	6.5	17.6	19.1	24.3	21.2	13.1	15.9	12.4	18.4	21.6
Sodium	200		101	3.6	4.8	3.5	3.7	4.3	4.1	9.1	20	15.4	32.1	3.2	3.1
Sulphate	500		257	16	16	13	14	9	10	9	7	6	8	7	9
Solids - Total Dissolved (TDS)	500		308	215	282	174	280	205	197	162	126	231	156	179	225
Total Kjeldahl Nitrogen (TKN)	NV			1.9	2.9	1.1	2.1	1.1	1.4	0.3	0.8	0.3	0.8	1	1.3
Total Ammonia as N (NH ₃ + NH ₄)	NV			0.34	0.54	0.25	0.13	0.03	0.06	0.03	0.16	0.03	0.05	0.02	0.09
Aluminum	0.10	0.08	0.06	0.02	0.02	0.02	0.03	0.02	0.04	0.03	0.02	0.04	0.03	0.03	0.04
Antimony	0.006	0.02	0.002	< 0.0001	< 0.0001	< 0.0001	0.0002	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.002	< 0.0001	< 0.0001
Arsenic	0.025	0.005	0.006	0.0004	0.0009	0.0004	0.0005	0.0005	0.0004	< 0.0001	0.0013	0.001	< 0.0001	0.0026	0.0047
Barium	1		0.33	0.138	0.195	0.109	0.298	0.259	0.414	0.238	0.117	0.302	0.145	0.267	0.308
Beryllium	NV	0.011		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Boron	5	<u>1.3</u>	1.3	0.063	0.073	0.036	0.052	0.013	0.055	0.036	0.038	0.026	0.062	0.099	0.129
Cadmium	0.005	0.0001	0.001	0.00016	0.00025	0.00014	0.00018	0.000151	0.000222	0.000174	0.000103	0.000254	0.00009	0.000138	0.000164
Chromium	0.05	0.001	0.013	0.0027	0.0095	< 0.0002	0.0018	< 0.001	< 0.001	< 0.001	0.001	0.001	0.001	< 0.001	0.002
Cobalt	NV	0.0009		0.042	0.078	0.035	0.073	0.059	0.069	0.0443	0.02	0.048	0.009	0.042	0.033
Copper	1	0.005	0.50	0.0229	0.0335	0.0194	0.0189	0.0143	0.016	0.0107	0.0122	0.0075	0.0217	0.0386	0.0499
Lead	0.01	0.003	0.003	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	0.00004	0.00013
Molybdenum	NV	0.04		< 0.0001	0.0006	0.0005	0.0004	0.0004	0.0003	0.0002	0.0003	0.0002	0.0004	0.0004	0.0005
Nickel	NV	<u>0.025</u>		0.03	0.04	0.02	0.02	0.01	0.02	< 0.01	< 0.01	0.01	< 0.01	0.01	0.01
Selenium	0.01	0.1	0.003	0.001	0.002	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.001	0.001	0.001
Silver	NV	0.0001		< 0.00002	< 0.00002	< 0.00002	< 0.0002	< 0.00002	< 0.00002	< 0.00002	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Strontium	NV			0.57	0.744	0.391	0.748	0.494	0.549	0.337	0.178	0.452	0.209	0.398	0.497
Thallium	NV	0.0003		< 0.00005	0.00007	< 0.00005	< 0.0005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Vanadium	NV	0.006		0.0017	0.0034	0.0014	0.0007	0.001	0.0006	0.0003	0.0001	< 0.0001	0.0001	0.0002	0.0002
Zinc	5	<u>0.02</u>	2.5	< 0.005	0.006	< 0.005	< 0.005	< 0.005	0.005	0.006	< 0.005	0.008	< 0.005	< 0.005	< 0.005
Field Conductivity (µs/cm)	NV			324	416	316	430	288	390	380	210	560	270	380	390
Field pH (units)	6.5 - 8.5			6.44	6.54	7.84	7.08	7.26	7.72	7.02	7.09	7.43	6.94	6.95	7.03
Field Temperature (°C)	NV			14.44	12.37	11.35	11.1	10.3	11.5	6.5	11.2	8.1	8.6	5.8	10.4

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Bold / Red Highlighting - PWQO / CWQG Exceedance
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Summary of Ground Water Quality - General
Chemistry
Laxton Waste Disposal Site

Parameter	ODWQS	PWQO / CWQG	RUP	DUP				DUP				DUP			
				MW8 15-Apr-21	MW8 13-Oct-21	MW8 12-Apr-22	MW8 16-Oct-22	MW8 26-Apr-23	MW8 26-Apr-23	MW8 11-Oct-23	MW8 11-Oct-23	MW10 30-May-08	MW10 01-Oct-08	MW10 24-Jun-09	MW10 24-Aug-09
Alkalinity (as CaCO3)	500		301	193	161	166	191	185	187	189	192	162	153.68	153	150
Calcium	NV			63.8	55.5	46.7	53.4	56	53.8	47.4	48.8	95	103	94	99
Chloride	250	<u>120</u>	126	6.2	8.8	3	10.4	19.7	19.6	7.4	7.6	2	1.3	2	2
Oxygen Demand - Chemical (COD)	NV			75	56	66	69	41	40	43	55	2	6	6	4
Conductivity (µS/cm)	NV			442	404	356	482	456	454	443	444	550	647	516	521
Organic Carbon - Dissolved (DOC)	5		3.4	25.7	16.8	22.5	18.2	10.2	17.1	22.2	22.1	3	2.791	3	3
Fluoride	1.5		0.80	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	<0.1	<0.1	0.4	<0.1	0.3	0.3
Hardness (as CaCO3)	500		309	208	181	154	179	187	182	164	167	293	307	288	305
Iron	0.3	0.3		< 0.005	0.007	< 0.005	< 0.005	0.006	< 0.005	0.029	0.028	<0.1	1.843	1.2	1.1
Magnesium	NV			11.9	10.2	9.03	11.1	11.4	11.6	11	10.9	14	12.1	13	14
Manganese	0.050		0.03	3.57	2.6	1.48	1.43	1.55	1.49	1.12	1.14	<0.01	0.131	0.15	0.14
Mercury	0.001	0.0002	0.0003	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	<0.00002	<0.00002	<0.00002	<0.00002	< 0.00002	< 0.00002
Nitrate as N	10	<u>13</u>	2.5	1.51	4.93	1.56	5.31	1.65	1.65	4.82	4.68	<0.1	<0.1	< 0.1	< 0.1
Nitrite as N	1	<u>0.06</u>	0.29	< 0.05	0.19	< 0.05	0.14	0.05	0.05	<0.05	<0.05	<0.1	<0.1	< 0.1	< 0.1
pH	6.5 - 8.5			7.12	6.84	7.41	7.21	7.15	7.22	6.8	6.79	6.88	7.85	7.6	7.62
Phenols	NV	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
Phosphorus	NV	0.03		0.12	0.12	< 0.1	< 0.1	< 0.1	< 0.1	<0.1	<0.1	0.02	<0.01	< 0.01	0.01
Potassium	NV			18.3	22.7	27.7	35.4	38.8	39.6	42.3	41	2.3	2.48	2.4	2.3
Sodium	200		101	3.1	4	2.1	3.5	3.1	3.2	2.8	2.8	4	13.5	4	4
Sulphate	500		257	5	8	6	6	5	5	7	7	137	198	135	135
Solids - Total Dissolved (TDS)	500		308	228	208	196	236	246	246	229	229	358	420.55	335	339
Total Kjeldahl Nitrogen (TKN)	NV			0.9	1.3	1.1	1.1	0.9	0.6	1.1	1.2	<0.1	0.2	0.2	0.1
Total Ammonia as N (NH ₃ + NH ₄)	NV			0.03	0.09	0.27	0.07	0.14	0.04	0.16	0.19	<0.1	<0.1	0.05	0.02
Aluminum	0.10	0.08	0.06	0.01	0.03	0.02	< 0.01	0.04	0.02	0.04	0.04	<0.01	0.514	< 0.01	< 0.01
Antimony	0.006	0.02	0.002	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.0001	0.0001	<0.01	<0.01	< 0.01	< 0.01
Arsenic	0.025	0.005	0.006	0.002	0.0017	0.0023	0.0024	0.0022	0.0022	0.0034	0.0033	<0.01	<0.01	< 0.01	< 0.01
Barium	1		0.33	0.3	0.299	0.305	0.389	0.433	0.415	0.403	0.41	0.1	<0.1	< 0.1	< 0.1
Beryllium	NV	0.011		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	<0.0001	<0.0001	<0.1	<0.1	< 0.1	< 0.1
Boron	5	<u>1.3</u>	1.3	0.113	0.099	0.112	0.11	0.103	0.104	0.13	0.126	<0.1	<0.1	< 0.1	< 0.1
Cadmium	0.005	0.0001	0.001	0.000149	0.000108	0.000083	0.000112	0.000109	0.000108	0.000109	0.000101	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Chromium	0.05	0.001	0.013	< 0.001	0.001	< 0.001	< 0.001	< 0.001	< 0.001	<0.001	<0.001	0.0002	0.001724	0.0001	0.0003
Cobalt	NV	0.0009		0.017	0.024	0.017	0.017	0.024	0.021	0.0273	0.0273	<0.0003	0.000994	< 0.0003	< 0.0003
Copper	1	0.005	0.50	0.0429	0.0347	0.0409	0.0427	0.0329	0.0335	0.0535	0.0525	0.0027	0.002443	< 0.0001	< 0.0001
Lead	0.01	0.003	0.003	0.00005	0.00003	< 0.00002	< 0.00002	< 0.00002	< 0.00002	<0.00002	<0.00002	<0.001	<0.001	< 0.001	< 0.001
Molybdenum	NV	0.04		0.0005	0.0006	0.0008	0.0008	0.001	0.001	0.0009	0.0009	<0.002	0.002614	< 0.002	< 0.002
Nickel	NV	0.025		< 0.01	0.01	< 0.01	< 0.01	0.01	< 0.01	0.0112	0.0112	<0.01	<0.01	< 0.01	< 0.01
Selenium	0.01	0.1	0.003	< 0.001	0.001	< 0.001	0.001	0.001	0.001	0.002	0.002	<0.01	<0.01	< 0.01	< 0.01
Silver	NV	0.0001		< 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	NV			0.502	0.422	0.353	0.406	0.403	0.411	0.38	0.37	0.201	2.69	2	1.98
Thallium	NV	0.0003		< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	<0.00005	<0.00005	<0.0003	<0.0003	< 0.0003	< 0.0003
Vanadium	NV	0.006		0.0002	0.0002	0.0002	0.0002	0.0002	0.0001	0.0002	0.0002	<0.001	0.002055	< 0.001	< 0.001
Zinc	5	<u>0.02</u>	2.5	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.005	<0.005	<0.005	<0.01	<0.01	< 0.01	< 0.01
Field Conductivity (µs/cm)	NV			550	425	350	400	410	410	350	350	-	-	-	-
Field pH (units)	6.5 - 8.5			7.62	6.64	6.47	6.73	7.9	7.9	6.9	6.9	-	-	-	-
Field Temperature (°C)	NV			7.2	11.2	8.6	9.4	7	7	10	10	-	-	-	-

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term criteria
Bold / Grey Highlighting - ODWQS Exceedance
Red / Bold - PWQO Exceedance
Bold / Underlined - RUP Exceedance
Bold / Red Highlighting - PWQO / CWQG Exceedance
all results in mg/L unless otherwise stated

Summary of Ground Water Quality - General
Chemistry
Laxton Waste Disposal Site

Parameter	ODWQS	PWQO / CWQG	RUP	MW10	MW10	MW10	MW10	MW10	MW10	MW10	MW10	MW10	MW10	MW10	MW10
				04-Jun-10	05-Oct-10	26-May-11	07-Sep-11	08-Sep-11	30-May-12	01-Nov-12	10-Jun-13	30-Oct-13	29-Apr-14	23-Sep-14	09-Jun-15
Alkalinity (as CaCO3)	500		301	151	151	144	152	152	150	150	147	150	151	145	136
Calcium	NV			95	100	96	91	91	90	88	94.5	106	116	114	128
Chloride	250	<u>120</u>	126	2	1	3	2	2	1	2	1.9	1.7	1.9	1.7	2.5
Oxygen Demand - Chemical (COD)	NV			6	7	9	9	9	10	8.3	< 5	7	< 5	< 5	9
Conductivity (µS/cm)	NV			514	463	558	552	552	550	530	619	652	635	651	724
Organic Carbon - Dissolved (DOC)	5		3.4	2	3	2.7	2.2	2.2	2.6	2.2	4.6	4.7	2.9	3.8	3
Fluoride	1.5		0.80	0.3	0.3	0.4	0.39	0.39	0.38	0.37	0.4	0.4	0.4	0.5	0.6
Hardness (as CaCO3)	500		309	289	308	290	270	270	270	270	286	319	344	336	367
Iron	0.3	0.3		1.2	1.2	1.6	1.5	1.5	1.3	1.3	1.6	1.92	1.89	1.89	0.784
Magnesium	NV			13	14	12	11	11	12	12	12.2	13.1	12.9	12.2	11.7
Manganese	0.050		0.03	0.15	0.15	0.16	0.17	0.17	0.15	0.18	0.181	0.217	0.197	0.193	0.153
Mercury	0.001	0.0002	0.0003	< 0.00002	< 0.00002	0.00001	<0.00001	<0.00001	<0.00001	<0.00001	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Nitrate as N	10	<u>13</u>	2.5	< 0.1	< 0.1	<0.1	<0.1	<0.1	<0.010	<0.10	< 0.1	0.1	< 0.1	< 0.1	< 0.1
Nitrite as N	1	<u>0.06</u>	0.29	< 0.1	< 0.1	<0.01	<0.01	<0.01	<0.10	<0.010	< 0.1	< 0.1	< 0.1	< 0.1	0.1
pH	6.5 - 8.5			7.7	7.69	7.78	7.28	7.28	7.48	7.23	7.69	7.71	7.95	7.86	7.96
Phenols	NV	0.001		< 0.001	< 0.001	<0.001	0.002	0.002	0.0018	<0.0010	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Phosphorus	NV	0.03		< 0.01	< 0.02	0.009	-	0.018	<0.10	<0.10	< 0.01	< 0.01	< 0.01	0.02	< 0.01
Potassium	NV			2.1	2.1	2.1	2	2	2.1	2.1	1.9	2.1	2.4	2.3	1.9
Sodium	200		101	3	3	5.2	3.1	3.1	3.4	3.6	4.4	5.7	7.6	9.9	12
Sulphate	500		257	154	135	130	130	130	130	110	163	164	181	192	227
Solids - Total Dissolved (TDS)	500		308	334	301	348	346	346	342	321	368	386	415	421	466
Total Kjeldahl Nitrogen (TKN)	NV			0.1	0.2	0.2	<0.2	<0.2	<0.10	0.25	0.2	0.2	0.2	0.2	0.1
Total Ammonia as N (NH ₃ + NH ₄)	NV			0.01	< 0.01	<0.01	<0.01	<0.01	<0.10	0.05	0.018	0.027	0.02	0.07	0.02
Aluminum	0.10	0.08	0.06	< 0.01	< 0.01	0.007	0.024	0.024	<0.0050	<0.0050	0.04	0.04	0.03	0.03	0.04
Antimony	0.006	0.02	0.002	< 0.01	< 0.01	<0.0005	<0.0005	<0.0005	<0.00050	<0.00050	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Arsenic	0.025	0.005	0.006	< 0.005	< 0.005	<0.001	<0.001	<0.001	<0.0010	<0.0010	0.0002	< 0.0001	0.0002	0.0002	< 0.0001
Barium	1		0.33	< 0.1	< 0.1	0.07	0.091	0.091	0.085	0.09	0.087	0.08	0.054	0.026	0.02
Beryllium	NV	0.011		< 0.1	< 0.1	<0.0005	<0.0005	<0.0005	<0.00050	<0.00050	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Boron	5	1.3	1.3	< 0.1	< 0.1	0.024	0.02	0.02	0.023	0.023	0.024	0.03	0.028	0.031	0.025
Cadmium	0.005	0.0001	0.001	< 0.0001	< 0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.00010	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Chromium	0.05	0.001	0.013	0.0004	0.0003	<0.005	<0.005	<0.005	<0.0050	<0.0050	< 0.002	0.0022	< 0.0002	0.0009	0.0012
Cobalt	NV	0.0009		< 0.0003	< 0.0003	<0.0005	<0.0005	<0.0005	<0.00050	<0.00050	< 0.0001	< 0.005	< 0.005	< 0.005	< 0.005
Copper	1	0.005	0.50	< 0.0001	< 0.0001	<0.001	<0.001	<0.001	<0.0010	<0.0010	0.0006	< 0.0001	0.0007	0.0004	< 0.0001
Lead	0.01	0.003	0.003	< 0.001	< 0.001	<0.0005	<0.0005	<0.0005	<0.00050	<0.00050	< 0.00002	< 0.00002	0.00003	< 0.00002	< 0.00002
Molybdenum	NV	0.04		0.002	0.002	0.002	0.002	0.002	0.0022	0.0016	0.0021	0.002	0.0027	0.0022	0.002
Nickel	NV	0.025		< 0.01	< 0.01	<0.001	<0.001	<0.001	<0.0010	<0.0010	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Selenium	0.01	0.1	0.003	< 0.01	< 0.01	<0.002	<0.002	<0.002	<0.0020	<0.0020	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Silver	NV	0.0001		< 0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.00010	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Strontium	NV			1.98	1.8	2.1	1.9	1.9	1.9	1.9	-	-	-	2.95	3.45
Thallium	NV	0.0003		0.0003	< 0.0003	<0.00005	<0.00005	<0.00005	<0.000050	<0.000050	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Vanadium	NV	0.006		< 0.001	< 0.001	<0.001	<0.0005	<0.0005	<0.00050	0.00077	0.0022	0.0008	0.0025	0.0024	0.0009
Zinc	5	0.02	2.5	< 0.01	< 0.01	0.006	<0.005	<0.005	0.0077	<0.0050	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Field Conductivity (µs/cm)	NV			-	-	-	-	-	773	600	703	660	-	-	720
Field pH (units)	6.5 - 8.5			-	-	-	-	-	7.73	7.74	7.29	7.32	-	-	7.69
Field Temperature (°C)	NV			-	-	-	-	-	10.1	7.1	11.2	8.6	-	-	13.19

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Summary of Ground Water Quality - General
Chemistry
Laxton Waste Disposal Site

Parameter	ODWQS	PWQO / CWQG	RUP	MW10	MW10	MW10	MW10	MW10	MW10	MW10	MW10	MW10	MW10	MW10	MW10
				11-Sep-15	31-May-16	17-Oct-16	19-Apr-17	17-Oct-17	24-Apr-18	26-Sep-18	17-Apr-19	18-Oct-19	21-Apr-20	13-Oct-20	15-Apr-21
Alkalinity (as CaCO3)	500		301	135	136	147	151	154	147	157	139	144	130	136	131
Calcium	NV			130	149	97.6	122	116	136	113	137	116	136	115	141
Chloride	250	<u>120</u>	126	2.3	14.9	4.5	6.1	4.8	4.6	5.1	4	4	2.8	3.6	3.6
Oxygen Demand - Chemical (COD)	NV			< 5	7	5	< 5	10	5	< 5	10	7	6		5
Conductivity (µS/cm)	NV			725	775	583	684	680	711	712	762	696	710	667	733
Organic Carbon - Dissolved (DOC)	5		3.4	1.9	1.8	2.9	3.1	3.3	<u>3.5</u>	<u>4.3</u>	<u>3.8</u>	<u>4.3</u>	<u>3.4</u>	<u>3.8</u>	<u>4.4</u>
Fluoride	1.5		0.80	0.7	0.6	0.4	0.6	0.4	0.4	0.3	< 0.1	0.4	0.2	0.6	0.4
Hardness (as CaCO3)	500		309	373	430	294	366	348	404	346	402	350	397	336	414
Iron	0.3	0.3		1.31	1.91	1.49	1.87	2.23	2.1	2.25	2.35	2.24	2.37	2.05	2.63
Magnesium	NV			11.5	14	12.2	14.8	14.2	15.5	15.5	14.5	14.5	13.9	11.8	15
Manganese	0.050		0.03	0.174	0.196	0.183	0.24	0.217	0.235	0.22	0.246	0.23	0.214	0.187	0.241
Mercury	0.001	0.0002	0.0003	< 0.00002	<0.00002	<0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Nitrate as N	10	13	2.5	< 0.1	<0.1	<0.1	< 0.1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nitrite as N	1	<u>0.06</u>	0.29	< 0.1	<0.1	0.2	0.1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
pH	6.5 - 8.5			8	7.81	7.93	7.93	7.81	7.76	7.75	7.56	7.77	7.63	7.83	7.66
Phenols	NV	0.001		< 0.001	<0.001	<0.001	< 0.001	0.006	< 0.001	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Phosphorus	NV	0.03		0.01	0.01	0.01	< 0.1	< 0.1	< 0.1	< 0.1	0.23	0.01	< 0.1	< 0.1	0.04
Potassium	NV			2.1	2.5	2.1	2.1	2.3	2.5	2.5	2.3	2.5	2.4	2.3	2.5
Sodium	200		101	14.4	14.6	6.4	6.9	6.9	8.4	8	9.3	9.1	7.4	7.8	8.2
Sulphate	500		257	238	249	154	202	164	246	207	221	203	241	211	254
Solids - Total Dissolved (TDS)	500		308	481	529	367	447	404	504	448	474	439	484	436	506
Total Kjeldahl Nitrogen (TKN)	NV			0.2	0.1	0.3	0.2	0.2	0.1	0.2	0.2	0.2	0.1	0.1	0.1
Total Ammonia as N (NH ₃ + NH ₄)	NV			0.02	0.03	0.07	< 0.01	0.03	0.03	0.03	0.04	0.04	0.03	0.06	0.02
Aluminum	0.10	0.08	0.06	0.04	0.04	0.04	0.04	0.06	0.08	0.08	0.07	0.09	0.07	0.07	0.08
Antimony	0.006	0.02	0.002	< 0.0001	<0.0001	0.0003	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Arsenic	0.025	0.005	0.006	0.0002	0.0001	0.0003	0.0001	0.0001	0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Barium	1		0.33	0.014	0.019	0.063	0.074	0.092	0.091	0.104	0.063	0.07	0.068	0.049	0.075
Beryllium	NV	0.011		< 0.002	<0.002	<0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Boron	5	1.3	1.3	0.038	0.045	0.03	0.012	0.07	0.085	0.122	0.092	0.116	0.066	0.08	0.091
Cadmium	0.005	0.0001	0.001	< 0.00002	<0.00002	<0.00002	0.000014	< 0.000014	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015
Chromium	0.05	0.001	0.013	0.0037	<0.0002	0.0013	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.001	< 0.001	0.001	< 0.001
Cobalt	NV	0.0009		< 0.005	<0.005	<0.005	< 0.005	< 0.005	< 0.0001	< 0.005	0.007	< 0.005	< 0.005	< 0.005	< 0.005
Copper	1	0.005	0.50	0.0001	<0.0001	<0.0001	< 0.0001	0.0003	0.0002	0.0005	0.0005	0.0008	0.0018	0.0002	< 0.0001
Lead	0.01	0.003	0.003	< 0.00002	<0.00002	<0.00002	< 0.00002	< 0.00002	< 0.00002	0.00002	< 0.00002	< 0.00002	0.00005	< 0.00002	< 0.00002
Molybdenum	NV	0.04		0.0033	0.0027	0.0021	0.0026	0.0018	0.0024	0.0016	0.0023	0.002	0.0024	0.002	0.0022
Nickel	NV	0.025		< 0.01	<0.01	<0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Selenium	0.01	0.1	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
Silver	NV	0.0001		< 0.00002	<0.00002	<0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Strontium	NV			3.4	4.13	2.31	2.76	2.58	3.23	2.79	3.3	3.06	3.15	2.77	3.32
Thallium	NV	0.0003		< 0.00005	<0.00005	<0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Vanadium	NV	0.006		0.0015	0.0009	0.0007	0.0008	0.0005	0.0007	0.0003	0.0002	0.0003	0.0002	0.0003	0.0003
Zinc	5	0.02	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
Field Conductivity (µs/cm)	NV			825	767	515	544	590	770	625	880	605	750	490	800
Field pH (units)	6.5 - 8.5			7.52	6.64	7.54	7.36	7.66	7.35	7.22	7.15	7.19	7.59	7	7.73
Field Temperature (°C)	NV			11.09	11.42	10.2	9.8	11	10.1	13	11	10.2	8	10.5	8.5

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Summary of Ground Water Quality - General
Chemistry
Laxton Waste Disposal Site

Parameter	ODWQS	PWQO / CWQG	RUP	MW10	MW10	MW10	MW10	MW10
				13-Oct-21	12-Apr-22	16-Oct-22	26-Apr-23	11-Oct-23
Alkalinity (as CaCO3)	500		301	144	147	164	155	154
Calcium	NV			129	132	122	146	169
Chloride	250	<u>120</u>	126	5.3	3.6	9.4	7.6	5.1
Oxygen Demand - Chemical (COD)	NV			13	10	6	< 5	9
Conductivity (µS/cm)	NV			698	752	781	844	1040
Organic Carbon - Dissolved (DOC)	5		3.4	3.1	3.6	4.8	3.1	3.5
Fluoride	1.5		0.80	0.6	< 0.1	0.3	0.2	0.3
Hardness (as CaCO3)	500		309	381	388	366	429	483
Iron	0.3	0.3		2.68	2.63	2.93	3.65	2.91
Magnesium	NV			14.3	14.3	14.6	15.5	14.7
Manganese	0.050		0.03	0.232	0.221	0.237	0.27	0.242
Mercury	0.001	0.0002	0.0003	< 0.00002	0.00005	< 0.00002	< 0.00002	<0.00002
Nitrate as N	10	<u>13</u>	2.5	< 0.05	0.08	0.06	0.12	<0.05
Nitrite as N	1	<u>0.06</u>	0.29	< 0.05	< 0.05	< 0.05	< 0.05	<0.05
pH	6.5 - 8.5			7.21	7.78	7.63	7.54	6.94
Phenols	NV	0.001		< 0.001	< 0.001	< 0.001	< 0.001	<0.001
Phosphorus	NV	0.03		< 0.01	< 0.1	< 0.1	< 0.1	<0.1
Potassium	NV			2.5	2.4	2.5	2.6	2.5
Sodium	200		101	8.2	7.3	8.8	9	8.7
Sulphate	500		257	251	246	242	258	449
Solids - Total Dissolved (TDS)	500		308	500	496	502	536	558
Total Kjeldahl Nitrogen (TKN)	NV			0.2	0.4	0.2	0.2	1.3
Total Ammonia as N (NH ₃ + NH ₄)	NV			0.05	0.24	0.04	0.03	1.21
Aluminum	0.10	0.08	0.06	0.07	0.04	0.03	0.05	0.1
Antimony	0.006	0.02	0.002	< 0.0001	< 0.0001	0.0001	< 0.0001	0.0001
Arsenic	0.025	0.005	0.006	< 0.0001	< 0.0001	< 0.0001	< 0.0001	<0.0001
Barium	1		0.33	0.071	0.066	0.066	0.083	0.069
Beryllium	NV	0.011		< 0.002	< 0.002	< 0.002	< 0.002	<0.0001
Boron	5	<u>1.3</u>	1.3	0.121	0.079	0.126	0.125	0.112
Cadmium	0.005	0.0001	0.001	< 0.000015	< 0.000015	< 0.000010	< 0.000010	<0.000015
Chromium	0.05	0.001	0.013	0.001	< 0.001	< 0.001	< 0.001	<0.001
Cobalt	NV	0.0009		< 0.005	< 0.005	< 0.005	< 0.005	0.0003
Copper	1	0.005	0.50	0.0003	0.0003	0.0006	0.0006	0.0005
Lead	0.01	0.003	0.003	0.00003	< 0.00002	< 0.00002	0.00002	<0.00004
Molybdenum	NV	0.04		0.0019	0.0024	0.002	0.0025	0.003
Nickel	NV	0.025		< 0.01	< 0.01	< 0.01	< 0.01	0.0003
Selenium	0.01	<u>0.1</u>	0.003	< 0.001	< 0.001	< 0.001	< 0.001	<0.001
Silver	NV	0.0001		< 0.0001	< 0.0001	< 0.0001	< 0.0001	<0.0001
Strontium	NV			3.14	3.2	3.05	3.68	4.27
Thallium	NV	0.0003		< 0.00005	< 0.00005	< 0.00005	< 0.00005	<0.00005
Vanadium	NV	0.006		0.0003	0.0002	0.0003	0.0002	0.0002
Zinc	5	<u>0.02</u>	2.5	< 0.005	< 0.005	< 0.005	< 0.005	<0.005
Field Conductivity (µs/cm)	NV			740	625	610	622	300
Field pH (units)	6.5 - 8.5			7.56	7.21	7.03	7.1	7.07
Field Temperature (°C)	NV			12.1	11.2	10.9	10.9	11.2

ODWQS - Ontario Drinking Water Quality Objectives
PWQO - Provincial Water Quality Objectives
CWQG - Canadian Water Quality Guidelines (underlined value) - long term criteria
Bold / Grey Highlighting - ODWQS Exceedance
Red / Bold - PWQO Exceedance
Bold / Underlined - RUP Exceedance
Bold / Red Highlighting - PWQO / CWQG Exceedance
all results in mg/L unless otherwise stated

Summary of Ground Water Quality - General Chemistry

Laxton Waste Disposal Site

Parameter	ODWQS	PWQO / CWQG	RUP	MW12	MW12	MW12	MW12	MW12	MW12	MW12	MW12	MW12	MW12	MW12	MW12
				30-May-08	01-Oct-08	24-Jun-09	24-Aug-09	07-Jun-10	07-Oct-10	26-May-11	08-Sep-11	30-May-12	01-Nov-12	10-Jun-13	30-Oct-13
Alkalinity (as CaCO3)	500		301	116	116.01	108	110	113	108	111	109	100	140	104	115
Calcium	NV			35	28.1	33	33	33	34	32	28	29	31	29.6	31.7
Chloride	250	<u>120</u>	126	2	2.5	3	2	1	1	2	1	1	2	1.7	1.3
Oxygen Demand - Chemical (COD)	NV			<2	3	< 2	4	< 2	3	8	10	9.3	6.3	< 5	8
Conductivity (µS/cm)	NV			252	254	237	246	203	216	245	238	230	270	240	253
Organic Carbon - Dissolved (DOC)	5		3.4	1	1.398	1	1	1	1	1.5	1.1	0.89	0.92	2.2	2.2
Fluoride	1.5		0.80	<0.1	<0.1	< 0.1	< 0.1	< 0.1	< 0.1	<0.1	0.06	<0.10	<0.10	0.2	< 0.1
Hardness (as CaCO3)	500		309	135	115.9	132	132	129	134	120	110	110	130	118	126
Iron	0.3	0.3		0.3	0.7725	0.7	6.1	0.7	0.7	0.99	0.7	0.79	0.95	0.868	1.55
Magnesium	NV			11	11.1	12	12	12	12	11	9.4	9.9	12	10.7	11.4
Manganese	0.050		0.03	0.28	0.1346	0.14	0.15	0.13	0.1	0.21	0.13	0.18	0.15	0.182	0.141
Mercury	0.001	0.0002	0.0003	<0.00002	<0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	0.00002	<0.00001	<0.00001	<0.00001	< 0.00002	< 0.00002
Nitrate as N	10	<u>13</u>	2.5	<0.1	<0.1	< 0.1	< 0.1	< 0.1	< 0.1	<0.1	<0.1	<0.10	<0.10	< 0.1	< 0.1
Nitrite as N	1	<u>0.06</u>	0.29	<0.1	<0.1	< 0.1	< 0.1	< 0.1	< 0.1	<0.01	<0.01	<0.010	<0.010	< 0.1	< 0.1
pH	6.5 - 8.5			6.73	7.45	7.32	7.32	7.39	7.43	7.47	7.09	7.35	7.01	7.38	7.48
Phenols	NV	0.001		<0.001	<0.001	< 0.001	< 0.001	< 0.001	< 0.001	<0.001	0.002	<0.0010	<0.0010	< 0.001	< 0.001
Phosphorus	NV	0.03		0.01	<0.01	< 0.01	0.23	< 0.01	< 0.002	-	-	<0.10	<0.10	0.09	0.22
Potassium	NV			2.9	2.55	2.8	2.7	2.6	2.3	2.6	2.2	2.3	2.5	2.2	2.3
Sodium	200		101	4	2.42	3	3	2	2	1.9	1.6	1.6	1.8	1.8	1.9
Sulphate	500		257	18	16.3	16	15	15	14	13	14	12	12	15	12
Solids - Total Dissolved (TDS)	500		308	164	165.1	154	160	132	140	140	132	129	157	124	132
Total Kjeldahl Nitrogen (TKN)	NV			<0.1	0.1	0.1	0.2	0.2	0.2	0.3	<2	0.35	0.24	0.3	< 0.1
Total Ammonia as N (NH ₃ + NH ₄)	NV			<0.1	<0.1	0.03	< 0.01	0.02	0.01	<0.01	<0.01	<0.01	0.05	0.008	0.021
Aluminum	0.10	0.08	0.06	<0.01	0.03777	< 0.01	1.78	0.02	< 0.01	<0.005	<0.005	<0.0050	<0.0050	0.01	0.02
Antimony	0.006	0.02	0.002	<0.01	<0.01	< 0.01	< 0.01	< 0.01	< 0.01	<0.0005	<0.0005	<0.00050	<0.00050	< 0.0001	< 0.0001
Arsenic	0.025	0.005	0.006	<0.01	<0.01	< 0.01	< 0.01	< 0.005	< 0.005	<0.001	<0.001	<0.0010	<0.0010	< 0.0001	< 0.0001
Barium	1		0.33	0.1	0.10771	< 0.1	0.2	0.1	< 0.1	0.11	0.11	0.1	0.12	0.115	0.125
Beryllium	NV	0.011		<0.1	<0.1	< 0.1	< 0.1	< 0.1	< 0.1	<0.0005	<0.0005	<0.00050	<0.00050	< 0.002	< 0.002
Boron	5	1.3	1.3	<0.1	<0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.015	0.01	0.017	0.017	0.014	0.017
Cadmium	0.005	0.0001	0.001	<0.0001	<0.0001	< 0.0001	0.0002	< 0.0001	< 0.0001	<0.0001	<0.0001	<0.00010	<0.00010	< 0.00002	< 0.00002
Chromium	0.05	0.001	0.013	0.0001	0.000951	< 0.0001	0.0033	0.0005	0.0004	<0.005	<0.005	<0.0050	<0.0050	< 0.002	0.0113
Cobalt	NV	0.0009		0.0014	0.00117	0.0011	0.0036	0.0011	0.0009	0.0024	0.0017	0.0016	0.0015	0.002	< 0.005
Copper	1	0.005	0.50	0.0017	0.000354	0.0008	0.0158	0.0004	0.0007	0.001	<0.001	<0.0010	<0.0010	0.0003	0.0002
Lead	0.01	0.003	0.003	<0.001	<0.001	< 0.001	0.002	< 0.001	< 0.001	<0.0005	<0.0005	<0.00050	<0.00050	< 0.00002	< 0.00002
Molybdenum	NV	0.04		<0.002	<0.002	< 0.002	< 0.002	< 0.002	< 0.002	<0.001	<0.0005	<0.00050	<0.00050	0.0004	0.0003
Nickel	NV	0.025		<0.01	<0.01	< 0.01	< 0.01	< 0.01	< 0.01	<0.001	<0.001	<0.0010	<0.0010	< 0.01	< 0.01
Selenium	0.01	0.1	0.003	<0.01	<0.01	< 0.01	< 0.01	< 0.01	< 0.01	<0.002	<0.002	<0.0020	<0.0020	< 0.001	< 0.001
Silver	NV	0.0001		<0.0001	<0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	<0.0001	<0.0001	<0.00010	<0.00010	< 0.00002	< 0.00002
Strontium	NV			0.189	0.1722	0.166	0.16	0.173	0.133	0.19	0.18	0.17	0.21	-	-
Thallium	NV	0.0003		<0.0003	<0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	<0.00005	<0.00005	<0.000050	<0.000050	< 0.00005	< 0.00005
Vanadium	NV	0.006		<0.001	<0.001	< 0.001	0.008	< 0.001	< 0.001	<0.001	<0.0005	<0.00050	<0.00050	0.0014	0.0004
Zinc	5	0.02	2.5	<0.01	<0.01	< 0.01	0.02	< 0.01	< 0.01	<0.005	<0.005	<0.0050	<0.0050	< 0.005	< 0.005
Field Conductivity (µs/cm)	NV			-	-	-	-	-	-	-	-	-	316	290	290
Field pH (units)	6.5 - 8.5			-	-	-	-	-	-	-	-	8.32	7.97	7.32	6.94
Field Temperature (°C)	NV			-	-	-	-	-	-	-	-	8.6	7.4	9.5	7.5

ODWQS - Ontario Drinking Water Quality Objectives

PWQO - Provincial Water Quality Objectives

CWQG - Canadian Water Quality Guidelines (underlined value) - long term criteria

RUP - Reasonable Use Policy Criteria

Bold / Grey Highlighting - ODWQS Exceedance

Bold / Underlined - RUP Exceedance

Bold / Red Highlighting - PWQO / CWQG Exceedance

all results in mg/L unless otherwise stated

Summary of Ground Water Quality - General Chemistry
Laxton Waste Disposal Site

Parameter	ODWQS	PWQO / CWQG	RUP	MW12	MW12	MW12	MW12	MW12	MW12	MW12	MW12	MW12	MW12	MW12	MW12
				29-Apr-14	23-Sep-14	09-Jun-15	11-Sep-15	31-May-16	17-Oct-16	19-Apr-17	17-Oct-17	24-Apr-18	26-Sep-18	17-Apr-19	18-Oct-19
Alkalinity (as CaCO3)	500		301	109	107	113	113	105	113	129	154	177	186	183	181
Calcium	NV			32.4	31.3	29.3	30.4	32.5	36.2	42.8	52.4	72.7	67	57.1	51.2
Chloride	250	<u>120</u>	126	1.7	1.6	1.9	2.1	4.5	5.5	11.7	30.8	54.7	43.7	26.4	20.4
Oxygen Demand - Chemical (COD)	NV			21	70	11	5	7	295	44	83	37	5	75	34
Conductivity (µS/cm)	NV			245	242	252	248	249	284	335	457	533	579	529	489
Organic Carbon - Dissolved (DOC)	5		3.4	1.7	2.1	2.2	1.1	1.1	2	2.2	3.2	3.1	3.3	4.3	4.2
Fluoride	1.5		0.80	0.1	< 0.1	0.1	0.1	0.1	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Hardness (as CaCO3)	500		309	129	125	123	125	134	146	174	217	298	282	238	221
Iron	0.3	0.3		0.854	1.05	0.508	0.428	0.801	1.43	1.4	1.59	2.01	1.89	0.533	1.52
Magnesium	NV			11.7	11.5	12	11.9	12.8	13.6	16.3	20.9	28.3	27.8	23.1	22.6
Manganese	0.050		0.03	0.123	0.1	0.116	0.051	0.123	0.116	0.179	0.117	0.172	0.15	0.104	0.128
Mercury	0.001	0.0002	0.0003	< 0.00002	< 0.00002	< 0.00002	0.00009	<0.00002	<0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Nitrate as N	10	<u>13</u>	2.5	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.1	< 0.1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nitrite as N	1	<u>0.06</u>	0.29	< 0.1	< 0.1	< 0.1	0.1	< 0.1	0.2	< 0.1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
pH	6.5 - 8.5			7.67	7.56	7.75	7.71	7.39	7.61	7.53	7.56	7.4	7.52	7.16	7.54
Phenols	NV	0.001		< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.005	< 0.001	0.003	< 0.002	< 0.002
Phosphorus	NV	0.03		0.01	0.23	0.1	0.09	0.17	11.1	< 0.1	< 0.1	< 0.1	< 0.1	3.56	0.87
Potassium	NV			2.6	2.5	2.1	2.4	2.5	2.5	2.6	3	3.6	3.9	3.2	3.7
Sodium	200		101	1.9	1.8	1.5	1.9	1.9	2.1	2	2.3	4.5	6.6	13.3	18.3
Sulphate	500		257	13	10	12	11	15	20	21	22	42	42	35	34
Solids - Total Dissolved (TDS)	500		308	130	124	127	129	133	151	175	226	315	305	268	261
Total Kjeldahl Nitrogen (TKN)	NV			0.1	< 0.1	0.2	0.3	0.3	4.6	0.7	1.2	0.6	0.6	1.3	0.6
Total Ammonia as N (NH ₃ + NH ₄)	NV			< 0.01	0.07	< 0.01	< 0.01	0.01	0.1	< 0.01	0.03	0.05	0.03	0.05	0.06
Aluminum	0.10	0.08	0.06	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.05	0.02	0.04	0.05	0.05	0.04	0.04
Antimony	0.006	0.02	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
Arsenic	0.025	0.005	0.006	< 0.0001	< 0.0001	< 0.0001	0.0001	< 0.0001	0.0001	< 0.0001	0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Barium	1		0.33	0.126	0.115	0.11	0.121	0.128	0.144	0.169	0.259	0.304	0.293	0.24	0.231
Beryllium	NV	0.011		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Boron	5	1.3	1.3	0.016	0.018	0.01	0.021	0.017	0.019	0.016	0.066	0.177	0.265	0.334	0.434
Cadmium	0.005	0.0001	0.001	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	0.00024	0.000023	< 0.000014	< 0.000015	< 0.000015	< 0.000015	< 0.000015
Chromium	0.05	0.001	0.013	< 0.0002	0.0005	0.0014	0.003	< 0.0002	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.001
Cobalt	NV	0.0009		< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.0031	< 0.005	< 0.005	< 0.005
Copper	1	0.005	0.50	0.0007	0.0006	< 0.0001	0.0004	< 0.0001	0.0003	0.0018	0.0002	0.0003	0.0007	0.0017	0.0006
Lead	0.01	0.003	0.003	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	0.00004	< 0.00002	< 0.00002	< 0.00002	0.00003	< 0.00002	< 0.00002
Molybdenum	NV	0.04		0.0004	0.0003	< 0.0001	0.0007	< 0.00002	0.0004	0.0003	0.0003	0.0003	0.0003	0.0004	0.0005
Nickel	NV	0.025		< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Selenium	0.01	0.1	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
Silver	NV	0.0001		< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.0001	< 0.0001	< 0.0001
Strontium	NV			-	0.221	0.213	0.213	0.238	0.261	0.293	0.351	0.494	0.504	0.405	0.414
Thallium	NV	0.0003		< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Vanadium	NV	0.006		0.0017	0.0017	0.0009	0.0011	0.0007	0.0005	0.0007	0.0003	0.0007	< 0.0001	< 0.0001	< 0.0001
Zinc	5	0.02	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
Field Conductivity (µs/cm)	NV			-	-	198	212	231	245	280	340	620	510	590	430
Field pH (units)	6.5 - 8.5			-	-	7.42	7.17	6.65	7.45	7.56	7.61	7.15	7.19	7.36	7.2
Field Temperature (°C)	NV			-	-	12.61	10.93	9.92	10.6	9.7	12.1	8	10.9	8.6	7.9

ODWQS - Ontario Drinking Water Quality Objectives

PWQO - Provincial Water Quality Objectives

CWQG - Canadian Water Quality Guidelines (underlined value) - long term criteria

RUP - Reasonable Use Policy Criteria

Bold / Grey Highlighting - ODWQS Exceedance

Bold / Underlined - RUP Exceedance

Bold / Red Highlighting - PWQO / CWQG Exceedance

all results in mg/L unless otherwise stated

Summary of Ground Water Quality - General Chemistry
Laxton Waste Disposal Site

Parameter	ODWQS	PWQO / CWQG	RUP	MW12	MW12	MW12	MW12	MW12	MW12	MW12	MW12	MW13	MW13	MW13	MW13
				21-Apr-20	13-Oct-20	15-Apr-21	13-Oct-21	12-Apr-22	16-Oct-22	26-Apr-23	11-Oct-23	30-May-08	01-Oct-08	24-Jun-09	24-Aug-09
Alkalinity (as CaCO3)	500		301	154	146	128	143	157	150	145	155	121	112.16	114	114
Calcium	NV			41.6	36	34.3	36.3	37.5	34	37	35.8	31	29.2	34	35
Chloride	250	<u>120</u>	126	12.6	10.4	9.4	14.9	10.4	11.2	12.3	10.3	2	2.3	2	1
Oxygen Demand - Chemical (COD)	NV			79		45	35	66	43	35	47	<2	4	2	3
Conductivity (µS/cm)	NV			403	379	346	386	392	396	374	376	262	246	242	248
Organic Carbon - Dissolved (DOC)	5		3.4	3	3.8	4.3	3.3	3.8	3	4	3.7	1	1.834	1	1
Fluoride	1.5		0.80	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Hardness (as CaCO3)	500		309	172	141	140	149	157	145	152	149	125	119	134	137
Iron	0.3	0.3		0.811	0.561	0.786	1.41	0.762	1.31	0.449	1.04	0.1	< 0.1	0.1	0.7
Magnesium	NV			16.5	12.5	13.3	14.1	15.4	14.7	14.5	14.5	12	11.286	12	12
Manganese	0.050		0.03	0.094	0.058	0.188	0.07	0.187	0.07	0.091	0.06	0.02	0.01	0.01	0.01
Mercury	0.001	0.0002	0.0003	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	0.00002
Nitrate as N	10	<u>13</u>	2.5	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.05	< 0.1	< 0.1	< 0.1	< 0.1
Nitrite as N	1	<u>0.06</u>	0.29	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.1	< 0.1	< 0.1	< 0.1
pH	6.5 - 8.5			7.43	7.62	7.42	7.02	7.61	7.4	7.18	6.76	6.83	7.5	7.49	7.33
Phenols	NV	0.001		< 0.002	< 0.002	< 0.002	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Phosphorus	NV	0.03		< 0.1	< 0.1	2.01	1.04	< 0.1	< 0.1	< 0.1	< 0.1	0.02	< 0.01	< 0.01	0.05
Potassium	NV			3.2	2.9	3	3	3	3	3	2.8	2.8	3.067	2.9	2.7
Sodium	200		101	22.9	22.9	25	25.1	21	19.6	17.7	18	2	2.529	2	2
Sulphate	500		257	30	27	26	36	33	31	32	30	18	16.5	17	16
Solids - Total Dissolved (TDS)	500		308	220	200	188	217	216	205	204	194	170	159.9	157	161
Total Kjeldahl Nitrogen (TKN)	NV			0.9	1.2	0.8	0.7	2	0.7	0.6	0.8	< 0.1	0.1	< 0.1	< 0.1
Total Ammonia as N (NH ₃ + NH ₄)	NV			0.01	0.07	0.04	0.12	0.38	0.09	0.04	0.09	< 0.1	< 0.1	0.03	< 0.01
Aluminum	0.10	0.08	0.06	0.03	0.03	0.03	0.03	0.01	< 0.01	0.02	0.03	< 0.01	-	< 0.01	0.06
Antimony	0.006	0.02	0.002	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.01	-	< 0.01	< 0.01
Arsenic	0.025	0.005	0.006	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.01	-	< 0.01	< 0.01
Barium	1		0.33	0.196	0.163	0.16	0.165	0.18	0.162	0.176	0.16	< 0.1	-	< 0.1	< 0.1
Beryllium	NV	0.011		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.0001	< 0.1	-	< 0.1	< 0.1
Boron	5	1.3	1.3	0.452	0.417	0.486	0.524	0.798	0.725	0.764	0.741	< 0.1	-	< 0.1	< 0.1
Cadmium	0.005	0.0001	0.001	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000010	< 0.000010	< 0.000015	< 0.0001	-	< 0.0001	< 0.0001
Chromium	0.05	0.001	0.013	< 0.001	< 0.001	< 0.001	0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.0001	-	0.0001	0.0003
Cobalt	NV	0.0009		< 0.005	< 0.005	0.005	< 0.005	0.006	< 0.005	< 0.005	0.0017	0.0005	-	0.0005	0.0006
Copper	1	0.005	0.50	0.0007	0.0004	0.0018	0.0006	0.0023	0.0009	0.0004	0.0009	0.0009	-	0.0026	0.0008
Lead	0.01	0.003	0.003	< 0.00002	< 0.00002	0.00006	0.00003	< 0.00002	0.00003	< 0.00002	< 0.00002	< 0.001	-	< 0.001	< 0.001
Molybdenum	NV	0.04		0.0005	0.0005	0.0005	0.0005	0.0004	0.0004	0.0004	0.0004	< 0.002	-	< 0.002	< 0.002
Nickel	NV	0.025		< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.0016	< 0.01	-	< 0.01	< 0.01
Selenium	0.01	0.1	0.003	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.01	-	< 0.01	< 0.01
Silver	NV	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	NV			0.293	0.252	0.242	0.266	0.268	0.259	0.274	0.26	0.188	-	0.186	0.132
Thallium	NV	0.0003		< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.0003	-	< 0.0003	< 0.0003
Vanadium	NV	0.006		0.0001	0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.001	-	< 0.001	< 0.001
Zinc	5	0.02	2.5	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.01	-	< 0.01	< 0.01
Field Conductivity (µs/cm)	NV			420	300	440	390	340	325	310	290	-	-	-	-
Field pH (units)	6.5 - 8.5			7.48	7.3	8.03	7.39	7.24	7.25	7.5	7.22	-	-	-	-
Field Temperature (°C)	NV			6	9.7	7.1	11.5	9	10	8.1	10.8	-	-	-	-

ODWQS - Ontario Drinking Water Quality Objectives

PWQO - Provincial Water Quality Objectives

CWQG - Canadian Water Quality Guidelines (underlined value) - long term criteria

RUP - Reasonable Use Policy Criteria

Bold / Grey Highlighting - ODWQS Exceedance

Bold / Underlined - RUP Exceedance

Bold / Red Highlighting - PWQO / CWQG Exceedance

all results in mg/L unless otherwise stated

Summary of Ground Water Quality - General Chemistry
Laxton Waste Disposal Site

Parameter	ODWQS	PWQO / CWQG	RUP	MW13	MW13	MW13	MW13	MW13	MW13	MW13	MW13	MW13	MW13	MW13	MW13
				07-Jun-10	07-Oct-10	26-May-11	08-Sep-11	30-May-12	01-Nov-12	10-Jun-13	30-Oct-13	29-Apr-14	23-Sep-14	09-Jun-15	11-Sep-15
Alkalinity (as CaCO3)	500		301	120	113	107	107	100	150	98	100	99	99	99	102
Calcium	NV			36	36	30	28	29	42	26.8	32.4	30.3	29	24.5	28.7
Chloride	250	<u>120</u>	126	2	1	1	1	<1	1	1.3	1.2	1.3	1.3	1.5	1.6
Oxygen Demand - Chemical (COD)	NV			< 2	3	8	9	6.6	6.5	< 5	< 5	< 5	< 5	9	< 5
Conductivity (µS/cm)	NV			213	221	238	232	230	310	220	241	221	226	221	226
Organic Carbon - Dissolved (DOC)	5		3.4	1	1	1.3	1.1	0.96	1.1	1.8	2	1.7	1.9	2.2	1.1
Fluoride	1.5		0.80	< 0.1	< 0.1	<0.1	0.06	<0.10	<0.10	0.2	< 0.1	0.1	< 0.1	0.1	0.1
Hardness (as CaCO3)	500		309	141	142	120	110	110	150	107	126	120	115	103	117
Iron	0.3	0.3		0.1	0.2	0.13	0.1	0.14	0.52	0.142	0.147	0.123	0.186	0.061	0.195
Magnesium	NV			13	13	11	9.7	10	12	9.8	10.9	10.7	10.4	10.2	11.1
Manganese	0.050		0.03	0.01	0.02	0.015	0.013	0.016	0.043	0.016	0.021	0.014	0.013	0.009	0.011
Mercury	0.001	0.0002	0.0003	< 0.00002	< 0.00002	<0.00001	<0.00001	<0.00001	<0.00001	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Nitrate as N	10	<u>13</u>	2.5	< 0.1	< 0.1	<0.1	<0.1	<0.10	<0.10	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Nitrite as N	1	<u>0.06</u>	0.29	< 0.1	< 0.1	<0.01	<0.01	<0.010	<0.010	< 0.1	< 0.1	< 0.1	< 0.1	0.1	< 0.1
pH	6.5 - 8.5			7.45	7.44	7.57	7.07	7.4	7.26	7.56	7.53	7.76	7.65	7.69	7.68
Phenols	NV	0.001		< 0.001	< 0.001	<0.001	0.002	<0.0010	<0.0010	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Phosphorus	NV	0.03		< 0.01	< 0.002	-	-	<0.10	<0.10	0.03	< 0.01	< 0.01	0.04	0.09	0.05
Potassium	NV			2.8	2.4	2.5	2.2	2.4	2.4	2.1	2.3	2.5	2.3	1.8	2.2
Sodium	200		101	1	1	1.6	1.4	1.5	1.8	1.6	1.7	1.7	1.6	1.2	1.8
Sulphate	500		257	16	13	13	14	13	18	12	12	12	11	11	11
Solids - Total Dissolved (TDS)	500		308	138	144	135	131	127	176	113	121	118	115	110	118
Total Kjeldahl Nitrogen (TKN)	NV			0.1	0.1	8.4	0.2	0.12	0.26	< 0.1	< 0.1	0.1	< 0.1	0.1	0.2
Total Ammonia as N (NH ₃ + NH ₄)	NV			0.05	< 0.01	<0.05	<0.02	<0.01	0.05	< 0.005	0.015	< 0.01	0.05	< 0.01	< 0.01
Aluminum	0.10	0.08	0.06	< 0.01	0.01	<0.005	<0.005	<0.0050	<0.0050	0.02	0.02	< 0.01	< 0.01	< 0.01	< 0.01
Antimony	0.006	0.02	0.002	< 0.01	< 0.01	<0.0005	<0.0005	<0.00050	<0.00050	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Arsenic	0.025	0.005	0.006	< 0.005	< 0.005	<0.001	<0.001	<0.0010	<0.0010	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Barium	1		0.33	< 0.1	< 0.1	0.098	0.094	0.091	0.11	0.09	0.1	0.096	0.089	0.081	0.097
Beryllium	NV	0.011		< 0.1	< 0.1	<0.0005	<0.0005	<0.00050	<0.00050	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Boron	5	1.3	1.3	< 0.1	< 0.1	0.011	<0.01	<0.010	0.012	0.008	0.011	0.009	0.01	< 0.005	0.01
Cadmium	0.005	0.0001	0.001	< 0.0001	< 0.0001	<0.0001	<0.0001	<0.00010	<0.00010	< 0.00002	< 0.00002	0.00004	< 0.00002	< 0.00002	< 0.00002
Chromium	0.05	0.001	0.013	0.0001	0.0004	<0.005	<0.005	<0.0050	<0.0050	< 0.002	0.0016	< 0.0002	0.0004	0.0013	0.0035
Cobalt	NV	0.0009		0.0004	0.0006	0.0007	0.0005	0.0007	0.00051	0.0006	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Copper	1	0.005	0.50	0.0013	0.0019	<0.001	<0.001	<0.0010	<0.0010	0.0004	0.0001	0.0005	0.0005	< 0.0001	0.0002
Lead	0.01	0.003	0.003	< 0.001	< 0.001	<0.0005	<0.0005	<0.00050	<0.00050	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Molybdenum	NV	0.04		< 0.002	< 0.002	<0.001	<0.0005	<0.00050	0.00064	0.0003	0.0003	0.0003	< 0.0001	< 0.0001	0.0006
Nickel	NV	0.025		< 0.01	< 0.01	<0.001	<0.001	<0.0010	<0.0010	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Selenium	0.01	0.1	0.003	< 0.01	< 0.01	<0.002	<0.002	<0.0020	<0.0020	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Silver	NV	0.0001		< 0.0001	< 0.0001	<0.0001	<0.0001	<0.00010	<0.00010	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Strontium	NV			0.187	0.186	0.19	0.19	0.18	0.26	-	-	-	0.214	0.186	0.205
Thallium	NV	0.0003		< 0.0003	< 0.0003	<0.00005	<0.00005	<0.000050	<0.000050	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Vanadium	NV	0.006		< 0.001	< 0.001	<0.001	<0.0005	<0.00050	<0.00050	0.0013	0.0005	0.0017	0.0016	0.0008	0.0013
Zinc	5	0.02	2.5	< 0.01	< 0.01	0.007	<0.005	0.0065	<0.0050	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Field Conductivity (µs/cm)	NV			-	-	-	-	431	360	228	330	-	-	176	198
Field pH (units)	6.5 - 8.5			-	-	-	-	8.55	7.91	7.59	7.02	-	-	7.64	7.29
Field Temperature (°C)	NV			-	-	-	-	8.7	7.3	10.6	7.4	-	-	13.12	11.69

ODWQS - Ontario Drinking Water Quality Objectives

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Bold / Grey Highlighting - ODWQS Exceedance

Bold / Underlined - RUP Exceedance

Bold / Red Highlighting - PWQO / CWQG Exceedance

all results in mg/L unless otherwise stated

Summary of Ground Water Quality - General Chemistry

Laxton Waste Disposal Site

Parameter	ODWQS	PWQO / CWQG	RUP	MW13	MW13	MW13	MW13	MW13	MW13	MW13	MW13	MW13	MW13	MW13	MW13
				31-May-16	17-Oct-16	19-Apr-17	17-Oct-17	24-Apr-18	26-Sep-18	17-Apr-19	18-Oct-19	21-Apr-20	13-Oct-20	15-Apr-21	13-Oct-21
Alkalinity (as CaCO3)	500		301	110	101	104	101	99	103	118	130	123	134	116	134
Calcium	NV			-	28.8	28.8	28.4	28.8	34	40.7	40.7	45.7	42.1	36.9	37.8
Chloride	250	<u>120</u>	126	<1	2.2	3.2	2.3	3.6	21.4	23.7	16.1	11.2	9.7	5.8	10.9
Oxygen Demand - Chemical (COD)	NV			8.9	11	5	11	11	< 5	7	8	10		< 5	14
Conductivity (µS/cm)	NV			240	229	231	228	212	294	355	339	314	338	298	359
Organic Carbon - Dissolved (DOC)	5		3.4	1.2	1.7	1.7	2.1	1.4	1.9	1.8	2.8	2.4	2.8	3.6	2.8
Fluoride	1.5		0.80	<0.10	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Hardness (as CaCO3)	500		309	120	117	118	115	118	144	165	173	169	169	150	154
Iron	0.3	0.3		<0.1	0.213	0.203	0.233	0.081	0.235	0.209	2.08	0.204	0.292	0.255	0.383
Magnesium	NV			10	11.1	11.2	10.6	11.2	14.3	15.3	17.3	16.6	15.5	14	14.5
Manganese	0.050		0.03	0.051	0.013	0.013	0.016	0.011	0.014	0.016	0.017	0.02	0.016	0.029	0.013
Mercury	0.001	0.0002	0.0003	<0.00001	<0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Nitrate as N	10	<u>13</u>	2.5	<0.10	<0.1	< 0.1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.05	< 0.05
Nitrite as N	1	<u>0.06</u>	0.29	<0.010	0.2	< 0.1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
pH	6.5 - 8.5			7.16	7.75	7.78	7.71	7.5	7.61	7.34	7.53	7.43	7.72	7.52	7.05
Phenols	NV	0.001		<0.0010	<0.001	< 0.001	0.006	0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.001
Phosphorus	NV	0.03		<0.10	1.49	< 0.1	< 0.1	< 0.1	< 0.1	0.24	0.07	< 0.1	< 0.1	0.33	0.41
Potassium	NV			2.5	2.3	2.1	2.3	2.3	2.8	2.5	3	2.8	2.8	2.7	2.8
Sodium	200		101	1.5	1.8	1.5	1.8	1.8	2	1.9	2.2	2.3	4.1	8.4	13.7
Sulphate	500		257	15	12	12	10	12	12	12	16	17	21	19	37
Solids - Total Dissolved (TDS)	500		308	135	120	121	116	119	149	167	176	170	176	157	198
Total Kjeldahl Nitrogen (TKN)	NV			0.19	<1	0.1	0.4	0.1	0.1	0.2	0.2	0.1	0.1	0.2	0.2
Total Ammonia as N (NH ₃ + NH ₄)	NV			<0.01	0.05	< 0.01	0.05	0.07	0.03	0.02	0.03	< 0.01	0.04	0.01	0.07
Aluminum	0.10	0.08	0.06	<0.0050	0.03	0.01	0.03	0.02	0.03	0.03	0.08	0.03	0.03	0.03	0.03
Antimony	0.006	0.02	0.002	<0.00050	0.0003	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.0002	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Arsenic	0.025	0.005	0.006	<0.0010	0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Barium	1		0.33	0.1	0.094	0.097	0.113	0.098	0.12	0.125	0.146	0.146	0.142	0.134	0.144
Beryllium	NV	0.011		<0.00050	<0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Boron	5	1.3	1.3	0.01	0.009	< 0.005	0.014	0.011	0.01	0.016	0.031	0.07	0.144	0.213	0.27
Cadmium	0.005	0.0001	0.001	<0.00010	<0.00002	0.000019	0.00002	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015
Chromium	0.05	0.001	0.013	<0.0050	0.0009	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.002	< 0.001	< 0.001	< 0.001	0.001
Cobalt	NV	0.0009		0.0012	<0.005	< 0.005	< 0.005	0.0005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Copper	1	0.005	0.50	0.0013	<0.0001	0.0009	0.0007	0.0003	0.0005	0.0004	0.0016	0.0019	0.0003	0.002	0.0006
Lead	0.01	0.003	0.003	<0.00050	<0.0002	< 0.00002	0.00002	< 0.00002	0.00002	< 0.00002	0.0002	0.00005	< 0.00002	0.00006	0.00003
Molybdenum	NV	0.04		<0.00050	0.0003	0.0003	0.0003	0.0003	0.0002	0.0003	0.0003	0.0003	0.0003	0.0002	0.0003
Nickel	NV	0.025		<0.0010	<0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Selenium	0.01	0.1	0.003	<0.0020	<0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Silver	NV	0.0001		<0.00010	<0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Strontium	NV			0.19	0.213	0.207	0.187	0.204	0.271	0.287	0.321	0.304	0.301	0.262	0.286
Thallium	NV	0.0003		<0.000050	<0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Vanadium	NV	0.006		<0.00050	0.0004	0.0006	0.0002	0.0003	< 0.0001	< 0.0001	0.0006	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Zinc	5	0.02	2.5	0.0062	<0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Field Conductivity (µs/cm)	NV			276	215	195	200	280	280	410	305	365	275	390	350
Field pH (units)	6.5 - 8.5			8.05	7.54	7.86	7.66	7.55	7.36	7.65	7.39	7.5	7.42	8	7.54
Field Temperature (°C)	NV			9.9	10.6	10	11.9	8.2	10.5	5.7	8	6.6	9.1	6.9	11.5

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Bold / Grey Highlighting - ODWQS Exceedance

Bold / Underlined - RUP Exceedance

Bold / Red Highlighting - PWQO / CWQG Exceedance

all results in mg/L unless otherwise stated

Summary of Ground Water Quality - General Chemistry
Laxton Waste Disposal Site

Parameter	ODWQS	PWQO / CWQG	RUP	MW13	MW13	MW13	MW13	MW14	MW14	MW14	MW14	MW14	MW14	MW14	MW14
				12-Apr-22	16-Oct-22	26-Apr-23	11-Oct-23	30-May-08	01-Oct-08	24-Jun-09	24-Aug-09	07-Jun-10	07-Oct-10	26-May-11	08-Sep-11
Alkalinity (as CaCO3)	500		301	145	146	145	151	121	115.75	110	115	120	118	123	131
Calcium	NV			34	33.7	37	32.6	31	27.5	33	34	34	36	31	28
Chloride	250	<u>120</u>	126	7.4	10.1	9.6	8.2	2	2	2	1	2	2	2	1
Oxygen Demand - Chemical (COD)	NV			13	6	< 5	11	<2	3	< 2	< 2	< 2	3	15	9
Conductivity (µS/cm)	NV			355	388	372	337	262	252	235	245	214	229	268	269
Organic Carbon - Dissolved (DOC)	5		3.4	3.1	3.3	4.3	2.9	1	1.579	1	1	1	1	1.1	0.9
Fluoride	1.5		0.80	< 0.1	< 0.1	< 0.1	<0.1	<0.1	<0.1	< 0.1	< 0.1	< 0.1	< 0.1	<0.1	0.07
Hardness (as CaCO3)	500		309	143	141	151	135	125	116	132	134	139	142	120	110
Iron	0.3	0.3		0.285	0.241	0.124	0.224	0.4	1.167	0.4	3.1	0.5	0.4	0.56	0.4
Magnesium	NV			14.2	13.9	14.3	13.1	12	11.5	12	12	13	13	11	9.5
Manganese	0.050		0.03	0.015	0.01	0.016	0.007	<0.01	0.01428	< 0.01	0.04	< 0.01	< 0.01	0.011	0.01
Mercury	0.001	0.0002	0.0003	< 0.00002	< 0.00002	< 0.00002	<0.00002	<0.00002	<0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	<0.00001	<0.00001
Nitrate as N	10	<u>13</u>	2.5	< 0.05	< 0.05	< 0.05	<0.05	<0.1	<0.1	< 0.1	< 0.1	< 0.1	< 0.1	<0.1	<0.1
Nitrite as N	1	<u>0.06</u>	0.29	< 0.05	< 0.05	< 0.05	<0.05	<0.1	<0.1	< 0.1	< 0.1	< 0.1	< 0.1	<0.01	<0.01
pH	6.5 - 8.5			7.73	7.53	7.27	6.84	6.87	7.45	7.4	7.31	7.41	7.46	7.76	7.37
Phenols	NV	0.001		< 0.001	< 0.001	< 0.001	<0.001	<0.001	<0.001	< 0.001	< 0.001	< 0.001	< 0.001	<0.001	0.002
Phosphorus	NV	0.03		< 0.1	< 0.1	< 0.1	<0.1	0.01	<0.01	< 0.01	7.36	< 0.01	< 0.002	-	-
Potassium	NV			2.8	2.8	2.8	2.7	2.2	2.08	2.4	2.5	2.3	2.2	2.2	2
Sodium	200		101	19.8	17.8	20.4	16.2	2	1.84	2	2	1	1	1.7	1.5
Sulphate	500		257	31	35	35	29	18	16.3	16	17	18	15	13	14
Solids - Total Dissolved (TDS)	500		308	197	201	206	173	170	163.8	153	159	139	149	147	146
Total Kjeldahl Nitrogen (TKN)	NV			0.3	< 0.1	0.2	0.2	<0.1	0.2	0.1	0.2	0.2	0.1	0.6	1
Total Ammonia as N (NH ₃ + NH ₄)	NV			0.1	< 0.01	0.03	<0.05	<0.1	<0.1	0.03	< 0.01	0.03	< 0.01	<0.05	0.04
Aluminum	0.10	0.08	0.06	0.01	< 0.01	0.01	0.03	<0.01	0.276	< 0.01	1.65	< 0.01	< 0.01	<0.005	0.019
Antimony	0.006	0.02	0.002	< 0.0001	< 0.0001	< 0.0001	0.0002	<0.01	<0.01	< 0.01	< 0.01	< 0.01	< 0.01	<0.0005	<0.0005
Arsenic	0.025	0.005	0.006	< 0.0001	< 0.0001	< 0.0001	<0.0001	<0.01	<0.01	< 0.01	< 0.01	< 0.005	< 0.005	<0.001	<0.001
Barium	1		0.33	0.145	0.136	0.153	0.128	<0.1	<0.1	< 0.1	0.1	< 0.1	< 0.1	0.11	0.1
Beryllium	NV	0.011		< 0.002	< 0.002	< 0.002	<0.0001	<0.1	<0.1	< 0.1	< 0.1	< 0.1	< 0.1	<0.0005	<0.0005
Boron	5	1.3	1.3	0.565	0.457	0.684	0.715	<0.1	<0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.011	<0.01
Cadmium	0.005	0.0001	0.001	< 0.000015	< 0.000010	< 0.000010	<0.000015	<0.0001	<0.0001	< 0.0001	0.0001	< 0.0001	< 0.0001	<0.0001	<0.0001
Chromium	0.05	0.001	0.013	< 0.001	< 0.001	< 0.001	<0.001	0.0001	0.001446	0.0002	0.003	0.0003	0.0002	<0.005	<0.005
Cobalt	NV	0.0009		< 0.005	< 0.005	< 0.005	0.0007	0.0003	0.000732	< 0.0003	0.0018	0.0003	< 0.0003	<0.0005	<0.0005
Copper	1	0.005	0.50	0.0021	0.0007	0.0004	0.0008	0.0007	0.002302	0.0012	0.0036	0.0002	0.0008	<0.001	<0.001
Lead	0.01	0.003	0.003	< 0.00002	< 0.00002	< 0.00002	0.00003	<0.001	<0.001	< 0.001	0.001	< 0.001	< 0.001	<0.0005	<0.0005
Molybdenum	NV	0.04		0.0004	0.0003	0.0004	0.0003	<0.002	<0.002	< 0.002	< 0.002	< 0.002	< 0.002	<0.001	<0.0005
Nickel	NV	0.025		< 0.01	< 0.01	< 0.01	0.0012	<0.01	<0.01	< 0.01	< 0.01	< 0.01	< 0.01	<0.001	<0.001
Selenium	0.01	0.1	0.003	< 0.001	< 0.001	< 0.001	<0.001	<0.01	<0.01	< 0.01	< 0.01	< 0.01	< 0.01	<0.002	<0.002
Silver	NV	0.0001		< 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	NV			0.258	0.258	0.285	0.25	0.194	0.18183	0.193	0.216	0.197	0.168	0.21	0.2
Thallium	NV	0.0003		< 0.00005	< 0.00005	< 0.00005	<0.00005	<0.0003	<0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	<0.00005	<0.00005
Vanadium	NV	0.006		< 0.0001	< 0.0001	< 0.0001	<0.0001	<0.001	0.00103	< 0.001	0.008	< 0.001	< 0.001	<0.001	<0.0005
Zinc	5	0.02	2.5	< 0.005	< 0.005	< 0.005	<0.005	<0.01	<0.01	< 0.01	0.02	< 0.01	< 0.01	<0.005	0.006
Field Conductivity (µs/cm)	NV			325	315	315	270	-	-	-	-	-	-	-	-
Field pH (units)	6.5 - 8.5			7.38	7.28	7.49	7.28	-	-	-	-	-	-	-	-
Field Temperature (°C)	NV			8.2	9.5	7.7	10.6	-	-	-	-	-	-	-	-

ODWQS - Ontario Drinking Water Quality Objectives

PWQO - Provincial Water Quality Objectives

CWQG - Canadian Water Quality Guidelines (underlined value) - long term criteria

RUP - Reasonable Use Policy Criteria

Bold / Grey Highlighting - ODWQS Exceedance

Bold / Underlined - RUP Exceedance

Bold / Red Highlighting - PWQO / CWQG Exceedance

all results in mg/L unless otherwise stated

Summary of Ground Water Quality - General Chemistry
Laxton Waste Disposal Site

Parameter	ODWQS	PWQO / CWQG	RUP	MW14	MW14	MW14	MW14	MW14	MW14	MW14	MW14	MW14	MW14	MW14
				30-May-12	01-Nov-12	10-Jun-13	30-Oct-13	29-Apr-14	23-Sep-14	09-Jun-15	11-Sep-15	31-May-16	17-Oct-16	19-Apr-17
Alkalinity (as CaCO3)	500		301	100	100	98	98	97	93	96	96	98	97	102
Calcium	NV			28	27	25.9	29.3	29.4	28.1	25.2	27.7	28.4	27.7	28.8
Chloride	250	<u>120</u>	126	<1	<1	1.2	1.1	1.2	1.2	1.3	1.3	1.7	1.1	2.1
Oxygen Demand - Chemical (COD)	NV			6.6	<4.0	< 5	< 5	< 5	< 5	8	10	6	7	8
Conductivity (µS/cm)	NV			230	220	217	228	217	216	216	214	215	217	225
Organic Carbon - Dissolved (DOC)	5		3.4	0.93	0.96	1.6	1.8	1.4	1.8	2	1	0.9	1.3	1.5
Fluoride	1.5		0.80	<0.10	<0.10	0.2	< 0.1	0.1	< 0.1	0.1	0.1	0.1	0.1	< 0.1
Hardness (as CaCO3)	500		309	110	110	105	116	116	112	105	113	117	112	117
Iron	0.3	0.3		0.49	0.38	0.535	0.471	0.432	0.54	0.183	0.265	0.34	0.388	0.326
Magnesium	NV			10	10	9.68	10.5	10.2	10.1	10.3	10.6	11.1	10.4	10.9
Manganese	0.050		0.03	0.0098	0.0091	0.013	0.012	0.011	0.01	0.006	0.006	0.008	0.011	0.011
Mercury	0.001	0.0002	0.0003	<0.00001	<0.00001	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	<0.00002	<0.00002	< 0.00002
Nitrate as N	10	<u>13</u>	2.5	<0.10	<0.10	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.2	<0.1	< 0.1
Nitrite as N	1	<u>0.06</u>	0.29	<0.010	<0.010	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.1	<0.1	0.2	< 0.1
pH	6.5 - 8.5			7.35	6.96	7.57	7.49	7.73	7.65	7.68	7.72	7.69	7.73	7.75
Phenols	NV	0.001		<0.0010	<0.0010	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	<0.001	<0.001	< 0.001
Phosphorus	NV	0.03		<0.10	<0.10	0.74	0.03	< 0.01	0.12	0.25	0.97	0.27	0.57	< 0.1
Potassium	NV			2.1	2.1	1.8	2.1	2.2	2.1	1.7	1.9	2.1	2	1.8
Sodium	200		101	1.6	1.6	1.7	1.7	1.7	1.6	1.3	1.8	1.7	1.8	1.6
Sulphate	500		257	12	12	12	12	12	12	11	11	11	11	11
Solids - Total Dissolved (TDS)	500		308	128	127	113	116	115	112	109	114	116	113	118
Total Kjeldahl Nitrogen (TKN)	NV			<0.10	0.16	< 0.1	< 0.1	0.3	0.1	0.1	0.2	0.3	0.5	0.1
Total Ammonia as N (NH ₃ + NH ₄)	NV			0.01	0.05	< 0.005	0.014	< 0.01	0.05	< 0.01	0.02	<0.01	0.05	< 0.01
Aluminum	0.10	0.08	0.06	<0.0050	0.0067	0.02	0.02	< 0.01	< 0.01	< 0.01	< 0.01	<0.01	0.05	< 0.01
Antimony	0.006	0.02	0.002	<0.00050	<0.00050	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	<0.0001	0.0002	< 0.0001
Arsenic	0.025	0.005	0.006	<0.0010	<0.0010	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.0001	<0.0001	0.0002	< 0.0001
Barium	1		0.33	0.093	0.099	0.093	0.099	0.094	0.091	0.082	0.095	0.101	0.091	0.098
Beryllium	NV	0.011		<0.00050	<0.00050	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	<0.002	<0.002	< 0.002
Boron	5	1.3	1.3	0.01	<0.010	0.009	0.011	0.009	0.01	< 0.005	0.011	0.008	0.009	< 0.005
Cadmium	0.005	0.0001	0.001	<0.00010	<0.00010	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	<0.00002	0.00007	< 0.000014
Chromium	0.05	0.001	0.013	<0.0050	<0.0050	< 0.002	0.103	< 0.0002	0.0004	0.001	0.0027	<0.0002	0.0008	< 0.001
Cobalt	NV	0.0009		<0.00050	<0.00050	0.0003	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	<0.005	<0.005	< 0.005
Copper	1	0.005	0.50	<0.0010	<0.0010	0.0003	< 0.0001	0.0004	0.0003	< 0.0001	0.0003	<0.0001	<0.0001	0.0003
Lead	0.01	0.003	0.003	<0.00050	<0.00050	0.00004	< 0.00002	0.00005	< 0.00002	< 0.00002	< 0.00002	<0.00002	<0.00002	< 0.00002
Molybdenum	NV	0.04		<0.00050	<0.00050	0.0003	0.0003	0.0003	0.0001	< 0.0001	0.0005	0.0004	0.0003	0.0003
Nickel	NV	0.025		<0.0010	<0.0010	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	<0.01	<0.01	< 0.01
Selenium	0.01	0.1	0.003	<0.0020	<0.0020	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	<0.001	<0.001	< 0.001
Silver	NV	0.0001		<0.00010	<0.00010	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	<0.00002	<0.00002	< 0.00002
Strontium	NV			0.18	0.19	-	-	-	0.211	0.195	0.204	0.221	0.207	0.208
Thallium	NV	0.0003		<0.000050	<0.000050	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	<0.00005	<0.00005	< 0.00005
Vanadium	NV	0.006		<0.00050	0.00064	0.0015	0.0003	0.0013	0.0016	0.0007	0.0011	0.0007	0.0004	0.0006
Zinc	5	0.02	2.5	0.0057	<0.0050	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	<0.005	<0.005	< 0.005
Field Conductivity (µs/cm)	NV			310	250	222	280	-	-	177	191	198	205	189
Field pH (units)	6.5 - 8.5			8.08	8.18	7.52	7.34	-	-	7.59	7.28	6.73	7.6	7.71
Field Temperature (°C)	NV			8.7	7.6	10.1	2.3	-	-	11.31	10.19	9.58	10.2	10.1

ODWQS - Ontario Drinking Water Quality Objectives

PWQO - Provincial Water Quality Objectives

CWQG - Canadian Water Quality Guidelines (underlined value) - long term criteria

RUP - Reasonable Use Policy Criteria

Bold / Grey Highlighting - ODWQS Exceedance

Bold / Underlined - RUP Exceedance

Bold / Red Highlighting - PWQO / CWQG Exceedance

all results in mg/L unless otherwise stated

Summary of Ground Water Quality - General Chemistry
Laxton Waste Disposal Site

Parameter	ODWQS	PWQO / CWQG	RUP	MW14	MW14	MW14	MW14	MW14	MW14	MW14	MW14	MW14	MW14	MW14
				17-Oct-17	24-Apr-18	26-Sep-18	17-Apr-19	18-Oct-19	21-Apr-20	13-Oct-20	15-Apr-21	13-Oct-21	12-Apr-22	16-Oct-22
Alkalinity (as CaCO3)	500		301	100	98	93	88	96	99	103	98	104	115	113
Calcium	NV			27.8	27.3	24.4	23.7	25.9	30	29.1	30.8	33.4	30.5	28.1
Chloride	250	<u>120</u>	126	1.4	1.5	2.1	1.8	2.8	2.2	3.2	2.2	3.9	2.4	2.5
Oxygen Demand - Chemical (COD)	NV			< 5	8	< 5	< 5	6	< 5	< 5	< 5	8	13	< 5
Conductivity (µS/cm)	NV			224	204	209	204	219	229	240	238	249	253	254
Organic Carbon - Dissolved (DOC)	5		3.4	1.7	1.1	1.4	1.8	1.9	1.5	1.9	2.7	2	1.7	1.1
Fluoride	1.5		0.80	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Hardness (as CaCO3)	500		309	113	111	103	97	111	123	114	125	134	127	118
Iron	0.3	0.3		0.505	0.363	0.423	0.304	0.544	0.727	0.485	0.521	0.634	0.551	0.632
Magnesium	NV			10.5	10.5	10.2	9.11	11.2	11.6	10.1	11.6	12.4	12.4	11.6
Manganese	0.050		0.03	0.01	0.009	0.008	0.007	0.009	0.01	0.008	0.011	0.011	0.01	0.009
Mercury	0.001	0.0002	0.0003	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Nitrate as N	10	<u>13</u>	2.5	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nitrite as N	1	<u>0.06</u>	0.29	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
pH	6.5 - 8.5			7.73	7.56	7.65	7.38	7.52	7.45	7.72	7.64	6.93	7.69	7.59
Phenols	NV	0.001		< 0.001	< 0.001	0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.001	< 0.001	< 0.001
Phosphorus	NV	0.03		< 0.1	< 0.1	< 0.1	0.3	0.21	< 0.1	< 0.1	0.28	0.28	< 0.1	< 0.1
Potassium	NV			2	2	2.1	1.8	2.2	2.2	2.1	2.2	2.2	2.2	2.2
Sodium	200		101	1.6	1.8	1.7	1.5	1.8	1.7	1.7	1.8	1.9	1.7	1.7
Sulphate	500		257	9	11	11	10	11	12	12	12	19	17	15
Solids - Total Dissolved (TDS)	500		308	113	114	108	101	113	119	121	120	136	135	130
Total Kjeldahl Nitrogen (TKN)	NV			0.2	< 0.1	< 0.1	0.1	0.1	< 0.1	< 0.1	0.1	0.2	0.2	< 0.1
Total Ammonia as N (NH ₃ + NH ₄)	NV			0.02	0.02	< 0.01	0.02	0.02	< 0.01	0.03	< 0.01	0.05	0.02	< 0.01
Aluminum	0.10	0.08	0.06	0.02	0.02	0.01	0.02	0.03	0.03	0.02	0.02	0.03	< 0.01	0.02
Antimony	0.006	0.02	0.002	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Arsenic	0.025	0.005	0.006	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Barium	1		0.33	0.115	0.096	0.09	0.077	0.094	0.104	0.1	0.108	0.119	0.113	0.104
Beryllium	NV	0.011		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Boron	5	1.3	1.3	0.011	0.01	0.008	0.011	0.012	0.01	0.013	0.011	0.014	0.007	0.03
Cadmium	0.005	0.0001	0.001	< 0.000014	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000010
Chromium	0.05	0.001	0.013	< 0.001	< 0.001	< 0.001	< 0.001	0.001	< 0.001	< 0.001	< 0.001	0.001	< 0.001	< 0.001
Cobalt	NV	0.0009		< 0.005	0.0002	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Copper	1	0.005	0.50	0.0002	0.0001	0.0003	0.0004	0.0003	0.0002	0.0002	0.0017	0.0003	0.0005	0.0004
Lead	0.01	0.003	0.003	< 0.00002	< 0.00002	< 0.00002	0.00002	< 0.00002	0.00003	< 0.00002	0.00005	0.00003	< 0.00002	0.00002
Molybdenum	NV	0.04		0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003
Nickel	NV	0.025		< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Selenium	0.01	0.1	0.003	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Silver	NV	0.0001		< 0.00002	< 0.00002	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Strontium	NV			0.192	0.198	0.199	0.174	0.219	0.215	0.212	0.219	0.245	0.227	0.213
Thallium	NV	0.0003		< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Vanadium	NV	0.006		0.0003	0.0004	0.0001	0.0001	0.0001	0.0003	0.0001	0.0002	0.0002	0.0002	0.0003
Zinc	5	0.02	2.5	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Field Conductivity (µs/cm)	NV			192	280	195	230	200	250	220	310	265	225	220
Field pH (units)	6.5 - 8.5			7.64	7.68	7.49	7.93	7.45	7.67	7.7	8.09	7.49	7.3	7.36
Field Temperature (°C)	NV			12.2	6.9	10.6	6.8	7.9	5.4	9	6	10.6	9	9

ODWQS - Ontario Drinking Water Quality Objectives

PWQO - Provincial Water Quality Objectives

CWQG - Canadian Water Quality Guidelines (underlined value) - long term criteria

RUP - Reasonable Use Policy Criteria

Bold / Grey Highlighting - ODWQS Exceedance

Bold / Underlined - RUP Exceedance

Bold / Red Highlighting - PWQO / CWQG Exceedance

all results in mg/L unless otherwise stated

Summary of Ground Water Quality - General Chemistry

Laxton Waste Disposal Site

Parameter	ODWQS	PWQO / CWQG	RUP	MW14 26-Apr-23	MW14 11-Oct-23
Alkalinity (as CaCO3)	500		301	106	107
Calcium	NV			29.2	28.3
Chloride	250	<u>120</u>	126	2.2	3.1
Oxygen Demand - Chemical (COD)	NV			< 5	13
Conductivity (µS/cm)	NV			247	240
Organic Carbon - Dissolved (DOC)	5		3.4	2.4	1.8
Fluoride	1.5		0.80	< 0.1	<0.1
Hardness (as CaCO3)	500		309	119	116
Iron	0.3	0.3		0.435	0.19
Magnesium	NV			11.2	11.1
Manganese	0.050		0.03	0.01	0.004
Mercury	0.001	0.0002	0.0003	< 0.00002	<0.00002
Nitrate as N	10	<u>13</u>	2.5	< 0.05	<0.05
Nitrite as N	1	<u>0.06</u>	0.29	< 0.05	<0.05
pH	6.5 - 8.5			7.15	6.66
Phenols	NV	0.001		< 0.001	<0.001
Phosphorus	NV	0.03		< 0.1	<0.1
Potassium	NV			2.1	2
Sodium	200		101	1.7	1.9
Sulphate	500		257	14	15
Solids - Total Dissolved (TDS)	500		308	125	123
Total Kjeldahl Nitrogen (TKN)	NV			< 0.1	0.1
Total Ammonia as N (NH ₃ + NH ₄)	NV			< 0.01	0.07
Aluminum	0.10	0.08	0.06	0.02	0.03
Antimony	0.006	0.02	0.002	< 0.0001	<0.0001
Arsenic	0.025	0.005	0.006	< 0.0001	<0.0001
Barium	1		0.33	0.106	0.095
Beryllium	NV	0.011		< 0.002	<0.0001
Boron	5	1.3	1.3	0.036	0.041
Cadmium	0.005	0.0001	0.001	< 0.000010	<0.000015
Chromium	0.05	0.001	0.013	< 0.001	<0.001
Cobalt	NV	0.0009		< 0.005	0.0002
Copper	1	0.005	0.50	0.0002	0.0002
Lead	0.01	0.003	0.003	< 0.00002	<0.00002
Molybdenum	NV	0.04		0.0003	0.0003
Nickel	NV	0.025		< 0.01	0.0003
Selenium	0.01	0.1	0.003	< 0.001	<0.001
Silver	NV	0.0001		< 0.0001	<0.0001
Strontium	NV			0.22	0.211
Thallium	NV	0.0003		< 0.00005	<0.00005
Vanadium	NV	0.006		0.0001	<0.0001
Zinc	5	0.02	2.5	< 0.005	<0.005
Field Conductivity (µs/cm)	NV			210	200
Field pH (units)	6.5 - 8.5			7.51	7.33
Field Temperature (°C)	NV			7.4	10.6

ODWQS - Ontario Drinking Water Quality Objectives

PWQO - Provincial Water Quality Objectives

CWQG - Canadian Water Quality Guidelines (underlined value) - long term criteria

RUP - Reasonable Use Policy Criteria

Bold / Grey Highlighting - ODWQS Exceedance

Bold / Underlined - RUP Exceedance

Bold / Red Highlighting - PWQO / CWQG Exceedance

all results in mg/L unless otherwise stated

Summary of Ground Water Quality - General Chemistry
Laxton Waste Disposal Site

Parameter	ODWQS	PWQO / CWQG	RUP	MW16	MW16	MW16	MW16	MW16	MW16	MW16	MW16	MW16	MW16	MW16	MW16
				30-May-08	01-Oct-08	24-Jun-09	21-Aug-09	04-Jun-10	05-Oct-10	26-May-11	30-May-12	01-Nov-12	10-Jun-13	30-Oct-13	29-Apr-14
Alkalinity (as CaCO3)	500		301	148	146	123	115	127	115	121	120	160	122	118	125
Calcium	NV			39	35.28	35	31	31	36	35	32	38	30.9	38.9	44.4
Chloride	250	<u>120</u>	126	8	7.2	6	6	5	5	4	3	3	2.6	2.5	3
Oxygen Demand - Chemical (COD)	NV			3	4	5	3	5	10	80	160	11	160	935	12
Conductivity (µS/cm)	NV			360	342	287	272	273	259	301	280	330	278	322	346
Organic Carbon - Dissolved (DOC)	5		3.4	2	2.148	2	2	2	2	1.9	1.9	1.4	3.5	2.7	2.9
Fluoride	1.5		0.80	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	<0.10	0.2	<0.1	<0.1
Hardness (as CaCO3)	500		309	153	146	141	127	124	141	140	130	150	126	157	178
Iron	0.3	0.3		<0.1	110	<0.1	0.1	0.1	<0.1	0.14	<0.10	0.21	0.076	0.059	0.045
Magnesium	NV			13	13.98	13	12	11	13	13	12	13	11.9	14.5	16.3
Manganese	0.050		0.03	0.09	1.62	0.06	0.05	0.04	0.05	0.054	0.049	0.061	0.054	0.077	0.071
Mercury	0.001	0.0002	0.0003	<0.00002	0.00005	<0.00002	<0.00002	<0.00002	<0.00002	0.00002	<0.00001	<0.00001	<0.00002	<0.00002	<0.00002
Nitrate as N	10	<u>13</u>	2.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	<0.10	<0.1	<0.1	<0.1
Nitrite as N	1	<u>0.06</u>	0.29	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.01	<0.010	<0.010	<0.1	<0.1	<0.1
pH	6.5 - 8.5			6.61	7.01	7.18	7	7.41	7.19	7.31	7.07	7.57	7.19	7.26	7.52
Phenols	NV	0.001		<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.001	<0.001	<0.001
Phosphorus	NV	0.03		0.02	0.92	<0.01	0.03	<0.01	<0.02	-	<0.10	<0.10	28	30.9	<0.01
Potassium	NV			4.3	4.699	3.7	3.4	3	3.2	3	3	3	2.6	3	3.4
Sodium	200		101	13	12.7797	11	11	8	7	6.8	5.8	7.3	5.3	5.8	5.8
Sulphate	500		257	33	29.7	23	22	26	26	25	22	23	20	33	50
Solids - Total Dissolved (TDS)	500		308	234	222.3	187	177	177	168	176	164	199	147	168	198
Total Kjeldahl Nitrogen (TKN)	NV			<0.1	2	0.2	0.2	0.3	0.2	3	2.1	<2.0	0.3	0.2	0.3
Total Ammonia as N (NH ₃ + NH ₄)	NV			<0.1	<0.1	0.05	0.03	0.03	0.03	0.13	0.17	0.14	0.057	0.082	0.04
Aluminum	0.10	0.08	0.06	<0.01	91.3	<0.01	<0.01	<0.01	<0.01	0.027	0.03	0.017	0.03	0.08	0.03
Antimony	0.006	0.02	0.002	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.0005	<0.00050	<0.00050	<0.0001	<0.0001	<0.0001
Arsenic	0.025	0.005	0.006	<0.01	<0.01	<0.01	<0.01	<0.005	<0.005	<0.001	<0.0010	<0.0010	0.0002	<0.0001	0.0002
Barium	1		0.33	<0.1	1.84	<0.1	<0.1	<0.1	<0.1	0.086	0.075	0.087	0.078	0.101	0.104
Beryllium	NV	0.011		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.0005	<0.00050	<0.00050	<0.002	<0.002	<0.002
Boron	5	1.3	1.3	0.1	0.324	<0.1	0.1	0.1	<0.1	0.12	0.1	0.11	0.088	0.102	0.111
Cadmium	0.005	0.0001	0.001	<0.0001	0.003478	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.00010	0.00004	0.00002	0.00004
Chromium	0.05	0.001	0.013	0.0001	0.2043	0.0002	0.0002	0.0003	0.0003	<0.005	<0.0050	<0.0050	<0.002	0.002	<0.0002
Cobalt	NV	0.0009		0.0023	0.14045	0.0022	0.004	0.0038	0.004	0.005	0.0042	0.0027	0.0039	<0.005	0.005
Copper	1	0.005	0.50	0.0025	0.6867	0.0022	0.005	0.0023	0.0025	0.002	0.0017	0.0012	0.0015	0.0018	0.0019
Lead	0.01	0.003	0.003	<0.001	0.057	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.00050	<0.00050	<0.00002	<0.00002	0.00002
Molybdenum	NV	0.04		<0.002	0.009782	<0.002	<0.002	<0.002	<0.002	<0.001	<0.00050	<0.00050	0.0003	0.0003	0.0003
Nickel	NV	0.025		<0.01	0.2469	<0.01	<0.01	<0.01	<0.01	0.005	0.0045	0.003	<0.01	<0.01	<0.01
Selenium	0.01	0.1	0.003	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.002	<0.0020	<0.0020	<0.001	<0.001	<0.001
Silver	NV	0.0001		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.00010	<0.00002	<0.00002	<0.00002
Strontium	NV			0.217	1.35	0.207	0.24	0.211	0.242	0.26	0.23	0.29	-	-	-
Thallium	NV	0.0003		<0.0003	0.00038	<0.0003	<0.0003	<0.0003	<0.0003	0.00013	0.00017	0.0001	0.00015	0.0001	0.00016
Vanadium	NV	0.006		<0.001	0.563	<0.001	<0.001	<0.001	<0.001	<0.001	<0.00050	<0.00050	0.002	0.0009	0.0022
Zinc	5	0.02	2.5	<0.01	0.685	<0.01	0.01	<0.01	<0.01	0.007	0.008	<0.0050	<0.005	<0.005	<0.005
Field Conductivity (µs/cm)	NV			-	-	-	-	-	-	-	382	370	293	5300	-
Field pH (units)	6.5 - 8.5			-	-	-	-	-	-	-	6.84	7.76	7.02	6.83	-
Field Temperature (°C)	NV			-	-	-	-	-	-	-	9.9	7.3	9.8	5.7	-

ODWQS - Ontario Drinking Water Quality Objectives

PWQO - Provincial Water Quality Objectives

CWQG - Canadian Water Quality Guidelines (underlined value) - long term criteria

RUP - Reasonable Use Policy Criteria

Bold / Grey Highlighting - ODWQS Exceedance

Bold / Underlined - RUP Exceedance

Bold / Red Highlighting - PWQO / CWQG Exceedance

all results in mg/L unless otherwise stated

Summary of Ground Water Quality - General Chemistry
Laxton Waste Disposal Site

Parameter	ODWQS	PWQO / CWQG	RUP	MW16	MW16	MW16	MW16	MW16	MW16	MW16	MW16	MW16	MW16	MW16	MW16
				23-Sep-14	09-Jun-15	11-Sep-15	31-May-16	17-Oct-16	19-Apr-17	17-Oct-17	24-Apr-18	26-Sep-18	17-Apr-19	18-Oct-19	21-Apr-20
Alkalinity (as CaCO3)	500		301	122	119	124	121	126	129	160	192	225	244	226	205
Calcium	NV			37.1	31.8	35.9	37.8	38.3	41.9	49.1	64.9	66.3	73.3	61.6	62.7
Chloride	250	<u>120</u>	126	2.8	2.9	3.3	3.3	5	7.5	10.9	17.9	23.7	21.2	18.7	16.3
Oxygen Demand - Chemical (COD)	NV			323	292	590	470	900	430	307	24	16	129	230	250
Conductivity (µS/cm)	NV			304	284	303	295	316	343	411	453	581	622	553	507
Organic Carbon - Dissolved (DOC)	5		3.4	3.1	3	1.9	1.4	2.1	2.4	4.1	3.7	5	6.4	6.1	5.8
Fluoride	1.5		0.80	< 0.1	0.1	0.1	0.1	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Hardness (as CaCO3)	500		309	149	134	147	156	155	170	198	258	277	293	258	250
Iron	0.3	0.3		0.049	< 0.005	0.075	0.053	0.318	0.056	0.075	0.063	0.226	0.151	0.215	0.091
Magnesium	NV			13.7	13.2	14	14.9	14.5	15.8	18.4	23.3	27.1	26.6	25.3	22.6
Manganese	0.050		0.03	0.068	0.06	0.064	0.066	0.081	0.097	0.106	0.181	0.176	0.19	0.155	0.198
Mercury	0.001	0.0002	0.0003	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Nitrate as N	10	<u>13</u>	2.5	< 0.1	< 0.1	< 0.1	< 0.1	0.1	< 0.1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nitrite as N	1	<u>0.06</u>	0.29	< 0.1	0.1	< 0.1	< 0.1	0.2	0.1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
pH	6.5 - 8.5			7.37	7.39	7.51	7.27	7.38	7.47	7.31	7.25	7.29	6.9	7.13	7.14
Phenols	NV	0.001		< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.003	< 0.002	< 0.002	< 0.002
Phosphorus	NV	0.03		75.2	68	12.3	33.6	58.7	< 0.1	< 0.1	< 0.1	< 0.1	29.9	17.1	< 0.1
Potassium	NV			3.2	2.6	2.9	3.1	3.2	3.2	3.7	4.3	4.8	4.3	4.8	4.4
Sodium	200		101	5	4.2	5	4.6	4.5	4.2	4.3	5.5	7.7	10.7	15.7	17.1
Sulphate	500		257	26	21	26	24	28	32	27	35	37	32	32	32
Solids - Total Dissolved (TDS)	500		308	161	148	162	161	171	182	210	267	302	315	294	279
Total Kjeldahl Nitrogen (TKN)	NV			0.2	0.8	0.7	0.8	1.4	2.2	1.5	1	0.7	0.5	0.7	0.8
Total Ammonia as N (NH ₃ + NH ₄)	NV			0.18	0.16	0.11	0.14	0.16	0.1	0.1	0.29	0.11	0.17	0.09	0.06
Aluminum	0.10	0.08	0.06	0.05	0.03	0.06	0.03	0.26	0.02	0.04	0.05	0.05	0.05	0.06	0.04
Antimony	0.006	0.02	0.002	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.0004	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.0002	< 0.0001
Arsenic	0.025	0.005	0.006	0.0002	< 0.0001	0.0002	< 0.0001	0.0002	0.0001	0.0002	0.0001	0.0002	0.0002	< 0.0001	0.0002
Barium	1		0.33	0.093	0.078	0.091	0.098	0.102	0.111	0.151	0.177	0.179	0.189	0.178	0.172
Beryllium	NV	0.011		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Boron	5	1.3	1.3	0.111	0.078	0.095	0.083	0.088	0.052	0.107	0.165	0.249	0.317	0.381	0.388
Cadmium	0.005	0.0001	0.001	0.00004	< 0.00002	0.00003	0.00003	0.00002	0.000047	0.000056	0.000074	0.000082	0.000082	0.000072	0.000079
Chromium	0.05	0.001	0.013	0.0005	0.0016	0.0052	< 0.0002	0.0014	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.002	< 0.001
Cobalt	NV	0.0009		< 0.005	< 0.005	< 0.005	< 0.005	0.009	< 0.005	< 0.005	0.0035	0.016	0.008	< 0.005	< 0.005
Copper	1	0.005	0.50	0.0019	0.0009	0.0018	0.001	0.0028	0.002	0.0015	0.0036	0.0023	0.0039	0.0039	0.0033
Lead	0.01	0.003	0.003	0.00002	< 0.00002	< 0.00002	< 0.00002	0.0001	< 0.00002	< 0.00002	0.00006	< 0.00002	0.00003	0.00002	< 0.00002
Molybdenum	NV	0.04		< 0.0001	< 0.0001	0.0004	0.0003	0.0002	0.0003	0.0003	0.0003	0.0002	0.0003	0.0003	0.0003
Nickel	NV	0.025		< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Selenium	0.01	0.1	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
Silver	NV	0.0001		< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Strontium	NV			0.313	0.27	0.292	0.313	0.324	0.331	0.367	0.502	0.592	0.579	0.564	0.476
Thallium	NV	0.0003		0.00012	0.00011	0.00018	0.00013	0.00013	0.00012	0.00015	0.00012	0.00016	0.00017	0.00014	0.00012
Vanadium	NV	0.006		0.0026	0.0013	0.002	0.0011	0.0015	0.0011	0.0007	0.0011	0.0003	0.0003	0.0003	0.0003
Zinc	5	0.02	2.5	0.012	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.005	0.007	0.005	< 0.005	< 0.005
Field Conductivity (µs/cm)	NV			-	232	255	267	290	237	205	410	450	670	455	535
Field pH (units)	6.5 - 8.5			-	7.28	6.94	6.58	7.19	7.38	7.74	7.05	6.81	6.87	6.84	7.07
Field Temperature (°C)	NV			-	10.7	9.79	10.86	10.5	9.2	11.2	9.9	12	8.5	9.2	5.8

ODWQS - Ontario Drinking Water Quality Objectives

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Bold / Grey Highlighting - ODWQS Exceedance

Bold / Underlined - RUP Exceedance

Bold / Red Highlighting - PWQO / CWQG Exceedance

all results in mg/L unless otherwise stated

Summary of Ground Water Quality - General Chemistry
Laxton Waste Disposal Site

Parameter	ODWQS	PWQO / CWQG	RUP	MW16	MW16	MW16	MW16	MW16	MW16	MW16	MW16-I	MW16-I	MW16-I	MW16-I	MW16-I
				13-Oct-20	15-Apr-21	13-Oct-21	12-Apr-22	16-Oct-22	26-Apr-23	11-Oct-23	21-Jul-09	21-Aug-09	04-Jun-10	07-Oct-10	26-May-11
Alkalinity (as CaCO3)	500		301	182	188	209	238	219	198	196	144	136	122	119	117
Calcium	NV			51.4	60.7	61	63.8	55.4	56	47.4	41	40	35	39	35
Chloride	250	<u>120</u>	126	12.8	12.7	13.6	13.8	11.1	13.2	11.4	2	2	2	2	2
Oxygen Demand - Chemical (COD)	NV				149	69	469	307	122	49	< 2	4	< 2	4	5
Conductivity (µS/cm)	NV			459	480	495	527	515	465	435	298	288	248	235	262
Organic Carbon - Dissolved (DOC)	5		3.4	4.8	7	5.3	6	4.9	5.3	4.4	2	2	1	2	1.5
Fluoride	1.5		0.80	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Hardness (as CaCO3)	500		309	195	238	238	255	220	211	186	160	153	134	147	130
Iron	0.3	0.3		0.09	0.123	0.175	0.543	0.154	0.135	0.46	0.3	< 0.1	< 0.1	< 0.1	0.15
Magnesium	NV			16.1	21	20.7	23.1	19.9	17.3	16.4	14	13	11	12	11
Manganese	0.050		0.03	0.154	0.224	0.256	0.274	0.292	0.407	0.359	0.21	0.19	0.11	0.1	0.11
Mercury	0.001	0.0002	0.0003	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	0.00003	< 0.00002	< 0.00002	< 0.00002	0.00002
Nitrate as N	10	<u>13</u>	2.5	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.07	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Nitrite as N	1	<u>0.06</u>	0.29	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.1	< 0.1	< 0.1	< 0.1	< 0.01
pH	6.5 - 8.5			7.36	7.19	6.99	7.43	7.37	7.32	6.99	7.53	7.53	7.5	7.45	7.53
Phenols	NV	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
Phosphorus	NV	0.03		< 0.1	25.5	25.4	< 0.1	< 0.1	< 0.1	< 0.1	< 0.01	0.01	< 0.01	< 0.002	-
Potassium	NV			3.9	4.2	4.3	4.4	4.1	3.8	3.6	3.3	3	2.6	2.6	2.6
Sodium	200		101	14.8	17.1	17.2	15.7	15.7	16.9	16.1	3	3	2	2	1.7
Sulphate	500		257	30	31	30	28	29	29	29	18	18	18	17	16
Solids - Total Dissolved (TDS)	500		308	238	260	273	293	267	256	225	194	187	161	153	149
Total Kjeldahl Nitrogen (TKN)	NV			1	0.3	1.9	21.2	0.1	1.1	1	< 0.1	< 0.1	0.1	0.1	0.2
Total Ammonia as N (NH ₃ + NH ₄)	NV			0.13	0.17	0.09	0.25	0.04	0.95	0.14	0.01	< 0.01	< 0.01	< 0.01	< 0.05
Aluminum	0.10	0.08	0.06	0.04	0.05	0.04	0.22	< 0.01	0.02	0.03	< 0.01	< 0.01	< 0.01	< 0.01	< 0.005
Antimony	0.006	0.02	0.002	< 0.0001	< 0.0001	0.0001	< 0.0001	< 0.0001	< 0.0001	0.0002	< 0.01	< 0.01	< 0.01	< 0.01	< 0.0005
Arsenic	0.025	0.005	0.006	0.0003	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	< 0.01	< 0.01	< 0.005	< 0.005	< 0.001
Barium	1		0.33	0.138	0.167	0.167	0.177	0.149	0.157	0.133	< 0.1	0.1	0.1	0.1	0.13
Beryllium	NV	0.011		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.0001	< 0.1	< 0.1	< 0.1	< 0.1	< 0.0005
Boron	5	1.3	1.3	0.386	0.451	0.492	0.572	0.535	0.557	0.558	< 0.1	< 0.1	< 0.1	< 0.1	0.015
Cadmium	0.005	0.0001	0.001	0.000069	0.000067	0.000072	0.000074	0.000088	0.000074	0.000059	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Chromium	0.05	0.001	0.013	< 0.001	< 0.001	0.002	< 0.001	< 0.001	< 0.001	< 0.001	0.0001	0.0002	0.0002	0.0005	< 0.005
Cobalt	NV	0.0009		< 0.005	0.006	< 0.005	< 0.005	0.006	0.006	0.006	0.0006	0.0006	0.0004	0.0004	0.0005
Copper	1	0.005	0.50	0.0033	0.0049	0.0038	0.0052	0.0038	0.0032	0.0024	0.0009	0.0009	0.0012	0.0013	0.002
Lead	0.01	0.003	0.003	0.00007	0.00006	0.00007	0.0002	< 0.00002	< 0.00002	0.00002	< 0.001	< 0.001	< 0.001	< 0.001	< 0.0005
Molybdenum	NV	0.04		0.0004	0.0003	0.0003	0.0003	0.0004	0.0004	0.0004	< 0.002	< 0.002	< 0.002	< 0.002	< 0.001
Nickel	NV	0.025		< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.0056	< 0.01	< 0.01	< 0.01	< 0.01	< 0.001
Selenium	0.01	0.1	0.003	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.01	< 0.01	< 0.01	< 0.01	< 0.002
Silver	NV	0.0001		< 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	NV			0.395	0.455	0.483	0.497	0.434	0.406	0.365	0.253	0.26	0.19	0.184	0.21
Thallium	NV	0.0003		0.00015	0.0001	0.00016	0.00015	0.00015	0.00012	0.00005	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.00005
Vanadium	NV	0.006		0.0004	0.0003	0.0004	0.0013	0.0004	0.0003	0.0004	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Zinc	5	0.02	2.5	< 0.005	< 0.005	0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.01	< 0.01	< 0.01	< 0.01	0.007
Field Conductivity (µs/cm)	NV			385	510	490	455	410	270	260	-	-	-	-	-
Field pH (units)	6.5 - 8.5			7.08	7.6	6.8	7.08	7.01	7.1	7	-	-	-	-	-
Field Temperature (°C)	NV			10.3	6.9	11.3	8.9	9.8	8.3	11.5	-	-	-	-	-

ODWQS - Ontario Drinking Water Quality Objectives

PWQO - Provincial Water Quality Objectives

CWQG - Canadian Water Quality Guidelines (underlined value) - long term criteria

RUP - Reasonable Use Policy Criteria

Bold / Grey Highlighting - ODWQS Exceedance

Bold / Underlined - RUP Exceedance

Bold / Red Highlighting - PWQO / CWQG Exceedance

all results in mg/L unless otherwise stated

Summary of Ground Water Quality - General Chemistry
Laxton Waste Disposal Site

Parameter	ODWQS	PWQO / CWQG	RUP	MW16-I	MW16-I	MW16-I	MW16-I	MW16-I	MW16-I	MW16-I	MW16-I	MW16-I	MW16-I	MW16-I	MW16-I
				30-May-12	01-Nov-12	10-Jun-13	30-Oct-13	29-Apr-14	23-Sep-14	09-Jun-15	10-Sep-15	31-May-16	17-Oct-16	19-Apr-17	17-Oct-17
Alkalinity (as CaCO3)	500		301	120	130	116	120	118	116	125	128	161	176	201	192
Calcium	NV			32	33	30	36.6	34.7	34.3	36.3	39.9	56.1	59.5	72.5	64.7
Chloride	250	<u>120</u>	126	<1	1	1.6	1.5	1.7	2.6	4.5	5.5	12.7	25.3	40.5	35.9
Oxygen Demand - Chemical (COD)	NV			5.7	7.3	< 5	6	< 5	< 5	9	< 5	7	5	9	11
Conductivity (µS/cm)	NV			260	260	251	279	260	275	313	326	429	495	597	580
Organic Carbon - Dissolved (DOC)	5		3.4	1.4	1.2	2.4	2.5	1.9	2.4	3		2.3	3.2	4.2	3.6
Fluoride	1.5		0.80	<0.10	<0.10	0.2	< 0.1	0.1	< 0.1	0.1	< 0.1	0.1	<0.1	< 0.1	< 0.1
Hardness (as CaCO3)	500		309	130	130	121	145	138	137	151	163	228	238	293	261
Iron	0.3	0.3		<0.10	<0.10	0.033	0.018	0.018	< 0.005	0.021	0.023	0.034	0.049	0.052	0.059
Magnesium	NV			11	12	11.2	13	12.4	12.6	14.8	15.3	21.3	21.8	27.2	24.2
Manganese	0.050		0.03	0.098	0.11	0.103	0.124	0.106	0.109	0.123	0.132	0.181	0.2	0.243	0.225
Mercury	0.001	0.0002	0.0003	<0.00001	<0.00001	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	<0.00002	<0.00002	< 0.00002	< 0.00002
Nitrate as N	10	<u>13</u>	2.5	<0.10	<0.10	0.1	0.1	0.1	0.1	< 0.1	0.1	<0.1	<0.1	< 0.1	< 0.05
Nitrite as N	1	<u>0.06</u>	0.29	<0.010	<0.010	< 0.1	< 0.1	< 0.1	< 0.1	0.2	0.2	<0.1	<0.1	0.2	< 0.05
pH	6.5 - 8.5			7.11	6.85	7.44	7.46	7.6	7.51	7.62	7.51	7.31	7.42	7.33	7.32
Phenols	NV	0.001		<0.0010	<0.0010	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	<0.001	<0.001	< 0.001	< 0.001
Phosphorus	NV	0.03		<0.10	<0.10	0.06	0.07	< 0.01	0.02	0.02	< 0.01	<0.01	0.02	< 0.1	< 0.1
Potassium	NV			2.5	2.6	2.3	2.6	2.8	2.7	2.4	2.8	3.4	3.5	3.7	3.9
Sodium	200		101	1.8	1.9	1.8	2	2.1	2	1.9	2.4	4.1	7.6	9.5	14.7
Sulphate	500		257	15	13	14	14	14	16	25	29	38	36	47	36
Solids - Total Dissolved (TDS)	500		308	146	152	136	143	139	140	161	173	233	260	322	294
Total Kjeldahl Nitrogen (TKN)	NV			0.12	0.16	0.2	< 0.1	0.3	0.2	< 0.1	0.1	0.2	0.3	0.2	0.3
Total Ammonia as N (NH ₃ + NH ₄)	NV			<0.01	0.03	< 0.005	0.017	< 0.01	0.05	< 0.01	< 0.01	<0.01	0.05	< 0.01	0.01
Aluminum	0.10	0.08	0.06	<0.0050	<0.0050	0.02	0.02	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.04
Antimony	0.006	0.02	0.002	<0.00050	<0.00050	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	<0.0001	0.0003	< 0.0001	< 0.0001
Arsenic	0.025	0.005	0.006	<0.0010	<0.0010	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.0001	0.0002	0.0001	0.0002
Barium	1		0.33	0.12	0.13	0.126	0.145	0.138	0.136	0.15	0.172	0.25	0.257	0.327	0.359
Beryllium	NV	0.011		<0.00050	<0.00050	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	<0.002	<0.0002	< 0.002	< 0.002
Boron	5	1.3	1.3	0.019	0.021	0.017	0.026	0.023	0.025	0.028	0.05	0.182	0.275	0.257	0.365
Cadmium	0.005	0.0001	0.001	<0.00010	<0.00010	0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	0.00002	0.00003	<0.00002	0.000069	0.000039
Chromium	0.05	0.001	0.013	<0.0050	<0.0050	< 0.002	0.0241	< 0.0002	0.0006	0.0019	0.0066	<0.0002	0.0016	< 0.001	< 0.001
Cobalt	NV	0.0009		<0.00050	<0.00050	0.0005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	<0.005	<0.005	< 0.005	< 0.005
Copper	1	0.005	0.50	0.0015	0.0011	0.0013	0.001	0.0013	0.0015	0.0015	0.0015	0.0018	0.0016	0.0032	0.003
Lead	0.01	0.003	0.003	<0.00050	<0.00050	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	<0.00002	<0.00002	< 0.00002	< 0.00002
Molybdenum	NV	0.04		<0.00050	0.00074	0.0003	0.0002	0.0003	0.0001	< 0.0001	0.0004	0.0003	0.0002	0.0002	0.0002
Nickel	NV	0.025		<0.0010	<0.0010	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	<0.01	<0.01	< 0.01	< 0.01
Selenium	0.01	0.1	0.003	<0.0020	<0.0020	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	<0.001	<0.001	< 0.001	< 0.001
Silver	NV	0.0001		<0.00010	<0.00010	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	<0.00002	<0.00002	< 0.00002	< 0.00002
Strontium	NV			0.21	0.22	-	-	-	0.254	0.279	0.29	0.429	0.447	0.53	0.449
Thallium	NV	0.0003		<0.000050	<0.000050	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.00006	<0.00005	<0.00005	< 0.00005	< 0.00005
Vanadium	NV	0.006		<0.00050	<0.00050	0.0016	0.0003	0.0016	0.0019	0.0012	0.0023	0.0011	0.0007	0.0015	0.0006
Zinc	5	0.02	2.5	0.014	<0.0050	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	<0.005	<0.005	< 0.005	< 0.005
Field Conductivity (µs/cm)	NV			256	290	265	270	-	-	254	263	383	440	470	500
Field pH (units)	6.5 - 8.5			6.83	7.68	7.35	6.78	-	-	7.26	7.01	6.48	7.07	7.24	7.65
Field Temperature (°C)	NV			10.1	7	10.6	8.2	-	-	11.73	11.52	10.36	9.3	9.9	10.5

ODWQS - Ontario Drinking Water Quality Objectives

PWQO - Provincial Water Quality Objectives

CWQG - Canadian Water Quality Guidelines (underlined value) - long term criteria

RUP - Reasonable Use Policy Criteria

Bold / Grey Highlighting - ODWQS Exceedance

Bold / Underlined - RUP Exceedance

Bold / Red Highlighting - PWQO / CWQG Exceedance

all results in mg/L unless otherwise stated

Summary of Ground Water Quality - General Chemistry
Laxton Waste Disposal Site

Parameter	ODWQS	PWQO / CWQG	RUP	MW16-I	MW16-I	MW16-I	MW16-I	MW16-I	MW16-I	MW16-I	MW16-I	MW16-I	MW16-I	MW16-I	MW16-I
				24-Apr-18	26-Sep-18	17-Apr-19	18-Oct-19	21-Apr-20	13-Oct-20	15-Apr-21	13-Oct-21	12-Apr-22	16-Oct-22	26-Apr-23	11-Oct-23
Alkalinity (as CaCO3)	500		301	184	181	170	155	156	153	159	148	157	160	154	172
Calcium	NV			63.3	47.5	48.3	38.6	47.9	42.3	55.6	45.9	42	40.8	45.5	42.5
Chloride	250	<u>120</u>	126	34.3	22.2	16.3	10.8	13.5	13.6	18.8	13.1	11	11.3	13	10
Oxygen Demand - Chemical (COD)	NV			16	< 5	16	5	10		10	17	26	6	6	14
Conductivity (µS/cm)	NV			504	488	462	392	415	409	466	395	385	409	399	398
Organic Carbon - Dissolved (DOC)	5		3.4	4.5	4.4	4.9	4.2	4.6	4.5	6.8	4.3	4.4	4.1	4.7	4.1
Fluoride	1.5		0.80	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Hardness (as CaCO3)	500		309	253	198	192	160	187	158	213	176	165	159	173	163
Iron	0.3	0.3		0.054	0.054	0.043	0.035	0.048	0.042	0.065	0.057	0.043	0.047	0.054	0.061
Magnesium	NV			23	19.3	17.3	15.5	16.4	12.8	18	14.8	14.6	13.9	14.3	13.8
Manganese	0.050		0.03	0.213	0.175	0.176	0.152	0.188	0.168	0.224	0.184	0.176	0.177	0.193	0.194
Mercury	0.001	0.0002	0.0003	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Nitrate as N	10	<u>13</u>	2.5	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nitrite as N	1	<u>0.06</u>	0.29	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
pH	6.5 - 8.5			7.39	7.51	7.19	7.47	7.36	7.5	7.33	7.08	7.55	7.36	7.11	6.75
Phenols	NV	0.001		< 0.001	0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Phosphorus	NV	0.03		< 0.1	< 0.1	0.24	0.01	< 0.1	< 0.1	0.03	0.02	< 0.1	< 0.1	< 0.1	< 0.1
Potassium	NV			4	3.8	3.3	3.5	3.5	3.3	3.8	3.4	3.4	3.4	3.4	3.4
Sodium	200		101	18.7	22.9	20.3	23.7	22	20.7	22.5	19.4	17.1	16.5	16.1	17.2
Sulphate	500		257	41	34	28	26	32	32	40	36	30	32	33	31
Solids - Total Dissolved (TDS)	500		308	295	259	236	212	230	217	255	222	213	214	218	205
Total Kjeldahl Nitrogen (TKN)	NV			0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.2	0.3	0.2
Total Ammonia as N (NH ₃ + NH ₄)	NV			0.03	0.01	0.02	0.03	< 0.01	0.07	0.03	0.05	0.17	0.04	0.05	0.11
Aluminum	0.10	0.08	0.06	0.04	0.03	0.04	0.04	0.03	0.03	0.03	0.04	0.01	< 0.01	0.02	0.04
Antimony	0.006	0.02	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
Arsenic	0.025	0.005	0.006	< 0.0001	< 0.0001	0.0001	< 0.0001	< 0.0001	< 0.0001	0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Barium	1		0.33	0.291	0.23	0.215	0.184	0.214	0.192	0.256	0.211	0.198	0.189	0.209	0.197
Beryllium	NV	0.011		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.0001
Boron	5	1.3	1.3	0.368	0.408	0.443	0.471	0.562	0.663	0.905	0.843	0.781	0.742	0.744	0.776
Cadmium	0.005	0.0001	0.001	0.000044	0.000039	0.000036	0.000034	0.000036	0.000033	0.000059	0.000034	0.000036	0.000041	0.000043	0.000032
Chromium	0.05	0.001	0.013	< 0.001	< 0.001	< 0.001	0.001	< 0.001	< 0.001	< 0.001	0.001	< 0.001	< 0.001	< 0.001	< 0.001
Cobalt	NV	0.0009		0.0013	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.0012
Copper	1	0.005	0.50	0.005	0.0037	0.004	0.0036	0.0052	0.0042	0.0058	0.0045	0.004	0.0041	0.0037	0.0041
Lead	0.01	0.003	0.003	0.00005	0.00002	0.00002	< 0.00002	0.00005	0.00002	0.00005	0.00003	< 0.00002	< 0.00002	< 0.00002	0.00003
Molybdenum	NV	0.04		0.0002	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003
Nickel	NV	0.025		< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.0023
Selenium	0.01	0.1	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
Silver	NV	0.0001		< 0.00002	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Strontium	NV			0.46	0.402	0.358	0.327	0.332	0.303	0.395	0.336	0.315	0.303	0.337	0.317
Thallium	NV	0.0003		< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Vanadium	NV	0.006		0.0009	0.0001	0.0001	0.0001	0.0001	< 0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
Zinc	5	0.02	2.5	0.007	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Field Conductivity (µs/cm)	NV			580	425	520	345	440	365	570	430	340	335	330	310
Field pH (units)	6.5 - 8.5			6.97	7.02	7.04	7	7.18	7.1	7.6	6.94	7.19	7.12	7.22	7.05
Field Temperature (°C)	NV			10	10.9	10	9.5	4.9	10.1	8.6	10	10.8	9.8	9.7	10.3

ODWQS - Ontario Drinking Water Quality Objectives

PWQO - Provincial Water Quality Objectives

CWQG - Canadian Water Quality Guidelines (underlined value) - long term criteria

RUP - Reasonable Use Policy Criteria

Bold / Grey Highlighting - ODWQS Exceedance

Bold / Underlined - RUP Exceedance

Bold / Red Highlighting - PWQO / CWQG Exceedance

all results in mg/L unless otherwise stated

Summary of Ground Water Quality - General Chemistry
Laxton Waste Disposal Site

Parameter	ODWQS	PWQO / CWQG	RUP	MW17	MW17	MW17	MW17	MW17	MW17	MW17	MW17	MW17	MW17	MW17	MW17
				25-Nov-09	07-Jun-10	07-Oct-10	26-May-11	07-Sep-11	30-May-12	01-Nov-12	10-Jun-13	30-Oct-13	29-Apr-14	23-Sep-14	09-Jun-15
Alkalinity (as CaCO3)	500		301	62	45	80	57	68	68	78	87	96	73	82	75
Calcium	NV			15	16	25	12	14	-	11	17.1	25.4	17.6	21.2	16.2
Chloride	250	<u>120</u>	126	14	9	3	24	16	21	37	19.1	18	5.2	3.6	3.1
Oxygen Demand - Chemical (COD)	NV			22	21	21	160	110	100	20	33	30	17	301	217
Conductivity (µS/cm)	NV			202	108	163	215	189	220	290	224	268	184	203	192
Organic Carbon - Dissolved (DOC)	5		3.4	5	9	10	11.3	4.9	3.5	5.2	2.5	2.1	2.8	6	10.6
Fluoride	1.5		0.80	< 0.1	< 0.1	< 0.1	<0.1	0.09	<0.10	0.11	0.2	0.3	0.2	< 0.1	0.2
Hardness (as CaCO3)	500		309	58	43.1	97.9	44	59	71	49	78	111	75	92	73
Iron	0.3	0.3		0.8	< 0.1	1.3	0.35	2.2	1.5	0.74	0.803	0.876	1.77	3.27	3.3
Magnesium	NV			5	1	8	3.7	5.7	7.5	5.1	8.56	11.6	7.6	9.41	7.97
Manganese	0.050		0.03	0.07	< 0.01	0.06	0.056	0.096	0.15	0.091	0.136	0.176	0.203	0.253	0.221
Mercury	0.001	0.0002	0.0003	< 0.00002	< 0.00002	< 0.00002	<0.00001	<0.00001	<0.00001	<0.00001	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Nitrate as N	10	<u>13</u>	2.5	0.1	< 0.1	< 0.1	<0.1	<0.1	<0.10	<0.10	0.1	< 0.1	0.2	0.1	< 0.1
Nitrite as N	1	<u>0.06</u>	0.29	< 0.1	< 0.1	< 0.1	<0.01	<0.01	<0.010	<0.010	< 0.1	< 0.1	< 0.1	< 0.1	0.1
pH	6.5 - 8.5			7.68	9.41	6.78	7.13	6.75	6.67	6.4	7.74	7.72	7.69	7.75	7.48
Phenols	NV	0.001		< 0.001	< 0.001	0.013	<0.001	0.003	<0.0010	<0.0010	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Phosphorus	NV	0.03		< 0.01	< 0.01	0.07	-	-	<0.10	<0.10	0.05	0.06	0.03	9.03	4.56
Potassium	NV			2.2	1.6	0.9	0.88	1.2	1.2	0.8	1.1	1.6	1.1	1.2	0.7
Sodium	200		101	18	12	5	4.1	5.4	5	3.8	5.5	7.3	4.9	5.4	3.9
Sulphate	500		257	17	6	19	8	9	10	14	12	15	14	10	13
Solids - Total Dissolved (TDS)	500		308	131	70	106	97	112	124	130	118	138	97.7	105	94.7
Total Kjeldahl Nitrogen (TKN)	NV			1	0.4	0.9	0.4	0.5	<0.10	0.4	0.3	0.2	0.5	0.3	0.7
Total Ammonia as N (NH ₃ + NH ₄)	NV			0.31	0.23	0.84	0.08	0.03	<0.01	0.08	0.108	0.135	0.18	0.28	0.23
Aluminum	0.10	0.08	0.06	0.01	0.01	0.01	<0.005	0.11	<0.0050	<0.0050	< 0.01	0.02	0.11	0.02	< 0.01
Antimony	0.006	0.02	0.002	< 0.01	< 0.01	< 0.01	<0.0005	0.0006	<0.00050	<0.00050	< 0.0001	< 0.0001	0.0001	< 0.0001	< 0.0001
Arsenic	0.025	0.005	0.006	< 0.01	< 0.005	< 0.005	<0.001	<0.001	<0.0010	<0.0010	0.0004	0.0002	< 0.0001	0.0001	< 0.0001
Barium	1		0.33	< 0.1	< 0.1	< 0.1	0.023	0.024	0.022	0.017	0.019	0.024	0.046	0.042	0.029
Beryllium	NV	0.011		< 0.1	< 0.1	< 0.1	<0.0005	<0.0005	<0.00050	<0.00050	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Boron	5	1.3	1.3	< 0.1	< 0.1	< 0.1	0.016	0.01	0.018	<0.010	0.005	0.008	0.036	0.013	< 0.005
Cadmium	0.005	0.0001	0.001	0.0002	< 0.0001	< 0.0001	<0.0001	0.0001	<0.00010	<0.00010	0.00013	0.00003	0.00006	< 0.00002	< 0.00002
Chromium	0.05	0.001	0.013	0.0023	0.0007	0.001	<0.005	0.011	<0.0050	<0.0050	< 0.002	0.0184	< 0.0002	< 0.0002	0.0011
Cobalt	NV	0.0009		< 0.0003	< 0.0003	< 0.0003	<0.0005	<0.0005	<0.00050	<0.00050	0.0002	< 0.005	< 0.005	< 0.005	< 0.005
Copper	1	0.005	0.50	0.0009	0.0006	0.0013	0.001	0.003	<0.0010	0.0012	0.001	< 0.0001	0.0007	0.0005	< 0.0001
Lead	0.01	0.003	0.003	< 0.001	< 0.001	< 0.001	<0.0005	0.0033	<0.00050	<0.00050	0.00005	< 0.00002	0.00005	< 0.00002	< 0.00002
Molybdenum	NV	0.04		< 0.002	< 0.002	< 0.002	< 0.001	<0.0005	<0.00050	<0.00050	< 0.0001	< 0.0001	0.0033	0.0012	0.0002
Nickel	NV	0.025		< 0.01	< 0.01	< 0.01	<0.001	<0.001	<0.0010	<0.0010	< 0.01	< 0.01	0.05	0.03	0.01
Selenium	0.01	0.1	0.003	< 0.01	< 0.01	< 0.01	<0.002	<0.002	<0.0020	<0.0020	0.001	< 0.001	< 0.001	< 0.001	< 0.001
Silver	NV	0.0001		< 0.0001	< 0.0001	< 0.0001	<0.0001	<0.0001	<0.00010	<0.00010	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Strontium	NV			0.087	0.075	0.108	0.071	0.11	0.1	0.072	-	-	-	0.119	0.093
Thallium	NV	0.0003		< 0.0003	< 0.0003	< 0.0003	<0.00005	<0.00005	<0.000050	<0.000050	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Vanadium	NV	0.006		0.002	0.002	< 0.001	<0.001	0.0014	<0.00050	<0.00050	0.0009	< 0.0001	0.0017	0.0013	0.0007
Zinc	5	0.02	2.5	1.19	0.04	0.41	29	30	18	57	18.7	10.9	1.82	0.477	0.013
Field Conductivity (µs/cm)	NV			-	-	-	-	-	323	390	263	300	-	-	155
Field pH (units)	6.5 - 8.5			-	-	-	-	-	7.02	6.85	7.22	7.24	-	-	7.63
Field Temperature (°C)	NV			-	-	-	-	-	9.8	7.7	12.7	7.4	-	-	10.99

ODWQS - Ontario Drinking Water Quality Objectives

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RUP - Reasonable Use Policy Criteria

Bold / Grey Highlighting - ODWQS Exceedance

Bold / Underlined - RUP Exceedance

Bold / Red Highlighting - PWQO / CWQG Exceedance

all results in mg/L unless otherwise stated

Summary of Ground Water Quality - General Chemistry
Laxton Waste Disposal Site

Parameter	ODWQS	PWQO / CWQG	RUP	MW17	MW17	MW17	MW17	MW17	MW17	MW17	MW17	MW17	MW17	MW17	MW17
				11-Sep-15	02-Jun-16	17-Oct-16	19-Apr-17	17-Oct-17	24-Apr-18	26-Sep-18	17-Apr-19	18-Oct-19	21-Apr-20	13-Oct-20	15-Apr-21
Alkalinity (as CaCO3)	500		301	83	89	89	Well Under Water	Well Under Water	Well Under Water	Well Under Water	Well Under Water	174	Well Under Water	Well Under Water	Well Under Water
Calcium	NV			21.8	17.4	24.7						44.1			
Chloride	250	<u>120</u>	126	3.6	4.3	6.3						3.1			
Oxygen Demand - Chemical (COD)	NV			248	53	97						147			
Conductivity (µS/cm)	NV			203	216	228						343			
Organic Carbon - Dissolved (DOC)	5		3.4	-	2	2.5						15.3			
Fluoride	1.5		0.80	0.2	0.1	0.1						0.1			
Hardness (as CaCO3)	500		309	96	76	107						186			
Iron	0.3	0.3		6.01	1.84	0.371						1.96			
Magnesium	NV			10.1	7.97	10.9						18.4			
Manganese	0.050		0.03	0.289	0.191	0.235						0.149			
Mercury	0.001	0.0002	0.0003	< 0.00002	<0.00002	<0.00002						< 0.00002			
Nitrate as N	10	<u>13</u>	2.5	< 0.1	<0.1	<0.1						< 0.05			
Nitrite as N	1	<u>0.06</u>	0.29	< 0.1	<0.1	0.2						0.06			
pH	6.5 - 8.5			7.7	7.83	7.93						7.67			
Phenols	NV	0.001		< 0.001	<0.001	<0.001						< 0.002			
Phosphorus	NV	0.03		1.56	0.75	1.56						3.08			
Potassium	NV			1.1	0.9	1.3						1.2			
Sodium	200		101	5.7	4.7	6.7						2.4			
Sulphate	500		257	13	13	15						2			
Solids - Total Dissolved (TDS)	500		308	112	104	120						179			
Total Kjeldahl Nitrogen (TKN)	NV			0.9	0.5	<1						4.1			
Total Ammonia as N (NH ₃ + NH ₄)	NV			0.21	0.19	0.23						1.05			
Aluminum	0.10	0.08	0.06	< 0.01	<0.01	0.04						0.03			
Antimony	0.006	0.02	0.002	< 0.0001	<0.0001	0.0003						0.0003			
Arsenic	0.025	0.005	0.006	0.0001	<0.0001	0.0001						< 0.0001			
Barium	1		0.33	0.036	0.026	0.031						0.064			
Beryllium	NV	0.011		< 0.002	<0.002	<0.002						< 0.002			
Boron	5	1.3	1.3	0.011	0.01	0.007						0.018			
Cadmium	0.005	0.0001	0.001	< 0.00002	<0.00002	<0.00002						< 0.000015			
Chromium	0.05	0.001	0.013	0.003	0.0004	0.0007						0.002			
Cobalt	NV	0.0009		< 0.005	<0.005	<0.005						< 0.005			
Copper	1	0.005	0.50	0.0003	<0.0001	<0.0001						0.0002			
Lead	0.01	0.003	0.003	0.00002	<0.00002	<0.00002						0.00003			
Molybdenum	NV	0.04		0.0012	0.0008	0.0006						0.0001			
Nickel	NV	0.025		< 0.01	<0.01	<0.01						< 0.01			
Selenium	0.01	0.1	0.003	< 0.001	<0.001	<0.001						< 0.001			
Silver	NV	0.0001		< 0.00002	<0.00002	<0.00002						< 0.0001			
Strontium	NV			0.12	0.1	0.142						0.537			
Thallium	NV	0.0003		< 0.00005	<0.00005	<0.00005						< 0.00005			
Vanadium	NV	0.006		0.0012	0.0002	0.0006						0.0012			
Zinc	5	0.02	2.5	0.007	0.013	0.015						< 0.005			
Field Conductivity (µs/cm)	NV			191	202	280						310			
Field pH (units)	6.5 - 8.5			7.33	6.44	7.5						7.4			
Field Temperature (°C)	NV			11.99	11.18	11.6						9.3			

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Bold / Underlined - RUP Exceedance

Bold / Red Highlighting - PWQO / CWQG Exceedance

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Summary of Ground Water Quality - General Chemistry
Laxton Waste Disposal Site

Parameter	ODWQS	PWQO / CWQG	RUP	MW17 13-Oct-21	MW17 12-Apr-22	MW17 16-Oct-22	MW17 26-Apr-23	MW17 11-Oct-23	MW18 05-Oct-10	MW18 26-May-11	MW18 08-Sep-11	MW18 30-May-12	MW18 01-Nov-12	MW18 10-Jun-13	MW18 30-Oct-13
Alkalinity (as CaCO3)	500		301	Well Under Water	Well Under Water	Well Under Water	Well Under Water	Well Under Water	81	82	71	82	94	66	67
Calcium	NV								28	16	13	16	14	13.3	11.8
Chloride	250	<u>120</u>	126						2	3	2	2	3	2.4	2.1
Oxygen Demand - Chemical (COD)	NV								16	52	35	46	28	44	43
Conductivity (µS/cm)	NV								192	190	172	190	160	156	146
Organic Carbon - Dissolved (DOC)	5		3.4						8	9.8	6	6.9	6.4	8.7	5.2
Fluoride	1.5		0.80						< 0.1	<0.1	0.07	<0.10	<0.10	< 0.1	< 0.1
Hardness (as CaCO3)	500		309						108	65	56	60	62	56	53
Iron	0.3	0.3							1.6	4.6	5.1	5.8	7	7.34	14.5
Magnesium	NV								9	6.3	5.4	5.8	6.4	5.61	5.61
Manganese	0.050		0.03						0.06	0.061	0.072	0.064	0.083	0.074	0.104
Mercury	0.001	0.0002	0.0003						< 0.00002	0.00002	<0.00001	<0.00001	<0.00001	< 0.00002	< 0.00002
Nitrate as N	10	<u>13</u>	2.5						< 0.1	<0.1	<0.1	<0.10	<0.10	< 0.1	< 0.1
Nitrite as N	1	<u>0.06</u>	0.29						< 0.1	<0.01	<0.01	<0.010	<0.010	< 0.1	< 0.1
pH	6.5 - 8.5								6.99	6.85	6.51	6.57	6.49	7.05	6.9
Phenols	NV	0.001							< 0.001	<0.001	0.002	<0.0010	<0.0010	0.004	< 0.001
Phosphorus	NV	0.03							0.08	-	-	<0.10	<0.10	0.21	0.12
Potassium	NV								0.7	0.83	0.6	0.83	0.65	0.6	0.8
Sodium	200		101						4	3.3	2.9	3.2	3.3	2.8	3.4
Sulphate	500		257						21	10	18	23	10	18	17
Solids - Total Dissolved (TDS)	500		308						125	112	107	123	122	91.1	95.7
Total Kjeldahl Nitrogen (TKN)	NV								1.1	1.7	1.1	1.2	1.3	1.4	1.1
Total Ammonia as N (NH ₃ + NH ₄)	NV								0.66	1.5	0.8	0.9	0.9	1	0.803
Aluminum	0.10	0.08	0.06						0.04	0.034	0.025	0.031	0.025	0.04	0.04
Antimony	0.006	0.02	0.002						< 0.01	<0.0005	<0.0005	<0.00050	<0.00050	< 0.0001	< 0.0001
Arsenic	0.025	0.005	0.006						< 0.005	<0.001	<0.001	<0.0010	<0.0010	0.0003	< 0.0001
Barium	1		0.33						< 0.1	0.042	0.04	0.038	0.052	0.042	0.05
Beryllium	NV	0.011							< 0.1	<0.0005	<0.0005	<0.00050	<0.00050	< 0.002	< 0.002
Boron	5	1.3	1.3						< 0.1	<0.010	<0.01	0.011	<0.010	0.009	0.013
Cadmium	0.005	0.0001	0.001						< 0.0001	<0.0001	<0.0001	<0.00010	0.00011	0.00003	< 0.00002
Chromium	0.05	0.001	0.013						0.0023	<0.005	<0.005	<0.0050	<0.0050	< 0.002	0.0024
Cobalt	NV	0.0009							< 0.0003	<0.0005	<0.0005	<0.0005	0.00053	0.0002	< 0.005
Copper	1	0.005	0.50						0.0011	0.001	0.003	<0.00050	<0.0010	0.0003	0.0004
Lead	0.01	0.003	0.003						< 0.001	<0.0005	0.0015	0.0013	0.0034	0.00096	0.00036
Molybdenum	NV	0.04							< 0.002	<0.001	<0.0005	<0.00050	<0.00050	0.0001	< 0.0001
Nickel	NV	0.025							< 0.01	<0.001	<0.001	<0.0010	0.0011	< 0.01	< 0.01
Selenium	0.01	0.1	0.003						< 0.01	<0.002	<0.002	<0.0020	<0.0020	< 0.001	< 0.001
Silver	NV	0.0001							< 0.0001	<0.0001	<0.0001	<0.00010	<0.00010	< 0.00002	< 0.00002
Strontium	NV								0.238	0.13	0.12	0.13	0.13	-	-
Thallium	NV	0.0003							< 0.0003	<0.00005	<0.00005	<0.000050	<0.000050	< 0.00005	< 0.00005
Vanadium	NV	0.006							0.001	0.001	<0.0005	0.0014	0.0017	0.0026	0.0016
Zinc	5	0.02	2.5						1.01	12	10	9.9	13	7.54	7.64
Field Conductivity (µs/cm)	NV								-	-	-	377	240	198.2	220
Field pH (units)	6.5 - 8.5								-	-	-	7.05	7.56	6.9	6.7
Field Temperature (°C)	NV								-	-	-	7.2	7	9.3	7.8

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Summary of Ground Water Quality - General Chemistry

Laxton Waste Disposal Site

Parameter	ODWQS	PWQO / CWQG	RUP	MW18	MW18	MW18	MW18	MW18	MW18	MW18	MW18	MW18	MW18	MW18	MW18
				29-Apr-14	23-Sep-14	23-Jun-15	11-Sep-15	31-May-16	17-Oct-16	19-Apr-17	17-Oct-17	24-Apr-18	26-Sep-18	17-Apr-19	18-Oct-19
Alkalinity (as CaCO3)	500		301	63	64	52	96	48	57	71	85	102	107	102	133
Calcium	NV			20	21.5	19.9	18.8	8.33	17.5		21.1	26.3	24.2	23.9	30.4
Chloride	250	<u>120</u>	126	2.3	2.2	2.2	2.1	2.3	2.3	2.5	1.6	1.9	2.5	1.8	2.4
Oxygen Demand - Chemical (COD)	NV			61	1280	112	48	41	57	37	37	55	33	39	35
Conductivity (µS/cm)	NV			178	193	179	175	163	172	169	191	207	266	215	270
Organic Carbon - Dissolved (DOC)	5		3.4	9.9	4.8	5.8	6.1	7.8	6.3	10.3	11.6	13.1	13.6	12.8	14
Fluoride	1.5		0.80	< 0.1	< 0.1	0.1	< 0.1	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Hardness (as CaCO3)	500		309	81	88	85	79	43	73		88	110	106	101	135
Iron	0.3	0.3		8.4	6.64	10.6	8.49	4.1	6.52	7.31	7.41	9.37	8.64	13.2	10.8
Magnesium	NV			7.6	8.29	8.58	7.71	5.29	7.12		8.59	10.8	11.1	10.1	14.4
Manganese	0.050		0.03	0.12	0.11	0.124	0.107	0.044	0.086	0.093	0.1	0.126	0.115	0.122	0.143
Mercury	0.001	0.0002	0.0003	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	0.00003	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Nitrate as N	10	<u>13</u>	2.5	< 0.1	< 0.1	< 0.1	< 0.1	0.1	< 0.1	< 0.1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nitrite as N	1	<u>0.06</u>	0.29	< 0.1	< 0.1	0.1	< 0.1	< 0.1	0.1	0.2	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
pH	6.5 - 8.5			6.93	6.88	6.89	6.98	6.66	6.9	6.84	6.94	6.83	6.88	6.55	6.8
Phenols	NV	0.001		< 0.001	0.011	0.004	< 0.001	< 0.001	< 0.001	0.002	< 0.001	0.004	< 0.002	< 0.002	< 0.002
Phosphorus	NV	0.03		0.05	2	0.19	0.13	0.06	0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.28	0.06
Potassium	NV			0.7	0.7	0.6	0.5	0.5	0.7		0.8	0.8	1	0.7	1.1
Sodium	200		101	3.3	3.7	3.3	3.6	3.8	3.1		2.9	3.2	3	2.5	3
Sulphate	500		257	19	21	29	25	26	22	9	10	7	3	1	2
Solids - Total Dissolved (TDS)	500		308	100	104	107	125	80.7	95.2	87.5	105	113	111	103	135
Total Kjeldahl Nitrogen (TKN)	NV			1.1	20.2	2.2	1.3	1.2	1.5	1.4	1.6	2.1	1.6	1.4	1.8
Total Ammonia as N (NH ₃ + NH ₄)	NV			0.76	0.71	0.97	0.73	0.96	1.14	0.98	1.22	1.15	1.16	1.07	1.35
Aluminum	0.10	0.08	0.06	0.08	0.06	0.8	0.07	0.05	0.09	0.07	0.07	0.06	0.06	0.06	0.06
Antimony	0.006	0.02	0.002	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.0002	0.0001
Arsenic	0.025	0.005	0.006	0.0001	0.0002	0.0004	0.0001	< 0.0001	0.0001	< 0.0001	0.0001	0.0002	0.0002	0.0004	< 0.0001
Barium	1		0.33	0.066	0.058	0.078	0.061	0.021	0.056	0.058	0.082	0.083	0.079	0.067	0.095
Beryllium	NV	0.011		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Boron	5	1.3	1.3	0.011	0.014	0.006	0.013	0.005	0.013	< 0.005	0.017	0.016	0.019	0.029	0.023
Cadmium	0.005	0.0001	0.001	< 0.00002	< 0.00002	0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.000014	< 0.000014	< 0.000015	< 0.000015	< 0.000015	< 0.000015
Chromium	0.05	0.001	0.013	< 0.0002	0.002	0.0089	0.0053	0.0006	0.0017	< 0.001	< 0.001	0.002	< 0.001	0.001	0.002
Cobalt	NV	0.0009		< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.0001	< 0.005	< 0.005	< 0.005
Copper	1	0.005	0.50	0.0004	0.0005	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.0005	0.0001	0.0002	0.0001	0.0009	0.0003
Lead	0.01	0.003	0.003	0.00002	< 0.00002	0.00037	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	0.00033	< 0.00002	< 0.00002	< 0.00002
Molybdenum	NV	0.04		< 0.0001	< 0.0001	< 0.0001	0.0001	< 0.001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Nickel	NV	0.025		< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Selenium	0.01	0.1	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
Silver	NV	0.0001		< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.0001	< 0.0001	< 0.0001
Strontium	NV			-	0.219	0.189	0.18	0.082	0.168	0.167	0.186	0.233	0.264	0.22	0.322
Thallium	NV	0.0003		< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Vanadium	NV	0.006		0.0032	0.0034	0.0061	0.0031	0.0022	0.0015	0.0017	0.0012	0.0018	0.0009	0.0014	0.0011
Zinc	5	0.02	2.5	2	1.31	11.3	0.043	0.115	1.02	0.033	0.043	0.138	0.102	0.056	0.129
Field Conductivity (µs/cm)	NV			-	-	133.4	164	170	480	158	310	230	230	290	280
Field pH (units)	6.5 - 8.5			-	-	6.86	6.6	6.98	7.13	7.03	7.34	6.61	6.7	7.2	6.5
Field Temperature (°C)	NV			-	-	8.7	11.28	10.4	10	6.8	6.5	6.1	12	6.1	8.9

ODWQS - Ontario Drinking Water Quality Objectives

PWQO - Provincial Water Quality Objectives

CWQG - Canadian Water Quality Guidelines (underlined value) - long term criteria

RUP - Reasonable Use Policy Criteria

Bold / Grey Highlighting - ODWQS Exceedance

Bold / Underlined - RUP Exceedance

Bold / Red Highlighting - PWQO / CWQG Exceedance

all results in mg/L unless otherwise stated

Summary of Ground Water Quality - General Chemistry

Laxton Waste Disposal Site

Parameter	ODWQS	PWQO / CWQG	RUP	MW18 21-Apr-20	MW18 13-Oct-20	MW18 15-Apr-21	MW18 13-Oct-21	MW18 12-Apr-22	MW18 16-Oct-22	MW18 26-Apr-23	MW18 11-Oct-23	MW19 30-May-12	MW19 01-Nov-12	MW19 10-Jun-13	MW19 30-Oct-13
Alkalinity (as CaCO3)	500		301	Well Under Water	151	148	166	Well Under Water	Well Under Water	Well Under Water	Well Under Water	110	100	107	104
Calcium	NV				36	40.3	39.7					-	28	26.9	31
Chloride	250	<u>120</u>	126		2.8	2.1	3.3					<1	1	1.4	1.5
Oxygen Demand - Chemical (COD)	NV					38	50					8.9	5	< 5	< 5
Conductivity (µS/cm)	NV				306	315	335					240	230	233	242
Organic Carbon - Dissolved (DOC)	5		3.4		13.8	16	12.9					1.2	1.1	2.8	2.2
Fluoride	1.5		0.80		< 0.1	< 0.1	< 0.1					<0.10	<0.10	0.2	< 0.1
Hardness (as CaCO3)	500		309		144	169	165					120	120	111	124
Iron	0.3	0.3			12.1	16.5	14.8					<0.1	<0.10	0.014	0.028
Magnesium	NV				13.1	16.7	15.9					10	11	10.6	11.3
Manganese	0.050		0.03		0.163	0.2	0.192					0.051	0.046	0.029	0.035
Mercury	0.001	0.0002	0.0003		< 0.00002	< 0.00002	< 0.00002					<0.00001	<0.00001	< 0.00002	< 0.00002
Nitrate as N	10	<u>13</u>	2.5		< 0.05	< 0.05	< 0.05					<0.10	<0.10	0.1	0.1
Nitrite as N	1	<u>0.06</u>	0.29		< 0.05	< 0.05	< 0.05					<0.010	<0.010	< 0.1	< 0.1
pH	6.5 - 8.5				6.92	6.63	6.5					7.16	6.71	7.52	7.46
Phenols	NV	0.001			< 0.002	< 0.002	< 0.001					<0.0010	<0.0010	< 0.001	< 0.001
Phosphorus	NV	0.03			< 0.1	0.17	0.19					<0.10	<0.10	0.48	0.08
Potassium	NV				1	1	1.1					2.5	2.8	2.2	2.3
Sodium	200		101		2.4	2.4	2.5					1.5	1.6	1.6	1.7
Sulphate	500		257		< 1	< 1	< 1					15	12	14	12
Solids - Total Dissolved (TDS)	500		308		160	153	164					135	130	121	122
Total Kjeldahl Nitrogen (TKN)	NV				2	1.7	2.2					0.19	0.29	0.2	< 0.1
Total Ammonia as N (NH ₃ + NH ₄)	NV				1.51	1.28	1.54					<0.01	0.06	< 0.005	0.016
Aluminum	0.10	0.08	0.06		0.06	0.07	0.06					<0.0050	<0.0050	0.02	0.02
Antimony	0.006	0.02	0.002		< 0.0001	< 0.0001	0.0001					<0.00050	<0.00050	< 0.0001	< 0.0001
Arsenic	0.025	0.005	0.006		0.0002	0.0002	0.0002					<0.0010	<0.0010	< 0.0001	< 0.0001
Barium	1		0.33		0.108	0.117	0.123					0.1	0.11	0.107	0.118
Beryllium	NV	0.011			< 0.002	< 0.002	< 0.002					<0.00050	<0.00050	< 0.002	< 0.002
Boron	5	1.3	1.3		0.049	0.015	0.017					0.01	0.012	0.01	0.016
Cadmium	0.005	0.0001	0.001		< 0.000015	< 0.000015	< 0.000015					<0.00010	<0.00010	0.00002	< 0.00002
Chromium	0.05	0.001	0.013		< 0.001	< 0.001	0.001					<0.0050	<0.0050	< 0.002	0.0014
Cobalt	NV	0.0009			< 0.005	< 0.005	< 0.005					0.0012	0.00087	0.0006	< 0.005
Copper	1	0.005	0.50		0.0002	0.0016	0.0005					0.0013	0.0015	0.0014	0.0011
Lead	0.01	0.003	0.003		< 0.00002	0.00006	0.00003					<0.00050	<0.00050	< 0.00002	< 0.00002
Molybdenum	NV	0.04			< 0.0001	< 0.0001	< 0.0001					<0.00050	<0.00050	0.0003	0.0003
Nickel	NV	0.025			< 0.01	< 0.01	< 0.01					<0.0010	<0.0010	< 0.01	< 0.01
Selenium	0.01	0.1	0.003		< 0.001	< 0.001	< 0.001					<0.0020	<0.0020	< 0.001	< 0.001
Silver	NV	0.0001			< 0.0001	< 0.0001	< 0.0001					<0.00010	<0.00010	< 0.00002	< 0.00002
Strontium	NV				0.326	0.355	0.371					0.19	0.2	-	-
Thallium	NV	0.0003			< 0.00005	< 0.00005	< 0.00005					<0.000050	0.000052	< 0.00005	< 0.00005
Vanadium	NV	0.006			0.0013	0.0012	0.0012					<0.00050	<0.00050	0.0015	0.0006
Zinc	5	0.02	2.5		0.167	0.114	0.112					0.0062	<0.0050	< 0.005	< 0.005
Field Conductivity (µs/cm)	NV				295	470	980					276	260	218	290
Field pH (units)	6.5 - 8.5				6.4	7.8	6.84					8.05	8.74	7.2	6.86
Field Temperature (°C)	NV				10.3	6.1	12.8					9.9	7.7	9.9	6.8

ODWQS - Ontario Drinking Water Quality Objectives

PWQO - Provincial Water Quality Objectives

CWQG - Canadian Water Quality Guidelines (underlined value) - long term criteria

RUP - Reasonable Use Policy Criteria

Bold / Grey Highlighting - ODWQS Exceedance

Bold / Underlined - RUP Exceedance

Bold / Red Highlighting - PWQO / CWQG Exceedance

all results in mg/L unless otherwise stated

Summary of Ground Water Quality - General Chemistry
Laxton Waste Disposal Site

Parameter	ODWQS	PWQO / CWQG	RUP	MW19	MW19	MW19	MW19	MW19	MW19	MW19	MW19	MW19	MW19	MW19	MW19
				29-Apr-14	23-Sep-14	09-Jun-15	31-May-16	17-Oct-16	19-Apr-17	17-Oct-17	24-Apr-18	26-Sep-18	17-Apr-19	18-Oct-19	21-Apr-20
Alkalinity (as CaCO3)	500		301	109	142	112	142	156	183	175	183	169	149	124	132
Calcium	NV			32.8	29.5	30.8	50.9	64.8	71.6	59.6	56.7	39.3	35.7	27.6	35.9
Chloride	250	<u>120</u>	126	1.8	1.7	4.2	17.7	64	55.7	39.8	31.3	18.5	10.8	8.4	9
Oxygen Demand - Chemical (COD)	NV			< 5	< 5	8	6	5	9	9	15	< 5	11	9	9
Conductivity (µS/cm)	NV			246	233	267	382	551	613	560	508	448	393	311	345
Organic Carbon - Dissolved (DOC)	5		3.4	2.5	2.3	2.6	2	2.6	3.9	3.3	5	4.6	4.3	3.9	3.5
Fluoride	1.5		0.80	0.1	< 0.1	0.1	0.1	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Hardness (as CaCO3)	500		309	130	118	129	208	261	292	241	230	168	146	117	145
Iron	0.3	0.3		0.009	0.008	< 0.005	0.012	0.02	0.017	0.015	0.017	0.011	0.011	0.01	0.007
Magnesium	NV			11.8	10.9	12.6	19.7	24.1	27.5	22.3	21.5	16.9	13.8	11.8	13.5
Manganese	0.050		0.03	0.031	0.032	0.036	0.044	0.058	0.069	0.063	0.063	0.048	0.043	0.038	0.05
Mercury	0.001	0.0002	0.0003	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Nitrate as N	10	<u>13</u>	2.5	0.2	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nitrite as N	1	<u>0.06</u>	0.29	< 0.1	< 0.1	0.1	< 0.1	< 0.1	0.3	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
pH	6.5 - 8.5			7.58	7.48	7.63	7.36	7.49	7.42	7.44	7.44	7.48	7.18	7.42	7.33
Phenols	NV	0.001		< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.002	< 0.002	< 0.002	< 0.002
Phosphorus	NV	0.03		< 0.01	0.08	0.07	0.05	0.05	< 0.1	< 0.1	< 0.1	< 0.1	0.27	0.04	< 0.1
Potassium	NV			2.6	2.4	2.1	3	3.3	3.4	3.5	3.7	3.4	2.7	2.9	3
Sodium	200		101	1.8	1.6	1.4	2.9	5.1	12.5	17.2	28.6	28.7	24.4	25.4	22.3
Sulphate	500		257	14	11	17	24	32	45	33	43	31	25	20	26
Solids - Total Dissolved (TDS)	500		308	131	120	135	203	287	327	280	295	239	202	171	189
Total Kjeldahl Nitrogen (TKN)	NV			0.2	0.1	0.2	0.2	0.3	0.2	0.3	0.2	0.3	0.3	0.2	0.2
Total Ammonia as N (NH ₃ + NH ₄)	NV			< 0.01	0.05	< 0.01	0.03	0.13	0.02	0.01	0.03	0.02	0.05	0.03	< 0.01
Aluminum	0.10	0.08	0.06	0.01	< 0.01	< 0.01	0.01	0.02	0.02	0.04	0.04	0.03	0.03	0.03	0.03
Antimony	0.006	0.02	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
Arsenic	0.025	0.005	0.006	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.0002	0.0002	0.0002	0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Barium	1		0.33	0.12	0.109	0.118	0.206	0.247	0.291	0.313	0.258	0.185	0.149	0.126	0.16
Beryllium	NV	0.011		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Boron	5	1.3	1.3	0.011	0.017	< 0.005	0.129	0.194	0.277	0.312	0.404	0.424	0.392	0.331	0.442
Cadmium	0.005	0.0001	0.001	< 0.00002	< 0.00002	< 0.00002	0.00003	< 0.00002	0.000081	0.000026	0.000038	0.00003	0.00003	0.000028	0.000053
Chromium	0.05	0.001	0.013	< 0.0002	0.0008	0.0015	< 0.0002	0.0013	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.001	< 0.001
Cobalt	NV	0.0009		< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.0008	< 0.005	< 0.005	< 0.005	< 0.005
Copper	1	0.005	0.50	0.0015	0.0015	0.001	0.0016	0.0013	0.0035	0.0032	0.0045	0.0042	0.0048	0.0034	0.0035
Lead	0.01	0.003	0.003	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Molybdenum	NV	0.04		0.0003	< 0.0001	< 0.0001	0.0004	0.0002	0.0003	0.0002	0.0002	0.0002	0.0003	0.0004	0.0003
Nickel	NV	0.025		< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Selenium	0.01	0.1	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
Silver	NV	0.0001		< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Strontium	NV			-	0.23	0.247	0.401	0.492	0.54	0.425	0.431	0.345	0.276	0.242	0.271
Thallium	NV	0.0003		< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Vanadium	NV	0.006		0.0015	0.0017	0.0011	0.0009	0.0006	0.0009	0.0006	0.0009	0.0001	0.0001	0.0001	0.0001
Zinc	5	0.02	2.5	< 0.005	0.007	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Field Conductivity (µs/cm)	NV			-	-	218	344	480	490	483	570	395	440	280	375
Field pH (units)	6.5 - 8.5			-	-	7.3	6.76	7.13	7.29	7.76	7.1	7.31	7.51	7.39	7.33
Field Temperature (°C)	NV			-	-	11.71	10.22	10	9.7	9.9	10	10.5	9.4	8.9	6.6

ODWQS - Ontario Drinking Water Quality Objectives

PWQO - Provincial Water Quality Objectives

CWQG - Canadian Water Quality Guidelines (underlined value) - long term criteria

RUP - Reasonable Use Policy Criteria

Bold / Grey Highlighting - ODWQS Exceedance

Bold / Underlined - RUP Exceedance

Bold / Red Highlighting - PWQO / CWQG Exceedance

all results in mg/L unless otherwise stated

Summary of Ground Water Quality - General Chemistry
Laxton Waste Disposal Site

Parameter	ODWQS	PWQO / CWQG	RUP	MW19	MW19	MW19	MW19	MW19	MW19	MW19	MW20-I	MW20-I	MW20-II	MW20-II
				13-Oct-20	15-Apr-21	13-Oct-21	12-Apr-22	16-Oct-22	26-Apr-23	11-Oct-23	26-Apr-23	11-Oct-23	26-Apr-23	11-Oct-23
Alkalinity (as CaCO3)	500		301	132	140	133	151	134	143	150	240	230	101	168
Calcium	NV			34.6	46.8	38.9	38.8	33.3	39.5	33.6	71.4	67	30.1	41
Chloride	250	<u>120</u>	126	12.2	14.5	10.8	10.7	8	10.8	7.1	20.8	17.4	1.7	1.7
Oxygen Demand - Chemical (COD)	NV				5	17	11	< 5	< 5	13	46	24	102	53
Conductivity (µS/cm)	NV			356	410	355	367	342	374	329	601	550	226	313
Organic Carbon - Dissolved (DOC)	5		3.4	4	5.9	4.1	4.4	3.9	4.3	2.9	4	6.5	5.1	12.7
Fluoride	1.5		0.80	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.1	< 0.1
Hardness (as CaCO3)	500		309	133	187	157	160	136	157	134	259	245	111	158
Iron	0.3	0.3		0.007	0.011	0.017	< 0.005	< 0.005	0.005	0.007	3.62	3.97	1.12	2.42
Magnesium	NV			11.4	17.1	14.5	15.2	12.9	14.2	12.2	19.7	18.8	8.64	13.5
Manganese	0.050		0.03	0.049	0.074	0.064	0.068	0.06	0.072	0.064	1.61	1.03	0.701	0.621
Mercury	0.001	0.0002	0.0003	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Nitrate as N	10	<u>13</u>	2.5	< 0.05	< 0.05	0.09	< 0.05	< 0.05	0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nitrite as N	1	<u>0.06</u>	0.29	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
pH	6.5 - 8.5			7.51	7.32	6.94	7.55	7.36	7.11	6.73	7.44	6.87	7.09	6.78
Phenols	NV	0.001		< 0.002	< 0.002	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Phosphorus	NV	0.03		< 0.1	0.06	0.02	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Potassium	NV			2.7	3.2	2.9	2.9	2.7	2.8	2.5	5.6	4.6	2.2	1.8
Sodium	200		101	19.3	19.6	16.6	15	12.7	14.2	12.2	18.1	18.7	2.1	1.9
Sulphate	500		257	29	39	34	28	27	34	25	45	46	8	5
Solids - Total Dissolved (TDS)	500		308	189	224	198	201	177	202	169	330	285	116	161
Total Kjeldahl Nitrogen (TKN)	NV			0.2	0.2	0.2	0.2	0.1	0.2	0.4	0.3	0.3	0.7	0.5
Total Ammonia as N (NH ₃ + NH ₄)	NV			0.04	0.01	0.04	0.13	< 0.01	0.03	0.53	0.12	0.12	0.19	0.21
Aluminum	0.10	0.08	0.06	0.03	0.03	0.03	0.01	< 0.01	0.02	0.03	0.03	0.04	< 0.01	0.06
Antimony	0.006	0.02	0.002	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Arsenic	0.025	0.005	0.006	0.0001	0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.0002	0.0003	0.0004	0.0008
Barium	1		0.33	0.152	0.206	0.173	0.172	0.149	0.175	0.15	0.184	0.178	0.043	0.05
Beryllium	NV	0.011		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.0001	< 0.002	< 0.0001	< 0.002	0.0001
Boron	5	1.3	1.3	0.516	0.868	0.802	0.721	0.542	0.72	0.543	0.712	0.629	0.035	0.031
Cadmium	0.005	0.0001	0.001	0.000026	0.000034	0.000022	0.000029	0.000022	0.000031	0.000025	< 0.000010	< 0.000015	< 0.000010	< 0.000015
Chromium	0.05	0.001	0.013	< 0.001	< 0.001	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.002
Cobalt	NV	0.0009		< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.0009	< 0.005	0.0011	< 0.005	0.0004
Copper	1	0.005	0.50	0.0039	0.0057	0.0045	0.0036	0.0038	0.0038	0.0039	0.0004	0.0006	0.0006	0.001
Lead	0.01	0.003	0.003	< 0.00002	0.00005	0.00003	< 0.00002	< 0.00002	< 0.00002	0.00002	0.00003	0.00004	0.00005	0.00026
Molybdenum	NV	0.04		0.0003	0.0002	0.0002	0.0003	0.0004	0.0003	0.0003	0.0017	0.0012	0.0011	0.0002
Nickel	NV	0.025		< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.0011	< 0.01	0.0019	< 0.01	0.0008
Selenium	0.01	0.1	0.003	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Silver	NV	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	NV			0.263	0.345	0.312	0.302	0.261	0.308	0.258	0.763	0.641	0.251	0.351
Thallium	NV	0.0003		< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Vanadium	NV	0.006		0.0002	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0005	0.0008	0.0049	0.0124
Zinc	5	0.02	2.5	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.005	< 0.005	< 0.005	< 0.005
Field Conductivity (µs/cm)	NV			285	500	380	330	300	310	265	445	400	220	255
Field pH (units)	6.5 - 8.5			7.18	7.87	6.95	7.15	7.2	7.34	7.16	7.04	6.73	7.48	6.85
Field Temperature (°C)	NV			10	7.8	10.1	10.6	9.3	9.4	10	12	12.4	11	14.3

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Bold / Grey Highlighting - ODWQS Exceedance

Bold / Underlined - RUP Exceedance

Bold / Red Highlighting - PWQO / CWQG Exceedance

all results in mg/L unless otherwise stated

**Summary of Surface Water Quality -
General Chemistry
Laxton Waste Disposal Site**

Parameter	PWQO	SW A	SW A	SW A	SW A	SW A	SW A	SW A	SW A	SW A	SW A	SW A	SW A	SW A	SW A
		02-Jun-08	18-Jul-08	01-Oct-08	28-Apr-09	23-Jun-09	25-Aug-09	03-May-10	19-Aug-10	01-Nov-10	26-May-11	02-Aug-11	27-Oct-11	01-Nov-12	10-Jun-13
Alkalinity (as CaCO ₃)	decrease >25% of background	109	55	<5	5	112	66	98	129	148	108	131	145	38	161
Oxygen Demand - Biological (BOD)	NV	3	4	5	3	15	3	<2	<2	4	<2	<2	<2	2	<3
Calcium	NV	31	17	8	5	32	19	27	38	45	28	43	47	25	40.1
Chloride	NV	<1	<1	1.2	3	<1	<1	1	1	3	2	2	3	2	0.6
Oxygen Demand - Chemical (COD)	NV	52	12	36	51	36	83	40	7	46	54	57	46	68	45
Colour (TCU)	NV	60	84	372	258	190	252	94	132	84	150	130	65	170	80
Conductivity (µS/cm)	NV	203	118	-	58	209	138	157	241	231	212	318	331	210	321
Carbon - Dissolved Organic (DOC)	NV	21	27.8	50.77	29	25	30	14	22	15	21.8	19.3	13.3	24	18.8
Fluoride	NV	<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	0.2
Free Cyanide	0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.0020	<0.005
Hardness (as CaCO ₃)	NV	126	69	29	17.6	129	80.4	112	149	184	120	170	170	100	163
Iron	0.3	0.2	1.27	0.6636	0.6	2.1	1	0.2	1.3	0.3	0.25	1.2	1	<0.10	0.692
Magnesium	NV	12	6.379	2.36	1	12	8	11	13	18	11	14	18	11	15.2
Manganese	NV	0.05	0.176	0.0991	0.08	0.24	0.06	0.01	0.08	0.03	0.037	0.22	0.064	0.032	0.151
Mercury	0.0002	0.00002	0.00004	<0.00002	<0.0002	<0.00002	0.00003	<0.00002	<0.00002	<0.00002	0.00002	<0.00001	<0.00001	<0.00001	<0.00002
Nitrogen - Nitrate (NO ₃)	NV	0.3	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
Nitrogen - Nitrite (NO ₂)	NV	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.01	0.05	<0.01	<0.010	<0.1
pH	6.5 - 8.5	7.24	6.66	5.3	5.9	7.24	7.16	7.3	7.23	7.4	7.39	7.51	7.81	6.57	7.63
Phenols	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	<0.0010	<0.001
Phosphorus	0.03	0.04	0.61	0.08	0.1	0.34	0.08	0.04	0.38	0.099	0.048	0.16	0.082	0.027	0.1
Potassium	NV	0.3	0.9367	2.21	0.7	0.6	1	0.8	0.4	1	0.63	1.1	1.3	1.2	0.2
Sodium	NV	1	1.556	1.41	2	2	1	1	1	1	1.2	1.2	1.5	1	1.3
Sulphate	NV	5	3.2	17.3	12	<1	4	5	<1	2	<1	31	25	54	5
Solids - Total Dissolved (TDS)	NV	132	76.64	50.38	38	136	90	102	157	150	112	186	184	123	160
Nitrogen - Total Kjeldahl (TKN)	NV	1.4	4.5	3.1	1.2	6.2	2.1	0.9	2.3	1.5	0.9	1.8	1.1	1.6	1.85
Total Ammonia as N (NH ₃ + NH ₄)	NV	0.1	0.15	0.42	0.1	0.53	0.16	0.03	0.32	<0.01	0.01	0.22	<0.01	0.03	<0.01
Solids - Total Suspended (TSS)	NV	5	165	46	11	145	26	6	156	52	10	5	2	<1	14
Turbidity (NTU)	NV	2.2	9.91	9.53	3.3	25.3	5.6	4.1	23	10	4.6	7.5	5.4	1.1	3
Ammonia - Unionized (as N)	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Aluminum	0.075	0.05	0.6715	0.448	0.42	0.28	0.68	0.06	0.12	0.01	0.031	0.036	0.062	0.097	0.05
Antimony	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.0005	<0.0005	<0.0005	<0.00050	0.0001
Arsenic	0.005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.005	<0.005	<0.001	<0.001	<0.001	<0.0010	0.0004
Barium	NV	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.045	0.074	0.056	0.041	0.07
Beryllium	0.011	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.0005	<0.0005	<0.0005	<0.00050	<0.002
Boron	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.010	0.022	<0.01	<0.010	0.016
Cadmium	0.0001	<0.0001	0.000218	0.000294	0.0002	0.0002	0.0001	0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	0.00005
Chromium	0.001	0.0004	0.001317	0.000858	0.0008	0.0006	0.0012	0.0004	0.0004	0.0003	<0.005	<0.005	<0.005	<0.0050	0.0007
Cobalt	0.0009	<0.0003	0.000846	0.000688	0.0009	0.0007	0.0006	<0.0003	0.0005	<0.0003	<0.0005	<0.0005	<0.0005	<0.00050	<0.005
Copper	0.005	0.0022	0.020008	0.09452	0.0018	0.873	0.0058	0.0031	0.0027	0.0007	<0.001	<0.001	<0.001	<0.0010	0.0078
Lead	0.003	0.001	0.003306	0.001817	0.001	0.002	0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.00050	0.00099
Molybdenum	0.04	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	0.0009	<0.0005	<0.00050	0.0008
Nickel	0.025	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.001	<0.001	<0.001	<0.0010	<0.01
Selenium	0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.002	<0.002	<0.002	<0.0020	<0.001
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	<0.00010	<0.00002
Strontium	NV	0.154	0.1649	0.08018	0.048	0.256	0.187	0.186	0.304	0.268	0.21	0.32	0.31	0.2	-
Thallium	0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.00005	<0.00005	<0.00005	<0.000050	<0.00005
Vanadium	0.006	<0.001	0.002007	<0.001	<0.001	<0.001	0.002	<0.001	<0.001	<0.001	0.001	0.0008	0.0006	<0.00050	0.0005
Zinc	0.02	0.02	0.028	0.0327	0.03	0.02	0.01	<0.01	<0.01	<0.01	<0.005	<0.005	0.005	0.01	<0.005
Field Temperature (°C)	NV	21	20	7	13.8	19.06	18.01	19.46	16.8	3.5	14.6	23.5	6.5	6.2	15.3
Field Dissolved Oxygen (DO)	NV	4.61	1.25	2.33	3.38	3.63	5.2	3.48	3.34	3.62	3.05	1.48	10.53	8.25	7.87
Field pH (units)	6.5 - 8.5	6.4	5.2	5.53	4.75	6.92	7.17	7.3	6.94	7.24	7.13	7.64	7.56	7.76	7.28
Field Conductivity (µS/cm)	NV	168	120	79	49	193	128	176	238.4	194.1	213	311.8	216.6	230	316

PWQO - Provincial Water Quality Objectives

Bold / highlighting - PWQO Exceedance

all results in mg/L unless otherwise stated

**Summary of Surface Water Quality -
General Chemistry
Laxton Waste Disposal Site**

Parameter	PWQO	SW A	SW A	SW A	SW A	SW A	SW A	SW A	SW A	SW A	SW A	SW A	SW A	SW A	SW A
		30-Oct-13	28-Apr-14	23-Sep-14	09-Jun-15	29-Jul-15	11-Sep-15	30-May-16	24-Aug-16	17-Oct-16	19-Apr-17	17-Jul-17	17-Oct-17	24-Apr-18	18-Jul-18
Alkalinity (as CaCO ₃)	decrease >25% of background	77	113	159	186	172	72	68	133	79	79	150	142	39	151
Oxygen Demand - Biological (BOD)	NV	<3	< 3	< 3	11	8	< 3	<2	3	8	< 3	< 3	< 3	< 3	36
Calcium	NV	22	32.8	47.7	54.2	87.8	27	23.7	53.5	77.5	22.7	36.1	43.4	15.3	46.3
Chloride	NV	1.3	1.2	1.4	0.7	0.9	1.7	1.3	0.6	3.6	1.5	1.1	2.3	< 0.5	4.5
Oxygen Demand - Chemical (COD)	NV	62	16	41	113	489	91	359	79	72	38	55	69	46	148
Colour (TCU)	NV	164	58	90	79	185	308	289	97	61	102	95	150	70	110
Conductivity (µS/cm)	NV	176	237	327	354	341	191	141	398	543	179	291	290	84	315
Carbon - Dissolved Organic (DOC)	NV	31	11.9	19.4	16.5	25.7	46.5	29.3	20.2	19	13.8	18.9	21	8.7	25.2
Fluoride	NV	0.1	0.1	0.2	0.1	< 0.1	0.1	0.2	0.1	<0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Free Cyanide	0.005	<0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	<0.005	<0.005	<0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Hardness (as CaCO ₃)	NV	92	132	192	213	307	109	91	215	288	97	148	177	60	184
Iron	0.3	0.162	0.087	0.165	8.35	68.2	0.336	2.36	0.293	0.448	0.069	0.242	0.426	0.125	5.48
Magnesium	NV	9.05	12.1	17.6	18.7	21.3	10.2	7.82	19.7	22.9	9.38	13.9	16.6	5.39	16.5
Manganese	NV	0.004	0.016	0.032	0.623	3.59	0.14	0.133	0.218	0.433	0.017	0.096	0.291	0.035	1.29
Mercury	0.0002	<0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	0.00009	<0.00002	<0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	0.00004
Nitrogen - Nitrate (NO ₃)	NV	<0.1	< 0.1	0.2	0.1	0.1	< 0.1	0.1	0.2	<0.1	< 0.1	< 0.05	< 0.05	< 0.05	< 0.05
Nitrogen - Nitrite (NO ₂)	NV	<0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	<0.1	0.1	0.1	< 0.1	< 0.05	< 0.05	< 0.05	< 0.05
pH	6.5 - 8.5	7.23	8.1	7.64	7.77	7.12	7.21	7.02	7.67	7.21	7.32	8.03	7.84	7.11	7.68
Phenols	0.001	<0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	<0.001	<0.001	0.002	0.002	0.009	0.004	< 0.001	0.002
Phosphorus	0.03	0.02	0.01	0.12	0.56	9.18	0.08	0.76	0.06	0.21	0.03	0.09	0.17	0.06	1.18
Potassium	NV	0.2	0.7	0.4	0.7	1.7	1.8	1.4	0.8	1.7	0.5	0.7	2.2	1.1	7.8
Sodium	NV	1.1	1.4	1.2	1.9	2.5	1.3	1.8	1.2	5	1	1	2.2	1.9	2.9
Sulphate	NV	8	9	6	2	2	18	1	73	193	9	1	3	2	< 1
Solids - Total Dissolved (TDS)	NV	88	125	171	200	297	104	81.2	231	352	92.2	144	145	49	177
Nitrogen - Total Kjeldahl (TKN)	NV	0.9	0.5	1.4	3.1	53.4	1.5	8.2	1.3	2.4	0.6	0.9	1.1	0.6	5.4
Total Ammonia as N (NH ₃ + NH ₄)	NV	0.084	0.05	0.11	0.19	3.75	0.03	0.21	0.24	0.06	0.03	0.06	0.03	0.07	0.74
Solids - Total Suspended (TSS)	NV	4	< 3	8	148	1000	8	620	16	122	< 3	6	10	6	1200
Turbidity (NTU)	NV	0.6	0.5	1.5	47.7	458	1.6	177	4.4	32.7	0.8	1.2	2.4	1	114
Ammonia - Unionized (as N)	0.02	<0.005	< 0.01	< 0.01	< 0.01	0.01	< 0.01	0.01	<0.01	<0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aluminum	0.075	0.08	0.04	0.05	0.62	7.01	0.13	1.28	0.03	0.04	0.07	0.02	0.04	0.03	0.03
Antimony	0.02	<0.0001	< 0.0001	< 0.0001	0.0002	0.0003	0.0003	0.0001	0.0001	0.0001	< 0.0001	0.0001	0.0001	< 0.0001	0.0002
Arsenic	0.005	0.0003	0.0002	0.0003	0.001	0.0055	0.001	0.0008	0.0006	0.0004	0.0002	0.0003	0.0005	0.0004	0.0009
Barium	NV	0.031	0.047	0.061	0.145	0.661	0.053	0.081	0.086	0.1	0.041	0.059	0.071	0.029	0.193
Beryllium	0.011	<0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	<0.002	<0.002	<0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Boron	0.2	<0.005	0.009	0.013	0.012	0.053	0.024	0.008	0.021	0.033	< 0.005	0.011	0.015	0.006	0.057
Cadmium	0.0001	<0.00002	< 0.00002	< 0.00002	0.00023	0.0022	0.00005	0.00033	<0.00002	<0.00002	0.000043	< 0.000014	0.000062	0.000062	0.000125
Chromium	0.001	<0.0002	< 0.0002	< 0.0002	0.0012	0.0045	0.0008	0.0018	<0.0002	0.0006	< 0.001	< 0.001	< 0.001	< 0.001	0.001
Cobalt	0.0009	<0.005	< 0.005	< 0.005	< 0.005	0.013	< 0.005	<0.005	0.0002	0.0003	< 0.0001	0.0001	0.0002	< 0.0001	0.0013
Copper	0.005	0.0003	0.001	0.0004	0.0031	0.0244	0.0033	0.0102	0.0004	<0.0001	< 0.0001	0.0002	0.0097	0.0062	0.0048
Lead	0.003	0.00008	0.00006	0.00009	0.00474	0.0306	0.00109	0.00382	0.00005	<0.00002	0.00007	0.00008	0.00079	0.00122	0.00221
Molybdenum	0.04	<0.0001	0.0006	0.0004	0.0006	0.0012	0.0004	0.0003	0.0011	0.0005	0.0002	0.0004	0.0004	0.0002	0.0006
Nickel	0.025	<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
Selenium	0.1	<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
Silver	0.0001	<0.00002	0.00003	< 0.00002	< 0.00002	0.00015	0.00002	0.00004	<0.00002	<0.00002	0.00005	< 0.00002	< 0.00002	< 0.00002	< 0.0001
Strontium	NV	-	-	0.411	0.452	0.753	0.237	0.204	0.426	0.572	0.182	0.295	0.273	0.117	0.347
Thallium	0.0003	<0.00005	< 0.00005	< 0.00005	< 0.00005	0.00022	< 0.00005	<0.00005	<0.00005	<0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Vanadium	0.006	0.0002	0.0002	0.0006	0.0024	0.0241	0.0006	0.003	0.0002	0.0002	0.0002	< 0.0001	0.0002	0.0002	0.0011
Zinc	0.02	<0.005	0.012	0.007	0.032	0.311	0.021	0.038	<0.005	0.014	0.006	0.007	0.054	0.036	0.027
Field Temperature (°C)	NV	-	14.8	10.1	20.89	20.1	16.26	14.75	-	12.1	7.7	19.6	5.4	1.7	16.8
Field Dissolved Oxygen (DO)	NV	-	3.89	3.28	5.98	0.18	2.22	0.01	-	4.73	6.2	1.08	1.32	6.58	0.48
Field pH (units)	6.5 - 8.5	-	8.16	7.52	7.46	6.99	7.01	7.98	-	7.65	7.89	8.36	7.45	8.37	6.95
Field Conductivity (µs/cm)	NV	-	290	320	308	361.6	156	139	-	520	150	223	235	160	290

PWQO - Provincial Water Quality Objectives

Bold / highlighting - PWQO Exceedance

all results in mg/L unless otherwise stated

Summary of Surface Water Quality -
General Chemistry
Laxton Waste Disposal Site

Parameter	PWQO	SW A	SW A	SW A	SW A	SW A	SW A	SW A	SW A	SW A	SW A	SW A	SW A	SW A	SW A
		26-Sep-18	17-Apr-19	18-Jul-19	18-Oct-19	21-Apr-20	20-Jul-20	13-Oct-20	15-Apr-21	16-Aug-21	13-Oct-21	12-Apr-22	20-Jul-22	16-Oct-22	26-Apr-23
Alkalinity (as CaCO ₃)	decrease >25% of background	134	110	13	95	96	Dry	116	136	162	219	62	Dry	109	107
Oxygen Demand - Biological (BOD)	NV	3	< 3	5	4	< 3		< 3	< 3	< 3	7	< 3		< 3	< 3
Calcium	NV	36.3	29.5	5.84	30.6	29.5		36.4	36.2	46.6	62.2	18.1		26.4	7.88
Chloride	NV	1.8	1.8	< 0.5	2.9	1.8		2.3	2.2	0.8	4.8	2.7		3.6	0.9
Oxygen Demand - Chemical (COD)	NV	65	15	61	59	28		42	29	68	81	42		45	33
Colour (TCU)	NV	120	40	164	125	57		131	79	88	190	79		127	75
Conductivity (µS/cm)	NV	262	238	36	241	214		239	275	302	405	145		215	223
Carbon - Dissolved Organic (DOC)	NV	20.1	7.6	15.8	24.1	9.1		0.9	15.2	21.9	26.9	14.7		18.6	18.4
Fluoride	NV	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1		< 0.1	< 0.1
Free Cyanide	0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		< 0.005	< 0.005
Hardness (as CaCO ₃)	NV	140	120	16	130	120		145	161	181	241	79		110	118
Iron	0.3	0.401	0.187	4.57	0.203	0.061		0.108	0.087	0.404	0.472	0.097		0.06	0.077
Magnesium	NV	13.8	11.9	0.86	13.4	11.2		13.1	13.6	14.9	25.7	6.82		11.1	9.79
Manganese	NV	0.371	0.034	0.125	0.061	0.003		0.017	0.009	0.263	0.894	0.008		0.014	0.003
Mercury	0.0002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002		< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002		< 0.00002	< 0.00002
Nitrogen - Nitrate (NO ₃)	NV	< 0.05	0.17	0.09	< 0.05	< 0.05		< 0.05	< 0.05	0.07	0.13	1.34		< 0.05	0.12
Nitrogen - Nitrite (NO ₂)	NV	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05	< 0.05
pH	6.5 - 8.5	7.69	7.53	6.56	7.75	7.73		7.94	8	7.89	7.78	7.53		7.25	7.88
Phenols	0.001	0.003	< 0.002	< 0.002	< 0.002	< 0.002		< 0.002	< 0.002	< 0.002	0.005	< 0.001		< 0.001	< 0.001
Phosphorus	0.03	0.09	0.26	0.18	0.06	0.01		0.03	0.05	0.13	0.13	< 0.1		< 0.1	< 0.1
Potassium	NV	0.6	0.7	0.3	1.7	0.5		0.6	0.9	0.2	2.3	0.8		1.2	0.5
Sodium	NV	0.9	1.3	1.1	1.4	1.5		0.8	1.8	0.5	2.5	1.3		1.8	1.4
Sulphate	NV	1	4	< 1	18	8		4	7	3	< 1	7		2	6
Solids - Total Dissolved (TDS)	NV	136	116	21	125	110		122	143	163	231	75		112	108
Nitrogen - Total Kjeldahl (TKN)	NV	1.1	0.5	1.8	0.8	0.4		0.7	0.7	1.9	1.3	0.6		0.6	0.6
Total Ammonia as N (NH ₃ + NH ₄)	NV	0.1	0.22	0.08	0.04	< 0.01		0.03	0.02	0.06	0.08	0.57		< 0.01	0.15
Solids - Total Suspended (TSS)	NV	6	< 3	70	61	5		< 3	3	43	13	5		14	< 3
Turbidity (NTU)	NV	1.8	0.8	15.9	1.2	0.7		2.1	1.4	16.3	2.4	0.6		1.5	0.6
Ammonia - Unionized (as N)	0.02	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01		< 0.01	< 0.01	< 0.01	< 0.01	< 0.01		< 0.01	< 0.01
Aluminum	0.075	0.04	0.03	0.06	0.05	0.02		0.03	0.04	0.02	0.04	0.05		< 0.01	0.02
Antimony	0.02	0.0001	< 0.0001	0.0002	0.0003	< 0.0001		0.0002	0.0003	0.0004	0.0002	0.0003		0.0003	0.0002
Arsenic	0.005	0.0003	0.0001	0.0001	0.0003	0.0002		0.0002	0.0002	0.0004	0.0003	0.0002		0.0001	0.0002
Barium	NV	0.063	0.039	0.024	0.043	0.037		0.05	0.048	0.071	0.112	0.025		0.035	0.037
Beryllium	0.011	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002		< 0.002	< 0.002
Boron	0.2	< 0.005	0.007	0.035	0.017	0.007		0.02	0.012	0.022	0.022	0.012		0.013	0.007
Cadmium	0.0001	0.000125	< 0.000015	0.000026	< 0.000015	< 0.000015		< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015		< 0.000015	< 0.000015
Chromium	0.001	0.001	< 0.001	< 0.001	0.001	< 0.001		< 0.001	< 0.001	0.004	0.002	< 0.001		0.005	< 0.001
Cobalt	0.0009	0.0003	0.0002	0.001	0.0002	< 0.0001		< 0.0001	< 0.0001	0.0004	0.0005	0.0001		< 0.0001	< 0.0001
Copper	0.005	0.0048	0.0002	0.0013	0.0005	0.0002		0.0003	0.0002	0.0004	0.0003	0.0004		0.0002	0.0003
Lead	0.003	0.00036	0.00003	0.00015	0.00014	0.00007		0.00003	0.00004	0.00009	0.00007	0.00005		0.00003	< 0.00002
Molybdenum	0.04	0.0002	0.0003	< 0.0001	0.0006	0.0003		0.0002	0.0004	< 0.0001	0.0002	0.0002		0.0001	0.0002
Nickel	0.025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01		< 0.01	< 0.01	< 0.01	< 0.01	< 0.01		0.01	< 0.01
Selenium	0.1	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001		< 0.001	< 0.001	< 0.001	< 0.001	< 0.001		< 0.001	< 0.001
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
Strontium	NV	0.307	0.188	0.025	0.248	0.185		0.283	0.269	0.391	0.538	0.134		0.215	0.214
Thallium	0.0003	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005		< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005		< 0.00005	< 0.00005
Vanadium	0.006	0.0001	0.0003	0.0003	0.0004	0.0003		0.0001	0.0002	0.0001	0.0001	0.0004		0.0001	0.0001
Zinc	0.02	0.023	0.01	0.008	0.009	< 0.005		< 0.005	0.107	0.022	0.009	< 0.005		< 0.005	< 0.005
Field Temperature (°C)	NV	17	2	18.9	7.1	4		10.2	6.6	15.4	16.1	4.1		7.9	4.7
Field Dissolved Oxygen (DO)	NV	3.2	8.74	0.85	5.62	9.61		7.71	18.85	2.01	0.28	8.02		4.2	8
Field pH (units)	6.5 - 8.5	6.6	7.94	7.74	7.31	8.05		7.49	8.28	7	7.17	6.95		7.07	8.55
Field Conductivity (µs/cm)	NV	225	270	52	200	230		210	360	266.3	430	170		220	190

PWQO - Provincial Water Quality Objectives
Bold / highlighting - PWQO Exceedance
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Summary of Surface Water Quality -
General Chemistry
Laxton Waste Disposal Site

Parameter	PWQO	SW A	SW A	SWC	SWC	SWC	SWC	SWC	SWC	SWC	SWC	SWC	SWC	SWC	SWC
		11-Aug-23	11-Oct-23	2-Jun-08	17-Jul-08	1-Oct-08	28-Apr-09	23-Jun-09	25-Aug-09	3-May-10	19-Aug-10	1-Nov-10	26-May-11	2-Aug-11	27-Oct-11
Alkalinity (as CaCO ₃)	decrease >25% of background	Dry	146	146	197	170	161	174	169	117	180	154	148	146	121
Oxygen Demand - Biological (BOD)	NV		9	2	3	3	2	3	2	<2	<2	2	<2	<2	<2
Calcium	NV		23.2	44	64.9	48.98	47	60	50	35	63	52	46	60	51
Chloride	NV		8	4	15.7	3.9	10	9	4	2	4	4	3	4	5
Oxygen Demand - Chemical (COD)	NV		86	32	36	38	14	40	37	33	36	26	43	31	38
Colour (TCU)	NV		195	77	58	120	17	58	41	79	74	62	75	74	53
Conductivity (µS/cm)	NV		278	302	454	369	377	405	346	213	350	266	312	424	375
Carbon - Dissolved Organic (DOC)	NV		43.8	15	11.91	13.42	7	12	15	12	15	10	14.4	14	12.6
Fluoride	NV		<0.1	0.1	<0.1	0.1	<0.1	0.1	0.1	<0.1	0.2	0.1	0.1	0.1	0.1
Free Cyanide	0.005		<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002
Hardness (as CaCO ₃)	NV		127	169	229	187	174	216	191	137	232	202	170	220	180
Iron	0.3		0.803	0.7	1.134	0.5783	2	2.3	0.7	0.2	2.4	0.6	2	1.7	0.4
Magnesium	NV		16.9	14	16.3	15.72	14	16	16	12	18	18	15	18	16
Manganese	NV		0.679	0.09	0.2365	0.0579	0.21	0.32	0.12	0.01	0.22	0.11	0.29	0.38	0.11
Mercury	0.0002		<0.00002	<0.00002	0.00002	<0.00002	<0.0002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	0.00002	<0.00001	<0.00001
Nitrogen - Nitrate (NO ₃)	NV		<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
Nitrogen - Nitrite (NO ₂)	NV		<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.01	<0.01	<0.01
pH	6.5 - 8.5		7.36	7.29	7.19	7.54	7.18	7.44	7.48	7.6	7.53	7.58	7.58	7.47	7.65
Phenols	0.001		0.002	<0.001	<0.001	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Phosphorus	0.03		0.38	0.01	0.02	<0.01	0.07	0.04	0.07	0.02	0.05	0.022	0.031	0.026	0.022
Potassium	NV		6.3	0.9	2.85	0.86	3.4	2.2	1.2	1.2	1.1	1	1.1	0.85	1.1
Sodium	NV		3.1	6	17.3	5.12	13	11	6	2	4	4	3.5	4.5	3.6
Sulphate	NV		<1	20	37.9	26.2	25	38	15	13	12	21	10	67	57
Solids - Total Dissolved (TDS)	NV		147	196	295	239.8	245	263	225	138	228	173	173	252	210
Nitrogen - Total Kjeldahl (TKN)	NV		2.1	0.8	0.8	0.8	1.2	1.6	0.9	0.7	0.8	0.6	0.6	0.8	0.6
Total Ammonia as N (NH ₃ + NH ₄)	NV		0.14	<0.1	<0.1	<0.1	0.02	0.05	<0.01	0.02	0.01	0.01	0.01	<0.01	<0.01
Solids - Total Suspended (TSS)	NV		20	<1	5	7	180	39	2	1	21	<1	5	5	<1
Turbidity (NTU)	NV		8	1.2	2.87	3.32	39.3	13.7	3.3	2	12.3	2	4.1	6.2	1.1
Ammonia - Unionized (as N)	0.02		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Aluminum	0.075		0.03	0.03	0.0248	0.0409	0.05	0.06	0.02	0.01	0.05	0.01	0.032	0.032	0.018
Antimony	0.02		0.0005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.0005	<0.0005	<0.0005
Arsenic	0.005		0.0002	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.005	<0.005	<0.001	<0.001	<0.001
Barium	NV		0.044	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.047	0.067	0.04
Beryllium	0.011		<0.0001	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.0005	<0.0005	<0.0005
Boron	0.2		0.008	<0.1	0.172	0.172	0.1	0.1	<0.1	<0.1	<0.1	<0.1	0.029	0.057	0.03
Cadmium	0.0001		<0.000015	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	0.0002	0.0001	<0.0001	<0.0001	<0.0001
Chromium	0.001		<0.001	0.0005	0.000624	0.000456	0.0003	0.0005	0.0003	0.0003	0.0005	0.0005	<0.005	<0.005	<0.005
Cobalt	0.0009		0.0005	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0005	<0.0005	<0.0005
Copper	0.005		0.0003	0.0012	<0.0001	0.000576	0.0003	0.0057	<0.0001	0.0002	0.0008	<0.0001	<0.001	<0.001	<0.001
Lead	0.003		0.00005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005
Molybdenum	0.04		0.0001	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	0.0006	0.0005
Nickel	0.025		0.0007	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.001	<0.001	<0.001
Selenium	0.1		<0.001	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.002	<0.002	<0.002
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	NV		0.192	0.506	0.775	0.636	0.445	0.774	0.61	0.312	0.569	0.457	0.48	0.73	0.6
Thallium	0.0003		<0.00005	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.00005	<0.00005	<0.00005
Vanadium	0.006		0.0001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0007	<0.0005
Zinc	0.02		<0.005	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.005	<0.005
Field Temperature (°C)	NV		4.7	22	25	8	16.32	21.93	21.08	17.81	16.1	4.3	13.3	23.1	6.3
Field Dissolved Oxygen (DO)	NV		3.95	10.17	8.57	9.52	8.72	5.65	6.67	6.29	5.11	9.05	4.86	6.67	10.37
Field pH (units)	6.5 - 8.5		8.55	5.45	5.9	6.95	4.21	6.75	7.12	7.45	7.1	7.21	7.5	8.37	7.82
Field Conductivity (µs/cm)	NV		230	280	466	349	211	414	340	205	360.1	220.6	311	381.6	236.9

PWQO - Provincial Water Quality Objectives
Bold / highlighting - PWQO Exceedance
all results in mg/L unless otherwise stated

**Summary of Surface Water Quality -
General Chemistry
Laxton Waste Disposal Site**

Parameter	PWQO	SWC	SWC	SWC	SWC	SW C2	SW C2	SW C2	SW C2	SW C2	SW C2	SW C2	SW C2	SW C2	SW C2
		30-May-12	9-Jul-12	1-Nov-12	29-Jul-13	10-Jun-13	30-Oct-13	28-Apr-14	5-Aug-14	23-Sep-14	9-Jun-15	29-Jul-15	10-Sep-15	30-May-16	24-Aug-16
Alkalinity (as CaCO ₃)	decrease >25% of background	170	180	55	172	160	120	108	201	152	185	244	180	177	205
Oxygen Demand - Biological (BOD)	NV	<2.0	<2.0	<2.0	<3	<3	<3	< 3	4	< 3	< 2	25	< 3	5	<3
Calcium	NV	-	62.7	83	64.7	47.6	39.1	31.4	75.2	51.1	60.8	85.5	65.4	46.9	54.5
Chloride	NV	10	14	4	12.1	3.6	2.3	2.1	11.1	2.4	4.7	4.6	4	1.7	3.1
Oxygen Demand - Chemical (COD)	NV	22	22	37	21	38	31	12	28	34	36	511	30	63	58
Colour (TCU)	NV	57	26	65	39	88	60	46	28	70	59	70	94	200	79
Conductivity (µS/cm)	NV	430	440	570	435	387	280	249	491	361	454	503	431	352	422
Carbon - Dissolved Organic (DOC)	NV	8.3	5.7	14	11.9	20.8	14.6	9.8	12.5	16.4	14.9	17.1	17.1	17.7	17.7
Fluoride	NV	0.13	0.12	<0.10	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Free Cyanide	0.005	<0.0020	<0.0020	<0.0020	<0.005	<0.005	<0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	<0.005	<0.005
Hardness (as CaCO ₃)	NV	200	210	290	216	176	154	123	254	194	220	296	242	187	207
Iron	0.3	2.7	3	0.16	20.6	1.74	0.274	0.246	5.27	0.625	5.49	137	2.65	2.87	3.03
Magnesium	NV	15	13	28	13.3	13.8	13.8	10.8	16	16.2	16.6	20.1	19	16.9	17.2
Manganese	NV	1	0.93	0.044	0.987	0.288	0.072	0.064	3.02	0.106	0.667	21	0.457	0.867	0.537
Mercury	0.0002	0.00002	-	<0.00001	<0.00002	<0.00002	<0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	0.00003	< 0.00002	0.00003	<0.00002
Nitrogen - Nitrate (NO ₃)	NV	<0.10	<0.10	<0.10	<0.1	<0.1	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	<0.1	0.1
Nitrogen - Nitrite (NO ₂)	NV	<0.010	<0.010	<0.010	<0.1	<0.1	<0.1	< 0.1	< 0.1	0.2	< 0.1	< 0.1	< 0.1	<0.1	<0.1
pH	6.5 - 8.5	7.47	7.38	6.61	7.55	7.55	7.83	7.92	7.49	7.78	7.64	7.21	7.65	7.59	7.61
Phenols	0.001	0.0039	0.003	<0.0010	<0.001	<0.001	<0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.014	<0.001
Phosphorus	0.03	0.03	0.032	0.004	0.12	0.04	<0.01	0.02	0.06	0.02	0.01	0.68	< 0.01	0.07	0.05
Potassium	NV	2.7	1	2	2.6	0.9	0.6	0.9	2.8	0.4	1	1.2	1	1.9	2.1
Sodium	NV	11	14	3.6	13.5	4.9	2.5	2.3	14	3.3	6.6	7.9	5.1	2.3	3.7
Sulphate	NV	31	34	210	35	33	19	16	34	28	44	17	40	7	11
Solids - Total Dissolved (TDS)	NV	246	262	364	266	202	150	129	282	194	251	441	246	186	219
Nitrogen - Total Kjeldahl (TKN)	NV	0.66	0.45	1.1	0.78	0.92	0.4	0.3	0.7	0.7	0.6	4.3	0.9	1	1
Total Ammonia as N (NH ₃ + NH ₄)	NV	0.01	0.02	0.03	<0.01	<0.01	<0.005	0.01	0.06	0.06	0.02	0.13	0.02	0.04	0.2
Solids - Total Suspended (TSS)	NV	4	6	<1	550	6	<2	< 3	30	5	34	1300	4	15	12
Turbidity (NTU)	NV	6.7	18	0.9	487	3	0.7	0.7	14.3	1.3	17.8	749	5.4	5.2	10.9
Ammonia - Unionized (as N)	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	<0.01	<0.01
Aluminum	0.075	0.02	<0.005	0.031	0.06	0.04	0.03	0.02	0.11	0.03	0.05	0.28	0.03	0.04	0.03
Antimony	0.02	<0.00050	<0.00050	<0.00050	<0.0001	0.0001	<0.0001	< 0.0001	0.0003	< 0.0001	0.0001	0.0003	0.0002	0.0001	<0.0001
Arsenic	0.005	<0.0010	<0.0010	<0.0010	0.0007	0.0004	0.0002	0.0003	0.0005	0.0002	0.0004	0.002	0.0005	0.0005	0.0004
Barium	NV	0.08	0.084	0.065	0.113	0.055	0.03	0.031	0.16	0.043	0.067	0.549	0.077	0.072	0.08
Beryllium	0.011	<0.00050	<0.00050	<0.00050	<0.002	<0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	<0.002	<0.002
Boron	0.2	0.14	0.19	0.039	0.183	0.058	0.02	0.023	0.213	0.035	0.097	0.128	0.07	0.01	0.046
Cadmium	0.0001	<0.00010	<0.00010	<0.00010	<0.00002	<0.00002	<0.00002	0.00003	< 0.00002	< 0.00002	< 0.00002	0.0001	0.00004	0.00004	<0.00002
Chromium	0.001	<0.0050	<0.0050	<0.0050	0.0004	0.0002	<0.0002	0.0002	0.0002	< 0.0002	0.0007	0.0014	0.0005	0.0005	<0.0002
Cobalt	0.0009	<0.00050	<0.00050	<0.00050	<0.005	<0.005	<0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.009	< 0.005	<0.005	0.0001
Copper	0.005	<0.0010	<0.0010	0.001	0.0007	0.0007	0.0003	0.0002	0.0001	0.0002	0.0009	0.002	0.0022	0.0048	<0.0001
Lead	0.003	<0.00050	<0.00050	<0.00050	0.00017	0.00006	<0.00002	0.00004	0.00018	0.00003	0.00053	0.00195	0.00044	0.00029	0.00003
Molybdenum	0.04	<0.00050	<0.00050	0.00058	0.0002	0.0007	0.0003	0.0006	< 0.0001	< 0.0001	0.0004	0.0008	0.0003	0.003	0.0001
Nickel	0.025	<0.0010	<0.0010	<0.0010	<0.01	<0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	<0.01	<0.01
Selenium	0.1	<0.0020	<0.0020	<0.0020	<0.001	<0.001	<0.001	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	<0.001	<0.001
Silver	0.0001	<0.00010	<0.00010	<0.00010	<0.00002	<0.00002	<0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	0.00004	< 0.00002	<0.00002	<0.00002
Strontium	NV	0.71	0.71	0.98	-	-	-	-	0.831	0.646	0.884	1.08	0.952	0.479	0.617
Thallium	0.0003	<0.000050	<0.000050	<0.000050	<0.00005	<0.00005	<0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	<0.00005	<0.00005
Vanadium	0.006	0.00074	0.0007	<0.00050	0.0009	0.0005	0.0002	0.0001	0.0009	0.0003	0.0008	0.0055	0.0003	0.0008	0.0004
Zinc	0.02	<0.0050	<0.0050	<0.0050	<0.005	0.006	<0.005	0.008	0.021	0.006	< 0.005	0.155	< 0.005	0.011	<0.005
Field Temperature (°C)	NV	19.5	20.3	6.7	14.7	15.7	-	9.7	-	10.1	16.82	19.55	22.24	-	-
Field Dissolved Oxygen (DO)	NV	4.53	4.41	8.95	7.58	6.44	-	4.75	-	3.81	4.03	2.03	5.7	0.66	-
Field pH (units)	6.5 - 8.5	6.94	7.08	7.67	6.79	7.52	-	7.94	-	7.52	7.06	7.36	7	6.59	-
Field Conductivity (µS/cm)	NV	514	395.6	620	374	396	-	300	-	380	376	527	385	335	-

PWQO - Provincial Water Quality Objectives

Bold / highlighting - PWQO Exceedance

all results in mg/L unless otherwise stated

**Summary of Surface Water Quality -
General Chemistry
Laxton Waste Disposal Site**

Parameter	PWQO	SW C2	SW C2	SW C2	SW C2	SW C2	SW C2	SW C2	SW C2	SW C2	SW C2	SW C2	SW C2	SW C2	SW C2
		17-Oct-16	19-Apr-17	17-Jul-17	17-Oct-17	24-Apr-18	18-Jul-18	26-Sep-18	17-Apr-19	18-Jul-19	18-Oct-19	21-Apr-20	20-Jul-20	13-Oct-20	15-Apr-21
Alkalinity (as CaCO ₃)	decrease >25% of background	179	103	180	160	89	178	170	89	194	138	100	187	143	119
Oxygen Demand - Biological (BOD)	NV	<3	< 3	< 3	< 3	< 3	< 2	2	< 3	< 3	< 3	< 3	< 3	< 3	< 3
Calcium	NV	54.2	29.8	52.9	46.2	23.3	61.6	47.8	24.9	55.3	41.3	29	65.1	46.9	32.8
Chloride	NV	4.2	2.8	2.4	3.8	0.8	5.9	5.2	1.9	3.3	3.1	3.2	6	4.4	3.5
Oxygen Demand - Chemical (COD)	NV	22	24	57	28	18	56	34	14	49	32	20	34	39	19
Colour (TCU)	NV	47	50	165	64	25	70	130	31	174	37	32	73	47	39
Conductivity (µS/cm)	NV	381	234	361	346	191	392	352	203	388	317	239	400	312	273
Carbon - Dissolved Organic (DOC)	NV	12.5	9.1	21.7	12.3	5	12.1	17.5	6.6	19.3	12.5	6.9	15.5	15.1	10.6
Fluoride	NV	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
Free Cyanide	0.005	<0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Hardness (as CaCO ₃)	NV	201	124	203	178	98	220	177	101	203	166	129	218	172	149
Iron	0.3	3.23	0.356	9.37	2.41	0.226	5.85	6.72	0.354	12.6	1	0.189	4.85	8.3	0.539
Magnesium	NV	16.1	11.4	17.2	15.2	9.61	16.1	14.3	9.99	17.2	15.2	10.8	17.7	13.4	11.2
Manganese	NV	0.433	0.029	0.539	0.267	0.036	0.393	0.392	0.044	0.481	0.047	0.018	0.328	0.162	0.061
Mercury	0.0002	<0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Nitrogen - Nitrate (NO ₃)	NV	<0.1	< 0.1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.13	< 0.05	< 0.05	0.06	< 0.05	< 0.05	0.08
Nitrogen - Nitrite (NO ₂)	NV	0.2	< 0.1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
pH	6.5 - 8.5	7.78	7.69	7.71	7.98	7.83	7.77	7.71	7.49	7.72	7.71	7.65	7.75	7.89	7.88
Phenols	0.001	<0.001	< 0.001	0.011	0.002	< 0.001	< 0.001	0.003	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Phosphorus	0.03	0.07	0.01	0.12	0.03	0.02	0.12	0.08	0.24	0.18	0.05	< 0.01	0.05	0.14	0.01
Potassium	NV	2	0.9	1.4	2.5	1	1.3	1.3	0.9	0.4	0.9	1	1.5	1.3	1.7
Sodium	NV	4.3	1.9	3.5	3.1	1.3	4.9	3.2	1.5	4	2.6	2.5	6.7	3.6	3.2
Sulphate	NV	13	15	3	11	9	20	6	7	2	17	15	7	11	16
Solids - Total Dissolved (TDS)	NV	206	124	198	177	99	223	187	100	212	164	122	221	162	141
Nitrogen - Total Kjeldahl (TKN)	NV	0.7	0.5	1.1	0.7	0.3	0.9	0.8	0.4	1	0.7	0.3	0.7	0.9	0.4
Total Ammonia as N (NH ₃ + NH ₄)	NV	0.15	< 0.01	0.1	0.14	0.01	0.32	0.09	0.08	0.2	0.05	< 0.01	0.12	0.05	0.05
Solids - Total Suspended (TSS)	NV	14	7	32	6	< 3	13	8	4	50	11	< 3	3	22	7
Turbidity (NTU)	NV	13.2	1.7	23.6	7.5	0.9	46.7	17.7	1.4	18.2	15.7	0.8	17.1	20.7	1.9
Ammonia - Unionized (as N)	0.02	<0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aluminum	0.075	0.03	0.02	0.08	0.04	0.02	0.03	0.04	0.03	0.05	0.04	0.02	0.04	0.03	0.04
Antimony	0.02	<0.0001	< 0.0001	0.0002	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.0002	< 0.0001	0.0003	0.0002	0.0003	0.0002	0.0003
Arsenic	0.005	0.0005	0.0002	0.0007	0.0003	0.0004	0.0003	0.0003	0.0001	0.0005	0.0002	0.0001	0.0003	0.0003	0.0001
Barium	NV	0.073	0.032	0.088	0.06	0.022	0.103	0.072	0.028	0.099	0.042	0.029	0.106	0.067	0.036
Beryllium	0.011	<0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Boron	0.2	0.048	< 0.005	0.039	0.028	0.009	0.077	0.045	0.014	0.073	0.025	0.029	0.139	0.063	0.037
Cadmium	0.0001	<0.00002	< 0.000014	0.000115	0.000055	< 0.000014	< 0.000015	0.000068	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015
Chromium	0.001	0.0004	< 0.001	0.002	< 0.001	< 0.001	< 0.001	0.001	< 0.001	< 0.001	0.002	< 0.001	0.01	0.001	< 0.001
Cobalt	0.0009	<0.0001	< 0.0001	0.0005	< 0.0001	< 0.0001	0.0003	0.0002	0.0001	0.0003	0.0002	< 0.0001	0.0002	0.0001	< 0.0001
Copper	0.005	<0.0001	< 0.0001	0.0127	0.0083	< 0.0001	0.0001	0.0053	0.0002	0.0004	0.0001	0.0005	0.0001	0.0003	< 0.0001
Lead	0.003	<0.00002	< 0.00002	0.00134	0.00036	0.00005	0.00014	0.00031	0.00006	0.0001	0.00008	0.00004	0.00007	0.00031	0.00003
Molybdenum	0.04	0.0001	0.0005	0.0005	0.0002	0.0003	0.0001	0.0002	0.0003	0.0001	0.0002	0.0004	0.0002	0.0001	0.0004
Nickel	0.025	<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
Selenium	0.1	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Silver	0.0001	<0.00002	0.00006	< 0.00002	< 0.00002	< 0.00002	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Strontium	NV	0.62	0.291	0.596	0.435	0.212	0.577	0.543	0.224	0.601	0.474	0.232	0.608	0.487	0.332
Thallium	0.0003	<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
Vanadium	0.006	0.0005	0.0004	0.0017	0.0003	0.0003	0.0012	0.0008	0.0003	0.0014	0.0005	0.0002	0.0008	0.0015	0.0004
Zinc	0.02	<0.005	< 0.005	0.019	0.006	0.005	0.054	0.019	0.009	0.005	0.005	0.005	0.007	< 0.005	< 0.005
Field Temperature (°C)	NV	11.3	9.9	21.3	11.1	6.8	20.9	15.2	3.5	17.3	8.6	6.5	18.1	10.4	7.7
Field Dissolved Oxygen (DO)	NV	4.76	7.62	2.06	7.76	9.53	1.98	3.31	8.22	0.96	7.42	9.05	2.02	5.21	12.45
Field pH (units)	6.5 - 8.5	7.09	7.35	7.19	4.88	7.53	7.63	7.21	7.34	7.26	7.28	7.92	7.9	7.4	7.92
Field Conductivity (µS/cm)	NV	370	198	290	205	250	365	315	230	366	280	240	331	255	360

PWQO - Provincial Water Quality Objectives

Bold / highlighting - PWQO Exceedance

all results in mg/L unless otherwise stated

**Summary of Surface Water Quality -
General Chemistry
Laxton Waste Disposal Site**

Parameter	PWQO	SW C2	SW C2	SW C2	SW C2	SW C2	SWC2	SWC2	SWC2	SW D	SW D	SW D	SW D	SW D	SW D
		16-Aug-21	13-Oct-21	12-Apr-22	20-Jul-22	16-Oct-22	26-Apr-23	31-Aug-23	11-Oct-23	2-Jun-08	17-Jul-08	1-Oct-08	28-Apr-09	25-Aug-09	3-May-10
Alkalinity (as CaCO ₃)	decrease >25% of background	226	185	97	221	165	123	181	172	164	113	149	132	170	121
Oxygen Demand - Biological (BOD)	NV	< 3	< 3	< 3	< 3	4	< 3	<3	<3	2	4	4	2	3	<2
Calcium	NV	58.1	52.9	25.9	59.6	45.8	8.01	40.9	34.8	43	33.9	37.6	36	45	33
Chloride	NV	4.2	4.2	3	2.9	3.9	1.7	0.6	3.2	<1	<1	<1	1	2	1
Oxygen Demand - Chemical (COD)	NV	41	47	26	42	76	10	45	36	34	44	40	25	145	36
Colour (TCU)	NV	124	103	34	82	31	42	101	52	79	110	180	82	101	79
Conductivity (µS/cm)	NV	418	348	212	407	329	257	324	305	282	223	296	256	308	192
Carbon - Dissolved Organic (DOC)	NV	18.8	14.7	8.2	19	14.1	10.7	19.8	16.2	15	22.39	24.47	10	22	12
Fluoride	NV	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
Free Cyanide	0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	<0.005	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	0.002
Hardness (as CaCO ₃)	NV	243	196	116	221	164	135	160	137	174	137	160	144	182	137
Iron	0.3	11.4	7.26	0.407	6.82	28.6	0.499	4.79	3.58	0.5	0.9945	2.1378	0.2	11.1	1.5
Magnesium	NV	17.1	17.5	9.57	17.6	14.8	11.3	14.1	12.1	16	12.7	16	14	17	13
Manganese	NV	0.529	0.393	0.036	0.424	0.461	0.029	0.128	0.218	0.04	0.0578	0.103	0.02	1.33	0.1
Mercury	0.0002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	<0.00002	<0.00002	<0.00002	0.00002	<0.00002	<0.0002	<0.00002	<0.00002
Nitrogen - Nitrate (NO ₃)	NV	< 0.05	< 0.05	0.09	0.07	< 0.05	0.08	0.08	<0.05	<0.1	<0.1	<0.1	<0.1	0.2	<0.1
Nitrogen - Nitrite (NO ₂)	NV	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
pH	6.5 - 8.5	7.81	7.67	7.78	7.57	7.34	8.01	7.47	7.53	7.33	7.07	7.13	7.58	7.22	7.55
Phenols	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
Phosphorus	0.03	0.11	0.06	< 0.1	< 0.1	0.4	< 0.1	0.14	0.06	0.07	0.06	0.2	0.26	0.99	0.1
Potassium	NV	1	1.5	1.2	0.6	1	1	0.2	0.9	0.3	0.25	0.148	0.6	0.1	0.9
Sodium	NV	4.1	3.8	1.8	4.5	4.4	2.1	1.1	3	2	<1	1.15	2	2	1
Sulphate	NV	3	3	14	4	9	9	4	6	4	8.1	10.1	6	<1	6
Solids - Total Dissolved (TDS)	NV	236	202	115	229	181	127	174	167	183	145	192	166	200	125
Nitrogen - Total Kjeldahl (TKN)	NV	1	0.7	0.9	0.9	1.7	1	0.8	0.5	0.8	1.5	1.9	3.5	6.3	1.9
Total Ammonia as N (NH ₃ + NH ₄)	NV	0.28	0.13	0.92	0.35	0.06	0.58	0.12	0.1	<0.1	<0.1	<0.1	0.04	0.06	0.04
Solids - Total Suspended (TSS)	NV	15	10	3	12	70	3	18	25	14	18	44	153	272	35
Turbidity (NTU)	NV	39.1	2.2	1.9	170	0.2	1.7	29.1	21.4	1.4	3.62	7.77	24.2	31.6	6.4
Ammonia - Unionized (as N)	0.02	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Aluminum	0.075	0.02	0.04	0.02	0.03	< 0.01	< 0.01	0.04	0.04	0.04	0.10465	0.1395	0.03	0.65	0.04
Antimony	0.02	0.0003	0.0002	0.0003	0.0003	0.0002	0.0003	0.0003	0.0008	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Arsenic	0.005	0.0005	0.0003	0.0001	0.0004	0.0008	0.0001	0.0003	0.0003	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005
Barium	NV	0.096	0.082	0.029	0.09	0.106	0.031	0.051	0.053	<0.1	<0.1	<0.1	<0.1	0.1	<0.1
Beryllium	0.011	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	<0.0001	<0.0001	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Boron	0.2	0.08	0.065	0.021	0.098	0.089	0.034	0.016	0.054	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Cadmium	0.0001	< 0.000015	< 0.000015	< 0.000015	< 0.000015	0.000027	< 0.000015	<0.000015	<0.000015	<0.0001	<0.0001	0.000141	<0.0001	0.0006	<0.0001
Chromium	0.001	0.001	0.002	< 0.001	< 0.001	< 0.001	< 0.001	<0.001	<0.001	0.0007	0.000747	0.000516	0.0002	0.0012	0.0003
Cobalt	0.0009	0.0003	0.0002	< 0.0001	0.0002	0.0004	0.0001	0.0002	0.0003	<0.0003	0.000382	0.00065	<0.0003	0.0042	0.0003
Copper	0.005	0.0002	0.0002	0.0002	0.0002	0.0006	0.0004	<0.0001	0.0002	0.266	0.034063	0.039402	0.0376	0.113	0.0007
Lead	0.003	0.00005	0.0001	0.00005	0.00002	0.00075	0.00005	0.00004	0.00005	<0.001	0.001338	0.001629	<0.001	0.011	<0.001
Molybdenum	0.04	0.0002	0.0001	0.0005	< 0.0001	0.0004	0.0003	<0.0001	0.0001	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Nickel	0.025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	<0.0002	0.0004	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium	0.1	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	<0.001	<0.001	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
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
Strontium	NV	0.612	0.588	0.23	0.631	0.532	0.273	0.474	0.371	0.29	0.226	0.277	0.21	0.34	0.205
Thallium	0.0003	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	<0.00005	<0.00005	<0.0003	<0.0003	<0.0003	<0.0003	0.0003	<0.0003
Vanadium	0.006	0.0011	0.0008	0.0003	0.0007	0.0035	0.0003	0.0008	0.0003	<0.001	<0.001	<0.001	<0.001	0.005	<0.001
Zinc	0.02	0.014	0.009	< 0.005	0.006	< 0.005	< 0.005	<0.005	0.011	0.03	0.01649	0.024	<0.01	0.07	<0.01
Field Temperature (°C)	NV	13.2	16	11.3	18.5	8.2	7.59	15.6	12.2	21	22	8	13.73	14.83	18.16
Field Dissolved Oxygen (DO)	NV	0.23	1.05	7.52	3.08	3.52	8.83	0.27	3.92	5.63	2.93	2.86	8.41	2.86	5.2
Field pH (units)	6.5 - 8.5	7.02	7.17	7.57	6.97	7.15	7.59	6.91	7.59	6.2	6.76	6.15	4.21	6.97	7.44
Field Conductivity (µS/cm)	NV	474.3	380	195	355	290	230	283	250	251	198	283	199	265	198

PWQO - Provincial Water Quality Objectives

Bold / highlighting - PWQO Exceedance

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**Summary of Surface Water Quality -
General Chemistry
Laxton Waste Disposal Site**

Parameter	PWQO	SW D	SW D	SW D	SW D	SW D	SW D	SW D	SW D	SW D	SW D	SW D	SW D	SW D	SW D
		26-May-11	2-Aug-11	27-Oct-11	1-Nov-12	10-Jun-13	30-Oct-13	28-Apr-14	23-Sep-14	15-Jun-15	11-Sep-15	30-May-16	24-Aug-16	17-Oct-16	19-Apr-17
Alkalinity (as CaCO ₃)	decrease >25% of background	152	138	127	92	157	132	94	158	155	156	187	123	124	113
Oxygen Demand - Biological (BOD)	NV	<2	<2	<2	<2.0	9	<3	< 3	4	5	< 3	6	6	19	< 3
Calcium	NV	42	49	41	46	39.8	37.4	28.5	49.2	41.3	49.5	49.2	44.9	38.8	31.8
Chloride	NV	1	2	3	3	0.6	1.6	1.4	1.3	0.6	1.5	1.3	1	2.1	1.7
Oxygen Demand - Chemical (COD)	NV	37	110	110	50	89	33	39	141	86	49	68	90	74	30
Colour (TCU)	NV	72	120	57	82	108	66	120	88	96	100	117	127	108	72
Conductivity (µS/cm)	NV	290	325	301	350	307	275	205	318	301	326	350	339	272	234
Carbon - Dissolved Organic (DOC)	NV	14.9	20.2	14.2	17	23.5	14.3	18.5	19.4	14.9	19.6	19.7	21.1	22	11
Fluoride	NV	<0.1	<0.1	<0.1	<0.10	0.2	0.1	0.1	< 0.1	0.1	0.1	0.2	<0.1	0.1	< 0.1
Free Cyanide	0.005	<0.002	<0.002	<0.002	<0.0020	<0.005	<0.005	< 0.005	< 0.005	< 0.005	< 0.005	<0.005	<0.005	<0.005	< 0.005
Hardness (as CaCO ₃)	NV	160	180	150	180	160	154	114	188	166	201	197	178	150	131
Iron	0.3	0.18	6.4	1.9	<0.10	1.68	0.716	0.183	0.725	1.53	0.934	0.823	2.05	2.51	0.103
Magnesium	NV	17	16	16	18	14.6	14.6	10.5	15.7	15.2	18.7	18	16.1	12.8	12.5
Manganese	NV	0.008	0.69	0.14	0.0062	0.096	0.06	0.004	0.075	0.143	0.212	1.64	0.925	0.492	0.009
Mercury	0.0002	0.00001	0.00001	0.00001	<0.00001	<0.00002	<0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	0.00003	<0.00002	<0.00002	< 0.00002
Nitrogen - Nitrate (NO ₃)	NV	<0.1	<0.1	<0.1	<0.10	<0.1	0.1	0.1	< 0.1	< 0.1	< 0.1	<0.1	<0.1	<0.1	< 0.1
Nitrogen - Nitrite (NO ₂)	NV	<0.01	<0.01	<0.01	<0.010	<0.1	<0.1	< 0.1	0.2	< 0.1	< 0.1	<0.1	<0.1	0.2	< 0.1
pH	6.5 - 8.5	7.69	7.43	7.61	6.7	7.48	7.81	7.78	7.67	7.72	7.66	7.54	7.44	7.29	7.7
Phenols	0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.002	<0.001	0.023	0.002
Phosphorus	0.03	0.087	0.18	0.11	0.016	0.58	0.01	0.02	0.03	0.15	0.02	0.26	0.38	0.8	0.06
Potassium	NV	0.72	0.64	1.3	1.2	1.4	0.4	0.7	0.3	0.3	0.4	1.8	1.9	2.7	0.8
Sodium	NV	1.3	1.3	1.4	1.5	1.6	1.3	1.3	1.1	1.1	1.8	1.9	1.1	1	0.9
Sulphate	NV	<1	30	26	92	1	8	11	3	2	12	<1	46	11	8
Solids - Total Dissolved (TDS)	NV	153	189	167	219	155	144	110	168	155	179	187	188	147	123
Nitrogen - Total Kjeldahl (TKN)	NV	0.8	3	2.7	0.91	5.05	0.6	0.5	0.2	1.6	0.7	2.4	1.9	4.2	0.7
Total Ammonia as N (NH ₃ + NH ₄)	NV	<0.05	<0.01	<0.01	0.02	<0.01	<0.005	0.02	0.07	0.02	0.01	0.07	0.06	0.14	< 0.01
Solids - Total Suspended (TSS)	NV	1	96	37	1	96	9	< 3	54	64	10	50	26	128	3
Turbidity (NTU)	NV	0.5	11	7.5	0.8	55.7	1.2	0.6	9	7.1	3.5	7.3	6.3	25	0.6
Ammonia - Unionized (as N)	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	< 0.01	< 0.01	< 0.01	< 0.01	<0.01	<0.01	<0.01	< 0.01
Aluminum	0.075	0.016	0.15	0.077	0.029	0.08	0.05	0.04	0.04	0.08	0.07	0.05	0.03	0.03	0.03
Antimony	0.02	<0.0005	<0.0005	<0.0005	<0.00050	0.0001	<0.0001	< 0.0001	< 0.0001	< 0.0001	0.0002	0.0002	0.0002	<0.0001	< 0.0001
Arsenic	0.005	<0.001	0.002	<0.001	<0.0010	0.0008	0.0003	0.0004	0.0004	0.0004	0.0006	0.0007	0.0006	0.0005	0.0002
Barium	NV	0.052	0.097	0.053	0.054	0.079	0.042	0.039	0.054	0.064	0.076	0.107	0.098	0.109	0.041
Beryllium	0.011	<0.0005	<0.0005	<0.0005	<0.00050	<0.002	<0.002	< 0.002	< 0.002	< 0.002	< 0.002	<0.002	<0.002	0.002	< 0.002
Boron	0.2	<0.010	0.017	<0.01	0.015	0.012	0.006	0.008	0.01	0.015	0.022	<0.005	0.019	0.019	< 0.005
Cadmium	0.0001	<0.0001	<0.0001	<0.0001	<0.00010	0.00007	<0.00002	0.00003	< 0.00002	< 0.00002	0.00003	0.00005	<0.00002	<0.00002	0.000017
Chromium	0.001	<0.005	<0.005	<0.005	<0.0050	0.001	0.0003	< 0.0002	< 0.0002	< 0.0002	0.0003	0.0004	<0.0002	0.0005	< 0.001
Cobalt	0.0009	<0.0005	0.0016	<0.0005	<0.00050	<0.005	<0.005	< 0.005	< 0.005	< 0.005	< 0.005	<0.005	0.0004	0.0003	< 0.0001
Copper	0.005	<0.001	0.002	0.001	0.0012	0.0057	0.0005	0.0004	0.0004	< 0.0001	0.0023	0.0027	0.0002	<0.0001	< 0.0001
Lead	0.003	<0.0005	0.0022	0.0009	<0.00050	0.00103	0.00032	0.00011	0.00028	0.00069	0.0005	0.00034	0.00009	<0.00002	0.00019
Molybdenum	0.04	<0.001	0.0006	0.0006	0.00059	0.0003	0.0003	0.0004	0.0002	0.0002	0.0006	0.0005	0.0002	<0.0001	0.0003
Nickel	0.025	<0.001	<0.001	<0.001	<0.0010	<0.01	<0.01	< 0.01	< 0.01	< 0.01	< 0.01	<0.01	<0.01	<0.01	< 0.01
Selenium	0.1	<0.002	<0.002	<0.002	<0.0020	<0.001	<0.001	< 0.001	< 0.001	< 0.001	< 0.001	<0.001	<0.001	<0.001	< 0.001
Silver	0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.00002	<0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	<0.00002	0.00003	<0.00002	0.00007
Strontium	NV	0.28	0.32	0.27	0.32	-	-	-	0.338	0.339	0.351	0.364	0.361	0.301	0.216
Thallium	0.0003	<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
Vanadium	0.006	<0.001	0.0015	0.0008	<0.00050	0.0006	0.0003	0.0003	0.0007	0.0004	0.0003	0.0003	<0.0001	0.0002	0.0001
Zinc	0.02	<0.005	0.017	0.011	0.0055	0.018	0.008	0.011	0.009	0.009	0.011	0.018	<0.005	0.01	0.01
Field Temperature (°C)	NV	14.1	20	5.1	6.6	16	-	11.7	9.7	18.55	16.51	15.86	-	10.7	9
Field Dissolved Oxygen (DO)	NV	4.31	0.9	5.86	9.08	5.19	-	2.95	2.7	2.49	4.45	0.85	-	3.09	6.79
Field pH (units)	6.5 - 8.5	7.62	7.55	7.4	7.94	7.07	-	8.08	7.47	5.95	7.22	6.96	-	7.05	7.54
Field Conductivity (µs/cm)	NV	283	292.2	183.5	370	314	-	240	340	257	284	326	-	255	200

PWQO - Provincial Water Quality Objectives

Bold / highlighting - PWQO Exceedance

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**Summary of Surface Water Quality -
General Chemistry
Laxton Waste Disposal Site**

Parameter	PWQO	SW D	SW D	SW D	SW D	SW D	SW D	SW D	SW D	SW D	SW D	SW D	SW D	SW D	SW D
		17-Jul-17	17-Oct-17	24-Apr-18	18-Jul-18	26-Sep-18	17-Apr-19	18-Jul-19	18-Oct-19	21-Apr-20	20-Jul-20	13-Oct-20	15-Apr-21	16-Aug-21	13-Oct-21
Alkalinity (as CaCO ₃)	decrease >25% of background	143	154	41	156	132	71	112	110	113	105	115	144	142	182
Oxygen Demand - Biological (BOD)	NV	7	< 3	< 3	6	3	< 3	4	5	6	4	11	< 10	17	8
Calcium	NV	36.8	51.7	17.7	44.4	34.7	21.6	30.1	29.9	32.1	37.3	36	36.5	38.4	44.5
Chloride	NV	1.2	1.9	< 0.5	3.3	1.5	1.2	2.2	2.3	2.3	0.8	2.1	3.2	1.3	4
Oxygen Demand - Chemical (COD)	NV	53	57	19	60	49	22	108	99	29	59	84	30	143	92
Colour (TCU)	NV	90	85	21	90	100	25	83	62	46	112	81	58	79	90
Conductivity (µS/cm)	NV	278	309	86	318	221	160	224	235	237	212	234	292	269	340
Carbon - Dissolved Organic (DOC)	NV	17.4	18	3.9	19.4	17.1	7.9	17.2	18.6	9.5	20.6	18.5	12.6	22.9	17.9
Fluoride	NV	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.2	< 0.1
Free Cyanide	0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Hardness (as CaCO ₃)	NV	151	200	71	181	114	74	117	126	135	124	141	171	159	191
Iron	0.3	0.289	1.34	0.086	0.796	1.04	0.923	1.63	0.519	0.129	1.99	1.28	0.563	1.86	0.992
Magnesium	NV	14.3	17.1	6.4	17	11.9	5.91	12.2	11.9	12.7	12.9	12.5	14.1	16.7	17
Manganese	NV	0.038	0.107	0.017	0.125	0.155	0.164	0.108	0.058	0.008	0.055	0.131	0.038	0.064	0.134
Mercury	0.0002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	0.00005	< 0.00002
Nitrogen - Nitrate (NO ₃)	NV	< 0.05	< 0.05	< 0.05	0.13	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.07	0.14	0.15
Nitrogen - Nitrite (NO ₂)	NV	< 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
pH	6.5 - 8.5	7.99	7.8	7.48	7.99	7.64	6.97	7.44	7.82	7.83	7.68	7.77	7.9	7.61	7.81
Phenols	0.001	0.01	0.005	< 0.001	< 0.001	0.003	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	0.003
Phosphorus	0.03	0.1	0.17	0.05	0.09	0.11	0.29	0.52	0.12	0.02	0.24	0.42	0.1	0.47	0.36
Potassium	NV	2.2	4.4	0.7	2.6	2.1	2.1	0.7	2.1	0.7	0.3	3.4	1.2	0.8	2.9
Sodium	NV	2	2.2	1.9	2.1	2.2	0.9	1.1	1.3	1.5	1.3	1.1	1.8	1	2.1
Sulphate	NV	< 1	< 1	2	< 1	3	3	< 1	4	7	1	2	6	4	2
Solids - Total Dissolved (TDS)	NV	143	151	53	165	135	80	116	118	124	119	118	150	150	183
Nitrogen - Total Kjeldahl (TKN)	NV	1.1	1.2	0.5	1.3	1.2	1.3	4.7	1.4	0.4	1.9	2.5	1	4.3	2.5
Total Ammonia as N (NH ₃ + NH ₄)	NV	0.05	0.04	0.05	0.14	0.03	0.75	0.19	0.07	< 0.01	0.05	0.06	0.03	0.11	0.07
Solids - Total Suspended (TSS)	NV	16	36	10	18	30	5	160	15	140	14	130	11	870	48
Turbidity (NTU)	NV	1.9	3.2	0.4	3.7	21	4.9	74.2	5.8	5.2	10.1	5.6	4.3	228	5.7
Ammonia - Unionized (as N)	0.02	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aluminum	0.075	0.04	0.04	0.01	0.03	0.02	0.04	0.23	0.03	0.03	0.03	0.02	0.03	0.02	0.03
Antimony	0.02	0.0002	0.0001	< 0.0001	0.0002	0.0001	< 0.0001	< 0.0001	0.0001	0.0002	0.0003	0.0003	0.0002	0.0005	0.0003
Arsenic	0.005	0.0003	0.0005	0.0004	0.0004	0.0003	0.0001	0.0003	0.0002	0.0001	0.0005	0.0003	0.0002	0.0005	0.0003
Barium	NV	0.052	0.056	0.027	0.071	0.06	0.036	0.121	0.04	0.038	0.062	0.055	0.044	0.066	0.068
Beryllium	0.011	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Boron	0.2	0.037	0.014	0.005	0.015	0.014	0.016	0.018	0.016	0.006	0.011	0.063	0.011	0.016	0.027
Cadmium	0.0001	0.00008	0.000028	< 0.000014	0.00008	0.000118	0.000019	0.000057	< 0.000015	< 0.000015	< 0.000015	0.000015	< 0.000015	0.000079	< 0.000015
Chromium	0.001	0.001	< 0.001	< 0.001	< 0.001	0.001	< 0.001	< 0.001	0.002	0.007	< 0.001	< 0.001	< 0.001	0.001	0.001
Cobalt	0.0009	0.0002	< 0.0001	< 0.0001	0.0004	0.0002	0.0004	0.0002	0.0002	0.0001	0.0003	0.0003	< 0.0001	0.0003	0.0002
Copper	0.005	0.008	0.0036	< 0.0001	0.0028	0.0061	0.0008	0.0013	0.0007	0.0006	0.0005	0.0011	0.0002	0.0034	0.0005
Lead	0.003	0.00157	0.00048	0.00011	0.00081	0.00096	0.00029	0.00244	0.00012	0.00034	0.00035	0.00221	0.00016	0.00868	0.00066
Molybdenum	0.04	0.0003	0.0001	0.0003	0.0002	0.0001	0.0002	0.0001	0.0003	0.0003	< 0.0001	0.0002	0.0003	0.0002	0.0001
Nickel	0.025	< 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
Selenium	0.1	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Silver	0.0001	< 0.00002	< 0.00002	< 0.00002	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Strontium	NV	0.263	0.116	0.295	0.248	0.126	0.223	0.21	0.175	0.21	0.221	0.231	0.304	0.29	
Thallium	0.0003	< 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
Vanadium	0.006	< 0.0001	0.0002	0.0002	0.0002	0.0002	0.0001	0.0004	0.0001	0.0003	0.0003	0.0004	0.0002	0.0013	0.0003
Zinc	0.02	0.029	0.16	0.021	0.037	0.023	0.135	0.012	0.009	0.006	0.011	0.025	0.005	0.049	0.01
Field Temperature (°C)	NV	22	6.8	1.3	22	15.9	1.8	18.1	6.6	5.9	20.8	10.9	9.1	15.5	17.1
Field Dissolved Oxygen (DO)	NV	3.3	1.33	8.67	3.24	2.44	3.78	0.65	8.17	8.12	0.97	2.42	7.65	0.21	0.64
Field pH (units)	6.5 - 8.5	8.1	7.47	7.66	7.31	7.05	7.51	7.19	7.47	7.58	7.77	7.3	7.94	6.92	6.95
Field Conductivity (µS/cm)	NV	223	241	90	305	195	170	180	205	250	232	220	360	250.5	380

PWQO - Provincial Water Quality Objectives

Bold / highlighting - PWQO Exceedance

all results in mg/L unless otherwise stated

Summary of Surface Water Quality -
General Chemistry
Laxton Waste Disposal Site

Parameter	PWQO	SW D	SW D	SW D	SW D	SW D	SW D	SWF	SWF	SWF	SWF	SWF	SWF	SWF	SWF
		12-Apr-22	20-Jul-22	16-Oct-22	26-Apr-23	31-Aug-23	11-Oct-23	2-Jun-08	18-Jul-08	1-Oct-08	28-Apr-09	23-Jun-09	25-Aug-09	3-May-10	19-Jul-10
Alkalinity (as CaCO ₃)	decrease >25% of background	97	133	168	140	139	195	154	208	208	136	173	187	118	188
Oxygen Demand - Biological (BOD)	NV	< 3	5	4	< 3	9	5	2	3	3	3	2	4	<2	<2
Calcium	NV	25.8	34.8	41.2	8.05	31.6	45.9	41	65.2	53.1	37	58	49	34	58
Chloride	NV	2.8	1	3.6	1.5	1.1	3.6	<1	<1	1.2	1	<1	1	1	2
Oxygen Demand - Chemical (COD)	NV	31	79	52	24	59	304	35	32	16	23	4	4	30	32
Colour (TCU)	NV	45	117	65	55	51	48	82	120	96	67	77	91	84	120
Conductivity (µS/cm)	NV	201	241	320	281	241	349	266	385	385	265	360	333	185	328
Carbon - Dissolved Organic (DOC)	NV	10.4	30.6	16.6	15.2	17.4	22	16	21.62	21.2	11	16	18	12	18
Fluoride	NV	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.2	< 0.1	< 0.1	0.2	< 0.1	< 0.1	0.1
Free Cyanide	0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Hardness (as CaCO ₃)	NV	112	148	165	151	127	190	163	239	207	148	215	196	139	219
Iron	0.3	0.14	1.21	0.204	0.084	0.945	2.36	0.2	24.8	8.058	0.1	3.3	2.7	0.1	132
Magnesium	NV	10.1	14.8	16.5	12.7	11.8	18.2	15	18.5	18	13	17	18	13	18
Manganese	NV	0.012	0.055	0.023	0.006	0.102	0.118	< 0.01	0.6244	0.1216	< 0.01	0.15	0.13	< 0.01	0.76
Mercury	0.0002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	0.00002	< 0.00002	0.00003	< 0.00002	< 0.0002	< 0.00002	< 0.00002	< 0.00002	0.00003
Nitrogen - Nitrate (NO ₃)	NV	0.62	0.08	< 0.05	< 0.05	0.06	0.42	< 0.1	< 0.1	< 0.1	< 0.1	0.1	< 0.1	< 0.1	< 0.1
Nitrogen - Nitrite (NO ₂)	NV	< 0.05	< 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
pH	6.5 - 8.5	7.84	7.73	7.61	8.05	7.18	7.81	7.34	7.08	7.23	7.72	7.51	7.35	7.61	7.33
Phenols	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
Phosphorus	0.03	< 0.1	0.2	0.1	< 0.1	0.13	1.01	0.04	0.24	0.6	0.05	0.03	0.45	0.02	0.31
Potassium	NV	0.9	0.4	1.9	0.7	0.4	6.1	< 0.1	0.1	0.217	0.7	0.5	< 0.1	1	0.2
Sodium	NV	1.4	1	2.1	1.4	0.8	2.7	2	2.89	1.91	2	3	2	1	2
Sulphate	NV	8	1	2	4	1	2	3	9.6	4.5	6	38	< 1	8	1
Solids - Total Dissolved (TDS)	NV	111	135	168	134	132	200	173	250	250	172	234	216	120	213
Nitrogen - Total Kjeldahl (TKN)	NV	0.9	2.3	0.8	0.6	1.9	11.9	0.7	2.2	6	0.9	0.6	1.2	0.7	1.9
Total Ammonia as N (NH ₃ + NH ₄)	NV	0.64	0.47	< 0.01	0.02	0.07	0.24	< 0.1	< 0.1	< 0.1	< 0.01	< 0.01	< 0.01	0.01	0.02
Solids - Total Suspended (TSS)	NV	3	21	21	< 3	54	74	6	100	554	8	6	32	< 1	95
Turbidity (NTU)	NV	1.3	7	1.6	0.9	10.4	34.5	1.5	95.8	266	3.3	3.7	17	1.8	91
Ammonia - Unionized (as N)	0.02	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aluminum	0.075	0.03	0.04	< 0.01	< 0.01	0.09	0.04	0.02	0.166	0.72	0.01	0.06	0.06	0.02	0.03
Antimony	0.02	0.0003	0.0003	0.0003	0.0004	0.0004	0.0005	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Arsenic	0.005	0.0001	0.0005	0.0002	0.0001	0.0002	0.0005	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.005	0.006
Barium	NV	0.031	0.054	0.049	0.036	0.057	0.096	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.2
Beryllium	0.011	< 0.002	< 0.002	< 0.002	< 0.002	< 0.0001	< 0.0001	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Boron	0.2	0.009	0.013	0.012	0.008	0.009	0.046	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Cadmium	0.0001	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	0.000174	< 0.0001	0.000459	0.00024	< 0.0001	0.0001	< 0.0001	< 0.0001	0.0018
Chromium	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.001	0.0004	0.000857	0.001164	0.0001	0.0004	0.0004	0.0003	0.0015
Cobalt	0.0009	< 0.0001	0.0002	< 0.0001	0.0001	0.0003	0.0007	< 0.0003	0.002026	0.000856	< 0.0003	0.0004	0.0006	< 0.0003	0.0036
Copper	0.005	0.0004	0.0008	0.0004	0.0003	0.0004	0.006	0.0005	0.003133	0.001792	0.0003	0.0063	0.0003	0.0002	0.0008
Lead	0.003	0.00013	0.0004	0.00011	0.00005	0.00019	0.0196	< 0.001	0.004941	0.002749	< 0.001	< 0.001	< 0.001	< 0.001	0.007
Molybdenum	0.04	0.0004	0.0001	0.0003	0.0002	0.0001	0.0003	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Nickel	0.025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.0002	0.0028	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Selenium	0.1	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
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
Strontium	NV	0.163	0.266	0.279	0.188	0.245	0.304	0.321	0.8192	0.362	0.213	0.892	0.37	0.256	0.793
Thallium	0.0003	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003
Vanadium	0.006	0.0002	0.0004	0.0001	0.0002	0.0004	0.0025	< 0.001	0.003	0.001888	< 0.001	< 0.001	< 0.001	< 0.001	0.011
Zinc	0.02	0.005	0.011	< 0.005	0.037	0.006	0.116	< 0.01	0.013	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.02
Field Temperature (°C)	NV	13.8	24	7.3	8.5	13.7	8.5	22	25	8	15.32	19.91	17.2	17.62	17.5
Field Dissolved Oxygen (DO)	NV	6.89	1.55	2.55	8.69	1.84	4.15	8.28	1.51	3.23	8.97	7.79	1.55	5.36	0.92
Field pH (units)	6.5 - 8.5	7.22	7.05	7.03	7.81	6.99	7.81	5.67	6.71	6.53	4.06	6.88	7.01	7.37	6.81
Field Conductivity (µS/cm)	NV	185	245	285	235	242	275	235	371	214	214	350	310	205	365.5

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**Summary of Surface Water Quality -
General Chemistry
Laxton Waste Disposal Site**

Parameter	PWQO	SWF	SWF	SWF	SWF	SWF	SWF	SWF	SWF	SWF	SWF	SWF	SWF	SWF	SWF
		1-Nov-10	26-May-11	2-Aug-11	27-Oct-11	30-May-12	9-Jul-12	1-Nov-12	10-Jun-13	29-Jul-13	30-Oct-13	30-Oct-13	28-Apr-14	5-Aug-14	23-Sep-14
Alkalinity (as CaCO ₃)	decrease >25% of background	159	152	135	122	170	180	81	150	193	113	114	67	224	154
Oxygen Demand - Biological (BOD)	NV	2	<2	<2	<2	<2.0	66	<2.0	<3	<8	<3	<4	< 3	5	< 3
Calcium	NV	52	42	66	45	52	56.2	45	48.6	90.2	38.6	37.4	24.7	82.4	45.4
Chloride	NV	3	2	1	3	2	5	4	0.7	0.5	1.5	1.6	1.4	1.4	1.3
Oxygen Demand - Chemical (COD)	NV	27	41	42	60	31	820	44	47	308	34	33	32	180	43
Colour (TCU)	NV	50	82	94	58	93	470	83	136	100	66	55	120	84	90
Conductivity (µS/cm)	NV	257	298	462	350	370	380	380	386	385	282	280	163	429	309
Carbon - Dissolved Organic (DOC)	NV	11	17.2	16.3	13	13	13	17	22.2	29.1	15.2	12.3	16.8	20.1	18.1
Fluoride	NV	<0.1	<0.1	0.1	0.1	0.14	0.16	<0.10	0.3	0.2	0.2	0.14	0.2	0.2	< 0.1
Free Cyanide	0.005	<0.001	<0.002	<0.002	<0.002	<0.0020	<0.0020	<0.0020	<0.005	<0.005	<0.005	<0.01	< 0.005	< 0.005	< 0.005
Hardness (as CaCO ₃)	NV	207	170	240	170	190	200	190	181	309	152	149	97	295	182
Iron	0.3	0.4	0.45	1.3	4	1.5	150	<0.10	1.19	369	0.252	0.205	1.13	86.6	0.27
Magnesium	NV	19	15	20	16	18	18	18	14.6	20.2	13.5	13.4	8.54	21.7	16.7
Manganese	NV	0.03	0.045	0.21	0.068	0.26	1.7	0.0049	0.118	4.85	0.011	0.0109	0.048	1.24	0.013
Mercury	0.0002	<0.00002	0.00002	<0.00001	<0.00001	<0.00001	-	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	< 0.00002	< 0.00002	< 0.00002
Nitrogen - Nitrate (NO ₃)	NV	<0.1	<0.1	<0.1	<0.1	<0.10	<0.10	<0.10	<0.1	<0.1	0.1	<0.06	< 0.1	< 0.1	< 0.1
Nitrogen - Nitrite (NO ₂)	NV	<0.1	<0.01	<0.01	<0.01	<0.010	<0.010	<0.010	<0.1	<0.1	<0.1	<0.03	< 0.1	< 0.1	0.2
pH	6.5 - 8.5	7.68	7.72	7.44	7.65	7.46	7.13	6.61	7.55	7.38	7.92	7.86	7.64	7.43	7.71
Phenols	0.001	<0.001	<0.001	<0.001	<0.001	0.0013	0.017	<0.0010	<0.001	<0.005	<0.001	<0.001	< 0.001	< 0.001	< 0.001
Phosphorus	0.03	0.015	0.025	0.041	0.072	0.031	4.3	0.009	0.02	5.58	<0.01	<0.009	0.04	0.6	0.01
Potassium	NV	0.5	0.68	0.34	0.5	0.56	<1	1.7	0.2	0.5	0.5	0.573	0.5	0.3	< 0.1
Sodium	NV	2	1.9	2.5	1.8	3	3.7	1.7	2.7	2.2	2	1.83	1.9	2.8	1.3
Sulphate	NV	12	<1	100	49	26	9	110	46	3	27	57	16	1	3
Solids - Total Dissolved (TDS)	NV	167	160	280	197	208	238	239	204	231	152	180	95.1	332	161
Nitrogen - Total Kjeldahl (TKN)	NV	0.5	0.7	0.8	1.2	0.74	20	1.1	0.89	17.3	0.5	<0.5	0.6	3.2	0.7
Total Ammonia as N (NH ₃ + NH ₄)	NV	0.05	0.07	<0.01	<0.01	<0.01	0.47	0.04	<0.01	<0.01	<0.005	<0.1	0.02	0.17	0.07
Solids - Total Suspended (TSS)	NV	<1	<1	2	3	3	1500	<1	8	2850	3	<2	< 3	240	10
Turbidity (NTU)	NV	1.4	1	3.8	1.8	2	950	0.6	3.5	6190	1.1	3.02	3.1	485	1.5
Ammonia - Unionized (as N)	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.005	< 0.01	< 0.01	< 0.01
Aluminum	0.075	0.03	0.019	0.026	0.11	0.03	<0.005	0.023	0.05	1.45	0.04	0.02	0.07	0.32	0.03
Antimony	0.02	<0.01	<0.0005	<0.0005	<0.0005	<0.00050	<0.00050	<0.00050	0.0001	0.0002	<0.0001	<0.0002	< 0.0001	0.0001	< 0.0001
Arsenic	0.005	<0.005	<0.001	<0.001	<0.001	<0.0010	0.014	<0.0010	0.0006	0.0285	0.0002	0.0004	0.0003	0.0028	0.0002
Barium	NV	<0.1	0.044	0.063	0.048	0.053	0.36	0.049	0.038	0.627	0.024	0.0201	0.02	0.251	0.05
Beryllium	0.011	<0.1	<0.0005	<0.0005	<0.0005	<0.00050	<0.00050	<0.00050	<0.002	<0.002	<0.00002	< 0.002	< 0.002	< 0.002	< 0.002
Boron	0.2	<0.1	<0.010	0.032	<0.01	0.026	0.032	0.016	0.03	0.108	0.013	0.0131	0.012	0.039	0.01
Cadmium	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	0.0004	<0.00010	0.00006	0.00014	<0.00002	0.000017	0.00004	< 0.00002	< 0.00002
Chromium	0.001	0.0003	<0.005	<0.005	<0.005	<0.0050	<0.0050	<0.0050	0.0036	0.0022	<0.0002	<0.0005	< 0.0002	< 0.0002	< 0.0002
Cobalt	0.0009	<0.0003	<0.0005	<0.0005	<0.0005	<0.00050	0.0036	<0.00050	<0.005	0.039	<0.005	0.000044	< 0.005	0.006	< 0.005
Copper	0.005	<0.0001	<0.001	<0.001	<0.001	<0.0010	0.0054	<0.0010	0.0088	0.0048	0.0003	0.0006	0.0005	0.0009	0.0002
Lead	0.003	<0.001	<0.0005	<0.0005	<0.0005	<0.00050	0.0072	<0.00050	0.00109	0.00246	0.00012	0.00011	0.00013	0.00011	0.00003
Molybdenum	0.04	<0.002	<0.001	0.0011	<0.0005	0.00055	0.0011	<0.00050	0.0014	0.0015	0.0005	0.00072	0.0004	0.0001	< 0.0001
Nickel	0.025	<0.01	<0.001	<0.001	<0.001	<0.0010	0.002	<0.0010	<0.01	<0.01	<0.01	0.0005	< 0.01	< 0.01	< 0.01
Selenium	0.1	<0.01	<0.002	<0.002	<0.002	<0.0020	<0.0020	<0.0020	<0.001	0.001	<0.001	<0.001	0.001	< 0.001	< 0.001
Silver	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.00010	<0.00010	<0.00002	0.00005	<0.00002	<0.00001	< 0.00002	< 0.00002	< 0.00002
Strontium	NV	0.428	0.037	0.96	0.32	0.67	1	0.31	-	-	-	0.482	-	1.06	0.344
Thallium	0.0003	<0.0003	<0.00005	<0.00005	<0.00005	<0.000050	0.00005	<0.000050	<0.00005	<0.00005	<0.00005	<0.0002	< 0.00005	< 0.00005	< 0.00005
Vanadium	0.006	<0.001	<0.001	<0.0005	0.0011	<0.00050	0.031	<0.00050	0.0007	0.0394	0.0002	0.00033	0.0004	0.0051	0.0002
Zinc	0.02	<0.01	<0.005	<0.005	<0.005	<0.0050	0.058	<0.0050	0.006	0.075	<0.005	0.003	0.009	0.033	0.006
Field Temperature (°C)	NV	3.7	13.6	20.6	6.6	18.5	21.4	6.7	16	15.2	-	-	11.2	17.6	9
Field Dissolved Oxygen (DO)	NV	7.55	5.16	2.1	5.58	4.08	0.2	8.95	7.74	0.81	-	-	3.11	1.23	3.09
Field pH (units)	6.5 - 8.5	7.28	7.77	7.52	7.42	7.05	7.23	7.87	7.29	6.8	-	-	8.11	6.86	7.53
Field Conductivity (µS/cm)	NV	209.4	295	400.1	273	546	224.7	420	389	327	-	-	210	368.2	320

PWQO - Provincial Water Quality Objectives

Bold / highlighting - PWQO Exceedance

all results in mg/L unless otherwise stated

**Summary of Surface Water Quality -
General Chemistry
Laxton Waste Disposal Site**

Parameter	PWQO	SWF	SWF	SW F	SW F	SW F	SW F	SW F	SW F	SW F	SW F	SW F	SW F	SW F	SW F
		9-Jun-15	29-Jul-15	10-Sep-15	30-May-16	24-Aug-16	17-Oct-16	19-Apr-17	17-Jul-17	17-Oct-17	24-Apr-18	18-Jul-18	26-Sep-18	17-Apr-19	18-Jul-19
Alkalinity (as CaCO ₃)	decrease >25% of background	188	296	179	170	203	179	110	145	173	24	147	139	49	146
Oxygen Demand - Biological (BOD)	NV	< 2	80	< 3	2	3	8	< 3	< 3	< 3	< 3	3	3	< 3	< 3
Calcium	NV	51.3	173	63.3	48.9	56.6	53.4	29.5	38.8	55.1	11.5	42.2	45.7	13.5	37.5
Chloride	NV	0.7	5.6	2.8	1.6	1	2.4	1.6	1.3	1.3	< 0.5	2.4	1.8	0.9	0.6
Oxygen Demand - Chemical (COD)	NV	88	2600	46	49	65	45	28	46	36	10	68	69	10	46
Colour (TCU)	NV	89	115	94	97	89	48	65	85	50	8	80	90	33	74
Conductivity (µS/cm)	NV	357	613	427	342	391	352	232	290	256	46	313	294	107	288
Carbon - Dissolved Organic (DOC)	NV	18.5	32.3	17.9	16.3	20.2	19.8	9.8	17	14.2	4.4	18.3	22.4	4.5	17.4
Fluoride	NV	0.2	0.2	0.2	0.2	0.2	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Free Cyanide	0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Hardness (as CaCO ₃)	NV	202	543	237	194	216	194	128	156	213	38	172	152	50	152
Iron	0.3	6.65	778	1.94	1.11	2.84	1.18	0.295	0.685	0.755	0.087	1.06	0.629	1.67	0.779
Magnesium	NV	17.9	26.8	19.2	17.4	18.1	14.7	11.8	14.4	18.2	2.27	16.3	14.2	2.78	14.8
Manganese	NV	0.263	137	0.172	0.162	0.424	0.277	0.009	0.114	0.061	0.027	0.042	0.121	0.18	0.053
Mercury	0.0002	< 0.00002	< 0.00002	< 0.00002	0.0001	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Nitrogen - Nitrate (NO ₃)	NV	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.06	0.09
Nitrogen - Nitrite (NO ₂)	NV	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.2	< 0.1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
pH	6.5 - 8.5	7.69	7.35	7.61	7.85	7.7	7.58	7.79	7.93	8.13	7.38	8.19	7.88	7.07	7.87
Phenols	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.018	0.004	0.01	0.004	< 0.001	0.001	0.002	< 0.002	< 0.002
Phosphorus	0.03	0.05	8.13	0.02	0.08	0.04	0.09	0.02	0.04	0.04	0.03	0.05	0.05	0.25	0.04
Potassium	NV	0.1	3.3	0.4	1.9	1.7	1.9	0.6	1.5	2.1	0.8	2	1.1	0.8	0.2
Sodium	NV	2.2	9.9	3.4	2.4	1.9	2	0.9	2.1	3.1	1.3	2.6	3	0.7	1.5
Sulphate	NV	< 1	24	41	10	< 1	2	10	1	9	< 1	2	12	3	2
Solids - Total Dissolved (TDS)	NV	193	1330	239	186	205	186	121	148	183	30	157	162	53	146
Nitrogen - Total Kjeldahl (TKN)	NV	1	64.7	0.7	1.1	1.1	1.5	0.5	0.9	0.7	0.2	1	1.1	0.5	1
Total Ammonia as N (NH ₃ + NH ₄)	NV	0.01	0.28	0.03	0.04	0.04	0.07	0.17	0.04	0.02	0.02	0.04	0.05	0.16	0.06
Solids - Total Suspended (TSS)	NV	56	4600	10	8	12	18	3	10	5	< 3	< 3	3	4	10
Turbidity (NTU)	NV	24.9	1620	10.3	0.9	6.7	6.4	0.8	2.2	2	0.4	4.1	1.7	5.4	4.4
Ammonia - Unionized (as N)	0.02	< 0.01	< 0.01	< 0.01	0.02	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aluminum	0.075	0.1	4.76	0.05	0.31	0.02	0.03	0.01	0.03	0.04	< 0.01	0.03	0.04	0.07	0.04
Antimony	0.02	0.0002	0.0005	0.0001	0.0002	0.0001	0.0001	< 0.0001	0.0002	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Arsenic	0.005	0.0007	0.0169	0.0006	0.0004	0.0008	0.0006	0.0002	0.0003	0.0004	0.0003	0.0005	0.0003	0.0001	0.0003
Barium	NV	0.075	3.98	0.062	0.074	0.078	0.063	0.033	0.05	0.065	0.017	0.041	0.179	0.028	0.041
Beryllium	0.011	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Boron	0.2	0.007	0.429	0.035	0.017	0.016	0.019	< 0.005	0.022	0.014	< 0.005	0.023	0.019	0.005	0.017
Cadmium	0.0001	0.00005	0.00104	0.00006	0.00004	< 0.00002	< 0.00002	< 0.000014	0.000065	0.000036	< 0.000014	< 0.000015	0.000116	< 0.000015	< 0.000015
Chromium	0.001	0.0013	0.0119	0.0006	0.0006	< 0.0002	0.0005	< 0.001	0.001	< 0.001	< 0.001	< 0.001	0.001	< 0.001	< 0.001
Cobalt	0.0009	< 0.005	0.091	< 0.005	< 0.005	0.0002	0.0002	< 0.0001	0.0001	< 0.0001	< 0.0001	0.0002	0.0001	0.0003	0.0001
Copper	0.005	0.0014	0.015	0.003	0.0025	< 0.0001	0.0001	< 0.0001	0.0087	0.0056	< 0.0001	0.0001	0.0051	0.0008	0.0007
Lead	0.003	0.00119	0.0238	0.00078	0.00043	< 0.00002	0.00025	< 0.00002	0.00053	0.00036	0.00006	0.00006	0.0003	0.0002	0.00007
Molybdenum	0.04	0.0003	0.0029	0.0003	0.0004	< 0.0001	< 0.0001	0.0004	0.0002	0.0002	< 0.0001	< 0.0001	0.0001	0.0002	< 0.0001
Nickel	0.025	< 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
Selenium	0.1	< 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
Silver	0.0001	< 0.00002	0.00013	0.00003	< 0.00002	< 0.00002	< 0.00002	0.00005	< 0.00002	< 0.00002	< 0.00002	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Strontium	NV	0.43	2.73	0.93	0.413	0.484	0.39	0.22	0.323	0.503	0.057	0.415	0.493	0.069	0.419
Thallium	0.0003	< 0.00005	0.00015	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Vanadium	0.006	0.0011	0.0616	0.0006	0.0008	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.0002	0.0001	0.0007	0.0001	0.0004	0.0001
Zinc	0.02	0.016	0.336	< 0.005	0.02	< 0.005	0.014	< 0.005	0.02	0.047	0.015	0.024	0.019	0.012	0.006
Field Temperature (°C)	NV	14.04	20.8	17.71	28.3	-	12	9.9	26	7.8	8.5	28.4	17.2	8.3	22.1
Field Dissolved Oxygen (DO)	NV	1.85	0.37	3.28	1.18	-	2.8	6.52	2.91	4.13	7.2	2.16	3.53	1.15	3.99
Field pH (units)	6.5 - 8.5	7.14	7.21	6.98	9.39	-	7.34	7.67	7.93	7.23	7.7	7.88	7.25	7.14	7.53
Field Conductivity (µS/cm)	NV	317	488.2	382	326	-	320	195	226	290	90	265	255	420	268

PWQO - Provincial Water Quality Objectives

Bold / highlighting - PWQO Exceedance

all results in mg/L unless otherwise stated

Summary of Surface Water Quality -
General Chemistry
Laxton Waste Disposal Site

Parameter	PWQO	SW F	SW F	SW F	SW F	SW F	SW F	SW F	SW F	SW F	SW F	SW F	SW F	SW F	SW F
		18-Oct-19	21-Apr-20	20-Jul-20	13-Oct-20	15-Apr-21	16-Aug-21	13-Oct-21	1-Nov-21	12-Apr-22	20-Jul-22	16-Oct-22	26-Apr-23	31-Aug-23	11-Oct-23
Alkalinity (as CaCO ₃)	decrease >25% of background	148	106	110	138	120	99	165	152	93	86	160	129	157	180
Oxygen Demand - Biological (BOD)	NV	< 3	7	4	< 3	< 10	< 3	< 3	3	4	7	3	< 3	<3	3
Calcium	NV	43.2	34.7	31.9	45.6	33.5	23	46.1	45.6	23.6	18	41.4	7.94	40.9	38
Chloride	NV	1.4	2.1	1.3	2	2.2	1.2	2.5	1	2.6	1.3	1.5	1.2	<0.5	1.3
Oxygen Demand - Chemical (COD)	NV	32	50	59	47	30	44	50	42	28	71	56	19	46	45
Colour (TCU)	NV	41	42	77	57	53	78	51	54	41	64	40	50	56	46
Conductivity (µS/cm)	NV	328	243	216	305	266	179	307	313	193	161	310	265	285	312
Carbon - Dissolved Organic (DOC)	NV	13.8	11.8	19.3	17	12.4	17.6	13.4	19.1	8.9	23.6	13.8	9	16.8	18.5
Fluoride	NV	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.4	< 0.1	< 0.1	< 0.1	0.1	< 0.1	< 0.1	<0.1	<0.1
Free Cyanide	0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	<0.005	<0.005
Hardness (as CaCO ₃)	NV	176	135	127	169	157	113	175	180	105	93	161	143	160	156
Iron	0.3	0.332	0.356	1.93	0.288	0.73	0.648	0.401	0.411	0.229	2.91	0.293	0.194	0.979	0.689
Magnesium	NV	15.5	11.6	15.8	13.3	12.5	10.5	16.1	16.1	9.45	11.7	14.8	12.2	14	14.9
Manganese	NV	0.037	0.054	0.083	0.035	0.044	0.039	0.065	0.041	0.013	0.183	0.029	0.009	0.173	0.091
Mercury	0.0002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	<0.00002	<0.00002
Nitrogen - Nitrate (NO ₃)	NV	< 0.05	< 0.05	< 0.05	< 0.05	0.05	< 0.05	< 0.05	< 0.05	0.07	0.09	< 0.05	< 0.05	< 0.05	0.05
Nitrogen - Nitrite (NO ₂)	NV	< 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
pH	6.5 - 8.5	8.02	7.73	8.17	8.01	7.9	8.75	7.96	7.48	7.82	7.52	7.54	7.94	7.57	7.62
Phenols	0.001	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	<0.001	<0.001
Phosphorus	0.03	0.07	0.09	0.09	0.06	0.06	0.03	0.03	0.05	< 0.1	0.2	< 0.1	< 0.1	0.04	0.04
Potassium	NV	0.5	1.8	0.5	0.5	1	0.1	0.9	0.7	0.8	0.2	0.5	0.8	0.4	0.4
Sodium	NV	1.6	1.6	2.5	1.8	1.9	0.9	1.6	2.2	1	1.3	2	1.4	0.9	1.3
Sulphate	NV	17	12	2	17	17	2	4	3	9	2	8	7	3	3
Solids - Total Dissolved (TDS)	NV	168	128	122	159	141	99	171	161	103	87	165	128	156	175
Nitrogen - Total Kjeldahl (TKN)	NV	0.9	0.7	1.7	1.2	0.8	0.9	0.9	1	0.6	2.1	1.2	0.8	1.1	5.2
Total Ammonia as N (NH ₃ + NH ₄)	NV	0.07	< 0.01	0.04	0.04	0.02	0.06	0.07	0.04	0.37	0.23	0.04	0.04	0.06	5.38
Solids - Total Suspended (TSS)	NV	5	54	14	7	12	10	< 3	20	34	560	18	6	3	11
Turbidity (NTU)	NV	1.3	2.3	9.5	1.4	2.3	4.8	2.3	3.1	1.3	16.2	76.4	1.8	5.1	10.8
Ammonia - Unionized (as N)	0.02	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	<0.01	0.02
Aluminum	0.075	0.04	0.02	0.02	0.02	0.03	< 0.01	0.03	< 0.01	0.02	0.01	< 0.01	< 0.01	0.04	0.04
Antimony	0.02	0.0003	0.0002	0.0002	0.0003	0.0002	0.0005	0.0002	0.0006	0.0003	0.0004	0.0003	0.0003	0.0003	0.0003
Arsenic	0.005	0.0002	0.0002	0.0004	0.0002	0.0002	0.0003	0.0002	0.0002	0.0001	0.0003	0.0002	0.0001	0.0002	0.0002
Barium	NV	0.038	0.033	0.053	0.04	0.033	0.027	0.063	0.046	0.025	0.038	0.043	0.032	0.05	0.046
Beryllium	0.011	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	<0.0001	<0.0001
Boron	0.2	0.011	0.03	0.018	0.019	0.013	0.009	0.016	0.014	0.011	0.016	0.011	0.01	0.015	0.009
Cadmium	0.0001	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	<0.000015	<0.000015
Chromium	0.001	0.002	< 0.001	< 0.001	< 0.001	0.002	0.001	0.002	< 0.001	0.002	< 0.001	< 0.001	< 0.001	<0.001	<0.001
Cobalt	0.0009	0.0002	0.0001	< 0.0001	< 0.0001	< 0.0001	0.0002	< 0.0001	< 0.0001	0.0001	0.0004	< 0.0001	0.0001	0.0001	0.0002
Copper	0.005	< 0.0001	0.0005	0.0001	0.0001	0.0002	0.0008	< 0.0001	0.0018	0.0007	0.0008	0.0007	0.0002	<0.0001	<0.0001
Lead	0.003	0.00004	0.00031	0.00004	0.00004	0.00005	0.00005	0.00003	0.00004	0.00006	0.00033	0.00004	0.00004	<0.00002	0.00003
Molybdenum	0.04	0.0002	0.0005	< 0.0001	0.0002	0.0004	0.0051	0.0001	0.0002	0.0004	< 0.0001	0.0002	0.0003	<0.0001	<0.0001
Nickel	0.025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	<0.0002	0.0004
Selenium	0.1	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	<0.001	<0.001
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
Strontium	NV	0.472	0.214	0.357	0.507	0.317	0.207	0.382	0.423	0.169	0.179	0.415	0.22	0.392	0.366
Thallium	0.0003	< 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
Vanadium	0.006	0.0002	0.0003	0.0002	0.0001	0.0002	0.0017	< 0.0001	0.0002	0.0002	0.001	0.0001	0.0002	<0.0001	<0.0001
Zinc	0.02	0.006	0.005	0.007	< 0.005	0.006	0.019	< 0.005	0.005	< 0.005	0.007	< 0.005	0.008	0.007	0.015
Field Temperature (°C)	NV	8.3	7.3	24.1	13.1	9.8	17.9	18.7	7.6	10.5	25.6	8.6	10	15.2	10
Field Dissolved Oxygen (DO)	NV	7.7	8.6	4.06	6.24	12.37	0.82	4.42	7.7	6.11	0.35	3.31	8.52	1.71	5.01
Field pH (units)	6.5 - 8.5	7.04	7.85	7.9	7.5	7.9	6.66	7.69	7.31	7.23	7.53	7.02	7.27	7.17	7.27
Field Conductivity (µs/cm)	NV	365	260	227	250	330	204.7	330	316.7	180	145	290	230	254	250

PWQO - Provincial Water Quality Objectives
Bold / highlighting - PWQO Exceedance
all results in mg/L unless otherwise stated

**Summary of Surface Water Quality -
General Chemistry
Laxton Waste Disposal Site**

Parameter	PWQO	SWG	SWG	SWG	SW G	SW G	SW G	SW G	SW G	SW G	SW G	SW G	SW G	SW G	SW G
		30-Oct-13	28-Apr-14	23-Sep-14	09-Jun-15	29-Jul-15	11-Sep-15	30-May-16	24-Aug-16	17-Oct-16	19-Apr-17	17-Jul-17	17-Oct-17	24-Apr-18	18-Jul-18
Alkalinity (as CaCO ₃)	decrease >25% of background	108	110	171	Dry	Dry	Dry	208	Dry	144	99	244	209	111	Dry
Oxygen Demand - Biological (BOD)	NV	5	< 3	< 3				6		<3	< 3	7	< 3	< 3	
Calcium	NV	34	31.9	56.9				67.7		42.5	27.5	70.6	65.2	29.4	
Chloride	NV	6.2	2.1	2.4				11.2		4	3.9	6.6	9.9	7.8	
Oxygen Demand - Chemical (COD)	NV	146	14	42				99		9	15	192	45	24	
Colour (TCU)	NV	50	49	25				96		12	33	23	18	12	
Conductivity (µS/cm)	NV	236	249	350				444		298	223	492	437	248	
Carbon - Dissolved Organic (DOC)	NV	11.4	8.7	9.4				9.9		5.6	5.8	34	9	7.1	
Fluoride	NV	0.1	0.2	< 0.1				0.2		0.1	< 0.1	< 0.1	< 0.1	< 0.1	
Free Cyanide	0.005	<0.005	< 0.005	< 0.005				<0.005		<0.005	< 0.005	< 0.005	< 0.005	< 0.005	
Hardness (as CaCO ₃)	NV	123	124	205				249		154	114	263	248	112	
Iron	0.3	134	1.23	46.5				206		5.65	0.644	101	18	2.96	
Magnesium	NV	9.31	10.8	15.4				19.3		11.7	10.1	21	20.6	9.44	
Manganese	NV	0.646	0.173	1.76				2.34		2.25	0.127	2.25	1.86	0.916	
Mercury	0.0002	<0.00002	< 0.00002	< 0.00002				<0.00002		<0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	
Nitrogen - Nitrate (NO ₃)	NV	0.1	< 0.1	< 0.1				<0.1		<0.1	< 0.1	< 0.05	< 0.05	< 0.05	
Nitrogen - Nitrite (NO ₂)	NV	<0.1	0.1	0.1				<0.1		0.2	< 0.1	< 0.05	< 0.05	< 0.05	
pH	6.5 - 8.5	7.41	7.89	7.63				7.86		7.41	7.73	7.44	8.06	7.68	
Phenols	0.001	<0.001	< 0.001	< 0.001				<0.001		<0.001	0.002	0.009	0.002	0.003	
Phosphorus	0.03	1.2	0.02	0.12				0.41		<0.001	0.02	0.5	0.09	0.04	
Potassium	NV	2.9	1.2	2				4.7		2.8	1.2	1.1	3	3.8	
Sodium	NV	5.4	2.6	4.8				7.2		4.4	2.4	6.4	6.5	5.4	
Sulphate	NV	<1	14	4				4		3	9	< 1	1	6	
Solids - Total Dissolved (TDS)	NV	125	131	237				448		164	114	356	219	133	
Nitrogen - Total Kjeldahl (TKN)	NV	1.9	0.3	0.9				1.3		0.4	0.4	2.7	1.1	0.5	
Total Ammonia as N (NH ₃ + NH ₄)	NV	0.009	0.02	0.09				0.04		0.09	0.02	0.13	0.07	0.08	
Solids - Total Suspended (TSS)	NV	300	< 3	260				350		12	56	540	34	12	
Turbidity (NTU)	NV	434	4	235				170		9.5	35.1	935	38.7	15.3	
Ammonia - Unionized (as N)	0.02	<0.005	< 0.01	< 0.01				<0.01		<0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Aluminum	0.075	0.07	0.02	0.06				0.17		0.01	< 0.01	0.11	0.06	0.02	
Antimony	0.02	<0.0001	< 0.0001	< 0.0001				0.0002		0.0001	< 0.0001	0.0002	< 0.0001	< 0.0001	
Arsenic	0.005	0.0009	0.0003	0.0002				0.0017		0.0004	0.0001	0.001	0.0003	0.0006	
Barium	NV	0.219	0.038	0.219				0.562		0.109	0.033	0.346	0.145	0.056	
Beryllium	0.011	<0.002	< 0.002	< 0.002				<0.002		<0.002	< 0.002	< 0.002	< 0.002	< 0.002	
Boron	0.2	0.056	0.023	0.04				0.13		0.033	< 0.005	0.074	0.034	0.05	
Cadmium	0.0001	0.00009	< 0.00002	< 0.00002				0.00009		<0.00002	0.000054	0.000232	0.000058	< 0.000014	
Chromium	0.001	0.0003	< 0.0002	< 0.0002				0.0006		0.0003	< 0.001	0.008	< 0.001	< 0.001	
Cobalt	0.0009	0.008	< 0.005	< 0.005				0.02		0.0003	< 0.0001	0.0008	0.0001	0.0003	
Copper	0.005	0.0012	0.0001	0.0006				0.0039		<0.0001	< 0.0001	0.0826	0.0107	< 0.0001	
Lead	0.003	0.00061	< 0.00002	0.00029				0.00106		<0.00002	< 0.00002	0.00266	0.0005	0.00017	
Molybdenum	0.04	0.0006	0.0005	< 0.0001				0.001		0.0003	0.0004	0.0026	0.0004	0.0004	
Nickel	0.025	<0.01	< 0.01	< 0.01				<0.01		<0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Selenium	0.1	<0.001	0.001	< 0.001				<0.001		0.001	< 0.001	< 0.001	< 0.001	< 0.001	
Silver	0.0001	0.00002	0.00002	< 0.00002				<0.00002		<0.00002	0.00004	0.00032	< 0.00002	< 0.00002	
Strontium	NV	-	-	0.463				0.641		0.341	0.25	0.529	0.42	0.221	
Thallium	0.0003	<0.00005	< 0.00005	< 0.00005				<0.00005		<0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	
Vanadium	0.006	0.0006	0.0001	0.0005				0.0033		<0.0001	0.0002	0.0023	0.0003	0.0002	
Zinc	0.02	0.046	0.018	0.04				0.064		0.009	< 0.005	0.038	0.055	0.007	
Field Temperature (°C)	NV	-	12	8.9				16.61		11.7	8.4	18.1	9.5	6.5	
Field Dissolved Oxygen (DO)	NV	-	3.24	2.95				0.62		2.53	3.77	0.36	1.31	6.21	
Field pH (units)	6.5 - 8.5	-	7.95	7.32				6.51		7.19	7.33	7.49	7.82	7.4	
Field Conductivity (µS/cm)	NV	-	290	400				410		300	198	425	420	260	

PWQO - Provincial Water Quality Objectives

Bold / highlighting - PWQO Exceedance

all results in mg/L unless otherwise stated

Summary of Surface Water Quality - General Chemistry

Parameter	PWQO	SW G	SW G	SW G	SW G	SW G	SW G	SW G	SW G	SW G	SW G	SW G	SW G	SW G
		26-Sep-18	17-Apr-19	18-Jul-19	18-Oct-19	21-Apr-20	20-Jul-20	13-Oct-20	15-Apr-21	16-Aug-21	13-Oct-21	12-Apr-22	20-Jul-22	26-Apr-23
Alkalinity (as CaCO ₃)	decrease >25% of background	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
Oxygen Demand - Biological (BOD)	NV													
Calcium	NV													
Chloride	NV													
Oxygen Demand - Chemical (COD)	NV													
Colour (TCU)	NV													
Conductivity (µS/cm)	NV													
Carbon - Dissolved Organic (DOC)	NV													
Fluoride	NV													
Free Cyanide	0.005													
Hardness (as CaCO ₃)	NV													
Iron	0.3													
Magnesium	NV													
Manganese	NV													
Mercury	0.0002													
Nitrogen - Nitrate (NO ₃)	NV													
Nitrogen - Nitrite (NO ₂)	NV													
pH	6.5 - 8.5													
Phenols	0.001													
Phosphorus	0.03													
Potassium	NV													
Sodium	NV													
Sulphate	NV													
Solids - Total Dissolved (TDS)	NV													
Nitrogen - Total Kjeldahl (TKN)	NV													
Total Ammonia as N (NH ₃ + NH ₄)	NV													
Solids - Total Suspended (TSS)	NV													
Turbidity (NTU)	NV													
Ammonia - Unionized (as N)	0.02													
Aluminum	0.075													
Antimony	0.02													
Arsenic	0.005													
Barium	NV													
Beryllium	0.011													
Boron	0.2													
Cadmium	0.0001													
Chromium	0.001													
Cobalt	0.0009													
Copper	0.005													
Lead	0.003													
Molybdenum	0.04													
Nickel	0.025													
Selenium	0.1													
Silver	0.0001													
Strontium	NV													
Thallium	0.0003													
Vanadium	0.006													
Zinc	0.02													
Field Temperature (°C)	NV													
Field Dissolved Oxygen (DO)	NV													
Field pH (units)	6.5 - 8.5													
Field Conductivity (µs/cm)	NV													

PWQO - Provincial Water Quality Objectives

Bold / highlighting - PWQO Exceedance

all results in mg/L unless otherwise stated

**Summary of Ground Water Quality - Volatile
Organic Compounds - Laxton Waste Disposal
Site**

Parameters	ODWQS	MW3	MW3	MW3	MW3	MW3	MW3	MW3	MW3	MW3	MW3	MW3
		09-Jun-15	10-Sep-15	31-May-16	17-Oct-16	19-Apr-17	17-Oct-17	24-Apr-18	26-Sep-18	17-Apr-19	18-Oct-19	21-Apr-20
Acetone		< 30	< 30	<30	<30	< 30	3	< 30	< 30	< 30	< 30	< 30
Benzene	100	< 0.5	< 0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	1.2
Bromodichloromethane	200	< 2	< 2	<2	<2	< 2	< 0.1	< 2	< 2	< 2	< 2	< 2
Bromoform	60	< 5	< 5	<5	<5	< 5	< 0.1	< 5	< 5	< 5	< 5	< 5
Bromomethane	0.9	< 0.5	< 0.5	<0.5	<0.5	< 0.5	< 0.3	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Carbon Tetrachloride		< 0.2	< 0.2	<0.2	<0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chloroethane											< 3	
Chloroform		< 1	< 1	<1	<1	< 1	< 0.3	< 1	< 1	< 1	< 1	< 1
Chloromethane	700										< 2	
Dibromochloromethane				<2	<2	< 2	< 0.1	< 2	< 2	< 2	< 2	< 2
Dibromoethane, 1,2- (Ethylene Dibromide)	5.0000	< 0.2	< 0.2	<0.2	<0.2	< 0.2	< 0.1	< 0.2	< 20	< 0.2	< 0.2	< 0.2
Dichlorobenzene, 1,2-	2.5000	< 0.5	< 0.5	<0.5	<0.5	< 0.5	< 0.1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dichlorobenzene, 1,3-	2.5	< 0.5	< 0.5	<0.5	<0.5	< 0.5	< 0.1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dichlorobenzene, 1,4-	4	< 0.5	< 0.5	<0.5	<0.5	< 0.5	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dichloroethane, 1,1-	200	< 0.5	< 0.5	<0.5	<0.5	< 0.5	< 0.1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dichloroethane, 1,2-	100	< 0.5	< 0.5	<0.5	<0.5	< 0.5	< 0.1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dichloroethene, cis-1,2-	200	< 0.5	< 0.5	<0.5	<0.5	< 0.5	< 0.1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dichloroethene, trans-1,2-	200	< 0.5	< 0.5	<0.5	<0.5	< 0.5	< 0.1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dichloroethylene, 1,1-	40	< 0.5	< 0.5	<0.5	<0.5	< 0.5	< 0.1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dichloromethane (Methylene Chloride)	100	< 5	< 5	<5	<5	< 5	< 0.3	< 5	< 0.5	< 5	< 5	< 5
Dichloropropane, 1,2-	0.7	< 0.5	< 0.5	<0.5	<0.5	< 0.5	< 0.1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dichloropropene, cis-1,3-		< 0.5	< 0.5	<0.5	<0.5	< 0.5	< 0.1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dichloropropene, trans-1,3-	7	< 0.5	< 0.5	<0.5	<0.5	< 0.5	< 0.1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Ethylbenzene	8	< 0.5	< 0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.2	< 0.5	< 0.5	< 0.5
Methyl Ethyl Ketone	400	< 20	< 20	<20	<20	< 20	< 1	< 20	< 2	< 20	< 20	< 20
Methyl Isobutyl Ketone		< 20	< 20	<20	<20	< 20	< 1	< 20	< 0.3	< 20	< 20	< 20
Methyl-t-butyl Ether	200	< 2	< 2	<2	<2	< 2	< 1	< 2	< 20	< 2	< 2	< 2
Monochlorobenzene (Chlorobenzene)	15	< 0.5	< 0.5	<0.5	0.6	< 0.5	< 0.2	< 0.5	< 0.5	< 0.5	0.7	< 0.5
Styrene	4	< 0.5	< 0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Tetrachloroethane, 1,1,1,2-	20	< 0.5	< 0.5	<0.5	<0.5	< 0.5	< 0.1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Tetrachloroethane, 1,1,2,2-	70	< 0.5	< 0.5	<0.5	<0.5	< 0.5	< 0.4	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Tetrachloroethylene	50	< 0.5	< 0.5	<0.5	<0.5	< 0.5	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Toluene	24	< 0.5	< 0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Trichlorobenzene, 1,2,4-	0.5	< 0.5	< 0.5	<0.5	<0.5	< 0.5	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethane, 1,1,1-	10	< 0.5	< 0.5	<0.5	<0.5	< 0.5	< 0.1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethane, 1,1,2-	800	< 0.5	< 0.5	<0.5	<0.5	< 0.5	< 0.1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethylene	20	< 0.5	< 0.5	<0.5	<0.5	< 0.5	< 0.1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Trichlorofluoromethane		< 5	< 5	<5	<5	< 5	< 0.1	< 5	< 5	< 5	< 5	< 5
Vinyl Chloride	600	< 0.5	< 0.5	<0.5	<0.5	< 0.5	< 0.2	< 0.5	< 0.5	< 0.2	< 0.2	< 0.2
Xylene, m,p-	2	< 1.0	< 1.0	<1.0	<1.0	< 1.0	< 0.4	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Xylene, m,p,o-	2			<1.1	<1.1	< 1.1	< 0.4	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1
Xylene, o-	40	< 0.5	< 0.5	<0.5	<0.5	< 0.5	< 0.1	< 0.5	< 0.5	< 0.5	< 0.5	0.6

ODWQS - Ontario Drinking Water Quality Objectives

Bold / highlighting - ODWQS Exceedance

Bold indicates detection

all results in ug/L unless otherwise stated

**Summary of Ground Water Quality - Volatile
Organic Compounds - Laxton Waste Disposal
Site**

Parameters	ODWQS	MW3	MW 3	MW 3	MW 3	MW 3	MW 3	MW 3	MW 3	MW 3	MW4	MW4	MW4
		13-Oct-20	15-Apr-21	13-Oct-21	12-Apr-22	16-Oct-22	12-Apr-22	26-Apr-23	11-Oct-23	09-Jun-15	10-Sep-15	30-May-16	
Acetone		< 30	< 30	< 30	< 30	< 30	< 30	< 30	<30	< 30	< 30	<30	
Benzene	100	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	1.7	1.4	1.1	
Bromodichloromethane	200	< 2	< 2	< 2	< 2	< 2	< 2	< 2	<2	< 2	< 2	<2	
Bromoform	60	< 5	< 5	< 5	< 5	< 5	< 5	< 5	<5	< 5	< 5	<5	
Bromomethane	0.9	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	<0.5	
Carbon Tetrachloride		< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	<0.2	< 0.2	< 0.2	<0.2	
Chloroethane									<3				
Chloroform		< 1	< 1	< 1	< 1	< 1	< 1	< 1	<1	< 1	< 1	<1	
Chloromethane	700								<2				
Dibromochloromethane		< 2	< 2	< 2	< 2	< 2	< 2	< 2	<2			<0.5	
Dibromoethane, 1,2- (Ethylene Dibromide)	5.0000	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	<0.2	< 0.2	< 0.2	<0.2	
Dichlorobenzene, 1,2-	2.5000	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	<0.5	
Dichlorobenzene, 1,3-	2.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	<0.5	
Dichlorobenzene, 1,4-	4	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	<0.5	
Dichloroethane, 1,1-	200	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	<0.5	
Dichloroethane, 1,2-	100	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	<0.5	
Dichloroethene, cis-1,2-	200	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	<0.5	
Dichloroethene, trans-1,2-	200	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	<0.5	
Dichloroethylene, 1,1-	40	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	<0.5	
Dichloromethane (Methylene Chloride)	100	< 5	< 5	< 5	< 5	< 5	< 5	< 5	<0.5	< 5	< 5	<5	
Dichloropropane, 1,2-	0.7	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	<0.5	
Dichloropropene, cis-1,3-		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	<0.5	
Dichloropropene, trans-1,3-	7	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	<0.5	
Ethylbenzene	8	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	<0.5	
Methyl Ethyl Ketone	400	< 20	< 20	< 20	< 20	< 20	< 20	< 20	<20	< 20	< 20	<20	
Methyl Isobutyl Ketone		< 20	< 20	< 20	< 20	< 20	< 20	< 20	<20	< 20	< 20	<20	
Methyl-t-butyl Ether	200	< 2	< 2	< 2	< 2	< 2	< 2	< 2	<2	< 2	< 2	<2	
Monochlorobenzene (Chlorobenzene)	15	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 5	0.5	1.7	2.3	<0.5	
Styrene	4	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	<0.5	
Tetrachloroethane, 1,1,1,2-	20	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	<0.5	
Tetrachloroethane, 1,1,2,2-	70	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	<0.5	
Tetrachloroethylene	50	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	<0.5	
Toluene	24	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	<0.5	
Trichlorobenzene, 1,2,4-	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	<0.5	
Trichloroethane, 1,1,1,-	10	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	<0.5	
Trichloroethane, 1,1,2,-	800	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	<0.5	
Trichloroethylene	20	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	<0.5	
Trichlorofluoromethane		< 5	< 5	< 5	< 5	< 5	< 5	< 5	<5	< 5	< 5	<5	
Vinyl Chloride	600	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	<0.2	< 0.5	< 0.5	<0.5	
Xylene, m,p-	2	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<1	< 1.0	< 1.0	<1.0	
Xylene, m,p,o-	2	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	<1.1			<1.1	
Xylene, o-	40	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	<0.5	

ODWQS - Ontario Drinking Water Quality Objectives

Bold / highlighting - ODWQS Exceedance

Bold indicates detection

all results in ug/L unless otherwise stated

**Summary of Ground Water Quality - Volatile
Organic Compounds - Laxton Waste Disposal
Site**

Parameters	ODWQS	MW4	MW4	MW4	MW4	MW4	MW4	MW4	MW4	MW4	MW 4	MW 4
		17-Oct-16	19-Apr-17	17-Oct-17	24-Apr-18	26-Sep-18	17-Apr-19	18-Oct-19	21-Apr-20	13-Oct-20	15-Apr-21	13-Oct-21
Acetone		<30	< 30	14	< 30	< 30	< 30	< 30	< 30	< 30	< 30	< 30
Benzene	100	<0.5	0.7	0.7	0.6	0.5	0.8	0.9	1.2	0.6	1.3	1
Bromodichloromethane	200	<2	< 2	< 0.1	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Bromoform	60	<5	< 5	< 0.1	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Bromomethane	0.9	<0.5	< 0.5	< 0.3	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Carbon Tetrachloride		<0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chloroethane								4				
Chloroform		<1	< 1	< 0.3	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Chloromethane	700							< 2				
Dibromochloromethane		<0.5	< 2	< 0.1	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Dibromoethane, 1,2- (Ethylene Dibromide)	5.0000	<0.2	< 0.2	< 0.1	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Dichlorobenzene, 1,2-	2.5000	<0.5	< 0.5	< 0.1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dichlorobenzene, 1,3-	2.5	<0.5	< 0.5	< 0.1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dichlorobenzene, 1,4-	4	<0.5	< 0.5	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dichloroethane, 1,1-	200	<0.5	< 0.5	< 0.1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dichloroethane, 1,2-	100	<0.5	< 0.5	< 0.1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dichloroethene, cis-1,2-	200	<0.5	< 0.5	< 0.1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dichloroethene, trans-1,2-	200	<0.5	< 0.5	< 0.1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dichloroethylene, 1,1-	40	<0.5	< 0.5	< 0.1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dichloromethane (Methylene Chloride)	100	<5	< 5	< 0.3	< 5	< 0.5	< 5	< 5	< 5	< 5	< 5	< 5
Dichloropropane, 1,2-	0.7	<0.5	< 0.5	< 0.1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dichloropropene, cis-1,3-		<0.5	< 0.5	< 0.1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dichloropropene, trans-1,3-	7	<0.5	< 0.5	< 0.1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Ethylbenzene	8	<0.5	< 0.5	< 0.5	< 0.5	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Methyl Ethyl Ketone	400	<20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
Methyl Isobutyl Ketone		<20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
Methyl-t-butyl Ether	200	<2	< 2	< 1	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Monochlorobenzene (Chlorobenzene)	15	0.5	< 0.5	0.3	1	< 0.5	< 0.5	0.6	< 0.5	< 0.5	< 0.5	< 0.5
Styrene	4	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Tetrachloroethane, 1,1,1,2-	20	<0.5	< 0.5	< 0.1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Tetrachloroethane, 1,1,2,2-	70	<0.5	< 0.5	< 0.4	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Tetrachloroethylene	50	<0.5	< 0.5	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Toluene	24	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Trichlorobenzene, 1,2,4-	0.5	<0.5	< 0.5	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethane, 1,1,1-	10	<0.5	< 0.5	< 0.1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethane, 1,1,2-	800	<0.5	< 0.5	< 0.1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethylene	20	<0.5	< 0.5	< 0.1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Trichlorofluoromethane		<5	< 5	< 0.1	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Vinyl Chloride	600	<0.5	< 0.5	< 0.2	< 0.5	< 0.5	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Xylene, m,p-	2	<1.0	< 1.0	< 0.4	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Xylene, m,p,o-	2	<1.1	< 1.1	< 0.4	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1
Xylene, o-	40	<0.5	< 0.5	< 0.1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5

ODWQS - Ontario Drinking Water Quality Objectives

Bold / highlighting - ODWQS Exceedance

Bold indicates detection

all results in ug/L unless otherwise stated

**Summary of Ground Water Quality - Volatile
Organic Compounds - Laxton Waste Disposal
Site**

Parameters	ODWQS	MW 4	MW 4	MW 4	MW 4	MW6	MW6	MW6	MW6	MW6	MW6	MW6
		12-Apr-22	16-Oct-22	26-Apr-23	11-Oct-23	15-Jun-15	11-Sep-15	30-May-16	17-Oct-16	19-Apr-17	17-Oct-17	24-Apr-18
Acetone		< 30	< 30	< 30	<30	< 30	< 30	<30	<30	< 30	< 2	< 30
Benzene	100	1	0.6	0.6	1	< 0.5	< 0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5
Bromodichloromethane	200	< 2	< 2	< 2	<2	< 2	< 2	<2	<2	< 2	< 0.1	< 2
Bromoform	60	< 5	< 5	< 5	<5	< 5	< 5	<5	<5	< 5	< 0.1	< 5
Bromomethane	0.9	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	<0.5	<0.5	< 0.5	< 0.3	< 0.5
Carbon Tetrachloride		< 0.2	< 0.2	< 0.2	<0.2	< 0.2	< 0.2	<0.2	<0.2	< 0.2	< 0.2	< 0.2
Chloroethane												
Chloroform		< 1	< 1	< 1	<1	< 1	< 1	<1	<1	< 1	< 0.3	< 1
Chloromethane	700				<2							
Dibromochloromethane		< 2	< 2	< 2	<2			<2	<2	< 2	< 0.1	< 2
Dibromoethane, 1,2- (Ethylene Dibromide)	5.0000	< 0.2	< 0.2	< 0.2	<0.2	< 0.2	< 0.2	<0.2	<0.2	< 0.2	< 0.1	< 0.2
Dichlorobenzene, 1,2-	2.5000	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	<0.5	<0.5	< 0.5	< 0.1	< 0.5
Dichlorobenzene, 1,3-	2.5	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	<0.5	<0.5	< 0.5	< 0.1	< 0.5
Dichlorobenzene, 1,4-	4	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	<0.5	<0.5	< 0.5	< 0.2	< 0.5
Dichloroethane, 1,1-	200	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	<0.5	<0.5	< 0.5	< 0.1	< 0.5
Dichloroethane, 1,2-	100	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	<0.5	<0.5	< 0.5	< 0.1	< 0.5
Dichloroethene, cis-1,2-	200	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	<0.5	<0.5	< 0.5	< 0.1	< 0.5
Dichloroethene, trans-1,2-	200	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	<0.5	<0.5	< 0.5	< 0.1	< 0.5
Dichloroethylene, 1,1-	40	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	<0.5	<0.5	< 0.5	< 0.1	< 0.5
Dichloromethane (Methylene Chloride)	100	< 5	< 5	< 5	<5	< 5	< 5	<5	<5	< 5	< 0.3	< 5
Dichloropropane, 1,2-	0.7	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	<0.5	<0.5	< 0.5	< 0.1	< 0.5
Dichloropropene, cis-1,3-		< 0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	<0.5	<0.5	< 0.5	< 0.1	< 0.5
Dichloropropene, trans-1,3-	7	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	<0.5	<0.5	< 0.5	< 0.1	< 0.5
Ethylbenzene	8	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5
Methyl Ethyl Ketone	400	< 20	< 20	< 20	<20	< 20	< 20	<20	<20	< 20	< 20	< 20
Methyl Isobutyl Ketone		< 20	< 20	< 20	<20	< 20	< 20	<20	<20	< 20	< 20	< 20
Methyl-t-butyl Ether	200	< 2	< 2	< 2	<2	< 2	< 2	<2	<2	< 2	< 2	< 2
Monochlorobenzene (Chlorobenzene)	15	< 0.5	< 0.5	< 5	<0.5	< 0.5	< 0.5	<0.5	<0.5	< 0.5	< 0.2	< 0.5
Styrene	4	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5
Tetrachloroethane, 1,1,1,2-	20	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	<0.5	<0.5	< 0.5	< 0.1	< 0.5
Tetrachloroethane, 1,1,2,2-	70	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	<0.5	<0.5	< 0.5	< 0.4	< 0.5
Tetrachloroethylene	50	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	<0.5	<0.5	< 0.5	< 0.2	< 0.5
Toluene	24	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5
Trichlorobenzene, 1,2,4-	0.5	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	<0.5	<0.5	< 0.5	< 0.2	< 0.5
Trichloroethane, 1,1,1-	10	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	<0.5	<0.5	< 0.5	< 0.1	< 0.5
Trichloroethane, 1,1,2-	800	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	<0.5	<0.5	< 0.5	< 0.1	< 0.5
Trichloroethylene	20	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	<0.5	<0.5	< 0.5	< 0.1	< 0.5
Trichlorofluoromethane		< 5	< 5	< 5	<5	< 5	< 5	<5	<5	< 5	< 0.1	< 5
Vinyl Chloride	600	< 0.2	< 0.2	< 0.2	<0.2	< 0.5	< 0.5	<0.5	<0.5	< 0.5	< 0.2	< 0.5
Xylene, m,p-	2	< 1.0	< 1.0	< 1.0	<1	< 1.0	< 1.0	<1.0	<1.0	< 1.0	< 0.4	< 1.0
Xylene, m,p,o-	2	< 1.1	< 1.1	< 1.1	<0.5			<1.1	<1.1	< 1.1	< 0.4	< 1.1
Xylene, o-	40	< 0.5	< 0.5	< 0.5		< 0.5	< 0.5	<0.5	<0.5	< 0.5	< 0.1	< 0.5

ODWQS - Ontario Drinking Water Quality Objectives

Bold / highlighting - ODWQS Exceedance

Bold indicates detection

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**Summary of Ground Water Quality - Volatile
Organic Compounds - Laxton Waste Disposal
Site**

Parameters	ODWQS	MW6	MW6	MW6	MW6	MW 6	MW6	MW6	MW 6
		26-Sep-18	17-Apr-19	18-Oct-19	13-Oct-20	13-Oct-21	12-Apr-22	12-Apr-22	16-Oct-22
Acetone		< 30	< 30	< 30	< 30	< 30	< 30	< 30	< 30
Benzene	100	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Bromodichloromethane	200	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Bromoform	60	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Bromomethane	0.9	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Carbon Tetrachloride		< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chloroethane				< 3					
Chloroform		< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Chloromethane	700			< 2					
Dibromochloromethane		< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Dibromoethane, 1,2- (Ethylene Dibromide)	5.0000	< 20	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Dichlorobenzene, 1,2-	2.5000	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dichlorobenzene, 1,3-	2.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dichlorobenzene, 1,4-	4	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dichloroethane, 1,1-	200	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dichloroethane, 1,2-	100	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dichloroethene, cis-1,2-	200	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dichloroethene, trans-1,2-	200	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dichloroethylene, 1,1-	40	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dichloromethane (Methylene Chloride)	100	< 0.5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Dichloropropane, 1,2-	0.7	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dichloropropene, cis-1,3-		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dichloropropene, trans-1,3-	7	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Ethylbenzene	8	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Methyl Ethyl Ketone	400	< 2	< 20	< 20	< 20	< 20	< 20	< 20	< 20
Methyl Isobutyl Ketone		< 0.3	< 20	< 20	< 20	< 20	< 20	< 20	< 20
Methyl-t-butyl Ether	200	< 20	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Monochlorobenzene (Chlorobenzene)	15	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Styrene	4	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Tetrachloroethane, 1,1,1,2-	20	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Tetrachloroethane, 1,1,2,2-	70	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Tetrachloroethylene	50	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Toluene	24	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Trichlorobenzene, 1,2,4-	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethane, 1,1,1-	10	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethane, 1,1,2-	800	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethylene	20	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Trichlorofluoromethane		< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Vinyl Chloride	600	< 0.5	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Xylene, m,p-	2	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Xylene, m,p,o-	2	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1
Xylene, o-	40	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5

ODWQS - Ontario Drinking Water Quality Objectives

Bold / highlighting - ODWQS Exceedance

Bold indicates detection

all results in ug/L unless otherwise stated

**Summary of Ground Water Quality - Volatile
Organic Compounds - Laxton Waste Disposal
Site**

Parameters	ODWQS	MW 6	MW 6	MW 6	MW16-I	MW16-I	MW16-I	MW16-I	MW16-I	MW16-I	MW16-I	MW16-I
		16-Oct-22	26-Apr-23	11-Oct-23	09-Jun-15	10-Sep-15	31-May-16	19-Apr-17	17-Oct-17	24-Apr-18	26-Sep-18	17-Apr-19
Acetone		< 30	< 30	<30	< 30	< 30	<30	< 30	< 2	< 30	< 30	< 30
Benzene	100	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Bromodichloromethane	200	< 2	< 2	<2	< 2	< 2	<2	< 2	< 0.1	< 2	< 2	< 2
Bromoform	60	< 5	< 5	<5	< 5	< 5	<5	< 5	< 0.1	< 5	< 5	< 5
Bromomethane	0.9	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.3	< 0.5	< 0.5	< 0.5
Carbon Tetrachloride		< 0.2	< 0.2	<0.2	< 0.2	< 0.2	<0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chloroethane				<3								
Chloroform		< 1	< 1	<1	< 1	< 1	<1	< 1	< 0.3	< 1	< 1	< 1
Chloromethane	700			<2								
Dibromochloromethane		< 2	< 2	<2			<2	< 2	< 0.1	< 2	< 2	< 2
Dibromoethane, 1,2- (Ethylene Dibromide)	5.0000	< 0.2	< 0.2	<0.2	< 0.2	< 0.2	<0.2	< 0.2	< 0.1	< 0.2	< 20	< 0.2
Dichlorobenzene, 1,2-	2.5000	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.1	< 0.5	< 0.5	< 0.5
Dichlorobenzene, 1,3-	2.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.1	< 0.5	< 0.5	< 0.5
Dichlorobenzene, 1,4-	4	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.2	< 0.5	< 0.5	< 0.5
Dichloroethane, 1,1-	200	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.1	< 0.5	< 0.5	< 0.5
Dichloroethane, 1,2-	100	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.1	< 0.5	< 0.5	< 0.5
Dichloroethene, cis-1,2-	200	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.1	< 0.5	< 0.5	< 0.5
Dichloroethene, trans-1,2-	200	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.1	< 0.5	< 0.5	< 0.5
Dichloroethylene, 1,1-	40	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	<0.5	< 0.5	0.2	< 0.5	< 0.5	< 0.5
Dichloromethane (Methylene Chloride)	100	< 5	< 5	<0.5	< 5	< 5	<5	< 5	0.3	< 5	< 0.5	< 5
Dichloropropane, 1,2-	0.7	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.1	< 0.5	< 0.5	< 0.5
Dichloropropene, cis-1,3-		< 0.5	< 0.5	<0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.1	< 0.5	< 0.5	< 0.5
Dichloropropene, trans-1,3-	7	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.1	< 0.5	< 0.5	< 0.5
Ethylbenzene	8	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.2	< 0.5
Methyl Ethyl Ketone	400	< 20	< 20	<20	< 20	< 20	<20	< 20	< 1	< 20	< 2	< 20
Methyl Isobutyl Ketone		< 20	< 20	<20	< 20	< 20	<20	< 20	< 1	< 20	< 0.3	< 20
Methyl-t-butyl Ether	200	< 2	< 2	<2	< 2	< 2	<2	< 2	< 1	< 2	< 20	< 2
Monochlorobenzene (Chlorobenzene)	15	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.2	< 0.5	< 0.5	< 0.5
Styrene	4	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Tetrachloroethane, 1,1,1,2-	20	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.1	< 0.5	< 0.5	< 0.5
Tetrachloroethane, 1,1,2,2-	70	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.4	< 0.5	< 0.5	< 0.5
Tetrachloroethylene	50	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.2	< 0.5	< 0.5	< 0.5
Toluene	24	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Trichlorobenzene, 1,2,4-	0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.2	< 0.5	< 0.5	< 0.5
Trichloroethane, 1,1,1-	10	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.1	< 0.5	< 0.5	< 0.5
Trichloroethane, 1,1,2-	800	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.1	< 0.5	< 0.5	< 0.5
Trichloroethylene	20	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.1	< 0.5	< 0.5	< 0.5
Trichlorofluoromethane		< 5	< 5	<5	< 5	< 5	<5	< 5	< 0.1	< 5	< 5	< 5
Vinyl Chloride	600	< 0.2	< 0.2	<0.2	< 0.5	< 0.5	<0.5	< 0.5	0.2	< 0.5	< 0.5	< 0.2
Xylene, m,p-	2	< 1.0	< 1.0	<1	< 1.0	< 1.0	<1.0	< 1.0	< 0.4	< 1.0	< 1.0	< 1.0
Xylene, m,p,o-	2	< 1.1	< 1.1	<1.1			<1.1	< 1.1	< 0.4	< 1.1	< 1.1	< 1.1
Xylene, o-	40	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.1	< 0.5	< 0.5	< 0.5

ODWQS - Ontario Drinking Water Quality Objectives

Bold / highlighting - ODWQS Exceedance

Bold indicates detection

all results in ug/L unless otherwise stated

**Summary of Ground Water Quality - Volatile
Organic Compounds - Laxton Waste Disposal
Site**

Parameters	ODWQS	MW16-I	MW16-1	MW16-I	MW 16-1	MW 16-I	MW 16-1	MW 16-I	MW 16-I	MW 16-I	MW16-I	MW17
		18-Oct-19	21-Apr-20	13-Oct-20	15-Apr-21	13-Oct-21	12-Apr-22	16-Oct-22	26-Apr-23	11-Oct-23	11-Sep-15	
Acetone		< 30	< 30	< 30	< 30	< 30	< 30	< 30	< 30	<30	< 30	
Benzene	100	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	
Bromodichloromethane	200	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	<2	< 2	
Bromoform	60	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	<5	< 5	
Bromomethane	0.9	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	
Carbon Tetrachloride		< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	<0.2	< 0.2	
Chloroethane		< 3								<3		
Chloroform		< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	<1	< 1	
Chloromethane	700	< 2								<2		
Dibromochloromethane		< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	<2		
Dibromoethane,1,2- (Ethylene Dibromide)	5.0000	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	<0.2	< 0.2	
Dichlorobenzene,1,2-	2.5000	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	
Dichlorobenzene,1,3-	2.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	
Dichlorobenzene,1,4-	4	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	
Dichloroethane,1,1-	200	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	
Dichloroethane,1,2-	100	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	
Dichloroethene, cis-1,2-	200	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	
Dichloroethene, trans-1,2-	200	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	
Dichloroethylene,1,1-	40	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	
Dichloromethane (Methylene Chloride)	100	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	<0.5	< 5	
Dichloropropane,1,2-	0.7	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	
Dichloropropene, cis-1,3-		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	
Dichloropropene, trans-1,3-	7	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	
Ethylbenzene	8	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	
Methyl Ethyl Ketone	400	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	<20	< 20	
Methyl Isobutyl Ketone		< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	<20	< 20	
Methyl-t-butyl Ether	200	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	<2	< 2	
Monochlorobenzene (Chlorobenzene)	15	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	
Styrene	4	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	
Tetrachloroethane,1,1,1,2-	20	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	
Tetrachloroethane,1,1,2,2-	70	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	
Tetrachloroethylene	50	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	
Toluene	24	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	
Trichlorobenzene,1,2,4-	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	
Trichloroethane,1,1,1-	10	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	
Trichloroethane,1,1,2-	800	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	
Trichloroethylene	20	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	
Trichlorofluoromethane		< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	<5	< 5	
Vinyl Chloride	600	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	<0.2	< 0.5	
Xylene, m,p-	2	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<1	< 1.0	
Xylene, m,p,o-	2	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	<1.1		
Xylene, o-	40	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	

ODWQS - Ontario Drinking Water Quality Objectives

Bold / highlighting - ODWQS Exceedance

Bold indicates detection

all results in ug/L unless otherwise stated

**Summary of Ground Water Quality - Volatile
Organic Compounds - Laxton Waste Disposal
Site**

Parameters	ODWQS	MW17	MW17	MW17	MW20-I	MW20-II
		02-Jun-16	17-Oct-16	18-Oct-19	26-Apr-23	26-Apr-23
Acetone		<30	<30	< 30	< 30	< 30
Benzene	100	<0.5	<0.5	< 0.5	< 0.5	< 0.5
Bromodichloromethane	200	<2	<2	< 2	< 2	< 2
Bromoform	60	<5	<5	< 5	< 5	< 5
Bromomethane	0.9	<0.5	<0.5	< 0.5	< 0.5	< 0.5
Carbon Tetrachloride		<0.2	<0.2	< 0.2	< 0.2	< 0.2
Chloroethane				< 3	< 3	< 3
Chloroform		<1	<1	< 1	< 1	< 1
Chloromethane	700			< 2	< 2	< 2
Dibromochloromethane		<2	<2	< 2	< 2	< 2
Dibromoethane,1,2- (Ethylene Dibromide)	5.0000	<0.2	<0.2	< 0.2	< 0.2	< 0.2
Dichlorobenzene,1,2-	2.5000	<0.5	<0.5	< 0.5	< 0.5	< 0.5
Dichlorobenzene,1,3-	2.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5
Dichlorobenzene,1,4-	4	<0.5	<0.5	< 0.5	< 0.5	< 0.5
Dichloroethane,1,1-	200	<0.5	<0.5	< 0.5	< 0.5	< 0.5
Dichloroethane,1,2-	100	<0.5	<0.5	< 0.5	< 0.5	< 0.5
Dichloroethene, cis-1,2-	200	<0.5	<0.5	< 0.5	< 0.5	< 0.5
Dichloroethene, trans-1,2-	200	<0.5	<0.5	< 0.5	< 0.5	< 0.5
Dichloroethylene,1,1-	40	<0.5	<0.5	< 0.5	< 0.5	< 0.5
Dichloromethane (Methylene Chloride)	100	<5	<5	< 5	< 5	< 5
Dichloropropane,1,2-	0.7	<0.5	<0.5	< 0.5	< 0.5	< 0.5
Dichloropropene, cis-1,3-		<0.5	<0.5	< 0.5	< 0.5	< 0.5
Dichloropropene, trans-1,3-	7	<0.5	<0.5	< 0.5	< 0.5	< 0.5
Ethylbenzene	8	<0.5	<0.5	< 0.5	< 0.5	< 0.5
Methyl Ethyl Ketone	400	<20	<20	< 20	< 20	< 20
Methyl Isobutyl Ketone		<20	<20	< 20	< 20	< 20
Methyl-t-butyl Ether	200	<2	<2	< 2	< 2	< 2
Monochlorobenzene (Chlorobenzene)	15	<0.5	<0.5	< 0.5	< 0.5	< 0.5
Styrene	4	<0.5	<0.5	< 0.5	< 0.5	< 0.5
Tetrachloroethane,1,1,1,2-	20	<0.5	<0.5	< 0.5	< 0.5	< 0.5
Tetrachloroethane,1,1,2,2-	70	<0.5	<0.5	< 0.5	< 0.5	< 0.5
Tetrachloroethylene	50	<0.5	<0.5	< 0.5	< 0.5	< 0.5
Toluene	24	<0.5	<0.5	3.8	3.8	3.8
Trichlorobenzene,1,2,4-	0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5
Trichloroethane,1,1,1-	10	<0.5	<0.5	< 0.5	< 0.5	< 0.5
Trichloroethane,1,1,2-	800	<0.5	<0.5	< 0.5	< 0.5	< 0.5
Trichloroethylene	20	<0.5	<0.5	< 0.5	< 0.5	< 0.5
Trichlorofluoromethane		<5	<5	< 5	< 5	< 5
Vinyl Chloride	600	<0.5	<0.5	< 0.2	< 0.2	< 0.2
Xylene, m,p-	2	<1.0	<1.0	< 1.0	< 1.0	< 1.0
Xylene, m,p,o-	2	<1.1	<1.1	< 1.1	< 1.1	< 1.1
Xylene, o-	40	<0.5	<0.5	< 0.5	< 0.5	< 0.5

ODWQS - Ontario Drinking Water Quality Objectives

Bold / highlighting - ODWQS Exceedance

Bold indicates detection

all results in ug/L unless otherwise stated

**Summary of Surface Water Quality -
Volatile Organic Compounds
Laxton Waste Disposal Site**

Parameters	PWQO	SW F	SW F	SW F	SW F	SW F	SW F	SW F	SW F	SW F	SW F
		29-Jul-15	10-Sep-15	30-May-16	24-Aug-16	17-Oct-16	19-Apr-17	17-Jul-17	17-Oct-17	24-Apr-18	18-Jul-18
Acetone	-	< 30	< 2	<30	<30	<30	< 30	< 30	< 2	< 30	< 30
Benzene	100	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Bromodichloromethane	200	< 2	< 0.1	<2	<2	<2	< 2	< 2	< 0.1	< 2	< 2
Bromoform	60	< 5	< 0.1	<5	<5	<5	< 5	< 5	< 0.1	< 5	< 5
Bromomethane	0.9	< 0.5	< 0.3	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.3	< 0.5	< 0.5
Carbon Tetrachloride	-	< 0.2	< 0.2	<0.2	<0.2	<0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chloroethane	-		< 0.1								
Chloroform	-	< 1	< 0.3	<1	<1	<1	< 1	< 1	< 0.3	< 1	< 1
Chloromethane	700		< 0.3								
Dibromochloromethane	-	< 2	< 0.1	<2	<2	<2	< 2	< 2	< 0.1	< 2	< 2
Dibromoethane,1,2- (Ethylene Dibromide)	5.0	< 0.2	< 0.1	<0.2	<0.2	<0.2	< 0.2	< 0.2	< 0.1	< 0.2	< 20
Dichlorobenzene,1,2-	2.5	< 0.5	< 0.1	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.1	< 0.5	< 0.5
Dichlorobenzene,1,3-	2.5	< 0.5	< 0.1	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.1	< 0.5	< 0.5
Dichlorobenzene,1,4-	4	< 0.5	< 0.2	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.2	< 0.5	< 0.5
Dichloroethane,1,1-	200	< 0.5	< 0.1	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.1	< 0.5	< 0.5
Dichloroethane,1,2-	100	< 0.5	< 0.1	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.1	< 0.5	< 0.5
Dichloroethene, cis-1,2-	200	< 0.5	< 0.1	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.1	< 0.5	< 0.5
Dichloroethene, trans-1,2-	200	< 0.5	< 0.1	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.1	< 0.5	< 0.5
Dichloroethylene,1,1-	40	< 0.5	< 0.1	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.1	< 0.5	< 0.5
Dichloromethane (Methylene Chloride)	100	< 5	< 0.3	<5	<5	<5	< 5	< 5	< 0.3	< 5	< 0.5
Dichloropropane,1,2-	0.7	< 0.5	< 0.1	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.1	< 0.5	< 0.5
Dichloropropene, cis-1,3-	-	< 0.5	< 0.1	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.1	< 0.5	< 0.5
Dichloropropene, trans-1,3-	7	< 0.5	< 0.1	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.1	< 0.5	< 0.5
Ethylbenzene	8	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.2
Methyl Ethyl Ketone	400	< 20	< 1	<20	<20	<20	< 20	< 20	< 1	< 20	< 2
Methyl Isobutyl Ketone	-	< 20	< 1	<20	<20	<20	< 20	< 20	< 1	< 20	< 0.3
Methyl-t-butyl Ether	200	< 2	< 1	<2	<2	<2	< 2	< 2	< 1	< 2	< 20
Monochlorobenzene (Chlorobenzene)	15	< 0.5	< 0.2	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.2	< 0.5	< 0.5
Styrene	4	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Tetrachloroethane,1,1,1,2-	20	< 0.5	< 0.1	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.1	< 0.5	< 0.5
Tetrachloroethane,1,1,2,2-	70	< 0.5	< 0.4	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.4	< 0.5	< 0.5
Tetrachloroethylene	50	< 0.5	< 0.2	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.2	< 0.5	< 0.5
Toluene	0.8	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Trichlorobenzene,1,2,4-	0.5	< 0.5	< 0.2	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.2	< 0.5	< 0.5
Trichloroethane,1,1,1,-	10	< 0.5	< 0.1	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.1	< 0.5	< 0.5
Trichloroethane,1,1,1,2-	800	< 0.5	< 0.1	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.1	< 0.5	< 0.5
Trichloroethylene	20	< 0.5	< 0.1	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.1	< 0.5	< 0.5
Trichlorofluoromethane	-	< 5	< 0.1	<5	<5	<5	< 5	< 5	< 0.1	< 5	< 5
Vinyl Chloride	600	< 0.5	< 0.2	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.2	< 0.5	< 0.5
Xylene, m,p-	2	< 1.0	< 0.4	<1.0	<1.0	<1.0	< 1.0	< 1.0	< 0.4	< 1.0	< 1.0
Xylene, m,p,o-	2	< 1.1	< 0.4	<1.1	<1.1	<1.1	< 1.1	< 1.1	< 0.4	< 1.1	< 1.1
Xylene, o-	40	< 0.5	< 0.1	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.1	< 0.5	< 0.5

PWQO - Provincial Water Quality Objectives

Bold / highlighting - PWQO Exceedance

Bold indicates detection

all results in ug/L unless otherwise stated

**Summary of Surface Water Quality -
Volatile Organic Compounds
Laxton Waste Disposal Site**

Parameters	PWQO	SW F	SW F	SW F	SW F	SW F	SW F	SW F	SW F	SW F	SW F	SW F
		26-Sep-18	17-Apr-19	18-Jul-19	18-Oct-19	21-Apr-20	20-Jul-20	13-Oct-20	15-Apr-21	16-Aug-21	13-Oct-21	12-Apr-22
Acetone	-	< 30	< 30	< 30	< 30	< 30	< 30	< 30	< 30	< 30	< 30	< 30
Benzene	100	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Bromodichloromethane	200	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Bromoform	60	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Bromomethane	0.9	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Carbon Tetrachloride	-	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chloroethane	-											
Chloroform	-	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Chloromethane	700											
Dibromochloromethane	-	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Dibromoethane,1,2- (Ethylene Dibromide)	5.0	< 20	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Dichlorobenzene,1,2-	2.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dichlorobenzene,1,3-	2.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dichlorobenzene,1,4-	4	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dichloroethane,1,1-	200	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dichloroethane,1,2-	100	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dichloroethene, cis-1,2-	200	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dichloroethene, trans-1,2-	200	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dichloroethylene,1,1-	40	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dichloromethane (Methylene Chloride)	100	< 0.5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Dichloropropane,1,2-	0.7	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dichloropropene, cis-1,3-	-	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dichloropropene, trans-1,3-	7	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Ethylbenzene	8	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Methyl Ethyl Ketone	400	< 2	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
Methyl Isobutyl Ketone	-	< 0.3	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
Methyl-t-butyl Ether	200	< 20	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Monochlorobenzene (Chlorobenzene)	15	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Styrene	4	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Tetrachloroethane,1,1,1,2-	20	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Tetrachloroethane,1,1,2,2-	70	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Tetrachloroethylene	50	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Toluene	0.8	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Trichlorobenzene,1,2,4-	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethane,1,1,1-	10	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethane,1,1,2-	800	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethylene	20	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Trichlorofluoromethane	-	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Vinyl Chloride	600	< 0.5	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Xylene, m,p-	2	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Xylene, m,p,o-	2	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1
Xylene, o-	40	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5

PWQO - Provincial Water Quality Objectives

Bold / highlighting - PWQO Exceedance

Bold indicates detection

all results in ug/L unless otherwise stated

**Summary of Surface Water Quality -
Volatile Organic Compounds
Laxton Waste Disposal Site**

Parameters	PWQO	SW F	SW F	SWF	SWF	SWF
		20-Jul-22	16-Oct-22	26-Apr-23	31-Aug-23	11-Oct-23
Acetone	-	< 30	< 30	< 30	<30	<30
Benzene	100	< 0.5	< 0.5	< 0.5	<0.5	<0.5
Bromodichloromethane	200	< 2	< 2	< 2	<2	<2
Bromoform	60	< 5	< 5	< 5	<5	<5
Bromomethane	0.9	< 0.5	< 0.5	< 0.5	<0.5	<0.5
Carbon Tetrachloride	-	< 0.2	< 0.2	< 0.2	<0.2	<0.2
Chloroethane	-				<0.5	<0.5
Chloroform	-	< 1	< 1	< 1	<1	<1
Chloromethane	700				<2	<2
Dibromochloromethane	-	< 2	< 2	< 2	<2	<2
Dibromoethane,1,2- (Ethylene Dibromide)	5.0	< 0.2	< 0.2	< 0.2	<0.2	<0.2
Dichlorobenzene,1,2-	2.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5
Dichlorobenzene,1,3-	2.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5
Dichlorobenzene,1,4-	4	< 0.5	< 0.5	< 0.5	<0.5	<0.5
Dichloroethane,1,1-	200	< 0.5	< 0.5	< 0.5	<0.5	<0.5
Dichloroethane,1,2-	100	< 0.5	< 0.5	< 0.5	<0.5	<0.5
Dichloroethene, cis-1,2-	200	< 0.5	< 0.5	< 0.5	<0.5	<0.5
Dichloroethene, trans-1,2-	200	< 0.5	< 0.5	< 0.5	<0.5	<0.5
Dichloroethylene,1,1-	40	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dichloromethane (Methylene Chloride)	100	< 5	< 5	< 5	< 5	< 5
Dichloropropane,1,2-	0.7	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dichloropropene, cis-1,3-	-	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dichloropropene, trans-1,3-	7	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Ethylbenzene	8	< 0.5	< 0.5	< 0.5	<0.5	<0.5
Methyl Ethyl Ketone	400	< 20	< 20	< 20	<20	<20
Methyl Isobutyl Ketone	-	< 20	< 20	< 20	<20	<20
Methyl-t-butyl Ether	200	< 2	< 2	< 2	<2	<2
Monochlorobenzene (Chlorobenzene)	15	< 0.5	< 0.5	< 0.5	<0.5	<0.5
Styrene	4	< 0.5	< 0.5	< 0.5	<0.5	<0.5
Tetrachloroethane,1,1,1,2-	20	< 0.5	< 0.5	< 0.5	<0.5	<0.5
Tetrachloroethane,1,1,2,2-	70	< 0.5	< 0.5	< 0.5	<0.5	<0.5
Tetrachloroethylene	50	< 0.5	< 0.5	< 0.5	<0.5	<0.5
Toluene	0.8	< 0.5	< 0.5	< 0.5	<0.5	<0.5
Trichlorobenzene,1,2,4-	0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5
Trichloroethane,1,1,1-	10	< 0.5	< 0.5	< 0.5	<0.5	<0.5
Trichloroethane,1,1,2-	800	< 0.5	< 0.5	< 0.5	<0.5	<0.5
Trichloroethylene	20	< 0.5	< 0.5	< 0.5	<0.5	<0.5
Trichlorofluoromethane	-	< 5	< 5	< 5	<5	<5
Vinyl Chloride	600	< 0.2	< 0.2	< 0.2	<0.2	<0.2
Xylene, m,p-	2	< 1.0	< 1.0	< 1.0	<1	<1
Xylene, m,p,o-	2	< 1.1	< 1.1	< 1.1		
Xylene, o-	40	< 0.5	< 0.5	< 0.5	<0.5	<0.5

PWQO - Provincial Water Quality Objectives

Bold / highlighting - PWQO Exceedance

Bold indicates detection

all results in ug/L unless otherwise stated

Laxton Landfill Site - PFAS Summary

Location ID	Guideline*	MW3	MW4	MW6	MW8	MW10	MW12	MW13	MW14	MW16-I	MW16	MW20-I	MW20-II
Sample Date		11-Oct-23	11-Oct-23	11-Oct-23	11-Oct-23	11-Oct-23	11-Oct-23	11-Oct-23	11-Oct-23	11-Oct-23	11-Oct-23	11-Oct-23	11-Oct-23
Eicosafuoro-3-oxaundecane-1-sulfonic acid, 11-chloro- [11Cl-PF3OUdS]		<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Ethyl perfluorooctanesulfonamide, n- [NEtFOSA]		<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Ethyl perfluorooctanesulfonamidoacetic acid, n- [NEtFOSAA]		<u>0.02</u>	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Ethyl perfluorooctanesulfonamidoethanol, n- [NEtFOSE]		<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Fluorotelomer carboxylic acid, 3:3 [3:3 FTCA]		<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030
Fluorotelomer carboxylic acid, 5:3 [5:3 FTCA]		<u>0.026</u>	<u>0.036</u>	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Fluorotelomer carboxylic acid, 7:3 [7:3 FTCA]		<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Fluorotelomer sulfonic acid, 4:2 [4:2 FTS]		<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Fluorotelomer sulfonic acid, 6:2 [6:2 FTS]		<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Fluorotelomer sulfonic acid, 8:2 [8:2 FTS]		<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Hexadecafluoro-3-oxanone-1-sulfonic acid, 9-chloro- [9Cl-PF3ONS]		<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Hexafluoropropylene oxide dimer acid [HFPO-DA]		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Methyl perfluorooctanesulfonamide, N- [NMeFOSA]		<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Methyl perfluorooctanesulfonamidoacetic acid, n- [NMeFOSAA]		<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Methyl perfluorooctanesulfonamidoethanol, n- [NMeFOSE]		<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Nonafluoro-3,6-dioxaheptanoic acid [NFDHA]		<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Perfluoro-3-methoxypropanoic acid [PFMPA]		<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Perfluoro-4-methoxybutanoic acid [PFMBA]		<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Perfluorobutanesulfonic acid [PFBS]		<u>0.102</u>	<0.020	<0.020	<0.020	<0.020	<u>0.074</u>	<u>0.024</u>	<0.020	<u>0.064</u>	<u>0.064</u>	<u>0.056</u>	<0.020
Perfluorobutanoic acid [PFBA]		<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Perfluorodecane sulfonic acid [PFDS]		<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Perfluorodecanoic acid [PFDA]		<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Perfluorododecanesulfonic acid [PFDoS]		<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Perfluorododecanoic acid [PFDoA]		<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Perfluoroheptanesulfonic acid [PFHpS]		<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Perfluoroheptanoic acid [PFHpA]		<0.020	<0.020	<0.020	<0.020	<0.020	<u>0.024</u>	<0.020	<0.020	<u>0.026</u>	<u>0.022</u>	<u>0.024</u>	<0.020
Perfluorohexanesulfonic acid [PFHxS]		<u>0.038</u>	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Perfluorohexanoic acid [PFHxA]		<u>0.13</u>	<0.020	<0.020	<0.020	<0.020	<0.020	<u>0.032</u>	<0.020	<u>0.06</u>	<u>0.056</u>	<u>0.062</u>	<0.020
Perfluorononanesulfonic acid [PFNS]		<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Perfluorononanoic acid [PFNA]		<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Perfluorononanoic acid, 4,8-dioxa-3H- [ADONA]		<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Perfluorooctanesulfonamide [PFOSA]		<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Perfluorooctanesulfonic acid [PFOS]	0.2	<u>0.042</u>	<u>0.058</u>	<u>0.066</u>	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<u>0.028</u>	<0.020	<0.020
Perfluorooctanoic acid [PFOA]	0.6	<u>0.132</u>	<u>0.062</u>	<0.020	<0.020	<0.020	<u>0.02</u>	<0.020	<0.020	<u>0.022</u>	<u>0.048</u>	<u>0.034</u>	<0.020
Perfluoropentanesulfonic acid [PFPeS]		<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Perfluoropentanoic acid [PFPeA]		<u>0.174</u>	<0.020	<0.020	<0.020	<0.020	<u>0.098</u>	<u>0.05</u>	<0.020	<u>0.104</u>	<u>0.084</u>	<u>0.082</u>	<0.020
Perfluorotetradecanoic acid [PFTeDA]		<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Perfluorotridecanoic acid [PFTrDA]		<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Perfluoroundecanoic acid [PFUnA]		<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
perfluoro(2-ethoxyethane)sulfonic acid [PFEEESA]		<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
PFAS, total	0.07**	<u>0.664</u>	<u>0.156</u>	<u>0.066</u>	<1.1	<1.1	<u>0.216</u>	<u>0.106</u>	<1.1	<u>0.276</u>	<u>0.302</u>	<u>0.258</u>	<1.1

* Guideline for Canadian Drinking Water Quality

** Interim MECP guideline for drinking water

Bold & Underlined - Detected

Shaded - Exceeds Guideline

all results in µg/L



APPENDIX C

Ground Water Elevation & Landfill Gas Tables

**Summary of Water Level Elevations
Laxton Waste Disposal Site
The Corporation of the City of Kawartha Lakes**

[illegible]

Monitor No.	Ground Elevation (mASL)	Top of Pipe Elevation (mASL)	Date																	
			Sep-11	May-12	Jun-13	Oct-13	Apr-14	Sep-14	Jun-15	Sep-15	May-16	Oct-16	Apr-17	Oct-17	Apr-18	Oct-18	Apr-19	Oct-19	Apr-20	Oct-20
1	270.81	271.53	270.29	270.41	270.52	270.56	270.67	270.40	270.46	270.30	270.58	270.18	270.72	270.54	270.74	270.52	270.71	270.43	270.71	270.53
2	271.09	271.80	270.27	270.39	270.50	270.53	270.64	270.39	270.44	270.28	270.56	270.17	270.68	270.50	270.70	270.50	270.69	270.42	270.68	270.52
3	271.20	272.13	270.25	271.37	270.47	270.51	268.48	270.35	270.42	270.26	270.54	270.16	271.59	270.51	270.68	270.48	270.65	270.41	270.65	270.51
4	275.69	276.43	270.23	270.36	270.51	270.63	270.80	270.36	270.38	270.21	270.84	270.84	271.10	270.85	270.98	270.83	270.73	270.72	271.07	270.88
5	274.60	275.24	270.30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	274.48	275.24	271.16	270.50	270.62	270.71	270.82	270.48	270.59	270.35	270.70	270.27	270.94	270.70	271.00	270.76	270.84	270.51	270.87	270.66
7	277.32	278.25	269.88	270.45	270.75	270.77	270.93	270.60	269.80	269.55	270.65	Dry	270.65	270.65	269.54	-	270.75	270.43	270.75	270.53
8	274.24	274.95	273.63	270.58	270.72	270.74	270.97	270.54	270.62	270.42	270.78	270.28	270.95	270.65	270.97	270.63	270.55	270.49	270.89	270.59
9	274.05	274.33	273.48	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10	271.09	271.62	270.30	270.46	270.56	270.60	269.70	270.45	270.45	270.30	270.57	270.23	270.70	270.47	270.77	270.51	270.71	270.42	270.64	270.42
12	270.35	271.07	270.19	270.17	270.26	270.28	270.31	270.14	270.18	270.10	270.22	270.10	270.39	270.19	270.39	270.34	270.52	270.27	270.40	270.32
13	270.20	271.07	270.09	270.20	270.28	270.29	270.36	270.21	270.16	270.05	270.23	269.99	270.30	270.24	270.36	270.21	270.44	269.25	270.36	270.29
14	270.10	270.87	270.04	270.18	270.27	270.30	270.12	270.21	270.20	270.10	270.28	270.05	270.25	270.29	270.45	270.30	270.43	270.23	270.36	270.29
15	278.15	279.05	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
16-I	270.58	271.28		270.34	270.44	270.47	270.56	270.33	270.39	270.24	270.51	270.14	270.66	270.44	270.62	270.46	270.64	270.40	270.62	270.49
16	270.40	271.62	270.17	270.30	270.14	270.37	270.34	270.20	270.26	270.12	270.34	270.01	270.39	270.31	270.43	270.27	270.56	270.35	270.53	270.42
17	269.98	271.14	270.16	270.29	270.37	270.41	270.54	270.31	270.38	270.25	270.63	270.30	inaccessible - flooded beaver pond in area					270.71	flooded	Flooded
18	270.39	271.74	270.28	270.42	270.04	270.62	270.74	270.55	-	270.37	270.79	270.40	270.80	270.87	271.08	270.82	270.90	270.74	flooded	270.86
19	270.49	271.51	-	270.36	270.43	270.50	270.60	270.35	270.41	270.26	270.53	270.15	270.64	270.50	270.67	270.47	270.66	270.41	270.64	270.50
20-I	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20-II	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Monitor No.	Ground Elevation (mASL)	Top of Pipe Elevation (mASL)	Date					
			Apr-21	Oct-21	Apr-22	Oct-22	Apr-23	Oct-23
1	270.81	271.53	270.63	270.49	270.68	270.46	270.72	270.45
2	271.09	271.80	270.62	270.48	270.65	270.45	270.70	270.44
3	271.20	272.13	270.60	270.47	270.63	270.44	270.75	270.51
4	275.69	276.43	270.89	270.78	270.80	270.74	271.03	270.71
5	274.60	275.24	-	-	-	-	-	-
6	274.48	275.24	270.76	270.59	270.80	271.03	270.89	270.52
7	277.32	278.25	270.66	270.49	270.71	270.45	270.77	270.44
8	274.24	274.95	270.77	270.56	270.83	270.54	270.93	270.49
9	274.05	274.33	-	-	-	-	-	-
10	271.09	271.62	270.62	270.44	270.62	270.32	270.67	270.36
12	270.35	271.07	270.38	270.28	270.40	270.27	270.49	270.35
13	270.20	271.07	270.38	270.27	270.37	270.27	270.42	270.26
14	270.10	270.87	270.28	270.26	270.22	270.21	270.26	270.32
15	278.15	279.05	Dry	Dry	Dry	Dry	Dry	Dry
16-I	270.58	271.28	270.58	270.45	270.61	270.42	270.63	270.41
16	270.40	271.62	270.50	270.38	270.54	270.36	270.67	270.48
17	269.98	271.14	flooded	flooded	flooded	flooded	flooded	flooded
18	270.39	271.74	270.93	270.77	flooded	flooded	flooded	flooded
19	270.49	271.51	270.55	270.46	270.63	270.44	270.65	270.42
20-I	-	-	-	-	-	-	-	-
20-II	-	-	-	-	-	-	-	-

Gas Monitoring Data Summary (2015-2023)
Laxton Waste Disposal Site

Date	GP-1		GP-2	
	%Volume	%LEL	%Volume	%LEL
16-Jan-15	0	0	0	0
18-Feb-15	0	0	0	0
17-Mar-15	0	0	0	0
09-Jun-15	0	0	0	0
29-Jul-15	0	0	0	0
11-Sep-15	0	0	0	0
27-Jan-16	0	0	0	0
22-Feb-16	0	0	0	0
29-Mar-16	0	0	0	0
31-May-16	0	0	0	0
18-Aug-16	0	0	0	0
17-Oct-16	0	0	0	0
13-Dec-16	0	0	0	0
26-Jan-17	0	0	0	0
08-Feb-17	0	0	0	0
01-Mar-17	0	0	0	0
29-Mar-17	0	0	0	0
19-Apr-17	0	0	0	0
17-Jul-17	0	0	0	0
17-Oct-17	0	0	0	0
08-Dec-17	0	0	0	0
17-Jan-18	0	0	0	0
28-Feb-18	0	0	0	0
19-Mar-18	0	0	0	0
24-Apr-18	0	0	0	0
18-Jul-18	0	0	0	0
26-Sep-18	0	0	<0.1%	0
10-Dec-18	0	0	0	0
15-Jan-19	0	0	0	0
11-Feb-19	0	0	0	0
12-Mar-19	0	0	0	0
17-Apr-19	0	0	0	0
26-Jul-19	0	0	0	0
18-Oct-19	0	0	0	0
03-Dec-19	0	0	0	0
14-Jan-20	0	0	0	0
27-Feb-20	0	0	0	0
21-Apr-20	0	0	0	0
20-Jul-20	0	0	0	0
13-Oct-20	0	0	0	0
22-Jan-21	0	0	0	0
19-Feb-21	0	0	0	0
10-Mar-21	0	0	0	0
15-Apr-21	0	0	0	0
16-Aug-21	0	0	0	0
13-Oct-21	0	0	0	0

Gas Monitoring Data Summary (2015-2023)
Laxton Waste Disposal Site

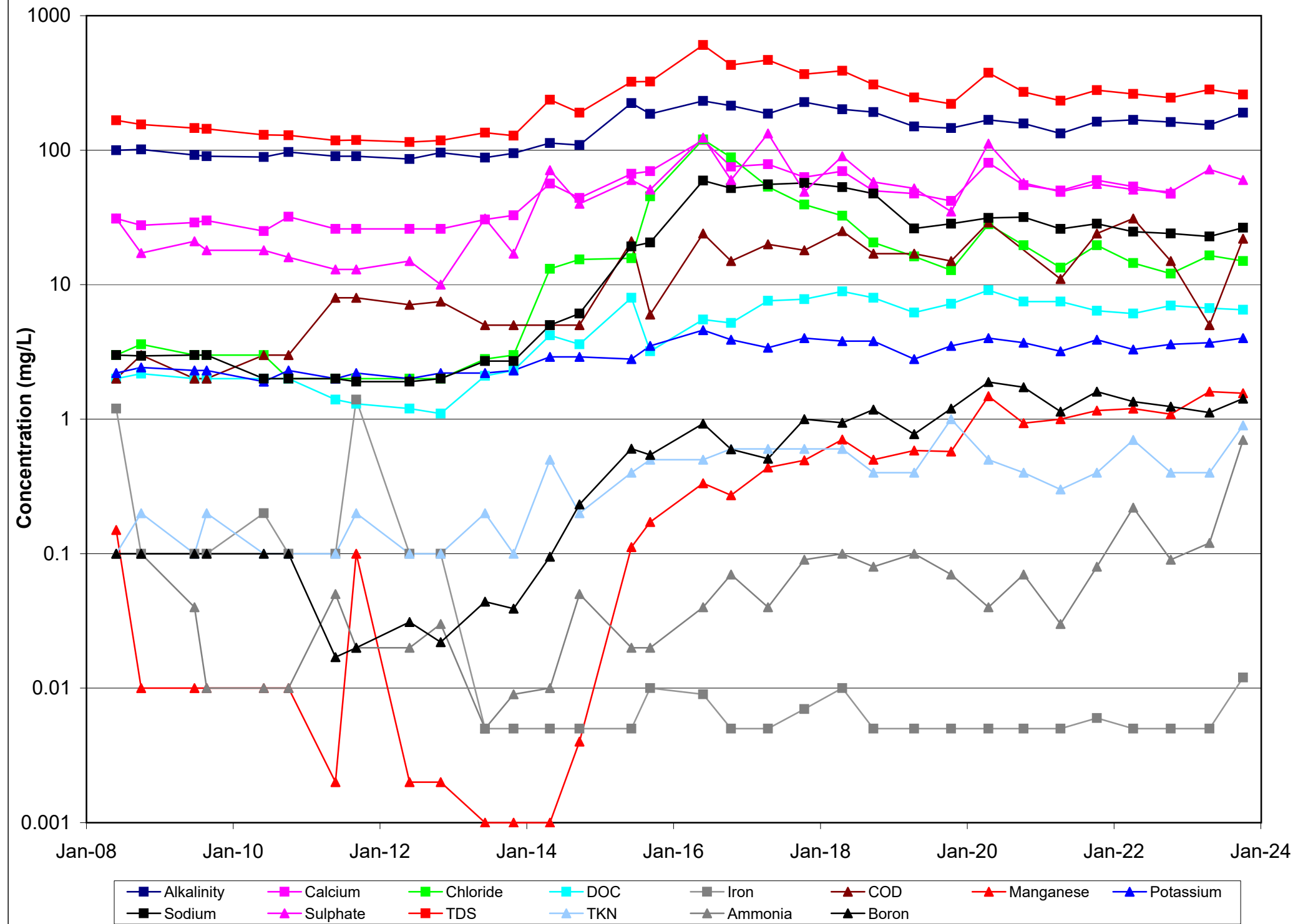
Date	GP-1		GP-2	
	%Volume	%LEL	%Volume	%LEL
16-Dec-21	0	0	0	0
12-Apr-22	0	0	0	0
20-Jul-22	0	0	0	0
16-Oct-22	0	0	0	0
02-Dec-22	0	0	0	0
06-Jan-23	0	0	0	0
15-Feb-23	0	0	0	0
26-Apr-23	0	0	0	0
31-Aug-23	0	0	0	0
11-Oct-23	0	0	0	0



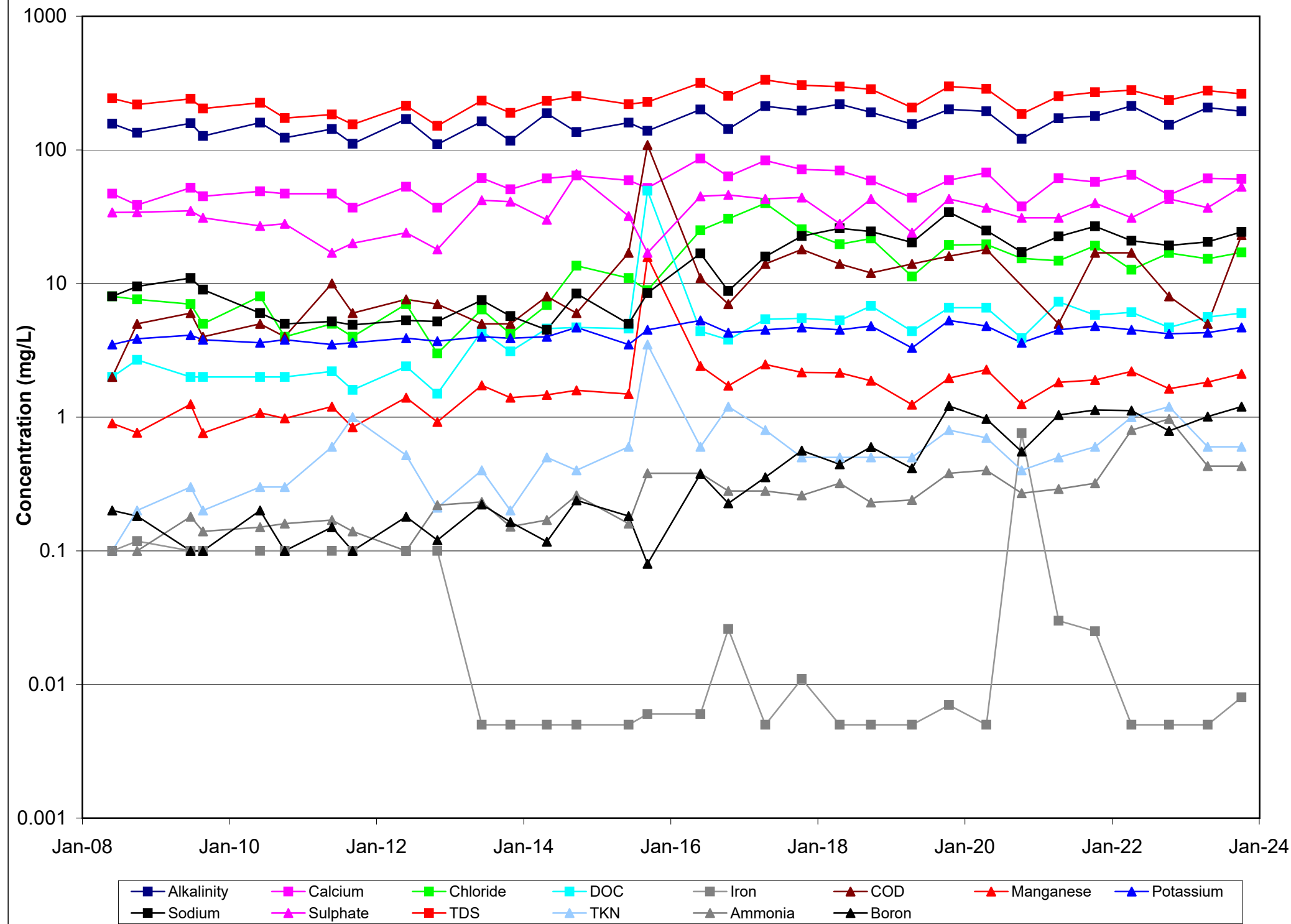
APPENDIX D

Chemistry Over Time Graphs

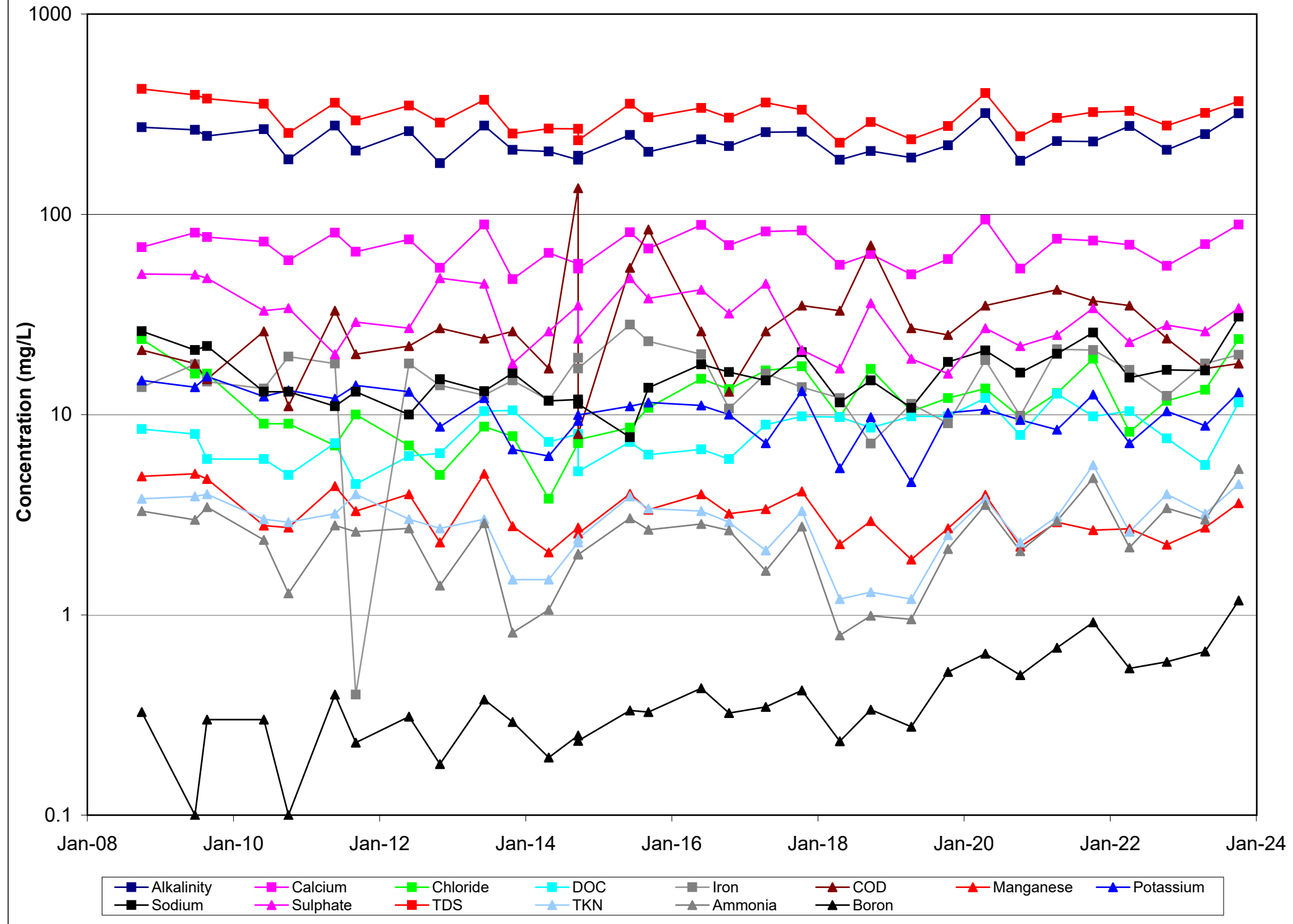
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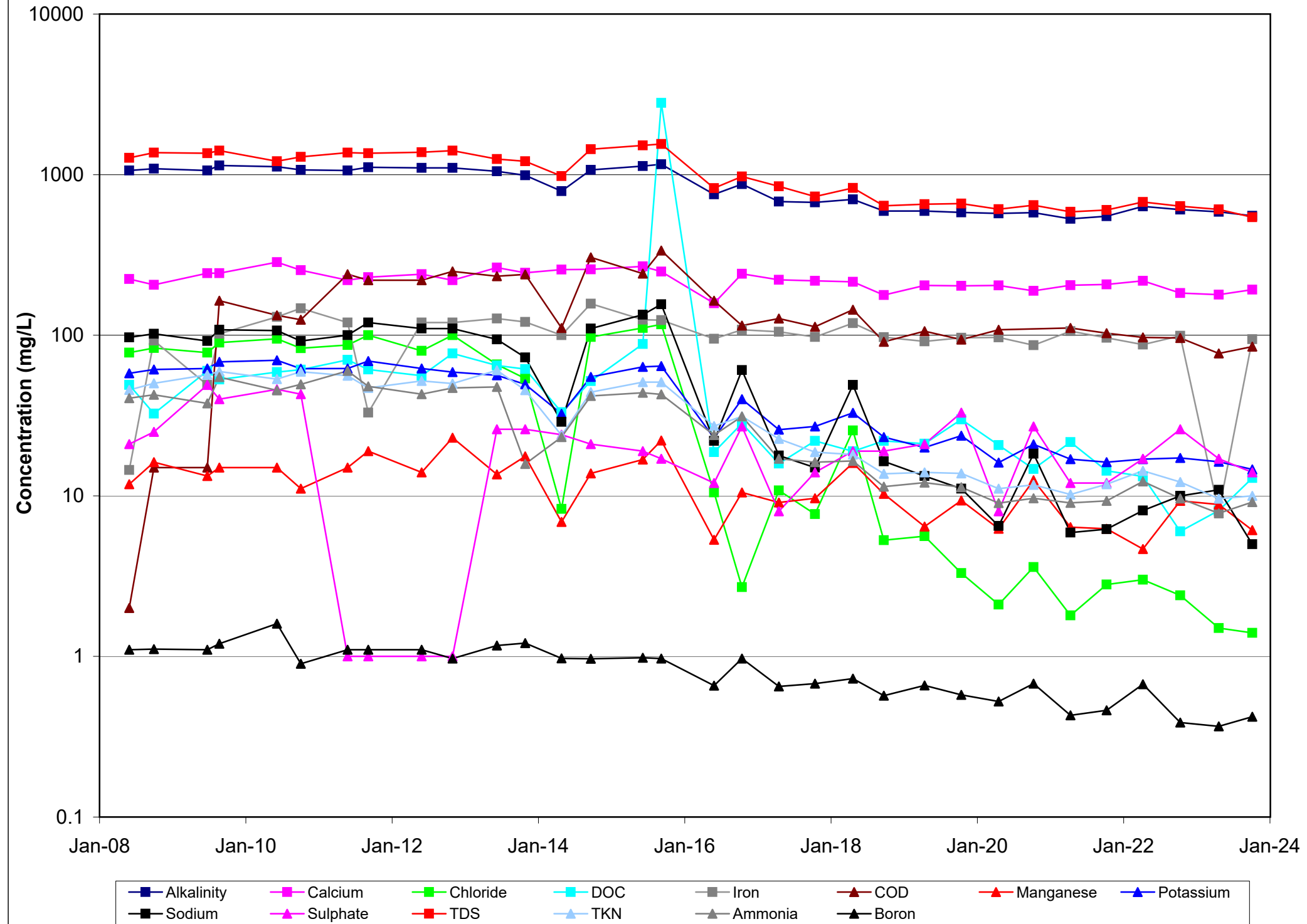
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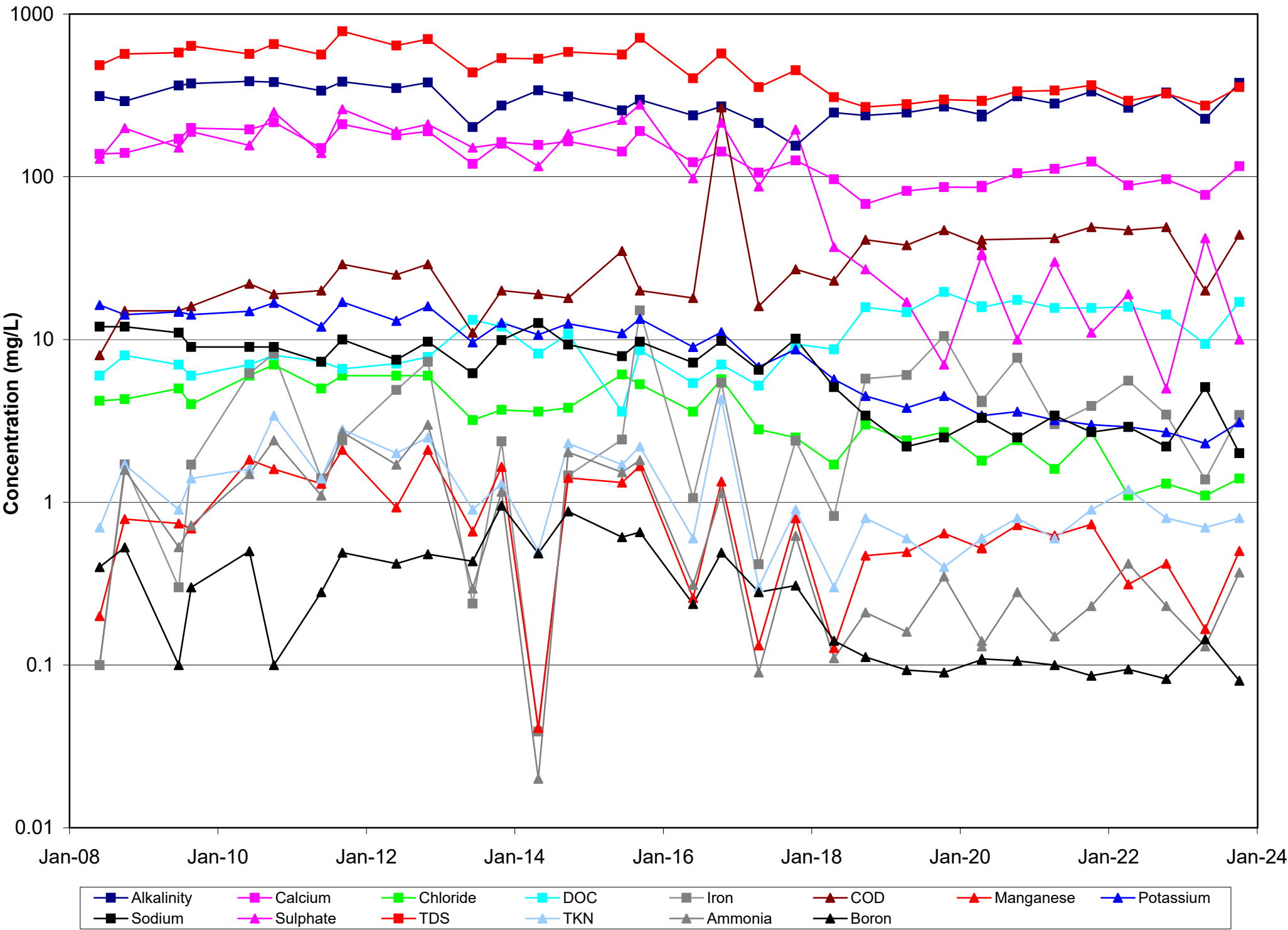
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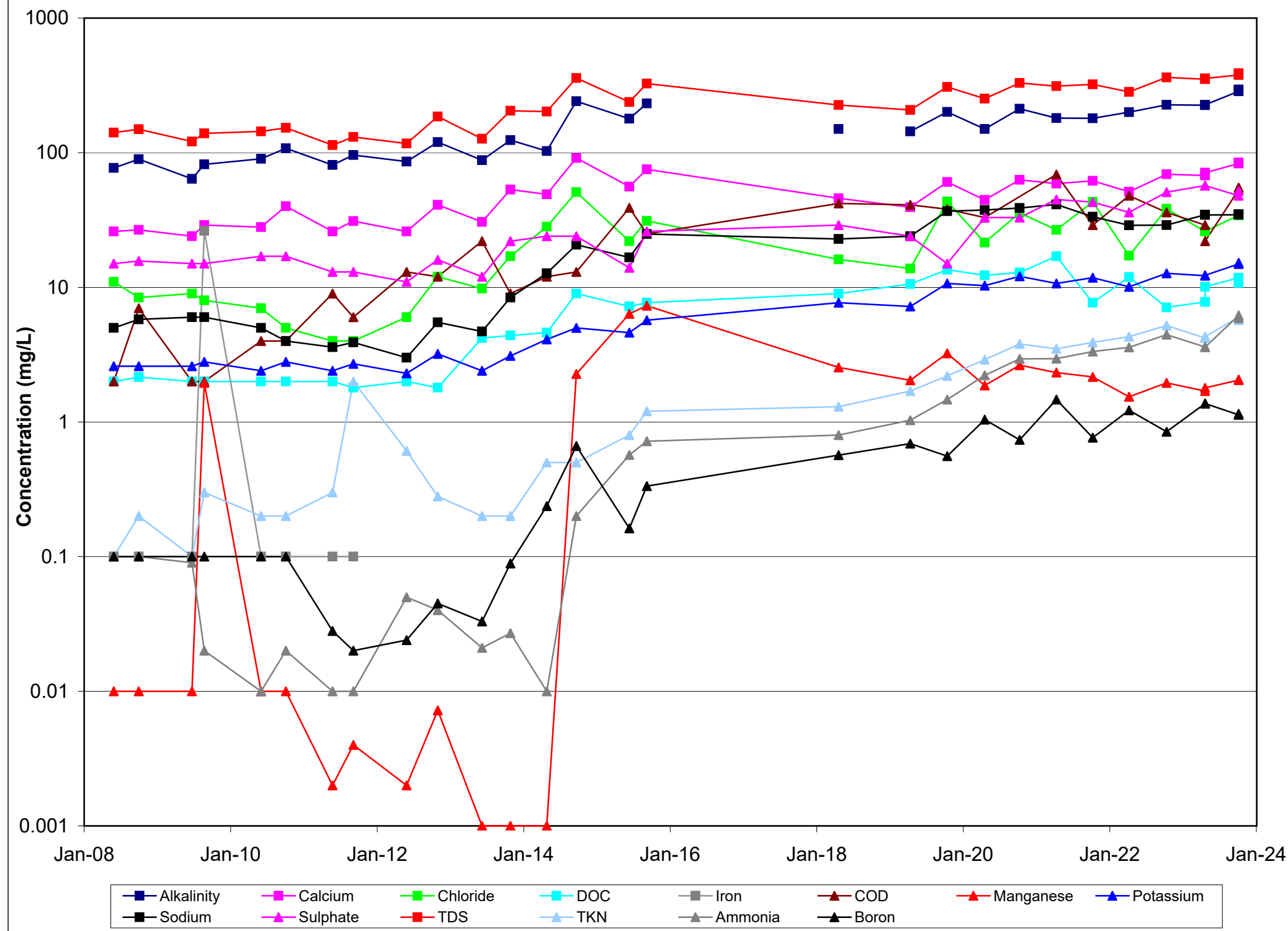
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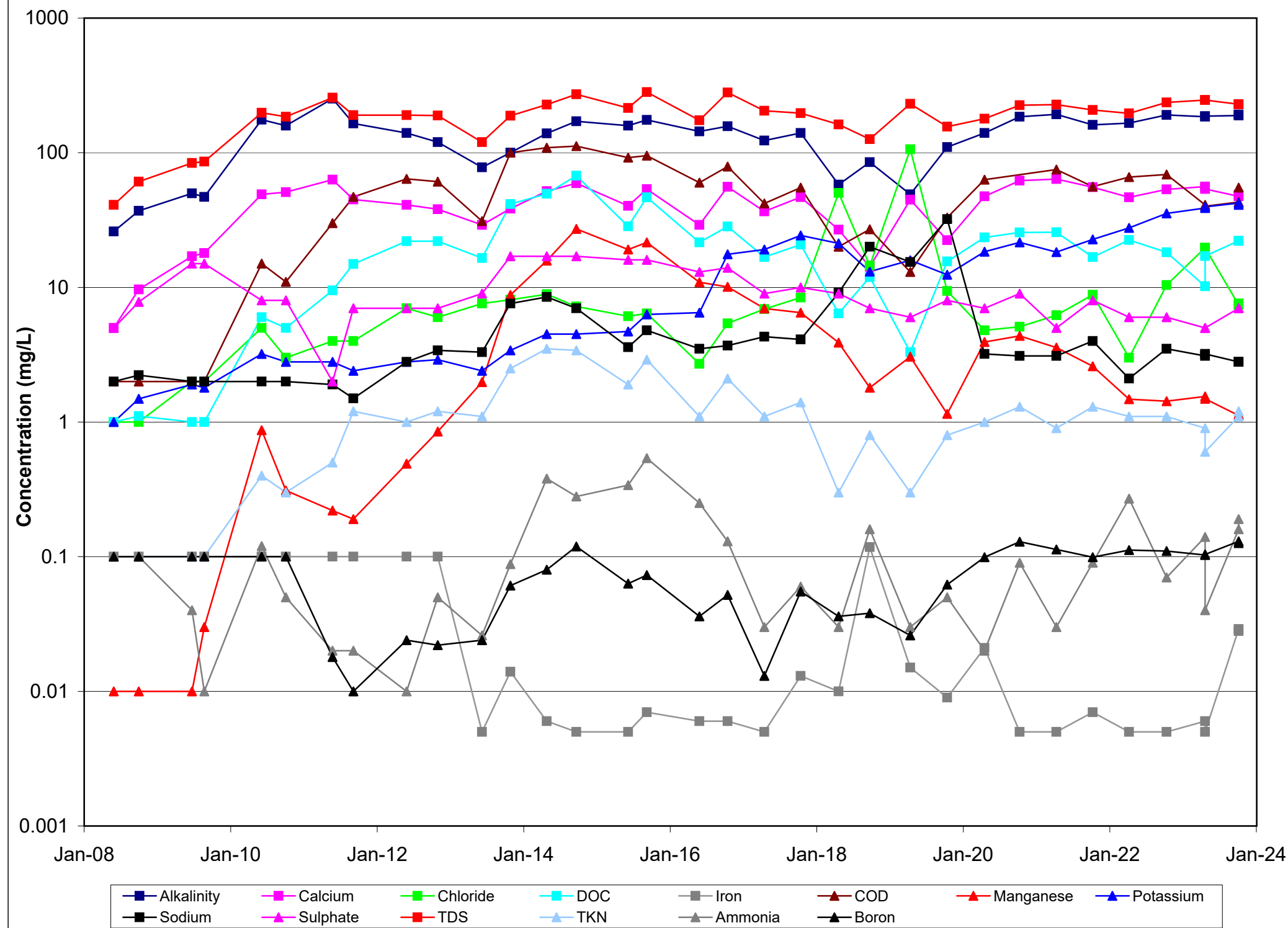
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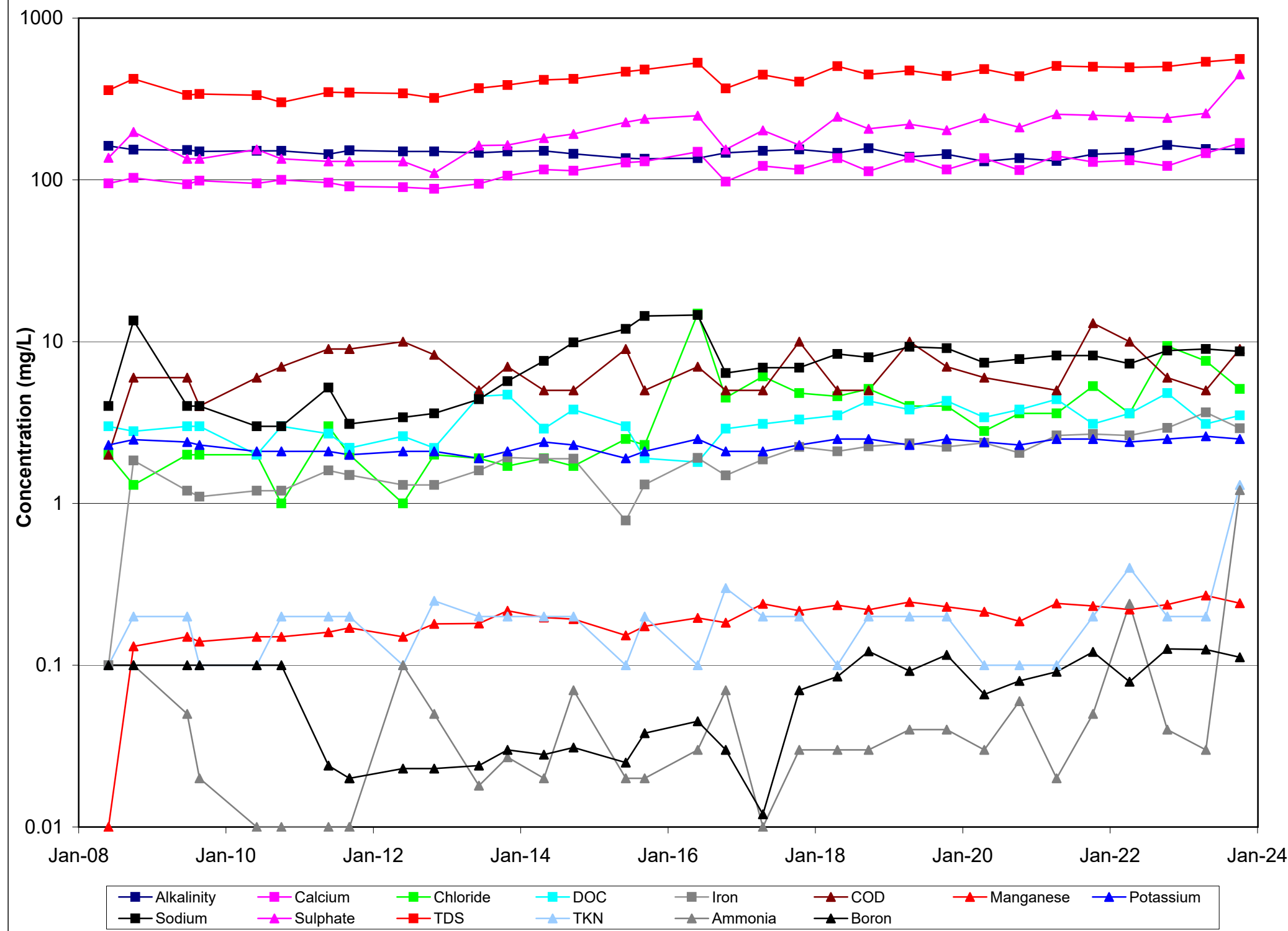
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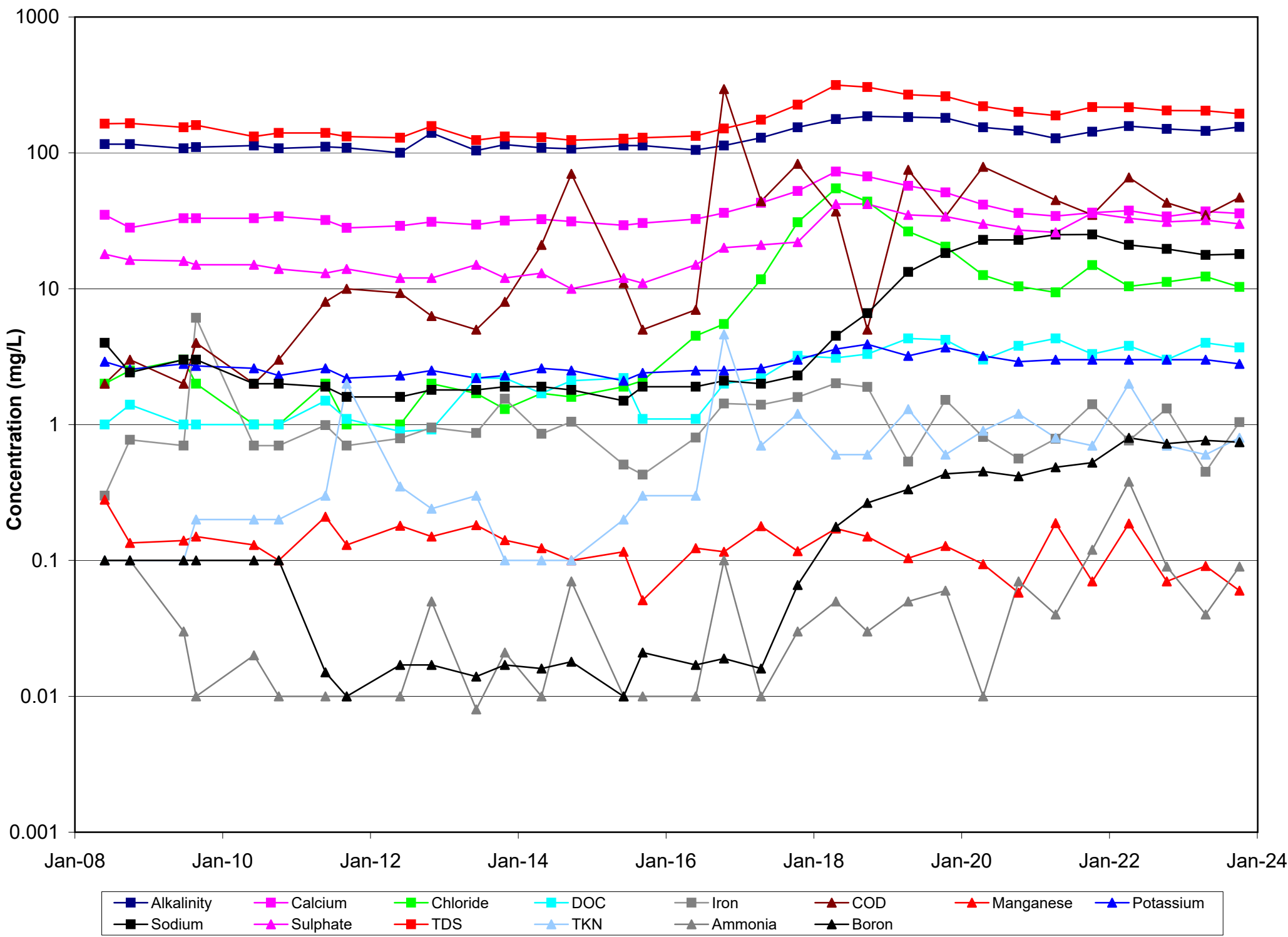
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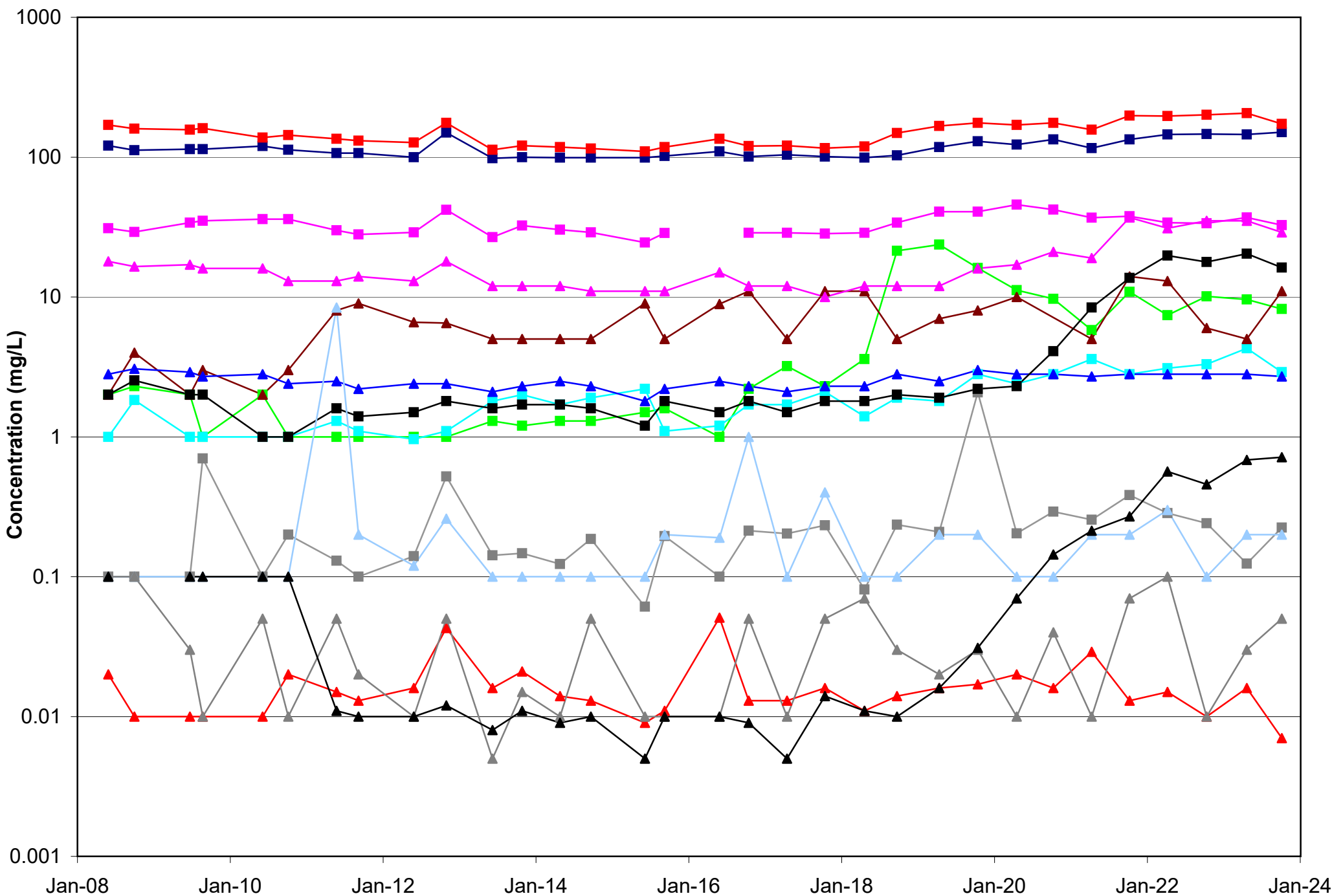
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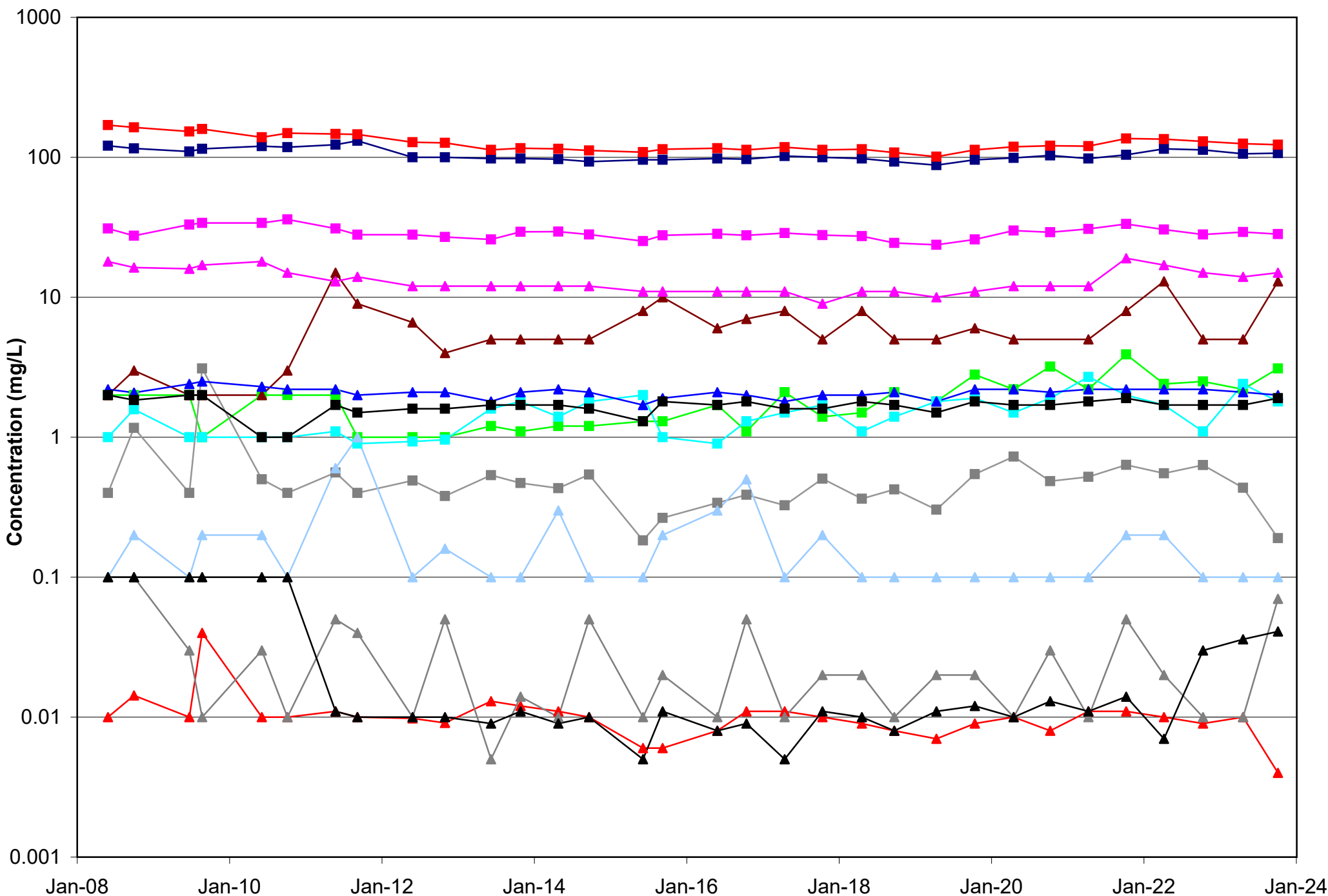
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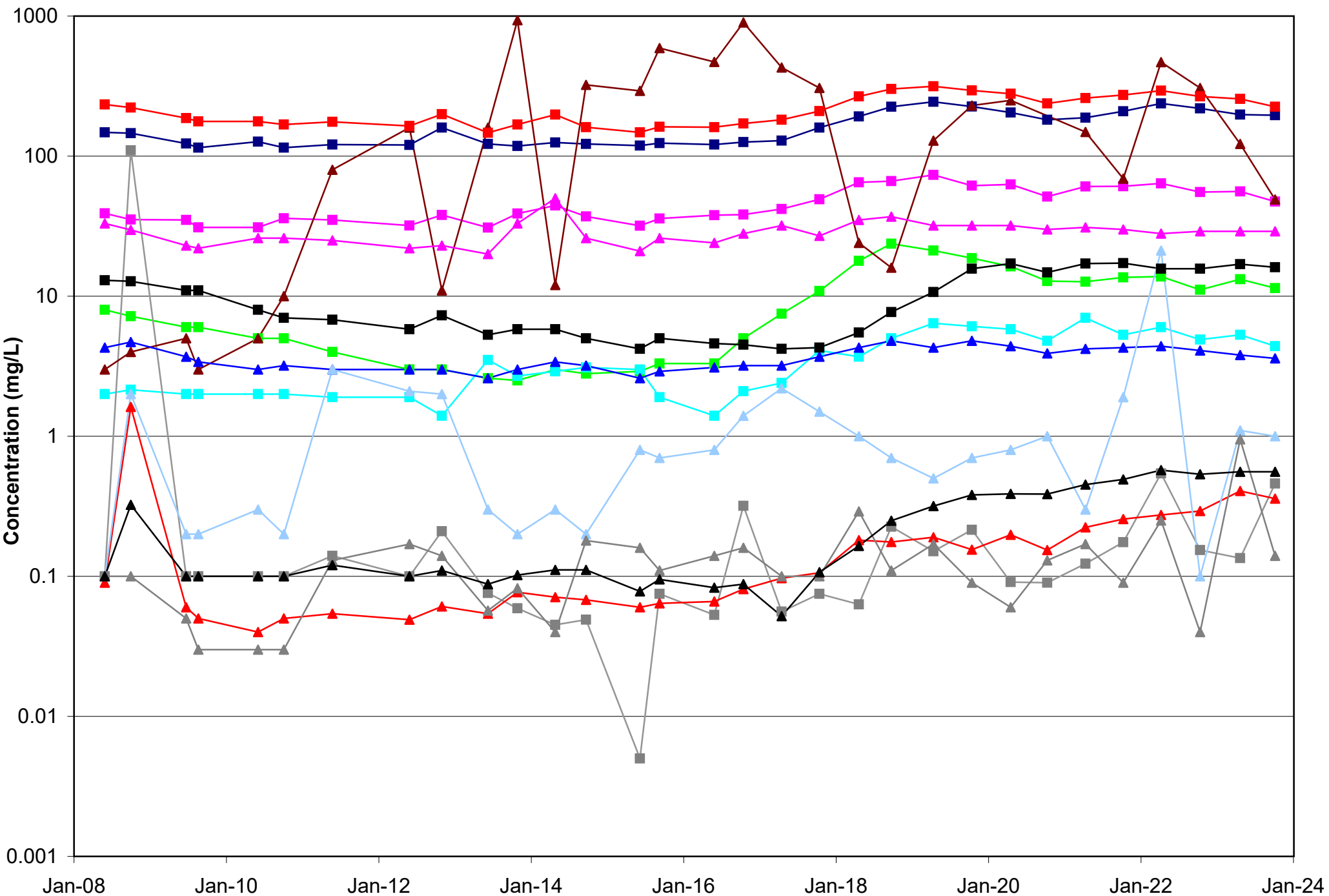
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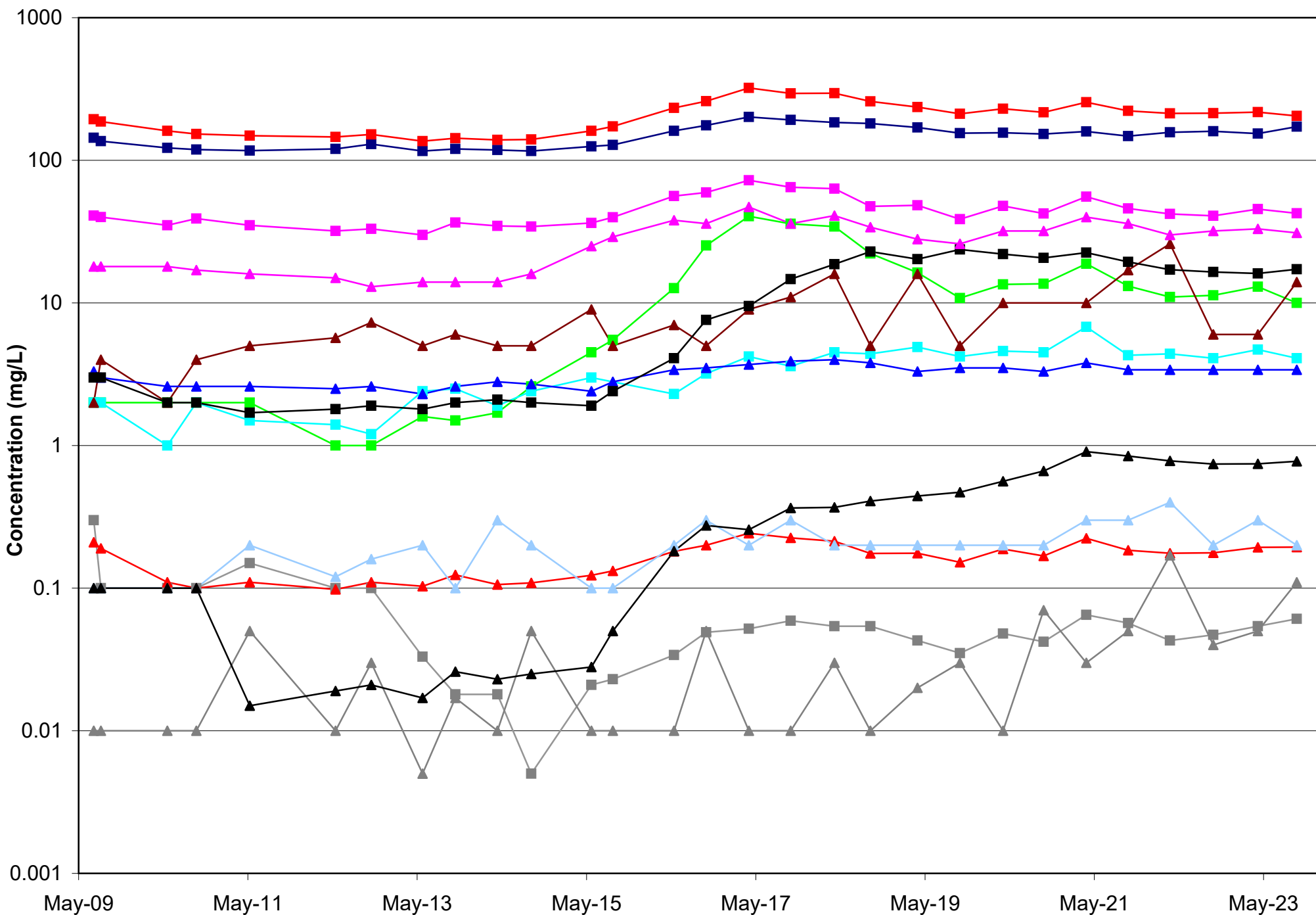
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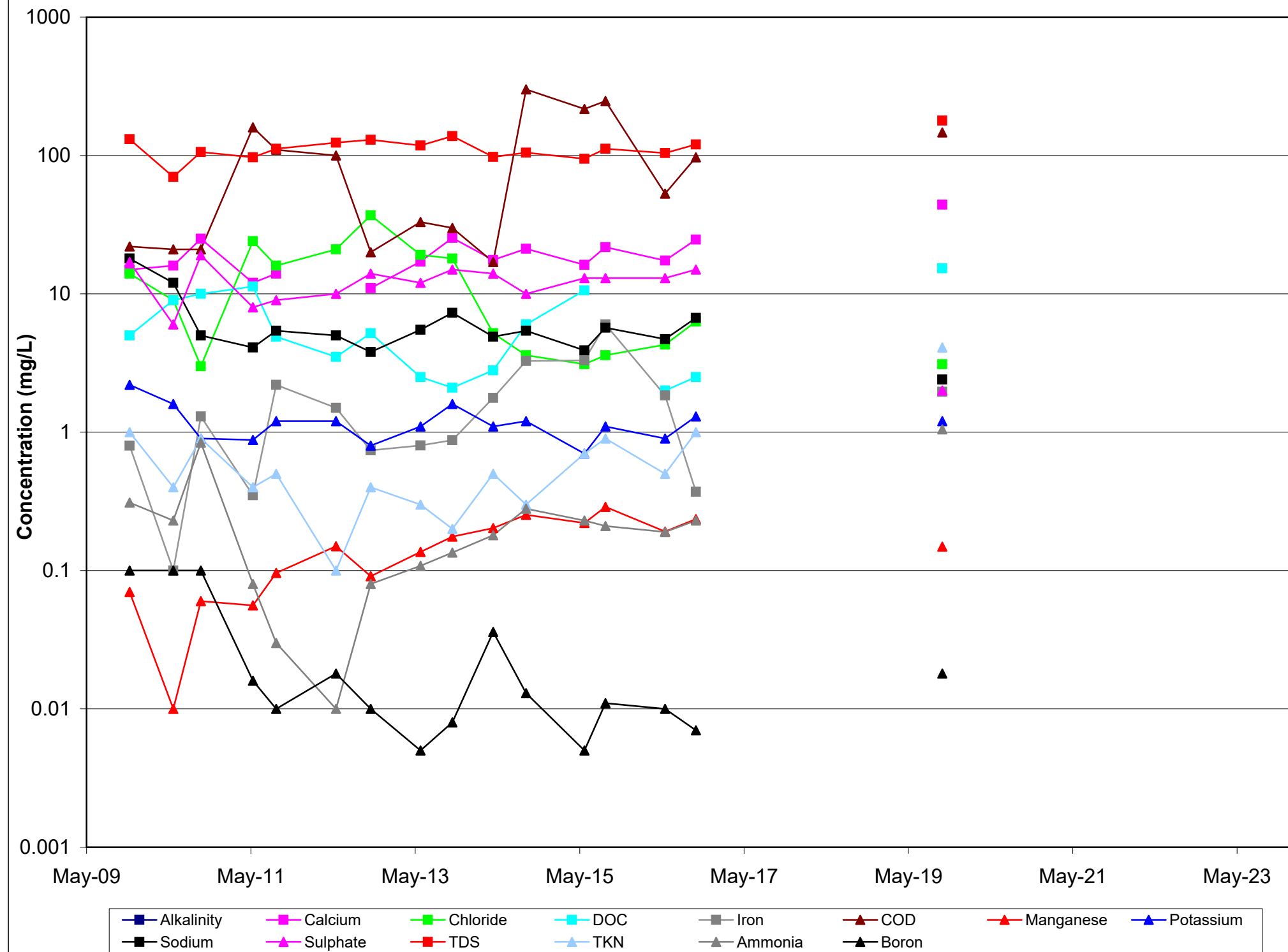
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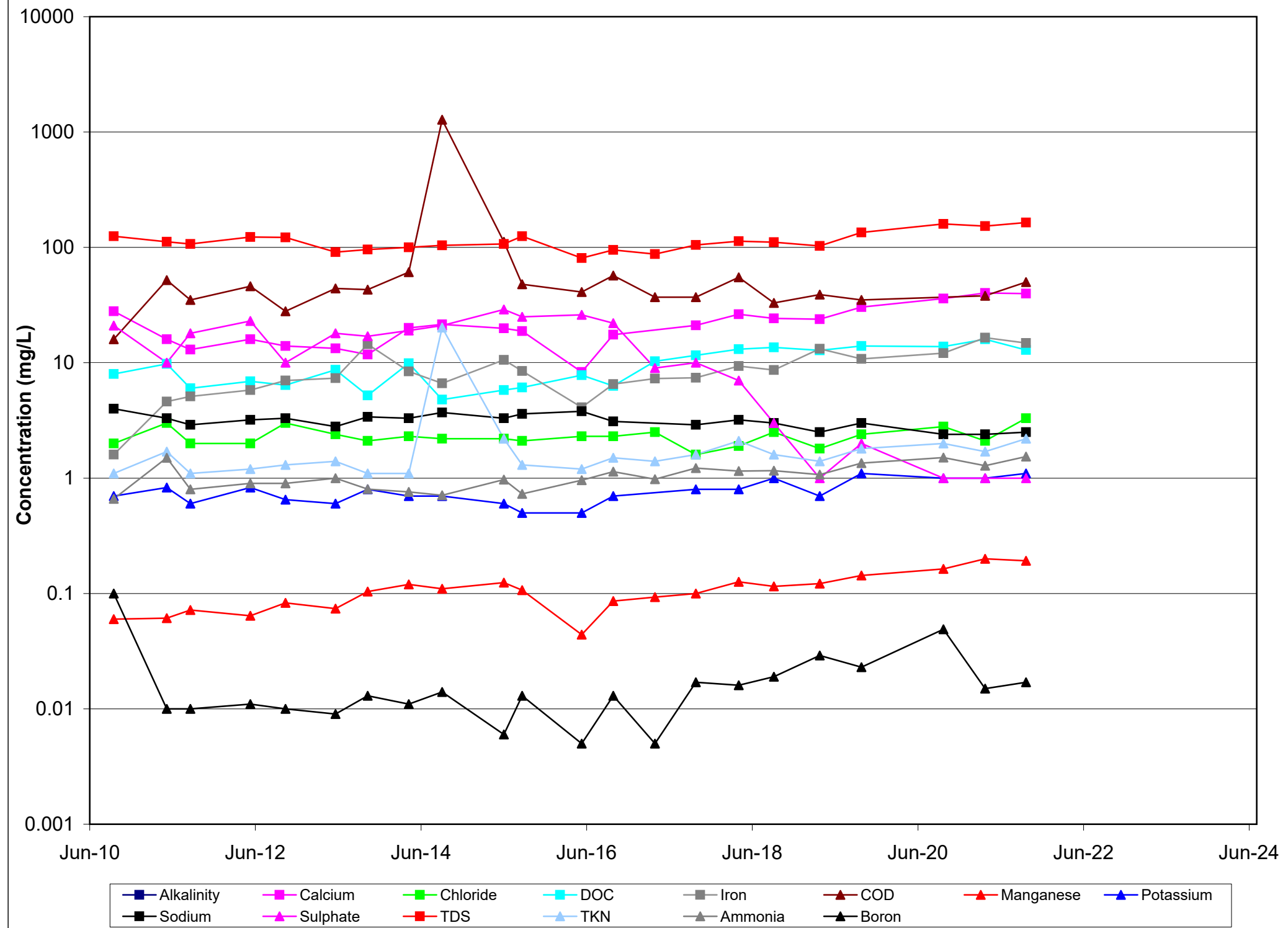
MW16-1



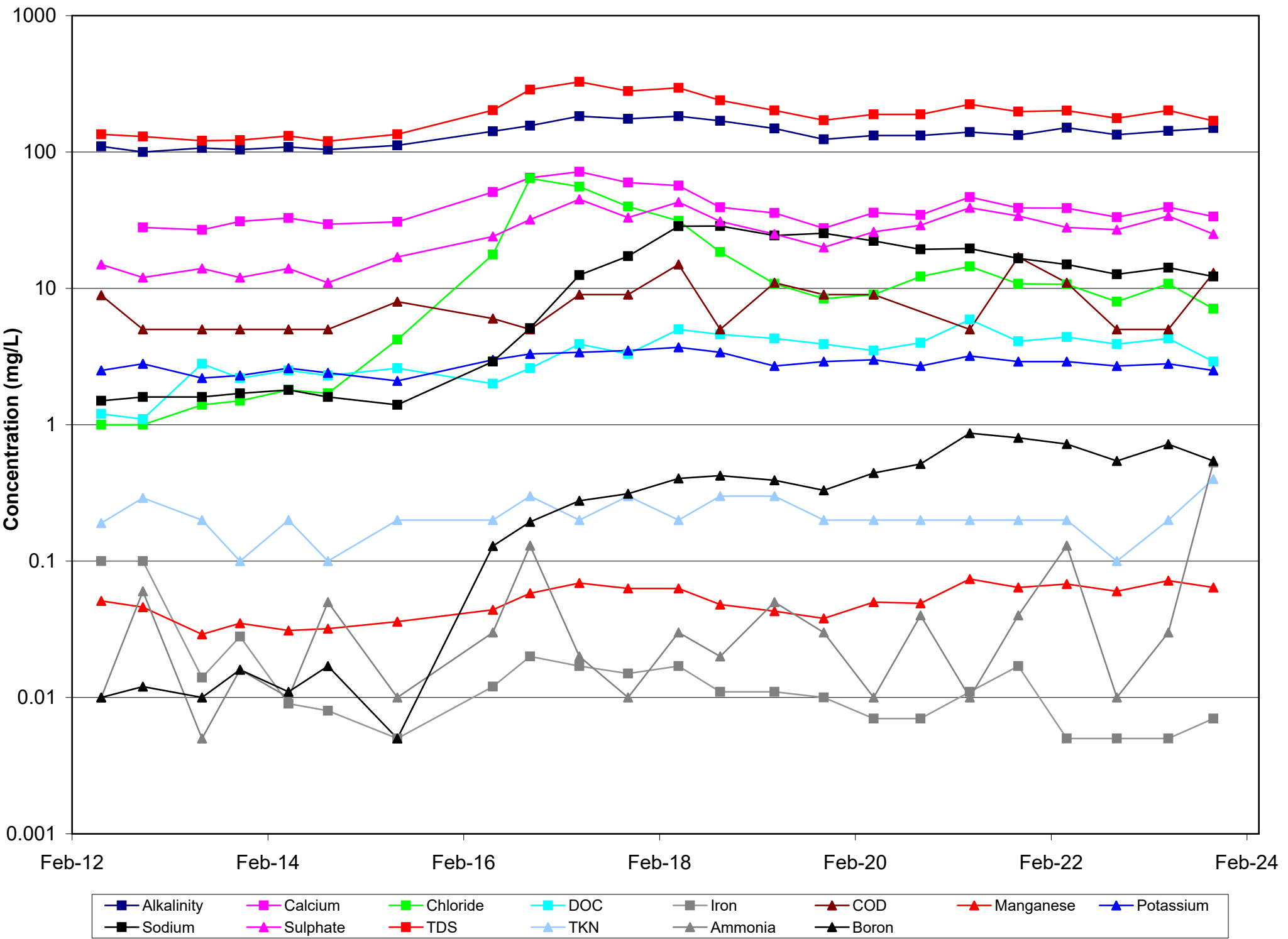
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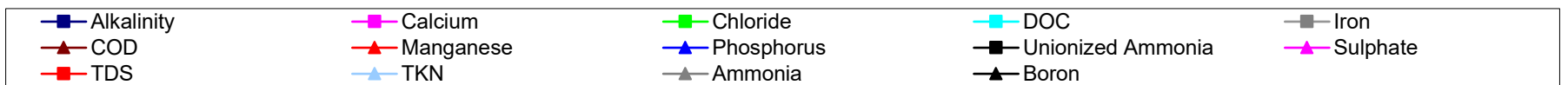
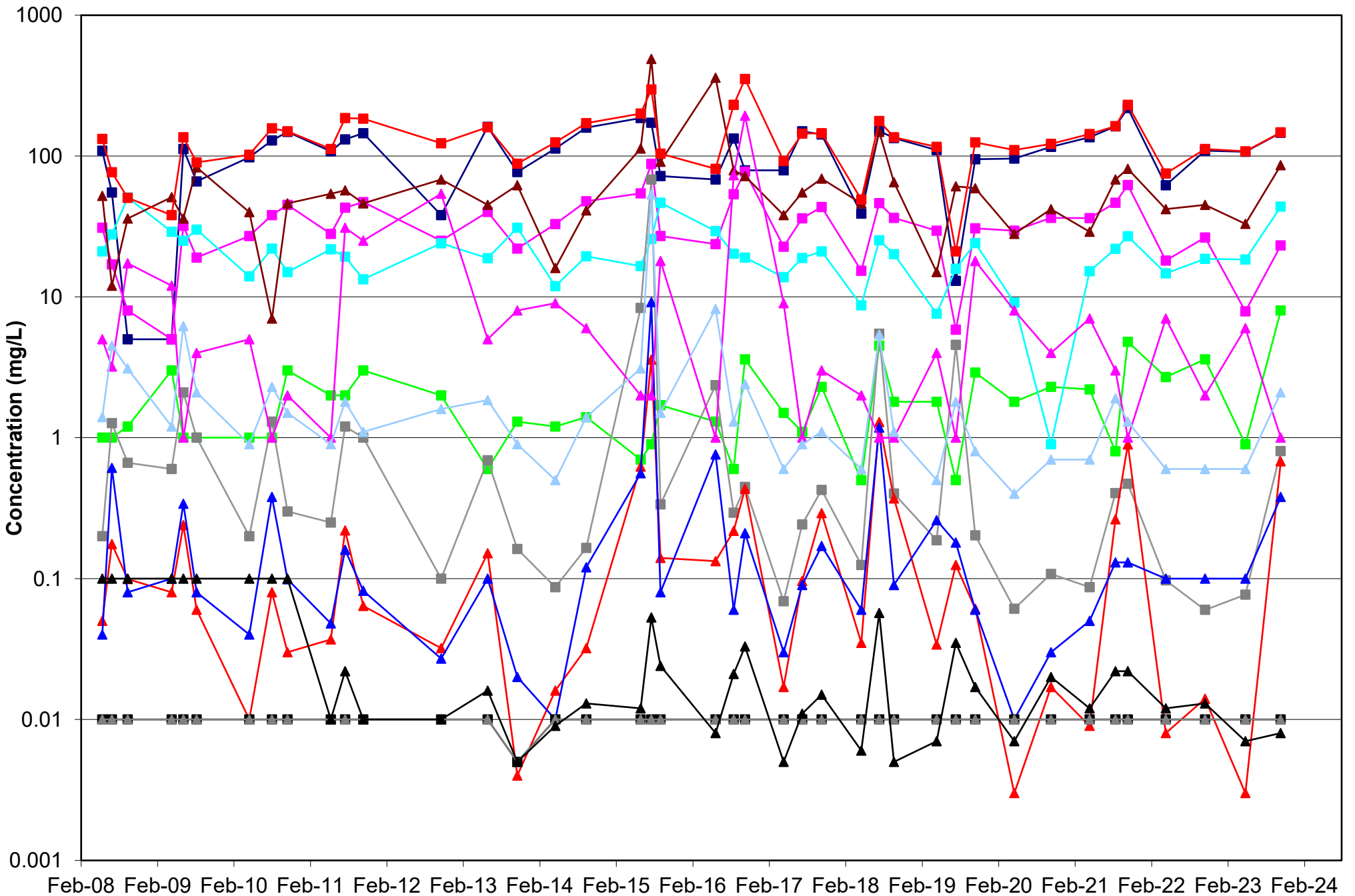
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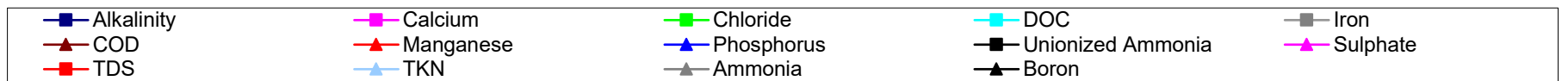
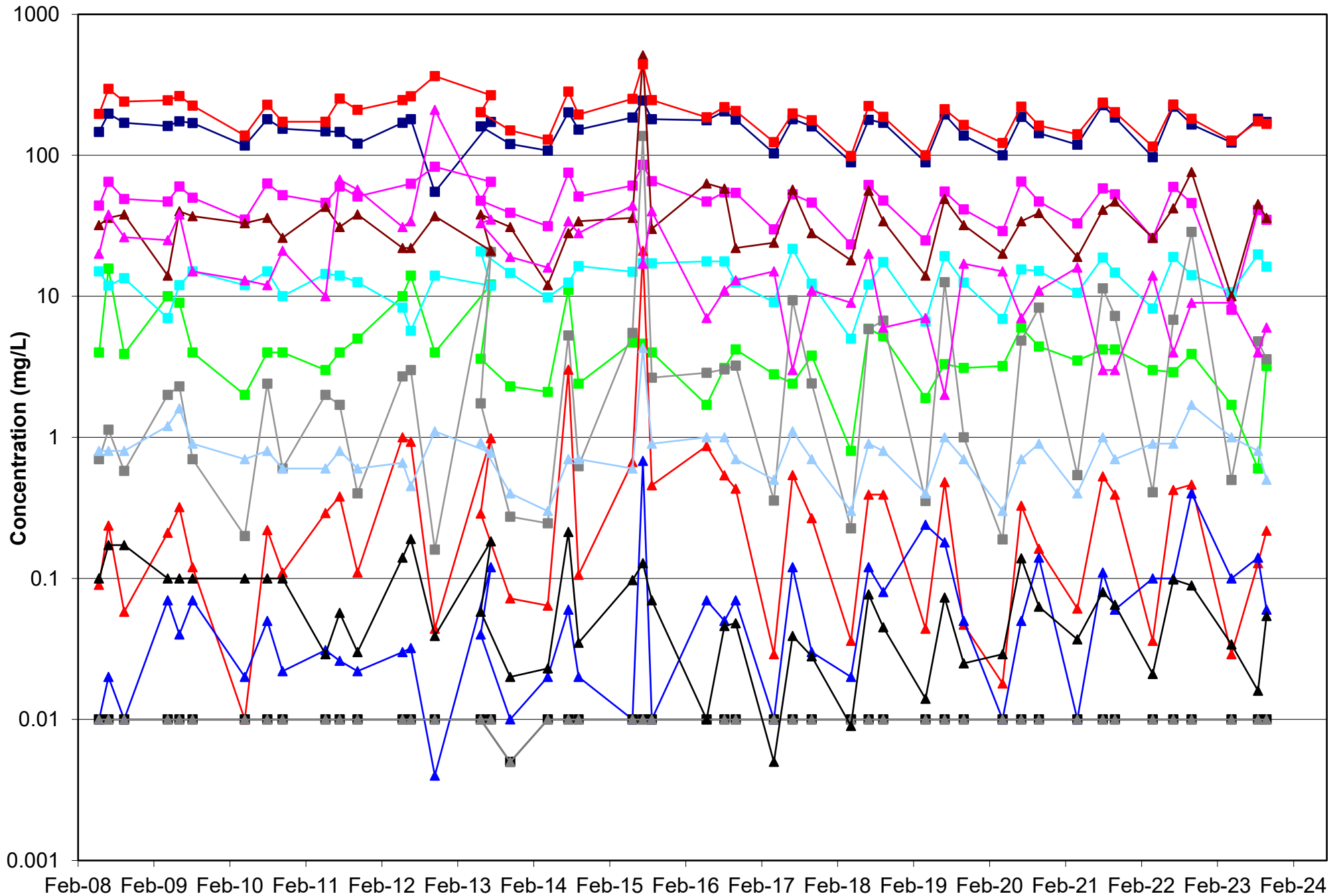
MW19



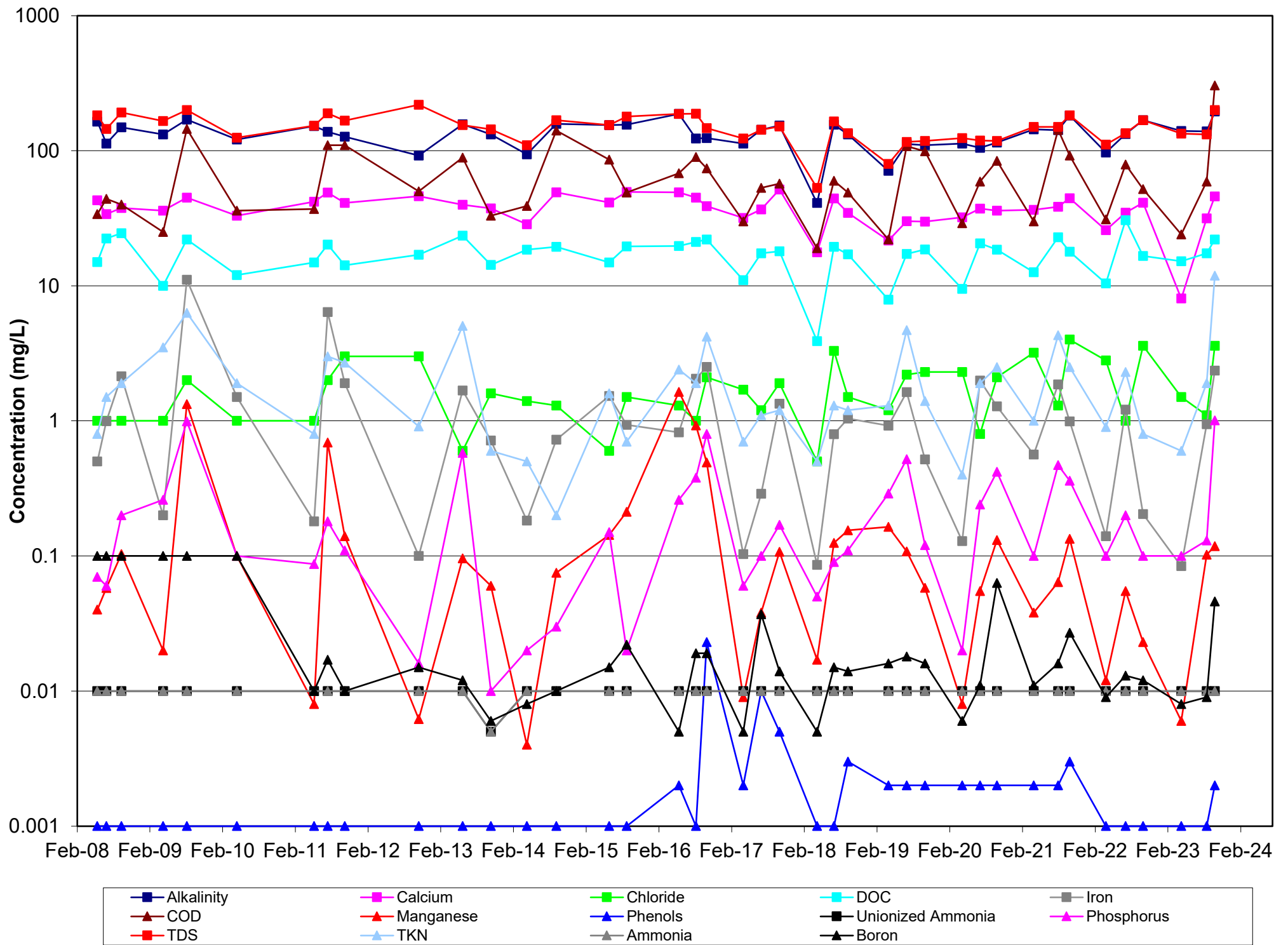
SWA



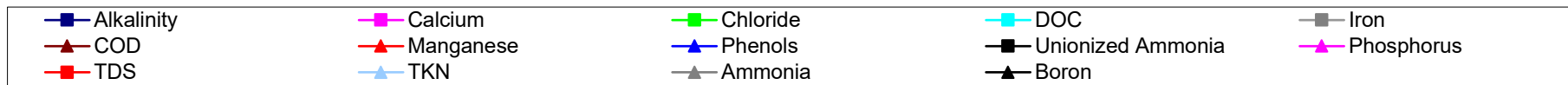
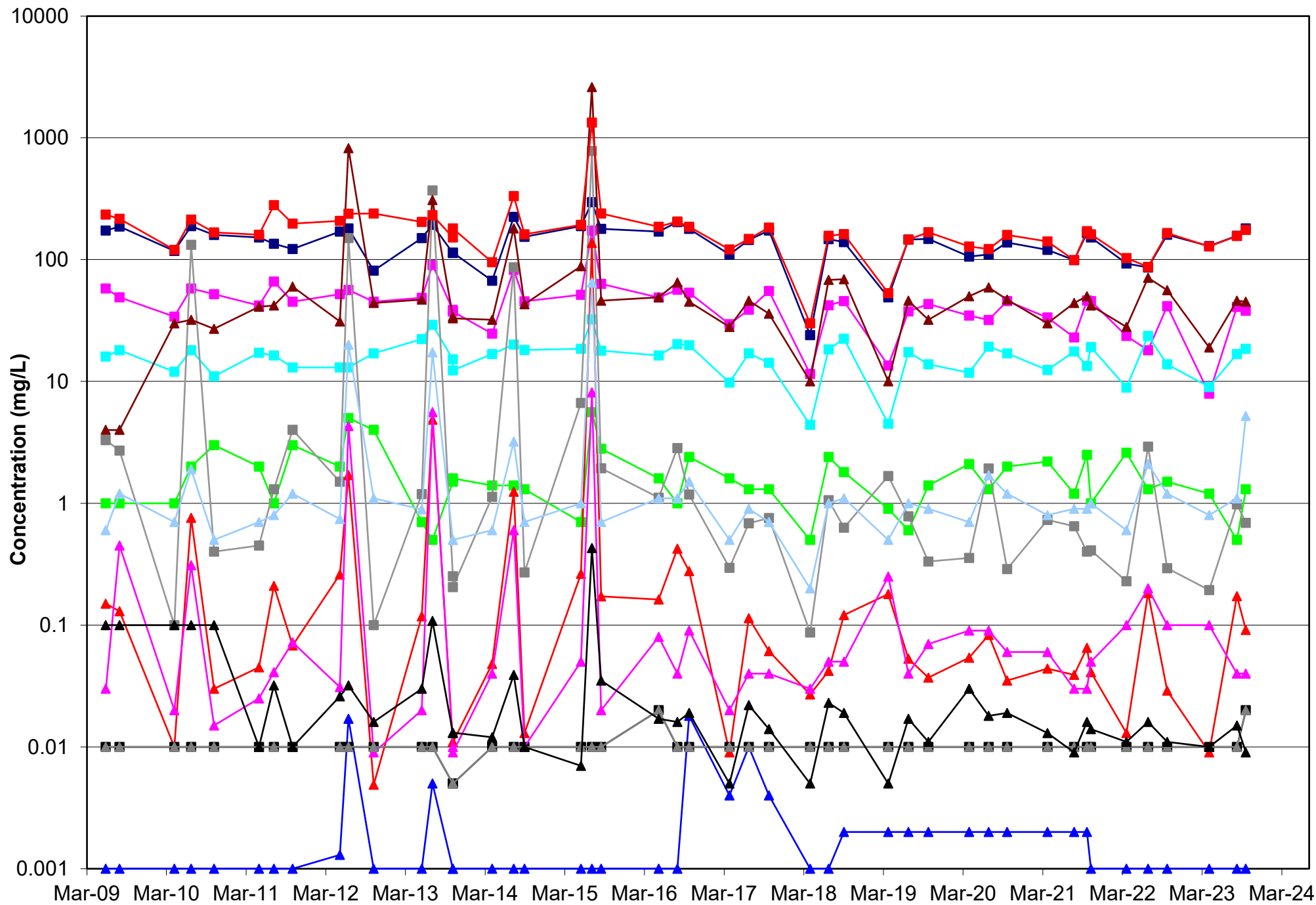
SWC



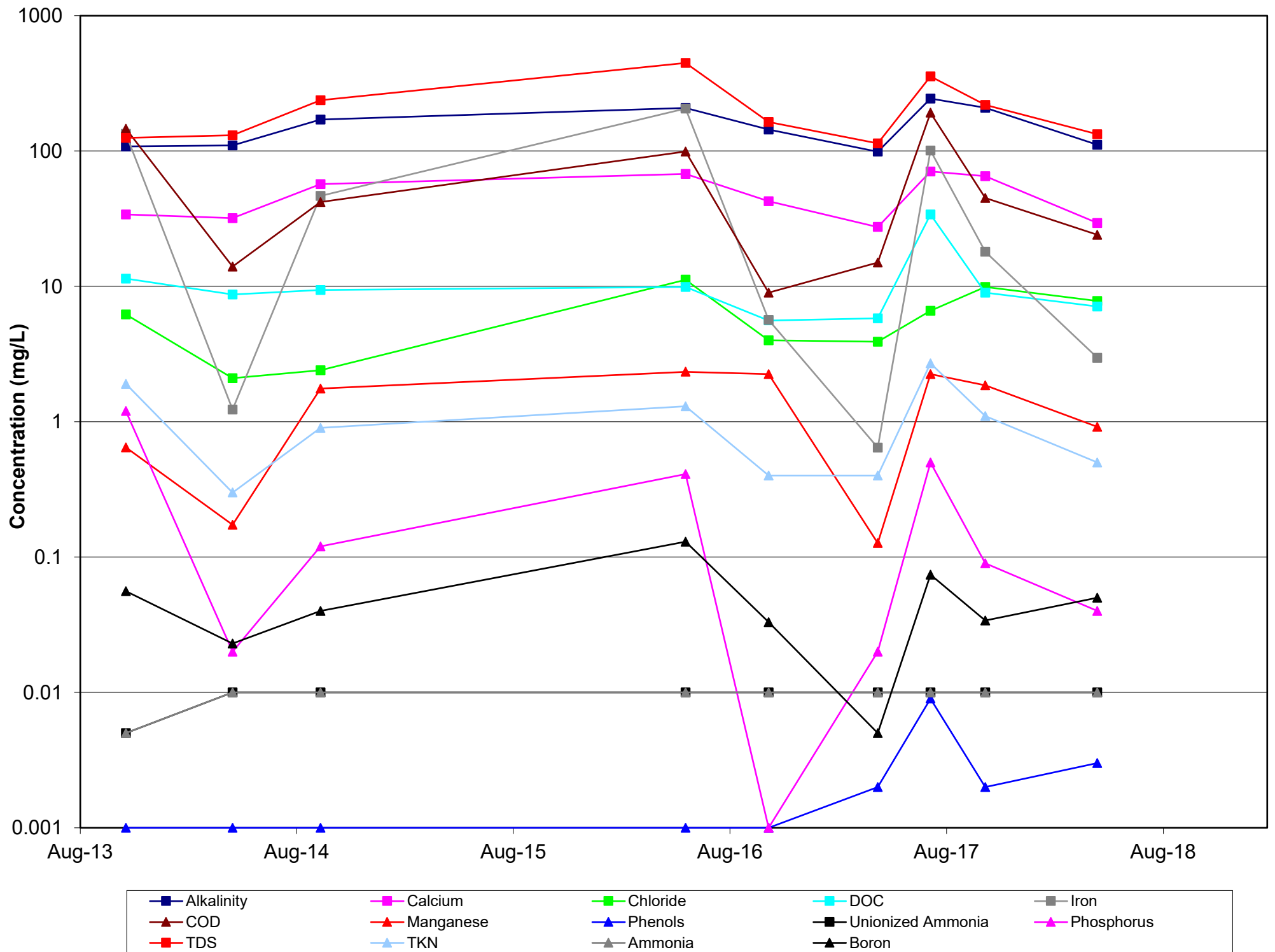
SWD



SWF



SWG





APPENDIX E

Site Inspection Forms

CITY OF KAWARTHA LAKES
OPERATING LANDFILL INSPECTION FORM

LANDFILL: Laxton

DATE: APRIL 26, 2023

Inspected by: Drew West

Date: April 26, 2023

Time: 10:30 am

Weather Conditions: overcast - 3°C

A. GENERAL OBSERVATIONS

A.1 Landfill Site: Closed during inspection, waste being compacted by heavy equipment operator

A.2 Status of Landfill Development/Construction Activities: Waste and old cell being compacted

A.3 Tipping Face: see above

A.4 Residential Container Station: N/A

A.5 Maintenance and Administration Building: N/A

A.6 Weigh Scale Inspection Building: Closed

A.7 Reuse Centre: N/A

A.8 HHW Facility: N/A

A.9 Leaf & Yard Waste Composting Facility: Good

B. STAFFING:

B.1 Is staffing for the landfill operations and ancillary landfill operations (i.e., HHW Facility, Reuse Centre Leaf & Yard Waste Composting Facility) adequate?

Closed

B.2 Are staff wearing adequate safety equipment? N/A

C. LANDFILL COVER:

C.1 Any evidence of leachate seeps or erosion of landfill cover on waste disposal fill area? _____

No

C.2 Condition of North Slope? All slopes stable

C.3 Condition of vegetation? dormant

D. STORM WATER MANAGEMENT SYSTEM:

D.1 Is the surface water management system in good operating order? (e.g. any erosion, litter, debris of the perimeter stormwater ditches or stormwater sedimentation ponds? Are culverts free from debris? _____

N/A

E. LEACHATE COLLECTION SYSTEM

E.1 Are manholes free of litter and debris? N/A

E.2 Condition of manholes/need repairs? N/A

F. MAIN ENTRANCE AND INTERNAL ROADS:

F.1 Is the main entrance or internal roads in need of repair or maintenance work? _____

No - good condition

G. DUST CONTROL:

G.1 Any dust problems because of the internal roads, working face or fill stockpiles? _____

No

G.2 Condition of Roads: _____

Good, no erosion/ruts

H. ODOURS:

H.1 Any odour problems? _____

No

I. LITTER CONTROL:

I.1 Any evidence of litter on the landfill buffer area site fencing, along Wilson Road, on adjacent properties or around the residential container station? _____

Yes lots of litter in wetland to east

J. LANDSCAPING:

J.1 Does the landscaping (trees, shrubs, and ground cover) require maintenance work (e.g. grass cutting, replacement or vegetation)?

No

K. SITE PERIMETER FENCING AND SIGNING:

K.1 Is the site perimeter fencing in good condition?

Yes

K.2 Are the traffic and information signs in good condition?

Yes

L. LANDFILL OPERATIONS:

L.1 Is there sufficient material for daily and interim cover?

Unknown

L.2 Is the landfill operations equipment in good working order?

Unknown

L.3 Is the waste being spread, compacted and covered in accordance with the Maintenance & Operations Report?

Unknown

M. SITE SECURITY AND SAFETY PROTOCOLS

M.1 Are waste loads being adequately inspected (weigh scale/inspection building, residential container station, tipping face)? _____

Closed

M.2 Are there sufficient fire extinguishers (fully loaded and operable) at tipping face, weigh scale/inspection building, maintenance and administration building, HHW Facility, Reuse Centre? _____

Unknown

M.3 Location and condition of medical emergency kits (eye wash stations and first aid kits): _____

Unknown

M.4 Staff knowledge of emergency procedures/numbers? _____

No staff present

N. OTHER COMMENTS:

None

O. RECOMMENDATIONS:

None

CITY OF KAWARTHA LAKES
OPERATING LANDFILL INSPECTION FORM

LANDFILL: ~~Foreston L~~ Laxton Landfill

Inspected by: Deonte Leven

Date: Aug 31, 2023

Time: 10:10 AM - 1:07 PM

Weather Conditions: Sunny 14°C

A. GENERAL OBSERVATIONS

A.1 Landfill Site: Good, notice bear activity & Staff spotted one in front of scales

A.2 Status of Landfill Development/Construction Activities: Good

A.3 Tipping Face: Rough... One car got stuck trying to leave. Road can use some care.

A.4 Residential Container Station: Okay

A.5 Maintenance and Administration Building: Shack okay

A.6 Weigh Scale Inspection Building: Okay

A.7 Reuse Centre: N/A

A.8 HHW Facility: N/A

A.9 Leaf & Yard Waste Composting Facility: Good & separate

B. STAFFING:

B.1 Is staffing for the landfill operations and ancillary landfill operations (i.e., HHW Facility, Reuse Centre Leaf & Yard Waste Composting Facility) adequate? _____

Yes

B.2 Are staff wearing adequate safety equipment? Yes

C. LANDFILL COVER:

C.1 Any evidence of leachate seeps or erosion of landfill cover on waste disposal fill area? _____

No

C.2 Condition of North Slope? Good

C.3 Condition of vegetation? Good

D. STORM WATER MANAGEMENT SYSTEM:

D.1 Is the surface water management system in good operating order? (e.g. any erosion, litter, debris of the perimeter stormwater ditches or stormwater sedimentation ponds? Are culverts free from debris? _____

N/A

E. LEACHATE COLLECTION SYSTEM

E.1 Are manholes free of litter and debris? _____

N/A

E.2 Condition of manholes/need repairs? _____

N/A

F. MAIN ENTRANCE AND INTERNAL ROADS:

F.1 Is the main entrance or internal roads in need of repair or maintenance work? _____

Yes needs in my opinion. Is rough

G. DUST CONTROL:

G.1 Any dust problems because of the internal roads, working face or fill stockpiles? _____

Yes dust problem

G.2 Condition of Roads: _____

Road leading to tipping face needs work. Other road ways good

H. ODOURS:

H.1 Any odour problems? _____

Yes, smell of garbage

I. LITTER CONTROL:

I.1 Any evidence of litter on the landfill buffer area site fencing, along Wilson Road, on adjacent properties or around the residential container station? _____

N/A

J. LANDSCAPING:

J.1 Does the landscaping (trees, shrubs, and ground cover) require maintenance work (e.g. grass cutting, replacement or vegetation)?

NO

K. SITE PERIMETER FENCING AND SIGNING:

K.1 Is the site perimeter fencing in good condition?

yes

K.2 Are the traffic and information signs in good condition?

yes

L. LANDFILL OPERATIONS:

L.1 Is there sufficient material for daily and interim cover?

yes

L.2 Is the landfill operations equipment in good working order?

Yes, even though things are getting stuck in its traids

L.3 Is the waste being spread, compacted and covered in accordance with the Maintenance & Operations Report?

Yes, as best as it can with a dozer

M. SITE SECURITY AND SAFETY PROTOCOLS

M.1 Are waste loads being adequately inspected (weigh scale/inspection building, residential container station, tipping face)? _____

Yes

M.2 Are there sufficient fire extinguishers (fully loaded and operable) at tipping face, weigh scale/inspection building, maintenance and administration building, HHW Facility, Reuse Centre? _____

Yes

M.3 Location and condition of medical emergency kits (eye wash stations and first aid kits). _____

Good, scales

M.4 Staff knowledge of emergency procedures/numbers? _____

Yes

N. OTHER COMMENTS:

O. RECOMMENDATIONS:

CITY OF KAWARTHA LAKES
OPERATING LANDFILL INSPECTION FORM

LANDFILL: Laxton

Inspected by: Drew West

Date: Oct 11, 2023

Time: 10:30 am

Weather Conditions: Overcast 10°C

A. GENERAL OBSERVATIONS

A.1 Landfill Site: Good, nothing out of the ordinary

A.2 Status of Landfill Development/Construction Activities: New tipping
face is operational at north end of landfill

A.3 Tipping Face: Good, some minor ruts and puddles

A.4 Residential Container Station: N/A

A.5 Maintenance and Administration Building: N/A

A.6 Weigh Scale Inspection Building: Good from outside

A.7 Reuse Centre: N/A

A.8 HHW Facility: N/A

A.9 Leaf & Yard Waste Composting Facility: Good

B. STAFFING:

B.1 Is staffing for the landfill operations and ancillary landfill operations (i.e., HHW Facility, Reuse Centre Leaf & Yard Waste Composting Facility) adequate?

Landfill closed during inspection

B.2 Are staff wearing adequate safety equipment? Unknown

C. LANDFILL COVER:

C.1 Any evidence of leachate seeps or erosion of landfill cover on waste disposal fill area? _____

No

C.2 Condition of North Slope? All slopes stable

C.3 Condition of vegetation? Good

D. STORM WATER MANAGEMENT SYSTEM:

D.1 Is the surface water management system in good operating order? (e.g. any erosion, litter, debris of the perimeter stormwater ditches or stormwater sedimentation ponds? Are culverts free from debris? _____

N/A

E. LEACHATE COLLECTION SYSTEM

E.1 Are manholes free of litter and debris? _____

N/A

E.2 Condition of manholes/need repairs? _____

N/A

F. MAIN ENTRANCE AND INTERNAL ROADS:

F.1 Is the main entrance or internal roads in need of repair or maintenance work? _____

No

G. DUST CONTROL:

G.1 Any dust problems because of the internal roads, working face or fill stockpiles? _____

No

G.2 Condition of Roads: _____

Good

H. ODOURS:

H.1 Any odour problems? _____

No

I. LITTER CONTROL:

I.1 Any evidence of litter on the landfill buffer area site fencing, along Wilson Road, on adjacent properties or around the residential container station? _____

Some litter in adjacent wetland

J. LANDSCAPING:

J.1 Does the landscaping (trees, shrubs, and ground cover) require maintenance work (e.g. grass cutting, replacement or vegetation)?

No

K. SITE PERIMETER FENCING AND SIGNING:

K.1 Is the site perimeter fencing in good condition?

Yes

K.2 Are the traffic and information signs in good condition?

Yes

L. LANDFILL OPERATIONS:

L.1 Is there sufficient material for daily and interim cover?

Unknown

L.2 Is the landfill operations equipment in good working order?

Unknown

L.3 Is the waste being spread, compacted and covered in accordance with the Maintenance & Operations Report?

Unknown

M. SITE SECURITY AND SAFETY PROTOCOLS

M.1 Are waste loads being adequately inspected (weigh scale/inspection building, residential container station, tipping face)?

Closed during inspection

M.2 Are there sufficient fire extinguishers (fully loaded and operable) at tipping face, weigh scale/inspection building, maintenance and administration building, HHW Facility, Reuse Centre?

Unknown

M.3 Location and condition of medical emergency kits (eye wash stations and first aid kits):

Unknown

M.4 Staff knowledge of emergency procedures/numbers?

No staff present

N. OTHER COMMENTS:

None

O. RECOMMENDATIONS:

None



APPENDIX F

Borehole Logs

TABLE 1: OBSERVATION WELL
CONSTRUCTION DETAILS

<u>MW 1-02</u>	<u>Depth Interval (metres)</u>
Screen Set	3.05 – 6.10
Filter Pack	2.59 – 6.10
Bentonite Seal	1.82 – 2.59
Sand Pack	0.62 – 1.83
Surface Seal (Cement)	0.00 – 0.62

<u>MW 2-02</u>	<u>Depth Interval (metres)</u>
Screen Set	2.45 – 6.10
Filter Pack	1.83 – 6.10
Bentonite Seal	1.22 – 1.83
Sand Pack	0.62 – 1.83
Surface Seal (Cement)	0.00 – 0.62

<u>MW 3-02</u>	<u>Depth Interval (metres)</u>
Screen Set	2.45 – 5.49
Filter Pack	1.83 – 5.49
Bentonite Seal	1.22 – 1.83
Sand Pack	0.46 – 1.22
Surface Seal (Cement)	0.00 – 0.46

<u>MW 4-02</u>	<u>Depth Interval (metres)</u>
Screen Set	4.57 – 7.63
Filter Pack	4.27 – 7.63
Bentonite Seal	3.81 – 4.27
Sand Pack	0.62 – 3.81
Surface Seal (Cement)	0.0 – 0.62

TABLE 1: OBSERVATION WELL
CONSTRUCTION DETAILS

MW 5-02 Depth Interval (metres)

Screen Set	6.10 – 9.14
Filter Pack	5.44 – 9.14
Bentonite Seal	4.57 – 5.44
Sand Pack	0.62 – 4.57
Surface Seal (Cement)	0.00 – 0.62

MW 6-02 Depth Interval (metres)

Screen Set	3.05 – 6.10
Filter Pack	2.60 – 6.10
Bentonite Seal	2.00 – 2.60
Sand Pack	0.91 – 2.00
Surface Seal (Cement)	0.00 – 0.91

MW 7-02 Depth Interval (metres)

Screen Set	4.57 – 6.10
Filter Pack	2.44 – 6.10
Bentonite Seal	1.83 – 2.44
Sand Pack	0.91 – 1.83
Surface Seal (Cement)	0.00 – 0.91

MW 8-02 Depth Interval (metres)

Screen Set	4.57 – 6.10
Filter Pack	3.96 – 6.10
Bentonite Seal	3.35 – 3.96
Sand Pack	0.62 – 3.35
Surface Seal (Cement)	0.00 – 0.62

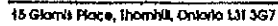
TABLE 1: OBSERVATION WELL
CONSTRUCTION DETAILS

<u>MW 9-02</u>	<u>Depth Interval (metres)</u>
Screen Set	4.27 – 5.79
Sand Pack	0.62 – 5.79
Bentonite Seal	0.0 – 24.08
 <u>MW 10-02</u>	 <u>Depth Interval (metres)</u>
Screen Set	24.69 – 25.60
Sand Pack	24.08 – 25.60
Steel Casing	0.0 – 24.08

NOTES:

1. Excepting MW 9-02, a steel protective casing was installed at each of the other monitor wells.
2. Auger hole 11-02 was extended to refusal at a depth of 21.6 metres near MW 6-02.

ENGINEER L8[illegible]



ENGINEER _____ LB

[illegible]



HYDROTERRA LIMITED

15 Gloria Place, Thornhill, Ontario L3T 3G7

BOREHOLE NO. 3-02

PROJECT NAME Laxton-Digby-Longford Landfill

PROJECT NO. 1593

CLIENT City of Kawartha Lakes

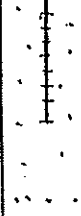
DATE July 8, 2002

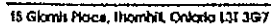
BOREHOLE TYPE 108 mm ID Hollow Stem

FIELD SUPERVISOR LB

GROUND ELEVATION 97.95 m (98.97 m/TOC)

ENGINEER LB

DEPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	SAMPLE					CORE PENETRATION		WATER CONTENT %		REMARKS	
				TYPE	N VALUE	% WATER	% RECOVERY	RQD (%)	SPT N' VALUE	SHEAR STRENGTH	Wp . Wl			
1	Greyish brown COARSE SAND to GRAVELLY COARSE SAND, wet, compact			1	18									
2														
3														
4														
5														
6														
6.7	MEDIUM-COARSE SAND, loose			3	4									
7	COARSE SAND, loose													
8														
9														
10														

BOREHOLE NO. 4-02

PROJECT NAME Laxton-Digby Longford Landfill

PROJECT NO. 1593

CLIENT City of Kawartha Lakes

DATE July 8, 2002

BOREHOLE TYPE 108 mm ID Hollow Stem

FIELD SUPERVISOR LB

GROUND ELEVATION 101.57 m (102.57 m/TOC)

ENGINEER _____ **L8**

[illegible]



HYDROTERRA LIMITED

15 Gloria Place, Thornhill, Ontario L3T 3G7

BOREHOLE NO. 5-02

PROJECT NAME Laxton-Digby-Longford Landfill

PROJECT NO. 1693

CLIENT City of Kawartha Lakes

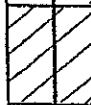
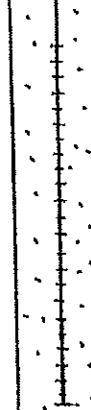
DATE July 9, 2002

BOREHOLE TYPE 108 mm ID Hollow Stem

FIELD SUPERVISOR LB

GROUND ELEVATION 101.67 m (102.21 m/TGC)

ENGINEER LB

DEPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	SAMPLE					CORE PENETRATION		WATER CONTENT %		REMARKS
				TYPE	N VALUE	% WATER	% RECOVERY	ROD (m)	SPT 'N' VALUE	SPT STRENGTH	W P W L		
1	REFUSE												
2													
3													
4													
5													
5.5				1	16								
6	Greyish brown SILTY FINE SAND, wet, loose												
7													
8													
9													
9.8	Dark brown, SANDY SILT, loose												
10													



BOREHOLE NO. 6-02

PROJECT NAME Laxton-Digby-Longford Landfill

CLIENT City of Kawartha Lakes

BOREHOLE TYPE 108 mm ID Hollow Stem

GROUND ELEVATION 101.42 m (102.26 m/TOC)

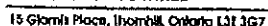
PROJECT NO. 1593

DATE July 9, 2002

FIELD SUPERVISOR LB

ENGINEER _____ LB _____

[illegible]



ENGINEER _____ LB

[illegible]



8-02

PROJECT NO. 1593

DATE July 9, 2002

FIELD SUPERVISOR LB

ENGINEER _____ LB

[illegible]



15 Glen's Place, Thornhill, Ontario L3T 3G7

BOREHOLE NO. 9-02

PROJECT NAME Laxton-Digby-Longford Landfill

PROJECT NO. 1593.

CLIENT City of Kawartha Lakes

DATE July 9, 2002

BOREHOLE TYPE 75 mm OD Solid Augers

FIELD SUPERVISOR LB

GROUND ELEVATION 101.02 m (101.30 m/TDC)

ENGINEER LB

[illegible]


 Ministry
of the
Environment

WATER WELL RECORD

 Print only in spaces provided.
Mark correct box with a checkmark, where applicable.

County or District City of Kawartha Lakes (Victoria)	Township/Borough/City/Town/Village Lakelse Twp.	On block tract survey, etc. Con, 9	Lot 6
Owner's address City of Kawartha Lakes	First Name 300 Water St., Whitby, ON L1M 9J2	Date completed 11 09 02	Day month year

General colour	Most common material	Other materials	General description	Depth - feet	
				From	To
Black	Topsoil			0	.5
Brown	Gravel			.5	12
Brown	Gravel		wet	12	77
Gray	Gravel		wet	77	79
Gray	Granite			79	84

WATER RECORD Water found at - feet 79		CASING & OPEN HOLE RECORD Depth - feet From To 61 188 +24 79 2 81 +24 81		SCREENING & SEALING RECORD Screen depth - feet From To 0 20 Material and type (Concrete, gravel, bentonite, etc.) Bentonite	
---	--	---	--	---	--

Pumping test method ☒ Pump ☐ Bailer	Pumping rate Water level Water level during 15 minutes 30 minutes 45 minutes 60 minutes	Duration of pumping Hours Minutes
Water level at end of test ☐ Rising ☐ Falling ☐ Steady	Pumping rate at end of test ☐ Rising ☐ Falling ☐ Steady	Water level at end of test ☐ Rising ☐ Falling ☐ Steady

FINAL STATUS OF WELL ☒ Water supply ☐ Abandoned ☐ Other (specify)	☐ Abandoned, installation faulty ☐ Abandoned, poor quality ☐ Abandoned, other (specify)	☐ Undersized ☐ Reinstallation needed
WATER LINE ☐ Domestic ☐ Stock ☐ Irrigation ☐ Industrial	☐ Commercial ☐ Municipal ☐ Public supply ☐ Cooling & air conditioning	☐ Not used ☐ Other (specify)
METHOD OF CONSTRUCTION ☒ Cable tool ☐ Rotary (percussion) ☐ Rotary (auger) ☐ Rotary (jet)	☐ Air pressure ☐ Boring ☐ Drilling ☐ Jetting	☐ Casing ☐ Drilling ☐ Other

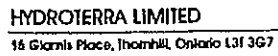
LOCATION OF WELL In diagram below show distances of well from road and lot line. Indicate north by arrow.
Top of Casing: 98.56 m Ground Level: 97.85 m

Name of contractor G. Hart & Sons Well Drilling Ltd., 2662	Well Driller's License No. T-0546
Address Box 850, Fensholt Falls, ON	Signature of Technician Jim Leach
Name of Well Technician Jim Leach	Signature of Owner/Client [Signature]

1 - CONTRACTOR'S COPY

0008 (07/00) Form 10-02

MW 10-02

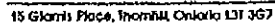


PROJECT NO. 1593A

DATE February 28, 2003

FIELD SUPERVISOR _____

ENGINEER LBENGINEER LB[illegible]



BOREHOLE NO. 13-03

PROJECT NAME Laxton-Oigby-Longford Landfill

PROJECT NO. 1593A

CLIENT City of Kawartha Lakes

DATE February 28, 2003

BOREHOLE TYPE 108 mm ID Hollow Stem

FIELD SUPERVISOR : _____

GROUND ELEVATION

ENGINEER _____ LB

[illegible]

BOREHOLE NO. 14-03

PROJECT NAME Laxton-Digby-Longford Landfill

PROJECT NO. 1593A

CLIENT .. City of Kawartha Lakes

DATE February 28, 2003

BOREHOLE TYPE 108 mm ID Hollow Stem

FIELD SUPERVISOR

GROUND ELEVATION --

ENGINEER 18

[illegible]

BOREHOLE NO.:

Project: City of Kawartha Lakes - Laxton Landfill
 Date Drilled/Installed: Dec. 11, 2006
 Drilling Contractor: All-Terrain Drilling Ltd.
 Drilling Method: 4 1/2 H.S.H
 Supervisor: Don Grant

Geologic Interpretation

Depth
(ft) (m)

Elev.
(m)

Sampling

Blow
Count
Interval
Recovery
Number

Well Installation Details

Refuse 0.0m → 4.87m

4.87m

Bentonite
0.0m to
1.52m

Sandpack
1.52m to
4.87m

2" PVC Sch 40
 5.1 I.D Riser
 6.1 O.D Screen

End of borehole
 4.87m.

1

5

2

10

3

4

15

5

20

6

7

25

8

9

30

10

35

11

12

40

Well Owner's Information

First Name: City of Kawartha Lakes
Last Name:
E-mail Address: info@city.kawarthalakes.ca
Mailing Address (Street Number/Name, RR): 26 Francis St W.
Municipality: Lindsay
Province: ON
Postal Code: K9V5R8
Telephone No. (inc. area code): 705 324 9411

Part A Construction and/or Major Alteration of a Well

Address of Well Location (Street Number/Name, RR): 3225 Monk Rd.
Township: Laxton
County/District/Municipality: Kawartha Lakes
City/Town/Village:
Province: Ontario
Postal Code:
UTM Coordinates: NAD 83 117 07 113 117 49 94 659
GPS Unit Make: Garmin
Model: etrex
Mode of Operation: ☐ Undifferentiated ☒ Averaged
☐ Differentiated, specify:
Lot: E part of 6
Concession: 9

Overburden and Bedrock Materials (see instructions on the back of this form)

General Colour	Most Common Material	Other Materials	General Description	Depth (Metres) From	Depth (Metres) To
Black	Peat		Soft	0	3.3
Grey	Sand	Silt	Compact	3.3	5

Annular Space/Abandonment Sealing Record

Depth Set at (Metres) From	Depth Set at (Metres) To	Type of Sealant Used (Material and Type)	Volume Placed (Cubic Metres)
0	3	Bentonite chips	0.09
3	5	Sand	0.06

Results of Well Yield Testing

Check box if after test of well yield, water was:	Draw Down		Recovery	
	Time (Min)	Water Level (Metres)	Time (Min)	Water Level (Metres)
☐ Clear and sand free	Static Level		Static Level	
☐ Cannot develop to sand-free state	1		1	
If pumping discontinued, give reason:	2		2	
Pumping test method	3		3	
Pump intake set at (Metres)	4		4	
Pumping rate (Litres/min)	5		5	
Duration of pumping hrs + min	10		10	
Final water level end of pumping (Metres)	15		15	
Recommended pump type ☐ Shallow ☐ Deep	20		20	
Recommended pump depth (Metres)	25		25	
Recommended pump rate (Litres/min)	30		30	
If flowing give rate (Litres/min)	40		40	
	50		50	
	60		60	

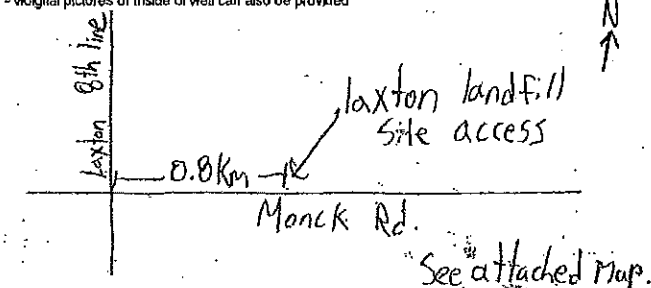
Method of Construction	Water Use
☐ Cable Tool	☐ Public
☐ Rotary (Conventional)	☐ Domestic
☐ Rotary (Reverse)	☐ Municipal
☐ Rotary (Air)	☐ Livestock
☐ Air percussion	☐ Test Hole
☐ Other, specify: Auger	☐ Cooling & Air Conditioning
	☐ Industrial
	☐ Other, specify:

Status of Well

☐ Water Supply	☐ Dewatering Well	☒ Observation and/or Monitoring Hole
☐ Replacement Well	☐ Abandoned, Insufficient Supply	☐ Alteration (Construction)
☐ Test Hole	☐ Abandoned, Poor Water Quality	☐ Other, specify:
☐ Recharge Well	☐ Abandoned, other, specify:	

Location of Well

Please provide a map below showing:
- all property boundaries, and measurements sufficient to locate the well in relation to fixed points,
- an arrow indicating the North direction
- detailed drawings can be provided as attachments no larger than legal size (8.5" by 14")
- digital pictures of inside of well can also be provided



Water Details

Water found at Depth	Kind of Water
1.3 Metres	☐ Gas ☐ Fresh ☐ Salty ☐ Sulphur ☐ Minerals
Metres	☐ Gas ☐ Fresh ☐ Salty ☐ Sulphur ☐ Minerals
Metres	☐ Gas ☐ Fresh ☐ Salty ☐ Sulphur ☐ Minerals

Casing Used	Screen Used	Casing and Well Details
☐ Galvanized ☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete	☐ Galvanized ☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete	Diameter of the Hole (Centimetres): 25 Depth of the Hole (Metres): 5 Well Thickness (Metres): Sch 40 Inside Diameter of the Casing (Metres): 5 cm

☐ No Casing and Screen Used	Disinfected? ☒ Yes ☐ No
	Depth of the Casing (Metres): 3.3

Ministry Use Only

Audit No. 275175	Well Contractor No.
Date Received (yyyy/mm/dd)	Date of Inspection (yyyy/mm/dd)
Remarks	

Date Well Completed (yyyy/mm/dd): 2007/12/17
Was the well owner's information package delivered? ☐ Yes ☒ No
Date the Well Record and Package Delivered to Well Owner (yyyy/mm/dd):

Well Contractor and Well Technician Information
Business Name of Well Contractor: Aardark Drilling Inc.
Well Contractor's Licence No.: 7121318
Business Address (Street No./Name, number, RR): 25 Lewis Rd.
Municipality: Guelph
Province: ON
Postal Code: N1H1E9
Business E-mail Address: www.aardarkdrillinginc.com
Bus. Telephone No. (inc. area code): 519 822 9340
Name of Well Technician (Last Name, First Name): Mike
Well Technician's Licence No.: 11776
Signature of Technician: [Signature]
Date Submitted (yyyy/mm/dd): 2007/12/17

DRILL HOLE # MW 1

Page 1 of 1

Date Drilled: Dec. 17, 2007
Rig: CME 55N
Contractor: Aardvark Drilling Inc.
Hammer Type: cathead

Location: Laxton Landfill
Elevation:
Co-ord: 671317 E, 4954659 N

Project No. 07-0384-00
Project: Kawartha Lakes
Client: City of Kawartha Lakes

Depth (m)	Sample Type	Recovery Number	Blows/0.15 m	Symbols	SOIL DESCRIPTION	Well Installation	Moisture Content % Wp ---X--- Wl 10 30 50 70 90	Pocket Penetrometer kPa 100 200 300 400 SPT (N) Blows/ft 10 20 30 40
0					Ground Surface 0 PEAT black, saturated > organics	Concrete		
1						Bentonite		
2					SILTY SAND brown, saturated	Raised Steel Casing, padlocked		
3					SAND very fine, grey, saturated	#2 Silica Sand		
4						2" Slot 10 Screen		
5								
6								
7								

Note: This borehole log has been prepared for geotechnical purposes and does not necessarily contain information suitable for an environmental assessment of the subsurface conditions.

Aardvark Drilling Inc.
25-C Lewis Road
Guelph, Ontario



Cambium Environmental Inc.
PO Box 325 • Unit 2 • 2085 Whittington Drive
Peterborough • Ontario • K9J 6X4

Project No.: 1584-001

Project Name: Laxton Waste Disposal Site Well Installation

Client: City of Kawartha Lakes

Location: Laxton Waste Disposal Site

Log of Borehole: MW 17-09

UTM: 17T: N 4954726 E 671223

Logged By: D.Snowball

Project Manager: D. Bucholtz

SUBSURFACE PROFILE			Well Installation	Remarks
Depth	Symbol	Description		
-5 ft m				Well stick up = 1.37m Galvanized steel well riser equipped with lockable J-Plug and weather proof lock. Well equipped with sample tubing and footvalve
-3				0.05m galvanized steel well riser pipe
-1		Ground Surface		Water level October 14, 2009 at ground surface (0.0 m)
1		Peat Dark brown peat material, high in organics and roots, wet throughout		Bentonite chips 0.05m galvanized coupling
3		Drive Point Well - No Samples		0.05m galvanized steel well riser pipe
5				Native soil material
7				0.05m galvanized coupling
9				Well Screen: Stainless Steel - 0.76m x 0.05m
11		End of Borehole		Solid iron well point

Drilled By: D. Snowball

Drill Method: Drive Point

Drill Date: October 14, 2009

Input By: D. Snowball

Checked By: D. Bucholtz

Sheet: 1 of 1



Cambium Environmental Inc.
PO Box 325 • Unit 2 • 2085 Whittington Drive
Peterborough • Ontario • K9J 6X4

Project No.: 1584-001

Project Name: Laxton Waste Disposal Site Well Installation

Client: City of Kawartha Lakes

Location: Laxton Waste Disposal Site

Log of Borehole: MW 18-09

UTM: 17T: N 4954640 E 671059

Logged By: D. Snowball

Project Manager: D. Bucholtz

SUBSURFACE PROFILE			Well Installation	Remarks
Depth	Symbol	Description		
-5 m				Well stick up = 1.42m Galvanized steel well riser equiped with lockable J-Plug and weather proof lock. Well equiped with sample tubing and footvalve
-3				
-1		Ground Surface		0.05m galvanized steel well riser pipe
1		Peat Dark brown peat material, high in organics and roots, wet throughout		Water level October 14, 2009 at ground surface (0.0m) Bentonite chips 0.05m galvanized coupling
3		<i>Drive Point Well - No Samples</i>		0.05m galvanized steel well riser pipe
5				Native soil material
7				0.05m galvanized coupling
9				Well Screen: Stainless Steel - 0.76m x 0.05m
11		End of Borehole		Solid Iron well point

Drilled By: D. Snowball

Drill Method: Drive Point

Drill Date: October 14, 2009

Input By: D. Snowball

Checked By: D. Bucholtz

Sheet: 1 of 1



Cambium Environmental Inc.
PO Box 325 • 52 Hunter Street East •
Peterborough • Ontario • K9H 1G5

Project No.: 2071-001

Project Name: Laxton Waste Diposal Site

Client: City of Kawartha Lakes

Location: Laxton Waste Disposal Site

Log of Borehole: MW19

UTM: 0671281 4954596

Logged By: C. MacDougall

Project Manager: Kevin Warner

SUBSURFACE PROFILE			SAMPLE				Well Installation	Remarks
Depth	Symbol	Description	Number	Type	% Recovery	SPT (n)		
ft m -3 -1 1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 49 51 53 55 57 59		Ground Surface						Locking J-Plug, stick-up of 0.83 m 1.52m x 0.1m Square Casing Bentonite Chips (No concrete was added due to likelihood of heaving in winter) Natural Fill Bentinite Pellets Silica Sand 1.52m x 0.05m Screen 0.05 Diameter slip on cap
		<i>Sand</i> Grey medium to coarse sand, wet						
			1	SS	100%	4		
			2	SS	100%	1		
		<i>Sand</i> Grey medium to coarse sand, trace clay, wet						
			3	SS	100%	1		
		<i>Sand and Gravel</i> Greyish brown coarse sand with some gravel, wet						
			4	SS	100%	1		
		<i>Bedrock</i>						
		End of Borehole						

Drilled By: Pontil Drilling

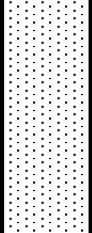
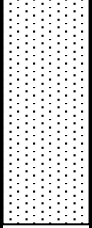
Drill Method: Auger

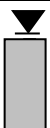
Drill Date: February 27, 2012

Input By: C. MacDougall

Checked By: K. Warner

Sheet: 1 of 1

Project: Laxton Landfill Drilling			Project Number: 23-116			Client: City of Kawartha Lakes			Borehole ID: BH 20-1			
Project Location: Laxton Landfill, Kawartha Lake, Ontario						Drilling Contractor: Walker Drilling			Drilling Method: Hollow Stem Augers			
Logged By: A. Turner				Date: 31-Mar-2023			Stickup (m): Stick-up Casing			Well Depth (mbgs): 9.1		
UTM: (NAD 83, Zone 17T) Easting: 671309 Northing: 4954722				Ground Elevation (masl):			Water Level (mbgs):			Well Diameter (mm) 50.8		
				Well Screen Type: 10-Slot PVC, Schedule 40			Riser Pipe Type: Schedule 40 PVC			Well Screen Length (m): 1.5		
Lithology Description												
<u>Soil Group Name:</u> grain size, density/consistency, colour, moisture, stratification, other descriptors												
<u>Rock Description:</u> modifier, color, hardness/degree of concentration, bedding and joint characteristics, solutions, void conditions.												
2 4 6 8 10 12	SS 1	1	17			PEAT: Brown to dark brown, amorphous peat, some sand, organics, trace gravel, very moist to wet (0.0 - 0.6m)						
	SS 2	17	58			SILTY SAND: Compact, brown to dark brown, silty sand, trace organics, trace gravel, very moist (0.6 - 1.5m) First ground water strike at 1.4m						
	SS 3	13	42			SAND: Very loose to compact, brown to dark grey, coarse sand, trace gravel, wet (1.5 - 4.6m)						
	SS 4	11	17									
	SS 5	10	17									
	SS 6	4	-			SAND AND GRAVEL: Very loose, brown, coarse sand and gravel, with cobbles and boulders, wet (4.6 - 6.1m) No recovery in spoon, grab sample						
	SS 7	11	50				SAND: Compact to dense, brown to dark grey, coarse sand, trace gravel, wet (6.1 - 9.1m)					
	SS 8	50+	17	Cobbles and boulders at 8.5 m								
						Borehole terminated at 9.1 mbgs due to auger refusal, assumed Bedrock Upon completion of augering Water at 1.0 m No cave, borehole flushed out with drilling mud and water before monitoring well install						



Ground Water Level Upon Well Completion (mbgs)

Seal (grout / hole plug)



Silica Sand Pack



Well Screen

Project: Laxton Landfill Drilling			Project Number: 23-116		Client: City of Kawartha Lakes		Borehole ID: BH 20-2		
Project Location: Laxton Landfill, Kawartha Lake, Ontario						Drilling Contractor: Walker Drilling		Drilling Method: Hollow Stem Augers	
Logged By: A. Turner			Date: 31-Mar-2023		Stickup (m): Stick-up Casing		Well Depth (mbgs): 4.6		
UTM: (NAD 83, Zone 17T)			Ground Elevation (masl):		Water Level (mbgs):		Well Diameter (mm) 50.8		
Easting: 671309			Well Screen Type: 10-Slot PVC, Schedule 40		Riser Pipe Type: Schedule 40 PVC		Well Screen Length (m): 1.5		
Northing: 4954722									

Depth Below Ground Surface (mbgs)	Sample Type / No.	N - Value	Sample Recovery (%)	Lithology	Monitoring Well Construction	Lithology Description
						Soil Group Name: grain size, density/consistency, colour, moisture, stratification, other descriptors Rock Description: modifier, color, hardness/degree of concentration, bedding and joint characteristics, solutions, void conditions.
2						PEAT: Brown to dark brown, amorphous peat, some sand, organics, trace gravel, very moist to wet (0.0 - 0.6m)
						SILTY SAND: Compact, brown to dark brown, silty sand, trace organics, trace gravel, very moist (0.6 - 1.5m) First ground water strike at 1.4m
4						SAND: Very loose to compact, brown to dark grey, coarse sand, trace gravel, wet (1.5 - 4.6m)
6						
8						
10						
12						
						Borehole terminated at 9.1 mbgs due to auger refusal, assumed Bedrock



Ground Water Level Upon Well Completion (mbgs)

Seal (grout / hole plug)



Silica Sand Pack

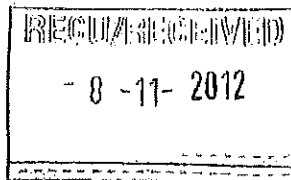


Well Screen



APPENDIX G

ECA and MECP Communications



Ministry of the Environment
Ministère de l'Environnement

AMENDMENT TO ENVIRONMENTAL COMPLIANCE APPROVAL

NUMBER A321304

Notice No. 4

Issue Date: October 29, 2012

The Corporation of the City of Kawartha Lakes
12 Peel St
Post Office Box, No. 9000
Lindsay, Ontario
K9V 2J2

Site Location: Laxton Landfill Site
3225 Monck Road, Lot 6, Concession 9, former Laxton Township
Kawartha Lakes City,

You are hereby notified that I have amended Approval No. A321304 issued on February 14, 1980 and amended on May 3, 2007, July 17, 2007 and June 11, 2009 for a disposal / recycling / reuse / composting site within a total site area of 29 hectares , as follows:

Condition 20.2 is hereby revoked and replaced with:

- 20.2 Only the following types of waste shall be accepted at the *Site*:
- (a) Municipal Waste;
 - (b) Non-hazardous Solid Industrial Wastes;
 - (c) Commercial Waste;
 - (d) Leaf and Yard Waste;
 - (e) Household Hazardous Waste (HHW);
 - (f) Waste electrical and electronic equipment (WEEE);
 - (g) Scrap Tires;
 - (h) Other waste that meets the requirements of Condition 36.5

Condition 27.4, 27.5 and 27.6 have hereby been added:

- 27.4 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 a separate letter that shall accompany the Annual Report.
- 27.5 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 *Approval* be amended to approve the proposed changes to the environmental monitoring plan prior to implementation.

- 27.6 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 *Approval*.

Condition 36 is hereby revoked and replaced with:

WASTE DIVERSION

36.0 Waste Diversion

- 36.1 The *Owner* may receive, temporarily store and transfer WEEE subject to the following:
- (a) prior to being accepted at the *Site*, all incoming WEEE shall be inspected by the *Owner* to ensure that it meets the *Owner's* acceptance criteria for the WEEE diversion program;
 - (b) WEEE shall only be stored in designated WEEE storage bins;
 - (c) no processing / dismantling of WEEE shall take place at the *Site*; and
 - (d) WEEE shall be managed and disposed of in accordance with the *EPA* and *Regulation 347*;
 - (e) a daily record is kept of all WEEE that is accepted, stored and transferred (including destination) from the *Site*.
- 36.2 (a) The total amount of WEEE that may be stored on the *Site* at any one time shall not exceed 50 tonnes; and
- (b) In the event that WEEE can not be removed from the *Site* and the total storage capacity as approved in Condition 36.2(a) has been reached, the *Owner* shall, forthwith upon reaching the approved storage capacity:
- (i) cease accepting additional WEEE to ensure that the total approved storage capacity is not exceeded;
 - (ii) notify the *District Manager* that the approved storage capacity has been reached, that the *Site* has ceased to accept additional WEEE and provide a contingency plan for the long term removal and disposal and/or diversion of WEEE from the *Site*.
- 36.3 The *Owner* may receive, temporarily store and transfer scrap tires subject to the following:
- (a) the total amount of scrap tires stored on *Site* shall not exceed 5000 tire units; and
 - (b) a daily record is kept of the number of tire units accepted, stored and transferred from the *Site*; and
 - (c) scrap tires shall be stockpiled as follows:
 - (i) no individual stockpile shall exceed a volume of 300 m³; and
 - (ii) stockpiles shall be located a minimum of 15 metres from the property line, any buildings and the active landfilling area; and
 - (iii) stockpiles shall be separated from each other and from other waste piles by a minimum of 6 metres; and
 - (iv) an area of no less than 4.5 metres around each stockpile shall be kept free of vegetation; or

(d) scrap tires shall be stockpiled in accordance with a plan approved by the local Fire Department.

36.4 In the event that scrap tires can not be removed from the *Site* and the total storage capacity as approved in Condition 36.3 has been reached, the *Owner* shall, forthwith upon reaching the approved storage capacity,:

- (a) cease accepting additional scrap tires to ensure that the total approved storage capacity is not exceeded;
- (b) notify the *District Manager* that the approved storage capacity has been reached and that the *Site* has ceased to accept additional scrap tires and provide a contingency plan for the long term removal and disposal and/or diversion of scrap tires from the *Site*.

36.5 The *Owner* may implement other waste diversion programs subject to the following:

- (a) the waste diversion program is technically and economically viable; and
- (b) the implementation of the waste diversion program does not entail design changes to the *Site*, does not impact existing approved activities on *Site* nor impact existing monitoring and/or control programs; and
- (c) the *Owner* has notified the *District Manager* of the proposed waste diversion program (type of waste to be diverted and maximum amount to be stored) and has obtained confirmation, in writing, from the *District Manager* that the implementation of the waste diversion program satisfies Condition 36.5(b);
- (d) the *Owner* maintains a record of all waste received, stored and transferred (including destination) from the *Site*, under the waste diversion program.

Waste diversion programs that would not meet the requirements of Condition 36.5(b) require *Director's* approval.

Condition 37 has hereby been added:

ANNUAL REPORTING

37.0 Reporting Requirements

37.1 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* no later than June 30th of the year following the year being reported upon.

37.2 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 description of the waste diversion activities undertaken during that operating year, the amount of waste diverted, by type of waste and the destination of the diverted waste;
- (h) a summary of any complaints received and the responses made;
- (i) a discussion of any operational problems encountered at the *Site* and corrective action taken;
- (j) any changes to the Design and Operations Report and the Closure Plan that have been approved by the *Director* since the last *Annual Report*;
- (k) a report on the status of all monitoring wells and a statement as to compliance with Ontario Regulation 903; and
- (l) any other information with respect to the *Site* which the *Regional Director* may require from time to time.

All other Terms and Conditions on Provisional Certificate of Approval No. A321304, which was issued on February 14, 1980, and subsequent notices of amendment, not affected by this amendment, continue to remain in effect.

The reason(s) for this amendment to the Approval is (are) as follows:

- 31. Condition 20.2 was amended to approve the receipt of tires and waste electrical and electronic equipment. The condition also provides conditional flexibility for inclusion of other wastes in the Owner's waste diversion program subject to the requirements of Condition 36.5.
- 32. Conditions 27.4, 27.5 and 27.6 were added to provide a mechanism for the Owner to make alterations to the Site monitoring program(s).
- 33. The reason for Conditions 36.1, 36.2, 36.3 and 36.4 is to approve the establishment of waste electrical and electronic equipment and scrap tire diversion programs and to ensure that the waste diversion programs are conducted in an acceptable manner and does not result in a hazard or nuisance to the natural environment or any person.
- 34. The reason for Condition 36.5 is to facilitate the implementation of future waste diversion programs. The Ministry supports the goal of maximizing waste diversion where such diversion is technically feasible and viable end markets exist. These programs may be implemented with the concurrence of the District Manager provided that the implementation of the program does not involve Site design changes, for example the construction of permanent structures, and the programs are accounted for in the Annual Report. Waste diversion programs which require Site design changes must be approved by the Director.

35. The reasons for Condition 37 (formerly Condition 36) 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.

This Notice shall constitute part of the approval issued under Approval No. A321304 dated February 14, 1980

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

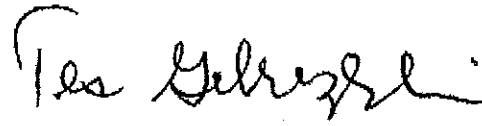
AND

The Director appointed for the purposes of
Part II.1 of the Environmental Protection Act
Ministry of the Environment
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) 212-6349, Fax: (416) 314-4506 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 29th day of October, 2012



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

VP/

c: District Manager, MOE Peterborough



Ministry
of the
Environment

Ministère
de
l'Environnement

AMENDMENT TO PROVISIONAL CERTIFICATE OF APPROVAL
WASTE DISPOSAL SITE

NUMBER A321304

Notice No. 3

Issue Date: June 11, 2009

RECEIVED

JUN 22 2009

OFFICE OF THE CITY CLERK
CITY OF K.L.

The Corporation of the City of Kawartha Lakes
40 Wolfe St
Rural Route, No. 5
Lindsay, Ontario
K9V 2J2

Site Location: Laxton Landfill Site
Lot 6, Concession 9, Laxton
Kawartha Lakes City,

You are hereby notified that I have amended Provisional Certificate of Approval No. A321304 issued on February 14, 1980 and amended on May 3, 2007 and July 17, 2007 for disposal/recycling/reuse/composting site within a total site area of 29 hectares , as follows:

Conditions 30.1 and 30.2 are revoked and replaced by the following:

- 30.1 Trigger mechanisms for the Laxton landfill site is approved as proposed in Items 7 and 8 of Schedule "A".
- 30.2 The *Owner* shall include in the 2008 Annual Report and submit to the *Director* for approval, and copies to the *District Manager*, a contingency plan to be implemented in the event that the surface water or groundwater quality exceeds the trigger level .

Schedule "A"

7. Report titled "Laxton Landfill Site, Status Report, January 1 to December 31, 2006" prepared by City of Kawartha Lakes and Hydroterra Limited" submitted with the cover letter from Bill Pickard addressed to Tesfaye Gebrezghi, Ministry of the Environment, dated July 30, 2007.
8. Report titled "Laxton Landfill Site, Status Report, January 1 to December 31, 2007" prepared by City of Kawartha Lakes and Cambium Environmental".

The reasons for this amendment to the Certificate of Approval are as follows:

1. The reason for Condition 30.1 is to approve the trigger mechanisms.
2. The reason for Condition 30.2 is to require the Owner to have a contingency plan approved by the Director in the event that the surface water or groundwater quality exceeds a trigger level. The reason for having an approved contingency plan before the trigger criteria is exceeded is to implement contingency plans in a timely manner to minimize adverse effects and to ensure public health and safety and environmental protection.

This Notice shall constitute part of the approval issued under Provisional Certificate of Approval No. A321304 dated February 14, 1980 as amended

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 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
2300 Yonge St., Suite 1700
P.O. Box 2382
Toronto, Ontario
M4P 1E4

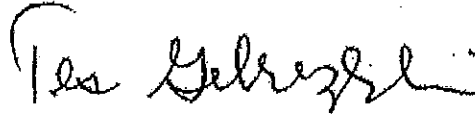
AND

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 11th day of June, 2009



Tesfaye Gebrezghi, P.Eng.

Director

Section 39, *Environmental Protection Act*

RM/

c: District Manager, MOE Peterborough
Bill Pickard, The Corporation of the City of Kawartha Lakes



Ministry
of the
Environment

Ministère
de
l'Environnement

AMENDMENT TO PROVISIONAL CERTIFICATE OF APPROVAL
WASTE DISPOSAL SITE
NUMBER A321304
Notice No. 2
Issue Date: July 17, 2007

The Corporation of the City of Kawartha Lakes
2573 Highway 7 R.R. #5
Lindsay, Ontario
K9V 4R5

Site Location: Laxton Landfill Site
Lot 6, Concession 9, Laxton
Kawartha Lakes City,

You are hereby notified that I have amended Provisional Certificate of Approval No. A321304 issued on February 14, 1980 and amended on May 3, 2007 for the use and operation of a 2.5 hectare of waste disposal/recycling/reuse/composting site within a total site area of 29 hectares , as follows:

Condition 27.2 is revoked and replaced with the following:

27.2 Groundwater samples from all wells in the monitoring network described in Condition 27.1 shall be obtained and analyzed at least once between March and May and at least once between August and November of each year. Groundwater elevations in all monitoring wells shall be measured during each monitoring event prior to obtaining water quality samples.

The reason for this amendment to the Certificate of Approval is

to correct a typographical error.

This Notice shall constitute part of the approval issued under Provisional Certificate of Approval No. A321304 dated February 14, 1980, as amended.

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 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
2300 Yonge St., Suite 1700
P.O. Box 2382
Toronto, Ontario
M4P 1E4

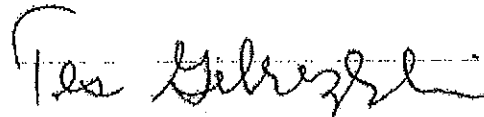
AND

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 17th day of July, 2007



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

RM/

c: District Manager, MOE Peterborough
Roberta Perdue, The Corporation of the City of Kawartha Lakes



Ministry
of the
Environment

Ministère
de
l'Environnement

AMENDMENT TO PROVISIONAL CERTIFICATE OF APPROVAL
WASTE DISPOSAL SITE
NUMBER A321304
Notice No. 1
Issue Date: May 3, 2007

The Corporation of the City of Kawartha Lakes
PO Box 9000 Stn Main
Lindsay, Ontario
K9V 5R8

Site Location: Laxton Landfill Site
Lot 6, Concession 9, Laxton
Kawartha Lakes City

You are hereby notified that I have amended Provisional Certificate of Approval No. A321304 issued on February 14, 1980 for the use and operation of a 2.5 hectare of waste disposal/recycling/reuse/composting site within a total site area of 29 hectares, as follows:

Condition 1 in the Certificate of Approval dated February 14, 1980 is hereby revoked.

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

"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;

"District Office" means the Peterborough District Office, Ministry of the Environment;

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

"HHW " means household hazardous waste;

"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 City of Kawartha Lakes, its successors and assigns;

"*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* ;

"*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;

"*Re-use Area*" means the area of land identified as Reuse in the Plan 3 dated November 2004;

"*Site*" means the entire waste disposal site, including the buffer lands, contaminant attenuation zone located at Part of East Half of Lot 6, Concession 9, City of Kawartha Lake, approved by this *Certificate*; and

"*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* .

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

TERMS AND CONDITIONS

GENERAL

1.0 Compliance

- 1.1 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.
- 1.2 Any person authorized to carry out work on or operate any aspect of the *Site* shall comply with the conditions of this *Certificate* .

2.0 In Accordance

- 2.1 Except as otherwise provided for in this *Certificate*, the *Site* shall be designed, developed, built, operated and maintained in accordance with the application for this *Certificate*, dated October 17, 1972, and the supporting documentation listed in Schedule "A".

3.0 Interpretation

- 3.1 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.
- 3.2 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.
- 3.3 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.
- 3.4 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.

4.0 Other Legal Obligations

- 4.1 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*;

5.0 Adverse Effect

- 5.1 The *Owner* and *Operator* shall take steps to minimize 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.
- 5.2 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.

6.0 Change of Owner

- 6.1 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.
- 6.2 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. In the event of any change in *Ownership* of the works, other than change to a successor municipality, 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*.

7.0 Certificate of Requirement

- 7.1 Pursuant to Section 197 of the *EPA*, no person having an interest in the *Site* shall deal in any way with the *Site* without first giving a copy of this *Certificate* to each person acquiring an interest in the *Site* as a result of the dealing.
- 7.2 Two copies of a completed Certificate of Requirement, containing a registerable description of the *Site*, shall be submitted to the *Director* for the *Director's* signature within six (6) calendar months of the date of this *Certificate*.
- 7.3 The Certificate of Requirement, shall be registered in the appropriate land registry office on title to the *Site* by the *Owner* within ten (10) calendar days of receiving the Certificate of Requirement, signed by the *Director*, and a duplicate registered copy shall be submitted to the *Director*.

8.0 Inspections

- 8.1 No person shall hinder or obstruct a *Provincial Officer* from carrying out any and all inspections authorized by the *OWRA*, the *EPA*, or the *PA*, 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* or the *PA*.

9.0 Information and Record Retention

- 9.1 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*.
- 9.2 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.

10.0 Signs

- 10.1 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 twenty-four (24) hour emergency telephone number (if different from above); and
 - (h) a warning against dumping outside the *Site*.

11.0 Operation

- 11.1 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.
- 11.2 The Design and Operations Report shall be retained at the *Site*, kept up to date through periodic revisions; and be available for inspection by *Ministry* staff. Changes to the Design and Operations Report shall be submitted to the *Director* for approval.

12.0 Vermin, etc.

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

13.0 Hours of Operation

- 13.1 Waste/reuse material shall only be accepted at the *Site* during the following time periods:

6:00 am to 8:00 pm - Monday to Sunday

- 13.2 On-site equipment used for daily site preparation and closing activities shall only be used during the following time periods:

6:00 am to 8:00 pm - Monday to Sunday

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

14.0 Site Security

- 14.1 No waste/reuse material 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.
- 14.2 The *Site* shall be operated and maintained in a 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.

15.0 Employees and Training

- 15.1 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*.

16.0 Complaints Procedure

- 16.1 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.

17.0 Emergency Situation

- 17.1 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.

- 17.2 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*.
- 17.3 All wastes resulting from an emergency situation shall be managed and disposed of in accordance with *O.Reg. 347*.
- 17.4 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) be adequately maintained and kept in good repair.
- 17.5 The *Owner* shall ensure that the emergency response personnel are familiar with the use of such equipment and its location(s).

18.0 Daily Log Book

- 18.1 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 waste and cover material received at the *Site*;
 - (b) the area of the *Site* in which waste disposal operations are taking place;
 - (c) a calculation of the total quantity (tonnes) of waste received at the *Site* during each operating day and each operating week;
 - (d) a record of litter collection activities and the application of any dust suppressants;
 - (e) a record of the daily inspections; and
 - (f) 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.
- 18.2 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.

19.0 Daily Inspections and Log Book

- 19.1 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.
- 19.2 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.

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

19.4 The *Owner* shall forthwith notify the *District Office*, of any and all waste load refusals at the *Site* related to the requirements of this *Certificate*, including service area and waste type. The *Owner* shall confirm the verbal notification in writing within seven (7) business days.

20.0 Approved Waste Types

20.1 The *Operator* shall develop and implement a program to inspect waste to ensure that the waste is of a type approved for acceptance under this *Certificate*.

20.2 Only the following types of waste shall be accepted at the *Site*:

- (a) Municipal Waste;
- (b) Non-hazardous Solid Industrial Wastes;
- (c) Commercial Waste;
- (d) Leaf and Yard Waste; and
- (e) Household Hazardous Waste (HHW).

21.0 Service Area

21.1 Only waste that is generated in the City of Kawartha Lake shall be accepted at the *Site*.

LANDFILL DESIGN AND DEVELOPMENT

22.0 Approved Waste Types

22.1 The waste to be received at the landfill for disposal is restricted to non-hazardous domestic, municipal, commercial, institutional and solid industrial waste.

22.2 No liquid industrial wastes or hazardous wastes, as defined under *Ontario Regulation 347*, shall be disposed of in the landfill area of the *Site*.

23.0 Capacity

23.1 The maximum theoretical waste disposal volume of the *Site*, consisting of the waste, daily cover and intermediate cover, but excluding the final cover is 125,000 cubic metres.

LANDFILL OPERATION

24.0 Cover

24.1 The *Owner* shall ensure that all waste accepted for disposal at the site is disposed of in the waste fill zone and is covered weekly in accordance with this section.

- 24.2 The approved cover material are the following waste material considered to be solid non-hazardous waste including: soil, foundry sand, wood chips, compost, auto fluff, shredder fluff, dredged materials, grill ash, tire shreds, processed asphalt shingles and contaminated soil.
- 24.3 Odourous waste materials shall not be used as cover material.
- 24.4 Alternative materials to cover material approved in 24.2 may be used, 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.
- 24.5 Cover material shall be applied as follows:
- (a) Daily Cover - entire working face shall be covered weekly with a minimum thickness of 150 millimetre of soil cover or an approved thickness of alternative cover material;
 - (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 approved alternative intermediate 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.
- 24.6 If in the opinion of the *District Manager*, covering the waste weekly is creating nuisance/adverse effects, the frequency of the cover application may be changed by the *District Manager*.

LANDFILL MONITORING

25.0 Landfill Gas

- 25.1 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.

26.0 Compliance Limits

- 26.1 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*;
 - (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*.

27.0 Surface Water and Groundwater

- 27.1 The *Owner* shall monitor surface water and groundwater as approved; construct and maintain to the satisfaction of the *Ministry*, a groundwater monitoring network which fully delineates the horizontal and vertical extent of leachate migration resulting from the activities at the *Site*.
- 27.2 Groundwater samples from all wells in the above-described monitoring network will be obtained and analyzed at least once between March and May and at least once August and November. Groundwater elevations in all monitoring wells shall be measured during each monitoring event prior to obtaining water quality samples.
- 27.3 A certified Professional Geoscientist or Engineer possessing appropriate hydrogeologic training and experience will prepare and evaluate the execution of the groundwater monitoring and reporting program.

28.0 Groundwater Wells/Monitors

- 28.1 The *Owner* shall ensure that all groundwater monitoring wells which form part of the monitoring program are properly capped, locked and protected from damage.
- 28.2 Where landfilling is to proceed around monitoring wells, suitable extensions shall be added to the wells and the wells shall be properly re-secured.
- 28.3 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.

29.0 Remedial Measures/Contaminant Attenuation Zone

- 29.1 Should unacceptable groundwater quality conditions be established at the property boundary, the *Owner* shall implement remedial measures; or purchase or obtain a written easement agreement with the property owner(s) of the land(s) required for the Contaminant Attenuation Zone, which will provide the property rights necessary to establish the Contaminant Attenuation Zone; to bring the site into compliance with Reasonable Use Policy Objectives at the property boundary.
- 29.2 The *Owner* must continue to own the property rights to the Contaminant Attenuation Zone for all of the

contaminating life span of the *Site*.

- 29.3 The ownership of the property rights must include the right to:
- (a) discharge contaminants from the operations at the *Site* into the Contaminant Attenuation Zone;
 - (b) 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;
 - (c) install, operate and maintain works, for the purposes mentioned in clause (ii), in or the Contaminant Attenuation Zone, including on the surface above the Contaminant Attenuation Zone; and
 - (d) prevent the owner(s) of the land(s) in which the Contaminant Attenuation Zone is located from paving, erecting a structure or making any use of land(s) 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.
- 29.4 The *Owner* shall notify the *Director* in writing within thirty (30) days after any change in his, her or its ownership of the property rights in the Contaminant Attenuation Zone.
- 29.5 The *Owner* shall ensure that the written easement agreement, specified in Condition 29.1 includes an agreement of the property owner(s) of the land(s) required for the Contaminant Attenuation Zone, to register a Certificate of Requirement on title to the land(s) to be used as the Contaminant Attenuation Zone.
- 30.0 Trigger Mechanisms and Contingency Plan**
- 30.1 Within ninety (90) days 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 monitoring locations.
- 30.2 By July 30, 2007, the *Owner* shall submit to the *Director* for approval, and copies to the *District Manager*, a contingency plan to be implemented in the event that the surface water or groundwater quality exceeds the a trigger level.
- 30.3 In the event of a confirmed exceedence of a site-specific trigger level relating to leachate mounding or groundwater or surface water impacts, 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.
- 30.4 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*.

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

LANDFILL CLOSURE

31.0 Closure Plan

31.1 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.

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

COMPOSTING

32.0 Approved Waste Types

32.1 Only leaf and yard waste shall be composted at this *Site*.

33.0 Operations

- 33.1 Composting operations at the *Site* shall be carried out in a manner as not to interfere with normal waste disposal operations as approved in this *Certificate*.
- 33.2 Should the ensuing compost be destined for use by the general public, composting operations at the *Site* shall be carried out in accordance with the *Ministry's* Interim Guidelines for the Production and Use of Aerobic Compost in Ontario, dated November 2004, and revised from time to time.
- 33.4 Composting operations at the *Site* must be carried out in a manner that does not cause groundwater or surface water contamination, offensive odours or encourage the presence of vermin or any other adverse effect.

RE-USE PROGRAM

34.0 Re-use Facility Operations

- 34.1 The operation of the Re-Use Facility shall be limited to the receipt, temporary storage and public pick-up of non-hazardous items and any other items as approved in advance in writing by the *District Manager*, after they have successfully undergone screening and found to have some residual value, subject to the following conditions:
- (a) Records of the quantities of re-use items (summarized by individual category) received and offered to the public for reuse, are kept and reported in the Annual Report.
 - (b) A "Re-Use material Exchange Disclaimer and Release" form signed by the individual prior to release of the re-use item from the site; and
 - (c) The item is not a commercially banned product.
- 34.2 The total amount of re-use items (non-hazardous items of some residual value) stored at the Re-Use Facility at any one time, shall not exceed 200 tonnes.
- 34.3 Prior to being accepted at the Re-Use Facility, all incoming re-use items shall be inspected by the *Owner*, and shall only be permitted to enter the Re-Use Facility if that type of item is approved to be accepted at the Re-Use Facility.
- 34.4 The Re-Use Facility shall be operated in a secure manner within an enclosed-type structure, such that unauthorized persons cannot enter the Re-Use Facility without supervision.
- 34.5 The *Owner* shall ensure that the Re-Use Facility is operated in a safe and secure manner, and that the re-use items are properly handled, packaged and stored so as not to pose any threat to the general public, site personnel and the natural environment.
- 34.6 All wastes generated at the Re-Use Facility shall be managed and disposed of in accordance with the *EPA* and Ontario Regulation 347.

HOUSEHOLD HAZARDOUS WASTE DEPOT

35.0 HHW Facility Operations

- 35.1 The *HHW* depot shall not receive more than 20 cubic metres of *HHW* per day; and
- 35.2 The *HHW* depot shall not store in excess of 50 cubic metres of *HHW* on *Site*.
- 35.3 *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 35.2.
- 35.4 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.
- 35.5 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.
- 35.6 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.
- 35.7 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.
- 35.8 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.
- 35.9 No radioactive wastes shall be accepted at this *Site*.
- 35.10 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.

- 35.11 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.
- 35.12 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 35.11.

ANNUAL REPORTING

36.0 Reporting Requirements

- 36.1 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* no later than June 30th of the year following the year being reported upon.
- 36.2 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.

SCHEDULE "A"

1. Supporting information to an Application for Approval of a Landfill Disposal Site dated October 17, 1972.
2. Site development Plan and Survey submitted to the Waste Management Branch, June 21, 1973 by F.V. Lecraw.
3. Sketch map entitled "Township of Laxton" 321304, Lot 6, C9.
4. Instructions in the letter to Mr. F.V. LeCraw dated August 28, 1974.
5. Application for a Provisional Certificate of Approval for a Waste Disposal Site dated January 14, 2005 signed by Bill Pickard, Manager of Solid Waste Services.
6. Report entitled "Laxton Landfill Site Design/Operations & Closure Report" prepared by City of Kawartha Lakes, Environmental Services Division.

The reason(s) for this amendment to the Certificate of Approval is (are) as follows:

1. The reasons for this amendment are to approve the establishment of Leaf and Yard Waste Composting Operation, Re-use Centre and Household Hazardous Waste Depot.
2. The reason for Conditions 1, 3, 4, 5 and 9 is to clarify the legal rights and responsibilities of the *Owner* and *Operator* under this Certificate of Approval.
3. The reasons for Conditions 2 and 11.2 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.
4. The reasons for Condition 6.1 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.
5. The reason for Condition 6.2 is 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.
6. Condition 7 is 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 8 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 *EPA* and *OWRA*.

8. The reason for Condition 10 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 of Approval.
9. The reasons for Conditions 11, 12, 19.1 and 20.1 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.
10. The reasons for Condition 13 are to specify the hours of operation for the landfill site and a mechanism for amendment of the hours of operation, as required.
11. The reasons for Condition 14 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.
12. The reason for Condition 15 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.
13. The reason for Condition 16 is to ensure that any complaints regarding landfill operations at this *Site* are responded to in a timely and efficient manner.
14. Conditions 17.1 and 17.2 are included to ensure that emergency situations are reported to the Ministry to ensure public health and safety and environmental protection.
15. Condition 17.3, 17.4 and 17.5 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.
16. The reason for Condition 18 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.
17. The reason for Conditions 19.2, 19.3 and 19.4 is to specify record keeping requirements which are necessary to determine compliance with this Certificate of Approval. Notification of the District Manager of load refusals is required to allow the MOE to consider and take appropriate action in a timely manner under this Certificate, the *EPA* or its regulations.
18. The reason for Conditions 20.2, 21, 22, 23 and 32 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.
19. The reasons for Condition 24 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.

20. Condition 25 is included to ensure that 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*.
21. Condition 26 is included to provide the groundwater and surface water limits to prevent water pollution at the *Site*.
22. Condition 27 is 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.
23. Condition 28 is included to ensure the integrity of the groundwater monitoring network so that accurate monitoring results are achieved and the natural environment is protected.
24. Condition 29 is included to require the *Owner* to obtain property rights to land(s) that is required for a Contaminant Attenuation Zone that is necessary for attenuation of contamination resulting from the operation of the *Site* or to use an alternative method to bring the site into compliance with Reasonable Use Policy Objectives.
25. Condition 30 is 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.
26. The reasons for Condition 31 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.
27. Condition 33 is included to ensure that the *Owner* undertake the composting activities in accordance with Ministry's requirements and in a manner that would not result in a hazard or nuisance to the natural environment.
28. The reason for Condition 34.1 is to ensure that the Re-Use Facility 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.
29. The reason for Conditions 34.2 to 34.7 inclusive to allow sufficient quantity of re-use items to be stocked and released for re-use, and to ensure the operation of the Re-Use Facility will not result in a nuisance or a hazard to public health and safety.
30. The reason for the condition 35 is to approve the establishment and operation of a household hazardous waste transfer station and to ensure that the wastes are managed in a manner that protects the environment and the health and safety of the public.

31. The reasons for Condition 36 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.

This Notice shall constitute part of the approval issued under Provisional Certificate of Approval No. A321304 dated February 14, 1980

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 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
2300 Yonge St., Suite 1700
P.O. Box 2382
Toronto, Ontario
M4P 1E4

AND

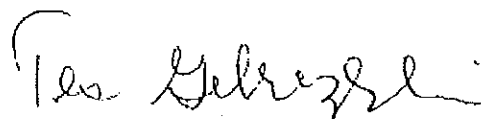
The Director
Section 39, *Environmental Protection Act*
Ministry of the Environment
2 St. Clair Avenue West, Floor 12A
Toronto, Ontario
M4V 1L5

* 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 May, 2007



Tesfaye Gebrezghi, P.Eng.

Director
Section 39, *Environmental Protection Act*

RM/

c: District Manager, MOE Peterborough



M E M O R A N D U M

January 14, 2015

TO: Cathy Curlew
Senior Environmental Officer
Peterborough District Office
Eastern Region

FROM: Mark Phillips
Surface Water Scientist
Technical Support Section
Eastern Region

RE: 2013 Annual Monitoring Report
Laxton WDS
Lot 6, Concession 9, Laxton
City of Kawartha Lakes
IDS #: 5777-9M2L9U

I have reviewed the above noted report prepared by WESA (dated June 2014) from a surface water impact perspective and have the following comments.

Background

The Laxton Waste Disposal Site (WDS) operates under a Provisional Environmental Compliance Approval (ECA) (#A321304) which allows for the landfilling of domestic, commercial and non-hazardous industrial wastes within a 2.5 hectare fill area. The WDS has been in operation since 1973. There is approximately 7 years of capacity remaining at this site.

The WDS is located within an "extensive" wetland which drains easterly through an unnamed tributary towards the Gull River. Locally, both the north and south wetlands which flank the landfill discharge to the easterly flowing unnamed tributary which flows under Highway 503 (approximately 700 metres south east of the landfill).

In 2013, surface water monitoring involved the collection of surface water samples three times (June, July, October) at 5 locations (SWA upstream/background of WDS; SWD, 50 m north of the landfill in wetland; SWF located 20 m north of landfill on tributary; SWG located 80 m east of the landfill in wetland/tributary; and, SWC2 located 180 m down gradient from landfill on tributary). The monitoring program was amended in 2012 following discussions with MOECC.

Comments on the 2010 Annual Monitoring Report were provided in a memorandum dated March 1, 2012. In addition, I also provided comments on the Performance Monitoring Program in a memorandum dated June 8, 2012. Most recently I provided comments on the 2011 Annual Monitoring Report in a memorandum dated August 1, 2012.

Comments

Surface water samples were collected in June, July and October during 2013. Iron and Total Phosphorus exceeded the Provincial Water Quality Objectives (PWQO) at all stations during 2013. Iron was recorded as high as 3 orders of magnitude above the PWQO; however the exceedances were attributed to elevated concentrations of suspended sediment in the samples. Iron, in particular, is known to be elevated with the landfill leachate and is a parameter of concern at this site. However, the elevated level of iron in the samples does coincide with elevated suspended solids and I accept the consultant's conclusion that suspended solids may be the cause. The consultants should take added care to ensure that samples are free of suspended sediment.

In addition to iron and TP (as noted above), aluminum and copper at SWD; aluminum, arsenic, cadmium, chromium, cobalt, vanadium, zinc and DO at SWF; cobalt and zinc at SWG; and aluminum and copper at SWA (background) all exceeded the PWQO during 2013.

The consultants compare a number of groundwater monitoring stations to the PWQO. To the north of the landfill (MW6, MW17, MW18), significant PWQO exceedances for zinc at MW17 and MW18 were attributed to the galvanized drive point piezometers. In addition, iron, TP, boron and alkalinity were also elevated above the PWQO at these locations.

To the east of the landfill, the consultants compared groundwater quality at MW3, MW16 and MW16-1 to the PWQO. Significantly elevated concentrations of iron (MW3) and TP (MW16) were measured. The source of the elevated iron at MW3 needs to be identified/determined.

Water quality at MW4 (leachate monitoring well) was also found to have elevated (above Canadian Water Quality Guidelines) concentrations of monochlorobenzene (chlorobenzene). Although a number of other wells were sampled for VOCs, MW17 was not. Given that this parameter has been found to be elevated above the CWQG for a number of years I recommend that both MW17 and SWF be sampled for this parameter during the next monitoring period.

The consultants have determined that at least some of the elevated parameters measured at SWG may be the result of landfill related impacts. I agree.

The groundwater results from wells which are located immediately adjacent to or within surface water features have concentrations of some parameters which may impair the aquatic ecosystem. Likewise, some parameters measured at surface water stations show similar results. Although the consultants have provided reasonable explanations for the sampling results (see also groundwater comments from G. Faaren) the leachate wells (also located immediately adjacent to the wetland) show that many of these same parameters are similarly elevated in the landfill leachate. Future monitoring at these stations will be needed to verify if the consultant's explanations (e.g. sediment in the sample) are adequate, if they are not, then mitigative actions will be required. As this site is nearing capacity, I would recommend that the municipality consider applying final cover and seeding to those areas of the landfill which are at final contours – and in particular those areas adjacent to the wetland.

If you have any questions regarding the above comments please contact me at (613) 540-6854.

A handwritten signature in black ink, appearing to read "Mark Phillips". The signature is written in a cursive, flowing style.

Mark Phillips
MP/sh

ec: Peter Taylor, Manager, Technical Support Section, MOECC
Jim Martherus, Acting District Supervisor, Peterborough, MOECC

c: File SW KL KL C9 03 06
Groundwater Unit Files

Angela Porteous, *Regulatory Compliance Officer*

April 15, 2015

Ms. Cathy Curlew
Senior Environmental Officer
Peterborough District Office
Ministry of the Environment
300 Water Street
Peterborough, Ontario, K9V 2J2

Dear Ms. Curlew,

As required and further to the Laxton Waste Disposal Site Inspection you preformed on October 30, 2014, the City has prepared the following response in bold to M. Phillips (MP) comments/ recommendations made regarding the 2013 Annual Monitoring Report.

MP- Surface water samples were collected in June, July and October during 2013. Iron and Total Phosphorus exceeded the Provincial Water Quality Objectives (PWQO); however the exceedences were attributed to elevated concentrations of suspended sediment in the samples. Iron, in particular, is known to be elevated with the landfill leachate and is a parameter of concern at this site. However, the elevated level of iron in the samples does coincide with elevated suspended solids and I accept the consultant's conclusion that suspended solids may be the cause. The consultants should take care to ensure that samples are free of suspended sediment.

The City acknowledges your agreement with the consultants conclusions that suspended solids may be the cause. It should also be noted that starting January 2015, the City has started working with a new consultant firm to complete environmental monitoring at various open and closed landfill sites including the Laxton Waste Disposal Site. Part of the orientation has been ensure that samples taken are free of suspended sediment wherever possible.

MP- In addition to iron and TP (noted above) aluminum and copper at SWD; aluminum, arsenic, cadmium, chromium, cobalt, vanadium, zinc and DO at SWF; cobalt and zinc at SWG; and aluminum and copper at SWA (background) all exceeded the PWQO during 2013.

As noted in the 2013 AMR all exceedences were observed to be within historical concentrations ranges for SWA, SWD and SWF. Also, 2013 was the first year collecting samples at SWG and additional monitoring is required to establish trends.

Elevated concentrations for iron, phosphorus, phenols, aluminum, pH (low), cadmium, chromium, copper, lead, zinc and DO (low) have been noted at the

background surface water location (SWA) and attributed to non-landfill related activities that are upgradient of the waste disposal site.

MP- The consultants compare a number of groundwater monitoring stations to the PWQO. To the north of the landfill (MW6, MW17, MW18), significant PWQO exceedences for zinc at MW17 and MW18 were attributed to the galvanized drive point piezometers. In addition, iron, TP, boron and alkalinity were also elevated above the PWQO at these locations.

Both MW17 and MW18 were replaced on December 17th, 2013 by Cambium. The City will continue to take samples from these two (2) new drive points (constructed of stainless steel) during the 2015 monitoring season to determine whether historical elevated concentrations of some of the noted metals at these locations can be attributed to the construction of the piezometers. The City will review the trends for TP, Boron and alkalinity closely in the 2014 annual monitoring report.

MP- To the east of the landfill, the consultants compared groundwater quality at MW3, MW16 and MW16-I to the PWQO. Significantly elevated concentrations of iron (MW3) and TP (MW16) were measured. The source of the elevated iron at MW3 needs to be identified/ determined.

MW3 is located at the toe of the landfill; higher concentrations of certain parameters are expected at this location as a result of the landfill. However, although iron is elevated it does appear to be within historical ranges. We will continue to closely monitor iron and TP at these locations.

SWG will be reviewed in relation to MW3 to establish trends in specific parameters also.

MP- Water quality at MW4 (leachate monitoring well) was also found to have elevated (above Canadian Water Quality Guidelines) concentrations of monochlorobenzene (chlorobenzene). Although a number of other wells were sampled for VOCs, MW17 was not. Given that this parameter has been found to be elevated above the CWQG for a number of years I recommend that both MW17 and SWF be sampled for this parameter during the next monitoring period.

In 2015, the City will monitoring for VOCs (including chlorobenzene) at MW17 during regular spring and fall sampling events and at SWF during spring, summer and fall. Results will be incorporated into the 2015 AMR and the consultant will be asked to make recommendations if continued monitoring of VOCs is required beyond 2015 at MW17 and SWF.

MP- The consultants have determined that at least some of the elevated parameters measured at SWG may be the result of landfill related impacts. I agree.

Further sampling at this location is required to determine trends and confirm if the impacts are the result of leachate since the one set of samples taken to date were highly turbid with high suspended sediment. WESA indicated that the PWQO exceedences noted are likely a result of sediment entrapment in the sample. Care will be taken to minimize sediment entrapment in future samples.

MP- Groundwater results from wells which are located immediately adjacent to or within surface water features have concentrations of some parameters which may impair the aquatic ecosystem. Likewise, some parameters measured at surface water stations show similar results. Although the consultants have provided reasonable explanations for the sampling results (see also groundwater comments from G. Faaren) the leachate wells (also located immediately adjacent to the wetland) show that many of these same parameters are similarly elevated in the landfill leachate. Future monitoring at these stations will be needed to verify if the consultant's explanations (e.g. sediment in the samples) are adequate, if they are not, then mitigation actions will be required. As this site is nearing capacity, I would recommend that the municipality consider applying final cover and seeding to those areas of the landfill which are at final contours- and in particular those areas adjacent to the wetland.

The City agrees and will discuss modifying our operations to ensure final cover is placed in sensitive areas. Also, more recently final cover has been placed in the northern portion of the landfill adjacent to the wetland and it is anticipated that this will result in improved water quality in this area.

We hope our response addresses your comments. Please do not hesitate to contact me at (705) 324-9411, extension 2360 if you have any questions.

Yours truly,



Angela Porteous
Regulatory Compliance Officer

cc: David Kerr, Manager of Environmental Services
Tara Stephen, Acting Waste Management Operations Supervisor
File



MEMORANDUM

January 15, 2015

TO: Cathy Curlew
Senior Environmental Officer
Peterborough District Office
Eastern Region

FROM: Greg Faaren
Hydrogeologist
Technical Support Section
Eastern Region

RE: 2013 Annual Status Report
Laxton Waste Disposal Site
Lot 6, Concession 9, Township of Laxton
City of Kawartha Lakes, Certificate of Approval No. A321304

I have reviewed the hydrogeologically pertinent sections of the above noted report prepared by WESA, a division of BluMetric Environmental Inc. (WESA) and dated June, 2014. This report was provided on behalf of the City of Kawartha Lakes in order to fulfill the monitoring/reporting conditions of the Environmental Compliance Approval (ECA) for the site. I offer the following comments for your consideration.

Summary

- Groundwater flow is predominantly within the sand/gravel overburden aquifer. There is a groundwater divide at the site with flow out from the waste mound to the north and to the southeast.
- The Laxton Waste Disposal Site is not in conformance with Guideline B-7 as there are Reasonable Use (RU) exceedances in monitoring well MW3. WESA reports that the City of Kawartha Lakes is in the process of acquiring lands to the east of the site for a contaminant attenuation zone (CAZ). It is recommended that delineation of the landfill impacts to the east of the site be determined before the area of the CAZ is finalized.
- Groundwater in the vicinity of leachate impacted monitoring wells MW17 and MW18 likely discharges to the adjacent wetland. WESA indicates that the elevated concentrations of leachate parameters observed in wells MW17 and MW18 may not be solely landfill related. Wells MW17 and MW18 were constructed using galvanized (i.e. zinc coated) pipe. It is likely that the observed zinc concentrations in wells MW17 and MW18 are from the breakdown of the galvanized steel pipes and not from the wetland. This issue has also been observed at other landfill sites where galvanized steel pipes were used for drive point wells. WESA indicates that these wells were to be replaced in 2014. Further monitoring of the new wells will be required to determine the extent of the leachate impacts in this area.

- WESA indicates that well MW14 is interpreted to be unimpacted by landfill leachate and proposes to use well MW14 as the new background well. Monitoring well MW14 was noted to exceed the Ontario Drinking Water Quality Standards (ODWQS; MOECC, 2006) for iron and chromium in 2013. Close attention will have to be paid to this well to determine if it is suitable to use as a background well as this well is located downgradient of the waste mound.
- In 2013 landfill gas monitoring was conducted in June and October. WESA reports that no detectable concentrations of landfill gas were observed in the gas probes on-site.
- The proposed list of sampling parameters for the semi-annual monitoring program is acceptable. The proposed groundwater and landfill gas monitoring/sampling frequency are also acceptable. The reporting frequency should be annual.

Environmental Compliance Approval (ECA)

The Laxton Waste Disposal Site (WDS) is located on the east half of Lot 6, Concession 9, geographic region of Laxton, City of Kawartha Lakes. The landfill has operated under Provisional ECA No. A321304 since 1973. The site is licensed as a domestic, commercial and non-hazardous solid industrial waste disposal site. The approved waste footprint is 2.5 hectares within a 29 hectare site area. The Laxton WDS operates as a naturally attenuating site.

Geology

The geology of the site has been described as:

- A discontinuous organic peat unit;
- A silty fine sand unit;
- A fine-coarse sand unit;
- A medium-coarse sand and gravel unit.

The depth to bedrock is approximately 20 m. WESA reports that the depth to bedrock may increase toward the northeast property boundary. WESA reports that based on the results of the borehole drilling programs conducted at the site, a channel of coarser grained sediments trending east-west may exist at depth along the southern landfill perimeter. WESA indicates that this channel (if present) could act as a preferential flow path for landfill contaminants.

Hydrogeology

The hydrogeological characteristics of the site are described as:

- The 2013 groundwater monitoring data for the shallow overburden monitoring wells showed that a groundwater divide trending north-southeast exists on site.
- Hydraulic conductivities for the site were previously determined to range from 10^{-2} to 10^{-6} cm/second.
- Previously, horizontal hydraulic gradients ranging from 0.1 to 0.2 m/m were estimated for wells at the site.
- Water levels at well MW1 and MW10 indicate low vertical hydraulic gradients with predominantly discharging conditions in 2013.

WESA indicates that there are eighteen (18) overburden monitoring wells and one (1) bedrock monitoring well located at the site. Each of these wells were monitored and sampled in June and October of 2013, with the exception of well MW15. Well MW15 has been dry on most occasions since its installation.

Background Groundwater Quality

Background groundwater quality was formerly monitored at upgradient monitoring well MW8, screened in the shallow overburden aquifer. However, WESA reports that well MW8 may be starting to show leachate impacts as increasing trends were noted in this well from 2007 to 2010.

WESA notes that there are three (3) wells located downgradient of the site (wells MW12, MW13 and MW14). WESA indicates that these wells are interpreted to be unimpacted by landfill leachate and proposes to use well MW14 as a background well. Monitoring well MW14 was noted to exceed the ODWQS for iron and chromium in 2013.

Leachate

Leachate from the waste mound is characterized at monitoring well MW4 which is screened in the overburden directly beneath of the waste. In 2013, as in previous years, several exceedances of the ODWQS were noted in this well. The elevated parameter concentrations, as compared to background water quality at MW08 and MW14, are interpreted by WESA to be characteristic of leachate at the site.

Downgradient Water Quality

Leachate impacts were evident at several downgradient monitoring wells, located along the perimeter of the waste footprint related to the radial flow of leachate from the site. Exceedances of the ODWQS for one (1) or more of iron, manganese, DOC, TDS, pH and zinc were noted in monitoring wells MW2, MW3, MW6, MW7, MW8, MW10, MW12, MW16, MW16-I, MW17 and MW18 on at least one occasion during the 2013 monitoring program. The highest levels of impact were observed in groundwater samples collected from monitoring well MW3. It is noted that the impacts observed in well MW3 are undelineated to the east.

Overburden monitoring wells located to the east of the waste mound (i.e. wells MW2, MW12, MW16-1 and MW16 are showing exceedances of the ODWQS for manganese only, which may not be landfill related.

WESA indicates that the leachate impact at bedrock monitoring well MW10 is expected to be minor as this is not considered the main pathway for groundwater flows originating from the landfill area. At this location iron and manganese exceeded the ODWQS during the 2013 sampling events.

WESA reports that the elevated leachate parameters observed in wells MW17 and MW18 may not be solely the result of landfill impacts. WESA reports that the elevated zinc concentrations observed in these wells appears to be related to the wetland environs surrounding the site. It was previously noted that the well construction logs for wells MW17 and MW18 indicate that

while the well screens are made of stainless steel, the riser pipes and couplings for these wells are constructed of galvanized steel pipe (i.e. zinc coated pipe). Given that no other wells at the site showed any zinc issues it is more likely that the observed zinc concentrations in wells MW17 and MW18 are from the breakdown of the pipe material and not from the wetland. This issue has also been observed at other landfill sites where galvanized steel pipes were used for drive point wells. WESA reports that wells MW17 and MW18 were to be replaced in 2013. However, elevated concentrations of other leachate indicators including iron, manganese and/or DOC were noted at these locations. Further monitoring of the new replacement monitoring wells will be required to ascertain the significance of these exceedances.

Volatile organic compounds (VOCs) were sampled in monitoring wells MW3 and MW6. All concentrations of VOCs were below the ODWQS criteria.

WESA indicates that the Laxton WDS is nearing capacity. Given the significant strength of the leachate quality and the leachate impacts observed in monitoring wells near the waste mound, it may be prudent to consider final capping of areas of the landfill where filling is complete. This may help reduce leachate generation at the site.

Groundwater/Surface Water Interaction

Several monitoring wells located upgradient of the wetland to the north of the waste mound are showing leachate impacts. In order to better assess groundwater quality immediately upgradient of the wetland, WESA supervised the installation of two (2) drive point piezometers (wells MW17 and MW18) downgradient of the waste mound and immediately upgradient of the wetland. WESA reports that iron, manganese, zinc and/or DOC exceeded the ODWQS in these wells. WESA also reports that alkalinity, iron, phosphorous and/or zinc exceeded the PWQO in these wells. As stated above, WESA attributes these impacts to the wetland environs. However, the impacts are likely the result of leachate impacts and issues with the well construction materials for wells MW17 and MW18 (i.e. galvanized steel pipe used in the well construction). Therefore, there is the potential for leachate impacted groundwater to discharge to the adjacent wetland. WESA reports that wells MW17 and MW18 were to be replaced in 2014. Further monitoring of the new replacement monitoring wells will be required to ascertain the significance of these PWQO exceedances.

Guideline B-7

Guideline B-7 applies to operating waste disposal sites. WESA determined Reasonable Use (RU) concentrations for several landfill related chemical parameters and conducted a RU assessment for the site. WESA determined that exceedances of the RU guidelines were observed at several monitoring wells including wells MW3, MW12, MW16, MW16-I, MW17, MW18 and MW19. Exceedances were typically for iron and manganese. However, well MW3, MW17 and MW18 showed RUC exceedances for several parameters.

WESA indicates that the RUC exceedances observed in well MW3 are due to landfill leachate and are undelineated. WESA reports that the City of Kawartha Lakes is looking at purchasing a parcel of land to the east of the site to act as a CAZ.

It is noted that monitoring wells MW12, MW16-1 and MW16 showed exceedances of the RU criteria for iron and/or manganese on at least one (1) occasion in 2013. It is less clear if wells MW12, MW16-1 and MW16 are impacted by leachate or have naturally elevated iron and/or manganese.

As stated above, it is likely that the observed RUC exceedances in wells MW17 and MW18 are a combination of the breakdown of the pipe material and from the landfill. WESA reports that wells MW17 and MW18 were to be replaced in 2014. Further monitoring of the new replacement monitoring wells will be required to ascertain the significance of these exceedances.

Landfill Gas Monitoring

WESA reports that two landfill gas probes were installed at the site in the summer of 2008. In 2013 landfill gas monitoring was conducted in June and October. WESA reports that no detectable concentrations of landfill gas were observed.

Trigger/Contingency Plans

The proposed trigger mechanisms comprise the RU criteria for current groundwater analytical parameters. WESA also proposes to include drive point wells MW17 and MW18 as part of the trigger mechanism.

WESA reports that the groundwater analytical results observed in wells MW3 are the result of leachate impact and therefore the trigger mechanism for the site is activated. WESA reports that the City of Kawartha Lakes is in the process of acquiring lands to the east of the site for a CAZ.

Groundwater Monitoring

WESA recommends that the semi-annual groundwater monitoring and quarterly landfill gas monitoring program continue at the site. The current parameter list is acceptable. The reporting frequency is to be annual. WESA proposes to remove wells MW12, MW16 and MW16-1 from the monitoring program once the CAZ is acquired.



Greg Faaren, P.Geo.
GF/sh

ec: David Bradley
Peter Taylor

c: Mark Philips
File GW KL KL C9 01 02 (A321304)
GF/IDS# 1248-9M2L9H

Angela Porteous, *Regulatory Compliance Officer*

April 15, 2015

Ms. Cathy Curlew
Senior Environmental Officer
Peterborough District Office
Ministry of the Environment and Climate Change
300 Water Street, Peterborough, Ontario, K9V 2J2

Dear Ms. Curlew,

As requested and further to the Laxton Waste Disposal Site Inspection you performed on October 30, 2014, the City has prepared the following response in bold to G. Faaren (GF) comments/ recommendations made regarding the 2013 Annual Monitoring Report.

GF- Groundwater flow is predominantly within the sand/gravel overburden aquifer. There is a groundwater divide at the site with flow out from the waste mound to the north and to the southeast.

Acknowledged.

GF- The Laxton Waste Disposal Site is not in conformance with Guideline B-7 as there are Reasonable Use (RU) exceedences in monitoring well MW3. WESA reports that the City of Kawartha Lakes is in the process of acquiring lands to the east of the site for a contaminant attenuation zone (CAZ). It is recommended that delineation of the landfill impacts to the east of the site be determined before the CAZ is finalized.

The property to the east is approximately 100 acres and should be more than sufficient as an attenuation zone. Currently the City is trying to negotiate the purchase of the property. Once the property is acquired additional monitoring wells will be installed on the property to confirm the CAZ.

GF- Groundwater in the vicinity of leachate impacted monitoring wells MW17 and MW18 likely discharges to the adjacent wetland. WESA indicates that the elevated concentrations of leachate parameters observed in wells MW17 and MW18 may not be solely landfill related. Wells MW17 and MW18 were constructed using galvanized (i.e. zinc coated) pipe. It is likely that the observed zinc concentrations in wells MW17 and MW18 are from the breakdown of the galvanized steel pipes and not from the wetland. This issue has also been observed at other landfill sites where galvanized steel pipes were used for drive point wells. WESA indicates that these wells were to be replaced in 2014. Further monitoring of the new wells will be required to determine the extent of the leachate impacts in this area.

Both MW17 and MW18 were replaced on December 17th, 2013 by Cambium. The City will continue to take samples from these groundwater monitoring wells during the 2015 monitoring season as per the ECA. The new wells are constructed of stainless steel.

GF- WESA indicates that well MW14 is interpreted to be unimpacted by landfill leachate and proposes to use well MW14 as the new background well. Monitoring well MW14 was noted to exceed the Ontario Drinking Water Quality Standards (ODWQS; MOECC, 2006) for iron and chromium in 2013. Close attention will have to be paid to this well to determine if it is suitable to use as a background well as this well is located downgradient of the waste mound.

The City will continue to use MW14 to represent background groundwater quality in overburden at the site as recommended by Azimuth and undertaken by WESA in the 2013 AMR. Through future reporting, the City will continually assess water quality at this well to ensure that it continues to be representative of background.

GF- In 2013 landfill gas monitoring was conducted in June and October. WESA reports that no detectable concentrations of landfill gas were observed in the gas probes on-site.

To clarify 2013 landfill gas monitoring was conducted on the following occasions shown in the table below. All monitoring completed indicated results of no detectable concentrations of landfill gas.

Date Gas Monitoring Completed	Conducted By
January 10, 2013	CKL staff
February 18, 2013	CKL staff
June 10, 2013	Cambium
July 31, 2013	CKL staff
October 30, 2013	Cambium

GF- The proposed list of sampling parameters for the semi-annual monitoring program is acceptable. The proposed groundwater and landfill gas monitoring/ sampling frequency are also acceptable. The reporting frequency should be annual.

The City will continue its current monitoring program and annual reporting.

Please do not hesitate to contact me at (705) 324-9411, ext. 2360 if you have any questions.

Yours truly,



Angela Porteous
Regulatory Compliance Officer

cc: David Kerr, Manager of Environmental Services
Tara Stephen, Acting Waste Management Operations Supervisor
File



Solid Non-Hazardous Waste Disposal Site Inspection Report

Client:	The Corporation of the City of Kawartha Lakes Mailing Address: 12 Peel St, Post Office Box, 9000, Lindsay, Ontario, Canada, K9V 5R8 Physical Address: 12 Peel St Lindsay, Kawartha Lakes, City, Ontario, Canada, K9V 5R8 Telephone: (705)324-9411, Extension: 1151, email: rmacpherson@kawarthalakes.ca Client #: 4353-78NJW9, Client Type: Municipal Government, NAICS: 913910 Additional Address Info: Lindsay		
Inspection Site Address:	Laxton Landfill Site Address: 3225 Monck Rd Lot 6 Concession 9 former Laxton Township, Kawartha Lakes, City District Office: Peterborough GeoReference: Map Datum: NAD83, Method: Not Available, , LIO GeoReference: Zone: 17, UTM Easting: 671027.4, UTM Northing: 4954442.0, Latitude: 44.722942, Longitude: -78.84041 Site #: 4263-5WBJ46		
Contact Name:	Shayne Hartin	Title:	Operations Supervisor
Contact Telephone:	(705)324-9411 ext1133	Contact Fax:	
Last Inspection Date:	2014/10/30		
Inspection Start Date:	2018/06/21	Inspection Finish Date:	2018/06/21
Region:	Eastern		

1.0 INTRODUCTION

The City of Kawartha Lakes operates a solid non-hazardous waste landfill site at 3225 Monck Road, in the former Township of Laxton. The site is known as the Laxton Landfill Site.

The landfill accepts solid, non-hazardous wastes from a service area consisting of the City of Kawartha Lakes. Environmental Compliance Approval (ECA) No. A321204 Notice 4, dated October 29, 2012, allows for the use and operation of a 29 hectare site. The facility can accept the following wastes:

- Municipal Waste
- Non-hazardous Solid Industrial Waste
- Commercial Waste
- Leaf and Yard Waste
- Household Hazardous Waste (HHW)

The Laxton Landfill Site is open to the public on:

Winter Hours

Thursday 11 am - 5 pm

Sunday 12 pm - 4 pm

Summer Hours

Thursday 11 am - 5 pm

Sunday 11 am - 5 pm

On the day of the inspection, an interview was conducted with Shayne Hartin, Operations Supervisor, David Kerr, Manager of Environmental Services, and Kerri Snoddy, Waste Technician, of the City of Kawartha Lakes. The

inspection was conducted by Provincial Officer Glenn Rutherford and Environmental Assistant Jami Cernele. The inspection was undertaken to determine compliance with the Environmental Protection Act (EPA), Regulation 347 (O. Reg. 347), Amended ECA #A321206 issued January 20, 2016, and other relevant ministry legislation, policies and guidelines. At the time of the inspection, the landfill was open to the public. On the day of the inspection, the weather was sunny and warm.

INSPECTION NOTE: Changes to the EPA effective October 2011 have resulted in Certificates of Approval (CofA) now being referred to as Environmental Compliance Approvals (ECA). The electronic template for this inspection report form has not been updated to reflect this change, however, the text entered in the report reflects this change in terminology.

2.0 INSPECTION OBSERVATIONS

Certificate of Approval Number(s):

A321304 Notices 1-4

Notice No. 1 - issued May 7, 2007

Notice No. 2 - issued July 17, 2007

Notice No. 3 - issued June 11, 2009

Notice No. 4 - issued October 29, 2012

2.1 FINANCIAL ASSURANCE:

Specifics:

Financial assurance is not required for this municipally owned waste disposal site.

2.2 APPROVED AREA OF THE SITE:

Specifics:

The Site has an approved waste footprint area of 2.5 ha, within the total site area of 29 ha, and relies on natural attenuation of leachate impacts.

At the time of the inspection, it was indicated that the City of Kawartha Lakes is in the process of acquiring additional Contaminant Attenuation Zone (CAZ) lands to the north-east, which was recommended by their consultant. An application to amend ECA No. A321304 will be required once the City has acquired these lands.

2.3 APPROVED CAPACITY:

Specifics:

Condition 23(1) states that:

23 Capacity

(1) The maximum theoretical waste disposal volume of the Site, consisting of the waste, daily cover and intermediate cover, but excluding final cover is 125,000 cubic metres.

According to the 2017 Annual Monitoring Report, prepared by Azimuth Environmental Consulting Inc. dated June 27, 2018, the site has an estimated remaining capacity of 23,950 cubic meters, or 19% of the site volume. At the time of the inspection, it was indicated that the landfill site had approximately 5 years of capacity remaining. This estimate was concluded using the average annual fill rate of 4,514 cubic metres.

2.4 ACCESS CONTROL:

Specifics:

Condition 14(1) and (2) states that:

14. Site Security

(1) No waste/reuse material 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.

(2) The Site shall be operated and maintained in a 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 a lockable gate and fencing.

Access to the site is controlled by lockable gates and fencing on days when the landfill is closed. At the time of the inspection, the landfill was open to the public, and scale-house attendants were on site.

2.5 COVER MATERIAL:

Specifics:

Condition 24(5) states that

24.5 Cover material shall be applied as follows:

(a) Daily Cover - entire working face shall be covered weekly with a minimum thickness of 150 millimetre of soil cover or an approved thickness of alternative cover material;

(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 approved alternative intermediate 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 the inspection, there was no evidence of wind blown litter. It was indicated that daily cover was applied weekly at end of day on Thursdays as per Condition 24.5(b).

2.6 WASTE BURNING:

Specifics:

At the time of the inspection, there was no evidence of waste burning. City of Kawartha Lakes staff indicated that the burning of wastes is not an operational practice at this site.

The site did experience a fire in August 2014 consisting of mainly construction and demolition waste mixed with residential waste. At the time of the most recent inspection, there was no indication or evidence of a fire at the site since.

2.7 GROUNDWATER/SURFACEWATER IMPACT:

Specifics:

According to the 2017 Annual Monitoring Report, the site is out of compliance with the Reasonable Use B-7 Guideline to the east of the landfill. The City of Kawartha Lakes is negotiating to acquire additional Contaminant Attenuation Zone (CAZ) lands to the east of the site. See Section 5 below, for required actions.

The 2017 Annual Monitoring Report states that the stability of the ground and surface water quality would allow for a reduction in surface water sampling to a bi-annual schedule, corresponding with the ground water monitoring program.

2.8 LEACHATE CONTROL SYSTEM:

Specifics:

Condition 29 of ECA No. A321304 is included to require the Owner to obtain property rights to the land(s) that is required for a Contaminant Attenuation Zone that is necessary for attenuation of contamination resulting from the operation of the Site or to use an alternative method to bring the site into compliance with Reasonable Use Policy Objectives.

There is no leachate control system at the site. The site has been approved and is currently operated as a natural attenuation facility. The City is in the process of acquiring CAZ lands to the east of the landfill to bring the facility into compliance with the Reasonable Use B-7 Guideline.

2.9 METHANE GAS CONTROL SYSTEM:

Specifics:

Condition 25(1) states:

25. 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.

Landfill gas is monitored at the site at two gas monitoring wells, both located to the south of the active waste area. The 2017 Annual Monitoring Report suggests that landfill gas monitoring could be eliminated due to the lack of landfill gas detections at the monitors and limited sensitive land uses surrounding the landfill.

2.10 OTHER WASTES:**Specifics:**

The site operates as a Household Hazardous Waste (HHW) Depot. The site also collects for diversion electronics and electrical equipment, tires, scrap metal, empty propane tanks, white goods and bale wrap. The site accepts and composts leaf and yard waste.

3.0 REVIEW OF PREVIOUS NON-COMPLIANCE ISSUES

The inspection on October 30, 2014 resulted in the following action items:

1. By June 30, 2015, include in the annual monitoring report for the site a method for using unfinished compost at the site for encouraging vegetative growth on final cover and interim cover areas. The method should include the texture of the compost, the permeability, the leachability and potential for impacts to the adjacent wetland.
2. By June 30, 2015, include in the annual monitoring report for 2014 the results of the site survey and a discussion if the site is in a fill beyond approved limits situation along the eastern boundary. If necessary, the discussion should include a proposed action plan.
3. By April 15, 2015, submit to the undersigned Provincial Officer, written responses to the technical memorandums prepared by Greg Faaren and Mark Phillips following their reviews of the 2013 Annual Monitoring Report.

According to Incident Report Ref No. 0606-9TKMQY, action items #1-3 have been satisfied.

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:

None were observed at the time of the inspection.

Was there any indication of a known or anticipated environmental impact during the inspection and/or review of relevant material ?

No

Specifics:

None were observed at the time of the inspection.

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:

None were observed at the time of the inspection.

Was there any indication of a potential for environmental impairment during the inspection and/or the review of relevant material ?

Yes

Specifics:

As noted in Section 2.7, above, the site is not in conformance with the Reasonable Use B-7 Guideline. The 2010 and

2014 inspections also indicated non-conformance with the B-7 RUG.

Was there any indication of minor administrative non-compliance?

No

Specifics:

None were observed at the time of the inspection.

5.0 ACTION(S) REQUIRED

1. By September 20, 2018, provide to the undersigned Provincial Officer an update to the status of the negotiation for the acquisition of the additional CAZ lands, and confirm that upon ownership of the proponent's rights for the CAZ, the City will notify the Director as per ECA Condition 24.4 and that the written easement will be registered on title as per Condition 29.5.

6.0 OTHER INSPECTION FINDINGS

At the time of the inspection, there was an intermittent smell of hydrocarbon fuel with an unknown source around the tire piles and outdoor leaf and yard waste piles. City staff began investigating to determine the source of the odour.

At the time of the inspection, City staff indicated that they are planning to relocate the scale house to a location closer to Road 45 to allow for improved traffic flow at the site.

7.0 INCIDENT REPORT

Applicable
8718-B37SHU 

8.0 ATTACHMENTS

PREPARED BY:

Environmental Officer:

Name:

Glenn M Rutherford

District Office:

Peterborough District Office

Date:

2018/08/23

Signature



REVIEWED BY:

District Supervisor:

Name:

Courtney Redmond

District Office:

Peterborough District Office

Date:

2018/08/23

Signature:



File Storage Number:

KL LA 250

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"



Environmental Assessments & Approvals

October 16, 2018

AEC 18-010

City of Kawartha Lakes
Waste Management Department
12 Peel Street
Lindsay, ON
K9V 5R8

Attention: Ms. Kerri Snoddy, C.Tech.
Regulatory Compliance Officer

Re: Proposed Monitoring Well Locations for Delineation of Potential Leachate Impacts - Laxton Landfill Site

Dear Kerri:

The purpose of this correspondence is to propose for review with the Ministry of Environment, Conservation and Parks (MECP), additional monitoring well locations east of the waste footprint at the Laxton Landfill Site (Site). These additional locations have been proposed historically as there has been uncertainty with respect to the potential for leachate impacts east of the Site. For the past number of years, the City has been working towards reaching an agreement to purchase or establish an easement on the lands east of the landfill property for the purposes of potential expansion of the monitoring well network and / or expansion of the existing Contaminant Attenuation Zone (CAZ). However, to date the property owner has not been amenable to such discussions. As a result, the City is proposing to install a new monitoring well nest along the road allowance that extends along eastern property boundary, immediately east of the waste footprint (Figure appended).

The well nest is proposed to be of similar depths to that at MW16 which is further south along the eastern property boundary and has target depths of 4.6 and 13.2 mbgs, the deeper of which targets a more granular sand and gravel unit atop the bedrock contact. The purpose of the nest will help to delineate any vertical variability with respect to leachate migration as it is noted that there is an overall increase in grain size with depth from the fine grained soils generally observed in the upper 5 m, while the base of the



overburden is characterized by coarser sand and gravel, which could represent a more transmissive / conductive leachate migration pathway.

The water quality results obtained from these new wells will be used in establishment of compliance with MECP Guideline B7 – Reasonable Use Concept (RUC) at the eastern property boundary, which is the City owned road allowance. The data collected thus far at the Site from the existing monitoring network, which includes 17 monitoring wells and 5 surface water locations does not indicate significant leachate influence beyond the perimeter of the waste such that significant elevations are not expected to extend much beyond the eastern extent of the landfill. However, if the data collected indicates a need for additional CAZ to be established, then this additional data will be beneficial in potentially refining the extent, while assisting in determining locations and depths of any additional monitoring wells required in the future.

If the MECP has any questions or recommendations with respect to the proposed monitoring wells, do not hesitate to provide these such that the proposed monitoring locations can be adjusted accordingly.

Yours truly,
AZIMUTH ENVIRONMENTAL CONSULTING, INC.



Colin Ross, B.Sc., P.Geo.
Senior Hydrogeologist



Laxton Landfill Site
3225 MONCK RD, KAWARTHA LAKES, ON, K0M 2L0

Inspection Report

System Number:
Entity: CITY OF KAWARTHA LAKES
Inspection Start Date: 05/10/2022
Inspection End Date: 06/29/2022
Inspected By: Glenn Rutherford
Badge #: 472



(signature)

NON-COMPLIANCE/NON-CONFORMANCE ITEMS

The following item(s) have been identified as non-compliance/non-conformance, based on a "No" response captured for a legislative or best management practice (BMP) question (s), respectively.

Question Group: Operations

Question ID	NOL 9	Question Type	Legislative
Question: Does the holder of the landfill ECA own the property rights for the CAZ?			
Legislative Requirement	EPA 27 (1); EPA O. Reg. 232/98 4 (1);		
Observation/Corrective Action(s)			
Component Assessed: LANDFILL SITE			
No			
The 2021 AMR for the site indicates in an appended screening checklist form that Reasonable Use Concept (RUC) exceedances are noted at eastern monitoring locations, however, are more related to natural earth elements or organic sources associated with the peat soils. The City is looking to acquire additional CAZ lands to the east. The 2021 AMR for the site indicates in an appended 2018 letter from the City's consultant that for the past number of years, the City has been working towards reaching an agreement to purchase or establish an easement on the lands east of the landfill property for the purposes of potential expansion of the monitoring well network and/or expansion of the existing Contaminant Attenuation Zone (CAZ). The 2018 letter also discusses installing an additional monitoring well nest east of the waste mound will be beneficial to confirming leachate impact is not occurring east of the Site. Action: By July 28, 2022, please confirm if the additional monitoring well nest proposed to be installed east of the waste mound was installed or if additional discussion with the ministry is required.			

Question ID	NOL 10	Question Type	Legislative
Question: Do the property rights for the CAZ meet the requirements of Reg 232?			

Legislative Requirement	EPA 27 (1); EPA O. Reg. 232/98 4 (3);
Observation/Corrective Action(s)	
Component Assessed: LANDFILL SITE	
No The City has been working towards reaching an agreement to purchase or establish an easement on the lands east of the landfill property for the purposes of potential expansion of the monitoring well network and/or expansion of the existing Contaminant Attenuation Zone (CAZ). The City has or is considering an additional monitoring well nest proposed to be installed east of the waste mound. This well nest will be beneficial to confirming leachate impact is not occurring east of the Site.	

Question ID	NOL 42	Question Type	Legislative
Question: Is Daily cover applied to the waste at the end of each working day or as otherwise specified in the ECA?			
Legislative Requirement	EPA 27 (1); EPA O. Reg. 232/98 7;		
Observation/Corrective Action(s)			
Component Assessed: LANDFILL SITE			
No			
The ECA requires: Daily Cover - entire working face shall be covered weekly with a minimum thickness of 150 millimetre of soil cover or an approved thickness of alternative cover material.			
On the day of the inspection, the "daily cover" which is applied weeks had not been applied since the previous Thursday as per operating procedures. It was not possible to assess the adequacy of the "daily cover" on the day of the inspection.			

Question Group: Other Inspection Findings

Question ID	949100	Question Type	Legislative
Question: Were the inspection questions sufficient to address other identified non-compliance items?			
Legislative Requirement	Not Applicable		
Observation/Corrective Action(s)			
Component Assessed: LANDFILL SITE			
The following instances of non-compliance were also noted during the inspection: On the day of the inspection two concerns were noted at these site. Firstly, there were a significant number of large items placed on the waste mound but which were not covered, nor did they appear to placed in those locations for a reason. Second, there was a significant amount of litter at the site. Actions required: By July 28,, 2022, the City shall submit an action plan identifying steps to be taken to address these two issues and timelines for their completion.			

INSPECTION DETAILS

This section includes all questions that were assessed during the inspection.

Ministry Program: WASTE | **Regulated Activity:** Landfills

Component Assessed: LANDFILL SITE

Question ID	NOL 1	Question Type	Legislative
Question: Does the Open landfill site have an Environmental Compliance Approval (ECA)?			
Legislative Requirement	EPA 27 (1);		
Observation Yes Environmental Compliance Approval (ECA) A321204 approves the use and operation of a 29 hectare site. ECA A321304 consists of Notices 1-4 Notice No. 1 - issued May 7, 2007 Notice No. 2 - issued July 17, 2007 Notice No. 3 - issued June 11, 2009 Notice No. 4 - issued October 29, 2012 The Laxton Landfill is nearing capacity and may only have 2-3 years of capacity remaining. The City is planning to apply for vertical expansion of the landfill to gain additional capacity at the site.			

Question ID	NOL 3	Question Type	Legislative
Question: Does the holder of the landfill ECA own the entire site?			
Legislative Requirement	EPA 27 (1); EPA O. Reg. 232/98 3;		
Observation			
Yes			

Question ID	NOL 4	Question Type	Information
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Question:	
Does the landfill have a Contaminant Attenuation Zone (CAZ)?	
Legislative Requirement	Not Applicable
Observation	
Yes	

Question ID	NOL 9	Question Type	Legislative
Question:			
Does the holder of the landfill ECA own the property rights for the CAZ?			
Legislative Requirement	EPA 27 (1); EPA O. Reg. 232/98 4 (1);		
Observation			
No			
The 2021 AMR for the site indicates in an appended screening checklist form that Reasonable Use Concept (RUC) exceedances are noted at eastern monitoring locations, however, are more related to natural earth elements or organic sources associated with the peat soils. The City is looking to acquire additional CAZ lands to the east. The 2021 AMR for the site indicates in an appended 2018 letter from the City's consultant that for the past number of years, the City has been working towards reaching an agreement to purchase or establish an easement on the lands east of the landfill property for the purposes of potential expansion of the monitoring well network and/or expansion of the existing Contaminant Attenuation Zone (CAZ). The 2018 letter also discusses installing an additional monitoring well nest east of the waste mound will be beneficial to confirming leachate impact is not occurring east of the Site. Action: By July 28, 2022, please confirm if the additional monitoring well nest proposed to be installed east of the waste mound was installed or if additional discussion with the ministry is required.			

Question ID	NOL 10	Question Type	Legislative
Question:			
Do the property rights for the CAZ meet the requirements of Reg 232?			
Legislative Requirement	EPA 27 (1); EPA O. Reg. 232/98 4 (3);		
Observation			

No

The City has been working towards reaching an agreement to purchase or establish an easement on the lands east of the landfill property for the purposes of potential expansion of the monitoring well network and/or expansion of the existing Contaminant Attenuation Zone (CAZ).

The City has or is considering an additional monitoring well nest proposed to be installed east of the waste mound. This well nest will be beneficial to confirming leachate impact is not occurring east of the Site.

Question ID	NOL 12	Question Type	Legislative
Question: Does the landfill have a large enough Buffer Area as specified in the ECA or Regulation 232/98?			
Legislative Requirement	EPA 27 (1);		
Observation			
Yes			

Question ID	NOL 13	Question Type	Information
Question: Are access roads and on-site roads provided so that vehicles hauling waste to and on the site may travel readily on any day under all normal weather conditions?			
Legislative Requirement	EPA 27 (1);		
Observation			
Yes			

Question ID	NOL 14	Question Type	Legislative
Question: Is site access limited to times when an attendant is on duty?			
Legislative Requirement	EPA 27 (1);		
Observation			
Yes			

The site is open as follows:

Winter hours (Oct 16-Apr 30)

Thursday: 11am to 5pm

Sunday: 12pm to 4pm

Summer hours (May 1-Oct 15)

Thursday: 11am to 5pm

Sunday: 11am to 5pm

In the summer, open from 11am to 5pm on holiday Mondays.

Question ID	NOL 15	Question Type	Legislative
Question: Does the site only receive waste from within its approved service area?			
Legislative Requirement	EPA 27 (1);		
Observation			
Yes			

Question ID	NOL 16	Question Type	Information
Question: Is the site required to have a ground water monitoring program by the ECA?			
Legislative Requirement	Not Applicable		
Observation			
Yes			

Question ID	NOL 17	Question Type	Legislative
Question: Is the site implementing the groundwater monitoring program as required by the ECA?			
Legislative Requirement	EPA 27 (1);		
Observation			
Yes			

Question ID	NOL 18	Question Type	Legislative
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Question:	
Are monitoring well samples taken and tested to determine the quality of the ground water?	
Legislative Requirement	EPA 27 (1); EPA O. Reg. 232/98 25;
Observation	
Yes	

Question ID	NOL 19	Question Type	Information
Question:			
Is the ministry concerned with the results of the samples that have been tested?			
Legislative Requirement	Not Applicable		
Observation			
No The 2021 AMR does not identify any significant groundwater issues at the site.			

Question ID	NOL 20	Question Type	Information
Question:			
Is there ongoing abatement to address any concerns the ministry has with the ground water monitoring?			
Legislative Requirement	Not Applicable		
Observation			
No			

Question ID	NOL 28	Question Type	Legislative
Question:			
Is landfill gas managed and monitored at this site?			
Legislative Requirement	EPA 27 (1);		
Observation			
Yes There is no requirement for landfill gas to be managed at the site. There is limited landfill gas monitoring at this site.			

The ECA only requires landfill gas to be monitored as follows:

Condition 25.1

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.

In addition, the City monitors landfill gas at two gas monitoring wells, both located to the south of the active waste area. The AMR recommends that this aspect of the landfill gas monitoring could be eliminated at these locations as there are no landfill gas detections at the monitors and limited sensitive land uses surrounding the landfill.

Question ID	NOL 29	Question Type	Information
Question: Is the ministry concerned with landfill gas at this site?			
Legislative Requirement	Not Applicable		
Observation No			

Question ID	NOL 31	Question Type	Information
Question:			
Is the site required to have a surface water monitoring program by the ECA?			
Legislative Requirement	Not Applicable		
Observation			
Yes			

Question ID	NOL 32	Question Type	Legislative
Question: Is the site implementing the surface water monitoring program as required by the ECA?			
Legislative Requirement	EPA 27 (1);		
Observation			
Yes			

Question ID	NOL 33	Question Type	Legislative
Question: Is the water quality being monitored/sampled for surface water features on-site and for any off-site surface water features that receive run-off from the site?			
Legislative Requirement	EPA 27 (1); EPA O. Reg. 232/98 24;		
Observation			
Yes			

Question ID	NOL 34	Question Type	Information
Question: Are there water quality concerns with the results of the samples that have been tested?			
Legislative Requirement	Not Applicable		
Observation			
No			

Question ID	NOL 36	Question Type	Legislative
Question: Is proper equipment available for the compaction of waste and applying cover material?			
Legislative Requirement	EPA 27 (1);		
Observation			
Yes			

Question ID	NOL 37	Question Type	Legislative
Question: Is the landfill able to accurately determine the amount of waste received?			
Legislative Requirement	EPA 27 (1);		
Observation			
Yes			

Question ID	NOL 38	Question Type	Legislative
Question: Are all disposal operations at the site adequately and continually supervised?			
Legislative Requirement	EPA 27 (1);		
Observation			
Yes			

Question ID	NOL 39	Question Type	Information
Question: Does the landfill operator have a site inspection program as required by the ECA?			
Legislative Requirement	Not Applicable		
Observation			
Yes			

Question ID	NOL 40	Question Type	Legislative
Question: Does the landfill operator have a procedure in place to address issues identified by staff during the site inspection?			
Legislative Requirement	EPA 27 (1);		
Observation			
Yes			

Question ID	NOL 41	Question Type	Legislative
Question: Is the waste being compacted adequately?			
Legislative Requirement	EPA 27 (1);		
Observation			
Yes			

Question ID	NOL 42	Question Type	Legislative
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Question:	
Is Daily cover applied to the waste at the end of each working day or as otherwise specified in the ECA?	
Legislative Requirement	EPA 27 (1); EPA O. Reg. 232/98 7;
Observation	
No	
The ECA requires: Daily Cover - entire working face shall be covered weekly with a minimum thickness of 150 millimetre of soil cover or an approved thickness of alternative cover material. On the day of the inspection, the "daily cover" which is applied weeks had not been applied since the previous Thursday as per operating procedures. It was not possible to assess the adequacy of the "daily cover" on the day of the inspection.	

Question ID	NOL 43	Question Type	Legislative
Question:			
Are procedures implemented to control rodents or other animals and insects at the site?			
Legislative Requirement	EPA 27 (1);		
Observation			
Yes			

Question ID	NOL 44	Question Type	Legislative
Question:			
Is site access restricted by use of a gate, fence, or physical barrier when the site is not operating?			
Legislative Requirement	EPA 27 (1);		
Observation			
Yes			

Question ID	NOL 45	Question Type	Legislative
Question:			
Is the waste disposal area adequately screened from public view?			

Legislative Requirement	EPA 27 (1);
Observation	
Yes	

Question ID	NOL 46	Question Type	Legislative
Question: Are daily records of site operations available at the site for at least the past 2 years or as otherwise required by the ECA?			
Legislative Requirement	EPA 27 (1); EPA O. Reg. 232/98 21;		
Observation			
Yes			

Question ID	NOL 47	Question Type	Legislative
Question: Has the annual operations report been submitted to MECP or available on site as required by the ECA?			
Legislative Requirement	EPA 27 (1);		
Observation			
Yes			

Question ID	NOL 48	Question Type	Legislative
Question: Is scavenging being prevented?			
Legislative Requirement	EPA 27 (1); EPA O. Reg. 232/98 23;		
Observation			
Yes			

Question ID	NOL 51	Question Type	Legislative
Question: Is the landfill only accepting the types of waste that they are approved to receive?			

Legislative Requirement	EPA 27 (1);
Observation	
Yes	

Question ID	NOL 52	Question Type	Information
Question: Does the landfill have a waste refusal procedure in place to manage waste that arrives at the site that the site is not approved the accept?			
Legislative Requirement	Not Applicable		
Observation			
Yes			

Question ID	NOL 53	Question Type	Legislative
Question: is the waste refusal procedure being followed?			
Legislative Requirement	EPA 27 (1);		
Observation			
Yes			

Question ID	NOL 54	Question Type	Legislative
Question: Does the landfill have a procedure in place to address and document spills and fires?			
Legislative Requirement	EPA 27 (1);		
Observation			
Yes			

Question ID	NOL 55	Question Type	Legislative
Question: Does the landfill have emergency contingency plan as required by the ECA?			
Legislative Requirement	EPA 27 (1);		

Observation
Yes

Question ID	NOL 59	Question Type	Legislative
Question: Does the landfill have a procedure in place to address complaints?			
Legislative Requirement	EPA 27 (1);		
Observation			
Yes			

Question ID	NOL 61	Question Type	Information
Question: Has the landfill operator developed a Design and Operations Manual?			
Legislative Requirement	EPA 27 (1);		
Observation			
Yes			

Question ID	NOL 62	Question Type	Information
Question: Is the Design and Operations Manual up to date?			
Legislative Requirement	Not Applicable		
Observation			
Yes			

Question ID	NOL 63	Question Type	Legislative
Question: Does the landfill operator have training procedures for site personnel?			
Legislative Requirement	EPA 27 (1);		
Observation			

Yes

Question ID	NOL 64	Question Type	Legislative
Question: Is the landfill operator following the established training procedures?			
Legislative Requirement	EPA 27 (1);		
Observation			
Yes			

Question ID	949100	Question Type	Legislative
Question: Were the inspection questions sufficient to address other identified non-compliance items?			
Legislative Requirement	Not Applicable		
Observation The following instances of non-compliance were also noted during the inspection: On the day of the inspection two concerns were noted at these site. Firstly, there were a significant number of large items placed on the waste mound but which were not covered, nor did they appear to placed in those locations for a reason. Second, there was a significant amount of litter at the site. Actions required: By July 28,, 2022, the City shall submit an action plan identifying steps to be taken to address these two issues and timelines for their completion.			



APPENDIX H

Sampling Protocols



FIELD SAMPLING PROTOCOL FOR CKL LANDFILL SITES
Last updated: November 19, 2018

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Review Sampling Requirements

- All of the sampling requirements are listed in the monthly sampling requirements spreadsheet S G:\Environmental\Env Ser - SWaste - Gen\W22 LANDFILL MONITORING PROGRAMS. The Waste Technician and Regulatory Compliance Officer will ensure that the sampling requirements spreadsheet is kept up to date.
- Ensure that the sampling requirements spreadsheets and site maps are in the back of each field book, and are current prior to each sampling event.

Prepare Equipment

- Ensure that you have all equipment on the field equipment list. See Appendix A - Field Sampling Equipment List.
- Equipment must be calibrated according to manufacturer's standards. See Appendix B - Equipment Calibration and Maintenance Protocols for a complete set of maintenance and calibration instructions.
- Sampling bottles should be ordered at least 2 weeks before scheduled field sampling. Sample bottles should be stored primarily at 12 Peel Street in the Waste Management Department, or the Lindsay Ops maintenance building if necessary.
- Check the charge on the phone, GPS, YSI (dissolved oxygen, pH, temperature and conductivity) and gas monitor.
- Inspect your vehicle to ensure you have enough fuel, washer fluid and oil. Also check tire pressure and make note of any other alarms present on the vehicle. It is important to fill out the daily log book located in the vehicle to document the checks being conducted. Do not drive the vehicle if it requires servicing – contact Fleet for assistance.
- Leave the Supervisor of Waste Management Operations with your daily schedule. The Administrative Assistant or Regulatory Compliance Officer should also be informed of your schedule. If you will be working alone, you must follow SOP WM-005 – Working Alone. You are required to contact TAS (1-877-885-7337) when you arrive on-site and when you leave the site.
- Contact the Supervisor of Waste Management Operations or Regulatory Compliance Officer as well as TAS in the case of after-hours sampling. Confirm with the Supervisor of Waste Management Operations or Regulatory Compliance Officer and TAS when you arrive back at the office.
- Ensure that you have your cell phone and that it is fully charged at all times when you are out of the vehicle.

On-site Arrival

- Observe your surroundings. Note if gates and offices (if applicable) are locked if site is not in operation. Contact Supervisor of Waste Management Operations immediately if suspicious activity is noted.
- Honk the vehicle horn if you note bear signs in the area.
- Generally always work from areas of less contamination to areas of higher potential contamination to reduce the possibility of sample cross contamination.
- Sampling should not be conducted during a thunderstorm or other severe weather conditions. If severe weather conditions arise while you are at a landfill follow the SOP WM004 – Extreme Weather.
- Appropriate precautions must be followed in extreme cold/heat conditions. See Appendix D - Health and Safety information.
- Ensure that appropriate PPE is worn for sampling including gloves, steel toed boots, long pants, sunscreen, safety glasses, etc.
- Do not proceed with work in isolated areas if you are uncomfortable with the work. Contact the Supervisor of Waste Management Operations to make alternate arrangements.

SAMPLING

Landfill Gas Monitoring

1. The GMI GT-44 Methane Monitor is a certified Class 1, Div 1 Groups C and D instrument. The GT-44 should be operated and maintained as per manufacture's instructions. See Appendix B for further information; a copy of the manual is available in the Equipment Manuals binder. The monitor uses 3 C batteries as a power source – ensure extra batteries are always available.
2. The GMI GT-44 Gas Monitor can be programmed to read %VOL, %LEL and ppm CH₄. Readings should be recorded in %VOL. This can be achieved by placing the monitor in Purge Mode. Record the date, site, monitor number and both the %VOL and the %LEL in the methane field book.
3. You must complete a fresh air calibration before each sampling event. Switch the monitor on in an open environment away from any sources of contamination. The monitor will begin a 30 second warm-up and calibration sequence.
4. If gas monitoring is required, it should be done before water level measurements and shall be taken without the removal of the any dedicated sampling device. Place the tube of the gas meter into the monitoring well. Avoid lowering the tube into the well water; water will damage the meter's sensors. If a release valve is

not available hold your hand over the top of the well ensuring a seal. You must wear latex or protective gloves when putting your hand over the monitoring well. If taking measurements from a dedicated gas monitoring probe, insert the tip of the monitor into the well valve and then open the stopcock. The monitor should be attached before opening the stopcock to ensure there is no release of methane gas.

5. Place the monitor in purge mode and allow the automatic pump to run for at least 30 seconds, or until the gas reading reaches a maximum and then begins to decline. In the field book record the highest %VOL displayed on the meter and determine the %LEL. The maximum reading is stored in the monitor for your reference.

Groundwater

1. Field Book Setup

Monitoring Well Number	Water Level	Well Depth	Casing Volume (WD-WL x F)	Casing Volume x 3	Volume of Water Purged	Sample Collected (2B4B, VOC etc)	Date Sample Collected	Well Condition, Weather, etc.
MW	WL	WD	V	Vx3	Purge	Sample	Date	Comments
e.g. MW1	6.2	15.2	18.18	54.54	55	2B4B	25-Oct-10	overcast, 25°C, well cap replaced

Table 1: Sample field book format

Pipe Size (inch)	Factor (F)
1/2	0.127
3/4	0.285
1	0.506
1 1/4	0.791
1 1/2	1.140
1 3/4	1.551
2	2.026

Table 2: Common factors for determining well volume

2. Water Level Measurements

- a. To ensure that water levels are not affected by purging adjacent wells, gas and water levels should be taken from all wells prior to sampling/purging any wells in the area. Sample tubing should not be moved until the gas and water level measurements have been taken.

- b. Water level measurements shall be taken without the removal of any dedicated sampling device (tubing and foot-valve arrangements). Disturbing anything in the well including the tubing and foot-valve can alter the water level reading.
- c. Rinse the water level meter with distilled water prior to lowering it into the well. Make sure the water meter is on and lower the meter into the well until the meter beeps. The meter can be affected by condensation on the walls of the pipe or conductivity levels, so slightly raise and lower the water meter to be sure of your measurement. Water levels shall be measured with an electric depth gauge to the nearest 0.01 meters.
- d. Measurements shall be taken from the top of the monitored well. The measurement will be taken from the top of the PVC casing (well pipe) and not the top of the protective casing. Ensure that the TOP levels are up to date.
- e. Water level measurements shall be recorded in the field book for each specific monitor.
- f. Switch off the water level monitor and continue lowering the tape until it reaches the bottom of the well – the tape should become slack. Raise the tape just until it becomes taught and read the depth from the top of the PVC casing (well pipe). The height of standing water in each well shall be calculated by subtracting the static water level from the total well depth.

3. Purging Procedure

- a. Prior to sampling, each well shall be purged to remove stagnant water within the casing.
- b. Three casing volumes shall be removed by the dedicated samplers or by use of a bailer from the wells with moderate inflow. The casing volume can be determined by multiplying the height of standing water by F. The casing volume is then multiplied by 3 to determine the purge volume. Record these values in the field book.
- c. The volume of water required to be purged is calculated as follows:

$\text{Volume (m}^3\text{)} = 3 \times (F(\text{m}^2) \times (\text{Depth of Well-Water Level (m)}))$

Where:

F is equal to the area ($F = (3.14 \times D^2) / 4 \times 1000$)

D is the diameter measured in meters

- d. The purged water shall be measured into a calibrated container (i.e. bucket with known volume) and the volume of water purged shall be recorded in the field book for the specific monitor. Be sure to purge any sediment that may have accumulated at the bottom of the well.
- e. Slow inflow monitors shall be purged entirely dry. The volume of purged water shall be recorded in the field book for the specific monitor. Staff should leave

the monitor to recharge and return periodically to the well to attempt to purge the full volume.

- f. For slow recharge wells it may be necessary to return the following day to collect your sample.

4. Sampling Procedure

- a. Suitable sample bottles (containing pre-measured preservatives, as required) shall be obtained from the analyzing laboratory in advance of the sampling program.
- b. Each sample bottle shall be labeled to indicate the project name (landfill site), well designation, date, time of sample collection, and preservatives added.
- c. Samples shall be collected by means of the dedicated samplers in all monitoring wells, if present. For slow inflow monitors, samples shall be collected the day following the purging exercise (to permit water-level recovery, if required).
- d. Nitrile gloves should be worn when taking any sample. Change gloves for each sampling location.
- e. When 3 borehole volumes have been purged sample the groundwater in the following order as necessary:
 - i. If required, pH, conductivity, and water temperature
 - ii. VOC glass amber bottles contain preservatives (usually HCl) but need to be filled with no headspace. Carefully fill the VOC bottles to the top without losing the preservative. To help ensure no air in the sample fill the top of the cap with the groundwater as well or ensure there is a convex surface on the mouth of the bottle. After filling the bottle and putting the lid on, invert the bottle and tap the sides to ensure that no air is present in the sample. Add more sample until no air bubbles remain. If a significant volume of water is lost during refilling, the sample must be collected in a new bottle to ensure sufficient preservatives.
 - iii. Poly Aromatic Hydrocarbons (PAHs) - 1 L amber bottles with Teflon lids.
 - iv. Pesticides – 1 or 2 unpreserved 1 L amber bottles may be required (depending on the amount of sediment, check with the lab). Fill bottle leaving a bit of headspace to allow for liquid to expand in temperature changes. Ensure that the lip of the bottle and the lid do not come into contact with anything except the sample.
 - v. Dissolved Organic Carbon (DOC) –bottle may contain preservative
 - vi. Phenols – glass bottle with preservative (H_2SO_4 or CuSO_4)
 - vii. Mercury – glass bottle contains preservative ($\text{K}_2\text{Cr}_2\text{O}_7$ or HNO_3)
 - viii. General chemistry is taken in PET bottles with no filtration and no preservative
 - ix. Inorganic compounds (metals) – PET bottle with acid preservative (often HNO_3). In Ontario metals are measured in the dissolved state so groundwater samples must be filtered. Use a 45 micron filter, ensure that it is placed on the waterra tubing in the correct direction, purge some water though the filter and then fill the bottle. There is a preservative in metals

bottles. Fill the bottle almost entirely but not all the way to the top. If there is a lot of sediment you may require more than one filter. Alternatively you can request lab filtration of the sample but this must be indicated on the sample bottle and the chain of custody and the sample must be collected in an unpreserved bottle.

- f. Sampling information shall be recorded in the field book. Information includes the well number, date of sample collection, static water level, well casing volume, purge volume, actual volume of water purged, and any repairs necessary on the well and weather conditions. Take any field notes on the condition of the well or the reason if a sample could not be obtained. A pencil is preferred as it won't smudge if wet.
- g. If sampling during the winter ensure that all water is emptied from the waterra tubing before closing the well.

5. Laboratory Procedures

Laboratory sample submission protocols should be confirmed with the laboratory where samples will be shipped to. This information should be known ahead of time.

6. Troubleshooting in the Field

The following are a number of common issues that may be encountered in the field when groundwater sampling.

Issue	Solution
Water level meter won't beep	Check that the meter is on. If the meter is on and will not buzz, try changing the batteries. If the meter still will not buzz, the well may be dry. Attempt purging the well using the dedicated tubing. If no water is present note this in the field book.
Water level meter won't stop beeping	Try rinsing the water level meter with distilled water.
While purging, water stops coming out of Waterra	The foot valve may have become plugged with sediment or small stones or may have fallen off. Remove the waterra (making sure not to rest it on the ground) and inspect the foot valve. If there is no problem with the foot valve, the well may be dry. Confirm this with the water level meter and make note in the field book.
When you remove the well cap the Waterra has slid too far down the PVC casing to grab.	Always carry a coat hanger in your field bag. This can be used to hook and raise waterra that has fallen down the standpipe.
The waterra tubing has split and	If the leak is coming from the connection between

water is spraying out of the side	the large diameter and small diameter tubing, ensure they are connected properly and use electrical tape if necessary. If the leak is coming from other parts of the waterra, cut and replace that section. Depending on where the leak is, you may have to replace the entire length of tubing.
Well has been purged dry and exhibits slow recharge	Move on and complete the remaining wells, returning to the dry well at the end of the sampling day. If the well is still dry, you may have to return the following day to collect the sample. Note this in the field book.

Surface Water

1. Field Book Setup

Your field book should be set up in the following way, prior to heading out into the field:

Station	pH	DO (mg/L)	Cond (uS/cm)	H ₂ O Temp	Air Temp	Width (m)	Depth (m)	Flow (m/s)	Sample/Date/Comments
SWA	7.03	2.36	456	14	17	2	1	0.3	2B4B/Aug 3/silty sample

2. Sampling Procedure

- Sampling should usually be conducted under base flow conditions (to observe maximum quality impact). Thus, there shall be several days without precipitation before the sampling survey. However, sampling of ponding water during stagnant conditions shall be discouraged unless representative of the local conditions. If a sample is collected in a stagnant water body this should be noted in the field book.
- Confirm the monitoring regime. There are some sites where surface water sampling is specified to occur after a rainfall event (e.g. Lindsay Ops and Verulam surface water sampling).
- Samples should be collected from the furthest station downstream from the site first and then progress up stream towards the site. This ensures that downstream samples are not affected by disturbances caused from upstream sampling.
- Ensure that equipment is properly cleaned and gloves are changed between sampling locations, especially prior to taking a background sample.
- Prior to sampling conduct a visual inspection and take photographs of the site. Label the site and the SW location in the photos once they have been uploaded to the computer in the office. Field measurements shall be taken for temperature, conductivity, pH and DO at each sampling

station when samples are collected for chemical analysis. It is best to take these measurements from a location slightly downstream of your collection location before you take samples to avoid influencing results from disturbances during sample collection. You can also take these measurements after sample collection but in this case they should be taken slightly upstream of the sample collection location.

- f. The YSI must be calibrated at the beginning of every day it is being used (see Appendix C). Turn the YSI on 5-15 minutes before use. Allow temperature readings to stabilize. The probe shall be placed perpendicular to flow direction in a flowing stream. In a non-flowing sample, the YSI probe should be stirred at least 6 inches per second (for 1.25 PE membranes). When the DO values plateau and stabilize you may record the measurement in the field book or log the data set. The probe should be completely submerged for accurate conductivity readings; the pH probe may need a bit of time to stabilize so take this reading last.
- g. Nitrile or latex gloves should be worn when taking any sample. Change gloves for each sampling location.
- h. Samples should not be filtered unless directly indicated in the protocol. The general chemistry bottle can be used to fill bottles with preservatives already in the bottle (bottles with preservative should not be filled directly in the surface water).
- i. To take the sample, remove the lid and keep in your fingers of one hand (the lids and mouth of the bottle should only be in contact with the air and sample). Collect the sample from the middle of the stream where possible. Place the sample bottle into the water column facing downwards about half way down the water column. Turn the sample bottle facing upstream to collect the sample.
- j. Weather conditions shall be recorded in the field book.
- k. Flow measurements shall be recorded after samples have been collected.
 - i. For typical stream flow in a distinguished channel, measure the average water depth, stream width, and water velocity using the method below. It is preferable to measure at a minimum of three (3) locations across the stream. The measurement should be taken in an area as straight as possible with similar substrate.
 - ii. Flow can also be measured at culverts by taking the depth of the water in the culvert, and diameter of the culvert, and the velocity of the water entering or exiting the culvert.
 - iii. Water velocity can be measured by the time it takes a floating object to travel a set distance (orange peel and stop-watch method). Make sure that you measure the distance and have a stop watch to measure the time.
- l. Additional observations may include vegetation, substrate, water colour, odour, iron staining, algae etc. All measurements and observations should be recorded in the field book.

- m. Any digitally-metered instrument used to obtain field measurements (other than temperature) shall be calibrated before the sampling survey to ensure reliable results.

Lindsay OPS Stormwater Sampling

Lindsay OPS Stormwater sampling at SW14, SW15 and SW18 must be completed following at least four storm events producing surface water runoff in the spring, summer and fall. At each station, one sample is collected to measure pH using a general chemistry bottle, one sample is collected to measure for ammonia using a nutrients bottle, and an additional sample is collected to conduct an on-site ammonia reading using a general chemistry bottle. One general chemistry bottle and one nutrients bottle will be sent to the lab for certified analysis of pH and ammonia.

When each station has been sampled, immediately bring the additional sample bottle collected to the Lindsay Ops Administration Building. There is a LaMotte Ammonia-Nitrogen kit kept on-site for analysis. Proper PPE, including safety glasses and nitrile gloves should be worn during this procedure. The test kits contain reagents that may be harmful if you come in contact with them.

The following is the procedure for the Ammonia-Nitrogen Kit:

- a. Insert the Ammonia Nitrogen Octa-Slide 2 Bar into the Octa-Slide 2 Viewer.
- b. Fill a test tube to the 5 mL line with the water sample.
- c. Add 10 drops of Salicylate Ammonia #1. Cap the test tube and mix thoroughly.
- d. Add 7 drops of Salicylate Ammonia #2. Cap the test tube and mix thoroughly.
- e. Wait 1 minute. Add 7 drops of Salicylate Ammonia #3. Cap the test tube and mix thoroughly. Wait 20 minutes.
- f. Insert the test tube into the Octa-Slide 2 Viewer. Match the sample colour to a standard colour. Record as ppm of ammonia nitrogen.

Follow the laboratory submission protocol. It is imperative to request that laboratory analysis is completed as quickly as possible.

Leachate Pumping Chambers

Field Book Setup

Your field book should be set up in the following way prior to heading into the field:

Station	pH	Cond (uS/cm)	H ₂ O Temp	Air Temp	Sample/Date/ Comments
LPC WPCP	7.03	456	14	17	2B4B/Aug 3/orange colouration

1. Lindsay Ops and Lindsay St. North Leachate Pumping Chambers

- Open chamber lid.
- Lower dedicated bailer attached inside the chamber to collect water sample. Lift and lower the bailer until it is full.
- Fill an extra PET bottle with a representative sample of leachate and use the YSI to record sample temperature, pH, DO and conductivity in the field book.
- Samples can be collected directly from the bailer into sample bottles.
- Metals must be collected in an unfiltered metals bottle which must be lab filtered and preserved. This should be indicated on the bottle and laboratory submission sheet.
- Ensure that after sample collection the bailer is emptied and securely tied to the top of the chamber to avoid fouling in the chamber.
- If a bailer is not available use a large bucket to collect a sample. Ensure that the rope on the bucket is secured to something before lowering the bucket into the chamber.

2. Emily Purge Wells

When the system is not turned off and the system is in use, sampling protocol for the purge wells are as follows:

- All pumps should be placed in the off position.
- Open TW1 slightly and turn on Pump 1. Allow TW1 to flush to the lagoons for at least five minutes. This will help dislodge any sediment that has become trapped in the pipes. Once complete turn off Pump1.
- The backflow valve should be closed to prevent water from the force main back flowing into your sample.
- Open the ball valve for TW1 slightly to avoid build up of pressure in the pipes when collecting the sample.
- Turn on TW1 and open the upper tap. Run the tap into a bucket until it runs clear. There is sometimes build up of iron in the pipes that comes loose when the taps are opened.
- After you have run the tap, collect your samples. When you are done collecting the sample turn off the tap and the pump.
- It should be indicated on the bottle and laboratory submission sheet that the sample could not be filtered.
- Follow the same procedure for TW2 and TW3 using the middle and bottom taps, respectively.
- For the composite sample, use the procedure outlined above to fill each sample bottle 1/3 with a sample from each TW. You can fill the combined bottles at the same time as you are filling the sample bottles for each TW.

- To restart the collection system, open the force main valve. Then start all the pumps and follow the procedures outlined in the Emily Operations Manual to set the optimal flow rates for each pump.

Residential

- If possible, notify resident of sampling prior to your arrival at their house. When you arrive at their home, knock on the door and identify yourself as a City employee conducting water sampling, and ask if it is a convenient time to take a sample. If resident is not home but received prior notification, proceed with sampling.
- Ensure sampling location is of raw water (water not treated by a water softener or other treatment device).
- Run the tap for 3-5 minutes prior to sampling. Generally it is good to direct the water away from the foundation of the house with a hose or bucket with running the tap. The home owner may have specific requests which will be noted in the sampling requirements per site sheet.
- Prior to collecting the sample, remove hose if taking sample from an outside tap.
- Take sample.
- Place sample in cooler with ice for transport back to office.
- If taking a sample for bacteria, please follow the directions for sampling and submission provided by the Health Unit with the sample bottle.
- See the residential section of Laboratory Procedures.

Compost

- Samples are to be taken and submitted for analysis once the compost has finished curing and it is ready to be moved. Take 10 grab samples from diverse points within the compost pile; dig in at least 1 meter into the pile.
- Each grab sample will contain a minimum of 20 liters (one pail, ensure pail/ tools are clean).
- Mix the 10 grab samples in a separate pile, and from that pile, take one sample for submission to the laboratory.
- Sample will be sent to Caduceon laboratory for compost analysis.

- Samples are to be contained in a clean PET bag, PET bottle, or glass jars and submitted for analysis for the parameters listed below.
- Currently Caduceon laboratory will provide 2 glass jars (one for metals and one for particle size) for the analysis.

Table 3: Ontario Compost Quality Standards, July 2012

Parameter	Category AA	Category A	Category B
	ppm = mg/kg = ug/g		
Arsenic	13	13	75
Cadmium	3	3	20
Chromium	210	210	1060
Cobalt	34	34	150
Copper	100	400	760
Lead	150	150	500
Mercury	0.8	0.8	5
Molybdenum	5	5	20
Nickel	62	62	180
Selenium	2	2	14
Zinc	500	700	1850
Foreign matter particles greater than 3mm	1%	1%	2%
Plastic foreign matter	0.5%	0.5%	0.5%
Sharp foreign matter	No material that can reasonably cause injury	No material that can reasonably cause injury	Max. 3 pieces/500 ml, Max. 12.5 mm in size
Pathogen Testing (SSO only) Fecal coliforms	<1000 MPN/g of total solids on dry weight basis	<1000 MPN/g of total solids on dry weight basis	<1000 MPN/g of total solids on dry weight basis
Pathogen Testing (SSO only) Salmonellae	<3 MPN/4g total solids calculated on dry weight basis	<3 MPN/4g total solids calculated on dry weight basis	<3 MPN/4g total solids calculated on dry weight basis

LABORATORY PROCEDURES

Laboratory procedures are subject to change with a new lab. Procedures should be confirmed with the lab if there are any changes in laboratories.

Groundwater and Surface Water

- QA/QC procedures (i.e. number and type of field and spiked blanks) shall be determined by prior consultation with the laboratory representative. Current practice is 1 duplicate sample taken for every 10 samples collected. Additionally, one travel blank should be included for every couple of sites.
- Place samples into a cooler with pre-frozen ice packs and if possible send the samples to the lab the same day or next morning. Surface water samples must be sent to the laboratory within 48 hours of sample collection because of BOD holding times. Groundwater samples may be kept up to a maximum of 72 hours before they are sent to the laboratory.
- Samples must maintain a temperature below 10°C. Coolers (or samples) must be stored in fridge at Lindsay Ops if keeping overnight. If they cannot be stored in the fridge, make sure to add extra ice in the coolers for overnight keeping, and ensure more ice is added in the morning.
- A chain of custody form shall be completed and submitted together with the samples to the laboratory. A copy of the chain of custody shall be retained by the sample collector.
- Surface water samples should not be sampled on Friday as the sample will not get to the laboratory before holding time expires. Laboratory holding times for samples are currently as follows:

Table 4: Laboratory holding times

Parameter	Days
ICP Metals	60
Mercury	14
Nitrite	7
Nitrate	7
Fluoride	30
Turbidity	7
Alkalinity	14

Chloride	30
Sulphate	30
DOC	5
TDS	7
pH	ASAP
BOD	5
VOC	14

Residential Well Sample Submission

- Residential well samples must be submitted to the laboratory as soon as possible after sampling. Bacti samples are to be submitted to the health unit as soon as possible. Samples cannot sit over the weekend and cannot be shipped on a Friday.
- Complete the chain of custody ensuring all the required information is completed. There may be specific forms from the lab for submitting residential drinking water samples.
- Pack samples in a cooler with LOTS of ice and ship via courier. Residential samples must be 5°C upon receipt at the laboratory.

POST MONITORING PROCEDURES

Groundwater

- Ensure that all equipment is cleaned and stored in the equipment area at Lindsay Ops.
- Transfer water level information into the field notes folder in the G drive. Go to G:\Environmental\Env Ser - SWaste - Gen\W22 LANDFILL MONITORING PROGRAMS.
- If monitoring well repairs are required note these in the MW repair excel sheet in the G drive. Go to G:\Environmental\Env Ser - SWaste - Gen\W22 LANDFILL MONITORING PROGRAMS and select the excel sheet for the appropriate year entitled Monitoring Well Repairs.

Surface Water

- Ensure that all equipment is clean and stored in the equipment area at Lindsay Ops. The YSI and calibration solutions should be stored inside at 12 Peel Street with the Waste Management Department.

- Transfer surface water information into the field notes folder in the G drive. Go to G:\Environmental\Env Ser - SWaste - Gen\W22 LANDFILL MONITORING PROGRAMS.
- Copy pictures into the SW photo folder for the appropriate site in the G drive. Ensure that the date of the picture is included in the name.

Landfill Gas

- Transfer methane information into the field notes folder in the G drive. Go to G:\Environmental\Env Ser - SWaste - Gen\W22 LANDFILL MONITORING PROGRAMS.

Monitoring Well Repairs

- Monitoring wells should be repaired on a regular basis. Repairs include fixing the waterra tubing, fixing loose casings, cutting down well PVC pipe if the casing has sunk and won't close, extending the well if it is too short. etc.
- All repairs should be documented in the monitoring well repairs excel spreadsheet in the landfill general folder in the G drive.
- For some repairs, it may be necessary to contract a licensed well technician to complete the work. Refer to O Reg. 903 for more information.
- **Be sure to measure the length of PVC that is being extended or cut and adjust the well depth in the field book accordingly.
- **Any changes to the elevation of the pipe must be carried out by a certified well technician and must be indicated to the Regulatory Compliance Officer so a new TOP elevation can be surveyed at the end of the year

Appendix A – Field Sampling Equipment List

All sampling

- Site keys
- Location maps and field sheets
- GPS and locations for the site
- Mobile phone equipped with a camera, or digital camera
- Bear deterrents (bear spray, fog horn, whistle, etc.)
- Cell phone
- Small knife
- Tool box and socket set
- PPE (gloves, bug spray, sunscreen)
- Biodegradable detergent
- Distilled water
- Sharpies
- Hand wipes/hand sanitizer
- Pencils
- Electrical tape
- Measuring tape
- Watch or mobile phone displaying time
- Paper towel

Groundwater monitoring

- Water level indicator (extra C batteries)
- Sampling bottles
- Purging buckets – at least 2 marked with volumes (i.e. 4L, 8L, etc)
- Filters for GW samples
- Additional tubing and foot valves
- Calculator
- Field book
- Coat hanger or threaded rod
- Extra locks and well caps

Surface water monitoring

- Sampling bottles
- YSI meter (extra AA batteries)
- Calibration solutions and distilled water
- Swing sampler
- Mobile phone equipped with camera, or digital camera
- Hip waders
- Rubber boots
- Field book

Gas monitoring

- Methane monitoring device (GMI GT-44)
- Extra C batteries
- Methane field book

Monitoring well repairs

- Hand held electric saw
- Casing caps and collars
- Well caps
- Bucket
- Concrete
- Bentonite
- Waterra tubing (high and low density)
- Foot valves
- PVC pipe
- Ski pole
- Orange spray paint
- Locks

Appendix B – Equipment Calibration and Maintenance Protocols

YSI

For detailed information on YSI please consult the Professional Plus User Manual.

General Use

- The YSI should be calibrated at the beginning of every day that it will be used.
- Prior to departing for field work the protective sleeve can be removed and the field sleeve can be attached.
- Upon return from the field the probe should be rinsed with clean water.
- At the end of every day the probe should be stored with a damp sponge in the bottom of the storage sleeve, or a small amount of water is to be added to the storage sleeve if no sponge is present. The YSI and calibration solutions should be stored in a temperature regulated room. Check the acceptable range for storage on the calibration solution bottles.
- Calibration solutions should be transferred into smaller glass jars to avoid contaminating the entire bottle of solution. Jars should be labeled with the name and concentration of solution as well as the date of transfer and expiry date.

Calibration and Maintenance

- DO Meter

- Follow the “Calibrating DO % in Water Saturated Air: 1 Point Calibration” as described in the Professional Plus YSI user manual (pg 27) and below:
- The supplied sensor storage container (a screw on plastic cup) can be used for DO calibration purposes
- Moisten the sponge in the storage sleeve or plastic cup with small amount of clean water. The sponge should be clean since bacterial growth may consume oxygen and interfere with the calibration. If using the cup and you no longer have the sponge, place a small amount of clean water (1/8 inch) in the plastic storage cup instead.
- Make sure there are no water droplets on the DO membrane or temperature sensor. Then install the storage sleeve or cup over the sensors. The storage sleeve ensures venting to the atmosphere. If using the cup, screw it on the cable and then disengage one or two threads to ensure atmospheric venting. Make sure the DO and temperature sensors are not immersed in water. Turn the instrument on and wait approximately 5-15 minutes for the storage container to become completely saturated and to allow the sensors to stabilize.
- Pres Cal. Highlight probe ID (which must be enabled in the GLP menu to appear in calibration menu).
- Highlight DO % and press enter to confirm.
- Wait for the temperature and DO % values under “actual readings” to stabilize then highlight accept calibration and press enter to calibrate. Or press Esc to cancel calibration.
- The potassium chloride solution and membrane cap should be changed at least every 30 days during regular use.

- Conductivity

- Follow the “Calibrating in Specific (Sp.) Conductance or Conductivity” as described in the Professional Plus YSI manual (pg 36) and below:
- Press Cal. Highlight Probe ID
- Place the sensor into a fresh, traceable conductivity calibration solution. The solution must cover the holes of the conductivity sensor that are closest to the cable. Ensure the entire conductivity sensor is submerged in the solution or the instrument will read approximately half the expected value
- Choose the units in SPC-uS/cm
- Highlight Calibration Value and press enter to input the value of the calibration standard
- Once the temperature and conductivity readings stabilize highlight accept calibration and press enter or press esc to cancel

- The openings that allow sample access to the conductivity electrodes should be cleaned regularly (small cleaning brush included in the maintenance kit). Dip the brush into clean water and insert into each hole 10 to 12 times.
- pH
- Follow the instructions “Calibration pH” as described in the Professional Plus SI user manual (pg40).
- Press Calc. Highlight probe ID
- Highlight ISE (pH) and press enter. The message line will show the instrument is “Ready for point 1” (The pH calibration allows up to six points)
- Rinse the sensor with distilled water and pat dry before placing in the buffer solution.
- Place the sensor in a traceable pH buffer solution. The value of the buffer should show up at the top of the calibration screen. If not, highlight calibration value and enter it manually.
- Once the temperature and pH readings stabilize press accept calibration.
- The probe should be rinsed with distilled water and patted dry in between buffer solutions.
- To continue with the second point, place the sensor in the second buffer solution. Again this buffer solution should be recognized or entered manually.
- Once the pH and temperature have stabilized press accept calibration and press enter.
- If you do not wish to perform a 3rd calibration point press cal to complete the calibration.

Barometer

- Do not calibrate the barometer unless you have specific reason to believe that the values are untrue. If calibrating the barometer carefully follow the instructions in the Professional Plus YSI user manual (pg 32).

GMI GT-44 (Methane Monitor)

For detailed information on the GT-44 please consult the GMI GT Series User Handbook – CSA.

General Use

- To turn the unit on hold the PUMP button down for 1 second. The instrument will ask you if all filters are installed and in good condition – check that they are and then select YES.
- The unit will then ask you if you would like to perform a flow fault test. Place your finger over the sensor. The monitor should read successful – select yes to continue.

- Fresh air calibration should be conducted at the beginning of every sampling day. The monitor will do this automatically, counting down from 30 in the top right hand corner.
- The following different modes will read methane concentration in these units:
 - Confined space - %LEL
 - Barhole – 0-100% LEL ; 0-100% VOL
 - Purge – 0-100% VOL
 - Sniffer - ppm CH₄
 - Leak Test – ppm CH₄
- For best results, the monitor should be operated in Purge mode as methane readings must be recorded in %VOL. However, if you would like to identify very small methane concentrations, the monitor can be placed in sniffer or leak test mode and ppm CH₄ can be easily converted to %VOL using the following equation:

$$\text{\%VOL methane} = \text{ppm}/10,000$$

- To switch between operation modes, press and hold both the INVERT and PUMP buttons at the same time.
- The max/live or min/max methane readings can be seen by pressing and holding the INVERT button (only available in confined space or leak test mode). To return to live readings press and hold the INVERT button again.
- The automatic pump can be turned on and off by pressing the PUMP button.
- To turn the monitor off, press and hold the INVERT and PUMP button simultaneously while the monitor counts down from 3.

Calibration

- To conduct a Fresh Air calibration, turn the monitor on – the monitor will automatically begin the fresh air calibration and warm up sequence.
- If the instrument reads error please refer to the Instruction manual or call a service technician.
- The unit is to be calibrated when Hetek Solutions Inc. is on site for gas detection calibration at the Lindsay Ops Landfill.

Compost Thermometer

Please refer to Recalibrating your Reotemp Dial Compost Thermometer information sheet for more information.

- To calibrate the thermometer prepare a Reference Bath. You will need a bath of water of a known temperature. You can use ice water for any range that includes 0°C. The ice bath should be mostly ice, with just enough water to fill the spaces.
- You can use any other temperature bath (room temperature is most convenient, but your working temperature will be most effective), if you have another reference thermometer that you know is accurate.
- The reference bath should be at least 4 inches deep (6 or more inches is better.) If the reference bath is water at room temperature, use a big container, like a bucket.

- The bath should be agitated (stirred) just before or during calibration (boiling water will do its own agitation).
- If you are using a reference thermometer, place the Unit under test (UUT) right next to the reference unit (REF). You can even strap them together with a small rubber band. The UUT should be immersed at least 4 inches into the bath, as the sensitive portion of the thermometer is in the last 2-3 inches of the stem.
- Leave the UUT in the bath for at least a minute, to make sure temperatures have stabilized. Then rotate the small (1/4") hex screw head on the back of the dial case of the UUT until the pointer is indicating the proper temperature. You can use a flat screwdriver, or a small coin, or pliers to rotate the screw head. Once the UUT and REF thermometers agree, you are done!
- If your thermometer will not recalibrate, it may need factory repair. (If the stem is bent, it cannot be repaired, and must be replaced). Contact our factory at 858-784-0710, or fax us at 858-784-0720, or email (sales@reotemp.com) to discuss repair/replacement options.

Appendix C – Contact Information

City of Kawartha Lakes Contact List

Name	Position	Number (705) 324-9411 ext:	Cell
Heather Dzurko	Supervisor of Waste Management Operations	1133	705-328-4263
Kerri Snoddy	Regulatory Compliance Officer	2360	705-879-2666
Nikki Payne	Waste Technician	1144	705-928-3056
David Kerr	Manager Environmental Services	1118	705-340-3448

Repair and Maintenance Contact List

Company Name	Contact Name/Information	Number	Email	Equipment
Coe Fisher Cameron	Herman Wimmelbach or Geoff Lees	705-324-4152	geoff@coefishercameron.com	Surveys
Sitech	Spencer Wykes	905-669-4773(w) 416-436-3241(c)	spencer.wykes@sitechmidcanada.com	Trimble GPS unit
Hart & Sons Drilling	Clark Watson	887-3331		Monitoring well repairs
Kevin Keenan	Keenan Electric	878-2111		Electrician for Emily (set up spray irrigation times etc.)
Tom Taylor	Taylor Electric	705-878-6050		Emily electrical
Steve Walsh	Walsh's welding	705-328-0738		Welding repairs of Emily irrigation system
Christie Mechanical	Christie Mechanical (7415 Highway 9 Rr	519-943-0506		Emily Rotork Valves: for replcement only

	1, Palgrave L0N 1P0, ON			
Syntec Maintenance	Steve Stoll	905-951-8000	steve@syntecpe.com	Emily Rotork Valves: for information/sup port
Hetek Environmental Solutions	Karl Stoute, Account Manager - GTA	519-659-1144	karl.stoute@hete.com	GMI GT-44 Methane Monitor Calibration and Support

Equipment Supplies Contact List

Company Name	Contact Name/ Information	Number	Email	Equipment
Hoskin Scientific	Natalia Lecki 4210 Morris Dr. Burlington	905-333-5510 x 232	nlecki@hoskin.ca	Calibration Solutions for YSI and other environmental monitoring equipment
Desco Plumbing and Heating Supply Inc.	39 Colborne St. East Lindsay	705-324-9421		Plumbing supplies
Solinst Canada Ltd.	35 Todd Rd Georgetown, ON	1-800-516-9081	john.buckley@solinst.com	environmental monitoring equipment
Pine Environmental Services	Aimee Fossett or Graham Johnstone, 6380 Tomken Rd. Mississauga	905-795-9700	gjohnstone@pineenvironmental.com	renting water level meter, other equipment
Maxim Environmental & Safety	Paul Coulombe, 170 Ambassador ON	1-888-285-2324	paul@maximenvironmental.com	environmental monitoring equipment
Osprey Scientific	Claire Aucott, Mississauga	905-820-3122	caucott@ospreyscientific.com	environmental monitoring equipment

Appendix D – Health and Safety Information

Every field sample technician should be aware of the hazards of working in the outdoor environment. Please consult the following information included in the protocol and ask any questions if you feel additional information should be included.

Confined Space Entry

- Consult the City Policy number M-HR-003.

Bear Spray

- Consult the Bear Spray fact sheet included in this appendix. Detailed information about being bear safe can be found on the MNR website.
- <http://www.mnr.gov.on.ca/en/Business/Bearwise/index.html>

Heat and Cold

- Consult the Working in Hot and Cold Temperatures SOP WM025.

Plants to avoid

- Consult the plants to avoid information sheet included in G:\Environmental\Env Ser
- SWaste - Gen\W22 LANDFILL MONITORING PROGRAMS.



APPENDIX I

Laboratory Certificates of Analysis

C.O.C.: ---

REPORT No. B23-03160 (i)

Report To:

City of Kawartha Lakes

PO Box 9000, 12 Peel St

Lindsay ON K9V 5R8

Attention: Kayla Pantaleo

Caduceon Environmental Laboratories

112 Commerce Park Drive

Barrie ON L4N 8W8

Tel: 705-252-5743

Fax: 705-252-5746

DATE RECEIVED: 27-Apr-23

JOB/PROJECT NO.: Laxton Landfill

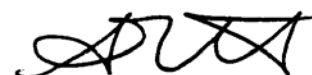
DATE REPORTED: 09-Jun-23

P.O. NUMBER:

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

			Client I.D.		1	2	3	4
			Sample I.D.		B23-03160-1	B23-03160-2	B23-03160-3	B23-03160-4
			Date Collected		26-Apr-23	26-Apr-23	26-Apr-23	26-Apr-23
Parameter	Units	R.L.	Reference Method	Date/Site Analyzed				
Alkalinity(CaCO ₃) to pH4.5	mg/L	5	SM 2320B	01-May-23/O	154	207	251	586
Conductivity @25°C	µmho/cm	1	SM 2510B	01-May-23/O	479	507	579	1120
pH @25°C	pH Units		SM 4500H	01-May-23/O	7.10	7.17	7.01	6.79
TDS(ion sum calc.)	mg/L	1	Calc.	03-May-23/O	282	277	321	608
Total Suspended Solids	mg/L	3	SM2540D	03-May-23/K				2060
Dissolved Organic Carbon	mg/L	0.2	EPA 415.2	01-May-23/O	6.7	5.6	5.6	8.1
BOD(5 day)	mg/L	3	SM 5210B	04-May-23/K				4
COD	mg/L	5	SM5220C	08-May-23/K	5	< 5	17	77
Phenolics	mg/L	0.001	MOEE 3179	08-May-23/K	< 0.001	< 0.001	< 0.001	< 0.001
Chloride	mg/L	0.5	SM4110C	01-May-23/O	16.5	15.3	13.3	1.5
Fluoride	mg/L	0.1	SM4110C	01-May-23/O	< 0.1	< 0.1	< 0.1	< 0.1
Ammonia (N)-Total	mg/L	0.01	SM4500-NH ₃ -H	08-May-23/K	0.12	0.43	2.99	7.79
Sulphate	mg/L	1	SM4110C	01-May-23/O	72	37	26	17
Nitrite (N)	mg/L	0.05	SM4110C	01-May-23/O	< 0.05	< 0.05	< 0.05	< 0.05
Nitrate (N)	mg/L	0.05	SM4110C	01-May-23/O	0.26	< 0.05	0.07	0.17
Total Kjeldahl Nitrogen	mg/L	0.1	E3516.2	18-May-23/K	0.4	0.6	3.2	9.6
Hardness (as CaCO ₃)	mg/L	1	SM 3120	02-May-23/O	203	204	235	543
Aluminum	mg/L	0.01	SM 3120	02-May-23/O	0.02	0.02	0.02	0.06
Antimony	mg/L	0.0001	EPA 200.8	05-May-23/O	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Arsenic	mg/L	0.0001	EPA 200.8	05-May-23/O	0.0002	0.0002	0.0004	0.0070
Barium	mg/L	0.001	SM 3120	02-May-23/O	0.210	0.211	0.284	0.109
Beryllium	mg/L	0.002	SM 3120	02-May-23/O	< 0.002	< 0.002	< 0.002	< 0.002
Boron	mg/L	0.005	SM 3120	02-May-23/O	1.12	1.01	0.656	0.367
Cadmium	mg/L	0.000010	EPA 200.8	05-May-23/O	0.000129	0.000096	< 0.000010	< 0.000012
Calcium	mg/L	0.02	SM 3120	02-May-23/O	61.3	61.2	71.0	179
Chromium	mg/L	0.001	EPA 200.8	05-May-23/O	< 0.001	< 0.001	< 0.001	0.003
Chromium (VI)	mg/L	0.001	MOE E3056	09-May-23/O	< 0.001 ¹	< 0.001 ¹	< 0.001 ¹	< 0.001 ²



R.L. = Reporting Limit

Test methods may be modified from specified reference method unless indicated by an *

Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

Steve Garrett

Director of Laboratory Services

The analytical results reported herein refer to the samples as received. Reproduction of this analytical report in full or in part is prohibited without prior consent from

C.O.C.: ---

REPORT No. B23-03160 (i)

Report To:

City of Kawartha Lakes

PO Box 9000, 12 Peel St

Lindsay ON K9V 5R8

Attention: Kayla Pantaleo

Caduceon Environmental Laboratories

112 Commerce Park Drive

Barrie ON L4N 8W8

Tel: 705-252-5743

Fax: 705-252-5746

DATE RECEIVED: 27-Apr-23

JOB/PROJECT NO.: Laxton Landfill

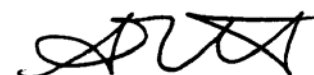
DATE REPORTED: 09-Jun-23

P.O. NUMBER:

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

			Client I.D.		1	2	3	4
			Sample I.D.		B23-03160-1	B23-03160-2	B23-03160-3	B23-03160-4
			Date Collected		26-Apr-23	26-Apr-23	26-Apr-23	26-Apr-23
Parameter	Units	R.L.	Reference Method	Date/Site Analyzed				
Cobalt	mg/L	0.005	SM 3120	02-May-23/O	< 0.005	< 0.005	0.005	0.045
Copper	mg/L	0.0001	EPA 200.8	05-May-23/O	0.0084	0.0070	0.0006	0.0002
Iron	mg/L	0.005	SM 3120	02-May-23/O	< 0.005	< 0.005	18.0	7.97
Lead	mg/L	0.00002	EPA 200.8	05-May-23/O	< 0.00002	< 0.00002	< 0.00002	< 0.00004
Magnesium	mg/L	0.02	SM 3120	02-May-23/O	12.0	12.3	14.0	14.4
Manganese	mg/L	0.001	SM 3120	02-May-23/O	1.60	1.83	2.73	8.82
Mercury	mg/L	0.00002	SM 3112 B	03-May-23/O	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Molybdenum	mg/L	0.0001	EPA 200.8	05-May-23/O	0.0006	0.0005	0.0005	0.0015
Nickel	mg/L	0.01	SM 3120	02-May-23/O	< 0.01	< 0.01	< 0.01	< 0.01
Potassium	mg/L	0.1	SM 3120	02-May-23/O	3.7	4.3	8.8	16.3
Phosphorus-Total	mg/L	0.01	E3516.2	18-May-23/K	< 0.01	0.08	0.05	0.77
Phosphorus	mg/L	0.1	SM 3120	02-May-23/O	< 0.1	< 0.1	< 0.1	< 0.1
Selenium	mg/L	0.001	EPA 200.8	05-May-23/O	< 0.001	< 0.001	< 0.001	< 0.001
Silver	mg/L	0.0001	EPA 200.8	05-May-23/O	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Sodium	mg/L	0.2	SM 3120	02-May-23/O	22.8	20.5	16.6	10.9
Strontium	mg/L	0.001	SM 3120	02-May-23/O	0.348	0.364	0.424	0.827
Tin	mg/L	0.05	SM 3120	02-May-23/O	< 0.05	< 0.05	< 0.05	< 0.05
Titanium	mg/L	0.005	SM 3120	02-May-23/O	< 0.005	< 0.005	< 0.005	< 0.005
Thallium	mg/L	0.00005	EPA 200.8	05-May-23/O	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Uranium	mg/L	0.00005	EPA 200.8	05-May-23/O	0.00148	0.00255	0.00286	0.00121
Vanadium	mg/L	0.0001	EPA 200.8	05-May-23/O	0.0001	0.0001	0.0024	0.0128
Zinc	mg/L	0.005	SM 3120	02-May-23/O	< 0.005	< 0.005	< 0.005	< 0.005
Anion Sum	meq/L		Calc.	03-May-23/O	5.06	5.34	5.93	12.1
Cation Sum	meq/L		Calc.	03-May-23/O	5.20	5.15	6.73	11.8
% Difference	%		Calc.	03-May-23/O	1.40	1.84	6.28	1.23
Ion Ratio	AS/CS		Calc.	03-May-23/O	0.972	1.04	0.882	1.02
Conductivity (calc.)	µmho/cm		Calc.	03-May-23/O	502	495	533	985



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Site Analyzed=K-Kingston, W-Windsor, O-Ottawa, R-Richmond Hill, B-Barrie

Steve Garrett

Director of Laboratory Services

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C.O.C.: ---

REPORT No. B23-03160 (i)

Report To:

City of Kawartha Lakes

PO Box 9000, 12 Peel St

Lindsay ON K9V 5R8

Attention: Kayla Pantaleo

Caduceon Environmental Laboratories

112 Commerce Park Drive

Barrie ON L4N 8W8

Tel: 705-252-5743

Fax: 705-252-5746

DATE RECEIVED: 27-Apr-23

JOB/PROJECT NO.: Laxton Landfill

DATE REPORTED: 09-Jun-23

P.O. NUMBER:

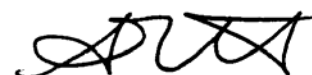
SAMPLE MATRIX: Groundwater

WATERWORKS NO.

			Client I.D.		1	2	3	4
			Sample I.D.		B23-03160-1	B23-03160-2	B23-03160-3	B23-03160-4
			Date Collected		26-Apr-23	26-Apr-23	26-Apr-23	26-Apr-23
Parameter	Units	R.L.	Reference Method	Date/Site Analyzed				
Sodium Adsorption Ratio	-		Calc.	03-May-23/O	0.697	0.625	0.471	0.210
TDS(calc.)/EC(actual)	-		Calc.	03-May-23/O	0.589	0.545	0.554	0.542
Langelier Index(25°C)	S.I.		Calc.	03-May-23/O	-0.367	-0.169	-0.182	0.338

1 Chromium (VI) result is based on total Chromium

2 Chromium (VI) result is based on total Chromium



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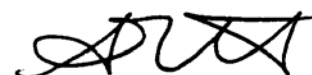
DATE REPORTED: 09-Jun-23

P.O. NUMBER:

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

			Client I.D.		6	DUP-1	7	8
			Sample I.D.		B23-03160-5	B23-03160-6	B23-03160-7	B23-03160-8
			Date Collected		26-Apr-23	26-Apr-23	26-Apr-23	26-Apr-23
Parameter	Units	R.L.	Reference Method	Date/Site Analyzed				
Alkalinity(CaCO3) to pH4.5	mg/L	5	SM 2320B	01-May-23/O	227	227	225	185
Conductivity @25°C	µmho/cm	1	SM 2510B	01-May-23/O	507	624	618	456
pH @25°C	pH Units		SM 4500H	01-May-23/O	7.38	7.15	7.12	7.15
TDS(ion sum calc.)	mg/L	1	Calc.	03-May-23/O	274	356	351	246
Total Suspended Solids	mg/L	3	SM2540D	03-May-23/K				
Dissolved Organic Carbon	mg/L	0.2	EPA 415.2	01-May-23/O	9.4	10.1	7.8	10.2
BOD(5 day)	mg/L	3	SM 5210B	04-May-23/K				
COD	mg/L	5	SM5220C	08-May-23/K	20	22	29	41
Phenolics	mg/L	0.001	MOEE 3179	08-May-23/K	< 0.001	< 0.001	< 0.001	< 0.001
Chloride	mg/L	0.5	SM4110C	01-May-23/O	1.1	26.1	26.0	19.7
Fluoride	mg/L	0.1	SM4110C	01-May-23/O	< 0.1	< 0.1	< 0.1	< 0.1
Ammonia (N)-Total	mg/L	0.01	SM4500-NH3-H	08-May-23/K	0.13	3.59	3.61	0.14
Sulphate	mg/L	1	SM4110C	01-May-23/O	42	57	57	5
Nitrite (N)	mg/L	0.05	SM4110C	01-May-23/O	< 0.05	< 0.05	< 0.05	0.05
Nitrate (N)	mg/L	0.05	SM4110C	01-May-23/O	< 0.05	< 0.05	< 0.05	1.65
Total Kjeldahl Nitrogen	mg/L	0.1	E3516.2	18-May-23/K	0.7	4.3	4.2	0.9
Hardness (as CaCO3)	mg/L	1	SM 3120	02-May-23/O	231	229	220	187
Aluminum	mg/L	0.01	SM 3120	02-May-23/O	0.03	0.02	0.02	0.04
Antimony	mg/L	0.0001	EPA 200.8	05-May-23/O	0.0002	0.0001	0.0001	< 0.0001
Arsenic	mg/L	0.0001	EPA 200.8	05-May-23/O	0.0002	0.0008	0.0008	0.0022
Barium	mg/L	0.001	SM 3120	02-May-23/O	0.034	0.371	0.352	0.433
Beryllium	mg/L	0.002	SM 3120	02-May-23/O	< 0.002	< 0.002	< 0.002	< 0.002
Boron	mg/L	0.005	SM 3120	02-May-23/O	0.144	1.37	1.37	0.103
Cadmium	mg/L	0.000010	EPA 200.8	05-May-23/O	0.000080	< 0.000010	< 0.000010	0.000109
Calcium	mg/L	0.02	SM 3120	02-May-23/O	77.3	71.1	67.7	56.0
Chromium	mg/L	0.001	EPA 200.8	05-May-23/O	< 0.001	0.002	0.002	< 0.001
Chromium (VI)	mg/L	0.001	MOE E3056	09-May-23/O	< 0.001 ¹	< 0.001 ¹	< 0.001 ¹	< 0.001 ¹



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Steve Garrett

Director of Laboratory Services

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PO Box 9000, 12 Peel St

Lindsay ON K9V 5R8

Attention: Kayla Pantaleo

Caduceon Environmental Laboratories

112 Commerce Park Drive

Barrie ON L4N 8W8

Tel: 705-252-5743

Fax: 705-252-5746

DATE RECEIVED: 27-Apr-23

JOB/PROJECT NO.: Laxton Landfill

DATE REPORTED: 09-Jun-23

P.O. NUMBER:

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

			Client I.D.		6	DUP-1	7	8
			Sample I.D.		B23-03160-5	B23-03160-6	B23-03160-7	B23-03160-8
			Date Collected		26-Apr-23	26-Apr-23	26-Apr-23	26-Apr-23
Parameter	Units	R.L.	Reference Method	Date/Site Analyzed				
Cobalt	mg/L	0.005	SM 3120	02-May-23/O	< 0.005	0.008	0.006	0.024
Copper	mg/L	0.0001	EPA 200.8	05-May-23/O	0.0022	0.0009	0.0007	0.0329
Iron	mg/L	0.005	SM 3120	02-May-23/O	1.38	5.25	4.96	0.006
Lead	mg/L	0.00002	EPA 200.8	05-May-23/O	< 0.00002	0.00002	0.00003	< 0.00002
Magnesium	mg/L	0.02	SM 3120	02-May-23/O	9.10	12.4	12.4	11.4
Manganese	mg/L	0.001	SM 3120	02-May-23/O	0.166	1.79	1.70	1.55
Mercury	mg/L	0.00002	SM 3112 B	03-May-23/O	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Molybdenum	mg/L	0.0001	EPA 200.8	05-May-23/O	0.0006	0.0005	0.0005	0.0010
Nickel	mg/L	0.01	SM 3120	02-May-23/O	< 0.01	< 0.01	< 0.01	0.01
Potassium	mg/L	0.1	SM 3120	02-May-23/O	2.3	12.3	12.2	38.8
Phosphorus-Total	mg/L	0.01	E3516.2	18-May-23/K	< 0.01	0.11	0.15	0.19
Phosphorus	mg/L	0.1	SM 3120	02-May-23/O	< 0.1	< 0.1	< 0.1	< 0.1
Selenium	mg/L	0.001	EPA 200.8	05-May-23/O	< 0.001	< 0.001	< 0.001	0.001
Silver	mg/L	0.0001	EPA 200.8	05-May-23/O	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Sodium	mg/L	0.2	SM 3120	02-May-23/O	5.1	34.5	34.6	3.1
Strontium	mg/L	0.001	SM 3120	02-May-23/O	0.392	0.369	0.370	0.403
Tin	mg/L	0.05	SM 3120	02-May-23/O	< 0.05	< 0.05	< 0.05	< 0.05
Titanium	mg/L	0.005	SM 3120	02-May-23/O	< 0.005	< 0.005	< 0.005	< 0.005
Thallium	mg/L	0.00005	EPA 200.8	05-May-23/O	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Uranium	mg/L	0.00005	EPA 200.8	05-May-23/O	0.00084	0.00146	0.00149	0.00440
Vanadium	mg/L	0.0001	EPA 200.8	05-May-23/O	0.0018	0.0013	0.0013	0.0002
Zinc	mg/L	0.005	SM 3120	02-May-23/O	0.008	< 0.005	0.006	< 0.005
Anion Sum	meq/L		Calc.	03-May-23/O	5.44	6.45	6.41	4.47
Cation Sum	meq/L		Calc.	03-May-23/O	4.97	6.74	6.56	4.93
% Difference	%		Calc.	03-May-23/O	4.49	2.23	1.14	4.83
Ion Ratio	AS/CS		Calc.	03-May-23/O	1.09	0.956	0.977	0.908
Conductivity (calc.)	µmho/cm		Calc.	03-May-23/O	483	614	604	459

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Tel: 705-252-5743

Fax: 705-252-5746

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JOB/PROJECT NO.: Laxton Landfill

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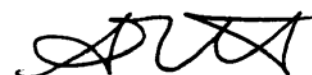
SAMPLE MATRIX: Groundwater

WATERWORKS NO.

			Client I.D.		6	DUP-1	7	8
			Sample I.D.		B23-03160-5	B23-03160-6	B23-03160-7	B23-03160-8
			Date Collected		26-Apr-23	26-Apr-23	26-Apr-23	26-Apr-23
Parameter	Units	R.L.	Reference Method	Date/Site Analyzed				
Sodium Adsorption Ratio	-		Calc.	03-May-23/O	0.147	0.993	1.01	0.0993
TDS(calc.)/EC(actual)	-		Calc.	03-May-23/O	0.541	0.571	0.568	0.540
Langelier Index(25°C)	S.I.		Calc.	03-May-23/O	0.182	-0.0952	-0.150	-0.267

1 Chromium (VI) result is based on total Chromium

2 Chromium (VI) result is based on total Chromium



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DATE RECEIVED: 27-Apr-23

JOB/PROJECT NO.: Laxton Landfill

DATE REPORTED: 09-Jun-23

P.O. NUMBER:

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

			Client I.D.		10	12	13	14
			Sample I.D.		B23-03160-9	B23-03160-10	B23-03160-11	B23-03160-12
			Date Collected		26-Apr-23	26-Apr-23	26-Apr-23	26-Apr-23
Parameter	Units	R.L.	Reference Method	Date/Site Analyzed				
Alkalinity(CaCO ₃) to pH4.5	mg/L	5	SM 2320B	01-May-23/O	155	145	145	106
Conductivity @25°C	µmho/cm	1	SM 2510B	01-May-23/O	844	374	372	247
pH @25°C	pH Units		SM 4500H	01-May-23/O	7.54	7.18	7.27	7.15
TDS(ion sum calc.)	mg/L	1	Calc.	03-May-23/O	536	204	206	125
Total Suspended Solids	mg/L	3	SM2540D	03-May-23/K				
Dissolved Organic Carbon	mg/L	0.2	EPA 415.2	01-May-23/O	3.1	4.0	4.3	2.4
BOD(5 day)	mg/L	3	SM 5210B	04-May-23/K				
COD	mg/L	5	SM5220C	08-May-23/K	< 5	35	< 5	< 5
Phenolics	mg/L	0.001	MOEE 3179	08-May-23/K	< 0.001	< 0.001	< 0.001	< 0.001
Chloride	mg/L	0.5	SM4110C	01-May-23/O	7.6	12.3	9.6	2.2
Fluoride	mg/L	0.1	SM4110C	01-May-23/O	0.2	< 0.1	< 0.1	< 0.1
Ammonia (N)-Total	mg/L	0.01	SM4500-NH ₃ -H	08-May-23/K	0.03	0.04	0.03	< 0.01
Sulphate	mg/L	1	SM4110C	01-May-23/O	258	32	35	14
Nitrite (N)	mg/L	0.05	SM4110C	01-May-23/O	< 0.05	< 0.05	< 0.05	< 0.05
Nitrate (N)	mg/L	0.05	SM4110C	01-May-23/O	0.12	< 0.05	< 0.05	< 0.05
Total Kjeldahl Nitrogen	mg/L	0.1	E3516.2	18-May-23/K	0.2	0.6	0.2	< 0.1
Hardness (as CaCO ₃)	mg/L	1	SM 3120	02-May-23/O	429	152	151	119
Aluminum	mg/L	0.01	SM 3120	02-May-23/O	0.05	0.02	0.01	0.02
Antimony	mg/L	0.0001	EPA 200.8	05-May-23/O	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Arsenic	mg/L	0.0001	EPA 200.8	05-May-23/O	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Barium	mg/L	0.001	SM 3120	02-May-23/O	0.083	0.176	0.153	0.106
Beryllium	mg/L	0.002	SM 3120	02-May-23/O	< 0.002	< 0.002	< 0.002	< 0.002
Boron	mg/L	0.005	SM 3120	02-May-23/O	0.125	0.764	0.684	0.036
Cadmium	mg/L	0.000010	EPA 200.8	05-May-23/O	< 0.000010	< 0.000010	< 0.000010	< 0.000010
Calcium	mg/L	0.02	SM 3120	02-May-23/O	146	37.0	37.0	29.2
Chromium	mg/L	0.001	EPA 200.8	05-May-23/O	< 0.001	< 0.001	< 0.001	< 0.001

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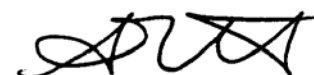
DATE REPORTED: 09-Jun-23

P.O. NUMBER:

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Client I.D.					10	12	13	14
Sample I.D.					B23-03160-9	B23-03160-10	B23-03160-11	B23-03160-12
Date Collected					26-Apr-23	26-Apr-23	26-Apr-23	26-Apr-23
Parameter	Units	R.L.	Reference Method	Date/Site Analyzed				
Chromium (VI)	mg/L	0.001	MOE E3056	09-May-23/O	< 0.001 ¹	< 0.001 ¹	< 0.001 ¹	< 0.001 ¹
Cobalt	mg/L	0.005	SM 3120	02-May-23/O	< 0.005	< 0.005	< 0.005	< 0.005
Copper	mg/L	0.0001	EPA 200.8	05-May-23/O	0.0006	0.0004	0.0004	0.0002
Iron	mg/L	0.005	SM 3120	02-May-23/O	3.65	0.449	0.124	0.435
Lead	mg/L	0.00002	EPA 200.8	05-May-23/O	0.00002	< 0.00002	< 0.00002	< 0.00002
Magnesium	mg/L	0.02	SM 3120	02-May-23/O	15.5	14.5	14.3	11.2
Manganese	mg/L	0.001	SM 3120	02-May-23/O	0.270	0.091	0.016	0.010
Mercury	mg/L	0.00002	SM 3112 B	03-May-23/O	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Molybdenum	mg/L	0.0001	EPA 200.8	05-May-23/O	0.0025	0.0004	0.0004	0.0003
Nickel	mg/L	0.01	SM 3120	02-May-23/O	< 0.01	< 0.01	< 0.01	< 0.01
Potassium	mg/L	0.1	SM 3120	02-May-23/O	2.6	3.0	2.8	2.1
Phosphorus-Total	mg/L	0.01	E3516.2	18-May-23/K	< 0.01	1.48	0.23	0.19
Phosphorus	mg/L	0.1	SM 3120	02-May-23/O	< 0.1	< 0.1	< 0.1	< 0.1
Selenium	mg/L	0.001	EPA 200.8	05-May-23/O	< 0.001	< 0.001	< 0.001	< 0.001
Silver	mg/L	0.0001	EPA 200.8	05-May-23/O	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Sodium	mg/L	0.2	SM 3120	02-May-23/O	9.0	17.7	20.4	1.7
Strontium	mg/L	0.001	SM 3120	02-May-23/O	3.68	0.274	0.285	0.220
Tin	mg/L	0.05	SM 3120	02-May-23/O	< 0.05	< 0.05	< 0.05	< 0.05
Titanium	mg/L	0.005	SM 3120	02-May-23/O	< 0.005	< 0.005	< 0.005	< 0.005
Thallium	mg/L	0.00005	EPA 200.8	05-May-23/O	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Uranium	mg/L	0.00005	EPA 200.8	05-May-23/O	0.00246	0.00027	0.00118	0.00118
Vanadium	mg/L	0.0001	EPA 200.8	05-May-23/O	0.0002	< 0.0001	< 0.0001	0.0001
Zinc	mg/L	0.005	SM 3120	02-May-23/O	< 0.005	< 0.005	< 0.005	< 0.005
Anion Sum	meq/L		Calc.	03-May-23/O	8.71	3.90	3.89	2.48
Cation Sum	meq/L		Calc.	03-May-23/O	9.23	3.91	3.99	2.53
% Difference	%		Calc.	03-May-23/O	2.91	0.129	1.24	0.966
Ion Ratio	AS/CS		Calc.	03-May-23/O	0.944	0.997	0.975	0.981



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Steve Garrett

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REPORT No. B23-03160 (i)

Report To:

City of Kawartha Lakes

PO Box 9000, 12 Peel St

Lindsay ON K9V 5R8

Attention: Kayla Pantaleo

Caduceon Environmental Laboratories

112 Commerce Park Drive

Barrie ON L4N 8W8

Tel: 705-252-5743

Fax: 705-252-5746

DATE RECEIVED: 27-Apr-23

JOB/PROJECT NO.: Laxton Landfill

DATE REPORTED: 09-Jun-23

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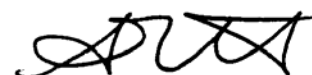
SAMPLE MATRIX: Groundwater

WATERWORKS NO.

			Client I.D.	10	12	13	14
			Sample I.D.	B23-03160-9	B23-03160-10	B23-03160-11	B23-03160-12
			Date Collected	26-Apr-23	26-Apr-23	26-Apr-23	26-Apr-23
Parameter	Units	R.L.	Reference Method	Date/Site Analyzed			
Conductivity (calc.)	µmho/cm		Calc.	03-May-23/O	865	378	381
Sodium Adsorption Ratio	-		Calc.	03-May-23/O	0.190	0.624	0.722
TDS(calc.)/EC(actual)	-		Calc.	03-May-23/O	0.635	0.544	0.554
Langelier Index(25°C)	S.I.		Calc.	03-May-23/O	0.423	-0.522	-0.433
							242
							0.0694
							0.506
							-0.741

1 Chromium (VI) result is based on total Chromium

2 Chromium (VI) result is based on total Chromium



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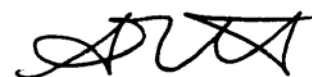
DATE REPORTED: 09-Jun-23

P.O. NUMBER:

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

			Client I.D.		16-I	16	19	DUP
			Sample I.D.		B23-03160-13	B23-03160-14	B23-03160-15	B23-03160-16
			Date Collected		26-Apr-23	26-Apr-23	26-Apr-23	26-Apr-23
Parameter	Units	R.L.	Reference Method	Date/Site Analyzed				
Alkalinity(CaCO3) to pH4.5	mg/L	5	SM 2320B	01-May-23/O	154	198	143	187
Conductivity @25°C	µmho/cm	1	SM 2510B	01-May-23/O	399	465	374	454
pH @25°C	pH Units		SM 4500H	01-May-23/O	7.11	7.32	7.11	7.22
TDS(ion sum calc.)	mg/L	1	Calc.	03-May-23/O	218	256	202	246
Total Suspended Solids	mg/L	3	SM2540D	03-May-23/K				
Dissolved Organic Carbon	mg/L	0.2	EPA 415.2	01-May-23/O	4.7	5.3	4.3	17.1
BOD(5 day)	mg/L	3	SM 5210B	04-May-23/K				
COD	mg/L	5	SM5220C	08-May-23/K	6	122	< 5	40
Phenolics	mg/L	0.001	MOEE 3179	08-May-23/K	< 0.001	< 0.001	< 0.001	< 0.001
Chloride	mg/L	0.5	SM4110C	01-May-23/O	13.0	13.2	10.8	19.6
Fluoride	mg/L	0.1	SM4110C	01-May-23/O	< 0.1	< 0.1	< 0.1	< 0.1
Ammonia (N)-Total	mg/L	0.01	SM4500-NH3-H	08-May-23/K	0.05	0.95	0.03	0.04
Sulphate	mg/L	1	SM4110C	01-May-23/O	33	29	34	5
Nitrite (N)	mg/L	0.05	SM4110C	01-May-23/O	< 0.05	< 0.05	< 0.05	0.05
Nitrate (N)	mg/L	0.05	SM4110C	01-May-23/O	< 0.05	< 0.05	0.06	1.65
Total Kjeldahl Nitrogen	mg/L	0.1	E3516.2	18-May-23/K	0.3	1.1	0.2	0.6
Hardness (as CaCO3)	mg/L	1	SM 3120	02-May-23/O	173	211	157	182
Aluminum	mg/L	0.01	SM 3120	02-May-23/O	0.02	0.02	0.02	0.02
Antimony	mg/L	0.0001	EPA 200.8	05-May-23/O	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Arsenic	mg/L	0.0001	EPA 200.8	05-May-23/O	< 0.0001	0.0002	< 0.0001	0.0022
Barium	mg/L	0.001	SM 3120	02-May-23/O	0.209	0.157	0.175	0.415
Beryllium	mg/L	0.002	SM 3120	02-May-23/O	< 0.002	< 0.002	< 0.002	< 0.002
Boron	mg/L	0.005	SM 3120	02-May-23/O	0.744	0.557	0.720	0.104
Cadmium	mg/L	0.000010	EPA 200.8	05-May-23/O	0.000043	0.000074	0.000031	0.000108
Calcium	mg/L	0.02	SM 3120	02-May-23/O	45.5	56.0	39.5	53.8
Chromium	mg/L	0.001	EPA 200.8	05-May-23/O	< 0.001	< 0.001	< 0.001	< 0.001



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Steve Garrett

Director of Laboratory Services

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PO Box 9000, 12 Peel St

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Attention: Kayla Pantaleo

Caduceon Environmental Laboratories

112 Commerce Park Drive

Barrie ON L4N 8W8

Tel: 705-252-5743

Fax: 705-252-5746

DATE RECEIVED: 27-Apr-23

JOB/PROJECT NO.: Laxton Landfill

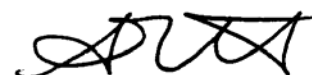
DATE REPORTED: 09-Jun-23

P.O. NUMBER:

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

			Client I.D.		16-I	16	19	DUP
			Sample I.D.		B23-03160-13	B23-03160-14	B23-03160-15	B23-03160-16
			Date Collected		26-Apr-23	26-Apr-23	26-Apr-23	26-Apr-23
Parameter	Units	R.L.	Reference Method	Date/Site Analyzed				
Chromium (VI)	mg/L	0.001	MOE E3056	09-May-23/O	< 0.001 ¹	< 0.001 ¹	< 0.001 ¹	< 0.001 ¹
Cobalt	mg/L	0.005	SM 3120	02-May-23/O	< 0.005	0.006	< 0.005	0.021
Copper	mg/L	0.0001	EPA 200.8	05-May-23/O	0.0037	0.0032	0.0038	0.0335
Iron	mg/L	0.005	SM 3120	02-May-23/O	0.054	0.135	0.005	< 0.005
Lead	mg/L	0.00002	EPA 200.8	05-May-23/O	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Magnesium	mg/L	0.02	SM 3120	02-May-23/O	14.3	17.3	14.2	11.6
Manganese	mg/L	0.001	SM 3120	02-May-23/O	0.193	0.407	0.072	1.49
Mercury	mg/L	0.00002	SM 3112 B	03-May-23/O	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Molybdenum	mg/L	0.0001	EPA 200.8	05-May-23/O	0.0003	0.0004	0.0003	0.0010
Nickel	mg/L	0.01	SM 3120	02-May-23/O	< 0.01	< 0.01	< 0.01	< 0.01
Potassium	mg/L	0.1	SM 3120	02-May-23/O	3.4	3.8	2.8	39.6
Phosphorus-Total	mg/L	0.01	E3516.2	18-May-23/K	< 0.01	2.52	0.24	0.18
Phosphorus	mg/L	0.1	SM 3120	02-May-23/O	< 0.1	< 0.1	< 0.1	< 0.1
Selenium	mg/L	0.001	EPA 200.8	05-May-23/O	< 0.001	< 0.001	< 0.001	0.001
Silver	mg/L	0.0001	EPA 200.8	05-May-23/O	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Sodium	mg/L	0.2	SM 3120	02-May-23/O	16.1	16.9	14.2	3.2
Strontium	mg/L	0.001	SM 3120	02-May-23/O	0.337	0.406	0.308	0.411
Tin	mg/L	0.05	SM 3120	02-May-23/O	< 0.05	< 0.05	< 0.05	< 0.05
Titanium	mg/L	0.005	SM 3120	02-May-23/O	< 0.005	< 0.005	< 0.005	< 0.005
Thallium	mg/L	0.00005	EPA 200.8	05-May-23/O	< 0.00005	0.00012	< 0.00005	< 0.00005
Uranium	mg/L	0.00005	EPA 200.8	05-May-23/O	0.00109	0.0101	0.00074	0.00429
Vanadium	mg/L	0.0001	EPA 200.8	05-May-23/O	0.0001	0.0003	0.0001	0.0001
Zinc	mg/L	0.005	SM 3120	02-May-23/O	< 0.005	< 0.005	< 0.005	0.005
Anion Sum	meq/L		Calc.	03-May-23/O	4.12	4.93	3.89	4.50
Cation Sum	meq/L		Calc.	03-May-23/O	4.25	5.07	3.83	4.86
% Difference	%		Calc.	03-May-23/O	1.48	1.42	0.768	3.79
Ion Ratio	AS/CS		Calc.	03-May-23/O	0.971	0.972	1.02	0.927



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Steve Garrett

Director of Laboratory Services

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REPORT No. B23-03160 (i)

Report To:

City of Kawartha Lakes

PO Box 9000, 12 Peel St

Lindsay ON K9V 5R8

Attention: Kayla Pantaleo

Caduceon Environmental Laboratories

112 Commerce Park Drive

Barrie ON L4N 8W8

Tel: 705-252-5743

Fax: 705-252-5746

DATE RECEIVED: 27-Apr-23

JOB/PROJECT NO.: Laxton Landfill

DATE REPORTED: 09-Jun-23

P.O. NUMBER:

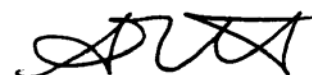
SAMPLE MATRIX: Groundwater

WATERWORKS NO.

			Client I.D.		16-I	16	19	DUP
			Sample I.D.		B23-03160-13	B23-03160-14	B23-03160-15	B23-03160-16
			Date Collected		26-Apr-23	26-Apr-23	26-Apr-23	26-Apr-23
Parameter	Units	R.L.	Reference Method	Date/Site Analyzed				
Conductivity (calc.)	µmho/cm		Calc.	03-May-23/O	406	473	376	457
Sodium Adsorption Ratio	-		Calc.	03-May-23/O	0.533	0.506	0.493	0.103
TDS(calc.)/EC(actual)	-		Calc.	03-May-23/O	0.545	0.550	0.540	0.542
Langelier Index(25°C)	S.I.		Calc.	03-May-23/O	-0.478	-0.0687	-0.569	-0.211

1 Chromium (VI) result is based on total Chromium

2 Chromium (VI) result is based on total Chromium



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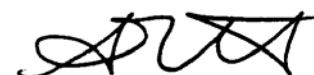
DATE REPORTED: 09-Jun-23

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SAMPLE MATRIX: Groundwater

WATERWORKS NO.

			Client I.D.	20-I	20-II		
			Sample I.D.	B23-03160-17	B23-03160-18		
			Date Collected	26-Apr-23	26-Apr-23		
Parameter	Units	R.L.	Reference Method	Date/Site Analyzed			
Alkalinity(CaCO ₃) to pH4.5	mg/L	5	SM 2320B	01-May-23/O	240	101	
Conductivity @25°C	µmho/cm	1	SM 2510B	01-May-23/O	601	226	
pH @25°C	pH Units		SM 4500H	01-May-23/O	7.44	7.09	
TDS(ion sum calc.)	mg/L	1	Calc.	03-May-23/O	330	116	
Total Suspended Solids	mg/L	3	SM2540D	03-May-23/K			
Dissolved Organic Carbon	mg/L	0.2	EPA 415.2	01-May-23/O	4.0	5.1	
BOD(5 day)	mg/L	3	SM 5210B	04-May-23/K			
COD	mg/L	5	SM5220C	08-May-23/K	46	102	
Phenolics	mg/L	0.001	MOEE 3179	08-May-23/K	< 0.001	< 0.001	
Chloride	mg/L	0.5	SM4110C	01-May-23/O	20.8	1.7	
Fluoride	mg/L	0.1	SM4110C	01-May-23/O	< 0.1	0.1	
Ammonia (N)-Total	mg/L	0.01	SM4500-NH ₃ -H	08-May-23/K	0.12	0.19	
Sulphate	mg/L	1	SM4110C	01-May-23/O	45	8	
Nitrite (N)	mg/L	0.05	SM4110C	01-May-23/O	< 0.05	< 0.05	
Nitrate (N)	mg/L	0.05	SM4110C	01-May-23/O	< 0.05	< 0.05	
Total Kjeldahl Nitrogen	mg/L	0.1	E3516.2	18-May-23/K	0.3	0.7	
Hardness (as CaCO ₃)	mg/L	1	SM 3120	02-May-23/O	259	111	
Aluminum	mg/L	0.01	SM 3120	02-May-23/O	0.03	< 0.01	
Antimony	mg/L	0.0001	EPA 200.8	05-May-23/O	< 0.0001	< 0.0001	
Arsenic	mg/L	0.0001	EPA 200.8	05-May-23/O	0.0002	0.0004	
Barium	mg/L	0.001	SM 3120	02-May-23/O	0.184	0.043	
Beryllium	mg/L	0.002	SM 3120	02-May-23/O	< 0.002	< 0.002	
Boron	mg/L	0.005	SM 3120	02-May-23/O	0.712	0.035	
Cadmium	mg/L	0.000010	EPA 200.8	05-May-23/O	< 0.000010	< 0.000010	
Calcium	mg/L	0.02	SM 3120	02-May-23/O	71.4	30.1	
Chromium	mg/L	0.001	EPA 200.8	05-May-23/O	< 0.001	< 0.001	



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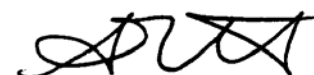
DATE REPORTED: 09-Jun-23

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SAMPLE MATRIX: Groundwater

WATERWORKS NO.

			Client I.D.	20-I	20-II		
			Sample I.D.	B23-03160-17	B23-03160-18		
			Date Collected	26-Apr-23	26-Apr-23		
Parameter	Units	R.L.	Reference Method	Date/Site Analyzed			
Chromium (VI)	mg/L	0.001	MOE E3056	09-May-23/O	< 0.001 ¹	< 0.001 ¹	
Cobalt	mg/L	0.005	SM 3120	02-May-23/O	< 0.005	< 0.005	
Copper	mg/L	0.0001	EPA 200.8	05-May-23/O	0.0004	0.0006	
Iron	mg/L	0.005	SM 3120	02-May-23/O	3.62	1.12	
Lead	mg/L	0.00002	EPA 200.8	05-May-23/O	0.00003	0.00005	
Magnesium	mg/L	0.02	SM 3120	02-May-23/O	19.7	8.64	
Manganese	mg/L	0.001	SM 3120	02-May-23/O	1.61	0.701	
Mercury	mg/L	0.00002	SM 3112 B	03-May-23/O	< 0.00002	< 0.00002	
Molybdenum	mg/L	0.0001	EPA 200.8	05-May-23/O	0.0017	0.0011	
Nickel	mg/L	0.01	SM 3120	02-May-23/O	< 0.01	< 0.01	
Potassium	mg/L	0.1	SM 3120	02-May-23/O	5.6	2.2	
Phosphorus-Total	mg/L	0.01	E3516.2	18-May-23/K	0.09	0.83	
Phosphorus	mg/L	0.1	SM 3120	02-May-23/O	< 0.1	< 0.1	
Selenium	mg/L	0.001	EPA 200.8	05-May-23/O	< 0.001	< 0.001	
Silver	mg/L	0.0001	EPA 200.8	05-May-23/O	< 0.0001	< 0.0001	
Sodium	mg/L	0.2	SM 3120	02-May-23/O	18.1	2.1	
Strontium	mg/L	0.001	SM 3120	02-May-23/O	0.763	0.251	
Tin	mg/L	0.05	SM 3120	02-May-23/O	< 0.05	< 0.05	
Titanium	mg/L	0.005	SM 3120	02-May-23/O	< 0.005	< 0.005	
Thallium	mg/L	0.00005	EPA 200.8	05-May-23/O	< 0.00005	< 0.00005	
Uranium	mg/L	0.00005	EPA 200.8	05-May-23/O	0.00417	0.00065	
Vanadium	mg/L	0.0001	EPA 200.8	05-May-23/O	0.0005	0.0049	
Zinc	mg/L	0.005	SM 3120	02-May-23/O	0.005	< 0.005	
Anion Sum	meq/L		Calc.	03-May-23/O	6.33	2.25	
Cation Sum	meq/L		Calc.	03-May-23/O	6.38	2.45	
% Difference	%		Calc.	03-May-23/O	0.400	4.28	
Ion Ratio	AS/CS		Calc.	03-May-23/O	0.992	0.918	



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Steve Garrett

Director of Laboratory Services

The analytical results reported herein refer to the samples as received. Reproduction of this analytical report in full or in part is prohibited without prior consent from

C.O.C.: ---

REPORT No. B23-03160 (i)

Report To:

City of Kawartha Lakes

PO Box 9000, 12 Peel St

Lindsay ON K9V 5R8

Attention: Kayla Pantaleo

Caduceon Environmental Laboratories

112 Commerce Park Drive

Barrie ON L4N 8W8

Tel: 705-252-5743

Fax: 705-252-5746

DATE RECEIVED: 27-Apr-23

JOB/PROJECT NO.: Laxton Landfill

DATE REPORTED: 09-Jun-23

P.O. NUMBER:

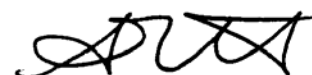
SAMPLE MATRIX: Groundwater

WATERWORKS NO.

			Client I.D.	20-I	20-II		
			Sample I.D.	B23-03160-17	B23-03160-18		
			Date Collected	26-Apr-23	26-Apr-23		
Parameter	Units	R.L.	Reference Method	Date/Site Analyzed			
Conductivity (calc.)	µmho/cm		Calc.	03-May-23/O	584	223	
Sodium Adsorption Ratio	-		Calc.	03-May-23/O	0.489	0.0856	
TDS(calc.)/EC(actual)	-		Calc.	03-May-23/O	0.549	0.512	
Langelier Index(25°C)	S.I.		Calc.	03-May-23/O	0.232	-0.799	

1 Chromium (VI) result is based on total Chromium

2 Chromium (VI) result is based on total Chromium



R.L. = Reporting Limit

Test methods may be modified from specified reference method unless indicated by an *

Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

Steve Garrett

Director of Laboratory Services

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REPORT No. B23-03160 (ii)

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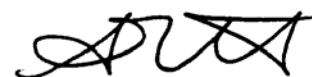
DATE REPORTED: 09-Jun-23

P.O. NUMBER:

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

			Client I.D.	3	4	6	16-l
			Sample I.D.	B23-03160-3	B23-03160-4	B23-03160-5	B23-03160-13
			Date Collected	26-Apr-23	26-Apr-23	26-Apr-23	26-Apr-23
Parameter	Units	R.L.	Reference Method	Date/Site Analyzed			
Dichloroethane, 1,1-	µg/L	0.5	EPA 8260	01-May-23/R	< 0.5	< 0.5	< 0.5
Dichloroethylene, 1,1-	µg/L	0.5	EPA 8260	01-May-23/R	< 0.5	< 0.5	< 0.5
Dichloroethane, 1,2-	µg/L	0.5	EPA 8260	01-May-23/R	< 0.5	< 0.5	< 0.5
Dichlorobenzene, 1,2-	µg/L	0.5	EPA 8260	01-May-23/R	< 0.5	< 0.5	< 0.5
Dichloropropane, 1,2-	µg/L	0.5	EPA 8260	01-May-23/R	< 0.5	< 0.5	< 0.5
Dichlorobenzene, 1,3-	µg/L	0.5	EPA 8260	01-May-23/R	< 0.5	< 0.5	< 0.5
Dichlorobenzene, 1,4-	µg/L	0.5	EPA 8260	01-May-23/R	< 0.5	< 0.5	< 0.5
Tetrachloroethane, 1,1,1,2-	µg/L	0.5	EPA 8260	01-May-23/R	< 0.5	< 0.5	< 0.5
Tetrachloroethane, 1,1,2,2-	µg/L	0.5	EPA 8260	01-May-23/R	< 0.5	< 0.5	< 0.5
Trichloroethane, 1,1,1-	µg/L	0.5	EPA 8260	01-May-23/R	< 0.5	< 0.5	< 0.5
Trichloroethane, 1,1,2-	µg/L	0.5	EPA 8260	01-May-23/R	< 0.5	< 0.5	< 0.5
Trichlorobenzene, 1,2,4-	µg/L	0.5	EPA 8260	01-May-23/R	< 0.5	< 0.5	< 0.5
Acetone	µg/L	30	EPA 8260	01-May-23/R	< 30	< 30	< 30
Bromodichloromethane	µg/L	2	EPA 8260	01-May-23/R	< 2	< 2	< 2
Bromomethane	µg/L	0.5	EPA 8260	01-May-23/R	< 0.5	< 0.5	< 0.5
Bromoform	µg/L	5	EPA 8260	01-May-23/R	< 5	< 5	< 5
Benzene	µg/L	0.5	EPA 8260	01-May-23/R	< 0.5	0.6	< 0.5
Dichloroethene, cis-1,2-	µg/L	0.5	EPA 8260	01-May-23/R	< 0.5	< 0.5	< 0.5
Dichloropropene, cis-1,3-	µg/L	0.5	EPA 8260	01-May-23/R	< 0.5	< 0.5	< 0.5
Carbon Tetrachloride	µg/L	0.2	EPA 8260	01-May-23/R	< 0.2	< 0.2	< 0.2
Monochlorobenzene (Chlorobenzene)	µg/L	0.5	EPA 8260	01-May-23/R	< 0.5	< 0.5	< 0.5
Chloroform	µg/L	1	EPA 8260	01-May-23/R	< 1	< 1	< 1
Dibromochloromethane	µg/L	2	EPA 8260	01-May-23/R	< 2	< 2	< 2
Ethylbenzene	µg/L	0.5	EPA 8260	01-May-23/R	< 0.5	< 0.5	< 0.5
Dibromoethane, 1,2- (Ethylene Dibromide)	µg/L	0.2	EPA 8260	01-May-23/R	< 0.2	< 0.2	< 0.2
Methyl Ethyl Ketone	µg/L	20	EPA 8260	01-May-23/R	< 20	< 20	< 20



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Steve Garrett

Director of Laboratory Services

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C.O.C.: ---

REPORT No. B23-03160 (ii)

Report To:

City of Kawartha Lakes

PO Box 9000, 12 Peel St

Lindsay ON K9V 5R8

Attention: Kayla Pantaleo

Caduceon Environmental Laboratories

112 Commerce Park Drive

Barrie ON L4N 8W8

Tel: 705-252-5743

Fax: 705-252-5746

DATE RECEIVED: 27-Apr-23

JOB/PROJECT NO.: Laxton Landfill

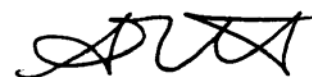
DATE REPORTED: 09-Jun-23

P.O. NUMBER:

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

			Client I.D.	3	4	6	16-I
			Sample I.D.	B23-03160-3	B23-03160-4	B23-03160-5	B23-03160-13
			Date Collected	26-Apr-23	26-Apr-23	26-Apr-23	26-Apr-23
Parameter	Units	R.L.	Reference Method	Date/Site Analyzed			
Methyl-t-butyl Ether	µg/L	2	EPA 8260	01-May-23/R	< 2	< 2	< 2
Methyl Isobutyl Ketone	µg/L	20	EPA 8260	01-May-23/R	< 20	< 20	< 20
Dichloromethane (Methylene Chloride)	µg/L	5	EPA 8260	01-May-23/R	< 5	< 5	< 5
Xylene, m,p-	µg/L	1.0	EPA 8260	01-May-23/R	< 1.0	< 1.0	< 1.0
Xylene, o-	µg/L	0.5	EPA 8260	01-May-23/R	< 0.5	< 0.5	< 0.5
Xylene, m,p,o-	µg/L	1.1	EPA 8260	01-May-23/R	< 1.1	< 1.1	< 1.1
Styrene	µg/L	0.5	EPA 8260	01-May-23/R	< 0.5	< 0.5	< 0.5
Dichloroethene, trans-1,2-	µg/L	0.5	EPA 8260	01-May-23/R	< 0.5	< 0.5	< 0.5
Dichloropropene, trans-1,3-	µg/L	0.5	EPA 8260	01-May-23/R	< 0.5	< 0.5	< 0.5
Trichloroethylene	µg/L	0.5	EPA 8260	01-May-23/R	< 0.5	< 0.5	< 0.5
Trichlorofluoromethane	µg/L	5	EPA 8260	01-May-23/R	< 5	< 5	< 5
Toluene	µg/L	0.5	EPA 8260	01-May-23/R	< 0.5	< 0.5	< 0.5
Tetrachloroethylene	µg/L	0.5	EPA 8260	01-May-23/R	< 0.5	< 0.5	< 0.5
Vinyl Chloride	µg/L	0.2	EPA 8260	01-May-23/R	< 0.2	< 0.2	< 0.2



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Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

Steve Garrett

Director of Laboratory Services

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REPORT No. B23-03160 (ii)

Report To:

City of Kawartha Lakes

PO Box 9000, 12 Peel St

Lindsay ON K9V 5R8

Attention: Kayla Pantaleo

Caduceon Environmental Laboratories

112 Commerce Park Drive

Barrie ON L4N 8W8

Tel: 705-252-5743

Fax: 705-252-5746

DATE RECEIVED: 27-Apr-23

JOB/PROJECT NO.: Laxton Landfill

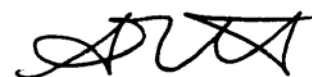
DATE REPORTED: 09-Jun-23

P.O. NUMBER:

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

			Client I.D.	20-I	20-II		
			Sample I.D.	B23-03160-17	B23-03160-18		
			Date Collected	26-Apr-23	26-Apr-23		
Parameter	Units	R.L.	Reference Method	Date/Site Analyzed			
Dichloroethane, 1,1-	µg/L	0.5	EPA 8260	01-May-23/R	< 0.5	< 0.5	
Dichloroethylene, 1,1-	µg/L	0.5	EPA 8260	01-May-23/R	< 0.5	< 0.5	
Dichloroethane, 1,2-	µg/L	0.5	EPA 8260	01-May-23/R	< 0.5	< 0.5	
Dichlorobenzene, 1,2-	µg/L	0.5	EPA 8260	01-May-23/R	< 0.5	< 0.5	
Dichloropropane, 1,2-	µg/L	0.5	EPA 8260	01-May-23/R	< 0.5	< 0.5	
Dichlorobenzene, 1,3-	µg/L	0.5	EPA 8260	01-May-23/R	< 0.5	< 0.5	
Dichlorobenzene, 1,4-	µg/L	0.5	EPA 8260	01-May-23/R	< 0.5	< 0.5	
Tetrachloroethane, 1,1,1,2-	µg/L	0.5	EPA 8260	01-May-23/R	< 0.5	< 0.5	
Tetrachloroethane, 1,1,2,2-	µg/L	0.5	EPA 8260	01-May-23/R	< 0.5	< 0.5	
Trichloroethane, 1,1,1-	µg/L	0.5	EPA 8260	01-May-23/R	< 0.5	< 0.5	
Trichloroethane, 1,1,2-	µg/L	0.5	EPA 8260	01-May-23/R	< 0.5	< 0.5	
Trichlorobenzene, 1,2,4-	µg/L	0.5	EPA 8260	01-May-23/R	< 0.5	< 0.5	
Acetone	µg/L	30	EPA 8260	01-May-23/R	< 30	< 30	
Bromodichloromethane	µg/L	2	EPA 8260	01-May-23/R	< 2	< 2	
Bromomethane	µg/L	0.5	EPA 8260	01-May-23/R	< 0.5	< 0.5	
Bromoform	µg/L	5	EPA 8260	01-May-23/R	< 5	< 5	
Benzene	µg/L	0.5	EPA 8260	01-May-23/R	< 0.5	< 0.5	
Dichloroethene, cis-1,2-	µg/L	0.5	EPA 8260	01-May-23/R	< 0.5	< 0.5	
Dichloropropene, cis-1,3-	µg/L	0.5	EPA 8260	01-May-23/R	< 0.5	< 0.5	
Carbon Tetrachloride	µg/L	0.2	EPA 8260	01-May-23/R	< 0.2	< 0.2	
Monochlorobenzene (Chlorobenzene)	µg/L	0.5	EPA 8260	01-May-23/R	< 0.5	< 0.5	
Chloroform	µg/L	1	EPA 8260	01-May-23/R	< 1	< 1	
Dibromochloromethane	µg/L	2	EPA 8260	01-May-23/R	< 2	< 2	
Ethylbenzene	µg/L	0.5	EPA 8260	01-May-23/R	< 0.5	< 0.5	
Dibromoethane, 1,2- (Ethylene Dibromide)	µg/L	0.2	EPA 8260	01-May-23/R	< 0.2	< 0.2	



R.L. = Reporting Limit

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Steve Garrett

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Attention: Kayla Pantaleo

Caduceon Environmental Laboratories

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Tel: 705-252-5743

Fax: 705-252-5746

DATE RECEIVED: 27-Apr-23

JOB/PROJECT NO.: Laxton Landfill

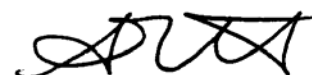
DATE REPORTED: 09-Jun-23

P.O. NUMBER:

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

			Client I.D.	20-I	20-II		
			Sample I.D.	B23-03160-17	B23-03160-18		
			Date Collected	26-Apr-23	26-Apr-23		
Parameter	Units	R.L.	Reference Method	Date/Site Analyzed			
Methyl Ethyl Ketone	µg/L	20	EPA 8260	01-May-23/R	< 20	< 20	
Methyl-t-butyl Ether	µg/L	2	EPA 8260	01-May-23/R	< 2	< 2	
Methyl Isobutyl Ketone	µg/L	20	EPA 8260	01-May-23/R	< 20	< 20	
Dichloromethane (Methylene Chloride)	µg/L	5	EPA 8260	01-May-23/R	< 5	< 5	
Xylene, m,p-	µg/L	1.0	EPA 8260	01-May-23/R	< 1.0	< 1.0	
Xylene, o-	µg/L	0.5	EPA 8260	01-May-23/R	< 0.5	< 0.5	
Xylene, m,p,o-	µg/L	1.1	EPA 8260	01-May-23/R	< 1.1	< 1.1	
Styrene	µg/L	0.5	EPA 8260	01-May-23/R	< 0.5	< 0.5	
Dichloroethene, trans-1,2-	µg/L	0.5	EPA 8260	01-May-23/R	< 0.5	< 0.5	
Dichloropropene, trans-1,3-	µg/L	0.5	EPA 8260	01-May-23/R	< 0.5	< 0.5	
Trichloroethylene	µg/L	0.5	EPA 8260	01-May-23/R	< 0.5	< 0.5	
Trichlorofluoromethane	µg/L	5	EPA 8260	01-May-23/R	< 5	< 5	
Toluene	µg/L	0.5	EPA 8260	01-May-23/R	< 0.5	< 0.5	
Tetrachloroethylene	µg/L	0.5	EPA 8260	01-May-23/R	< 0.5	< 0.5	
Vinyl Chloride	µg/L	0.2	EPA 8260	01-May-23/R	< 0.2	< 0.2	



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Steve Garrett

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REPORT No. B23-03147 (i)

Report To:

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PO Box 9000, 12 Peel St

Lindsay ON K9V 5R8

Attention: Kayla Pantaleo

Caduceon Environmental Laboratories

112 Commerce Park Drive

Barrie ON L4N 8W8

Tel: 705-252-5743

Fax: 705-252-5746

DATE RECEIVED: 27-Apr-23

JOB/PROJECT NO.: Laxton Landfill

DATE REPORTED: 02-Jun-23

P.O. NUMBER:

SAMPLE MATRIX: Surface Water

WATERWORKS NO.

			Client I.D.	SWA	SWD	SWF	SWC2
			Sample I.D.	B23-03147-1	B23-03147-2	B23-03147-3	B23-03147-4
			Date Collected	26-Apr-23	26-Apr-23	26-Apr-23	26-Apr-23
Parameter	Units	R.L.	Reference Method	Date/Site Analyzed			
Alkalinity(CaCO ₃) to pH4.5	mg/L	5	SM 2320B	01-May-23/O	107	140	129
Conductivity @25°C	µmho/cm	1	SM 2510B	01-May-23/O	223	281	265
pH @25°C	pH Units		SM 4500H	01-May-23/O	7.88	8.05	7.94
Colour	TCU	2	SM 2120C	02-May-23/O	75	55	50
Turbidity	NTU	0.1	SM 2130	10-May-23/O	0.6	0.9	1.8
TDS(ion sum calc.)	mg/L	1	Calc.	03-May-23/O	108	134	128
Total Suspended Solids	mg/L	3	SM2540D	03-May-23/K	< 3	< 3	6
Dissolved Organic Carbon	mg/L	0.2	EPA 415.2	01-May-23/O	18.4	15.2	9.0
BOD(5 day)	mg/L	3	SM 5210B	04-May-23/K	< 3	< 3	< 3
COD	mg/L	5	SM5220C	05-May-23/K	33	24	19
Phenolics	mg/L	0.001	MOEE 3179	05-May-23/K	< 0.001	< 0.001	< 0.001
Cyanide (Free)	mg/L	0.005	SM 4500CN	02-May-23/K	< 0.005	< 0.005	< 0.005
Chloride	mg/L	0.5	SM4110C	01-May-23/O	0.9	1.5	1.2
Fluoride	mg/L	0.1	SM4110C	01-May-23/O	< 0.1	< 0.1	< 0.1
Ammonia (N)-Total	mg/L	0.01	SM4500-NH ₃ -H	08-May-23/K	0.15	0.02	0.04
Ammonia (N)-unionized	mg/L	0.01	CALC	08-May-23/K	< 0.01	< 0.01	< 0.01
Sulphate	mg/L	1	SM4110C	01-May-23/O	6	4	7
Nitrite (N)	mg/L	0.05	SM4110C	01-May-23/O	< 0.05	< 0.05	< 0.05
Nitrate (N)	mg/L	0.05	SM4110C	01-May-23/O	0.12	< 0.05	< 0.05
Total Kjeldahl Nitrogen	mg/L	0.1	E3516.2	15-May-23/K	0.6	0.6	0.8
Hardness (as CaCO ₃)	mg/L	1	SM 3120	03-May-23/O	118	151	143
Aluminum	mg/L	0.01	SM 3120	03-May-23/O	0.02	< 0.01	< 0.01
Aluminum (total)	mg/L	0.01	SM 3120	03-May-23/O	0.02	0.02	0.02
Antimony	mg/L	0.0001	EPA 200.8	08-May-23/O	0.0002	0.0004	0.0003



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Christine Burke

Lab Manager

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Tel: 705-252-5743

Fax: 705-252-5746

DATE RECEIVED: 27-Apr-23

JOB/PROJECT NO.: Laxton Landfill

DATE REPORTED: 02-Jun-23

P.O. NUMBER:

SAMPLE MATRIX: Surface Water

WATERWORKS NO.

			Client I.D.		SWA	SWD	SWF	SWC2
			Sample I.D.		B23-03147-1	B23-03147-2	B23-03147-3	B23-03147-4
			Date Collected		26-Apr-23	26-Apr-23	26-Apr-23	26-Apr-23
Parameter	Units	R.L.	Reference Method	Date/Site Analyzed				
Arsenic	mg/L	0.0001	EPA 200.8	08-May-23/O	0.0002	0.0001	0.0001	0.0001
Barium	mg/L	0.001	SM 3120	03-May-23/O	0.037	0.036	0.032	0.031
Beryllium	mg/L	0.002	SM 3120	03-May-23/O	< 0.002	< 0.002	< 0.002	< 0.002
Boron	mg/L	0.005	SM 3120	03-May-23/O	0.007	0.008	0.010	0.034
Cadmium	mg/L	0.000015	EPA 200.8	08-May-23/O	< 0.000015	< 0.000015	< 0.000015	< 0.000015
Calcium	mg/L	0.02	SM 3120	03-May-23/O	24.6	29.1	28.4	27.9
Chromium	mg/L	0.001	EPA 200.8	08-May-23/O	< 0.001	< 0.001	< 0.001	< 0.001
Chromium (VI)	mg/L	0.001	MOE E3056	09-May-23/O	< 0.001 ¹	< 0.001 ¹	< 0.001 ¹	< 0.001 ¹
Cobalt	mg/L	0.0001	EPA 200.8	08-May-23/O	< 0.0001	0.0001	0.0001	0.0001
Copper	mg/L	0.0001	EPA 200.8	08-May-23/O	0.0003	0.0003	0.0002	0.0004
Iron	mg/L	0.005	SM 3120	03-May-23/O	0.077	0.084	0.194	0.499
Lead	mg/L	0.00002	EPA 200.8	08-May-23/O	< 0.00002	0.00005	0.00004	0.00005
Magnesium	mg/L	0.02	SM 3120	03-May-23/O	9.79	12.7	12.2	11.3
Manganese	mg/L	0.001	SM 3120	03-May-23/O	0.003	0.006	0.009	0.029
Mercury	mg/L	0.00002	SM 3112 B	03-May-23/O	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Molybdenum	mg/L	0.0001	EPA 200.8	08-May-23/O	0.0002	0.0002	0.0003	0.0003
Nickel	mg/L	0.01	SM 3120	03-May-23/O	< 0.01	< 0.01	< 0.01	< 0.01
Potassium	mg/L	0.1	SM 3120	03-May-23/O	0.5	0.7	0.8	1.0
Phosphorus-Total	mg/L	0.01	E3516.2	15-May-23/K	0.02	0.02	0.05	0.01
Phosphorus	mg/L	0.1	SM 3120	03-May-23/O	< 0.1	< 0.1	< 0.1	< 0.1
Selenium	mg/L	0.001	EPA 200.8	08-May-23/O	< 0.001	< 0.001	< 0.001	< 0.001
Silver	mg/L	0.0001	EPA 200.8	08-May-23/O	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Sodium	mg/L	0.2	SM 3120	03-May-23/O	1.4	1.4	1.4	2.1
Strontium	mg/L	0.001	SM 3120	03-May-23/O	0.214	0.188	0.220	0.273
Tin	mg/L	0.05	SM 3120	03-May-23/O	< 0.05	< 0.05	< 0.05	< 0.05



R.L. = Reporting Limit

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Site Analyzed=K-Kingston, W-Windsor, O-Ottawa, R-Richmond Hill, B-Barrie

Christine Burke

Lab Manager

The analytical results reported herein refer to the samples as received. Reproduction of this analytical report in full or in part is prohibited without prior consent from

C.O.C.: ---

REPORT No. B23-03147 (i)

Report To:

City of Kawartha Lakes

PO Box 9000, 12 Peel St

Lindsay ON K9V 5R8

Attention: Kayla Pantaleo

Caduceon Environmental Laboratories

112 Commerce Park Drive

Barrie ON L4N 8W8

Tel: 705-252-5743

Fax: 705-252-5746

DATE RECEIVED: 27-Apr-23

JOB/PROJECT NO.: Laxton Landfill

DATE REPORTED: 02-Jun-23

P.O. NUMBER:

SAMPLE MATRIX: Surface Water

WATERWORKS NO.

			Client I.D.	SWA	SWD	SWF	SWC2
			Sample I.D.	B23-03147-1	B23-03147-2	B23-03147-3	B23-03147-4
			Date Collected	26-Apr-23	26-Apr-23	26-Apr-23	26-Apr-23
Parameter	Units	R.L.	Reference Method	Date/Site Analyzed			
Titanium	mg/L	0.005	SM 3120	03-May-23/O	< 0.005	< 0.005	< 0.005
Thallium	mg/L	0.00005	EPA 200.8	08-May-23/O	< 0.00005	< 0.00005	< 0.00005
Uranium	mg/L	0.00005	EPA 200.8	08-May-23/O	0.00014	0.00038	0.00032
Vanadium	mg/L	0.0001	EPA 200.8	08-May-23/O	0.0001	0.0002	0.0003
Zinc	mg/L	0.005	SM 3120	03-May-23/O	< 0.005	0.037	< 0.005
Anion Sum	meq/L		Calc.	03-May-23/O	2.30	2.92	2.75
Cation Sum	meq/L		Calc.	03-May-23/O	2.11	2.58	2.51
% Difference	%		Calc.	03-May-23/O	4.24	6.25	4.56
Ion Ratio	AS/CS		Calc.	03-May-23/O	1.09	1.13	1.10
Conductivity (calc.)	µmho/cm		Calc.	03-May-23/O	209	256	247
Sodium Adsorption Ratio	-		Calc.	03-May-23/O	0.0613	0.0558	0.0571
TDS(calc.)/EC(actual)	-		Calc.	03-May-23/O	0.483	0.475	0.484
Langelier Index(25°C)	S.I.		Calc.	03-May-23/O	-0.0708	0.275	0.122

1 Chromium (VI) result is based on total Chromium



Christine Burke
Lab Manager

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C.O.C.: ---

REPORT No. B23-03147 (ii)

Report To:

City of Kawartha Lakes

PO Box 9000, 12 Peel St

Lindsay ON K9V 5R8

Attention: Kayla Pantaleo

Caduceon Environmental Laboratories

112 Commerce Park Drive

Barrie ON L4N 8W8

Tel: 705-252-5743

Fax: 705-252-5746

DATE RECEIVED: 27-Apr-23

JOB/PROJECT NO.: Laxton Landfill

DATE REPORTED: 02-Jun-23

P.O. NUMBER:

SAMPLE MATRIX: Surface Water

WATERWORKS NO.

			Client I.D.	SWF			
			Sample I.D.	B23-03147-3			
			Date Collected	26-Apr-23			
Parameter	Units	R.L.	Reference Method	Date/Site Analyzed			
Dichloroethane, 1,1-	µg/L	0.5	EPA 8260	01-May-23/R	< 0.5		
Dichloroethylene, 1,1-	µg/L	0.5	EPA 8260	01-May-23/R	< 0.5		
Dichloroethane, 1,2-	µg/L	0.5	EPA 8260	01-May-23/R	< 0.5		
Dichlorobenzene, 1,2-	µg/L	0.5	EPA 8260	01-May-23/R	< 0.5		
Dichloropropane, 1,2-	µg/L	0.5	EPA 8260	01-May-23/R	< 0.5		
Dichlorobenzene, 1,3-	µg/L	0.5	EPA 8260	01-May-23/R	< 0.5		
Dichlorobenzene, 1,4-	µg/L	0.5	EPA 8260	01-May-23/R	< 0.5		
Tetrachloroethane, 1,1,1,2-	µg/L	0.5	EPA 8260	01-May-23/R	< 0.5		
Tetrachloroethane, 1,1,2,2-	µg/L	0.5	EPA 8260	01-May-23/R	< 0.5		
Trichloroethane, 1,1,1-	µg/L	0.5	EPA 8260	01-May-23/R	< 0.5		
Trichloroethane, 1,1,2-	µg/L	0.5	EPA 8260	01-May-23/R	< 0.5		
Trichlorobenzene, 1,2,4-	µg/L	0.5	EPA 8260	01-May-23/R	< 0.5		
Acetone	µg/L	30	EPA 8260	01-May-23/R	< 30		
Bromodichloromethane	µg/L	2	EPA 8260	01-May-23/R	< 2		
Bromomethane	µg/L	0.5	EPA 8260	01-May-23/R	< 0.5		
Bromoform	µg/L	5	EPA 8260	01-May-23/R	< 5		
Benzene	µg/L	0.5	EPA 8260	01-May-23/R	< 0.5		
Dichloroethene, cis-1,2-	µg/L	0.5	EPA 8260	01-May-23/R	< 0.5		
Dichloropropene, cis-1,3-	µg/L	0.5	EPA 8260	01-May-23/R	< 0.5		
Carbon Tetrachloride	µg/L	0.2	EPA 8260	01-May-23/R	< 0.2		
Monochlorobenzene (Chlorobenzene)	µg/L	0.5	EPA 8260	01-May-23/R	< 0.5		
Chloroform	µg/L	1	EPA 8260	01-May-23/R	< 1		
Dibromochloromethane	µg/L	2	EPA 8260	01-May-23/R	< 2		
Ethylbenzene	µg/L	0.5	EPA 8260	01-May-23/R	< 0.5		



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Christine Burke

Lab Manager

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REPORT No. B23-03147 (ii)

Report To:

City of Kawartha Lakes

PO Box 9000, 12 Peel St

Lindsay ON K9V 5R8

Attention: Kayla Pantaleo

Caduceon Environmental Laboratories

112 Commerce Park Drive

Barrie ON L4N 8W8

Tel: 705-252-5743

Fax: 705-252-5746

DATE RECEIVED: 27-Apr-23

JOB/PROJECT NO.: Laxton Landfill

DATE REPORTED: 02-Jun-23

P.O. NUMBER:

SAMPLE MATRIX: Surface Water

WATERWORKS NO.

			Client I.D.	SWF			
			Sample I.D.	B23-03147-3			
			Date Collected	26-Apr-23			
Parameter	Units	R.L.	Reference Method	Date/Site Analyzed			
Dibromoethane, 1,2- (Ethylene Dibromide)	µg/L	0.2	EPA 8260	01-May-23/R	< 0.2		
Methyl Ethyl Ketone	µg/L	20	EPA 8260	01-May-23/R	< 20		
Methyl-t-butyl Ether	µg/L	2	EPA 8260	01-May-23/R	< 2		
Methyl Isobutyl Ketone	µg/L	20	EPA 8260	01-May-23/R	< 20		
Dichloromethane (Methylene Chloride)	µg/L	5	EPA 8260	01-May-23/R	< 5		
Xylene, m,p-	µg/L	1.0	EPA 8260	01-May-23/R	< 1.0		
Xylene, o-	µg/L	0.5	EPA 8260	01-May-23/R	< 0.5		
Xylene, m,p,o-	µg/L	1.1	EPA 8260	01-May-23/R	< 1.1		
Styrene	µg/L	0.5	EPA 8260	01-May-23/R	< 0.5		
Dichloroethene, trans-1,2-	µg/L	0.5	EPA 8260	01-May-23/R	< 0.5		
Dichloropropene, trans-1,3-	µg/L	0.5	EPA 8260	01-May-23/R	< 0.5		
Trichloroethylene	µg/L	0.5	EPA 8260	01-May-23/R	< 0.5		
Trichlorofluoromethane	µg/L	5	EPA 8260	01-May-23/R	< 5		
Toluene	µg/L	0.5	EPA 8260	01-May-23/R	< 0.5		
Tetrachloroethylene	µg/L	0.5	EPA 8260	01-May-23/R	< 0.5		
Vinyl Chloride	µg/L	0.2	EPA 8260	01-May-23/R	< 0.2		

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Christine Burke

Lab Manager

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C.O.C.: -

REPORT No: 23-023216 - Rev. 0

Report To:

City of Kawartha Lakes
PO Box 9000
322 Kent Street West
Lindsay, ON K9V 4T7

CADUCEON Environmental Laboratories

110 West Beaver Creek Rd
Unit #14
Richmond Hill, ON L4B 1J9

Attention: Kayla Pantaleo

DATE RECEIVED: 2023-Sep-01
DATE REPORTED: 2023-Sep-14
SAMPLE MATRIX: Surface Water

CUSTOMER PROJECT: Laxton Landfill
P.O. NUMBER:

Analyses	Qty	Site Analyzed	Authorized	Date Analyzed	Lab Method	Reference Method
Anions (Liquid)	3	OTTAWA	VKASYAN	2023-Sep-06	A-IC-01	SM 4110B
BOD5 (Liquid)	3	KINGSTON	JWOLFE	2023-Sep-06	BOD-001	SM 5210B
COD (Liquid)	3	KINGSTON	EHINCH	2023-Sep-11	COD-001	SM 5220D
Colour (Liquid)	3	OTTAWA	MDON	2023-Sep-07	A-COL-01	SM 2120C
Cond/pH/Alk Auto (Liquid)	3	OTTAWA	SBOUDREAU	2023-Sep-05	COND-02/PH-02/A LK-02	SM 2510B/4500H/ 2320B
Cyanide WAD (Liquid)	3	KINGSTON	JMACINNES	2023-Sep-07	CN-001	SM 4500-CN-E
DOC/DIC (Liquid)	3	OTTAWA	VKASYAN	2023-Sep-06	C-OC-01	EPA 415.2
Ion Balance (Calc.)	3	OTTAWA	STAILLON		CP-028	MECP E3196
Chromium VI (Liquid)	3	OTTAWA	STAILLON	2023-Sep-08	D-CRVI-01	MECP E3056
ICP/MS Total (Liquid)	3	OTTAWA	TPRICE	2023-Sep-08	D-ICPMS-01	EPA 6020
ICP/OES Total (Liquid)	3	OTTAWA	NHOGAN	2023-Sep-11	D-ICP-01	SM 3120B
ICP/OES (Liquid)	3	OTTAWA	NHOGAN	2023-Sep-12	D-ICP-01	SM 3120B
Mercury (Liquid)	3	OTTAWA	TBENNETT	2023-Sep-06	D-HG-02	SM 3112B
Ammonia & o-Phosphate (Liquid)	3	KINGSTON	KDIBBITS	2023-Sep-12	NH3-001	SM 4500NH3
Phenols (Liquid)	3	KINGSTON	JMACINNES	2023-Sep-14	PHEN-01	MECP E3179
TP & TKN (Liquid)	3	KINGSTON	KDIBBITS	2023-Sep-11	TPTKN-001	MECP E3516.2
TSS (Liquid)	3	KINGSTON	AMANIYA	2023-Sep-11	TSS-001	SM 2540D
Turbidity (Liquid)	3	OTTAWA	MDON	2023-Sep-07	A-TURB-01	SM 2130B
VOC-Volatiles Full (Water)	1	RICHMOND_HILL	FLENA	2023-Sep-07	C-VOC-02	EPA 8260

R.L. = Reporting Limit

NC = Not Calculated

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Michelle Dubien
Data Specialist

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Final Report
REPORT No: 23-023216 - Rev. 0

			Client I.D.	SWD	SWF	SWC2
			Sample I.D.	23-023216-1	23-023216-2	23-023216-3
			Date Collected	2023-08-31	2023-08-31	2023-08-31
Parameter	Units	R.L.		-	-	-
Alkalinity(CaCO3) to pH4.5	mg/L	5		139	157	181
pH @25°C	pH units	-		7.18	7.57	7.47
Conductivity @25°C	uS/cm	1		241	285	324
Colour	TCU	2		51	56	101
Turbidity	NTU	0.1		10.4	5.1	29.1
Fluoride	mg/L	0.1		<0.1	<0.1	<0.1
Chloride	mg/L	0.5		1.1	<0.5	0.6
Nitrate (N)	mg/L	0.05		0.06	0.08	0.08
Nitrite (N)	mg/L	0.05		<0.05	<0.05	<0.05
Sulphate	mg/L	1		1	3	4
BOD5	mg/L	3		9	<3	<3
Total Suspended Solids	mg/L	3		54	3	18
Phosphorus (Total)	mg/L	0.01		0.13	0.04	0.14
Total Kjeldahl Nitrogen	mg/L	0.1		1.9	1.1	0.8
Ammonia (N)-Total (NH3+NH4)	mg/L	0.05		0.07	0.06	0.12
Ammonia (N)-unionized	mg/L	0.01		<0.01	<0.01	<0.01
Dissolved Organic Carbon	mg/L	0.2		17.4	16.8	19.8
Cyanide (WAD)	mg/L	0.005		<0.005	<0.005	<0.005
Phenolics	mg/L	0.001		<0.001	<0.001	<0.001
COD	mg/L	5		59	46	45
Aluminum	mg/L	0.01		0.09	0.04	0.04



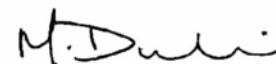
Michelle Dubien
Data Specialist

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Final Report
REPORT No: 23-023216 - Rev. 0

			Client I.D.	SWD	SWF	SWC2
			Sample I.D.	23-023216-1	23-023216-2	23-023216-3
			Date Collected	2023-08-31	2023-08-31	2023-08-31
Parameter	Units	R.L.		-	-	-
Hardness (as CaCO3)	mg/L	-		127	160	160
Aluminum (Total)	mg/L	0.01		0.14	0.03	0.05
Barium (Total)	mg/L	0.001		0.057	0.050	0.051
Boron (Total)	mg/L	0.005		0.009	0.015	0.016
Calcium (Total)	mg/L	0.02		31.6	40.9	40.9
Iron (Total)	mg/L	0.005		0.945	0.979	4.79
Magnesium (Total)	mg/L	0.02		11.8	14.0	14.1
Manganese (Total)	mg/L	0.001		0.102	0.173	0.128
Phosphorus (Total)	mg/L	0.1		0.2	<0.1	0.1
Potassium (Total)	mg/L	0.1		0.4	0.4	0.2
Sodium (Total)	mg/L	0.2		0.8	0.9	1.1
Strontium (Total)	mg/L	0.001		0.245	0.392	0.474
Tin (Total)	mg/L	0.05		<0.05	<0.05	<0.05
Titanium (Total)	mg/L	0.005		0.007	<0.005	<0.005
Zinc (Total)	mg/L	0.005		0.006	0.007	<0.005
Antimony (Total)	mg/L	0.0001		0.0004	0.0003	0.0003
Arsenic (Total)	mg/L	0.0001		0.0002	0.0002	0.0003
Beryllium (Total)	mg/L	0.0001		<0.0001	<0.0001	<0.0001
Cadmium (Total)	mg/L	0.000015		<0.000015	<0.000015	<0.000015
Chromium (Total)	mg/L	0.001		<0.001	<0.001	<0.001
Cobalt (Total)	mg/L	0.0001		0.0003	0.0001	0.0002



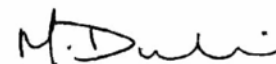
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Data Specialist

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Final Report
REPORT No: 23-023216 - Rev. 0

Client I.D.			SWD	SWF	SWC2
Sample I.D.			23-023216-1	23-023216-2	23-023216-3
Date Collected			2023-08-31	2023-08-31	2023-08-31
Parameter	Units	R.L.	-	-	-
Copper (Total)	mg/L	0.0001	0.0004	<0.0001	<0.0001
Lead (Total)	mg/L	0.00002	0.00019	<0.00002	0.00004
Molybdenum (Total)	mg/L	0.0001	0.0001	<0.0001	<0.0001
Nickel (Total)	mg/L	0.0002	<0.0002	<0.0002	<0.0002
Selenium (Total)	mg/L	0.001	<0.001	<0.001	<0.001
Silver (Total)	mg/L	0.0001	<0.0001	<0.0001	<0.0001
Thallium (Total)	mg/L	0.00005	<0.00005	<0.00005	<0.00005
Uranium (Total)	mg/L	0.00005	0.00006	<0.00005	0.00007
Vanadium (Total)	mg/L	0.0001	0.0004	<0.0001	0.0008
Chromium (VI)	mg/L	0.001	<0.001	<0.001	<0.001
Mercury	mg/L	0.00002	<0.00002	<0.00002	<0.00002
Anion Sum	meq/L	-	2.84	3.22	3.71
Cation Sum	meq/L	-	2.65	3.31	3.53
% Difference	%	-	3.42	1.27	2.51
Ion Ratio	-	-	1.07	0.975	1.05
Sodium Adsorption Ratio	-	-	0.0305	0.0296	0.0368
TDS (Ion Sum Calc)	mg/L	1	132	156	174
TDS(calc.)/EC(actual)	-	-	0.547	0.546	0.538
Conductivity Calc	µmho/cm	-	253	300	318
Conductivity Calc / Conductivity	-	-	1.05	1.05	0.982
Langelier Index(25°C)	-	-	-0.560	-0.0243	-0.0742



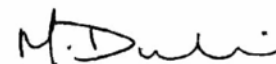
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			Client I.D.	SWD	SWF	SWC2
			Sample I.D.	23-023216-1	23-023216-2	23-023216-3
			Date Collected	2023-08-31	2023-08-31	2023-08-31
Parameter	Units	R.L.		-	-	-
Saturation pH (25°C)	-	-		7.74	7.59	7.54
pH (Client Data)	pH units	-		6.99	7.17	6.91
Temperature (Client Data)	°C	-		13.7	15.2	15.6



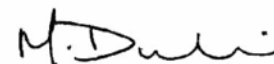
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		Client I.D.	SWF
		Sample I.D.	23-023216-2
		Date Collected	2023-08-31
Parameter	Units	R.L.	-
Acetone	µg/L	30	<30
Benzene	µg/L	0.5	<0.5
Bromodichloromethane	µg/L	2	<2
Bromoform	µg/L	5	<5
Bromomethane	µg/L	0.5	<0.5
Carbon Tetrachloride	µg/L	0.2	<0.2
Chlorobenzene	µg/L	0.5	<0.5
Chloroform	µg/L	1	<1
Chloromethane (Methyl Chloride)	µg/L	2	<2
Dibromochloromethane	µg/L	2	<2
Ethylene Dibromide	µg/L	0.2	<0.2
Dichlorobenzene,1,2-	µg/L	0.5	<0.5
Dichlorobenzene,1,3-	µg/L	0.5	<0.5
Dichlorobenzene,1,4-	µg/L	0.5	<0.5
Dichloroethane,1,1-	µg/L	0.5	<0.5
Dichloroethane,1,2-	µg/L	0.5	<0.5
Dichloroethylene,1,1-	µg/L	0.5	<0.5
Dichloroethylene,1,2-cis-	µg/L	0.5	<0.5
Dichloroethylene,1,2-trans-	µg/L	0.5	<0.5
Dichloropropane,1,2-	µg/L	0.5	<0.5
Dichloropropene,1,3-cis-	µg/L	0.5	<0.5



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Final Report
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		Client I.D.	SWF
		Sample I.D.	23-023216-2
		Date Collected	2023-08-31
Parameter	Units	R.L.	-
Dichloropropene, 1,3-trans-	µg/L	0.5	<0.5
Ethylbenzene	µg/L	0.5	<0.5
Dichloromethane (Methylene Chloride)	µg/L	5	<5
Methyl Ethyl Ketone	µg/L	20	<20
Methyl Isobutyl Ketone	µg/L	20	<20
Methyl tert-Butyl Ether (MTBE)	µg/L	2	<2
Styrene	µg/L	0.5	<0.5
Tetrachloroethane, 1,1,1,2-	µg/L	0.5	<0.5
Tetrachloroethane, 1,1,2,2-	µg/L	0.5	<0.5
Tetrachloroethylene	µg/L	0.5	<0.5
Toluene	µg/L	0.5	<0.5
Trichlorobenzene, 1,2,4-	µg/L	0.5	<0.5
Trichloroethane, 1,1,1-	µg/L	0.5	<0.5
Trichloroethane, 1,1,2-	µg/L	0.5	<0.5
Trichloroethylene	µg/L	0.5	<0.5
Trichlorofluoromethane (Freon 11)	µg/L	5	<5
Vinyl Chloride	µg/L	0.2	<0.2
Xylene, m,p-	µg/L	1	<1
Xylene, o-	µg/L	0.5	<0.5



Michelle Dubien
Data Specialist

The analytical results reported herein refer to the samples as received. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

CERTIFICATE OF ANALYSIS

Work Order	: WT2334454	Page	: 1 of 8
Client	: Caduceon Environmental Laboratories	Laboratory	: ALS Environmental - Waterloo
Contact	: Christine Burke	Account Manager	: Costas Farassoglou
Address	: 2378 Holly Lane Ottawa ON Canada K1V 7P1	Address	: 60 Northland Road, Unit 1 Waterloo ON Canada N2V 2B8
Telephone	: 28-475-5442	Telephone	: 613 225 8279
Project	: Laxton Landfill - 23-029041	Date Samples Received	: 24-Oct-2023 11:15
PO	: ----	Date Analysis Commenced	: 25-Oct-2023
C-O-C number	: ----	Issue Date	: 02-Nov-2023 21:43
Sampler	: CLIENT		
Site	: ----		
Quote number	: PFAS Testing - Soil and Water		
No. of samples received	: 12		
No. of samples analysed	: 12		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	Position	Laboratory Department
Sanja Risticvic	Department Manager - LCMS	LCMS, Waterloo, Ontario



General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances
LOR: Limit of Reporting (detection limit).

Unit	Description
µg/L	micrograms per litre

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Qualifiers

Qualifier	Description
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).



Analytical Results

Sub-Matrix: Water					Client sample ID				
(Matrix: Water)					3 (29041-1)	4 (29041-2)	6 (29041-3)	8 (29041-4)	10 (29041-5)
Client sampling date / time					11-Oct-2023 00:00	11-Oct-2023 00:00	11-Oct-2023 00:00	11-Oct-2023 00:00	11-Oct-2023 00:00
Analyte	CAS Number	Method/Lab	LOR	Unit	WT2334454-001	WT2334454-002	WT2334454-003	WT2334454-004	WT2334454-005
					Result	Result	Result	Result	Result
Perfluoroalkyl Substances (PFAS)									
Eicosafuoro-3-oxaundecane-1-sulfonic acid, 11-chloro- [11Cl-PF3OUdS]	763051-92-9	E745/WT	0.020	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020
Ethyl perfluorooctanesulfonamide, n- [NEtFOSA]	4151-50-2	E745/WT	0.020	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020
Ethyl perfluorooctanesulfonamidoacetic acid, n- [NEtFOSAA]	2991-50-6	E745/WT	0.020	µg/L	0.020	<0.020	<0.020	<0.020	<0.020
Ethyl perfluorooctanesulfonamidoethanol, n- [NEtFOSE]	1691-99-2	E745/WT	0.020	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020
Fluorotelomer carboxylic acid, 3:3 [3:3 FTCA]	356-02-5	E745/WT	0.020	µg/L	<0.030 ^{DLM}	<0.030 ^{DLM}	<0.030 ^{DLM}	<0.030 ^{DLM}	<0.030 ^{DLM}
Fluorotelomer carboxylic acid, 5:3 [5:3 FTCA]	914637-49-3	E745/WT	0.020	µg/L	0.026	0.036	<0.020	<0.020	<0.020
Fluorotelomer carboxylic acid, 7:3 [7:3 FTCA]	812-70-4	E745/WT	0.020	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020
Fluorotelomer sulfonic acid, 4:2 [4:2 FTS]	757124-72-4	E745/WT	0.020	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020
Fluorotelomer sulfonic acid, 6:2 [6:2 FTS]	27619-97-2	E745/WT	0.020	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020
Fluorotelomer sulfonic acid, 8:2 [8:2 FTS]	39108-34-4	E745/WT	0.020	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020
Hexadecafluoro-3-oxanonane-1-sulfonic acid, 9-chloro- [9Cl-PF3ONS]	756426-58-1	E745/WT	0.020	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020
Hexafluoropropylene oxide dimer acid [HFPO-DA]	13252-13-6	E745/WT	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Methyl perfluorooctanesulfonamide, N- [NMeFOSA]	31506-32-8	E745/WT	0.020	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020
Methyl perfluorooctanesulfonamidoacetic acid, n- [NMeFOSAA]	2355-31-9	E745/WT	0.020	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020
Methyl perfluorooctanesulfonamidoethanol, n- [NMeFOSE]	24448-09-7	E745/WT	0.020	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020
Nonafluoro-3,6-dioxaheptanoic acid [NFDHA]	151772-58-6	E745/WT	0.020	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020
perfluoro(2-ethoxyethane)sulfonic acid [PFEEA]	113507-82-7	E745/WT	0.020	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020
Perfluoro-3-methoxypropanoic acid [PFMPA]	377-73-1	E745/WT	0.020	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020
Perfluoro-4-methoxybutanoic acid [PFMBA]	863090-89-5	E745/WT	0.020	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020
Perfluorobutanesulfonic acid [PFBS]	375-73-5	E745/WT	0.020	µg/L	0.102	<0.020	<0.020	<0.020	<0.020
Perfluorobutanoic acid [PFBA]	375-22-4	E745/WT	0.10	µg/L	<0.10	<0.10	<0.10	<0.10	<0.10
Perfluorodecane sulfonic acid [PFDS]	335-77-3	E745/WT	0.020	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020



Analytical Results

Sub-Matrix: Water					Client sample ID				
(Matrix: Water)					3 (29041-1)	4 (29041-2)	6 (29041-3)	8 (29041-4)	10 (29041-5)
Client sampling date / time					11-Oct-2023 00:00	11-Oct-2023 00:00	11-Oct-2023 00:00	11-Oct-2023 00:00	11-Oct-2023 00:00
Analyte	CAS Number	Method/Lab	LOR	Unit	WT2334454-001	WT2334454-002	WT2334454-003	WT2334454-004	WT2334454-005
					Result	Result	Result	Result	Result
Perfluoroalkyl Substances (PFAS)									
Perfluorodecanoic acid [PFDA]	335-76-2	E745/WT	0.020	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020
Perfluorododecanesulfonic acid [PFDoS]	79780-39-5	E745/WT	0.020	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020
Perfluorododecanoic acid [PFDoA]	307-55-1	E745/WT	0.020	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020
Perfluoroheptanesulfonic acid [PFHpS]	375-92-8	E745/WT	0.020	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020
Perfluoroheptanoic acid [PFHpA]	375-85-9	E745/WT	0.020	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020
Perfluorohexanesulfonic acid [PFHxS]	355-46-4	E745/WT	0.020	µg/L	0.038	<0.020	<0.020	<0.020	<0.020
Perfluorohexanoic acid [PFHxA]	307-24-4	E745/WT	0.020	µg/L	0.130	<0.020	<0.020	<0.020	<0.020
Perfluorononanesulfonic acid [PFNS]	68259-12-1	E745/WT	0.020	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020
Perfluorononanoic acid [PFNA]	375-95-1	E745/WT	0.020	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020
Perfluorononanoic acid, 4,8-dioxa-3H- [ADONA]	919005-14-4	E745/WT	0.020	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020
Perfluorooctanesulfonamide [PFOSA]	754-91-6	E745/WT	0.020	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020
Perfluorooctanesulfonic acid [PFOS]	1763-23-1	E745/WT	0.020	µg/L	0.042	0.058	0.066	<0.020	<0.020
Perfluorooctanoic acid [PFOA]	335-67-1	E745/WT	0.020	µg/L	0.132	0.062	<0.020	<0.020	<0.020
Perfluoropentanesulfonic acid [PFPeS]	2706-91-4	E745/WT	0.020	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020
Perfluoropentanoic acid [PFPeA]	2706-90-3	E745/WT	0.020	µg/L	0.174	<0.020	<0.020	<0.020	<0.020
Perfluorotetradecanoic acid [PFTeDA]	376-06-7	E745/WT	0.020	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020
Perfluorotridecanoic acid [PFTrDA]	72629-94-8	E745/WT	0.020	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020
Perfluoroundecanoic acid [PFUnA]	2058-94-8	E745/WT	0.020	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020
PFAS, total (EPA 1633)	n/a	E745/WT	1.1	µg/L	<1.1	<1.1	<1.1	<1.1	<1.1
Perfluoroalkyl Substances (PFAS) Surrogates									
Perfluorooctanesulfonic acid [13C8-PFOS]	265893-05-6	E745/WT	0.01	%	74.4	63.6	84.8	61.6	66.0

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Please refer to the Accreditation section for an explanation of analyte accreditations.



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	12 (29041-6)	13 (29041-7)	14 (29041-8)	16-I (29041-9)	16 (29041-10)
Client sampling date / time					11-Oct-2023 00:00	11-Oct-2023 00:00	11-Oct-2023 00:00	11-Oct-2023 00:00	11-Oct-2023 00:00	
Analyte	CAS Number	Method/Lab	LOR	Unit	WT2334454-006	WT2334454-007	WT2334454-008	WT2334454-009	WT2334454-010	
					Result	Result	Result	Result	Result	
Perfluoroalkyl Substances (PFAS)										
Eicosafuoro-3-oxaundecane-1-sulfonic acid, 11-chloro- [11Cl-PF3OUdS]	763051-92-9	E745/WT	0.020	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	
Ethyl perfluorooctanesulfonamide, n- [NEtFOSA]	4151-50-2	E745/WT	0.020	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	
Ethyl perfluorooctanesulfonamidoacetic acid, n- [NEtFOSAA]	2991-50-6	E745/WT	0.020	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	
Ethyl perfluorooctanesulfonamidoethanol, n- [NEtFOSE]	1691-99-2	E745/WT	0.020	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	
Fluorotelomer carboxylic acid, 3:3 [3:3 FTCA]	356-02-5	E745/WT	0.020	µg/L	<0.030 ^{DLM}	<0.030 ^{DLM}	<0.030 ^{DLM}	<0.030 ^{DLM}	<0.030 ^{DLM}	
Fluorotelomer carboxylic acid, 5:3 [5:3 FTCA]	914637-49-3	E745/WT	0.020	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	
Fluorotelomer carboxylic acid, 7:3 [7:3 FTCA]	812-70-4	E745/WT	0.020	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	
Fluorotelomer sulfonic acid, 4:2 [4:2 FTS]	757124-72-4	E745/WT	0.020	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	
Fluorotelomer sulfonic acid, 6:2 [6:2 FTS]	27619-97-2	E745/WT	0.020	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	
Fluorotelomer sulfonic acid, 8:2 [8:2 FTS]	39108-34-4	E745/WT	0.020	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	
Hexadecafluoro-3-oxanonane-1-sulfonic acid, 9-chloro- [9Cl-PF3ONS]	756426-58-1	E745/WT	0.020	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	
Hexafluoropropylene oxide dimer acid [HFPO-DA]	13252-13-6	E745/WT	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Methyl perfluorooctanesulfonamide, N- [NMeFOSA]	31506-32-8	E745/WT	0.020	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	
Methyl perfluorooctanesulfonamidoacetic acid, n- [NMeFOSAA]	2355-31-9	E745/WT	0.020	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	
Methyl perfluorooctanesulfonamidoethanol, n- [NMeFOSE]	24448-09-7	E745/WT	0.020	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	
Nonafluoro-3,6-dioxaheptanoic acid [NFDHA]	151772-58-6	E745/WT	0.020	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	
perfluoro(2-ethoxyethane)sulfonic acid [PFEEA]	113507-82-7	E745/WT	0.020	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	
Perfluoro-3-methoxypropanoic acid [PFMPA]	377-73-1	E745/WT	0.020	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	
Perfluoro-4-methoxybutanoic acid [PFMBA]	863090-89-5	E745/WT	0.020	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	
Perfluorobutanesulfonic acid [PFBS]	375-73-5	E745/WT	0.020	µg/L	0.074	0.024	<0.020	0.064	0.064	
Perfluorobutanoic acid [PFBA]	375-22-4	E745/WT	0.10	µg/L	<0.10	<0.10	<0.10	<0.10	<0.10	
Perfluorodecane sulfonic acid [PFDS]	335-77-3	E745/WT	0.020	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	
Perfluorodecanoic acid [PFDA]	335-76-2	E745/WT	0.020	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	



Analytical Results

Sub-Matrix: Water					Client sample ID	12 (29041-6)	13 (29041-7)	14 (29041-8)	16-I (29041-9)	16 (29041-10)
(Matrix: Water)										
Client sampling date / time										
					11-Oct-2023 00:00	11-Oct-2023 00:00	11-Oct-2023 00:00	11-Oct-2023 00:00	11-Oct-2023 00:00	11-Oct-2023 00:00
Analyte	CAS Number	Method/Lab	LOR	Unit	WT2334454-006	WT2334454-007	WT2334454-008	WT2334454-009	WT2334454-010	
					Result	Result	Result	Result	Result	
Perfluoroalkyl Substances (PFAS)										
Perfluorododecanesulfonic acid [PFDoS]	79780-39-5	E745/WT	0.020	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Perfluorododecanoic acid [PFDoA]	307-55-1	E745/WT	0.020	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Perfluoroheptanesulfonic acid [PFHpS]	375-92-8	E745/WT	0.020	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Perfluoroheptanoic acid [PFHpA]	375-85-9	E745/WT	0.020	µg/L	0.024	<0.020	<0.020	0.026	0.022	
Perfluorohexanesulfonic acid [PFHxS]	355-46-4	E745/WT	0.020	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Perfluorohexanoic acid [PFHxA]	307-24-4	E745/WT	0.020	µg/L	<0.020	0.032	<0.020	0.060	0.056	
Perfluorononanesulfonic acid [PFNS]	68259-12-1	E745/WT	0.020	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Perfluorononanoic acid [PFNA]	375-95-1	E745/WT	0.020	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Perfluorononanoic acid, 4,8-dioxa-3H- [ADONA]	919005-14-4	E745/WT	0.020	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Perfluorooctanesulfonamide [PFOSA]	754-91-6	E745/WT	0.020	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Perfluorooctanesulfonic acid [PFOS]	1763-23-1	E745/WT	0.020	µg/L	<0.020	<0.020	<0.020	<0.020	0.028	
Perfluorooctanoic acid [PFOA]	335-67-1	E745/WT	0.020	µg/L	0.020	<0.020	<0.020	0.022	0.048	
Perfluoropentanesulfonic acid [PFPeS]	2706-91-4	E745/WT	0.020	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Perfluoropentanoic acid [PFPeA]	2706-90-3	E745/WT	0.020	µg/L	0.098	0.050	<0.020	0.104	0.084	
Perfluorotetradecanoic acid [PFTeDA]	376-06-7	E745/WT	0.020	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Perfluorotridecanoic acid [PFTrDA]	72629-94-8	E745/WT	0.020	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Perfluoroundecanoic acid [PFUnA]	2058-94-8	E745/WT	0.020	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
PFAS, total (EPA 1633)	n/a	E745/WT	1.1	µg/L	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1
Perfluoroalkyl Substances (PFAS) Surrogates										
Perfluorooctanesulfonic acid [13C8-PFOS]	265893-05-6	E745/WT	0.01	%	78.0	69.6	64.4	71.6	70.4	

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Please refer to the Accreditation section for an explanation of analyte accreditations.



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	20-I (29041-11)	20-II (29041-12)	----	----	----
Client sampling date / time						11-Oct-2023 00:00	11-Oct-2023 00:00	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit	WT2334454-011	WT2334454-012	-----	-----	-----	-----
					Result	Result	----	----	----	----
Perfluoroalkyl Substances (PFAS)										
Eicosafuoro-3-oxaundecane-1-sulfonic acid, 11-chloro- [11CI-PF3OUdS]	763051-92-9	E745/WT	0.020	µg/L	<0.020	<0.020	----	----	----	----
Ethyl perfluorooctanesulfonamide, n- [NEtFOSA]	4151-50-2	E745/WT	0.020	µg/L	<0.020	<0.020	----	----	----	----
Ethyl perfluorooctanesulfonamidoacetic acid, n- [NEtFOSAA]	2991-50-6	E745/WT	0.020	µg/L	<0.020	<0.020	----	----	----	----
Ethyl perfluorooctanesulfonamidoethanol, n- [NEtFOSE]	1691-99-2	E745/WT	0.020	µg/L	<0.020	<0.020	----	----	----	----
Fluorotelomer carboxylic acid, 3:3 [3:3 FTCA]	356-02-5	E745/WT	0.020	µg/L	<0.030 ^{DLM}	<0.030 ^{DLM}	----	----	----	----
Fluorotelomer carboxylic acid, 5:3 [5:3 FTCA]	914637-49-3	E745/WT	0.020	µg/L	<0.020	<0.020	----	----	----	----
Fluorotelomer carboxylic acid, 7:3 [7:3 FTCA]	812-70-4	E745/WT	0.020	µg/L	<0.020	<0.020	----	----	----	----
Fluorotelomer sulfonic acid, 4:2 [4:2 FTS]	757124-72-4	E745/WT	0.020	µg/L	<0.020	<0.020	----	----	----	----
Fluorotelomer sulfonic acid, 6:2 [6:2 FTS]	27619-97-2	E745/WT	0.020	µg/L	<0.020	<0.020	----	----	----	----
Fluorotelomer sulfonic acid, 8:2 [8:2 FTS]	39108-34-4	E745/WT	0.020	µg/L	<0.020	<0.020	----	----	----	----
Hexadecafluoro-3-oxanonane-1-sulfonic acid, 9-chloro- [9CI-PF3ONS]	756426-58-1	E745/WT	0.020	µg/L	<0.020	<0.020	----	----	----	----
Hexafluoropropylene oxide dimer acid [HFPO-DA]	13252-13-6	E745/WT	1.0	µg/L	<1.0	<1.0	----	----	----	----
Methyl perfluorooctanesulfonamide, N- [NMeFOSA]	31506-32-8	E745/WT	0.020	µg/L	<0.020	<0.020	----	----	----	----
Methyl perfluorooctanesulfonamidoacetic acid, n- [NMeFOSAA]	2355-31-9	E745/WT	0.020	µg/L	<0.020	<0.020	----	----	----	----
Methyl perfluorooctanesulfonamidoethanol, n- [NMeFOSE]	24448-09-7	E745/WT	0.020	µg/L	<0.020	<0.020	----	----	----	----
Nonafluoro-3,6-dioxahexanoic acid [NFDHA]	151772-58-6	E745/WT	0.020	µg/L	<0.020	<0.020	----	----	----	----
perfluoro(2-ethoxyethane)sulfonic acid [PFEESA]	113507-82-7	E745/WT	0.020	µg/L	<0.020	<0.020	----	----	----	----
Perfluoro-3-methoxypropanoic acid [PFMPA]	377-73-1	E745/WT	0.020	µg/L	<0.020	<0.020	----	----	----	----
Perfluoro-4-methoxybutanoic acid [PFMBA]	863090-89-5	E745/WT	0.020	µg/L	<0.020	<0.020	----	----	----	----
Perfluorobutanesulfonic acid [PFBS]	375-73-5	E745/WT	0.020	µg/L	0.056	<0.020	----	----	----	----
Perfluorobutanoic acid [PFBA]	375-22-4	E745/WT	0.10	µg/L	<0.10	<0.10	----	----	----	----
Perfluorodecane sulfonic acid [PFDS]	335-77-3	E745/WT	0.020	µg/L	<0.020	<0.020	----	----	----	----
Perfluorodecanoic acid [PFDA]	335-76-2	E745/WT	0.020	µg/L	<0.020	<0.020	----	----	----	----



Analytical Results

Sub-Matrix: Water					Client sample ID				
(Matrix: Water)					20-I (29041-11)	20-II (29041-12)	----	----	----
Client sampling date / time					11-Oct-2023 00:00	11-Oct-2023 00:00	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit	WT2334454-011	WT2334454-012	-----	-----	-----
					Result	Result	----	----	----
Perfluoroalkyl Substances (PFAS)									
Perfluorododecanesulfonic acid [PFDoS]	79780-39-5	E745/WT	0.020	µg/L	<0.020	<0.020	----	----	----
Perfluorododecanoic acid [PFDoA]	307-55-1	E745/WT	0.020	µg/L	<0.020	<0.020	----	----	----
Perfluoroheptanesulfonic acid [PFHpS]	375-92-8	E745/WT	0.020	µg/L	<0.020	<0.020	----	----	----
Perfluoroheptanoic acid [PFHpA]	375-85-9	E745/WT	0.020	µg/L	0.024	<0.020	----	----	----
Perfluorohexanesulfonic acid [PFHxS]	355-46-4	E745/WT	0.020	µg/L	<0.020	<0.020	----	----	----
Perfluorohexanoic acid [PFHxA]	307-24-4	E745/WT	0.020	µg/L	0.062	<0.020	----	----	----
Perfluorononanesulfonic acid [PFNS]	68259-12-1	E745/WT	0.020	µg/L	<0.020	<0.020	----	----	----
Perfluorononanoic acid [PFNA]	375-95-1	E745/WT	0.020	µg/L	<0.020	<0.020	----	----	----
Perfluorononanoic acid, 4,8-dioxa-3H- [ADONA]	919005-14-4	E745/WT	0.020	µg/L	<0.020	<0.020	----	----	----
Perfluorooctanesulfonamide [PFOSA]	754-91-6	E745/WT	0.020	µg/L	<0.020	<0.020	----	----	----
Perfluorooctanesulfonic acid [PFOS]	1763-23-1	E745/WT	0.020	µg/L	<0.020	<0.020	----	----	----
Perfluorooctanoic acid [PFOA]	335-67-1	E745/WT	0.020	µg/L	0.034	<0.020	----	----	----
Perfluoropentanesulfonic acid [PFPeS]	2706-91-4	E745/WT	0.020	µg/L	<0.020	<0.020	----	----	----
Perfluoropentanoic acid [PFPeA]	2706-90-3	E745/WT	0.020	µg/L	0.082	<0.020	----	----	----
Perfluorotetradecanoic acid [PFTeDA]	376-06-7	E745/WT	0.020	µg/L	<0.020	<0.020	----	----	----
Perfluorotridecanoic acid [PFTrDA]	72629-94-8	E745/WT	0.020	µg/L	<0.020	<0.020	----	----	----
Perfluoroundecanoic acid [PFUnA]	2058-94-8	E745/WT	0.020	µg/L	<0.020	<0.020	----	----	----
PFAS, total (EPA 1633)	n/a	E745/WT	1.1	µg/L	<1.1	<1.1	----	----	----
Perfluoroalkyl Substances (PFAS) Surrogates									
Perfluorooctanesulfonic acid [13C8-PFOS]	265893-05-6	E745/WT	0.01	%	74.4	84.8	----	----	----

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Please refer to the Accreditation section for an explanation of analyte accreditations.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: WT2334454	Page	: 1 of 6
Client	: Caduceon Environmental Laboratories	Laboratory	: ALS Environmental - Waterloo
Contact	: Christine Burke	Account Manager	: Costas Farassoglou
Address	: 2378 Holly Lane Ottawa ON Canada K1V 7P1	Address	: 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8
Telephone	: 28-475-5442	Telephone	: 613 225 8279
Project	: Laxton Landfill - 23-029041	Date Samples Received	: 24-Oct-2023 11:15
PO	: ----	Issue Date	: 02-Nov-2023 21:42
C-O-C number	: ----		
Sampler	: CLIENT		
Site	: ----		
Quote number	: PFAS Testing - Soil and Water		
No. of samples received	: 12		
No. of samples analysed	: 12		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.

CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.

DQO: Data Quality Objective.

LOR: Limit of Reporting (detection limit).

RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "----" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- No Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.



Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water**

Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group : Analytical Method Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Perfluoroalkyl Substances (PFAS) : PFAS (Extended List) in Water by LC-MS-MS										
HDPE - LCMS 10 (29041-5)	E745	11-Oct-2023	25-Oct-2023	28 days	15 days	✓	25-Oct-2023	28 days	0 days	✓
Perfluoroalkyl Substances (PFAS) : PFAS (Extended List) in Water by LC-MS-MS										
HDPE - LCMS 12 (29041-6)	E745	11-Oct-2023	25-Oct-2023	28 days	15 days	✓	25-Oct-2023	28 days	0 days	✓
Perfluoroalkyl Substances (PFAS) : PFAS (Extended List) in Water by LC-MS-MS										
HDPE - LCMS 13 (29041-7)	E745	11-Oct-2023	25-Oct-2023	28 days	15 days	✓	25-Oct-2023	28 days	0 days	✓
Perfluoroalkyl Substances (PFAS) : PFAS (Extended List) in Water by LC-MS-MS										
HDPE - LCMS 14 (29041-8)	E745	11-Oct-2023	25-Oct-2023	28 days	15 days	✓	25-Oct-2023	28 days	0 days	✓
Perfluoroalkyl Substances (PFAS) : PFAS (Extended List) in Water by LC-MS-MS										
HDPE - LCMS 16 (29041-10)	E745	11-Oct-2023	25-Oct-2023	28 days	15 days	✓	25-Oct-2023	28 days	0 days	✓
Perfluoroalkyl Substances (PFAS) : PFAS (Extended List) in Water by LC-MS-MS										
HDPE - LCMS 16-I (29041-9)	E745	11-Oct-2023	25-Oct-2023	28 days	15 days	✓	25-Oct-2023	28 days	0 days	✓
Perfluoroalkyl Substances (PFAS) : PFAS (Extended List) in Water by LC-MS-MS										
HDPE - LCMS 20-I (29041-11)	E745	11-Oct-2023	25-Oct-2023	28 days	15 days	✓	25-Oct-2023	28 days	0 days	✓



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group : Analytical Method Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Perfluoroalkyl Substances (PFAS) : PFAS (Extended List) in Water by LC-MS-MS										
HDPE - LCMS 20-II (29041-12)	E745	11-Oct-2023	25-Oct-2023	28 days	15 days	✓	25-Oct-2023	28 days	0 days	✓
Perfluoroalkyl Substances (PFAS) : PFAS (Extended List) in Water by LC-MS-MS										
HDPE - LCMS 3 (29041-1)	E745	11-Oct-2023	25-Oct-2023	28 days	15 days	✓	25-Oct-2023	28 days	0 days	✓
Perfluoroalkyl Substances (PFAS) : PFAS (Extended List) in Water by LC-MS-MS										
HDPE - LCMS 4 (29041-2)	E745	11-Oct-2023	25-Oct-2023	28 days	15 days	✓	25-Oct-2023	28 days	0 days	✓
Perfluoroalkyl Substances (PFAS) : PFAS (Extended List) in Water by LC-MS-MS										
HDPE - LCMS 6 (29041-3)	E745	11-Oct-2023	25-Oct-2023	28 days	15 days	✓	25-Oct-2023	28 days	0 days	✓
Perfluoroalkyl Substances (PFAS) : PFAS (Extended List) in Water by LC-MS-MS										
HDPE - LCMS 8 (29041-4)	E745	11-Oct-2023	25-Oct-2023	28 days	15 days	✓	25-Oct-2023	28 days	0 days	✓

Legend & Qualifier Definitions

Rec. HT: ALS recommended hold time (see units).



Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water** Evaluation: ✖ = QC frequency outside specification; ✔ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	Method	QC Lot #	QC	Regular	Actual	Expected	Evaluation
Laboratory Duplicates (DUP)							
PFAS (Extended List) in Water by LC-MS-MS	E745	1204258	1	20	5.0	5.0	✓
Laboratory Control Samples (LCS)							
PFAS (Extended List) in Water by LC-MS-MS	E745	1204258	1	20	5.0	5.0	✓
Method Blanks (MB)							
PFAS (Extended List) in Water by LC-MS-MS	E745	1204258	1	20	5.0	5.0	✓
Matrix Spikes (MS)							
PFAS (Extended List) in Water by LC-MS-MS	E745	1204258	1	20	5.0	5.0	✓



Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
PFAS (Extended List) in Water by LC-MS-MS	E745 ALS Environmental - Waterloo	Water	MECP E3533	An aliquot of water is analyzed for PFAs by direct injection LC/MS/MS

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation of PFAS in Water by Direct Injection	EP745 ALS Environmental - Waterloo	Water	MECP E3533	An aliquot of water is analyzed for PFAs by direct injection LC/MS/MS

QUALITY CONTROL REPORT

Work Order	: WT2334454	Page	: 1 of 10
Client	: Caduceon Environmental Laboratories	Laboratory	: ALS Environmental - Waterloo
Contact	: Christine Burke	Account Manager	: Costas Farassoglou
Address	: 2378 Holly Lane Ottawa ON Canada K1V 7P1	Address	: 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8
Telephone	:	Telephone	: 613 225 8279
Project	: Laxton Landfill - 23-029041	Date Samples Received	: 24-Oct-2023 11:15
PO	: ----	Date Analysis Commenced	: 25-Oct-2023
C-O-C number	: ----	Issue Date	: 02-Nov-2023 21:42
Sampler	: CLIENT 28-475-5442		
Site	: ----		
Quote number	: PFAS Testing - Soil and Water		
No. of samples received	: 12		
No. of samples analysed	: 12		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	Position	Laboratory Department
Sanja Risticvic	Department Manager - LCMS	Waterloo LCMS, Waterloo, Ontario



General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.

CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percent Difference

= Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.



Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: Water					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Perfluoroalkyl Substances (PFAS) (QC Lot: 1204258)											
WT2334486-001	Anonymous	Eicosafuoro-3-oxaundecane-1-sulfonic acid, 11-chloro-[11Cl-PF3OUdS]	763051-92-9	E745	0.020	µg/L	<0.020	<0.020	0	Diff <2x LOR	----
		Ethyl perfluorooctanesulfonamide, n-[NEtFOSA]	4151-50-2	E745	0.020	µg/L	<0.020	<0.020	0	Diff <2x LOR	----
		Ethyl perfluorooctanesulfonamido acetic acid, n-[NEtFOSAA]	2991-50-6	E745	0.020	µg/L	<0.020	<0.020	0	Diff <2x LOR	----
		Ethyl perfluorooctanesulfonamido ethanol, n-[NEtFOSE]	1691-99-2	E745	0.020	µg/L	<0.020	<0.020	0	Diff <2x LOR	----
		Fluorotelomer carboxylic acid, 3:3 [3:3 FTCA]	356-02-5	E745	0.020	µg/L	<0.030	<0.020	0.010	Diff <2x LOR	----
		Fluorotelomer carboxylic acid, 5:3 [5:3 FTCA]	914637-49-3	E745	0.020	µg/L	<0.020	<0.020	0	Diff <2x LOR	----
		Fluorotelomer carboxylic acid, 7:3 [7:3 FTCA]	812-70-4	E745	0.020	µg/L	<0.020	<0.020	0	Diff <2x LOR	----
		Fluorotelomer sulfonic acid, 4:2 [4:2 FTS]	757124-72-4	E745	0.020	µg/L	<0.020	<0.020	0	Diff <2x LOR	----
		Fluorotelomer sulfonic acid, 6:2 [6:2 FTS]	27619-97-2	E745	0.020	µg/L	<0.020	<0.020	0	Diff <2x LOR	----
		Fluorotelomer sulfonic acid, 8:2 [8:2 FTS]	39108-34-4	E745	0.020	µg/L	<0.020	<0.020	0	Diff <2x LOR	----
		Hexadecafluoro-3-oxanonane-1-sulfonic acid, 9-chloro-[9Cl-PF3ONS]	756426-58-1	E745	0.020	µg/L	<0.020	<0.020	0	Diff <2x LOR	----
		Hexafluoropropylene oxide dimer acid [HFPO-DA]	13252-13-6	E745	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Methyl perfluorooctanesulfonamide, N-[NMeFOSA]	31506-32-8	E745	0.020	µg/L	<0.020	<0.020	0	Diff <2x LOR	----
		Methyl perfluorooctanesulfonamido acetic acid, n-[NMeFOSAA]	2355-31-9	E745	0.020	µg/L	<0.020	<0.020	0	Diff <2x LOR	----
		Methyl perfluorooctanesulfonamido ethanol, n-[NMeFOSE]	24448-09-7	E745	0.020	µg/L	<0.020	<0.020	0	Diff <2x LOR	----
		Nonafluoro-3,6-dioxaheptanoic acid [NFDHA]	151772-58-6	E745	0.020	µg/L	<0.020	<0.020	0	Diff <2x LOR	----
		perfluoro(2-ethoxyethane)sulfonic acid [PFEESA]	113507-82-7	E745	0.020	µg/L	<0.020	<0.020	0	Diff <2x LOR	----
		Perfluoro-3-methoxypropanoic acid [PFMPA]	377-73-1	E745	0.020	µg/L	<0.020	<0.020	0	Diff <2x LOR	----



Sub-Matrix: Water					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Perfluoroalkyl Substances (PFAS) (QC Lot: 1204258) - continued											
WT2334486-001	Anonymous	Perfluoro-4-methoxybutanoic acid [PFMBA]	863090-89-5	E745	0.020	µg/L	<0.020	<0.020	0	Diff <2x LOR	----
		Perfluorobutanesulfonic acid [PFBS]	375-73-5	E745	0.020	µg/L	<0.020	<0.020	0	Diff <2x LOR	----
		Perfluorobutanoic acid [PFBA]	375-22-4	E745	0.10	µg/L	<0.10	<0.10	0	Diff <2x LOR	----
		Perfluorodecane sulfonic acid [PFDS]	335-77-3	E745	0.020	µg/L	<0.020	<0.020	0	Diff <2x LOR	----
		Perfluorodecanoic acid [PFDA]	335-76-2	E745	0.020	µg/L	<0.020	<0.020	0	Diff <2x LOR	----
		Perfluorododecanesulfonic acid [PFDoS]	79780-39-5	E745	0.020	µg/L	<0.020	<0.020	0	Diff <2x LOR	----
		Perfluorododecanoic acid [PFDoA]	307-55-1	E745	0.020	µg/L	<0.020	<0.020	0	Diff <2x LOR	----
		Perfluoroheptanesulfonic acid [PFHpS]	375-92-8	E745	0.020	µg/L	<0.020	<0.020	0	Diff <2x LOR	----
		Perfluoroheptanoic acid [PFHpA]	375-85-9	E745	0.020	µg/L	<0.020	<0.020	0	Diff <2x LOR	----
		Perfluorohexanesulfonic acid [PFHxS]	355-46-4	E745	0.020	µg/L	<0.020	<0.020	0	Diff <2x LOR	----
		Perfluorohexanoic acid [PFHxA]	307-24-4	E745	0.020	µg/L	<0.020	<0.020	0	Diff <2x LOR	----
		Perfluorononanesulfonic acid [PFNS]	68259-12-1	E745	0.020	µg/L	<0.020	<0.020	0	Diff <2x LOR	----
		Perfluorononanoic acid [PFNA]	375-95-1	E745	0.020	µg/L	<0.020	<0.020	0	Diff <2x LOR	----
		Perfluorononanoic acid, 4,8-dioxo-3H- [ADONA]	919005-14-4	E745	0.020	µg/L	<0.020	<0.020	0	Diff <2x LOR	----
		Perfluorooctanesulfonamide [PFOSA]	754-91-6	E745	0.020	µg/L	<0.020	<0.020	0	Diff <2x LOR	----
		Perfluorooctanesulfonic acid [PFOS]	1763-23-1	E745	0.020	µg/L	<0.020	<0.020	0	Diff <2x LOR	----
		Perfluorooctanoic acid [PFOA]	335-67-1	E745	0.020	µg/L	<0.020	<0.020	0	Diff <2x LOR	----
		Perfluoropentanesulfonic acid [PFPeS]	2706-91-4	E745	0.020	µg/L	<0.020	<0.020	0	Diff <2x LOR	----
		Perfluoropentanoic acid [PFPeA]	2706-90-3	E745	0.020	µg/L	<0.020	<0.020	0	Diff <2x LOR	----
		Perfluorotetradecanoic acid [PFTeDA]	376-06-7	E745	0.020	µg/L	<0.020	<0.020	0	Diff <2x LOR	----
		Perfluorotridecanoic acid [PFTrDA]	72629-94-8	E745	0.020	µg/L	<0.020	<0.020	0	Diff <2x LOR	----
		Perfluoroundecanoic acid [PFUnA]	2058-94-8	E745	0.020	µg/L	<0.020	<0.020	0	Diff <2x LOR	----



Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Perfluoroalkyl Substances (PFAS) (QCLot: 1204258)						
Eicosafluoro-3-oxaundecane-1-sulfonic acid, 11-chloro-[11Cl-PF3OUdS]	763051-92-9	E745	0.02	µg/L	<0.020	----
Ethyl perfluorooctanesulfonamide, n- [NEtFOSA]	4151-50-2	E745	0.02	µg/L	<0.020	----
Ethyl perfluorooctanesulfonamidoacetic acid, n- [NEtFOSAA]	2991-50-6	E745	0.02	µg/L	<0.020	----
Ethyl perfluorooctanesulfonamidoethanol, n- [NEtFOSE]	1691-99-2	E745	0.02	µg/L	<0.020	----
Fluorotelomer carboxylic acid, 3:3 [3:3 FTCA]	356-02-5	E745	0.02	µg/L	<0.020	----
Fluorotelomer carboxylic acid, 5:3 [5:3 FTCA]	914637-49-3	E745	0.02	µg/L	<0.020	----
Fluorotelomer carboxylic acid, 7:3 [7:3 FTCA]	812-70-4	E745	0.02	µg/L	<0.020	----
Fluorotelomer sulfonic acid, 4:2 [4:2 FTS]	757124-72-4	E745	0.02	µg/L	<0.020	----
Fluorotelomer sulfonic acid, 6:2 [6:2 FTS]	27619-97-2	E745	0.02	µg/L	<0.020	----
Fluorotelomer sulfonic acid, 8:2 [8:2 FTS]	39108-34-4	E745	0.02	µg/L	<0.020	----
Hexadecafluoro-3-oxanonane-1-sulfonic acid, 9-chloro-[9Cl-PF3ONS]	756426-58-1	E745	0.02	µg/L	<0.020	----
Hexafluoropropylene oxide dimer acid [HFPO-DA]	13252-13-6	E745	1	µg/L	<1.0	----
Methyl perfluorooctanesulfonamide, N- [NMeFOSA]	31506-32-8	E745	0.02	µg/L	<0.020	----
Methyl perfluorooctanesulfonamidoacetic acid, n- [NMeFOSAA]	2355-31-9	E745	0.02	µg/L	<0.020	----
Methyl perfluorooctanesulfonamidoethanol, n- [NMeFOSE]	24448-09-7	E745	0.02	µg/L	<0.020	----
Nonafluoro-3,6-dioxaheptanoic acid [NFDHA]	151772-58-6	E745	0.02	µg/L	<0.020	----
perfluoro(2-ethoxyethane)sulfonic acid [PFEEESA]	113507-82-7	E745	0.02	µg/L	<0.020	----
Perfluoro-3-methoxypropanoic acid [PFMPA]	377-73-1	E745	0.02	µg/L	<0.020	----
Perfluoro-4-methoxybutanoic acid [PFMBA]	863090-89-5	E745	0.02	µg/L	<0.020	----
Perfluorobutanesulfonic acid [PFBS]	375-73-5	E745	0.02	µg/L	<0.020	----
Perfluorobutanoic acid [PFBA]	375-22-4	E745	0.1	µg/L	<0.10	----
Perfluorodecane sulfonic acid [PFDS]	335-77-3	E745	0.02	µg/L	<0.020	----
Perfluorodecanoic acid [PFDA]	335-76-2	E745	0.02	µg/L	<0.020	----
Perfluorododecanesulfonic acid [PFDoS]	79780-39-5	E745	0.02	µg/L	<0.020	----
Perfluorododecanoic acid [PFDoA]	307-55-1	E745	0.02	µg/L	<0.020	----
Perfluoroheptanesulfonic acid [PFHpS]	375-92-8	E745	0.02	µg/L	<0.020	----
Perfluoroheptanoic acid [PFHpA]	375-85-9	E745	0.02	µg/L	<0.020	----
Perfluorohexanesulfonic acid [PFHxS]	355-46-4	E745	0.02	µg/L	<0.020	----
Perfluorohexanoic acid [PFHxA]	307-24-4	E745	0.02	µg/L	<0.020	----
Perfluorononanesulfonic acid [PFNS]	68259-12-1	E745	0.02	µg/L	<0.020	----



Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Perfluoroalkyl Substances (PFAS) (QCLot: 1204258) - continued						
Perfluorononanoic acid [PFNA]	375-95-1	E745	0.02	µg/L	<0.020	----
Perfluorononanoic acid, 4,8-dioxa-3H- [ADONA]	919005-14-4	E745	0.02	µg/L	<0.020	----
Perfluorooctanesulfonamide [PFOSA]	754-91-6	E745	0.02	µg/L	<0.020	----
Perfluorooctanesulfonic acid [PFOS]	1763-23-1	E745	0.02	µg/L	<0.020	----
Perfluorooctanoic acid [PFOA]	335-67-1	E745	0.02	µg/L	<0.020	----
Perfluoropentanesulfonic acid [PFPeS]	2706-91-4	E745	0.02	µg/L	<0.020	----
Perfluoropentanoic acid [PFPeA]	2706-90-3	E745	0.02	µg/L	<0.020	----
Perfluorotetradecanoic acid [PFTeDA]	376-06-7	E745	0.02	µg/L	<0.020	----
Perfluorotridecanoic acid [PFTrDA]	72629-94-8	E745	0.02	µg/L	<0.020	----
Perfluoroundecanoic acid [PFUnA]	2058-94-8	E745	0.02	µg/L	<0.020	----



Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: Water

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Perfluoroalkyl Substances (PFAS) (QCLot: 1204258)									
Eicosafuoro-3-oxaundecane-1-sulfonic acid, 11-chloro- [11Cl-PF3OUdS]	763051-92-9	E745	0.02	µg/L	0.3 µg/L	90.7	50.0	150	----
Ethyl perfluorooctanesulfonamide, n- [NEtFOSA]	4151-50-2	E745	0.02	µg/L	0.3 µg/L	92.7	50.0	150	----
Ethyl perfluorooctanesulfonamidoacetic acid, n- [NEtFOSAA]	2991-50-6	E745	0.02	µg/L	0.3 µg/L	90.7	50.0	150	----
Ethyl perfluorooctanesulfonamidoethanol, n- [NEtFOSE]	1691-99-2	E745	0.02	µg/L	0.3 µg/L	98.7	50.0	150	----
Fluorotelomer carboxylic acid, 3:3 [3:3 FTCA]	356-02-5	E745	0.02	µg/L	0.3 µg/L	107	50.0	150	----
Fluorotelomer carboxylic acid, 5:3 [5:3 FTCA]	914637-49-3	E745	0.02	µg/L	0.3 µg/L	105	50.0	150	----
Fluorotelomer carboxylic acid, 7:3 [7:3 FTCA]	812-70-4	E745	0.02	µg/L	0.3 µg/L	77.3	50.0	150	----
Fluorotelomer sulfonic acid, 4:2 [4:2 FTS]	757124-72-4	E745	0.02	µg/L	0.3 µg/L	104	50.0	150	----
Fluorotelomer sulfonic acid, 6:2 [6:2 FTS]	27619-97-2	E745	0.02	µg/L	0.3 µg/L	94.0	50.0	150	----
Fluorotelomer sulfonic acid, 8:2 [8:2 FTS]	39108-34-4	E745	0.02	µg/L	0.3 µg/L	79.3	50.0	150	----
Hexadecafluoro-3-oxanonane-1-sulfonic acid, 9-chloro- [9Cl-PF3ONS]	756426-58-1	E745	0.02	µg/L	0.3 µg/L	96.0	50.0	150	----
Hexafluoropropylene oxide dimer acid [HFPO-DA]	13252-13-6	E745	1	µg/L	3 µg/L	88.5	50.0	150	----
Methyl perfluorooctanesulfonamide, N- [NMeFOSA]	31506-32-8	E745	0.02	µg/L	0.3 µg/L	76.0	50.0	150	----
Methyl perfluorooctanesulfonamidoacetic acid, n- [NMeFOSAA]	2355-31-9	E745	0.02	µg/L	0.3 µg/L	95.3	50.0	150	----
Methyl perfluorooctanesulfonamidoethanol, n- [NMeFOSE]	24448-09-7	E745	0.02	µg/L	0.3 µg/L	84.0	50.0	150	----
Nonafluoro-3,6-dioxaheptanoic acid [NFDHA]	151772-58-6	E745	0.02	µg/L	0.3 µg/L	100	50.0	150	----
perfluoro(2-ethoxyethane)sulfonic acid [PFEESA]	113507-82-7	E745	0.02	µg/L	0.3 µg/L	86.7	50.0	150	----
Perfluoro-3-methoxypropanoic acid [PFMPA]	377-73-1	E745	0.02	µg/L	0.3 µg/L	64.7	50.0	150	----
Perfluoro-4-methoxybutanoic acid [PFMBA]	863090-89-5	E745	0.02	µg/L	0.3 µg/L	78.0	50.0	150	----
Perfluorobutanesulfonic acid [PFBS]	375-73-5	E745	0.02	µg/L	0.3 µg/L	80.7	50.0	150	----
Perfluorobutanoic acid [PFBA]	375-22-4	E745	0.1	µg/L	1 µg/L	82.6	50.0	150	----
Perfluorodecane sulfonic acid [PFDS]	335-77-3	E745	0.02	µg/L	0.3 µg/L	98.0	50.0	150	----
Perfluorodecanoic acid [PFDA]	335-76-2	E745	0.02	µg/L	0.3 µg/L	89.3	50.0	150	----
Perfluorododecanesulfonic acid [PFDoS]	79780-39-5	E745	0.02	µg/L	0.3 µg/L	117	50.0	150	----
Perfluorododecanoic acid [PFDoA]	307-55-1	E745	0.02	µg/L	0.3 µg/L	101	50.0	150	----
Perfluoroheptanesulfonic acid [PFHpS]	375-92-8	E745	0.02	µg/L	0.3 µg/L	92.7	50.0	150	----
Perfluoroheptanoic acid [PFHpA]	375-85-9	E745	0.02	µg/L	0.3 µg/L	90.7	50.0	150	----
Perfluorohexanesulfonic acid [PFHxS]	355-46-4	E745	0.02	µg/L	0.3 µg/L	75.3	50.0	150	----
Perfluorohexanoic acid [PFHxA]	307-24-4	E745	0.02	µg/L	0.3 µg/L	96.0	50.0	150	----



Sub-Matrix: Water					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
					Concentration	LCS	Low	High	Qualifier
Analyte	CAS Number	Method	LOR	Unit					
Perfluoroalkyl Substances (PFAS) (QCLot: 1204258) - continued									
Perfluorononanesulfonic acid [PFNS]	68259-12-1	E745	0.02	µg/L	0.3 µg/L	98.0	50.0	150	----
Perfluorononanoic acid [PFNA]	375-95-1	E745	0.02	µg/L	0.3 µg/L	81.3	50.0	150	----
Perfluorononanoic acid, 4,8-dioxa-3H- [ADONA]	919005-14-4	E745	0.02	µg/L	0.3 µg/L	83.3	50.0	150	----
Perfluorooctanesulfonamide [PFOSA]	754-91-6	E745	0.02	µg/L	0.3 µg/L	98.7	50.0	150	----
Perfluorooctanesulfonic acid [PFOS]	1763-23-1	E745	0.02	µg/L	0.3 µg/L	74.0	50.0	150	----
Perfluorooctanoic acid [PFOA]	335-67-1	E745	0.02	µg/L	0.3 µg/L	77.3	50.0	150	----
Perfluoropentanesulfonic acid [PFPeS]	2706-91-4	E745	0.02	µg/L	0.3 µg/L	92.0	50.0	150	----
Perfluoropentanoic acid [PFPeA]	2706-90-3	E745	0.02	µg/L	0.3 µg/L	92.7	50.0	150	----
Perfluorotetradecanoic acid [PFTeDA]	376-06-7	E745	0.02	µg/L	0.3 µg/L	98.7	50.0	150	----
Perfluorotridecanoic acid [PFTrDA]	72629-94-8	E745	0.02	µg/L	0.3 µg/L	106	50.0	150	----
Perfluoroundecanoic acid [PFUnA]	2058-94-8	E745	0.02	µg/L	0.3 µg/L	92.0	50.0	150	----



Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Perfluoroalkyl Substances (PFAS) (QCLot: 1204258)										
WT2334486-001	Anonymous	Eicosafuoro-3-oxaundecane-1-sulfonic acid, 11-chloro- [11Cl-PF3OUdS]	763051-92-9	E745	0.254 µg/L	0.3 µg/L	84.7	50.0	150	----
		Ethyl perfluorooctanesulfonamide, n- [NEtFOSA]	4151-50-2	E745	0.278 µg/L	0.3 µg/L	92.7	50.0	150	----
		Ethyl perfluorooctanesulfonamidoacetic acid, n- [NEtFOSAA]	2991-50-6	E745	0.272 µg/L	0.3 µg/L	90.7	50.0	150	----
		Ethyl perfluorooctanesulfonamidoeth anol, n- [NEtFOSE]	1691-99-2	E745	0.280 µg/L	0.3 µg/L	93.3	50.0	150	----
		Fluorotelomer carboxylic acid, 3:3 [3:3 FTCA]	356-02-5	E745	0.166 µg/L	0.3 µg/L	55.3	50.0	150	----
		Fluorotelomer carboxylic acid, 5:3 [5:3 FTCA]	914637-49-3	E745	0.270 µg/L	0.3 µg/L	90.0	50.0	150	----
		Fluorotelomer carboxylic acid, 7:3 [7:3 FTCA]	812-70-4	E745	0.266 µg/L	0.3 µg/L	88.7	50.0	150	----
		Fluorotelomer sulfonic acid, 4:2 [4:2 FTS]	757124-72-4	E745	0.280 µg/L	0.3 µg/L	93.3	50.0	150	----
		Fluorotelomer sulfonic acid, 6:2 [6:2 FTS]	27619-97-2	E745	0.300 µg/L	0.3 µg/L	100	50.0	150	----
		Fluorotelomer sulfonic acid, 8:2 [8:2 FTS]	39108-34-4	E745	0.312 µg/L	0.3 µg/L	104	50.0	150	----
		Hexadecafluoro-3-oxanonane-1-sulfonic acid, 9-chloro- [9Cl-PF3ONS]	756426-58-1	E745	0.228 µg/L	0.3 µg/L	76.0	50.0	150	----
		Hexafluoropropylene oxide dimer acid [HFPO-DA]	13252-13-6	E745	3.0 µg/L	3 µg/L	102	50.0	150	----
		Methyl perfluorooctanesulfonamide, N- [NMeFOSA]	31506-32-8	E745	0.290 µg/L	0.3 µg/L	96.7	50.0	150	----
		Methyl perfluorooctanesulfonamidoace tic acid, n- [NMeFOSAA]	2355-31-9	E745	0.292 µg/L	0.3 µg/L	97.3	50.0	150	----
		Methyl perfluorooctanesulfonamidoeth anol, n- [NMeFOSE]	24448-09-7	E745	0.280 µg/L	0.3 µg/L	93.3	50.0	150	----
		Nonafluoro-3,6-dioxaheptanoic acid [NFDHA]	151772-58-6	E745	0.236 µg/L	0.3 µg/L	78.7	50.0	150	----
		perfluoro(2-ethoxyethane)sulfonic acid [PFEEESA]	113507-82-7	E745	0.264 µg/L	0.3 µg/L	88.0	50.0	150	----
		Perfluoro-3-methoxypropanoic acid [PFMPA]	377-73-1	E745	0.206 µg/L	0.3 µg/L	68.7	50.0	150	----
		Perfluoro-4-methoxybutanoic acid [PFMBA]	863090-89-5	E745	0.250 µg/L	0.3 µg/L	83.3	50.0	150	----



Sub-Matrix: Water					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		Qualifier
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	
Perfluoroalkyl Substances (PFAS) (QCLot: 1204258) - continued										
WT2334486-001	Anonymous	Perfluorobutanesulfonic acid [PFBS]	375-73-5	E745	0.250 µg/L	0.3 µg/L	83.3	50.0	150	----
		Perfluorobutanoic acid [PFBA]	375-22-4	E745	0.85 µg/L	1 µg/L	85.4	50.0	150	----
		Perfluorodecane sulfonic acid [PFDS]	335-77-3	E745	0.264 µg/L	0.3 µg/L	88.0	50.0	150	----
		Perfluorodecanoic acid [PFDA]	335-76-2	E745	0.278 µg/L	0.3 µg/L	92.7	50.0	150	----
		Perfluorododecanesulfonic acid [PFDoS]	79780-39-5	E745	0.324 µg/L	0.3 µg/L	108	50.0	150	----
		Perfluorododecanoic acid [PFDoA]	307-55-1	E745	0.286 µg/L	0.3 µg/L	95.3	50.0	150	----
		Perfluoroheptanesulfonic acid [PFHpS]	375-92-8	E745	0.234 µg/L	0.3 µg/L	78.0	50.0	150	----
		Perfluoroheptanoic acid [PFHpA]	375-85-9	E745	0.280 µg/L	0.3 µg/L	93.3	50.0	150	----
		Perfluorohexanesulfonic acid [PFHxS]	355-46-4	E745	0.266 µg/L	0.3 µg/L	88.7	50.0	150	----
		Perfluorohexanoic acid [PFHxA]	307-24-4	E745	0.292 µg/L	0.3 µg/L	97.3	50.0	150	----
		Perfluorononanesulfonic acid [PFNS]	68259-12-1	E745	0.276 µg/L	0.3 µg/L	92.0	50.0	150	----
		Perfluorononanoic acid [PFNA]	375-95-1	E745	0.236 µg/L	0.3 µg/L	78.7	50.0	150	----
		Perfluorononanoic acid, 4,8-dioxa-3H-[ADONA]	919005-14-4	E745	0.248 µg/L	0.3 µg/L	82.7	50.0	150	----
		Perfluorooctanesulfonamide [PFOSA]	754-91-6	E745	0.276 µg/L	0.3 µg/L	92.0	50.0	150	----
		Perfluorooctanesulfonic acid [PFOS]	1763-23-1	E745	0.222 µg/L	0.3 µg/L	74.0	50.0	150	----
		Perfluorooctanoic acid [PFOA]	335-67-1	E745	0.230 µg/L	0.3 µg/L	76.7	50.0	150	----
		Perfluoropentanesulfonic acid [PFPeS]	2706-91-4	E745	0.290 µg/L	0.3 µg/L	96.7	50.0	150	----
		Perfluoropentanoic acid [PFPeA]	2706-90-3	E745	0.284 µg/L	0.3 µg/L	94.7	50.0	150	----
		Perfluorotetradecanoic acid [PFTeDA]	376-06-7	E745	0.306 µg/L	0.3 µg/L	102	50.0	150	----
		Perfluorotridecanoic acid [PFTrDA]	72629-94-8	E745	0.276 µg/L	0.3 µg/L	92.0	50.0	150	----
		Perfluoroundecanoic acid [PFUnA]	2058-94-8	E745	0.302 µg/L	0.3 µg/L	101	50.0	150	----

C.O.C.: -

REPORT No: 23-028406 - Rev. 0

Report To:

City of Kawartha Lakes
PO Box 9000
322 Kent Street West
Lindsay, ON K9V 4T7

CADUCEON Environmental Laboratories

112 Commerce Park Dr Unit L
Barrie, ON L4N 8W8

Attention: Kayla Pantaleo

DATE RECEIVED: 2023-Oct-12
DATE REPORTED: 2023-Nov-02
SAMPLE MATRIX: Ground Water

CUSTOMER PROJECT: Laxton Landfill
P.O. NUMBER:

Analyses	Qty	Site Analyzed	Authorized	Date Analyzed	Lab Method	Reference Method
Anions (Liquid)	18	OTTAWA	VKASYAN	2023-Oct-23	A-IC-01	SM 4110B
BOD5 (Liquid)	1	KINGSTON	JWOLFE2	2023-Oct-20	BOD-001	SM 5210B
COD (Liquid)	18	KINGSTON	EHINCH	2023-Oct-20	COD-001	SM 5220D
Cond/pH/Alk Auto (Liquid)	18	OTTAWA	SBOUDREAU	2023-Oct-18	COND-02/PH-02/A LK-02	SM 2510B/4500H/ 2320B
DOC/DIC (Liquid)	18	OTTAWA	VKASYAN	2023-Oct-20	C-OC-01	EPA 415.2
Ion Balance (Calc.)	18	OTTAWA	STAILLON		CP-028	MECP E3196
Chromium VI (Liquid)	18	OTTAWA	STAILLON	2023-Oct-23	D-CRVI-01	MECP E3056
ICP/MS (Liquid)	18	OTTAWA	TPRICE	2023-Oct-20	D-ICPMS-01	EPA 200.8
ICP/OES (Liquid)	18	OTTAWA	NHOGAN	2023-Oct-17	D-ICP-01	SM 3120B
Mercury (Liquid)	18	OTTAWA	TBENNETT	2023-Oct-18	D-HG-02	SM 3112B
Ammonia (Liquid)	18	KINGSTON	KDIBBITS	2023-Oct-20	NH3-001	SM 4500NH3
Phenols (Liquid)	18	KINGSTON	JMACINNES	2023-Oct-25	PHEN-01	MECP E3179
TP & TKN (Liquid)	18	KINGSTON	KDIBBITS	2023-Oct-25	TPTKN-001	MECP E3516.2
TSS (Liquid)	1	KINGSTON	TSUNNY	2023-Oct-19	TSS-001	SM 2540D
VOC-Volatiles Full (Water)	3	RICHMOND_HILL	FLENA	2023-Oct-19	C-VOC-02	EPA 8260

R.L. = Reporting Limit

NC = Not Calculated

Test methods may be modified from specified reference method unless indicated by an *



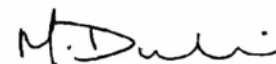
Michelle Dubien
Data Specialist

CADUCEON Environmental Laboratories Certificate of Analysis

Final Report

REPORT No: 23-028406 - Rev. 0

Client I.D.			1	2	3	4	6
Sample I.D.			23-028406-1	23-028406-2	23-028406-3	23-028406-4	23-028406-5
Date Collected			2023-10-11	2023-10-11	2023-10-11	2023-10-11	2023-10-11
Parameter	Units	R.L.	-	-	-	-	-
Alkalinity(CaCO3) to pH4.5	mg/L	5	190	194	319	554	377
TDS (Calc. from Cond.)	mg/L	3	259	263	367	543	356
Conductivity @25°C	uS/cm	1	501	509	706	1020	686
pH @25°C	pH units	-	6.77	6.83	6.79	6.73	6.96
Fluoride	mg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chloride	mg/L	0.5	15.0	17.1	23.8	1.4	1.4
Nitrate (N)	mg/L	0.05	<0.05	0.06	<0.05	0.08	<0.05
Nitrite (N)	mg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulphate	mg/L	1	60	53	34	14	10
BOD5	mg/L	3				<3	
Total Suspended Solids	mg/L	3				11800	
Phosphorus (Total)	mg/L	0.01	<0.01	0.03	0.03	0.71	0.02
Total Kjeldahl Nitrogen	mg/L	0.1	0.9	0.6	4.5	10.0	0.8
Ammonia (N)-Total (NH3+NH4)	mg/L	0.05	0.70	0.43	5.35	9.15	0.37
Dissolved Organic Carbon	mg/L	0.2	6.5	6.0	11.5	12.9	17.0
Phenolics	mg/L	0.001	0.001	<0.001	<0.001	<0.001	<0.001
COD	mg/L	5	22	23	18	85	44
Hardness (as CaCO3)	mg/L	0.02	195	202	286	514	367
Aluminum	mg/L	0.01	0.04	0.03	0.06	0.12	0.08
Barium	mg/L	0.001	0.207	0.219	0.393	0.260	0.063
Boron	mg/L	0.005	1.42	1.20	1.18	0.421	0.080



**Michelle Dubien
Data Specialist**

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Final Report

REPORT No: 23-028406 - Rev. 0

Client I.D.			1	2	3	4	6
Sample I.D.			23-028406-1	23-028406-2	23-028406-3	23-028406-4	23-028406-5
Date Collected			2023-10-11	2023-10-11	2023-10-11	2023-10-11	2023-10-11
Parameter	Units	R.L.	-	-	-	-	-
Calcium	mg/L	0.02	58.0	60.6	88.9	192	116
Iron	mg/L	0.005	0.012	0.008	19.9	94.6	3.43
Magnesium	mg/L	0.02	12.1	12.4	15.6	8.26	18.8
Manganese	mg/L	0.001	1.56	2.11	3.61	6.11	0.502
Phosphorus	mg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Potassium	mg/L	0.1	4.0	4.7	12.9	14.6	3.1
Sodium	mg/L	0.2	26.5	24.3	30.8	5.0	2.0
Strontium	mg/L	0.001	0.339	0.359	0.479	0.780	0.767
Tin	mg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Titanium	mg/L	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	mg/L	0.005	<0.005	<0.005	<0.005	<0.005	0.007
Antimony	mg/L	0.0001	0.0001	<0.0001	<0.0001	<0.0001	0.0002
Arsenic	mg/L	0.0001	0.0002	0.0002	0.0006	0.0054	0.0003
Beryllium	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Cadmium	mg/L	0.000015	0.000110	0.000127	<0.000015	<0.000015	0.000099
Chromium	mg/L	0.001	<0.001	<0.001	<0.001	0.003	0.001
Cobalt	mg/L	0.0001	0.0058	0.0078	0.0091	0.0197	0.0034
Copper	mg/L	0.0001	0.0093	0.0086	0.0010	0.0004	0.0036
Lead	mg/L	0.00002	0.00002	<0.00002	0.00003	<0.00002	<0.00002
Molybdenum	mg/L	0.0001	0.0006	0.0006	0.0006	0.0009	0.0005
Nickel	mg/L	0.0002	0.0051	0.0081	0.0027	0.0011	0.0028



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REPORT No: 23-028406 - Rev. 0

Client I.D.			1	2	3	4	6
Sample I.D.			23-028406-1	23-028406-2	23-028406-3	23-028406-4	23-028406-5
Date Collected			2023-10-11	2023-10-11	2023-10-11	2023-10-11	2023-10-11
Parameter	Units	R.L.	-	-	-	-	-
Selenium	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Silver	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Thallium	mg/L	0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Uranium	mg/L	0.00005	0.00160	0.00235	0.00316	0.00110	0.00342
Vanadium	mg/L	0.0001	0.0002	0.0002	0.0031	0.0120	0.0029
Chromium (VI)	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Mercury	mg/L	0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Anion Sum	meq/L	-	5.47	5.48	7.76	11.4	7.78
Cation Sum	meq/L	-	5.26	5.34	8.98	11.7	7.75
% Difference	%	-	1.99	1.33	7.27	1.34	0.195
Ion Ratio	-	-	1.04	1.03	0.864	0.973	1.00
Sodium Adsorption Ratio	-	-	0.826	0.743	0.792	0.0954	0.0459
TDS (Ion Sum Calc)	mg/L	1	292	292	428	587	382
TDS(calc.)/EC(actual)	-	-	0.584	0.574	0.606	0.577	0.557
Conductivity Calc	µmho/cm	-	515	517	713	1000	678
Conductivity Calc / Conductivity	-	-	1.03	1.02	1.01	0.988	0.988
Langelier Index(25°C)	-	-	-0.631	-0.542	-0.219	0.284	0.148
Saturation pH (25°C)	-	-	7.40	7.37	7.01	6.45	6.81
pH (Client Data)	pH units	-	7.02	6.85	6.73	6.65	7.35
Temperature (Client Data)	°C	-	10.3	10	9.4	9	7.7



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Client I.D.			7-1	7	8	10	12
Sample I.D.			23-028406-6	23-028406-7	23-028406-8	23-028406-9	23-028406-10
Date Collected			2023-10-11	2023-10-11	2023-10-11	2023-10-11	2023-10-11
Parameter	Units	R.L.	-	-	-	-	-
Alkalinity(CaCO3) to pH4.5	mg/L	5	286	295	189	154	155
TDS (Calc. from Cond.)	mg/L	3	377	389	229	558	194
Conductivity @25°C	uS/cm	1	724	745	443	1040	376
pH @25°C	pH units	-	6.84	6.88	6.80	6.94	6.76
Fluoride	mg/L	0.1	<0.1	<0.1	<0.1	0.3	<0.1
Chloride	mg/L	0.5	34.2	34.7	7.4	5.1	10.3
Nitrate (N)	mg/L	0.05	<0.05	0.07	4.82	<0.05	0.05
Nitrite (N)	mg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulphate	mg/L	1	48	52	7	449	30
Phosphorus (Total)	mg/L	0.01	0.06	0.09	0.14	<0.01	1.90
Total Kjeldahl Nitrogen	mg/L	0.1	6.0	5.7	1.1	1.3	0.8
Ammonia (N)-Total (NH3+NH4)	mg/L	0.05	6.19	5.91	0.16	1.21	0.09
Dissolved Organic Carbon	mg/L	0.2	11.8	10.8	22.2	3.5	3.7
Phenolics	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
COD	mg/L	5	53	55	43	9	47
Hardness (as CaCO3)	mg/L	0.02	270	275	164	483	149
Aluminum	mg/L	0.01	0.07	0.07	0.04	0.10	0.03
Barium	mg/L	0.001	0.422	0.429	0.403	0.069	0.160
Boron	mg/L	0.005	1.13	1.15	0.130	0.112	0.741
Calcium	mg/L	0.02	83.2	84.5	47.4	169	35.8
Iron	mg/L	0.005	7.91	8.18	0.029	2.91	1.04



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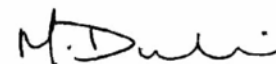
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Client I.D.			7-1	7	8	10	12
Sample I.D.			23-028406-6	23-028406-7	23-028406-8	23-028406-9	23-028406-10
Date Collected			2023-10-11	2023-10-11	2023-10-11	2023-10-11	2023-10-11
Parameter	Units	R.L.	-	-	-	-	-
Magnesium	mg/L	0.02	15.2	15.4	11.0	14.7	14.5
Manganese	mg/L	0.001	2.05	2.07	1.12	0.242	0.060
Phosphorus	mg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Potassium	mg/L	0.1	14.9	15.2	42.3	2.5	2.8
Sodium	mg/L	0.2	34.6	35.0	2.8	8.7	18.0
Strontium	mg/L	0.001	0.439	0.446	0.380	4.27	0.260
Tin	mg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Titanium	mg/L	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	mg/L	0.005	0.005	<0.005	<0.005	<0.005	<0.005
Antimony	mg/L	0.0001	0.0001	0.0002	0.0001	0.0001	<0.0001
Arsenic	mg/L	0.0001	0.0008	0.0009	0.0034	<0.0001	<0.0001
Beryllium	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Cadmium	mg/L	0.00001 5	0.000028	0.000030	0.000109	<0.000015	<0.000015
Chromium	mg/L	0.001	0.002	0.002	<0.001	<0.001	<0.001
Cobalt	mg/L	0.0001	0.0104	0.0110	0.0273	0.0003	0.0017
Copper	mg/L	0.0001	0.0015	0.0018	0.0535	0.0005	0.0009
Lead	mg/L	0.00002	0.00004	0.00004	<0.00002	<0.00004	<0.00002
Molybdenum	mg/L	0.0001	0.0005	0.0005	0.0009	0.0030	0.0004
Nickel	mg/L	0.0002	0.0041	0.0044	0.0112	0.0003	0.0016
Selenium	mg/L	0.001	<0.001	<0.001	0.002	<0.001	<0.001
Silver	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001



**Michelle Dubien
Data Specialist**

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Client I.D.			7-1	7	8	10	12
Sample I.D.			23-028406-6	23-028406-7	23-028406-8	23-028406-9	23-028406-10
Date Collected			2023-10-11	2023-10-11	2023-10-11	2023-10-11	2023-10-11
Parameter	Units	R.L.	-	-	-	-	-
Thallium	mg/L	0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Uranium	mg/L	0.00005	0.00199	0.00192	0.00310	0.00326	0.00038
Vanadium	mg/L	0.0001	0.0015	0.0017	0.0002	0.0002	<0.0001
Chromium (VI)	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Mercury	mg/L	0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Anion Sum	meq/L	-	7.68	7.94	4.48	12.5	4.02
Cation Sum	meq/L	-	8.23	8.33	4.54	10.5	3.90
% Difference	%	-	3.48	2.40	0.630	8.72	1.49
Ion Ratio	-	-	0.933	0.953	0.987	1.19	1.03
Sodium Adsorption Ratio	-	-	0.916	0.919	0.0966	0.173	0.641
TDS (Ion Sum Calc)	mg/L	1	420	431	254	745	206
TDS(calc.)/EC(actual)	-	-	0.580	0.579	0.574	0.714	0.548
Conductivity Calc	µmho/cm	-	730	744	447	1110	378
Conductivity Calc / Conductivity	-	-	1.01	0.999	1.01	1.07	1.01
Langelier Index(25°C)	-	-	-0.246	-0.187	-0.679	-0.127	-0.928
Saturation pH (25°C)	-	-	7.09	7.07	7.48	7.07	7.69
pH (Client Data)	pH units	-	7.4	7.4	7.9	7.1	7.5
Temperature (Client Data)	°C	-	10.2	10.2	7	10.9	8.1



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Client I.D.			13	14	16-I	16	19
Sample I.D.			23-028406-11	23-028406-12	23-028406-13	23-028406-14	23-028406-15
Date Collected			2023-10-11	2023-10-11	2023-10-11	2023-10-11	2023-10-11
Parameter	Units	R.L.	-	-	-	-	-
Alkalinity(CaCO3) to pH4.5	mg/L	5	151	107	172	196	150
TDS (Calc. from Cond.)	mg/L	3	173	123	205	225	169
Conductivity @25°C	uS/cm	1	337	240	398	435	329
pH @25°C	pH units	-	6.84	6.66	6.75	6.99	6.73
Fluoride	mg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chloride	mg/L	0.5	8.2	3.1	10.0	11.4	7.1
Nitrate (N)	mg/L	0.05	<0.05	<0.05	<0.05	0.07	<0.05
Nitrite (N)	mg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulphate	mg/L	1	29	15	31	29	25
Phosphorus (Total)	mg/L	0.01	0.06	0.31	<0.01	2.97	<0.01
Total Kjeldahl Nitrogen	mg/L	0.1	0.2	0.1	0.2	1.0	0.4
Ammonia (N)-Total (NH3+NH4)	mg/L	0.05	<0.05	0.07	0.11	0.14	0.53
Dissolved Organic Carbon	mg/L	0.2	2.9	1.8	4.1	4.4	2.9
Phenolics	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
COD	mg/L	5	11	13	14	49	13
Hardness (as CaCO3)	mg/L	0.02	135	116	163	186	134
Aluminum	mg/L	0.01	0.03	0.03	0.04	0.03	0.03
Barium	mg/L	0.001	0.128	0.095	0.197	0.133	0.150
Boron	mg/L	0.005	0.715	0.041	0.776	0.558	0.543
Calcium	mg/L	0.02	32.6	28.3	42.5	47.4	33.6
Iron	mg/L	0.005	0.224	0.190	0.061	0.460	0.007



**Michelle Dubien
Data Specialist**

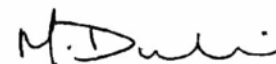
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Client I.D.			13	14	16-I	16	19
Sample I.D.			23-028406-11	23-028406-12	23-028406-13	23-028406-14	23-028406-15
Date Collected			2023-10-11	2023-10-11	2023-10-11	2023-10-11	2023-10-11
Parameter	Units	R.L.	-	-	-	-	-
Magnesium	mg/L	0.02	13.1	11.1	13.8	16.4	12.2
Manganese	mg/L	0.001	0.007	0.004	0.194	0.359	0.064
Phosphorus	mg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Potassium	mg/L	0.1	2.7	2.0	3.4	3.6	2.5
Sodium	mg/L	0.2	16.2	1.9	17.2	16.1	12.2
Strontium	mg/L	0.001	0.250	0.211	0.317	0.365	0.258
Tin	mg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Titanium	mg/L	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	mg/L	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Antimony	mg/L	0.0001	0.0002	<0.0001	0.0001	0.0002	<0.0001
Arsenic	mg/L	0.0001	<0.0001	<0.0001	<0.0001	0.0002	<0.0001
Beryllium	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Cadmium	mg/L	0.000015	<0.000015	<0.000015	0.000032	0.000059	0.000025
Chromium	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt	mg/L	0.0001	0.0007	0.0002	0.0012	0.0060	0.0009
Copper	mg/L	0.0001	0.0008	0.0002	0.0041	0.0024	0.0039
Lead	mg/L	0.00002	0.00003	<0.00002	0.00003	0.00002	0.00002
Molybdenum	mg/L	0.0001	0.0003	0.0003	0.0003	0.0004	0.0003
Nickel	mg/L	0.0002	0.0012	0.0003	0.0023	0.0056	0.0011
Selenium	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Silver	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001



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Client I.D.			13	14	16-I	16	19
Sample I.D.			23-028406-11	23-028406-12	23-028406-13	23-028406-14	23-028406-15
Date Collected			2023-10-11	2023-10-11	2023-10-11	2023-10-11	2023-10-11
Parameter	Units	R.L.	-	-	-	-	-
Thallium	mg/L	0.00005	<0.00005	<0.00005	<0.00005	0.00005	<0.00005
Uranium	mg/L	0.00005	0.00096	0.00127	0.00109	0.00678	0.00058
Vanadium	mg/L	0.0001	<0.0001	<0.0001	0.0001	0.0004	0.0001
Chromium (VI)	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Mercury	mg/L	0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Anion Sum	meq/L	-	3.85	2.54	4.38	4.84	3.73
Cation Sum	meq/L	-	3.50	2.48	4.12	4.56	3.32
% Difference	%	-	4.73	1.22	3.08	2.98	5.80
Ion Ratio	-	-	1.10	1.02	1.06	1.06	1.12
Sodium Adsorption Ratio	-	-	0.606	0.0750	0.586	0.514	0.458
TDS (Ion Sum Calc)	mg/L	1	192	126	222	243	184
TDS(calc.)/EC(actual)	-	-	0.571	0.525	0.558	0.558	0.559
Conductivity Calc	µmho/cm	-	352	243	405	442	339
Conductivity Calc / Conductivity	-	-	1.04	1.01	1.02	1.02	1.03
Langelier Index(25°C)	-	-	-0.890	-1.24	-0.818	-0.475	-0.980
Saturation pH (25°C)	-	-	7.73	7.90	7.57	7.46	7.71
pH (Client Data)	pH units	-	7.49	7.51	7.22	7.1	7.34
Temperature (Client Data)	°C	-	7.7	7.4	9.7	8.3	9.4



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			Client I.D.	8-1	20-I	20-II
			Sample I.D.	23-028406-16	23-028406-17	23-028406-18
			Date Collected	2023-10-11	2023-10-11	2023-10-11
Parameter	Units	R.L.		-	-	-
Alkalinity(CaCO3) to pH4.5	mg/L	5		192	230	168
TDS (Calc. from Cond.)	mg/L	3		229	285	161
Conductivity @25°C	uS/cm	1		444	550	313
pH @25°C	pH units	-		6.79	6.87	6.78
Fluoride	mg/L	0.1		<0.1	<0.1	<0.1
Chloride	mg/L	0.5		7.6	17.4	1.7
Nitrate (N)	mg/L	0.05		4.68	0.11	<0.05
Nitrite (N)	mg/L	0.05		<0.05	<0.05	<0.05
Sulphate	mg/L	1		7	46	5
Phosphorus (Total)	mg/L	0.01		0.15	0.05	0.21
Total Kjeldahl Nitrogen	mg/L	0.1		1.2	0.3	0.5
Ammonia (N)-Total (NH3+NH4)	mg/L	0.05		0.19	0.12	0.21
Dissolved Organic Carbon	mg/L	0.2		22.1	6.5	12.7
Phenolics	mg/L	0.001		<0.001	<0.001	<0.001
COD	mg/L	5		55	24	53
Hardness (as CaCO3)	mg/L	0.02		167	245	158
Aluminum	mg/L	0.01		0.04	0.04	0.06
Barium	mg/L	0.001		0.410	0.178	0.050
Boron	mg/L	0.005		0.126	0.629	0.031
Calcium	mg/L	0.02		48.8	67.0	41.0
Iron	mg/L	0.005		0.028	3.97	2.42



Michelle Dubien
Data Specialist

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Final Report
REPORT No: 23-028406 - Rev. 0

Client I.D.			8-1	20-I	20-II
Sample I.D.			23-028406-16	23-028406-17	23-028406-18
Date Collected			2023-10-11	2023-10-11	2023-10-11
Parameter	Units	R.L.	-	-	-
Magnesium	mg/L	0.02	10.9	18.8	13.5
Manganese	mg/L	0.001	1.14	1.03	0.621
Phosphorus	mg/L	0.1	<0.1	<0.1	<0.1
Potassium	mg/L	0.1	41.0	4.6	1.8
Sodium	mg/L	0.2	2.8	18.7	1.9
Strontium	mg/L	0.001	0.370	0.641	0.351
Tin	mg/L	0.05	<0.05	<0.05	<0.05
Titanium	mg/L	0.005	<0.005	<0.005	<0.005
Zinc	mg/L	0.005	<0.005	<0.005	<0.005
Antimony	mg/L	0.0001	0.0001	<0.0001	<0.0001
Arsenic	mg/L	0.0001	0.0033	0.0003	0.0008
Beryllium	mg/L	0.0001	<0.0001	<0.0001	0.0001
Cadmium	mg/L	0.00001 5	0.000101	<0.000015	<0.000015
Chromium	mg/L	0.001	<0.001	<0.001	0.002
Cobalt	mg/L	0.0001	0.0273	0.0011	0.0004
Copper	mg/L	0.0001	0.0525	0.0006	0.0010
Lead	mg/L	0.00002	<0.00002	0.00004	0.00026
Molybdenum	mg/L	0.0001	0.0009	0.0012	0.0002
Nickel	mg/L	0.0002	0.0112	0.0019	0.0008
Selenium	mg/L	0.001	0.002	<0.001	<0.001
Silver	mg/L	0.0001	<0.0001	<0.0001	<0.0001



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Final Report
REPORT No: 23-028406 - Rev. 0

Client I.D.			8-1	20-I	20-II
Sample I.D.			23-028406-16	23-028406-17	23-028406-18
Date Collected			2023-10-11	2023-10-11	2023-10-11
Parameter	Units	R.L.	-	-	-
Thallium	mg/L	0.00005	<0.00005	<0.00005	<0.00005
Uranium	mg/L	0.00005	0.00324	0.00676	0.00121
Vanadium	mg/L	0.0001	0.0002	0.0008	0.0124
Chromium (VI)	mg/L	0.01	<0.01	<0.01	<0.01
Mercury	mg/L	0.00002	<0.00002	<0.00002	<0.00002
Anion Sum	meq/L	-	4.53	6.04	3.52
Cation Sum	meq/L	-	4.57	6.09	3.46
% Difference	%	-	0.382	0.466	0.904
Ion Ratio	-	-	0.992	0.991	1.02
Sodium Adsorption Ratio	-	-	0.0937	0.520	0.0658
TDS (Ion Sum Calc)	mg/L	1	255	315	170
TDS(calc.)/EC(actual)	-	-	0.575	0.574	0.542
Conductivity Calc	µmho/cm	-	449	558	317
Conductivity Calc / Conductivity	-	-	1.01	1.01	1.01
Langelier Index(25°C)	-	-	-0.670	-0.385	-0.794
Saturation pH (25°C)	-	-	7.46	7.26	7.57
pH (Client Data)	pH units	-	7.9	7.04	7.48
Temperature (Client Data)	°C	-	7	12	11



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Final Report
REPORT No: 23-028406 - Rev. 0

			Client I.D.	3	6	16-I
			Sample I.D.	23-028406-3	23-028406-5	23-028406-13
			Date Collected	2023-10-11	2023-10-11	2023-10-11
Parameter	Units	R.L.		-	-	-
Acetone	µg/L	30		<30	<30	<30
Benzene	µg/L	0.5		<0.5	<0.5	<0.5
Bromobenzene	µg/L	0.4		<0.4	<0.4	<0.4
Bromochloromethane	µg/L	0.2		<0.2	<0.2	<0.2
Bromodichloromethane	µg/L	2		<2	<2	<2
Bromoform	µg/L	5		<5	<5	<5
Bromomethane	µg/L	0.5		<0.5	<0.5	<0.5
Carbon Tetrachloride	µg/L	0.2		<0.2	<0.2	<0.2
Chlorobenzene	µg/L	0.5		0.5	<0.5	<0.5
Chloroethane	µg/L	3		<3	<3	<3
Chloroform	µg/L	1		<1	<1	<1
Chloromethane (Methyl Chloride)	µg/L	2		<2	<2	<2
Chlorotoluene,2-	µg/L	0.2		<0.2	<0.2	<0.2
Chlorotoluene,4-	µg/L	0.2		<0.2	<0.2	<0.2
Dibromo-3-Chloropropane,1,2-	µg/L	0.6		<0.6	<0.6	<0.6
Dibromochloromethane	µg/L	2		<2	<2	<2
Ethylene Dibromide	µg/L	0.2		<0.2	<0.2	<0.2
Dibromomethane	µg/L	0.5		<0.5	<0.5	<0.5
Dichlorobenzene,1,2-	µg/L	0.5		<0.5	<0.5	<0.5
Dichlorobenzene,1,3-	µg/L	0.5		<0.5	<0.5	<0.5
Dichlorobenzene,1,4-	µg/L	0.5		<0.5	<0.5	<0.5



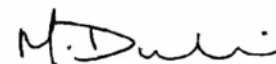
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Final Report
REPORT No: 23-028406 - Rev. 0

			Client I.D.	3	6	16-I
			Sample I.D.	23-028406-3	23-028406-5	23-028406-13
			Date Collected	2023-10-11	2023-10-11	2023-10-11
Parameter	Units	R.L.		-	-	-
Dichlorodifluoromethane (Freon 12)	µg/L	2		<2	<2	<2
Dichloroethane, 1,1-	µg/L	0.5		<0.5	<0.5	<0.5
Dichloroethane, 1,2-	µg/L	0.5		<0.5	<0.5	<0.5
Dichloroethylene, 1,1-	µg/L	0.5		<0.5	<0.5	<0.5
Dichloroethylene, 1,2-cis-	µg/L	0.5		<0.5	<0.5	<0.5
Dichloroethylene, 1,2-cis+trans-	µg/L	0.7		<0.7	<0.7	<0.7
Dichloroethylene, 1,2-trans-	µg/L	0.5		<0.5	<0.5	<0.5
Dichloropropane, 1,2-	µg/L	0.5		<0.5	<0.5	<0.5
Dichloropropane, 1,3-	µg/L	0.2		<0.2	<0.2	<0.2
Dichloropropane, 2,2-	µg/L	0.2		<0.2	<0.2	<0.2
Dichloropropene, 1,1-	µg/L	0.2		<0.2	<0.2	<0.2
Dichloropropene, 1,3-cis-	µg/L	0.5		<0.5	<0.5	<0.5
Dichloropropene, 1,3-cis+trans- (Calculated)	µg/L	0.5		<0.5	<0.5	<0.5
Dichloropropene, 1,3-trans-	µg/L	0.5		<0.5	<0.5	<0.5
Dioxane, 1,4-	µg/L	20		<20	<20	<20
Ethylbenzene	µg/L	0.5		<0.5	<0.5	<0.5
Hexachlorobutadiene	µg/L	0.6		<0.6	<0.6	<0.6
Hexane	µg/L	5		<5	<5	<5
Isopropylbenzene	µg/L	0.2		<0.2	<0.2	<0.2
Methyl Butyl Ketone	µg/L	5		<5	<5	<5
Dichloromethane (Methylene Chloride)	µg/L	5		<5	<5	<5



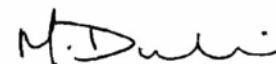
Michelle Dubien
Data Specialist

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Final Report
REPORT No: 23-028406 - Rev. 0

			Client I.D.	3	6	16-I
			Sample I.D.	23-028406-3	23-028406-5	23-028406-13
			Date Collected	2023-10-11	2023-10-11	2023-10-11
Parameter	Units	R.L.		-	-	-
Methyl Ethyl Ketone	µg/L	20		<20	<20	<20
Methyl Isobutyl Ketone	µg/L	20		<20	<20	<20
Methyl tert-Butyl Ether (MTBE)	µg/L	2		<2	<2	<2
Naphthalene	µg/L	0.4		<0.4	<0.4	<0.4
n-Butylbenzene	µg/L	0.4		<0.4	<0.4	<0.4
n-Propylbenzene	µg/L	0.1		<0.1	<0.1	<0.1
p-Isopropyltoluene	µg/L	0.2		<0.2	<0.2	<0.2
sec-Butylbenzene	µg/L	0.1		<0.1	<0.1	<0.1
Styrene	µg/L	0.5		<0.5	<0.5	<0.5
tert-Butylbenzene	µg/L	0.1		<0.1	<0.1	<0.1
Tetrachloroethane,1,1,1,2-	µg/L	0.5		<0.5	<0.5	<0.5
Tetrachloroethane,1,1,2,2-	µg/L	0.5		<0.5	<0.5	<0.5
Tetrachloroethylene	µg/L	0.5		<0.5	<0.5	<0.5
Total Trihalomethanes	µg/L	6		<6	<6	<6
Toluene	µg/L	0.5		<0.5	<0.5	<0.5
Trichlorobenzene,1,2,3-	µg/L	0.5		<0.5	<0.5	<0.5
Trichlorobenzene,1,2,4-	µg/L	0.5		<0.5	<0.5	<0.5
Trichloroethane,1,1,1,-	µg/L	0.5		<0.5	<0.5	<0.5
Trichloroethane,1,1,2,-	µg/L	0.5		<0.5	<0.5	<0.5
Trichloroethylene	µg/L	0.5		<0.5	<0.5	<0.5
Trichlorofluoromethane (Freon 11)	µg/L	5		<5	<5	<5



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Final Report
REPORT No: 23-028406 - Rev. 0

			Client I.D.	3	6	16-I
			Sample I.D.	23-028406-3	23-028406-5	23-028406-13
			Date Collected	2023-10-11	2023-10-11	2023-10-11
Parameter	Units	R.L.		-	-	-
Trichloropropane, 1,2,3-	µg/L	0.5		<0.5	<0.5	<0.5
Trimethylbenzene, 1,2,4-	µg/L	1		<1	<1	<1
Trimethylbenzene, 1,3,5-	µg/L	0.1		<0.1	<0.1	<0.1
Vinyl Chloride	µg/L	0.2		<0.2	<0.2	<0.2
Xylene, m,p-	µg/L	1		<1	<1	<1
Xylene, m,p,o-	µg/L	1.1		<1.1	<1.1	<1.1
Xylene, o-	µg/L	0.5		<0.5	<0.5	<0.5



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CERTIFICATE OF ANALYSIS

Final Report

C.O.C.:

REPORT No: - Rev. 0

Attention: Kayla Pantaleo

Client I.D.

Sample I.D.

Date Collected

Parameter

Units

R.L.

C.O.C.: -

REPORT No: 23-029350 - Rev. 0

Report To:

City of Kawartha Lakes
PO Box 9000
322 Kent Street West
Lindsay, ON K9V 4T7

CADUCEON Environmental Laboratories

112 Commerce Park Dr Unit L
Barrie, ON L4N 8W8

Attention: Kayla Pantaleo

DATE RECEIVED: 2023-Oct-19
DATE REPORTED: 2023-Nov-07
SAMPLE MATRIX: Ground Water

CUSTOMER PROJECT: Laxton Landfill
P.O. NUMBER:

Analyses	Qty	Site Analyzed	Authorized	Date Analyzed	Lab Method	Reference Method
VOC-Volatiles Full (Water)	1	RICHMOND_HILL	FLENA	2023-Oct-29	C-VOC-02	EPA 8260

R.L. = Reporting Limit

NC = Not Calculated

Test methods may be modified from specified reference method unless indicated by an *

		Client I.D.	Sample I.D.	Date Collected
		4	23-029350-1	2023-10-18
Parameter	Units	R.L.		
Acetone	µg/L	30	<30	
Benzene	µg/L	0.5	1.0	
Bromodichloromethane	µg/L	2	<2	
Bromoform	µg/L	5	<5	
Bromomethane	µg/L	0.5	<0.5	
Carbon Tetrachloride	µg/L	0.2	<0.2	
Chlorobenzene	µg/L	0.5	<0.5	
Chloroform	µg/L	1	<1	
Chloromethane (Methyl Chloride)	µg/L	2	<2	
Dibromochloromethane	µg/L	2	<2	
Ethylene Dibromide	µg/L	0.2	<0.2	



Michelle Dubien
Data Specialist

		Client I.D.	4
		Sample I.D.	23-029350-1
		Date Collected	2023-10-18
Parameter	Units	R.L.	-
Dichlorobenzene,1,2-	µg/L	0.5	<0.5
Dichlorobenzene,1,3-	µg/L	0.5	<0.5
Dichlorobenzene,1,4-	µg/L	0.5	<0.5
Dichloroethane,1,1-	µg/L	0.5	<0.5
Dichloroethane,1,2-	µg/L	0.5	<0.5
Dichloroethylene,1,1-	µg/L	0.5	<0.5
Dichloroethylene,1,2-cis-	µg/L	0.5	<0.5
Dichloroethylene,1,2-trans-	µg/L	0.5	<0.5
Dichloropropane,1,2-	µg/L	0.5	<0.5
Dichloropropene,1,3-cis-	µg/L	0.5	<0.5
Dichloropropene,1,3-trans-	µg/L	0.5	<0.5
Ethylbenzene	µg/L	0.5	<0.5
Dichloromethane (Methylene Chloride)	µg/L	5	<5
Methyl Ethyl Ketone	µg/L	20	<20
Methyl Isobutyl Ketone	µg/L	20	<20
Methyl tert-Butyl Ether (MTBE)	µg/L	2	<2
Styrene	µg/L	0.5	<0.5
Tetrachloroethane,1,1,1,2-	µg/L	0.5	<0.5
Tetrachloroethane,1,1,2,2-	µg/L	0.5	<0.5
Tetrachloroethylene	µg/L	0.5	<0.5
Toluene	µg/L	0.5	<0.5

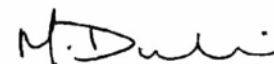


Michelle Dubien
Data Specialist

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Final Report
REPORT No: 23-029350 - Rev. 0

		Client I.D.	4
		Sample I.D.	23-029350-1
		Date Collected	2023-10-18
Parameter	Units	R.L.	-
Trichlorobenzene, 1,2,4-	µg/L	0.5	<0.5
Trichloroethane, 1,1,1,-	µg/L	0.5	<0.5
Trichloroethane, 1,1,2,-	µg/L	0.5	<0.5
Trichloroethylene	µg/L	0.5	<0.5
Trichlorofluoromethane (Freon 11)	µg/L	5	<5
Vinyl Chloride	µg/L	0.2	<0.2
Xylene, m,p-	µg/L	1	<1
Xylene, o-	µg/L	0.5	<0.5



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		SAMPLES SUBMITTED TO:		TESTING REQUIREMENTS						REPORT NUMBER (Lab Use)																							
		Kingston ☐ Ottawa ☐ Richmond Hill ☐ Barrie ☒ London ☐ Windsor ☐	☐ Q/Rag 153 ☐ RPT ☐ Medium/Fine ☐ MISA Guidelines ☐ Provincial Water Quality Objectives ☐ Other	☐ Table (1-9) ☐ ICC ☐ Course	☐ Record of Site (Y/N) ☐ Agricultural ☐ Q/Rag 153 Leachate Analysis ☐ Site ☒ Landfill Monitoring	23-028412																											
Are any samples to be submitted intended for Human Consumption under any Drinking Water Regulations? ☐ Yes ☒ No (If yes, submit all Drinking Water Samples on a Drinking Water Chain of Custody)																																	
Organization: City of Kawartha Lakes		Address: 322 Kent St. W. Lindsay, Ontario		Invoicing Address (if different):		ANALYSES REQUESTED (type text in the boxes)				TURNAROUND SERVICE REQUESTED (see back page)																							
Contact: Kayla Pantaleo		Quote No.:		Project Name/No. LAXTON LANDFILL		<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width: 10%;">2B4B</td> <td style="width: 10%;">2C4C</td> <td style="width: 10%;">VOC</td> <td style="width: 10%;">Al (diss)</td> <td style="width: 10%;">Suspended Highly Contaminants</td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </table>				2B4B	2C4C	VOC	Al (diss)	Suspended Highly Contaminants						<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width: 10%;">Platinum</td> <td style="width: 10%;">200% Surcharge</td> </tr> <tr> <td>Gold</td> <td>100% Surcharge</td> </tr> <tr> <td>Silver</td> <td>50% Surcharge</td> </tr> <tr> <td>Bronze</td> <td>25% Surcharge</td> </tr> <tr> <td>☒ Standard</td> <td>5-7 days</td> </tr> <tr> <td colspan="2">Specific Date: _____</td> </tr> </table>		Platinum	200% Surcharge	Gold	100% Surcharge	Silver	50% Surcharge	Bronze	25% Surcharge	☒ Standard	5-7 days	Specific Date: _____	
2B4B	2C4C									VOC	Al (diss)	Suspended Highly Contaminants																					
Platinum	200% Surcharge																																
Gold	100% Surcharge																																
Silver	50% Surcharge																																
Bronze	25% Surcharge																																
☒ Standard	5-7 days																																
Specific Date: _____																																	
Tel: _____ Fax: _____		P.O. No.:		Additional Info:																													
Email: Kpantaleo@kawarthalakes.ca																																	
Additional Info (email, cell, etc.):																																	

* Sample Matrix Legend: WW=Waste Water, SW=Surface Water, GW=Groundwater, LS=Liquid Sludge, SS=Solid Sludge, S=Soil, Sed=Sediment, PC=Paint Chips, F=Filter, Oil=Oil

Lab No.	Sample Source and/or Sample Identification	S.P.L.	Sample Matrix *	Date Collected (yy-mm-dd)	Time Collected	Indicate Test For Each Sample										X	Field		# Bottles/ Sample	Field Filtered Y/N
						By Using A Check Mark In The Box Provided											pH	Temp.		
16-I		1BE98	GW	23-04-26		X	X									7.22	9.7		Y	
16		1F87A	GW	23-04-26		X										7.1	8.3		Y	
19		31BF2	GW	23-04-26		X										7.34	9.4		Y	
DUP		-		23-04-26												7.9	7		Y	
1	SWA	1A2B6	SW	23-04-26 23-10-11			X		X							8.55	4.7	9	N	
2	SWD	1A2D6	SW	23-04-26 23-10-11			X		X							7.81	8.5	9	N	
3	SWF	1A2D8	SW	23-04-26 23-10-11			X	X	X							7.27	10	11	N	
4	SWC2	3151C	SW	23-04-26 23-10-11			X		X							7.59	12.2	9	N	
20-I		-	GW	23-04-26		X		X								7.04	12		Y	
20-II		-	GW	23-04-26		X		X								7.48	11		Y	

SAMPLE SUBMISSION INFORMATION		SHIPPING INFORMATION		REPORTING / INVOICING		SAMPLE RECEIVING INFORMATION (LABORATORY USE ONLY)			
Sampled by:	Submitted by:	Courier (Client account)	☐	Invoice	Report by Fax	Received By (print):	Nicholas		
Print: Drew West	Drew West	Courier (Caduceus account)	☐		Report by Email	Date Received (yy-mm-dd):	23-10-12		
Sign: DW	DW	Drop Off (AH)	☒	# of Pieces:	Invoice by Email	Laboratory Prepared Bottles:	☒ Yes ☐ No		
23-04-26	23-04-27	Caduceus (Pick up)	☐	2	Invoice by Mail	Sample Temperature °C:	9.8		
Date (yy-mm-dd) Time:		Date (yy-mm-dd) Time:				Labeled by:	JP		
Comments:		date changed as per email NH 23-10-13							

1-4: Genchem + nut + cyanide + phendyl → K
 1-4: Genchem + Doc + Hg + CrVI + Metal (uf) + Metal (ef) → U

3: visls → RH

C.O.C.: -

REPORT No: 23-028412 - Rev. 0

Report To:

City of Kawartha Lakes
PO Box 9000
322 Kent Street West
Lindsay, ON K9V 4T7

CADUCEON Environmental Laboratories

112 Commerce Park Dr Unit L
Barrie, ON L4N 8W8

Attention: Kayla Pantaleo

DATE RECEIVED: 2023-Oct-12
DATE REPORTED: 2023-Oct-30
SAMPLE MATRIX: Surface Water

CUSTOMER PROJECT: Laxton Landfill
P.O. NUMBER:

Analyses	Qty	Site Analyzed	Authorized	Date Analyzed	Lab Method	Reference Method
Anions (Liquid)	4	OTTAWA	VKASYAN	2023-Oct-24	A-IC-01	SM 4110B
BOD5 (Liquid)	4	KINGSTON	JWOLFE2	2023-Oct-20	BOD-001	SM 5210B
COD (Liquid)	4	KINGSTON	EHINCH	2023-Oct-20	COD-001	SM 5220D
Colour (Liquid)	4	OTTAWA	MDON	2023-Oct-18	A-COL-01	SM 2120C
Cond/pH/Alk Auto (Liquid)	4	OTTAWA	SBOUDREAU	2023-Oct-18	COND-02/PH-02/A LK-02	SM 2510B/4500H/ 2320B
Cyanide WAD (Liquid)	4	KINGSTON	JMACINNES	2023-Oct-20	CN-001	SM 4500-CN-E
DOC/DIC (Liquid)	4	OTTAWA	VKASYAN	2023-Oct-24	C-OC-01	EPA 415.2
Ion Balance (Calc.)	4	OTTAWA	STAILLON		CP-028	MECP E3196
Chromium VI (Liquid)	4	OTTAWA	STAILLON	2023-Oct-19	D-CRVI-01	MECP E3056
ICP/MS Total (Liquid)	4	OTTAWA	AOZKAYMAK	2023-Oct-18	D-ICPMS-01	EPA 6020
ICP/OES Total (Liquid)	4	OTTAWA	NHOGAN	2023-Oct-18	D-ICP-01	SM 3120B
ICP/OES (Liquid)	4	OTTAWA	NHOGAN	2023-Oct-18	D-ICP-01	SM 3120B
Mercury (Liquid)	4	OTTAWA	TBENNETT	2023-Oct-18	D-HG-02	SM 3112B
Ammonia & o-Phosphate (Liquid)	4	KINGSTON	KDIBBITS	2023-Oct-20	NH3-001	SM 4500NH3
Phenols (Liquid)	4	KINGSTON	JMACINNES	2023-Oct-26	PHEN-01	MECP E3179
TP & TKN (Liquid)	4	KINGSTON	KDIBBITS	2023-Oct-27	TPTKN-001	MECP E3516.2
TSS (Liquid)	4	KINGSTON	TSUNNY	2023-Oct-19	TSS-001	SM 2540D
Turbidity (Liquid)	4	OTTAWA	MDON	2023-Oct-18	A-TURB-01	SM 2130B
VOC-Volatiles Full (Water)	1	RICHMOND_HILL	FLENA	2023-Oct-19	C-VOC-02	EPA 8260

R.L. = Reporting Limit

NC = Not Calculated

Test methods may be modified from specified reference method unless indicated by an *



Michelle Dubien
Data Specialist

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Parameter	Client I.D.		SWA	SWD	SWF	SWC2
	Sample I.D.		23-028412-1	23-028412-2	23-028412-3	23-028412-4
	Date Collected		2023-10-11	2023-10-11	2023-10-11	2023-10-11
	Units	R.L.	-	-	-	-
Alkalinity(CaCO3) to pH4.5	mg/L	5	146	195	180	172
pH @25°C	pH units	-	7.36	7.81	7.62	7.53
Conductivity @25°C	uS/cm	1	278	349	312	305
Colour	TCU	2	195	48	46	52
Turbidity	NTU	0.1	8.0	34.5	10.8	21.4
Fluoride	mg/L	0.1	<0.1	<0.1	<0.1	<0.1
Chloride	mg/L	0.5	8.0	3.6	1.3	3.2
Nitrate (N)	mg/L	0.05	<0.05	0.42	0.05	<0.05
Nitrite (N)	mg/L	0.05	<0.05	0.10	<0.05	<0.05
Sulphate	mg/L	1	<1	2	3	6
BOD5	mg/L	3	9	5	3	<3
Total Suspended Solids	mg/L	3	20	74	11	25
Phosphorus (Total)	mg/L	0.01	0.38	1.01	0.04	0.06
Total Kjeldahl Nitrogen	mg/L	0.1	2.1	11.9	5.2	0.5
Ammonia (N)-Total (NH3+NH4)	mg/L	0.05	0.14	0.24	5.38	0.10
Ammonia (N)-unionized	mg/L	0.01	<0.01	<0.01	0.02	<0.01
Dissolved Organic Carbon	mg/L	0.2	43.8	22.0	18.5	16.2
Cyanide (WAD)	mg/L	0.005	<0.005	<0.005	<0.005	<0.005
Phenolics	mg/L	0.001	0.002	0.002	<0.001	<0.001
COD	mg/L	5	86	304	45	36
Aluminum	mg/L	0.01	0.03	0.04	0.04	0.04



**Michelle Dubien
Data Specialist**

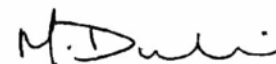
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			Client I.D.	SWA	SWD	SWF	SWC2
			Sample I.D.	23-028412-1	23-028412-2	23-028412-3	23-028412-4
			Date Collected	2023-10-11	2023-10-11	2023-10-11	2023-10-11
Parameter	Units	R.L.		-	-	-	-
Hardness (as CaCO ₃)	mg/L	-		127	190	156	137
Aluminum (Total)	mg/L	0.01		0.03	0.74	0.04	0.03
Barium (Total)	mg/L	0.001		0.044	0.096	0.046	0.053
Boron (Total)	mg/L	0.005		0.008	0.046	0.009	0.054
Calcium (Total)	mg/L	0.02		23.2	45.9	38.0	34.8
Iron (Total)	mg/L	0.005		0.803	2.36	0.689	3.58
Magnesium (Total)	mg/L	0.02		16.9	18.2	14.9	12.1
Manganese (Total)	mg/L	0.001		0.679	0.118	0.091	0.218
Phosphorus (Total)	mg/L	0.1		0.3	1.0	<0.1	<0.1
Potassium (Total)	mg/L	0.1		6.3	6.1	0.4	0.9
Sodium (Total)	mg/L	0.2		3.1	2.7	1.3	3.0
Strontium (Total)	mg/L	0.001		0.192	0.304	0.366	0.371
Tin (Total)	mg/L	0.05		<0.05	<0.05	<0.05	<0.05
Titanium (Total)	mg/L	0.005		<0.005	0.040	<0.005	<0.005
Zinc (Total)	mg/L	0.005		<0.005	0.116	0.015	0.011
Antimony (Total)	mg/L	0.0001		0.0005	0.0005	0.0003	0.0008
Arsenic (Total)	mg/L	0.0001		0.0002	0.0005	0.0002	0.0003
Beryllium (Total)	mg/L	0.0001		<0.0001	<0.0001	<0.0001	<0.0001
Cadmium (Total)	mg/L	0.000015		<0.000015	0.000174	<0.000015	<0.000015
Chromium (Total)	mg/L	0.001		<0.001	0.001	<0.001	<0.001
Cobalt (Total)	mg/L	0.0001		0.0005	0.0007	0.0002	0.0003



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Client I.D.			SWA	SWD	SWF	SWC2
Sample I.D.			23-028412-1	23-028412-2	23-028412-3	23-028412-4
Date Collected			2023-10-11	2023-10-11	2023-10-11	2023-10-11
Parameter	Units	R.L.	-	-	-	-
Copper (Total)	mg/L	0.0001	0.0003	0.0060	<0.0001	0.0002
Lead (Total)	mg/L	0.00002	0.00005	0.0196	0.00003	0.00005
Molybdenum (Total)	mg/L	0.0001	0.0001	0.0003	<0.0001	0.0001
Nickel (Total)	mg/L	0.0002	0.0007	0.0028	0.0004	0.0004
Selenium (Total)	mg/L	0.001	<0.001	<0.001	<0.001	<0.001
Silver (Total)	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Thallium (Total)	mg/L	0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Uranium (Total)	mg/L	0.00005	<0.00005	0.00050	0.00010	0.00009
Vanadium (Total)	mg/L	0.0001	0.0001	0.0025	<0.0001	0.0003
Chromium (VI)	mg/L	0.001	<0.001	<0.001	<0.001	<0.001
Mercury	mg/L	0.00002	<0.00002	0.00002	<0.00002	<0.00002
Anion Sum	meq/L	-	3.15	4.07	3.70	3.65
Cation Sum	meq/L	-	2.93	4.22	3.62	3.10
% Difference	%	-	3.74	1.83	1.18	8.21
Ion Ratio	-	-	1.08	0.964	1.02	1.18
Sodium Adsorption Ratio	-	-	0.118	0.0860	0.0449	0.111
TDS (Ion Sum Calc)	mg/L	1	147	200	175	167
TDS(calc.)/EC(actual)	-	-	0.530	0.574	0.561	0.548
Conductivity Calc	µmho/cm	-	283	377	341	302
Conductivity Calc / Conductivity	-	-	1.02	1.08	1.09	0.989
Langelier Index(25°C)	-	-	-0.503	0.339	0.0429	-0.0957



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			Client I.D.	SWA	SWD	SWF	SWC2
			Sample I.D.	23-028412-1	23-028412-2	23-028412-3	23-028412-4
			Date Collected	2023-10-11	2023-10-11	2023-10-11	2023-10-11
Parameter	Units	R.L.		-	-	-	-
Saturation pH (25°C)	-	-		7.86	7.47	7.58	7.63
pH (Client Data)	pH units	-		8.55	7.81	7.27	7.59
Temperature (Client Data)	°C	-		4.7	8.5	10	12.2



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		Client I.D.	SWF
		Sample I.D.	23-028412-3
		Date Collected	2023-10-11
Parameter	Units	R.L.	-
Acetone	µg/L	30	<30
Benzene	µg/L	0.5	<0.5
Bromodichloromethane	µg/L	2	<2
Bromoform	µg/L	5	<5
Bromomethane	µg/L	0.5	<0.5
Carbon Tetrachloride	µg/L	0.2	<0.2
Chlorobenzene	µg/L	0.5	<0.5
Chloroform	µg/L	1	<1
Chloromethane (Methyl Chloride)	µg/L	2	<2
Dibromochloromethane	µg/L	2	<2
Ethylene Dibromide	µg/L	0.2	<0.2
Dichlorobenzene,1,2-	µg/L	0.5	<0.5
Dichlorobenzene,1,3-	µg/L	0.5	<0.5
Dichlorobenzene,1,4-	µg/L	0.5	<0.5
Dichloroethane,1,1-	µg/L	0.5	<0.5
Dichloroethane,1,2-	µg/L	0.5	<0.5
Dichloroethylene,1,1-	µg/L	0.5	<0.5
Dichloroethylene,1,2-cis-	µg/L	0.5	<0.5
Dichloroethylene,1,2-trans-	µg/L	0.5	<0.5
Dichloropropane,1,2-	µg/L	0.5	<0.5
Dichloropropene,1,3-cis-	µg/L	0.5	<0.5



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		Client I.D.	SWF
		Sample I.D.	23-028412-3
		Date Collected	2023-10-11
Parameter	Units	R.L.	-
Dichloropropene, 1,3-trans-	µg/L	0.5	<0.5
Ethylbenzene	µg/L	0.5	<0.5
Dichloromethane (Methylene Chloride)	µg/L	5	<5
Methyl Ethyl Ketone	µg/L	20	<20
Methyl Isobutyl Ketone	µg/L	20	<20
Methyl tert-Butyl Ether (MTBE)	µg/L	2	<2
Styrene	µg/L	0.5	<0.5
Tetrachloroethane, 1,1,1,2-	µg/L	0.5	<0.5
Tetrachloroethane, 1,1,2,2-	µg/L	0.5	<0.5
Tetrachloroethylene	µg/L	0.5	<0.5
Toluene	µg/L	0.5	<0.5
Trichlorobenzene, 1,2,4-	µg/L	0.5	<0.5
Trichloroethane, 1,1,1,-	µg/L	0.5	<0.5
Trichloroethane, 1,1,2,-	µg/L	0.5	<0.5
Trichloroethylene	µg/L	0.5	<0.5
Trichlorofluoromethane (Freon 11)	µg/L	5	<5
Vinyl Chloride	µg/L	0.2	<0.2
Xylene, m,p-	µg/L	1	<1
Xylene, o-	µg/L	0.5	<0.5



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APPENDIX J

MECP Landfill Reporting Submission Forms

Appendix D-Monitoring and Screening Checklist

General Information and Instructions

General Information: The checklist is to be completed, and submitted with the Monitoring Report.

Instructions: A complete checklist consists of:

- (a) a completed and signed checklist, including any additional pages of information which can be attached as needed to provide further details where indicated.
- (b) completed contact information for the Competent Environmental Practitioner (CEP)
- (c) self-declaration that CEP(s) meet(s) the qualifications as set out below and in Section 1.2 of the Technical Guidance Document.

Definition of Groundwater CEP:

For groundwater, the CEP must have expertise in hydrogeology and meet one of the following:

- (a) the person holds a licence, limited licence or temporary licence under the *Professional Engineers Act*; or
- (b) the person holds a certificate of registration under the *Professional Geoscientists Act, 2000* and is a practicing member, temporary, member or limited member of the Association of Professional Geoscientists of Ontario. O. Reg. 66/08, s. 2..

Definition of Surface water CEP:

A CEP for surface water assessments is a scientist, professional engineer or professional geoscientist as described in (a) and (b) above with demonstrated experience and post-secondary education, either a diploma or degree, in hydrology, aquatic ecology, limnology, aquatic biology, physical geography with specialization in surface water, and/or water resource management.

The type of scientific work that a CEP performs must be consistent with that person's education and experience. If an individual has appropriate training and credentials in both groundwater and surface water and is responsible for both areas of expertise, the CEP may then complete and validate both sections of the checklist.

Monitoring Report and Site Information	
Waste Disposal Site Name	Laxton Landfill Site
Location (e.g. street address, lot, concession)	3225 Monck Rd, Woodville, ON
GPS Location (taken within the property boundary at front gate/ front entry)	671064 / 4954481
Municipality	City of Kawartha Lakes
Client and/or Site Owner	City of Kawartha Lakes
Monitoring Period (Year)	2023
This Monitoring Report is being submitted under the following:	
Certificate of Approval No.:	A321304
Director's Order No.:	Type Here
Provincial Officer's Order No.:	Type Here
Other:	Type Here

Report Submission Frequency	☒ Annual ☐ Other	Specify (Type Here):
The site is:	☒ Active ☐ Inactive ☐ Closed	
If closed, specify C of A, control or authorizing document closure date:		
Has the nature of the operations at the site changed during this monitoring period?	☐ Yes ☒ No	
If yes, provide details:	Type Here	
Have any measurements been taken since the last reporting period that indicate landfill gas volumes have exceeded the MOE limits for subsurface or adjacent buildings? (i. e. exceeded the LEL for methane)	☐ Yes ☒ No	

Groundwater WDS Verification:

Based on all available information about the site and site knowledge, it is my opinion that:

Sampling and Monitoring Program Status:

1) The monitoring program continues to effectively characterize site conditions and any groundwater discharges from the site. All monitoring wells are confirmed to be in good condition and are secure:	☒ Yes ☐ No	
2) All groundwater, leachate and WDS gas sampling and monitoring for the monitoring period being reported on was successfully completed as required by Certificate(s) of Approval or other relevant authorizing/control document(s):	☐ Yes ☒ No ☐ Not Applicable	If no, list exceptions below or attach information.

Groundwater Sampling Location	Description/Explanation for change (change in name or location, additions, deletions)	Date
MW15	Dry	all year
MW17 and 18	well underwater	all year
MW7	lid seized	26-Sep-2019
Type Here	Type Here	Select Date

3) a) Some or all groundwater, leachate and WDS gas sampling and monitoring requirements have been established or defined outside of a ministry C of A, authorizing, or control document.		☒ Yes ☐ No ☐ Not Applicable	
b) If yes, the sampling and monitoring identified under 3(a) for the monitoring period being reported on was successfully completed in accordance with established protocols, frequencies, locations, and parameters developed as per the Technical Guidance Document:		☒ Yes ☐ No ☐ Not Applicable	If no, list exceptions below or attach additional information.
Groundwater Sampling Location	Description/Explanation for change (change in name or location, additions, deletions)	Date	
Type Here	Type Here	Select Date	
Type Here	Type Here	Select Date	
Type Here	Type Here	Select Date	
Type Here	Type Here	Select Date	
Type Here	Type Here	Select Date	
4) All field work for groundwater investigations was done in accordance with standard operating procedures as established/outlined per the Technical Guidance Document (including internal/external QA/ QC requirements) (Note: A SOP can be from a published source, developed internally by the site owner's consultant, or adopted by the consultant from another organization):	☒ Yes ☐ No	If no, specify (Type Here):	

Sampling and Monitoring Program Results/WDS Conditions and Assessment:

5) The site has an adequate buffer, Contaminant Attenuation Zone (CAZ) and/or contingency plan in place. Design and operational measures, including the size and configuration of any CAZ, are adequate to prevent potential human health impacts and impairment of the environment.	☐ Yes ☒ No	RUC exceedances are noted at eastern monitoring locations, however, are more related to natural earth elements or organic sources associated with the peat soils. The City is looking to acquire additional CAZ lands to the east.	
6) The site meets compliance and assessment criteria.	☐ Yes ☒ No	see section 4.2.5 of report	
7) The site continues to perform as anticipated. There have been no unusual trends/ changes in measured leachate and groundwater levels or concentrations.	☒ Yes ☐ No	If no, list exceptions and explain reason for increase/change (Type Here):	
1) Is one or more of the following risk reduction practices in place at the site: (a) There is minimal reliance on natural attenuation of leachate due to the presence of an effective waste liner and active leachate collection/treatment; or (b) There is a predictive monitoring program in-place (modeled indicator concentrations projected over time for key locations); or (c) The site meets the following two conditions (typically achieved after 15 years or longer of site operation): <i>i.</i> The site has developed stable leachate mound(s) and stable leachate plume geometry/concentrations; and <i>ii.</i> Seasonal and annual water levels and water quality fluctuations are well understood.	☒ Yes ☐ No	Note which practice(s):	☐ (a) ☒ (b) ☒ (c)
9) Have trigger values for contingency plans or site remedial actions been exceeded (where they exist):	☐ Yes ☒ No ☐ Not Applicable		

Groundwater CEP Declaration:

I am a licensed professional Engineer or a registered professional geoscientist in Ontario with expertise in hydrogeology, as defined in Appendix D under Instructions. Where additional expertise was needed to evaluate the site monitoring data, I have relied on individuals who I believe to be experts in the relevant discipline, who have co-signed the compliance monitoring report or monitoring program status report, and who have provided evidence to me of their credentials.

I have examined the applicable Certificate of Approval and any other environmental authorizing or control documents that apply to the site. I have read and followed the Monitoring and Reporting for Waste Disposal Sites Groundwater and Surface Water Technical Guidance Document (MOE, 2010, or as amended), and associated monitoring and sampling guidance documents, as amended from time to time. I have reviewed all of the data collected for the above-referenced site for the monitoring period(s) identified in this checklist. Except as otherwise agreed with the ministry for certain parameters, all of the analytical work has been undertaken by a laboratory which is accredited for the parameters analysed to *ISO/IEC 17025:2005 (E)- General requirements for the competence of testing and calibration laboratories*, or as amended from time to time by the ministry.

If any exceptions or potential concerns have been noted in the questions in the checklist attached to this declaration, it is my opinion that these exceptions and concerns are minor in nature and will be rectified for the next monitoring/reporting period. Where this is not the case, the circumstances concerning the exception or potential concern and my client's proposed action have been documented in writing to the Ministry of the Environment District Manager in a letter from me dated:

21-Mar-2024

Recommendations:

Based on my technical review of the monitoring results for the waste disposal site:

☐ No changes to the monitoring program are recommended

as noted in report

☒ The following change(s) to the monitoring program is/are recommended:

☒ No Changes to site design and operation are recommended

Type Here

☐ The following change(s) to the site design and operation is/are recommended:

Name:	Colin Ross, B.Sc., P.Geo.		
Seal:	Add Image 		
Signature:		Date:	21-Mar-2024
CEP Contact Information:	Colin Ross		
Company:	Azimuth Environmental Consulting Inc.		
Address:	642 Welham Road, Barrie, ON L4N 9A1		
Telephone No.:	705-721-8451	Fax No. :	705-721-8926
E-mail Address:	colin@azimuthenvironmental.com		
Co-signers for additional expertise provided:			
Signature:		Date:	Select Date
Signature:		Date:	Select Date

Surface Water WDS Verification:		
Provide the name of surface water body/bodies potentially receiving the WDS effluent and the approximate distance to the waterbody (including the nearest surface water body/bodies to the site):		
Name (s)	Tributary flowing into Shadow Lake	
Distance(s)	40m	
Based on all available information and site knowledge, it is my opinion that:		
Sampling and Monitoring Program Status:		
1) The current surface water monitoring program continues to effectively characterize the surface water conditions, and includes data that relates upstream/background and downstream receiving water conditions:	☒ Yes ☐ No	If no, identify issues (Type Here):
2) All surface water sampling for the monitoring period being reported was successfully completed in accordance with the Certificate(s) of Approval or relevant authorizing/control document(s) (if applicable):	☒ Yes ☐ No ☐ Not applicable (No C of A, authorizing / control document applies)	If no, specify below or provide details in an attachment.
Surface Water Sampling Location	Description/Explanation for change (change in name or location, additions, deletions)	Date
some locations are not sampled when dry	Type Here	Select Date
Type Here	Type Here	Select Date
Type Here	Type Here	Select Date
Type Here	Type Here	Select Date

3) a) Some or all surface water sampling and monitoring program requirements for the monitoring period have been established outside of a ministry C of A or authorizing/control document.		☐ Yes ☒ No ☐ Not Applicable	
b) If yes, all surface water sampling and monitoring identified under 3 (a) was successfully completed in accordance with the established program from the site, including sampling protocols, frequencies, locations and parameters) as developed per the Technical Guidance Document:		☒ Yes ☐ No ☐ Not Applicable	If no, specify below or provide details in an attachment.
Surface Water Sampling Location	Description/Explanation for change (change in name or location, additions, deletions)		Date
Type Here	Type Here		Select Date
Type Here	Type Here		Select Date
Type Here	Type Here		Select Date
Type Here	Type Here		Select Date
4) All field work for surface water investigations was done in accordance with standard operating procedures, including internal/external QA/QC requirements, as established/ outlined as per the Technical Guidance Document, MOE 2010, or as amended. (Note: A SOP can be from a published source, developed internally by the site owner's consultant, or adopted by the consultant from another organization):	☒ Yes ☐ No	If no, specify (Type Here):	

Sampling and Monitoring Program Results/WDS Conditions and Assessment:

5) The receiving water body meets surface water-related compliance criteria and assessment criteria: i.e., there are no exceedances of criteria, based on MOE legislation, regulations, Water Management Policies, Guidelines and Provincial Water Quality Objectives and other assessment criteria (e.g., CWQGs, APVs), as noted in Table A or Table B in the Technical Guidance Document (Section 4.6):

☐ Yes

☒ No

If no, list parameters that exceed criteria outlined above and the amount/percentage of the exceedance as per the table below or provide details in an attachment:

Parameter	Compliance or Assessment Criteria or Background	Amount by which Compliance or Assessment Criteria or Background Exceeded
e.g. Nickel	e.g. C of A limit, PWQO, background	e.g. X% above PWQO
iron Total Phosphorus chromium Phenols Aluminum	0.3 mg/L 0.03 mg/L 0.001 mg/L 0.001 mg/L 0.075 mg/L	>100 % >100 % >100 % 100% 20%
cadmium copper lead zinc	0.0001 mg/L 0.005 mg/L 0.003 mg/L 0.02 mg/L	75% 20% >100% >100%
6) In my opinion, any exceedances listed in Question 5 are the result of non-WDS related influences (such as background, road salting, sampling site conditions)?	☒ Yes ☐ No	These concentrations are all observed in the upstream location as well historically and are most likely attributable to the stagnant, shallow water which does not typically allow for a sediment free sample to be collected. Also natural sources within the peat could account for the elevated iron (earth element) and total phosphorus is expected to be derived from decaying vegetation in these conditions

7) All monitoring program surface water parameter concentrations fall within a stable or decreasing trend. The site is not characterized by historical ranges of concentrations above assessment and compliance criteria.	☒ Yes ☐ No	Some variability exists over time with respect to parameter concentrations however, the 2023 results fall within the historical range for each location.
8) For the monitoring program parameters, does the water quality in the groundwater zones adjacent to surface water receivers exceed assessment or compliance criteria (e.g., PWQOs, CWQGs, or toxicity values for aquatic biota (APVs)):	☒ Yes ☐ No ☐ Not Known ☐ Not Applicable	If yes, provide details and whether remedial measures are necessary (Type Here) There is no trending that would suggest further actions are required.
9) Have trigger values for contingency plans or site remedial actions been exceeded (where they exist):	☐ Yes ☒ No ☐ Not Applicable	If yes, list value(s) that are/have been exceeded and follow-up action taken (Type Here)

Surface Water CEP Declaration:

I, the undersigned hereby declare that I am a Competent Environmental Practitioner as defined in Appendix D under Instructions, holding the necessary level of experience and education to design surface water monitoring and sampling programs, conduct appropriate surface water investigations and interpret the related data as it pertains to the site for this monitoring period.

I have examined the applicable Certificate of Approval and any other environmental authorizing or control documents that apply to the site. I have read and followed the Monitoring and Reporting for Waste Disposal Sites Groundwater and Surface Water Technical Guidance Document (MOE, 2010, or as amended) and associated monitoring and sampling guidance documents, as amended from time to time. I have reviewed all of the data collected for the above-referenced site for the monitoring period(s) identified in this checklist. Except as otherwise agreed with the ministry for certain parameters, all of the analytical work has been undertaken by a laboratory which is accredited for the parameters analysed to *ISO/IEC 17025:2005 (E)- General requirements for the competence of testing and calibration laboratories*, or as amended from time to time by the ministry.

If any exceptions or potential concerns have been noted in the questions in the checklist attached to this declaration, it is my opinion that these exceptions and concerns are minor in nature or will be rectified for future monitoring events. Where this is not the case, the circumstances concerning the exception or potential concern and my client's proposed action have been documented in writing to the Ministry of the Environment District Manager in a letter from me dated:

21-Mar-2024

Recommendations:

Based on my technical review of the monitoring results for the waste disposal site:

☐ No Changes to the monitoring program are recommended ☒ The following change(s) to the monitoring program is/are recommended:	see report
☒ No changes to the site design and operation are recommended ☐ The following change(s) to the site design and operation is/are recommended:	Type Here

CEP Signature		
Relevant Discipline	Hydrogeology	
Date:	21-Mar-2024	
CEP Contact Information:	Colin Ross	
Company:	Azimuth Environmental Consulting Inc.	
Address:	642 Welham Road, Barrie, ON L4N 9A1	
Telephone No.:	705-721-8451 x 205	
Fax No. :	705-721-8926	
E-mail Address:	colin@azimuthenvironmental.com	
Save As		Print Form



APPENDIX K

Surface Water Photos



SW-A: April 26, 2023



SW-D: April 26, 2023



SW-C2: April 26, 2023



SW-F: April 26, 2023



SW-G: April 26, 2023



SW-C2: August 31, 2023



SW-D: August 31, 2023



SW-F: August 31, 2023



SW-F: October 11, 2023



SW-A: October 11, 2023



SW-G: October 11, 2023



SW-C2: October 11, 2023



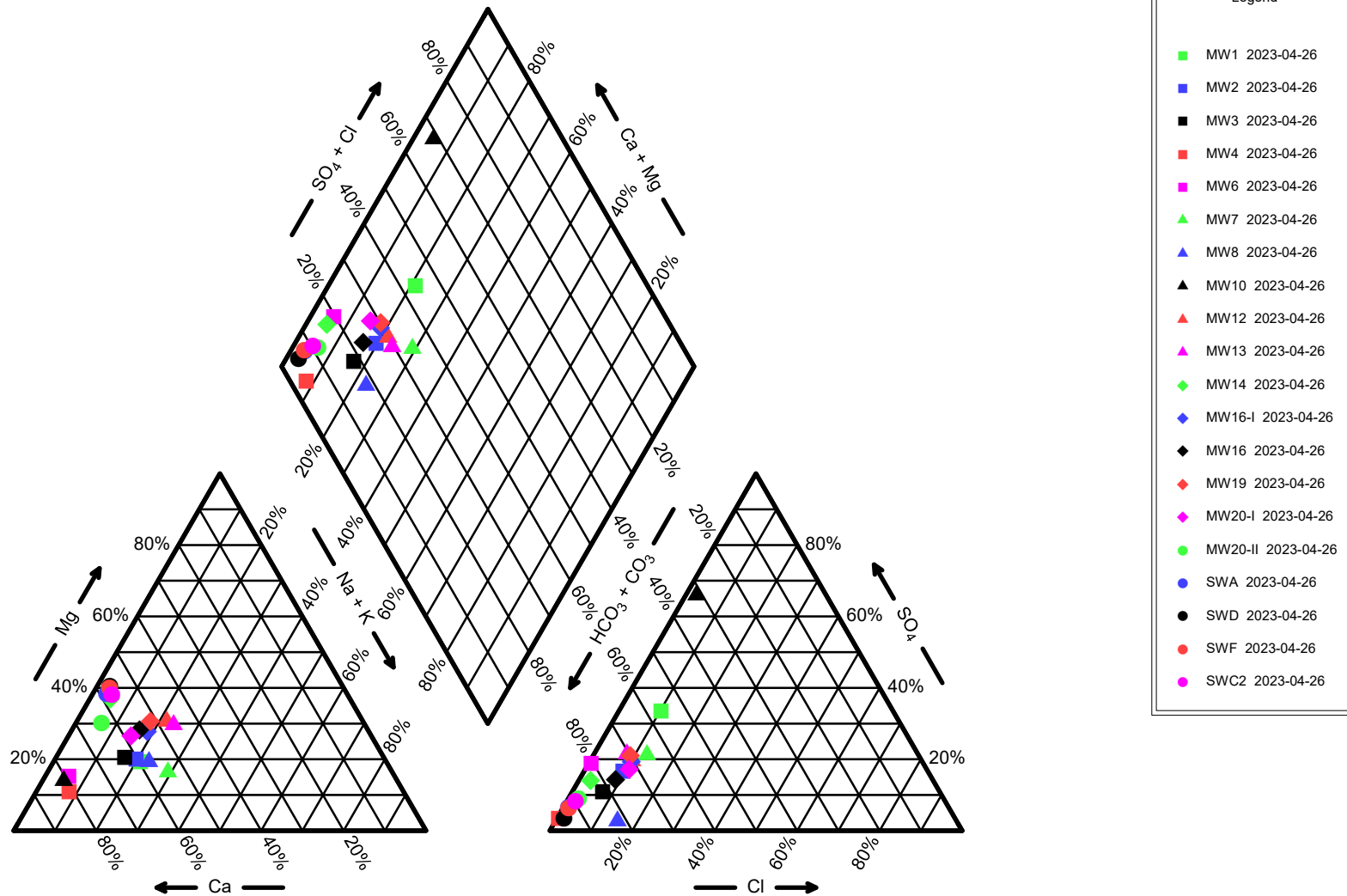
SW-D: October 11, 2023



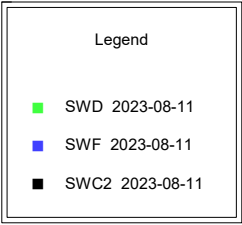
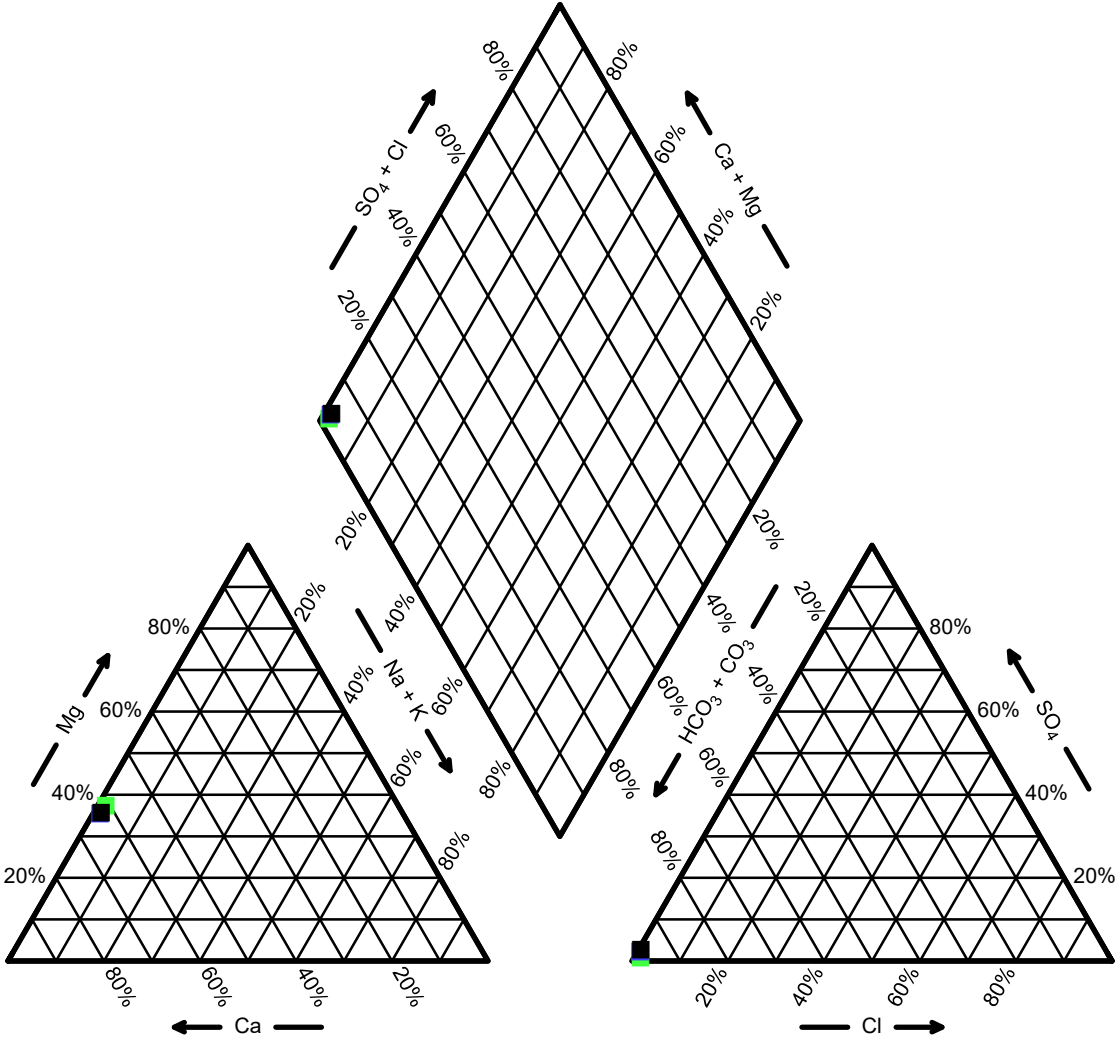
APPENDIX L

Piper Diagrams

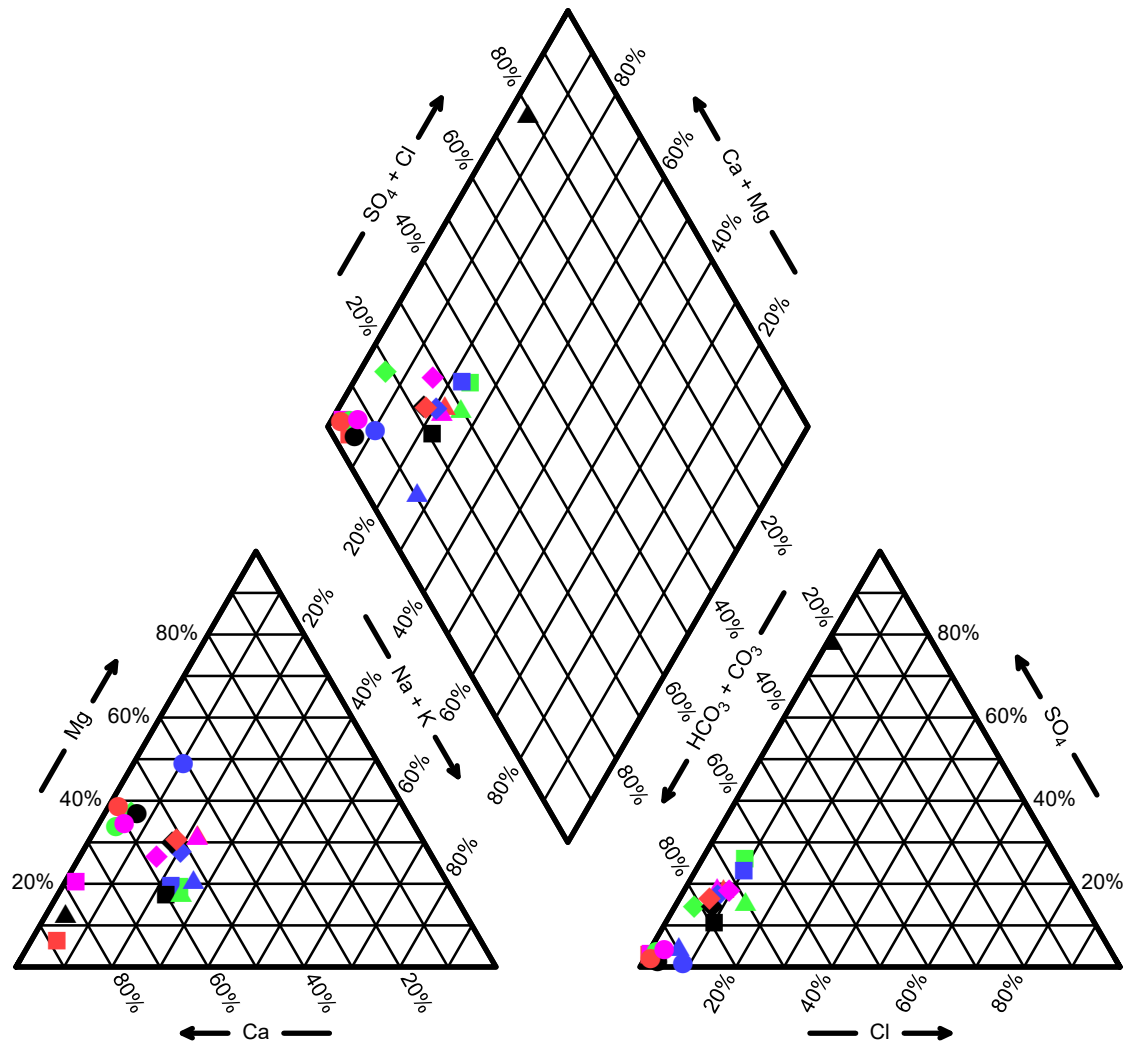
April 2023



August 2023



October 2023



Legend

- MW1 2023-10-11
- MW2 2023-10-11
- MW3 2023-10-11
- MW4 2023-10-11
- MW6 2023-10-11
- ▲ MW7 2023-10-11
- ▲ MW8 2023-10-11
- ▲ MW10 2023-10-11
- ▲ MW12 2023-10-11
- ▲ MW13 2023-10-11
- ◆ MW14 2023-10-11
- ◆ MW16-I 2023-10-11
- ◆ MW16 2023-10-11
- ◆ MW19 2023-10-11
- ◆ MW20-I 2023-10-11
- MW20-II 2023-10-11
- SWA 2023-10-11
- SWD 2023-10-11
- SWF 2023-10-11
- SWC2 2023-10-11