2024 Annual Report

Final

Norway Lake Waste Transfer Site
ECA No. A411702

March 27, 2025

Jp2g Project # 22-6213D

Jp2g Consultants Inc.
ENGINEERS · PLANNERS · PROJECT MANAGERS

Table of Contents

Tables

Figures

Appendices

Distribution List

PDF	Association / Company
1	Township of Greater Madawaska
1	Ministry of the Environment, Conservation and Parks
1	Jp2g Consultants Inc.

Jp2g Consultants Inc. Signatures

Report Prepared By: _____
Abdul Kader Alhaj, EIT
Environmental Technologist | Environmental Services

Report Reviewed By: _____
Kevin Mooder, MCIP RPP
Manager | Environment Services

Report Reviewed and Approved By: _____
Andrew Buzza, P.Geo
Senior Hydrogeologist

PROFESSIONAL GEOSCIENTIST
ANDREW BUZZA
PRACTISING MEMBER
0942
March 27, 2025
ONTARIO

Executive Summary

Jp2g Consultants Inc. (Jp2g) was retained by the Township of Greater Madawaska to conduct the 2024 ground and surface water monitoring at the Norway Lake Waste Disposal Site (WDS or landfill), located on part of Lot 20, Concession 7 within the geographic Township of Bagot, in the Township of Greater Madawaska. The site is located approximately five (5) kilometers east of the Village of Calabogie, at 574 Norway Lake Road. The Norway Lake site was closed to landfill operations in 2002, and final closure of the waste mound was completed in 2007. Since 2002, the Norway Lake site has operated as a municipal solid waste and recycling transfer station (WTS) only.

The Norway Lake WTS operates in accordance with Environmental Compliance Approval (ECA) No. A411702, for the transfer of municipal solid waste and Blue Box recycling material to GFL Environmental Inc. for disposal and processing. Other materials are stored and transferred off site. The site consists of a 1.37 ha waste disposal/transfer site within a total site area of 18.47 ha.

A Revised Design & Operations Plan for the Norway Lake Waste Disposal Site (Greenview, 2022) was submitted to the Ministry of the Environment, Conservation and Parks (and or the Ministry) as supporting documentation for an amended ECA on May 11, 2022. The amended ECA No. A411702 was issued March 17, 2023.

The groundwater flow direction at the site in 2024 was similar to historical interpretations in the overburden and bedrock aquifers. The predominant groundwater flow directions in the overburden and bedrock aquifers were interpreted to be to the northeast with a minor component to the southeast.

Groundwater quality northeast, east and immediately downgradient of the site was interpreted to be impacted by the Norway Lake WTS in both the overburden and bedrock aquifers. Based on the results of the 2024 Reasonable Use Concept criteria assessment, the site was interpreted to meet the intent of Ontario Ministry Guideline B-7 at all downgradient property boundaries for a closed landfill.

Historically, surface water quality in the vicinity of the site was assessed at the seasonally inundated creek/low-lying depressional area located to the north and east of the closed waste mound. Historically, the downstream sampling location SW-1 has not been interpreted tobe significantly impacted by landfill-related factors and surface water quality was interpreted to meet Provincial Water Quality Objectives. Surface water monitoring and sampling is completed on a biennial basis. Sampling was last completed in June and September 2023. The next sampling is scheduled for spring and fall 2025.

Based on Township Greater Madawaska records approximately 12,309 vehicles visited the Norway Lake WTS in 2024 and accepted approximately 26,677 bags of waste. A recorded 453 tonnes of municipal waste were collected in 2024 and transported for final disposal to the approved waste disposal facility of GFL in Moose Creek, Ontario. Additionally, approximately 932 cubic metres of leaf and yard waste and 4,406 cubic metres of construction, demolition, and bulky waste were accepted at the Norway Lake WTS in 2024.

Recycling tonnage records indicated that 134 tonnes of Blue Box recyclables were collected and diverted including 61 tonnes of commingled containers, 36 tonnes of mixed fibres, and 37 tonnes of old corrugated cardboard.

A recorded 91 tonnes of scrap metal, 36 refrigerant units and 6 tonnes of waste electronic and electrical equipment were collected from the Norway Lake WTS.

1 Introduction

Jp2g Consultants Inc. (Jp2g) was retained by the Township of Greater Madawaska to conduct the 2024 ground and surface water monitoring at the Norway Lake Waste Disposal Site (WDS or landfill), located at 574 Norway Lake Road on part of Lot 20, Concession 7 within the geographic Township of Bagot, in the amalgamated Township of Greater Madawaska (Township). This annual report summarizes the results of the 2024 monitoring program, and the results are compared to historical results dating from 2016 to 2023.Since 2002, the Norway lake site has operated as a municipal solid waste and recycling transfer station (WTS) only. The Norway Lake site was closed to landfilling operations in 2002, and final closure of the waste mound was completed in 2007. As part of the Township's long-term waste management plan, the Norway Lake site was identified for an upgrade to the site's existing municipal solid waste and recycling transfer station, similar to the transfer stations at the Township's Griffith and Mount St. Patrick sites. Construction was initiated in fall 2008 and was opened to the public on November 21, 2009. Currently the site receives Residential, Industrial, Commercial and Institutional (IC&I) waste and Blue Box recyclables which are transported to GFL Environmental Inc. (GFL) for disposal and processing.

Jp2g Consultants Inc. completed the environmental compliance program in 2024. This service was previously offered by Greenview Environmental until 2022 monitoring year. For consistency, many details in this report have been copied in part or in whole from previous reports including Greenview (2023).

1.1 Site Information

A detailed description of the site location is as follows:

- The site is located on part of Lot 20, Concession 7 within the geographic Township of Bagot, in the amalgamated Township of Greater Madawaska (Township) as shown on **Figure 1.**
- The civic address of the site is 574 Norway Lake Road.
- The site coordinates are NAD 1983 UTM Zone 18 – 367326E 5021906N.
- The site is located approximately five (5) kilometers (km) east of the Village of Calabogie, on Norway Lake Road.
- The site consists of an approved landfilling area of 1.37 hectares (ha) within a total site area of approximately 18.47 ha.
- The site operates in accordance with the Amended Environmental Compliance Approval (ECA) A411702 issued on April 9, 2013, and amended September 26, 2013 which was revoked and replaced with the ECA dated March 17, 2023 (**Appendix A**).

1.2 Site Ownership and Key Personnel

Site operations are directed by the Township. Contacts for the municipality and the Competent Environmental Practitioner (CEP) for both groundwater and surface water as defined by the Ministry (2010) are as follows:

Municipal Contact
Township of Greater Madawaska
Leonard Emon
Facilities Manager
Phone: 613.752.2249
Email: lemon@greatermadawaska.com

CEP Contact
Jp2g Consultants Inc.
Andrew Buzza, P.Geo
Sr. Hydrogeologist
Email: andrew.buzza@jp2g.com

1.3 Site Development of the Waste Disposal Site

The following section provides a general description of the site, including operational details:

Environmental Compliance Approval:
The site operates under ECA No. A411702 dated March 17, 2023 (**Appendix A**).

Site Status:
The site is currently operating as a waste transfer facility.

Site Capacity:
Unknown.

Projected Site Life:
Site is closed for landfilling.

Area of current waste cell footprint and approved footprint:
The current ECA recognizes a 1.37 ha landfilling area within a total site area of 18.47 ha.

Dates when the site opened, operated and closed as applicable:
The site was opened in the 1960's and ceased receiving municipal solid waste in 2002.

Information on final cover, slopes and engineering controls:
Final cover was applied in 2007.

Any Permits To Take Water associated with the site:
There are no permits to take water associated with the site.

Other authorizing and/or control instruments associated with the site:
There are no storm water management facilities associated with the site.

Description of any leachate collection systems; and any sewage works, including the C of A number of the works:
The closed Norway Lake Waste Disposal Site is designed for the natural attenuation of leachate. There are no collection systems or sewage works at the site.

Any site developments which occurred during the year of the monitoring report:
None

Any new developments in the vicinity of the site of relevance from a monitoring perspective:
None.

Historical Site Overview

Environmental Baseline Investigations which were undertaken:
Investigations of the Norway Lake Waste Disposal Site have been carried out since 1996. Reports have been submitted annually to the Ministry.

Design and Construction of the Site:
The site design, development and operational requirements for the WTS are outlined in Greenview (2023) referenced in item 31 in Schedule A of the ECA.

Development of environmental monitoring systems:
Environmental monitoring is conducted annually in accordance with Condition 8 and Schedule 2 and 3 of the ECA.

Conceptual site model:
Infiltrating groundwater at the site will migrate vertically through more porous overburden material until intersected by the shallow groundwater table over bedrock. Groundwater flow is governed by local topography predominantly to be downhill to the north and northeast.

Initial placement of waste materials:
Within the 1.37 ha landfilling area.

Filling, closure and placement of final cover over waste cells:
Final cover applied in 2007.

Problems associated with of final cover over waste:
There have been no documented issues with final cover of the waste disposal site.

Date of site closure, actual or projected, including any closure plans:
Closed in 2002.

1.4 Ministry Consultation

On August 28, 2008, the Ministry issued an Amendment to the ECA for the Norway Lake site, defining changes in types and volumes of acceptable waste and recyclables allowed on-site, and procedures for the storage and transfer of source separated organic waste.

The Township received Ministry Technical Support Section (TSS) surface water review comments, dated March 5, 2012, on the 2010 Annual Report (Greenview, 2011). The TSS agreed to the discontinuation of surface water sample collection at surface water sampling locations SW2 and SW3, as the locations were historically observed to be shallow, stagnant pools of water with no flow or limited flow conditions.

The Township also received TSS groundwater review comments, dated October 4, 2012, on the 2011 Annual Report (Greenview, 2012), and further to the subsequent site meeting involving Township representatives and Ministry, the TSS provided an Addendum to the October 4, 2012, review comments (Greenview, 2013). The Ministry TSS agreed that groundwater quality at monitoring well 08-11 was impacted by road salt utilized by the Township for winter road maintenance and amended the interpretation of non-compliance of the site with Ministry Guideline B-7. The TSS agreed that historical overburden groundwater quality prior to fall 2009 from monitoring well 08-12 could be used for assessing compliance with the Reasonable Use Concept (RUC) and conformance with Ministry Guideline B-7. A consistent calculation for background bedrock groundwater quality

was also initiated at that time, using groundwater quality results from prior to fall 2009 from background bedrock well BR-2 to calculate median background groundwater quality for the site. These practices have been continued for this 2023 Annual Report.

The Township provided response comments to the Ministry on the draft Amended ECA (February 28, 2012), and the surface water review comments (March 5, 2012) in correspondence, dated October 31, 2012. Following the submission, the Ministry issued an Amended ECA on April 9, 2013.

Condition 5.1 of the Amended ECA required the Township to submit a Contingency Plan by June 3, 2013. The Contingency Plan was submitted to the Ministry Environmental Approvals Branch (EAB) by Greenview on behalf of the Township on May 31, 2013 (Greenview, 2014). Subsequent to the submission of the Contingency Plan, an Amendment to the ECA was issued by the Ministry on September 26, 2013.

On September 29, 2014, the Township received TSS groundwater review comments on the 2012 Annual Report dated February 5, 2014 (Greenview, 2015). The review comments noted that the Norway Lake site was interpreted to be in conformance with Ministry Guideline B-7 and the monitoring schedule and analytical program were deemed to be satisfactory. On January 20, 2015, the Township received TSS surface water review comments on the 2013 Annual Report dated January 14, 2015 (Greenview, 2015). The TSS surface water review noted that the surface water system in the vicinity of the Norway Lake site was not adversely impacted from former and current site operations, and that the current surface water monitoring program and schedule at the site was sufficient.

On March 16, 2016, the Township requested approval from the Ministry Ottawa District Office to amend the operating hours for the transfer station at the Norway Lake Waste Disposal Site (Greenview, 2017). On May 12, 2016, the Ministry Ottawa District Office provided the Township with an electronic letter confirming the Ministry 's approval to amend the hours of operation of the transfer station effective May 21, 2016 (Greenview, 2017).

On June 14, 2019, the Township received TSS surface water review comments on the 2017 Annual Report, dated June 12, 2019. The Ministry TSS reviewer noted that the seasonal creek at the site was not being impacted by landfill-related factors. The reviewer noted that it was premature to cease the surface water monitoring program at the site; however, they noted that they would be agreeable to reduce the frequency of the surface water monitoring program. Subsequent communications between Greenview and the Ministry clarified the intended wording of the Ministry review and reducing the frequency of the surface water monitoring program to a biennial program (once every two [2] years, in spring and fall) was confirmed (Greenview, 2020).

On January 04, 2022, Design Operations Plan was provided to the Ministry Ottawa District Office for preliminary review and as part of the Township's obligation to initiate a Pre-Submission Meeting with the Ministry relative to the planned ECA Application for 2022. The Pre-Submission Meeting was held between representatives of the Ministry, Greenview, and the Township on January 20, 2022. Formal submission of the ECA Application package, including the Revised Design and Operations Plan, was submitted to the Ministry on May 11, 2022 under review by the Ministry (5066-CEBKYF). The amended ECA was issued March 17, 2023.

The Ministry filed an Inspection Report dated November 21, 2022, which was not acknowledged in the 2022 Annual Report (Greenview, 2023). A copy is included in **Appendix B**. The inspection identified the following:

- The Township shall include a monthly summary of all waste received and transferred from the site in the Annual Report.
- Ensure that forms are completed in a consistent manner.

- Details of burning leaf and yard waste be included in the Annual Report and destination of the ash.

These requirements are included in this report.

1.5 Purpose and Scope

Jp2g Consultants Inc. (Jp2g) was retained to conduct ground and surface water sampling in 2024, and provide an overview of the annual monitoring, environmental compliance, and operations at the Norway Lake site in accordance with Condition 19 of the ECA (A411702), including the following:

- Groundwater quality assessment and RUC (Ministry Guideline B-7) compliance
- Surface water quality assessment
- Site operational overview and capacity assessment.
- Preparation of an annual report that summarises the results of the monitoring program and submitting the report to the Ministry.

2 Site Description

The following sections present a summary of the physical characteristics for the Norway Lake WDS and is based in part on the descriptions in the Annual Monitoring Reports 2008-2022 prepared by Greenview (2009-2023).

2.1 Topography and Drainage

Local topography in the vicinity of the Norway Lake site is characterized by granite and gneissic marble bedrock outcrops, while the topography of the actual site area is of relatively flat to hummocky terrain (Golder Associates Ltd. [Golder], 2007). The former landfilling area at the site is relatively flat; however, the adjacent ground surface topography slopes towards low-lying areas located to the southeast, east, and northeast of the waste mound.

A topographic depression exists in the northern corner of the contaminant attenuation zone (CAZ), in which a seasonally inundated creek is located, and which is sampled by the two (2) existing surface water sampling locations at the site, SW-1 and SW-4. The seasonally inundated creek was historically interpreted to be a localized zone of potential groundwater discharge present during periods when the shallow groundwater table is elevated, primarily in the spring and fall.

A dormant aggregate resource area, locally identified as Burke's Pit, is located to the southwest of the site in the vicinity of monitoring wells OB-11R and OB-12, and adjacent to Norway Lake Road.

2.2 Hydrogeological Conditions

In the southern and western portions of the site, overburden geology is characterized by a thin layer of fine sand to silty sand, ranging from 0.3 m to 4.2 m, overlying fractured granite and gneissic marble. A layer of peat was determined to be present over the sandy overburden layer in the vicinity of monitoring well OB-2 (Golder, 2007).

To the north of the site, in the vicinity of the seasonally inundated creek, overburden geology is characterized by silty to coarse sand from surface to a depth of 3.7 m, underlain by a bedrock unit characterized by gneiss, marble, and fractured granite (Golder, 2007).
On the southwest side of Norway Lake Road in Burke's Pit overburden geology is characterized by fine to coarse

sand with trace gravel and/or cobbles, with auger refusal encountered at depths of 2.15 m to 3.65 m bgs (Golder, 2007). Based on observations during the installation of replacement monitoring well OB-11 R in October 2018, bedrock was interpreted at a depth of 4.22 m, and overburden was observed to be generally fine to coarse-grained sand with gravel (Greenview, 2023).

Historically, overburden and bedrock groundwater was interpreted to flow predominantly towards the east, with a localized component of radial flow away from the waste mound. Prior to the 2007 groundwater monitoring program, groundwater in the overburden aquifer in the vicinity of Burke's Pit (southwest of the waste mound) was reported to flow to the east and west (Golder, 2007). Generally, the groundwater flow direction is to the north and northeast.

All available borehole logs for monitoring wells at the Norway Lake site are included in **Appendix C**. The available borehole logs include details regarding well construction for the corresponding monitoring wells.

2.3 Land Use and Zoning

The Norway Lake Site is designated Active and Inactive Waste Disposal Site on Schedule "A" of the County Official Plan. Adjacent lands are designated Rural. On Schedule "A" of the Township of Greater Madawaska Zoning By-Law, the site is zoned Disposal Industrial (DM) and Disposal Industrial Exception 1 (DM-E1) for the land area east of the waste mound that is used for CAZ purposes. Adjacent land use is zoned Rural (RU) and a dormant mineral aggregate resource area (Burke's Pit) directly southwest of the landfill on the southwest side of Norway Lake Road is zoned Extractive Industrial Resource (EMR).

2.4 Operational Setting

The site is closed for landfilling (since 2002) but operates as a transfer station. The operational area is 1.37 ha within a total licensed site area of approximately 18.47 ha.

As part of waste transfer operations at the site, the Township maintains a waste and recycling depot which was opened to the public on November 21, 2009. Municipal waste and Blue Box recycling received at the site is transferred to GFL Environmental Inc. for disposal, processing, and market. Scrap metal, tires and other recyclables are transferred to other processing sites. Bulky and C&D waste are stored and then transferred to the Black Donald or Mount St. Patrick sites for processing and disposal.

The site is currently approved under ECA Conditions 7.5 and 7.5 to accept up to 200 cubic metres (m^3) of solid non-hazardous waste and recyclables per day, and the maximum amount of non-hazardous solid waste and recyclable materials to be stored or be present at the site at any given time cannot exceed 3613.26 m^3.

3 Environmental Monitoring Program

The following sections present a methodology of the environmental monitoring program conducted at the Norway Lake site in 2024.

3.1 Monitoring Locations

Table 1 (provided at the end of the text) summarizes the location of monitoring wells and surface water monitoring stations. All monitoring locations including groundwater wells and the surface water monitoring stations are provided in **Figure 2**. Borehole logs are provided in **Appendix C**, and **Appendix D** contains photographs of the wells and surface water monitoring stations in 2024.

3.1.1 Groundwater Monitoring Locations

Eighteen ground water wells and nine mini piezometers have been installed at and around the Norway Lake WDS. In 2024, water levels were measured at all monitoring locations, and groundwater samples were collected from selected wells. Details of the sampled wells are as follows:

- **Monitoring Well BR-1**
  Located approximately 75 m southeast of the former disposal area at the site.
- **Monitoring Well BR-2**
  Located approximately 175 m southeast of the Approved Waste Disposal Area AWDA.
- **Monitoring Well BR-8**
  Located approximately 300 m east and downgradient of the site and upgradient of the low-lying area east of the Norway Lake waste mound.
- **Monitoring Well BR-9**
  Located approximately 400 m east and downgradient of the site and upgradient of the low-lying area east of the Norway Lake waste mound.
- **Monitoring Well BR-10**
  Located on the southern boundary of the existing limit of waste at the site.
- **Monitoring well OB-3**
  Located approximately 80 m downgradient and southeast of the former disposal area.
- **Monitoring Well OB-8**
  Located approximately 220 m northeast of the eastern corner of the former disposal area.
- **Monitoring Well OB-11R**
  Located on the southwest side of the Norway Lake Road in Burke's Pit.
- **Monitoring Well OB-12**
  Background Monitoring Well located on the southwest side of the Norway Lake Road in Burke's Pit.

3.1.2 Surface Water Monitoring Locations

The two active surface water stations are:

- **Monitoring Location SW-1**
  located approximately 80 m downstream of surface water location SW-4
- **Monitoring Location SW-4**
  Background surface water station Sw-4 is located approximately 420 m northeast of the former disposal area on a seasonally inundated creek.

3.2 Monitoring Procedures and Methods

All samplings were completed in general accordance with Jp2g Consultants Inc. standard operating procedures. Sampling methods and quality assurance measures are summarized and provided in **Appendix E**.

3.3 Groundwater Monitoring Program 2024

Historically, sampling at the site was completed in May/June and August/September. In 2024, samples were collected by Jp2g staff in July and November. The monitoring included the recording of groundwater levels and the collection of water quality samples from selected groundwater monitoring stations. **Table 2** summarizes the groundwater monitoring completed in 2024.

As part of the 2024 monitoring program, BR-1 was sampled for VOCs during fall sampling event.

Field measurements of pH, conductivity, temperature, and dissolved oxygen (DO) were recorded at each respective groundwater well as part of the sampling process. The field sampling records and results of the 2024 groundwater monitoring program are presented in **Appendix I**.

3.4 Surface Water Monitoring Program 2024

Surface water monitoring and sampling is completed on a biennial basis and accordingly the last sample for surface water was completed in June and September 2023. The next sampling is scheduled for 2025. **Table 2** summarizes the surface water monitoring completed in 2023.

3.5 Analytical Laboratory Accreditation

All samples were submitted for analysis to Caduceon Environmental Laboratories (Caduceon), located in Ottawa, 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 Ministry to perform analysis on drinking water in Ontario in accordance with the Safe Drinking Water Act.

3.6 Landfill Gas Monitoring

Landfill gas monitoring is not part of the current environmental monitoring program at the site. However, WDS gas measurements were conducted at all monitoring wells in spring and fall 2024 using a handheld gas meter. There were no detections of methane at any location during the 2024 monitoring events. The waste mound at the Norway Lake site is covered with porous soil materials, allowing natural gas flux to the atmosphere. Overburden geology at and adjacent to the site is characterized by shallow, sandy materials, overlying a dense bedrock unit. 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.

3.7 Operational Monitoring

Operational monitoring at the Norway Lake site is minimal. Daily waste records are completed as part of the regular site operations in part to track transfer activities and vehicular traffic. The Township submits annual reports in accordance with the Municipal Datacall, inclusive of the Norway Lake site, to the Resource Productivity and Recovery Authority (RPRA).

4 Environmental Monitoring Results

4.1 Historical Data

Historical static water level and sampling results are presented in earlier reports completed by Greenview Environmental and are summarized in **Appendix F** of this report.

4.2 Groundwater Flow Monitoring 2024

Static water levels from select monitoring locations were measured in July and November 2024, and are summarized in **Appendix G**. Overburden ground water flow patterns are provided in **Figures 3a** and **4a** for the July and November sampling events respectively. Bedrock ground water flow patterns are provided in **Figures 3b** and **4b** for the July and November sampling events respectively.

In 2024, the interpreted groundwater flow at the site was interpreted to be consistent with historical results, as groundwater was interpreted to flow generally to the northeast with a minor component of flow to the southeast.

4.3 Groundwater Quality Assessment

4.3.1 Background and Leachate Assessment Criteria

Groundwater at landfill sites is generally assessed with regard to the criteria specified in the Ontario Drinking Water Quality Standards (ODWQS). The ODWQS is split into health and non-health related parameters. Non-health related parameters are in turn split into aesthetic objectives and operational guidelines.

Background groundwater quality in the overburden aquifer at the site has historically been assessed at overburden monitoring well OB-12. Further to Ministry TSS groundwater review comments, dated December 11, 2012, the Ministry confirmed that OB-12 was being impacted by road salt and with the absence of any suitable locations for a replacement background well, the Ministry agreed that historical (stable; pre-fall 2009) groundwater quality data from OB-12 should be used for the purpose of establishing median background groundwater quality and the RUC (Greenview 2023).

Background groundwater quality in the bedrock aquifer at the site has historically been assessed at bedrock monitoring well BR-2, located approximately 175 m southeast of the Approved Waste Disposal Area AWDA (Greenview, 2023). Further to review comments dated December 11, 2012, the Ministry confirmed that BR-2 was being impacted by road salt and with the absence of any suitable locations for a replacement background well, it was agreed that historical groundwater quality data from prior to fall 2009 at background bedrock well BR-2 should be used for the purpose of calculating median background groundwater quality and the RUC (Greenview 2023).

Technical Support Section review comments dated December 11, 2012, confirmed that water quality from BR-1 was best suited to assess leachate quality at the site. (Greenview, 2023). Water quality from OB-3 is considered the most representative of impacted overburden groundwater at the site.

4.3.2 Groundwater Quality

Photos of the monitoring wells are included in **Appendix D**. The laboratory Certificates of Analysis are presented in **Appendix H,** and the results of the 2024 groundwater monitoring program are presented in **Appendix I**. Analytical data were compared to the Ontario Drinking Water Standards (ODWS) and Ministry Guideline B-7.

Overburden Wells

- **Background Monitoring Well OB-12**
  In 2024, all parameters met the ODWQS except for manganese (November only). Historically, groundwater quality at OB-12 interpreted to be impacted by road salt from winter road maintenance activities at the nearby Norway Lake Road and the transfer station of the site.

- **Monitoring Well OB-3**
  Groundwater at monitoring well OB-3 is considered most representative of leachate quality in the overburden unit given the proximity of the well to the existing limit of waste and the interpreted groundwater flow direction. In 2024, all parameters met the ODWS except for alkalinity, TDS, chloride (November only), DOC (July only), hardness, and manganese. Overburden groundwater at this location was interpreted to be impacted by landfill-related factors and winter road maintenance operations at the transfer station of the site.

- **Monitoring Well OB-8**
  In 2024, all parameters met the ODWS except for TDS (November only), DOC, and hardness (November only).

- **Monitoring Well OB-11R**
  In 2024, all parameters met the ODWS except TDS, chloride (July only), hardness, and sodium. Based on the direction of groundwater flow in the vicinity of overburden monitoring well OB-11R, it is unlikely that groundwater was impacted from landfill-related activities of the site. However, results in 2024 suggest continued impacts related to winter road maintenance activities of Norway Lake Road and the transfer station.

Bedrock Wells

- **Monitoring Well BR-1 and BR-10**
  In 2024, all parameters met the ODWS at monitoring well BR-1 except alkalinity, TDS, hardness, iron, manganese, DOC (July only), and chloride (November only). Groundwater quality results from BR-1 were interpreted to continue to be representative of leachate characterization at the site. Well BR-1 is also interpreted to be partially impacted by winter road maintenance. Volatile Organic Compound (VOCs) were analyzed at BR-1 in November and the results did not indicate any exceedance to applicable criteria.

- **Background Monitoring Well BR-2**
  In 2024, all parameters met the ODWS except TDS (November only), iron (November only), and manganese. Groundwater quality at BR-2 was interpreted to continue to be impacted by winter road maintenance activities along Norway Lake Road.

- **Monitoring Well BR-8**
  In 2024, all parameters met the ODWS. Monitoring wells BR-8 was not interpreted to be significantly impacted from landfill-related factors in 2024.

- **Monitoring Well BR-9**
  In 2024, all parameters met the ODWS. Given the close proximity of BR-9 to the low-lying area northeast of the site, groundwater results from BR-9 were also compared with PWQO. In 2024, all parameters met the PWQO except phosphorus. Phosphorus concentrations at this well were interpreted to be generally consistent with historical concentrations at background monitor BR-2 and were not interpreted to represent significant landfill-related impacts at the site.

- **Monitoring Well BR-1 and BR-10**
  In 2024, all parameters met the ODWS at monitoring well BR-10 except alkalinity, TDS, hardness, iron, manganese, chloride, barium (November) and sodium exceeded the ODWS criteria. Well BR-10 is also interpreted to be partially impacted by winter road maintenance.

Non-conformances of the ODWS limits for manganese concentrations at the Norway Lake Waste Disposal Site were not interpreted to represent significant landfill-related impacts, as similar high concentrations of manganese (and iron) have been historically documented in background groundwater at the site.

Similarly, the ODWS non-conformances of hardness in 2024 were generally consistent with historical concentrations at background monitors and were interpreted to be result of local bedrock geology. High concentrations of DOC have also historically been documented in the background at the site and are interpreted generally to natural conditions in the low-lying areas in the vicinity of the Norway Lake site. Monitoring wells BR-8 and BR-9 were not interpreted to be significantly impacted from landfill-related factors in 2024.

4.3.3 Reasonable Use Concept Assessment

The Reasonable Use Concept was developed by the Ministry to address the levels of off-site contaminants that are considered acceptable. The Reasonable Use Criteria allows for the definition of the level of contamination in the groundwater beyond which mitigative action should be undertaken. The acceptability of the landfill in terms of its impact on groundwater has been assessed in terms of the Reasonable Use Criteria (RUC). The RUC established the acceptability of change in groundwater quality (C_m) as follows:

Aesthetic Parameters
Degradation of less than 50% of the difference between the background quality and the established objective for the particular health related parameter.

Health Related Parameters
Degradation of less than 25% of the difference between the background quality and the established objective for the particular health related parameter. Acceptable concentrations are based on background levels and water quality guidelines (i.e. drinking water objectives).

The chosen background values are utilized to calculate the RUC allowable concentrations for specific parameters, as per the following formulas:

Health Related:

$$C_{allow} = P_b + (C_m - P_b) \times 25\%$$

Non-Health Related:

$$C_{allow} = P_b + (C_m - P_b) \times 50\%$$

where:

C_{allow} = Maximum allowable concentration of parameter as per the RUC guidelines.

C_m = Maximum acceptable concentration (MAC) of parameter as per the ODWS/OG.

P_b = Chosen background value of parameter

The RUC assessment was conducted using the concepts and procedures outlined in Ministry Procedure B-7-1, specifically using the median value of individual background parameter concentrations from monitoring wells BR-2 (bedrock aquifer) and OB-12 (overburden aquifer) to characterize natural groundwater quality at the site. Further to Ministry TSS Addendum, dated December 11, 2012, the Ministry confirmed that monitoring wells BR-2 and OB-12 were being impacted by road salt and with the absence of any suitable locations for replacement background wells, the Ministry agreed that historical groundwater quality data prior to fall 2009 from background wells BR-2 and OB-12 should be used for the purpose of calculating median background concentrations and the RUC.

RUC values for overburden and bedrock aquifers were generated based on historical background data for individual parameters at the site up to and including August 2009. If RUC non-conformances are noted, then action will be undertaken as appropriate and necessary in accordance with a defined groundwater contingency plan for the site. In cases where a groundwater contingency plan is not defined, a meeting with representatives of the local Ministry District office should be held to develop an appropriate contingency plan, as necessary and appropriate for the particular site.

Tables 3a and **3b** outline the Reasonable Use Criteria calculation based on the monitoring wells OB-12 and BR-2 results up to and including August 2009.

4.3.4 Reasonable Use Conclusions

The reasonable use conclusions and the indicator parameters that exceed the RUC for the 2024 sampling events are presented in **Tables 4a** and **4b.**

For assessing site compliance with the RUC and Ministry Guideline B-7, groundwater monitoring wells OB-8, BR-8 and BR-9 were used for monitoring downgradient impacts at the property boundary northeast of the waste mound. OB-11R, located in the vicinity of Burke's Pit and southwest of the site, was used for monitoring potential downgradient impacts near the property boundary southwest of the waste mound along Norway Lake Road. Background monitoring well BR-2, located southeast and generally upgradient and/or cross-gradient of the waste mound, was used to assess compliance with the RUC at the southeastern property boundary.

OB-8:

Results indicate that all parameters met the RUC criteria in June 2024 except TDS (November only), DOC, and hardness (November only). This well is located approximately two thirds of the distance to the downgradient property boundary, and it is expected that the elevated parameters will attenuate to acceptable levels within the final one third distance.

OB-11R:

Results indicate that all parameters met the RUC criteria in 2024 except barium, alkalinity, chloride (July only), hardness, sodium, and TDS. Based on the direction of groundwater flow in the vicinity of overburden monitoring well OB-11R, it is unlikely that the impacts are related to the former landfilling activities. maintenance.

BR-2:
Results indicate that all parameters met the RUC criteria except chloride (November only), TDS, Hardness, iron (November only), and manganese (November only).

BR-8 and BR-9:
Results indicate that all parameters met the RUC criteria in 2024 except for DOC. The significant distance of these two locations from the former fill area to the downgradient boundary is interpreted to be sufficient to attenuate any landfill related factors in the groundwater.

Dissolved organic carbon, hardness, and TDS concentrations have consistently been noted to be high in background groundwater monitoring locations (BR-2 and OB-12) prior to 2009 and were generally attributed to naturally occurring conditions in the vicinity of the site and in the low-lying depressional area northeast of the AWDA. Accordingly, the two downgradient bedrock locations reveal only DOC to exceed the RUC and these values are interpreted to be naturally occurring.

Overall, and based on the above lines of evidence the Norway Lake site is considered compliant with the Ministry's Guideline B-7

4.4 Surface Water Quality Assessment

4.4.1 Surface Water Assessment Criteria

Surface water at landfill sites is generally assessed regarding the criteria specified in the Provincial Water Quality Objectives (PWQO). The PWQOs are a set of ambient surface water quality criteria. In addition to the PWQOs, surface water quality results are, where relevant, compared to select Canadian Water Quality Guidelines (CWQGs).

4.4.2 Surface Water Monitoring 2024

Surface water monitoring and sampling is completed on a biennial basis. Sampling was last completed in June and September 2023. The next sampling is scheduled for spring and fall 2025.

Surface water at the site is assessed by sampling SW-1 and SW-4. Surface water location SW-4 is located approximately 420 m northeast of the former disposal area on a seasonally inundated creek that flows to the southeast (**Figure 2**). Surface water location SW-1 is located approximately 80 m downstream from SW-4.

Surface water location SW-1 has consistently been observed to be dry for all fall sampling events since 2008 (**Appendix F**).

4.5 Operations Summary

The waste management operations for Norway Lake WTS are included in **Appendix K**, and a summary of the site operations is presented below.

4.5.1 Site Operations

The site operates as a municipal solid waste and recycling transfer station, servicing residents and IC&I generators of the Township of Greater Madawaska. The site has been closed to landfilling operations since 2002. Final closure construction activities were completed for the waste mound area in 2007.

The hours of operation for the Norway Lake WTS are as follows:

Day of the Week	Hours of Operation
Wednesday	8:00 am – 4:00 pm
Saturday	8:00 am – 6:00 pm
Sunday	10:00 am – 5:00 pm
Extended Summer Hours: Sundays Victoria Day - Thanksgiving	10:00 am – 6:00 pm
Extended Summer Hours: Victoria Day Monday, August Civic Holiday Monday, Labour Day Monday, Thanksgiving Monday	12:00 pm – 6:00 pm

As per the Amended ECA dated March 17, 2023, the Norway Lake WTS is approved for the acceptance and diversion of the following waste and recyclable materials:

Waste / Recyclable Material	Quantity (units)
Residential & IC&I Waste	120 m^3
Organic Waste	20 m^3
Waste Electronic and Electrical Equipment (WEEE)	40 m^3
Blue Box Recyclables (mixed fibres/commingled containers / old corrugated cardboard)	240 m^3
Tires	100 m^3
Leaf and Yard Waste	1000 m^3
C&D and Bulk Waste	2000 m^3
Scrap Metal and White Goods	60 m^3
Refrigerants	25 m^3
Automotive Plastics	5 m^3
Fluorescent Light Bulbs	0.06 m^3
Single Use and Rechargeable Batteries	0.2 m^3
Small Propane Cylinders	1 m^3
Large Propane Cylinders	2 m^3

The Norway Lake site is well screened with surrounding trees and thick vegetation, and a screening berm and fence exist between the site and the Norway Lake Road. Lockable gates control access to the site.

The access roads at the site entrance and within the Norway Lake WTS have sufficient width to allow for unimpeded winter travel and access for emergency and snow removal equipment. The site access road was observed to be in serviceable condition during the routine site inspections conducted by Jp2g during various site visits in 2024.

On January 04, 2022, a copy of the Revised Design and Operations Plan was provided to the Ministry Ottawa District Office for preliminary review. The Pre-Submission Meeting was held between representatives of the Ministry, Greenview, and the Township on January 20, 2022. Formal submission of the ECA Application package was submitted to the Ministry on May 11, 2022. The amended ECA was issued March 17, 2023.

4.5.2 Waste Disposal / Transfer Summary

The Norway Lake WTS is currently closed to all landfilling operations; however, the site is presently operating as a municipal solid waste and recycling transfer station.

Based on Township Greater Madawaska records approximately 12,309 vehicles visited the Norway Lake WTS in 2024 and accepted approximately 26,677 bags of waste. A recorded 453 tonnes of municipal waste were collected in 2024 and transported for final disposal to the approved waste disposal facility of GFL Environmental.

Additionally, approximately 932 cubic metres of leaf and yard waste and 4,406 cubic metres of construction, demolition, and bulky waste were accepted at the Norway Lake WTS in 2024. There was no burning of brush at the site in 2024, and the material was transferred to the Mount St Patrick site to be ground in the Fall 2024.

Recycling tonnage records indicated that 134 tonnes of Blue Box recyclables were collected including 61 tonnes of commingled containers, 36 tonnes of mixed fibres, and 37 tonnes of old corrugated cardboard. These materials were transported to either the Ottawa Valley Waste Recovery Centre (OVWRC) or Emterra in Renfrew.

A recorded for 91 tonnes of scrap metal, 36 refrigerant units were collected by Yolkowski scrap metal in Renfrew. A recorded 6 tonnes of waste electronic and electrical equipment were collected from the Norway Lake Waste Disposal Site. 286 tires were collected in 2024.

4.5.3 Site Inspections and Maintenance

Site inspections of the transfer station area, waste disposal area, and property at the Norway Lake site were conducted by Jp2g July 15, 2024, and November 12, 2024 during the sampling events. The Township also conducted periodic investigations to verify the compliance status of the site. Copies are provided in **Appendix B**.

The site inspections included a cursory investigation of housekeeping and litter control aspects, monitoring well maintenance requirements in accordance with Ontario Regulation 903 (Wells), and a general site overview for MINISTRY regulatory compliance issues.

4.5.4 Monitoring and Screening Checklist

Appendix J contains a groundwater and surface water Monitoring and Screening Checklist. Based on the 2024 results, no contingency measures are required to be implemented.

5 Conclusions and Recommendations

Based on the results of the 2024 environmental monitoring program completed for the Norway Lake Waste Disposal Site, the following conclusions are provided:

- The groundwater flow direction at the site in 2024 was interpreted to be similar to historical interpretations in the overburden and bedrock aquifers. The predominant groundwater flow directions in the overburden and bedrock aquifers were interpreted to be to the northeast with a small component to the southeast from the area of the site entrace.
- Based on the results of the 2024 RUC assessment at the site, the site was interpreted to meet the intent of Ministry Guideline B-7 at the downgradient property boundaries to the north, northeast, south, and southeast of the site.
- Groundwater in the overburden aquifer southwest of the site was interpreted to be impacted by road salt from winter road maintenance activities at the transfer station of the Norway Lake site and along Norway Lake Road.
- Surface water quality in the vicinity of the site is historically assessed at the seasonally inundated creek/low-lying depressional area located to the north and east of the closed waste mound, at surface water locations SW-1 and background surface water location SW-4.
- Surface water monitoring and sampling is completed on a biennial basis. Sampling was last completed in June and September 2023. The next sampling is scheduled for spring and fall 2025.
- Based on Township records, approximately 12,309 vehicles visited the Norway Lake WTS in 2024, and accepted approximately 26,677bags of waste. A recorded 453 tonnes of municipal waste were collected in 2024 and transported for final disposal to the approved waste disposal facility of GFL Environmental. Additionally, approximately 932 m^3 of leaf and yard waste and 4,406 m^3 of C&D and bulky waste were accepted at the Norway Lake WTS in 2024.
- Recycling tonnage records indicated that 134 tonnes of Blue Box recyclables were collected including 61 tonnes of old commingled containers, 36 tonnes of mixed fibres, and 37 tonnes of old corrugated cardboard.
- A recorded 91 tonnes of scrap metal, 36 refrigerant units and 6 tonnes of waste electronic and electrical equipment were collected from the depots at the Norway Lake WTS. 286 tires were collected in 2024.

5.1 Groundwater Monitoring 2025

No changes to groundwater monitoring are recommended for 2025. Groundwater monitoring should continue to occur twice per year (May/June, August/September) and consist of the following (see **Table 5**):

- Water levels at all locations should be collected.
- Any wells that are found to be damaged should be repaired or replaced.
- Groundwater samples should be collected from all locations as per **Table 5** in May/June and August/September and include appropriate duplicate samples; and
- Samples should be analyzed for the parameters listed in **Table 5**.

5.2 Surface Water Monitoring 2025

Surface water monitoring and sampling are conducted on a biennial basis, with the next sampling scheduled for spring and fall 2025. The monitoring program in 2025 should include the following (see **Table 5**):

- Collect surface water from SW1 and SW4.
- Collect samples in May/June, August/September.
- Samples should be analyzed for the parameters listed in **Table 5.**
- Un-ionized ammonia should be calculated using field results.

6 References

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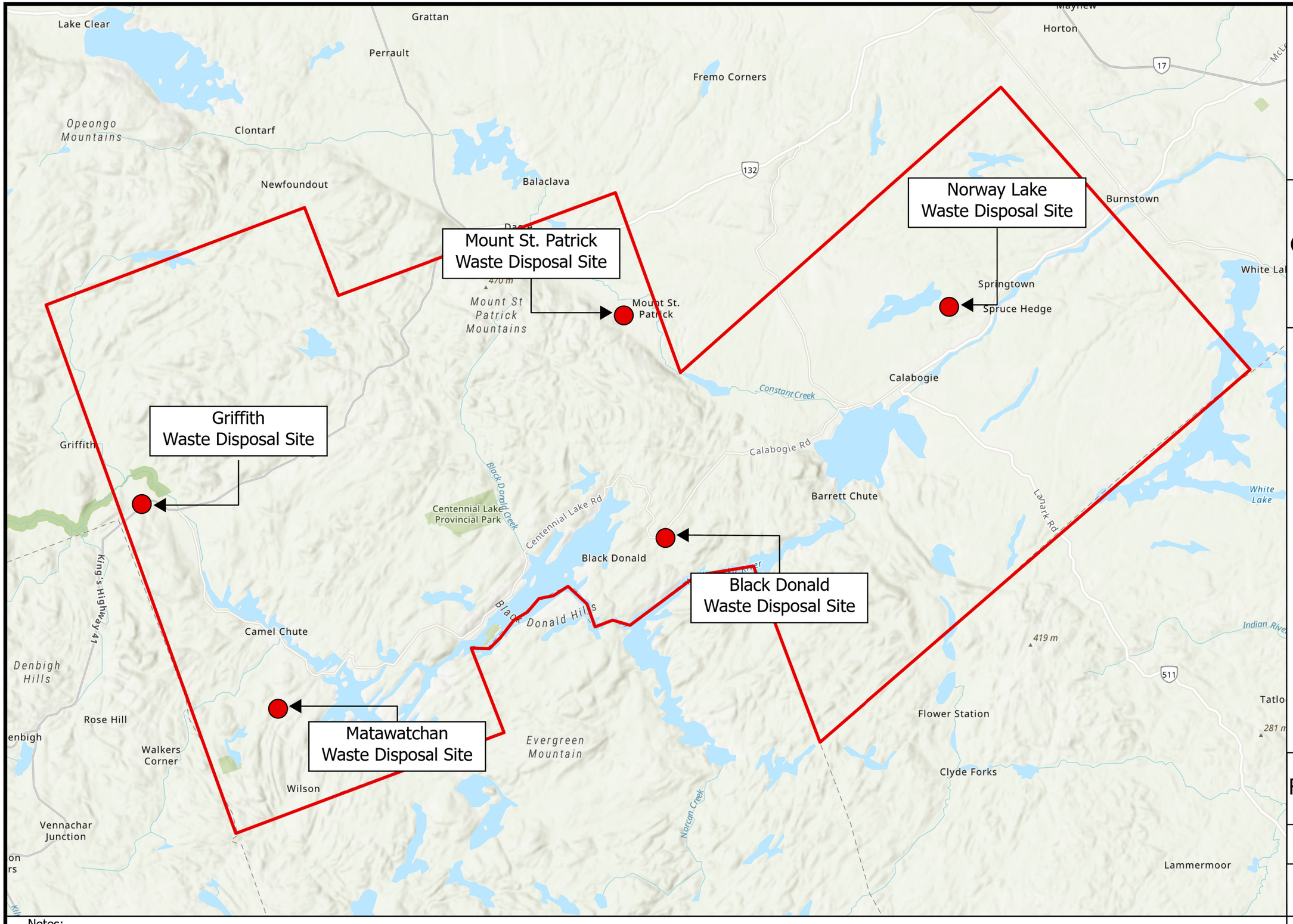
SGS Lakefield Research Ltd., 2005. 2004 Annual Report, Norway Lake Waste Disposal Site. March 28, 2005.

LIMITATIONS AND USE OF THE REPORT

This report was prepared for the exclusive use of the Township of Greater Madawaska. Any use which a third party makes of this report, or and reliance on, or decisions to be made based on it, are the responsibilities of such third parties. Jp2g Consultants Inc. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

This landfill impact report involves a limited sampling of locations to assess the probability of contamination on site. The test data, chemical analyses, and conclusions given herein are the results of analyzing the groundwater encountered during the sampling programs. Based upon the total number of test holes performed, these are considered to be fairly representative of the groundwater conditions within each area tested. It should be noted, however, that any assessment regarding the presence of contamination on the property is based on interpretation of conditions determined at specific locations and depths. Chemical results are limited to those parameters tested.

Figures



N

Township of Greater Madawaska

Waste Disposal Sites

LEGEND

- Waste Disposal Site
- Township Boundary

1:250 0000

0 2,5005,000 10,000 Meters

Regional Location Plan

Project No. 22-6213C Greater Madawaska

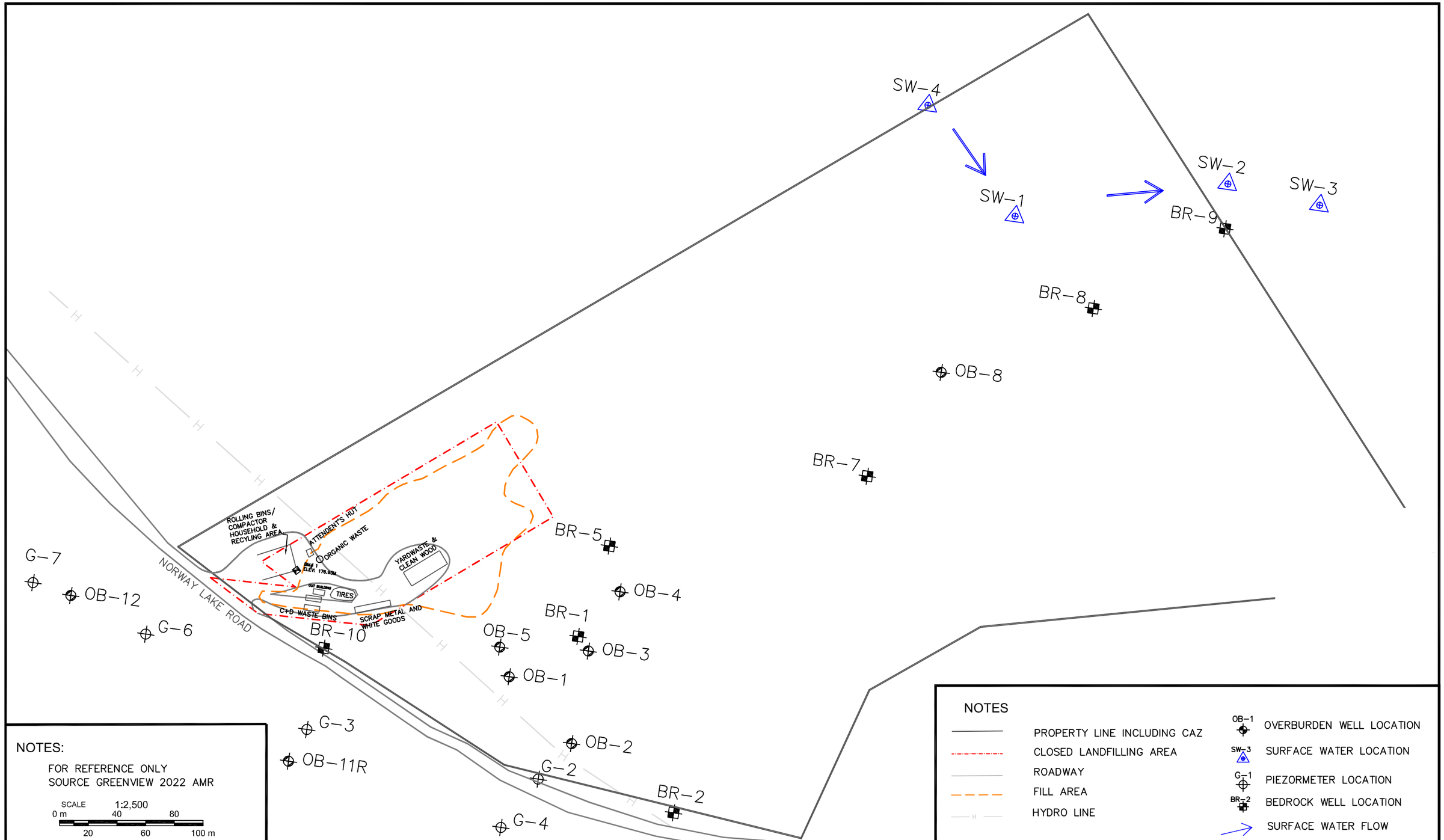
Date:3/12/2024

Drawn By: HV

Checked By: KM

Notes:
Map Layers Obtained from LIO
Waste Disposal Site Locations Sourced from Greenview Environmental Management (2023)

Jp2g Consultants Inc.
ENGINEERS · PLANNERS · PROJECT MANAGERS



NOTES:

FOR REFERENCE ONLY
SOURCE GREENVIEW 2022 AMR

SCALE 1:2,500
0 m 20 40 60 80 100 m

NOTES

- PROPERTY LINE INCLUDING CAZ
- CLOSED LANDFILLING AREA
- ROADWAY
- FILL AREA
- HYDRO LINE
- OB–1 OVERBURDEN WELL LOCATION
- SW–3 SURFACE WATER LOCATION
- G–1 PIEZORMETER LOCATION
- BR–2 BEDROCK WELL LOCATION
- SURFACE WATER FLOW

No.	DATE	BY	REVISIONS

NORTH
TRUE NORTH

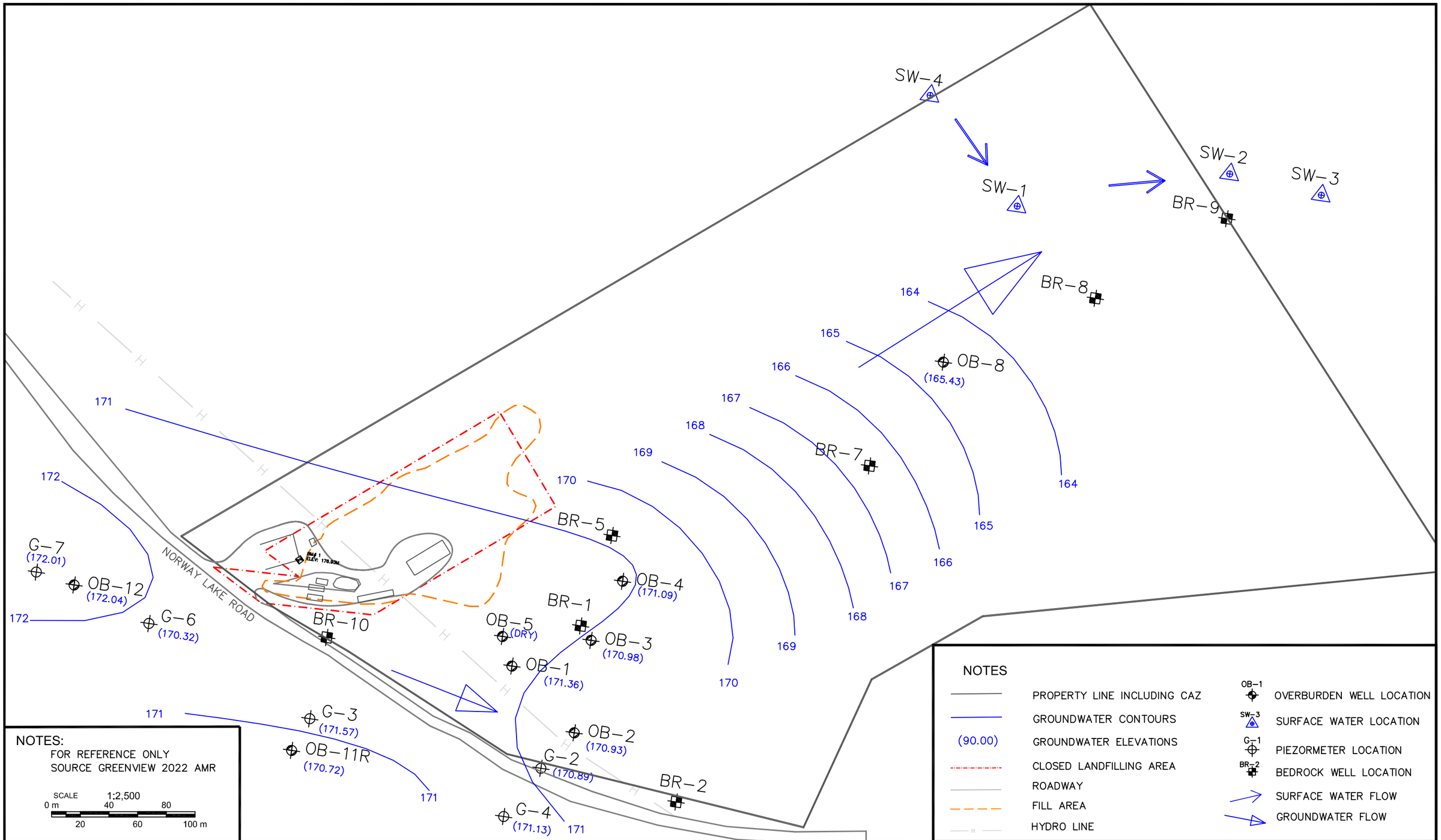
Jp2g Consultants Inc.
ENGINEERS • PLANNERS • PROJECT MANAGERS
1150 MORRISON DRIVE, SUITE 410, OTTAWA, ON K2H 8S9
PHONE: 613-828-7800 FAX: 613-826-2600

DESIGNED	QS
DRAWN	QS
CHECKED	KM
APPROVED	KM
SCALE	1:2500

TOWNSHIP OF GREATER MADAWASKA
NORWAY LAKE WASTE DISPOSAL SITE

Site Plan

DATE	15–JAN–2025
PROJECT	22–6213D
PLOTTED	15–JAN–2025
REF	FIG 2



NOTES:
FOR REFERENCE ONLY
SOURCE GREENVIEW 2022 AMR

SCALE 1:2,500
0 m 40 80
20 60 100 m

NOTES

- PROPERTY LINE INCLUDING CAZ
- GROUNDWATER CONTOURS
- (90.00) GROUNDWATER ELEVATIONS
- CLOSED LANDFILLING AREA
- ROADWAY
- FILL AREA
- H HYDRO LINE
- OB-1 OVERBURDEN WELL LOCATION
- SW-3 SURFACE WATER LOCATION
- G-1 PIEZORMETER LOCATION
- BR-2 BEDROCK WELL LOCATION
- SURFACE WATER FLOW
- GROUNDWATER FLOW

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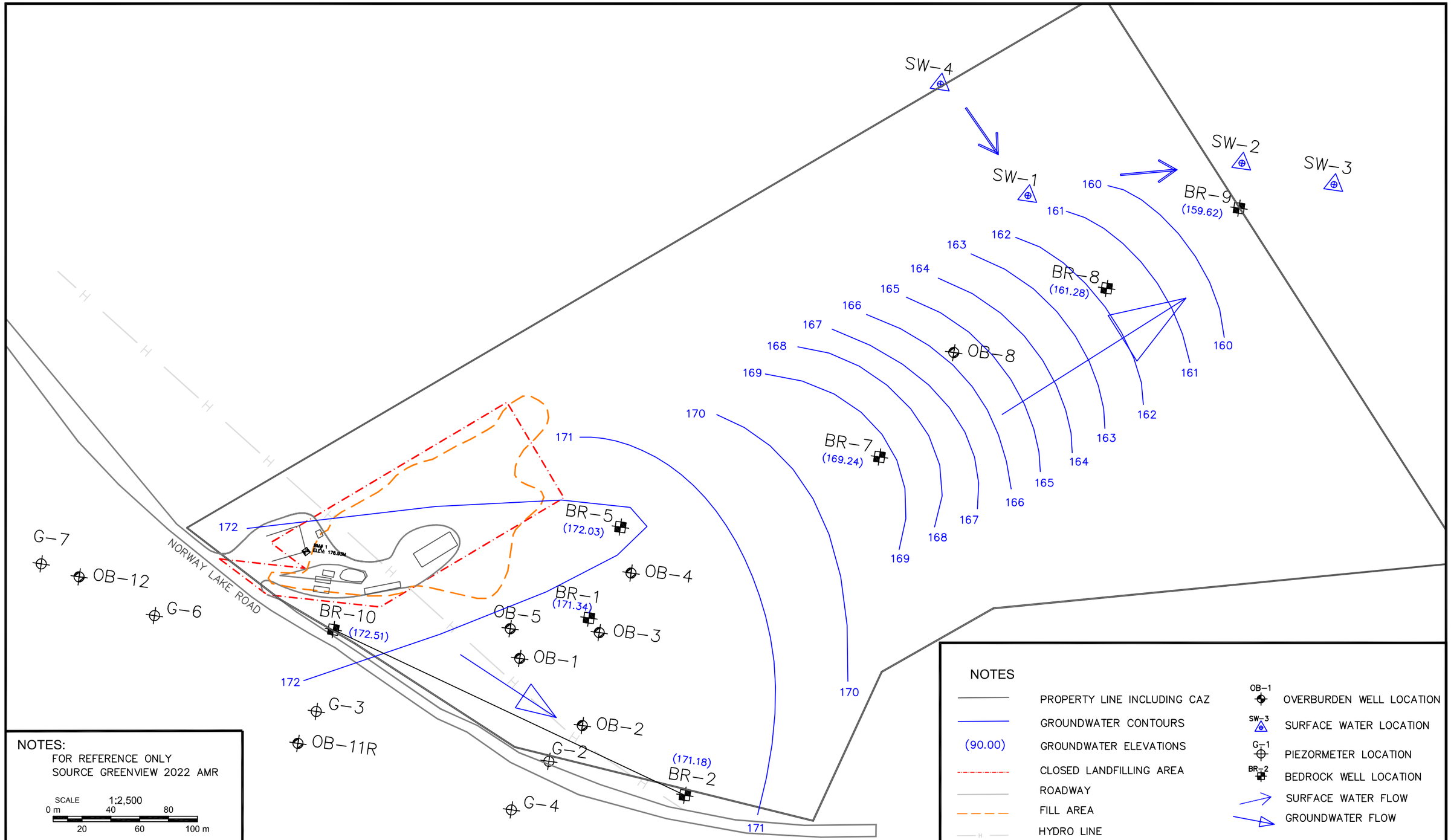
PHONE: 613-828-7800 FAX: 613-828-2600

DESIGNED	QS
DRAWN	QS
CHECKED	KM
APPROVED	KM
SCALE	1: 2500

TOWNSHIP OF GREATER MADAWASKA
NORWAY LAKE WASTE DISPOSAL SITE

Summer Overburden Flow – JULY 2024

DATE	15-JAN-2025
PROJECT	22-6213D
PLOTTED	15-JAN-2025
REF	FIG 3A



NOTES:
FOR REFERENCE ONLY
SOURCE GREENVIEW 2022 AMR

SCALE 1:2,500
0 m 40 80
20 60 100 m

NOTES

- PROPERTY LINE INCLUDING CAZ
- GROUNDWATER CONTOURS
- (90.00) GROUNDWATER ELEVATIONS
- CLOSED LANDFILLING AREA
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- FILL AREA
- HYDRO LINE
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- SW-3 SURFACE WATER LOCATION
- G-1 PIEZORMETER LOCATION
- BR-2 BEDROCK WELL LOCATION
- SURFACE WATER FLOW
- GROUNDWATER FLOW

No.	DATE	BY	REVISIONS

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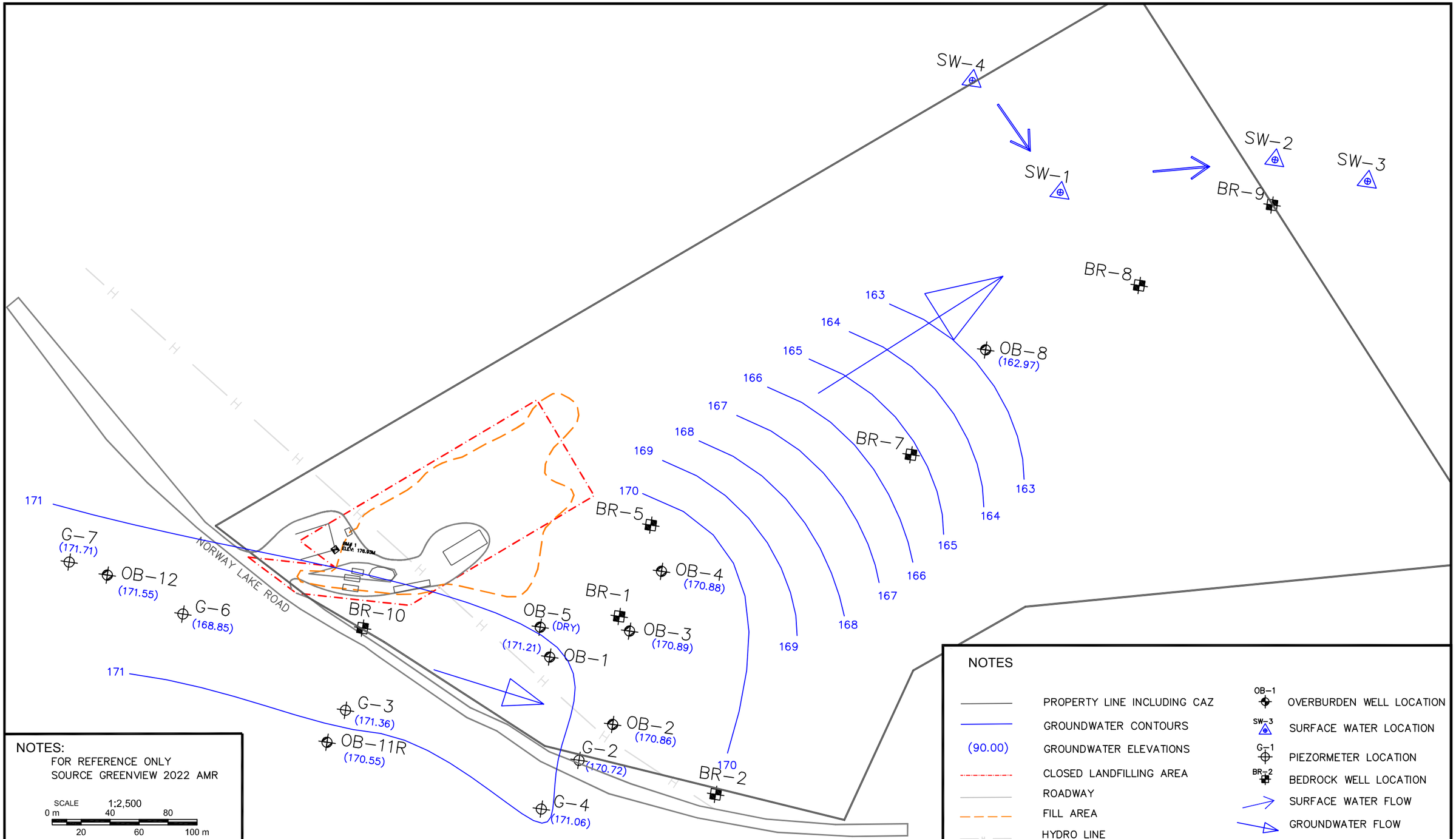
ENGINEERS · PLANNERS · PROJECT MANAGERS
1150 MORRISON DRIVE, SUITE 410, OTTAWA, ON K2H 8S9
PHONE: 613-828-7800 FAX: 613-828-2600

DESIGNED	QS
DRAWN	QS
CHECKED	KM
APPROVED	KM
SCALE	1:2500

TOWNSHIP OF GREATER MADAWASKA
NORWAY LAKE WASTE DISPOSAL SITE

Summer Bedrock Flow – JULY 2024

DATE	15-JAN-2025
PROJECT	22-6213D
PLOTTED	15-JAN-2025
REF	FIG 3B



NOTES:
FOR REFERENCE ONLY
SOURCE GREENVIEW 2022 AMR

SCALE 1:2,500
0 m 40 80
20 60 100 m

NOTES

- PROPERTY LINE INCLUDING CAZ
- GROUNDWATER CONTOURS
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- SURFACE WATER FLOW
- GROUNDWATER FLOW

No.	DATE	BY	REVISIONS

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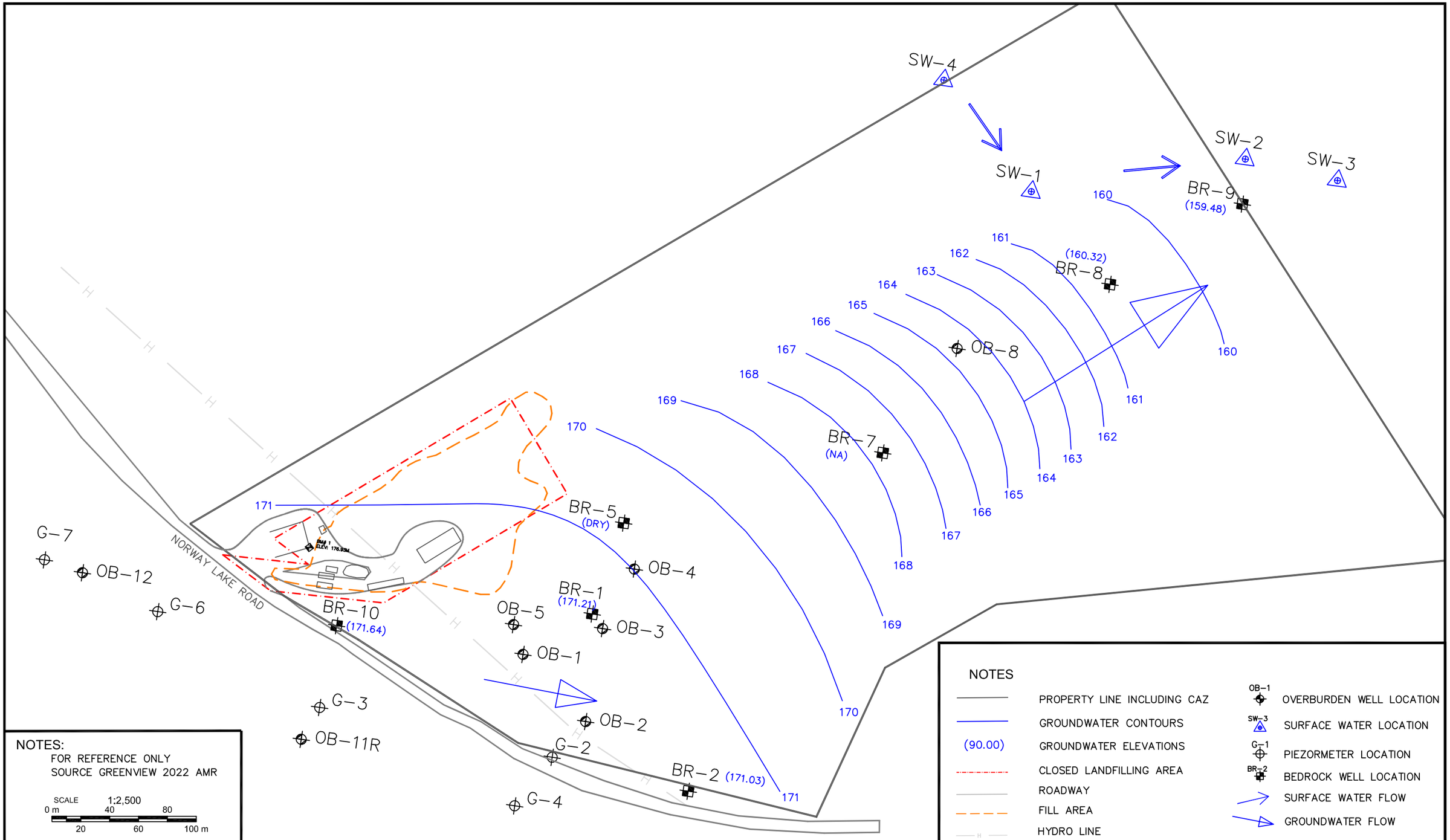
Jp2g Consultants Inc.
ENGINEERS • PLANNERS • PROJECT MANAGERS
1150 MORRISON DRIVE, SUITE 410, OTTAWA, ON K2H 8S9
PHONE: 613-828-7800 FAX: 613-828-2600

DESIGNED	QS
DRAWN	QS
CHECKED	KM
APPROVED	KM
SCALE	1:2500

TOWNSHIP OF GREATER MADAWASKA
NORWAY LAKE WASTE DISPOSAL SITE

FALL OVERBURDEN Flow – November 2024

DATE	15-JAN-2025
PROJECT	22-6213D
PLOTTED	15-JAN-2025
REF	FIG 4A



NOTES:
FOR REFERENCE ONLY
SOURCE GREENVIEW 2022 AMR

SCALE 1:2,500
0 m 20 40 60 80 100 m

NOTES

- PROPERTY LINE INCLUDING CAZ
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- CLOSED LANDFILLING AREA
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- SW–3 SURFACE WATER LOCATION
- G–1 PIEZORMETER LOCATION
- BR–2 BEDROCK WELL LOCATION
- SURFACE WATER FLOW
- GROUNDWATER FLOW

No.	DATE	BY		REVISIONS

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Jp2g Consultants Inc.
ENGINEERS • PLANNERS • PROJECT MANAGERS
1150 MORRISON DRIVE, SUITE 410, OTTAWA, ON K2H 8S9
PHONE: 613-828-7800 FAX: 613-828-2600

DESIGNED	QS
DRAWN	QS
CHECKED	KM
APPROVED	KM
SCALE	1: 2500

TOWNSHIP OF GREATER MADAWASKA
NORWAY LAKE WASTE DISPOSAL SITE

FALL BEDROCK Flow – November 2024

DATE	15–JAN–2025
PROJECT	22–6213D
PLOTTED	15–JAN–2025
REF	FIG 4B

Tables

THE TOWNSHIP OF GREATER MADAWASKA

Table 1
Groundwater Monitoring Well and Surface Water Sampling Locations
Norway Lake Waste Disposal Site

Groundwater			
Monitor	**Zone**	**Northing**	**Easting**
BR-1	18T	5021910	367520
BR-2	18T	5021811	367580
BR-8	18T	5022137	367795
BR-9	18T	5022200	367859
BR-10	18T	5021888	367372
OB-3	18T	5021906	367525
OB-8	18T	5022091	367711
OB-11R	18T	5021820	367360
OB-12	18T	5021900	367222

Surface Water			
Monitor	**Zone**	**Northing**	**Easting**
SW-1	18T	5022187	367743
SW-2	18T	5022232	367884
SW-3	18T	5022213	367919
SW-4	18T	5022244	367687

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

Table 2: Monitoring Program 2024

Station ID	Task	July	November	Notes
Groundwater				
OB-1, OB-2, OB-4, OB-5, & OB-7	Measure water levels	√	√	- OB-5 was Dry in spring and summer 2024 - OB-7 was Destroyed
OB-3	Measure water levels / Sample groundwater	√	√	
OB-8	Measure water levels / Sample groundwater	√	√	
OB-11R	Measure water levels / Sample groundwater	√	√	
OB-12	Measure water levels / Sample groundwater	√	√	
BR-1	Measure water levels / Sample groundwater	√	√	
BR-2	Measure water levels / Sample groundwater	√	√	
BR-8	Measure water levels / Sample groundwater	√	√	
BR-9	Measure water levels / Sample groundwater	√	√	
BR-10	Measure water levels / Sample groundwater	√+Dup	√+Dup	
BR-3, BR-4, BR-5, BR-7	Measure water levels	√	√	BR-3 and BR-4 were Destroyed
Mimi Piezometer G-1 to G-9	Measure water levels	√	√	- G-1 & G-5 were destroyed - G-8 and G-9 were not measured.
Surface Water				
SW-1	Sample Surface water	Biennial - The next sampling event for surface water monitoring (spring and fall) is scheduled for 2025		
SW-4	Sample Surface water			

Notes:

1. √ = samplled for the required parameters, field parameters and water level
2. DUP = Duplicate Sample taken

Table 3a: Reasonable Use Determination 2024 - Overburden (Using OB-12 results prior to August 2009)

Parameter (mg/L)	Pb (The median using OB-12 results prior to August 2009)	Cm	F	Callow
Nitrate	0.1	10	0.25	**2.6**
Barium	0.09	1	0.25	**0.3**
Boron	0.02	5	0.25	**1.27**
Alkalinity	246	500	0.5	**373**
Chloride	33	250	0.5	**142**
Sulphate	8	500	0.5	**254**
TDS	318	500	0.5	**409**
DOC	1.3	5	0.5	**3.15**
Hardness	254	500	0.5	**377**
Iron	0.05	0.3	0.5	**0.18**
Manganese	0.12	0.05	0.5	**0.09**
Sodium	12	200	0.5	**106**

Table 3b: Reasonable Use Determination 2024 - Bedrock (Using BR-2 results prior to August 2009)

Parameter (mg/L)	Pb (The median using BR-2 results prior to August 2009)	Cm	F	Callow
Nitrate	0.05	10	0.25	**2.5**
Barium	0.081	1	0.25	**0.3**
Boron	0.018	5	0.25	**1.26**
Alkalinity	199	500	0.5	**350**
Chloride	39	250	0.5	**145**
Sulphate	11	500	0.5	**256**
TDS	332	500	0.5	**416**
DOC	1.5	5	0.5	**3.25**
Hardness	254	500	0.5	**377**
Iron	2.18	0.3	0.5	**1.24**
Manganese	0.11	0.05	0.5	**0.08**
Sodium	3	200	0.5	**102**

Table 4a: Reasonable Use Conclusions 2024 - Overburden

Parameters	ODWS	C_{allow}	OB-8		OB-11R	
			Jul-24	Nov-24	Jul-24	Nov-24
Health Related						
Nitrate	**10**	**2.60**	--	--	2	0.16
Barium	**1**	**0.30**	--	--	**0.68**	**0.397**
Boron	**5**	**1.27**	0.12	0.0159	0.04	0.037
Aesthetic Parameters						
Alkalinity	**500**	**373**	280	388	**411**	**387**
Chloride	**250**	**142**	116	169	**1510**	97.3
Sulphate	**500**	**254**	--	--	88	8
TDS	**500**	**409**	467	**661**	**2710**	**2050**
DOC	**5**	**3.15**	**8.5**	**5.9**	1.1	1.8
Hardness	**500**	**377**	331	**568**	**854**	**501**
Iron	**0.3**	**0.18**	0.007	<0.05	<0.005	0.031
Manganese	**0.05**	**0.09**	<0.001	<0.001	0.004	0.002
Sodium	**200**	**106**	36.3	55	**688**	**522**

Table 4b: Reasonable Use Conclusions 2024 - Bedrock

Parameters	ODWS	C_{allow}	BR-2		BR-8		BR-9	
			Jul-24	Nov-24	Jul-24	Nov-24	Jul-24	Nov-24
Health Related								
Nitrate	**10**	**2.50**	<0.05	<0.05	--	--	<0.05	0.09
Barium	**1**	**0.30**	0.192	0.224	--	--	0.07	0.105
Boron	**5**	**1.26**	0.011	0.013	0.164	0.238	0.019	0.044
Aesthetic Parameters								
Alkalinity	**500**	**350**	253	263	256	254	244	256
Chloride	**250**	**145**	133	**151**	86.2	67.6	12.1	52
Sulphate	**500**	**256**	9	7	--	--	12	13
TDS	**500**	**416**	**478**	**510**	405	369	259	344
DOC	**5**	**3.25**	3.1	3	**4.6**	**4.6**	**4.2**	**4**
Hardness	**500**	**377**	**441**	**485**	313	339	246	348
Iron	**0.3**	**1.24**	0.178	**7.3**	0.039	0.084	<0.005	<0.005
Manganese	**0.05**	**0.08**	0.06	**0.144**	0.006	0.024	<0.001	<0.001
Sodium	**200**	**102**	31	34.2	22.9	23	4.8	12

NS : Not Sampled

Exceeds Resonable Use Criteria

Table 5 : Proposed Monitoring Program 2025

Station ID	Spring 2025	Late Summer 2025	Analytical Parameters
Groundwater			
OB-1, OB-2, OB-4, OB-5, & OB-7	√	√	None - Water level only
OB-3	√	√	- Major and minor ions (Na, Cl, B) - Trace metals (Fe, Mn) - General parameters (alkalinity, total dissolved solids, hardness, dissolved organic carbon) - Field measurements of pH, conductivity, Dissolved Oxygen, and water tempreture
OB-8	√	√	
BR-8	√		
OB-11R	√	√	- Major and minor ions (Ca, Na, Cl, SO4, B, K, Mg, Ba) - Trace metals (Fe, Mn, Cu, Sr, Al, Cd, Cr, Co, Si, Zn) - Nitrogen species (NO3, NO2, NH3, TKN) - General parameters (alkalinity, COD, total dissolved solids, phosphorous, hardness, dissolved organic carbon) - Field measurements of pH, conductivity, Dissolved Oxygen, and water tempreture - EPA 624 Volatile Organic Compounds VOC sample collected late summer from BR-1.
OB-12	√	√	
BR-1	√	√	
BR-2	√	√	
BR-9	√	√	
BR-10	√+Dup	√	
BR-3, BR-4, BR-5, & BR-7	√	√	None - Water level only
Piezometer G-1 to G-9	√	√	None - Water level only
Surface Water			
SW-1	√	√	- Major and minor ions (Ca, Na, K, Cl, total phosphorous, Ba, B, Mg, SO4) - Trace metals (Fe, Mn, Cu, Cd, Cr, Co, Sr, Zn) with detection limits to PWQO - Nitrogen species (NH3, TKN) - General parameters (alkalinity, COD, Total suspended solids, phenols, total dissolved solids, hardness, biochemical oxygen demand) - Field measurements of dissolved oxygen, pH, conductivity, water temperature, and Un-ionized ammonia (calculation)
SW-4	√	√	

Notes:

One Duplicate Sample to be collected during each sampling event.

Appendix A
Environmental Compliance Approval and Certificate of Requirement

AMENDED ENVIRONMENTAL COMPLIANCE APPROVAL
NUMBER A411702
Issue Date: March 17, 2023

The Corporation of the Township of Greater Madawaska
19 Parnell St
Post Office Box, No. 180
Calabogie, Ontario
K0J 1H0

Site Location: Norway Lake Waste Disposal Site
574 Norway Lake Road
Lot Part of 20, Concession 7
Greater Madawaska Township, 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 1.37 hectare waste disposal/transfer site within a total site area of 18.47 hectares.

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

"Approval" means this Environmental Compliance Approval and any Schedules to it;

"Contaminating Life Span" means contaminating life span as defined in Ontario Regulation 232/98;

"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 II.1 of the EPA;

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

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

"Ministry" means the ministry of the government of Ontario responsible for the EPA and OWRA and includes all officials, employees or other persons acting on its behalf;

“NMA” means the *Nutrient Management Act, 2002,* S.O. 2002, c. 4, as amended;

“O. Reg. 232/98” means Ontario Regulation 232/98: (Landfilling Sites), made under the EPA, as amended;

"O. Reg. 463/10" means Ontario Regulation 463/10 (Ozone Depleting Substances and Other Halocarbons), made under the EPA, as amended;

“Ontario Drinking Water Quality Standards” means Ontario Regulation 169/03 (Ontario Drinking Water Quality Standards), made under the SDWA, as amended;

“Operator” means any person, other than the Owner's employees, authorized by the Owner as having the charge, management or control of any aspect of the Site and includes its successors or assigns;

"Organic Waste" means waste from kitchens, restaurants, food processing operations, waste of vegetable and animal origin, packaging materials that have been in direct contact with and are contaminated by these wastes and waste of a similar nature and characteristics, including waste that is liable to become putrid, rotten or decayed;

“Owner” means any person that is responsible for the establishment or operation of the Site being approved by this Approval, and includes the Corporation of the Township of Greater Madawaska and its successors and assigns;

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

“PA” means the *Pesticides Act,* R.S.O. (1990), c. P.11, as amended;

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

“Regional Director” means the Regional Director of the local Regional Office of the Ministry in which the Site is located;

“Reg. 347” means R.R.O. 1990, Reg. 347: (General - Waste Management), made under the EPA, as amended;

“Reg. 903” means R.R.O. 1990, Reg. 903: (Wells), made under the OWRA, as amended;

“SDWA” means the *Safe Drinking Water Act, 2002* , S.O. 2002, c. 32, as amended;

"Schedules" means the following schedules attached to this Approval and forming part of this Approval namely:

- Schedule 1 - Supporting Documentation;
- Schedule 2 - Surface Water Monitoring Program; and
- Schedule 3 - Groundwater Monitoring Program;

"Site" means the entire waste disposal site, including the buffer lands, and contaminant attenuation zone at Norway Lake Waste Disposal Site, 574 Norway Lake Road, Lot Part of 20, Concession 7, Greater Madawaska Township, County of Renfrew;

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

- relevant waste management legislation, regulations and guidelines;
- major environmental concerns pertaining to the waste to be handled;
- occupational health and safety concerns pertaining to the processes and wastes to be handled;
- management procedures including the use and operation of equipment for the processes and wastes to be handled;
- emergency response procedures;
- specific written procedures for the control of nuisance conditions;
- specific written procedures for refusal of unacceptable waste loads; and
- the requirements of this Approval; and

"White Goods" means household appliances which use, or may use refrigerants, and which include, but is not limited to, refrigerators, freezers and air-conditioning systems.

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. GENERAL

Compliance

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

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

In Accordance

3. Except as otherwise provided by this Approval, the Site shall be designed, developed, built, operated and maintained in accordance with the documentation listed in the attached Schedule 1.

Interpretation

4. Where there is a conflict between a provision of any document listed in Schedule 1 in this Approval, and the conditions of this Approval, the conditions in this Approval shall take precedence.

5. Where there is a conflict between the application and a provision in any document listed in Schedule 1, the application shall take precedence, unless it is clear that the purpose of the document was to amend the application and that the Ministry approved the amendment.

6. Where there is a conflict between any two documents listed in Schedule 1, the document bearing the most recent date shall take precedence.

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

Other Legal Obligations

8. The issuance of, and compliance with, this Approval does not:
   a. relieve any person of any obligation to comply with any provision of any applicable statute, regulation or other legal requirement; or
   b. limit in any way the authority of the Ministry to require certain steps be taken or to require the Owner and Operator to furnish any further information related to compliance with this Approval.

Adverse Effect

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

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

Change of Ownership

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

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

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

13. In the event of any change in ownership of the Site, other than change to a successor municipality, the Owner shall notify the successor of and provide the successor with a copy of this Approval, and the Owner shall provide a copy of the notification to the District Manager and the Director.

Registration on Title Requirement

14. Prior to dealing with the property in any way, the Owner shall provide a copy of this Approval and any amendments, to any person who will acquire an interest in the property as a result of the dealing.

15. a. Within thirty (30) calendar days from the date of issuance of this Approval, the Owner shall submit to the Director a completed Certificate of Requirement which shall include:
    i. a plan of survey prepared, signed and sealed by an Ontario Land Surveyor, which shows the area of the Site where waste has been or is to be deposited at the Site;
    ii. proof of ownership of the Site;
    iii. a letter signed by a member of the Law Society of Upper Canada or other qualified legal practitioner acceptable to the Director, verifying the legal description provided in the Certificate of Requirement;
    iv. the legal abstract of the property; and
    v. any supporting documents including a registerable description of the Site.

    b. Within fifteen (15) calendar days of receiving a Certificate of Requirement authorized by the Director, the Owner shall:
    i. register the Certificate of Requirement in the appropriate Land Registry Office on the title to the property; and
    ii. submit to the Director and the District Manager, written verification that the Certificate of Requirement has been registered on title.

Inspections by the Ministry

16. No person shall hinder or obstruct a Provincial Officer from carrying out any and all inspections authorized by the OWRA, the EPA, the PA, the SDWA or the NMA, of any place to which this Approval relates, and without limiting the foregoing:
    a. to enter upon the premises where the approved works are located, or the location where the records required by the conditions of this Approval are kept;
    b. to have access to, inspect, and copy any records required to be kept by the conditions of this Approval;
    c. to inspect the Site, related equipment and appurtenances;
    d. to inspect the practices, procedures, or operations required by the conditions of this Approval; and
    e. to sample and monitor for the purposes of assessing compliance with the terms and conditions of this Approval or the EPA, the OWRA, the PA, the SDWA or the NMA.

Information and Record Retention

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

    b. The Owner shall retain all documentation listed in Schedule 1 for as long as this Approval is valid.

    c. All monthly summary reports of waste records collected are to be kept at the Site until they are included in the Annual Report.

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

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

18. 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 Approval or under any statute, regulation or other legal requirement, in relation to the information, shall not be construed as:
    a. an approval, waiver, or justification by the Ministry of any act or omission of any person that contravenes any term or condition of this Approval or any statute, regulation or other legal requirement; or
    b. acceptance by the Ministry of the information's completeness or accuracy.

19. The Owner shall ensure that a copy of this Approval, in its entirety and including all its Notices of Amendment, and documentation listed in Schedule 1, are retained at the Site

at all times.

20. Any information related to this Approval 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.

2. SITE OPERATION

Operation

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

Signs

2. The Owner shall install and maintain a sign at the entrance to the Site. The sign shall be visible and readable from the main road leading to the Site. The following information shall be included on the sign:

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

3. The Owner shall install and maintain signs to direct vehicles to waste storage areas.

4. The Owner shall provide signs at the waste bins and storage locations informing users what materials are acceptable and directing users to appropriate storage areas.

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

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

6. The Owner shall take all practical steps to prevent the escape of litter from the Site. Periodic pick-up of litter at the Site and along the Access Road in the vicinity of the Site shall be carried out as required. Private property adjacent to the Landfill shall be

inspected weekly and litter shall be collected if necessary, with permission of access from the property owner.

Burning Waste Prohibited

7. a. Burning of waste at the Site is prohibited.

   b. Notwithstanding condition 2.7.a above, burning of segregated, clean wood and brush at the landfill may be carried out in strict compliance with the Ministry of the Environment Document titled "Guideline C-7, Burning at Landfill Sites" dated April 1994.

   c. The leaf and yard waste collection management area, shall include segregated collection and burn areas.

   d. Burn operations shall be undertaken while the Site is not open to residents, during optimal weather conditions (non windy days).

   e. Once burned, ash material shall be transferred to the Township's other waste disposal sites or to an approved facility for disposal or use as an alternative daily cover.

Site Access

8. Waste shall only be accepted during the following time periods:

Sunday (Thanksgiving to Victoria Day)	- 10:00 a.m. to 5:00 p.m.
Sunday (Victoria Day to Thanksgiving)	- 10:00 a.m. to 6:00 p.m.
Holiday Monday(s)	- 12:00 p.m. to 6:00 p.m.
Wednesday	- 8:00 a.m. to 4:00 p.m.
Saturday	- 8:00 a.m. to 6:00 p.m.

9. The Owner may provide alternative hours of operation providing that they are correctly posted at the Site gate, that suitable public notice is given of any change and that there are no objections or complaints from the public regarding the hours of operation.

10. The Owner shall notify the District Manager of the new proposed operating hours fourteen (14) business days prior to their implementation. The notification shall include the details on the public notification undertaken by the Owner and the public’s response to the proposal.

Site Security

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

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

Scavenging

13. Scavenging at the Site is prohibited, except at a designated re-use area under the supervision of the Site attendant.

3. EMPLOYEE TRAINING

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

4. COMPLAINTS RESPONSE PROCEDURE

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

    a. The Owner shall record and number each complaint, either electronically or in a log book, and shall include the following information: the nature of the complaint, the name, address and the telephone number of the complainant if the complainant will provide this information and the time and date of the complaint;
    b. The Owner, upon notification of the complaint, shall initiate appropriate steps to determine possible causes of the complaint, proceed to take the necessary actions to eliminate the cause of the complaint and forward a formal reply to the complainant; and
    c. The Owner shall complete and retain on-site a report written within one (1) week of the complaint date, listing the actions taken to resolve the complaint and any recommendations for remedial measures, and managerial or operational changes to reasonably avoid the recurrence of similar incidents.

5. EMERGENCY RESPONSE

1. All Spills as defined in the EPA shall be immediately reported to the **Ministry's Spills Action Centre at 1-800-268-6060** and shall be recorded in the log book as to the nature of the emergency situation, and the action taken for clean-up, correction and prevention of future occurrences.

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

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

4. All equipment and materials required to handle the emergency situations shall be:
   a. kept on hand at all times that waste handling is undertaken at the Site; and
   b. adequately maintained and kept in good repair.

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

6. INSPECTIONS, RECORD KEEPING AND REPORTING

Daily Log Book

1. A daily log shall be maintained in written or electronic format and shall include the following information:
   a. quantity and source of waste received;
   b. quantity of waste at the Transfer Station at the end of the operating week;
   c. quantities and destination of each type of waste shipped from the Transfer Station;
   d. a record of the daily inspections; and
   e. a description of any out-of-service period of any control, treatment, disposal or monitoring facilities, the reasons for the loss of service, and action taken to restore and maintain service;

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

Inspections and Log Book

3. An inspection of the entire Site and all equipment on the Site shall be conducted each day the Site is in operation to ensure that: the Site is secure; that the operation of the Site is

not causing any nuisances; that the operation of the Site is not causing any adverse effects on the environment and that the Site is being operated in compliance with this Approval. Any deficiencies discovered as a result of the inspection shall be remedied immediately, including temporarily ceasing operations at the Site if needed**.**

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

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

Annual Report

6. A written report on the development, operation and monitoring of the Site, shall be completed annually (Annual Report). The Annual Report shall be submitted to the District Manager, by March 31st of the year following the period being reported upon.

7. The Annual Report shall include but are not be limited to the following information:
   a. the results and an interpretive analysis of the results of all leachate, groundwater, surface water and landfill gas monitoring, including an assessment of the need to amend the monitoring programs;
   b. an assessment of the operation and performance of all engineered facilities, the need to amend the design or operation of the Site, and the adequacy of and need to implement the contingency plans;
   c. site plans showing the existing contours of the Site; areas of intended operation during the next reporting period; facilities existing, added or removed during the reporting period; and site preparations and facilities planned for installation during the next reporting period;
   d. a summary of the weekly, maximum daily and total annual quantity (tonnes) of waste received at the Site and transferred from the Site;
   e. a summary of any complaints received and the responses made;
   f. a discussion of any operational problems encountered at the Site and corrective action taken;
   g. a report on the status of all monitoring wells and a statement as to compliance with Reg. 903; and
   h. any other information with respect to the Site which the District Manager may require from time to time.

7. TRANSFER STATION

Service Area

1. Transfer Station (TS) shall only accept wastes generated by ratepayers in the Township of Greater Madawaska.

Approved Waste Types and Quantities

2. The Transfer Station shall only accept the following types of residential and industrial, commercial, and institutional (IC&I) waste and recyclables:
   a. residential and IC&I waste;
   b. blue-box recyclables;
   c. source separated organics (SSO);
   d. waste tires;
   e. leaf and yard waste;
   f. waste electrical and electronic equipment (WEEE);
   g. refrigerant appliances;
   h. scrap metal;
   i. construction and demolition (C&D) and bulky waste;
   j. Single-Use and Rechargeable Batteries;
   k. Large Propane Tanks (re-fillable);
   l. Small Propane Cylinders (single-use);
   m. Compact Fluorescent Light Bulbs (CFLs); and
   n. Automotive Plastics

3. All waste shall be inspected by Trained Personnel prior to being accepted at the Transfer Station to ensure that the waste is of a type approved for acceptance under this Approval.

4. The maximum amount of solid non-hazardous waste and recyclables that can be accepted at the Site is 200 cubic metres per day.

5. The maximum amount of non-hazardous solid waste and recyclable materials to be stored or be present at the Site shall be as follows:
   a. residential and IC&I waste - 120 cubic metres;
   b. blue-box recycables - 240 cubic metres;
   c. source separated organics (SSO) contained in locking, bear-proof roll-off container - 20 cubic metres;
   d. waste tires - 100 cubic metres;
   e. leaf and yard waste - 1000 cubic metres;
   f. waste electrical and electronic equipment (WEEE) - 40 cubic metres;
   g. refrigerant appliances - 25 cubic metres;
   h. scrap metal - 60 cubic metres;
   i. construction and demolition (C & D) and bulky waste - 2000 cubic metres;
   j. Single-Use and Rechargeable Batteries - 0.2 cubic meters;

k. Large Propane Tanks (re-fillable) - 2 m3 (50 units);
l. Small Propane Cylinders (single-use) - 1 m3;
m. Compact Fluorescent Light Bulbs (CFLs) - 0.06 m3; and
n. Automotive Plastics - 5 m3.

Organic Waste

6. The Owner shall ensure that containers used to store source separated organic (SSO) waste are leakproof, lockable and bear resistant.

7. The Owner shall monitor the containers in which SSO waste are stored:
   a. to ensure that the organic waste has not decomposed to the point where it is unacceptable for the intended receiving facility; and
   b. odours.

8. The Owner shall empty the containers used to store organic waste and transfer the organic waste from the Site when:
   a. the maximum capacity approved has been reached;
   b. the organic waste has decomposed to the point where it is unacceptable to the receiving facility; or
   c. the organic waste is creating odours that are creating a negative impact on Site users or off-site.

White Goods Containing Refrigerants

9. The Owner/Operator shall remove the refrigerant as defined in O. Reg. 463/10 in accordance with the following:
   a. all White Goods containing refrigerants which have not been tagged by a licensed technician to verify that the equipment no longer contains refrigerants, shall be stored in a separate area in an upright position; and

   b. White Goods containing refrigerants received at the Site shall be shipped off-Site in order to have the refrigerants removed by a licensed technician in accordance with O. Reg. 463/10; or

   c. the refrigerant shall be removed at the Site by a licensed technician, in accordance with O. Reg. 463/10, prior to shipping White Goods off-Site; and

   d. a detailed log of all White Goods containing refrigerants received shall be maintained. The log shall include the following:

      i. date of the record;

      ii. types, quantities and source of White Goods containing refrigerants received;

iii. details on removal of refrigerants as required by O. Reg. 463/10; and

iv. the quantities and destination of the White Goods and/or refrigerants transferred from the Site.

Miscellaneous

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

11. Collection, storage and transfer of Waste Electrical and Electronic Equipment shall be in accordance with the documents in the Schedule 1. If there is any discrepancy between the guideline titled "Collection Site Organizing & Operating Waste Electrical and Electronic Equipment (WEEE) Guidebook" dated November 2012 as amended prepared by Ontario Electronic Stewardship and the documents in Schedule 1, the guideline shall take precedence.

12. The contingency plan to reduce or otherwise control, to prevent adverse impacts resultant from leachate, noise, dust, odour, litter, traffic, or vermin associated with the operation of the Site carried out by the Owner in accordance with Item 30 in Schedule 1.

8. LANDFILL MONITORING

Landfill Gas

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

Compliance

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

   a. Reasonable Use Guideline B-7 for the protection of the groundwater at the Site;

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

   c. Ontario Drinking Water Quality Standards

Surface Water and Groundwater

3. The Owner shall monitor surface water and ground water in accordance with the monitoring programs outlined in Schedules 2 and 3.

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

Groundwater Wells and Monitors

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

6. Any groundwater monitoring well included in the on-going monitoring program that is damaged shall be assessed, repaired, replaced or decommissioned by the Owner, as required.

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

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

Trigger Mechanisms and Contingency Plans

7. The Trigger Mechanism Plans and Contingency Plans to address potential off-site exceedances related to groundwater and surface water shall be carried out by the *Owner* in accordance with Item 30 in Schedule 1.

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

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

    a. The Owner shall notify the District Manager, in writing of the need to implement contingency measures, no later than 30 days after confirmation of the

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 for approval; and

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

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

Changes to the Monitoring Programs, Trigger Mechanisms and Contingency Plans

11. The Owner may request to make changes to the monitoring program(s), trigger mechanisms and/or contingency plan to the District Manager in accordance with the recommendations of the annual report. The Owner shall make clear reference to the proposed changes in a separate letter that shall accompany the annual report.

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

On Site Wells

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

9. SITE CLOSURE

1. The Site is closed for waste disposal and no waste shall be accepted at the Site for disposal.

Post Closure Care

2. Following the application of the cover and seeding, the Owner shall:
    a. inspect the cover integrity on a quarterly basis. If cover integrity is damaged, then the necessary remedial measure shall be undertaken by the Owner within five (5) working days following the day of inspection (weather permitting);
    b. inspect the vegetative cover in the fall and spring seasons. Any deficiencies in the vegetative cover shall be repaired as soon as weather and equipment availability permits;
    c. inspect for leachate seeps on a quarterly basis. If a leachate seep is observed, then the necessary remedial measures shall be undertaken by the Owner within five (5) working days following the day of inspection (weather permitting);
    d. inspect for slope erosion on a quarterly basis. If erosion is observed, then the necessary remediation measures shall be undertaken by the Owner within five (5) working days following the day of inspection (weather permitting);
    e. inspect for other nuisance factors (litter, rodents, bears) on a quarterly basis. If any problems are observed, then the necessary remedial measures shall be undertaken by the Owner within five (5) working days following the day of inspection (weather permitting)..

Transfer Site Closure Plan

3. Six (6) months prior to the permanent closure of the Site, the Township shall submit to the Director, written notification of the decision to cease activities at this Site. The written notification shall also include, for approval by the Director, a closure plan detailing a list of activities and schedule for the implementation of those activities necessary for the decommissioning of the Site.

4. Within ten (10) business days after closure of the Site, the Township must notify the Director, in writing, that the Site is closed and that the Site closure plan has been implemented.

Schedule 1

1. A report entitled Site Development, Operation and Closure Report, Norway Lake Landfill Site, PC of A No. A411702, dated September, 1998 and prepared by The Greer Galloway Group Inc.

2. A report entitled Hydrogeology, Norway Lake Waste Disposal Site, Township of Bagot, Blythfield and Brougham, dated September, 1998 and prepared by Golder Associates Ltd.

3. A completed Ministry of the Environment form entitled Application for Approval of a Waste Disposal Site dated February 8, 2000 (revised) with a cover letter dated February 7, 2000, from Brian Whitehead, Janota Patrick & Associates Ltd., to Tesfaye Gebrezghi, MOE.

4. Letter dated February 1,2000, from Brian Whitehead, Janota Patrick & Associates Ltd., to Andrew Polley, MOE.

5. Fax dated December 2, 1999, from Brian Whitehead, Janota Patrick & Associates Ltd., to MOE.

6. Letter dated August 6, 1998, from Brian Whitehead, Janota Patrick & Associates Ltd., to Tesfaye Gebrezghi, MOE.

7. Letter dated September 14, 1998, from Kevin Mooder, The Greer Galloway Group Inc., to A. Dominski, MOE.

8. Letter dated June 23, 2000, to Tesfaye Gebrezghi, MOE, from Brian whitehead, Jonata Patrick & Associates Ltd.

9. Final Contour Plan (Drawing No.1), dated June 2000.

10. Application for a Provisional Certificate of Approval and supporting information, dated July 24, 2002, including report entitled, "Design and Operations Report: Proposed Municipal Solid Waste Transfer Station: Township of Greater Madawaska, Norway Lake Waste Disposal Site." prepared by SGS Lakefield Research.

11. Facsimile dated September 30, 2002, from Philippa McPhee, Project Manager, SGS Lakefiled Research to David Lee, MOE supplying requested information.

12. Interim Closure Plan, Norway Lake Waste Disposal Site, prepared for the Corporation of the Township of Greater Madawaska, prepared by SGS Lakefield Research Limited, dated May 2003.

13. 2002 Annual Report, Norway Lake Waste Disposal Site, prepared for the Corporation of the Township of Greater Madawaska, prepared by SGS Lakefield Research Limited, dated March 20, 2003.

14. Application for a Provisional Certificate of Approval for a Waste Disposal Site dated June 8, 2007 and signed by John A. Baird, CAO, the Township of Greater Madawaska, including all

supporting documentation.

15. Document entitled "Design and Operations Plan Municipal Solid Waste Transfer Station - Norway Lake Waste Disposal Site" dated June 29, 2007, prepared by Tyler H. Peters, P.Eng., Project Manager of Greenview Environmental Management Limited, describing the design and operation of the transfer site.

16. Response letter to MOE dated August 24, 2007, prepared by Tyler H. Peters, P.Eng., Project Manager of Greenview Environmental Management Limited.

17. Application for a Provisional Certificate of Approval for a Waste Disposal Site dated May 1, 2008 and signed by John A. Baird, CAO/Clerk, the Corporation of the Township of Greater Madawaska, including all supporting documentation.

18. Document entitled "Revised Design and Operations Plan Municipal Solid Waste Transfer Station - Norway Lake Waste Disposal Site" dated May 12, 2008 (Revision to June 29, 207 Version), prepared by Tyler H. Peters, P.Eng., Project Manager of Greenview Environmental Management Limited, describing the design and operation of the transfer Site.

19. E-mails from Tyler Peters addressed to Jim Chisholm of the Ministry of Environment dated July 21, 2008 and July 30, 2008.

20. Letter dated September 8, 2011 from Tyler Peters, Greenview Environmental Management Ltd., with attached application for an Approval for a Waste Disposal Site signed by Angela Yolkowskie, the Corporation of the Township of Greater Madawaska, dated September 6, 2011.

21. Letter dated September 26, 2011 from Tyler Peters, Greenview Environmental Management Ltd.

22. Final Contour & Site Plan dated June 6, 2000 submitted by Janota Patrick & Associates Ltd.

23. Letter dated June 21, 2010 from Tyler Peters, Greenview Environmental Management Ltd. to MOE Ottawa D.O. re Amendment to Operational Hours.

24. MOE TSS surface water review dated March 5, 2012 of the 2010 Annual Report.

25. MOE TSS groundwater review dated October 4, 2012 of the 2011 Annual Monitoring Report.

26. E-mail dated October 31, 2012 from Dan Hagan, Greenview Environmental Management Ltd. to Roman Lysiak, MOE.

27. E-mail dated December 12, 2012 from. Emily Tieu, MOE Ottawa District Office to Ms. Holtzhauer, Township of Greater Madawaska with attached Addendum, 2011 Annual Monitoring Report, Norway Lake Waste Disposal Site A411702.

28. Addendum, 2011 Annual Monitoring Report, Norway Lake Waste Disposal Site A411702, prepared by Shawn Kinney, MOE TSS dated December 11, 2012.

29. E-mail dated January 28, 2013 from Dan Hagan, Greenview Environmental Management Ltd. to Roman Lysiak, MOE.

30. Letter report dated May 31, 2013 addressed to Director, Environmental Approvals Branch from Mr. Dan Hagan, Greenview Environmental Management Limited providing various contingency plans related to groundwater, surface water, litter, noise, odour, traffic, dust and vermin.

31. Environmental Compliance Approval Application dated May 10, 2022 and signed Allison Holtzhauer, CAO/Clerk-Deputy Treasurer, The Corporation of the Township of Greater Madawaska including the attached supporting documentation.

Schedule 2
Surface Water Monitoring Program

Sampling Location	Parameters	Sampling Frequency
SW-1, SW-4 1 QA/QC	Alkalinity, aluminum, ammonia (total), barium, boron, BOD, calcium, chloride, COD, chromium, cobalt, copper, DOC, hardness, conductivity, iron, magnesium, manganese, nitrate, nitrite, phenols, potassium, sodium, silicon, strontium, total phosphorus, TKN, TDS, TSS, zinc <u>Field Measurements:</u> pH, conductivity, dissolved oxygen, temperature, unionized Ammonia (calculation)	Twice (2) annually: - in the spring (April/May/June) - in late fall (October/November)

Schedule 3

Groundwater Monitoring Program

Sampling Location	Parameters	Sampling Frequency
Routine		
OB3, OB8, BR-8 1 QA/QC	Alkalinity, boron, chloride, DOC, hardness, iron, manganese, sodium, TDS <u>Field Measurements:</u> conductivity, pH, temperature,dissolved oxygen	Twice (2) annually: - in the spring (April/May/June) - in late summer (August/September)
Surveillance		
BR-1, BR-2, BR-9, BR-10 OB-11R, OB-12 1 QA/QC	Alkalinity, aluminum, ammonia (total), barium, boron, calcium, chloride, chromium, cobalt, COD,copper, DOC, hardness, iron, magnesium, manganese, nitrate, total phosphorus potassium, sodium, silicon, strontium, sulphate, , TKN, TDS, zinc Field Measurements: conductivity, pH, temperature, dissolved oxygen	Twice (2) annually: - in the spring (April/May/June) - in late summer (August/September)
Volatile Organic Compounds		
BR-1	VOC – EPA 624	Once (1) annually: - in late summer (August/September)
Groundwater Elevations		
<u>Monitoring Wells:</u> BR-1, BR-2, BR-4, BR-5, BR-7, BR-8, BR-9, BR-10 OB-1, OB-2, OB-3, OB-4, OB-5, OB-7, OB-8, OB-11, OB-12 <u>Piezometers:</u> G-1, G-2, G-3, G-4, G-5, G-6, G-7, G-8, G-9	Groundwater elevation measurements (in metres)	Twice (2) annually: - in the spring (April/May/June) - in late summer (August/September)

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

GENERAL

- The reason for conditions 1.1, 1.2, 1.4, 1.5, 1.6, 1.7, 1.8, 1.9, 1.10, 1.17, 1.18 and 1.19 is to clarify the legal rights and responsibilities of the Owner and Operator under this Approval.

- The reasons for condition 1.3 are 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.

- The reasons for condition 1.11 are to ensure that the Site is operated under the corporate name which appears on the application form submitted for this approval and to ensure that the Director is informed of any changes.

- The reasons for condition 1.12 are to restrict potential transfer or encumbrance of the Site without the approval of the Director and to ensure that any transfer of encumbrance can be made only on the basis that it will not endanger compliance with this Approval.

- The reason for condition 1.13 is to ensure that the successor is aware of its legal responsibilities.

- The reasons for conditions 1.14 and 1.15 are that the Part II.1 Director is an individual with authority pursuant to Section 197 of the Environmental Protection Act to require registration on title and provide any person with an interest in property before dealing with the property in any way to give a copy of the Approval to any person who will acquire an interest in the property as a result of the dealing.

- The reason for condition 1.16 is to ensure that appropriate Ministry staff has ready access to the Site for inspection of facilities, equipment, practices and operations required by the conditions in this Approval. This condition is supplementary to the powers of entry afforded a Provincial Officer pursuant to the Act, the OWRA, the PA, the NMA and the SDWA.

- Condition 1.20 has been included in order to clarify what information may be subject to the Freedom of Information Act.

SITE OPERATION

- The reasons for conditions 2.1, 2.5, 2.6, 2.13 and 6.3 are to ensure that the Site is operated, inspected and maintained in an environmentally acceptable manner and does not result in a hazard or nuisance to the natural environment or any person.

- The reason for conditions 2.2, 2.3 and 2.4 is to ensure that users of the Site are fully aware of important information and restrictions related to Site operations and access under this Approval.

- The reasons for condition 2.7 are open burning of municipal waste is unacceptable because of concerns with air emissions, smoke and other nuisance effects, and the potential fire hazard and to make sure burning of brush and wood are carried out in accordance with Ministry guidelines.

- The reasons for condition 2.8, 2.9 and 2.10 are to specify the hours of operation for the landfill site and a mechanism for amendment of the hours of operation, as required.

- The reasons for condition 2.11 and 2.12 are to ensure that the Site is supervised by properly trained staff in a manner which does not result in a hazard or nuisance to the natural environment or any person and to ensure the controlled access and integrity of the Site by preventing unauthorized access when the Site is closed and no site attendant is on duty.

EMPLOYEE TRAINING

- The reason for condition 3.1 is to ensure that the Site is supervised and operated by properly trained staff in a manner which does not result in a hazard or nuisance to the natural environment or any person.

COMPLAINTS RESPONSE PROCEDURE

- The reason for condition 4.1 is to ensure that any complaints regarding landfill operations at this Site are responded to in a timely and efficient manner.

EMERGENCY RESPONSE

- Conditions 5.1 and 5.2 are included to ensure that emergency situations are reported to the Ministry to ensure public health and safety and environmental protection.

- Conditions 5.3, 5.4 and 5.5 are included to ensure that emergency situations are handled in a manner to minimize the likelihood of an adverse effect and to ensure public health and safety and environmental protection.

INSPECTIONS, RECORD KEEPING AND REPORTING

- The reason for conditions 6.1 and 6.2 is to ensure that accurate waste records are maintained to ensure compliance with the conditions in this Approval (such as fill rate, site capacity, record keeping, annual reporting, and financial assurance requirements), the EPA and its regulations.

- The reason for conditions 6.4 and 6.5 is to ensure that detailed records of Site inspections are recorded and maintained for inspection and information purposes.

- The reasons for conditions 6.6 and 6.7 are to ensure that regular review of site development, operations and monitoring data is documented and any possible improvements to site design, operations or monitoring programs are identified. An annual report is an important tool used in reviewing site activities and for determining the effectiveness of site design.

TRANSFER STATION

- The reason for conditions 7.1 to 7.5 inclusive is to specify the approved areas from which waste may be accepted at the Site and the types and amounts of waste that may be accepted at the Site for transfer, based on the Owner's application and supporting documentation.

- Conditions 7.6 to 7.11 inclusive are included to ensure that the recyclable materials are stored in their temporary storage location and transferred off-site in a manner as to minimize a likelihood of an adverse effect or a hazard to the natural environment or any person.

- The reasons for Condition 7.12 is to incorporate and approve the contingency plan into the Approval. This is to ensure the long-term health and safety of the public and the environment.

LANDFILL MONITORING

- Reasons for condition 8.1 are to ensure that landfill gas is monitored and all buildings at the Site are free of any landfill gas accumulation, which due to a methane gas component may be explosive and thus create a danger to any persons at the Site.

- Condition 8.2 is included to provide the groundwater and surface water limits to prevent water pollution at the Site.

- Conditions 8.3 and 8.4 are included to require the Owner to demonstrate that the Site is performing as designed and the impacts on the natural environment are acceptable. Regular monitoring allows for the analysis of trends over time and ensures that there is an early warning of potential problems so that any necessary remedial/contingency action can be taken.

- Conditions 8.5 and 8.6 are included to ensure the integrity of the groundwater monitoring network so that accurate monitoring results are achieved, and the natural environment is protected.

- Conditions 8.7 to 8.10 inclusive are added to ensure the Owner has a plan with an organized set of procedures for identifying and responding to potential issues relating to groundwater and surface water contamination at the Site's compliance point.

- Conditions 8.11 and 8.12 are included to streamline the approval of the changes to the monitoring plans and trigger mechanisms and contingency plans.

- The reason for Condition 8.13 is to ensure that water from on site wells are not consumed as it is not safe for human health.

CLOSURE PLAN

- The reasons for conditions 9.1 and 9.2 are to ensure that no waste is disposed at the Site as it is closed and post closure care is carried out, in accordance with Ministry standards, and to ensure the long-term protection of the health and safety of the public and the environment.

- The reason for Conditions 9.3 and 9.4 are to ensure that the Site is closed in accordance with the Ministry standards and to protect the health and safety of the environment.

Upon issuance of the environmental compliance approval, I hereby revoke Approval No(s). A411702 issued on April 9, 2013 as amended.

In accordance with Section 139 of the *Environmental Protection Act,* you may by written notice served upon me and the Ontario Land 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 ("the Notice") shall state:

a. 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;
b. 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:

1. The name of the appellant;
2. The address of the appellant;
3. The environmental compliance approval number;
4. The date of the environmental compliance approval;
5. The name of the Director, and;
6. 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:

Registrar*
Ontario Land Tribunal
655 Bay Street, Suite 1500
Toronto, Ontario
M5G 1E5
OLT.Registrar@ontario.ca

and

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

*** Further information on the Ontario Land Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349 or 1 (866) 448-2248, or www.oltt.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 17th day of March, 2023

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

RM/
c: District Manager, MECP Ottawa

Appendix B
MOE Correspondence

NORWAY LAKE WASTE DISPOSAL SITE
LOT:20, CONCESSION:7, GEOTOWNSHIP:BAGOT,
GREATER MADAWASKA, ON,

Inspection Report

System Number:	1597-5AKGP5
Entity:	THE CORPORATION OF THE TOWNSHIP OF GREATER MADAWASKA
Inspection Start Date:	10/03/2022
Inspection End Date:	11/21/2022
Inspected By:	Thandeka Ponalo
Badge #:	1718

Thandeka Ponalo

_____
(signature)

NON-COMPLIANCE/NON-CONFORMANCE ITEMS

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

Question Group: Operations

Question ID	1-E2TOCQ	**Question Type**	Legislative
Question: Is the site maintaining records on incoming, outgoing, and waste storage amounts, as specified in the ECA?			
Legislative Requirement	EPA | 27 | (1);		
Observation/Corrective Action(s)			
No Condition 15(2) of the ECA requires that a log shall be maintained, either electronically or in written format, and shall include the date, quantity and source of waste received, quantity of waste at the site at the end of the operating week and the quantities and destination of each type of waste shipped from the site. Condition 12(1) of the ECA also requires that the Annual Report shall include a detailed monthly summary of the type and quantity of all wastes received and transferred from the site. At time of the inspection, records of the daily quantities of waste received at the site were provided for review. However, a review of the 2021 Annual Report showed that only annual quantities of waste quantities are included in the Annual Report. ACTION 1. In accordance with Condition 12(1)(a), the Township shall include a detailed monthly summary of the type and quantity of all wastes received and transferred from the site in the Annual Report.			

Question Group: Other Inspection Findings

Question ID	949100	**Question Type**	Legislative
Question: Were the inspection questions sufficient to address other identified non-compliance items?			
Legislative Requirement	Not Applicable		

Observation/Corrective Action(s)
The following instances of non-compliance were also noted during the inspection: Condition 9(8) of the ECA requires that all waste bins shall be clearly marked showing the type of waste they are to contain. At time of the inspection, it was observed that the C&D waste pile and the propane tanks storage area did not have signage. ACTION 1) As required by the ECA, the Township shall ensure that all waste storage areas and bins have signage. Condition 14(2) of the ECA requires an inspection of the entire site and all equipment on the site shall be conducted each week the site is in operation to ensure that the site is secure, operations are not causing any nuisances or causing any adverse effects on the environment, and 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. At time of the inspection, staff provided daily inspection records of the site which were reviewed. Inspection logs for the site were compared with other sites and it was observed that there are inconsistencies on how forms are completed. ACTION 1) Township staff shall ensure that forms are completed in a consistent manner. If any deficiencies are identified they shall be noted and corrective actions will be documented within the report.

Question Group: Treatment Processes

Question ID	1-E2TOAX	Question Type	Legislative
Question: Are wastes processed in accordance with the ECA conditions?			
Legislative Requirement	EPA | 27 | (1);		
Observation/Corrective Action(s)			
No Condition 11(1) of the ECA outlines the burn operations at the site. The ECA requires that the leaf and yard waste collection management area shall include segregated collection and burn areas. Burn operations shall be undertaken while the site is not open to residents and during optimal weather conditions (non-windy days). The burn area shall be designed and operated in accordance with Guideline C-7 Burning at Landfill Sites. Once burned, ash material shall be transferred to the Township's other waste disposal sites or to an			

approved facility for disposal or use as an alternative daily cover.

At time of the inspection, Township staff confirmed that the site has a designated burn pit and only leaf and yard waste are burned at the location. The local fire department is also notified when burning is to take place. However, Condition 12(a) of the ECA requires that a detailed monthly summary of the type and quantity of all wastes received and transferred from the site shall be included in the report. A review of the 2021 Annual Report did not include burning as a process that occurs at the site or provide details on where ash is taken for final disposal.

ACTION

1) It is recommended that details of the burning of leaf and yard waste be detailed in the Annual Report.
2) As required in Condition 12 of the ECA, the destination of the ash waste shall be included in all subsequent Annual Reports.

INSPECTION DETAILS

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

Ministry Program: WASTE | **Regulated Activity:** Receiver Transfer Processing

Question ID	1-E2RB6B	**Question Type**	Legislative
Question: Is the site only accepting wastes limited to the types specified in the ECA?			
Legislative Requirement	EPA | 27 | (1); EPA | 40;		
Observation			
Yes The site is currently closed to all landfilling operations and is operating as a transfer station. All residential waste and blue box recycling is transferred to GFL for disposal and processing. Condition 9(4) of the ECA states that the site shall only accept residential and industrial, commercial, and institutional (IC&I) waste and recyclables. This includes residential and IC&I waste, blue-box recyclables, source separated organics, waste tires, leaf and yard waste, waste electrical and electronic equipment (WEEE), refrigerant appliances, scrap metal, construction and demolition (C&D) and bulky waste. The 2021 Annual Report listed the following waste quantities for 2021, - 415 tonnes of municipal waste transferred to the GFL facility in Moose Creek - 780 cubic metres of leaf and yard waste - 3,800 cubic metres of C&D and bulky waste - 97 tonnes of blue box recyclables (45 tonnes commingled waste, 35 tonnes mixed fibres and 17 tonnes cardboard) - 3 tonnes organics - 129 tonnes of scrap metal - 63 refrigerant units - 3,078 tires - 20 tonnes of WEEE At time of the inspection, staff stated that they no longer accept organics at the site. They have an agreement with the Town of Renfrew for residents in their Township to take hazardous household waste to the Renfrew Landfill.			

Question ID	1-E2TK4H	**Question Type**	Legislative
Question: Is waste received at the Site within the approved limits as specified in the ECA?			

Legislative Requirement	EPA | 27 | (1); EPA | 40;

Observation

Yes
In accordance with Condition 9(5) of the ECA, the maximum amount of solid non-hazardous waste and recyclables that can be accepted at the site is 200 cubic metres per day. Condition 9(6) outlines the maximum amount of non-hazardous solid waste and recyclable materials to be stored or present at the site at any given time shall not exceed 910 cubic metres:
(i) residential and IC&I waste - 120 cubic metres
(ii) blue-box recycables - 240 cubic metres
(iii) organics contained in locking, bear-proof roll-off container - 20 cubic metres
(iv) waste tires - 100 cubic metres
(v) leaf and yard waste - 200 cubic metres
(vi) WEEE - 40 cubic metres
(vii) refrigerant appliances - 25 cubic metres
(viii) scrap metal - 60 cubic metres
(ix) C & D and bulky waste contained in two (2) forty (40) cubic metres containers and one (1) twenty-five (25) cubic metres container - 105 cubic metres

Question ID	1-E2TK4P	Question Type	Legislative

Question:

Are wastes stored and handled in accordance with the ECA conditions?

Legislative Requirement	EPA | 27 | (1);

Observation

Yes
Condition 10(1) of the ECA requires that all waste stored on site shall be appropriately protected from rodents, animals and weather to prevent nuisance impacts such as dust, litter, odour, run-off and leachate generation. At time of the inspection, waste was observed to be in lockable bins and segregated piles. No dust or litter were observed during the site visit.

In accordance with Condition 10(2) of the ECA, scavenging is prohibited at the site, except at the designated re-use area under the supervision of the site attendant.

In accordance with Condition 13(2) of the ECA, the site is operated and maintained in a secure manner, such that unauthorized persons cannot enter the site. The site is surrounded by trees and thick vegetation, a screening berm and fence are in place. There is a lockable gate to control unauthorized access, that is kept locked when the site attendant is not on site.

Question ID	1-E2TOAX	Question Type	Legislative

Question:

Are wastes processed in accordance with the ECA conditions?

Legislative Requirement	EPA | 27 | (1);

Observation

No
Condition 11(1) of the ECA outlines the burn operations at the site. The ECA requires that the leaf and yard waste collection management area shall include segregated collection and burn areas. Burn operations shall be undertaken while the site is not open to residents and during optimal weather conditions (non-windy days). The burn area shall be designed and operated in accordance with Guideline C-7 Burning at Landfill Sites. Once burned, ash material shall be transferred to the Township's other waste disposal sites or to an approved facility for disposal or use as an alternative daily cover.

At time of the inspection, Township staff confirmed that the site has a designated burn pit and only leaf and yard waste are burned at the location. The local fire department is also notified when burning is to take place. However, Condition 12(a) of the ECA requires that a detailed monthly summary of the type and quantity of all wastes received and transferred from the site shall be included in the report. A review of the 2021 Annual Report did not include burning as a process that occurs at the site or provide details on where ash is taken for final disposal.

ACTION

1) It is recommended that details of the burning of leaf and yard waste be detailed in the Annual Report.
2) As required in Condition 12 of the ECA, the destination of the ash waste shall be included in all subsequent Annual Reports.

Question ID	1-E2TOBP	Question Type	Legislative

Question:

Are waste areas of the site being inspected, as specified in the ECA?

Legislative Requirement	EPA | 27 | (1);

Observation

Yes
In accordance with Condition 9(3) of the ECA, all waste shall be inspected by Trained personnel prior to being accepted at the site to ensure that the waste is of a type approved for acceptance under this ECA.

Question ID	1-E2TOBY	Question Type	Legislative
Question: Are trained/competent personnel inspecting the waste areas, as specified in the ECA?			
Legislative Requirement	EPA | 27 | (1);		
Observation			
Yes In accordance with Condition 14(1) of the ECA, all incoming and outgoing wastes shall be inspected by trained personnel prior to being received, transferred and/or shipped to ensure wastes are being managed and disposed of in accordance with the EPA and Regulation 347.			

Question ID	1-E2TOCQ	Question Type	Legislative
Question: Is the site maintaining records on incoming, outgoing, and waste storage amounts, as specified in the ECA?			
Legislative Requirement	EPA | 27 | (1);		
Observation			
No Condition 15(2) of the ECA requires that a log shall be maintained, either electronically or in written format, and shall include the date, quantity and source of waste received, quantity of waste at the site at the end of the operating week and the quantities and destination of each type of waste shipped from the site. Condition 12(1) of the ECA also requires that the Annual Report shall include a detailed monthly summary of the type and quantity of all wastes received and transferred from the site. At time of the inspection, records of the daily quantities of waste received at the site were provided for review. However, a review of the 2021 Annual Report showed that only annual quantities of waste quantities are included in the Annual Report. ACTION 1. In accordance with Condition 12(1)(a), the Township shall include a detailed monthly summary of the type and quantity of all wastes received and transferred from the site in the Annual Report.			

Question ID	949100	Question Type	Legislative
Question:			

Were the inspection questions sufficient to address other identified non-compliance items?	
Legislative Requirement	Not Applicable
Observation	
The following instances of non-compliance were also noted during the inspection: Condition 9(8) of the ECA requires that all waste bins shall be clearly marked showing the type of waste they are to contain. At time of the inspection, it was observed that the C&D waste pile and the propane tanks storage area did not have signage. ACTION 1) As required by the ECA, the Township shall ensure that all waste storage areas and bins have signage. Condition 14(2) of the ECA requires an inspection of the entire site and all equipment on the site shall be conducted each week the site is in operation to ensure that the site is secure, operations are not causing any nuisances or causing any adverse effects on the environment, and 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. At time of the inspection, staff provided daily inspection records of the site which were reviewed. Inspection logs for the site were compared with other sites and it was observed that there are inconsistencies on how forms are completed. ACTION 1) Township staff shall ensure that forms are completed in a consistent manner. If any deficiencies are identified they shall be noted and corrective actions will be documented within the report.	

Question ID	1-E2TK60	**Question Type**	Legislative
Question: Are wastes stored in accordance with the storage quantity limits specified in the ECA?			
Legislative Requirement	EPA | 27 | (1);		
Observation			
Yes			

THE TOWNSHIP OF GREATER MADAWASKA

Norway Lake
Quarterly Inspection Log
~~Griffith~~ Waste Disposal Site
Township of Greater Madawaska

Waste Mound Final Cover Inspections			
Potential Issues	Deficiencies Noted		Actions Taken
	Y / N	Location of Issue & Description	
Erosion of Final Cover	N		
Vegetation	N		
Settlement Areas	N		
Leachate Seeps	N		
Litter Management	N		

Inspection Completed By:	Name	Date (mm/dd/yyyy)	Time
	L. Emer.	11/07/23	11 AM

THE TOWNSHIP OF GREATER MADAWASKA

Norway Lake
Quarterly Inspection Log
~~Griffith~~ Waste Disposal Site
Township of Greater Madawaska

Waste Mound Final Cover Inspections			
Potential Issues	Deficiencies Noted		Actions Taken
	Y / N	Location of Issue & Description	
	N		
Vegetation	N		
Settlement Areas	N		
Leachate Seeps	N		
Litter Management	N		

Inspection Completed By:	Name	Date (mm/dd/yyyy)	Time
	L. Emon.	02/10/23	1pm

Greenview

THE TOWNSHIP OF GREATER MADAWASKA

Norway Lake

Quarterly Inspection Log
~~Griffith~~ Waste Disposal Site
Township of Greater Madawaska

Waste Mound Final Cover Inspections			
Potential Issues	Deficiencies Noted		Actions Taken
	Y / N	Location of Issue & Description	
Erosion of Final Cover	N		
Vegetation	N		
Settlement Areas	N		
Leachate Seeps	N		
Litter Management	N		

Inspection Completed By:	Name	Date (mm/dd/yyyy)	Time
	L. Enns	05/03/23	11 AM

THE TOWNSHIP OF GREATER MADAWASKA

Norway lake.

Quarterly Inspection Log
~~Landfill~~ Waste Disposal Site
Township of Greater Madawaska

Waste Mound Final Cover Inspections			
Potential Issues	Deficiencies Noted		Actions Taken
	Y / N	Location of Issue & Description	
Erosion of Final Cover	N		
Vegetation	N		
Settlement Areas	N		
Leachate Seeps	N		
Litter Management	N		

Inspection Completed By:	Name	Date (mm/dd/yyyy)	Time
	L. Emon	08/16/23	2pm

Appendix C
Borehole Logs

Project No: 10392-015

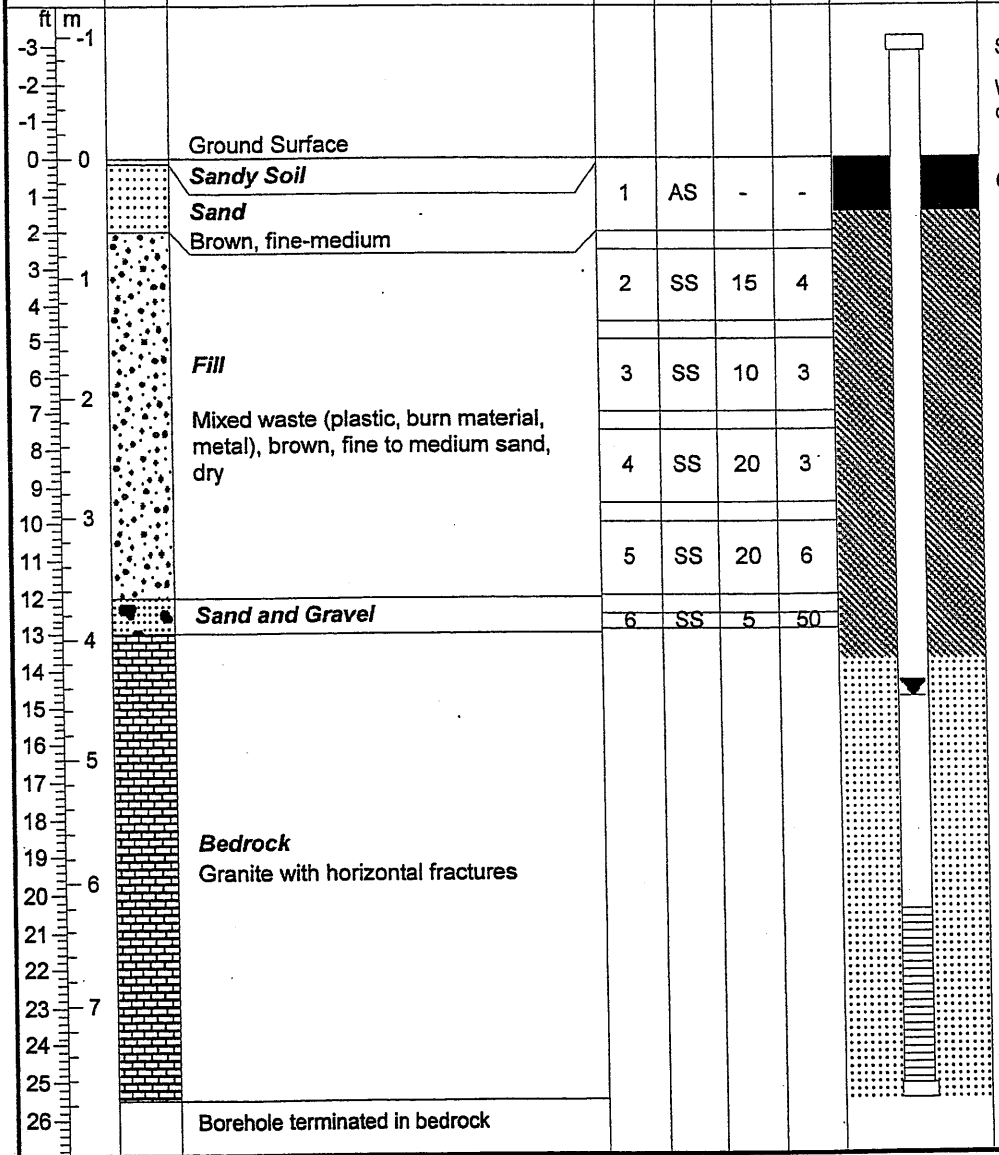
Log of Borehole: BR-10

Project: Norway Lake WDS

Client: Township of Greater Madawaska

Location: See Site Plan

Logged By: STM



Drill Method: Hollow Stem Auger/Diamond Bit Core

Drill Date: August 30, 2004

Input by: STM

Checked by: DFB

Sheet: 1 of 1

SGS

Project No: 10392-015

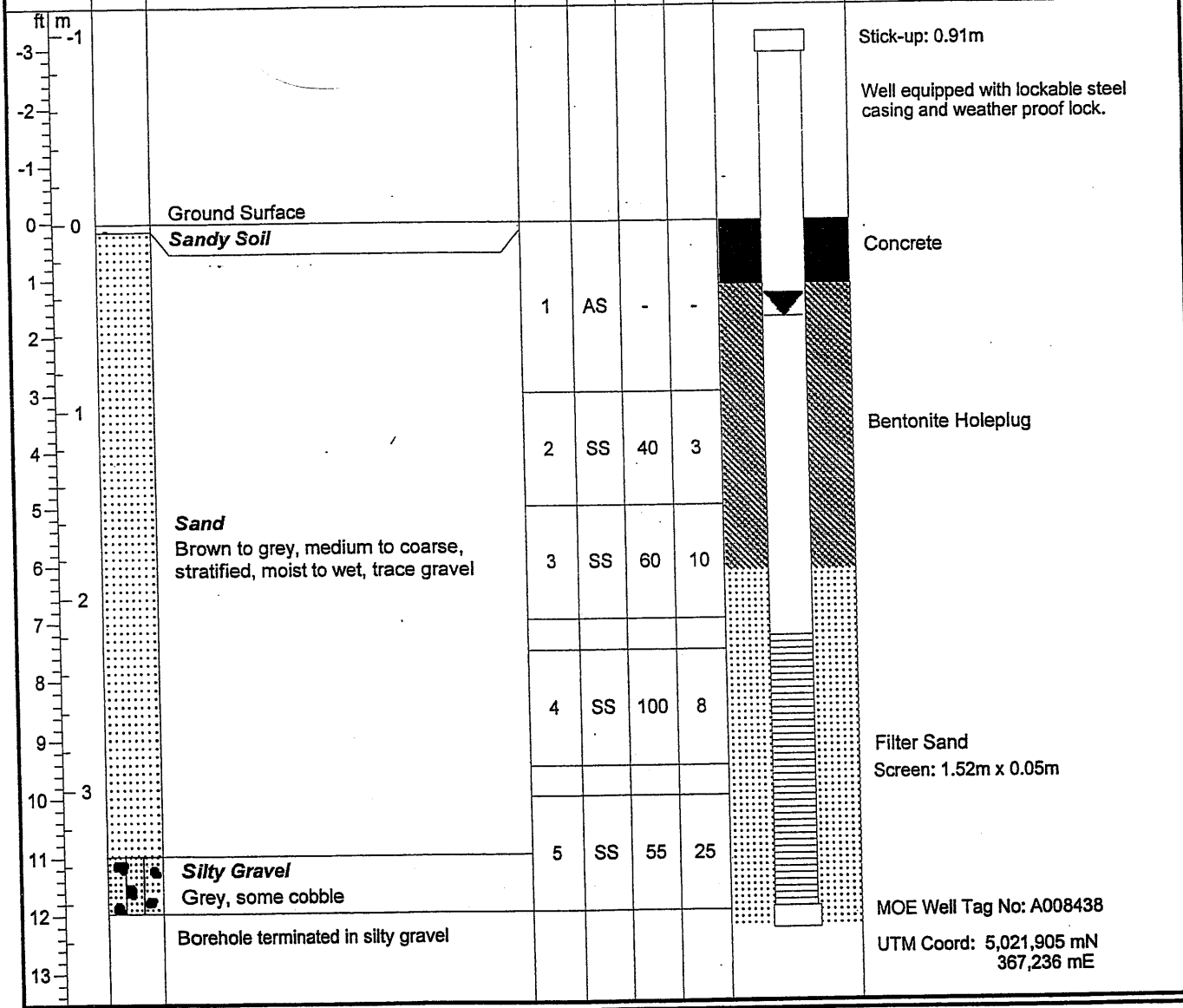
Log of Borehole: OB-11

Project: Norway Lake WDS

Client: Township of Greater Madawaska

Location: See Site Plan

Logged By: STM



Drill Method: Hollow Stem Auger - CME 75

Drill Date: August 30, 2004

Input by: STM

Checked by: DFB

Sheet: 1 of 1

SGS

Project No: 10392-015

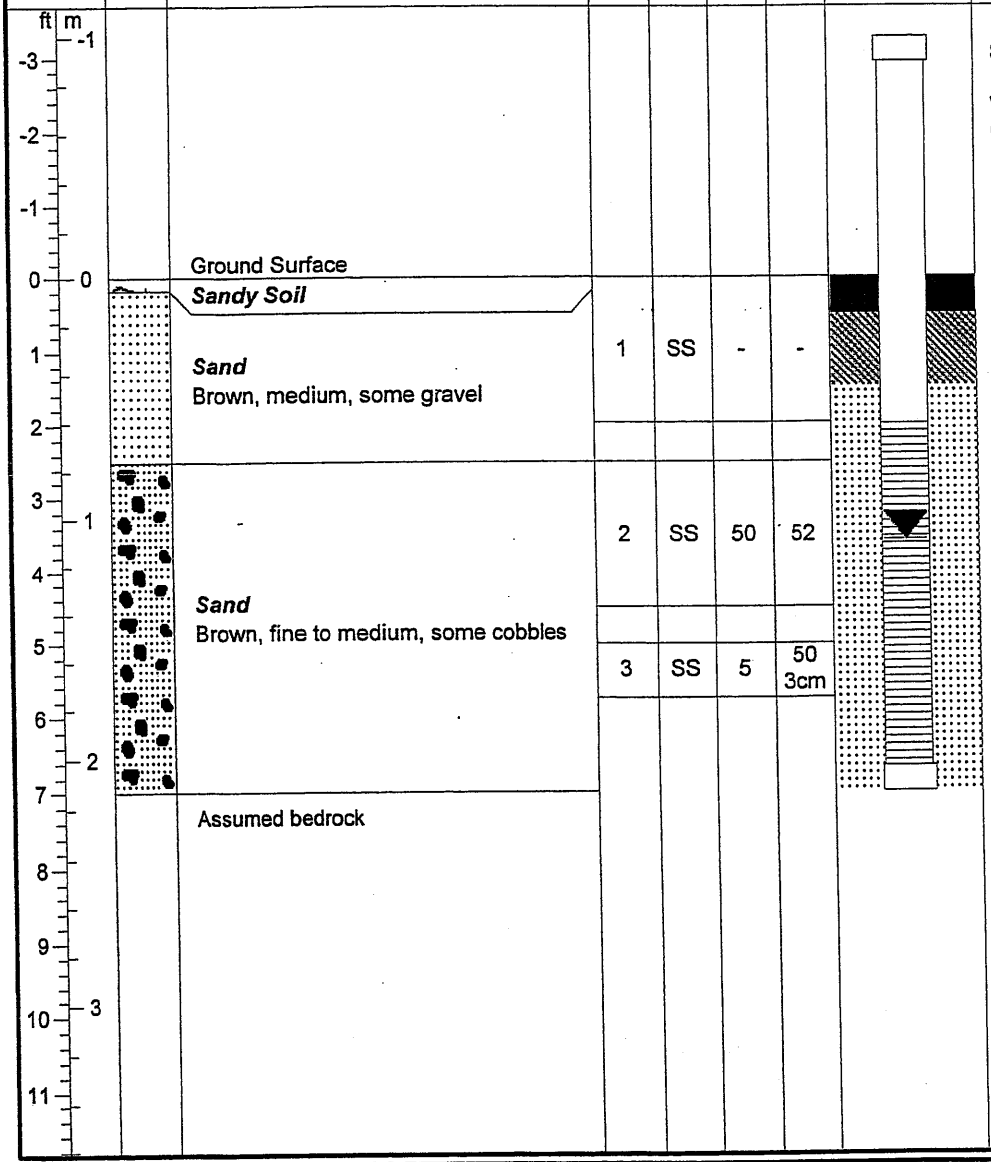
Log of Borehole: OB-12

Project: Norway Lake WDS

Client: Township of Greater Madawaska

Location: See Site Plan

Logged By: SR



Drill Method: Hollow Stem Auger - CME 75

Drill Date: August 30, 2004

Input by: STM

Checked by: DFB

Sheet: 1 of 1

SGS

BOREHOLE LOG OB-11R

Greenview
ENVIRONMENTAL MANAGEMENT

CLIENT Township of Greater Madawaska
PROJECT NAME Norway Lake Waste Disposal Site
PROJECT NUMBER 102.18.013
PROJECT LOCATION Burnstown, Ontario
DATE STARTED 10/29/18 **COMPLETED** 10/29/18
GROUND ELEVATION 171.74 m **HOLE SIZE** 0.1524 m (6")
DRILLING CONTRACTOR OGS Inc.
GROUND WATER LEVELS:
DRILLING METHOD Hollow Stem Auger (0.1524 m)
AT TIME OF DRILLING ---
LOGGED BY DMH **CHECKED BY** THP
AT END OF DRILLING ---
NOTES Replacement well for OB-11
1hrs AFTER DRILLING 0.50 m / Elev 171.24 m

DEPTH (m)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	▲ SPT N VALUE ▲ (20 40 60 80)	WELL DIAGRAM (Stickup = 1.04 m)
			0.00 Brown topsoil, dry					
	1		Grey, fine-grained sand, damp	SS 1	49	1-4-5-5 (9)		
	2		0.76 Grey, medium to fine-grained sand, wet					
1	3			SS 2	49	2-8-26-36 (34)		Bentonite hole plug
	4							
	5			SS 3	16	2-22-50 (72)		
2	6							
	7		2.29 Grey, medium to fine-grained sand with gravel, wet					
	8			SS 4	34	2-2-4-6 (6)		0.05 m (2") PVC well pipe
	9							
3	10		3.05 No sample due to gravel plug in splitspoon (interpreted to be grey, medium to fine-grained sand with gravel, wet)	SS 5	0	3-50		Silica sand
	11							Well Screen = 1.524 m
	12							
4	13		4.22 Refusal encountered - interpreted bedrock					

Bottom of hole at 4.22 m.

GREENVIEW - MW LOG - MAY18-2011 102.18.013 - NORWAY LAKE WDS - BOREHOLE LOG (OB-11R) - OCT29-18.GPJ GINT STD CANADA.GDT 1/24/19

Appendix D
Photographs

BR-1

BR-2

BR-7

BR-8

BR-9

BR-10

Jp2g Consultants Inc.
ENGINEERS · PLANNERS · PROJECT MANAGERS

Norway Lake Waste Disposal Site

2024 Groundwater Monitoring Locations

DATE	March 2025
PROJECT	22-6213D
FIGURE	1

G2

G3

G4

G6

G7

OB-1

Jp2g Consultants Inc.
ENGINEERS · PLANNERS · PROJECT MANAGERS

Noray Lake Waste Disposal Site

2024 Groundwater Monitoring Locations

DATE	March 2025
PROJECT	22-6213D
FIGURE	1

OB-2

OB-3

OB-4

OB-8

OB-11R

OB-12

Jp2g Consultants Inc.
ENGINEERS · PLANNERS · PROJECT MANAGERS

Noraway Lake Waste Disposal Site

2024 Groundwater Monitoring Locations

DATE	March 2025
PROJECT	22-6213D
FIGURE	1

SW-1

SW-2

SW-4

Jp2g Consultants Inc.
ENGINEERS · PLANNERS · PROJECT MANAGERS

Norway Lake Waste Disposal Site

2024 Surface Water Monitoring Locations

DATE	March 2025
PROJECT	22-6213D
FIGURE	1

Appendix E
Sampling Protocol

STANDARD SAMPLING PROTOCOL

The following is a description of the monitoring procedures and protocols used for groundwater and surface water monitoring for landfill sites.

Equipment Cleaning and Calibration

Regardless of matrix, prior to traveling to the site to be sampled, all equipment such as water level indicators and multi-parameter meters must be cleaned and calibrated as specified by the equipment manufacturer. Details of the cleaning and calibration should be recorded in the field notes.

GROUNDWATER
Monitoring Well Assessment

Provide an assessment of the status of all monitoring wells at the site.

Note any changes to the well and/or protective casing and record the physical condition of the well; and

Label all observation wells clearly and accurately on both the protective casing and well pipe.

Groundwater Monitoring

Maintain and use an accurate, up-to-date list of all observation wells to be monitored.

Check all field equipment for cleanliness; and

Wear personnel protective equipment as required (i.e., gloves, protective glasses, splash guards) during all phases of work, and follow any appropriate health and safety plan procedures.

Gas Detection in Wells (Prior to Measuring Water Levels)

Turn on gas meter and prepare for sampling atmospheric condition inside monitoring well.

Remove protective casing cover and well cap avoiding introduction of foreign materials into the well.

Immediately insert the probe attached to the gas meter into the well and wait for readings to stabilize.

Record the measurement in the appropriate column on the field data sheet or field book.

Water Level Measurements (Prior to Purging)

Record water level measurements prior to purging or sampling when required.

Do not move dedicated sampling devices such as the "Waterra" inertial pump prior to measuring the water level unless the well diameter dictates removal; reference the measurement from the same location each time (marked location or lowest point on pipe).

Lower the tape/probe into the wells - record the depth to water when the indicator (audible/visual) shows the water level has been reached.

Measure the water level twice by raising and lowering the tape/probe; and

Record the measurement to the nearest cm (0.5 cm) in the appropriate column on the field data sheet or field book.

Well Purging (Prior to Sampling)

The purpose of purging is to remove the stagnant water from within a monitor (removal of all stagnant water) so that a representative water sample may be collected. The procedures for purging are as follows.

Purge the well only after water levels have been confirmed.

Lift the tubing off the bottom of the well and "pump" at a minimum all stagnant water from the well into a graduated container such as a bucket, pail or cylinder so that the purged volume can be measured and recorded.

For low-yield wells, it is expected that either “no purge sampling techniques or low flow purging will be utilized (avoid purging well dry).

Under normal circumstances purged water may be discarded on the ground, away from the well to avoid the potential of water seeping back into the well; and

Allow a sufficient recovery period before sampling (not more than 48 hours).

Field Measurements

Field measurements are to be collected and recorded as outlined in the Environmental Compliance Approval or the approved monitoring program. Typically, these include at a minimum: temperature, pH and conductivity.

Well Sampling

Collect the water sample as soon as practical (not more than 48 hours) after purging starting at the least contaminated location and proceeding to the most contaminated.

Lift tubing and check valve off bottom of well to avoid introducing unnecessary sediment into the sample and transfer some representative sample water into a clean, well rinsed container to conduct measurements of field parameters.

Lift the tubing and gently transfer a sample into a clean container and thoroughly mix to form a single representative sample.

Transfer the sample into a pre-labelled sample bottle; labelling to consist of at a minimum, the project number, well ID and the date.

For samples that require filtering, attach the disposable filter onto the end of the tubing (typically a 0.45-micron membrane filter or as otherwise specified should be used).

Attempt to keep sample agitation to a minimum during sample transfer.

Store samples in a cooler, with ice packs to keep cool.

Transport samples to laboratory within the maximum hold time established by the laboratory (typically within a 48-hour period).

Volatile Organic Compound (VOC) Sampling

Volatile Organic Compounds (VOC) can be easily lost during sample collection, storage, and transportation. The following sampling and handling protocols are adhered to.

VOC samples are to be collected in special containers provided by the laboratory. These typically include glass vials, preferably amber, with a minimum capacity of 20 ml and sealed with Septum tops.

Vials must be filled just to overflowing in such a manner that no air bubbles pass through the vial as it is being filled (this is easier to accomplish by inserting a 4' length of ¼ " poly tubing into the existing Wattera tubing and filling the vial from the ¼" tubing).

Vials must then be sealed with the cap so that no air bubbles are entrapped within it; the septum is placed with the Teflon side face down toward the inside of the bottle.

Check for the presence of air bubbles by inverting the vial and tapping on hard surface; if air bubbles are present, discard the sample and re-sample.

All VOC samples must be preserved as specified by the laboratory (typically with 1 to 2 drops of Hydrochloric Acid (HCI)) and refrigerated or stored on ice until analysed; and

VOC samples should be submitted in duplicate at a ratio specified in the approved monitoring program (typically 1:10)

Surface Water Sampling (General)

Surface water samples should be collected at the same designated location during each sample event (do not collect samples from any station which is frozen, stagnant or otherwise not representative of normal conditions).

If you must stand in the stream, position yourself downstream of the sample location to avoid contaminating the sample with sediment, debris, and other floating materials.

All equipment must be thoroughly rinsed with distilled water at the beginning of each station to avoid cross-contamination.

Wear gloves as required to handle the sample bottles.

Fill all bottles using an unpreserved transfer bottle (to avoid overflowing pre-preserved bottles).

When sampling for dissolved metals, the sample must be filtered and placed in a separate metals bottle, while sampling for total metals, the sample is placed in a common bottle for metals that is provided by the laboratory.

Label and store all samples in the same manner as for groundwater samples; and

Conduct field measurements (these typically include temperature, pH, conductivity, Dissolved Oxygen and Flow).

Flow Measurements (General)

Discharge flow measurements must be taken at designated stations.

QA/QC Water Samples

A field quality assurance and quality control program for all monitoring events will be established as follows and or as dictated in the approved monitoring program.

Where groundwater or surface water samples are collected, and if stipulated in the approved monitoring program, a field blank in which a set of sample bottles is filled with distilled water at a known site or monitoring station is submitted to the laboratory for analysis along with the samples

Where VOC samples are taken, a trip blank, in which 1 set of VOC vials are filled with distilled water (at the laboratory or office) prior to going to the field and accompanies the sample bottles until they are returned to the lab; and

Duplicate of as outlined in the approved monitoring program or 1 duplicate for every 10 samples (do not identify the sample ID number to the laboratory, but have it recorded in the field notes) use the sampling technique as for observation wells.

SAMPLING

Station Sampling Order

The stations will be sampled beginning with those wells exhibiting the lowest chemical concentrations and then moving on to wells with greater chemical concentrations.

Monitoring Periods

The monitoring periods are as recommended in either the approved monitoring program or the Environmental Compliance Approval.

Analytical Parameters

Analysis will be as recommended in either the approved monitoring program and or the Environmental Compliance Approval.

Gas Detection of On-site Buildings

Gas detection in on-site buildings is to be included as part of regular monitoring.

Appendix F

Historic Static Levels, Ground and Surface Water Analysis

THE TOWNSHIP OF GREATER MADAWASKA

Groundwater Elevations
Norway Lake Waste Disposal Site

Monitor	Ground Elevation (m) [1]	Top of Pipe Elevation (m) [1]	Original Stick-up (m)	Measured Stick-Up (m) [2]	Depth of Well (m)	Well Diameter (mm)	Groundwater Elevation (m)													
							25-May-16	01-Sep-16	08-May-17	18-Sep-17	02-May-18	13-Aug-18	29-Oct-18	15-May-19	21-Aug-19	27-Apr-20	18-Aug-20	17-May-21	19-Aug-21	05-May-22	17-Aug-22
OB-1	171.63	172.39	0.76	0.65	1.55	38.1	171.31	171.04	171.44	171.23	171.42	171.09	-	171.40	170.79	171.38	171.21	171.31	171.09	171.36	171.20
OB-2	171.21	171.96	0.75	0.81	0.45	38.1	170.96	170.77	171.01	170.94	171.01	170.79	-	170.97	170.45	170.97	170.90	170.91	170.75	170.86	170.82
OB-3	171.20	172.01	0.81	0.80	4.35	38.1	170.98	170.73	171.05	170.93	171.06	170.75	-	171.03	170.42	171.02	170.92	170.99	170.68	170.97	170.82
OB-4	171.74	172.75	1.01	0.94	1.29	38.1	171.09	170.72	171.56	170.94	171.41	170.78	-	171.32	-	171.25	170.86	171.05	170.72	171.15	170.79
OB-5	174.48	174.88	0.40	0.39	3.03	38.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OB-7	170.29	171.29	1.00	1.00	2.37	38.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OB-8	166.76	167.51	0.75	0.72	4.23	38.1	164.00	162.69	166.45	163.34	166.38	163.00	-	166.25	162.68	165.60	162.55	164.36	162.99	165.18	163.51
OB-11 [4]	171.87	172.78	0.91	0.85	3.58	50.8	171.50	-	172.04	-	171.86	171.28	-	-	-	-	-	-	-	-	-
OB-11R [4]	171.04	172.08	1.04	1.04	4.22	50.8	-	-	-	-	-	-	171.24	171.71	170.97	171.63	171.32	170.72	170.48	170.83	170.58
OB-12	172.66	173.67	1.01	1.01	2.07	50.8	171.94	171.71	172.55	171.82	172.39	171.74	-	172.33	171.47	172.27	171.90	172.89	171.55	172.07	171.73
BR-1	171.18	171.91	0.73	0.64	5.39	101.6	171.31	171.04	171.41	171.04	171.43	171.07	-	171.39	170.75	171.38	171.26	171.34	171.09	171.43	171.11
BR-2	172.09	172.64	0.55	0.55	3.00	101.6	171.09	170.82	171.31	170.82	171.25	170.97	-	171.21	170.62	171.15	171.10	171.13	170.93	171.17	170.96
BR-3	176.25	176.69	0.44	0.37	4.70	101.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BR-4 [3]	179.06	179.86	0.80	0.46	7.89	101.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BR-5	175.60	176.14	0.54	0.56	4.56	101.6	171.62	-	169.16	-	173.00	170.97	-	172.60	-	172.47	-	171.85	-	172.40	-
BR-7	170.29	171.29	1.00	0.90	5.60	38.1	169.09	168.48	169.55	168.48	169.48	168.58	-	-	-	169.32	168.33	169.28	168.59	169.16	168.78
BR-8	162.09	162.69	0.60	0.54	5.44	38.1	161.09	160.07	161.75	160.07	161.46	160.44	-	161.52	160.18	161.41	160.41	161.20	160.39	161.38	160.71
BR-9	160.86	161.30	0.44	0.41	5.14	38.1	159.58	159.15	159.74	159.15	159.70	159.34	-	159.65	159.09	159.64	159.43	160.60	160.34	159.62	159.48
BR-10 [3]	176.09	177.20	1.11	1.10	7.79	31.8	171.39	171.82	173.41	171.82	172.86	171.83	-	172.91	171.54	172.72	171.98	172.23	171.76	172.57	171.98
G-1	173.73	174.18	0.45	0.36	2.04	25.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
G-2	171.21	171.73	0.52	0.44	2.01	25.0	171.18	170.97	171.38	168.97	171.11	170.92	-	171.12	170.56	171.03	170.74	171.03	170.82	170.92	170.79
G-3	171.66	172.18	0.52	0.38	2.08	25.0	-	-	-	171.44	171.90	171.32	-	171.88	171.11	171.78	171.43	171.65	-	171.79	-
G-4	171.69	172.08	0.39	0.35	2.06	25.0	171.27	171.10	171.54	169.10	171.57	171.27	-	171.47	170.87	171.35	171.11	171.23	171.04	171.31	171.11
G-5	171.60	172.08	0.48	0.39	2.01	25.0	171.53	-	-	-	-	-	-	171.90	-	171.79	-	-	-	-	-
G-6	171.80	172.74	0.94	0.49	1.59	25.0	172.07	171.73	172.52	171.73	172.44	171.76	-	172.38	171.56	172.37	171.79	172.13	171.74	172.26	171.90
G-7	171.99	173.51	1.52	1.40	1.07	25.0	171.93	171.79	172.16	171.79	172.18	171.87	-	172.09	171.44	172.10	171.88	171.94	171.71	172.03	171.83
G-8	171.85	172.81	0.96	0.85	1.34	25.0	-	-	172.82	172.70	172.24	171.92	-	171.94	171.72	172.15	171.81	172.14	171.92	172.09	171.93
G-9	171.89	172.84	0.95	0.85	1.42	25.0	-	-	-	-	172.16	171.89	-	172.08	171.66	172.08	171.92	172.01	171.82	172.02	171.94

Notes:
1. Elevations surveyed by SGS Lakefield Research on October 7, 2003 and October 5, 2004
2. Stick-Up measured by Greenview April 25, 2007.
3. BR-4 was decommissioned and BR-10 repaired by Greenview July 29, 2013.
4. OB-11 was decommissioned and OB-11R was installed on October 29, 2018.
All elevations are relative to a site specific benchmark (BM# 1) elevation of 176.93 m.
"-" indicates water level is not available.

THE TOWNSHIP OF GREATER MADAWASKA

Groundwater Quality - Overburden
Norway Lake Waste Disposal Site

Parameter	Background Overburden (median)	Overburden RUC [1]	ODWS [2]	OB-3													5-year Trends
				25-May-16	01-Sep-16	08-May-17	18-Sep-17	02-May-18	13-Aug-18	15-May-19	21-Aug-19	27-Apr-20	18-Aug-20	17-May-21	19-Aug-21	05-May-22	17-Aug-22	(sparkline)
Alkalinity (as $CaCO_3$)	246	373	30 - 500	**962**	**752**	**782**	**1160**	**754**	**765**	**602**	**779**	**570**	**674**	**651**	**646**	**511**	**730**	
Aluminum	0.01	0.06	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Ammonia, Total (as N)	0.1	N/L	N/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Barium	0.09	0.32	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Boron	0.02	1.26	5	0.566	0.719	0.663	***1.610***	0.943	1.020	0.637	0.885	0.632	0.671	0.573	0.621	0.503	0.563	
Calcium	74	N/L	N/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Chloride	33	142	250	91.2	***197***	124	69.1	82.7	117	***187***	127	**251**	**252**	***201.0***	**338.0**	**312**	**261**	
Chromium	0.0014	0.014	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Cobalt	0.0005	N/L	N/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Chemical Oxygen Demand	8	N/L	N/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Conductivity (µS/cm) [4]	430	N/L	N/L	1308	1860	1164	1564	1060	1239	948	1147	987	1204	1181	1280	1088	1506	
Copper	0.002	0.5	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Dissolved Organic Carbon	1.3	3.15	5	**8.7**	***3.9***	**6.8**	**20.2**	**9.9**	**8.3**	**8.2**	**10.1**	***4.0***	**5.9**	***4.1***	2.9	***3.2***	***3.7***	
Hardness (as $CaCO_3$)	254	254	80 - 100	**852**	**943**	**923**	**1350**	**820**	**874**	**758**	**995**	**871**	**961**	**817**	**956**	**949**	**958**	
Iron	0.05	0.18	0.3	< 0.005	0.019	***0.236***	0.104	0.078	0.150	0.044	0.091	***0.260***	***0.227***	0.088	***0.215***	0.033	0.099	
Magnesium	17	N/L	N/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Manganese	0.12	0.12	0.05	**0.334**	**0.391**	**0.384**	**0.663**	**0.387**	**0.445**	**0.348**	**0.492**	**0.449**	**0.468**	**0.394**	**0.461**	**0.457**	**0.468**	
Nitrate (as N)	0.1	2.58	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
pH (units) [4]	7.50	8.00	6.5 - 8.5	7.24	6.86	7.77	**5.69**	6.90	6.88	7.39	6.99	7.06	7.23	6.99	8.00	7.17	7.13	
Phosphorus, Total	0.02	N/L	N/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Potassium	3	N/L	N/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Silicon	4	N/L	N/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Sodium	12	106	200	77.0	89.4	89.7	***114***	84.8	88.3	73.8	86.3	81.6	79.7	77	87.6	87.5	84.6	
Strontium	0.18	N/L	N/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Sulphate	8	254	500	94	-	-	-	-	-	-	-	-	-	-	-	-	-	
Total Dissolved Solids	318	409	500	**1130**	**1100**	**1020**	**1280**	**909**	**1000**	**886**	**1940**	**1002**	**1102**	**999**	**1091**	**1148**	**1137**	
Total Kjeldahl Nitrogen	0.5	N/L	N/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Zinc	0.006	2.5	5.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Note:
1. Reasonable Use Concept (RUC) criteria.
2. Ontario Drinking Water Standards (ODWS).
3. Results obtained from laboratory analysis.
4. Results obtained from field analysis.
All results are expressed in mg/L unless otherwise stated.
Bold and shaded values exceed the ODWS.
Bold and Italic values exceed RUC limits.
Bedrock RUC is compared to background monitoring well BR-2.
Overburden RUC is compared to background monitoring well OB-12.
N/L indicates No Limit.
"-" indicates the parameter was not analyzed.

Greenview ENVIRONMENTAL MANAGEMENT

THE TOWNSHIP OF GREATER MADAWASKA

Groundwater Quality - Overburden
Norway Lake Waste Disposal Site

Parameter	Background Overburden (median)	Overburden RUC [1]	ODWS [2]	OB-8											5-year Trends
				25-May-16	08-May-17	18-Sep-17	02-May-18	13-Aug-18	15-May-19	27-Apr-20	17-May-21	19-Aug-21	05-May-22	17-Aug-22	(sparkline)
Alkalinity (as $CaCO_3$)	246	373	30 - 500	272	233	***394***	261	338	229	223	257	351	224	324	
Aluminum	0.01	0.06	0.1	-	-	-	-	-	-	-	-	-	-	-	
Ammonia, Total (as N)	0.1	N/L	N/L	-	-	-	-	-	-	-	-	-	-	-	
Barium	0.09	0.32	1	-	-	-	-	-	-	-	-	-	-	-	
Boron	0.02	1.26	5	0.054	0.062	***1.620***	0.052	0.085	0.070	0.078	0.079	0.107	0.089	0.119	
Calcium	74	N/L	N/L	-	-	-	-	-	-	-	-	-	-	-	
Chloride	33	142	250	71.6	66.0	69.0	55.1	89.6	86.7	92.8	95.0	***162.0***	104	***149.0***	
Chromium	0.0014	0.014	0.05	-	-	-	-	-	-	-	-	-	-	-	
Cobalt	0.0005	N/L	N/L	-	-	-	-	-	-	-	-	-	-	-	
Chemical Oxygen Demand	8	N/L	N/L	-	-	-	-	-	-	-	-	-	-	-	
Conductivity (µS/cm) [4]	430	N/L	N/L	497	436	792	387	672	433	423	525	737	421	748	
Copper	0.002	0.5	1	-	-	-	-	-	-	-	-	-	-	-	
Dissolved Organic Carbon	1.3	3.15	5	***4.3***	**6.8**	**20.8**	***4.4***	**6.1**	**7.1**	**5.5**	***4.9***	***4.3***	***4.8***	***3.2***	
Hardness (as $CaCO_3$)	254	254	80 - 100	**303**	**342**	**1350**	**315**	**439**	**341**	**367**	**347**	**548**	**361**	**466**	
Iron	0.05	0.18	0.3	0.009	0.011	0.105	0.009	< 0.005	0.027	0.011	0.063	0.154	0.066	0.170	
Magnesium	17	N/L	N/L	-	-	-	-	-	-	-	-	-	-	-	
Manganese	0.12	0.12	0.05	0.001	< 0.001	**0.663**	< 0.001	0.001	0.001	0.001	0.002	0.006	0.002	0.004	
Nitrate (as N)	0.1	2.58	10	-	-	-	-	-	-	-	-	-	-	-	
pH (units) [4]	7.50	8.00	6.5 - 8.5	7.78	7.89	8.16	7.87	7.09	7.45	7.45	7.91	8.14	7.46	6.78	
Phosphorus, Total	0.02	N/L	N/L	-	-	-	-	-	-	-	-	-	-	-	
Potassium	3	N/L	N/L	-	-	-	-	-	-	-	-	-	-	-	
Silicon	4	N/L	N/L	-	-	-	-	-	-	-	-	-	-	-	
Sodium	12	106	200	21.2	25.0	***115***	18.8	32.3	23.9	27.5	27.8	38	31.0	40.6	
Strontium	0.18	N/L	N/L	-	-	-	-	-	-	-	-	-	-	-	
Sulphate	8	254	500	19	-	-	-	-	-	-	-	-	-	-	
Total Dissolved Solids	318	409	500	382	397	**577**	334	**509**	391	406	***419***	**607**	***420***	**569**	
Total Kjeldahl Nitrogen	0.5	N/L	N/L	-	-	-	-	-	-	-	-	-	-	-	
Zinc	0.006	2.5	5.0	-	-	-	-	-	-	-	-	-	-	-	

Note:
1. Reasonable Use Concept (RUC) criteria.
2. Ontario Drinking Water Standards (ODWS).
3. Results obtained from laboratory analysis.
4. Results obtained from field analysis.
All results are expressed in mg/L unless otherwise stated.
Bold and shaded values exceed the ODWS.
Bold and Italic values exceed RUC limits.
Bedrock RUC is compared to background monitoring well BR-2.
Overburden RUC is compared to background monitoring well OB-12.
N/L indicates No Limit.
"-" indicates the parameter was not analyzed.

Greenview ENVIRONMENTAL MANAGEMENT

THE TOWNSHIP OF GREATER MADAWASKA

Groundwater Quality - Overburden
Norway Lake Waste Disposal Site

Parameter	Background Overburden (median)	Overburden RUC [1]	ODWS [2]	OB-11					OB-11R								5-year Trends
				25-May-16	01-Sep-16	08-May-17	18-Sep-17	13-Aug-18	15-May-19	21-Aug-19	27-Apr-20	18-Aug-20	17-May-21	19-Aug-21	05-May-22	17-Aug-22	(sparkline)
Alkalinity (as $CaCO_3$)	246	373	30 - 500	324	338	254	***421***	***381***	182	345	249	342	***403***	***409***	356	**368**	
Aluminum	0.01	0.06	0.1	0.05	***0.06***	***0.06***	**0.14**	***0.08***	**0.71**	***0.09***	***0.07***	**0.10**	**0.10**	**0.10**	**0.14**	0.05	
Ammonia, Total (as N)	0.1	N/L	N/L	0.02	0.08	0.01	0.03	0.02	0.16	0.08	0.03	0.03	0.05	0.04	0.06	< 0.01	
Barium	0.09	0.32	1	***0.356***	***0.594***	0.112	***0.742***	***0.402***	0.084	***0.360***	0.231	***0.531***	***0.462***	***0.489***	***0.481***	***0.590***	
Boron	0.02	1.26	5	0.016	0.030	< 0.005	0.041	0.041	0.020	0.033	0.027	0.038	0.040	0.044	0.034	0.027	
Calcium	74	N/L	N/L	160	271	101	298	167	72.8	194	129	242	210	206	225	236	
Chloride	33	142	250	**623**	**898**	97.0	75.9	**572**	121	**646**	**405**	**881**	**865**	**912**	**870**	**1160**	
Chromium	0.0014	0.014	0.05	< 0.002	< 0.002	< 0.001	0.002	< 0.001	0.001	< 0.001	< 0.001	< 0.001	< 0.002	< 0.002	< 0.001	< 0.001	
Cobalt	0.0005	N/L	N/L	0.0003	0.0003	0.0014	0.0017	0.0008	0.0017	0.0001	0.0003	< 0.0005	< 0.001	< 0.001	< 0.0005	< 0.0005	
Chemical Oxygen Demand	8	N/L	N/L	101	6	25	10	36	20	30	12	8	19	11	17	27	
Conductivity (µS/cm) [4]	430	N/L	N/L	1683	3251	569	2508	1862	461	1863	995	2335	2354	3150	1993	2034	
Copper	0.002	0.5	1	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	0.003	< 0.002	< 0.002	0.0018	0.0021	< 0.002	0.0023	0.0012	
Dissolved Organic Carbon	1.3	3.15	5	0.4	0.6	***4.1***	2.3	1.2	***3.7***	2.1	1.5	2.3	2.1	1.8	1.5	0.6	
Hardness (as $CaCO_3$)	254	254	80 - 100	**571**	**934**	**324**	**1030**	**577**	**253**	**637**	**436**	**784**	**703**	**678**	**747**	**767**	
Iron	0.05	0.18	0.3	0.062	0.022	**1.10**	**0.609**	0.163	**1.34**	0.035	0.016	0.015	0.011	0.021	***0.241***	< 0.005	
Magnesium	17	N/L	N/L	41.3	62.3	17.5	68.8	38.8	17.2	36.9	27.6	43.6	43.2	39.6	44.9	43.0	
Manganese	0.12	0.12	0.05	0.022	0.016	**0.991**	**0.284**	**0.051**	**0.112**	0.003	0.001	0.002	0.002	0.003	0.014	0.002	
Nitrate (as N)	0.1	2.58	10	0.7	2.3	< 0.05	0.15	< 0.5	< 0.05	1.22	0.42	2.31	2.18	2.07	1.38	0.28	
pH (units) [4]	7.50	8.00	6.5 - 8.5	7.32	7.27	7.82	**8.67**	7.09	7.82	7.20	7.19	**6.40**	7.28	7.74	7.13	6.87	
Phosphorus, Total	0.02	N/L	N/L	1.67	0.53	0.29	0.22	0.55	0.37	0.39	0.39	0.14	0.45	0.04	0.09	0.04	
Potassium	3	N/L	N/L	3.2	4.8	2.2	5.7	4.5	2.1	4.8	2.8	5.4	4.7	5.3	4.6	6.3	
Silicon	4	N/L	N/L	4.12	5.51	5.98	6.82	5.04	4.17	4.73	3.80	5.30	4.59	5.64	5.03	5.36	
Sodium	12	106	200	**216**	**322**	75.3	**397**	**322**	65.1	**373**	**232**	**437**	**469**	**499**	**498**	**571**	
Strontium	0.18	N/L	N/L	0.383	0.693	0.158	0.714	0.430	0.161	0.435	0.303	0.527	0.522	0.504	0.511	0.592	
Sulphate	8	254	500	45	80	9	8	68	8	53	37	78	64	74	58	65	
Total Dissolved Solids	318	409	500	**1290**	**1840**	***470***	**1950**	**1451**	380	**1583**	**941**	**1944**	**2042**	**2036**	**2145**	**2474**	
Total Kjeldahl Nitrogen	0.5	N/L	N/L	1.1	1.1	0.5	0.3	0.4	0.1	0.3	0.3	0.3	0.3	0.2	0.2	0.3	
Zinc	0.006	2.5	5.0	0.007	0.005	< 0.005	< 0.005	< 0.005	0.007	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	

Note:
1. Reasonable Use Concept (RUC) criteria.
2. Ontario Drinking Water Standards (ODWS).
3. Results obtained from laboratory analysis.
4. Results obtained from field analysis.
All results are expressed in mg/L unless otherwise stated.
Bold and shaded values exceed the ODWS.
Bold and Italic values exceed RUC limits.
Bedrock RUC is compared to background monitoring well BR-2.
Overburden RUC is compared to background monitoring well OB-12.
N/L indicates No Limit.
"-" indicates the parameter was not analyzed.

THE TOWNSHIP OF GREATER MADAWASKA

Groundwater Quality - Overburden
Norway Lake Waste Disposal Site

Parameter	Background Overburden (median)	Overburden RUC [1]	ODWS [2]	OB-12 (Background)													5-year Trends
				25-May-16	01-Sep-16	08-May-17	18-Sep-17	02-May-18	13-Aug-18	15-May-19	21-Aug-19	27-Apr-20	18-Aug-20	17-May-21	19-Aug-21	05-May-22	17-Aug-22	(sparkline)
Alkalinity (as $CaCO_3$)	246	373	30 - 500	247	246	211	284	220	243	203	232	207	254	243	253	214	269	
Aluminum	0.01	0.06	0.1	0.02	0.03	***0.06***	***0.06***	0.05	***0.07***	0.05	0.05	0.05	**0.15**	***0.06***	***0.06***	0.02	0.03	
Ammonia, Total (as N)	0.1	N/L	N/L	0.02	0.08	0.03	0.03	0.06	0.03	0.13	0.14	0.02	0.02	0.02	0.05	0.18	< 0.01	
Barium	0.09	0.32	1	0.102	0.158	0.100	0.130	0.101	0.174	0.120	0.143	0.124	0.164	0.126	0.145	0.130	0.170	
Boron	0.02	1.26	5	0.007	0.016	< 0.005	0.009	0.006	0.013	0.007	0.015	0.008	0.013	0.009	0.013	0.008	0.008	
Calcium	74	N/L	N/L	71.8	97.1	80.5	78.5	82.5	105	93.4	98.0	97.8	98.1	92.0	89.4	107	108	
Chloride	33	142	250	138	128	39.5	39.6	123	***194***	***158***	140	***204***	***160***	***147***	132	***175***	***197***	
Chromium	0.0014	0.014	0.05	< 0.002	< 0.002	< 0.001	0.002	< 0.001	< 0.001	< 0.001	< 0.001	0.002	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	
Cobalt	0.0005	N/L	N/L	< 0.0001	0.0002	< 0.0001	0.0003	< 0.0001	0.0003	0.0002	< 0.0001	< 0.0002	0.0005	< 0.0001	0.0002	< 0.0001	< 0.0002	
Chemical Oxygen Demand	8	N/L	N/L	37	46	34	17	12	39	23	43	9	7	10	< 5	7	8	
Conductivity (µS/cm) [4]	430	N/L	N/L	642	866	385	540	477	881	531	643	578	713	635	570	601	908	
Copper	0.002	0.5	1	< 0.002	0.002	< 0.002	< 0.002	< 0.002	< 0.002	0.002	< 0.002	< 0.002	0.0033	0.0013	< 0.002	0.0018	0.0007	
Dissolved Organic Carbon	1.3	3.15	5	0.9	1.2	1.9	3.1	1.4	1.3	2.8	2.8	1.4	2.0	1.5	1.7	1.3	0.6	
Hardness (as $CaCO_3$)	254	254	80 - 100	**253**	**330**	**271**	**271**	**291**	**364**	**321**	**338**	**339**	**326**	**319**	**305**	**366**	**361**	
Iron	0.05	0.18	0.3	< 0.005	0.013	0.006	0.007	0.029	< 0.005	0.009	0.005	0.006	**0.315**	0.005	0.009	< 0.005	< 0.005	
Magnesium	17	N/L	N/L	17.8	21.2	16.9	18.3	20.5	24.7	21.3	22.7	22.9	19.7	21.6	19.9	24.2	22.5	
Manganese	0.12	0.12	0.05	0.008	**0.251**	0.047	**0.752**	0.033	**0.290**	0.027	**0.363**	0.012	**0.200**	0.020	**0.421**	0.010	**0.059**	
Nitrate (as N)	0.1	2.58	10	0.2	0.2	< 0.05	< 0.05	< 0.05	< 0.05	0.07	0.08	0.07	< 0.05	0.10	< 0.05	< 0.05	< 0.05	
pH (units) [4]	7.50	8.00	6.5 - 8.5	7.71	7.71	7.98	**8.75**	7.51	7.27	7.30	7.09	7.19	**6.20**	7.50	7.93	7.30	6.91	
Phosphorus, Total	0.02	N/L	N/L	0.70	0.37	4.48	0.48	0.25	1.21	0.42	0.31	0.16	0.11	0.07	0.10	0.04	0.08	
Potassium	3	N/L	N/L	2.3	3.4	2.5	3.0	2.3	3.8	2.9	3.6	2.5	3.2	2.8	3.4	2.8	3.8	
Silicon	4	N/L	N/L	3.38	4.71	3.32	5.16	3.05	4.48	3.21	4.35	3.19	4.43	3.33	4.59	3.35	4.49	
Sodium	12	106	200	58.9	54.8	26.4	59.5	35.2	79.5	50.2	67.7	74.4	93.9	61.2	70	62.3	89.6	
Strontium	0.18	N/L	N/L	0.170	0.262	0.166	0.197	0.185	0.287	0.210	0.258	0.220	0.218	0.212	0.224	0.218	0.255	
Sulphate	8	254	500	16	15	6	12	6	13	15	15	9	13	10	12	9	17	
Total Dissolved Solids	318	409	500	***455***	***481***	301	382	392	**590**	***467***	***494***	**556**	**551**	***497***	***449***	**536**	**610**	
Total Kjeldahl Nitrogen	0.5	N/L	N/L	0.7	0.4	1.7	0.4	0.3	0.6	0.2	0.4	0.2	0.2	0.2	0.2	0.2	0.2	
Zinc	0.006	2.5	5.0	0.008	0.006	< 0.005	< 0.005	< 0.005	0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	

Note:
1. Reasonable Use Concept (RUC) criteria.
2. Ontario Drinking Water Standards (ODWS).
3. Results obtained from laboratory analysis.
4. Results obtained from field analysis.
All results are expressed in mg/L unless otherwise stated.
Bold and shaded values exceed the ODWS.
Bold and Italic values exceed RUC limits.
Bedrock RUC is compared to background monitoring well BR-2.
Overburden RUC is compared to background monitoring well OB-12.
N/L indicates No Limit.
"-" indicates the parameter was not analyzed.

THE TOWNSHIP OF GREATER MADAWASKA

Groundwater Quality - Bedrock
Norway Lake Waste Disposal Site

Parameter	Background Bedrock (median)	Bedrock RUC [1]	ODWS [2]	BR-1													5-year Trends
				25-May-16	01-Sep-16	08-May-17	18-Sep-17	02-May-18	13-Aug-18	15-May-19	21-Aug-19	27-Apr-20	18-Aug-20	17-May-21	19-Aug-21	05-May-22	17-Aug-22	(sparkline)
Alkalinity (as $CaCO_3$)	199	350	30 - 500	**1020**	**825**	**962**	**1090**	**864**	**880**	**684**	**820**	**651**	**743**	**788**	**705**	**572**	**772**	
Aluminum	0.0045	0.052	0.1	***0.05***	***0.06***	**0.11**	**0.11**	***0.09***	**0.10**	***0.09***	**0.10**	***0.09***	***0.09***	**0.10**	**0.10**	***0.06***	0.05	
Ammonia, Total (as N)	0.1	N/L	N/L	0.04	0.09	0.09	0.14	0.22	0.16	0.21	0.25	0.27	0.21	0.28	0.22	0.29	0.21	
Barium	0.081	0.31	1	0.130	0.153	0.175	0.219	0.172	0.160	0.136	0.175	0.161	0.184	0.154	0.172	0.156	0.181	
Boron	0.018	1.26	5	0.757	0.830	1.02	***1.38***	1.20	1.15	0.949	1.01	0.939	0.822	0.823	0.752	0.777	0.678	
Calcium	73	N/L	N/L	183	208	233	264	221	199	177	231	204	227	189	208	201	211	
Chloride	39	144	250	63.0	***154***	53.0	59.2	80.3	79.3	106	96.7	***156***	***164***	11.8	***241***	**257**	***193***	
Chromium	0.002	0.014	0.05	< 0.002	< 0.002	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.001	< 0.001	
Cobalt	0.0005	N/L	N/L	0.0104	0.0079	0.0094	0.0106	0.0122	0.0097	0.0085	0.0104	0.0100	0.0101	0.0096	0.0084	0.0195	0.0085	
Chemical Oxygen Demand	8	N/L	N/L	67	23	42	58	56	42	48	43	55	34	37	28	26	33	
Conductivity (µS/cm) [4]	424	N/L	N/L	1351	1253	1191	1468	1222	1274	950	1100	990	1147	1137	1630	1039	1316	
Copper	0.0039	0.5	1	0.006	0.005	< 0.002	0.002	0.004	< 0.002	0.003	< 0.002	0.004	0.0043	0.0051	0.002	0.0101	0.0030	
Dissolved Organic Carbon	1.5	3.3	5	**13.5**	**5.8**	**13.9**	**20.8**	**15.6**	**11.9**	**13.4**	**13.9**	**9.1**	**8.8**	**10.0**	**5.9**	***4.5***	**5.2**	
Hardness (as $CaCO_3$)	254	254	80 - 100	**871**	**961**	**1080**	**1220**	**1030**	**945**	**838**	**1050**	**942**	**987**	**875**	**943**	**917**	**944**	
Iron	2.18	2.18	0.3	**0.967**	**0.877**	**1.69**	**1.05**	**0.820**	**0.995**	**1.57**	**0.993**	**3.74**	**3.99**	**1.01**	**1.77**	**2.27**	**2.27**	
Magnesium	17	N/L	N/L	101	107	122	136	115	109	96.3	116	105	102	98.0	103.0	101	102	
Manganese	0.11	0.11	0.05	**0.510**	**0.488**	**0.585**	**0.773**	**0.661**	**0.572**	**0.496**	**0.693**	**0.651**	**0.645**	**0.610**	**0.564**	**0.609**	**0.604**	
Nitrate (as N)	0.05	2.54	10	< 0.1	0.1	< 0.05	< 0.05	0.06	< 0.05	< 0.05	< 0.05	0.06	< 0.05	0.08	< 0.05	< 0.05	< 0.05	
pH (units) [4]	7.53	8.02	6.5 - 8.5	7.10	6.85	7.17	6.52	6.65	6.78	7.24	7.08	6.97	7.09	6.94	7.91	7.04	**6.46**	
Phosphorus, Total	0.025	N/L	N/L	0.03	0.02	0.02	0.02	0.03	0.03	0.03	0.04	0.10	0.03	0.02	0.01	0.02	0.04	
Potassium	6	N/L	N/L	11.9	13.0	16.7	19.1	17.2	16.8	15.7	18.2	18.0	17.4	17.4	17.3	17.9	17.6	
Silicon	4	N/L	N/L	5.84	6.76	7.43	8.21	6.75	6.93	6.25	6.81	6.56	6.63	6.13	6.82	6.16	6.63	
Sodium	3	101	200	73.2	88.6	86.2	99.4	78.3	85.4	65.9	80.3	72.6	76.0	67.7	81.1	72.7	77.5	
Strontium	0.13	N/L	N/L	0.661	0.865	0.903	1.01	0.880	0.916	0.844	0.927	0.898	0.847	0.808	0.885	0.811	0.912	
Sulphate	11	255	500	82	92	55	92	104	91	61	110	75	13	7	80	48	66	
Total Dissolved Solids	332	416	500	**1130**	**1080**	**1040**	**1190**	**994**	**1034**	**897**	**1034**	**960**	**1051**	**975**	**1045**	**1043**	**1067**	
Total Kjeldahl Nitrogen	0.5	N/L	N/L	0.7	0.5	0.7	0.9	0.8	0.8	0.6	0.8	0.8	0.7	0.8	0.6	0.6	0.8	
Zinc	0.01	2.5	5.0	0.008	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	

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

All results are expressed in mg/L unless otherwise stated.
Bold and shaded values exceed the ODWS.
Bold and Italic values exceed RUC limits.
Bedrock RUC is compared to background monitoring well BR-2.
Overburden RUC is compared to background monitoring well OB-12.
N/L indicates No Limit.
"-" indicates the parameter was not analyzed.

Greenview ENVIRONMENTAL MANAGEMENT

THE TOWNSHIP OF GREATER MADAWASKA

Groundwater Quality - Bedrock
Norway Lake Waste Disposal Site

Parameter	Background Bedrock (median)	Bedrock RUC [1]	ODWS [2]	BR-2 (Background)													5-year Trends
				25-May-16	01-Sep-16	08-May-17	18-Sep-17	02-May-18	13-Aug-18	15-May-19	21-Aug-19	27-Apr-20	18-Aug-20	17-May-21	19-Aug-21	05-May-22	17-Aug-22	(sparkline)
Alkalinity (as $CaCO_3$)	199	350	30 - 500	322	327	250	296	290	320	258	268	267	292	328	338	301	318	
Aluminum	0.0045	0.052	0.1	0.03	0.04	***0.06***	***0.08***	0.05	***0.08***	0.05	0.05	***0.06***	***0.06***	***0.07***	***0.08***	0.04	0.03	
Ammonia, Total (as N)	0.1	N/L	N/L	< 0.01	0.05	< 0.01	0.03	0.03	0.01	0.04	0.28	0.02	0.02	0.02	0.03	< 0.01	< 0.01	
Barium	0.081	0.31	1	0.132	0.163	0.147	0.188	0.136	0.166	0.129	0.125	0.141	0.164	0.156	0.197	0.180	0.234	
Boron	0.018	1.26	5	0.007	0.020	< 0.005	0.014	0.011	0.013	0.011	0.017	0.010	0.015	0.012	0.016	0.013	0.009	
Calcium	73	N/L	N/L	98.7	115	107	128	96.9	112	91.0	92.4	101	111	110	132.0	132	151	
Chloride	39	144	250	51.0	80.1	42.9	65.4	44.6	71.8	31.4	49.5	32.7	51.0	56.4	91.7	84.2	***146***	
Chromium	0.002	0.014	0.05	< 0.002	< 0.002	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	
Cobalt	0.0005	N/L	N/L	0.0002	0.0002	< 0.0001	0.0003	< 0.0001	0.0004	0.0004	< 0.0001	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	
Chemical Oxygen Demand	8	N/L	N/L	14	7	8	6	14	13	19	16	7	5	15	19	11	20	
Conductivity (µS/cm) [4]	424	N/L	N/L	438	731	406	593	441	553	361	399	342	468	526	565	458	770	
Copper	0.0039	0.5	1	0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	0.0014	0.0011	< 0.002	0.0012	0.0004	
Dissolved Organic Carbon	1.5	3.3	5	2.3	2.2	2.2	***3.3***	2.5	3.0	3.1	***4.0***	***3.6***	***4.1***	***3.9***	3.0	2.6	1.2	
Hardness (as $CaCO_3$)	254	254	80 - 100	**330**	**387**	**352**	**416**	**319**	**369**	**301**	**309**	**331**	**358**	**363**	**428**	**432**	**487**	
Iron	2.18	2.18	0.3	**1.06**	**4.89**	**1.27**	**0.794**	**0.311**	**1.55**	**0.788**	**5.93**	**0.923**	**2.98**	**0.643**	**0.604**	**0.857**	**1.02**	
Magnesium	17	N/L	N/L	20.1	24.2	20.5	23.3	18.7	21.6	18.0	18.9	19.2	19.6	21.5	23.9	24.7	26.5	
Manganese	0.11	0.11	0.05	0.032	**0.118**	**0.058**	0.025	0.019	0.037	0.023	**0.117**	0.027	**0.082**	0.034	0.049	**0.051**	**0.058**	
Nitrate (as N)	0.05	2.54	10	< 0.1	0.1	< 0.05	< 0.05	< 0.05	0.38	< 0.05	< 0.05	0.08	< 0.05	0.15	< 0.05	< 0.05	< 0.05	
pH (units) [4]	7.53	8.02	6.5 - 8.5	**6.06**	7.53	7.93	**8.80**	7.90	7.63	7.57	7.42	7.33	6.95	7.79	8.37	7.48	6.70	
Phosphorus, Total	0.025	N/L	N/L	0.01	0.12	0.04	0.02	0.05	0.08	0.07	0.13	0.10	0.13	0.10	0.22	0.02	0.11	
Potassium	6	N/L	N/L	5.4	7.3	6.6	8.1	5.9	7.4	5.6	6.6	6.0	7.1	6.5	7.8	6.9	8.1	
Silicon	4	N/L	N/L	4.63	5.24	5.19	7.04	5.04	5.72	4.94	4.66	5.23	5.19	5.13	6.39	5.58	6.22	
Sodium	3	101	200	17.4	22.3	18.7	25.2	19.9	26.0	19.7	22.3	20.6	21.7	21.5	26.4	24.9	28.3	
Strontium	0.13	N/L	N/L	0.172	0.218	0.174	0.218	0.172	0.209	0.163	0.154	0.172	0.181	0.200	0.229	0.209	0.259	
Sulphate	11	255	500	24	24	15	16	19	19	19	16	22	20	20	25	20	21	
Total Dissolved Solids	332	416	500	411	***493***	366	***451***	348	***433***	328	368	347	394	413	***469***	***466***	**563**	
Total Kjeldahl Nitrogen	0.5	N/L	N/L	0.1	0.2	0.2	0.1	0.1	0.2	< 0.1	0.2	0.1	0.2	0.2	0.3	0.1	0.1	
Zinc	0.01	2.5	5.0	< 0.005	0.007	< 0.005	< 0.005	< 0.005	0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	

Note:
1. Reasonable Use Concept (RUC) criteria.
2. Ontario Drinking Water Standards (ODWS).
3. Results obtained from laboratory analysis.
4. Results obtained from field analysis.
All results are expressed in mg/L unless otherwise stated.
Bold and shaded values exceed the ODWS.
Bold and Italic values exceed RUC limits.
Bedrock RUC is compared to background monitoring well BR-2.
Overburden RUC is compared to background monitoring well OB-12.
N/L indicates No Limit.
"-" indicates the parameter was not analyzed.

Greenview ENVIRONMENTAL MANAGEMENT

THE TOWNSHIP OF GREATER MADAWASKA

Groundwater Quality - Bedrock
Norway Lake Waste Disposal Site

Parameter	Background Bedrock (median)	Bedrock RUC [1]	ODWS [2]	BR-8													5-year Trends
				25-May-16	01-Sep-16	08-May-17	18-Sep-17	02-May-18	13-Aug-18	15-May-19	21-Aug-19	27-Apr-20	18-Aug-20	17-May-21	19-Aug-21	05-May-22	17-Aug-22	(sparkline)
Alkalinity (as $CaCO_3$)	199	350	30 - 500	259	258	230	264	255	265	226	239	218	247	250	260	227	279	
Aluminum	0.0045	0.052	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Ammonia, Total (as N)	0.1	N/L	N/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Barium	0.081	0.31	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Boron	0.018	1.26	5	0.104	0.275	0.102	0.261	0.121	0.194	0.144	0.152	0.100	0.208	0.191	0.259	0.148	0.125	
Calcium	73	N/L	N/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Chloride	39	144	250	32.5	43.1	47.8	38.7	50.4	42.5	45.3	41.0	56.5	56.6	55.1	61.1	73.0	98.2	
Chromium	0.002	0.014	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Cobalt	0.0005	N/L	N/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Chemical Oxygen Demand	8	N/L	N/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Conductivity (µS/cm) [4]	424	N/L	N/L	425	408	398	448	384	462	337	376	345	405	402	408	359	528	
Copper	0.0039	0.5	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Dissolved Organic Carbon	1.5	3.3	5	***3.3***	3.2	***3.9***	**5.4**	***3.9***	***3.7***	**5.1**	***4.8***	***4.2***	***4.6***	***4.1***	***3.6***	***3.7***	2.5	
Hardness (as $CaCO_3$)	254	254	80 - 100	**277**	**293**	**326**	**344**	**298**	**312**	**294**	**324**	**330**	**344**	**307**	**327**	**349**	**388**	
Iron	2.18	2.18	0.3	0.083	0.294	0.052	**0.354**	0.040	0.111	0.074	0.155	0.044	**0.658**	0.161	0.232	0.056	0.032	
Magnesium	17	N/L	N/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Manganese	0.11	0.11	0.05	0.013	**0.074**	0.016	**0.091**	**0.173**	0.041	0.016	**0.058**	0.012	**0.090**	**0.054**	**0.064**	0.018	0.024	
Nitrate (as N)	0.05	2.54	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
pH (units) [4]	7.53	8.02	6.5 - 8.5	7.02	7.95	8.06	**8.78**	7.89	7.33	7.23	7.82	7.48	6.89	8.15	8.19	7.69	6.90	
Phosphorus, Total	0.025	N/L	N/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Potassium	6	N/L	N/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Silicon	4	N/L	N/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Sodium	3	101	200	16.4	16.9	19.0	21.5	21.0	23.2	16.9	19.7	20.8	18.6	17.4	18.7	21.0	30.2	
Strontium	0.13	N/L	N/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Sulphate	11	255	500	23	-	-	-	-	-	-	-	-	-	-	-	-	-	
Total Dissolved Solids	332	416	500	326	364	358	372	325	343	320	328	340	367	347	361	369	***440***	
Total Kjeldahl Nitrogen	0.5	N/L	N/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Zinc	0.01	2.5	5.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

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

All results are expressed in mg/L unless otherwise stated.
Bold and shaded values exceed the ODWS.
Bold and Italic values exceed RUC limits.
Bedrock RUC is compared to background monitoring well BR-2.
Overburden RUC is compared to background monitoring well OB-12.
N/L indicates No Limit.
"-" indicates the parameter was not analyzed.

Greenview ENVIRONMENTAL MANAGEMENT

THE TOWNSHIP OF GREATER MADAWASKA

Groundwater Quality - Bedrock
Norway Lake Waste Disposal Site

Parameter	Background Bedrock (median)	Bedrock RUC [1]	ODWS [2]	BR-9													5-year Trends
				25-May-16	01-Sep-16	08-May-17	18-Sep-17	02-May-18	13-Aug-18	15-May-19	21-Aug-19	27-Apr-20	18-Aug-20	17-May-21	19-Aug-21	05-May-22	17-Aug-22	(sparkline)
Alkalinity (as $CaCO_3$)	199	350	30 - 500	254	249	209	246	251	260	217	228	234	260	253	256	241	262	
Aluminum	0.0045	0.052	0.1	0.02	0.03	0.04	***0.06***	0.04	0.05	0.05	0.05	0.05	**0.15**	0.05	***0.06***	0.04	0.01	
Ammonia, Total (as N)	0.1	N/L	N/L	< 0.01	0.04	< 0.01	< 0.01	0.05	< 0.01	0.04	0.05	0.03	< 0.01	< 0.01	0.01	0.26	< 0.01	
Barium	0.081	0.31	1	0.059	0.083	0.066	0.094	0.067	0.078	0.063	0.074	0.075	0.095	0.068	0.086	0.074	0.095	
Boron	0.018	1.26	5	0.009	0.026	< 0.005	0.028	0.007	0.026	0.008	0.023	0.008	0.024	0.013	0.026	0.013	0.025	
Calcium	73	N/L	N/L	61.2	79.3	71.1	81.0	71.0	75.5	68.5	77.5	79.1	86.8	70.9	83.2	79.8	84.2	
Chloride	39	144	250	5.5	13.1	1.3	10.6	1.5	15.1	3.6	16.4	4.6	17.6	6.0	21.8	8.2	27.2	
Chromium	0.002	0.014	0.05	< 0.002	< 0.002	0.002	< 0.001	< 0.001	< 0.001	0.001	< 0.001	0.001	0.002	< 0.001	< 0.001	0.002	< 0.001	
Cobalt	0.0005	N/L	N/L	0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.0001	0.0002	< 0.0001	0.0002	0.0024	0.0001	0.0001	0.0005	< 0.0001	
Chemical Oxygen Demand	8	N/L	N/L	5	< 5	18	6	6	5	11	5	< 5	< 5	8	9	5	18	
Conductivity (µS/cm) [4]	424	N/L	N/L	346	500	251	334	303	355	263	298	265	316	325	349	275	349	
Copper	0.0039	0.5	1	< 0.002	0.002	0.005	< 0.002	< 0.002	< 0.002	< 0.002	0.002	< 0.002	0.0031	0.0014	< 0.002	0.0029	0.0015	
Dissolved Organic Carbon	1.5	3.3	5	1.5	2.0	2.1	***3.4***	1.7	2.3	***3.3***	3.1	2.8	***3.6***	2.8	3.0	3.0	2.3	
Hardness (as $CaCO_3$)	254	254	80 - 100	**228**	**285**	**253**	**295**	**261**	**281**	**253**	**278**	**288**	**304**	**259**	**300**	**290**	**301**	
Iron	2.18	2.18	0.3	< 0.005	0.009	< 0.005	0.005	0.010	< 0.005	0.008	< 0.005	0.006	0.232	0.006	0.011	0.036	< 0.005	
Magnesium	17	N/L	N/L	18.2	21.2	18.4	22.5	20.3	22.5	20.0	20.4	21.9	21.2	20.0	22.4	22.1	22.1	
Manganese	0.11	0.11	0.05	< 0.001	< 0.001	0.002	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	**0.062**	0.001	0.002	0.013	< 0.001	
Nitrate (as N)	0.05	2.54	10	0.1	0.2	< 0.05	< 0.05	0.06	< 0.05	0.07	0.11	0.10	0.05	0.17	0.06	< 0.05	0.06	
pH (units) [4]	7.53	8.02	6.5 - 8.5	7.55	7.95	8.33	**8.89**	7.69	7.53	7.72	7.48	7.25	7.14	7.68	8.38	7.68	8.38	
Phosphorus, Total	0.025	N/L	N/L	0.05	0.14	0.17	0.04	0.11	0.03	0.09	0.08	0.10	0.08	0.03	0.04	0.04	0.03	
Potassium	6	N/L	N/L	2.3	3.2	2.5	3.5	2.6	3.6	2.5	3.0	2.8	3.3	2.8	3.4	3.0	3.5	
Silicon	4	N/L	N/L	3.47	4.34	4.37	4.95	4.01	4.07	3.78	4.00	4.12	4.19	3.67	4.35	4.18	4.26	
Sodium	3	101	200	3.6	6.0	2.4	5.9	2.8	6.9	2.9	5.4	3.4	6.1	3.7	6.5	3.9	6.8	
Strontium	0.13	N/L	N/L	0.114	0.183	0.101	0.188	0.117	0.203	0.114	0.163	0.121	0.170	0.136	0.184	0.126	0.194	
Sulphate	11	255	500	11	14	8	9	8	10	9	11	10	14	11	18	12	15	
Total Dissolved Solids	332	416	500	255	293	224	285	240	281	239	266	254	277	254	287	264	300	
Total Kjeldahl Nitrogen	0.5	N/L	N/L	0.2	0.2	0.7	0.1	0.1	0.1	< 0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.2	
Zinc	0.01	2.5	5.0	0.011	0.007	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	

Note:
1. Reasonable Use Concept (RUC) criteria.
2. Ontario Drinking Water Standards (ODWS).
3. Results obtained from laboratory analysis.
4. Results obtained from field analysis.
All results are expressed in mg/L unless otherwise stated.
Bold and shaded values exceed the ODWS.
Bold and Italic values exceed RUC limits.
Bedrock RUC is compared to background monitoring well BR-2.
Overburden RUC is compared to background monitoring well OB-12.
N/L indicates No Limit.
"-" indicates the parameter was not analyzed.

Greenview ENVIRONMENTAL MANAGEMENT

THE TOWNSHIP OF GREATER MADAWASKA

Groundwater Quality - Bedrock
Norway Lake Waste Disposal Site

Parameter	Background Bedrock (median)	Bedrock RUC [1]	ODWS [2]	BR-10													5-year Trends
				25-May-16	01-Sep-16	08-May-17	18-Sep-17	02-May-18	13-Aug-18	15-May-19	21-Aug-19	27-Apr-20	18-Aug-20	17-May-21	19-Aug-21	05-May-22	17-Aug-22	(sparkline)
Alkalinity (as $CaCO_3$)	199	350	30 - 500	**556**	**613**	***480***	**708**	***482***	**585**	**516**	**626**	***490***	**589**	**512**	**571**	***467***	**636**	
Aluminum	0.0045	0.052	0.1	0.04	***0.08***	***0.09***	**0.12**	***0.07***	**0.10**	***0.09***	**0.12**	***0.08***	**0.11**	**0.10**	**0.13**	***0.07***	***0.07***	
Ammonia, Total (as N)	0.1	N/L	N/L	12.4	11.7	6.38	16.5	8.60	18.3	12.5	20.2	13.4	19.8	12.6	12.8	10.0	13.7	
Barium	0.081	0.31	1	***0.500***	**1.19**	***0.640***	***0.878***	***0.626***	**1.16**	***0.617***	**1.17**	***0.612***	**1.14**	***0.762***	**1.4**	***0.711***	**1.06**	
Boron	0.018	1.26	5	0.362	0.483	0.398	0.704	0.349	0.650	0.550	0.713	0.482	0.613	0.415	0.476	0.425	0.508	
Calcium	73	N/L	N/L	131	302	167	201	157	270	159	291	149	277	193	374	192	269	
Chloride	39	144	250	***211***	**752**	***186***	***176***	**289**	**519**	**271**	**571**	***229***	**657**	**469**	**987**	**435**	**720**	
Chromium	0.002	0.014	0.05	< 0.002	0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	< 0.002	0.002	0.002	
Cobalt	0.0005	N/L	N/L	0.0087	0.0183	0.0121	0.0115	0.0115	0.0177	0.0127	0.0131	0.0103	0.0136	0.0116	0.0174	0.0120	0.0126	
Chemical Oxygen Demand	8	N/L	N/L	51	59	67	87	150	116	82	72	74	92	44	60	44	63	
Conductivity (µS/cm) [4]	424	N/L	N/L	1864	2168	1109	1441	1239	2195	1102	1825	1040	1902	1909	3800	1383	2382	
Copper	0.0039	0.5	1	0.002	0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	0.0013	0.0020	< 0.002	0.0019	< 0.0005	
Dissolved Organic Carbon	1.5	3.3	5	**6.3**	2.8	**9.0**	**9.0**	**6.2**	**5.3**	**14.4**	**8.0**	**8.1**	**6.6**	**5.2**	***4.8***	***4.9***	***4.3***	
Hardness (as $CaCO_3$)	254	254	80 - 100	**463**	**1080**	**579**	**725**	**550**	**963**	**559**	**1010**	**519**	**925**	**664**	**1260**	**650**	**907**	
Iron	2.18	2.18	0.3	**12.1**	**26.2**	**19.0**	**25.9**	**17.9**	**28.9**	**20.3**	**29.7**	**19.7**	**20.7**	**21.2**	**30.3**	**22.0**	**26.1**	
Magnesium	17	N/L	N/L	32.6	77.9	39.2	54.2	38.4	70.0	39.4	69.4	35.7	56.6	44.2	79.9	41.3	57.0	
Manganese	0.11	0.11	0.05	**4.09**	**9.07**	**7.81**	**7.27**	**5.95**	**7.33**	**6.65**	**7.18**	**5.45**	**6.02**	**5.26**	**8.03**	**5.98**	**6.16**	
Nitrate (as N)	0.05	2.54	10	0.6	0.6	0.23	< 0.05	< 0.05	< 0.5	0.22	< 0.05	0.08	0.28	0.66	< 0.5	< 0.3	< 0.05	
pH (units) [4]	7.53	8.02	6.5 - 8.5	**6.02**	6.92	7.11	**8.95**	7.04	6.78	6.95	6.81	6.82	6.88	6.97	7.7	6.60	6.69	
Phosphorus, Total	0.025	N/L	N/L	0.11	0.31	0.23	0.49	0.41	0.80	0.48	0.23	0.69	0.52	0.20	0.13	0.05	0.14	
Potassium	6	N/L	N/L	15.2	21.6	18.3	29.0	17.8	32.1	24.1	34.4	23.9	35.7	25.2	33.6	22.7	32.8	
Silicon	4	N/L	N/L	7.81	11.1	11.2	12.6	10.2	10.6	10.5	10.7	11.1	9.99	9.72	10.7	10.9	10.6	
Sodium	3	101	200	***112***	**252**	***138***	***149***	***150***	**244**	***134***	**246**	***141***	**264**	**212**	**444**	**228**	**315**	
Strontium	0.13	N/L	N/L	0.394	0.870	0.466	0.600	0.472	0.847	0.523	0.840	0.482	0.767	0.603	1.090	0.541	0.828	
Sulphate	11	255	500	26	69	36	31	33	42	34	43	24	47	33	64	32	52	
Total Dissolved Solids	332	416	500	**896**	**1830**	**915**	**1080**	**960**	**1520**	**977**	**1669**	**893**	**1686**	**1336**	**2266**	**1268**	**1835**	
Total Kjeldahl Nitrogen	0.5	N/L	N/L	14.8	14.7	13.6	20.6	10.1	21.9	15.4	23.5	15.5	23.3	13.4	13.6	10.5	23.1	
Zinc	0.01	2.5	5.0	0.010	0.009	< 0.005	0.005	< 0.005	0.006	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.005	< 0.005	< 0.005	

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

All results are expressed in mg/L unless otherwise stated.
Bold and shaded values exceed the ODWS.
Bold and Italic values exceed RUC limits.
Bedrock RUC is compared to background monitoring well BR-2.
Overburden RUC is compared to background monitoring well OB-12.
N/L indicates No Limit.
"-" indicates the parameter was not analyzed.

THE TOWNSHIP OF GREATER MADAWASKA

Groundwater Quality Compared to PWQO
Norway Lake Waste Disposal Site

Parameter	PWQO [1]	BR-9														5-year Trends
		25-May-16	01-Sep-16	08-May-17	18-Sep-17	02-May-18	13-Aug-18	15-May-19	21-Aug-19	27-Apr-20	18-Aug-20	17-May-21	19-Aug-21	05-May-22	17-Aug-22	(sparkline)
Alkalinity (as $CaCO_3$)	< 25% decrease	254	249	209	246	251	260	217	228	234	260	253	256	241	262	
Aluminum	0.075	0.02	0.03	0.04	0.06	0.04	0.05	0.05	0.05	0.05	**0.15**	0.05	0.06	0.04	0.01	
Ammonia, Total (as N)	N/L	< 0.01	0.04	< 0.01	< 0.01	0.05	< 0.01	0.04	0.05	0.03	< 0.01	< 0.01	0.01	0.26	< 0.01	
Barium	N/L	0.059	0.083	0.066	0.094	0.067	0.078	0.063	0.074	0.075	0.095	0.068	0.086	0.074	0.095	
Boron	0.2	0.009	0.026	< 0.005	0.028	0.007	0.026	0.008	0.023	0.008	0.024	0.013	0.026	0.013	0.025	
Calcium	N/L	61.2	79.3	71.1	81.0	71.0	75.5	68.5	77.5	79.1	86.8	70.9	83.2	79.8	84.2	
Chloride	N/L	5.5	13.1	1.3	10.6	1.5	15.1	3.6	16.4	4.6	17.6	6.0	21.8	8.2	27.2	
Chromium	0.001	< 0.002	< 0.002	**0.002**	< 0.001	< 0.001	< 0.001	**0.001**	< 0.001	**0.001**	**0.002**	< 0.001	< 0.001	**0.002**	< 0.001	
Cobalt	0.0009	0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.0001	0.0002	< 0.0001	0.0002	**0.0024**	0.0001	0.0001	0.0005	< 0.0001	
Chemical Oxygen Demand	N/L	5	< 5	18	6	6	5	11	5	< 5	< 5	8	9	5	18	
Conductivity (µS/cm) [3]	N/L	346	500	251	334	303	355	263	298	265	316	325	349	275	349	
Copper	0.005	< 0.002	0.002	**0.005**	< 0.002	< 0.002	< 0.002	< 0.002	0.002	< 0.002	0.0031	0.0014	< 0.002	0.0029	0.0015	
Dissolved Organic Carbon	N/L	1.5	2.0	2.1	3.4	1.7	2.3	3.3	3.1	2.8	3.6	2.8	3.0	3.0	2.3	
Hardness (as $CaCO_3$)	N/L	228	285	253	295	261	281	253	278	288	304	259	300	290	301	
Iron	0.3	< 0.005	0.009	< 0.005	0.005	0.01	< 0.005	0.008	< 0.005	0.006	0.232	0.006	0.011	0.036	< 0.005	
Magnesium	N/L	18.2	21.2	18.4	22.5	20.3	22.5	20.0	20.4	21.9	21.2	20.0	22.4	22.1	22.1	
Manganese	N/L	< 0.001	< 0.001	0.002	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.062	0.001	0.002	0.013	< 0.001	
Nitrate (as N)	N/L	0.1	0.2	< 0.05	< 0.05	0.06	< 0.05	0.07	0.11	0.10	0.05	0.17	0.06	< 0.05	0.06	
pH (units) [3]	6.5 - 8.5	7.55	7.95	8.33	**8.89**	7.69	7.53	7.72	7.48	7.25	7.14	7.68	8.38	7.68	8.38	
Phosphorus, Total	0.03	**0.05**	**0.14**	**0.17**	**0.04**	**0.11**	**0.03**	**0.09**	**0.08**	**0.10**	**0.08**	**0.03**	**0.04**	**0.04**	**0.03**	
Potassium	N/L	2.3	3.2	2.5	3.5	2.6	3.6	2.5	3.0	2.8	3.3	2.8	3.4	3.0	3.5	
Silicon	N/L	3.47	4.34	4.37	4.95	4.01	4.07	3.78	4.00	4.12	4.19	3.67	4.35	4.18	4.26	
Sodium	N/L	3.6	6.0	2.4	5.9	2.8	6.9	2.9	5.4	3.4	6.1	3.7	6.5	3.9	6.8	
Strontium	N/L	0.114	0.183	0.101	0.188	0.117	0.203	0.114	0.163	0.121	0.170	0.136	0.184	0.126	0.194	
Sulphate	N/L	11	14	8	9	8	10	9	11	10	14	11	18	12	15	
Total Dissolved Solids	N/L	255	293	224	285	240	281	239	266	254	277	254	287	264	300	
Total Kjeldahl Nitrogen	N/L	0.2	0.2	0.7	0.1	0.1	0.1	< 0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.2	
Zinc	0.02	0.011	0.007	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	

Note:
1. Provincial Water Quality Objectives (PWQO).
2. Results obtained from laboratory analysis.
3. Results obtained from field analysis.
All results are expressed in mg/L unless otherwise stated.
Bold and shaded values exceed the PWQO.
N/L indicates No Limit.
"-" indicates the parameter was not analyzed.

Greenview ENVIRONMENTAL MANAGEMENT

THE TOWNSHIP OF GREATER MADAWASKA

Groundwater Quality Compared to PWQO
Norway Lake Waste Disposal Site

Parameter	PWQO [1]	BR-2 (Background)														5-year Trends
		25-May-16	01-Sep-16	08-May-17	18-Sep-17	02-May-18	13-Aug-18	15-May-19	21-Aug-19	27-Apr-20	18-Aug-20	17-May-21	19-Aug-21	05-May-22	17-Aug-22	(sparkline)
Alkalinity (as $CaCO_3$)	< 25% decrease	322	327	250	296	290	320	258	268	267	292	328	338	301	318	
Aluminum	0.075	0.03	0.04	0.06	**0.08**	0.05	**0.08**	0.05	0.05	0.06	0.06	0.07	**0.08**	0.04	0.03	
Ammonia, Total (as N)	N/L	< 0.01	0.05	< 0.01	0.03	0.03	0.01	0.04	0.28	0.02	0.02	0.02	0.03	< 0.01	< 0.01	
Barium	N/L	0.132	0.163	0.147	0.188	0.136	0.166	0.129	0.125	0.141	0.164	0.156	0.197	0.180	0.234	
Boron	0.2	0.007	0.020	< 0.005	0.014	0.011	0.013	0.011	0.017	0.010	0.015	0.012	0.016	0.013	0.009	
Calcium	N/L	98.7	115	107	128	96.9	112	91.0	92.4	101	111	110	132	132	151	
Chloride	N/L	51.0	80.1	42.9	65.4	44.6	71.8	31.4	49.5	32.7	51.0	56.4	91.7	84.2	146	
Chromium	0.001	< 0.002	< 0.002	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	
Cobalt	0.0009	0.0002	0.0002	< 0.0001	0.0003	< 0.0001	0.0004	0.0004	< 0.0001	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	
Chemical Oxygen Demand	N/L	14	7	8	6	14	13	19	16	7	5	15	19	11	20	
Conductivity (µS/cm) [3]	N/L	438	731	406	593	441	553	361	399	342	468	526	565	458	770	
Copper	0.005	0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	0.0014	0.0011	< 0.002	0.0012	0.0004	
Dissolved Organic Carbon	N/L	2.3	2.2	2.2	3.3	2.5	3.0	3.1	4.0	3.6	4.1	3.9	3.0	2.6	1.2	
Hardness (as $CaCO_3$)	N/L	330	387	352	416	319	369	301	309	331	358	363	428	432	487	
Iron	0.3	**1.06**	**4.89**	**1.27**	**0.794**	**0.311**	**1.55**	**0.788**	**5.93**	**0.923**	**2.98**	**0.643**	**0.604**	**0.857**	**1.02**	
Magnesium	N/L	20.1	24.2	20.5	23.3	18.7	21.6	18.0	18.9	19.2	19.6	21.5	23.9	24.7	26.5	
Manganese	N/L	0.032	0.118	0.058	0.025	0.019	0.037	0.023	0.117	0.027	0.082	0.034	0.049	0.051	0.058	
Nitrate (as N)	N/L	< 0.1	0.1	< 0.05	< 0.05	< 0.05	0.38	< 0.05	< 0.05	0.08	< 0.05	0.15	< 0.05	< 0.05	< 0.05	
pH (units) [3]	6.5 - 8.5	**6.06**	7.53	7.93	**8.80**	7.90	7.63	7.57	7.42	7.33	6.95	7.79	8.37	7.48	6.70	
Phosphorus, Total	0.03	0.01	**0.12**	**0.04**	0.02	**0.05**	**0.08**	**0.07**	**0.13**	**0.10**	**0.13**	**0.10**	**0.22**	0.02	**0.11**	
Potassium	N/L	5.4	7.3	6.6	8.1	5.9	7.4	5.6	6.6	6.0	7.1	6.5	7.8	6.9	8.1	
Silicon	N/L	4.63	5.24	5.19	7.04	5.04	5.72	4.94	4.66	5.23	5.19	5.13	6.39	5.58	6.22	
Sodium	N/L	17.4	22.3	18.7	25.2	19.9	26.0	19.7	22.3	20.6	21.7	21.5	26.4	24.9	28.3	
Strontium	N/L	0.172	0.218	0.174	0.218	0.172	0.209	0.163	0.154	0.172	0.181	0.200	0.229	0.209	0.259	
Sulphate	N/L	24	24	15	16	19	19	19	16	22	20	20	25	20	21	
Total Dissolved Solids	N/L	411	493	366	451	348	433	328	368	347	394	413	469	466	563	
Total Kjeldahl Nitrogen	N/L	0.1	0.2	0.2	0.1	0.1	0.2	< 0.1	0.2	0.1	0.2	0.2	0.3	0.1	0.1	
Zinc	0.02	< 0.005	0.007	< 0.005	< 0.005	< 0.005	0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	

Note:
1. Provincial Water Quality Objectives (PWQO).
2. Results obtained from laboratory analysis.
3. Results obtained from field analysis.
All results are expressed in mg/L unless otherwise stated.
Bold and shaded values exceed the PWQO.
N/L indicates No Limit.
"-" indicates the parameter was not analyzed.

THE TOWNSHIP OF GREATER MADAWASKA

Groundwater Quality - Volatile Organic Compounds
Norway Lake Waste Disposal Site

Parameter	ODWS [1]	BR-1						
		01-Sep-16	18-Sep-17	13-Aug-18	21-Aug-19	18-Aug-20	19-Aug-21	17-Aug-22
Acetone	N/L	< 0.002	< 0.002	< 0.002	< 0.03	< 0.03	< 0.03	< 0.03
Benzene	0.001	< 0.0005	0.0009	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Bromobenzene	N/L	< 0.0001	< 0.0001	< 0.0001	< 0.0004	< 0.0004	< 0.0004	< 0.0004
Bromodichloromethane	N/L	< 0.0001	< 0.0001	< 0.0001	< 0.002	< 0.002	< 0.002	< 0.002
Bromoform	N/L	< 0.0001	< 0.0001	< 0.0001	< 0.005	< 0.005	< 0.005	< 0.005
Bromomethane	N/L	< 0.0003	< 0.0003	< 0.0003	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Carbon Tetrachloride	0.002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Chlorobenzene	0.08	0.0007	0.0033	0.0014	< 0.0005	< 0.0005	< 0.0005	0.0006
Chloroethane	N/L	< 0.0001	< 0.0001	0.0016	< 0.003	< 0.003	< 0.003	< 0.003
Chloroform	N/L	< 0.0003	< 0.0003	< 0.0003	< 0.001	< 0.001	< 0.001	< 0.001
Chloromethane	N/L	< 0.0003	0.0025	0.0003	< 0.002	< 0.002	< 0.002	< 0.002
Chlorotoluene,2-	N/L	< 0.0002	< 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	< 0.0002
Dibromo-3-Chloropropane, 1,2-	N/L	< 0.001	< 0.001	< 0.001	< 0.0006	< 0.0006	< 0.0006	< 0.0006
Dibromochloromethane	N/L	< 0.0001	< 0.0001	< 0.0001	< 0.002	< 0.002	< 0.002	< 0.002
Dibromoethane,1,2- (Ethylene Dibromide)	N/L	< 0.001	< 0.0001	< 0.0001	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Dibromomethane	N/L	< 0.001	< 0.001	< 0.001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Dichlorobenzene,1,2-	0.2	< 0.0001	< 0.0001	< 0.0001	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Dichlorobenzene, 1,3-	N/L	< 0.0001	< 0.0001	< 0.0001	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Dichlorobenzene, 1,4-	0.005	0.0007	0.0012	0.001	< 0.0005	< 0.0005	0.0011	0.0009
Dichlorodifluoromethane	N/L	< 0.001	< 0.001	< 0.001	< 0.002	< 0.002	< 0.002	< 0.002
Dichloroethane, 1,1-	N/L	0.0002	0.0002	0.0001	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Dichloroethane, 1,2-	0.005	< 0.0001	< 0.0001	< 0.0001	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Dichloroethylene (vinylidene chloride), 1,1-	0.014	< 0.0001	< 0.0001	< 0.0001	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Dichloroethylene, cis-1,2-	N/L	0.0001	0.0001	0.0001	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Dichloroethylene, trans-1,2-	N/L	< 0.0001	< 0.0001	< 0.0001	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Dichloromethane (Methylene Chloride)	0.05	< 0.0003	< 0.0003	< 0.0003	< 0.005	< 0.005	< 0.005	< 0.005
Dichloropropane, 1,2-	0.7	< 0.0001	< 0.0001	< 0.0001	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Dichloropropane,1,3-	N/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Dichloropropane,2,2-	N/L	< 0.0002	< 0.0002	< 0.0002	-	-	-	-
Dichloropropylene, cis-1,3-	N/L	< 0.0001	< 0.0001	< 0.0001	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Dichloropropylene, trans-1,3-	N/L	< 0.0001	< 0.0001	< 0.0001	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Dichloropropene,1,1-	N/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Ethylbenzene	0.14	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Hexachlorobutadiene	N/L	< 0.001	< 0.001	< 0.001	< 0.0006	< 0.0006	< 0.0006	< 0.0006
Hexane	N/L	< 0.001	< 0.001	< 0.001	< 0.005	< 0.005	< 0.005	< 0.005
Isopropylbenzene	N/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Isopropyltoluene,4-	N/L	< 0.0004	< 0.0004	< 0.0004	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Methyl Butyl Ketone	N/L	< 0.010	< 0.010	< 0.01	< 0.005	< 0.005	< 0.005	< 0.005
Methyl Ethyl Ketone	N/L	< 0.001	< 0.001	< 0.001	< 0.02	< 0.02	< 0.02	< 0.02
Methyl Isobutyl Ketone	N/L	< 0.001	< 0.001	< 0.001	< 0.02	< 0.02	< 0.02	< 0.02
Methyl-t-Butyl Ether	N/L	< 0.001	< 0.001	< 0.001	< 0.002	< 0.002	< 0.002	< 0.002
Naphthalene	N/L	< 0.0007	< 0.0007	< 0.0007	< 0.0004	< 0.0004	< 0.0004	< 0.0004
n-Butylbenzene	N/L	< 0.0007	< 0.0007	< 0.0007	< 0.0004	< 0.0004	< 0.0004	< 0.0004
n-Propylbenzene	N/L	< 0.0004	< 0.0004	< 0.0004	< 0.0001	< 0.0001	< 0.0001	< 0.0001
sec-Butylbenzene	N/L	< 0.0005	< 0.0005	< 0.0005	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Styrene	N/L	< 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	< 0.0001
Tetrachloroethane, 1,1,1,2-	N/L	< 0.0001	< 0.0001	< 0.0001	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Tetrachloroethane, 1,1,2,2-	N/L	< 0.0004	< 0.0004	< 0.0004	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Tetrachloroethylene (Perchloroethylene)	0.03	< 0.0002	< 0.0002	< 0.0002	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Toluene	0.06	< 0.0005	< 0.0005	< 0.0005	0.0006	< 0.0005	< 0.0005	< 0.0005
Trichlorobenzene,1,2,3-	N/L	< 0.0002	< 0.0002	< 0.0002	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Trichlorobenzene,1,2,4-	N/L	< 0.0002	< 0.0002	< 0.0002	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Trichloroethane, 1,1,1-	N/L	< 0.0001	< 0.0001	< 0.0001	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Trichloroethane, 1,1,2-	N/L	< 0.0001	< 0.0001	< 0.0001	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Trichloroethene (Trichloroethylene)	0.005	< 0.0001	< 0.0001	< 0.0001	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Trichlorofluoromethane	N/L	< 0.0001	< 0.0001	< 0.0001	< 0.005	< 0.005	< 0.005	< 0.005
Trichloropropane,1,2,3-	N/L	< 0.0002	< 0.0002	< 0.0002	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Trimethylbenzene,1,2,4-	N/L	< 0.002	< 0.002	< 0.002	< 0.001	< 0.001	< 0.001	< 0.001
Trimethylbenzene,1,3,5-	N/L	< 0.0006	< 0.0006	< 0.0006	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Vinyl Chloride	0.001	< 0.0002	0.0003	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Xylene	0.09	< 0.0005	< 0.0005	< 0.0004	< 0.0015	< 0.0015	< 0.0015	< 0.0015
m-Xylene & p-Xylene	N/L	< 0.0004	< 0.0004	< 0.0004	< 0.001	< 0.001	< 0.001	< 0.001
o-Xylene	N/L	< 0.0001	< 0.0001	< 0.0001	< 0.0005	< 0.0005	< 0.0005	< 0.0005

1. Ontario Drinking Water Standards (ODWS).
2. Results obtained from field analysis.

All results are expressed in mg/L unless otherwise stated.
Bold and shaded values exceed the ODWS.
N/L indicates No Limit.
"-" indicates the parameter was not analyzed.

Greenview ENVIRONMENTAL MANAGEMENT

THE TOWNSHIP OF GREATER MADAWASKA

Surface Water Quality
Norway Lake Waste Disposal Site

Parameter	Background	PWQO [1]	SW-1						5-year Trends
	(75th Percentile)		26-May-15	25-May-16	08-May-17	02-May-18	15-May-19	17-May-21	(sparkline)
Alkalinity (as $CaCO_3$)	125	25 % Decrease	143	138	84	85	96	128	
Aluminum	0.039	0.075	**0.0790**	**0.22**	0.06	0.02	0.03	**0.17**	
Ammonia, Total (as N)	0.1	N/L	< 0.1	0.01	< 0.01	0.01	0.03	0.01	
Ammonia, Un-ionized (as N) [2]	0.001	0.02	0.00068	0.000004	0.000265	0.000003	0.000253	0.000154	
Barium	0.12	N/L	0.0700	0.075	0.059	0.046	0.060	0.064	
Biological Oxygen Demand	3	N/L	< 4	< 3	< 2	< 2	< 3	< 3	
Boron	0.03	0.2	0.0245	0.020	0.010	0.016	0.019	0.026	
Calcium	45	N/L	42.8	38.7	29.4	23.7	32.4	38.7	
Chemical Oxygen Demand	49	N/L	31	32	30	23	34	23	
Chloride	2	N/L	1	0.7	0.9	< 0.5	0.7	1.0	
Chromium	0.001	0.001	0.00020	< 0.002	< 0.001	< 0.001	< 0.001	< 0.001	
Conductivity (µS/cm) [3]	193	N/L	119	223	109	101	123	260	
Cobalt	0.00034	0.0009	0.000099	0.0003	< 0.0001	< 0.0001	0.0001	0.0002	
Copper	0.001	0.005	0.00127	0.0012	0.0007	0.0005	0.0008	0.0015	
Dissolved Organic Carbon	18.7	N/L	12.1	7.2	11.2	7.6	11.4	9.5	
Dissolved Oxygen	7.22	5	10.12	14.38	12.78	11.10	10.61	8.72	
Hardness	148	N/L	151	138	102	84	113	139	
Iron	0.23	0.3	0.107	**0.748**	0.051	0.024	0.033	0.268	
Magnesium	10	N/L	10.7	10.1	6.82	5.91	7.75	10.2	
Manganese	0.163	N/L	0.00781	0.051	0.004	0.001	0.002	0.025	
pH (units) [3]	7.54	6.5 - 8.5	7.59	**6.18**	8.33	**6.40**	7.80	7.95	
Nitrate (as N)	0.15	N/L	< 0.06	0.1	0.07	< 0.05	< 0.05	0.13	
Nitrite (as N)	0.06	N/L	< 0.03	< 0.1	< 0.05	< 0.05	< 0.05	0.07	
Phenols	0.001	0.001	< 0.001	< 0.001	**0.005**	< 0.001	< 0.002	< 0.001	
Phosphorus, Total	0.043	0.03	0.012	**0.08**	0.02	0.02	**0.03**	0.02	
Potassium	1.4	N/L	1.43	1.0	1.2	1.0	1.0	1.0	
Silicon	5	N/L	4.40	3.96	3.51	2.72	3.17	3.71	
Sodium	2	N/L	1.84	1.7	1.4	1.1	1.4	1.9	
Strontium	0.14	N/L	0.124	0.114	0.081	0.072	0.090	0.112	
Total Dissolved Solids	208	N/L	137	141	98	87	106	133	
Total Kjeldahl Nitrogen	0.7	N/L	< 0.5	0.65	1.8	0.3	0.3	0.4	
Total Suspended Solids	11	N/L	3	22	< 3	< 3	< 3	< 3	
Zinc	0.0065	0.02	0.003	< 0.005	< 0.005	< 0.005	0.010	0.013	

Notes:
1. Provincial Water Quality Objectives (PWQO).
2. Calculated using Total Ammonia and field analysis.
3. Results obtained from field analysis.

All results are expressed in mg/L unless otherwise stated.
Bold and shaded values exceed the PWQO.
N/L indicates No Limit.
"-" indicates the parameter was not analyzed.

Greenview ENVIRONMENTAL MANAGEMENT

THE TOWNSHIP OF GREATER MADAWASKA

Surface Water Quality
Norway Lake Waste Disposal Site

Parameter	Background	PWQO [1]	SW-4 (Background)			5-year Trends
	(75th Percentile)		25-May-16	08-May-17	02-May-18	(sparkline)
Alkalinity (as $CaCO_3$)	125	25 % Decrease	174	88	60	
Aluminum	0.039	0.075	0.02	0.04	0.04	
Ammonia, Total (as N)	0.1	N/L	< 0.01	< 0.01	0.04	
Ammonia, Un-ionized (as N) [2]	0.001	0.02	0.00009	0.00024	0.00001	
Barium	0.12	N/L	0.127	0.063	0.048	
Biological Oxygen Demand	3	N/L	< 3	< 2	< 2	
Boron	0.03	0.2	0.031	0.014	0.013	
Calcium	45	N/L	48.6	30.0	21.5	
Chemical Oxygen Demand	49	N/L	31	30	35	
Chloride	2	N/L	0.9	0.7	< 0.5	
Chromium	0.001	0.001	< 0.002	< 0.001	< 0.001	
Conductivity (µS/cm) [3]	193	N/L	262	103	109	
Cobalt	0.00034	0.0009	0.0001	< 0.0001	0.0001	
Copper	0.001	0.005	0.0009	0.0008	0.0006	
Dissolved Organic Carbon	18.7	N/L	13.0	11.0	9.5	
Dissolved Oxygen	7.22	5	9.87	11.02	6.24	
Hardness	148	N/L	172	106	72	
Iron	0.23	0.3	0.096	0.016	0.121	
Magnesium	10	N/L	12.4	7.57	4.36	
Manganese	0.163	N/L	0.150	0.003	0.033	
pH (units) [3]	7.54	6.5 - 8.5	7.48	8.29	**6.45**	
Nitrate (as N)	0.15	N/L	0.2	0.19	< 0.05	
Nitrite (as N)	0.06	N/L	< 0.1	< 0.05	< 0.05	
Phenols	0.001	0.001	< 0.001	**0.004**	< 0.001	
Phosphorus, Total	0.043	0.03	0.02	0.01	**0.10**	
Potassium	1.4	N/L	1.3	1.3	1.3	
Silicon	5	N/L	3.63	3.62	2.80	
Sodium	2	N/L	2.5	1.6	2.2	
Strontium	0.14	N/L	0.117	0.066	0.089	
Total Dissolved Solids	208	N/L	176	103	60	
Total Kjeldahl Nitrogen	0.7	N/L	0.42	0.4	0.7	
Total Suspended Solids	11	N/L	< 3	3	8	
Zinc	0.0065	0.02	< 0.005	< 0.005	**0.025**	

Notes:
1. Provincial Water Quality Objectives (PWQO).
2. Calculated using Total Ammonia and field analysis.
3. Results obtained from field analysis.

All results are expressed in mg/L unless otherwise stated.
Bold and shaded values exceed the PWQO.
N/L indicates No Limit.
"-" indicates the parameter was not analyzed.

Greenview ENVIRONMENTAL MANAGEMENT

Appendix G
Groundwater Elevations 2024

Groundwater Elevations: Norway Lake WDS (Closed)

Monitor	Top of Pipe Elevation (Assumed Datum)	Ground Elevation (Assumed Datum)	Well of Bottom Depth (M)	Jun-23		Sep-23		Jul-24		Nov-24	
				Water Level	Elevation	Water Level	Elevation	Water Level	Elevation	Water Level	Elevation
OB 1 Greenview measured Depth 1.55	172.39	171.63	2.21	1.14	171.25	1.23	171.16	1.03	171.36	1.18	171.21
OB 2 Greenview measured Depth 0.45	171.96	171.21	1.26	1.08	170.88	1.16	170.80	1.03	170.93	1.10	170.86
OB 3 Greenview measured Depth 4.35	172.01	171.20	4.35	1.12	170.89	1.15	170.86	1.03	170.98	1.12	170.89
OB 4 Greenview measured Depth 1.29	172.75	171.74	2.29	1.88	170.87	1.95	170.80	1.66	171.09	1.87	170.88
OB 5 Greenview measured Depth 3.03	174.88	174.48	1.47	DRY	--	DRY	--	DRY	--	DRY	--
OB 7 As reported by Greenview	Destroyed	--	--	NM	--	NM	--	NM	--	NM	--
OB 8 Greenview measured Depth 4.23	167.51	166.76	4.96	4.09	163.42	4.85	162.66	2.08	165.43	4.54	162.97
OB 11R Greenview measured Depth 4.22	172.08	171.04	4.35	1.47	170.61	1.56	170.52	1.36	170.72	1.53	170.55
OB 12 Greenview measured Depth 2.07	173.67	172.66	3.17	1.96	171.71	2.10	171.57	1.63	172.04	2.12	171.55
BR 1 Greenview measured Depth 5.39	171.91	171.18	5.39	0.64	171.27	0.70	171.21	0.57	171.34	0.63	171.28
BR 2 Greenview measured Depth 3.00	172.64	172.09	3.60	2.65	169.99	1.61	171.03	1.46	171.18	1.62	171.02
BR 3 As reported by Greenview	Destroyed	--	--	NM	--	NM	--	NM	--	NM	--
BR 4 As reported by Greenview	Destroyed	--	--	NM	--	NM	--	NM	--	NM	--
BR 5 Greenview measured Depth 4.56	176.14	175.60	5.10	4.80	171.34	DRY	--	4.11	172.03	2.42	173.72
BR 7 Greenview measured Depth 5.60	171.29	170.29	6.57	2.76	168.53	2.84	168.45	2.05	169.24	MISSED	--

Groundwater Elevations: Norway Lake WDS (Closed)

Monitor	Top of Pipe Elevation (Assumed Datum)	Ground Elevation (Assumed Datum)	Well of Bottom Depth (M)	Jun-23		Sep-23		Jul-24		Nov-24	
				Water Level	Elevation	Water Level	Elevation	Water Level	Elevation	Water Level	Elevation
BR 8 Greenview measured Depth 5.44	162.69	162.09	5.44	1.75	160.94	2.62	160.07	1.41	161.28	2.37	160.32
BR 9 Greenview measured Depth 5.14	161.30	160.86	5.14	1.74	159.56	1.94	159.36	1.68	159.62	1.82	159.48
BR 10 Greenview measured Depth 7.79	177.20	176.09	7.93	5.12	172.08	5.39	171.81	4.69	172.51	5.56	171.64
G-1 Greenview 2016	Destroyed		--	NM	--	NM	--	NM	--	NM	--
G-2 Greenview measured Depth 2.01	171.73	171.21	2.52	0.86	170.87	1.26	170.47	0.84	170.89	1.01	170.72
G-3 Greenview measured Depth 2.08	172.18	171.66	2.50	0.67	171.51	0.86	171.32	0.61	171.57	0.82	171.36
G-4 Greenview measured Depth 2.06	172.08	171.69	0.96	0.81	171.27	1.03	171.05	0.95	171.13	1.02	171.06
G-5 Greenview since 2016	Destroyed	--	--	NM	--	NM	--	NM	--	NM	--
G-6 Greenview measured Depth 1.59	172.74	171.80	2.14	0.62	172.12	1.03	171.71	0.54	172.20	1.07	171.67
G-7 Greenview measured Depth 1.07	173.51	171.99	2.53	1.59	171.92	1.99	171.52	1.50	172.01	1.80	171.71
G-8 Greenview measured Depth 1.34	172.81	171.85	--	Not found	--	Not found	--	Not found	--	Not found	--
G-9 Greenview measured Depth 1.42	172.84	171.89	--	Not found	--	Not found	--	Not found	--	Not found	--

Note:

1. Well depths based on Jp2g measurements in 2023
2. BR-10 was repaired by Greenview 2013
3. Elevations based on SGS Lakefield Research 2004
4. Elevations are assumed from BM# 1 @ 176.93
5. NM : Not measured

Appendix H
Laboratory Certificates of Analysis 2024

CADUCEON ENVIRONMENTAL LABORATORIES
Client committed. Quality assured. Canadian owned.

CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: G111311 **REPORT No: 24-021716 - Rev. 0**

Report To:
Jp2g Consultants Inc
1150 Morrison Dr.
Ottawa, ON K2H 8S9

CADUCEON Environmental Laboratories
2378 Holly Lane
Ottawa, ON K1V 7P1

Attention: Nick Weston

DATE RECEIVED: 2024-Jul-17
DATE REPORTED: 2024-Jul-26
SAMPLE MATRIX: Ground Water

CUSTOMER PROJECT: Norway Lake WDS
P.O. NUMBER:

Analyses	Qty	Site Analyzed	Authorized	Date Analyzed	Lab Method	Reference Method
Anions (Liquid)	10	OTTAWA	PCURIEL	2024-Jul-17	A-IC-01	SM 4110B
COD (Liquid)	7	KINGSTON	EHINCH	2024-Jul-22	COD-001	SM 5220D
Cond/pH/Alk Auto (Liquid)	10	OTTAWA	SBOUDREAU	2024-Jul-18	COND-02/PH-02/ALK-02	SM 2510B/4500H/2320B
DOC/DIC (Liquid)	10	OTTAWA	VKASYAN	2024-Jul-18	C-OC-01	EPA 415.2
ICP/MS (Liquid)	7	OTTAWA	AOZKAYMAK	2024-Jul-22	D-ICPMS-01	EPA 200.8
ICP/OES (Liquid)	10	OTTAWA	TPRICE	2024-Jul-19	D-ICP-01	SM 3120B
Ammonia & o-Phosphate (Liquid)	7	KINGSTON	JYEARWOOD	2024-Jul-26	NH3-001	SM 4500NH3
TP & TKN (Liquid)	7	KINGSTON	KDIBBITS	2024-Jul-23	TPTKN-001	MECP E3516.2

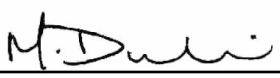
R.L. = Reporting Limit
NC = Not Calculated
Test methods may be modified from specified reference method unless indicated by an *

Michelle Dubien
Data Specialist

	Client I.D.	BR9	BR8	OB8	BR1	OB3
	Sample I.D.	24-021716-1	24-021716-2	24-021716-3	24-021716-4	24-021716-5
	Date Collected	2024-07-15	2024-07-15	2024-07-15	2024-07-15	2024-07-15
Parameter	**Units** / **R.L.**	-	-	-	-	-
Alkalinity(CaCO3) to pH4.5	mg/L / 5	244	256	280	783	672
TDS (Calc. from Cond.)	mg/L / 3	259	405	467	1000	1080
Conductivity @25°C	uS/cm / 1	501	774	883	1830	1960
pH @25°C	pH units / -		7.72	7.66		7.91
Chloride	mg/L / 0.5	12.1	86.2	116	120	230
Nitrate (N)	mg/L / 0.05	<0.05			<0.40	
Sulphate	mg/L / 1	12			62	
Phosphorus (Total)	mg/L / 0.01	0.07			0.02	
Total Kjeldahl Nitrogen	mg/L / 0.1	<0.1			0.8	
Ammonia (N)-Total (NH3+NH4)	mg/L / 0.05	<0.05			0.48	
Dissolved Organic Carbon	mg/L / 0.2	4.2	4.6	8.5	8.8	5.7
COD	mg/L / 5	10			40	
Hardness (as CaCO3)	mg/L / 0.02	246	313	331	824	820
Aluminum	mg/L / 0.01	0.02			0.08	
Barium	mg/L / 0.001	0.070			0.164	
Boron	mg/L / 0.005	0.019	0.164	0.120	0.744	0.596
Calcium	mg/L / 0.02	67.5	80.7	86.4	180	183
Iron	mg/L / 0.005	<0.005	0.039	0.007	6.98	0.216
Magnesium	mg/L / 0.02	18.8	27.0	28.1	91.0	88.3
Manganese	mg/L / 0.001	<0.001	0.006	<0.001	0.685	0.433
Potassium	mg/L / 0.1	2.9			20.2	

Michelle Dubien
Data Specialist

	Client I.D.		BR9	BR8	OB8	BR1	OB3
	Sample I.D.		24-021716-1	24-021716-2	24-021716-3	24-021716-4	24-021716-5
	Date Collected		2024-07-15	2024-07-15	2024-07-15	2024-07-15	2024-07-15
Parameter	**Units**	**R.L.**	-	-	-	-	-
Silicon	mg/L	0.01	3.98			6.39	
Sodium	mg/L	0.2	4.8	22.9	36.3	67.2	78.9
Strontium	mg/L	0.001	0.140			0.884	
Zinc	mg/L	0.005	0.005			<0.005	
Chromium	mg/L	0.001	<0.001			<0.001	
Cobalt	mg/L	0.0001	0.0002			0.0080	
Copper	mg/L	0.0001	0.0015			0.0037	
pH (Client Data)	pH units	-	7.3	6.8	6.7	6.6	6.9
Temperature (Client Data)	°C	-	9.2	10.9	12.1	11.2	10.9



Michelle Dubien
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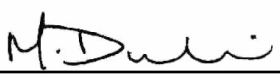
	Client I.D.		BR10	OB11R	OB12	BR2	Dup #1
	Sample I.D.		24-021716-6	24-021716-7	24-021716-8	24-021716-9	24-021716-10
	Date Collected		2024-07-15	2024-07-15	2024-07-15	2024-07-15	2024-07-15
Parameter	**Units**	**R.L.**	-	-	-	-	-
Alkalinity(CaCO3) to pH4.5	mg/L	5	543	387	260	253	566
TDS (Calc. from Cond.)	mg/L	3	1490	2050	403	478	1910
Conductivity @25°C	uS/cm	1	2680	3660	769	902	3410
Chloride	mg/L	0.5	560	97.3	85.9	133	795
Nitrate (N)	mg/L	0.05	<0.40	0.16	<0.05	<0.05	<0.40
Sulphate	mg/L	1	52	8	12	9	64
Phosphorus (Total)	mg/L	0.01	0.58	0.55	0.09	0.08	1.08
Total Kjeldahl Nitrogen	mg/L	0.1	15.0	0.3	0.2	0.3	15.4
Ammonia (N)-Total (NH3+NH4)	mg/L	0.05	13.1	0.05	<0.05	<0.05	13.0
Dissolved Organic Carbon	mg/L	0.2	3.7	1.8	4.4	3.1	3.9
COD	mg/L	5	110	45	17	27	120
Hardness (as CaCO3)	mg/L	0.02	780	501	258	441	752
Aluminum	mg/L	0.01	0.10	0.08	0.03	0.07	0.10
Barium	mg/L	0.001	0.915	0.397	0.110	0.192	0.893
Boron	mg/L	0.005	0.440	0.037	0.010	0.013	0.415
Calcium	mg/L	0.02	232	153	75.4	133	222
Iron	mg/L	0.005	21.8	0.031	0.008	0.178	21.5
Magnesium	mg/L	0.02	48.7	28.8	16.9	26.3	48.0
Manganese	mg/L	0.001	5.91	0.002	0.008	0.060	5.83
Potassium	mg/L	0.1	29.8	4.9	2.9	8.1	29.2
Silicon	mg/L	0.01	9.78	4.99	4.00	5.46	9.67



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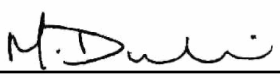
			Client I.D.	BR10	OB11R	OB12	BR2	Dup #1
			Sample I.D.	24-021716-6	24-021716-7	24-021716-8	24-021716-9	24-021716-10
			Date Collected	2024-07-15	2024-07-15	2024-07-15	2024-07-15	2024-07-15
Parameter	**Units**	**R.L.**		-	-	-	-	-
Sodium	mg/L	0.2		350	522	48.9	31.0	347
Strontium	mg/L	0.001		0.782	0.432	0.175	0.250	0.767
Zinc	mg/L	0.005		0.008	<0.005	<0.005	0.005	<0.005
Chromium	mg/L	0.001		0.001	<0.001	<0.001	<0.001	0.001
Cobalt	mg/L	0.0001		0.0148	0.0003	0.0002	0.0004	0.0133
Copper	mg/L	0.0001		0.0005	0.0013	0.0018	0.0005	0.0008
pH (Client Data)	pH units	-		6.4	6.7	7.2	6.8	
Temperature (Client Data)	°C	-		11.8	13.9	15.8	13.3	

Elevated RLs due to sample matrix interferences



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Data Specialist

CADUCEON ENVIRONMENTAL LABORATORIES
Client committed. Quality assured. Canadian owned.

CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: G 138164

REPORT No: 24-035652 - Rev. 0

Report To:
Jp2g Consultants Inc
1150 Morrison Dr.
Ottawa, ON K2H 8S9

CADUCEON Environmental Laboratories
2378 Holly Lane
Ottawa, ON K1V 7P1

Attention: Nick Weston

DATE RECEIVED: 2024-Nov-13
DATE REPORTED: 2024-Nov-29
SAMPLE MATRIX: Ground Water

CUSTOMER PROJECT: 22-6213C Norway Lake
P.O. NUMBER:

Analyses	Qty	Site Analyzed	Authorized	Date Analyzed	Lab Method	Reference Method
Anions (Liquid)	10	OTTAWA	LMACGREGOR	2024-Nov-14	A-IC-01	SM 4110B
COD (Liquid)	7	KINGSTON	DCASSIDY	2024-Nov-15	COD-001	SM 5220D
Cond/pH/Alk Auto (Liquid)	10	OTTAWA	SBOUDREAU	2024-Nov-14	COND-02/PH-02/ALK-02	SM 2510B/4500H/2320B
DOC/DIC (Liquid)	10	OTTAWA	SLOZO	2024-Nov-26	C-OC-01	EPA 415.2
ICP/MS (Liquid)	7	OTTAWA	AOZKAYMAK	2024-Nov-15	D-ICPMS-01	EPA 200.8
ICP/OES (Liquid)	10	OTTAWA	APRUDYVUS	2024-Nov-14	D-ICP-01	SM 3120B
Ammonia & o-Phosphate (Liquid)	7	KINGSTON	KDIBBITS	2024-Nov-18	NH3-001	SM 4500NH3
TP & TKN (Liquid)	7	KINGSTON	YLIEN	2024-Nov-25	TPTKN-001	MECP E3516.2
VOC-Volatiles Full (Water)	1	RICHMOND_HILL	FLENA	2024-Nov-15	C-VOC-02	EPA 8260

R.L. = Reporting Limit
NC = Not Calculated
Test methods may be modified from specified reference method unless indicated by an *

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	Client I.D.	BR1	BR2	BR8	BR9	BR10
	Sample I.D.	24-035652-1	24-035652-2	24-035652-3	24-035652-4	24-035652-5
	Date Collected	2024-11-12	2024-11-12	2024-11-12	2024-11-12	2024-11-12
Parameter	**Units** / **R.L.**	-	-	-	-	-
Alkalinity(CaCO3) to pH4.5	mg/L / 5	675	263	254	256	560
TDS (Calc. from Cond.)	mg/L / 3	1110	510	369	344	2410
Conductivity @25°C	uS/cm / 1	2020	959	711	662	4280
pH @25°C	pH units / -			8.00		
Chloride	mg/L / 0.5	275	151	67.6	52.0	1200
Nitrate (N)	mg/L / 0.05	<0.05	<0.05		0.09	<0.40
Sulphate	mg/L / 1	54	7		13	114
Phosphorus (Total)	mg/L / 0.01	0.01	0.09		0.06	0.37
Total Kjeldahl Nitrogen	mg/L / 0.1	0.8	0.3		0.1	14.4
Ammonia (N)-Total (NH3+NH4)	mg/L / 0.05	0.39	<0.05		<0.05	12.5
Dissolved Organic Carbon	mg/L / 0.8	4.2	3.0	4.6	4.0	2.3
COD	mg/L / 5	24	36		<5	73
Hardness (as CaCO3)	mg/L / 0.02	995	485	339	348	1160
Aluminum	mg/L / 0.01	0.06	0.04		0.03	0.09
Barium	mg/L / 0.001	0.195	0.224		0.105	1.18
Boron	mg/L / 0.005	0.775	0.021	0.238	0.044	0.414
Calcium	mg/L / 0.02	216	142	85.1	95.2	336
Iron	mg/L / 0.005	6.17	7.30	0.084	<0.005	19.0
Magnesium	mg/L / 0.02	111	31.6	30.7	26.8	78.1
Manganese	mg/L / 0.001	0.718	0.144	0.024	<0.001	6.08
Potassium	mg/L / 0.1	21.9	9.4		4.2	31.8

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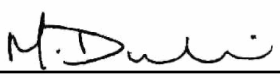
Data Specialist

			Client I.D.	BR1	BR2	BR8	BR9	BR10
			Sample I.D.	24-035652-1	24-035652-2	24-035652-3	24-035652-4	24-035652-5
			Date Collected	2024-11-12	2024-11-12	2024-11-12	2024-11-12	2024-11-12
Parameter	**Units**	**R.L.**		-	-	-	-	-
Silicon	mg/L	0.01		6.44	5.10		4.16	8.98
Sodium	mg/L	0.2		91.6	34.2	23.0	12.0	462
Strontium	mg/L	0.001		1.03	0.278		0.229	1.03
Zinc	mg/L	0.005		<0.005	<0.005		<0.005	<0.005
Chromium	mg/L	0.001		<0.001	<0.001		<0.001	0.001
Cobalt	mg/L	0.0001		0.0070	0.0003		0.0002	0.0146
Copper	mg/L	0.0001		0.0033	0.0015		0.0026	0.0010
pH (Client Data)	pH units	-		6.9	7.6	7.8	7.6	6.9
Temperature (Client Data)	°C	-		8.5	9.8	9.7	8.7	9.6

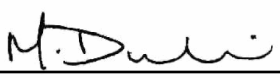


Michelle Dubien
Data Specialist

	Client I.D.		OB3	OB8	OB11R	OB12	Dup #1
	Sample I.D.		24-035652-6	24-035652-7	24-035652-8	24-035652-9	24-035652-10
	Date Collected		2024-11-12	2024-11-12	2024-11-12	2024-11-12	2024-11-12
Parameter	**Units**	**R.L.**	-	-	-	-	-
Alkalinity(CaCO3) to pH4.5	mg/L	5	615	388	411	232	546
TDS (Calc. from Cond.)	mg/L	3	1150	661	2710	377	2040
Conductivity @25°C	uS/cm	1	2080	1220	4800	723	3640
pH @25°C	pH units	-	7.70	7.80			
Chloride	mg/L	0.5	350	169	1510	89.5	963
Nitrate (N)	mg/L	0.05			2.00	0.10	<0.40
Sulphate	mg/L	1			88	12	89
Phosphorus (Total)	mg/L	0.01			0.51	0.12	0.33
Total Kjeldahl Nitrogen	mg/L	0.1			0.3	0.2	13.0
Ammonia (N)-Total (NH3+NH4)	mg/L	0.05			<0.05	<0.05	10.6
Dissolved Organic Carbon	mg/L	0.8	3.8	5.9	1.1	3.0	2.6
COD	mg/L	5			57	6	66
Hardness (as CaCO3)	mg/L	0.02	965	568	854	256	1160
Aluminum	mg/L	0.01			0.07	0.02	0.09
Barium	mg/L	0.001			0.680	0.101	1.18
Boron	mg/L	0.005	0.646	0.159	0.040	0.012	0.413
Calcium	mg/L	0.02	214	149	261	73.3	336
Iron	mg/L	0.005	0.197	<0.005	<0.005	<0.005	19.1
Magnesium	mg/L	0.02	105	47.5	49.1	17.8	77.6
Manganese	mg/L	0.001	0.429	<0.001	0.004	0.308	6.06
Potassium	mg/L	0.1			6.7	3.0	31.8

Michelle Dubien
Data Specialist

	Client I.D.	OB3	OB8	OB11R	OB12	Dup #1
	Sample I.D.	24-035652-6	24-035652-7	24-035652-8	24-035652-9	24-035652-10
	Date Collected	2024-11-12	2024-11-12	2024-11-12	2024-11-12	2024-11-12
Parameter	**Units** / **R.L.**	-	-	-	-	-
Silicon	mg/L / 0.01			5.03	3.73	9.02
Sodium	mg/L / 0.2	97.6	55.0	688	60.2	462
Strontium	mg/L / 0.001			0.724	0.196	1.03
Zinc	mg/L / 0.005			<0.005	<0.005	<0.005
Chromium	mg/L / 0.001			<0.001	<0.001	0.001
Cobalt	mg/L / 0.0001			0.0004	0.0002	0.0148
Copper	mg/L / 0.0001			0.0019	0.0016	0.0003
pH (Client Data)	pH units / -	7.0	7.3	7.4	9.2	
Temperature (Client Data)	°C / -	9.4	9.5	9.8	8.0	



Michelle Dubien
Data Specialist

			Client I.D.	BR1
			Sample I.D.	24-035652-1
			Date Collected	2024-11-12
Parameter	Units	R.L.		-
Acetone	µg/L	30		<30
Benzene	µg/L	0.5		<0.5
Bromodichloromethane	µg/L	2		<2
Bromoform	µg/L	5		<5
Bromomethane	µg/L	0.5		<0.5
Carbon Tetrachloride	µg/L	0.2		<0.2
Chlorobenzene	µg/L	0.5		<0.5
Chloroform	µg/L	1		<1
Dibromochloromethane	µg/L	2		<2
Ethylene Dibromide	µg/L	0.2		<0.2
Dichlorobenzene,1,2-	µg/L	0.5		<0.5
Dichlorobenzene,1,3-	µg/L	0.5		<0.5
Dichlorobenzene,1,4-	µg/L	0.5		0.8
Dichlorodifluoromethane (Freon 12)	µg/L	2		<2
Dichloroethane,1,1-	µg/L	0.5		<0.5
Dichloroethane,1,2-	µg/L	0.5		<0.5
Dichloroethylene,1,1-	µg/L	0.5		<0.5
Dichloroethylene,1,2-cis-	µg/L	0.5		<0.5
Dichloroethylene,1,2-cis+trans-	µg/L	0.7		<0.7
Dichloroethylene,1,2-trans-	µg/L	0.5		<0.5
Dichloropropane,1,2-	µg/L	0.5		<0.5

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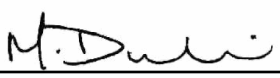
			Client I.D.	BR1
			Sample I.D.	24-035652-1
			Date Collected	2024-11-12
Parameter	Units	R.L.		-
Dichloropropene,1,3-cis-	µg/L	0.5		<0.5
Dichloropropene,1,3-cis+trans- (Calculated)	µg/L	0.5		<0.5
Dichloropropene,1,3-trans-	µg/L	0.5		<0.5
Ethylbenzene	µg/L	0.5		<0.5
Hexane	µg/L	5		<5
Dichloromethane (Methylene Chloride)	µg/L	5		<5
Methyl Ethyl Ketone	µg/L	2		<2
Methyl Isobutyl Ketone	µg/L	20		<20
Methyl tert-Butyl Ether (MTBE)	µg/L	2		<2
Styrene	µg/L	0.5		<0.5
Tetrachloroethane,1,1,1,2-	µg/L	0.5		<0.5
Tetrachloroethane,1,1,2,2-	µg/L	0.5		<0.5
Tetrachloroethylene	µg/L	0.5		<0.5
Toluene	µg/L	0.5		<0.5
Trichloroethane,1,1,1-	µg/L	0.5		<0.5
Trichloroethane,1,1,2-	µg/L	0.5		<0.5
Trichloroethylene	µg/L	0.5		<0.5
Trichlorofluoromethane (Freon 11)	µg/L	5		<5
Vinyl Chloride	µg/L	0.2		<0.2
Xylene, m,p-	µg/L	1		<1
Xylene, m,p,o-	µg/L	1.1		<1.1



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		Client I.D.	BR1
		Sample I.D.	24-035652-1
		Date Collected	2024-11-12
Parameter	**Units**	**R.L.**	-
Xylene, o-	µg/L	0.5	<0.5

Elevated RLs due to sample matrix interferences

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Data Specialist

Appendix I

Chemistry Analysais 2024

Groundwater Quality
Project Name: Norway Lake

Monitor Number->		BR 1				
Date->	ODWS	Jun-23	Sep-23	Jul-24	Nov-24	
Parameters mg/L						
Alkalinity(CaCO3) to pH4.5	30-500	921	860	783	675	
pH @25°C	6.5 - 8.5					
Conductivity @25°C				1830	2020	
TDS (Calc. from Cond.)	500	949	1110	1000	1110	
Chloride	250	82.4	176	120	275	
Nitrate (N)	10	< 0.05	<0.40	<0.40	<0.05	
Nitrite (N)	1					
Sulphate	500	57	46	62	54	
Phosphorus (Total)		0.01	0.04	0.02	0.01	
Total Kjeldahl Nitrogen		0.9	0.8	0.8	0.8	
Ammonia (N)-Total (NH3+NH4)		0.37	0.37	0.48	0.39	
Dissolved Organic Carbon	5	2.1	5.2	8.8	4.2	
Phenolics						
COD		27	57	40	24	
Hardness (as CaCO3)	500	871	953	824	995	
Aluminum	0.1	0.06	0.11	0.08	0.06	
Barium	1	0.172	0.207	0.164	0.195	
Boron	5	0.869	0.788	0.744	0.775	
Calcium		193	215	180	216	
Iron	0.3	6.5	30.3	6.98	6.17	
Magnesium		94.8	101	91	111	
Manganese	0.05	0.737	0.944	0.685	0.718	
Potassium		18.5	20.5	20.2	21.9	
Silicon		6.54	7.03	6.39	6.44	
Sodium	200	68.9	77.2	67.2	91.6	
Strontium		0.858	1.13	0.884	1.03	
Zinc	5	< 0.005	<0.005	<0.005	<0.005	
Arsenic	0.01					
Cadmium	0.005					
Chromium	0.050	< 0.001	<0.001	<0.001	<0.001	
Cobalt		0.0107	0.0029	0.008	0.007	
Copper	1	0.0025	0.001	0.0037	0.0033	
Lead	0.01					
Mercury	0.001					
Field Measured						
Water Temp. (°C)		9.2	10.4	11.2	8.6	
Conductivity (microS/cm)		1940	2060	1390	2190	
pH (pH units)		7.2	6.8	6.6	6.90	

Notes:
All values reported in mg/L unless otherwise noted
ODWS = Ontario Drinking Water Standards
Shaded values exceed ODWS

Groundwater Quality
Project Name: Norway Lake

Monitor Number->		BR 2				
Date->	ODWS	Jun-23	Sep-23	Jul-24	Nov-24	
Parameters mg/L						
Alkalinity(CaCO3) to pH4.5	30-500	306	321	253	263	
pH @25°C	6.5 - 8.5					
Conductivity @25°C				902	959	
TDS (Calc. from Cond.)	500	413	490	478	510	
Chloride	250	86.5	104	133	151	
Nitrate (N)	10	< 0.05	<0.05	<0.05	<0.05	
Nitrite (N)	1					
Sulphate	500	8	17	9	7	
Phosphorus (Total)		0.04	0.3	0.08	0.09	
Total Kjeldahl Nitrogen		0.2	0.4	0.3	0.3	
Ammonia (N)-Total (NH3+NH4)		< 0.01	0.08	<0.05	<0.05	
Dissolved Organic Carbon	5	1	2.6	3.1	3	
Phenolics						
COD		12	39	27	36	
Hardness (as CaCO3)	500	360	398	441	485	
Aluminum	0.1	0.03	0.07	0.07	0.04	
Barium	1	0.17	0.204	0.192	0.224	
Boron	5	0.011	0.013	0.013	0.021	
Calcium		110	123	133	142	
Iron	0.3	6.91	3.69	0.178	7.3	
Magnesium		20.7	22	26.3	31.6	
Manganese	0.05	0.114	0.065	0.06	0.144	
Potassium		6.2	7.6	8.1	9.4	
Silicon		5.11	6.2	5.46	5.1	
Sodium	200	23.4	25.9	31	34.20	
Strontium		0.191	0.227	0.25	0.28	
Zinc	5	< 0.005	<0.005	0.005	<0.005	
Arsenic	0.01					
Cadmium	0.005					
Chromium	0.050	< 0.001	<0.001	<0.001	<0.001	
Cobalt		0.0003	0.0007	0.0004	0.0003	
Copper	1	0.0003	0.0008	0.0005	0.0015	
Lead	0.01					
Mercury	0.001					
Field Measured						
Water Temp. (°C)		10.3	13.3	13.3	9.8	
Conductivity (microS/cm)		920	900	760	1070	
pH (pH units)		7.4	7.2	6.8	7.6	

Notes:
All values reported in mg/L unless otherwise noted
ODWS = Ontario Drinking Water Standards
Shaded values exceed ODWS

Groundwater Quality
Project Name: Norway Lake

Monitor Number->		BR 8				
Date->	ODWS	Jun-23	Sep-23	Jul-24	Nov-24	
Parameters mg/L						
Alkalinity(CaCO3) to pH4.5	30-500	261	271	256	254	
pH @25°C	6.5 - 8.5			7.72	8	
Conductivity @25°C				774	711	
TDS (Calc. from Cond.)	500	382	394	405	369	
Chloride	250	85.6	71.9	86.2	67.6	
Nitrate (N)	10					
Nitrite (N)	1					
Sulphate	500					
Phosphorus (Total)						
Total Kjeldahl Nitrogen						
Ammonia (N)-Total (NH3+NH4)						
Dissolved Organic Carbon	5	2.2	3.1	4.6	4.6	
Phenolics						
COD						
Hardness (as CaCO3)	500	317	326	313	339	
Aluminum	0.1					
Barium	1					
Boron	5	0.171	0.174	0.164	0.238	
Calcium		81.3		80.7	85.1	
Iron	0.3	0.104	0.032	0.039	0.084	
Magnesium		27.6		27	30.7	
Manganese	0.05	0.027	0.011	0.006	0.024	
Potassium						
Silicon						
Sodium	200	19.5	23.70	22.90	23	
Strontium						
Zinc	5					
Arsenic	0.01					
Cadmium	0.005					
Chromium	0.050					
Cobalt						
Copper	1					
Lead	0.01					
Mercury	0.001					
Field Measured						
Water Temp. (°C)		9.1	10.9	10.9	9.7	
Conductivity (microS/cm)		830	790	660	770	
pH (pH units)		7.9	5.8	6.8	7.8	

Notes:
All values reported in mg/L unless otherwise noted
ODWS = Ontario Drinking Water Standards
Shaded values exceed ODWS

Groundwater Quality
Project Name: Norway Lake

Monitor Number->		BR 9				
Date->	ODWS	Jun-23	Sep-23	Jul-24	Nov-24	
Parameters mg/L						
Alkalinity(CaCO3) to pH4.5	30-500	246	266	244	256	
pH @25°C	6.5 - 8.5					
Conductivity @25°C				501	662	
TDS (Calc. from Cond.)	500	250	316	259	344	
Chloride	250	9.6	34.7	12.1	52	
Nitrate (N)	10	< 0.05	0.11	<0.05	0.09	
Nitrite (N)	1					
Sulphate	500	11	12	12	13	
Phosphorus (Total)		0.06	0.03	0.07	0.06	
Total Kjeldahl Nitrogen		0.2	0.2	<0.1	0.1	
Ammonia (N)-Total (NH3+NH4)		< 0.01	<0.05	<0.05	<0.05	
Dissolved Organic Carbon	5	2.2	3	4.2	4	
Phenolics						
COD		< 5	9	10	<5	
Hardness (as CaCO3)	500	254	288	246	348	
Aluminum	0.1	0.04	0.06	0.02	0.03	
Barium	1	0.082	0.109	0.07	0.105	
Boron	5	0.018	0.033	0.019	0.044	
Calcium		69.9	80	67.5	95.2	
Iron	0.3	0.052	<0.005	<0.005	<0.005	
Magnesium		19.3	21.5	18.8	26.8	
Manganese	0.05	0.011	<0.001	<0.001	<0.001	
Potassium		2.7	3.6	2.9	4.2	
Silicon		3.97	4.27	3.98	4.16	
Sodium	200	4.5	8.50	4.80	12	
Strontium		0.165	0.214	0.14	0.229	
Zinc	5	< 0.005	<0.005	0.005	<0.005	
Arsenic	0.01					
Cadmium	0.005					
Chromium	0.050	0.001	<0.001	<0.001	<0.001	
Cobalt		0.0007	0.0002	0.0002	0.0002	
Copper	1	0.0028	0.0037	0.0015	0.0026	
Lead	0.01					
Mercury	0.001					
Field Measured						
Water Temp. (°C)		8.9	9.3	9.2	8.7	
Conductivity (microS/cm)		560	670	450	710	
pH (pH units)		7.0	6.7	7.3	7.6	

Notes:
All values reported in mg/L unless otherwise noted
ODWS = Ontario Drinking Water Standards
Shaded values exceed ODWS

Groundwater Quality
Project Name: Norway Lake

Monitor Number->		BR 10				
Date->	ODWS	Jun-23	Sep-23	Sep-23	Jul-24	Jul-24
Parameters mg/L				Dup #1		Dup #1
Alkalinity(CaCO3) to pH4.5	30-500	637	629	624	543	566
pH @25°C	6.5 - 8.5					
Conductivity @25°C					2680	3410
TDS (Calc. from Cond.)	500	1065	2090	2090	1490	1910
Chloride	250	328	869	855	560	795
Nitrate (N)	10	< 0.05	<0.40	<0.40	<0.40	<0.40
Nitrite (N)	1					
Sulphate	500	27	60	60	52	64
Phosphorus (Total)		0.87	0.46	0.41	0.58	1.08
Total Kjeldahl Nitrogen		19.90	19.80	19.9	15	15.4
Ammonia (N)-Total (NH3+NH4)		18.30	16.80	16.7	13.1	13
Dissolved Organic Carbon	5	1.30	3.80	3.5	3.7	3.9
Phenolics						
COD		67	91	100	110	120
Hardness (as CaCO3)	500	544	945	955	780	752
Aluminum	0.1	0.04	0.14	0.14	0.1	0.1
Barium	1	0.68	1.21	1.21	0.915	0.893
Boron	5	0.55	0.56	0.573	0.44	0.415
Calcium		158	280	283	232	222
Iron	0.3	22.5	28	28.2	21.8	21.5
Magnesium		36.3	59.7	60.3	48.7	48
Manganese	0.05	4.92	6.51	6.59	5.91	5.83
Potassium		26	33	33.6	29.8	29.2
Silicon		11	10	10.3	9.78	9.67
Sodium	200	148	326	330	350	347
Strontium		0.533	0.898	0.909	0.782	0.767
Zinc	5	< 0.005	0.006	<0.005	0.008	<0.005
Arsenic	0.01					
Cadmium	0.005					
Chromium	0.050	0.002	0.002	0.002	0.001	0.001
Cobalt		0.012	0.013	0.0133	0.0148	0.0133
Copper	1	0.002	0.004	0.0023	0.0005	0.0008
Lead	0.01					
Mercury	0.001					
Field Measured						
Water Temp. (°C)		11.1	10.5		11.8	
Conductivity (microS/cm)		2330	3680		2370	
pH (pH units)		6.9	6.9		6.4	

Notes:
All values reported in mg/L unless otherwise noted
ODWS = Ontario Drinking Water Standards
Shaded values exceed ODWS

Groundwater Quality
Project Name: Norway Lake

Monitor Number->		BR 10				
Date->	ODWS	Nov-24	Nov-24			
Parameters mg/L			Dup #1			
Alkalinity(CaCO3) to pH4.5	30-500	560	546			
pH @25°C	6.5 - 8.5					
Conductivity @25°C		4280	3640			
TDS (Calc. from Cond.)	500	2410	2040			
Chloride	250	1200	963			
Nitrate (N)	10	<0.40	<0.40			
Nitrite (N)	1					
Sulphate	500	114	89			
Phosphorus (Total)		0.37	0.33			
Total Kjeldahl Nitrogen		14.4	13			
Ammonia (N)-Total (NH3+NH4)		12.5	10.6			
Dissolved Organic Carbon	5	2.3	2.6			
Phenolics						
COD		73	66			
Hardness (as CaCO3)	500	1160	1160			
Aluminum	0.1	0.09	0.09			
Barium	1	1.18	1.18			
Boron	5	0.414	0.413			
Calcium		336	336			
Iron	0.3	19	19.1			
Magnesium		78.1	77.6			
Manganese	0.05	6.08	6.06			
Potassium		31.8	31.8			
Silicon		8.98	9.02			
Sodium	200	462	462			
Strontium		1.03	1.03			
Zinc	5	<0.005	<0.005			
Arsenic	0.01					
Cadmium	0.005					
Chromium	0.050	0.001	0.001			
Cobalt		0.0146	0.0148			
Copper	1	0.001	0.0003			
Lead	0.01					
Mercury	0.001					
Field Measured						
Water Temp. (°C)		9.6				
Conductivity (microS/cm)		4560				
pH (pH units)		6.9				

Notes:
All values reported in mg/L unless otherwise noted
ODWS = Ontario Drinking Water Standards
Shaded values exceed ODWS

Groundwater Quality
Project Name: Norway Lake

Monitor Number->		OB 3				
Date->	ODWS	Jun-23	Sep-23	Jul-24	Nov-24	
Parameters mg/L						
Alkalinity(CaCO3) to pH4.5	30-500	866	699	672	615	
pH @25°C	6.5 - 8.5			7.91	7.7	
Conductivity @25°C				1960	2080	
TDS (Calc. from Cond.)	500	1000	1230	1080	1150	
Chloride	250	152	355	230	350	
Nitrate (N)	10					
Nitrite (N)	1					
Sulphate	500					
Phosphorus (Total)						
Total Kjeldahl Nitrogen						
Ammonia (N)-Total (NH3+NH4)						
Dissolved Organic Carbon	5	1.9	3.8	5.7	3.8	
Phenolics						
COD						
Hardness (as CaCO3)	500	911	961	820	965	
Aluminum	0.1					
Barium	1					
Boron	5	0.688	0.587	0.596	0.646	
Calcium		206		183	214	
Iron	0.3	0.148	0.357	0.216	0.197	
Magnesium		96.2		88.3	105	
Manganese	0.05	0.482	0.506	0.433	0.429	
Potassium						
Silicon						
Sodium	200	82.8	85.2	78.9	97.6	
Strontium						
Zinc	5					
Arsenic	0.01					
Cadmium	0.005					
Chromium	0.050					
Cobalt						
Copper	1					
Lead	0.01					
Mercury	0.001					
Field Measured						
Water Temp. (°C)		8.6	10.6	10.9	9.4	
Conductivity (microS/cm)		2050	2220	1420	2250	
pH (pH units)		6.9	6.2	6.9	9.4	

Notes:
All values reported in mg/L unless otherwise noted
ODWS = Ontario Drinking Water Standards
Shaded values exceed ODWS

Groundwater Quality
Project Name: Norway Lake

Monitor Number->		OB 8				
Date->	ODWS	Jun-23	Sep-23	Jul-24	Nov-24	
Parameters mg/L						
Alkalinity(CaCO3) to pH4.5	30-500	279	NS	280	388	
pH @25°C	6.5 - 8.5			7.66	7.8	
Conductivity @25°C				883	1220	
TDS (Calc. from Cond.)	500	412		467	661	
Chloride	250	98.5		116	169	
Nitrate (N)	10					
Nitrite (N)	1					
Sulphate	500					
Phosphorus (Total)						
Total Kjeldahl Nitrogen						
Ammonia (N)-Total (NH3+NH4)						
Dissolved Organic Carbon	5	3.3		8.5	5.9	
Phenolics						
COD						
Hardness (as CaCO3)	500	331		331	568	
Aluminum	0.1					
Barium	1					
Boron	5	0.081		0.12	0.159	
Calcium		87.8		86.4	149	
Iron	0.3	0.061		0.007	<0.005	
Magnesium		27.2		28.1	47.5	
Manganese	0.05	0.002		<0.001	<0.001	
Potassium						
Silicon						
Sodium	200	32.7		36.3	55	
Strontium						
Zinc	5					
Arsenic	0.01					
Cadmium	0.005					
Chromium	0.050					
Cobalt						
Copper	1					
Lead	0.01					
Mercury	0.001					
Field Measured						
Water Temp. (°C)		9.1		12.1	9.5	
Conductivity (microS/cm)		900		740	1340	
pH (pH units)		7.6		6.7	7	

Notes:
All values reported in mg/L unless otherwise noted
ODWS = Ontario Drinking Water Standards
Shaded values exceed ODWS

Groundwater Quality
Project Name: Norway Lake

Monitor Number->		OB 11R				
Date->	ODWS	Jun-23	Sep-23	Jul-24	Nov-24	
Parameters mg/L						
Alkalinity(CaCO3) to pH4.5	30-500	265	407	411	387	
pH @25°C	6.5 - 8.5					
Conductivity @25°C				4800	3660	
TDS (Calc. from Cond.)	500	535	2280	2710	2050	
Chloride	250	185	1080	1510	97.3	
Nitrate (N)	10	< 0.05	1.91	2	0.16	
Nitrite (N)	1					
Sulphate	500	21	74	88	8	
Phosphorus (Total)		0.13	1.62	0.51	0.55	
Total Kjeldahl Nitrogen		0.3	0.3	0.3	0.3	
Ammonia (N)-Total (NH3+NH4)		0.01	<0.05	<0.05	0.05	
Dissolved Organic Carbon	5	< 0.2	1.2	1.1	1.8	
Phenolics						
COD		< 5	40	57	45	
Hardness (as CaCO3)	500	283	605	854	501	
Aluminum	0.1	0.02	0.13	0.07	0.08	
Barium	1	0.125	0.519	0.68	0.397	
Boron	5	0.01	0.033	0.04	0.037	
Calcium		82.2	189	261	153	
Iron	0.3	< 0.005	0.141	<0.005	0.031	
Magnesium		18.9	32.3	49.1	28.8	
Manganese	0.05	0.054	0.009	0.004	0.002	
Potassium		2.8	5.2	6.7	4.9	
Silicon		3.92	5.24	5.03	4.99	
Sodium	200	94.1	598	688	522	
Strontium		0.214	0.5	0.724	0.432	
Zinc	5	< 0.005	0.006	<0.005	<0.005	
Arsenic	0.01					
Cadmium	0.005					
Chromium	0.050	< 0.001	<0.001	<0.001	<0.001	
Cobalt		0.0002	0.0004	0.0004	0.0003	
Copper	1	0.0006	0.0059	0.0019	0.0013	
Lead	0.01					
Mercury	0.001					
Field Measured						
Water Temp. (°C)		11.8	13.2	13.9	9.8	
Conductivity (microS/cm)		3730	3810	2480	4890	
pH (pH units)		7.2	7	6.7	7.4	

Notes:
All values reported in mg/L unless otherwise noted
ODWS = Ontario Drinking Water Standards
Shaded values exceed ODWS

Groundwater Quality
Project Name: Norway Lake

Monitor Number->		OB 12				
Date->	ODWS	Jun-23	Sep-23	Jul-24	Nov-24	
Parameters mg/L						
Alkalinity(CaCO3) to pH4.5	30-500	372	258	260	232	
pH @25°C	6.5 - 8.5					
Conductivity @25°C				769	723	
TDS (Calc. from Cond.)	500	1810	526	403	377	
Chloride	250	989	156	85.9	89.5	
Nitrate (N)	10	0.5	0.05	<0.05	0.1	
Nitrite (N)	1					
Sulphate	500	60	14	12	12	
Phosphorus (Total)		0.37	0.31	0.09	0.12	
Total Kjeldahl Nitrogen		0.1	0.3	0.2	0.2	
Ammonia (N)-Total (NH3+NH4)		< 0.01	<0.05	<0.05	<0.05	
Dissolved Organic Carbon	5	< 0.2	1.3	4.4	3	
Phenolics						
COD		5	<5	17	6	
Hardness (as CaCO3)	500	570	295	258	256	
Aluminum	0.1	0.06	0.07	0.03	0.02	
Barium	1	0.426	0.158	0.11	0.101	
Boron	5	0.025	0.012	0.01	0.012	
Calcium		176	86.5	75.4	73.3	
Iron	0.3	0.033	0.083	0.008	<0.005	
Magnesium		31.6	19.1	16.9	17.8	
Manganese	0.05	0.005	0.177	0.008	0.308	
Potassium		4.5	3.3	2.9	3	
Silicon		4.58	4.43	4	3.73	
Sodium	200	496	79.4	48.9	60.2	
Strontium		0.458	0.236	0.175	0.196	
Zinc	5	< 0.005	<0.005	<0.005	<0.005	
Arsenic	0.01					
Cadmium	0.005					
Chromium	0.050	< 0.001	<0.001	<0.001	<0.001	
Cobalt		0.0004	0.0003	0.0002	0.0002	
Copper	1	0.0027	0.0036	0.0018	0.0016	
Lead	0.01					
Mercury	0.001					
Field Measured						
Water Temp. (°C)		12	14.3	15.8	9.2	
Conductivity (microS/cm)		1120	1090	650	820	
pH (pH units)		7.6	7.4	7.2	8	

Notes:
All values reported in mg/L unless otherwise noted
ODWS = Ontario Drinking Water Standards
Shaded values exceed ODWS

Groundwater Quality
Project Name: Norway Lake

Monitor Number->		GUIDELINE ODWSOG/ O.Reg 169/03		BR 1			
Date->	TYPE	LIMIT	UNITS	Jun-23	Sep-23	Jul-24	Nov-24
Parameters ug/L	ug/L						
Acetone	ug/L			< 30	<30	NS	<30
Benzene	ug/L	MAC	1	< 0.5	<0.5		<0.5
Bromodichloromethane	ug/L			< 2	<2		<2
Bromoform	ug/L			< 5	<5		<5
Bromomethane	ug/L			< 0.5	<0.5		<0.5
Carbon Tetrachloride	ug/L			< 0.2	<0.2		<0.2
Chlorobenzene	ug/L	MAC	80	1.4	<0.5		<0.5
Chloroform	ug/L			< 1	<1		<1
Dibromochloromethane	ug/L			< 2	<2		<2
Ethylene Dibromide	ug/L				<0.2		<0.2
Dichlorobenzene,1,2-	ug/L	MAC	200	< 0.5	<0.5		<0.5
Dichlorobenzene,1,3-	ug/L			< 0.5	<0.5		<0.5
Dichlorobenzene,1,4-	ug/L	MAC	5	1.2	0.7		0.7
Dichlorodifluoromethane (Freon 12)	ug/L			< 2	<2		<2
Dichloroethane,1,1-	ug/L			< 0.5	<0.5		<0.5
Dichloroethane,1,2-	ug/L	IMAC	5	< 0.5	<0.5		<0.5
Dichloroethylene,1,1-	ug/L	MAC	14	< 0.5	<0.5		<0.5
Dichloroethylene,1,2-cis-	ug/L			< 0.5	<0.5		<0.5
Dichloroethylene,1,2-trans-	ug/L			< 0.5	<0.5		<0.5
Dichloropropane,1,2-	ug/L			< 0.5	<0.5		<0.5
Dichloropropene,1,3-cis-	ug/L			< 0.5	<0.5		<0.5
Dichloropropene,1,3-cis+trans- (Calculated)	ug/L			< 0.5	<0.5		<0.5
Dichloropropene,1,3-trans-	ug/L			< 0.5	<0.5		<0.5
Ethylbenzene	ug/L	AO	140	< 0.5	<0.5		<0.5
Hexane	ug/L			< 0.2	<5		<5
Dichloromethane (Methylene Chloride)	ug/L	MAC	50	< 5	<5		<5
Methyl Ethyl Ketone	ug/L			< 20	<20		<20
Methyl Isobutyl Ketone	ug/L			< 20	<20		<20
Methyl tert-Butyl Ether (MTBE)	ug/L	AO	15	< 2	<2		<2
Styrene	ug/L			< 0.5	<0.5		<0.5
Tetrachloroethane,1,1,1,2-	ug/L			< 0.5	<0.5		<0.5
Tetrachloroethane,1,1,2,2-	ug/L			< 0.5	<0.5		<0.5
Tetrachloroethylene	ug/L	MAC	10	< 0.5	<0.5		<0.5
Toluene	ug/L	AO	60	< 0.5	<0.5		<0.5
Trichloroethane,1,1,1-	ug/L			< 0.5	<0.5		<0.5
Trichloroethane,1,1,2-	ug/L			< 0.5	<0.5		<0.5
Trichloroethylene	ug/L	MAC	5	< 0.5	<0.5		<0.5
Trichlorofluoromethane (Freon 11)	ug/L			< 5	<5		<5
Vinyl Chloride	ug/L	MAC	1	< 0.2	<0.2		<0.2
Xylene, m,p-	ug/L			< 1.0	<1		<1
Xylene, m,p,o-	ug/L			< 1.1	<1.1		<1.1
Xylene, o-	ug/L			< 0.5	<0.5		<0.5

Notes:

All values reported in ug/L unless otherwise noted

ODWS = Ontario Drinking Water Standards

Shaded values exceed ODWS

Surface Water Quality
Project Name: Norway Lake

Monitor Number ->					SW 1			
Parameters	**Limit**	**PWQO**	**CWQG**	**Background (75th Percentile)**	**Jun-23**	**Sep-23**		
Alkalinity(CaCO3) to pH4.5	IPWQO	a		125	NS	NS		
pH @25°C								
Conductivity @25°C								
TDS (Calc. from Cond.)				208				
Chloride			120	2				
Nitrate (N)			3	0.15				
Nitrite (N)			0.6					
Sulphate								
BOD5								
Total Suspended Solids				11				
Phosphorus (Total)	IPWQO	0.03		0.043				
Total Kjeldahl Nitrogen				0.70				
Ammonia (N)-Total (NH3+NH4)				N/L				
Dissolved Organic Carbon				18.70				
Phenolics				0.0010				
COD				49				
Hardness (as CaCO3)				148				
Aluminum (Total)				0.039				
Barium (Total)				0.120				
Boron (Total)	IPWQO	0.2	1.5	0.030				
Calcium (Total)				45				
Iron (Total)	PWQO	0.3	0.3	0.2				
Magnesium (Total)				10				
Manganese (Total)				0.163				
Potassium (Total)				1.400				
Silicon (Total)				5				
Sodium (Total)				2				
Strontium (Total)				0.140				
Zinc (Total)	PWQO IPWQO	0.03 0.02	0.007	0.007				
Arsenic (Total)								
Cadmium (Total)	PWQO	0.0002	0.00009					
Chromium (Total)	PWQO	0.001	0.001	0.001				
Copper (Total)	PWQO IPWQO	0.005 d	Max 0.004 min 0.002 (based on hardness)	0.001				
Lead (Total)	PWQO	0.005	0.001					
Mercury	PWQO	0.0002	0.000026					
Field Measured								
Water Temp. (°C)								
Conductivity (microS/cm)								
pH (pH units)		6.5 - 8.5	6.5 - 9	6.5 - 9				
DO								
FLOW L/S								

Notes:
All values reported in mg/L unless otherwise noted
PWQO- Provincial Water Quality Objectives
CWQG - Canadian Water Quality Guidelines
Exceeded the PWQO / CWQG
Exceeded the 75th Percentile
NS - No Sample Taken

Surface Water Quality
Project Name: Norway Lake

Monitor Number ->					SW 4			
Parameters	**Limit**	**PWQO**	**CWQG**	**Background (75th Percentile)**	**Jun-23**	**Sep-23**		
Alkalinity(CaCO3) to pH4.5	IPWQO	a		125	NS	NS		
pH @25°C								
Conductivity @25°C								
TDS (Calc. from Cond.)				208				
Chloride			120	2				
Nitrate (N)			3	0.15				
Nitrite (N)			0.6					
Sulphate								
BOD5								
Total Suspended Solids				11				
Phosphorus (Total)	IPWQO	0.03		0.043				
Total Kjeldahl Nitrogen				0.70				
Ammonia (N)-Total (NH3+NH4)				N/L				
Dissolved Organic Carbon				18.70				
Phenolics				0.0010				
COD				49				
Hardness (as CaCO3)				148				
Aluminum (Total)				0.039				
Barium (Total)				0.120				
Boron (Total)	IPWQO	0.2	1.5	0.030				
Calcium (Total)				45				
Iron (Total)	PWQO	0.3	0.3	0.2				
Magnesium (Total)				10				
Manganese (Total)				0.163				
Potassium (Total)				1.400				
Silicon (Total)				5				
Sodium (Total)				2				
Strontium (Total)				0.140				
Zinc (Total)	PWQO IPWQO	0.03 0.02	0.007	0.007				
Arsenic (Total)								
Cadmium (Total)	PWQO	0.0002	0.00009					
Chromium (Total)	PWQO	0.001	0.001	0.001				
Copper (Total)	PWQO IPWQO	0.005 d	Max 0.004 min 0.002 (based on hardness)	0.001				
Lead (Total)	PWQO	0.005	0.001					
Mercury	PWQO	0.0002	0.000026					
Field Measured								
Water Temp. (°C)								
Conductivity (microS/cm)								
pH (pH units)		6.5 - 8.5	6.5 - 9	6.5 - 9				
DO								
FLOW L/S								

Notes:
All values reported in mg/L unless otherwise noted
PWQO- Provincial Water Quality Objectives
CWQG - Canadian Water Quality Guidelines
Exceeded the PWQO / CWQG
Exceeded the 75th Percentile
NS - No Sample Taken

Appendix J
Monitoring and Screening Checklist

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	Norway Lake WDS
Location (e.g. street address, lot, concession)	Part of Lot 20, Concession 7 within the geographic Township of Bagot
GPS Location (taken within the property boundary at front gate/ front entry)	NAD 1983, UTM Zone 18, 367326E 5021906N
Municipality	Township of Greater Madawaska
Client and/or Site Owner	Township of Greater Madawaska
Monitoring Period (Year)	2024
This Monitoring Report is being submitted under the following:	
Environmental Compliance Approval Number:	A411702
Director's Order No.:	NA
Provincial Officer's Order No.:	NA
Other:	NA

Report Submission Frequency	◉ **Annual** ○ **Other**		
The site is: **(Operation Status)**	○ **Open** ○ **Inactive** ◉ **Closed**		
Does your Site have a Total Approved Capacity?	○ **Yes** ◉ **No**		
If yes, please specify Total Approved Capacity		*Units*	Cubic Metres
Does your Site have a Maximum Approved Fill Rate?	○ **Yes** ◉ **No**		
If yes, please specify Maximum Approved Fill Rate		*Units*	
Total Waste Received within Monitoring Period (Year)		*Units*	Cubic Metres
Total Waste Received within Monitoring Period (Year) *Methodology*			
Estimated Remaining Capacity		*Units*	Cubic Metres
Estimated Remaining Capacity *Methodology*			
Estimated Remaining Capacity *Date Last Determined*			
Non-Hazardous Approved Waste Types	☒ Domestic ☒ Industrial, Commercial & Institutional (IC&I) ☐ Source Separated Organics (Green Bin) ☐ Tires	☐ Contaminated Soil ☐ Wood Waste ☒ Blue Box Material ☐ Processed Organics ☒ Leaf and Yard Waste	☐ Food Processing/Preparation Operations Waste ☐ Hauled Sewage Other:
Subject Waste Approved Waste Classes: Hazardous & Liquid Industrial *(separate waste classes by comma)*			
Year Site Opened *(enter the Calendar Year only)*	1960	**Current ECA Issue Date**	March 17, 2023
Is your Site required to submit Financial Assurance?		○ **Yes** ◉ **No**	
Describe how your Landfill is designed.		◉ Natural Attenuation only ○ Fully engineered Facility ○ Partially engineered Facility	
Does your Site have an approved Contaminant Attenuation Zone?		○ **Yes** ◉ **No**	

If closed, specify C of A, control or authorizing document closure date:	Amendment to PC of A (A411702) dated Dec 24, 2003

Has the nature of the operations at the site changed during this monitoring period?	○ **Yes** ◉ **No**
If yes, provide details:	
Have any measurements been taken since the last reporting period that indicate landfill gas volumes have exceeded the MOE limits for subsurface or adjacent buildings? (i.e. exceeded the LEL for methane)	○ Yes ◉ No

Groundwater WDS Verification:

Based on all available information about the site and site knowledge, it is my opinion that:

Sampling and Monitoring Program Status:

1) The monitoring program continues to effectively characterize site conditions and any groundwater discharges from the site. All monitoring wells are confirmed to be in good condition and are secure:	◉ **Yes** ○ **No**	
2) All groundwater, leachate and WDS gas sampling and monitoring for the monitoring period being reported on was successfully completed as required by Certificate(s) of Approval or other relevant authorizing/control document (s):	○ **Yes** ◉ **No** ○ **Not Applicable**	If no, list exceptions below or attach information.

Groundwater Sampling Location	**Description/Explanation for change (change in name or location, additions, deletions)**	**Date**
OB-5	Dry	July & November 2024
OB-7, BR-3, & BR-4	Destroyed	July & November 2024

3) a) Is landfill gas being monitored or controlled at the site?	○ **Yes** ◉ **No**	
If yes to 3(a), please answer the next two questions below.		
b) Have any measurements been taken since the last reporting period that indicate landfill gas is present in the subsurface at levels exceeding criteria established for the site?	○ **Yes** ◉ **No**	
c) Has the sampling and monitoring identified under 3(a) for the monitoring period being reported on was successfully completed in accordance with established protocols, frequencies, locations, and parameters developed as per the Technical Guidance Document:	○ **Yes** ○ **No** ◉ **Not Applicable**	If no, list exceptions below or attach additional information.

Groundwater Sampling Location	**Description/Explanation for change (change in name or location, additions, deletions)**	**Date**
All sampling completed in general accordance with Jp2g sampling protocols		

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**	All sampling completed in general accordance with Jp2g sampling protocols

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		
6) The site meets compliance and assessment criteria.	(●) Yes ( ) No		
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		
1) Is one or more of the following risk reduction practices in place at the site: *(a)* There is minimal reliance on natural attenuation of leachate due to the presence of an effective waste liner and active leachate collection/ treatment; or *(b)* There is a predictive monitoring program in-place (modeled indicator concentrations projected over time for key locations); or *(c)* The site meets the following two conditions (typically achieved after 15 years or longer of site operation): *i.* 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.	(●) Yes ( ) No	Note which practice(s):	☐ (a) ☐ (b) ☒ (c)
9) Have trigger values for contingency plans or site remedial actions been exceeded (where they exist):	( ) Yes (●) No ( ) Not Applicable		

Groundwater CEP Declaration:

I am a licensed professional Engineer or a registered professional geoscientist in Ontario with expertise in hydrogeology, as defined in Appendix D under Instructions. Where additional expertise was needed to evaluate the site monitoring data, I have relied on individuals who I believe to be experts in the relevant discipline, who have co-signed the compliance monitoring report or monitoring program status report, and who have provided evidence to me of their credentials.

I have examined the applicable Certificate of Approval and any other environmental authorizing or control documents that apply to the site. I have read and followed the Monitoring and Reporting for Waste Disposal Sites Groundwater and Surface Water Technical Guidance Document (MOE, 2010, or as amended), and associated monitoring and sampling guidance documents, as amended from time to time. I have reviewed all of the data collected for the above-referenced site for the monitoring period(s) identified in this checklist. Except as otherwise agreed with the ministry for certain parameters, all of the analytical work has been undertaken by a laboratory which is accredited for the parameters analysed to *ISO/IEC 17025:2005 (E)- General requirements for the competence of testing and calibration laboratories,* or as amended from time to time by the ministry.

If any exceptions or potential concerns have been noted in the questions in the checklist attached to this declaration, it is my opinion that these exceptions and concerns are minor in nature and will be rectified for the next monitoring/reporting period. Where this is not the case, the circumstances concerning the exception or potential concern and my client's proposed action have been documented in writing to the Ministry of the Environment District Manager in a letter from me dated:

Recommendations:

Based on my technical review of the monitoring results for the waste disposal site:

◉ **No changes to the monitoring program are recommended**	Continue to monitor with no changes from 2024 monitoring program
○ **The following change(s) to the monitoring program is/are recommended:**	
◉ **No Changes to site design and operation are recommended**	
○ **The following change(s) to the site design and operation is/ are recommended:**	

Name:	Andrew Buzza, P.Geo Note: Report signed and stamped.		
Seal:	Add Image		
Signature:		**Date:**	March 2025
CEP Contact Information:	Andrew Buzza, p.Geo		
Company:	Jp2g Consultants Inc.		
Address:	1150 Morrison Drive Suite 410 Ottawa ON K2H 8S9		
Telephone No.:	613 828-7800	Fax No. :	613 828-2600
E-mail Address:	andrew.buzza@jp2g.com		
Co-signers for additional expertise provided:			
Signature:		**Date:**	
Signature:		**Date:**	

Surface Water WDS Verification:

Provide the name of surface water body/bodies potentially receiving the WDS effluent and the approximate distance to the waterbody (including the nearest surface water body/bodies to the site):

Name (s)	Un-named seasonally-inundated creek
Distance(s)	Approximately 200 m northeast of the site

Based on all available information and site knowledge, it is my opinion that:

Sampling and Monitoring Program Status:

1) The current surface water monitoring program continues to effectively characterize the surface water conditions, and includes data that relates upstream/background and downstream receiving water conditions:	◉ Yes ○ No	Surface water monitoring and sampling is completed on a biennial basis. Sampling was last completed in June and September 2023. The next sampling is scheduled for spring and fall in 2025
2) All surface water sampling for the monitoring period being reported was successfully completed in accordance with the Certificate(s) of Approval or relevant authorizing/control document(s) (if applicable):	○ Yes ○ No ◉ **Not applicable (No C of A, authorizing / control document applies)**	If no, specify below or provide details in an attachment.

Surface Water Sampling Location	Description/Explanation for change (change in name or location, additions, deletions)	Date

3) a) Some or all surface water sampling and monitoring program requirements for the monitoring period have been established outside of a ministry C of A or authorizing/control document.	○ **Yes** ○ **No** ◉ **Not Applicable**	
b) If yes, all surface water sampling and monitoring identified under 3 (a) was successfully completed in accordance with the established program from the site, including sampling protocols, frequencies, locations and parameters) as developed per the Technical Guidance Document:	○ **Yes** ○ **No** ◉ **Not Applicable**	If no, specify below or provide details in an attachment.

Surface Water Sampling Location	**Description/Explanation for change (change in name or location, additions, deletions)**	**Date**
All surface water sampling completed in general accordance with Jp2g sampling procedures.		

4) All field work for surface water investigations was done in accordance with standard operating procedures, including internal/external QA/QC requirements, as established/outlined as per the Technical Guidance Document, MOE 2010, or as amended. (Note: A SOP can be from a published source, developed internally by the site owner's consultant, or adopted by the consultant from another organization):	◉ **Yes** ○ **No**	All surface water sampling completed in general accordance with Jp2g sampling procedures.

Sampling and Monitoring Program Results/WDS Conditions and Assessment:

5) The receiving water body meets surface water-related compliance criteria and assessment criteria: i.e., there are no exceedances of criteria, based on MOE legislation, regulations, Water Management Policies, Guidelines and Provincial Water Quality Objectives and other assessment criteria (e.g., CWQGs, APVs), as noted in Table A or Table B in the Technical Guidance Document (Section 4.6):	◉ **Yes** ○ **No**

If no, list parameters that exceed criteria outlined above and the amount/percentage of the exceedance as per the table below or provide details in an attachment:

Parameter	Compliance or Assessment Criteria or Background	Amount by which Compliance or Assessment Criteria or Background Exceeded
e.g. Nickel	e.g. C of A limit, PWQO, background	e.g. X% above PWQO
6) In my opinion, any exceedances listed in Question 5 are the result of non-WDS related influences (such as background, road salting, sampling site conditions)?	◉ **Yes** ○ **No**	

7) All monitoring program surface water parameter concentrations fall within a stable or decreasing trend. The site is not characterized by historical ranges of concentrations above assessment and compliance criteria.	◉ **Yes** ◯ **No**	
8) For the monitoring program parameters, does the water quality in the groundwater zones adjacent to surface water receivers exceed assessment or compliance criteria (e.g. , PWQOs, CWQGs, or toxicity values for aquatic biota (APVs)):	◯ Yes ◉ No ◯ Not Known ◯ Not Applicable	Overall the results of the surface and groundwater sampling do not indicate that the landfill activities at this location is having a negative effect on the surface water around the Landfill site.
9) Have trigger values for contingency plans or site remedial actions been exceeded (where they exist):	◯ **Yes** ◉ **No** ◯ **Not Applicable**	

Surface Water CEP Declaration:

I, the undersigned hereby declare that I am a Competent Environmental Practitioner as defined in Appendix D under Instructions, holding the necessary level of experience and education to design surface water monitoring and sampling programs, conduct appropriate surface water investigations and interpret the related data as it pertains to the site for this monitoring period.

I have examined the applicable Certificate of Approval and any other environmental authorizing or control documents that apply to the site. I have read and followed the Monitoring and Reporting for Waste Disposal Sites Groundwater and Surface Water Technical Guidance Document (MOE, 2010, or as amended) and associated monitoring and sampling guidance documents, as amended from time to time. I have reviewed all of the data collected for the above-referenced site for the monitoring period(s) identified in this checklist. Except as otherwise agreed with the ministry for certain parameters, all of the analytical work has been undertaken by a laboratory which is accredited for the parameters analysed to *ISO/IEC 17025:2005 (E)- General requirements for the competence of testing and calibration laboratories,* or as amended from time to time by the ministry.

If any exceptions or potential concerns have been noted in the questions in the checklist attached to this declaration, it is my opinion that these exceptions and concerns are minor in nature or will be rectified for future monitoring events. Where this is not the case, the circumstances concerning the exception or potential concern and my client's proposed action have been documented in writing to the Ministry of the Environment District Manager in a letter from me dated:

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:**	Continue to monitor with no changes from previous year monitoring program
○ **No changes to the site design and operation are recommended** ◉ **The following change(s) to the site design and operation is/are recommended:**	

CEP Signature	
Relevant Discipline	Education with 30 years experience
Date:	March 2025
CEP Contact Information:	Andrew Buzza, P.Geo
Company:	Jp2g Consultants Inc.
Address:	1150 Morrison Drive Suite 410 Ottawa ON K2H 8S9
Telephone No.:	613 828-7800
Fax No. :	613 828-2600
E-mail Address:	andrew.buzza@jp2g.com

Save As **Print Form**

Appendix K
Township 2024 Operations Records

THE CORPORATION OF THE TOWNSHIP OF GREATER MADAWASKA

BY-LAW NUMBER 41-2023

Being a By-law to establish, maintain, and regulate a system for the disposal of Municipal Waste, Recyclables, and other Refuse.

WHEREAS the *Municipal Act S.O 2001*, Chapter 25, Section 11(3) authorizes the Council of a local municipality to pass by-laws for establishing, maintaining, and operating a waste management system;

AND WHEREAS the *Municipal Act S.O 2001*, Chapter 25, Section 127 authorizes the Council of a local municipality to pass by-laws prohibiting the throwing, placing, or depositing of refuse or debris on private property or on property of the municipality or any local board thereof without authority from the owner or occupant of such property;

AND WHEREAS the *Municipal Act S.O 2001,* Chapter 25, Section 391 authorizes a municipality to impose fees or charges on persons, for services or activities provided or done by or on behalf of it, and for costs payable by it for services or activities provided or done by or on behalf of any other municipality.

NOW THEREFORE the Council of the Corporation of the Township of Greater Madawaska deems it expedient to enact a by-law that reflects the provisions of the current provincial legislation and protects the ecological wellbeing of the Municipality as follows:

1. Title, Scope, and Definitions

1.1 Short Title
This by-law may be cited as the **"Waste Disposal By-law".**

1.2 Scope
1.2.1 The provisions of this By-law shall apply to all persons, lands, structures, and uses within the boundaries of the Township of Greater Madawaska

1.2.2 No person shall dispose of, or cause to be disposed, any waste, refuse, garbage, or recyclables except in conformity with the provisions of this by-law and schedules annexed hereto.

1.2.3 This by-law shall not be effective to relieve, reduce or mitigate any person from compliance with any provision of the Public Health Act or Environmental Protection Act or any regulation or order prescribed by the Medical Officer of Health or the Minister of the Environment, Conservation and Parks.

1.3 Definitions
For the purpose of this by-law:

1.3.1 "Blue Box Recyclables" means acceptable cans, plastics, glass, newspaper, and corrugated cardboard.

1.3.2 "Bulky Waste" means large items such as carpet, stumps, furniture, mattresses, and other waste of a similar nature.

1.3.3 "Clean" in reference to lumber shall refer to lumber which has not been painted, stained or treated with preservatives which will prevent the burning of said lumber due to the environmental impact of the smoke and toxic gases. The lumber may contain nails.
"Clean" in reference to Blue Box recyclables such as cans, plastic and glass shall mean items have been rinsed and are free of food and/or beverage residues.

1.3.4 “Commercial Hauler” means a person engaged in the collecting, transporting, or disposing of waste materials for profit or gain and includes persons collecting, transporting, or disposing of waste generated or originating from and incidental to a residence that is not the principal residence of that person.

1.3.5 "Construction Waste" means nonhazardous waste, refuse and litter generated from and incidental to lawful construction activities and include such items as: drywall, scrap lumber and wood products, fiberglass insulation (bagged), SM Styrofoam (bagged or tied), windows, doors, fiberglass tub surrounds, shingles, etc.

1.3.6 "Council" means the Council of The Corporation of the Township of Greater Madawaska.

1.3.7 “Demolition Waste” means nonhazardous waste, refuse and litter generated from and incidental to lawful demolition activities, those being the complete destruction of buildings or other structures, and shall include items as: drywall, burnable wood, and non-burnable wood; scrap steel; vinyl siding, shingles, etc. Masonry (brick, block, and stone) etc.

1.3.8 “Household Hazardous Waste” means those wastes generated by Township ratepayers not appropriate for landfill disposal and is designated as ‘hazardous’ by the Ministry of the Environment and is not acceptable at any waste disposal site or transfer stations in the Township.

1.3.9 "Landfill Area (face)" means that operative area of a municipal waste disposal site which is designated as an area for the disposal of approved waste and the subsequent covering by earth fill.

1.3.10 “Mixed Waste” is a combination of Waste and/or Recyclable Waste.

1.3.11 "Official" means an officer, servant or employee duly appointed by Council.

1.3.12 "Person" means any human being, association, firm, partnership, incorporated company, corporation, agent or trustee and any heirs, executors, successors, assigns or other legal representative of a person to whom a contract can apply accordingly to law.

1.3.13 “Recyclable Waste" means those clean, washed materials and items which are accepted by the Township at the Municipal Waste Disposal Sites for collection, transfer and processing at a recycling centre or third-party re-user and as may be further defined in the Schedule(s) annexed to this By-law.

1.3.14 “Re Use” means authorized removal of items from the Waste Sites. Authorization would come from the Waste Site Attendant(s).

1.3.15 “Scavenging” unauthorized removal of items from the Waste Sites.

1.3.16 "Waste" means garbage, refuse and other waste materials generated from domestic household sources and similar uses approved for disposal, by the Ministry of Environment and Council, at the Municipal Waste Disposal Sites and shall for the purpose of this definition include construction waste and demolition waste but shall not include recyclable waste, hazardous waste, or industrial waste.

1.3.17 "Waste Disposal Site" means a waste disposal site designated and operated by the Township of Greater Madawaska for the disposal or transfer of waste (Transfer Station) in accordance with the provisions of this By-law and with the guidelines of the Ministry of the Environment.

1.3.18 "Waste Disposal Attendant" means an employee responsible for the operation, under direction of the Facilities and Environment Manager, of a Municipal Waste Disposal Site and for the administration of this By-law.

1.3.19 “White Goods" means refrigerators, freezers, stoves, ovens, hot water heaters, water tanks, washing machines, clothes dryers and similar such items, goods, and materials.

2. Municipal Waste Disposal Sites and Transfer Stations
2.1 The following is a list of the designated Municipal Waste Disposal Sites and Transfer Stations:

Norway Lake Site	574 Norway Lake Road
Mt. St. Patrick Site	134 Flat Road
Griffith Site	6 Finns Road
Black Donald Site	34 Hydro Dam Road (Not Open to the Public)

2.2 No person shall use any lands within the Township of Greater Madawaska for a waste disposal site except lands designated for such use by by-law.

2.3 Notwithstanding any other penalty or remedy of law available to the Township, the owner, occupant, lessee or person using any structure or lands within the boundaries of the municipality for the dumping or disposing of garbage, refuse, industrial waste, hazardous materials or waste of any kind where such lands or structures are not designated as a waste disposal site, shall upon written notice served by the Township cease using such lands or structures for such purposes and to remove or cover such garbage, refuse, industrial waste, hazardous materials or other waste in the manner as may be prescribed by the Township or the Public Health Act or the Environmental Protection Act or any provision or order prescribed by the Medical Officer of Health or the Minister of Environment, Conservation and Parks.

2.4 The Municipal Waste Disposal Sites shall be operated and maintained by the Township of Greater Madawaska in accordance with the provisions of this By-law and the requirements of the Ministry of Environment, Conservation and Parks.

2.5 Disposal Hours of Operation of Waste Site
2.5.1 The Municipal Waste Disposal Sites shall be open for the disposal of waste and other permitted materials in accordance with the times prescribed by Council and subsequently advertised in a newspaper and on the Township’s website, which in the opinion of Council, is sufficient general circulation to give users reasonable public notice.

2.5.2 No access to the Waste Disposal Sites shall be permitted outside of regular operating hours unless under the direction of the Facilities and Environment Manager.

2.5.3 No person shall trespass on the Municipal Waste Disposal Sites except as is required to transfer material to the site in accordance with this by-law.

3. General Provisions
3.1 Authorized taxpayers of the Township of North Frontenac, from those areas bordering our Township, are permitted users of any of our sites. Authorized persons may dispose of, or cause to be disposed, household waste, Blue Box recyclables, Construction and Demolition (C&D) and Bulk Items at this site from a location or use within the designated municipal boundaries of the Townships of North Frontenac and Greater Madawaska.

3.2 An exception to 3.1 will also be made for persons with written permission from the Chief Administrative Officer (CAO), Facilities and Environment Manager or their designates.

3.3 Persons shall dispose of permitted waste at the Waste Disposal Sites in accordance with the directions of the Waste Disposal Attendant and in accordance with the provisions of this By-law.

3.4 All household waste to be disposed of at the Municipal Waste Disposal Sites shall be in a bag or other acceptable container in such a way to prevent scattering on the site.

3.5 Waste being transported to a Municipal Disposal Site shall be so contained so as not to be blown or scattered from the transport vehicle or to leave deposits along road allowances and abutting lands.

3.6 No person shall deposit or cause to be deposited waste of any kind on any lane, street, watercourse, private or public property.

3.7 No person shall dispose of, or cause to be disposed of in the Waste Disposal Site any strictly prohibited waste material as listed in Schedule “B” to this By-law.

3.8 Waste materials such as recyclable waste, brush, construction and demolition waste, electronics, white goods, and tires shall only be deposited in specific areas.

3.9 No person shall dispose of waste that is not in a bag or other acceptable container except for large or bulky items and loose construction waste.

3.10 The Waste Disposal Attendant shall advise their supervisor of any person who is in contravention of any provision of this By-law. The supervisor is hereby authorized to refuse access to a Municipal Waste Disposal Site by any person who is in contravention of any provision of this By-law, as may be reasonably determined by the Supervisor. All persons refused access to, or use of a Waste Disposal Site shall be referred to the Township Office by the Supervisor to review the grounds of such access refusal, such grounds to be provided to that person by the Waste Disposal Attendant.

3.11 Unauthorized removal/scavenging of materials from Waste Disposal Sites shall not be permitted.

3.12 No persons shall dispose of permitted waste at the Municipal Waste Disposal Sites in any area except those designated for the specific type of waste which is being deposited. Non-compliance shall result in waste being refused.

Persons depositing waste in areas outside of the Waste Disposal Sites, including the access area to these sites, will be deemed to be contravening this By-law and shall be subject to the penalties stated herein.

4. Special Provisions

4.1 Bagged wastes for disposal at Greater Madawaska Waste Disposal Sites shall be securely contained within a clear/transparent bag that permits inspection for prohibited wastes as listed in Schedule B. Each clear/transparent bag may contain one opaque privacy bag of no more than 1 cubic foot (1’x1’x1’) capacity. Any resident not using clear bags for household waste will still be permitted to deposit the waste at the Site. The Waste Disposal Attendant will encourage such resident, in a calm and respectable manner, to use clear bags in the future.

4.2 Construction waste may be disposed at a designated site (Schedule “A”) and deposited in accordance with the directions of the Waste Disposal Attendant.

4.3 Waste which is deemed reusable by the Waste Disposal Attendant shall be deposited in a designated area. Waste deemed to be reusable, if not taken by the end of the day on which it was received, shall be placed in the respective bin and/or designated area. before the Waste Disposal Attendant leaves that day. Items which are no longer in working order are not to be deemed reusable and are to be properly disposed of.

4.4 No person shall dispose of demolition waste at a Municipal Waste Disposal Site that is not properly separated.

4.5 Recyclable waste shall be those clean, washed items listed in Schedule “C” and may be deposited in the recycling containers at a designated site and shall be deposited in accordance with the directions of the Waste Disposal Site Attendant and the provisions of this by-law and Schedule “C”.

4.6 Scrap metal and all white goods, except for units containing Freon or Ozone depleting refrigerant such as refrigerators, freezers, air conditioners, shall be separated from other waste to be disposed of in the designated area at a designated site (Schedule A) and in accordance with the directions of the Site Attendant.

4.7 White goods containing Freon or any Ozone depleting refrigerant such as refrigerators, freezers, air conditioners or any other unit containing this substance shall not be deposited until the required tipping fee, as set out in Schedule "D" is paid to the Waste Disposal Attendant, who will in turn issue a receipt for payment.

4.8 Brush and clean, untreated lumber shall be deposited at a designated site (Schedule A) in a designated area.

4.9 Tires may be disposed of at a designated site (Schedule A) in a designated area. No fee shall be charged to dispose of a dry and clean passenger car or light truck tire.

4.10 Electronics shall be deposited at a designated site (Schedule A) in a designated area.

4.11 Burning operations at a Waste Disposal Site shall be in conformity with the requirements of the Ministry of Environment, Conservation and Parks as well as the Facilities and Environment Manager and provisions of this by-law as set out in Schedule "F".

4.12 No person shall dispose of waste, white metal or scrap metal that contains residue of gasoline, toxic chemicals, P.C.B. or other such hazardous materials in the landfilling (face) area at any Waste Disposal Site in the Township of Greater Madawaska.

4.13 Residents of the Township of Greater Madawaska wishing to dispose of Household Hazardous Waste shall do so at the Household Hazardous Waste Depot located at The Town of Renfrew's Waste Site, 376 Bruce St. The types and quantities of Household Hazardous Material accepted are as listed in Schedule "E".

If household hazardous waste is deposited (even though prohibited) at a Township waste site, the hazardous waste is to be safely moved by the Waste Disposal Attendant away from public access. The Waste Disposal Attendant is to then notify their supervisor to have it removed from the site.

4.14 Commercial haulers shall only be permitted to dispose of garbage that has originated within the boundaries of the Township of Greater Madawaska. The Waste Disposal Attendant shall report any suspected contravention of this clause to the CAO, who will provide the individual or firm with a written warning. Continued contravention of this Clause shall be deemed to be an infraction and subject to penalties as provided herein.

Mixed waste as defined in Section 1 shall be disposed of as Household waste. At no time shall a Waste Disposal Attendant open and/or remove recyclable waste items.

4.15 Wastes properly disposed of at Waste Disposal Sites in the Township of Greater Madawaska and approved Township of North Frontenac residents are subject to fees as defined in Schedule "D".

5. Penalties and Enforcement

5.1 Any person guilty of an infraction of any provision of this By-law may on conviction, pay a fine or penalty not exceeding $5,000.00, exclusive of costs, for each and every offence and such penalty shall be recoverable under the Provincial Offences Act. Upon conviction for a breach of the provisions of this By-law, the court of jurisdiction may make an order prohibiting the continuation or repetition of the offence by the offender.

5.2 Where a person fails or defaults to carry out any direction or action required by the Township of Greater Madawaska as authorized by this By-law, upon reasonable and written notice, the Township of Greater Madawaska may proceed to do such things or carry out such actions as directed, at the expense of the person and such expense may be recovered by the

Township of Greater Madawaska in a like manner as taxes in accordance with the provisions of the *Municipal Act 2001* Chapter 25, Section 398 (1) and amendments thereto.

5.3 Should any section, clause or provision in this By-law be held by a court of competent jurisdiction to be invalid, the validity of the remainder of this Bylaw shall not be affected.

6. Administration

6.1 The Waste Disposal Attendant shall supervise day-to-day operations at the Waste Disposal Site under the direction of the Supervisor and shall enforce compliance with the provision of this By-law.

6.2 Council may by resolution grant a minor variance to provisions of this Bylaw in circumstances where Council in its unfettered sole discretion deems that such action is within public interest and not contrary to the intent of this By-law.

6.3 Council may authorize studies and programs and the preparation of policies for the maximization of the life expectancy, efficiency and effectiveness of the Municipal Waste Disposal Sites and the reduction, reuse, and recycling of waste.

7. Schedules

The following schedules annexed and attached to this By-law shall form a part of this Bylaw:
Schedule A – Designated Sites Where Specific Types of Waste May Be Deposited
Schedule B – Prohibited Waste Materials- Acceptable Waste/Recyclable Materials
Schedule C – Recycling
Schedule D – Tipping Fees
Schedule E – Hazardous Waste Policy
Schedule F – Burning Policy

8. Implementation

8.1 This By-law repeals By-law 21-2018 and any and all previous by-laws pertaining to waste disposal upon its effective date.

READ a first and second time this 17th day of August, 2023.

READ a third time and passed this 17th day of August, 2023.

Rob Weir	Robin Emon
Mayor	Deputy Clerk

SCHEDULE "A"
BY-LAW 41-2023

Designated Sites for Waste

WASTE SITE HOURS

Site	Recyclable	Scrap Metal	White Goods	Bulky	C&D	Tire	Commercial	Electronic	House-hold Waste
Norway Lake Site	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Griffith Site	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mt. St. Patrick Site	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Black Donald Site	No	No	No	Yes	Yes	No	No	No	No

Norway Lake Site, 574 Norway Lake Road
Wednesday 8 a.m. – 4 p.m.
Saturday 8 a.m. – 6 p.m.
Sunday 10 a.m. – 5 p.m.
May long weekend to Thanksgiving weekend
Sunday 10 a.m. – 6 p.m.
Holiday Mondays (Victoria Day, Civic Holiday, Labour Day, Thanksgiving Day) 12 p.m. – 6 p.m.

Griffith Site, 6 Finns Road
Wednesday 1 p.m. – 5 p.m.
Saturday 1 p.m. – 5 p.m.
Sunday 1 p.m. – 6 p.m.
May long weekend to Thanksgiving weekend
Holiday Mondays (Victoria Day, Civic Holiday, Labour Day, Thanksgiving Day) 12 p.m. – 6 p.m.

Mount St. Patrick Site, 134 Flat Road
Wednesday 8a.m. – 12 p.m.
Saturday & Sunday 8 a.m. – 12 p.m.
Holiday Mondays Closed

SCHEDULE "B"
BY-LAW 41-2023

PROHIBITED WASTE MATERIALS

Disposal of the following items shall be strictly prohibited in any of the Waste Disposal Sites and/or Transfer Stations in the Township of Greater Madawaska:

☐ Asphalt pavement
☐ Biological or pathological waste
☐ Dead Animals
☐ Human Sewage
☐ Industrial or Manufacturers Waste
☐ Petroleum-soaked rags or explosives or any other highly combustible Material
☐ Hazardous Waste

ACCEPTABLE WASTE/RECYCLING MATERIALS

- Appliances and White Goods
- Brush and/or leaves and clean, untreated lumber/wood
- Construction Waste – separated (i.e. clean lumber separated from contaminated lumber; glass separated from metal, etc.)
- Demolition Wastes – toilets, shingles, lumber, brick, masonry etc.
- Fiberglass Insulation and SM Styrofoam (waste)
- Household garbage
- Household Furniture – i.e. beds, mattresses, couches, chairs, etc.
- Scrap metal – i.e. B.B.Q.
- Tires
- Waste Electrical – i.e. televisions, radios, computers, monitors, etc.

SCHEDULE "C"
BY-LAW 41-2023

RECYCLING

All recycling items shall be placed within the applicable compartment of the recycling bin located at the Waste Sites and or as directed by the Waste Disposal Attendant.

- All container recycling may be mixed but must be kept separate from paper recyclables.
- Container recyclables must be deposited loose inside the transfer station bins.
- Paper recyclables must be deposited loose inside the transfer station bins.
- Paper in plastic bags is not acceptable, with the exception of shredded paper.
- Shredded paper can be in clear plastic bags or grocery bags.
- Paper must be kept as clean and dry as possible.
- All paper recycling can be mixed but must be kept separate from container recyclables.
- Cardboard boxes should be flattened.

RECYCLABLE MATERIALS ACCEPTED

Paper Recycling

Advertising Flyers (bond & glossy)
Boxboard
Clean, corrugated cardboard
Computer paper
Egg cartons
Envelopes • File folders • Greeting cards
Hard cover books (covers & bindings removed)
Junk mail • Magazines • Mixed office paper
Newsprint • Packing paper • Phone books
Shredded paper (in a clear plastic bag)
Soft cover books • Wrapping paper

Container Recycling

Aluminum pop cans • Cardboard cans (with metal ends)
Coffee cup lids • Empty aerosol and paint cans
Milk & juice cartons, juice boxes
Non-refundable glass bottles and jars
Plastic food and beverage
Pop and water bottles
Small scrap metal items • Steel cans and lids

MATERIAL NOT ACCEPTED WITH RECYCLABLE ITEMS

These items may be placed in with your regular garbage

Juice pouches & foil food wrappers
Plastic household items & toys
Chip & sandwich bags, plastic wrap
Home health care waste,
plastic tubing, IV bags
Glasses or dishes
Salt, fertilizer, soil & wood pellet bags
Plastic bags & food packaging
(bacon, hot dog, pizza wrappers)
Styrofoam packing Styrofoam cups and plates

SCHEDULE "D"
BY-LAW 41-2023

WASTE SITE USER FEES & CHARGES

Fees & Charges By-law

To be in accordance with the most recent Fees & Charges By-law.

SCHEDULE "E"
BY-LAW 41-2023

HAZARDOUS WASTE LIST

- Solvents: Turpentine, Disinfectants, Household Cleaners, Bleach, Oven And Drain Cleaners, Furniture Stripper, Ammonia Etc.
- Pesticides: Herbicides, Pesticides, Insecticides, Weed Killer Etc.
- Pool Cleaners
- Used Oil: Oil and Brake Fluid
- Gasoline
- Anti-Freeze
- Batteries: Small Home Batteries, Car, and Boat Batteries.
- Paints: All types of Paint and Stains, Varnish Etc.

HOUSEHOLD HAZARDOUS WASTE ACCEPTED AT:
Town of Renfrew Landfill Site (613-432-0731)
376 Bruce Street — Mid May to Mid August
Tuesday, Wednesday & Saturday 8:00 a.m. to 4:00 p.m.
Thursday 8:00 a.m. to 7:00 p.m.
Closed Friday, Sunday & Monday

SCHEDULE "F"
BY-LAW 41-2023

BURNING AT WASTE DISPOSAL SITES POLICY

1. Burning will be carried out only in the designated burning area when prevailing weather conditions are suitable and according to the Site's Certificate of Approval. (i.e., no high winds and the operation should be supervised).

2. Prior to burning, tires, plastics or wet materials which may cause smoke or other undesirable emissions must be segregated and not burned.

3. The Facilities and Environment Manager shall notify the municipal office and the appropriate fire department personnel prior to burning.

4. The area of burning must be restricted in order to enable the operator to extinguish the fire immediately if necessary due to a change in weather or other conditions or if so ordered by the Ministry of Natural Resources and Forestry, a designated official of a Municipal Fire Department, or the Ministry of Environment, Conservation and Parks.

5. Access to the burn area by the public and/or other unauthorized personnel shall be controlled when burning is carried out. Burning shall take place when the Waste Disposal Site is closed.

6. Complaints from local residents regarding smoke or odor emissions will be referred to the Municipal Office. Office staff will work with the Facilities and Environment Manager to attempt to resolve the matter. If the situation cannot be resolved satisfactorily, the Facilities and Environment Manager may be ordered to stop burning.

7. The Facilities and Environment Manager shall comply with the Environmental Protection Act (R.S.O. 1990, c E.19, s.27), when burning.

8. Burning operations may only be carried out by authorized personnel.

9. A minimum of one authorized personnel shall be present for the controlled burn.

Annual Waste Statistics
2024

Location	Bags	Vehicles	Trailers	Bins	Tri-Axles	Waste (mt)	Containers (mt)	Fibres (mt)	OCC (mt)
Norway Lake Transfer Station	26677	12309				453	61	36	37
Mt.St. Patrick Transfer Station	10849	3,801	128	5	37	62	11	6	3
Griffith Transfer Station	13913	5601	54			109	22	10	10
Black Donald Waste Site					2				

Waste Site	Electronics (mt)	OTS #	Fridge #	Metal (mt)	Leaf/Yard (m^3)	C & D (m^3)
Norway Lake	6	286	36	91	932	4,406
Mt. St. Patrick	3	68	10	24	117	446
Griffith	4	143	27	24	407	782
Black Donald	0	0	0	0	0	0

Leaf/Yard and C&D measurements are in bulk, before being shredded

Location Items Transferred To	Unit	January	February	March	April	May	June	July	August	September	October	November	December	Annual Total
Emterra - Renfrew, ON Blue Box Materials	mt	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Ottawa Valley Waste Recovery Centre, Pembroke, ON Blue Box Materials	mt	8.35	7.37	10.25	6.5	12.6	12.6	17.6	18.22	9.9	12.3	10.56	8.72	**134.97**
GFL - MooseCreek, ON Household Waste	mt	46.46	28.66	34.2	23.94	48.56	37.6	66.32	24.9	42.4	32.05	29.1	38.7	**452.89**
Yolkowski Scrap Metal - Renfrew, ON Scrap Metal	mt	0	6.98	9.07	13.85	10.32	4.1	12.05	6.94	10.43	13.94	3.59	0	**91.27**
Mt. St. Patrick Site, Dacre, ON Construction & Demolition Material	m3	168	163	202	369	509	526	500	645	611	328	218	167	**4406**