2019 Annual Report

Round Lake Waste Disposal Site (A412303)

Township of Killaloe, Hagarty, and Richards

County of Renfrew, Ontario

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Greenview
ENVIRONMENTAL MANAGEMENT

13 Commerce Court
Bancroft, Ontario
613-332-0057
www.greenview-environmental.ca

Executive Summary

This report has been prepared to document the results of the 2019 environmental monitoring program for the Township of Killaloe, Hagarty and Richards' Round Lake Waste Disposal Site, located on Lot 27, Concession III, in the geographic Township of Richards, amalgamated Township of Killaloe, Hagarty and Richards. The site is located approximately 14 kilometres north of the Village of Killaloe, and is accessed by Sunrise Road which extends west from County Road 58.

The Round Lake Waste Disposal Site operates as a municipal solid waste transfer station with mobile waste and permanent Blue Box recycling facilities under Environmental Compliance Approval A412303 as issued on April 2, 1980 and the most recent amendment dated May 21, 2014, for waste and recyclables generated within the Township of Killaloe, Hagarty and Richards. The site is currently licensed in accordance with the Environmental Compliance Approval for a 1.62 hectare approved waste disposal area, within a property area of 3.5 hectares and a 1.33 hectare parcel of land designated for contaminant attenuation zone purposes. The Round Lake Waste Disposal Site has a remaining capacity of 77,305 cubic metres, in accordance with the remaining capacity identified in Condition 2.4 (1) of the site's Amended ECA (94,974 cubic metres) and the calculated waste-in-place volume of 17,669 cubic metres.

Historically, the direction of groundwater flow within the shallow overburden at the Round Lake site has been to the north and northeast, generally towards the Sherwood River northeast of the site. In 2019, the predominant groundwater flow direction within the shallow overburden at the Round Lake site was interpreted to be generally consistent with historical interpretations. In the spring of 2019, average horizontal gradients from the vicinity of the waste mound, and to the northeast of the waste mound, were calculated to be approximately 0.002 and 0.013, respectively. Similarly, in the fall of 2019, average horizontal gradients from the vicinity of the waste mound, and to the north and northeast of the waste mound, were calculated to be approximately 0.007 and 0.012, respectively.

Groundwater quality at the monitoring wells immediately downgradient of the waste mound, and to the northeast, were interpreted to be impacted from landfill-related factors in 2019, with monitoring well BH-2D exhibiting generally higher parameter concentrations than other wells in close proximity to the waste mound. The position and orientation of the leachate plume was interpreted to be consistent with historical interpretations, and most parameter concentrations downgradient of the site were interpreted to be either stable or to have decreasing trends.

There were no non-conformances for the trigger concentrations of barium, boron, chloride, and chromium at the groundwater wells identified for evaluation (BH-8, BH95-9, BH01-13D, and BH01-14). Volatile organic compound sampling and analysis is completed once every five (5) years at the Round Lake site, with the next sampling event scheduled for 2022. In 2019, the Trigger Mechanism for the Round Lake site was not interpreted to be activated. Continued regular monitoring is required to evaluate the results of the 2019 monitoring program. The Round Lake site was interpreted to be in conformance with the Trigger Mechanism and Ontario Ministry of the Environment, Conservation, and Parks Guideline B-7 following the completion of the 2019 groundwater monitoring program at the site.

In general, and based on five (5) year time trend analysis, leachate indicator parameters, and iron and manganese, were interpreted to be generally decreasing and/or remaining stable in the vicinity of the inactive Approved Waste Disposal Area and in the Contaminant Attenuation Zone of the Round Lake site. The only increasing trends for the noted parameters were interpreted in results from BH01-14 (manganese only) and BH95-9 (chloride only), which may be related to dry and/or low groundwater conditions observed in 2019 at the Round Lake site and to the application of road salt on the transfer station access roads.

Based on municipal records, approximately 3,229 residential vehicles visited the Round Lake site in 2019, with approximately 4,568 bags of waste received for transfer to the Killaloe Waste Disposal Site for management. Additionally, 4 IC&I vehicles visited the Round Lake site in 2019, with approximately 27 bags of waste received

for transfer to the Killaloe Waste Disposal Site for management.

In 2019 and based on documentation submitted to the municipality by GFL Environmental Inc., a total of 280.15 tonnes of municipal (residential and IC&I) waste was compacted at the Killaloe site and transferred to the GFL Environmental Inc. facility for disposal. Waste volumes collected from curbside collection within the Village of Killaloe, and transferred from the Round Lake Waste Disposal Site, are also included in the above waste tonnage. Additionally, 7.95 tonnes of municipal (residential and IC&I) waste was transferred from the Round Lake and Killaloe Waste Disposal Sites to the Ottawa Valley Waste Recovery Centre for disposal.

Recycling tonnage records provided by Beaumen Waste Management Systems Ltd., Tomlinson Group, Cascades Recovery+, and OVWRC for the Township indicate that approximately 143.90 tonnes of Blue Box recyclables were collected from the Township's Killaloe and Round Lake sites in 2019. Blue Box recyclables contributing to this total included approximately 63.34 tonnes of commingled containers (tin/aluminum/plastic/glass), 44.87 tonnes of mixed fibres, and 35.69 tonnes of old corrugated cardboard. Blue Box recyclables from curbside collection within the Village of Killaloe by the Township and Blue Box recyclables transferred from the Township's Round Lake site were included in the Blue Box recycling tonnages provided by Beaumen Waste Management Systems Ltd., Tomlinson Group, Cascades Recovery+, and OVWRC.

Approximately 16.82 tonnes of household organics were collected within the Township from the depots at the Killaloe and Round Lake Waste Disposal Sites in 2019 and processed by OVWRC in Pembroke, Ontario.

Based on the results of the 2019 groundwater monitoring program, the Round Lake site was interpreted to be in compliance with the terms and conditions of the Environmental Compliance Approval.

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1.0 Introduction

1.1 Site Information

The Round Lake Waste Disposal Site operates as a municipal solid waste transfer station with mobile waste and Blue Box recycling facilities under Environmental Compliance Approval (ECA) A412303 as issued on April 2, 1980 and the most recent amendment dated May 21, 2014 (Appendix A). The Round Lake site is located approximately 0.5 kilometres (km) west of County Road No. 58 on Part Lot 27, Concession III, in the geographic Township of Richards, amalgamated Township of Killaloe, Hagarty and Richards (Township), in Renfrew County. The Universal Transverse Mercator (UTM) coordinates at the site entrance gate relative to the North American Datum (NAD83) are 299418.0 metres (m) East, 5055794.0 m North, in Zone 18T (Google Earth, 2013). The site is accessed from Sunrise Road (Figure 1 and 2), and is situated on Township-owned land.

The Round Lake Waste Disposal Site has a remaining capacity of 77,305 cubic metres (m^3), in accordance with the remaining capacity identified in Condition 2.4 (1) of the site's Amended ECA (94,974 m^3, Appendix A) and the calculated waste-in-place volume (17,669 m^3, Greer Galloway Group, 1998).

1.2 Background

The Round Lake Waste Disposal Site has been in operation since 1967, and is currently approved to accept municipal waste, Blue Box recyclables, and household organics from the Township. Collected municipal waste is transferred from the Round Lake site at the end of each operating day for management at the Killaloe Waste Disposal Site, and Blue Box recyclables and household organics are stockpiled at the site and transferred directly to an approved material recovery facility, as required.

Landfilling operations at the Round Lake site ceased in 2003, following amendments to the site's ECA (Appendix A, April 8, 2003), and intermediate cover was applied over the approved waste disposal area (AWDA) of the site. Since June 2003, the Round Lake site has been interim-closed and has operated as a mobile waste and Blue Box recycling transfer station (Appendix A). Landfilling of waste at the Round Lake Waste Disposal Site is not permitted until such a time as sufficient lands have been acquired by the Township that are suitable for contaminant attenuation zone (CAZ) purposes, per Condition 3.2 of the site's Amended ECA (Appendix A, November 30, 2012).

On September 4, 2009, the Ontario Ministry of Environment, Conservation, and Parks (MECP) issued an Amended ECA for the Round Lake Waste Disposal Site, recognizing the establishment of an organic waste depot facility as part of waste transfer operations. The organic waste depot facility includes two (2) specialized Molok containers for the collection and transfer of organic waste with a total storage capacity of 1.6 m^3 (Appendix A).

Based on the Township's long-term *Municipal Solid Waste Management Strategic Plan* (MSWMSP), a permanent, upgraded municipal Blue Box recycling transfer station was identified as the preferred solution for operations at the Round Lake site. On November 30, 2012, the MECP issued an Amended ECA which recognized the *Design and Operations Plan* (DOP, Greenview, 2012a) for the operation of a waste transfer station at the Round Lake site (Appendix A). The Amended ECA replaced all previously issued ECA's for the Round Lake site. Municipal waste currently collected at the Round Lake site's waste transfer station is transferred to the Township's Killaloe site for management. Blue Box recyclables and household organics are collected and stored on-site, and transferred off-site for management as quantities warrant. Construction of the permanent Blue Box recycling transfer station was completed by the Township in summer 2012.

An *Emergency Response Manual* was submitted to the MECP dated January 28, 2013 to satisfy Condition 10.3 of the Amended ECA (Greenview, 2013a). An *Operations Manual* was submitted to the MECP dated February 28, 2013 to satisfy Conditions 2.2 and 2.3 of the Amended ECA (Greenview, 2013b). As part of the updated operations program for the Round Lake site, an upgraded site record book was prepared by the Township in 2013 for improved monitoring of the site and associated operations. Further updates to the site record book were completed concurrent with a waste management training event in December 2015.

On January 21, 2014, the Township submitted an application for an amendment to the Round Lake site's ECA in order to amend the operational hours at the site (Greenview, 2014). The application was approved by the MECP with the issuance of the Amendment to the ECA dated May 21, 2014 (Appendix A).

On September 17, 2015, the Round Lake Waste Disposal Site was inspected by the MECP Ottawa District Office, following which the MECP requested a copy of the Certificate of Prohibition (Requirement) from the Township as well as copies of waste record and inspection logs (and related logs) from the Township for select dates in 2015. A copy of the Certificate of Prohibition (Requirement) was provided by the Township electronically on September 23, 2015 (Appendix A), and copies of the requested logs were provided to the MECP Ottawa District Office electronically on September 29, 2015. A *Non-hazardous Waste Transfer Processing Inspection Report* (Inspection Report) was provided to the Township dated September 30, 2015 (Greenview, 2016). No additional actions were required by the MECP Inspection Report.

On March 06, 2020, the Township completed revisions to the *Emergency Response Plan* (Version 2.0, Greenview, 2020a) and *Operations and Procedures Manual* (Version 2.0, Greenview, 2020b) for the Round Lake Waste Disposal Site, and were submitted to the MECP Ottawa District Office for their file, in accordance with the requirements of Conditions 10.3 and 10.4 of the ECA (with respect to the Emergency Response Plan) and Conditions 2.2 and 2.3 of the ECA (with respect to the Operations and Procedures Manual).

In 2019, and as of the time of preparation of this report, no communications were received by the Township from the MECP relative to the Round Lake site.

Greenview Environmental Management Limited (Greenview) was retained by the Township to complete the 2019 environmental monitoring and reporting program at the Round Lake Waste Disposal Site.

1.3 Purpose and Scope

The purpose of this report is to provide an overview of the annual environmental monitoring, environmental compliance, and operations at the Round Lake Waste Disposal Site, in accordance with Condition 11 of the Amended ECA A412303, including the following:

- Groundwater quality assessment and the Reasonable Use Concept (RUC, MECP Guideline B-7) compliance (Section 4.1).
- Site operational overview (Section 4.2).
- Conclusions and recommendations (Section 5.0).

2.0 Site Description

The following sections present a summary of the physical characteristics for the Round Lake Waste Disposal Site. Locations of features described in this report are referenced to grid north.

2.1 Topography and Drainage

The Round Lake Waste Disposal Site is located approximately 450 metres (m) southwest of the Sherwood River, and 850 m west of Round Lake. Topography in the southern portion of the waste mound slopes to the south; however, local topography in the vicinity of the site slopes marginally to the northeast (Figure 2).

In the immediate vicinity of the waste mound, minimal surface water is observed under normal conditions due to the porous nature of the overburden (sands and gravels), and the relatively flat topography. In addition to the Sherwood River northeast of the site, a small creek tributary is understood to be located approximately 100 m south (upstream) of the site (Land Information Ontario, 2018).

2.2 Hydrogeological and Geological Conditions

Overburden geology at the Round Lake site is characterized by localized sand and gravel deposits typical of a glaciolacustrine delta. Bedrock immediately beneath the overburden is understood to consist of Precambrian igneous and metamorphic rock, specifically granite and gneiss (The Greer Galloway Group Inc. [GGG], 1998). Overburden geology to the west of the site (approximately two [2] km) is typified by sand and clay deposits, overlying the bedrock unit (County of Renfrew, 2007).

Consistent with historical results (Greenview, 2019), the predominant direction of groundwater flow at the Round Lake site in 2019 was to the north and northeast, towards the Sherwood River (Figures 3 and 4).

2.3 Operational Setting

The Round Lake site is situated on Township-owned lands and consists of an AWDA of 1.62 hectares (ha) within a property area of 3.5 ha, a 1.33 ha parcel of land designated for CAZ purposes, and an easement to access monitoring well BH95-10 (Figures 3 and 4). A Certificate of Prohibition (Requirement) for the Round Lake Waste Disposal Site's lands and easement were registered on title by the Township on July 21, 2003 and provided to the MECP (Appendix A).

The waste mound at Round Lake has been interim-closed to waste disposal operations since June 2003. From June 2003 to fall 2012 the site operated as a mobile waste transfer station.

In fall 2010, two (2) specialized Molok containers for the collection and transfer of organic waste, with a total storage capacity of 1.6 m^3, were installed at the Round Lake site, in accordance with Conditions 4.12 and 4.13 of the ECA (Appendix A).

In summer 2012, the Township completed construction of a permanent Blue Box recycling transfer station at the Round Lake site including a retaining wall and two (2) in-use Blue Box recycling roll-off containers for the storage and transfer of mixed fibres and commingled containers. In 2019, municipal waste continued to be collected at the site in a mobile waste truck for transfer to the Killaloe Waste Disposal Site for management.

3.0 2019 Environmental Monitoring Program

The following sections present a methodology of the environmental monitoring program conducted at the Round Lake Waste Disposal Site in 2019.

3.1 Groundwater Monitoring

Groundwater monitoring and sampling activities were conducted at the Round Lake site on May 13, 2019 and October 7, 2019 by Greenview using the network of groundwater monitoring wells as part of the site's 2019 environmental monitoring program (Table 1). The UTM coordinates of the groundwater monitoring wells were confirmed and/or measured by Greenview personnel during site visits in 2019 using a handheld geographic positioning system (GPS) instrument with an anticipated accuracy of within +/- 5 m (Table 2). An electronic water level tape was used prior to sampling to determine the static groundwater level at each monitoring well involved in the monitoring program during both the spring and fall sampling events (Table 3). Based on the groundwater elevation, a well purge volume equivalent to approximately three (3) borehole volumes was calculated using a standard conversion factor relevant to the respective well diameter. The calculated well purge volume was then removed using the dedicated polyethylene tube stored within the well column.

Groundwater samples were collected from each monitoring well using dedicated polyethylene tubing and inertial lift foot-valves. Samples were collected into appropriate sample bottles as provided by an accredited laboratory and the designated sample for metal parameters was field-filtered using a dedicated high capacity 45-micron filter to reduce the potential for turbidity-induced bias in the analytical results. Volatile organic compounds (VOCs) are sampled at the Round Lake site once every five (5) years, consistent with the sampling frequency identified on Table 1. The next sampling event for VOCs is scheduled for fall 2022.

During the spring 2019 sampling event, a groundwater sample was not obtained from residential sampling location R1, as the owner of the property denied access to Greenview; however, the homeowner approved access for sampling as part of the fall 2019 sampling event (Table 4, Appendix B).

As part of the spring 2019 sampling event, groundwater elevations were obtained at all monitoring wells and groundwater samples were obtained from all wells that required sampling; however, monitoring well BH-2S was observed to pump dry and a full purge volume was not obtained. For the fall 2019 sampling event, monitoring wells BH-3, BH01-13S, and BH01-15 were documented to be dry, BH-2S and BH-5 were observed to have insufficient water to sample, and BH-1 was observed to pump dry and a full purge volume was not obtained (Appendix B).

Duplicate groundwater samples were collected for QA/QC purposes from the background and surveillance parameter suite (Table 1) from monitoring well BH95-9 during the spring 2019 event and from BH-1 during the fall 2019 sampling event (Appendix B). A duplicate sample was collected from BH-6 during the fall 2019 sampling event for QA/QC purposes related to the routine parameter suite (Table 1, Appendix B).

All samples were submitted to an accredited analytical laboratory to be analyzed for the parameter suite listed in Table 1.

Field measurements of pH, conductivity, dissolved oxygen (DO), and temperature were recorded at all groundwater wells immediately following the collection of the groundwater samples. Field sampling records completed during the 2019 monitoring program are included in Appendix B. The groundwater samples were recorded on a laboratory Chain of Custody Form, and placed in coolers packed with contained ice for preservation during transport to the analytical laboratory.

Available borehole logs are included in Appendix C. The available borehole logs include details regarding well construction for the corresponding monitoring wells.

The results of the 2019 groundwater monitoring program are presented in Section 4.1 of this report.

3.2 Surface Water Monitoring

In accordance with Schedule "B" of ECA A412303, as amended April 8, 2003, surface water sampling was removed from the environmental monitoring program at the site as the sampling locations were typically dry, and flowing conditions were only observed following spring run-off or during exceptionally wet periods. Additionally, there was no evidence of landfill-related impacts noted during the surface water sampling events (Golder Associates [Golder], March 2004).

3.3 Analytical Laboratory Accreditation

Collected groundwater samples were submitted for analysis to the Caduceon Environmental Laboratories (Caduceon), located in Kingston, Ontario. Caduceon is accredited by the Canadian Association for Laboratory Accreditation (CALA), for specific environmental testing procedures listed in the scope of accreditation and is assessed biannually by CALA to the ISO/IEC 17025 standard. ISO/IEC 17025 is an international standard for both quality management and technical aspects of operating a testing laboratory. Caduceon is licensed by the MECP to perform analysis on drinking water in Ontario in accordance with the Safe Drinking Water Act.

3.4 Landfill Gas Monitoring

Landfill gas monitoring is not part of the environmental monitoring program for the site. The waste mound at the Round Lake site has porous cover materials, allowing natural gas flux to the atmosphere. Overburden geology at and adjacent to the site is characterized by shallow sand and gravel materials, overlying a dense igneous/metamorphic bedrock unit (GGG, 1998). These overburden and bedrock characteristics, coupled with the extended distance to the nearest residence, provide a minimal risk of landfill gases impinging off-site receivers.

3.5 Operational Monitoring

Operational monitoring at the Round Lake site is minimal given that the site currently only functions as a waste transfer station and the site status is presently interim-closed. The most recent topographic survey was completed by Greenview on October 25, 2012 in order to update site features at the Round Lake site (Figure 2).

Waste record keeping was conducted each operating day, documenting municipal solid waste, Blue Box recycling, and household organics quantities received at the Round Lake Waste Disposal Site.

The Township submits annual waste diversion reports in accordance with the Municipal Datacall, inclusive of the Round Lake site to the Resource Productivity and Recovery Authority (RPRA).

4.0 Environmental Monitoring Results

The following sections present a summary of the environmental monitoring results of the 2019 environmental monitoring program conducted at the Round Lake Waste Disposal Site.

4.1 Groundwater Quality Assessment

The results of the 2019 groundwater monitoring program conducted at the site are presented as follows.

4.1.1 Groundwater Configuration

Historically, groundwater within the shallow overburden unit at the Round Lake site was interpreted to flow to the north and northeast (Greenview, 2019).

Groundwater elevation data obtained during the 2019 environmental monitoring program at the site are provided in Table 3. Average horizontal gradients in the vicinity of the waste mound and to the northeast of the waste mound were calculated as follows:

Location	Horizontal Gradient (Spring 2019)	General Direction	Horizontal Gradient (Fall 2019)	General Direction
Vicinity of Waste Mound	0.002	Northeast	0.007	North
Northeast of Waste Mound	0.013	Northeast	0.012	Northeast

Using groundwater elevations measured in 2019 (Table 3), vertical hydraulic gradients were calculated at the following pairs of shallow and deep monitoring wells for the spring and fall groundwater elevation monitoring events. The vertical gradients calculated in 2019 were as follows:

Monitoring Wells	Vertical Gradient (Spring 2019)	Vertical Gradient (Fall 2019)
BH-2S & BH-2D	0.042	0.005
BH01-13S & BH01-13D	0.103	N/A (BH01-13S = DRY)

4.1.2 Groundwater Quality

Results of the 2019 groundwater monitoring program completed at Round Lake are presented in Table 4 and the accredited laboratory Certificates of Analysis are attached in Appendix D. Analytical data were compared to the Ontario Drinking Water Standards (ODWS, MECP, 2006), median background water quality at the site, and MECP Guideline B-7 and the RUC (MECP, 1994). Trend analysis was completed using results from the previous five (5) years and only significant trends are discussed in this report. Leachate indicator parameters at the site, as identified in Schedule "C" of ECA A412303 (Appendix A), include alkalinity, barium, boron, calcium, chloride, chromium, conductivity, hardness, and total dissolved solids (TDS). In accordance with the MECP TSS groundwater review comments dated August 28, 2012 (Greenview, 2013c), a discussion on the relationship between the leachate indicator parameters and iron and manganese is reviewed in Section 4.1.4 of this report.

Blind duplicate samples for QA/QC purposes were collected for the background and surveillance parameter suite (Table 1) from monitoring well BH95-9 in spring 2019 and BH-1 in fall 2019 (Appendix B). A blind duplicate sample was obtained for the routine parameter suite (Table 1) at BH-6 during the fall 2019 sampling event (Appendix B). The QA/QC sample results were similar to each of the identified samples, and therefore, the results of the 2019 groundwater monitoring program can be interpreted with confidence (Appendix D).

Background groundwater quality at the Round Lake site has historically been interpreted from groundwater samples acquired at monitoring wells BH-1 and BH-5, located upgradient of the waste mound. BH-1 is located

on the western property boundary of the Round Lake site, and well BH-5 is located near the southwestern corner of the site (Figures 3 and 4). Groundwater was sampled at BH-1 in spring and fall 2019, while BH-5 was only sampled in spring 2019 as it was observed to have insufficient water to sample during the fall 2019 sampling event (Appendix B). In 2019, many parameter concentrations in the samples collected from BH-1 and BH-5 were above the median background concentrations, with fewer concentrations above median background concentrations during the spring sampling event than in the fall in results from BH-1 (Table 4). Non-conformances of ODWS and significant groundwater trends at background groundwater monitoring locations BH-1 and BH-5 were as follows (Table 4):

Monitoring Well	ODWS Non-Conformance		Five (5) Year Trend Analysis	
	Spring 2019	Fall 2019	Increasing	Decreasing
BH-1 (background)	• Alkalinity (low) • Aluminum • Dissolved organic carbon (DOC)	• Alkalinity (low) • Aluminum • DOC • Iron • Manganese • pH (low)	• No significant trends	• Total dissolved solids (TDS)
BH-5 (background)	• Alkalinity (low) • Aluminum • Iron • Manganese	• Insufficient water for sampling purposes	• No significant trends	• No significant trends

Consistent with historical results (Greenview, 2018 and 2019), groundwater at background monitoring well BH-1 exhibited naturally high concentrations of aluminum, dissolved organic carbon (DOC), iron, and manganese, and naturally low concentrations of alkalinity and associated low pH values (Table 4). Similarly, groundwater at background monitoring well BH-5 exhibited naturally high concentrations of aluminum, iron, and manganese and low concentrations of alkalinity (Table 4). Low pH values have been documented at both background monitoring wells in historical sampling events, and were interpreted to be interrelated with the low alkalinity values (Table 4). Groundwater quality results at BH-1 and BH-5 in 2019 were interpreted to continue to be representative of naturally-occurring conditions in background groundwater in the vicinity of the Round Lake site.

Groundwater immediately downgradient of the waste mound was monitored for the routine parameter suite at groundwater wells BH-6 and BH01-15, and for the background and surveillance suite at monitors BH-2S and BH-2D (Table 1, Figures 3 and 4).

Characterization of leachate quality at the site has historically included a review of groundwater quality at monitoring wells BH-2S and BH-2D, which are located downgradient of the northeastern extent of the limit of waste (Figures 3 and 4). In 2019, most parameter concentrations in the samples collected from leachate monitoring wells BH-2S and BH2-D were above the median background concentrations (Table 4). Non-conformances of ODWS and significant groundwater trends at leachate monitoring locations BH-2S and BH-2D were as follows (Table 4):

Monitoring Well	ODWS Non-Conformance		Five (5) Year Trend Analysis	
	Spring 2019	Fall 2019	Increasing	Decreasing
BH-2S	• DOC • Hardness • Iron • Manganese	• Insufficient water for sampling purposes	• DOC	• Alkalinity • Nitrate • Sulphate • TDS

Monitoring Well	ODWS Non-Conformance		Five (5) Year Trend Analysis	
	Spring 2019	Fall 2019	Increasing	Decreasing
BH-2D	• DOC • Hardness • Iron • Manganese	• DOC • Iron • Manganese	• COD • DOC	• Alkalinity • Barium • Hardness • Manganese • TDS

Based on their proximity to the limit of waste, location in-line with the interpreted direction of groundwater flow, and documented parameter concentrations in 2019, BH-2S and BH-2D were interpreted to exhibit impacts resultant of landfill-related factors; however, the impacts were interpreted to be generally stable and/or decreasing with time. BH-2S was interpreted to be less significantly impacted by landfill-related factors than BH-2D, based on a review of documented results (Table 4).

Monitoring well BH-6 is located near the mid-point of the northern boundary of the AWDA, approximately 15 m north of the existing limit of waste. Monitoring well BH01-15 is located east and adjacent to the eastern property boundary (Figures 3 and 4). BH01-15 was not sampled in fall 2019 as it was observed to have insufficient water for sampling purposes (Table 4, Appendix B). In 2019, few parameter concentrations in the samples collected from BH-6 in fall 2019 were above the median background concentrations (Table 4). Non-conformances of ODWS and significant groundwater trends at monitoring locations BH-6 and BH01-15 were as follows (Table 4):

Monitoring Well	ODWS Non-Conformance		Five (5) Year Trend Analysis	
	Spring 2019	Fall 2019	Increasing	Decreasing
BH-6	• Not included in environmental monitoring program for spring events, per ECA	• Alkalinity (low) • Manganese	• Manganese	• Conductivity • Nitrate • TDS
BH01-15		• Insufficient water for sampling purposes	• Insufficient data for trend analysis	• Insufficient data for trend analysis

Based on 2019 results, BH-6 and BH01-15 were not interpreted to be significantly impacted by landfill-related factors at the Round Lake site (Table 4). The low alkalinity value, and high manganese concentration, in groundwater results from BH-6 were generally consistent with current and historical values documented for background monitoring wells BH-1 and BH-5 at the Round Lake Waste Disposal Site (Table 4).

Groundwater monitor BH01-12D is located approximately 10 m inside of the northwestern CAZ boundary, and approximately 60 m downgradient of the former waste mound (Figures 3 and 4). In 2019, many parameter concentrations in the samples collected from BH01-12D in spring 2019 were above the median background concentrations, while only some were above the median background concentrations in fall 2019 (Table 4). Non-conformances of ODWS and significant groundwater trends at monitoring location BH01-12D were as follows (Table 4):

Monitoring Well	ODWS Non-Conformance		Five (5) Year Trend Analysis	
	Spring 2019	Fall 2019	Increasing	Decreasing
BH01-12D	• Alkalinity (low) • Aluminum • DOC • Iron • Manganese • pH (low)	• Alkalinity (low) • DOC • Iron	• No significant trends	• TDS

Based on 2019 results, groundwater quality at BH01-12D may be partially impacted by landfill-related factors from the site; however, groundwater monitor BH01-12D was interpreted to be located partially cross-gradient to the direction of groundwater flow at the site and many parameter concentrations were comparable to background groundwater quality (Table 4, Figures 3 and 4).

Based on the interpreted direction of groundwater flow in 2019, monitoring well BH-8 was located downgradient of the AWDA and approximately 60 m upgradient of BH95-9, located at the downgradient CAZ boundary (Figure 3 and 4). In 2019, most parameter concentrations in the samples collected from BH-8 were above the median background concentrations (Table 4). Non-conformances of ODWS and significant groundwater trends at monitoring location BH-8 were as follows (Table 4):

Monitoring Well	ODWS Non-Conformance		Five (5) Year Trend Analysis	
	Spring 2019	Fall 2019	Increasing	Decreasing
BH-8	• Hardness • Iron • Manganese	• DOC • Hardness • Iron • Manganese	• No significant trends	• Alkalinity • Conductivity • Hardness • Iron • Manganese • TDS

As BH-8 was located downgradient from the limit of waste and in the direction of interpreted groundwater flow, and given that many parameter concentrations remain above background levels, BH-8 was interpreted to be impacted by landfill-related factors; however, naturally-occurring conditions at the site are also interpreted to be contributing to groundwater quality at BH-8. Based on the decreasing trends interpreted in 2019, impacts related for former landfilling operations were interpreted to be decreasing over time (Table 4).

Groundwater quality near the downgradient CAZ boundary is monitored primarily using the background and surveillance parameter suite (Table 1) at monitors BH01-14, BH01-13S, BH01-13D, and BH95-9 (Figures 3 and 4). Monitoring well BH95-10, located approximately 100 m north of the northeast corner of the CAZ and 210 m northeast of the existing limit of waste (Figure 3 and 4), is sampled as part of the routine groundwater sampling program (Table 1).

Monitoring well BH01-14, located approximately 80 m north of the waste mound, was used to assess groundwater quality at the downgradient CAZ boundary (Figures 3 and 4). In 2019, most parameter concentrations in the samples collected from BH01-14 were above the median background concentrations (Table 4). Non-conformances of ODWS and significant groundwater trends at monitoring location BH01-14 were as follows (Table 4):

Monitoring Well	ODWS Non-Conformance		Five (5) Year Trend Analysis	
	Spring 2019	Fall 2019	Increasing	Decreasing
BH01-14	• Hardness • Iron • Manganese	• Aluminum • Iron • Manganese	• DOC • Manganese	• TDS

Based on 2019 results, groundwater at BH01-14 was interpreted to be partially impacted from landfill-related factors; however, naturally-occurring conditions at the site were also interpreted to be contributing factors to groundwater quality results at BH01-14. With the exception of the high hardness concentration in spring 2019, all ODWS non-conformances noted for BH01-14 in 2019 have been historically apparent in background groundwater quality results at the Round Lake site (Table 4).

Groundwater quality at the downgradient CAZ boundary north of the site is also monitored at groundwater monitoring wells BH01-13S and BH01-13D, which are located at the CAZ boundary approximately 85 m north of

the northeastern extent of the existing limit of waste (Figures 3 and 4). BH01-13S was dry during the fall 2019 sampling event and no sample was collected (Appendix B). In 2019, many parameter concentrations in the samples collected from BH01-13S and BH01-13D were above median background concentrations (Table 4). Non-conformances of ODWS and significant groundwater trends at monitoring locations BH01-13S and BH01-13D were as follows (Table 4):

Monitoring Well	ODWS Non-Conformance		Five (5) Year Trend Analysis	
	Spring 2019	Fall 2019	Increasing	Decreasing
BH01-13S	• None	• Dry	• DOC	• No significant trends
BH01-13D	• Aluminum • DOC • Hardness • Iron • Manganese	• DOC • Iron • Manganese	• No significant trends	• Alkalinity • TDS

Based on the comparison of groundwater quality results at BH01-13S and BH01-13D to those at leachate monitoring well BH-2D, significant attenuation was interpreted to be occurring downgradient of the Round Lake site (Table 4). Groundwater quality at BH01-13D was interpreted to be impacted by landfill-related factors; however, naturally-occurring conditions at the site were also interpreted to be contributing factors to groundwater quality. Groundwater at BH01-13S was not interpreted to be impacted by landfill-related factors. With the exception of the high hardness concentration noted in spring 2019 at BH01-13D, ODWS non-conformances for concentrations of aluminum, DOC, iron and manganese at BH01-13D in 2019 are historically apparent in background groundwater quality results at the Round Lake site (Table 4).

Monitoring well BH95-9 is located at the northeastern extent of the CAZ, approximately 120 m northeast of the AWDA (Figures 3 and 4). In 2019, many parameter concentrations in the samples collected from BH95-9 were above the median background concentrations (Table 4). Non-conformances of ODWS and significant groundwater trends at monitoring location BH95-9 were as follows (Table 4):

Monitoring Well	ODWS Non-Conformance		Five (5) Year Trend Analysis	
	Spring 2019	Fall 2019	Increasing	Decreasing
BH95-9	• Iron • Manganese	• Iron • Manganese	• Chloride	• TDS

Groundwater quality from BH95-9 was interpreted to be generally stable, following the inclusion of 2019 data (Table 4). Groundwater at BH95-9 was interpreted to be impacted from landfill-related factors; however, naturally-occurring conditions at the site were also interpreted to be contributing factors. All ODWS non-conformances noted for BH95-9 in 2019 were historically apparent in background groundwater quality results at the Round Lake site (Table 4).

Groundwater monitoring well BH95-10 is located approximately 100 m north of the northeastern corner of the CAZ boundary at the Round Lake site (Figure 3 and 4). Access to this monitoring well and permission for sampling are provided under easement by the current property owner, as approved in the ECA (Appendix A). BH95-10 forms part of the routine (fall only) groundwater monitoring program at the site (Table 1). In 2019, some parameter concentrations in the samples collected from BH95-10 were above the median background concentrations (Table 4). Non-conformances of ODWS and significant groundwater trends at monitoring location BH95-10 were as follows (Table 4):

Monitoring Well	ODWS Non-Conformance		Five (5) Year Trend Analysis	
	Spring 2019	Fall 2019	Increasing	Decreasing
BH95-10	• Not included in environmental monitoring program for spring events, per ECA	• pH (low)	• No significant trends	• Hardness • TDS

Based on 2019 results, groundwater in the vicinity of BH95-10 was not interpreted to be significantly impacted from the Round Lake Waste Disposal Site (Table 4).

VOCs are sampled at the Round Lake site once every five (5) years during the fall sampling event, with the last sampling event completed as part of the fall 2017 sampling event (Greenview, 2018). All parameter concentrations were below ODWS limits (Table 4). The next sampling event for VOCs is scheduled for fall 2022.

Groundwater samples from upgradient residential sampling location R-1, located approximately 300 m east and upgradient of the site, on the south side of Sunrise Road, were not collected in spring 2019 due to the homeowner not granting access to sample the property's groundwater well. After discussions with the homeowner in fall 2019, access was granted to sample the groundwater well at the residential location (Appendix B). Residential groundwater location R1 has not previously been interpreted to be impacted from historical landfilling operations at the Round Lake site (Greenview, 2019).

Residential Monitoring Location	ODWS Non-Conformance		Five (5) Year Trend Analysis	
	Spring 2019	Fall 2019	Increasing	Decreasing
R-1	• Access not granted for sampling of groundwater well	• Alkalinity (low) • pH (low)	• No significant trends	• No significant trends

Based on the results of the fall 2019 sampling event at residential sampling location R-1, groundwater in the vicinity of the upgradient residential location was not interpreted to be impacted by the Round Lake Waste Disposal Site (Table 4).

4.1.3 Reasonable Use Concept Assessment

In an effort to assess potential landfill-related impacts migrating beyond the CAZ boundary, the RUC was used as an assessment tool to monitor downgradient impacts from the waste disposal site. Downgradient impacts are typically assessed using the RUC at monitoring wells located at, or in close proximity to, the downgradient CAZ boundary. The downgradient monitoring wells located near the CAZ boundary were compared to trigger concentrations for specific parameters as determined by groundwater quality at the site using the RUC for groundwater (MECP Procedure B-7-1, 1994a).

The MECP Procedure B-7-1: Determination of Contaminant Limits and Attenuation Zones iterates that in accordance with the appropriate criteria for particular uses, a change in groundwater quality on an adjacent property as a result of landfilling activities will only be accepted by the MECP 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 Ontario Drinking Water Standards for health-related parameters. Background is considered to be the quality of the groundwater prior to any man-made contamination.*
>
> *MECP Procedure B-7-1*

The RUC assessment was conducted using the concepts and procedures outlined in MECP Procedure B-7-1 (MECP, 1994), specifically using the median value of individual background parameter concentrations from a minimum of ten (10) previous sampling events from monitoring wells BH-1 and BH-5, to characterize natural

groundwater quality at the site. Groundwater monitoring wells BH-8, BH95-9, BH01-13D, and BH01-14 were used for monitoring downgradient impacts at the CAZ boundary for assessing site conformance in accordance with Schedule "C" of the ECA (Appendix A).

The compliance evaluation parameters for RUC evaluation, as detailed in Schedule "C" of the ECA, are barium, boron, chloride, chromium, and VOC. The RUC trigger concentrations are defined as 75% of the calculated RUC criteria for each of the respective compliance evaluation parameters. The compliance evaluation parameters and respective 75% values of the calculated RUC criteria were applied to the monitoring wells noted above (Table 5), as follows:

Monitoring Well	75% RUC Non-Conformance	
	Spring 2019	Fall 2019
BH-8	• None	• None
BH95-9	• None	• None
BH01-13D	• None	• None
BH01-14	• None	• None

There were no non-conformances for the trigger concentrations of barium, boron, chloride, and chromium at the groundwater wells identified for evaluation (BH-8, BH95-9, BH01-13D, and BH01-14, Table 5). VOC sampling and analysis is completed once every five (5) years at the Round Lake site, with the next sampling event scheduled for 2022 (Table 4). Continued regular monitoring is required to evaluate the results of the 2019 monitoring program.

Trend analysis for the compliance evaluation parameters barium, boron, chloride, and chromium over the previous five (5) year period in groundwater quality results at monitoring wells BH-8, BH95-9, BH01-13D, and BH01-14 was interpreted to indicate that the compliance evaluation parameters were generally stable at each monitoring location following inclusion of 2019 results, with the exception of an increasing trend for the concentration of chloride in results from BH95-9 (Table 5). Given that landfilling operations have not occurred at the Round Lake site since 2003, the increasing trend for the concentration of chloride in groundwater at downgradient monitoring well BH95-9 was interpreted to be likely resultant of the application of road salt on the transfer station access roads.

Based on the above noted information, the Round Lake site was interpreted to be in conformance with the Trigger Mechanism and MECP Guideline B-7 following the completion of the 2019 groundwater monitoring program at the site. As active landfilling operations have not occurred at the site since June 20, 2003, parameter concentrations are expected to remain generally stable and/or decrease over time.

4.1.4 Review of Relationship of Iron, Manganese, and Leachate Indicator Parameters

In accordance with the MECP TSS groundwater review comments dated August 28, 2012 (Greenview, 2013c), an evaluation of the relationship between the leachate indicator parameters (per Schedule C of the Amended ECA), and iron and manganese was requested. As part of each subsequent Annual Report, this practice has been continued.

The following is a review of the relationship of the leachate indicator parameters (alkalinity, barium, boron, calcium, chloride, chromium, conductivity, hardness, and TDS), and iron and manganese, at the site using five (5) year time trend analysis at background monitoring wells BH-1 and BH-5, leachate monitoring wells BH-2S and BH-2D, and downgradient monitoring wells BH01-12D, BH01-13S, BH01-13D, BH01-14, and BH95-9 (Table 4, Figures 3 and 4). Only significant increasing and decreasing trends are discussed below. Increasing trends are identified with a "↑" and decreasing trends are identified with a "↓". Generally stable trends are identified with a "-":

Monitoring Well	Trend Analysis Review										
	Iron	Manganese	Alkalinity	Barium	Boron	Calcium	Chloride	Chromium	Conductivity	Hardness	TDS
BH-1	-	-	-	-	-	-	-	-	-	-	↓
BH-5	None										
BH-2S	-	-	↓	-	-	-	-	-	-	-	↓
BH-2D	-	↓	↓	↓	-	-	-	-	-	↓	↓
BH01-12D	-	-	-	-	-	-	-	-	-	-	↓
BH01-13S	None										
BH01-13D	-	-	↓	-	-	-	-	-	-	-	↓
BH01-14	-	↑	-	-	-	-	-	-	-	-	↓
BH95-9	-	-	-	-	-	-	↑	-	-	-	↓

In general, and based on five (5) year time trend analysis, leachate indicator parameters, and iron and manganese, were interpreted to be generally decreasing and/or remaining stable in the vicinity of the inactive AWDA and in the CAZ of the Round Lake site. The only increasing trends for the noted parameters were interpreted in results from BH01-14 (manganese only) and BH95-9 (chloride only), which may be related to dry and/or low groundwater conditions observed in 2019 at the Round Lake site and to the application of road salt on the transfer station access roads (Tables 3 and 4).

Since the Round Lake site has not received waste for landfilling since 2003 (sixteen [16] years), decreasing trends for the leachate indicator parameters noted in Schedule C of the Amended ECA, and decreasing trends for iron and manganese, are anticipated in future environmental monitoring programs.

4.2 Operations Summary

A summary of 2019 waste management operations at the Round Lake Waste Disposal Site is presented below.

4.2.1 Site Operations

In 2019, the Round Lake Waste Disposal Site operated as a municipal mobile waste and permanent Blue Box recycling transfer station, and is interim-closed to active landfilling operations. In fall 2010, two (2) specialized Molok containers were installed at the Round Lake site, in accordance with Conditions 32 and 33 of the ECA dated September 4, 2009 (Appendix A). The Round Lake site currently operates under the Amended ECA, issued on November 30, 2012 and the most recent amendment dated May 21, 2014 (Appendix A). The Round Lake Waste Disposal Site has a remaining capacity of 77,305 m^3, in accordance with the remaining capacity identified in Condition 2.4 (1) of the site's Amended ECA (94,974 m^3, Appendix A) and the calculated waste-in-place volume (17,669 m^3, Greer Galloway Group, 1998).

In summer 2012, the Township completed construction of a permanent Blue Box recycling transfer station at the Round Lake site including a retaining wall and two (2) in-use Blue Box recycling roll-off containers for the storage and transfer of mixed fibres and commingled containers. Municipal waste collected as part of mobile operations was collected in a truck and transferred to the Killaloe Waste Disposal Site for management.

A sign is posted at the entrance to the waste disposal site that provides hours of operation, permitted users, the ECA number for the site, the waste management by-law number for the Township, accepted waste and recycling materials, and emergency contact information. The entrance of the site is equipped with a lockable gate controlling access to the site. The waste mound was well vegetated, and no exposed waste was observed during

site visits in 2019.

The site access road extending from Sunrise Road has sufficient width at the entrance and within the site to allow for unimpeded winter travel and access for emergency and snow removal equipment (Figure 2). The site access road was observed to be in good condition during the routine site inspections conducted by Greenview in 2019.

Following the issuance of the Amendment to the ECA on May 21, 2014 (Appendix A), the hours of operation at the Round Lake site were revised as follows:

Day of the Week	Hours of Operation
Thursday	8:30 a.m. – 3:30 p.m.
Sunday	8:30 a.m. – 3:30 p.m.
Holiday Mondays (May – October, excluding Canada Day)	10:00 a.m. – 6:00 p.m.

An *Emergency Response Manual* (Greenview, 2013a) was submitted to the MECP dated January 28, 2013 to satisfy Condition 10.3 of the Amended ECA. An *Operations Manual* (Greenview, 2013b) was submitted to the MECP dated February 28, 2013 to satisfy Conditions 2.2 and 2.3 of the Amended ECA. As part of the updated operations program for the Round Lake site an upgraded site record book was prepared by the Township in 2013 for improved monitoring of the site and associated operations. Further updates to the site record book for the Round Lake site were completed as part of a waste management training event conducted by Greenview with waste management operations staff in December 2015.

On March 06, 2020, the Township completed revisions to the *Emergency Response Plan* (Version 2.0) and *Operations and Procedures Manual* (Version 2.0) for the Round Lake Waste Disposal Site, and were submitted to the MECP Ottawa District Office for their file, in accordance with the requirements of Conditions 10.3 and 10.4 of the ECA (with respect to the Emergency Response Plan) and Conditions 2.2 and 2.3 of the ECA (with respect to the Operations and Procedures Manual).

4.2.2 Waste Disposal / Transfer Summary

The Round Lake Waste Disposal Site is currently interim-closed to active landfilling operations; however, the site operated as a mobile waste and Blue Box recycling transfer station in 2019, with all municipal waste transferred to the Township's Killaloe site for management. Blue Box recycling and household organics were transferred off-site for management as detailed below.

Based on Township records, approximately 3,229 residential vehicles visited the Round Lake site in 2019, with approximately 4,568 bags of waste received for transfer to the Township's Killaloe site for management. Additionally, 4 IC&I vehicles visited the Round Lake site in 2019, with approximately 27 bags of waste received for transfer to the Township's Killaloe site for management.

In 2019 and based on documentation submitted to the Township by GFL Environmental Inc., a total of 280.15 tonnes of municipal (residential and IC&I) waste was compacted at the Killaloe site and transferred to the GFL Environmental Inc. facility for disposal. Waste volumes collected from curbside collection within the Village of Killaloe, and transferred from the Township's Round Lake Waste Disposal Site, are also included in the above waste tonnage. Additionally, 7.95 tonnes of municipal (residential and IC&I) waste was transferred from the Round Lake and Killaloe Waste Disposal Sites to the Ottawa Valley Waste Recovery Centre (OVWRC) for disposal.

Recycling tonnage records provided by Beaumen Waste Management Systems Ltd., Tomlinson Group, Cascades Recovery+, and OVWRC for the Township indicate that approximately 143.90 tonnes of Blue Box recyclables were collected from the Township's Killaloe and Round Lake sites in 2019. Blue Box recyclables contributing to this total included approximately 63.34 tonnes of commingled containers (tin/aluminum/plastic/glass), 44.87 tonnes of mixed fibres, and 35.69 tonnes of old corrugated cardboard. Blue

Box recyclables from curbside collection within the Village of Killaloe by the Township and Blue Box recyclables transferred from the Township's Round Lake site were included in the Blue Box recycling tonnages provided by Beaumen Waste Management Systems Ltd., Tomlinson Group, Cascades Recovery+, and OVWRC.

Approximately 16.82 tonnes of household organics were collected within the Township from the depots at the Killaloe and Round Lake Waste Disposal Sites in 2019 and processed by OVWRC in Pembroke, Ontario.

4.2.3 Site Inspections and Maintenance

Site inspections of the Round Lake site were conducted by Greenview as part of the May 13, 2019 and October 7, 2019 spring and fall sampling events. The Township also conducted periodic inspections to verify the compliance status of the site.

The site inspections included a cursory investigation of housekeeping/litter control aspects, monitoring well maintenance requirements in accordance with O. Reg. 903 (Wells), as amended, and a general site overview for MECP regulatory compliance issues. During the site inspections conducted by Greenview in spring and fall 2019, as part of the 2019 environmental monitoring program, all monitoring wells were observed to be in good condition in accordance with O. Reg. 903, as amended.

The site inspection program undertaken by the Township at the site was completed in accordance with the Amended ECA (November 30, 2012, Appendix A).

A copy of the Certificate of Prohibition (Requirement) was provided to the MECP Ottawa District Office for their file by the Township electronically on September 23, 2015 (Appendix A).

4.2.4 Complaints

There were no reported complaints received by the Township in 2019 with respect to waste management operations at the Round Lake site.

4.2.5 Monitoring and Screening Checklist

In accordance with the MECP TGD (MECP, 2010), the Monitoring and Screening Checklist for the Round Lake Waste Disposal Site is included as Appendix E of this report.

5.0 Conclusions and Recommendations

Based on the results of the 2019 environmental monitoring program completed for the Round Lake Waste Disposal Site, the following conclusions are provided:

- Consistent with historical interpretations, the predominant groundwater flow direction within the shallow overburden at the Round Lake site was interpreted to be to the north and northeast, in the direction of the Sherwood River northeast of the site.
- Groundwater quality at the monitoring wells immediately downgradient of the waste mound, and to the northeast, were interpreted to be impacted from landfill-related factors in 2019, with monitoring well BH-2D exhibiting generally higher parameter concentrations than other wells in close proximity to the waste mound. The position and orientation of the leachate plume was interpreted to be consistent with historical interpretations, and most parameter concentrations downgradient of the site were interpreted to be either stable or to have decreasing trends.
- Groundwater samples from upgradient residential sampling location R-1 were not collected in spring 2019 due to the homeowner not granting access to sample the property's groundwater well. After discussions with the homeowner in fall 2019, access was granted to sample the groundwater well at the residential location. Based on fall 2019 results, and consistent with historical results, residential groundwater location R1 was not interpreted to be impacted from historical landfilling operations at the Round Lake site.
- There were no non-conformances for the trigger concentrations of barium, boron, chloride, and chromium at the groundwater wells identified for evaluation (BH-8, BH95-9, BH01-13D, and BH01-14). VOC sampling and analysis is completed once every five (5) years at the Round Lake site, with the next sampling event scheduled for 2022. In 2019, the Trigger Mechanism for the Round Lake site was not interpreted to be activated. Continued regular monitoring is required to evaluate the results of the 2019 monitoring program. The Round Lake site was interpreted to be in conformance with the Trigger Mechanism and MECP Guideline B-7 following the completion of the 2019 groundwater monitoring program at the site.
- In general, and based on five (5) year time trend analysis, leachate indicator parameters, and iron and manganese, were interpreted to be generally decreasing and/or remaining stable in the vicinity of the inactive AWDA and in the CAZ of the Round Lake site. The only increasing trends for the noted parameters were interpreted in results from BH01-14 (manganese only) and BH95-9 (chloride only), which may be related to dry and/or low groundwater conditions observed in 2019 at the Round Lake site and to the application of road salt on the transfer station access roads.
- Based on Township records, approximately 3,229 residential vehicles visited the Round Lake site in 2019, with approximately 4,568 bags of waste received for transfer to the Township's Killaloe site for management. Additionally, 4 IC&I vehicles visited the Round Lake site in 2019, with approximately 27 bags of waste received for transfer to the Township's Killaloe site for management.
- In 2019 and based on documentation submitted to the Township by GFL Environmental Inc., a total of 280.15 tonnes of municipal (residential and IC&I) waste was compacted at the Killaloe site and transferred to the GFL Environmental Inc. facility for disposal. Waste volumes collected from curbside collection within the Village of Killaloe, and transferred from the Township's Round Lake Waste Disposal Site, are also included in the above waste tonnage. Additionally, 7.95 tonnes of municipal (residential and IC&I) waste was transferred from the Round Lake and Killaloe Waste Disposal Sites to the OVWRC for disposal.
- Recycling tonnage records provided by Beaumen Waste Management Systems Ltd., Tomlinson Group, Cascades Recovery+, and OVWRC for the Township indicate that approximately 143.90 tonnes of Blue

Box recyclables were collected from the Township's Killaloe and Round Lake sites in 2019. Blue Box recyclables contributing to this total included approximately 63.34 tonnes of commingled containers (tin/aluminum/plastic/glass), 44.87 tonnes of mixed fibres, and 35.69 tonnes of old corrugated cardboard. Blue Box recyclables from curbside collection within the Village of Killaloe by the Township and Blue Box recyclables transferred from the Township's Round Lake site were included in the Blue Box recycling tonnages provided by Beaumen Waste Management Systems Ltd., Tomlinson Group, Cascades Recovery+, and OVWRC.

- Approximately 16.82 tonnes of household organics were collected within the Township from the depots at the Killaloe and Round Lake Waste Disposal Sites in 2019 and processed by OVWRC in Pembroke, Ontario.
- Based on the results of the 2019 environmental monitoring program, the Round Lake site was interpreted to be in compliance with the terms and conditions of the ECA.

The following recommendations are provided to the Township for consideration as part of the 2020 environmental work program for the Round Lake Waste Disposal Site:

- The groundwater monitoring program for the site should continue with two (2) annual sampling events, in the spring and fall, for the parameter suite provided in Table 1. Groundwater elevations at all monitoring wells should continue to be recorded during each sampling event, at least twice annually.
- VOC analysis at select groundwater monitoring wells on-site, per the Amended ECA, should be completed every five (5) years. VOC analysis should be completed next in 2022 as part of the groundwater monitoring program.

6.0 Closing

Greenview has prepared this 2019 Annual Report in accordance with Condition 11 of the ECA A412303 and MECP guidelines to document the results of the 2019 environmental monitoring program for the Round Lake Waste Disposal Site, for review by the MECP.

Based on the results of the 2019 environmental monitoring program, the Round Lake Waste Disposal Site is understood to be in compliance with all Conditions of the ECA (A412303) and with the inspections, monitoring, and reporting requirements of the Conditions therein.

This report is governed by the attached statement of service conditions and limitations (Appendix F).

All respectfully submitted by,

Greenview Environmental Management Limited

Dan Hagan, P.Geo.
Senior Project Manager / Geologist

Tyler H. Peters, P.Eng.
Project Director

7.0 References

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Tables

Table 1
2019 Groundwater Monitoring Program
Round Lake Waste Disposal Site

Location		Frequency	Parameters		
Groundwater (Background and Surveillance)					
BH-1	BH-2S	Twice (2x)	Alkalinity	Aluminum	Ammonia (total)
BH-2D	BH-5		Barium	Boron	Calcium
BH-8	BH95-9		Chloride	Chromium	Cobalt
BH01-12D	BH01-13S		COD	Copper	DOC
BH01-13D	BH01-14		Hardness	Iron	Magnesium
			Manganese	Nitrate	Nitrite
R1 (Residential)			Phosphorus (total)	Potassium	Silicon
		Spring (April / May / June) and Fall (September / October / November)	Sodium	Strontium	Sulphate
1x QA/QC			TDS	TKN	Zinc
			Field Measurements		
			Conductivity	Dissolved Oxygen	pH
COUNT =	***12***		Temperature		
Groundwater (Routine)					
BH-6	BH95-10	Once (1x)	Alkalinity	Barium	Boron
BH01-15			Chloride	Chromium	DOC
			Hardness	Iron	Manganese
1x QA/QC			Nitrate	Nitrite	Sodium
		Fall (September / October / November)	Sulphate	TDS	
			Field Measurements		
			Conductivity	Dissolved Oxygen	pH
COUNT =	***4***		Temperature		
Groundwater (Volatile Organic Compounds)					
BH-1	BH-2S	Once (1x) Every Five (5) Years	EPA 624 Volatile Organic Compounds		
BH-2D	BH-5				
BH95-9	BH01-14				
Trip Blank	Field Blank	Fall (September / October / November) *(Next in 2022)*			
1x QA/QC					
COUNT =	***9***				
Groundwater Elevations					
BH-1	BH-2S	Twice (2x)	Groundwater Elevations in metres (all monitoring wells)		
BH-2D	BH-3				
BH-4	BH-5				
BH-6	BH-7				
BH-8	BH95-9				
BH95-10	BH95-11	Spring (April / May / June) and Fall (September / October / November)			
BH01-12D	BH01-13S				
BH01-13D	BH01-14				
BH01-15					
COUNT =	***17***				

Table 2
Groundwater Monitoring Well and Surface Water Sampling Locations
Round Lake Waste Transfer Site

Groundwater			
Monitor	**Zone**	**Northing**	**Easting**
BH-1	18T	5055828	299271
BH-2D	18T	5055933	299362
BH-2S	18T	5055933	299362
BH-3	18T	5055880	299392
BH-4	18T	5055774	299414
BH-5	18T	5055780	299306
BH-6	18T	5055928	299314
BH-7	18T	5055897	299401
BH-8	18T	5055977	299401
BH01-12D	18T	5055973	299308
BH01-13D	18T	5056013	299391
BH01-13S	18T	5056013	299391
BH01-14	18T	5056005	299364
BH01-15	18T	5055873	299415
BH95-9	18T	5056041	299403
BH95-10	18T	5056107	299430
R1	18T	5055823	299640

Notes:
Global Positioning System (GPS) point locations acquired by Greenview using a Garmin eTrex Venture HC.

Table 3
Groundwater Elevations
Round Lake Waste Disposal Site

Monitor	Original Ground Elevations* (m)	Top Of Pipe Elevations* (m)	Revised Top of Pipe Elevations** (m)	Stick - Up (m)	Depth of Well (m) [1]	Groundwater Elevations (m)													
						24-Apr-13	31-Oct-13	13-May-14	27-Oct-14	20-May-15	8-Oct-15	30-May-16	31-Oct-16	3-May-17	24-Oct-17	1-May-18	17-Oct-18	13-May-19	7-Oct-19
BH-1	98.05	98.52	98.70	0.65	2.24	97.62	96.94	97.50	96.82	97.19	96.49	97.48	96.63	97.98	96.90	97.66	96.74	97.89	96.49
BH-2S	99.25	99.44	100.08	0.83	2.99	97.35	96.60	97.24	96.48	96.90	96.29	97.22	96.36	97.99	96.59	97.29	96.43	97.71	96.33
BH-2D	99.25	99.85	99.85	0.49	5.55	97.41	96.67	97.31	96.55	96.97	96.33	97.31	96.40	98.07	96.67	97.37	96.51	97.80	96.34
BH-3	100.24	100.69	100.69	0.39	5.87	97.38	-	97.25	96.51	96.86	-	97.25	-	98.03	-	97.35	-	97.75	-
BH-4	98.39	98.52	98.52	0.20	2.24	97.58	-	97.43	96.64	97.06	96.39	97.44	96.47	98.26	96.74	97.52	96.59	97.95	96.40
BH-5	97.95	98.42	98.42	0.52	1.93	97.51	96.68	97.38	96.57	97.02	96.33	97.35	96.42	98.07	96.68	97.54	96.52	97.86	96.35
BH-6	99.09	99.79	99.79	0.71	4.38	97.39	96.64	97.29	96.52	96.95	96.28	97.28	96.37	98.04	96.64	97.34	96.47	97.78	96.30
BH-7	100.48	100.89	100.89	0.29	5.67	97.39	96.64	97.28	96.53	97.06	96.29	97.27	96.38	98.03	96.65	97.39	96.48	97.75	96.31
BH-8	97.84	98.43	98.43	0.57	5.15	96.45	95.73	96.41	95.64	96.01	95.51	96.45	95.57	97.18	95.74	96.42	95.63	96.89	95.54
BH95-9	97.31	97.75	97.75	0.45	4.55	95.59	94.99	95.60	94.90	95.19	94.80	95.69	94.87	96.32	95.06	95.56	94.92	96.07	94.86
BH95-10	96.42	96.88	96.88	0.52	5.26	92.84	92.37	93.16	92.27	92.38	92.11	93.50	92.23	94.37	92.53	92.86	92.30	94.21	92.27
BH95-11	99.70	100.10	100.10	0.33	4.56	97.90	97.64	97.84	97.43	97.79	96.78	97.75	96.83	98.27	97.40	97.99	97.08	97.99	96.75
BH01-12D	98.76	99.45	99.19	0.38	5.28	97.10	96.36	96.01	96.23	96.66	96.01	96.99	96.06	97.77	96.36	97.07	96.18	97.48	96.01
BH01-13S	97.15	97.85	97.85	0.72	2.01	95.67	-	95.65	-	95.28	-	95.74	-	96.41	-	95.73	-	96.13	-
BH01-13D	97.15	97.92	97.92	0.63	3.77	95.86	95.19	95.83	95.10	95.45	95.01	95.91	95.05	96.59	95.22	95.91	95.11	96.31	95.06
BH01-14	97.17	97.61	97.61	0.32	7.15	95.86	95.14	95.81	95.05	95.42	94.94	95.90	95.01	96.57	95.19	95.85	95.07	96.28	95.01
BH01-15	101.79	102.55	102.55	0.69	5.42	97.41	96.65	97.29	96.52	96.97	-	97.29	-	98.07	96.66	97.35	96.48	97.78	-

Note:
1. Depth of well below ground surface (m).

* Values as surveyed in 2003, by Jp2g Consultants Inc.
** Corrected values based on above-ground PVC casing measurements in 2006.
All elevations are relative to a site specific benchmark elevation of 100.00 m.
"-" denotes no water level information available.

Table 4
Groundwater Quality
Round Lake Waste Disposal Site

Parameter	Background (median)	RUC [1]	ODWS [2]	BH-1 (Background)														5-year Trends
				24-Apr-13	31-Oct-13	13-May-14	27-Oct-14	20-May-15	08-Oct-15	30-May-16	31-Oct-16	03-May-17	24-Oct-17	1-May-18	17-Oct-18	13-May-19	07-Oct-19	(sparkline)
Alkalinity (as $CaCO_3$)	14	257	30 - 500	**11**	**11**	43	**9**	**12**	**13**	**12**	**11**	**8**	**16**	**17**	**15**	**9**	**10**	
Aluminum	0.28	0.3	0.1	**0.415**	**0.258**	**0.338**	**0.380**	**0.246**	**0.358**	**0.28**	**0.41**	**0.68**	**0.34**	**0.18**	**0.41**	**0.35**	**0.43**	
Ammonia, Total (as N)	0.1	N/L	N/L	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.06	< 0.01	< 0.01	0.06	0.02	0.04	0.04	0.06	
Barium	0.012	0.26	1.0	0.0117	0.0124	0.00899	0.00990	0.0104	0.01130	0.011	0.020	0.006	0.017	0.008	0.009	0.008	0.014	
Boron	0.005	1.3	5.0	0.0013	0.0027	0.0036	0.0031	0.0040	0.0059	< 0.005	< 0.005	< 0.005	0.005	< 0.005	0.005	< 0.005	< 0.005	
Calcium	5.0	N/L	N/L	4.44	4.86	4.31	6.01	4.78	5.13	5.48	7.88	2.87	7.03	5.10	4.57	4.96	4.99	
Chloride	2.5	126	250	1.6	1.8	1.5	1.9	3	3	2.4	2.5	4.0	2.3	3.1	2.3	3.0	< 0.5	
Chromium	0.001	0.013	0.05	0.0010	0.0022	0.00100	0.00123	0.00078	0.00130	< 0.002	0.002	0.001	0.001	< 0.001	0.002	0.001	0.003	
Chemical Oxygen Demand	33	N/L	N/L	16	30	19	33	< 8	31	96	32	39	68	33	35	40	61	
Cobalt	0.003	N/L	N/L	0.0070	0.0019	0.00233	0.00104	0.00106	0.00264	< 0.005	< 0.005	< 0.005	< 0.005	0.0006	0.0008	0.0009	0.0026	
Conductivity (µS/cm) [3]	40	N/L	N/L	36	240	30	207	32	51	45	25	37	51	35	40	29	59	
Copper	0.005	0.5	1	0.0047	0.0055	0.00463	0.00536	0.00474	0.00591	0.0061	0.0051	0.0055	0.0044	0.0041	0.0088	0.0095	0.0093	
Dissolved Organic Carbon	9.3	9.3	5	**15.1**	**8.6**	**12.3**	**13.7**	**10.1**	**14.0**	**10.9**	**14.2**	**9.3**	**15.8**	**8.0**	**13.2**	**13.5**	**15.6**	
Hardness (as $CaCO_3$)	21	61	100	18.5	20.3	18.0	23.0	19.6	21.3	22	34	14	30	22	20	21	22	
Iron	0.37	0.37	0.3	**0.45**	**0.37**	**0.344**	**0.439**	0.200	**0.503**	**0.346**	**0.683**	0.248	**0.980**	0.160	**0.376**	0.182	**0.806**	
Magnesium	1.99	N/L	N/L	1.81	1.98	1.75	1.94	1.86	2.05	2.10	3.51	1.69	3.11	2.14	1.99	2.20	2.23	
Manganese	0.063	0.06	0.05	0.0326	0.0336	0.0201	0.0323	0.0191	**0.0629**	0.027	**0.088**	0.020	**0.069**	0.015	0.031	0.017	**0.073**	
Nitrite (as N)	0.05	0.3	1	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	0.1	0.1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Nitrate (as N)	0.06	2.5	10	0.06	< 0.06	< 0.06	0.06	0.07	< 0.06	0.2	< 0.1	< 0.05	< 0.05	< 0.05	< 0.05	0.18	< 0.05	
pH (units) [3]	6.94	6.5 - 8.5	6.5 - 8.5	7.88	7.11	6.75	**6.25**	**6.36**	6.51	7.73	**6.26**	**6.07**	7.48	6.61	7.52	**6.40**	**5.44**	
Phosphorus, Total	0.11	N/L	N/L	0.06	< 0.03	< 0.03	0.04	< 0.03	< 0.03	0.77	0.17	0.16	0.01	0.04	0.05	0.11	0.80	
Potassium	0.62	N/L	N/L	0.454	0.619	0.424	1.21	0.446	0.551	0.4	0.6	0.5	0.7	0.3	0.5	0.5	0.6	
Silicon	8.17	N/L	N/L	6.8	9.9	8.13	10.7	8.71	8.93	8.17	11.1	9.72	10.4	8.46	9.25	8.41	9.35	
Sodium	3.06	102	200	3.75	2.35	2.60	2.30	3.06	2.64	3.1	3.8	3.2	3.2	3.1	3.0	2.4	2.9	
Strontium	0.03	N/L	N/L	0.0253	0.0281	0.0233	0.0276	0.0279	0.0300	0.030	0.053	0.019	0.047	0.030	0.031	0.031	0.034	
Sulphate	9	254	500	15.0	10.0	10	8.1	8	10	12	18	9	10	4	5	8	7	
Total Kjeldahl Nitrogen	0.5	N/L	N/L	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	1.4	0.6	0.4	0.5	0.3	0.8	0.7	0.9	
Total Dissolved Solids	60	280	500	106	109	63	86	117	74	35	45	33	42	31	29	28	32	
Zinc	0.005	2.5	5	0.003	0.002	0.002	0.004	0.005	0.007	0.011	< 0.005	< 0.005	< 0.005	< 0.005	0.008	< 0.005	< 0.005	

Notes:
1. Reasonable Use Concept (RUC) criteria.
2. Ontario Drinking Water Standards (ODWS).
3. Results obtained from field analysis.

All results expressed in mg/L unless otherwise noted.
Bold and shaded values exceed the ODWS.
Bold and Italic values exceed RUC limits.
N/L indicates no limit specified.
"-" means parameter not analyzed.

Table 4
Groundwater Quality
Round Lake Waste Disposal Site

Parameter	Background (median)	RUC [1]	ODWS [2]	BH-2S								5-year Trends
				24-Apr-13	31-Oct-13	13-May-14	30-May-16	03-May-17	24-Oct-17	1-May-18	13-May-19	(sparkline)
Alkalinity (as $CaCO_3$)	14	257	30 - 500	119	150	187	132	126	137	122	116	
Aluminum	0.28	0.3	0.1	0.0068	0.0069	0.0053	0.01	0.02	0.03	0.03	0.04	
Ammonia, Total (as N)	0.1	N/L	N/L	< 0.1	2.4	1.5	1.03	1.31	3.60	2.09	1.68	
Barium	0.012	0.26	1.0	0.162	0.164	0.113	0.073	0.073	0.146	0.077	0.076	
Boron	0.005	1.3	5.0	0.154	0.110	0.116	0.098	0.080	0.107	0.088	0.094	
Calcium	5.0	N/L	N/L	61.9	45.3	52.5	39.2	36.2	35.0	38.2	39.7	
Chloride	2.5	126	250	2.4	4.4	3.6	2.3	4.3	4.0	3.1	2.0	
Chromium	0.001	0.013	0.05	0.0019	0.0086	0.00098	< 0.002	< 0.001	< 0.001	< 0.001	< 0.001	
Chemical Oxygen Demand	33	N/L	N/L	< 8	17	11	16	11	63	17	12	
Cobalt	0.003	N/L	N/L	0.00092	0.00539	0.00424	< 0.005	< 0.005	0.012	0.0057	0.0039	
Conductivity (µS/cm) [3]	40	N/L	N/L	171	288	360	225	210	137	169	204	
Copper	0.005	0.5	1	0.0021	0.0030	0.00260	0.0014	0.0012	0.0021	0.0030	0.0025	
Dissolved Organic Carbon	9.3	9.3	5	3.0	3.1	3.8	3.7	2.5	**6.8**	4.5	**5.0**	
Hardness (as $CaCO_3$)	21	61	100	**211**	**152**	**171**	**126**	**116**	**117**	**121**	**130**	
Iron	0.37	0.37	0.3	0.14	**0.84**	0.243	0.220	0.216	**3.51**	**1.29**	**0.302**	
Magnesium	1.99	N/L	N/L	13.70	9.35	9.75	6.72	6.27	7.16	6.30	7.38	
Manganese	0.063	0.06	0.05	**0.22**	**1.96**	**1.44**	**0.206**	**0.530**	**3.24**	**1.75**	**0.964**	
Nitrite (as N)	0.05	0.3	1	< 0.03	< 0.03	< 0.03	0.2	< 0.05	< 0.05	< 0.05	< 0.05	
Nitrate (as N)	0.06	2.5	10	***5.09***	1.50	1.85	0.7	0.81	0.83	0.17	0.56	
pH (units) [3]	6.94	6.5 - 8.5	6.5 - 8.5	**6.00**	6.50	**6.21**	7.93	6.63	7.94	6.93	6.57	
Phosphorus, Total	0.11	N/L	N/L	< 0.03	< 0.03	< 0.03	0.03	0.07	0.09	0.03	0.02	
Potassium	0.62	N/L	N/L	14.4	14.4	14.4	10.5	9.2	12.3	10.2	9.3	
Silicon	8.17	N/L	N/L	8.0	12.2	10.5	7.07	7.43	11.8	8.68	7.61	
Sodium	3.06	102	200	8.86	6.93	6.85	5.0	4.1	5.2	4.4	3.6	
Strontium	0.03	N/L	N/L	0.318	0.252	0.268	0.191	0.187	0.223	0.200	0.202	
Sulphate	9	254	500	35	15	22	15	13	14	11	11	
Total Kjeldahl Nitrogen	0.5	N/L	N/L	1.1	2.2	1.8	1.2	1.5	3.8	2.3	1.8	
Total Dissolved Solids	60	280	500	269	243	249	167	163	185	138	139	
Zinc	0.005	2.5	5	0.004	< 0.002	< 0.002	0.011	< 0.005	< 0.005	< 0.005	< 0.005	

Notes:
1. Reasonable Use Concept (RUC) criteria.
2. Ontario Drinking Water Standards (ODWS).
3. Results obtained from field analysis.

All results expressed in mg/L unless otherwise noted.
Bold and shaded values exceed the ODWS.
Bold and Italic values exceed RUC limits.
N/L indicates no limit specified.
"-" means parameter not analyzed.

Table 4
Groundwater Quality
Round Lake Waste Disposal Site

Parameter	Background (median)	RUC [1]	ODWS [2]	BH-2D														5-year Trends
				24-Apr-13	31-Oct-13	13-May-14	27-Oct-14	20-May-15	08-Oct-15	30-May-16	31-Oct-16	03-May-17	24-Oct-17	1-May-18	17-Oct-18	13-May-19	07-Oct-19	(sparkline)
Alkalinity (as $CaCO_3$)	14	257	30 - 500	161	130	154	147	142	110	107	99	127	85	138	101	122	78	
Aluminum	0.28	0.3	0.1	**0.121**	**0.178**	**0.150**	**0.137**	0.0343	0.034	0.02	0.06	0.02	0.04	0.03	0.02	0.05	0.04	
Ammonia, Total (as N)	0.1	N/L	N/L	2.1	1.9	2.2	2.6	2.4	2.4	2.64	2.54	2.76	2.12	2.78	2.11	2.71	2.16	
Barium	0.012	0.26	1.0	0.1530	0.1280	0.142	0.130	0.150	0.106	0.104	0.100	0.117	0.096	0.139	0.092	0.123	0.081	
Boron	0.005	1.3	5.0	0.0783	0.0633	0.0782	0.0724	0.0940	0.0738	0.079	0.080	0.084	0.076	0.115	0.087	0.144	0.083	
Calcium	5.0	N/L	N/L	37.4	28.4	35.8	30.0	34.0	26.3	25.1	25.0	29.1	20.3	35.2	24.0	31.9	18.8	
Chloride	2.5	126	250	4.6	4.0	4.7	4.8	5	7	2.9	2.7	4.7	3.0	4.4	4.2	3.7	< 0.5	
Chromium	0.001	0.013	0.05	0.0033	0.0074	0.00258	0.00232	0.00201	0.00179	< 0.002	0.003	< 0.001	0.001	< 0.001	0.002	0.002	0.002	
Chemical Oxygen Demand	33	N/L	N/L	41	38	34	31	33	31	131	109	189	131	149	166	104	649	
Cobalt	0.003	N/L	N/L	0.0052	0.0016	0.00392	0.00236	0.000653	0.00156	< 0.005	< 0.005	< 0.005	< 0.005	0.0007	0.0010	0.0024	0.0012	
Conductivity (µS/cm) [3]	40	N/L	N/L	317	275	420	315	237	265	240	208	280	211	288	238	253	157	
Copper	0.005	0.5	1	0.0012	0.0024	0.00149	0.00125	0.00053	0.00076	0.0012	0.0006	< 0.0001	0.0002	0.0010	0.0007	0.0007	0.0009	
Dissolved Organic Carbon	9.3	9.3	5	4.1	3.6	**7.4**	**5.1**	**6.4**	**5.0**	4.7	4.6	4.1	**9.1**	**7.3**	**8.0**	**7.8**	**9.9**	
Hardness (as $CaCO_3$)	21	61	100	**134**	**102**	**129**	**117**	**122**	***95.7***	***92***	***93***	**106**	***77***	**130**	***91***	**119**	***71***	
Iron	0.37	0.37	0.3	**40.9**	**31.1**	**39.3**	**36.1**	**38.1**	**28.8**	**30.7**	**33.0**	**37.2**	**24.6**	**42.2**	**29.7**	**37.9**	**22.1**	
Magnesium	1.99	N/L	N/L	9.89	7.64	9.58	10.1	8.95	7.32	7.15	7.32	8.20	6.28	10.3	7.65	9.52	5.90	
Manganese	0.063	0.06	0.05	**2.96**	**1.94**	**2.40**	**2.30**	**2.29**	**1.72**	**1.72**	**1.68**	**2.08**	**1.30**	**2.13**	**1.46**	**2.07**	**1.14**	
Nitrite (as N)	0.05	0.3	1	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	0.2	0.2	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Nitrate (as N)	0.06	2.5	10	< 0.06	< 0.06	< 0.06	< 0.06	0.06	< 0.06	0.2	0.1	< 0.05	0.07	0.06	< 0.05	0.17	< 0.05	
pH (units) [3]	6.94	6.5 - 8.5	6.5 - 8.5	**6.49**	6.76	**6.01**	6.64	**6.31**	6.68	7.86	6.53	6.70	**6.24**	6.89	6.82	6.75	6.77	
Phosphorus, Total	0.11	N/L	N/L	2	1.47	2.15	2.14	2.16	3.82	5.47	2.96	3.59	4.25	5.50	5.90	2.68	3.74	
Potassium	0.62	N/L	N/L	10.20	8.70	10.2	8.96	11.2	8.49	8.3	8.5	8.5	7.9	9.3	7.5	8.9	7.5	
Silicon	8.17	N/L	N/L	15.5	15.9	16.2	16.0	16.2	13.0	13.6	15.4	13.2	13.4	13.4	11.8	13.0	12.5	
Sodium	3.06	102	200	9.6	8.0	8.77	7.92	9.33	6.48	7.4	8.1	7.0	6.5	8.4	6.8	7.0	5.8	
Strontium	0.03	N/L	N/L	0.266	0.202	0.250	0.249	0.274	0.188	0.184	0.190	0.209	0.155	0.251	0.183	0.227	0.144	
Sulphate	9	254	500	9.3	12.0	12	19	14	17	12	14	10	12	12	16	14	7	
Total Kjeldahl Nitrogen	0.5	N/L	N/L	2.4	2.2	2.3	2.4	2.8	2.7	4.1	3.2	4.5	3.6	4.6	3.6	3.8	3.2	
Total Dissolved Solids	60	280	500	246	189	211	203	203	183	139	133	159	119	162	129	151	97	
Zinc	0.005	2.5	5	0.002	0.004	< 0.002	0.003	0.005	0.005	0.011	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	

Notes:
1. Reasonable Use Concept (RUC) criteria.
2. Ontario Drinking Water Standards (ODWS).
3. Results obtained from field analysis.

All results expressed in mg/L unless otherwise noted.
Bold and shaded values exceed the ODWS.
Bold and Italic values exceed RUC limits.
N/L indicates no limit specified.
"-" means parameter not analyzed.

Table 4
Groundwater Quality
Round Lake Waste Disposal Site

Parameter	Background (median)	RUC [1]	ODWS [2]	BH-5 (Background)							5-year Trends
				24-Apr-13	13-May-14	30-May-16	03-May-17	24-Oct-17	1-May-18	13-May-19	(sparkline)
Alkalinity (as $CaCO_3$)	14	257	30 - 500	**14**	**15**	**21**	**15**	31	**11**	**15**	
Aluminum	0.28	0.3	0.1	**0.1320**	0.0547	0.02	0.02	0.01	< 0.01	**2.25**	
Ammonia, Total (as N)	0.1	N/L	N/L	0.1	< 0.1	0.12	0.03	0.03	0.05	0.08	
Barium	0.012	0.26	1.0	0.0106	0.0225	0.062	0.017	0.069	0.017	0.070	
Boron	0.005	1.3	5.0	0.0042	0.0061	< 0.005	< 0.005	0.007	0.007	0.016	
Calcium	5.0	N/L	N/L	2.34	4.88	10.4	2.95	11.1	3.57	4.13	
Chloride	2.5	126	250	1.7	2.8	17.9	4.5	13.9	1.6	2.5	
Chromium	0.001	0.013	0.05	< 0.0005	0.00024	< 0.002	< 0.001	< 0.001	< 0.001	0.004	
Chemical Oxygen Demand	33	N/L	N/L	< 8	< 8	79	95	59	18	56	
Cobalt	0.003	N/L	N/L	0.00531	0.00326	< 0.005	< 0.005	< 0.005	< 0.0001	0.0033	
Conductivity (µS/cm) [3]	40	N/L	N/L	18	52	93	37	148	33	34	
Copper	0.005	0.5	1	0.0009	0.00083	0.0007	0.0007	0.0012	0.0018	0.0113	
Dissolved Organic Carbon	9.3	9.3	5	2.3	< 1	1.4	1.8	1.5	1.8	4.6	
Hardness (as $CaCO_3$)	21	61	100	9.9	19.7	39	11	49	14	20	
Iron	0.37	0.37	0.3	**0.437**	0.278	0.113	0.021	0.027	0.034	**3.52**	
Magnesium	1.99	N/L	N/L	0.98	1.83	3.22	0.96	5.26	1.32	2.40	
Manganese	0.063	0.06	0.05	**0.067**	**0.270**	**0.322**	0.043	**1.39**	**0.101**	**0.682**	
Nitrite (as N)	0.05	0.3	1	< 0.03	< 0.03	< 0.1	< 0.05	< 0.05	< 0.05	< 0.05	
Nitrate (as N)	0.06	2.5	10	0.11	< 0.06	< 0.1	0.14	< 0.05	0.16	0.25	
pH (units) [3]	6.94	6.5 - 8.5	6.5 - 8.5	7.85	7.23	7.60	**6.37**	7.06	8.04	6.74	
Phosphorus, Total	0.11	N/L	N/L	0.53	0.08	2.15	3.22	0.25	0.27	1.22	
Potassium	0.62	N/L	N/L	0.82	1.13	2.7	1.0	2.8	1.1	2.9	
Silicon	8.17	N/L	N/L	3.44	5.46	4.89	4.14	7.79	3.82	6.14	
Sodium	3.06	102	200	1.61	2.01	3.1	4.8	6.3	3.3	5.1	
Strontium	0.03	N/L	N/L	0.0148	0.0329	0.080	0.023	0.076	0.026	0.032	
Sulphate	9	254	500	5.6	8.7	6	7	10	7	4	
Total Kjeldahl Nitrogen	0.5	N/L	N/L	< 0.5	< 0.5	1.2	1.9	0.4	0.3	1.2	
Total Dissolved Solids	60	280	500	83	71	66	33	81	25	27	
Zinc	0.005	2.5	5	0.003	< 0.002	0.007	< 0.005	< 0.005	< 0.005	0.011	

Notes:
1. Reasonable Use Concept (RUC) criteria.
2. Ontario Drinking Water Standards (ODWS).
3. Results obtained from field analysis.

All results expressed in mg/L unless otherwise noted.
Bold and shaded values exceed the ODWS.
Bold and Italic values exceed RUC limits.
N/L indicates no limit specified.
"-" means parameter not analyzed.

Table 4
Groundwater Quality
Round Lake Waste Disposal Site

Parameter	Background (median)	RUC [1]	ODWS [2]	BH-6							5-year Trends
				31-Oct-13	27-Oct-14	08-Oct-15	31-Oct-16	24-Oct-17	17-Oct-18	07-Oct-19	(sparkline)
Alkalinity (as $CaCO_3$)	14	257	30 - 500	**20**	**14**	**25**	30	30	**27**	**23**	
Aluminum	0.28	0.3	0.1	-	-	-	-	-	-	-	
Ammonia, Total (as N)	0.1	N/L	N/L	-	-	-	-	-	-	-	
Barium	0.012	0.26	1.0	0.00722	0.0097	0.00910	0.011	0.008	0.007	0.008	
Boron	0.005	1.3	5.0	0.0096	0.0103	0.0199	0.021	0.018	0.016	0.010	
Calcium	5.0	N/L	N/L	-	-	-	-	-	-	-	
Chloride	2.5	126	250	0.3	0.3	< 1	< 0.5	0.8	< 0.5	< 0.5	
Chromium	0.001	0.013	0.05	0.0014	0.00023	0.00028	< 0.002	< 0.001	< 0.001	< 0.001	
Chemical Oxygen Demand	33	N/L	N/L	-	-	-	-	-	-	-	
Cobalt	0.003	N/L	N/L	-	-	-	-	-	-	-	
Conductivity (µS/cm) [3]	40	N/L	N/L	320	230	157	62	53	53	27	
Copper	0.005	0.5	1	-	-	-	-	-	-	-	
Dissolved Organic Carbon	9.3	9.3	5	< 1	2.3	1.1	0.8	1.9	0.9	1.9	
Hardness (as $CaCO_3$)	21	61	100	15.3	19.3	26.5	33	26	23	20	
Iron	0.37	0.37	0.3	0.085	0.137	0.052	0.016	0.197	**0.300**	0.172	
Magnesium	1.99	N/L	N/L	-	-	-	-	-	-	-	
Manganese	0.063	0.06	0.05	0.00622	0.00372	0.00158	0.014	**0.257**	**0.059**	**0.271**	
Nitrite (as N)	0.05	0.3	1	< 0.03	< 0.03	< 0.03	< 0.1	< 0.05	< 0.05	< 0.05	
Nitrate (as N)	0.06	2.5	10	0.85	< 0.06	1.18	1.0	0.68	1.05	< 0.05	
pH (units) [3]	6.94	6.5 - 8.5	6.5 - 8.5	7.21	7.51	**6.06**	7.08	7.67	7.01	6.61	
Phosphorus, Total	0.11	N/L	N/L	-	-	-	-	-	-	-	
Potassium	0.62	N/L	N/L	-	-	-	-	-	-	-	
Silicon	8.17	N/L	N/L	-	-	-	-	-	-	-	
Sodium	3.06	102	200	3.95	4.54	5.66	6.5	3.7	4.3	3.5	
Strontium	0.03	N/L	N/L	-	-	-	-	-	-	-	
Sulphate	9	254	500	2.0	2.3	5	6	4	6	< 1	
Total Kjeldahl Nitrogen	0.5	N/L	N/L	-	-	-	-	-	-	-	
Total Dissolved Solids	60	280	500	60	66	77	47	39	40	29	
Zinc	0.005	2.5	5	-	-	-	-	-	-	-	

Notes:
1. Reasonable Use Concept (RUC) criteria.
2. Ontario Drinking Water Standards (ODWS).
3. Results obtained from field analysis.

All results expressed in mg/L unless otherwise noted.
Bold and shaded values exceed the ODWS.
Bold and Italic values exceed RUC limits.
N/L indicates no limit specified.
"-" means parameter not analyzed.

Table 4
Groundwater Quality
Round Lake Waste Disposal Site

Parameter	Background (median)	RUC [1]	ODWS [2]	BH-8														5-year Trends
				24-Apr-13	31-Oct-13	13-May-14	27-Oct-14	20-May-15	08-Oct-15	30-May-16	31-Oct-16	03-May-17	24-Oct-17	1-May-18	17-Oct-18	13-May-19	07-Oct-19	(sparkline)
Alkalinity (as $CaCO_3$)	14	257	30 - 500	190	161	190	180	190	162	138	131	133	132	122	130	122	110	
Aluminum	0.28	0.3	0.1	0.0454	0.0445	0.0616	0.0673	0.0159	0.018	0.02	0.02	0.02	0.04	0.03	0.03	0.04	0.03	
Ammonia, Total (as N)	0.1	N/L	N/L	3.7	3.3	4.1	3.6	4.2	4.2	4.37	4.47	3.85	3.98	4.17	3.67	3.17	2.76	
Barium	0.012	0.26	1.0	0.206	0.170	0.186	0.166	0.218	0.160	0.144	0.161	0.139	0.179	0.158	0.135	0.138	0.119	
Boron	0.005	1.3	5.0	0.0994	0.0945	0.112	0.0948	0.112	0.105	0.096	0.115	0.092	0.100	0.109	0.093	0.126	0.088	
Calcium	5.0	N/L	N/L	45.0	33.9	41.1	30.9	41.0	35.8	31.1	34.9	31.3	32.2	35.4	29.8	34.7	29.0	
Chloride	2.5	126	250	5.4	5.0	5.2	5.5	5	7	5.2	4.7	7.2	7.2	13.2	8.0	8.6	10.3	
Chromium	0.001	0.013	0.05	0.0031	0.0085	0.00255	0.00270	0.00186	0.00217	0.002	0.003	< 0.001	0.001	0.001	0.002	0.002	0.002	
Chemical Oxygen Demand	33	N/L	N/L	33	28	30	31	31	31	45	46	36	83	55	23	34	28	
Cobalt	0.003	N/L	N/L	0.0060	0.0053	0.00726	0.00360	0.00395	0.00347	0.006	0.005	0.005	0.005	0.0028	0.0030	0.0032	0.0025	
Conductivity (µS/cm) [3]	40	N/L	N/L	324	294	540	471	321	350	267	264	261	281	253	270	231	226	
Copper	0.005	0.5	1	0.0019	0.0033	0.00206	0.00503	0.00057	0.00055	0.0003	0.0007	0.0006	0.0007	0.0015	0.0009	0.0015	0.0014	
Dissolved Organic Carbon	9.3	9.3	5	**7.4**	3.6	**6.6**	**5.6**	**5.1**	**5.9**	3.9	4.2	1.7	**9.1**	**7.1**	**8.4**	0.2	**9.1**	
Hardness (as $CaCO_3$)	21	61	100	**157**	**117**	**144**	**111**	**144**	**124**	**109**	**122**	**109**	**113**	**123**	**105**	**122**	**102**	
Iron	0.37	0.37	0.3	**30.8**	**23.4**	**29.1**	**24.7**	**31.5**	**25.7**	**25.8**	**28.6**	**27.1**	**24.8**	**26.9**	**23.3**	**28.0**	**23.1**	
Magnesium	1.99	N/L	N/L	10.90	8.01	10.1	8.23	10.2	8.51	7.61	8.36	7.60	7.97	8.48	7.51	8.69	7.23	
Manganese	0.063	0.06	0.05	**6.46**	**4.13**	**4.94**	**4.10**	**4.94**	**4.02**	**3.55**	**3.87**	**3.49**	**3.33**	**3.59**	**3.05**	**3.54**	**2.80**	
Nitrite (as N)	0.05	0.3	1	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.1	***0.3***	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Nitrate (as N)	0.06	2.5	10	< 0.06	< 0.06	< 0.06	< 0.06	0.07	0.07	0.3	< 0.1	< 0.05	< 0.05	< 0.05	< 0.05	0.18	< 0.05	
pH (units) [3]	6.94	6.5 - 8.5	6.5 - 8.5	6.56	**6.41**	6.50	**6.31**	7.23	6.69	6.81	7.09	7.09	7.94	6.78	6.81	6.80	6.80	
Phosphorus, Total	0.11	N/L	N/L	0.33	0.13	0.14	0.06	0.18	0.11	0.42	0.25	0.42	0.34	0.57	0.38	0.23	0.17	
Potassium	0.62	N/L	N/L	17.6	15.8	17.5	15.4	20.2	16.7	13.9	16.6	13.4	16.9	15.1	15.6	13.7	14.0	
Silicon	8.17	N/L	N/L	15.9	16.6	15.9	16.8	14.8	14.5	14.0	16.9	13.3	15.2	13.6	13.1	12.8	13.6	
Sodium	3.06	102	200	11.3	9.7	9.85	10.5	10.3	8.58	8.0	9.2	7.1	7.7	7.4	7.7	6.9	7.0	
Strontium	0.03	N/L	N/L	0.343	0.259	0.312	0.277	0.362	0.280	0.250	0.281	0.242	0.258	0.271	0.254	0.267	0.235	
Sulphate	9	254	500	11.0	12.0	14	15	16	15	15	13	12	12	17	16	15	11	
Total Kjeldahl Nitrogen	0.5	N/L	N/L	3.8	3.5	4.1	4.0	4.7	4.6	4.7	4.5	4.6	4.5	4.4	3.8	3.3	3.0	
Total Dissolved Solids	60	280	500	243	231	240	223	254	240	184	171	183	183	167	168	161	144	
Zinc	0.005	2.5	5	0.002	0.003	< 0.002	0.005	0.003	0.003	0.013	< 0.005	< 0.005	< 0.005	0.005	< 0.005	< 0.005	0.006	

Notes:
1. Reasonable Use Concept (RUC) criteria.
2. Ontario Drinking Water Standards (ODWS).
3. Results obtained from field analysis.

All results expressed in mg/L unless otherwise noted.
Bold and shaded values exceed the ODWS.
Bold and Italic values exceed RUC limits.
N/L indicates no limit specified.
"-" means parameter not analyzed.

Table 4
Groundwater Quality
Round Lake Waste Disposal Site

Parameter	Background (median)	RUC [1]	ODWS [2]	BH95-9														5-year Trends
				24-Apr-13	31-Oct-13	13-May-14	27-Oct-14	20-May-15	08-Oct-15	30-May-16	31-Oct-16	03-May-17	24-Oct-17	1-May-18	17-Oct-18	13-May-19	07-Oct-19	(sparkline)
Alkalinity (as $CaCO_3$)	14	257	30 - 500	89	140	74	94	68	66	66	66	58	76	52	39	60	65	
Aluminum	0.28	0.3	0.1	0.0217	0.0135	0.0318	0.0445	0.0115	0.007	< 0.01	< 0.01	< 0.01	0.030	0.02	0.02	0.03	0.03	
Ammonia, Total (as N)	0.1	N/L	N/L	< 0.1	0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.09	0.03	0.04	0.06	0.06	0.08	0.09	0.10	
Barium	0.012	0.26	1.0	0.0461	0.0407	0.0337	0.0393	0.0370	0.0337	0.041	0.050	0.036	0.058	0.035	0.043	0.038	0.047	
Boron	0.005	1.3	5.0	0.0474	0.0420	0.0429	0.0451	0.0399	0.0388	0.035	0.047	0.031	0.054	0.042	0.043	0.043	0.046	
Calcium	5.0	N/L	N/L	21.9	20.0	19.8	18.6	19.4	18.3	21.3	23.3	18.8	23.9	18.5	21.9	20.7	21.6	
Chloride	2.5	126	250	4.8	7.5	9.3	7.3	11	12	17.9	15.1	17.1	15.3	19.0	27.3	19.1	28.1	
Chromium	0.001	0.013	0.05	0.0007	0.0034	0.00049	0.00043	0.00017	0.00023	< 0.002	< 0.002	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	
Chemical Oxygen Demand	33	N/L	N/L	29	11	10	10	8	10	16	27	8	43	12	< 5	9	< 5	
Cobalt	0.003	N/L	N/L	0.00535	0.00203	0.00338	0.00115	0.000813	0.000751	< 0.005	< 0.005	< 0.005	< 0.005	0.0007	0.0009	0.0008	0.0009	
Conductivity (µS/cm) [3]	40	N/L	N/L	155	157	185	184	133	164	170	162	153	188	130	179	139	166	
Copper	0.005	0.5	1	0.0014	0.0011	0.00118	0.00069	0.00053	0.00039	0.0003	0.0004	0.0005	0.0005	0.0012	0.0007	0.0005	0.0011	
Dissolved Organic Carbon	9.3	9.3	5	3.7	1.6	3.4	3.4	2.9	3.6	1.6	1.7	1.2	3.1	2.1	3.2	3.4	4.1	
Hardness (as $CaCO_3$)	21	61	100	***97.8***	***89.2***	***89.1***	***88.2***	***86.6***	***81.9***	***96***	**105**	***85***	**109**	***82***	**100**	***94***	***97***	
Iron	0.37	0.37	0.3	**5.27**	**7.39**	**8.04**	**7.68**	**6.99**	**6.33**	**7.93**	**8.07**	**7.30**	**7.96**	**6.12**	**7.04**	**6.63**	**6.81**	
Magnesium	1.99	N/L	N/L	10.40	9.53	9.61	10.1	9.30	8.79	10.3	11.3	9.24	11.9	8.65	10.9	10.2	10.4	
Manganese	0.063	0.06	0.05	**0.328**	**0.219**	**0.222**	**0.216**	**0.229**	**0.201**	**0.271**	**0.291**	**0.240**	**0.264**	**0.220**	**0.234**	**0.231**	**0.242**	
Nitrite (as N)	0.05	0.3	1	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.1	0.2	0.23	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Nitrate (as N)	0.06	2.5	10	< 0.06	< 0.06	< 0.06	0.07	< 0.06	< 0.06	< 0.1	< 0.1	< 0.05	< 0.05	< 0.05	< 0.05	0.17	< 0.05	
pH (units) [3]	6.94	6.5 - 8.5	6.5 - 8.5	6.59	6.60	6.53	**6.44**	**6.36**	6.62	6.76	**6.27**	7.12	7.81	7.24	6.70	6.87	6.90	
Phosphorus, Total	0.11	N/L	N/L	0.3	0.14	0.2	0.22	0.13	0.08	0.25	0.10	0.11	0.06	0.10	0.04	0.05	0.09	
Potassium	0.62	N/L	N/L	2.72	2.65	2.47	2.50	2.63	2.35	2.3	2.9	2.1	3.0	2.3	2.9	2.6	3.0	
Silicon	8.17	N/L	N/L	9.23	10.40	10.3	10.9	9.82	9.07	8.99	10.8	8.63	9.99	9.37	8.85	8.86	9.42	
Sodium	3.06	102	200	5.45	5.57	4.73	6.80	5.29	4.74	5.7	7.7	4.8	6.7	5.5	7.6	6.0	7.5	
Strontium	0.03	N/L	N/L	0.119	0.109	0.104	0.118	0.109	0.102	0.118	0.134	0.106	0.136	0.100	0.132	0.117	0.129	
Sulphate	9	254	500	15	15	13	17	14	14	13	12	11	13	10	17	15	13	
Total Kjeldahl Nitrogen	0.5	N/L	N/L	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.2	0.4	0.2	0.3	0.2	0.2	0.2	0.2	
Total Dissolved Solids	60	280	500	154	206	151	163	131	160	122	117	118	139	97	136	112	117	
Zinc	0.005	2.5	5	< 0.002	< 0.002	< 0.002	0.003	0.005	0.002	0.010	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	

Notes:
1. Reasonable Use Concept (RUC) criteria.
2. Ontario Drinking Water Standards (ODWS).
3. Results obtained from field analysis.

All results expressed in mg/L unless otherwise noted.
Bold and shaded values exceed the ODWS.
Bold and Italic values exceed RUC limits.
N/L indicates no limit specified.
"-" means parameter not analyzed.

Table 4
Groundwater Quality
Round Lake Waste Disposal Site

Parameter	Background (median)	RUC [1]	ODWS [2]	BH95-10							5-year Trends
				31-Oct-13	27-Oct-14	08-Oct-15	31-Oct-16	24-Oct-17	17-Oct-18	07-Oct-19	(sparkline)
Alkalinity (as $CaCO_3$)	14	257	30 - 500	41	45	60	38	32	65	31	
Aluminum	0.28	0.3	0.1	-	-	-	-	-	-	-	
Ammonia, Total (as N)	0.1	N/L	N/L	-	-	-	-	-	-	-	
Barium	0.012	0.26	1.0	0.0122	0.0172	0.0228	0.020	0.015	0.021	0.016	
Boron	0.005	1.3	5.0	0.028	0.0339	0.0559	0.032	0.020	0.042	0.018	
Calcium	5.0	N/L	N/L	-	-	-	-	-	-	-	
Chloride	2.5	126	250	8	16	25	17.0	10.6	31.8	16.5	
Chromium	0.001	0.013	0.05	0.0014	0.00019	0.00017	< 0.002	< 0.001	< 0.001	0.001	
Chemical Oxygen Demand	33	N/L	N/L	-	-	-	-	-	-	-	
Cobalt	0.003	N/L	N/L	-	-	-	-	-	-	-	
Conductivity (µS/cm) [3]	40	N/L	N/L	100	286	164	177	90	179	22	
Copper	0.005	0.5	1	-	-	-	-	-	-	-	
Dissolved Organic Carbon	9.3	9.3	5	< 1	2.1	2.8	0.8	1.4	1.0	2.0	
Hardness (as $CaCO_3$)	21	61	100	46.9	59.0	***91.9***	***70***	44	***73***	43	
Iron	0.37	0.37	0.3	0.025	< 0.007	0.018	0.009	0.007	0.006	0.011	
Magnesium	1.99	N/L	N/L	-	-	-	-	-	-	-	
Manganese	0.063	0.06	0.05	0.0031	0.00195	0.00080	< 0.001	< 0.001	< 0.001	< 0.001	
Nitrite (as N)	0.05	0.3	1	< 0.03	< 0.03	< 0.03	< 0.1	< 0.05	< 0.05	< 0.05	
Nitrate (as N)	0.06	2.5	10	0.61	1.07	1.67	0.7	0.31	0.59	0.16	
pH (units) [3]	6.94	6.5 - 8.5	6.5 - 8.5	6.97	**6.32**	6.68	6.83	7.40	6.73	**5.76**	
Phosphorus, Total	0.11	N/L	N/L	-	-	-	-	-	-	-	
Potassium	0.62	N/L	N/L	-	-	-	-	-	-	-	
Silicon	8.17	N/L	N/L	-	-	-	-	-	-	-	
Sodium	3.06	102	200	4.29	5.50	7.21	7.3	5.6	9.6	6.7	
Strontium	0.03	N/L	N/L	-	-	-	-	-	-	-	
Sulphate	9	254	500	10	11	15	10	6	12	4	
Total Kjeldahl Nitrogen	0.5	N/L	N/L	-	-	-	-	-	-	-	
Total Dissolved Solids	60	280	500	83	114	180	93	71	114	64	
Zinc	0.005	2.5	5	-	-	-	-	-	-	-	

Notes:
1. Reasonable Use Concept (RUC) criteria.
2. Ontario Drinking Water Standards (ODWS).
3. Results obtained from field analysis.

All results expressed in mg/L unless otherwise noted.
Bold and shaded values exceed the ODWS.
Bold and Italic values exceed RUC limits.
N/L indicates no limit specified.
"-" means parameter not analyzed.

Greenview ENVIRONMENTAL MANAGEMENT

Table 4
Groundwater Quality
Round Lake Waste Disposal Site

Parameter	Background (median)	RUC [1]	ODWS [2]	BH01-12D														5-year Trends
				24-Apr-13	31-Oct-13	13-May-14	27-Oct-14	20-May-15	08-Oct-15	30-May-16	31-Oct-16	03-May-17	24-Oct-17	1-May-18	17-Oct-18	13-May-19	07-Oct-19	(sparkline)
Alkalinity (as $CaCO_3$)	14	257	30 - 500	**14**	169	**21**	**20**	**16**	**13**	**14**	**13**	**9**	**12**	**13**	**12**	**9**	**14**	
Aluminum	0.28	0.3	0.1	**0.139**	**0.115**	**0.144**	**0.125**	0.0935	0.078	**0.10**	0.09	0.08	0.08	0.07	0.06	**1.92**	0.07	
Ammonia, Total (as N)	0.1	N/L	N/L	< 0.1	0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.09	0.04	0.07	0.07	0.19	0.07	0.10	0.09	
Barium	0.012	0.26	1.0	0.0156	0.0159	0.0133	0.0140	0.0169	0.0134	0.014	0.017	0.012	0.022	0.012	0.009	0.057	0.013	
Boron	0.005	1.3	5.0	0.005	0.005	0.0061	0.0058	0.0061	0.0097	< 0.005	0.007	0.009	0.009	0.012	0.006	0.022	0.007	
Calcium	5.0	N/L	N/L	4.53	4.33	4.74	3.95	5.22	4.84	5.31	5.40	4.38	4.35	4.80	3.49	5.17	4.39	
Chloride	2.5	126	250	1.4	1.4	1.2	1.2	3	3	1.3	1.2	3.5	1.5	1.4	1.2	1.9	< 0.5	
Chromium	0.001	0.013	0.05	0.0026	0.0039	0.00249	0.00214	0.00188	0.00174	0.002	0.003	0.002	0.001	0.002	0.002	0.008	0.002	
Chemical Oxygen Demand	33	N/L	N/L	31	32	30	25	34	27	189	87	205	99	85	65	218	20	
Cobalt	0.003	N/L	N/L	0.00358	0.00297	0.00509	0.00192	0.00169	0.00159	< 0.005	< 0.005	< 0.005	< 0.005	0.0016	0.0012	0.0045	0.0012	
Conductivity (µS/cm) [3]	40	N/L	N/L	48	150	89	54	52	84	59	53	52	54	47	46	46	54	
Copper	0.005	0.5	1	0.0034	0.0035	0.00277	0.00286	0.00131	0.00153	0.0012	0.0022	0.0011	0.0019	0.0024	0.0015	0.0161	0.0020	
Dissolved Organic Carbon	9.3	9.3	5	**9.3**	**6.7**	**9.5**	**9.5**	**10.7**	**8.1**	**8.8**	**7.6**	4.5	**9.9**	**8.1**	**7.6**	**9.5**	**8.3**	
Hardness (as $CaCO_3$)	21	61	100	19.3	18.1	20.0	17.2	21.5	20.2	22	23	19	19	20	15	28	19	
Iron	0.37	0.37	0.3	**9.30**	**8.42**	**10.1**	**8.23**	**9.97**	**9.42**	**10.1**	**11.1**	**9.31**	**8.78**	**9.31**	**7.73**	**14.3**	**8.93**	
Magnesium	1.99	N/L	N/L	1.94	1.76	1.97	1.78	2.06	1.97	2.11	2.33	1.95	1.98	2.06	1.55	3.78	1.95	
Manganese	0.063	0.06	0.05	**0.0773**	**0.0562**	**0.0630**	**0.0593**	**0.0628**	**0.0585**	**0.060**	**0.068**	**0.056**	**0.050**	**0.060**	0.042	**0.098**	0.048	
Nitrite (as N)	0.05	0.3	1	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	0.1	0.1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Nitrate (as N)	0.06	2.5	10	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	0.1	0.1	< 0.05	0.05	< 0.05	0.05	0.18	< 0.05	
pH (units) [3]	6.94	6.5 - 8.5	6.5 - 8.5	**6.48**	6.71	**6.34**	6.70	**6.24**	6.67	7.34	**6.31**	6.50	7.80	6.80	6.76	**6.43**	6.96	
Phosphorus, Total	0.11	N/L	N/L	0.97	1.08	0.79	0.94	0.53	0.72	3.06	1.41	4.81	1.27	2.44	1.27	6.75	0.44	
Potassium	0.62	N/L	N/L	1.14	1.25	1.16	1.22	1.32	1.29	1.0	1.3	0.8	1.2	1.0	1.0	2.0	1.2	
Silicon	8.17	N/L	N/L	8.4	9.7	9.73	9.99	9.62	8.85	8.63	10.3	8.38	9.75	9.09	8.32	10.7	8.82	
Sodium	3.06	102	200	2.00	2.13	2.16	2.41	2.40	2.40	2.6	3.1	2.3	2.6	2.4	2.4	2.4	2.6	
Strontium	0.03	N/L	N/L	0.0281	0.0271	0.0279	0.0278	0.0319	0.0297	0.031	0.036	0.028	0.029	0.030	0.024	0.032	0.029	
Sulphate	9	254	500	6.5	6.1	4.6	4.8	7	8	8	9	6	5	5	4	5	< 1	
Total Kjeldahl Nitrogen	0.5	N/L	N/L	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	1.1	0.8	1.6	0.7	0.9	0.6	1.7	0.4	
Total Dissolved Solids	60	280	500	< 30	120	74	63	89	109	30	29	25	27	25	21	21	26	
Zinc	0.005	2.5	5	< 0.002	0.003	0.002	0.002	0.003	0.005	0.011	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.008	< 0.005	

Notes:
1. Reasonable Use Concept (RUC) criteria.
2. Ontario Drinking Water Standards (ODWS).
3. Results obtained from field analysis.

All results expressed in mg/L unless otherwise noted.
Bold and shaded values exceed the ODWS.
Bold and Italic values exceed RUC limits.
N/L indicates no limit specified.
"-" means parameter not analyzed.

Table 4
Groundwater Quality
Round Lake Waste Disposal Site

Parameter	Background (median)	RUC [1]	ODWS [2]	BH01-13S						5-year Trends
				24-Apr-13	13-May-14	30-May-16	03-May-17	1-May-18	13-May-19	(sparkline)
Alkalinity (as $CaCO_3$)	14	257	30 - 500	41	32	55	36	86	32	
Aluminum	0.28	0.3	0.1	0.0559	0.0775	< 0.01	< 0.01	0.02	0.02	
Ammonia, Total (as N)	0.1	N/L	N/L	< 0.1	< 0.1	0.03	< 0.01	0.08	0.04	
Barium	0.012	0.26	1.0	0.0172	0.0112	0.020	0.014	0.040	0.014	
Boron	0.005	1.3	5.0	0.0346	0.0258	0.017	0.021	0.062	0.029	
Calcium	5.0	N/L	N/L	8.9	6.60	14.0	7.60	24.8	8.65	
Chloride	2.5	126	250	0.8	0.9	1.0	3.2	1.3	1.2	
Chromium	0.001	0.013	0.05	< 0.0005	0.00030	< 0.002	< 0.001	< 0.001	< 0.001	
Chemical Oxygen Demand	33	N/L	N/L	< 8	< 8	41	19	32	27	
Cobalt	0.003	N/L	N/L	0.00386	0.00230	< 0.005	< 0.005	< 0.0001	< 0.0001	
Conductivity (µS/cm) [3]	40	N/L	N/L	71	66	100	57	128	56	
Copper	0.005	0.5	1	0.0010	0.00093	0.0006	0.0004	0.0023	0.0016	
Dissolved Organic Carbon	9.3	9.3	5	1.8	1.1	1.6	1.0	3.0	2.6	
Hardness (as $CaCO_3$)	21	61	100	35.4	26.1	55	30	***99***	34	
Iron	0.37	0.37	0.3	0.100	0.148	0.024	0.020	0.015	0.041	
Magnesium	1.99	N/L	N/L	3.22	2.32	4.85	2.75	8.94	2.95	
Manganese	0.063	0.06	0.05	0.0091	0.00762	0.002	< 0.001	0.001	0.002	
Nitrite (as N)	0.05	0.3	1	< 0.03	< 0.03	0.1	< 0.05	< 0.05	< 0.05	
Nitrate (as N)	0.06	2.5	10	0.43	0.77	0.5	0.63	1.37	0.44	
pH (units) [3]	6.94	6.5 - 8.5	6.5 - 8.5	6.99	6.62	7.02	6.88	**6.18**	7.42	
Phosphorus, Total	0.11	N/L	N/L	0.3	0.46	0.51	0.65	0.37	0.33	
Potassium	0.62	N/L	N/L	2.16	2.06	2.8	1.9	3.4	2.6	
Silicon	8.17	N/L	N/L	4.17	4.27	4.64	3.36	5.16	3.79	
Sodium	3.06	102	200	3.85	3.03	4.5	3.1	6.1	3.4	
Strontium	0.03	N/L	N/L	0.056	0.0408	0.084	0.048	0.157	0.057	
Sulphate	9	254	500	5.4	4.6	5	5	9	5	
Total Kjeldahl Nitrogen	0.5	N/L	N/L	< 0.5	< 0.5	0.6	0.6	0.4	0.4	
Total Dissolved Solids	60	280	500	71	66	71	50	104	42	
Zinc	0.005	2.5	5	< 0.002	< 0.002	0.023	< 0.005	< 0.005	< 0.005	

Notes:
1. Reasonable Use Concept (RUC) criteria.
2. Ontario Drinking Water Standards (ODWS).
3. Results obtained from field analysis.

All results expressed in mg/L unless otherwise noted.
Bold and shaded values exceed the ODWS.
Bold and Italic values exceed RUC limits.
N/L indicates no limit specified.
"-" means parameter not analyzed.

Table 4
Groundwater Quality
Round Lake Waste Disposal Site

Parameter	Background (median)	RUC [1]	ODWS [2]	BH01-13D														5-year Trends
				24-Apr-13	31-Oct-13	13-May-14	27-Oct-14	20-May-15	08-Oct-15	30-May-16	31-Oct-16	03-May-17	24-Oct-17	1-May-18	17-Oct-18	13-May-19	07-Oct-19	(sparkline)
Alkalinity (as $CaCO_3$)	14	257	30 - 500	83	85	107	99	103	92	95	81	84	81	94	82	84	78	
Aluminum	0.28	0.3	0.1	0.0323	0.0578	0.0958	0.0640	0.0123	0.015	0.01	0.02	0.01	0.03	0.01	0.02	**1.27**	0.04	
Ammonia, Total (as N)	0.1	N/L	N/L	0.3	0.4	0.4	0.3	0.2	0.4	0.39	0.40	0.30	0.37	0.49	0.38	0.39	0.37	
Barium	0.012	0.26	1.0	0.0631	0.0707	0.0688	0.0805	0.0752	0.0684	0.072	0.080	0.066	0.105	0.083	0.074	0.098	0.065	
Boron	0.005	1.3	5.0	0.0456	0.0444	0.0502	0.0477	0.0449	0.0494	0.046	0.053	0.046	0.048	0.060	0.043	0.063	0.043	
Calcium	5.0	N/L	N/L	21.0	21.3	26.4	22.8	26.1	24.1	26.6	27.4	23.9	28.6	29.7	25.6	26.5	23.0	
Chloride	2.5	126	250	4.7	5.4	4.6	6.2	6	8	7.6	10.0	11.8	21.8	8.2	18.1	8.4	13.0	
Chromium	0.001	0.013	0.05	0.0010	0.0039	0.00103	0.00091	0.00052	0.00057	< 0.002	< 0.002	< 0.001	< 0.001	< 0.001	< 0.001	0.005	0.001	
Chemical Oxygen Demand	33	N/L	N/L	18	19	26	24	16	19	85	42	25	65	74	25	60	10	
Cobalt	0.003	N/L	N/L	0.00749	0.00693	0.00546	0.00281	0.00243	0.00231	< 0.005	0.005	0.005	< 0.005	0.0026	0.0025	0.0048	0.0020	
Conductivity (µS/cm) [3]	40	N/L	N/L	145	180	222	353	131	202	187	173	169	238	168	196	146	168	
Copper	0.005	0.5	1	0.0017	0.0043	0.00476	0.00331	0.00105	0.00058	0.0007	0.0006	< 0.0001	0.0007	0.0017	0.0011	0.0155	0.0010	
Dissolved Organic Carbon	9.3	9.3	5	**5.2**	2.2	2.6	**5.7**	4.1	**5.5**	2.8	3.2	2.0	4.0	4.0	4.2	**5.8**	**5.0**	
Hardness (as $CaCO_3$)	21	61	100	***87***	***86***	**108**	***93.9***	**101**	***96.7***	**109**	**111**	***97***	**120**	**118**	**104**	**111**	***94***	
Iron	0.37	0.37	0.3	**6.50**	**6.73**	**8.31**	**8.68**	**8.02**	**7.50**	**7.19**	**8.59**	**7.19**	**7.39**	**8.54**	**7.35**	**11.3**	**6.59**	
Magnesium	1.99	N/L	N/L	8.36	7.95	10.2	8.97	8.67	8.89	10.4	10.4	9.11	11.7	10.6	9.83	10.9	8.92	
Manganese	0.063	0.06	0.05	**1.61**	**1.44**	**1.74**	**1.88**	**1.95**	**1.76**	**1.88**	**1.99**	**1.89**	**1.87**	**2.54**	**1.89**	**2.32**	**1.65**	
Nitrite (as N)	0.05	0.3	1	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.1	0.2	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Nitrate (as N)	0.06	2.5	10	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	0.1	< 0.1	< 0.05	< 0.05	< 0.05	< 0.05	0.18	< 0.05	
pH (units) [3]	6.94	6.5 - 8.5	6.5 - 8.5	6.61	6.77	7.08	**6.17**	6.88	6.58	6.97	6.60	6.60	6.56	**6.15**	6.72	6.81	6.80	
Phosphorus, Total	0.11	N/L	N/L	0.53	0.58	0.65	0.54	0.22	0.26	1.47	0.76	0.58	0.45	2.35	1.18	0.58	0.38	
Potassium	0.62	N/L	N/L	4.52	5.07	5.03	5.20	5.58	5.23	4.6	5.7	4.4	6.3	5.4	5.7	5.5	5.4	
Silicon	8.17	N/L	N/L	9.7	11.4	11.3	12.3	11.4	10.3	9.77	12.1	9.27	11.0	10.5	9.54	11.2	10.1	
Sodium	3.06	102	200	4.76	4.98	5.24	5.69	5.34	5.09	5.7	6.4	5.1	6.1	6.0	5.9	5.3	5.5	
Strontium	0.03	N/L	N/L	0.138	0.141	0.169	0.174	0.165	0.164	0.179	0.193	0.161	0.206	0.198	0.187	0.183	0.165	
Sulphate	9	254	500	13	16	14	20	16	18	20	17	14	16	17	23	16	13	
Total Kjeldahl Nitrogen	0.5	N/L	N/L	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.6	0.9	0.7	0.7	0.7	1.1	0.8	0.7	0.6	
Total Dissolved Solids	60	280	500	137	143	123	180	174	171	145	129	137	163	129	141	118	114	
Zinc	0.005	2.5	5	< 0.002	0.002	0.002	0.002	0.003	0.003	0.022	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.005	< 0.005	

Notes:
1. Reasonable Use Concept (RUC) criteria.
2. Ontario Drinking Water Standards (ODWS).
3. Results obtained from field analysis.

All results expressed in mg/L unless otherwise noted.
Bold and shaded values exceed the ODWS.
Bold and Italic values exceed RUC limits.
N/L indicates no limit specified.
"-" means parameter not analyzed.

Table 4
Groundwater Quality
Round Lake Waste Disposal Site

Parameter	Background (median)	RUC [1]	ODWS [2]	BH01-14														5-year Trends
				24-Apr-13	31-Oct-13	13-May-14	27-Oct-14	20-May-15	08-Oct-15	30-May-16	31-Oct-16	03-May-17	24-Oct-17	1-May-18	17-Oct-18	13-May-19	07-Oct-19	(sparkline)
Alkalinity (as $CaCO_3$)	14	257	30 - 500	58	76	81	80	84	74	68	70	74	71	92	77	73	73	
Aluminum	0.28	0.3	0.1	**1.600**	0.098	**0.219**	**0.230**	0.0113	0.020	0.01	0.01	< 0.01	0.04	0.02	0.02	0.03	**0.10**	
Ammonia, Total (as N)	0.1	N/L	N/L	0.2	0.2	< 0.1	0.1	0.1	0.2	0.17	0.22	0.18	0.26	0.45	0.31	0.25	0.30	
Barium	0.012	0.26	1.0	0.0945	0.0523	0.0544	0.0636	0.0578	0.0505	0.051	0.062	0.053	0.089	0.071	0.072	0.058	0.059	
Boron	0.005	1.3	5.0	0.0322	0.0330	0.0363	0.0356	0.0396	0.0442	0.031	0.041	0.032	0.042	0.045	0.039	0.049	0.040	
Calcium	5.0	N/L	N/L	15.8	17.2	19.6	18.6	21.5	19.7	19.9	23.3	20.8	28.3	25.8	26.9	23.7	21.2	
Chloride	2.5	126	250	3.2	4.2	4.1	6.8	5	9	5.8	7.9	10.4	28.8	9.1	25.1	9.1	9.7	
Chromium	0.001	0.013	0.05	0.0055	0.0037	0.00099	0.00099	0.00032	0.00040	< 0.002	< 0.002	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.001	
Chemical Oxygen Demand	33	N/L	N/L	13	12	10	9	13	< 8	51	90	18	96	48	< 5	66	6	
Cobalt	0.003	N/L	N/L	0.00549	0.00180	0.00457	0.00122	0.000853	0.000783	< 0.005	< 0.005	< 0.005	< 0.005	0.0008	0.0010	0.0008	0.0007	
Conductivity (µS/cm) [3]	40	N/L	N/L	115	140	175	169	145	170	144	158	162	245	166	216	148	153	
Copper	0.005	0.5	1	0.0144	0.0029	0.00554	0.00924	0.00072	0.00052	0.0005	0.0007	0.0003	0.0002	0.0012	0.0012	0.0010	0.0017	
Dissolved Organic Carbon	9.3	9.3	5	2.8	2.0	3.1	3.6	3.0	3.2	2.4	2.4	1.5	3.4	3.4	3.5	4.2	4.4	
Hardness (as $CaCO_3$)	21	61	100	***74.5***	***74.4***	***85.4***	***83.5***	***91.0***	***84.1***	***86***	**101**	***92***	**127**	**110**	**118**	**104**	***92***	
Iron	0.37	0.37	0.3	**8.90**	**6.51**	**7.53**	**7.85**	**7.96**	**7.07**	**6.58**	**6.70**	**8.72**	**11.0**	**8.55**	**10.2**	**8.50**	**7.27**	
Magnesium	1.99	N/L	N/L	8.50	7.66	8.88	9.02	9.09	8.45	8.97	10.5	9.68	13.7	11.0	12.4	10.8	9.43	
Manganese	0.063	0.06	0.05	**0.470**	**0.420**	**0.497**	**0.553**	**0.676**	**0.645**	**0.496**	**0.593**	**0.648**	**0.930**	**1.13**	**1.09**	**0.907**	**0.920**	
Nitrite (as N)	0.05	0.3	1	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.1	0.2	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Nitrate (as N)	0.06	2.5	10	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	0.2	< 0.1	< 0.05	< 0.05	< 0.05	< 0.05	0.18	< 0.05	
pH (units) [3]	6.94	6.5 - 8.5	6.5 - 8.5	6.68	6.64	6.63	**6.39**	**6.38**	6.50	7.36	**6.46**	6.70	6.58	6.57	6.59	6.74	6.80	
Phosphorus, Total	0.11	N/L	N/L	2.16	0.64	1.56	1.86	0.52	2.28	1.11	1.89	0.75	1.35	1.59	1.75	1.33	1.09	
Potassium	0.62	N/L	N/L	4.17	3.34	3.54	3.53	4.47	3.76	3.4	4.4	3.2	4.9	4.7	4.8	4.1	4.5	
Silicon	8.17	N/L	N/L	11.4	10.6	10.2	10.9	10.1	9.31	9.04	10.7	8.79	10.2	10.3	8.92	8.97	9.34	
Sodium	3.06	102	200	3.33	3.59	3.63	3.95	4.19	3.99	4.4	5.4	4.1	5.4	5.2	5.5	4.7	5.1	
Strontium	0.03	N/L	N/L	0.096	0.101	0.112	0.126	0.131	0.121	0.121	0.149	0.126	0.183	0.161	0.180	0.147	0.138	
Sulphate	9	254	500	14	17	15	20	19	18	18	19	14	17	17	33	20	13	
Total Kjeldahl Nitrogen	0.5	N/L	N/L	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.3	0.5	0.5	0.6	0.6	0.7	0.8	0.5	
Total Dissolved Solids	60	280	500	111	154	137	151	157	160	111	114	125	171	122	155	114	107	
Zinc	0.005	2.5	5	0.014	< 0.002	0.002	0.004	0.003	0.004	0.010	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	

Notes:
1. Reasonable Use Concept (RUC) criteria.
2. Ontario Drinking Water Standards (ODWS).
3. Results obtained from field analysis.

All results expressed in mg/L unless otherwise noted.
Bold and shaded values exceed the ODWS.
Bold and Italic values exceed RUC limits.
N/L indicates no limit specified.
"-" means parameter not analyzed.

Table 4
Groundwater Quality
Round Lake Waste Disposal Site

Parameter	Background (median)	RUC [1]	ODWS [2]	BH01-15		5-year Trends
				31-Oct-13	24-Oct-17	(sparkline)
Alkalinity (as $CaCO_3$)	14	257	30 - 500	**7**	**13**	
Aluminum	0.28	0.3	0.1	-	-	-
Ammonia, Total (as N)	0.1	N/L	N/L	-	-	-
Barium	0.012	0.26	1.0	0.003	0.004	
Boron	0.005	1.3	5.0	0.003	< 0.005	
Calcium	5.0	N/L	N/L	-	-	-
Chloride	2.5	126	250	1.6	1.3	
Chromium	0.001	0.013	0.05	0.0006	< 0.001	
Chemical Oxygen Demand	33	N/L	N/L	-	-	-
Cobalt	0.003	N/L	N/L	-	-	-
Conductivity (µS/cm) [3]	40	N/L	N/L	30	31	
Copper	0.005	0.5	1	-	-	-
Dissolved Organic Carbon	9.3	9.3	5	< 1	1.3	
Hardness (as $CaCO_3$)	21	61	100	11.1	12	
Iron	0.37	0.37	0.3	0.06	0.013	
Magnesium	1.99	N/L	N/L	-	-	-
Manganese	0.063	0.06	0.05	0.0041	0.005	
Nitrite (as N)	0.05	0.3	1	< 0.03	< 0.05	
Nitrate (as N)	0.06	2.5	10	0.36	0.18	
pH (units) [3]	6.94	6.5 - 8.5	6.5 - 8.5	**5.99**	6.95	
Phosphorus, Total	0.11	N/L	N/L	-	-	-
Potassium	0.62	N/L	N/L	-	-	-
Silicon	8.17	N/L	N/L	-	-	-
Sodium	3.06	102	200	1.41	1.8	
Strontium	0.03	N/L	N/L	-	-	-
Sulphate	9	254	500	2.0	4	
Total Kjeldahl Nitrogen	0.5	N/L	N/L	-	-	-
Total Dissolved Solids	60	280	500	51	20	
Zinc	0.005	2.5	5	-	-	-

Notes:
1. Reasonable Use Concept (RUC) criteria.
2. Ontario Drinking Water Standards (ODWS).
3. Results obtained from field analysis.

All results expressed in mg/L unless otherwise noted.
Bold and shaded values exceed the ODWS.
Bold and Italic values exceed RUC limits.
N/L indicates no limit specified.
"-" means parameter not analyzed.

Table 4
Groundwater Quality
Round Lake Waste Disposal Site

Parameter	Background (median)	RUC [1]	ODWS [2]	R-1								5-year Trends
				31-Oct-13	13-May-14	27-Oct-14	20-May-15	08-Oct-15	03-May-17	24-Oct-17	07-Oct-19	(sparkline)
Alkalinity (as $CaCO_3$)	14	257	30 - 500	154	**29**	43	**28**	35	**21**	33	**23**	
Aluminum	0.28	0.3	0.1	0.006	0.0024	0.0069	0.0057	0.0060	< 0.01	0.01	< 0.01	
Ammonia, Total (as N)	0.1	N/L	N/L	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.01	0.01	0.02	
Barium	0.012	0.26	1.0	0.017	0.0122	0.0139	0.0131	0.0140	0.013	0.018	0.012	
Boron	0.005	1.3	5.0	0.005	0.0060	0.0056	0.0084	0.0098	< 0.005	0.005	< 0.005	
Calcium	5.0	N/L	N/L	9.50	5.58	8.85	6.38	8.82	5.04	8.58	5.49	
Chloride	2.5	126	250	0.6	0.4	0.5	< 1	< 1	3.4	0.9	< 0.5	
Chromium	0.001	0.013	0.05	0.0016	0.00012	0.00008	< 0.00003	0.00011	< 0.001	< 0.001	< 0.001	
Chemical Oxygen Demand	33	N/L	N/L	< 8	< 8	< 8	< 8	< 8	8	40	< 5	
Cobalt	0.003	N/L	N/L	0.00008	0.000053	< 0.000004	0.000026	0.000022	< 0.005	< 0.005	< 0.0001	
Conductivity (µS/cm) [3]	40	N/L	N/L	69	120	67	80	71	44	85	44	
Copper	0.005	0.5	1	0.088	0.100	0.0520	0.0389	0.0523	0.0846	0.0813	0.0665	
Dissolved Organic Carbon	9.3	9.3	5	< 1	1.2	1.6	2.0	1.5	1.1	1.9	1.6	
Hardness (as $CaCO_3$)	21	61	100	33.0	23.8	31.1	25.2	32.7	22	33	23	
Iron	0.37	0.37	0.3	0.007	0.020	0.037	0.015	0.054	< 0.005	0.017	0.012	
Magnesium	1.99	N/L	N/L	2.26	2.39	2.20	2.25	2.58	2.22	2.84	2.24	
Manganese	0.063	0.06	0.05	0.001	0.00091	0.00675	0.00193	0.00349	< 0.001	0.003	0.005	
Nitrite (as N)	0.05	0.3	1	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.05	< 0.05	< 0.05	
Nitrate (as N)	0.06	2.5	10	0.55	0.08	0.09	< 0.06	< 0.06	< 0.05	0.06	< 0.05	
pH (units) [3]	6.94	6.5 - 8.5	6.5 - 8.5	7.03	7.43	6.61	7.75	**6.39**	7.90	6.58	**6.30**	
Phosphorus, Total	0.11	N/L	N/L	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	0.01	0.02	0.02	
Potassium	0.62	N/L	N/L	1.34	1.08	1.25	1.25	1.49	0.8	1.4	1.2	
Silicon	8.17	N/L	N/L	7.44	6.91	7.88	7.19	6.97	6.10	8.19	7.18	
Sodium	3.06	102	200	1.63	1.46	1.79	1.64	1.72	2.0	2.1	1.9	
Strontium	0.03	N/L	N/L	0.056	0.0374	0.0546	0.0430	0.0551	0.036	0.053	0.038	
Sulphate	9	254	500	4.1	5.0	4.6	4	5	6	5	< 1	
Total Kjeldahl Nitrogen	0.5	N/L	N/L	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.1	0.2	0.1	
Total Dissolved Solids	60	280	500	54	60	49	51	94	33	44	28	
Zinc	0.005	2.5	5	0.003	0.006	0.003	0.003	0.004	< 0.005	< 0.005	< 0.005	

Notes:
1. Reasonable Use Concept (RUC) criteria.
2. Ontario Drinking Water Standards (ODWS).
3. Results obtained from field analysis.

All results expressed in mg/L unless otherwise noted.
Bold and shaded values exceed the ODWS.
Bold and Italic values exceed RUC limits.
N/L indicates no limit specified.
"-" means parameter not analyzed.

Table 4
Groundwater Quality
Round Lake Waste Disposal Site

Parameter	ODWS [1]	BH1 (Background)			BH-2S	BH-2D			BH-5 (Background)	BH95-9			BH01-14		
		4-Oct-11	25-Oct-12	24-Oct-17	24-Oct-17	04-Oct-11	25-Oct-12	24-Oct-17	24-Oct-17	4-Oct-11	25-Oct-12	24-Oct-17	4-Oct-11	25-Oct-12	24-Oct-17
Acetone	N/L	-	-	< 0.002	< 0.002	-	-	< 0.002	< 0.002	-	-	< 0.002	-	-	< 0.002
Benzene	0.001	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Bromobenzene	N/L	-	-	< 0.0001	< 0.0001	-	-	< 0.0001	< 0.0001	-	-	< 0.0001	-	-	< 0.0001
Bromodichloromethane	N/L	< 0.0005	< 0.0005	< 0.0001	< 0.0001	< 0.0005	< 0.0005	< 0.0001	< 0.0001	< 0.0005	< 0.0005	< 0.0001	< 0.0005	< 0.0005	< 0.0001
Bromoform	N/L	< 0.0005	< 0.0005	< 0.0001	< 0.0001	< 0.0005	< 0.0005	< 0.0001	< 0.0001	< 0.0005	< 0.0005	< 0.0001	< 0.0005	< 0.0005	< 0.0001
Bromomethane	N/L	< 0.0005	< 0.0005	< 0.0003	< 0.0003	< 0.0005	< 0.0005	< 0.0003	< 0.0003	< 0.0005	< 0.0005	< 0.0003	< 0.0005	< 0.0005	< 0.0003
Carbon Tetrachloride	0.002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Monochlorobenzene	0.08	< 0.0005	< 0.0005	< 0.0002	0.0003	< 0.0005	< 0.0005	0.0006	< 0.0002	< 0.0005	< 0.0005	< 0.0002	< 0.0005	< 0.0005	< 0.0002
Chloroethane	N/L	< 0.005	< 0.005	< 0.0001	< 0.0001	< 0.005	< 0.005	< 0.0001	< 0.0001	< 0.005	< 0.005	< 0.0001	< 0.005	< 0.005	< 0.0001
Chloroform	N/L	< 0.0005	< 0.0005	< 0.0003	< 0.0003	< 0.0005	< 0.0005	< 0.0003	< 0.0003	< 0.0005	< 0.0005	< 0.0003	< 0.0005	< 0.0005	< 0.0003
Chloromethane	N/L	< 0.005	< 0.005	< 0.0003	< 0.0003	< 0.005	< 0.005	< 0.0003	< 0.0003	< 0.005	< 0.005	< 0.0003	< 0.005	< 0.005	< 0.0003
Chlorotoluene,2-	N/L	-	-	< 0.0002	< 0.0002	-	-	< 0.0002	< 0.0002	-	-	< 0.0002	-	-	< 0.0002
Chlorotoluene,4-	N/L	-	-	< 0.0002	< 0.0002	-	-	< 0.0002	< 0.0002	-	-	< 0.0002	-	-	< 0.0002
Dibromo-3-Chloropropane, 1,2-	N/L	-	-	< 0.001	< 0.001	-	-	< 0.001	< 0.001	-	-	< 0.001	-	-	< 0.001
Dibromochloromethane	N/L	< 0.0005	< 0.0005	< 0.0001	< 0.0001	< 0.0005	< 0.0005	< 0.0001	< 0.0001	< 0.0005	< 0.0005	< 0.0001	< 0.0005	< 0.0005	< 0.0001
Dibromoethane (Ethylene dibromide) 1,2-	N/L	< 0.0002	< 0.0002	< 0.0001	< 0.0001	< 0.0002	< 0.0002	< 0.0001	< 0.0001	< 0.0002	< 0.0002	< 0.0001	< 0.0002	< 0.0002	< 0.0001
Dibromomethane	N/L	-	-	< 0.001	< 0.001	-	-	< 0.001	< 0.001	-	-	< 0.001	-	-	< 0.001
Dichlorobenzene 1,2-	0.2	< 0.0005	< 0.0005	< 0.0001	< 0.0001	< 0.0005	< 0.0005	< 0.0001	< 0.0001	< 0.0005	< 0.0005	< 0.0001	< 0.0005	< 0.0005	< 0.0001
Dichlorobenzene 1,3-	N/L	< 0.0005	< 0.0005	< 0.0001	< 0.0001	< 0.0005	< 0.0005	< 0.0001	< 0.0001	< 0.0005	< 0.0005	< 0.0001	< 0.0005	< 0.0005	< 0.0001
Dichlorobenzene 1,4-	0.005	< 0.0005	< 0.0005	< 0.0002	0.0002	< 0.0005	< 0.0005	0.0003	< 0.0002	< 0.0005	< 0.0005	< 0.0002	< 0.0005	< 0.0005	< 0.0002
Dichlorodifluoromethane	N/L	-	-	< 0.001	< 0.001	-	-	< 0.001	< 0.001	-	-	< 0.001	-	-	< 0.001
Dichloroethane 1,1-	N/L	< 0.0005	< 0.0005	< 0.0001	< 0.0001	< 0.0005	< 0.0005	< 0.0001	< 0.0001	< 0.0005	< 0.0005	< 0.0001	< 0.0005	< 0.0005	< 0.0001
Dichloroethane 1,2-	0.005	< 0.0005	< 0.0005	< 0.0001	< 0.0001	< 0.0005	< 0.0005	< 0.0001	< 0.0001	< 0.0005	< 0.0005	< 0.0001	< 0.0005	< 0.0005	< 0.0001
Dichloroethylene (vinylidene chloride) 1,1-	0.014	< 0.0005	< 0.0005	< 0.0001	< 0.0001	< 0.0005	< 0.0005	< 0.0001	< 0.0001	< 0.0005	< 0.0005	< 0.0001	< 0.0005	< 0.0005	< 0.0001
Dichloroethene cis-1,2	N/L	< 0.0005	< 0.0005	< 0.0001	0.0006	0.0012	0.00066	0.0002	< 0.0001	< 0.0005	< 0.0005	< 0.0001	< 0.0005	< 0.0005	< 0.0001
Dichloroethene trans-1,2	N/L	< 0.0005	< 0.0005	< 0.0001	< 0.0001	< 0.0005	< 0.0005	< 0.0001	< 0.0001	< 0.0005	< 0.0005	< 0.0001	< 0.0005	< 0.0005	< 0.0001
Dichloromethane (Methylene Chloride)	N/L	< 0.0005	< 0.0005	< 0.0003	< 0.0003	< 0.0005	< 0.0005	< 0.0003	< 0.0003	< 0.0005	< 0.0005	< 0.0003	< 0.0005	< 0.0005	< 0.0003
Dichloropropane 1,2-	N/L	< 0.0005	< 0.0005	< 0.0001	< 0.0001	< 0.0005	< 0.0005	< 0.0001	< 0.0001	< 0.0005	< 0.0005	< 0.0001	< 0.0005	< 0.0005	< 0.0001
Dichloropropane,1,3-	N/L	-	-	< 0.0002	< 0.0002	-	-	< 0.0002	< 0.0002	-	-	< 0.0002	-	-	< 0.0002
Dichloropropane,2,2-	N/L	-	-	< 0.0002	< 0.0002	-	-	< 0.0002	< 0.0002	-	-	< 0.0002	-	-	< 0.0002
Dichloropropene cis-1,3	N/L	< 0.0005	< 0.0005	< 0.0001	< 0.0001	< 0.0005	< 0.0005	< 0.0001	< 0.0001	< 0.0005	< 0.0005	< 0.0001	< 0.0005	< 0.0005	< 0.0001
Dichloropropene trans-1,3	N/L	< 0.0005	< 0.0005	< 0.0001	< 0.0001	< 0.0005	< 0.0005	< 0.0001	< 0.0001	< 0.0005	< 0.0005	< 0.0001	< 0.0005	< 0.0005	< 0.0001
Dichloropropene,1,1-	N/L	-	-	< 0.0002	< 0.0002	-	-	< 0.0002	< 0.0002	-	-	< 0.0002	-	-	< 0.0002
Ethylbenzene	0.0024	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Hexachlorobutadiene	N/L	-	-	< 0.001	< 0.001	-	-	< 0.001	< 0.001	-	-	< 0.001	-	-	< 0.001
Hexane	N/L	-	-	< 0.001	< 0.001	-	-	< 0.001	< 0.001	-	-	< 0.001	-	-	< 0.001
Isopropylbenzene	N/L	-	-	< 0.0002	< 0.0002	-	-	< 0.0002	< 0.0002	-	-	< 0.0002	-	-	< 0.0002
Isopropyltoluene,4-	N/L	-	-	< 0.0004	< 0.0004	-	-	< 0.0004	< 0.0004	-	-	< 0.0004	-	-	< 0.0004
Methyl Butyl Ketone	N/L	-	-	< 0.010	< 0.010	-	-	< 0.010	< 0.010	-	-	< 0.010	-	-	< 0.010
Methyl Ethyl Ketone	N/L	-	-	< 0.001	< 0.001	-	-	< 0.001	< 0.001	-	-	< 0.001	-	-	< 0.001
Methyl Isobutyl Ketone	N/L	-	-	< 0.001	< 0.001	-	-	< 0.001	< 0.001	-	-	< 0.001	-	-	< 0.001
Methyl-t-butyl Ether	N/L	-	-	< 0.001	< 0.001	-	-	< 0.001	< 0.001	-	-	< 0.001	-	-	< 0.001
Naphthalene	N/L	-	-	< 0.0007	< 0.0007	-	-	< 0.0007	< 0.0007	-	-	< 0.0007	-	-	< 0.0007
n-Butylbenzene	N/L	-	-	< 0.0007	< 0.0007	-	-	< 0.0007	< 0.0007	-	-	< 0.0007	-	-	< 0.0007
n-Propylbenzene	N/L	-	-	< 0.0004	< 0.0004	-	-	< 0.0004	< 0.0004	-	-	< 0.0004	-	-	< 0.0004
sec-Butylbenzene	N/L	-	-	< 0.0005	< 0.0005	-	-	< 0.0005	< 0.0005	-	-	< 0.0005	-	-	< 0.0005
Styrene	N/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
tert-Butylbenzene	N/L	-	-	< 0.0001	< 0.0001	-	-	< 0.0001	< 0.0001	-	-	< 0.0001	-	-	< 0.0001
Tetrachloroethane,1,1,1,2-	N/L	< 0.0005	< 0.0005	< 0.0001	< 0.0001	< 0.0005	< 0.0005	< 0.0001	< 0.0001	< 0.0005	< 0.0005	< 0.0001	< 0.0005	< 0.0005	< 0.0001
Tetrachloroethane 1,1,2,2-	N/L	< 0.0005	< 0.0005	< 0.0004	< 0.0004	< 0.0005	< 0.0005	< 0.0004	< 0.0004	< 0.0005	< 0.0005	< 0.0004	< 0.0005	< 0.0005	< 0.0004
Tetrachloroethylene (Perchloroethylene)	N/L	< 0.0005	< 0.0005	< 0.0002	< 0.0002	< 0.0005	< 0.0005	< 0.0002	< 0.0002	< 0.0005	< 0.0005	< 0.0002	< 0.0005	< 0.0005	< 0.0002
Toluene	0.024	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Trichlorobenzene,1,2,3-	N/L	-	-	< 0.0002	< 0.0002	-	-	< 0.0002	< 0.0002	-	-	< 0.0002	-	-	< 0.0002
Trichlorobenzene,1,2,4-	N/L	-	-	< 0.0002	< 0.0002	-	-	< 0.0002	< 0.0002	-	-	< 0.0002	-	-	< 0.0002
Trichloroethane 1,1,1-	N/L	< 0.0005	< 0.0005	< 0.0001	< 0.0001	< 0.0005	< 0.0005	< 0.0001	< 0.0001	< 0.0005	< 0.0005	< 0.0001	< 0.0005	< 0.0005	< 0.0001
Trichloroethane 1,1,2-	N/L	< 0.0005	< 0.0005	< 0.0001	< 0.0001	< 0.0005	< 0.0005	< 0.0001	< 0.0001	< 0.0005	< 0.0005	< 0.0001	< 0.0005	< 0.0005	< 0.0001
Trichloroethene (Trichloroethylene)	0.005	< 0.0005	< 0.0005	< 0.0001	< 0.0001	< 0.0005	< 0.0005	< 0.0001	< 0.0001	< 0.0005	< 0.0005	< 0.0001	< 0.0005	< 0.0005	< 0.0001
Trichlorofluoromethane	N/L	< 0.005	< 0.005	< 0.0001	< 0.0001	< 0.005	< 0.005	< 0.0001	< 0.0001	< 0.005	< 0.005	< 0.0001	< 0.005	< 0.005	< 0.0001
Trichloropropane,1,2,3-	N/L	-	-	< 0.0002	< 0.0002	-	-	< 0.0002	< 0.0002	-	-	< 0.0002	-	-	< 0.0002
Trimethylbenzene,1,2,4-	N/L	-	-	< 0.002	< 0.002	-	-	< 0.002	< 0.002	-	-	< 0.002	-	-	< 0.002
Trimethylbenzene,1,3,5-	N/L	-	-	< 0.0006	< 0.0006	-	-	< 0.0006	< 0.0006	-	-	< 0.0006	-	-	< 0.0006
Vinyl Chloride	0.001	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Xylene; total	0.3	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
m-Xylene & p-Xylene	N/L	< 0.0005	< 0.0005	< 0.0004	< 0.0004	< 0.0005	< 0.0005	< 0.0004	< 0.0004	< 0.0005	< 0.0005	< 0.0004	< 0.0005	< 0.0005	< 0.0004
o-Xylene	N/L	< 0.0005	< 0.0005	< 0.0001	< 0.0001	< 0.0005	< 0.0005	< 0.0001	< 0.0001	< 0.0005	< 0.0005	< 0.0001	< 0.0005	< 0.0005	< 0.0001

Notes:
1. Ontario Drinking Water Standards (ODWS).

Results expressed in mg/L unless otherwise noted.
Shaded area with bold text indicates ODWS exceedance.
N/L indicates no limit specified.
"--" parameter not analyzed.

Table 5
75% Reasonable Use Concept Assessment
Round Lake Waste Disposal Site

Parameter	75 % of RUC [1]	ODWS [2]	BH-8													
			24-Apr-13	31-Oct-13	13-May-14	27-Oct-14	20-May-15	08-Oct-15	30-May-16	31-Oct-16	03-May-17	24-Oct-17	1-May-18	17-Oct-18	13-May-19	07-Oct-19
Alkalinity (as $CaCO_3$)	-	30 - 500	190	161	190	180	190	162	138	131	133	132	122	130	122	110
Aluminum	-	0.1	0.0454	0.0445	0.0616	0.0673	0.0159	0.018	0.02	0.02	0.02	0.04	0.03	0.03	0.04	0.03
Ammonia, Total (N)	-	N/L	3.7	3.3	4.1	3.6	4.2	4.2	4.37	4.47	3.85	3.98	4.17	3.67	3.17	2.76
Barium	0.19	1.0	***0.206***	0.170	0.186	0.166	***0.218***	0.160	0.144	0.161	0.139	0.179	0.158	0.135	0.138	0.119
Boron	0.94	5.0	0.0994	0.0945	0.112	0.0948	0.112	0.105	0.096	0.115	0.092	0.100	0.109	0.093	0.126	0.088
Calcium	-	N/L	45.0	33.9	41.1	30.9	41.0	35.8	31.1	34.9	31.3	32.2	35.4	29.8	34.7	29.0
Chloride	94.7	250	5.4	5.0	5.2	5.5	5	7	5.2	4.7	7.2	7.2	13.2	8.0	8.6	10.3
Chromium	0.01	0.05	0.0031	0.0085	0.00255	0.00270	0.00186	0.00217	0.002	0.003	< 0.001	0.001	0.001	0.002	0.002	0.002
Chemical Oxygen Demand	-	N/L	33	28	30	31	31	31	45	46	36	83	55	23	34	28
Cobalt	-	N/L	0.0060	0.0053	0.00726	0.00360	0.00395	0.00347	0.006	0.005	0.005	0.005	0.0028	0.0030	0.0032	0.0025
Conductivity (µS/cm) [3]	-	N/L	324	294	540	471	321	350	267	264	261	281	253	270	231	226
Copper	-	1	0.0019	0.0033	0.00206	0.00503	0.00057	0.00055	0.0003	0.0007	0.0006	0.0007	0.0015	0.0009	0.0015	0.0014
Dissolved Organic Carbon	-	5	**7.4**	3.6	**6.6**	**5.6**	**5.1**	**5.9**	3.9	4.2	1.7	**9.1**	**7.1**	**8.4**	0.2	**9.1**
Hardness	-	100	**157**	**117**	**144**	**111**	**144**	**124**	**109**	**122**	**109**	**113**	**123**	**105**	**122**	**102**
Iron	-	0.3	**30.8**	**23.4**	**29.1**	**24.7**	**31.5**	**25.7**	**25.8**	**28.6**	**27.1**	**24.8**	**26.9**	**23.3**	**28.0**	**23.1**
Magnesium	-	N/L	10.90	8.01	10.1	8.23	10.2	8.51	7.61	8.36	7.60	7.97	8.48	7.51	8.69	7.23
Manganese	-	0.05	**6.46**	**4.13**	**4.94**	**4.10**	**4.94**	**4.02**	**3.55**	**3.87**	**3.49**	**3.33**	**3.59**	**3.05**	**3.54**	**2.80**
Nitrite	-	1	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.1	0.3	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nitrate	-	10	< 0.06	< 0.06	< 0.06	< 0.06	0.07	0.07	0.3	< 0.1	< 0.05	< 0.05	< 0.05	< 0.05	0.18	< 0.05
pH (units) [3]	-	6.5 - 8.5	6.56	**6.41**	6.50	**6.31**	7.23	6.69	6.81	7.09	7.09	7.94	6.78	6.81	6.80	6.80
Phosphorus, Total	-	N/L	0.33	0.13	0.14	0.06	0.18	0.11	0.42	0.25	0.42	0.34	0.57	0.38	0.23	0.17
Potassium	-	N/L	17.6	15.8	17.5	15.4	20.2	16.7	13.9	16.6	13.4	16.9	15.1	15.6	13.7	14.0
Silicon	-	N/L	15.9	16.6	15.9	16.8	14.8	14.5	14.0	16.9	13.3	15.2	13.6	13.1	12.8	13.6
Sodium	-	200	11.3	9.7	9.85	10.5	10.3	8.58	8.0	9.2	7.1	7.7	7.4	7.7	6.9	7.0
Strontium	-	N/L	0.343	0.259	0.312	0.277	0.362	0.280	0.250	0.281	0.242	0.258	0.271	0.254	0.267	0.235
Sulphate	-	500	11.0	12.0	14	15	16	15	15	13	12	12	17	16	15	11
Total Kjeldahl Nitrogen	-	N/L	3.8	3.5	4.1	4.0	4.7	4.6	4.7	4.5	4.6	4.5	4.4	3.8	3.3	3.0
Total Dissolved Solids	-	500	243	231	240	223	254	240	184	171	183	183	167	168	161	144
Zinc	-	5	0.002	0.003	< 0.002	0.005	0.003	0.003	0.013	< 0.005	< 0.005	< 0.005	0.005	< 0.005	< 0.005	0.006

Notes:
1. Reasonable Use Concept (RUC) criteria, in accordance with Provisional Certificate of Approval A412303.
2. Ontario Drinking Water Standards (ODWS).
3. Results obtained from field analysis.

All results expressed in mg/L unless otherwise noted.
Bold and Italic values exceed RUC limits.
Bold and shaded values exceed the ODWS.
N/L indicates no limit specified.
"-" means parameter not analyzed.

Table 5
75% Reasonable Use Concept Assessment
Round Lake Waste Disposal Site

Parameter	75 % of RUC [1]	ODWS [2]	BH95-9													
			24-Apr-13	31-Oct-13	13-May-14	27-Oct-14	20-May-15	08-Oct-15	30-May-16	31-Oct-16	03-May-17	24-Oct-17	1-May-18	17-Oct-18	13-May-19	07-Oct-19
Alkalinity (as $CaCO_3$)	-	30 - 500	89	140	74	94	68	66	66	66	58	76	52	39	60	65
Aluminum	-	0.1	0.0217	0.0135	0.0318	0.0445	0.0115	0.007	< 0.01	< 0.01	< 0.01	0.03	0.02	0.02	0.03	0.03
Ammonia, Total (N)	-	N/L	< 0.1	0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.09	0.03	0.04	0.06	0.06	0.08	0.09	0.10
Barium	0.19	1.0	0.0461	0.0407	0.0337	0.0393	0.0370	0.0337	0.041	0.050	0.036	0.058	0.035	0.043	0.038	0.047
Boron	0.94	5.0	0.0474	0.0420	0.0429	0.0451	0.0399	0.0388	0.035	0.047	0.031	0.054	0.042	0.043	0.043	0.046
Calcium	-	N/L	21.9	20.0	19.8	18.6	19.4	18.3	21.3	23.3	18.8	23.9	18.5	21.9	20.7	21.6
Chloride	94.7	250	4.8	7.5	9.3	7.3	11	12	17.9	15.1	17.1	15.3	19.0	27.3	19.1	28.1
Chromium	0.01	0.05	0.0007	0.0034	0.00049	0.00043	0.00017	0.00023	< 0.002	< 0.002	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Chemical Oxygen Demand	-	N/L	29	11	10	10	8	10	16	27	8	43	12	< 5	9	< 5
Cobalt	-	N/L	0.0054	0.0020	0.00338	0.00115	0.000813	0.000751	< 0.005	< 0.005	< 0.005	< 0.005	0.0007	0.0009	0.0008	0.0009
Conductivity (µS/cm) [3]	-	N/L	155	157	185	184	133	164	170	162	153	188	130	179	139	166
Copper	-	1	0.0014	0.0011	0.00118	0.00069	0.00053	0.00039	0.0003	0.0004	0.0005	0.0005	0.0012	0.0007	0.0005	0.0011
Dissolved Organic Carbon	-	5	3.7	1.6	3.4	3.4	2.9	3.6	1.6	1.7	1.2	3.1	2.1	3.2	3.4	4.1
Hardness	-	100	97.8	89.2	89.1	88.2	86.6	81.9	96	***105***	85	***109***	82	***100***	94	97
Iron	-	0.3	**5.27**	**7.39**	**8.04**	**7.68**	**6.99**	**6.33**	**7.93**	**8.07**	**7.30**	**7.96**	**6.12**	**7.04**	**6.63**	**6.81**
Magnesium	-	N/L	10.4	9.5	9.61	10.1	9.30	8.79	10.3	11.3	9.24	11.9	8.65	10.9	10.2	10.4
Manganese	-	0.05	**0.328**	**0.219**	**0.222**	**0.216**	**0.229**	**0.201**	**0.271**	**0.291**	**0.240**	**0.264**	**0.220**	**0.234**	**0.231**	**0.242**
Nitrite	-	1	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.1	0.2	0.23	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nitrate	-	10	< 0.06	< 0.06	< 0.06	0.07	< 0.06	< 0.06	< 0.1	< 0.1	< 0.05	< 0.05	< 0.05	< 0.05	0.17	< 0.05
pH (units) [3]	-	6.5 - 8.5	6.59	6.60	6.53	**6.44**	**6.36**	6.62	6.76	**6.27**	7.12	7.81	7.24	6.70	6.87	6.90
Phosphorus, Total	-	N/L	0.3	0.14	0.20	0.22	0.13	0.08	0.25	0.10	0.11	0.06	0.10	0.04	0.05	0.09
Potassium	-	N/L	2.72	2.65	2.47	2.50	2.63	2.35	2.3	2.9	2.1	3.0	2.3	2.9	2.6	3.0
Silicon	-	N/L	9.23	10.40	10.3	10.9	9.82	9.07	8.99	10.8	8.63	9.99	9.37	8.85	8.86	9.42
Sodium	-	200	5.45	5.57	4.73	6.80	5.29	4.74	5.7	7.7	4.8	6.7	5.5	7.6	6.0	7.5
Strontium	-	N/L	0.119	0.109	0.104	0.118	0.109	0.102	0.118	0.134	0.106	0.136	0.100	0.132	0.117	0.129
Sulphate	-	500	15	15	13	17	14	14	13	12	11	13	10	17	15	13
Total Kjeldahl Nitrogen	-	N/L	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.2	0.4	0.2	0.3	0.2	0.2	0.2	0.2
Total Dissolved Solids	-	500	154	206	151	163	131	160	122	117	118	139	97	136	112	117
Zinc	-	5	< 0.002	< 0.002	< 0.002	0.003	0.005	0.002	0.010	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005

Notes:
1. Reasonable Use Concept (RUC) criteria, in accordance with Provisional Certificate of Approval A412303.
2. Ontario Drinking Water Standards (ODWS).
3. Results obtained from field analysis.

All results expressed in mg/L unless otherwise noted.
Bold and Italic values exceed RUC limits.
Bold and shaded values exceed the ODWS.
N/L indicates no limit specified.
"-" means parameter not analyzed.

Table 5
75% Reasonable Use Concept Assessment
Round Lake Waste Disposal Site

Parameter	75 % of RUC [1]	ODWS [2]	BH01-13D												
			24-Apr-13	31-Oct-13	13-May-14	27-Oct-14	20-May-15	08-Oct-15	30-May-16	31-Oct-16	03-May-17	24-Oct-17	1-May-18	17-Oct-18	13-May-19	07-Oct-19
Alkalinity (as $CaCO_3$)	-	30 - 500	83	85	107	99	103	92	95	81	84	81	94	82	84	78
Aluminum	-	0.1	0.0323	0.0578	0.0958	0.0640	0.0123	0.015	0.01	0.02	0.01	0.03	0.01	0.02	**1.27**	0.04
Ammonia, Total (N)	-	N/L	0.3	0.4	0.4	0.3	0.2	0.4	0.39	0.40	0.30	0.37	0.49	0.38	0.39	0.37
Barium	0.19	1.0	0.0631	0.0707	0.0688	0.0805	0.0752	0.0684	0.072	0.080	0.066	0.105	0.083	0.074	0.098	0.065
Boron	0.94	5.0	0.046	0.044	0.0502	0.0477	0.0449	0.0494	0.046	0.053	0.046	0.048	0.060	0.043	0.063	0.043
Calcium	-	N/L	21.0	21.3	26.4	22.8	26.1	24.1	26.6	27.4	23.9	28.6	29.7	25.6	26.5	23.0
Chloride	94.7	250	4.7	5.4	4.6	6.2	6	8	7.6	10.0	11.8	21.8	8.2	18.1	8.4	13.0
Chromium	0.01	0.05	0.0010	0.0039	0.00103	0.00091	0.00052	0.00057	< 0.002	< 0.002	< 0.001	< 0.001	< 0.001	< 0.001	0.005	0.001
Chemical Oxygen Demand	-	N/L	18	19	26	24	16	19	85	42	25	65	74	25	60	10
Cobalt	-	N/L	0.00749	0.00693	0.00546	0.00281	0.00243	0.00231	< 0.005	0.005	0.005	< 0.005	0.0026	0.0025	0.0048	0.0020
Conductivity (µS/cm) [3]	-	N/L	145	180	222	353	131	202	187	173	169	238	168	196	146	168
Copper	-	1	0.0017	0.0043	0.00476	0.00331	0.00105	0.00058	0.0007	0.0006	< 0.0001	0.0007	0.0017	0.0011	0.0155	0.0010
Dissolved Organic Carbon	-	5	**5.2**	2.2	2.6	**5.7**	4.1	**5.5**	2.8	3.2	2.0	4.0	4.0	4.2	**5.8**	**5.0**
Hardness	-	100	87	85.9	**108**	93.9	**101**	96.7	**109**	**111**	97	**120**	**118**	**104**	**111**	94
Iron	-	0.3	**6.50**	**6.73**	**8.31**	**8.68**	**8.02**	**7.50**	**7.19**	**8.59**	**7.19**	**7.39**	**8.54**	**7.35**	**11.3**	**6.59**
Magnesium	-	N/L	8.36	7.95	10.2	8.97	8.67	8.89	10.4	10.4	9.11	11.7	10.6	9.83	10.9	8.92
Manganese	-	0.05	**1.61**	**1.44**	**1.74**	**1.88**	**1.95**	**1.76**	**1.88**	**1.99**	**1.89**	**1.87**	**2.54**	**1.89**	**2.32**	**1.65**
Nitrite	-	1	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.1	0.2	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nitrate	-	10	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	0.1	< 0.1	< 0.05	< 0.05	< 0.05	< 0.05	0.18	< 0.05
pH (units) [3]	-	6.5 - 8.5	6.61	6.77	7.08	**6.17**	6.88	6.58	6.97	6.6	6.6	6.56	**6.15**	6.72	6.81	6.80
Phosphorus, Total	-	N/L	0.53	0.58	0.65	0.54	0.22	0.26	1.47	0.76	0.58	0.45	2.35	1.18	0.58	0.38
Potassium	-	N/L	4.52	5.07	5.03	5.20	5.58	5.23	4.6	5.7	4.4	6.3	5.4	5.7	5.5	5.4
Silicon	-	N/L	9.7	11.4	11.3	12.3	11.4	10.3	9.77	12.1	9.27	11.0	10.5	9.54	11.2	10.1
Sodium	-	200	4.76	4.98	5.24	5.69	5.34	5.09	5.7	6.4	5.1	6.1	6.0	5.9	5.3	5.5
Strontium	-	N/L	0.138	0.141	0.169	0.174	0.165	0.164	0.179	0.193	0.161	0.206	0.198	0.187	0.183	0.165
Sulphate	-	500	13	16	14	20	16	18	20	17	14	16	17	23	16	13
Total Kjeldahl Nitrogen	-	N/L	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.6	0.9	0.7	0.7	0.7	1.1	0.8	0.7	0.6
Total Dissolved Solids	-	500	137	143	123	180	174	171	145	129	137	163	129	141	118	114
Zinc	-	5	< 0.002	0.002	0.002	0.002	0.003	0.003	0.022	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.005	< 0.005

Notes:
1. Reasonable Use Concept (RUC) criteria, in accordance with Provisional Certificate of Approval A412303.
2. Ontario Drinking Water Standards (ODWS).
3. Results obtained from field analysis.

All results expressed in mg/L unless otherwise noted.
Bold and Italic values exceed RUC limits.
Bold and shaded values exceed the ODWS.
N/L indicates no limit specified.
"-" means parameter not analyzed.

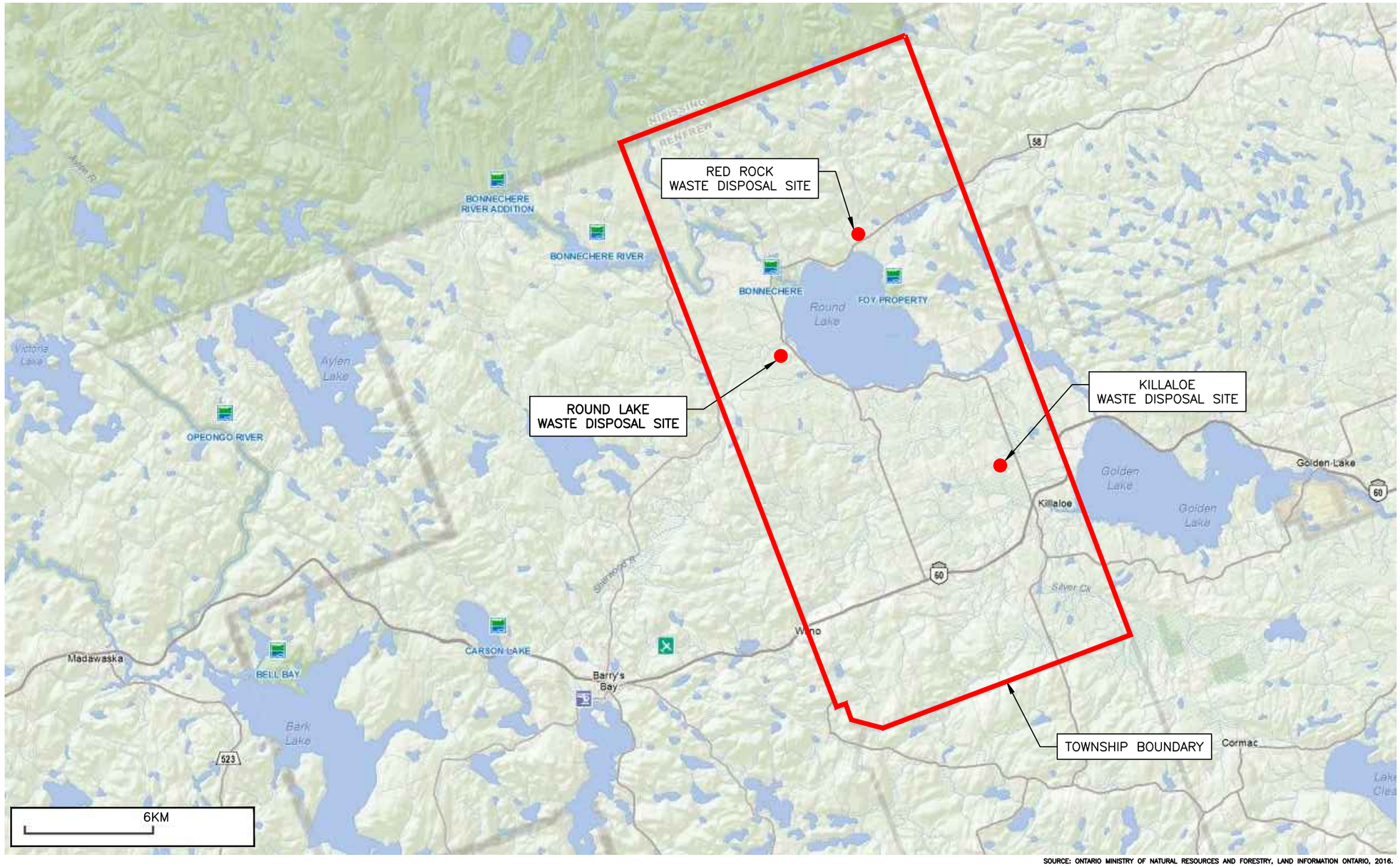
Table 5
75% Reasonable Use Concept Assessment
Round Lake Waste Disposal Site

Parameter	75 % of RUC [1]	ODWS [2]	BH01-14													
			24-Apr-13	31-Oct-13	13-May-14	27-Oct-14	20-May-15	08-Oct-15	30-May-16	31-Oct-16	03-May-17	24-Oct-17	1-May-18	17-Oct-18	13-May-19	07-Oct-19
Alkalinity (as $CaCO_3$)	-	30 - 500	58	76	81	80	84	74	68	70	74	71	92	77	73	73
Aluminum	-	0.1	***1.6***	0.0982	***0.219***	***0.230***	0.0113	0.020	0.01	0.01	< 0.01	0.04	0.02	0.02	0.03	***0.10***
Ammonia, Total (N)	-	N/L	0.2	0.2	< 0.1	0.1	0.1	0.2	0.17	0.22	0.18	0.26	0.45	0.31	0.25	0.30
Barium	0.19	1.0	0.0945	0.0523	0.0544	0.0636	0.0578	0.0505	0.051	0.062	0.053	0.089	0.071	0.072	0.058	0.059
Boron	0.94	5.0	0.0322	0.033	0.0363	0.0356	0.0396	0.0442	0.031	0.041	0.032	0.042	0.045	0.039	0.049	0.040
Calcium	-	N/L	15.8	17.2	19.6	18.6	21.5	19.7	19.9	23.3	20.8	28.3	25.8	26.9	23.7	21.2
Chloride	94.7	250	3.2	4.2	4.1	6.8	5	9	5.8	7.9	10.4	28.8	9.1	25.1	9.1	9.7
Chromium	0.01	0.05	0.0055	0.0037	0.00099	0.00099	0.00032	0.00040	< 0.002	< 0.002	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.001
Chemical Oxygen Demand	-	N/L	13	12	10	9	13	< 8	51	90	18	96	48	< 5	66	6
Cobalt	-	N/L	0.0055	0.0018	0.0046	0.0012	0.0009	0.0008	< 0.005	< 0.005	< 0.005	< 0.005	0.0008	0.0010	0.0008	0.0007
Conductivity (µS/cm) [3]	-	N/L	115	140	175	169	145	170	144	158	162	245	166	216	148	153
Copper	-	1	0.0144	0.0029	0.00554	0.00924	0.00072	0.00052	0.0005	0.0007	0.0003	0.0002	0.0012	0.0012	0.0010	0.0017
Dissolved Organic Carbon	-	5	2.8	2	3.1	3.6	3.0	3.2	2.4	2.4	1.5	3.4	3.4	3.5	4.2	4.4
Hardness	-	100	74.5	74.4	85.4	83.5	91.0	84.1	86	***101***	92	***127***	***110***	***118***	***104***	92
Iron	-	0.3	***8.9***	***6.51***	***7.53***	***7.85***	***7.96***	***7.07***	***6.58***	***6.70***	***8.72***	***11.0***	***8.55***	***10.2***	***8.50***	***7.27***
Magnesium	-	N/L	8.5	7.66	8.88	9.02	9.09	8.45	8.97	10.5	9.68	13.7	11.0	12.4	10.8	9.43
Manganese	-	0.05	***0.47***	***0.42***	***0.497***	***0.553***	***0.676***	***0.645***	***0.496***	***0.593***	***0.648***	***0.930***	***1.13***	***1.09***	***0.907***	***0.920***
Nitrite	-	1	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.1	0.2	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nitrate	-	10	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	0.2	< 0.1	< 0.05	< 0.05	< 0.05	< 0.05	0.18	< 0.05
pH (units) [3]	-	6.5 - 8.5	6.68	6.64	6.63	***6.39***	***6.38***	6.5	7.36	***6.46***	6.7	6.58	6.57	6.59	6.74	6.80
Phosphorus, Total	-	N/L	2.16	0.64	1.56	1.86	0.52	2.28	1.11	1.89	0.75	1.35	1.59	1.75	1.33	1.09
Potassium	-	N/L	4.17	3.34	3.54	3.53	4.47	3.76	3.4	4.4	3.2	4.9	4.7	4.8	4.1	4.5
Silicon	-	N/L	11.4	10.6	10.2	10.9	10.1	9.31	9.04	10.7	8.79	10.2	10.3	8.92	8.97	9.34
Sodium	-	200	3.33	3.59	3.63	3.95	4.19	3.99	4.4	5.4	4.1	5.4	5.2	5.5	4.7	5.1
Strontium	-	N/L	0.0962	0.101	0.112	0.126	0.131	0.121	0.121	0.149	0.126	0.183	0.161	0.180	0.147	0.138
Sulphate	-	500	14	17	15	20	19	18	18	19	14	17	17	33	20	13
Total Kjeldahl Nitrogen	-	N/L	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.3	0.5	0.5	0.6	0.6	0.7	0.8	0.5
Total Dissolved Solids	-	500	111	154	137	151	157	160	111	114	125	171	122	155	114	107
Zinc	-	5	0.014	< 0.002	0.002	0.004	0.003	0.004	0.010	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005

Notes:
1. Reasonable Use Concept (RUC) criteria, in accordance with Provisional Certificate of Approval A412303.
2. Ontario Drinking Water Standards (ODWS).
3. Results obtained from field analysis.

All results expressed in mg/L unless otherwise noted.
Bold and Italic values exceed RUC limits.
Bold and shaded values exceed the ODWS.
N/L indicates no limit specified.
"-" means parameter not analyzed.

Figures



SOURCE: ONTARIO MINISTRY OF NATURAL RESOURCES AND FORESTRY, LAND INFORMATION ONTARIO, 2016.

Greenview ENVIRONMENTAL MANAGEMENT

13 Commerce Court
Bancroft, Ontario
613.332.0657
greenview-environmental.ca

No.	DATE	BY	REMARKS
1	MAR16–20	SDK	ISSUED FOR MECP REVIEW
0	JAN08–20	SDK	ISSUED FOR CLIENT REVIEW

DRAWN BY: SDK	CHECKED BY: DMH
DESIGNED BY: SDK	APPROVED BY: DMH
SCALE: AS NOTED	DATE: MAR 2020

CLIENT: CORPORATION OF THE TOWNSHIP OF KILLALOE-HAGARTY-RICHARDS

PROJECT:

REGIONAL LOCATION PLAN
2019 ANNUAL REPORT
ROUND LAKE WASTE DISPOSAL SITE
TOWNSHIP OF KILLALOE, HAGARTY AND RICHARDS

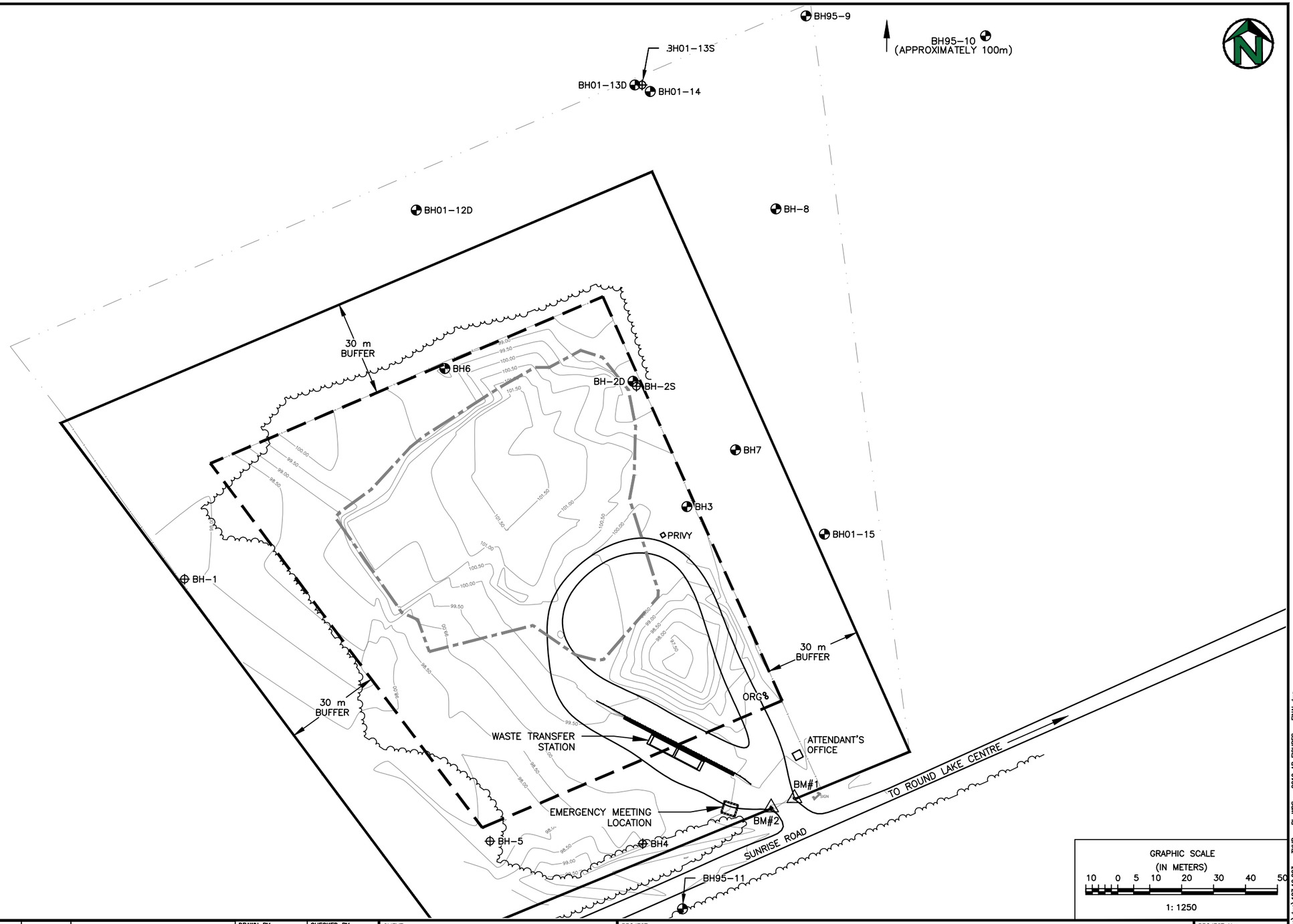
PROJECT No: 107.19.003

FIGURE: 1

G:\AutoCAD\107 KHR\003 Round Lake\dwg\107.19.003 - TKHR - RL WDS - 2019 AR FIGURES - FINAL.dwg

LEGEND

- PROPERTY BOUNDARY
- APPROVED WASTE DISPOSAL AREA
- EXISTING LIMIT OF WASTE
- CONTAMINANT ATTENUATION ZONE
- 100.00 TOPOGRAPHIC CONTOUR LINE
- ON-SITE ROAD
- FENCELINE
- APPROXIMATE TREE LINE
- BH-1 SHALLOW GROUNDWATER MONITORING WELL
- BH-3 DEEP GROUNDWATER MONITORING WELL
- BM#1 BENCHMARK



GRAPHIC SCALE
(IN METERS)
10 0 5 10 20 30 40 50
1: 1250

NOTES

1. BENCHMARKS
   BM#1
   NAIL ON WEST GATE POST
   ELEVATION = 100.000m
2. BASE SURVEY DATA PROVIDED BY SGS LAKEFIELD RESEARCH LIMITED AND Jp2g CONSULTANTS INC.
3. UPDATED TOPOGRAPHIC SURVEY COMPLETED BY GREENVIEW ON OCTOBER 25, 2012.

Greenview ENVIRONMENTAL MANAGEMENT
13 Commerce Court
Bancroft, Ontario
613.332.0057
greenview-environmental.ca

No.	DATE	BY	REMARKS
1	MAR16-20	SDK	ISSUED FOR MECP REVIEW
0	JAN08-20	SDK	ISSUED FOR CLIENT REVEIW

DRAWN BY: SDK | CHECKED BY: DMH
DESIGNED BY: SDK | APPROVED BY: DMH
SCALE: 1:1250 | DATE: MAR 2020

CLIENT: CORPORATION OF THE TOWNSHIP OF KILLALOE-HAGARTY-RICHARDS

PROJECT:

EXISTING SITE CONDITIONS PLAN
2019 ANNUAL REPORT
ROUND LAKE WASTE DISPOSAL SITE
TOWNSHIP OF KILLALOE, HAGARTY, AND RICHARDS

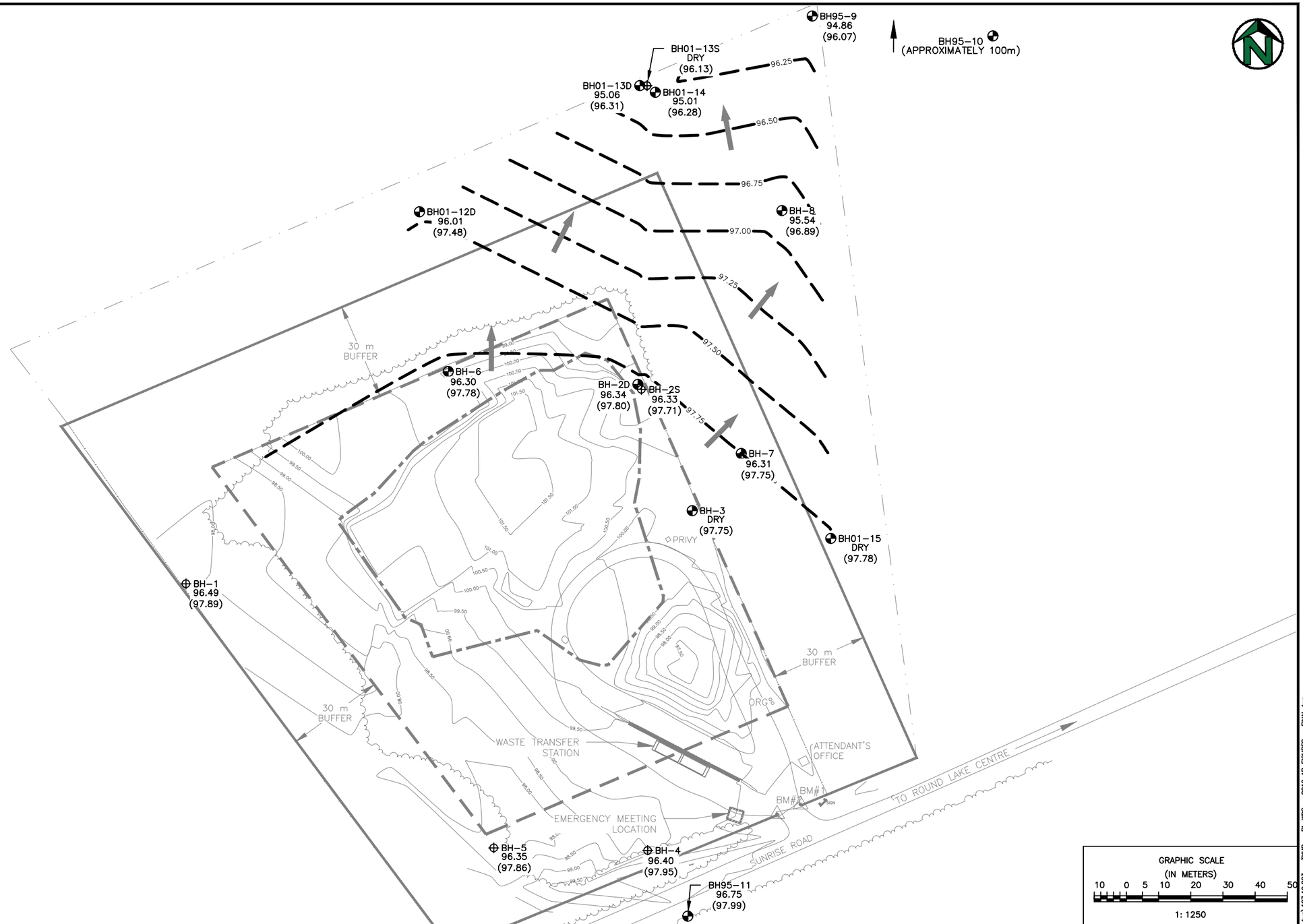
PROJECT No: 107.19.003

FIGURE: 2

G:\AutoCAD\107 KHR\003 Round Lake\dwg\107.19.003 - TKHR - RL WDS - 2019 AR FIGURES - FINAL.dwg

LEGEND

- PROPERTY BOUNDARY
- APPROVED WASTE DISPOSAL AREA
- EXISTING LIMIT OF WASTE
- CONTAMINANT ATTENUATION ZONE
- 100.00 — TOPOGRAPHIC CONTOUR LINE
- ON-SITE ROAD
- FENCELINE
- APPROXIMATE TREE LINE
- ⊕ BH-1 — SHALLOW GROUNDWATER MONITORING WELL
- ⊕ BH-3 — DEEP GROUNDWATER MONITORING WELL
- 97.00 — EQUIPOTENTIAL CONTOUR (MAY 13, 2019)
- 96.36 (97.10) — GROUNDWATER ELEVATIONS OCTOBER 07, 2019 (MAY 13, 2019)
- GROUNDWATER FLOW DIRECTION
- △ BM#1 — BENCHMARK



GRAPHIC SCALE
(IN METERS)
10 0 5 10 20 30 40 50
1: 1250

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   BM#1
   NAIL ON WEST GATE POST
   ELEVATION = 100.000m
2. BASE SURVEY DATA PROVIDED BY SGS LAKEFIELD RESEARCH LIMITED AND Jp2g CONSULTANTS INC.
3. UPDATED TOPOGRAPHIC SURVEY COMPLETED BY GREENVIEW ON OCTOBER 25, 2012.

Greenview ENVIRONMENTAL MANAGEMENT
13 Commerce Court
Bancroft, Ontario
613.332.0057
greenview-environmental.ca

No.	DATE	BY	REMARKS
1	MAR16-20	SDK	ISSUED FOR MECP REVIEW
0	JAN08-20	SDK	ISSUED FOR CLIENT REVEIW

DRAWN BY: SDK | CHECKED BY: DMH
DESIGNED BY: SDK | APPROVED BY: DMH
SCALE: 1:1250 | DATE: MAR 2020

CLIENT: CORPORATION OF THE TOWNSHIP OF KILLALOE-HAGARTY-RICHARDS

PROJECT:

ENVIRONMENTAL MONITORING LOCATION PLAN – SPRING 2019 ANNUAL REPORT ROUND LAKE WASTE DISPOSAL SITE TOWNSHIP OF KILLALOE, HAGARTY, AND RICHARDS

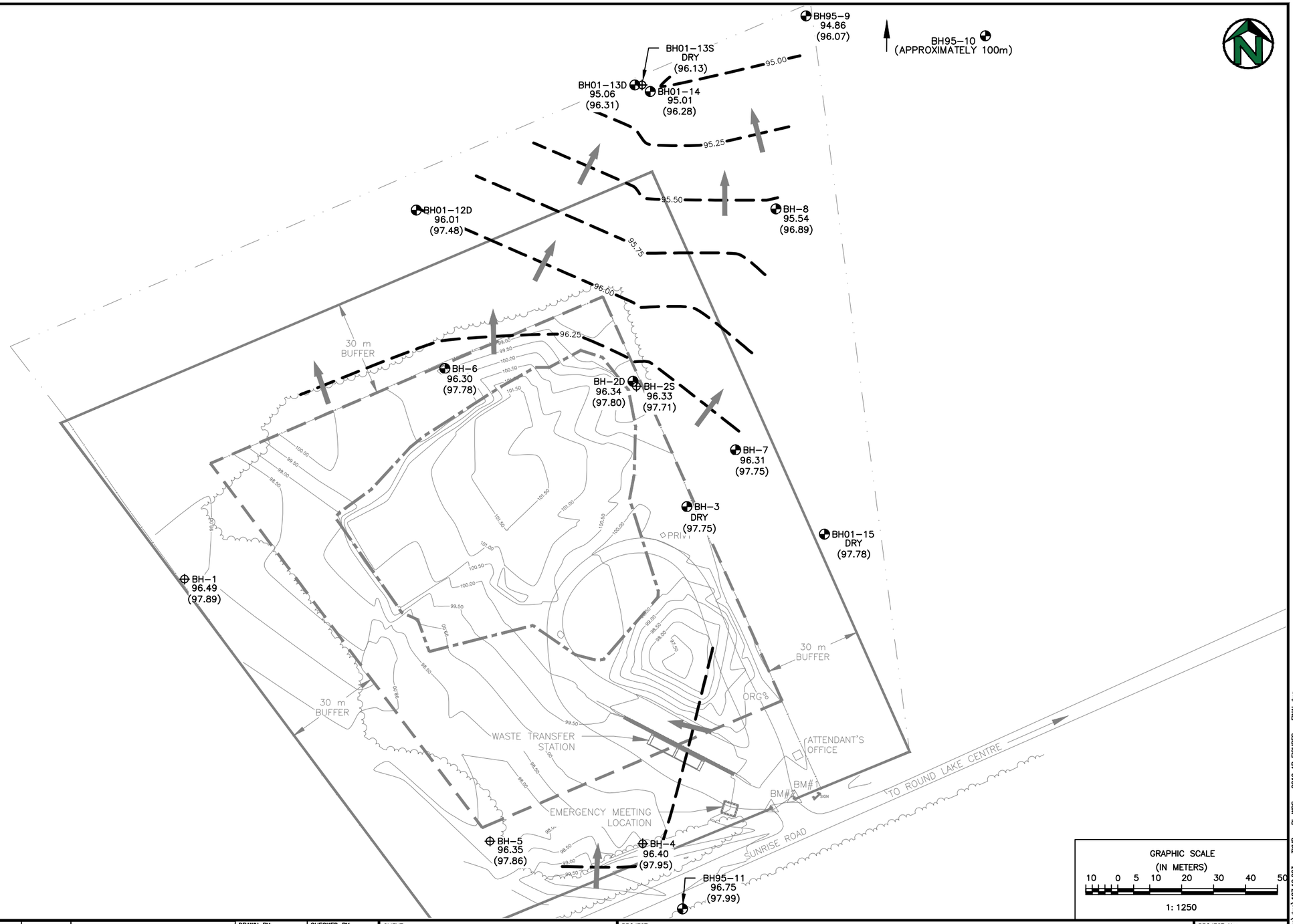
PROJECT No: 107.19.003

FIGURE: 3

G:\AutoCAD\107 KHR\003 Round Lake\dwg\107.19.003 - TKHR - RL WDS - 2019 AR FIGURES - FINAL.dwg

LEGEND

- PROPERTY BOUNDARY
- APPROVED WASTE DISPOSAL AREA
- EXISTING LIMIT OF WASTE
- CONTAMINANT ATTENUATION ZONE
- 100.00 TOPOGRAPHIC CONTOUR LINE
- ON-SITE ROAD
- FENCELINE
- APPROXIMATE TREE LINE
- BH-1 SHALLOW GROUNDWATER MONITORING WELL
- BH-3 DEEP GROUNDWATER MONITORING WELL
- 97.00 EQUIPOTENTIAL CONTOUR (OCTOBER 07, 2019)
- 96.36 (97.10) GROUNDWATER ELEVATIONS OCTOBER 07, 2019 (MAY 13, 2019)
- GROUNDWATER FLOW DIRECTION
- BM#1 BENCHMARK



GRAPHIC SCALE
(IN METERS)
10 0 5 10 20 30 40 50
1: 1250

NOTES

1. BENCHMARKS
   BM#1
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Greenview
ENVIRONMENTAL MANAGEMENT
13 Commerce Court
Bancroft, Ontario
613.332.0057
greenview-environmental.ca

No.	DATE	BY	REMARKS
1	MAR16-20	SDK	ISSUED FOR MECP REVIEW
0	JAN08-20	SDK	ISSUED FOR CLIENT REVEIW

DRAWN BY: SDK | CHECKED BY: DMH
DESIGNED BY: SDK | APPROVED BY: DMH
SCALE: 1:1250 | DATE: MAR 2020

CLIENT: CORPORATION OF THE TOWNSHIP OF KILLALOE-HAGARTY-RICHARDS

PROJECT:

ENVIRONMENTAL MONITORING LOCATION PLAN – FALL 2019 ANNUAL REPORT ROUND LAKE WASTE DISPOSAL SITE TOWNSHIP OF KILLALOE, HAGARTY, AND RICHARDS

PROJECT No: 107.19.003

FIGURE: 4

G:\AutoCAD\107 KHR\003 Round Lake\dwg\107.19.003 – TKHR – RL WDS – 2019 AR FIGURES – FINAL.dwg

Appendix A

Ontario

Ministry of the Environment
Ministère de l'Environnement

AMENDMENT TO ENVIRONMENTAL COMPLIANCE APPROVAL
NUMBER A412303
Notice No. 1
Issue Date: May 21, 2014

The Corporation of the Township of Killaloe, Hagarty and Richards
1 John St
P.O. Box No. 35
Killaloe, Ontario
K0J 2A0

Site Location: Round Lake Waste Disposal Site
168 Sunrise Road
Lot 27, Concession 3
Killaloe, Hagarty and Richards Township, County of Renfrew

You are hereby notified that I have amended Approval No. A412303 issued on November 30, 2012 for a Waste Disposal Site (landfill/transfer) , as follows:

CONDITIONS

The following Conditions are hereby revoked and replaced by the following:

2.6 (1) Waste shall only be accepted at the Site during the following time periods:

i. Holiday Mondays (May - October, excluding Canada Day)	10:00 a.m. - 6:00 p.m.
ii. Thursdays	8:30 a.m. - 3:30 p.m.
iii. Sundays	8:30 a.m. - 3:30 p.m.

2.6 (3) Amending the hours of operation requires the written approval of the District Manager of the MOE Ottawa District Office. The Township shall provide a copy of the written approval to the Director.

The following documents are hereby added to **Schedule "A"**:

16. Application for an Environmental Compliance Approval for a Waste Disposal Site signed by Lorna Hudder, CAO Clerk Treasurer, The Corporation of the Township of Killaloe, Hagarty and Richards, dated January 20, 2014.

17. Letter dated January 21, 2014 from Dan Hagan, Greenview Environmental Management Limited to the MOE EAB, with attached ECA application.

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

The reason for Condition 2.6 is to specify the normal hours of operation for the Site and a mechanism for amendment of the hours of operation.

This Notice shall constitute part of the approval issued under Approval No. A412303 dated November 30, 2012, as amended.

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) 314-3717 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 21st day of May, 2014

THIS NOTICE WAS MAILED
ON May 28, 2014
DC
(Signed)

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

RL/
c: District Manager, MOE Ottawa
Dan Hagan, Greenview Environmental Management Limited ✓

Ontario

Ministry of the Environment
Ministère de l'Environnement

AMENDED ENVIRONMENTAL COMPLIANCE APPROVAL
NUMBER A412303
Issue Date: November 30, 2012

The Corporation of the Township of Killaloe, Hagarty and Richards
1 John St
Post Office Box, No. 35
Killaloe, Ontario
K0J 2A0

Site Location: Round Lake Waste Disposal Site
168 Sunrise Road
Part Lot 27, Concession 3
Township of Killaloe, Hagarty and Richards, County of Renfrew

You have applied under section 20.2 of Part II.1 of the Environmental Protection Act, R.S.O. 1990, c. E. 19 (Environmental Protection Act) for approval of:

the use and operation of a 1.62 hectare landfill and a waste transfer station within a 3.5 hectare total Site area, including a 1.33 hectare contaminant attenuation zone and an easement to access monitoring well BH95-10.

For the purpose of this environmental compliance approval, the following definitions apply:

"Act" and ***"EPA"*** means the *Environmental Protection Act, R.S.O. 1990, C.E-19* as amended;

"Adverse Effect" means the same as the definition in the EPA;

"Applicant" means the Township of Killaloe, Hagarty and Richards, including its officers, employees, agents or contractors;

"Blue Box Recyclables" *or* ***"Blue Box Waste"*** means commingled containers (tin, aluminium, steel, plastic, mixed glass) and mixed fibres only for the operations approved in this *Approval;*

"Bulky Waste Materials" or ***"Bulky Household Items"*** mean large items of waste materials, such as appliances and furniture;

"Construction and Demolition Waste" *or* ***"C&D Waste"*** means waste building materials and rubble produced from construction, renovation, repair or demolition operations on houses, commercial buildings,

pavements and other structures;

"Design and Operations Plan" means the Design and Operations Plan contained within Item 15 of Schedule "A" of this *Approval* that the Owner has submitted to the Ministry as supporting technical information for the application to amend the current Approval for the Round Lake Waste Disposal Site, as described in Item 15 of 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" refers to the District Manager in the Ministry of the Environment's Ottawa District Office;

"District Office" refers to the Ministry of the Environment Ottawa District Office;

"EAB" refers to the *Environmental Approvals Branch* of the *Ministry of the Environment;*

"Environmental Compliance Approval" or "ECA" or ***"Approval"*** means this entire provisional Environmental Compliance Approval document, issued in accordance with *Section 20.2* of the *EPA* , and includes any schedules to it, the application and the supporting documentation listed in Schedule "A";

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

"Industrial, Commercial and Institutional Waste" or ***"IC&I Waste"*** means waste generated by industrial, commercial and institutional business sectors;

"MOE" or ***"Ministry"*** refers to the Ontario Ministry of the Environment;

"Municipal Waste" is as defined in *Ontario Regulations 347,* R.R.O. 1990;

"Operator" has the same meaning as "operator" as defined in *s.25* of the *EPA* ;

"Owner" means the Township of Killaloe, Hagarty and Richards;

"O. Reg. 101/94" means *Ontario Regulation 101/94* as amended from time to time;

"Organic Waste" or ***"Source Separated Organic Waste"*** or ***"SSO Waste"*** means source separated residential and/or commercial non-hazardous organic waste consisting of one or more of the following components: food waste, soiled paper products, leaf and yard waste, sanitary products, pet waste;

"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" refers to the Director of the *Ministry of the Environment* 's Eastern Regional Office;

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

"Residential Waste" means waste generated in single and multi-family homes, including newspapers, clothing, disposable tableware, food packaging, cans, bottles, food scraps and yard trimmings other than those that are diverted to composting;

"RUPO" means the Ministry of the Environment Reasonable Use Policy Objectives (Guideline B-7);

"Site" or ***"WDS"*** refers to the Round Lake Waste Disposal Site and lands owned by the Owner described as:

i. Part Lot 27, Concession 3, Township of Killaloe, Hagarty and Richards, County of Renfrew;

"Waste Fill Area" means the area on the surface of the site beneath which or above which waste is disposed by landfilling;

"Waste Transfer Facility" or ***"Waste Transfer Station"*** or **"WTS"** refers to the area of land contiguous to the landfill area and part of the Site, to be used for the temporary storage of wastes prior to the removal of the wastes from the Site or for final disposal at the Site.

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

TERMS AND CONDITIONS

1.0 General

1.1 The Requirements specified in this ECA are the requirements under the *Environmental Protection Act, R.S.O. 1990* . The issuance of this Approval in no way abrogates the Applicant's legal obligations to take all reasonable steps to avoid violating other applicable provisions of this legislation and other legislation and regulations.

1.2 The Applicant shall ensure that all communications/correspondence made pursuant to this ECA includes reference to the ECA approval number A 412303.

1.3 The obligations imposed by the terms and conditions of this ECA are obligations of due diligence.

Compliance

1.4 The *Owner* shall ensure that any person authorized to carry out work on or operate any aspect of

the *Site* is notified of the *ECA* and the conditions herein and shall take all reasonable measures to ensure the person complies with the same.

1.5 Any person authorized to carry out work on or operate any aspect of the *Site* shall comply with the conditions of this *ECA* .

In Accordance

1.6 Except as otherwise provided for in this *ECA* , the *Site* shall be operated and maintained in accordance with the application for *Environmental Compliance Approval for a Waste Disposal Site* , dated September 21, 1998, and the supporting documentation listed in Schedule "A".

Other Legal Obligations

1.7 The issuance of, and compliance with, this *ECA* does not:

(a) relieve any person of any obligation to comply with any provision of the *EPA* or any other 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 request that any further information related to compliance with this *ECA* be provided to the *Ministry* ;

unless a provision of this *ECA* specifically refers to the other requirement or authority and clearly states that the other requirement or authority is to be replaced or limited by this *ECA* .

Adverse Effect

1.8 The *Owner* or *Operator* remain responsible for any contravention of any other condition of this *ECA* or any applicable statute, regulation, or other legal requirement resulting from any act or omission that caused the adverse effect or impairment of air and/or water quality.

Furnish Information

1.9 Any information requested by the *Director* or a *Provincial Officer* concerning the *Site* and its operation under this *ECA* , including but not limited to any records required to be kept by this *ECA* shall be provided in a timely manner.

1.10 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 *ECA* or under any statute, regulation or subordinate legal instrument, in relation to the information, shall not be construed as:

i. an approval, waiver, or justification by the *Ministry* of any act or omission of any person that contravenes any condition of this *ECA* or any statute, regulation or other subordinate legal requirement; or

ii.. acceptance by the *Ministry* of the information's completeness or accuracy.

1.11 Any information related to this *ECA* and contained in *Ministry* files may be made available to the public in accordance with the provisions of the Freedom of Information and Protection of Privacy Act, RSO 1990, CF-31.

Interpretation

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

1.13 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 in writing.

1.14 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.

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

Certificate of Requirement

1.16 Pursuant to Section 197 of the *EPA* , no person having an interest in the *Site* shall deal with the *Site* in any way without first giving a copy of this *ECA* to each person acquiring an interest in the *Site* as a result of the dealing.

1.17 In the event any additional land is acquired for the *Site* , then two (2) copies of a completed Certificate of Requirement, containing a registerable description of the additional lands for the *Site* , shall be submitted to the Director for the Director's signature within sixty (60) calendar days of any amendment to this *ECA* that incorporates the land into the *ECA* .

1.18 In the event any additional land is acquired for the *Site* , then the Certificate of Requirement shall be registered in the appropriate land registry office on title to the *Site* and a duplicate registered copy shall be submitted to the *Director* within ten (10) calendar days of receiving the Certificate of Requirement signed by the *Director* .

No Transfer or Encumbrance

1.19 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 is satisfied with the arrangements made to ensure

that all conditions of this *ECA* will be carried out and that sufficient financial assurance is deposited with the *Ministry* to ensure that these conditions will be carried out.

Change of Owner

1.20 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:

i. the ownership of the *Site*;
ii. the Operator of the *Site*;
iii. the address of the *Owner* or *Operator*;
iv. 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;
v. the name of the corporation where the *Owner* or *Operator* is or at any time becomes a corporation, other than a municipal corporation, and a copy of the most current information filed under the *Corporations Information Act*, R. S. O. 1990, c. C.39, shall be included in the notification.

1.21 In the event of any change in the ownership of the *Site*, other than a change to a successor municipality, the *Owner* shall notify in writing the succeeding owner of the existence of this *ECA*, and a copy of such notice shall be forward to the *Director* and *District Manager*.

Inspections

1.22 No person shall hinder or obstruct a *Provincial Officer* from carrying out any and all inspections authorized by the *EPA* or the *PA*, of any place to which this *ECA* relates, and without limiting the foregoing:

i. to enter upon the premises where the approved works are located, or the location where the records required by the conditions of this *ECA* are kept;
ii. to have access to, inspect, and copy any records required to be kept by the conditions of this *ECA*;
iii. to inspect the *Site,* related equipment and appurtenances;
iv. to inspect the practices, procedures, or operations required by the conditions of this *ECA*; and
v. to sample and monitor for the purposes of assessing compliance with the terms and conditions of this *ECA* or the *EPA* or the *PA*.

2.0 GENERAL OPERATIONS

Proper Operation

2.1 The *Site* shall be properly operated and maintained at all times. All waste shall be managed and disposed of in accordance with the *EPA* and *Regulation* 347 and the requirements of this *ECA*. At no time shall the discharge of a contaminant that causes or is likely to cause an *Adverse Effect* be permitted.

Operations Manual

2.2 An operations and procedures manual that addresses the requirements of this *ECA* shall be prepared and submitted to the *District Manager* for approval within ninety (90) days of the issuance of this amendment and shall include the following:

(a) Health and safety;
(b) Operation and maintenance of the *Site* ;
(c) Waste acceptance;
(d) Waste disposal area and development;
(e) Nuisance management;
(f) Surface water/Storm water management;
(g) Inspections and monitoring;
(h) Contingency plans and emergency procedures;
(i) Complaints; and,
(j) Reporting and record keeping.

2.3 The operations and procedures manual shall be:

i. retained at the *Site* ;
ii. reviewed on an annual basis and updated by the *Owner,* as required; and
iii. be available for inspection by *Ministry* staff.

Capacity

2.4 (1) The final volumetric capacity of the *Site* is **94,974 cubic metres** (including waste and daily cover material); and

(2) The total capacity as identified in Condition No. 2.4 (1) does not include the final cover.

Service Area

2.5 Only Municipal Waste that is generated in the within the boundaries of the Township of Killaloe, Hagarty and Richards shall be accepted at the *Site* . No waste shall be received for disposal and/or transfer at this *Site* from outside the approved service area.

Hours of Operation

2.6 (1) Waste shall only be accepted at the *Site* during the following time periods:

i. Thursday - 8:30 a.m. to 3:30 p.m.;
ii. Sunday - 8:30 p.m to 3:30 p.m.; and
iii. Mondays of Long Weekends (May - October) - 2 p.m. to 6 p.m.

(2) The site will remain closed to ratepayers and IC&I generators on: Christmas Day, Boxing Day, New Year's Day, Family Day, Good Friday, Easter Sunday, Easter Monday, Canada Day.

(3) Amending the hours of operation requires *Director* 's Approval.

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

2.8 The *Owner* may provide limited hours of operation provided that the hours are posted at the landfill gate and that suitable notice is provided to the public of any change in operating hours.

2.9 Upon reasonable notice to the *Director,* contingency actions may take place outside normal hours of operation. Emergency response may occur at any time as required.

Signage

2.10 (1) Signs shall be placed at the landfill *Site* entrance/exit indicating, at a minimum, the following:

(a) Name of the landfill and name of the *Owner/Operator* ;
(b) *MOE ECA* Number;
(c) Days and hours of operation and public use;
(d) Contact telephone number at the Township of Killaloe, Hagarty and Richards;
(e) Service area for the *Site* ;
(f) Types of waste accepted and prohibited;
(g) Overview of landfill complaints procedure, including a phone number for registering a complaint;
(h) Unauthorized entry is prohibited; and
(i) A warning against dumping wastes outside the *Site* .

(2) The *Owner* shall install and maintain signs to direct vehicles to the landfill working face and transfer station for waste and recyclables.

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

Site Security

2.11 During non-operating hours, the *Site* entrance and exit gates shall be locked and the *Site* shall be secured against access by unauthorized persons

On-Site Roads

2.12 On-*Site* roads shall be provided and maintained in a manner that vehicles hauling waste to and on the *Site* may travel readily and safely on any operating day. During winter months, when the *Site* is in operation, roads must be maintained to ensure safe access to the landfill working face and transfer station. On-*Site* roads must be clear of mud, ice and debris which may create hazardous conditions.

Waste Inspection Procedures

2.13 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 *ECA* .

Waste Inspection and Deposition

2.14 All loads of waste must be properly inspected by trained site personnel prior to acceptance at the *Site* and waste vehicles must be diverted to appropriate areas for waste disposal and transfer.

Litter Control

2.15 The *Owner* shall take all practical steps to prevent escape of litter from the *Site* . The *Owner* shall inspect and collect litter from the *Site* on a monthly basis from April to November and as needed between December and March. All loose, windblown litter shall be collected and disposed of at the landfill working face if applicable, or transported off-*Site* to be disposed of at an approved facility.

Vermin, Scavenging, Dust, Litter, Odour, Noise, etc.

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

2.17 No scavenging is to occur at the *Site.*

2.18 The *Owner* shall control fugitive dust emissions from on site sources including but not limited to on-*Site* roads, stockpiled cover material and, closed landfill area prior to seeding especially during times of dry weather conditions. If necessary, major sources of dust shall be treated with water and/or dust suppression materials to minimize the overall dust emissions from the *Site.*

2.19 The *Owner* shall comply with noise criteria in MOE Guideline entitled *"Noise Guidelines for Landfill Sites."*

Overall Surface Water Management

2.20 (1) The *Owner* shall take all appropriate measures to minimize surface water from coming in

contact with waste. Temporary berms and ditches shall be constructed around active waste disposal areas to prevent extraneous surface water from coming in contact with the active working face.

(2) The *Owner* shall not discharge surface water to receiving water bodies without an approval under the *EPA* .

Landfill Gas

2.21 All buildings are to be free of any landfill gas accumulation. The *Owner* shall provide adequate ventilation systems to relieve landfill gas accumulations in buildings if necessary.

3.0 LANDFILL SITE OPERATIONS

Landfill Operations

3.1 Except as otherwise provided by these Conditions, the landfilling operations at the *Site* shall be conducted in accordance with the Application for an *Environmental Compliance Approval* for a Waste Disposal Site for the Corporation of the Township of Killaloe, Hagarty and Richards, dated September 21, 1998, and the supporting documentation, plans and specifications listed in Schedule "A".

3.2 The *Owner* shall refrain from further landfilling of waste on the *Site* , and shall apply intermediate interim cover to all cells where waste has been deposited, until such time as the *Owner* acquires sufficient property for a contaminant attenuation zone that will meet the long term needs of the *Site* , or an alternative contingency plan to remediate off-Site leachate impacts.

Unacceptable Waste

3.3 (1) The *Owner* shall conduct appropriate inspections and ensure that appropriate controls are in place to prevent the acceptance and landfilling of liquid industrial waste and hazardous waste and to prevent the acceptance of waste from outside the approved service area.

(2) The *Owner* shall record in the daily records for the *Site* operations any occurrence of unacceptable waste delivered to the *Site* , the name of the waste hauler delivering the waste to the *Site* and waste generator (if known).

(3) The *Owner* shall forthwith notify the *District Manager* of any and all waste load refusals at the *Site* related to requirements in this *ECA* , including service area and waste types.

Burning of Waste

3.4 Burning of waste is not permitted at the *Site* .

Waste Placement

3.5 No waste shall be landfilled outside of the **limit of fill area** for the *Site* as shown in Item 2 in Schedule "A" attached to this *ECA* .

3.6 No waste shall be landfilled below the **base grades** as discussed and shown in Item 2 in Schedule "A" attached to this *ECA* .

3.7 (1) No waste shall be landfilled at any time above the **final waste grades** as shown in Item 2 in Schedule "A" attached to this *ECA* ; and

(2) Final slopes above grade at the time of *Site* closure within the waste fill area shall be within the range of 4H:1V (25%) and 20H:1V (5%).

3.8 Waste placement shall occur at a minimum 1 meter above the highest groundwater table elevation at the *Site* .

3.9 No waste shall be landfilled in the buffer area.

3.10 The *Owner* shall deposit waste in a manner that minimizes exposure area at the landfill working face and all waste shall be compacted before cover is applied.

Cover Material

3.11 (1) Daily Cover - By the end of each working day, the entire working face shall be compacted and covered with a minimum thickness of 150 mm of soil cover or an approved thickness of alternative cover material.

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

Waste Processing

3.12 The *Owner* shall ensure that the following:

i. that all *ECA* required for the equipment for the operation and processing waste at the *Site* have been obtained by the *Owner* ; or

ii. that a retained contractor has all the *ECA'* s for the equipment to be used to process waste at the *Site* .

Landfill Surface Water Management

3.13 Stormwater runoff generated from the active waste fill area shall be considered contaminated and treated as leachate. Operational methods shall ensure that any precipitation falling onto active

waste fill areas, not under final cover, shall be directed into the waste or into a control structure for testing prior to confirm surface water can be discharged to the natural environment.

3.14 In the event of an exceedance of a leachate indicator parameter trigger level, the Owner shall conduct an investigation into the cause and the need for implementation of remedial or contingency actions in accordance with Schedule "C".

4.0 WASTE TRANSFER STATION

Waste Transfer Facility

4.1 Except as otherwise provided by these Conditions, the *Transfer Station* shall be designed, developed, used, maintained and operated, and all facilities, equipment and fixtures shall be built and/or installed in accordance with the Application for an *ECA* for an upgraded Waste Transfer Station at Round Lake Landfill Site for the Corporation of the Township of Killaloe, Hagarty and Richards dated January 31, 2012, and the supporting documentation, plans and specifications listed in Schedule "A".

4.2 The *Owner* shall limit transfer activities to the receiving and transferring of solid, non-hazardous, residential and *IC&I* waste, *Blue Box Recyclables* (commingled containers and mixed fibres only), and SSO, generated within the Township of Killaloe, Hagarty and Richards, as described in Item15 of Schedule "A".

4.3 The *Owner* shall ensure that all waste accepted for transfer shall be segregated either into bins with lids or doors, or in designated areas as defined by barriers. All bins and designated waste storage areas shall be clearly labelled.

4.4 The *Owner* shall ensure that each day on which the *Site* is open to accept waste for transfer, the Site is inspected and litter is picked up in the waste transfer area.

Waste Quantity

4.5 The maximum storage capacity for the *Waste Transfer Facility* and for each type of material is as follows:

Material	Total Volume (m^3)
Blue Box Recyclable – Commingled Containers	70
Blue Box Recyclable – Mixed Fibres	70
Residential and IC&I Waste	20
SSO	2
TOTAL	**162**

Operations

4.6 Recycling activities shall be completed as per *Ontario Regulation 101/94* .

4.7 Recyclable materials shall be properly separated and each area properly identified. The areas shall be kept in a neat and tidy manner.

4.8 The operating hours of the *Waste Transfer Facility* shall in as those in *Condition 2.6* in this *ECA* .

4.9 All waste types shall be segregated either into bins with locks and doors, or in designated areas defined by barriers. All bins and designated waste storage areas shall be clearly labelled.

4.10 No waste shall be received at the *Waste Transfer Station* except during operating hours when the *Waste Transfer Station* is under the supervision of the trained personnel.

4.11 (1) The *Owner* shall remove household waste at an interval at the end of the operating day.

(2) *Residential and IC&I Waste* to be collected at the transfer station in a mobile (non-compacting) waste truck with capacity of 20 m^3 and transferred to the Killaloe Waste Disposal Site for compaction.

Organic Depot Program

4.12 The organics depot program at the *Site* shall consist of the on-*Site* collection and transfer of organic waste that is stored in a maximum of two (2) specialized MOLOK containers with a total storage capacity of 1.6 cubic meters in accordance with the specifications listed in Item 14 in Schedule "A".

4.13 (1) The *Owner* shall ensure that containers used to store organic waste are leakproof, lockable and bear resistant;

(2) The *Owner* shall monitor the containers in which organic waste is stored for:

i. decomposition to ensure that the organic waste has not decomposed to the point where it is unacceptable for the intended receiving facility; and
ii. odours; and

(3) The *Owner* shall empty the containers used to store organic waste and transfer the organic waste from the *Site* forthwith when:

i. the maximum capacity approved in Condition 4.5 has been reached; or
ii. the organic waste has decomposed to the point where it is unacceptable to the original intended receiving facility; or
iii. the organic waste is creating odours that are causing off-*Site* impacts and/or negative impact to Site users.

5.0 TRAINING

Employees and Training

5.1 A training plan for all employees that operate any aspect of the site shall be developed and implemented by the *Operator*. Only trained employees shall operate any aspect of the *Site* or carry out any activity required under this *ECA* . For the purpose of this *ECA* "trained" means knowledgeable either through instruction or practice in:

i. the relevant waste management legislation *including EPA, O. Reg. 347* , regulations and guidelines;
ii. major environmental *and occupational health and safety* concerns pertaining to the waste to be handled;
iii. the proper handling of wastes;
iv. the management procedures including the use and operation of equipment for the processes and wastes to be handled;
v. the emergency response procedures;
vi. the specific written procedures for the control of nuisance conditions;
vii. the *terms, conditions and operating* requirements of this *ECA* and,
viii. proper inspection, receiving and recording procedures and the activities to be undertaken during and after a load rejection.

6.0 INSPECTIONS AND RECORD KEEPING

Daily Inspections and Log Book

6.1 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 being operated in compliance with this *ECA* . Any deficiencies discovered as a result of the inspection shall be remedied immediately, including temporarily ceasing operations at the *Site* if needed.

6.2 A record of the inspections shall be kept in a daily log book *or a dedicated electronic file* that includes:

i. the name and signature of person that conducted the inspection;
ii. the date and time of the inspection;
iii. the list of any deficiencies discovered;
iv. the recommendations for remedial action; and
v. the date, time and description of actions taken.

6.3 A record shall be kept in the daily log book of all the following:

i. the type, date and time of arrival, hauler, and estimated quantity (i.e. cubic metres) of

all waste received at the *Site* ; and,

ii. a list of the refusal of waste shipments, the reason(s) for refusal, and the origin of the waste, if known.

Site Inspections

6.4 During *Site* operations, the *Owner* shall inspect the *Site* monthly for the following items but not limited to these items:

i. General settlement areas or depressions on the waste mound;
ii. Shear and tension cracks on the waste mound;
iii. Condition of surface water drainage works;
iv. Erosion and sedimentation in surface water drainage system;
v. Presence of any ponded water on the waste mound;
vi. Evidence of vegetative stress, distressed poplars or side slope plantings on or adjacent to the waste mound; and
vii. Condition of fence surrounding the *Site*.

6.5 The *Owner* shall inspect the waste mound and surrounding areas weekly for presence of leachate seeps. Any leachate seeps that are discovered shall be repaired within 48 hours of notice by the *Owner* .

Record Retention

6.6 Except as authorized in writing by the *Director* , all records required by this *ECA* shall be retained at the *Site* for a minimum of two (2) years from their date of creation.

6.7 The *Owner* shall retain all documentation listed in Schedule "A" for as long as this *ECA* is valid.

6.8 All monthly summary reports are to be kept at the *Site* until they are included in the Annual Report.

6.9 The *Owner* shall retain employee training records as long as the employee is working at the *Site* .

6.10 The *Owner* shall make all of the above documents available for inspection upon request of *Ministry* staff.

7.0 MONITORING

Groundwater Monitors

7.1 The *Owner* shall ensure all groundwater monitoring wells are properly capped, locked and protected from damage.

7.2 In areas where landfilling is to proceed around monitoring wells, suitable extensions shall be added to the wells and they shall be properly re-secured.

7.3 All groundwater monitoring wells whether included in the monitoring program or not shall be assessed, repaired, replaced or decommissioned as required. Any well being decommissioned shall be decommissioned in accordance with good standard practice that will prevent contamination through the abandoned well and in accordance with Ontario Regulation 903.

7.4 The *Owner* shall repair or replace any monitoring well included in the monitoring program which is destroyed or in any way made inoperable for sampling such that no more than one sampling event is missed.

7.5 Any monitoring well included in the monitoring program that is no longer required as part of the groundwater monitoring program may be decommissioned provided its removal from the monitoring program has been approved by the *Director* . A report on the decommissioning shall be provided in the annual monitoring report for the period during which the well was decommissioned.

Monitoring Programs

7.6. The *Owner* shall conduct the environmental monitoring program at the frequencies and for the parameters specified in Schedule "B", as modified by the *District Manage* r. By March 31 on an annual basis, the *Owner* shall submit to the *District Manager* , an Annual Report that contains the following, for the previous calendar year:

(a) the analytical results of the sampling program;
(b) an analysis of the results of the monitoring programs conducted at the *Site* to date;
(c) recommendations for any alterations to the monitoring or operation of the *Site* ;
(e) an estimate of the total amount of waste lanfilled and an estimate of the *Site* 's remaining capacity;
(f) a statement as to compliance with the terms and conditions of the *ECA* ;
(g) a summary of complaints regarding the operation on the *Site* and the *Owner* 's response to those complaints; and
(h) an assessment of the need to develop and implement contingency plans for leachate control

7.7 (1) For any changes to the monitoring program, the *Owner* shall in a cover letter request the acceptance of the changes by the *District Manager* .

(2) Within fourteen (14) days of receiving the writing correspondence from the *District Manager* confirming that the *District Manager* is in agreement with the proposed changes to the monitoring program, the *Owner* shall forward a letter identifying the proposed changes and a copy of the correspondences from the *District Manager* , to the *Director* requesting the *ECA* be amended to approve the proposed changes prior to implementation.

Compliance Criteria

7.8 The *Owner* shall ensure the *Site* is in compliance with MOE Guideline B-7 Reasonable Use Concept is applied and met at all points on the property line which are impacted by leachate from the *Site.*

8.0 TRIGGER MECHANISMS AND CONTINGENCY PLANS

Trigger Mechanisms

8.1 In the event of a confirmed exceedance of a *Site* -specific trigger level for groundwater impacts due to leachate or gas levels, the *Owner* shall complete the following:

i. immediately notify the *District Manager* ; and
ii. 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 described in the Schedule "C"

Contingency Plans

8.2 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 *Director* and *District Manager* , in writing, of the need to implement contingency measures, no later than 30 days after confirmation of the exceedances;

(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 *Director* and *District Manager* for approval within 90 days after confirmation of the exceedances; and

(c) The contingency measures shall be implemented by the *Owner* upon approval by the *Director* .

8.3 The *Owner* shall ensure that any proposed changes to the *Site* -specific trigger levels for leachate impacts to the groundwater shall be approved in advance by the *Director* prior to implementation.

9.0 COMPLAINTS PROCEDURE

9.1 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 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. A copy of the report shall be retained on-site.

9.2 The *Owner* shall post site complaints procedure at site entrance along with the name and phone number of a suitable, local contact to receive complaints or questions related to the *Site* . All complaints and the *Owner* 's actions taken to remedy the complaints must be summarized in the Annual Report.

10.0 EMERGENCY SITUATIONS

10.1 In the event of a fire or discharge of a contaminant to the environment, *Site* staff shall contact the *MOE* Spills Action Centre (1-800-268-6060) and the *District Office* of the *MOE* .

10.2 The *Owner* shall submit to the *District Manager* a written report within 3 days of the spill or incident, outlining the nature of the incident, remedial measures taken and measures taken to prevent future occurrences at the Site.

10.3 The *Owner* shall prepare an Emergency Response Manual for the *Site* and submit to the *District Manager* within 60 days of the issuance of this amendment, in consultation with local emergency response agencies. The Emergency Response Manual should indicate the responsibility of each of the stakeholders with respect to handling possible emergency situations.

10.4 The Emergency Response Manual shall be updated on a regular basis and be provided to the *District Manager* within one month of the revision date.

10.5 The *Owner* shall ensure that adequate fire fighting and contingency spill clean up equipment is available and that emergency response personnel are familiar with its use and location.

11.0 ANNUAL REPORTING

11.1 A written report on the development, operation, monitoring and closure of the *Site* , shall be completed annually (the "Annual Report"). The Annual Report shall be submitted to the *Regional Director* and the *District Manager* by **March 31st** of each year and shall cover the year ending the preceding December 31st.

11.2 The Annual Report shall include the following:

i. the results and an interpretive analysis of the results of environmental monitoring program, including an assessment of the need to amend the monitoring program;

ii. an assessment with regards to compliance of the groundwater quality at the property boundary and compliance point with regards to Guideline B-7 - Reasonable Use Concept;

iii. 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;

iv. an assessment of the efficiency of the leachate management at the *Site* ;

v. site plans showing the existing contours of the *Site;*

vi. areas of landfilling operation during the reporting period;

vii. areas of intended operation during the next reporting period;

viii. areas of excavation during the reporting period;

ix. the progress of final cover, vegetative cover, and any intermediate cover application;

x. previously existing site facilities;

xi. facilities installed during the reporting period;

xii. *Site* preparations and facilities planned for installation during the next reporting period;

xiii. 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;

xiv. a summary of the quantity of any leachate or pre-treated leachate removed from the *Site* during each operating week;

xv. a summary of the weekly, maximum daily and total annual quantity (tonnes) of waste received at the Site.

xvi. a summary of any complaints received and the responses made;

xvii. a discussion of any operational problems encountered at the *Site* and corrective action taken;

xviii. a summary of the amount of wastes refused for acceptance at the *Site* , the reasons for refusal and the carrier who brought the waste to the *Site* ;

xix. a report on the status of all monitoring wells and a statement as to compliance with Ontario Regulation 903;

xx. any other information with respect to the site which the *District Manager or Regional Director may require from time to time;*

xxi. a statement of compliance with all conditions of this *ECA* and other relevant *Ministry* groundwater and surface water requirements;

xxii. a confirmation that the site inspection program as required by this *ECA* has been complied with by the *Owner* ;

xxiii. any changes in operations, equipment or procedures employed at the *Site* ; and

xxiv. recommendations regarding any proposed changes in operations of the *Site* .

12.0 SITE CLOSURE

12.1 At least two (2) year prior to the anticipated date of closure of this *Site* or the date 90 per cent of the total waste disposal volume is reached, whichever occurs first, 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.

SCHEDULE "A"

1. Application to amend a Certificate of Approval for a Waste Disposal Site, dated September 21, 1998 and signed by Janice Bush, Reeve, Township of Hagarty & Richards.

2. Document entitled "Design and Operations Report for the Round Lake Landfill Site, Provisional Certificate of Approval A412303", dated September 1998 and prepared by The Greer Galloway Group Inc.

3. Document entitled "Revised report on Round lake Landfill, Hydrogeology", dated September 1998 and prepared by Golder Associates Ltd.

4. Letter from I.. Parrot, MOE to K. Mooder, The Greer Galloway Group Inc., dated July 8, 1999 re: Ministry Review Comments.

5. Letter from K. Mooder, The Greer Galloway Group Inc. to I. Parrot, MOE, dated November 9, 1999 re: Response to Ministry Review Comments dated July 8, 1999.

6. Letter from B.J. Velderman, Golder Associates Ltd. to I. Parrot, MOE, dated March 15, 2000 re: Modified Surface Water Monitoring.

7. Application to amend a Certificate of Approval for a Waste Disposal Site, dated may 2, 2002 and signed by Janice Bush, Reeve, Township of Killaloe, Hagarty and Richards.

8. Letter from K. Mooder, Jp2g Consultants Inc. to EAAB, dated June 6, 2002 summarizing amendment requests.

9. Plan 49R-14688 and Transfer/Deed of Land for the purchase of Part Lot 27, Concession 3, being Part 1 on Reference Plan 49R-14688 and for the grant of easement of Part Lot 27, Concession 3 being Parts 2 & 3 on Reference Plan 49R-14688.

10. Letter from K. Mooder, Jp2g Consultants Inc. to EAAB, dated June 6, 2002 including Drawing No. 1 "Round Lake Landfill Site – Buffer Zone Plan".

11. Letter from D. Bohart, Chair, Killale, Hagarty and Richards Waste Management Committee, to EAAB, dated February 24, 2003 providing details of the waste transfer activities which take place at Round Lake waste disposal site.

12. Letter from B.J. Velderman, Golder Associates Ltd. to EAAB, dated February 27, 2003 providing clarification of Schedule "B" monitoring program and details of the trigger mechanisms for Round Lake.

13. Fax from K. Mooder to EAAM, dated April 2003 providing a final version of Schedule "B" sampling program and Schedule "C" trigger mechanisms and remedial action plan.

14. Application for a Provisional Certificate of Approval for a Waste Disposal Site, dated May 6, 2009 and signed by Ms. Lorna Hudder, CMO, CAO/Clerk, The Corporation of the Township of Killaloe, Hagarty and Richards, including: the cover letter dated May 22, 2009 from Heather Merritt, CEPIT, to Ministry, EAAB, requesting the addition of MOLOK containers at the Site, and including a site plan and information on the MOLOK containers.

15. Application for amendment to Environmental Compliance Approval for a Waste Disposal Site (landfill/transfer) and supporting documentation, dated January 31, 2012 and signed by Dan Hagan, B.Sc., Project Geologist at Greenview Environmental Management on behalf of the Township of Killaloe, Hagarty and Richards, and dated January 31, 2012 requesting approval for an updated Development and Operations Plan to reflect additional capacity. The supporting documentation included the following:

    i. Report entitled "Design and Operations Plan - Municipal Solid Waste Transfer Station for Round Lake Waste Disposal Site (A412303)", prepared for the Township of Killaloe, Hagarty and Richards by Greenview Environmental Management Limited (File No. 107.12.005), and dated January 31, 2012.

SCHEDULE "B"

Location	Frequency	Parameters
Groundwater ***Background and Surveillance*** BH-1, BH-2S, BH-2D, BH-5, BH-8, BH95-9, BH01-12D, BH01-13S, BH01-13D, BH01-14 R1 (Residential) 1 QA/QC	Twice (2) annually in the Spring (April/May/June) and Fall (September/October/ November) Field Measurements (pH, Conductivity, Temperature)	Alkalinity, aluminum, ammonia, barium, boron, calcium, chloride, chromium, cobalt, COD, copper, DOC, hardness, iron, magnesium, manganese, nitrate, nitrite, potassium, silicon, sodium, strontium, sulphate, TDS, TKN, total phosphorus, zinc
Routine BH-6, BH95-10, BH01-15 1 QA/QC	Once (1) in Fall (September/October/November) Field Measurements (pH, Conductivity, Temperature)	Alkalinity, barium, boron, chloride, chromium, DOC, hardness, iron, manganese, nitrate, nitrite, sodium, sulphate, TDS
BH-1, BH-2S, BH-2D, BH-5, BH95-9, BH01-14 Trip Blank Field Blank 1 QA/QC	Once (1) every five (5) years in Fall (September/October/November) Next in 2017	EPA 624 VOC's
Groundwater Elevations BH-1, BH-2S, BH-2D, BH-3, BH-4, BH-5, BH-6, BH-7, BH-8, BH95-9, BH95-10, BH95-11, BH01-12D, BH01-13S, BH01-13D, BH01-14, BH01-15	Twice (2) annually in Spring (April/May/June) and Fall (September/October/ November)	Groundwater Elevations in metres (all monitoring wells)

SCHEDULE "C"

Section A: Trigger Mechanism for Round Lake Landfill

The objective of the groundwater trigger mechanism at the Round Lake landfill Site is to utilize the results of the ongoing groundwater monitoring program to assess site compliance and to trigger implementation of contingency plans, when and if necessary. The purpose of the trigger mechanism is to prevent leachate-impacted groundwater exceeding MOE Guideline B-7 from migrating beyond the site boundaries. For the purpose of the trigger mechanism, the following shall apply:

The *Leachate Indicator Parameters* for the Round Lake Landfill include: alkalinity, barium, boron, calcium, chloride, chromium, conductivity, hardness and total dissolved solids (TDS).

The *Compliance Evaluation Parameters* for Round lake Landfill are barium, boron, chloride, chromium and volatile organic compounds.

The *Reasonable Use Performance Objective (RUPO)* refers to the maximum allowable concentration for a *Compliance Evaluation Parameter* in groundwater at the point of compliance under MOE Guideline B-7.

The *Trigger Concentration* for Round lake Landfill shall be over 75 percent of the *Reasonable Use Performance Objective* for the *Compliance Evaluation Parameters* at monitors BH-8, BH95-9, BH01-13D and BH01-14.

Any observed exceedance of the *Trigger Concentration(s)* will be verified by re-sampling for the parameter(s) of concern within one month of the original sampling session at which non-compliance with the trigger was initially measured. If the exceedance is not confirmed by the follow-up sample (Special Monitoring Session), then the initial exceedance will be considered anomalous and will be discounted. The historical trends in the groundwater quality at the trigger location shall also be used in concluding that monitoring results are anomalous.

Concurrent with the Special Monitoring Session will be the initiation of a three-step process for the purpose of determining whether implementation of an additional investigation program and/or the remedial action plan is warranted. The three-step process would be as follows:

Step 1: assess whether or not non-compliance with the applicable *Trigger Concentrations* is likely due to migration of the landfill leachate plume as a whole, or whether it is partially or wholly explicable by other factors. This will be achieved by considering trends in parameter concentrations at all relevant monitoring locations;

Step 2: discussion of the results of Step 1 among the Township, consultanta and the MOE to decide whether implementation of an additional investigation program and/or the remedial action plan is warranted; and

Step 3: if the conclusion of Step 2 is affirmative, then the additional investigation program and/or remedial action plan would be formulated and would be implemented.

Remedial action, as presented in Section B, shall be implemented when the *Trigger Concentration* at one monitoring location for two (2) parameters has been met or exceeded during two (2) consecutive monitoring sessions.

Section B: Remedial Action Plan

Under *MOE* Guideline B-7, the *Owner* of a waste site is responsible for preventing unacceptable off-property groundwater impacts. Should the ongoing groundwater monitoring program define the existence of, or potential for, unacceptable impacts, the Owner shall prepare and present a Remedial Action Plan for the approval of the *Director* or the *District Manager* . Actions taken by the Township to prevent or remediate the off-property impacts shall consist of:

(a) acquisition of additional land to obtain compliance with Guideline B-7; or
(b) gaining control over the migration of the contaminated groundwater; or
(c) gaining control over the migration of the contaminants.

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

1. *The reason for Condition 1.1, 1.2, 1.3, 1.4 and 1.5 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.*

2. *The reason for Conditions 1.6, 1.7, 1.8, 1.12, 1.13, 1.14 and 1.15 is to clarify the legal rights and responsibilities of the Owner under this ECA.*

3. *Conditions 1.9, 1.10 and 1.11 are included to ensure that the appropriate Ministry staff have ready access to information and the operations of the Site, which are approved under this ECA.*

4. *Conditions 1.16, 1.17 and 1.18 are included, pursuant to subsection 197(1) of the EPA, to provide that any persons having an interest in the Site are aware that the land has been approved and used for the purposes of waste disposal.*

5. *The reasons for Condition 1.19 are to restrict potential transfer or encumbrance of the Site without the approval of the Director and to ensure that any transfer of encumbrance can be made only on the basis that it will not endanger compliance with this ECA.*

6. *The reasons for Condition 1.20 and 1.21 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.*

7. *The reason for Condition 1.22 is to ensure that appropriate Ministry staff have ready access to the Site for inspection of facilities, equipment, practices and operations required by the conditions in this ECA. This condition is supplementary to the powers of entry afforded a Provincial Officer pursuant to the EPA and OWRA.*

8. *Conditions 2.1, 3.1, 3.2, 4.1, 4.2, 4.3 and 4.4 are included in order to ensure that waste disposal, waste transfer operations at the site is undertaken in accordance with applicable Ministry of the Environment regulations and guidelines. Compliance with these regulations and guidelines will ensure that the site does not cause and adverse effect on the environment.*

9. *Conditions 2.2 and 2.3 are to ensure the Owner has a operations plans for the site that details all current operations at the site and that a copy is kept on site for the Owner, the Owner's staff and/or operator. This is to ensure the site is operating is a safe manner and the environment and human health are protected.*

10. *Condition 2.4 specifies the maximum amount of waste that may be received at the site based*

on the previously approved Environmental Assessment for the Site.

11. *The reason for Conditions 2.5, 3.3 and 4.5 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.*

12. *The reasons for Conditions 2.6, 2.7, 2.8 and 2.9 are to specify the normal hours of operation for the landfill Site and a mechanism for amendment of the hours of operation.*

13. *The reason for Conditions 2.10 inclusive is to ensure that users of the Site are fully aware of important information and restrictions related to Site operations under this ECA.*

14. *The reason for Condition 2.11 are to specify site access to/from the Site 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.*

15. *The reason condition 2.12 has been included is to ensure that access roads are clear and do not pose a safety hazard to the general public.*

16. *Condition 2.13 is needed in order to make certain that the waste received at the site is in accordance with the ECA and O. Reg. 347.*

17. *Condition 2.14 is necessary in order to ensure that all waste loads are inspected and waste that is disposed of at the site is in accordance with the terms and conditions in this ECA.*

18. *The reasons for Conditions 2.15, 2.17 and 2.18 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.*

19. *The reasons for Condition 2.16 are the protection of public health and safety and minimization of the potential for damage to environmental control, monitoring and other works at the landfill Site. Scavenging is the uncontrolled removal of material from waste at a landfill site.*

20. *The reason for Condition 2.19 is to ensure that noise from or related to the operation of the landfill is kept to within Ministry limits and does not result in a hazard or nuisance to any person.*

21. *The reason for Condition 2.20 is to ensure that appropriate measures are taken in order to prevent surface water from contacting waste so as not to cause an adverse effect on the environment.*

22. *Condition 2.21 has been inserted in order to ensure that concentrations of landfill gas do not pose a hazard to human health or the environment.*

23. *The reason for Condition 3.4 is that open burning of municipal waste is unacceptable because of concerns with air emissions, smoke and other nuisance affects, and the potential fire hazard.*

24. *The reason for Condition 3.5, 3.6, 3.7, 3.8, 3.9 and 3.10 is to specify restrictions on the extent of landfilling at this Site based on the Owner's application and supporting documentation. These limits define the approved volumetric capacity of the site. Approval to landfill beyond these limits would require an application with supporting documentation submitted to the Director.*

25. *The reason for Condition 3.11 is to ensure that landfilling operations are conducted in an environmentally acceptable manner. 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.*

26. *The reason for Condition 3.12 is to ensure the Owner and any retained contactor uses the exact equipment for the operation and processing waste at the Site as approved in this ECA.*

27. *The reason for Condition 3.13 is to ensure impacted surface water at the site is handled in a manner that does not impact the environment or human health.*

28. *The reasons for Conditions 4.6 through 4.11 are to ensure the site operation completed in accordance with Ministry standards, and to ensure long-term protection of the health and safety of the public and the environment.*

29. *The reason for Condition 5.1 is to ensure that the Site is supervised and operated by properly trained staff in a manner which does not result in a hazard or nuisance to the natural environment or any person.*

30. *The reasons for Conditions 6.1, 6.2, 6.3, 6.4 and 6.5 are to provide for the proper assessment of effectiveness and efficiency of site design and operation, their effect or relationship to any nuisance or environmental impacts, and the occurrence of any public complaints or concerns. Record keeping is necessary to determine compliance with this ECA, the EPA and its regulations.*

31. *Conditions 6.1 and 6.2 are needed to ensure regular inspections of the site are conducted in order to protect the natural environment.*

32. *The reason for Conditions 6.6 through 6.10 is to ensure that accurate waste records are maintained to ensure compliance with the conditions in this ECA (such as fill rate, site capacity, record keeping, annual reporting, and financial assurance requirements), the EPA and its regulations.*

33. *The reason for Conditions 7.1 through 7.5 inclusive is to ensure protection of the natural environment and the integrity of the groundwater monitoring network.*

34. *The reason for Conditions 7.6, 7.7 and 7.8 inclusive is to demonstrate that the landfill 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.*

35. *The reason for Conditions 8.1 through 8.3 is to ensure that the Owner follows a plan with an organized set of procedures for identifying and responding to unexpected but possible problems at the Site. A remedial action / contingency plan is necessary to ensure protection of the natural environment. A leachate contingency plan is a specific requirement of Reg. 232.*

36. *The reason for Conditions 9.1 and 9.2 is to establish a forum for the exchange of information and public dialogue on activities carried out at the landfill Site. Open communication with the public and local authorities is important in helping to maintain high standards for site operation and environmental protection.*

37. *Conditions 10.1 through 10.5 are contained in the ECA to guarantee that appropriate measures are taken by the County to prevent future occurrences of spills or fires at the site and to protect public health and safety and the environment.*

38. *The reasons for Conditions 11.1 and 11.2 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.*

39. *The reason for Condition 12.1 is to ensure that final closure of the Site is completed in an aesthetically pleasing manner and to ensure the long-term protection of the natural environment.*

Upon issuance of the environmental compliance approval, I hereby revoke Approval No(s). A412303 issued on May 18, 2000.

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 30th day of November, 2012

THIS APPROVAL WAS MAILED
ON Dec. 3, 2012
DC
(Signed)

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

DG/
c: District Manager, MOE Ottawa
Tyler Peters, Greenview Environmental Management ✓

Ontario

Ministry of the Environment
Ministère de l'Environnement

AMENDMENT TO ENVIRONMENTAL COMPLIANCE APPROVAL
NUMBER A412303
Notice No. 5
Issue Date: August 1, 2012

The Corporation of the Township of Killaloe, Hagarty and Richards
1 John St
Post Office Box, No. 35
Killaloe, Ontario
K0J 2A0

Site Location: Round Lake Waste Disposal Site
168 Sunrise Road
Lot 27, Concession 3
Township of Killaloe, Hagarty and Richards, County of Renfrew

You are hereby notified that I have amended Approval No. A412303 issued on May 18, 2000 and amended through notices dated November 6, 2000, November 7, 2000, April 8, 2003 and September 4, 2009 for a Waste Disposal Site (landfill/transfer) , as follows:

I. The following Condition is hereby added to this ECA:

34 . The Owner is hereby approved to proceed with the detailed design and upgrading the Waste Transfer Station at the Round Lake Waste Disposal Site as described in Item 15 of Schedule "A".

II. The following items are hereby added to Schedule "A":

15. Application for amendment (MOE Reference No. 8199-8R3PZB) and supporting documentation submitted by Mr. Dan Hagan, B.Sc., Project Geologist at Greenview Environmental Management on behalf of the Township of Killaloe, Hagarty and Richards, and dated January 31, 2012 requesting approval for an updated Development and Operations Plan to reflect additional capacity. The supporting documentation included the following:

i. Report entitled "Design and Operations Plan - Municipal Solid Waste Transfer Station for Round Lake Waste Disposal Site (A412303)", prepared for the Township of Killaloe, Hagarty and Richards by Greenview Environmental Management Limited (File No. 107.12.005), and dated January 31, 2012.

16. Email from Albena Bukurova, EIT, Project Engineer Intern - Waste, EAB, MOE to Lorna Hudder, Clerk, Township of Killaloe, Hagarty and Richards and Tyler Peters, P.Eng., Project Manager, Greenview Environmental Management Limited, dated April 12, 2012, providing First Draft ECA No. A412303 Round Lake Waste Disposal Site for comments.

17. Email from Tyler Peters, P.Eng., Project Manager, Greenview Environmental Management Limited to Albena Bukurova, EIT, Project Engineer Intern - Waste, EAB, MOE, dated April 16, 2012, providing comments on First Draft ECA on behalf of the Township of Killaloe, Hagarty and Richards.

18. Email from Albena Bukurova, EIT, Project Engineer Intern - Waste, EAB, MOE to Lorna Hudder, Clerk, Township of Killaloe, Hagarty and Richards and Tyler Peters, P.Eng., Project Manager, Greenview Environmental Management Limited, dated April 17, 2012 providing revised Draft ECA for comments and inviting the Township and its Consultant to participate in a teleconference in order to discuss comments submitted on behalf of the Township.

19. Email from Tyler Peters, P.Eng., Project Manager, Greenview Environmental Management Limited to Albena Bukurova, EIT, Project Engineer Intern - Waste, EAB, MOE, dated April 23, 2012, submitting comments of the revised Draft ECA and a statement on behalf of the Township of Killaloe, Hagarty and Richards that the revised Dradt ECA content and conditions remains inconsistent with the ECA application package.

20. Email from Tyler Peters, P.Eng., Project Manager, Greenview Environmental Management Limited to Albena Bukurova, EIT, Project Engineer Intern - Waste, EAB, MOE, dated April 25, 2012, submitting a statement on behalf of the Township of Killaloe, Hagarty and Richards that there is no availability of the Township's project team to participate in a teleconference related to this application, and again stating the revised Draft ECA is inconsistent with the Township's application therefore no negotiations to speed up the review process are applicable.

21. Email from Dan Hagan, , B.Sc., Project Geologist, Greenview Environmental Management Limited, to Albena Bukurova, EIT, Project Engineer Intern - Waste, EAB, dated May 11, 2012 submitting a response letter from Tyler Peters, P.Eng., Project Manager, Greenview Environmental Management Limited in regards to the revised Draft ECA for the Round Lake WDS as received from MOE on April 17, 2012 providing comments on the revised Draft ECA of behalf of the Township of Killaloe, Hagarty and Richards, and supporting documentation.

21. Email from Tyler Peters, P.Eng., Project Manager, Greenview Environmental Management Limited to Albena Bukurova, EIT, Project Engineer Intern - Waste, EAB, MOE, dated June 5, 2012, requesting a partial approval of the application to allow Township to proceed with detailed design and establishment of the upgraded transfer station facility at the Round Lake Waste Disposal Site.

22. Email from Albena Bukurova, EIT, Project Engineer Intern - Waste, EAB, MOE to Tyler Peters, P.Eng., Project Manager, Greenview Environmental Management Limited, dated June 8, 2012, providing confirmation on issuance of Notice of partial approval of the application to allow Township to proceed with detailed design and establishment of the upgraded transfer station facility at the Round Lake Waste Disposal Site, which Notice of partial approval shall be revoked and replaced by the consolidated ECA should the TSS review is complete.

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

1. *The reason for this amendment to the Approval is to issue a partial approval of the application with MOE Reference Number 8199-8R3PZB, submitted by the Township of Killaloe, Hagarty and Richards, in order to allow the Township to proceed with the proposed project based on the forthcoming consolidated ECA, which shall revoke and replace this Notice.*

2. *The reason for Condition 34 is to allow the Township of Killaloe, Hagarty and Richards to complete detailed design and establish the new transfer station facilities at the Round Lake Waste Disposal Site.*

This Notice shall constitute part of the approval issued under Approval No. A412303 dated May 18, 2000, as amended.

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 1st day of August, 2012

THIS NOTICE WAS MAILED
ON August 2, 2012
(Signed)

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

AB/
c: District Manager, MOE Ottawa
Tyler Peters, Greenview Environmental Management

Ontario

Ministry of the Environment
Ministère de l'Environnement

AMENDMENT TO PROVISIONAL CERTIFICATE OF APPROVAL
WASTE DISPOSAL SITE
NUMBER A412303
Notice No. 4
Issue Date: September 4, 2009

The Corporation of the Township of Killaloe, Hagarty and Richards
1 John St
Post Office Box, No. 39
Killaloe, Ontario
K0J 2A0

Site Location: Round Lake Landfill
Lot 27, Concession 3
Killaloe, Hagarty and Richards Township, County of Renfrew

You are hereby notified that I have amended Provisional Certificate of Approval No. A412303 issued on May 18, 2000 and amended through notices dated November 6, 2000, November 7, 2000 and April 2003 for Waste Disposal Site (landfill / transfer) , as follows:

I The following Definition is hereby added:

(a) ***"organic waste"*** means source separated residential and/or commercial non-hazardous organic waste consisting of one or more of the following components: food waste, soiled paper products, leaf and yard waste, sanitary products, pet waste.

II The following Conditions are hereby added as follows for Organic Waste Depot Program :

32 The organic waste depot program at the Site shall consist of the on-Site collection and transfer of organic waste that is stored in a maximum of two (2) specialized MOLOK containers with a total storage capacity of 1.6 cubic metres in accordance with the specifications and location of Item 14 in Schedule "A".

33. (a) The Owner shall ensure that containers used to store organic waste are leakproof, lockable and bear resistant;

(b) The Owner shall monitor the containers in which organic waste is stored for:

(i) decomposition to ensure that the organic waste has not decomposed to the point where it is unacceptable for the intended receiving facility; and

(ii) odours;

and

(c) The Owner shall empty the containers used to store organic waste and transfer the organic waste from the Site forthwith when:

(i) the maximum capacity approved in Condition 32 has been reached; or

(ii) the organic waste has decomposed to the point where it is unacceptable to the original intended receiving facility; or

(iii) the organic waste is creating odours that are causing off-Site impacts and/or negative impact to Site users.

III The following items are hereby added to Schedule "A":

(14) Application for a Provisional Certificate of Approval for a Waste Disposal Site dated May 06, 2009 and signed by Ms. Lorna Hudder, CMO, CAO/Clerk, The Corporation of the Township of Killaloe, Hagarty and Richards, including: (1) the cover letter dated May 22, 2009 from Heather Merritt, CEPIT, to Ministry, EAAB, requesting the addition of MOLOK containers at the Site, and including a site plan and information on the MOLOK containers.

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

The reason for Definition and Conditions 32 and 33 is to allow the Township to undertake a small organic waste depot program.

This Notice shall constitute part of the approval issued under Provisional Certificate of Approval No. A412303 dated May 18, 2000

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

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

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The Certificate of Approval number;
6. The date of the Certificate of Approval;
7. The name of the Director;

8. The municipality within which the waste disposal site is located;

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

This Notice must be served upon:

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

AND

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

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

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

DATED AT TORONTO this 4th day of September, 2009

THIS NOTICE WAS MAILED
ON Sept. 8, 2009
(Signed)

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

HV/

c: District Manager, MOE Ottawa
Tyler Peters, Greenview Environmental Management Limited ✓

Ministry of the Environment | Ministère de l'Environnement

Ontario

AMENDMENT TO PROVISIONAL CERTIFICATE OF APPROVAL
WASTE DISPOSAL SITE
NUMBER A412303

The Corporation of the Township of Killaloe, Hagarty and Richards
PO Box 39
Killaloe, Ontario K0J 2A0

Site Location: Round Lake Landfill
Lot 27, Concession 3
Richards Township, County Of Renfrew

You are hereby notified that I have amended Provisional Certificate of Approval No. A412303 issued on May 8, 2000, as amended on November 6, 2000 and November 7, 2000 for a waste disposal site (landfill), as follows:

The preamble is hereby changed to:

for the use and operation of a 1.62 hectare landfill and a transfer station within a 3.5 hectare total Site area, including a 1.33 hectare attenuation zone and an easement to access BH-10:

The following Conditions are revoked:

Conditions 19 is revoked.

Condition 20 is revoked.

The following Conditions are hereby revoked and replaced:

15. (a) Pursuant to Section 197 of the EPA, neither the Applicant nor any person having an interest in the Site shall deal with the Site in any way without first giving a copy of the Provisional Certificate of Approval to each person acquiring an interest in the Site as a result of the dealing;
    (b) By June 30, 2003, the Owner shall submit to the Director for the Director's signature, two (2) copies of a completed Certificate of Prohibition containing a registerable description of the Site, in accordance with Form 1 of O. Reg. 14/92; and
    (c) Within ten (10) calendar days of receiving the Certificate of Prohibition with the Director's signature, the Owner shall register the Certificate of Prohibition in the appropriate Land Registry Office on title and immediately following registration, submit to the Director the duplicate registered copy.

The following Conditions are hereby added:

25. The Owner shall refrain from further landfilling of waste on the Site, and shall apply intermediate interim cover to all cells where waste has been deposited, until such time as the Owner acquires sufficient property for a contaminant attenuation zone that will meet the long term needs of the Site, or an alternative contingency plan to remediate off-site leachate impacts.

26. In the event of an exceedance of a leachate indicator parameter trigger level, the Owner shall conduct an investigation into the cause and the need for implementation of remedial or contingency actions in accordance with Schedule "C".

27. The Owner shall limit transfer activities to the receiving and transferring of solid, non-hazardous, residential and commercial waste, generated within the Township of Killaloe, Hagarty and Richards, as described in Item 11 of Schedule "A".

28. The Owner shall ensure that all waste accepted for transfer shall be segregated either into bins with lids or doors, or in designated areas as defined by barriers. All bins and designated waste storage areas shall be clearly labelled.

29. The Owner shall ensure that each day on which the Site is open to accept waste for transfer, the Site is inspected and litter is picked up in the waste transfer area.

30. The Owner shall maintain records on transfer activities including:
    (a) date of record;
    (b) number of deliveries and types of materials received;
    (c) quantities and destination of waste transferred from the Site; and
    (d) any accidents, injuries, spills, leaks, other upsets or complaints received.

    The Owner shall summarize the above information for inclusion in the annual report submitted to the District Manager.

The following are hereby added to Schedule "A":

7. Application to amend a Certificate of Approval for a Waste Disposal Site, dated May 2, 2002 and signed by Janice Bush, Reeve, Township of Killaloe, Hagarty and Richards.

8. Letter from K. Mooder, Jp2g Consultants Inc. to EAAB dated June 6, 2002 summarizing amendment requests.

9. Plan 49R-14688 and Transfer/Deed of Land for the purchase of Part Lot 27, Concession 3, being Part 1 on Reference Plan 49R-14688 and for the grant of easement of Part Lot 27, Concession 3 being Parts 2 & 3 on Reference Plan 49R-14688.

10. Letter from K. Mooder, Jp2g Consultants Inc. to EAAB dated June 26, 2002 including Drawing No. 1 "Round Lake Landfill Site - Buffer Zone Plan".

11. Letter from D. Bohart, Chair, Killaloe, Hagarty and Richards Waste Management Committee, to EAAB, dated February 24, 2003 providing details of the waste transfer activities which take place at Round Lake waste disposal site.

12. Letter from B.J. Velderman, Golder Associates Ltd. to EAAB, dated February 27, 2003 providing clarification of Schedule "B" monitoring program and details of the trigger mechanisms for Round Lake.

13. Fax from K. Mooder to EAAB, dated April 2003 providing a final version of Schedule "B" sampling program and Schedule "C" trigger mechanism and remedial action plan.

Schedule B is hereby revoked and replaced with:

SCHEDULE "B"

This Schedule "B" forms part of Provisional Certificate of Approval No. A412303.

	Sampling Location	**Parameters**	**Sampling Frequency**
Background and Surveillance	BH-1, BH-2S, BH-2D, BH-5, BH-8, BH95-9, BH01-12D, BH01-13S, BH01-13D, BH01-14, duplicate	pH, temperature, conductivity, chloride, hardness, sodium, iron, manganese, alkalinity, nitrate, total dissolved solids, barium, boron, chromium, ammonia, calcium, magnesium, potassium, aluminium, cobalt, copper, total phosphorous, silicon, strontium, sulphate, zinc, TKN, COD, DOC	biannually in the spring (May/June) and fall (September/October)
Routine	BH-6, BH95-10, BH01-15, duplicate	pH, temperature, conductivity, chloride, hardness, sodium, iron, manganese, alkalinity, barium, boron, chromium, sulphate, nitrate, DOC, TDS	annually in the fall (September/October)
Volatile Organic Compounds	BH-1, BH-2S, BH-2D, BH-5, BH95-9, BH01-14, trip blank, field blank, duplicate	parameters included in US Environmental Protection Agency 624 list	annually in the fall (September/October)

Water Levels	BH-1, BH-2S, BH-2D, BH-3, BH-4, BH-5, BH-6, BH-7, BH-8, BH95-9, BH95-10, BH95-11, BH01-12D, BH01-13S, BH01-13D, BH01-14, BH01-15	water levels	biannually in the spring (May/June) and fall (September/October)

SCHEDULE "C"

This Schedule "C" forms part of the Certificate of Approval No. A413103.

Section A: Trigger Mechanism for Round Lake Landfill

The objective of the groundwater trigger mechanism at the Round Lake Landfill Site is to utilize the results of the ongoing groundwater monitoring program to assess site compliance and to trigger implementation of contingency plans, when and if necessary. The purpose of the trigger mechanism is to prevent leachate-impacted groundwater exceeding MOE Guideline B-7 from migrating beyond the site boundaries. For the purpose of the trigger mechanism, the following shall apply:

The *Leachate Indicator Parameters* for the Round Lake Landfill include: alkalinity, barium, boron, calcium, chloride, chromium, conductivity, hardness and total dissolved solids (TDS).

The *Compliance Evaluation Parameters* for Round Lake Landfill are barium, boron, chloride, chromium and volatile organic compounds.

The *Reasonable Use Performance Objective (RUPO)* refers to the maximum allowable concentration for a *Compliance Evaluation Parameter* in groundwater at the point of compliance under MOE Guideline B-7.

The *Trigger Concentration* for Round Lake Landfill shall be over 75 percent of the *Reasonable Use Performance Objective* for the *Compliance Evaluation Parameters* at monitors BH-8, BH-95-9, BH01-13D and BH01-14.

Any observed exceedance of the *Trigger Concentration(s)* will be verified by re-sampling for the parameter(s) of concern within one month of the original sampling session at which non-compliance with the trigger was initially measured. If the exceedance is not confirmed by the follow-up sample (Special Monitoring Session), then the initial exceedance will be considered anomalous and will be discounted. The historical trends in the groundwater quality at the trigger location shall also be used in concluding that monitoring results are anomalous.

Concurrent with the Special Monitoring Session will be the initiation of a three-step process for the purpose of determining whether implementation of an additional investigation program and/or the remedial action plan is warranted. The three-step process would be as follows:

Step 1 assess whether or not non-compliance with the applicable *Trigger Concentrations* is likely due to migration of the landfill leachate plume as a whole, or whether it is partially or wholly explicable by other factors. This will be achieved by considering trends in parameter concentrations at all relevant monitoring locations;

Step 2 discussion of the results of Step 1 among the Township, consultants and the MOE to decide whether implementation of an additional investigation program and/or the

remedial action plan is warranted; and

Step 3 if the conclusion of Step 2 is affirmative, then the additional investigation program and/or remedial action plan would be formulated and would be implemented.

Remedial action, as presented in Section B, shall be implemented when the *Trigger Concentration* at one monitoring location for two (2) parameters has been met or exceeded during two (2) consecutive monitoring sessions.

Section B: Remedial Action Plan

Under MOE Guideline B-7, the Owner of a waste disposal site is responsible for preventing unacceptable off-property groundwater impacts. Should the ongoing groundwater monitoring program define the existence of, or potential for, unacceptable impacts, the Owner shall prepare and present a Remedial Action Plan for the approval of the Director or the District Manager. Actions taken by the Township to prevent or remediate the off-property impacts shall consist of:

(a) acquisition of additional land to obtain compliance with MOE Guideline B-7; or
(b) gaining control over the migration of the contaminated groundwater; or
(c) gaining control over the migration of the contaminants.

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

1. *Conditions 19 and 20 are revoked to reflect the Owner's acquisition of additional property.*

2. *Condition 15 is amended to ensure that the additional property acquired by the Owner as part of this Certificate is registered on title.*

3. *Conditions 25 and 26 are added to prevent additional contamination of the natural environment and to protect the health and safety of area groundwater users.*

4. *Conditions 27, 28 and 29 are included to ensure that the transfer activities are conducted in a manner which does not negatively impact the public health and safety or the environment.*

5. *Condition 30 is included to ensure that the Site is operated as stated in the application and not in a manner which the Director has not been asked to consider.*

This Notice shall constitute part of the approval issued under Provisional Certificate of Approval No. A412303 dated May 8, 2000, as amended on November 6, 2000 and November 7, 2000.

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 <u>each</u> 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., 12th Floor
P.O. Box 2382
Toronto, Ontario
M4P 1E4

<u>AND</u>

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

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

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

DATED AT TORONTO this 8th day of April, 2003

THIS CERTIFICATE WAS MAILED
ON April 16, 2003
9c
(Signed)

Ian Parrott, P.Eng.
Director
Section 39, *Environmental Protection Act*

VP/
c: District Manager, MOE Ottawa
Kevin Mooder, Jp2g Consultants Inc. ✓

Ontario

Ministry of the Environment | Ministère de l'Environnement

AMENDMENT TO PROVISIONAL CERTIFICATE OF APPROVAL
WASTE DISPOSAL SITE
NUMBER A412303
Notice No. 1

Corporation of the Township of Killaloe, Hagarty and Richards
1 John Street, P.O. Box 39
Killaloe, Ontario
K0J 2A0

Site Location: Round Lake Landfill
Lot 27, Concession 3
Killaloe Village, County Of Renfrew

You are hereby notified that I have amended Provisional Certificate of Approval No. A412303 issued on May 18, 2000 for a landfill site, as follows:

the address of the owner has changed

FROM: Corporation of the Township of Hagerty and Richards
Regional Road #2
Killaloe, Ontario
K0J 2W0

TO: Corporation of the Township of Killaloe, Hagarty and Richards
1 John Street, P.O. Box 39
Killaloe, Ontario
K0J 2A0

This Notice shall constitute part of the approval issued under Provisional Certificate of Approval No. A412303 dated May 18, 2000.

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 Appeal Board within 15 days after receipt of this Notice, require a hearing by the Board. 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;

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 Appeal Board
2300 Yonge St., 12th Floor
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 Appeal Board's requirements for an appeal can be obtained directly from the Board 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 7th day of November, 2000

Andrzej Dominski, P.Eng.
Director
Section 39, *Environmental Protection Act*

THIS IS A TRUE COPY OF THE ORIGINAL CERTIFICATE MAILED

ON ..... NOV 10 2000 .....

(Signed)

IP/

c: District Manager, MOE Ottawa
Kevin Mooder, Jp2g Consultants Inc.

Ontario

Ministry of the Environment | Ministère de l'Environnement

AMENDMENT TO PROVISIONAL CERTIFICATE OF APPROVAL
WASTE DISPOSAL SITE
NUMBER A412303
Notice No. 1

Corporation of the Township of Killaloe, Hagarty and Richards
1 John Street, P.O. Box 39
Killaloe, Ontario
K0J 2A0

Site Location: Round Lake Landfill
Lot 27, Concession 3
Killaloe Village, County Of Renfrew

You are hereby notified that I have amended Provisional Certificate of Approval No. A412303 issued on May 18, 2000 for a waste disposal site (landfill), as follows:

Condition 19 is hereby revoked and replaced by:

19. By February 1, 2001, the Owner shall do one of the following:

(a) acquire ownership of a sufficient amount of land adjacent to the Site, that will bring the Site into compliance with the RUPO;
(b) acquire the property rights, as defined in O.Reg. 232, for a sufficient amount of land adjacent to the Site, that will bring the Site into compliance with the RUPO;
(c) submit to the Director, for approval, an application for Site remediation technologies or measures designed to bring the Site into compliance with the RUPO; or
(d) cease receiving any waste at the Site and submit a Closure Plan, for approval of the Director.

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

The reason for this amendment is to approve a request to extend the compliance date in this condition to February 1, 2001.

This Notice shall constitute part of the approval issued under Provisional Certificate of Approval No. A412303 dated May 18, 2000.

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 Appeal Board within 15 days after receipt of this Notice, require a hearing by the Board. Section 142 of the Environmental Protection Act, provides that the Notice requiring the hearing shall state:

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 Appeal Board
2300 Yonge St., 12th Floor
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 Appeal Board's requirements for an appeal can be obtained directly from the Board 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 6th day of November, 2000

THIS IS A TRUE COPY OF THE ORIGINAL NOTICE MAILED

C : Nov 7 2000

BK

SIGNED

Yvonne Hall, P.Eng.
Director
Section 39, *Environmental Protection Act*

BK/
c: District Manager, MOE Ottawa
Kevin J. Mooder, Greer Galloway Group Inc.

ROUND LAKE

Ontario

Ministry of the Environment / *Ministère de l'Environnement*

PROVISIONAL CERTIFICATE OF APPROVAL
FOR A WASTE DISPOSAL SITE
NO. A 412303

Under the Environmental Protection Act and the regulations and subject to the limitations thereof, this Provisional Certificate of Approval is issued to:

The Corporation of the Township of Hagarty and Richards
R.R. #2
Killaloe, Ontario
K0J 2A0

for the use and operation of a 1.62 hectare landfill within a 2.4 hectare total Site area;

all in accordance with the following plans and specifications:

The application and supporting information as listed in Schedule "A", which is attached to this Provisional Certificate of Approval and forms part of this Certificate;

Located: Part Lot 27, Concession 3 (Richards Township)
Township of Hagarty and Richards
County of Renfrew

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

and subject to the following conditions:

A. DEFINITIONS

For the purpose of this Provisional Certificate of Approval:

1) "Act" and "EPA" mean the **Environmental Protection Act**, R.S.O. 1990, C. E-19 as amended;

2) "Applicant", "Owner" and "Operator" mean the Township of Hagarty and Richards, including its officers, employees, agents or contractors;

3) "Certificate" means this entire Provisional Certificate of Approval including its schedules, if any, issued in accordance with Section 27, Part V of the **Environmental Protection Act;**

4) "Director" means a Director, Environmental Assessment and Approvals Branch of the Ministry of the Environment;

"District Manager" means the District Manager of the Ottawa District Office, Eastern Region of the Ministry;

"Ministry" means the Ontario Ministry of the Environment (MOE);

"Municipal Waste" is as defined in Ontario Regulation 347, R.R.O. 1990;

"O.Reg. 232" means Ontario Regulation 232/98 (Landfilling Sites), R.R.O. 1990;

"RUPO" means the Ministry of the Environment Reasonable Use Policy Objectives (Guideline B-7);

"Site" means the landfill site as described in this Certificate; and

"Waste fill area" means the area on the surface of the site beneath which or above which waste is disposed by landfilling.

3. GENERAL

The Provisional Certificate of Approval No. A 412303, dated April 2, 1980 is hereby revoked and replaced by this Certificate.

Except as otherwise provided by these Conditions, the Site shall be operated and maintained, in accordance with the Applications for a Certificate of Approval for a Waste Disposal Site, dated September 21, 1998, and its supporting documents as listed in Schedule "A".

The requirements specified in this Certificate are the requirements under the **Environmental Protection Act**, R.S.O. 1990. The issuance of this Certificate in no way abrogates the Applicant's legal obligations to take all reasonable steps to avoid violating other applicable provisions of this legislation and other legislation and regulations.

The requirements of the Certificate are severable. If any requirement of this Provisional Certificate of Approval, or the application of any requirement of the Provisional Certificate of Approval to any circumstance, is held invalid, the application of such requirement to other circumstances and the remainder of the Provisional Certificate of Approval shall not be affected in any way.

The Applicant shall ensure compliance with all the terms and conditions of this Certificate. Any non-compliance constitutes a violation of the **Environmental Protection Act**, R.S.O. 1990 and its grounds for enforcement.

(a) The Applicant shall, forthwith upon request of the Director, District Manager, or Provincial Officer (as defined in the Act), furnish any information requested by such persons with respect to compliance with this Certificate, including but not limited to, any records required to be kept

(b) In the event, the Applicant provides the Ministry with information, records, documentation or notification in accordance with this Certificate (for the purposes of this condition referred to as "Information"),

i. the receipt of Information by the Ministry;

ii. the acceptance by the Ministry of the Information's completeness or accuracy; or

iii. the failure of the Ministry to prosecute the Applicant, or to require the Applicant to take any action, under this Certificate or any statute or regulation in relation to the Information;

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

7. The Applicant shall allow Ministry personnel, or a Ministry authorized representative(s), upon presentation of credentials, to:

(a) carry out any and all inspections authorized by Section 156, 157 or 158 of the **Environmental Protection Act**, R.S.O. 1990, Section 15, 16 or 17 of the **Ontario Water Resources Act**, R.S.O. 1990, or Section 19 or 20 of the **Pesticides Act**, R.S.O. 1990, as amended from time to time, of any place to which this Certificate relates; and

without restricting the generality of the foregoing, to:

(b) i. enter upon the premises where the records required by the conditions of this Certificate are kept;

ii. have access to and copy, at reasonable times, any records required by the conditions of this Certificate;

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

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

8. (a) Where there is a conflict between a provision of any document referred to in Schedule "A" and the conditions of this Certificate, the conditions in this Certificate shall take precedence; and

(b) Where there is a conflict between documents listed in Schedule "A", the document bearing the most recent date shall prevail.

tario

The Applicant shall ensure that all communications/correspondence made pursuant to this Certificate includes reference to the Certificate approval number A 412303.

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

(a) change of Applicant or Operator of the Site or both;

(b) change of address or address of the new Applicant;

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

(d) any change of name of the corporation where the Applicant or Operator is or at any time becomes a corporation, and a copy of the most current "Initial Notice or Notice of Change" (form 1 or 2 of O. Reg. 182, Chapter C-39, R.R.O. 1990 as amended from time to time), filed under the **Corporations Information Act** shall be included in the notification to the Director; and

(e) change in directors or officers of the corporation where the Applicant or Operator is or at any time becomes a corporation, and a copy of the most current "Initial Notice or Notice of Change" as referred to in 10(d), supra.

1. In the event of any change in ownership of the Site, the Applicant shall notify, in writing, the succeeding owner of the existence of this Certificate, and a copy of such notice shall be forwarded to the Director.

2. Any information relating to this Certificate and contained in Ministry files may be made available to the public in accordance with the provisions of the **Freedom of Information and Protection of Privacy Act**, R.S.O. 1990, C. F-31.

3. All records and monitoring data required by the conditions of this Certificate shall be kept on the Owners's premises for a minimum period of two (2) years from the date of their creation.

4. The obligations imposed by the terms and conditions of this Certificate are obligations of due diligence.

. PROHIBITION AND REGISTRATION ON TITLE

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

(b) By October 31, 2000, the Applicant shall submit to the Director for the Director's signature two [illegible] Certificate of Prohibition containing a register able description of the

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

D. SITE OPERATIONS

16. This Site shall only receive Municipal Waste that is generated from within the Township of Hagarty & Richards.

17. The final volumetric capacity of this Site, excluding final cover, is 94,974 cubic metres.

18. Waste shall be managed and landfilled at the Site in accordance with the items listed in Schedule "A".

19. By October 1, 2000,the Owner shall do one of the following:

(a) acquire ownership of a sufficient amount of land adjacent to the Site, that will bring the Site into compliance with the RUPO;
(b) acquire the property rights, as defined in O.Reg. 232, for a sufficient amount of land adjacent to the Site, that will bring the Site into compliance with the RUPO;
(c) submit to the Director, for approval, an application for Site remediation technologies or measures designed to bring the Site into compliance with the RUPO; or
(d) cease receiving any waste at the Site and submit a Closure Plan, for approval of the Director.

20. (a) If the Owner acquires of ownership or control of additional land, as specified in Conditions 19(a) or 19(b), then the Owner shall construct three additional groundwater monitoring wells by May 30, 2001, as specified in Item (4) of Schedule "A"; or

(b) If the Owner submits an application or a Closure Plan as specified in Conditions 19(c) or 19(d), a revised groundwater monitoring program, including a schedule for installing monitoring wells, shall be submitted to the Director, for approval.

E. MONITORING AND REPORTING

21. The Owner shall conduct surface and ground water sampling at the frequencies and for the parameters specified in Schedule "B", as modified by the District Manager. By March 31, 2001 and on an annual basis thereafter, the Owner shall submit to the District Manager, an Annual Report that contains the following, for the previous calendar year:

(a) the analytical results of the sampling program;
(b) an analysis of the results of the monitoring programs conducted at the Site to date;
(c) recommendations for any alterations to the monitoring or operation of the Site;

(e) an estimate of the total amount of waste landfilled and an estimate of the Site's remaining capacity;
(f) a statement as to compliance with the terms and conditions of the Certificate;
(g) a summary of complaints regarding the operation the Site and the Owner's response to those complaints; and
(h) an assessment of the need to develop and implement contingency plans for leachate control.

SITE CLOSURE

One (1) year prior to the Site reaching the capacity specified in Condition (17), the Owner shall submit to the Director, for approval, a plan for the closure, monitoring and long term maintenance of the Site.

G. EMERGENCIES

In case of an emergency or a spill at this Site, the Applicant shall forthwith call the Ministry of the Environment Spills Action Centre **(1-800-268-6060)** or the District Office.

H. RECORD KEEPING

4. The Company shall maintain records of the results of all inspections and monitoring and a summary of all activities associated with the Site (e.g. spills, maintenance work) in a record book located at the Site.

SCHEDULE "A"

This Schedule "A" forms part of Provisional Certificate of Approval No. A 412303:

Application to amend a Certificate of Approval for a Waste Disposal Site, dated September 21, 1998 and signed by Janice Bush, Reeve, Township of Hagarty & Richards.

Document entitled "Design and Operations Report for the Round Lake Landfill Site, Provisional Certificate of Approval A412303", dated September 1998 and prepared by The Greer Galloway Group Inc.

3. Document entitled "Revised Report on Round Lake Landfill, Hydrogeology", dated September 1998 and prepared by Golder Associates.

4. Letter from I. Parrott, MOE to K. Mooder, The Greer Galloway Group Inc. dated July 8, 1999 re: Ministry Review Comments.

5. Letter from K. Mooder, The Greer Galloway Group Inc. to I. Parrott, MOE, dated November 9, 1999 re: Response to Ministry Review Comments dated July 8, 1999.

6. Letter from B.J. Velderman, Golder Associates Ltd. to I. Parrott, MOE, dated March 15, 2000 re: Modified Surface Water Monitoring.

SCHEDULE "B"

s Schedule "B" forms part of Provisional Certificate of Approval No. A 412303:

OUNDWATER MONITORING

1 semi-annual basis every spring (May/June) and fall (September/October), samples shall be taken and alysed in the following manner:

Routine Groundwater Monitors, BH-1, BH-5, BH-6, BH95-10, shall be sampled and analyzed for the following parameters:

water level, temperature, conductivity, pH, chloride, hardness, sodium, iron, manganese, alkalinity, sulphate, nitrate, DOC and TDS.

Surveillance Groundwater Monitors, BH-2-D, BH-2-S, BH-8, BH95-9 and three additional wells to be constructed, shall be sampled and analysed for the following parameters:

water level, temperature, conductivity, pH, ammonia, calcium, magnesium, sodium, potassium, aluminum, barium, boron, chromium, cobalt, copper, iron, manganese, nitrate, total phosphorus, silicon, strontium, sulphate, zinc, alkalinity, TDS, chloride, TKN, COD, DOC and hardness.

JRFACE WATER MONITORING

1 a semi-annual basis every spring (May/June) and fall (September/October), samples shall be taken from rface Water Stations SW-A, SW-C, SW-D and SW-F and analysed in the following manner:

ow rate, DO, pH, conductivity, temperature, ammonia, chloride, calcium, magnesium, sodium, iron, anganese, phenols, alkalinity, sulphate, nitrite, nitrate, DOC and TDS.

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

1. Conditions 1, 3, 4, 5, 6, 8, 9, 10, 11, 12 and 13 are to clarify the legal rights and obligations of this Certificate.

2. Condition 7 is to ensure that the appropriate Ministry staff have ready access to the waste Site to inspect the operations that are approved under this Certificate. The condition is supplementary to the powers of entry afforded a Provincial Officer pursuant to the **Environmental Protection Act**, as amended.

3. Conditions 2, 21 and 24 are to ensure that the waste disposal Site is operated in accordance with the application for this Certificate and supporting information and not in any way or under any name which the Director has not been asked to consider.

4. Condition 14 is required to clarify that the terms and conditions of this Certificate impose a standard of due diligence and not absolute liability.

5. The reason for Condition 15, which requires registration of the Certificate, is that Section 46 of the Environmental Protection Act prohibits any use being made of the lands after they cease to be used for waste disposal purposes within a period of twenty-five years from the year in which such land ceased to be used, unless the approval of the Minister for the proposed use has been given. The purpose of this prohibition is to protect future occupants of the site and the environment from any hazards which might occur as a result of waste being disposed of on the site. This prohibition and potential hazard should be drawn to the attention of future owners and occupants by the Certificate being registered on title.

6. The reason for Conditions 16, 17, 18, 19, 20, 22 and 23 is to ensure that the Site is operated and maintained in a manner that protects the health and safety of people and the environment.

In accordance with Section 139 of the Environmental Protection Act, R.S.O. 1990 c. E-19, you may by written notice served upon me and the Environmental Appeal Board within 15 days after receipt of this Notice, require a hearing by the Board. Section 142 of the Environmental Protection Act, as amended provides that the Notice requiring a 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 <u>each</u> portion appealed.*

In addition to these legal requirements, 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;*

This Notice must be served upon:

Secretary,
Environmental Appeal Board,
300 Yonge St., 12th Floor,
P. Box 2382
Toronto, Ontario.
M4P 1E4

AND

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

Further information on the Environmental Appeal Board's requirements for an appeal can be obtained directly from the Board by: Tel: (416) 314-4600, Fax: (416) 314-4506 or e-mail: www.ert.gov.on.ca.

DATED AT TORONTO this 18th day of May, 2000.

A. Dominski, P. Eng.,
Director,
Section 39,
Environmental Protection Act

/kb

c: District Manager, Ottawa District Office, MOE
K. Mooder, The Greer Galloway Group Inc.

THIS IS A TRUE COPY OF THE ORIGINAL CERTIFICATE MAILED

ON 24-5-2000

RA

(Signed)

Ministry of the Environment
Ontario

Provisional Certificate No. A 412303

PROVISIONAL CERTIFICATE OF APPROVAL
WASTE DISPOSAL SITE

Under The Environmental Protection Act, 1971 and the regulations and subject to the limitations thereof, this Provisional Certificate of Approval is issued to:

Township of Hagarty and Richards
R.R. # 1
Wilno, Ontario
K0J 2N0

MINISTRY OF THE ENVIRONMENT
APR 16 1980
PEMBROKE

for the use and operation of a 2.4 hectare landfilling site

all in accordance with the following plans and specifications:

Located: S.½ Lot 29, Concession 2
Township of Richards
County of Renfrew

which includes the use of the site only for the disposal of the following categories of waste (NOTE: Use of the site for additional categories of wastes requires a new application and amendments to the Provisional Certificate of Approval) domestic waste and brush

and subject to the following conditions:

1. No operation shall be carried out at the site after sixty days from this condition becoming enforceable unless this Certificate including the reasons for this condition has been registered by the applicant as an instrument in the appropriate Land Registry Office against title to the site and a duplicate registered copy thereof has been returned by the applicant to the Director.

THIS IS A TRUE COPY OF THE
ORIGINAL CERTIFICATE MAILED
ON Apr. 10/80
D. L.
(Signed)

Dated this 2nd day of April, 1980.

Director, Section 39,
The Environmental Protection Act, 1971

Roy C. Reiche
BARRISTER & SOLICITOR

203 NELSON STREET
PEMBROKE, ONTARIO
K8A 3N1
PHONE: (613) 735-2313
FAX: (613) 735-2013
EMAIL: RCR@REICHE.ON.CA

July 23, 2003

COPY

Corporation of the Township
of Killaloe, Hagarty & Richards
1 John Street
P.O. Box 39
Killaloe, Ontario
K0J 2A0

ATTENTION:. LORNA HUDDER, CLERK-TREASURER

Dear Ms. Hudder:

Re: Provisional Certificate of Approval No. A412303
- Roundlake Landfill Site

As you are aware, the Notice amending Certificate of Approval No. A412303 acknowledges the acquisition of additional property for an attenuation zone and an easement. Pursuant to condition 15(c) of the Notice requires the registration of the amended Certificate under s. 197 of the *Environmental Protection Act* pursuant to s. 75 of the Land Titles Act relating to the above noted landfill site.

On July 21, 2003 my office electronically registered the Certificate which included the Certificate of Prohibition as Instrument Number RE6908. For your information and records, I am enclosing herewith a copy of Instrument Number RE6908. I would confirm that the original receipt of the Certificate which I registered on your behalf, was forwarded to the Ministry of Environment.

As this matter is now concluded and accordingly, I am enclosing herewith my disbursement account only which I trust you will find satisfactory.

Thank you for allowing me to be of assistance to the municipality.

Yours very truly,

Roy C. Reiche

RCR:glb
Encs.

Roy C. Reiche
BARRISTER & SOLICITOR

COPY

203 NELSON STREET
PEMBROKE, ONTARIO
K8A 3N1
PHONE: (613) 735-2313
FAX: (613) 735-2013
EMAIL: RCR@REICHE.ON.CA

July 23, 2003

MINISTRY OF THE ENVIRONMENT
2 St. Clair Avenue West
Floor 12A
Toronto, Ontario
M4V 1L5

ATTENTION: VERONICA POCHMURSKY, Waste Unit

Dear Ms. Pochmursky:

Re: Provisional Certificate of Approval No. A412303
Geographic Township of Killaloe, Hagarty and Richards
My file number: 932931

I acknowledge receipt of your letter dated July 8, 2003 and received in my office on July 11, 2003.

I would confirm that my office attended to the registration of the Certificate on July 21, 2003 under s. 197 of the *Environmental Protection Act*, pursuant to s. 75 of the Land Titles Act relating to the above noted Certificate of Approval.

For your information and records, I am enclosing herewith the original receipted copy of Instrument Number RE6908.

Thank you for your co-operation and assistance in dealing with this matter.

Yours very truly,

Roy C. Reiche

RCR:glb
Enc.

LRO # 49 **Certificate**
The appli(s) hereby applies to the Land Registrar.

Receipted as RE6908 on 2003 07 21 at 10:14
yyyy mm dd

Properties

PIN	57530 - 0159 LT	Estate/Qualifier	Fee Simple Lt Conversion Qualified
Description	PART BROKEN LOT 27 CONCESSION 3, RICHARDS, PART 1 PLAN 49R14688; KILLALOE, HAGARTY AND RICHARDS.		
Address	KILLALOE		
PIN	57530 - 0101 LT	Estate/Qualifier	Fee Simple Lt Conversion Qualified
Description	PT BROKEN LT 27 CON 3 RICHARDS AS IN R88381 ; HAGARTY & RICHARDS		
Address	KILLALOE		

Party From(s)

Name DIRECTOR APPOINTED UNDER SECTION 5 OF THE ENVIRONMENTAL PROTECTION ACT

Address for Service 2 St. Clair Avenue West
Floor 12A
Toronto, Ontario
M4V 1L5

I, Andrzej Dominksi, have the authority to bind the corporation.

This document is not authorized under Power of Attorney by this party.

Party To(s) — Capacity — Share

Name THE CORPORATION OF THE TOWNSHIP OF KILLALOE, HAGARTY AND RICHARDS

Address for Service 1 John Street
Killaloe, Ontario
K0J 2A0

Statements

Schedule: See Schedules

Signed By

Roy Carl Reiche	203 Nelson Street Pembroke K8A 3N1	acting for Party From(s)	Signed	2003 06 20
Tel 6137352313				
Fax 6137352013				

Submitted By

REICHE & ROSIEN	203 Nelson Street Pembroke K8A 3N1	2003 07 21
Tel 6137352313		
Fax 6137352013		

Fees/Taxes/Payment

Statutory Registration Fee	$60.00
Total Paid	$60.00

Certificate of Prohibition

s. 197(2) Environmental Protection Act

This is to certify that pursuant to a

Provisional Certificate of Approval No. A 412303

dated May 18, 2000, as amended on November 6, 2000,

November 7, 2000 and April 8, 2003

relating to a Waste Disposal Site more

particularly described in Box (6) hereto

the following persons, THE CORPORATION OF THE

TOWNSHIP OF KILLALOE, HAGARTY AND RICHARDS

are prohibited from dealing with the property described in Box 6 without first giving a copy of the Provisional Certificate of Approval, together with the amendments referred to above, to each person acquiring an interest in the property as a result of the dealing.

Under subsection 197(3) of the Environmental Protection Act, the prohibition applies to each person who, subsequent to the registration of this certificate, acquires an interest in the property.

Appendix B

Greenview
ENVIRONMENTAL MANAGEMENT

FIELD SAMPLING RECORD - GROUND WATER

LOCATION: Round Lake Waste Disposal Site | DATE: May 13, 2019 | SAMPLED BY: DMH / TJC

PROJECT NO.: 107.19.003 | WEATHER (SAMPLE DAY): Rain / overcast, 7°C | WEATHER (PREVIOUS DAY): Overcast, 10°C

Monitoring Location	Static Water Level	Borehole Depth (m)	Stick - Up (m)	Borehole Diameter (mm)	Purge Volumes (L)		Temperature (°C)	pH (units)	Conductivity (µS)	Dissolved Oxygen (mg/L)	Observations				Comments
					Needed	Obtained					Colour	Clarity	Odour	Sheen	
BH-1	0.81	2.86	0.65	38.1	6	6	3.65	6.40	29	7.90	light brown	cloudy	none	none	
BH-2S	2.37	3.82	0.83	50.8	9	7	8.20	6.57	204	6.90	light brown	cloudy	none	none	Pumped Dry
BH-2D	2.05	5.98	0.49	38.1	12	12	8.30	6.75	253	4.40	grey	opaque	sulphur	none	Sandy
BH-3	2.94	3.74	0.39	38.1	-	-	-	-	-	-	-	-	-	-	Water Level Only
BH-4	0.57	2.47	0.20	38.1	-	-	-	-	-	-	-	-	-	-	Water Level Only
BH-5	0.56	2.38	0.52	38.1	6	6	7.15	6.74	34	9.77	brown	opaque	none	none	
BH-6	2.01	4.94	0.71	38.1	-	-	-	-	-	-	-	-	-	-	Water Level Only
BH-7	3.14	5.95	0.29	38.1	-	-	-	-	-	-	-	-	-	-	Water Level Only
BH-8	1.54	5.96	0.57	38.1	13	13	6.65	6.80	231	5.95	light brown	cloudy	sulphur	none	
BH95-9	1.68	4.98	0.45	38.1	10	10	6.70	6.87	139	4.51	clear	clear	none	none	GW QA/QC (Background & Surveillance) - Sandy
BH95-10	2.67	5.95	0.52	50.8	-	-	-	-	-	-	-	-	-	-	Water Level Only
BH95-11	2.11	4.91	0.33	38.1	-	-	-	-	-	-	-	-	-	-	Water Level Only
BH01-12D	1.71	5.58	0.38	38.1	12	12	5.44	6.43	46	6.57	dark brown	opaque	none	none	
BH01-13S	1.72	2.65	0.72	38.1	3	3	4.04	7.42	56	13.43	light brown	opaque	none	none	
BH01-13D	1.61	4.40	0.63	50.8	17	17	4.95	6.81	146	5.99	brown	opaque	none	none	Sandy
BH01-14	1.33	7.42	0.32	50.8	37	37	7.16	6.74	148	4.78	dark grey	opaque	none	none	Sandy / Silty
BH01-15	4.77	6.11	0.69	50.8	-	-	-	-	-	-	-	-	-	-	Water Level Only
R1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	No Sample

Greenview
ENVIRONMENTAL MANAGEMENT

FIELD SAMPLING RECORD - GROUND WATER

LOCATION: Round Lake Waste Disposal Site | DATE: October 7, 2019 | SAMPLED BY: TJC / KSD

PROJECT NO.: 107.19.003 | WEATHER (SAMPLE DAY): Overcast, 8°C | WEATHER (PREVIOUS DAY): Overcast, 10°C

Monitoring Location	Static Water Level	Borehole Depth (m)	Stick - Up (m)	Borehole Diameter (mm)	Purge Volumes (L)		Temperature (°C)	pH (units)	Conductivity (µS)	Dissolved Oxygen (mg/L)	Observations				Comments
					Needed	Obtained					Colour	Clarity	Odour	Sheen	
BH-1	2.21	2.94	0.65	38.1	2	1	12.03	5.44	59	5.03	light brown	cloudy	none	none	GW QA/QC (Background & Surveillance) - Pumped Dry
BH-2S	3.75	3.81	0.83	50.8	-	-	-	-	-	-	-	-	-	-	Insufficient Water to Sample
BH-2D	3.51	5.97	0.49	38.1	7	7	11.24	6.77	157	9.83	grey	opaque	sulphur	none	Sandy
BH-3	-	3.87	0.39	38.1	-	-	-	-	-	-	-	-	-	-	Dry
BH-4	2.12	2.48	0.20	38.1	-	-	-	-	-	-	-	-	-	-	Water Level Only
BH-5	2.07	2.93	0.52	38.1	-	-	-	-	-	-	-	-	-	-	Insufficient Water to Sample
BH-6	3.49	5.02	0.71	38.1	4	4	13.42	6.61	27	11.89	clear	cloudy	none	none	GW QA/QC (Routine)
BH-7	4.58	5.96	0.29	38.1	-	-	-	-	-	-	-	-	-	-	Water Level Only
BH-8	2.89	5.92	0.57	38.1	9	9	11.84	6.80	226	4.11	clear	cloudy	sulphur	none	
BH95-9	2.89	5.06	0.45	38.1	6	6	10.48	6.90	166	3.48	clear	clear	none	none	Sandy
BH95-10	4.61	5.97	0.52	50.8	4	4	16.28	5.76	22	7.46	clear	cloudy	none	none	
BH95-11	3.35	4.91	0.33	38.1	-	-	-	-	-	-	-	-	-	-	Water Level Only
BH01-12D	3.18	5.60	0.38	38.1	14	14	10.52	6.96	54	11.75	light brown	cloudy	none	none	
BH01-13S	-	2.69	0.72	38.1	-	-	-	-	-	-	-	-	-	-	Dry
BH01-13D	2.86	4.80	0.63	50.8	6	6	9.67	6.80	168	4.75	light brown	cloudy	none	none	Sandy
BH01-14	2.60	7.42	0.32	50.8	24	24	9.60	6.80	153	4.85	light grey	cloudy	none	none	Sandy / Silty
BH01-15	-	6.12	0.69	50.8	-	-	-	-	-	-	-	-	-	-	Dry
R1	-	-	-	-	-	-	13.17	6.30	44	7.50	clear	clear	none	none	Residential

Appendix C

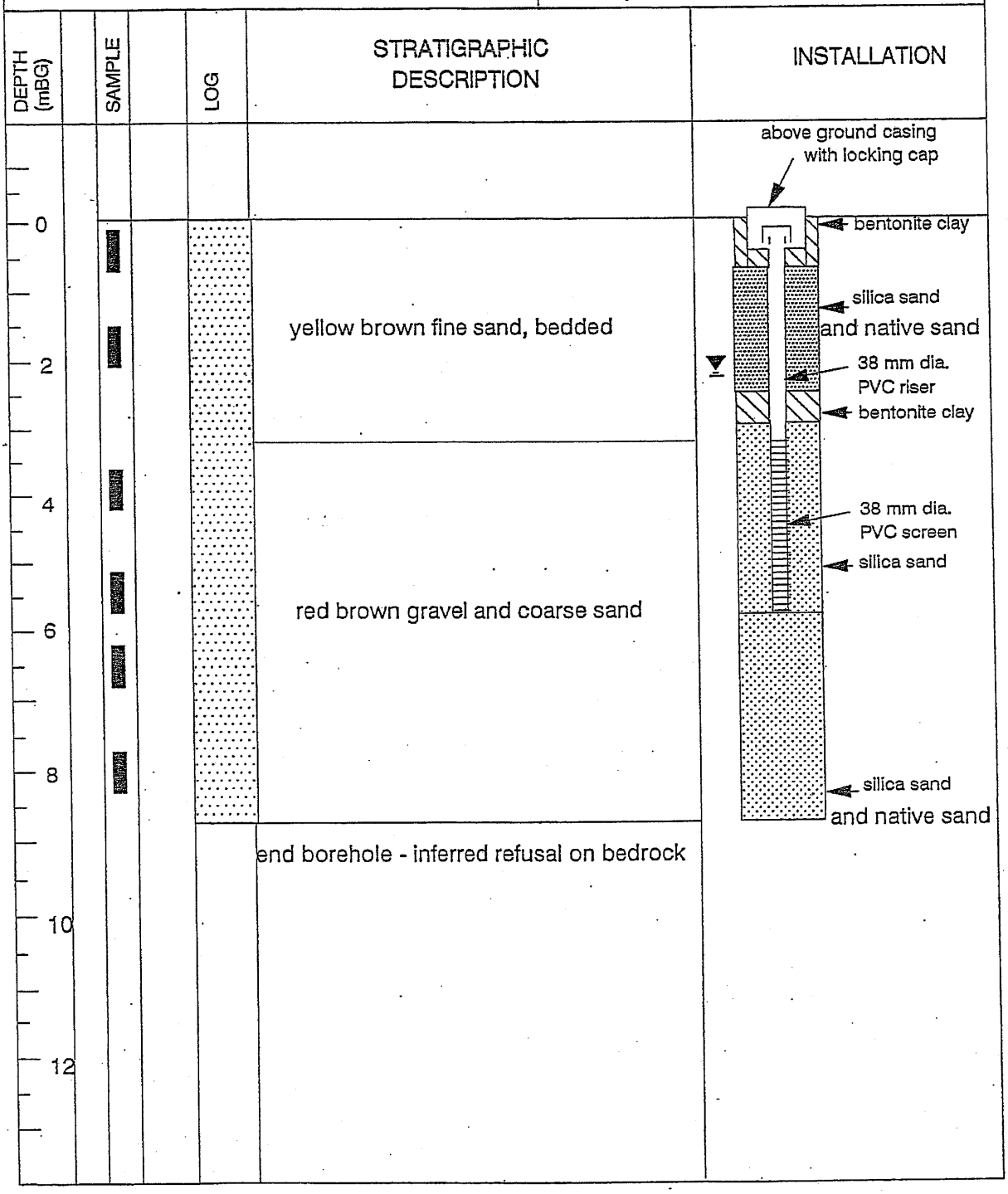
STRATIGRAPHIC AND INSTRUMENTATION LOG

Project No.:	95-210	Borehole No.:	BH-1
Client:	Tp. Hagarty & Richards	Date Completed:	DECEMBER 14, 1994
Location:	Round Lake Center	Drilling Method:	Hollow Stem Auger
Ground Surface Elevation:	98.047 m	Drill Supervisor:	B.J.V.

DEPTH (mBG)	SAMPLE	LOG	STRATIGRAPHIC DESCRIPTION	INSTALLATION
0			topsoil and sand	above ground casing with locking cap; bentonite clay
2			yellow brown coarse sand, bedded	38 mm dia. PVC riser; silica sand
4			brown gravel, pebbles and coarse sand	38 mm dia. PVC screen; silica sand and native sand
6			end borehole - inferred refusal on bedrock	
8				
10				
12				

STRATIGRAPHIC AND INSTRUMENTATION LOG

Project No.:	95-210	Borehole No.:	BH-2-1 (bi-level)
Client:	Tp. Hagarty & Richards	Date Completed:	DECEMBER 14, 1994
Location:	Round Lake Center	Drilling Method:	Hollow Stem Auger
Ground Surface Elevation:	99.246 m	Drill Supervisor:	B.J.V.



STRATIGRAPHIC AND INSTRUMENTATION LOG

Project No.:	95-210	Borehole No.:	BH-2-2 (bi-level)
Client:	Tp. Hagarty & Richards	Date Completed:	DECEMBER 14, 1994
Location:	Round Lake Center	Drilling Method:	Hollow Stem Auger
Ground Surface Elevation:	99.246 m	Drill Supervisor:	B.J.V.

DEPTH (mBG) | SAMPLE | LOG | STRATIGRAPHIC DESCRIPTION | INSTALLATION

0

yellow brown fine sand, bedded

2

4

red brown gravel and coarse sand

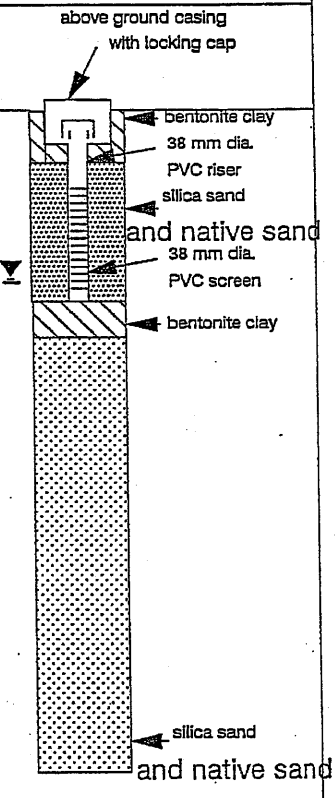
6

8

end borehole - inferred refusal on bedrock

10

12



STRATIGRAPHIC AND INSTRUMENTATION LOG

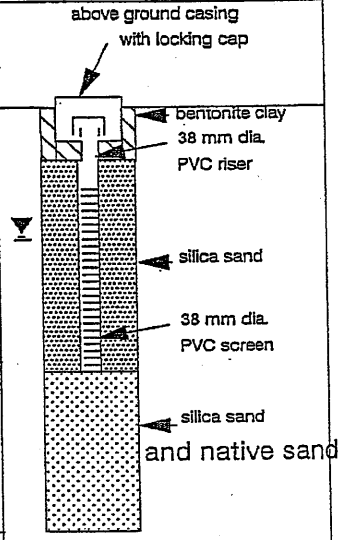
Project No.:	95-210	Borehole No.:	BH-3
Client:	Tp. Hagarty & Richards	Date Completed:	DECEMBER 14, 1994
Location:	Round Lake Center	Drilling Method:	Hollow Stem Auger
Ground Surface Elevation:	100.235 m	Drill Supervisor:	B.J.V.

DEPTH (mBG)	SAMPLE	LOG	STRATIGRAPHIC DESCRIPTION	INSTALLATION
0				above ground casing with locking cap
2			yellow brown medium sand, bedded	bentonite clay
4			yellow brown gravel and medium sand	38 mm dia. PVC riser
6			end borehole - quick sand	38 mm dia. PVC screen; silica sand; silica sand and native sand
8				
10				
12				

STRATIGRAPHIC AND INSTRUMENTATION LOG

Project No.:	95-210	Borehole No.:	BH-4
Client:	Tp. Hagarty & Richards	Date Completed:	DECEMBER 15, 1994
Location:	Round Lake Center	Drilling Method:	Hollow Stem Auger
Ground Surface Elevation:	98.387 m	Drill Supervisor:	B.J.V.

DEPTH (mBG)	SAMPLE	LOG	STRATIGRAPHIC DESCRIPTION	INSTALLATION
0			yellow brown medium to coarse sand with gravel	above ground casing with locking cap; bentonite clay; 38 mm dia. PVC riser; silica sand
2				38 mm dia. PVC screen
4			brown dense silty sand with stones Till	silica sand and native sand
6			end borehole - refusal on bedrock	
8				
10				
12				



STRATIGRAPHIC AND INSTRUMENTATION LOG

Project No.:	95-210	Borehole No.:	BH-5
Client:	Tp. Hagarty & Richards	Date Completed:	DECEMBER 15, 1994
Location:	Round Lake Center	Drilling Method:	Hollow Stem Auger
Ground Surface Elevation:	97.953 m	Drill Supervisor:	B.J.V.

DEPTH (mBG)	SAMPLE	LOG	STRATIGRAPHIC DESCRIPTION	INSTALLATION
0				above ground casing with locking cap
			brown dense silty sand with stones	bentonite clay
			Till	38 mm dia. PVC riser
2				38 mm dia. PVC screen
			end borehole - inferred refusal on bedrock	silica sand and native sand
4				
6				
8				
10				
12				

STRATIGRAPHIC AND INSTRUMENTATION LOG

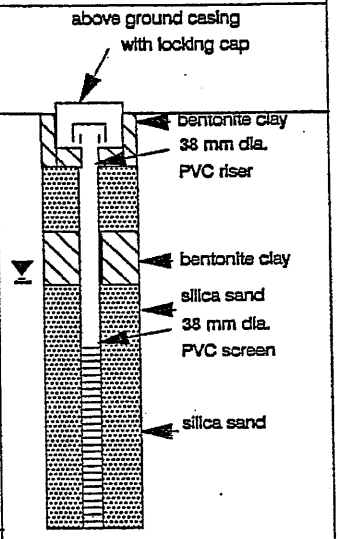
Project No.:	95-210	Borehole No.:	BH-6
Client:	Tp. Hagarty & Richards	Date Completed:	DECEMBER 15, 1994
Location:	Round Lake Center	Drilling Method:	Hollow Stem Auger
Ground Surface Elevation:	99.087 m	Drill Supervisor:	B.J.V.

DEPTH (mBG)	SAMPLE	LOG	STRATIGRAPHIC DESCRIPTION	INSTALLATION
0				above ground casing with locking cap
2			yellow brown medium sand, bedded	bentonite clay; 38 mm dia. PVC riser; silica sand; 38 mm dia. PVC screen; silica sand
4			end borehole- no refusal	
6				
8				
10				
12				

STRATIGRAPHIC AND INSTRUMENTATION LOG

Project No.:	95-210	Borehole No.:	BH-7
Client:	Tp. Hagarty & Richards	Date Completed:	February 23, 1995
Location:	Round Lake Center	Drilling Method:	Hollow Stem Auger
Ground Surface Elevation:	95.453m	Drill Supervisor:	A.W.

DEPTH (mBG)	SAMPLE	LOG	STRATIGRAPHIC DESCRIPTION	INSTALLATION
0				above ground casing with locking cap
2			yellow brown medium sand, bedded	bentonite clay; 38 mm dia. PVC riser; bentonite clay; silica sand; 38 mm dia. PVC screen; silica sand
4				
6			end borehole- no refusal	
8				
10				
12				



STRATIGRAPHIC AND INSTRUMENTATION LOG

Project No.:	95-210	Borehole No.:	BH-8
Client:	Tp. Hagarty & Richards	Date Completed:	February 23, 1995
Location:	Round Lake Center	Drilling Method:	Hollow Stem Auger
Ground Surface Elevation:	94.713 m	Drill Supervisor:	A.W.

DEPTH (mBG)	SAMPLE	LOG	STRATIGRAPHIC DESCRIPTION	INSTALLATION
0				above ground casing with locking cap
2			yellow brown medium sand, bedded	bentonite clay; 38 mm dia. PVC riser; bentonite clay; silica sand; 38 mm dia. PVC screen; silica sand
4				
6			end borehole- no refusal	
8				
10				
12				

Appendix D

CADUCEON™ ENVIRONMENTAL LABORATORIES
Client committed. Quality assured.

CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: G77512

REPORT No. B19-13431

Report To:

Greenview Environmental Management
13 Commerce Crt., PO Box 100
Bancroft Ontario K0L1C0
Attention: Tyler Casey

Caduceon Environmental Laboratories
285 Dalton Ave
Kingston Ontario K7K 6Z1
Tel: 613-544-2001
Fax: 613-544-2770

DATE RECEIVED: 15-May-19
DATE REPORTED: 07-Jun-19
SAMPLE MATRIX: Groundwater

JOB/PROJECT NO.: Round Lake WDS
P.O. NUMBER: -
WATERWORKS NO.

			Client I.D.		BH-1	BH-2S	BH-2D	BH-5
			Sample I.D.		B19-13431-1	B19-13431-2	B19-13431-3	B19-13431-4
			Date Collected		13-May-19	13-May-19	13-May-19	13-May-19
Parameter	**Units**	**R.L.**	**Reference Method**	**Date/Site Analyzed**				
Alkalinity(CaCO3) to pH4.5	mg/L	5	SM 2320B	17-May-19/O	9	116	122	15
pH @25°C	pH Units		SM 4500H	17-May-19/O	6.03	6.65	6.67	6.55
Conductivity @25°C	µmho/cm	1	SM 2510B	17-May-19/O	55	271	294	54
Chloride	mg/L	0.5	SM4110C	27-May-19/O	3.0	2.0	3.7	2.5
Nitrite (N)	mg/L	0.05	SM4110C	27-May-19/O	< 0.05	< 0.05	< 0.05	< 0.05
Nitrate (N)	mg/L	0.05	SM4110C	27-May-19/O	0.18	0.56	0.17	0.25
Sulphate	mg/L	1	SM4110C	27-May-19/O	8	11	14	4
Phosphorus-Total	mg/L	0.01	E3199A.1	30-May-19/K	0.11	0.02	2.68	1.22
Total Kjeldahl Nitrogen	mg/L	0.1	E3199A.1	30-May-19/K	0.7	1.8	3.8	1.2
Ammonia (N)-Total	mg/L	0.01	SM4500-NH3-H	24-May-19/K	0.04	1.68	2.71	0.08
TDS (Calc. from Cond.)	mg/L	1	Calc.	21-May-19	28	139	151	27
Dissolved Organic Carbon	mg/L	0.2	EPA 415.1	23-May-19/O	13.5	5.0	7.8	4.6
COD	mg/L	5	SM 5220D	29-May-19/O	40	12	104	56
Hardness (as CaCO3)	mg/L	1	SM 3120	22-May-19/O	21	130	119	20
Sodium	mg/L	0.2	SM 3120	22-May-19/O	2.4	3.6	7.0	5.1
Potassium	mg/L	0.1	SM 3120	22-May-19/O	0.5	9.3	8.9	2.9
Aluminum	mg/L	0.01	SM 3120	22-May-19/O	0.35	0.04	0.05	2.25
Barium	mg/L	0.001	SM 3120	22-May-19/O	0.008	0.076	0.123	0.070
Boron	mg/L	0.005	SM 3120	22-May-19/O	< 0.005	0.094	0.144	0.016
Calcium	mg/L	0.02	SM 3120	22-May-19/O	4.96	39.7	31.9	4.13
Chromium	mg/L	0.001	EPA 200.8	24-May-19/O	0.001	< 0.001	0.002	0.004
Cobalt	mg/L	0.0001	EPA 200.8	24-May-19/O	0.0009	0.0039	0.0024	0.0033
Copper	mg/L	0.0001	EPA 200.8	24-May-19/O	0.0095	0.0025	0.0007	0.0113
Iron	mg/L	0.005	SM 3120	22-May-19/O	0.182	0.302	37.9	3.52
Magnesium	mg/L	0.02	SM 3120	22-May-19/O	2.20	7.38	9.52	2.40
Manganese	mg/L	0.001	SM 3120	22-May-19/O	0.017	0.964	2.07	0.682
Silicon	mg/L	0.01	SM 3120	22-May-19/O	8.41	7.61	13.0	6.14

M. Dubien

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

Michelle Dubien
Lab Manager

CADUCEON™ ENVIRONMENTAL LABORATORIES
Client committed. Quality assured.

CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: G77512

REPORT No. B19-13431

Report To:

Greenview Environmental Management
13 Commerce Crt., PO Box 100
Bancroft Ontario K0L1C0
Attention: Tyler Casey

Caduceon Environmental Laboratories
285 Dalton Ave
Kingston Ontario K7K 6Z1
Tel: 613-544-2001
Fax: 613-544-2770

DATE RECEIVED: 15-May-19
DATE REPORTED: 07-Jun-19
SAMPLE MATRIX: Groundwater

JOB/PROJECT NO.: Round Lake WDS
P.O. NUMBER: -
WATERWORKS NO.

			Client I.D.		BH-1	BH-2S	BH-2D	BH-5
			Sample I.D.		B19-13431-1	B19-13431-2	B19-13431-3	B19-13431-4
			Date Collected		13-May-19	13-May-19	13-May-19	13-May-19
Parameter	**Units**	**R.L.**	**Reference Method**	**Date/Site Analyzed**				
Strontium	mg/L	0.001	SM 3120	22-May-19/O	0.031	0.202	0.227	0.032
Zinc	mg/L	0.005	SM 3120	22-May-19/O	< 0.005	< 0.005	< 0.005	0.011

1. Sediment present
2. Solids present in metals bottle

M. Dubien

Michelle Dubien
Lab Manager

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

CADUCEON™ ENVIRONMENTAL LABORATORIES
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CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: G77512

REPORT No. B19-13431

Report To:

Greenview Environmental Management
13 Commerce Crt., PO Box 100
Bancroft Ontario K0L1C0
Attention: Tyler Casey

Caduceon Environmental Laboratories
285 Dalton Ave
Kingston Ontario K7K 6Z1
Tel: 613-544-2001
Fax: 613-544-2770

DATE RECEIVED: 15-May-19
DATE REPORTED: 07-Jun-19
SAMPLE MATRIX: Groundwater

JOB/PROJECT NO.: Round Lake WDS
P.O. NUMBER: -
WATERWORKS NO.

			Client I.D.		BH-8	BH95-9	BH01-12D	BH01-13S
			Sample I.D.		B19-13431-5	B19-13431-6	B19-13431-7	B19-13431-8
			Date Collected		13-May-19	13-May-19	13-May-19	13-May-19
Parameter	Units	R.L.	Reference Method	Date/Site Analyzed				
Alkalinity(CaCO3) to pH4.5	mg/L	5	SM 2320B	17-May-19/O	122	60	9	32
pH @25°C	pH Units		SM 4500H	17-May-19/O	6.83	6.81	6.18	7.08
Conductivity @25°C	µmho/cm	1	SM 2510B	17-May-19/O	313	220	42	84
Chloride	mg/L	0.5	SM4110C	27-May-19/O	8.6	19.1	1.9	1.2
Nitrite (N)	mg/L	0.05	SM4110C	27-May-19/O	< 0.05	< 0.05	< 0.05	< 0.05
Nitrate (N)	mg/L	0.05	SM4110C	27-May-19/O	0.18	0.17	0.18	0.44
Sulphate	mg/L	1	SM4110C	27-May-19/O	15	15	5	5
Phosphorus-Total	mg/L	0.01	E3199A.1	30-May-19/K	0.23	0.05	6.75	0.33
Total Kjeldahl Nitrogen	mg/L	0.1	E3199A.1	30-May-19/K	3.3	0.2	1.7	0.4
Ammonia (N)-Total	mg/L	0.01	SM4500-NH3-H	24-May-19/K	3.17	0.09	0.10	0.04
TDS (Calc. from Cond.)	mg/L	1	Calc.	21-May-19	161	112	21	42
Dissolved Organic Carbon	mg/L	0.2	EPA 415.1	23-May-19/O	0.2	3.4	9.5	2.6
COD	mg/L	5	SM 5220D	29-May-19/O	34	9	218	27
Hardness (as CaCO3)	mg/L	1	SM 3120	22-May-19/O	122	94	28	34
Sodium	mg/L	0.2	SM 3120	22-May-19/O	6.9	6.0	2.4	3.4
Potassium	mg/L	0.1	SM 3120	22-May-19/O	13.7	2.6	2.0	2.6
Aluminum	mg/L	0.01	SM 3120	22-May-19/O	0.04	0.03	1.92 [2]	0.02
Barium	mg/L	0.001	SM 3120	22-May-19/O	0.138	0.038	0.057	0.014
Boron	mg/L	0.005	SM 3120	22-May-19/O	0.126	0.043	0.022	0.029
Calcium	mg/L	0.02	SM 3120	22-May-19/O	34.7	20.7	5.17	8.65
Chromium	mg/L	0.001	EPA 200.8	24-May-19/O	0.002	< 0.001	0.008	< 0.001
Cobalt	mg/L	0.0001	EPA 200.8	24-May-19/O	0.0032	0.0008	0.0045	< 0.0001
Copper	mg/L	0.0001	EPA 200.8	24-May-19/O	0.0015	0.0005	0.0161	0.0016
Iron	mg/L	0.005	SM 3120	22-May-19/O	28.0	6.63	14.3	0.041
Magnesium	mg/L	0.02	SM 3120	22-May-19/O	8.69	10.2	3.78	2.95
Manganese	mg/L	0.001	SM 3120	22-May-19/O	3.54	0.231	0.098	0.002
Silicon	mg/L	0.01	SM 3120	22-May-19/O	12.8	8.86	10.7	3.79

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Michelle Dubien
Lab Manager

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CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: G77512

REPORT No. B19-13431

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DATE RECEIVED: 15-May-19
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SAMPLE MATRIX: Groundwater

JOB/PROJECT NO.: Round Lake WDS
P.O. NUMBER: -
WATERWORKS NO.

			Client I.D.		BH-8	BH95-9	BH01-12D	BH01-13S
			Sample I.D.		B19-13431-5	B19-13431-6	B19-13431-7	B19-13431-8
			Date Collected		13-May-19	13-May-19	13-May-19	13-May-19
Parameter	**Units**	**R.L.**	**Reference Method**	**Date/Site Analyzed**				
Strontium	mg/L	0.001	SM 3120	22-May-19/O	0.267	0.117	0.032	0.057
Zinc	mg/L	0.005	SM 3120	22-May-19/O	< 0.005	< 0.005	0.008	< 0.005

1 Sediment present
2 Solids present in metals bottle

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SAMPLE MATRIX: Groundwater

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WATERWORKS NO.

			Client I.D.		BH01-13D	BH01-14	QA/QC GW	
			Sample I.D.		B19-13431-9	B19-13431-10	B19-13431-11	
			Date Collected		13-May-19	13-May-19	13-May-19	
Parameter	Units	R.L.	Reference Method	Date/Site Analyzed				
Alkalinity(CaCO3) to pH4.5	mg/L	5	SM 2320B	17-May-19/O	84	73	59	
pH @25°C	pH Units		SM 4500H	17-May-19/O	6.85	6.77	6.81	
Conductivity @25°C	µmho/cm	1	SM 2510B	17-May-19/O	232	223	217	
Chloride	mg/L	0.5	SM4110C	27-May-19/O	8.4	9.1	19.4	
Nitrite (N)	mg/L	0.05	SM4110C	27-May-19/O	< 0.05	< 0.05	< 0.05	
Nitrate (N)	mg/L	0.05	SM4110C	27-May-19/O	0.18	0.18	0.18	
Sulphate	mg/L	1	SM4110C	27-May-19/O	16	20	14	
Phosphorus-Total	mg/L	0.01	E3199A.1	30-May-19/K	0.58	1.33	0.09	
Total Kjeldahl Nitrogen	mg/L	0.1	E3199A.1	30-May-19/K	0.7	0.8	0.2	
Ammonia (N)-Total	mg/L	0.01	SM4500-NH3-H	24-May-19/K	0.39	0.25	0.06	
TDS (Calc. from Cond.)	mg/L	1	Calc.	21-May-19	118	114	111	
Dissolved Organic Carbon	mg/L	0.2	EPA 415.1	23-May-19/O	5.8	4.2	3.3	
COD	mg/L	5	SM 5220D	29-May-19/O	60	66	< 5	
Hardness (as CaCO3)	mg/L	1	SM 3120	22-May-19/O	111	104	94	
Sodium	mg/L	0.2	SM 3120	22-May-19/O	5.3	4.7	6.0	
Potassium	mg/L	0.1	SM 3120	22-May-19/O	5.5	4.1	2.6	
Aluminum	mg/L	0.01	SM 3120	22-May-19/O	1.27 [1]	0.03	0.03	
Barium	mg/L	0.001	SM 3120	22-May-19/O	0.098	0.058	0.038	
Boron	mg/L	0.005	SM 3120	22-May-19/O	0.063	0.049	0.044	
Calcium	mg/L	0.02	SM 3120	22-May-19/O	26.5	23.7	20.9	
Chromium	mg/L	0.001	EPA 200.8	24-May-19/O	0.005	< 0.001	< 0.001	
Cobalt	mg/L	0.0001	EPA 200.8	24-May-19/O	0.0048	0.0008	0.0008	
Copper	mg/L	0.0001	EPA 200.8	24-May-19/O	0.0155	0.0010	0.0005	
Iron	mg/L	0.005	SM 3120	22-May-19/O	11.3	8.50	6.80	
Magnesium	mg/L	0.02	SM 3120	22-May-19/O	10.9	10.8	10.2	
Manganese	mg/L	0.001	SM 3120	22-May-19/O	2.32	0.907	0.233	

M. Dubien

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Michelle Dubien
Lab Manager

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Final Report

C.O.C.: G77512

REPORT No. B19-13431

Report To:

Greenview Environmental Management
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Bancroft Ontario K0L1C0
Attention: Tyler Casey

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Kingston Ontario K7K 6Z1
Tel: 613-544-2001
Fax: 613-544-2770

DATE RECEIVED: 15-May-19
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SAMPLE MATRIX: Groundwater

JOB/PROJECT NO.: Round Lake WDS
P.O. NUMBER: -
WATERWORKS NO.

			Client I.D.		BH01-13D	BH01-14	QA/QC GW	
			Sample I.D.		B19-13431-9	B19-13431-10	B19-13431-11	
			Date Collected		13-May-19	13-May-19	13-May-19	
Parameter	**Units**	**R.L.**	**Reference Method**	**Date/Site Analyzed**				
Silicon	mg/L	0.01	SM 3120	22-May-19/O	11.2	8.97	8.87	
Strontium	mg/L	0.001	SM 3120	22-May-19/O	0.183	0.147	0.118	
Zinc	mg/L	0.005	SM 3120	22-May-19/O	0.005	< 0.005	< 0.005	

1. Sediment present
2. Solids present in metals bottle

Michelle Dubien
Lab Manager

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CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: G80177

REPORT No. B19-32478

Report To:

Greenview Environmental Management
13 Commerce Crt., PO Box 100
Bancroft Ontario K0L1C0
Attention: Tyler Casey

Caduceon Environmental Laboratories
285 Dalton Ave
Kingston Ontario K7K 6Z1
Tel: 613-544-2001
Fax: 613-544-2770

DATE RECEIVED: 09-Oct-19
DATE REPORTED: 29-Oct-19
SAMPLE MATRIX: Groundwater

JOB/PROJECT NO.: Round Lake WDS
P.O. NUMBER:
WATERWORKS NO.

			Client I.D.		BH-1	BH-2D	BH-8	BH-95-9
			Sample I.D.		B19-32478-1	B19-32478-2	B19-32478-3	B19-32478-4
			Date Collected		07-Oct-19	07-Oct-19	07-Oct-19	07-Oct-19
Parameter	**Units**	**R.L.**	**Reference Method**	**Date/Site Analyzed**				
Alkalinity(CaCO3) to pH4.5	mg/L	5	SM 2320B	10-Oct-19/O	10	78	110	65
Chloride	mg/L	0.5	SM4110C	18-Oct-19/O	< 0.5	< 0.5	10.3	28.1
Nitrite (N)	mg/L	0.05	SM4110C	18-Oct-19/O	< 0.05	< 0.05	< 0.05	< 0.05
Nitrate (N)	mg/L	0.05	SM4110C	18-Oct-19/O	< 0.05	< 0.05	< 0.05	< 0.05
Sulphate	mg/L	1	SM4110C	18-Oct-19/O	7	7	11	13
Phosphorus-Total	mg/L	0.01	E3199A.1	09-Oct-19/K	0.80	3.74	0.17	0.09
Total Kjeldahl Nitrogen	mg/L	0.1	E3199A.1	09-Oct-19/K	0.9	3.2	3.0	0.2
Ammonia (N)-Total	mg/L	0.01	SM4500-NH3-H	10-Oct-19/K	0.06	2.16	2.76	0.10
TDS (Calc. from Cond.)	mg/L	1	Calc.	11-Oct-19	32	97	144	117
Dissolved Organic Carbon	mg/L	0.2	EPA 415.1	15-Oct-19/O	15.6	9.9	9.1	4.1
COD	mg/L	5	SM 5220D	18-Oct-19/O	61	649	28	< 5
Hardness (as CaCO3)	mg/L	1	SM 3120	15-Oct-19/O	22	71	102	97
Aluminum	mg/L	0.01	SM 3120	15-Oct-19/O	0.43	0.04	0.03	0.03
Barium	mg/L	0.001	SM 3120	15-Oct-19/O	0.014	0.081	0.119	0.047
Boron	mg/L	0.005	SM 3120	15-Oct-19/O	< 0.005	0.083	0.088	0.046
Calcium	mg/L	0.02	SM 3120	15-Oct-19/O	4.99	18.8	29.0	21.6
Chromium	mg/L	0.001	EPA 200.8	15-Oct-19/O	0.003	0.002	0.002	< 0.001
Cobalt	mg/L	0.0001	EPA 200.8	15-Oct-19/O	0.0026	0.0012	0.0025	0.0009
Copper	mg/L	0.0001	EPA 200.8	15-Oct-19/O	0.0093	0.0009	0.0014	0.0011
Iron	mg/L	0.005	SM 3120	15-Oct-19/O	0.806	22.1	23.1	6.81
Magnesium	mg/L	0.02	SM 3120	15-Oct-19/O	2.23	5.90	7.23	10.4
Manganese	mg/L	0.001	SM 3120	15-Oct-19/O	0.073	1.14	2.80	0.242
Potassium	mg/L	0.1	SM 3120	15-Oct-19/O	0.6	7.5	14.0	3.0
Silicon	mg/L	0.01	SM 3120	15-Oct-19/O	9.35	12.5	13.6	9.42
Sodium	mg/L	0.2	SM 3120	15-Oct-19/O	2.9	5.8	7.0	7.5
Strontium	mg/L	0.001	SM 3120	15-Oct-19/O	0.034	0.144	0.235	0.129
Zinc	mg/L	0.005	SM 3120	15-Oct-19/O	< 0.005	< 0.005	0.006	< 0.005

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Michelle Dubien
Lab Manager

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			Client I.D.		BH-1	BH-2D	BH-8	BH-95-9
			Sample I.D.		B19-32478-1	B19-32478-2	B19-32478-3	B19-32478-4
			Date Collected		07-Oct-19	07-Oct-19	07-Oct-19	07-Oct-19
Parameter	**Units**	**R.L.**	**Reference Method**	**Date/Site Analyzed**				

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			Client I.D.		BH-01-12D	BH-01-13D	BH01-14	R1 (Residential)
			Sample I.D.		B19-32478-5	B19-32478-6	B19-32478-7	B19-32478-8
			Date Collected		07-Oct-19	07-Oct-19	07-Oct-19	07-Oct-19
Parameter	**Units**	**R.L.**	**Reference Method**	**Date/Site Analyzed**				
Alkalinity(CaCO3) to pH4.5	mg/L	5	SM 2320B	10-Oct-19/O	14	78	73	23
Chloride	mg/L	0.5	SM4110C	18-Oct-19/O	< 0.5	13.0	9.7	< 0.5
Nitrite (N)	mg/L	0.05	SM4110C	18-Oct-19/O	< 0.05	< 0.05	< 0.05	< 0.05
Nitrate (N)	mg/L	0.05	SM4110C	18-Oct-19/O	< 0.05	< 0.05	< 0.05	< 0.05
Sulphate	mg/L	1	SM4110C	18-Oct-19/O	< 1	13	13	< 1
Phosphorus-Total	mg/L	0.01	E3199A.1	09-Oct-19/K	0.44	0.38	1.09	0.02
Total Kjeldahl Nitrogen	mg/L	0.1	E3199A.1	09-Oct-19/K	0.4	0.6	0.5	0.1
Ammonia (N)-Total	mg/L	0.01	SM4500-NH3-H	10-Oct-19/K	0.09	0.37	0.30	0.02
TDS (Calc. from Cond.)	mg/L	1	Calc.	11-Oct-19	26	114	107	28
Dissolved Organic Carbon	mg/L	0.2	EPA 415.1	15-Oct-19/O	8.3	5.0	4.4	1.6
COD	mg/L	5	SM 5220D	18-Oct-19/O	20	10	6	< 5
Hardness (as CaCO3)	mg/L	1	SM 3120	15-Oct-19/O	19	94	92	23
Aluminum	mg/L	0.01	SM 3120	15-Oct-19/O	0.07	0.04	0.10	< 0.01
Barium	mg/L	0.001	SM 3120	15-Oct-19/O	0.013	0.065	0.059	0.012
Boron	mg/L	0.005	SM 3120	15-Oct-19/O	0.007	0.043	0.040	< 0.005
Calcium	mg/L	0.02	SM 3120	15-Oct-19/O	4.39	23.0	21.2	5.49
Chromium	mg/L	0.001	EPA 200.8	15-Oct-19/O	0.002	0.001	0.001	< 0.001
Cobalt	mg/L	0.0001	EPA 200.8	15-Oct-19/O	0.0012	0.0020	0.0007	< 0.0001
Copper	mg/L	0.0001	EPA 200.8	15-Oct-19/O	0.0020	0.0010	0.0017	0.0665
Iron	mg/L	0.005	SM 3120	15-Oct-19/O	8.93	6.59	7.27	0.012
Magnesium	mg/L	0.02	SM 3120	15-Oct-19/O	1.95	8.92	9.43	2.24
Manganese	mg/L	0.001	SM 3120	15-Oct-19/O	0.048	1.65	0.920	0.005
Potassium	mg/L	0.1	SM 3120	15-Oct-19/O	1.2	5.4	4.5	1.2
Silicon	mg/L	0.01	SM 3120	15-Oct-19/O	8.82	10.1	9.34	7.18
Sodium	mg/L	0.2	SM 3120	15-Oct-19/O	2.6	5.5	5.1	1.9
Strontium	mg/L	0.001	SM 3120	15-Oct-19/O	0.029	0.165	0.138	0.038

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Lab Manager

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P.O. NUMBER:
WATERWORKS NO.

			Client I.D.		BH-01-12D	BH-01-13D	BH01-14	R1 (Residential)
			Sample I.D.		B19-32478-5	B19-32478-6	B19-32478-7	B19-32478-8
			Date Collected		07-Oct-19	07-Oct-19	07-Oct-19	07-Oct-19
Parameter	**Units**	**R.L.**	**Reference Method**	**Date/Site Analyzed**				
Zinc	mg/L	0.005	SM 3120	15-Oct-19/O	< 0.005	< 0.005	< 0.005	< 0.005

Michelle Dubien
Lab Manager

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

CADUCEON™ ENVIRONMENTAL LABORATORIES
Client committed. Quality assured.

CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: G80177

REPORT No. B19-32478

Report To:

Greenview Environmental Management
13 Commerce Crt., PO Box 100
Bancroft Ontario K0L1C0
Attention: Tyler Casey

Caduceon Environmental Laboratories
285 Dalton Ave
Kingston Ontario K7K 6Z1
Tel: 613-544-2001
Fax: 613-544-2770

DATE RECEIVED: 09-Oct-19
DATE REPORTED: 29-Oct-19
SAMPLE MATRIX: Groundwater

JOB/PROJECT NO.: Round Lake WDS
P.O. NUMBER:
WATERWORKS NO.

			Client I.D.		QA/QC (Surveillance)	BH-6	BH95-10	QA/QC (Routine)
			Sample I.D.		B19-32478-9	B19-32478-10	B19-32478-11	B19-32478-12
			Date Collected		07-Oct-19	07-Oct-19	07-Oct-19	07-Oct-19
Parameter	Units	R.L.	Reference Method	Date/Site Analyzed				
Alkalinity(CaCO3) to pH4.5	mg/L	5	SM 2320B	10-Oct-19/O	11	23	31	23
Chloride	mg/L	0.5	SM4110C	18-Oct-19/O	< 0.5	< 0.5	16.5	< 0.5
Nitrite (N)	mg/L	0.05	SM4110C	18-Oct-19/O	< 0.05	< 0.05	< 0.05	< 0.05
Nitrate (N)	mg/L	0.05	SM4110C	18-Oct-19/O	< 0.05	< 0.05	0.16	< 0.05
Sulphate	mg/L	1	SM4110C	18-Oct-19/O	3	< 1	4	< 1
Phosphorus-Total	mg/L	0.01	E3199A.1	09-Oct-19/K	0.11			
Total Kjeldahl Nitrogen	mg/L	0.1	E3199A.1	09-Oct-19/K	0.5			
Ammonia (N)-Total	mg/L	0.01	SM4500-NH3-H	10-Oct-19/K	0.05			
TDS (Calc. from Cond.)	mg/L	1	Calc.	11-Oct-19	30	29	64	30
Dissolved Organic Carbon	mg/L	0.2	EPA 415.1	15-Oct-19/O	14.7	1.9	2.0	1.7
COD	mg/L	5	SM 5220D	18-Oct-19/O	36			
Hardness (as CaCO3)	mg/L	1	SM 3120	15-Oct-19/O	22	20	43	20
Aluminum	mg/L	0.01	SM 3120	15-Oct-19/O	0.41			
Barium	mg/L	0.001	SM 3120	15-Oct-19/O	0.011	0.008	0.016	0.009
Boron	mg/L	0.005	SM 3120	15-Oct-19/O	< 0.005	0.010	0.018	0.009
Calcium	mg/L	0.02	SM 3120	15-Oct-19/O	5.00			
Chromium	mg/L	0.001	EPA 200.8	15-Oct-19/O	0.003	< 0.001	0.001	< 0.001
Cobalt	mg/L	0.0001	EPA 200.8	15-Oct-19/O	0.0024			
Copper	mg/L	0.0001	EPA 200.8	15-Oct-19/O	0.0083			
Iron	mg/L	0.005	SM 3120	15-Oct-19/O	0.724	0.172	0.011	0.170
Magnesium	mg/L	0.02	SM 3120	15-Oct-19/O	2.19			
Manganese	mg/L	0.001	SM 3120	15-Oct-19/O	0.065	0.271	< 0.001	0.275
Potassium	mg/L	0.1	SM 3120	15-Oct-19/O	0.6			
Silicon	mg/L	0.01	SM 3120	15-Oct-19/O	9.08			
Sodium	mg/L	0.2	SM 3120	15-Oct-19/O	2.9	3.5	6.7	3.5

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Michelle Dubien
Lab Manager

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SAMPLE MATRIX: Groundwater

JOB/PROJECT NO.: Round Lake WDS
P.O. NUMBER:
WATERWORKS NO.

			Client I.D.		QA/QC (Surveillance)	BH-6	BH95-10	QA/QC (Routine)
			Sample I.D.		B19-32478-9	B19-32478-10	B19-32478-11	B19-32478-12
			Date Collected		07-Oct-19	07-Oct-19	07-Oct-19	07-Oct-19
Parameter	**Units**	**R.L.**	**Reference Method**	**Date/Site Analyzed**				
Strontium	mg/L	0.001	SM 3120	15-Oct-19/O	0.032			
Zinc	mg/L	0.005	SM 3120	15-Oct-19/O	< 0.005			

M. Dubien

Michelle Dubien
Lab Manager

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

Appendix E

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: Round Lake WDS
Location (e.g. street address, lot, concession): Lot 27, Concession III, geographic Township of Richards, Township of Killaloe, Hagarty, and Richards
GPS Location (taken within the property boundary at front gate/front entry):
North American Datum (NAD83) are 299418.0 metres (m) East, 5055794.0 m North, in Zone 18T
Municipality: Township of Killaloe, Hagarty, and Richards

Client and/or Site Owner: Township of Killaloe, Hagarty, and Richards

Monitoring Period (Year): 2019
This Monitoring Report is being submitted under the following:

- Certificate of Approval No.: A412303
- Director's Order No.: _____
- Provincial Officer's Order No.: _____
- Other: _____

Report Submission Frequency: Annual [X] Other [ ] specify : _____

The site is: active [ ] inactive [X] 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 [X]
If yes, provide details: _____

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

If no, list exceptions:

See report

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

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 or attach additional information.

Groundwater Sampling Location	Description/Explanation for change (change in name or location, additions, deletions)	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:

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

If no, the potential design and operational concerns/exceptions are as follows:

See report

6) The site meets compliance and assessment criteria.

☒ Yes ☐ No

If no, list and explain exceptions

See 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.

See report

8) 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. The site has developed stable leachate mound(s) and stable leachate plume geometry/concentrations; and
   ii. Seasonal and annual water levels and water quality fluctuations are well understood.

[X] Yes Note which practice(s): (a) [ ] b) [X] c) [X]
[ ] No

9) Have trigger values for contingency plans or site remedial actions been exceeded (where they exist):

[ ] Yes [X] No [ ] Not applicable

If yes, list value(s) that are/have been exceeded and follow-up action taken

See report

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: _____.

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:

_____

☒ No changes to the site design and operation are recommended
☐ The following change(s) to the site design and operation is/are recommended:

_____

_____

Name: Dan Hagan, P.Geo. Seal:

Signature: _____ Date: Mar26-20

CEP Contact Information:
Company: Greenview Environmental Address:
Telephone No.: Fax No. : E-mail Address:
613-332-0057
dan.hagan@greenview-environmental.ca

Co-signers for additional expertise provided:

Signature: _____ Date: _____

Signature: _____ Date: _____

Appendix F

Greenview
ENVIRONMENTAL MANAGEMENT

Statement of Service Conditions and Limitations

Provision of Services and Payment

Upon documented acceptance of Greenview's proposed services, costs and associated terms by the client, Greenview may commence work on the proposed services directly. Upon retention of Greenview's services related to this project, the client agrees to remit payment for the services rendered for the specified period within (30) days of receipt as invoiced by Greenview on a typical monthly basis, unless otherwise arranged between the client and Greenview. In the event of non-payment by the client, Greenview reserves the right, without external influence or expense, to discontinue services and retain any documentation, data, reports, or other project information until such time as payment is received by Greenview.

Warranty, Limitations, and Reliance

Greenview relies on background and historical information from the client to determine the appropriate scope of services to meet the client's objectives, in accordance with applicable legislation, guidelines, industry practices, and accepted methodologies.

Greenview provides its services under the specific terms and conditions of a specific proposal (and where necessary formal contract), in accordance with the above requirements and the *Limitations Act 2002,* as amended, only.

The hypotheses, results, conclusions, and recommendations presented in documentation authored by Greenview are founded on the information provided by the client to Greenview in preparation for the work. Facts, conditions, and circumstances discovered by Greenview during the performance of the work requested by the client are assumed by Greenview to be part of preparatory information provided by the client as part of the proposal stage of the project. Greenview assumes that, until notified or discovered otherwise, that the information provided by, or obtained by Greenview from, the client is factual, accurate, and represents a true depiction of the circumstances that exist related to the time of the work.

Greenview relies on its clients to inform Greenview if there are changes to any related information to the work. Greenview does not review, analyze or attempt to verify the accuracy or completeness of the information or materials provided, or circumstances encountered, other than in accordance with applicable accepted industry practice. Greenview will not be responsible for matters arising from incomplete, incorrect or misleading information or from facts or circumstances that are not fully disclosed to or that are concealed from Greenview during the period that services, work, or documentation preparation was performed by Greenview.

Facts, conditions, information and circumstances may vary with time and locations and Greenview's work is based on a review of such matters as they existed at the particular time and location indicated in its documentation. No assurance is made by Greenview that the facts, conditions, information, circumstances or any underlying assumptions made by Greenview in connection with the work performed will not change after the work is completed and documentation is submitted. If any such changes occur or additional information is obtained, Greenview should be advised and requested to consider if the changes or additional information affect its findings or results.

When preparing documentation, Greenview considers applicable legislation, regulations, governmental guidelines and policies to the extent they are within its knowledge, but Greenview is not qualified to advise with respect to legal matters. The presentation of information regarding applicable legislation, regulations, not intended to and should not be interpreted as constituting a legal opinion concerning the work completed or conditions outlined in a report. All legal matters should be reviewed and considered by an appropriately qualified legal practitioner.

Greenview's services, work and reports are provided solely for the exclusive use of the client which has retained the services of Greenview and to which its reports are addressed. Greenview is not responsible for the use of its services, work or reports by any other party, or for the reliance on, or for any decision which is made by any party using the services or work performed by or a report prepared by Greenview without Greenview's express written consent. Any party that uses, relies on, or makes a decision based on services or work performed by Greenview or a report prepared by Greenview without Greenview's express written consent, does so at its own risk. Except as set out herein, Greenview specifically disclaims any liability or responsibility to any third party for any loss, damage, expense, fine, penalty or other such thing which may arise or result from the use of, reliance on or decision based on any information, recommendation or other matter arising from the services, work or reports provided by Greenview.

Site Reviews and Assessments

A site assessment is created using data and information collected during the investigation of a site and based on conditions encountered at the time and particular locations at which fieldwork is conducted. The information, sample results and data collected represent the conditions only at the specific times at which and at those specific locations from which the information, samples and data were obtained and the information, sample results and data may vary at other locations and times. To the extent that Greenview's work or report considers any locations or times other than those from which information, sample results and data were specifically received, the work or report is based on a reasonable extrapolation from such information, sample results and data but the actual conditions encountered may vary from those based on extrapolations.

Only conditions, and substances, at the site and locations chosen for study by the client are evaluated; no adjacent or other properties are evaluated unless specifically requested by the client. Any physical or other aspects of the site that were not chosen for study by the client, or any other matter not specifically addressed in a report prepared by Greenview, are beyond the scope of the work performed by Greenview and such matters have not been investigated or addressed.

Confidentiality

Greenview provides proposals, reports, assessments, designs, and any other work for the sole party identified as the client or potential client in the case of proposals.

For proposals specifically, the information contained therein is confidential, proprietary information, and shall not be reproduced or disclosed to any other party than to that of the addressee of the original proposal submission, without prior written permission of Greenview.